KONGSBERG

K-Bridge Multi-functional Display Unit

Operator Manual

Kongsberg Maritime Part no. 371218

Release 6.1

381287/A

Document history

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Rev. A	August 2013	First issue, for release 6.1.x of the K-Bridge Navigation Software.

Note

Comments

To assist us in making improvements to the product and to this manual, please send comments and constructive criticism to the following e-mail address:
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Warnings and Cautions

WARNING

The equipment includes high voltage (230V) which means that the possibility of receiving an electrical shock is present.

WARNING

Lethal voltage

This system is not fitted with safety interlocks and lethal voltages may be exposed when access covers are removed. Only persons qualified and authorised must remove covers and these persons should always take extreme care once the covers are removed.

WARNING

Fire

If a fire condition arises, emission of toxic fumes can be anticipated from burning insulation, printed circuit boards, ETC.

WARNING

Health hazard

When cleaning the inside of this system, do not inhale the dust. The dust is a temporary health hazard, depending on individual allergies.

Kongsberg Maritime AS disclaims any responsibility for damage or injury caused by improper installation, use or maintenance of the equipment.

WARNING

Rotating antenna

The rotating antenna may be dangerous for people close by. The radiation levels at short distances may be harmful, especially for the eyes if you look straight into the antenna when it is transmitting.

Due caution should be used when working close to the antenna. A note should be left at the radar display that work is going on close to the antenna, and that the radar should not be switched on.

There are normally isolation switches to inhibit rotation and transmission during work.

They are normally located so that they may be operated by the radar operator. For S-Band there is also a switch on the Scanner Control Unit which inhibits rotation and transmission. For other antennae, if there is an isolation switch for the Scanner Control Unit, the switch should normally be located close to the Scanner Control Unit for ease of operation.

WARNING

Radiation hazard

Keep outside the hazard zone around an antenna or open waveguide that is radiating power.

Refer to the table below for hazard zones.

When it is necessary to work on the scanner unit, make sure the radar is switched OFF and that both the mains isolator and the scanner control unit are turned to the OFF position.

Never look directly into an open waveguide.

Radar and other forms of radio frequency radiation can cause cardiac pacemakers to malfunction. If you use a cardiac pacemaker and suspect a malfunction, leave the vicinity of the radar system immediately and seek medical advice.

Most countries accept that there is no significant radiation hazard at radio frequency power density levels of up to 100 W/m^2 (10 mW/cm^2).

Table 1 Radiation hazard zones for antennae of different lengths

Antenna length	**100 W/m^2**	**50 W/m^2**	**10 W/m^2**
1.2m (4ft) X-band	1.7m	3.4m	17m
1.8m (6ft) X-band	1.05m	2.1m	10.5m
2.4m (8ft) X-band	0.75m	1.5m	7.5m
2.7m (9ft) S-band	0.73m	1.5m	7.3m
3.7m (12ft) S-band	0.55m	1.1m	5.5m

Caution

Electrostatic sensitive device

Certain semi-conductive devices used in this equipment are liable to damage due to static voltage. Observe all precautions for handling of semi-conductive sensitive devices.

Note

The information contained in this document is subject to change without notice. Kongsberg Maritime AS shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this document.

List of abbreviations

AC	Alternating current
ACQ	Acquire
AIS	Automatic Identification System
ARCS	Admirality Raster Chart Service
ARPA	Automatic Radar Plotting Aid
BCR	Bow Crossing Range
BCT	Bow Crossing Time
BIST	Built In System Test
CD	Compact Disk
CFAR	Constant False Alarm Ratio
CLK	Clock
COG	Course Over Ground
CPA	Closest Point of Approach
CPU	Central Processing Unit
CRS	Course
CTW	Course Through Water
DCU	Display and Control Unit
dGPS	Differential GPS
EBL	Electronic Bearing Line
ECDIS	Electronic Chart Display and Information System
ETA	Estimated Time of Arrival
GMDSS	Global Maritime Distress and Safety System
GPS	Global Positioning System
HCRF	Hydrographic Chart Raster Format
HDG	Heading
IBS	Integrated Bridge System
IEC	International Electrotechnical Commission
IMO	International Maritime Organisation
INS	Inertial Navigational System. System used to improve dead reckoning by the use of accelerometers and gyro systems. Mostly used on military vessels
INS	Integrated Navigation System
I/O	Input/Output
IP	Ingress Protection

KM	Kongsberg Maritime
LAN	Local Area Network
LRU	Line Replaceable Unit
Man	Manual
MBS	Main Bang Suppression
MED	Marine Equipment Directive (Council Directive 96/98/EC of 20 December 1996 on Marine Equipment)
MHz	Mega Hertz
MMSI	Maritime Mobile Service Identifier
MOB	Man Over Board
NAVINT	Kalmanfilter based on NAVigation INTegrator
NC	Normally Closed
NM	Nautical mile
NO	Normally Open
NMEA	National Marine Electronics Association (USA)
PC	Personal Computer
PCB	Printed Circuit Board
PCI	Peripheral Component Interconnect (PC bus)
PDOP	Position Dilution of Precision
PROX	Proximity
PRF	Pulse Repetition Frequency
PRN	Satellite designated number
RAIM	Receiver Autonomous Integrity Monitoring
RL	RhumbLine
RIC	Radar Interface Card
RM	Relative Motion
ROM	Read Only Memory
ROT	Rate Of Turn
RPM	Revolutions Per Minute
RS	Radar System
Rx	Receive
SA	Combined Sync, Azimuth and Headingline signal
SART	Search and Rescue Transponder
SMG	Speed Made Good
SINT	Sensor Interface
SOG	Speed Over Ground

STW	Speed Through Water
TCPA	Time to Closest Point of Approach
TFT	Thin Film Transistor
TIC	Transceiver Interface and Control
TM	True motion
TP	Turn Point
TTD	An NMEA sentence for tracked target data
Tx	Transmit
UPS	Uninterruptible Power Supply
UTC	Coordinated Universal Time
UTM	Universal Transverse Mercator
VRM	Variable Range Maker
WGS84	World Geodetic System 1984
WOL	Wheel-over Line
WOP	Wheel-over Point
WPT	Waypoint
XTD	Cross Track Distance
XTL	Cross Track distance Limit

Glossary

AIS targets	Targets received from an external AIS receiver.
Apparent wind	See **Relative wind**.
Bearing	The horizontal direction of one terrestrial point from another, expressed as the angular distance from a reference direction, clockwise through 360º.
C-Map	Third party supplier of electronic charts.
Cartesian coordinate system	A coordinate system where the axes are mutually-perpendicular straight lines. Cartesian systems used are UTM, US State Plane and Local N/E.
Course	The horizontal direction in which a vessel is steered or is intended to be steered, expressed as angular distance from north, usually from 000º at north, clockwise through 360º. Differs from heading. **COG** - Course over Ground. **CTW** - Course Through Water
Cross track distance	The distance from the vessel's present position to the closest point on the track
Datum	Mathematical description of the shape of the earth (represented by flattening and semi-major axis as well as the origin and orientation of the coordinate systems used to map the earth).
Dead reckoning	The process of determining the position of a vessel at any instant by applying to the last well-determined position the run that has since been made, based on the recent history of speed and heading measurements.
Destination	The immediate geographic point of interest to which a vessel is navigating. It may be the next waypoint along a route of waypoints or the final destination of a voyage
ECDIS	Electronic Chart Display and Information System. A navigation information system which can be accepted as complying with the up-to-date chart required by regulation V/20 of the 1974 SOLAS Convention, by displaying selected information from a SENC with positional information from navigation sensors to assist the mariner in route planning and route monitoring, and if required display additional navigation-related information.
ENC	Electronic Navigation Chart. A Cell for use in ECDIS systems.
Feedback	Signals returned from the process (vessel) and used as input signals to the Vessel Model.
Gyrocompass	A compass having one or more gyroscopes as the directive element, and which is north-seeking. Its operation depends on four natural phenomena: gyroscopic inertia, gyroscopic precession, the earth's rotation and gravity.

Heading	The horizontal direction in which a vessel actually points or heads at any instant, expressed in angular units from a reference direction, normally true north, usually from 000º at the reference direction clockwise through 360º. Differs from **course**.
IAS	Integrated Automation System from Kongsberg Maritime. In an Integrated Automation System the K-Bridge communicates with other Kongsberg Maritime systems such as K-Chief and K-Thrust via a dual ethernet LAN.
IHO	International Hydrographics Organisation. Coordinates the activities of national hydrographic offices; promotes standards and provides advice to developing countries in the fields of hydrographic surveying and production of nautical charts and publications.
IMO	International Maritime Organisation. The IMO is the specialised agency of the United Nations responsible for maritime safety and effiency of navigation.
K-Bridge	Kongsberg Maritime new line of Bridge products, such as K-Bridge Radar, K-Bridge ECDIS, K-Bridge Planning, K-Bridge Conning.
Kalman Filter	The Kalman filter is a set of mathematical equations that provides an efficient computational (recursive) solution of the least-squares method. The filter is very powerful in several aspects: it supports estimations of past, present and even future states, and it can also do so even when the precise nature of the modelled system is unknown.
Leg	The straight line between two waypoints.
Log	An instrument for measuring the speed or distance or both travelled by a vessel.
Reference origin	The reference point of the first position-reference system that is selected and accepted for use with the system. The origin in the internal coordinate system.
Relative bearing	The bearing of an object relative to the vessel's heading.
Relative wind	The speed and relative direction from which the wind appears to blow with reference to the moving vessel.
Roll	Vessel rotation about the own-ship's centre line.
Route	A planned course of travel, usually composed of more than one leg.
S-52	An IHO publication defining the standard for presentation of charts on ECDIS.

S-57	The standard for the transfer of digital hydrographic data. This consists of (Part A) the Object Catalogue, (Part B) the S-57 format and digitizing or transfer conventions. Published by the IHO as its special Publication 57 (S-57).
SENC	A database resulting from transformation of the ENC by ECDIS for appropriate use, updates to the ENC by appropriate means and other data added by the mariner. It is this database that is actually accessed by ECDIS for display generation and other navigational functions and is equivalent to an up-to-date paper chart. The SENC may also contain information from other sources.
SOLAS	International Convention for the Safety of Life at Sea developed by IMO.
Surge	Vessel movement in the fore-and-aft direction.
Sway	Vessel movement in the transverse direction.
Setpoint circle	The circle around the terminal buoy where the vessel is positioned during offshore loading operations.
Thruster	In this document, this is used as a general term for any element of the vessel's propulsion system, such as an azimuth thruster, tunnel thruster, propeller or rudder.
Track	A route to be travelled defined by two or more waypoints. Line of travel may follow arcs with system or operator defined turn radius at waypoints.
Tracked targets	Radar targets tracked by the display unit's tracking algorithm.
Transponder	In this document, this is the physical reference of a position-reference system. For example: for an HPR system this means any deployed transponder; for an Artemis system, the Fixed Antenna unit/beacon; for a Taut Wire system, the depressor weight.
True bearing	Bearing relative to true north.
VAC	Voltage, Alternating Current
VDC	Voltage, Direct Current
Way point	A defined position or reference point on a track.
Way point table	A set of way points with their parameters, shown in a tabular form, which defines the track the vessel will follow.
Wheel-over point	The point where a vessel is commanded to change heading before a waypoint.
Windows	A computer operating system.
Yaw	Vessel rotation about the vertical axis; change of heading.

Table of contents

1 The Multi-functional Display console

This section contains the following topics:

1.1 Introduction

This manual describes the Radar, ECDIS, and Conning applications provided on the K-Bridge Multi-functional Display (MFD) units running release 5.x (or later) of the K-Bridge navigation software.

This chapter describes the operator panels and controls on the Multi-functional Display (MFD) console.

For a description of the user interfaces to the three applications available on the MFD unit, see *The Radar, ECDIS and Conning displays* on page 47.

For information about starting and stopping the MFD, switching between the different applications, and controlling the brightness of the display, see *Basic setup information* on page 103.

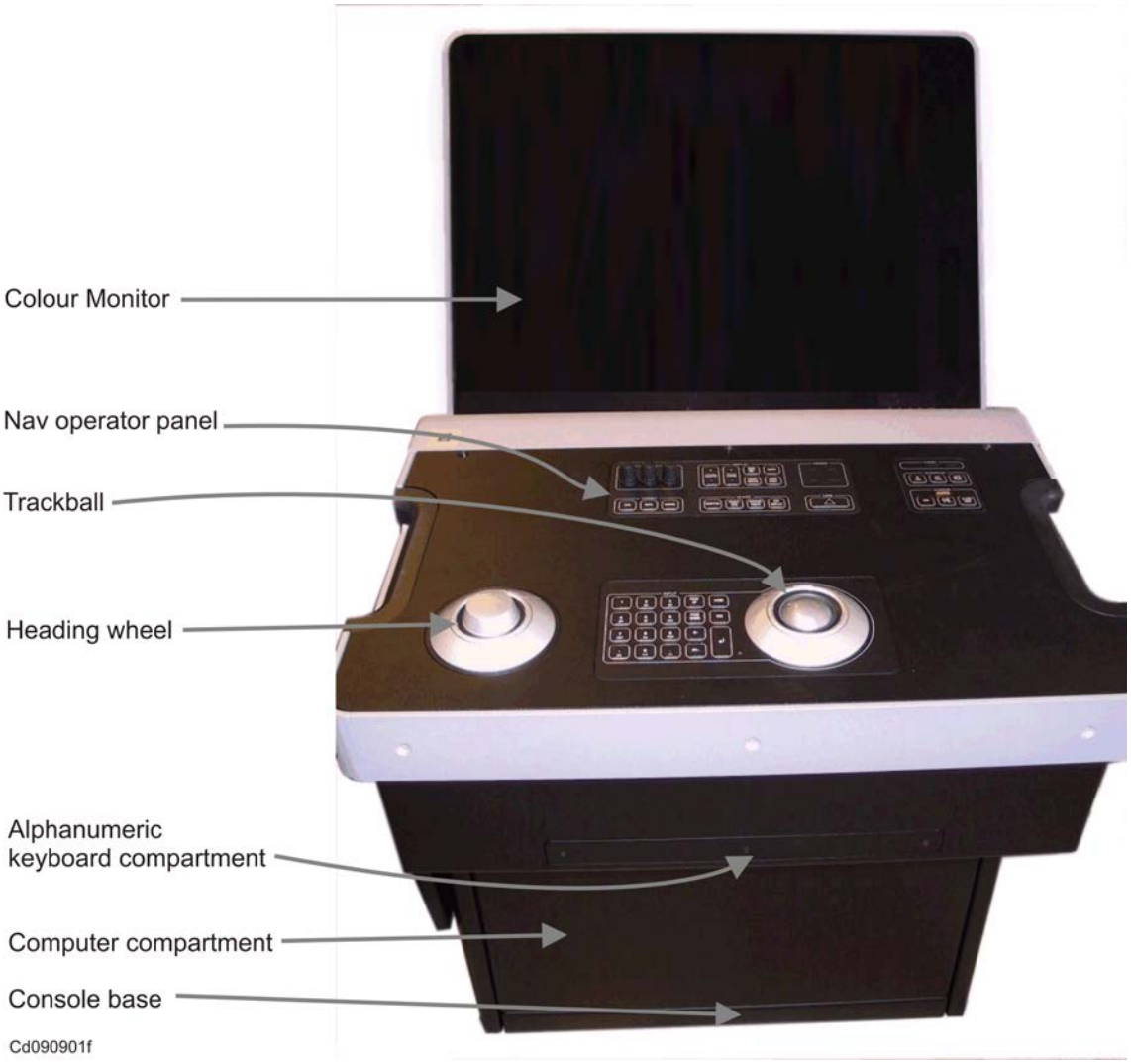
1.2 The console

The console of the Multi-functional Display (MFD) unit is fitted with a 26” or 27” colour display with a resolution of 1920 x 1200, or a 23” colour display with a resolution of 1600 x 1200.

The display presents radar and chart images and symbols, on-screen data such as the own-ship's heading and speed, information about radar targets, and conning information. (To switch the display between radar, chart, and conning information, see *Switching between Radar, ECDIS and Conning* on page 120.)

The display has a nominal viewing distance of 1.5 metres, which makes it comfortably viewable from the navigator's chair on the bridge of the vessel.

Figure 1 The K-Bridge Multi-functional Display (MFD) console



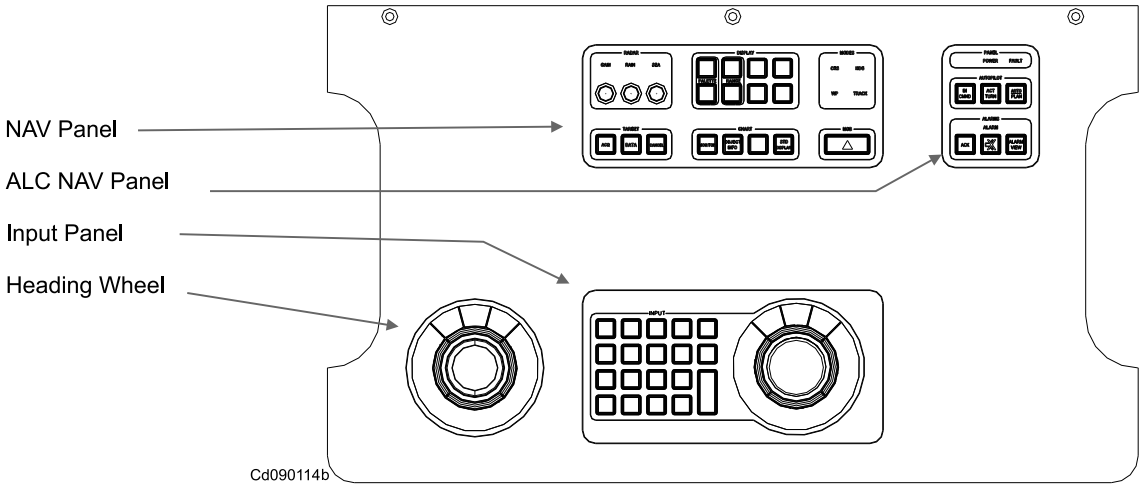
1.3 The operator panel and controls

The console contains an operator panel with a track-ball and a computer-style keyboard. The keyboard is located in a drawer below the operator panel. Use the openings underneath the operator panel to pull this drawer out.

The operator panel contains buttons that give immediate access to the most frequently used functions. These functions can in most cases also be accessed using the track-ball and select keys. The buttons are organized into sub-panels and command groups. These sub-panels, command groups, and all the buttons involved are described in the remainder of this chapter.

The layout of the operator panel is shown in the figure below.

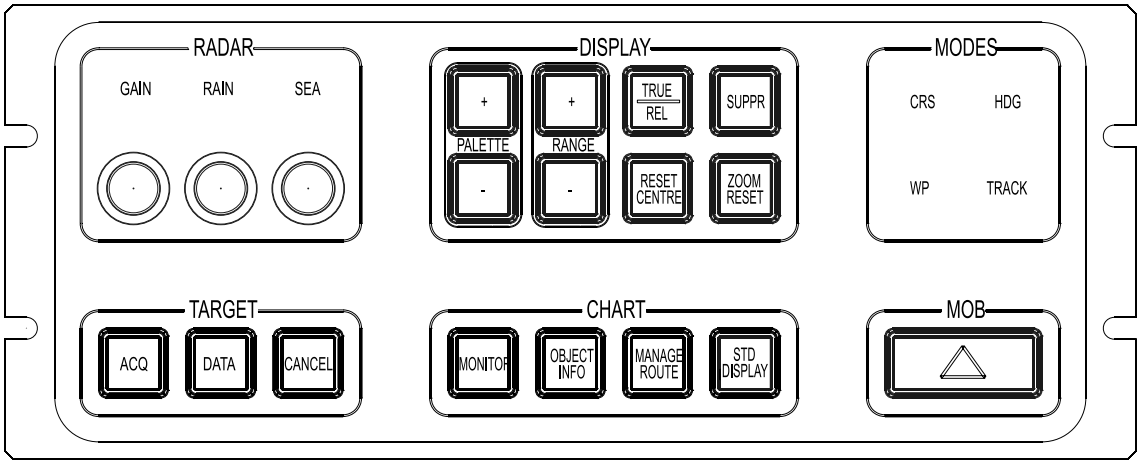
Figure 2 Layout of the operator panel



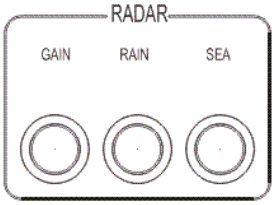
1.4 The NAV (navigation) panel

The NAV panel contains the following command groups for Navigation commands: Radar, Display, Modes, Target, Chart and Man Over Board (MOB). For details of the buttons in each group, see the figures and description below.

Figure 3 NAV (navigation) panel



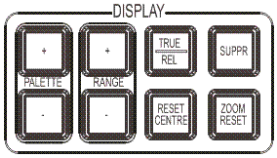
1.4.1 The RADAR group knobs



The RADAR group comprises three knobs:

- **Gain**. Used for setting of radar gain level.
- **Rain**. Used for setting of manual anti rain clutter level.
- **Sea**. Used for setting of manual anti sea clutter level.

1.4.2 The DISPLAY group buttons



The DISPLAY group contains six buttons:

- **PALETTE (+/-)**. Use **+** to brighten and **-** to darken the display.
- **RANGE (+/-)**.

  For K-Bridge Radar: Increases/decreases the range setting by one increment.

  For K-Bridge ECDIS: Increases/decreases the chart scale by a factor of two.
- **TRUE/REL**. Toggles between true and relative vector presentation mode.
- **SUPPR**.

  For K-Bridge Radar: Removes all static information from the display, leaving only the radar video.

  For K-Bridge ECDIS: Removes radar video and targets from the display when video or targets are visible.
- **RESET/CENTRE**.

  For K-Bridge Radar:

  – *True motion:* causes the sweep center to move to the position on the screen that gives the maximum possible look-ahead. For example, if the vessel is sailing from west to east, resetting the center will position the sweep center as close as possible to the left edge of the display. The reset also causes the vessel's course vector to point through the center of the display.

  – *Relative motion:* moves the sweep centre to the centre of the display.

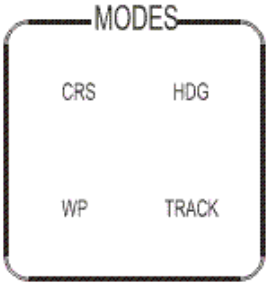
  – *Course Up:* resets the orientation of the screen so that upwards signifies the direction of the ship's heading (instead of signifying North).

  For K-Bridge ECDIS: This button causes the system to move the own-ship symbol on the screen to the position that gives the maximum possible look-ahead. For example, if the vessel is sailing from west to east, resetting the center will position the own-ship symbol as close as possible to the left edge of the display. The reset also causes the vessel's course vector to point through the center of the display.
- **ZOOM/RESET**.

  – For K-Bridge Radar: No effect.

  – For K-Bridge ECDIS: Resets chart scale to largest available.

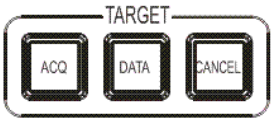
1.4.3 The MODES group lamps



The MODES group contains four lamps:

- **CRS**. When the lamp is lit green it indicates that the Autopilot operates in *Course* Mode. Turn commands from Curved EBL are accepted.
- **HDG**. When the lamp is lit green it indicates that the Autopilot operates in *Heading* Mode. Turn commands from Curved EBL are accepted.
- **WP**. When the lamp is lit green it indicates that the Autopilot operates in *Way Point* Mode.
- **TRACK**. When the lamp is lit green it indicates that the Autopilot operates in *Track* Mode.

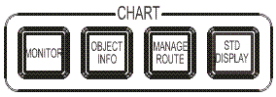
1.4.4 The TARGET group buttons



The TARGET group contains three buttons:

- **ACQ**. The system will search for a radar echo near the marker and try to acquire and track it as a target.
- **DATA**. Opens the Target Information dialog with information about the target closest to the marker (see *Target Information* on page 404).
- **CANCEL**. Causes tracking of the target closest to the marker to cease.

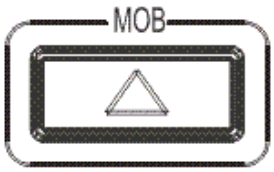
1.4.5 The CHART group buttons



The CHART group contains four buttons:

- **MONITOR**. Press this button to display the chart centred on the own-ship's current position. The best chart for that position is then loaded.
- **OBJECT INFO**. Press this button to display information about an object in the chart (see *Object Info* on page 377).
- **MANAGE ROUTES**. Press to manage routes (see *Route List* on page 416).
- **STD DISPLAY**. This button selects the standard chart themes (see *Chart Themes* on page 373). It has effect only when charts are displayed.

1.4.6 The MOB (Man Over Board) button



The MOB (Man Over Board) group contains only one button. Press it to record the ship's position at the time of a Man-Over-Board incident.

1.5 The ALC (alarm and control) NAV panel

The ALC NAV panel contains the following command groups:

- The Panel group (see *The Panel group* on page 36)
- The Autopilot group (see *The Autopilot group* on page 37)
- The Alarms group (see *The Alarms group* on page 39)

Figure 4 The ALC (alarm and control) NAV panel

1.5.1 The Panel group

The PANEL group contains two lamps:

- **POWER:** This lamp is lit green when power to the operator panel is OK.
- **FAULT:** This lamp is lit red when the operator panel has lost contact with the computer; otherwise the lamp is off.

1.5.2 The Autopilot group

The AUTOPILOT group contains two buttons with lamps and one button without a lamp:

- The IN CMD button (see *The IN CMD button* on page 37)
- The ACT TURN button (see *The ACT TURN button* on page 38)
- The AUTO/PLAN button (see *The AUTO/PLAN button* on page 39)

1.5.2.1 The IN CMD button

IN CMD (In Command): when you press this button on the operator panel, its lamp starts to flash green and the console attempts to become the operator station that is “in command” of the autopilot.

Once the console is successfully “in command”, the **IN CMD** button's lamp is lit a constant green. This indicates that:

1 This console is in command of the autopilot.

One of the lamps in the MODES group will be lit at the same time to indicate the autopilot's operating mode; when the autopilot allows itself to be commanded by a console, the console automatically attempts to activate Heading Mode. (For a description of the MODES group of lamps, see *The MODES group lamps* on page 35.)

2 The vessel's steering control system is switched to autopilot control.

3 The autopilot is ready to control the vessel's steering system.

When the **IN CMD** button is lit (indicating the above conditions), if you press it again, the Autopilot Modes dialog appears on the Radar or ECDIS console screen (see *Autopilot Mode* on page 427).

For information about how to make a particular operator station take command of the autopilot whenever the vessel's steering control switches from manual to autopilot, see *Making one console take command of the autopilot by default* on page 249.

1.5.2.2 The ACT TURN button

ACT TURN (Activate Turn): Pressing this button has different effects depending on the context in which it is pressed. Its main function is to cause the autopilot to accept a planned manoeuvre as input. But specifically it enables you to:

- **Specify a preset turn**

  If the autopilot is in heading or course mode, press the **ACT TURN** button to use the heading wheel and/or turn radius buttons to specify a turn that will not be performed immediately. A 'PT' symbol appears near the own-ship symbol on the console display to indicate that the heading controls are being used to specify a future maneouvre, not an immediate one. While the 'PT' symbol is displayed — and the button's green lamp is lit but blinking off every two seconds — you are free to use the heading controls without affecting the autopilot's heading set-point.

- **Activate a preset turn**

  When you have finished specifying a preset turn and you want to activate it, press the **ACT TURN** button again. The button's lamp flashes on and off three times after you press it to send a new manoeuvre to the autopilot.

- **Activate a planned turn**

  If you have pressed the **AUTO/PLAN** button (see below) in this command group and specified a planned turn (using the Trial Manoeuvre and Curved EBL facilities, see *Trial Manoeuvre and Curved EBL* on page 473), press the **ACT TURN** button to activate the planned turn. (The turn will be activated as a defined route, therefore the autopilot will go into track mode to execute it.)

  The **ACT TURN** button's lamp remains on while you specify a planned turn, and a 'P' symbol appears near the symbol of the own-ship on the console display. While the **ACT TURN** button lamp is on and you see the 'P' symbol, you can use the heading controls without affecting the autopilot's current heading set-point.

  The lamp flashes off three times after you press the **ACT TURN** button to send the new manoeuvre to the autopilot.

- **Abort a preset or planned turn**

  Press the **ACT TURN** button twice to abort a manoeuvre that has been sent to the autopilot.

- **Exit Track or Waypoint mode**

  Press the **ACT TURN** button twice to exit track or waypoint mode.

1.5.2.3 The AUTO/PLAN button

AUTO/PLAN (Autopilot Plan). This button toggles the Nav OS's display between the AUTO view and the PLAN view. These are:

- A real-time view of the vessel under the autopilot's control (AUTO).
- A view in which you can use the console display and heading wheel controls — along with the Curved EBL dialog — to specify a planned or preset turn (PLAN).

Press the **AUTO/PLAN** button to stop specifying a planned or preset turn (before you have activated it) and return the chart or radar display to a real-time view of the vessel under the autopilot's control.

If the chart or radar display currently shows the real-time view of the vessel under the autopilot's control, press the **AUTO/PLAN** button to start specifying a planned turn.

When you are specifying a planned manoeuvre, a 'P' symbol appears near the own-ship symbol on the console display.

When you are specifying a preset turn, a 'PT' symbol appears.

For more information about specifying manoeuvres in advance, see *Using the curved EBL facility* on page 308 and *Using the trial manoeuvre facility* on page 313. The Trial Manoeuvre facility enables you to test a turn before executing it to see whether it involves a risk of collision with a radar target. The facility is only available in the radar system (see also *Trial Manoeuvre and Curved EBL* on page 473).

1.5.3 The Alarms group

The Alarms group is comprised of one lamp and three buttons without a lamp.

- **ALARM**. This lamp flashes red when an alert has been detected. The lamp remains lit while the alert is still active. The lamp is dark when there are no active alerts present.
- **ACK**. Press this button once to see a list of unacknowledged alerts for the alert group of the most recent unacknowledged alert (see *Acknowledging alerts in the Alert Group dialog* on page 336.

  Press the button again to acknowledge all unacknowledged alerts in that group (as long as they have all been displayed; see *Acknowledging several alerts at once* on page 335).

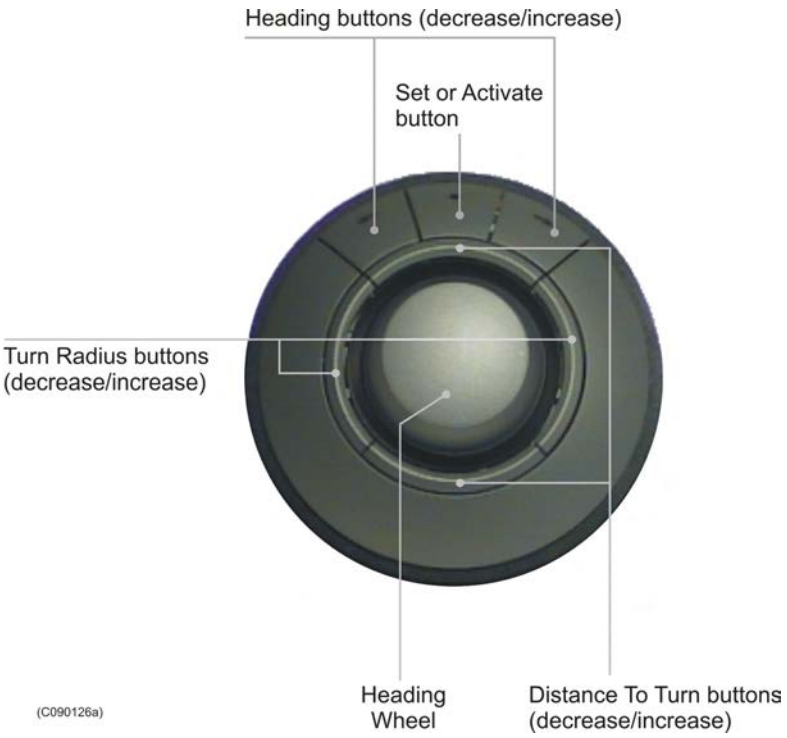
- **SOUND OFF**. Press this button to silence audible alerts. When more than one display unit is connected to the local area network, pressing the **SOUND OFF** button on any display unit will silence the audible alert on all units.
- **ALARM VIEW**. Press this button toggles the Alert Group dialog between the different alert groups (see *Acknowledging alerts in the Alert Group dialog* on page 336).

1.6 The heading wheel

The Heading wheel is for setting or changing the vessel's course when the console is in command of the autopilot.

For information about how to use it and its associated buttons, see the figures and description below.

Figure 5 The heading wheel



The heading wheel comprises one heading wheel and seven buttons. Three of these buttons are located above the heading wheel. The other four are located on either side of the heading wheel.

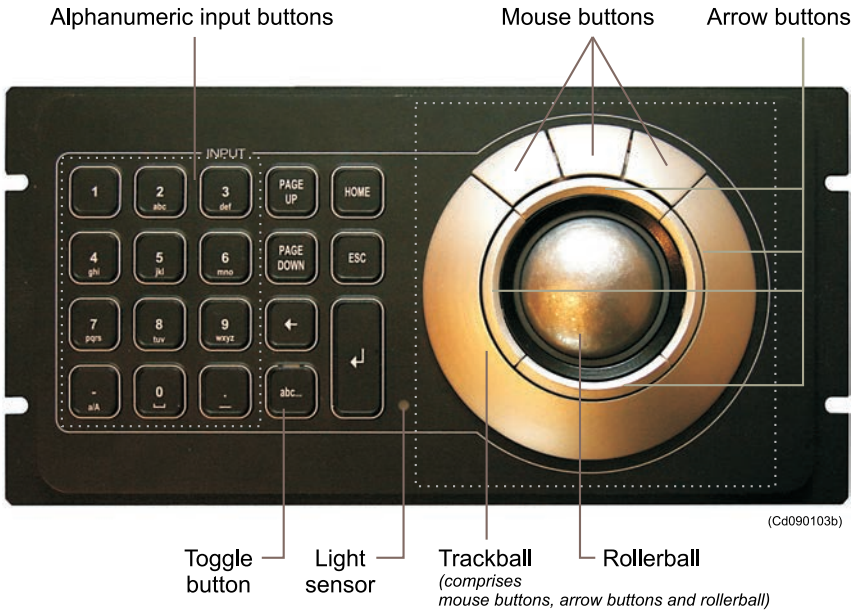
- **Heading Wheel:** This is used for setting a new heading or course.
- **Set/Activate button:** Use this button to initiate a heading or course change.
- **Heading buttons:** If the console is in command of the autopilot, and the autopilot is operating in Crs or Hdg mode, use the +/– buttons to set the new heading or course set-point on the autopilot (they adjust the heading or course by ± 1 degree for each press of the button).

  You can also use these buttons to adjust the curved EBL for a planned turn (see *The AUTO/PLAN button* on page 39). However, you cannot execute the planned turn unless the console is in command of the autopilot.
- **Turn Radius buttons:** Use the left and right buttons to adjust the turn radius.
- **Distance-to-Turn buttons:** Use the up and down buttons to adjust the distance to turn.

1.7 The input panel (including trackball)

The input panel is a general panel for navigation on bridge systems. It includes an alphanumeric keypad and a trackball which functions as a mouse device.

Figure 6 The input panel



The INPUT group of buttons contains 19 buttons. One of these has a lamp. This is the **abc...** (toggle) button.

- **2 / abc**. If the button is pressed when the panel is in numeric mode, the number 2 will be entered. When the panel is in alphanumeric mode the letter A will be entered. You need to press the button twice to enter the letter B and three times to enter the letter C.
- **abc...** (toggle button). Toggles between numeric and alphanumeric mode. Numeric mode is the default. Press the button for one second to toggle. A short beep will confirm the change. The lamp is lit green when the panel is in alphanumeric mode (letters) and not lit when it is in numeric mode (numbers).
- **PAGE UP**. This button has the same function as on a standard keyboard: it scrolls the screen up.
- **PAGE DOWN**. This button has the same function as on a standard keyboard: it scrolls the screen down.

The three mouse buttons have the following functions:

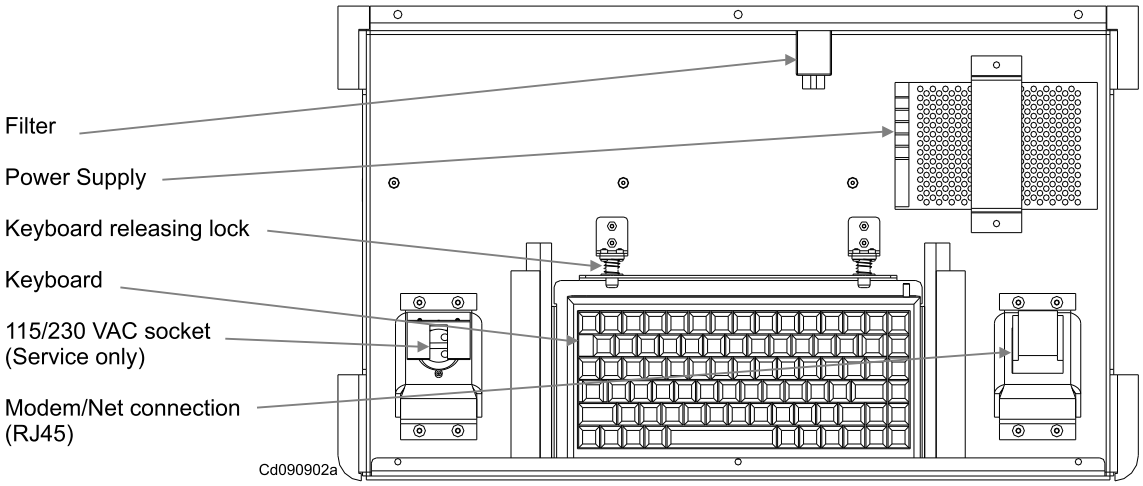
- **Left button:** Selects an object (and generally functions as a standard left mouse button).
- **Middle button:** Redraws the chart so that the vessel is shown at the last marker/cursor position. However, if the browsing facility is on (see *ECDIS range panel: viewing controls* on page 88), then clicking the middle button redraws the chart so that the centre of the display is at the last marker/cursor position.
- **Right button:** Brings up context-sensitive menus where applicable.

1.8 The alphanumeric keyboard

A standard alphanumeric keyboard is available in a drawer in front of the operator panel.

They layout of the alphanumeric keyboard compartment is as follows:

Figure 7 Keyboard compartment layout



1.9 A removable mouse device

You can attach a mouse to the operator station computer inside the console.

If you do this, the three mouse buttons will have the same function as the mouse buttons associated with the trackball (see *The input panel (including trackball)* on page 42).

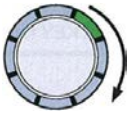
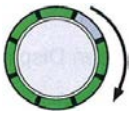
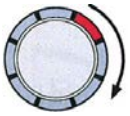
However, if the mouse has a scroll button, you can use this to zoom in and out both in ECDIS and Radar.

1.10 The brightness controls on the monitor

1.10.1 The status indicators and brightness knob on 27" and 23" monitors

If you are using a system with a Hatteland 27" TFT monitor (JH27T11, JH27T14) or a Hatteland 23" monitor (JH23T02, JH23T12, JH23T14), there is a brightness control knob with LEDs around it located near the bottom right-hand corner of the display. The patterns formed by the LEDs around this knob indicate the status of the monitor. The possible statuses are summarized in the table below.

Table 2 The monitor status LED patterns on the 27" monitor

LED pattern	Monitor status	Description
	Status: No power is connected to the monitor.	Eight LEDs are off (not lit).
	Status: The monitor is in standby mode.	Eight red LEDs are on (not flashing).
	Status: The monitor is searching for a video signal.	One green LED comes on in a sequence that loops through all the LEDs.
	Status: The monitor is on and the video signal is OK.	Eight green LEDs are on (not flashing).
	Status: The monitor is on but there is no video signal.	Four red LEDs, diagonally opposite to each other, are on (not flashing).
	Status: The monitor is on but there is a delay before the menu appears.	Seven green LEDS are on (not flashing) and one after another is off. This is a repeating sequence that loops through all the LEDs.
	Status: The monitor is going into standby mode.	One red LED after another is on (not flashing) in a sequence. This lasts for a few seconds, after which all LEDs are lit red.

There are further LED patterns which indicate whether the back-light and brightness are at the ECDIS calibration level. For instructions about checking the ECDIS calibration level, see *Establishing the correct colour calibration on the monitor* on page 116.

1.10.2 The brightness controls on 26” monitors

	To control the back-light on the 26” monitors, use the up and down (or on some models the + and – arrow) buttons beneath the screen.

For instructions about checking the ECDIS calibration level, see *Establishing the correct colour calibration on the monitor* on page 116.

1.11 References

While using this manual, you might need to refer to the following other Kongsberg Maritime publications:

386008	K-Bridge Autopilot Operator Manual
305306	K-Bridge Steering Control System Operator Manual

2 The Radar, ECDIS and Conning displays

This section contains the following topics:

2.1 Radar, ECDIS and Conning: general layout

This chapter describes the screen user-interface for each of the three applications available on the MFD unit: Radar, ECDIS and Conning.

For information about switching between the three applications, see *Switching between Radar, ECDIS and Conning* on page 120.

The layout of the screen for each application partly depends on the aspect ratio of the console's display: 16:1 (widescreen) displays have a different layout from 4:3 (standard) displays. The differences, as they affect each application, are listed in the table below.

Table 3 Differences in layout between 16:10 and 4:3 displays

Screen area	**Location on a 16:10 (widescreen) display**	**Location on a 4:3 (standard) display**
Top bar	Top of screen	Top of screen
Menu	At the far right end of the top bar	In Radar: beneath the radar dashboard In ECDIS: beneath the ECDIS range panel In Conning: top right-hand corner (beneath the top bar)
Radar dashboard	To the left of the square radar viewer	To the right of the square radar viewer
ECDIS range panel	Top left-hand corner of the ECDIS chart area	Top right-hand corner of the ECDIS chart area
Boarding area	In Radar: to the right of the square radar viewer In ECDIS: to the right and left of the screen (as required) In Conning: not available	In Radar: bottom right-hand corner In ECDIS: to the right and left of the screen (as required) In Conning: not available

The Conning application has a top bar and a menu, both of which it shares with ECDIS and Radar.

However, the Conning display is divided into different panes containing, thruster and rudder setpoints and feedback, heading, depth, and wind data, and some other panes some of which are optional.

For a description of the Conning panes, see *Using the Conning application* on page 261.

The largest of the Conning panes is the Ship pane. This contains a large outline of a ship which in turn encloses the thruster and rudder data. The orientation of this Ship pane determines the layout of the Conning user interface, and its orientation depends on the physical orientation of the operator station. If the operator station is:

- In the centre of the forward bridge (so that you stand at it and look straight ahead) then the Ship pane will be vertical with the bow of its ship symbol pointing upwards in the direction of the ship's bow.
- On a bridge wing (so that you stand at it and look straight out to port or starboard) then the Ship pane will be horizontal with the bow of its ship symbol pointing to the left or right in the direction of the ship's bow.

For a description of the Ship pane, see *The Ship pane* on page 263.

For information about specifying the orientation of the Ship pane, see *Select Monitor* on page 605.

Figure 8 The Radar layout (16:10 display) – dashboard on left

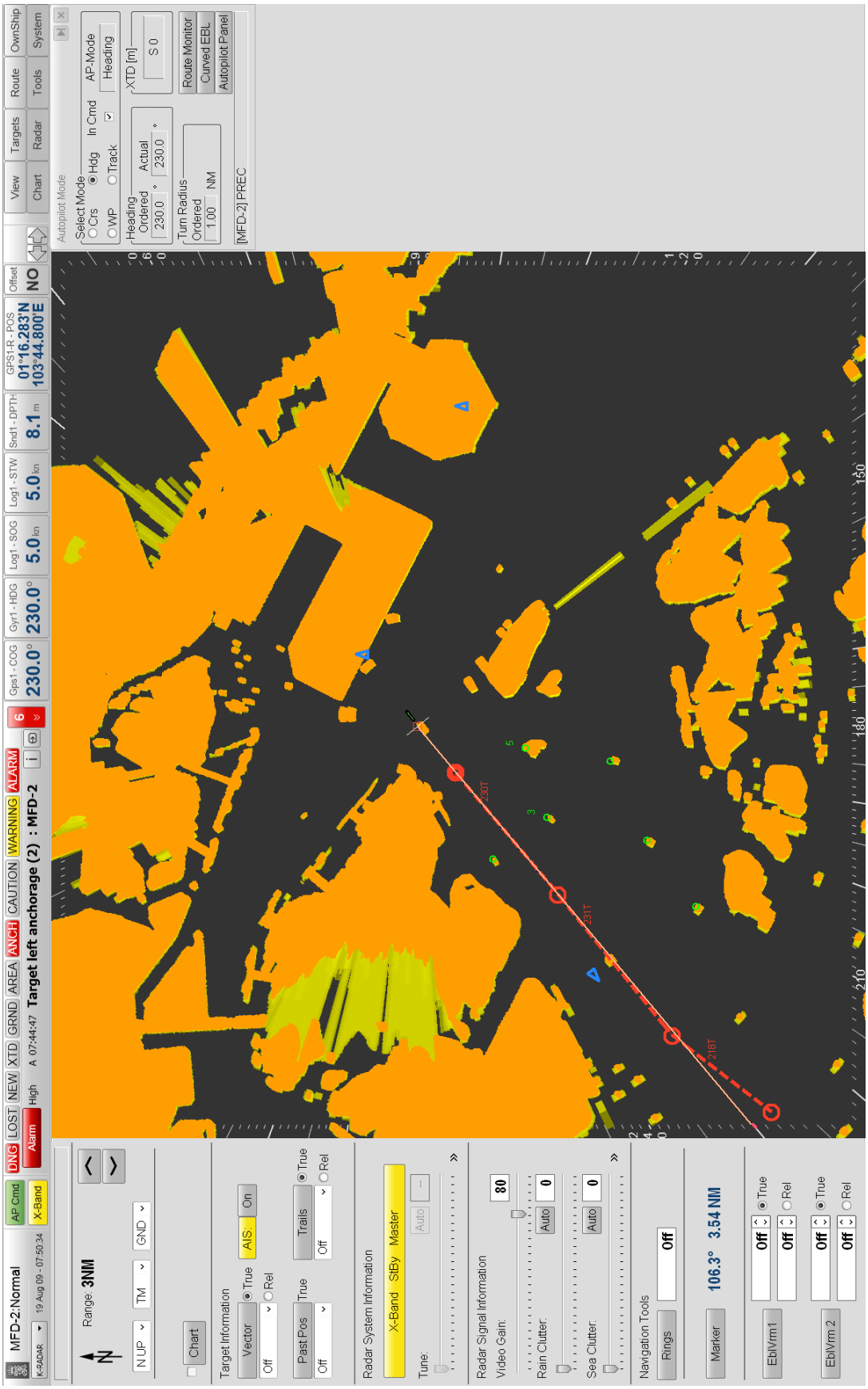


Figure 9 The Radar layout (4:3 display) – dashboard on right

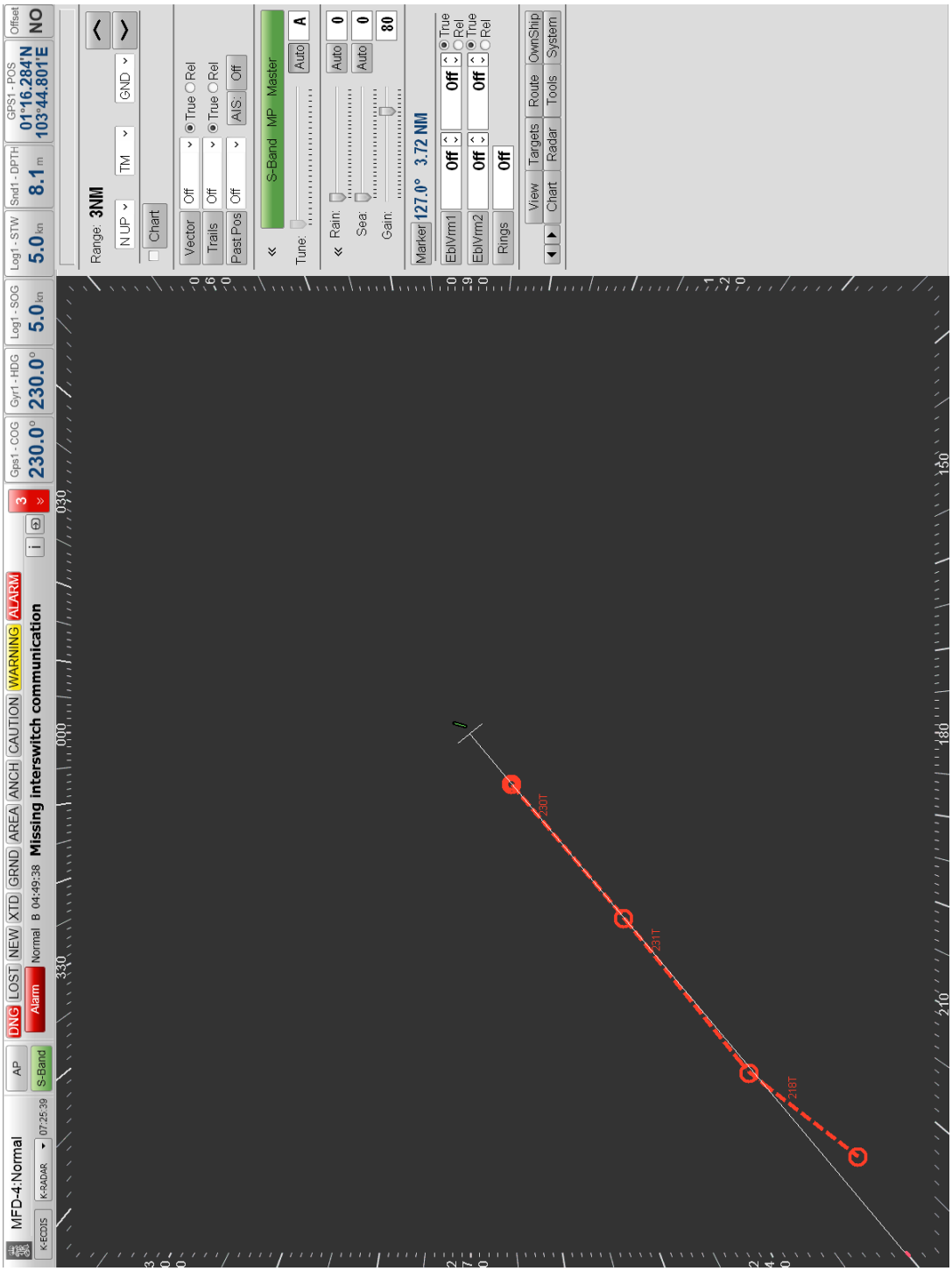


Figure 10 The ECDIS layout (16:10 display) – range panel on left

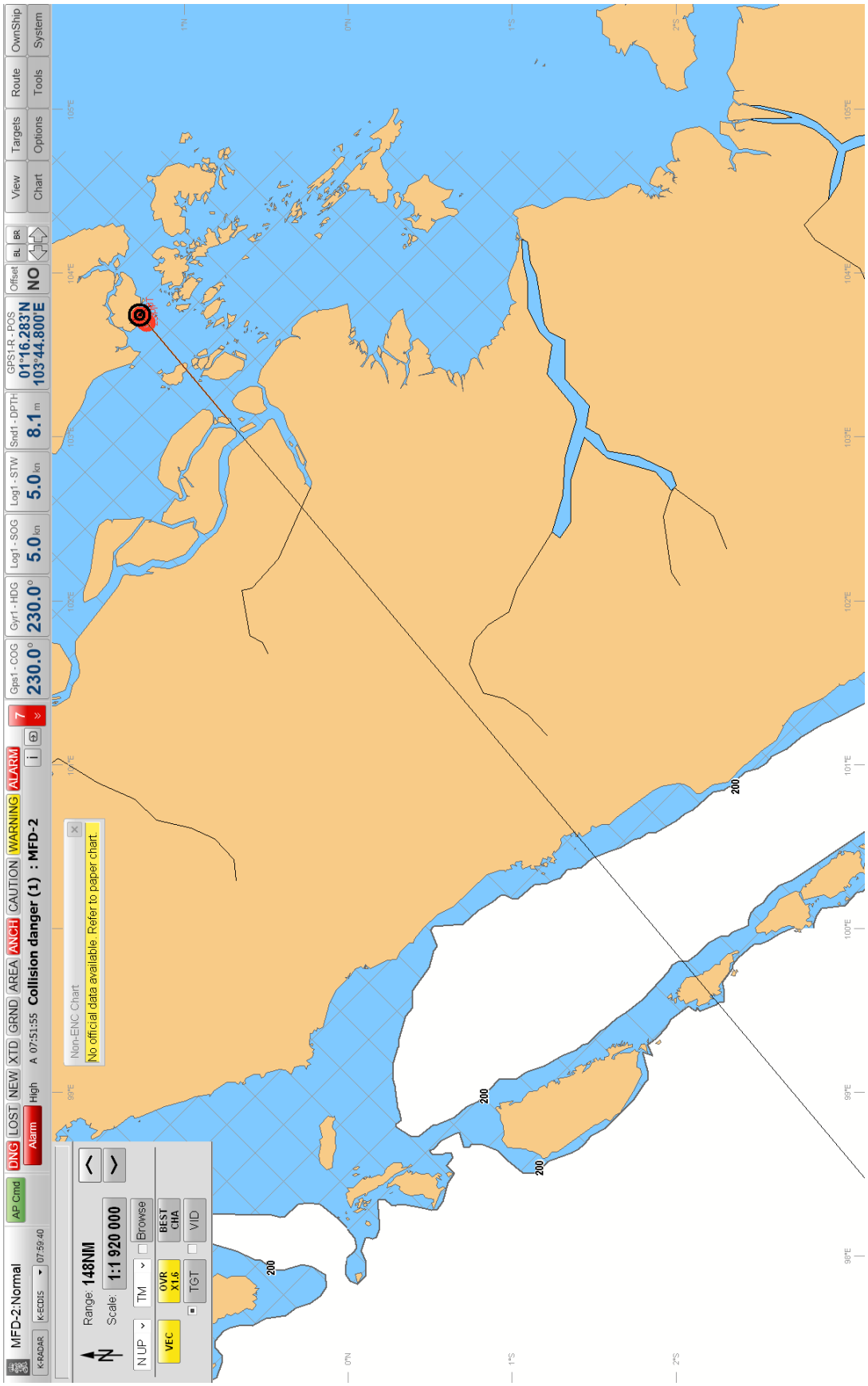


Figure 11 The ECDIS layout (4:3 display) – range panel on right

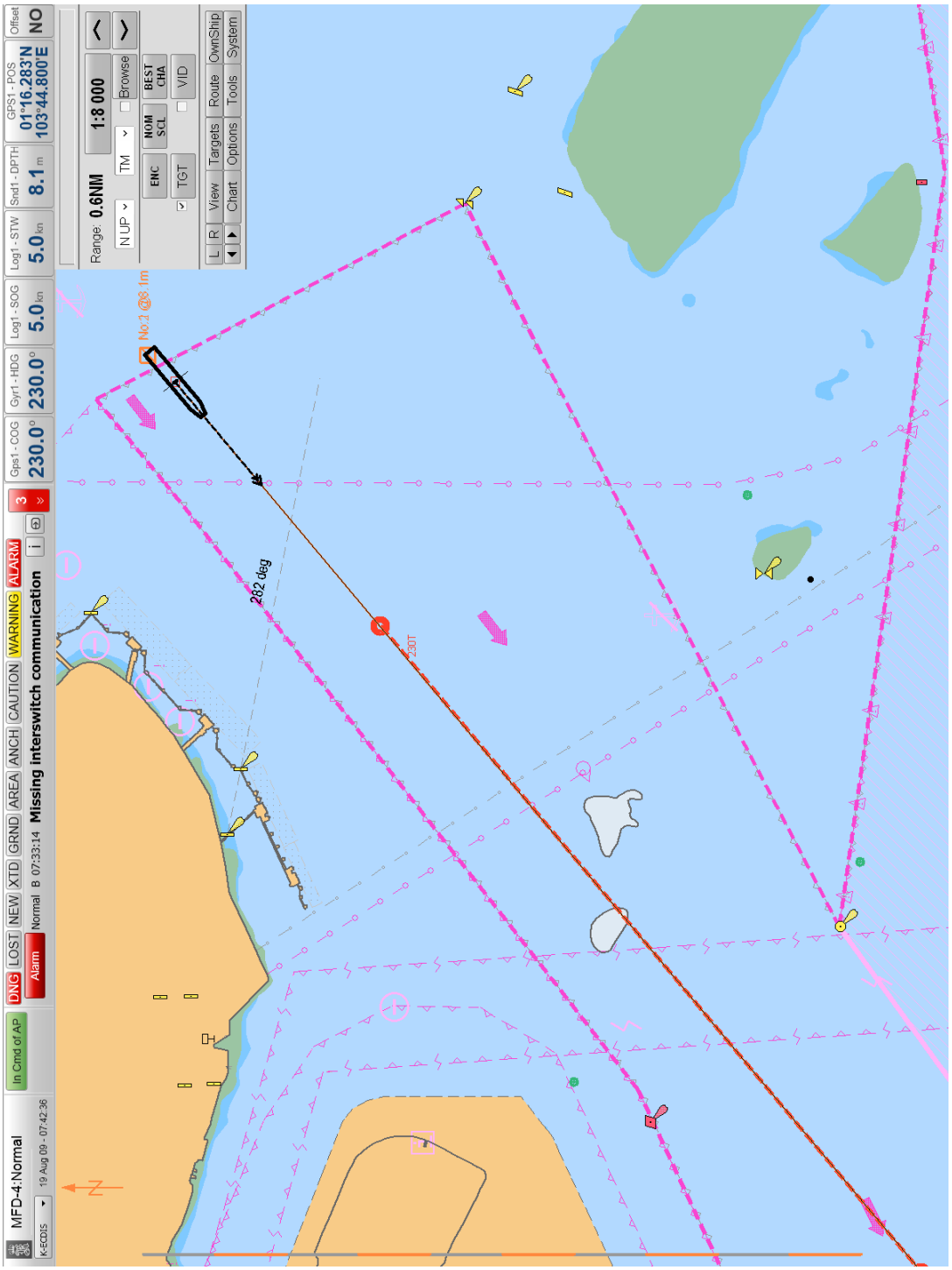


Figure 12 The Conning layout (16:10 display) with vertical Ship pane

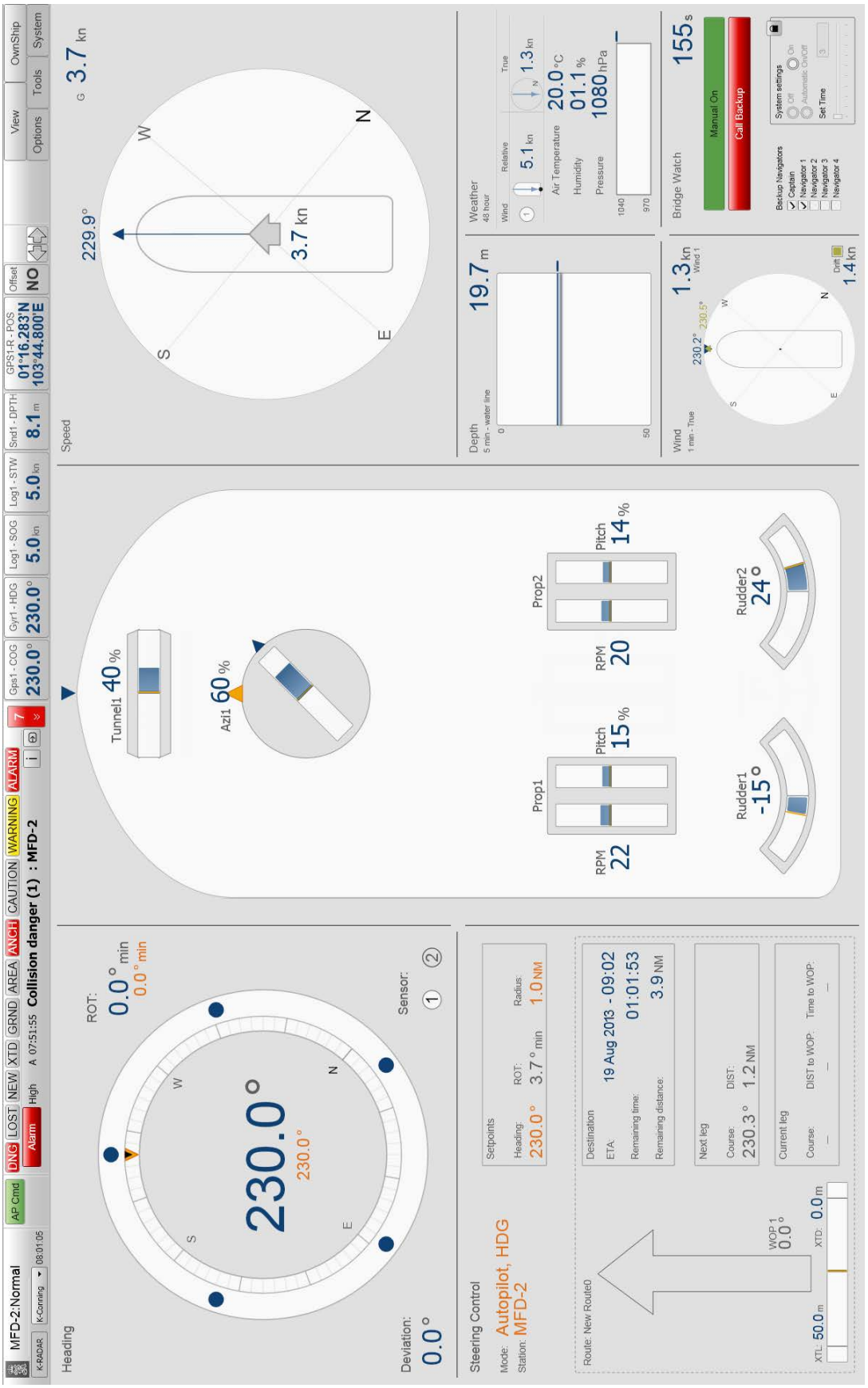


Figure 13 The Conning layout (4:3 display) with vertical Ship pane

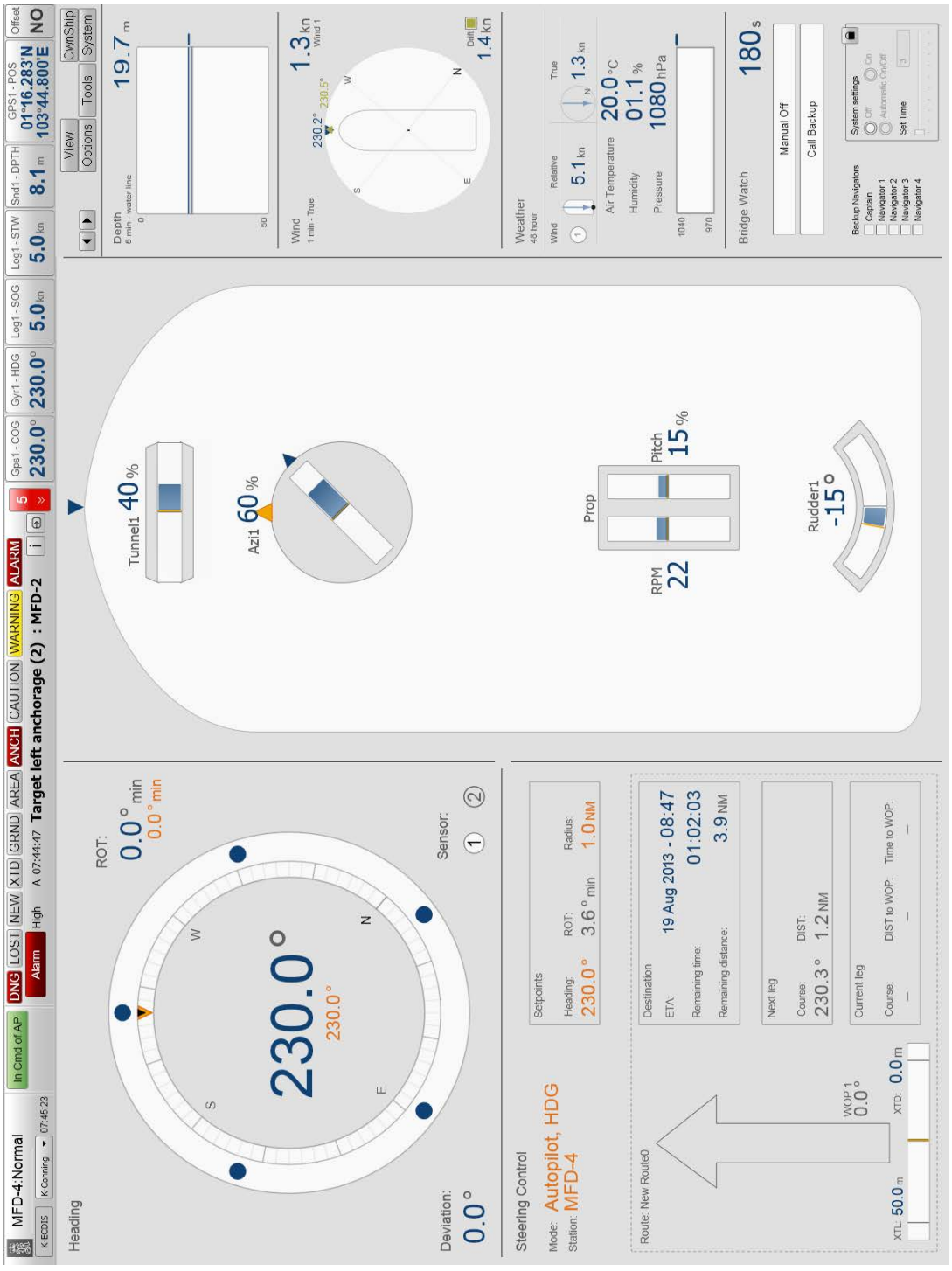
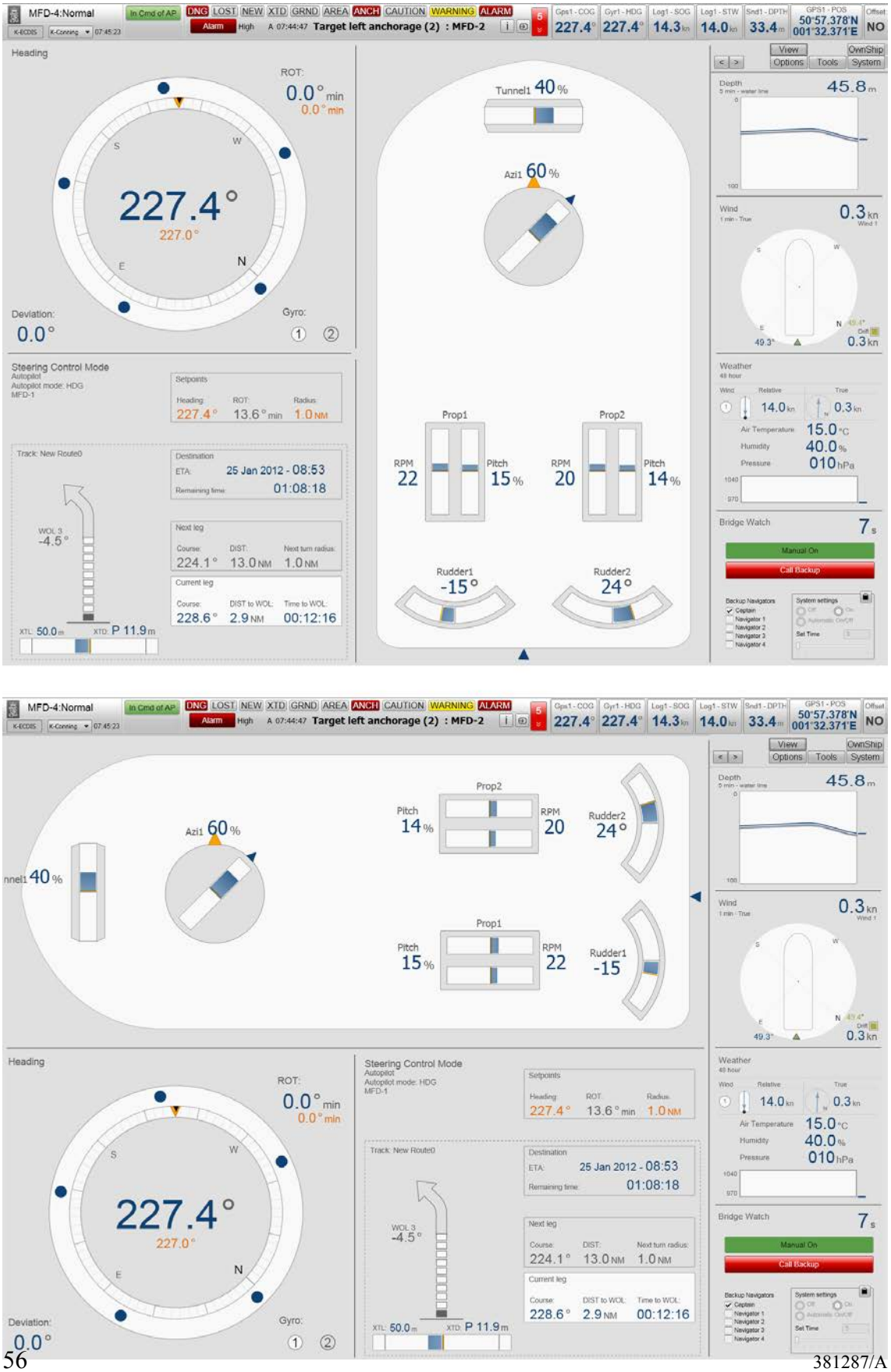


Figure 14 The Conning layout depends on whether the Ship pane is vertical or horizontal



2.2 The top bar

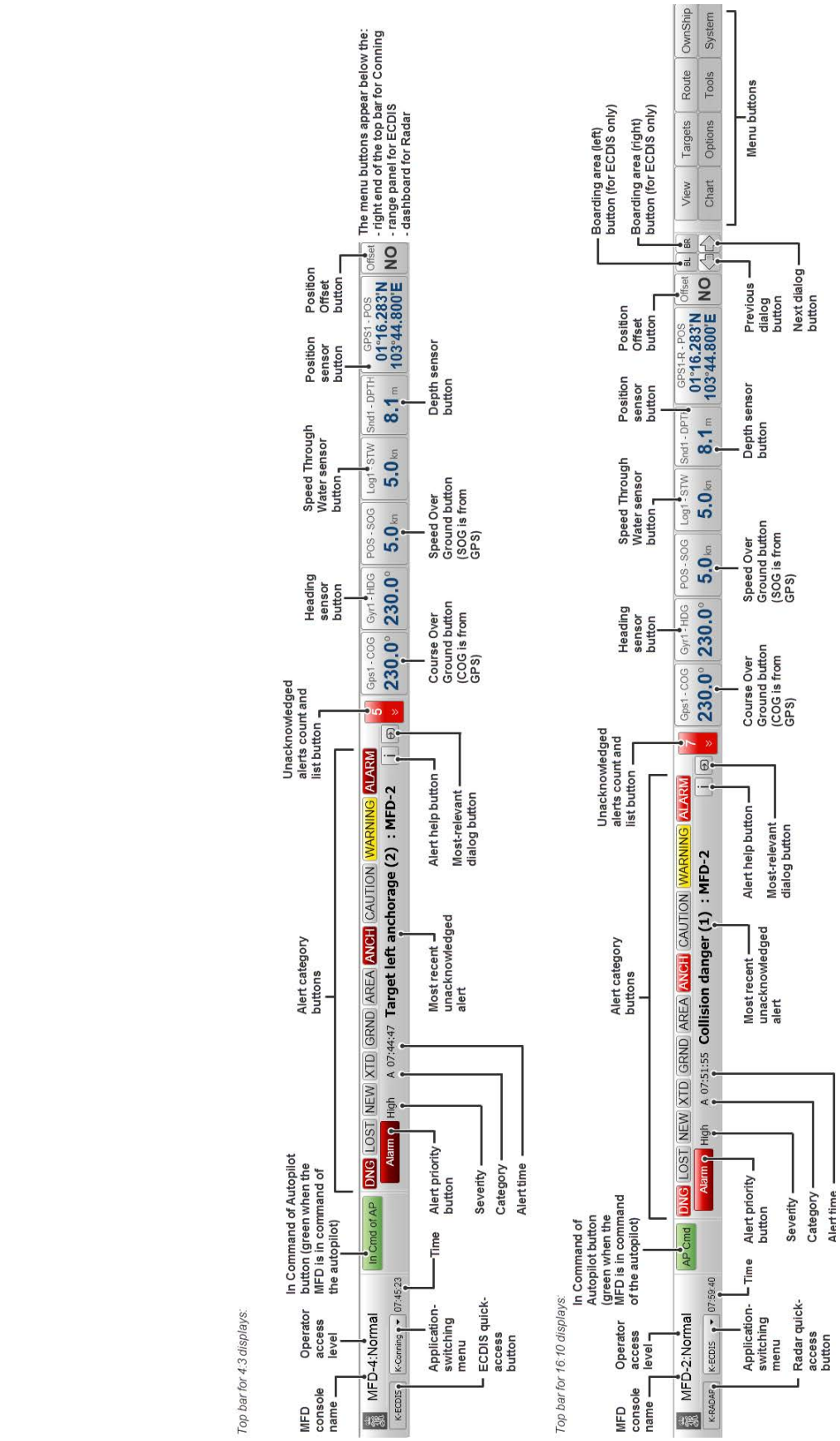
The top bar presents:

- The console's system name and the current operator’s password access level: **normal** (when no password has been entered); **user** (when the user password has been entered); **service** (when the service engineer password has been entered).

  To enter a password, see *Password* on page 593.
- The drop-down menu for switching between Radar, ECDIS and Conning (see *Switching between Radar, ECDIS and Conning* on page 120).
- The date and time.
- A button for taking command of the autopilot from the console.
- A button for turning the radar on.
- Buttons for acknowledging different categories of alarm.
- The text of the most recent unacknowledged alarm
- The own-ship's position (and position offset, if any), and its heading and speed. This information is presented on a series of buttons, and clicking them brings up dialogs on the screen.
- (On 16:10 displays for ECDIS only) Buttons for toggling on and off the left and right boarding areas.
- (On 16:10 displays) Forward and backward buttons (for navigating the menus and dialogs of the user interface.
- (On 16:10 displays) Buttons to access the menus and dialogs.

The contents of the top bar are described in this section.

Figure 15 The top bar for 4:3 and 16:10 displays



2.2.1 Top bar: the colours of the sensor buttons

Note

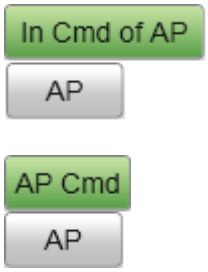
The information is displayed with different background colours to provide additional information to the user.

The colours of the position, position offset, heading and speed buttons in the top bar have the following meanings:

- **Grey:** Normal operation.
- **Yellow:** Abnormal operation. An example is if you are operating the system with manual heading or speed input: this will result in the heading or speed information being displayed on a yellow background.
- **Red:** Alarm. The data for heading, speed and position will be shown on a red background if there is no signal from the sensor providing the data.

For information about the colours of the alarm group buttons, see *The alert condition group buttons* on page 61.

2.2.2 Top bar: the "AP in Cmd/In Cmd of AP" button

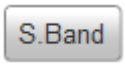


When the operator station is:

- in command of the autopilot, this button is green, and for:
  - 4:3 displays, the text reads "In Cmd of AP"
  - 16:10 displays, the text reads "AP Cmd"
- not in command of the autopilot, the button is grey and the label reads "AP".

Press the button to bring up the Autopilot Modes dialog (see *Autopilot Mode* on page 427), which enables you to take command of the autopilot at the console you are using and also to specify an operating mode for the autopilot.

2.2.3 Top bar: the Scanner/Transceiver button



Press this button to bring up the Radar Control dialog which enables you to start the radar transceiver (see *Radar Control* on page 539). To start it you must select **Master** and then **Run** in the Radar Control dialog.

This button on the top bar has the same function as the Scanner/Transceiver button on the Radar dashboard except that it displays only the name of the selected transceiver as its button text (it does not display any status information; see *Radar dashboard: the Radar System Information panel* on page 83).

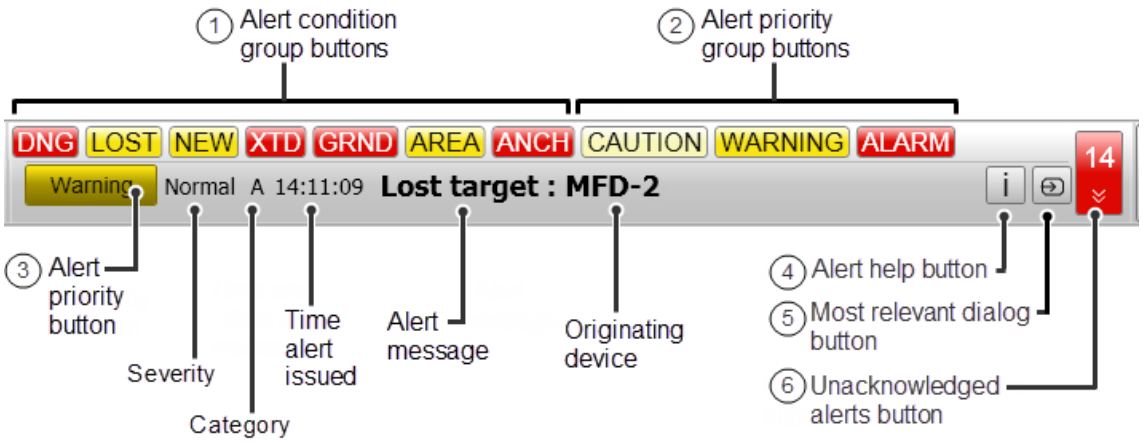
However, the colour of the button communicates status information as follows:

- **Green:** this console is master in relation to the transceiver (see also *Making the display unit master of the transceiver* on page 107).
- **Grey:** this console is a slave in relation to the transceiver.
- **Yellow:** one of the following is true:
  - The transceiver is in standby.
  - The pulse length is different from the current scale of the display. When this is the case, the pulse length indicator in the button text is prefixed by an exclamation mark (!).

For further information, see *Radar dashboard: the Radar System Information panel* on page 83.

2.2.4 Top bar: the alert area

Figure 16 The area on the top bar



For more information about the numbered items, see:

1 *The alert condition group buttons* on page 61

2 *The alert priority group buttons* on page 65

3 *The Alert priority button* on page 66

4 *The Alert help button and the Alert Information dialog* on page 68

5 *The Most-relevant dialog button* on page 68

6 *The Unacknowledged alerts button* on page 69

The alert area of the top bar contains:

- Seven alert condition group buttons: **DNG**, **LOST**, **NEW**, **XTD**, **GRND**, **AREA**, **ANCH**. These buttons each:

  - Show a certain colour to indicate that there are active alerts in the group. The colour is determined by the priority of the alerts in the group: red (for alarms), yellow (for warnings), off-white (for cautions). The alerts in a particular group are always all of the same priority.
  - Flash to indicate that there are unacknowledged alerts in the group.
  - Show grey if there are no unancknowledged or active alerts in the group.

  For information about how to use these buttons, see *The alert condition group buttons* on page 61.
- Three alert priority group buttons: **CAUTION**, **WARNING**, and **ALARM**.

  These buttons each:
  - Show a certain colour to indicate that there are active alerts in the group. The colour is determined by the priority of the alerts in the group: red (for alarms), yellow (for warnings), off-white (for cautions). The alerts in a particular group are always all of the same priority.
  - Flash to indicate that there are unacknowledged alerts in the group.
  - Show grey if there are no unancknowledged or active alerts in the group.

  For information about how to use these buttons, see *The alert priority group buttons* on page 65.
- A message area displaying the text of the most recent unacknowledged alert along with the date and time it was issued.
- An alert priority button. This button appears to the left of the alert text for the most recent unacknowledged alert, and indicates its priority. The button takes three forms: an off-white **Caution** button (this is the lowest priority), a yellow **Warning** button, a red **Alarm** button (this is the highest priority).
- An alert help button. Click this button to bring up a dialog containing more information about the most recent unacknowledged alert (see *The Alert help button and the Alert Information dialog* on page 68).
- A most-relevant dialog button. Click this button to bring up the dialog (if applicable) that is most relevant to the alert displayed (see *The Most-relevant dialog button* on page 68).
- An unacknowledged alerts button. Click this button to see a list of all currently unacknowledged alerts (see *The Unacknowledged alerts button* on page 69). The colour of this button is off-white, yellow, or red; it is determined by the priority of the highest priority active and unacknowledged alert in the list.

2.2.4.1 The alert condition group buttons

These buttons each represent alerts associated with a particular condition (the condition being one of either immediate or potential danger). Use the them as follows:

- Click on an alert condition group button when it is flashing see the list of active alerts for the group (see *The Alert list dialogs* on page 70). Click it again to acknowledge to acknowledge the currently unacknowledged alerts in the group.
- Click on an alert condition group button when it is not flashing but has a solid colour (red or yellow but not grey), to see the list of active alerts for the group.

If the button is not flashing but has a solid colour, there are currently no unacknowledged alerts in the group but there are still active alerts that require investigation.

If the button is grey, there are no active alerts in the group and no alert list will be displayed.

DNG: . Alerts in this group indicate that one or more tracked targets are exceeding the ship's proximity limit or that the own-ship is exceeding the CPA or TCPA limit for one or more targets. These limits are specified in the Alarm Limits dialog (see *Alarm Limits* on page 411).

DNG alerts can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged alerts the **DNG** button flashes RED.

To indicate acknowledged but still active alerts the **DNG** button shows a constant RED.

DNG alerts generated by a Radar application that is running on the same MFD unit as the ECDIS will not cause the **DNG** button to flash on the ECDIS top bar, nor will they appear in the **DNG** alert list for ECDIS. (**DNG** alerts generated by other Radar operator stations will cause the **DNG** button to flash on the ECDIS top bar and will appear in the **DNG** alert list for ECDIS.

LOST: . Alerts in this group indicate that the tracking system has lost track of a target. They are not issued for targets that are more than 20 NM distant from the own-ship or for automatically acquired targets that are lost in the blind sector behind the own-ship (as defined by the automatic acquisition zone). For an example of the symbol for a lost radar target, see *Radar target symbols* on page 145.

LOST alerts can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged **LOST** alerts this button flashes YELLOW.

To indicate acknowledged but still active **LOST** alerts the button shows a constant YELLOW.

LOST alerts generated by a Radar application that is running on the same MFD unit as the ECDIS will not cause the **LOST** button to flash on the ECDIS top bar, nor will they appear in the **LOST** alert list for ECDIS. (**LOST** alerts generated by other Radar operator stations will cause the **LOST** button to flash on the ECDIS top bar and will appear in the **LOST** alert list for ECDIS.

NEW: . Alerts in this group indicate that a new radar target has been acquired.

The radar system detects new targets automatically. They appear on the display with a flashing new target symbol. For an example of the symbol for a new target, see *Radar target symbols* on page 145.

When targets are in the acquisition phase (before they have been stably tracked), the **NEW** button is not active: it shows grey (in the daylight palette) and does not flash.

When one or more targets have been successfully acquired (in other words, when they are being stably tracked), the radar system issues a new target alert. The **NEW** button then flashes YELLOW until you click it. When you click it, the button stops flashing and so do the new targets in the radar area; they are now displayed as normal targets.

Note

*If you click the **NEW** button while the targets are still in the acquisition phase (before a new target alert has been issued), the target symbols in the radar display stop flashing straightaway and no new target alert will be issued when the targets become stably tracked.*

NEW alerts can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged alerts the button flashes YELLOW.

To indicate acknowledged but still active alerts the button shows a constant YELLOW.

NEW alerts generated by a Radar application that is running on the same MFD unit as the ECDIS will not cause the **NEW** button to flash on the ECDIS top bar, nor will they appear in the **NEW** alert list for ECDIS. (**NEW** alerts generated by other Radar operator stations will cause the **NEW** button to flash on the ECDIS top bar and will appear in the **NEW** alert list for ECDIS.

XTD: . Alerts in this group indicate that the cross-track distance exceeds the off-track limit minus the Off-track Alarm Margin (see *Ship (tab)* on page 571). The Off-track Alarm Margin is (at least) the distance from the own-ship's pivot point to the outer edge of the hull. This value enables the system to report that the ship is off track when part of it crosses the off-track limit, not just when the ship's pivot point has crossed the off-track limit.

You can specify an off-track limit for each leg of a route in the Waypoint List dialog (see *Edit route* on page 420).

The default off-track limit is specified in the Route tab of the System Parameter settings dialog (see *Route (tab)* on page 570).

XTD alerts can be acknowledged from any operator station on the network.

To indicate unacknowledged alerts the button flashes RED.

To indicate acknowledged but still active alerts the button shows a constant RED.

GRND: . Alarms in this group indicate that the vessel is in danger of running aground. The safe depth limits are specified in the Safety Depth dialog (see *Safety Depth* on page 479).

The look-ahead time for the grounding alarm is specified in the Grounding Alarm Setup dialog (see *Grounding Alarm Setup* on page 470; the width of the ground-check area is also specified in this dialog).

To check the vessel's maximum draught (see *Ship (tab)* on page 571.

GRND alerts can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged alerts the button flashes RED.

To indicate acknowledged but still active alerts the button shows a constant RED.

AREA: . Alerts in this group indicate that the vessel is sailing close to an area of the chart that is dangerous or restricted.

AREA alerts can only be finally acknowledged at the operator station that generated them.

To indicate unacknowledged alerts the button flashes YELLOW.

To indicate acknowledged but still active alerts the button shows a constant YELLOW.

ANCH: . Alerts in this group indicate that either the own-ship or a vessel on target anchor watch has left its anchorage (see *Using the anchor watch function* on page 324).

ANCH alerts can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged alerts the button flashes RED.

To indicate acknowledged but still active alarms the button shows a constant RED.

For a list of all the possible navigation alerts (including their priority and category of severity), see *Navigation system alerts* on page 668.

2.2.4.2 The alert priority group buttons

The alert priority group buttons are like the alert condition group buttons but each represents a particular priority (caution, warning or alarm) not an alert condition.

There is no overlap between the alert lists belonging to the alert condition group buttons and those belonging to the alert priority group buttons. For example, even though the alerts in the **DNG** alert condition group are all of alarm priority, they will not appear in the list displayed when you click the **ALARM** priority group button. Similarly, even though the alerts in the **LOST**, **NEW** and **AREA** condition groups are all of the priority warning, they will not appear in the list when you click the **WARNING** priority group button.

Use the alert priority group buttons as follows:

- Click the **CAUTION** button when it has a solid off-white colour (this button never flashes) to see the list of active cautions (see *The Alert list dialogs* on page 70).

  The **CAUTION** button does not flash, because alerts of this priority are always acknowledged automatically by the originating operator station at the time it generates them.

- Click the **WARNING** button when it is flashing to acknowledge all warnings in the button's group and to see the list of active warnings (see *The Alert list dialogs* on page 70).

  Click the button when it is a solid yellow colour to see the list of active warnings in the button's group.

- Click the **ALARM** button once whether it is flashing or is a solid red colour to see the list of active alarms in the button's group (see *The Alert list dialogs* on page 70). The list contains all active alarms in the group, whether they have been acknowledged or not.

  Click a second time on the **ALARM** button to acknowledge all currently unacknowledged alarms in the group.

  If the button is not flashing but has a solid colour (red or yellow), there are currently no unacknowledged alarms in the group, but there are still active alarms that require investigation.

  If the button is grey, there are no active alarms in the button's group, and so no list will be displayed.

ALARM: This is the highest priority of alert.

There are two categories of severity for alerts of this priority: A (highest) and B.

Alarm priority alerts of category A trigger the BNWAS alarm sequence. This starts with flashing BNWAS reset buttons, and proceeds to the sounding of buzzers on the bridge and in the crew's accommodation (see *The BNWAS alarm sequence* on page 276).

Some category A alarms can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

This priority group can include alerts from systems on the bridge that are not part of the navigation system.

To indicate unacknowledged alerts the button flashes RED.

To indicate acknowledged but still active alerts the button shows a constant RED.

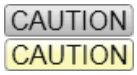
WARNING: This is the second highest priority of alert.

There are two categories of severity for alerts of this priority: A (highest) and B.

Some category A warnings can only be finally acknowledged at the operator station that generated them (see *Alerts that must be acknowledged from the station that generated them* on page 332).

To indicate unacknowledged alerts the button flashes YELLOW.

To indicate acknowledged but still active alerts the button shows a constant YELLOW.



CAUTION: This is the lowest priority of alert.

There is only one category of severity for cautions: A.

For a list of all the possible navigation alerts (including their priority and category of severity), see *Navigation system alerts* on page 668.

2.2.4.3 The Alert priority button

This button appears to the left of the alert message both on the top bar and in the list of unacknowledged alerts (see*The Unacknowledged alerts button* on page 69). It indicates the priority of the alert. You can click it to acknowledge the alert and bring up a list for the alert condition group or the alert priority group to which the alert belongs (see *The Alert list dialogs* on page 70).

There are three levels of priority, as described in the previous section (see *The alert priority group buttons* on page 65), but there are only two alert priority buttons:

Alarm: This is the highest priority of alert.

There are two of this priority: A (highest) and B.

Category A alarms trigger the BNWAS alarm sequence which starts with flashing BNWAS reset buttons and proceeds to

the sounding of buzzers on the bridge and in the crew's accommodation (see *The BNWAS alarm sequence* on page 276).

Warning: This is the second highest priority of alert.

There are two categories of severity for alerts of this priority: A (highest) and B.

"Caution"

Caution: This is the lowest priority of alert.

There is no priority button for cautions, because they cannot appear on the top bar or in the unacknowledged alerts list (see *The Unacknowledged alerts button* on page 69).

Instead cautions are automatically acknowledged by the operator station as soon as it generates them. They do, however, appear in the Alert Group dialog if you click the **CAUTION** button on the top bar (see *The Alert list dialogs* on page 70). And they appear in the lists of currently active alerts and in the alert history (see *Viewing current and past alerts* on page 336).

There are two categories of severity for alerts of this priority: A (highest) and B.

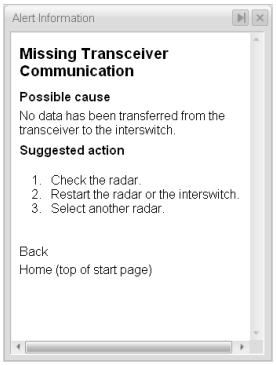
Click the priority button next to the alert message to acknowledge the alert and to acknowledge all alerts that have the same text (and originating operator station) as the alert. For **DNG**, **NEW**, **LOST**, **AREA** and **GRND** alerts, the system displays only one instance of an alert for each originating operator station. This means, for example, if there are several **DNG** alerts generated by a particular operator station (perhaps concerning several targets), you cannot see them individually: they will be represented by a single message such as “Collision danger: MFD-1”, “Collision danger: MFD-2”, “New target: MFD-1”, and so on. Click the priority button to acknowledge all of the alerts that the single message represents from the particular operator station it identifies. Those alerts will then be acknowledged as far as the operator station you are using is concerned (therefore any flashing and audible sound indications caused by them on that operator station will cease). However, you cannot acknowledge these alerts remotely on behalf of the operator station that generated them: each operator station must acknowledge its own instances of them. This is because the alerts are associated with graphical information that the operator must see and evaluate before he or she acknowledges the alert (see *Alerts that must be acknowledged from the station that generated them* on page 332).

As well as acknowledging the alert, clicking the priority button brings up the Alert Group dialog (see *The Alert list dialogs* on page 70). In the Alert Group dialog, the alert that you acknowledged by clicking the priority button will appear in the list as selected (in other words, it will have a black background).

2.2.4.4 The Alert help button and the Alert Information dialog

This button appears on the top bar to the right of the most recent unacknowledged alert text. It also appears to the right of each alert text in the unacknowledged alert list (see *The Unacknowledged alerts button* on page 69).

Click the alert help button to see a description of an alert.



For an alphabetical list of the alerts for which help is available, click **Back** or **Home** in the Alert Information dialog.

2.2.4.5 The Most-relevant dialog button

This button takes you to the dialog (if applicable) that is most relevant to the associated alert.

This button only works for ECDIS, radar, autopilot and speed pilot alerts.

2.2.4.6 The Unacknowledged alerts button

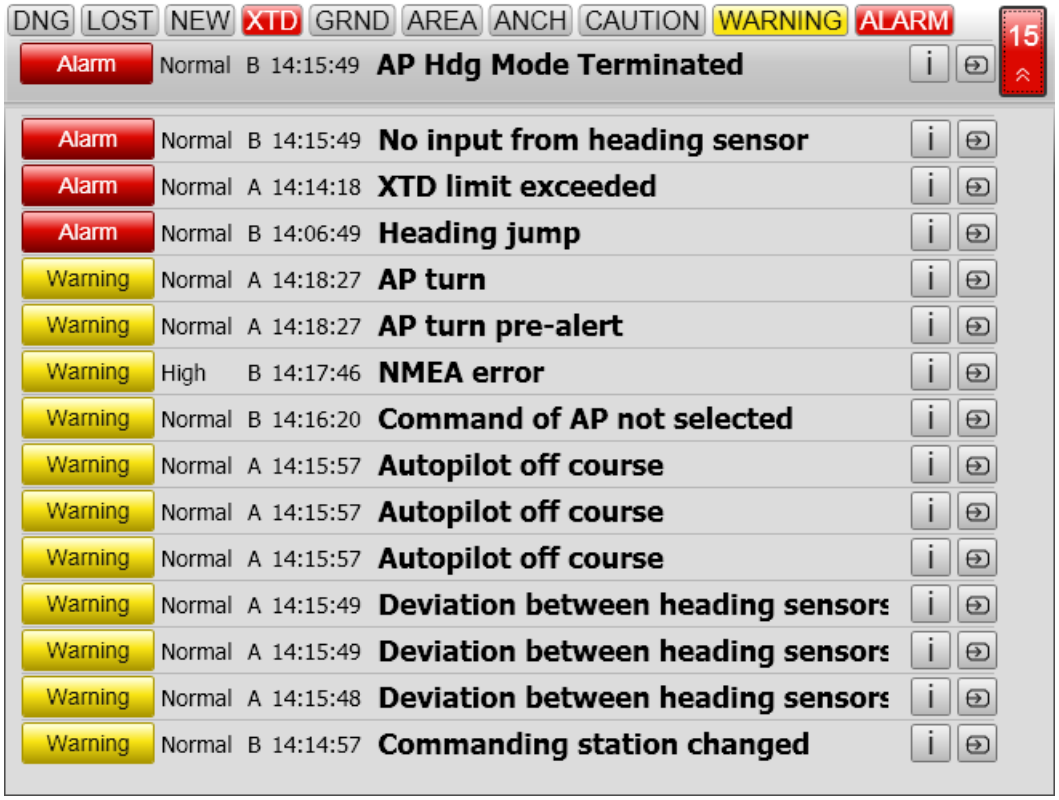
Clicking this button brings up a list of the currently unacknowledged alerts. The button takes the colour associated with the highest priority unacknowledged alert currently in the list.

Each alert is listed with:

- A priority button (click this to acknowledge the alert) (see *The Alert priority button* on page 66)
- A description (High or Normal)
- The time and date the alert was issued
- The alert message.
- A help button (see *The Alert help button and the Alert Information dialog* on page 68)
- A most-relevant dialog button (if applicable; see *The Most-relevant dialog button* on page 68) for the message.

To acknowledge an alert in the list, click its priority button (see *The Alert priority button* on page 66).

Figure 17 The Unacknowledged alerts list



2.2.4.7 The Alert list dialogs

To see the Alert Group dialog – which lists the active alerts for each alert condition/priority group – click an alert group button on the top bar (see *The alert condition group buttons* on page 61 and *The alert priority group buttons* on page 65). If there are no active alerts for a group (in other words, if the alert group button is grey), the dialog will not appear.

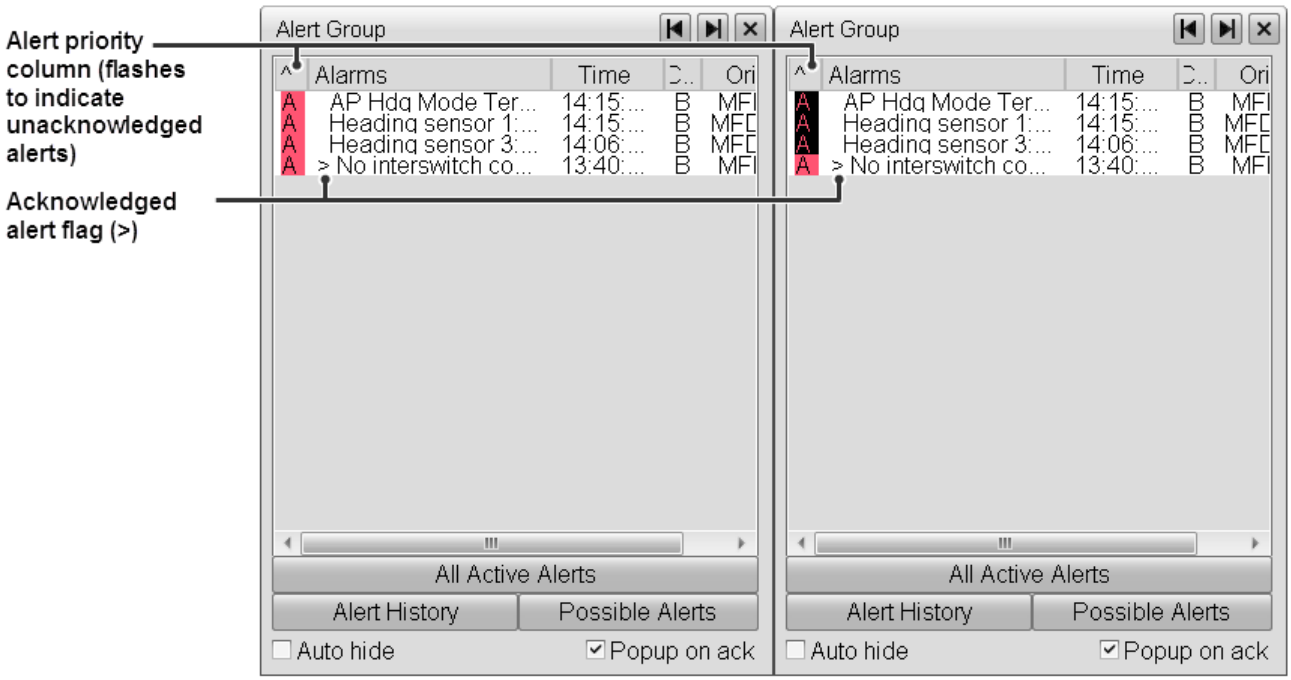
Alternatively, click the priority button to the left of the alert message on the top bar or in the unacknowledged alerts list.

To toggle the list between groups, click the **ALARM VIEW** button on the operator panel (see *The Alarms group* on page 39).

(The **ALARM VIEW** button on the operator panel can also be used to bring up the alert list in the first place, listing the alerts in the **ALARM** priority group.)

The Alert Group dialog also comes up (if it is not already displayed) when you press the **ACK** button on the operator panel (see *The Alarms group* on page 39 and *Acknowledging alerts using the operator panel* on page 333).

Figure 18 Alert Group dialog (with flashing priority column)



The Alert Group dialog appears when you click the alert (condition or priority) group buttons on the top bar; it lists the active alerts for the group whose button you pressed.

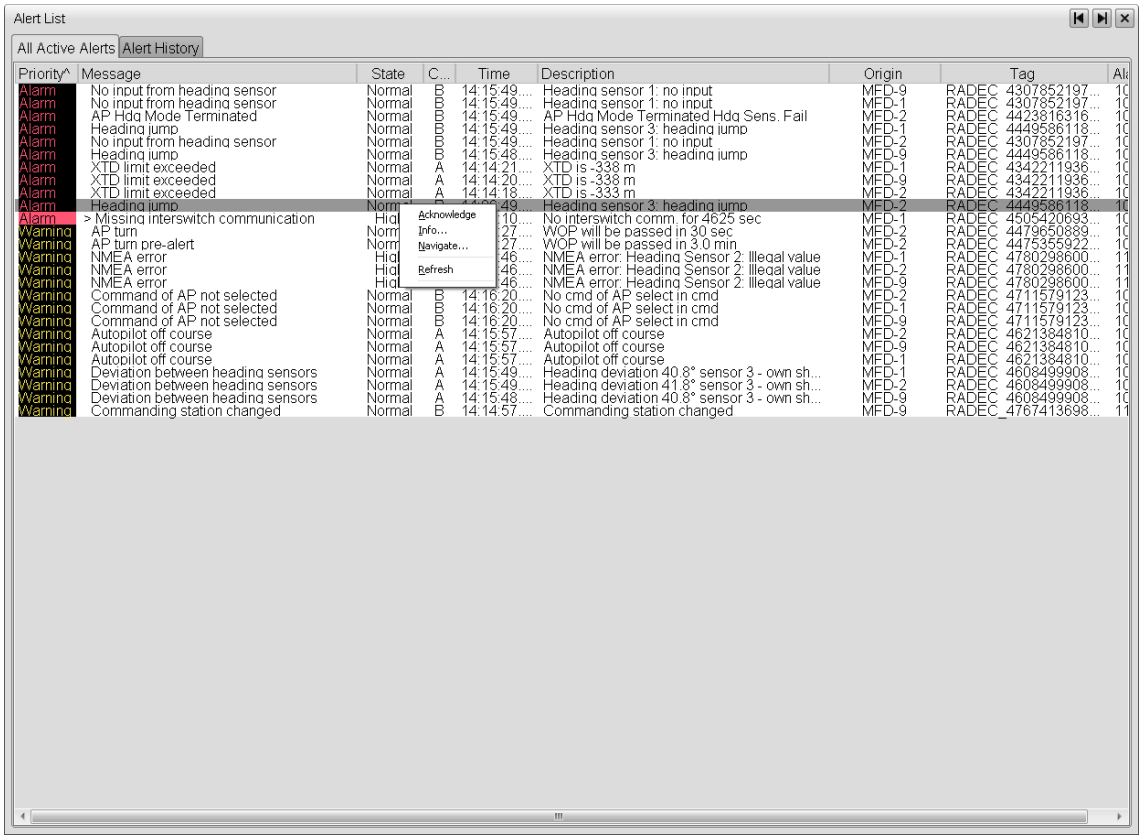
The leftmost field of each row in the table contains a priority letter: A for alarms and W for warnings. For:

- Unacknowledged alerts, the letter alternates rapidly between black text on a coloured background and coloured text on a black background: the colours are RED for alerts and YELLOW for warnings.
- Acknowledged alerts, this letter is black on a coloured background: the background is RED for alerts and YELLOW for warnings.

For a full description of the Alert Group dialog and of the large format Alert List dialog (which is displayed when you click the **All Active Alerts** or **Alert History** buttons in the Alert Group dialog), see *Viewing current and past alerts* on page 336.

For information about individual alerts, see *Alerts and Operator Messages* on page 665.

Figure 19 Large format Alert List dialog (with flashing priority column)



The leftmost field of each row in the table contains a priority label: Alarm, Warning, or Caution. For:

- Unacknowledged alerts, the letter alternates rapidly between black text on a coloured background and coloured text on a black background: the colours are RED for alerts and YELLOW for warnings (no unacknowledged cautions will appear in the list, because cautions are automatically acknowledged by the originating operator station at the time it issues them).

- Acknowledged alerts, this letter is black on a coloured background: the background is RED for alerts, YELLOW for warnings, and OFF-WHITE for cautions.

2.2.5 Top bar: the COG button

This button displays the own-ship's course over ground, based on data from the position reference system (typically, a GPS device). The name of the source device is indicated in the label text in the top lefthand corner. The button's background colour indicates the status of the source device:

- **Grey:** The position sensor is selected and functioning.
- **Yellow:** A low-accuracy source, such as radar positioning or dead reckoning, based on manually entered position input is selected, and the system is using this unreliable data to estimate the vessel's course over ground.
- **Red:** The input from the selected position sensor is lost.

Clicking on the COG button brings up the **Position** dialog (see *Position* on page 445). This dialog allows you to select a different position source or to specify manual position input.

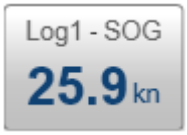
2.2.6 Top bar: the HDG button

This button displays the own-ship's heading. The name of the source device is indicated in the label text in the top lefthand corner. The button's background colour indicates the status of the heading source:

- **Grey:** The heading source is selected and functioning.
- **Yellow:** Manual heading input is selected.
- **Red:** The input from the selected heading source is lost.

Clicking on the heading button brings up the **Heading** dialog (see *Heading* on page 452). This dialog allows you to select a different heading source or to specify manual heading input.

2.2.7 Top bar: the SOG button



This button displays the own-ship's speed over ground, based on data from the position reference system (typically, a GPS device). The name of the source device is indicated in the label text in the top lefthand corner. The button's background colour indicates the status of the source device:

- **Grey:** The position sensor is selected and functioning.

- **Yellow:** A low-accuracy source, such as radar positioning or dead reckoning, based on manually entered position input is selected, and the system is using this unreliable data to calculate the vessel's current speed over ground.
- **Red:** The input from the selected position sensor is lost.

Clicking on the SOG button brings up the **Position** dialog (see *Position* on page 445). This dialog allows you to select a different position source or to specify manual position input.

2.2.8 Top bar: the STW button

This button displays the speed through water, as received from the speed log. The name of the source device is indicated in the label text in the top lefthand corner. The button's background colour indicates the status of the source device:

- **Grey:** The speed log is selected and functioning.
- **Yellow:** Manual speed input is selected.
- **Red:** The input from the selected speed sensor is lost.

Clicking on the speed brings up the **Speed** dialog (see *Water Speed* on page 455). This dialog allows you to select between available speed sources or to specify manual speed input.

2.2.9 Top bar: the depth button

If depth input is being provided to the system, then this button gives the current depth of water beneath the own-ship. If it is not, then the button gives the unit of measurement used for depth in the currently displayed chart:

- m = meters
- ft = feet
- fat = fathoms

Click the button to display the **Chart Legend** dialog (see *Chart Legend* on page 478).

The text in the right-hand corner gives the name of the depth sensor.

For more information about depth, view the Depth pane in the Conning application (see *The Depth pane* on page 269).

2.2.10 Top bar: the position and offset buttons

Position data: This includes the position fixing system currently in use plus the vessel's actual position in longitude and latitude.

It is clickable. Clicking it brings up the **Position** dialog (see *Position* on page 445), which allows you to view and select from the available position sensors.

The background colour of the button indicates the accuracy of the source as follows:

- **Grey:** An accurate source such as GPS (differential or absolute) is selected and functioning.
- **Yellow:** A low-accuracy source such as radar positioning or dead reckoning based on manually entered position input is selected and being used. For information about specifying the position input manually, see *Position* on page 445.
- **Red:** The input from the selected positioning system is lost; calculation is now based on dead reckoning.

Position Offset/No Offset: This button tells you whether or not the position information is displayed with an offset applied. If the button is yellow and its text is `POS OFS`, then an offset is being applied.

Click the button if you need to specify a position offset to compensate for errors arising from the positioning system or from the use of a chart that uses a different datum from the positioning system. (Clicking the button brings up the **Position Offset** dialog (see *Position Offset* on page 443), which enables you to specify the offset.)

2.3 The menu area

This section concerns the location of the menu area; the location differs according to the aspect ratio of the display. It also tells you generally how to access the dialogs, how to pass backwards and forwards through the menu hierarchy (using the previous and next dialog buttons), and how to toggle on and off the boarding areas (which are for keeping several dialogs open at the same time but away from the centre of the display).

For a full description of the menus and dialog boxes associated with the Radar, ECDIS and Conning applications, see *Reference Guide* on page 363.

2.3.1 Menu area: location

The top-level menu for accessing the dialog boxes associated with each application appears at the right end of the top bar on 16:10 displays.

On 4:3 displays the menu appears in different places for each application. In:

- Radar it is underneath the radar dashboard (see *The radar dashboard* on page 77).
- ECDIS it is underneath the ECDIS range panel (see *The ECDIS range panel* on page 88).
- Conning it is underneath the top bar in the top righthand corner.

Table 4 The menu area on 16:10 (widescreen) displays

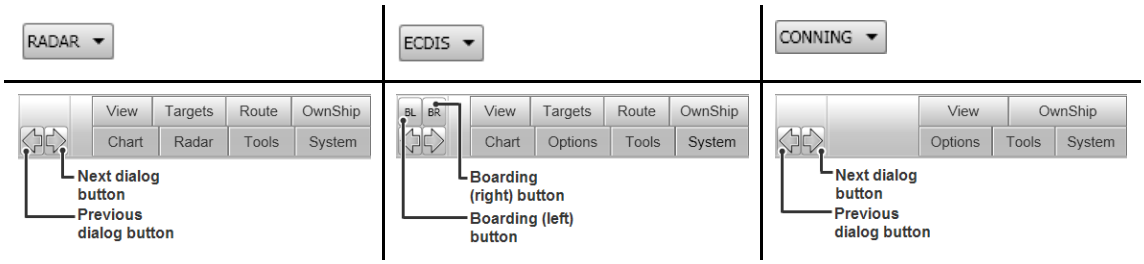
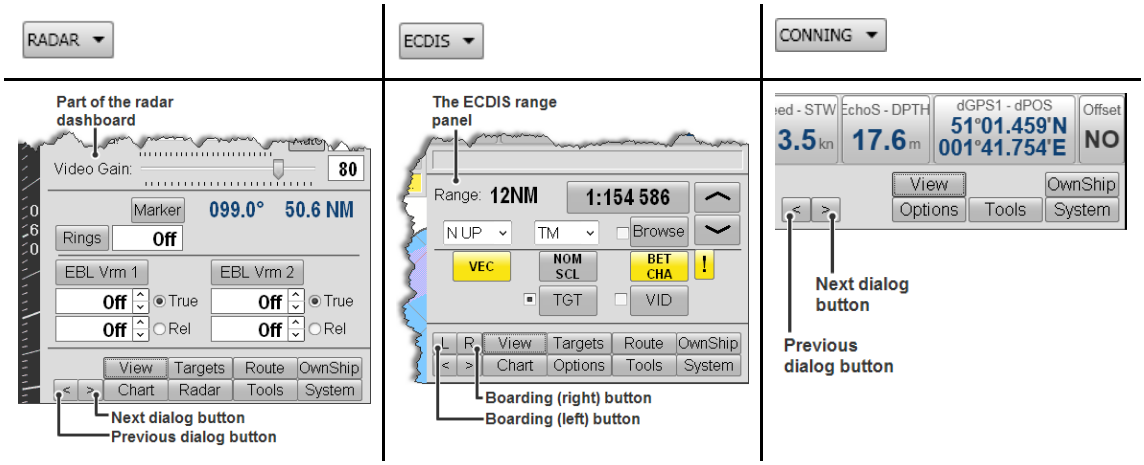


Table 5 The menu area on 4:3 (standard) displays



2.3.2 Menu area: ways of accessing the dialogs

Each item in the main menu is a clickable button: use the track-ball and **Left mouse** button to click through the menus and dialog boxes.

You can also reach particular menus and dialogs by:

- Pressing buttons on the operator panel (see *The operator panel and controls* on page 32).
- Clicking the sensor indicator buttons on the top bar (see *The top bar* on page 57).
- Clicking the buttons on the radar dashboard (see *The radar dashboard* on page 77).
- Clicking buttons on the ECDIS range panel (see *The ECDIS range panel* on page 88).
- Clicking the most-relevant dialog button on the top bar (see *The Most-relevant dialog button* on page 68).

2.3.3 Menu area: the boarding buttons in ECDIS

The boarding areas are spaces on the right and/or left of the chart display for keeping dialog boxes open for as long as you need them. In ECDIS, you can toggle the boarding areas on and off.

This is convenient because sometimes you will need an un-obscured chart display, and sometimes you will need multiple dialog boxes open at once, using either or both boarding areas.

To toggle the boarding areas on and off, click the left and right boarding buttons (see *The boarding areas in Radar and ECDIS* on page 99).

The appearance of these buttons depends on the aspect ratio of the display:

- On 4:3 displays the buttons just the letters ‘L’ and ‘R’ respectively.
- On 16:10 displays, the buttons are larger and contain the letters ‘BL’ (Boarding Left) and ‘BR’ (Boarding Right) respectively.

2.3.4 Menu area: the previous and next dialog buttons

Right arrow: Click to return from the previous dialog.

Left arrow: Click to bring up the previous dialog.

The appearance of these buttons depends on the display. On standard 4:3 displays, the arrow symbol is a simple chevron pointing to the left or right. On widescreen 16:10 displays, the buttons are slightly larger and the arrow symbol itself is larger.

2.4 The radar dashboard

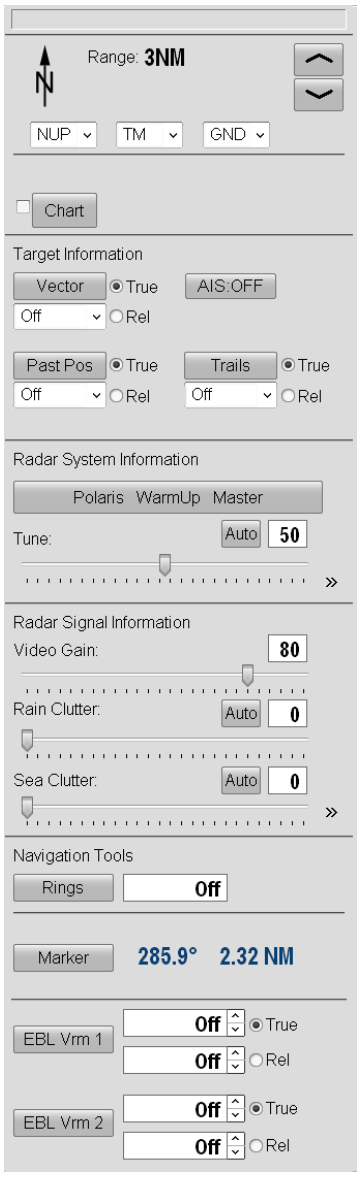
The radar dashboard contains all the controls that you need immediate access to at all times while operating the radar.

The buttons, menus, sliders and radio buttons on the dashboard are described in this section. Some of the buttons bring up dialog boxes.

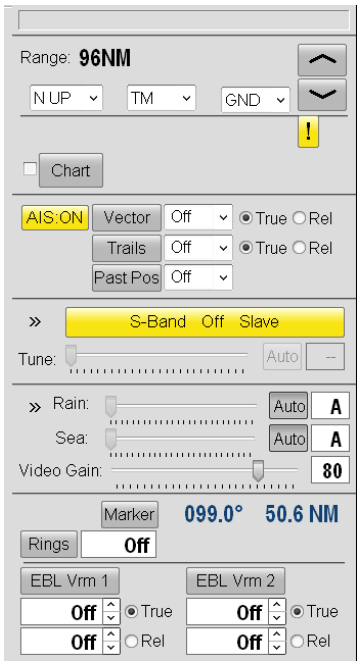
On widescreen 16:10 displays, the radar dashboard is on the left and its individual panels are labelled.

On standard 4:3 displays, the radar dashboard is on the right of the screen and its panels are not labelled.

16:10 display

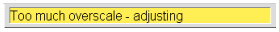


4:3 display



The information and controls on the radar dashboard are described in the following sub-sections:

2.4.1 Radar dashboard: the operator message field



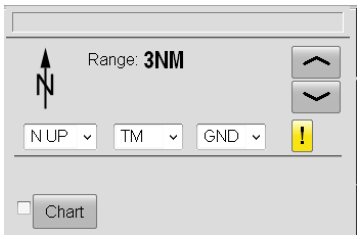
Operator message field: Radar and ECDIS operator messages are displayed on a yellow background in the message field just above the range panel. They may be accompanied by an audible beep, and they require no acknowledgement. The main purpose of such messages is to indicate to the operator when he or she has operated the system incorrectly.

For a list of the operator messages, see *Radar and ECDIS operator messages* on page 732.

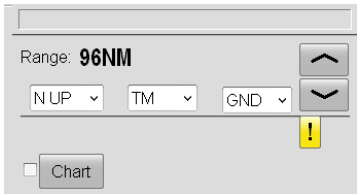
2.4.2 Radar dashboard: the range panel

The range panel at the top of the radar dashboard shows the range and scale of the display. This section describes the panel's contents.

16:10 display



4:3 display



Range Up/Down: Use the arrows to increase and decrease the range of the display. The range is the distance covered from the centre of the radar display to the top of it. There ranges available (in nautical miles) are: 0.125, 0.25, 0.5, 0.75; after 0.75 NM the next available range is always the existing range multiplied by two until the maximum range of 96 NM is reached. In radar the chart scale is determined by the range selected.

Scale: Use this button to bring up the Zoom dialog (see *Zoom* on page 370) which enables you to change the chart scale. In radar the chart scale depends on the currently selected range (refer to the description of the **Range Up/Down** arrows above).

Orientation and motion mode menus: Use these drop-down menus to choose one of the following combinations of orientation and motion modes:

- **NUP/TM** - north up, true motion
- **NUP/RM** - north up, relative motion
- **CUP/TM** - course up, true motion
- **CUP/RM** - course up, relative motion
- **HUP/RM** - head up, relative motion

The orientation modes specify whether the radar display's vertical axis represents North or the vessel's course or heading. They are as follows:

- **North Up (NUP):** The orientation of the screen becomes northwards. The direction of the heading line changes during manoeuvres.
- **Course Up (CUP):** The heading line points upwards on the screen (so that the view out of the windows of the bridge will correspond to the orientation of the screen). An automatic reset of the centre is performed to give maximum coverage ahead. The bearing scale will show north-referenced bearings. The direction of the heading line changes during manoeuvres.

- **Head Up (HUP):** The heading line points upwards on the screen (so that the view out of the windows of the bridge will correspond to the orientation of the screen). The bearing scale will show relative bearings. If input from the compass fails, the head-up option is the only available screen orientation.

The two possible motion display modes are True Motion (TM) and Relative Motion (RM):

- **TM (True Motion):** In true motion, the chart is fixed in the display while the own-ship symbol moves.
- **RM (Relative Motion):** In relative motion the own-ship symbol is fixed while the chart moves.

Speed stabilisation menu: Use this drop-down menu to choose between ground and water as the reference for the own-ship's speed and course, for the speed and course of radar and AIS targets, and for the vectors associated with the own-ship and targets. For more information, see *Ground and water stabilisation* on page 739.

Chart on/off: Click this button to turn the chart display on or off (optional function) in the Radar application. If no chart is available for the area you are navigating and you turn the chart function on, the background colour of the button turns yellow (to indicate there is a problem).

The range panel displays the symbols when charts are in use. For more information about displaying charts, see *Displaying charts on the radar display* on page 208.

– An hourglass is displayed when the system is fetching a new chart or re-scaling.

No chart is available in this geographic position.

An ENC (Electronic Navigational Chart) official chart is displayed.

The chart is being displayed over scale (in this example, by a factor of 1.7). In other words, it is being displayed at a larger scale than it was designed to be viewed at.

Click the button to display the chart at nominal scale.

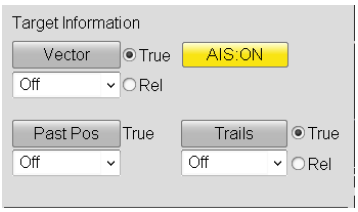
The chart is being displayed under scale. In other words, it is being displayed at a smaller scale than it was designed to be viewed at.

Click the button to display the chart at nominal scale.

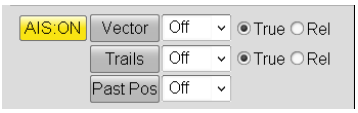
2.4.3 Radar dashboard: the Target Information panel

This panel enables you to control whether targets are shown with vectors, past position indicators and/or trails.

16:10 display



4:3 display



The Target Information panel contains the following controls:

Vector: Click this button to turn vectors for tracked targets on or off. Use the **Left mouse** button and the track-ball to change the vector length: the length can be any value between 1 and 60 minutes.

The drop-down menu beneath the **Vector** button either displays the vector length or states that vectors are switched off. You can use the drop-down menu to toggle vectors on and off.

Use the **True** and **Relative** radio buttons so specify true or relative vectors. You can increase the vectors' length and switch to relative vectors to see if collision avoidance measures are required.

For information about using vectors for collision avoidance, see *Collision avoidance* on page 157.

For information about using vectors as compared with trails and past position marks, see *Trails compared to vectors and past position marks* on page 158.

Past Pos: Click this button to turn on or off. Use the **Left mouse** button and the track-ball to specify the time interval between the history dots. Available time intervals (and their corresponding total past position times) are:

- 0.5 minutes
- 1 minutes
- 2 minutes

The drop-down menu beneath the **Past Pos** button either displays the time interval between the history dots or states that past position markers are off. You can use this drop-down menu to toggle markers on and off.

The past position markers show true (not relative) positions.

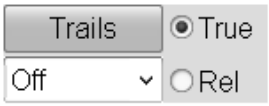
For more information, see *Displaying the past positions of targets* on page 153.

To display a trailing line with time markers indicating the past positions of the own-ship, select **Own Ship Past Track** in the Radar Themes dialog (see *Radar Themes* on page 371).

AIS:ON/OFF Click this button to toggle between the following AIS options:

- AIS:OFF – AIS target symbols and warnings are switched off. (This is the default status.)
- AIS:ON – AIS target symbols and warnings are switched on.

For a list of sample AIS symbols, see *AIS symbols* on page 174.



Trails: Click this button to turn target trails (afterglow) on or off. Radar trails resemble the afterglow found in many old radars, giving an indication of where ships are moving to.

You can specify the length of time you want the trails to remain visible: they can last a minimum of 10 seconds and a maximum of 6 minutes.

The drop-down menu beneath the **Trails** button either displays the length of time for which the trails are visible or states that trails are switched off. You can use this drop-down menu to toggle trails on and off.

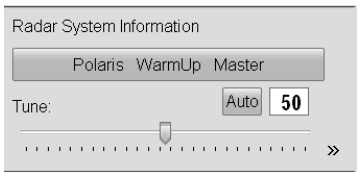
Use the **True** and **Relative** radio buttons so specify true or relative trails. True trails enable you to see exactly where the own-ship has sailed. Relative trails enable you to see whether there is any danger of collision. With true trails on, trails are displayed for all your targets (even ones that you are not tracking). This enables you to see at a glance if a target is moving: a stationary target displays no trail.

For more information, see *Using target trails* on page 155.

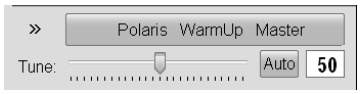
2.4.4 Radar dashboard: the Radar System Information panel

This panel enables you to run the radar transceiver, tune it, and put it into standby. For more information, see *Starting up the MFD (including the radar scanner)* on page 110.

16:10 display



4:3 display



Scanner/Transceiver: Click this button to bring up the Radar Control dialog which enables you to start the radar transceiver (see *Radar Control* on page 539). To start it you must select **Master** and then **Run** in the Radar Control dialog. (When the console is master, it means that you can control the transceiver from the console.)

This button is the same as the Scanner/Transceiver button on the top bar except that the text on the top bar button contains no status information, it just gives the transceiver name (see *Top bar: the Scanner/Transceiver button* on page 59).

The text displayed on this button tells you:

- Which transceiver is selected.
- Whether the transceiver is on, off or warming up. (When the radar transceiver is warming up after being powered on – which takes approximately three minutes – the label "WarmUp" appears in the text of the **Scanner/Transceiver** button.)
- The pulse length being used. Whenever the pulse length is different from the default for the current scale of the display, the **Scanner/Transceiver** button turns yellow and the pulse length indicator (“SP”, “MP”, or “LP”) in the button text is prefixed by an exclamation mark (!). The pulse length is normally selected automatically by the system to match the current scale of the display. However, when the console you are using is master in relation to the transceiver, you can specify a pulse length in the Radar Control dialog (this is the dialog that is displayed at the top of the Docking area when you click the **Scanner/Transceiver** button; see *Radar Control* on page 539).

- Whether the pulse length is locked (so that it remains the same whatever the current scale of the display). You can lock the pulse length in the Radar Control dialog. When it is locked, this is indicated in the text of the **Scanner/Transceiver** button; for example: **Kongsberg S Locked Master**.
- Whether the console you are using is master or slave with respect to the transceiver (in other words, whether you can control the transceiver from this console).

The colour of the button communicates status information:

- **Green:** this console is master in relation to the transceiver (see also *Making the display unit master of the transceiver* on page 107).
- **Grey:** this console is a slave in relation to the transceiver.
- **Yellow:** one of the following is true:
  - The transceiver is in standby.
  - The pulse length is different from the current scale of the display. As described above, when this is the case, the pulse length indicator in the button text is prefixed by an exclamation mark (!).

An alternative way to bring up an instance of the Radar Control dialog to is to click the chevrons in the bottom right-hand corner of this panel. An instance of the Radar Control dialog then appears not in the boarding area (to the right of the main radar display area) but adjacent to the dashboard and partially obscuring the radar display area itself.

Tune: This slider is for tuning the radar's reception from the transceiver. To have the system tune itself automatically, click the **Auto** button.

Click on the chevrons to bring up an instance of the Radar Control dialog (see *Radar Control* on page 539) that partially obscures the radar display itself. This dialog enables you to:

- Select the radar transceiver to be used .
- Start the transceiver (by selecting **Run** in the Radar Control dialog).
- Configure the pulse length.

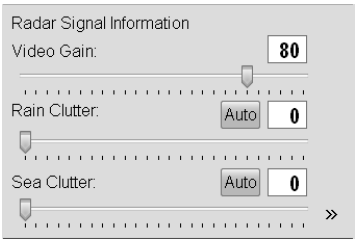
When you have clicked once to bring up the Radar Control dialog, the chevrons appear inverted (see left); click on them again to close the dialog.

The dialog is closed automatically if it is idle for more than a few seconds or if you move the marker (cursor) out of the dialog.

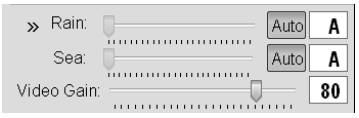
2.4.5 Radar dashboard: the Radar Signal Information panel

This panel enables you to control the radar video gain, and the rain and sea clutter.

16:10 display



4:3 display



To suppress noise and clutter across all ranges, use the slider to adjust the video gain threshold: any echoes whose strength is below the threshold you specify with the slider will not appear on the display.

To have the system tune itself automatically for rain or sea clutter, click the **Auto** button next to the appropriate slider control.

To return to manual clutter control, click the **Auto** button next to the appropriate slider once more or just use the sliders in this panel.

For full information about using the gain and clutter controls, see *Setting the gain and clutter controls* on page 120.

Click on the chevrons to bring up an instance of the Radar Control dialog (see *Radar Control* on page 539) that partially obscures the radar display itself. This dialog enables you to:

- Select the radar transceiver to be used .
- Start the transceiver (by selecting **Run** in the Radar Control dialog).
- Configure the pulse length.

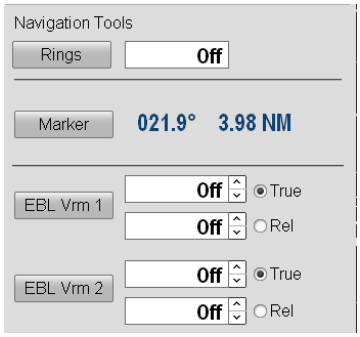
When you have clicked once to bring up the Radar Control dialog, the chevrons appear inverted (see left); click on them again to close the dialog.

The dialog is closed automatically if it is idle for more than a few seconds or if you move the marker (cursor) out of the dialog.

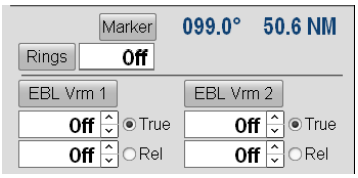
2.4.6 Radar dashboard: the Navigation Tools panel

This panel enables you to turn the display of range rings and electronic bearing lines (EBLs) on and off.

16:10 display



4:3 display



The Navigation Tool panel contains the following controls:

Rings: Click this button to toggle range rings on and off. When range rings are on, the field to the right of the button indicates the distance (in nautical miles) between the rings. You can vary the brightness of the rings (see *Intensity* on page 367).

Marker: The "marker" is the cursor. Click the **Marker** button to toggle the display of marker information (to the right of the button) between the following:

1 The bearing and range from the marker to the own-ship.

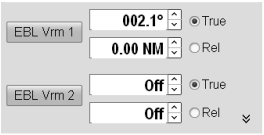
2 The latitude and longitude of the marker position. (This data is continuously updated as long as the marker remains inside the radar area.)

3 The time it would take to steam to the marker position and the ETA (Estimated Time of Arrival).

The values assume that the ship will sail in a straight line to the marker position. The Time to Marker is therefore Range/Speed Over Ground. The ETA is Local Time + Time to Marker.

The Time to Marker data is presented as hours and minutes (hh:mm) if the time is more than one hour; or minutes and seconds (mm:ss) if the time is less than one hour.

4 The own-ship's Closest Point of Approach (CPA) to the marker position, and the Time to the Closest Point of Approach (TCPA).



EBL/VRM: Clicking the **EblVrm 1** and **EblVrm2** buttons turns each of the two electronic bearing lines/variable range markers On or Off.

The **True/REL** radio buttons toggle between true and relative bearing.

The position of the EBL/VRM can be set using the entry fields and/or the **Left mouse** button and track-ball.

You can also drag the EBL/VRM so that its centre is not at the own-ship symbol but at some other position:

1. Turn an EBL/VRM on by clicking either **EblVrm1** or **EblVrm2**.
2. Put the cursor over the own-ship and press the **Left mouse** button.
3. Use the track-ball to reposition the EBL/VRM.
4. When you reposition an EBL/VRM in this way, the **F/M:** button appears (see below).

   When the EBL/VRM is offset from the own-ship, its centre point can either be fixed (F) in a geographic position or it can be set to move (M) with the ship. When you offset the centre point, therefore, an **F/M** button appears appears next to the EBL/VRM controls in the navigation panel. Use this button to toggle between the two options. (By default, an EBL/VRM is centred on the own-ship symbol and moves with the ship.)

For more information about using EBL/VRMs, see *Using the EBL/VRM tool* on page 300.

2.5 The ECDIS range panel

The range panel in ECDIS shows the range and scale of the current chart and contains buttons and menus for:

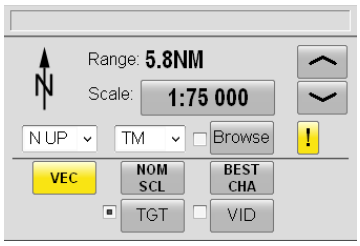
- Increasing and decreasing the range
- Controlling whether the chart's vertical axis represents north or the vessel's course or heading
- Controlling whether the chart is displayed in true or relative motion
- Switching the display of radar and AIS targets on and off

It also contains chart type, scale and status indicators.

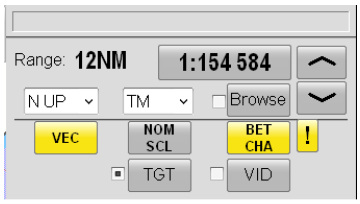
The ECDIS range panel cannot be closed or moved. Its position depends on the aspect ratio of the display; on:

- Widescreen 16:10 displays, the range panel is on the left beneath the top bar
- Standard 4:3 displays, it is on the right beneath the top bar.

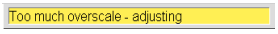
16:10 display



4:3 display



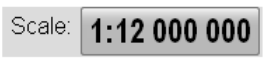
2.5.1 ECDIS range panel: operator message the field



Operator message field: Radar and ECDIS operator messages are displayed on a yellow background in the message field just above the range panel. They may be accompanied by a beep, and they require no acknowledgement. Their main purpose is to indicate to the operator when the system has been operated incorrectly.

For a list of the operator messages, see *Radar and ECDIS operator messages* on page 732.

2.5.2 ECDIS range panel: viewing controls



Scale: This button shows the scale of the displayed chart.

Click the button to see the **Zoom** dialog (see *Zoom* on page 370).

Range Up/Down: Use the arrows to increase and decrease the range of the display.

Presentation mode menus: Use these drop-down menus to choose one of the following combinations of orientation and motion display mode:

- **NUP/TM** - north up, true motion
- **NUP/RM** - north up, relative motion
- **CUP/TM** - course up, true motion
- **CUP/RM** - course up, relative motion
- **HUP/RM** - head up, relative motion

The orientation specifies whether the display's vertical axis represents North or the vessel's course or heading. The possible orientations are as follows:

- **North Up (NUP):** The orientation of the screen becomes northwards. The direction of the heading line changes during manoeuvres.
- **Course Up (CUP):** The heading line points upwards on the screen (so that the view out of the windows of the bridge will correspond to the orientation of the screen). An automatic reset of the centre is performed to give maximum coverage ahead. The bearing scale will show north-referenced bearings. The direction of the heading line changes during manoeuvres.
- **Head Up (HUP):** The heading line points upwards on the screen (so that the view out of the windows of the bridge will correspond to the orientation of the screen). The bearing scale will show relative bearings. If input from the compass fails, the head-up option is the only available screen orientation.

The two possible motion display modes are (TM) and (RM):

- **TM:** In true motion, the chart is fixed in the display while the own-ship symbol moves.
- **RM:** In relative motion the own-ship symbol is fixed while the chart moves.

Browse: When you click it on, the browsing indicator turns yellow to show that you are using the cursor to move freely in the chart, away from the own-ship's position. Click it again when you want to turn it off (the button then turns grey again).

The way to move freely – when browsing is on – is to move the trackball marker and then press the middle button on the trackball (see *The input panel (including trackball)* on page 42); each time you do this, the chart is redrawn with the trackball marker point used as the centre of the screen.

While you are browsing in this way, the system will not automatically update the display to follow the ship's movement.

(The **Browse** button remains yellow to indicate that you must return to one of the chart display modes to monitor the ship's movements again.)

The browsing facility is also available from the Browse Position and Date dialog in ECDIS (see *Browse Position and Date* on page 378). This dialog enables you to specify precise co-ordinates for the centre of the screen (instead of using the trackball marker to indicate the position you want to use as the centre of the screen).

TGT: Check the box to switch on the display of radar and AIS targets. Un-check the box to switch the display of targets off.

Click the **TGT** button to to display the Radar menu for the ECDIS application (see *Radar menu* on page 537).

VID: Check the box to switch the radar video display on for ECDIS; un-check it to switch the radar display off for ECDIS.

Click the **VID** button to display the Radar menu for the ECDIS application (see *Radar menu* on page 537).

When the video is distorted by more than 5 pixels relative to the displayed chart, or when the video is rotated relative to the chart and is therefore not displayed, the **VID** button is shown on a yellow background to indicate an error condition.

This indicator is displayed when there is a risk that parameter settings or external factors will permanently degrade the performance of the ECDIS system or render its type approval invalid. Click the button to bring up a dialog box explaining why the indicator has appeared.

2.5.3 The ECDIS range panel: chart indicators

This section describes the different values that the chart indicators in the ECDIS range panel can display.

Figure 20 The chart indicators in the ECDIS range panel

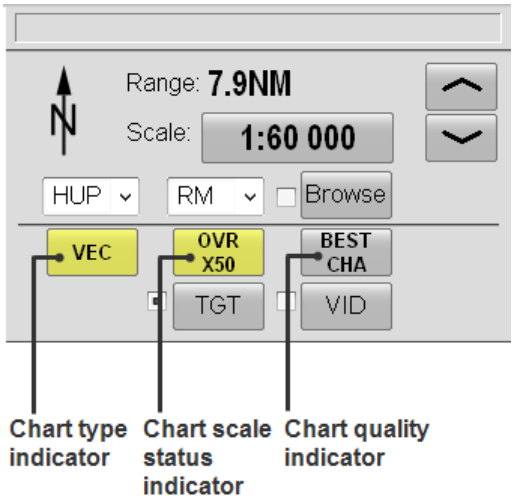


Chart type indicator

This button indicates the type of chart displayed. Click it to display the **Chart Type** dialog (see *Chart Types* on page 477).

The button takes the forms listed below:

NO CHA	No chart is available in this geographic position.
ENC	An (Electronic Navigational Chart) official chart is displayed.
ENC VEC	A combination of ENC and vector (non-ENC) chart data is displayed.
VEC	A vector (non-ENC) chart is displayed.
RNC	A raster chart is displayed.

Chart scale status button

As well as the actual scale of the displayed chart, the top bar includes a button that indicates whether the chart is displayed at nominal scale or whether it is under or over scale. The button takes the forms listed below.

The chart is being displayed at nominal range (approximately). This means it is being displayed at about the scale it was designed to be viewed at.

The chart is being displayed over scale (in this example, by a factor of 1.7). In other words, it is being displayed at a larger scale than it was designed to be viewed at.

Click the button to display the chart at nominal scale.

The chart is being displayed under scale. In other words, it is being displayed at a smaller scale than it was designed to be viewed at.

Click the button to display the chart at nominal scale.

The chart selection indicator takes the forms listed below:

The best chart available is currently displayed.

A better chart exists for the area surrounding the own-ship's current position.

Click the button to load the better chart at its nominal scale.

An official (ENC) chart is available at a better scale.

An official chart is available but it is a lower scale chart.

The chart with the best resolution (at the own-ship's position) is automatically loaded and displayed at nominal scale. (This facility is only available with the K-Bridge Planning application.)

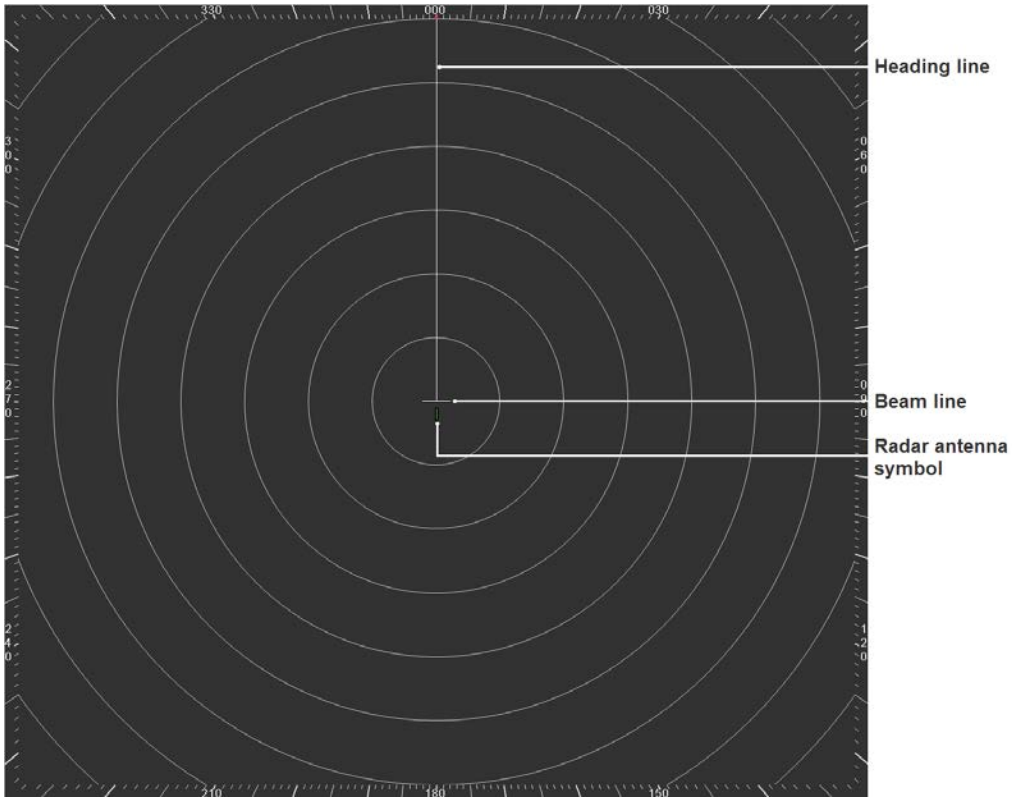
2.6 The radar video area

The part of the display that forms the radar area itself is 320 mm x 320 mm. This section describes the main features of the radar area, including the own-ship symbol (which itself includes the heading and beam lines, the radar antenna symbol, and an optional stern marker), the bearing scale and the range rings.

For more information about using the radar area, see *Tracking radar targets* on page 141 and *Working with AIS targets* on page 165. Refer also to the sections later in this manual on using:

- Electronic Bearing Lines and Variable Range Markers (*Using the EBL/VRM tool* on page 300),
- Parallel Index Lines (*Using parallel index lines* on page 304).

Figure 21 Radar video area with range rings on



The figure above shows the radar area with rings set to ON in the radar dashboard (see *Radar dashboard: the range panel* on page 79). The own-ship symbol is formed by the vessel's heading- and beam-lines.

In addition to the heading line (which is always displayed) you can display a “stern marker”. This is a dashed line that extends from the stern in the opposite direction to the heading line. To display this line, select **View→Main Radar Themes** and check the box labelled “Stern marker” (see *Radar Themes* on page 371).

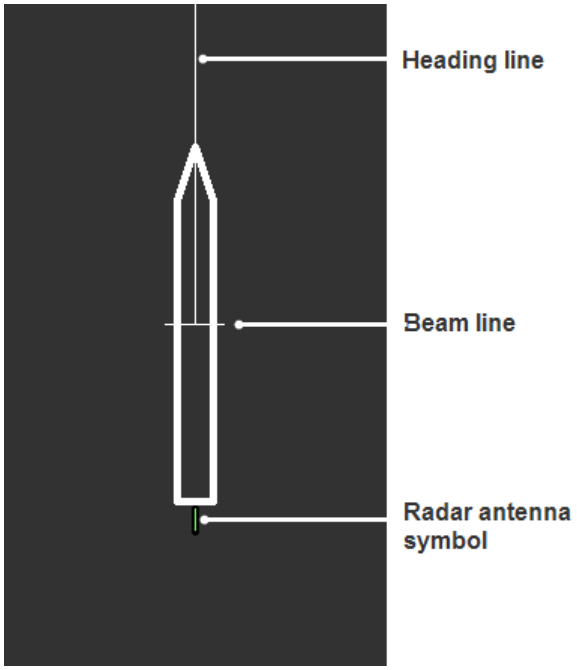
When the radar range you specify in the range panel is low (for example, 0.125 NM) the own-ship symbol appears as a scaled outline of the vessel (see figure below). When you set a higher range, causing the beam of the scaled outline to measure less than 6mm, the scaled outline disappears.

Note

*If you do not want the scaled outline to appear when you set a low range, select **View→Main Radar Themes** and un-check the **Display Ship Outline** option (see Radar Themes on page 371).*

2.6.1 The radar antenna symbol

Figure 22 Scaled outline of the own-ship



The vessel's radar antennas are represented on the own-ship symbol as a green line. The line rotates around a point on the own-ship symbol that corresponds to the position on the vessel of the radar antenna for the selected transceiver.

When the transceiver is transmitting, the direction of the green line at a given moment corresponds to the direction that the antenna is pointing towards in real time.

When the transceiver is not transmitting (in other words, when it is off, warming up or in standby), the green line flashes and points towards the stern (in the opposite direction from the heading line).

Note

If the green line stops rotating or flashing, then the radar screen is not refreshing. This can only be caused by a failure in the display unit. To resume normal updates, try restarting the display unit.

Note

*By default the position of the radar antenna is additionally indicated by a small cross. If you do not want the radar antenna cross to appear, select **View→Main Radar Themes** , and un-check the box labelled "Radar antenna" (see Radar Themes on page 371).*

The green line has a fixed length of 30 pixels. This can only be changed by qualified service personnel and involves editing the Windows Registry: the maximum configurable length is 100 pixels.

Radar antenna location marker 'x' and green rotating direction indicator

WARNING

Rotating Antenna and Radiation Hazard!

For important safety information about working in close proximity to the antenna, see Warnings and Cautions on page 3.

2.6.2 The radar bearing scale and the conning position

The bearing scale is always centred on the vessel's conning position. It shows the true bearing when in stabilized modes, and a relative bearing in head-up mode. You can find the vessel's precise conning position by selecting **System→Parameter Settings →Ship (tab)**, and inspecting the "Conning Pos:" fields. (This data is not configurable except by service engineers; see *Ship (tab)* on page 571.)

Figure 23 The radar bearing scale

If the radar antenna is located a long way from the vessel's conning position, then the location of the CCRP will be outside of the radar area (in other words, off the screen) for small range scales. When this happens, the bearing scale lines on the edge nearest to the (off-screen) CCRP will not be drawn, because they cannot indicate that they are pointing away from the screen. However, the bearing scale lines on the other three edges will continue to point towards the CCRP.

The algorithms for removing bearing scale lines that are too close only remove the one degree lines. This is normally sufficient to prevent the lines from blurring together. When the CCRP is close to the edge of the screen, the remaining 5 and 10 degrees lines and the bearing numbers may be too close to be easily distinguished.

For more information about the bearing scale, see *Establishing a common reference system* on page 114.

2.6.3 The behaviour of the radar area's centre

This section describes how and when the K-Bridge Radar system resets the centre of the radar area. It also tells you how to reset the centre manually.

For information about defining the chart regeneration area in the ECDIS application, see *Defining the chart regeneration area* on page 208.

Automatic resets

When the own-ship's radar antenna moves outside the R_{outer} circle (see figure below), the system automatically resets the centre of the radar area.

If the system is displaying in:

- Relative motion, this automatic reset makes the radar antenna position the centre of the radar area.
- True motion, the automatic reset makes the radar antenna position a point on the R_{reset} circle (see figure below) that is in a straight line (determined by the vessel's course) from the centre of the screen.
- True motion but the own-ship is steaming at less than 3 knots, the own-ship symbol will always remain inside the $R_{reset\ (lowspeed)}$ circle.

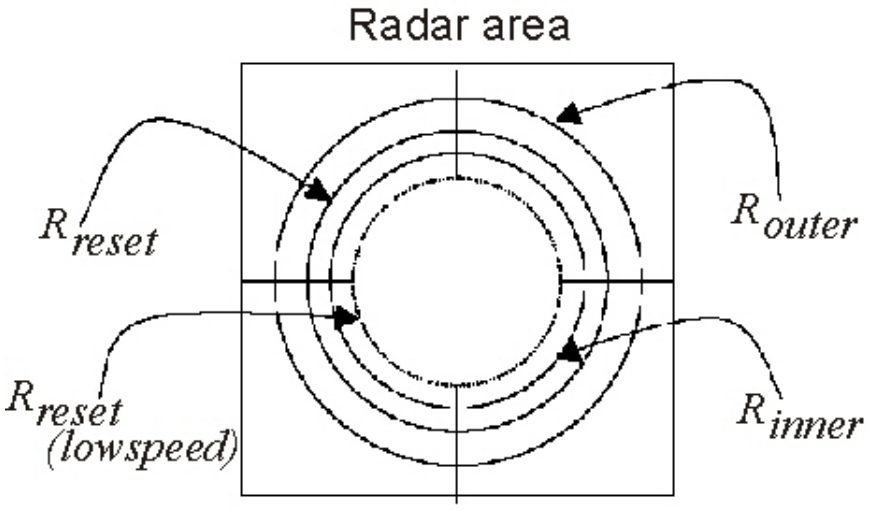
Resetting the centre manually

You can reset the centre of the radar area manually. To do so:

1 Place the marker at the point in the radar area that you intend as the new centre.

2 Click the middle mouse button on the track-ball.

Figure 24 The reset-centre circles



2.7 The ECDIS chart area

As well as showing the chart itself, the chart area displays chart-related objects and data, for example, routes and mariners' notes. It can also display radar and AIS targets.

Figure 25 Sample chart display

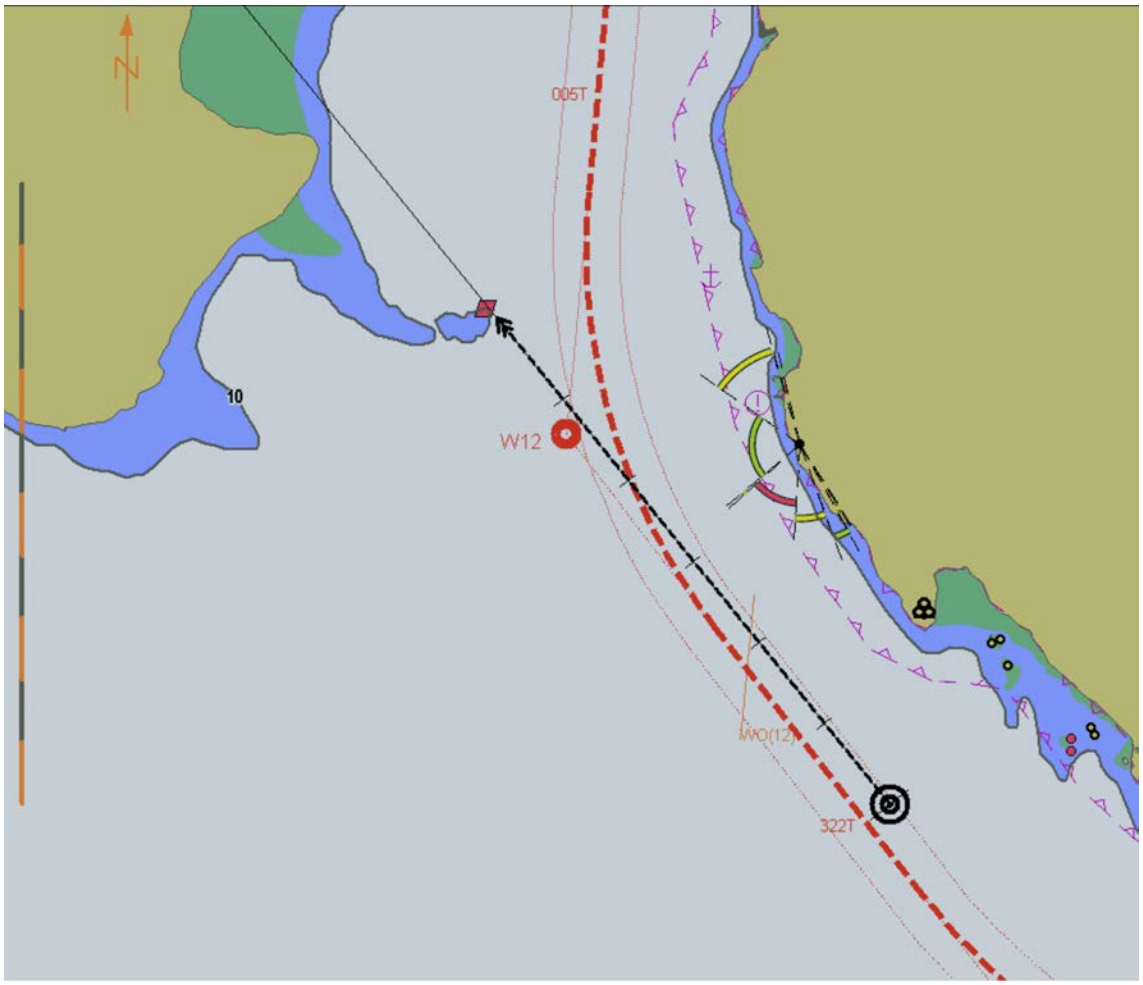
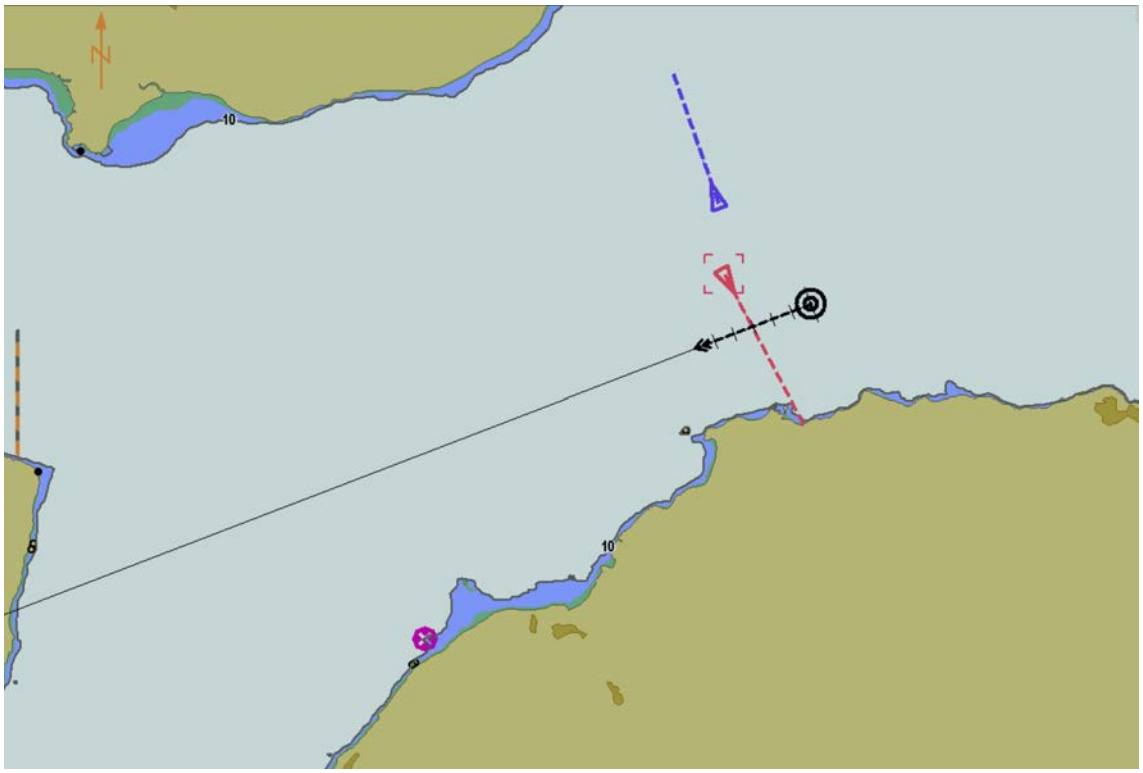


Table 6 The radar target symbol as displayed on a chart

	This symbol is used to indicate tracked targets where radar video and vectors for tracked targets are shown on top of chart information.

If the console is connected to an Automatic Identification System (AIS) receiver, AIS targets are shown on the chart display (and on the radar display). For examples of AIS target symbols and their meanings, see *AIS symbols* on page 174.

Figure 26 A chart display showing an active AIS target and a dangerous AIS target



2.8 The boarding areas in Radar and ECDIS

The boarding areas are on both sides of the ECDIS chart area and on the right-hand side of the radar display area.

The boarding areas enable you to view more than one menu and/or dialog at a time.

Boarding buttons: In ECDIS, you can make the area appear or disappear by clicking the boarding left and boarding right buttons on the top bar (see *Menu area: the boarding buttons in ECDIS* on page 76). The buttons differ according to the resolution of the display (16:10 or 4:3).

Note

The Radar application has a boarding area on the right only, but you cannot make it disappear therefore there is no boarding right button in the radar top bar. (There is no boarding left button either, because the radar dashboard occupies the area of the screen to the left of the radar display.)

If you want to:

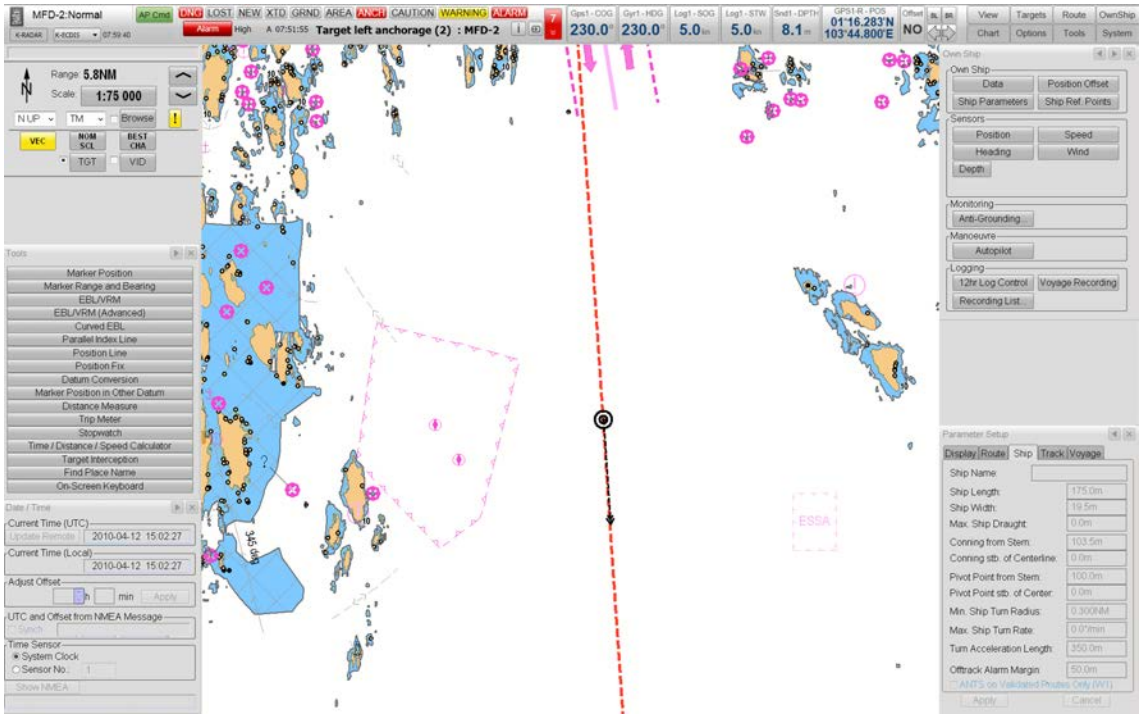
- Make a dialog or menu appear in the boarding area so that you can open another dialog without losing sight of the current one, click on the right or left arrow button in the top right-hand corner of the dialog (see left).

  The boarding areas are populated from the bottom upwards (when you click the boarding right or left button, the menu or dialog goes to the bottom of the boarding area).
- Move the dialog or menu up or down in the boarding area, press the left-mouse button down and drag the dialog or menu.
- Close the dialog, click the 'x' button in the top right-hand corner of the dialog.

Note

The Radar application has a boarding area on the right only. Therefore the Radar's menus and dialogs have only a right arrow in the top right-hand corner.

Figure 27 An ECDIS chart on a 16:10 display with both left and right boarding areas in use



2.9 The track-ball marker in Radar and ECDIS

The track-ball is the system's pointing device: it controls the marker. The marker (or cursor) appears in three forms, depending where you position it on the screen:

The marker as it appears inside the chart or radar area.

The marker outside the chart or radar area.

Digitizing marker. The cursor takes this shape when the system is waiting for a point input. You will see it, for example, during the process of digitizing a new route or graphical note object, when the system is waiting for you to left-click the mouse-button at some point on the chart.

For details of the marker's position on the display, use the **Marker** button on the dashboard (see *Radar dashboard: the Navigation Tools panel* on page 86).

3 Basic setup information

This section contains the following topics:

3.1 Introduction

This chapter provides general information on the setup of the MFD unit.

It also tells you how to start and stop the MFD unit.

Finally it describes the radar system's failure modes and effects.

3.2 About integrated navigation systems

This section describes how the K-Bridge Mulit-functional Display Unit:

- Works with other Kongsberg Maritime navigation systems.
- Displays radar video on multiple display units.

3.2.1 Kongsberg Maritime's integrated navigation systems

K-Bridge navigation consoles now customarily communicate with each other over single or dual Local Area Networks. K-Bridge consoles such as Multi-functional Display (MFD) units running Radar, ECDIS and Conning applications, dedicated Radar, ECDIS, and Conning consoles, and K-Bridge Autopilot systems are all able to communicate with each other over the LAN. This enables them to share such information as:

- The palette setting (day, dusk, or night)
- Routes
- Charts
- Targets
- Barrier Lines
- Mariners' notes
- Templates

The information is distributed in such a way that if one console is switched off or fails, the remaining consoles can continue without degraded performance. When, for instance, a route is edited in one display, it is automatically updated in all the other units.

The principle of sharing information has the following benefits:

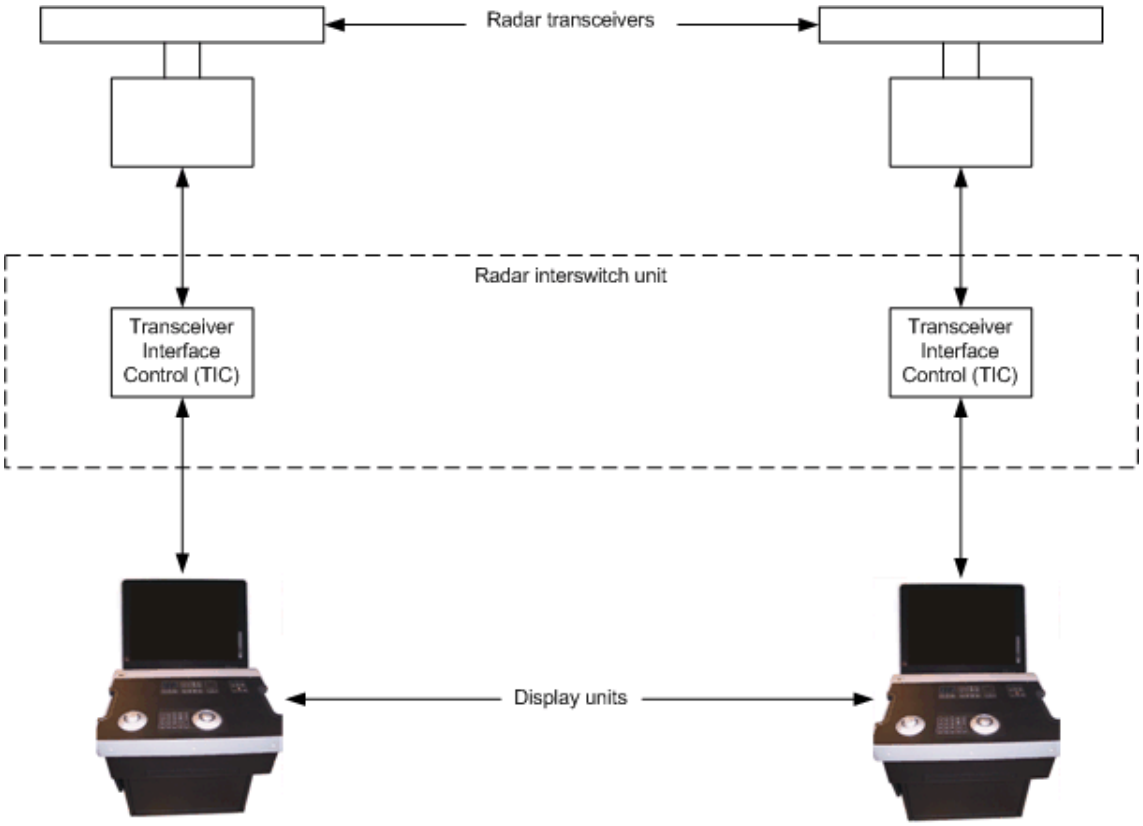
- A route selected for monitoring or for track steering will be common to all display units.
- The own-ship data is common to all display units.
- Tracks from any radar/ARPA target can be monitored at every ECDIS display unit.
- Radar video from any radar/ARPA can be monitored at every ECDIS display unit.

It is possible to switch a display unit off-line. This will stop the unit from sharing the system-wide information.

3.2.2 The radar interswitch unit

On a K-Bridge Radar system, the presence of a radar interswitch unit between the vessel's radar transceivers and display units means that it is possible to display radar video from one transceiver on multiple display units.

Figure 28 The radar interswitch unit

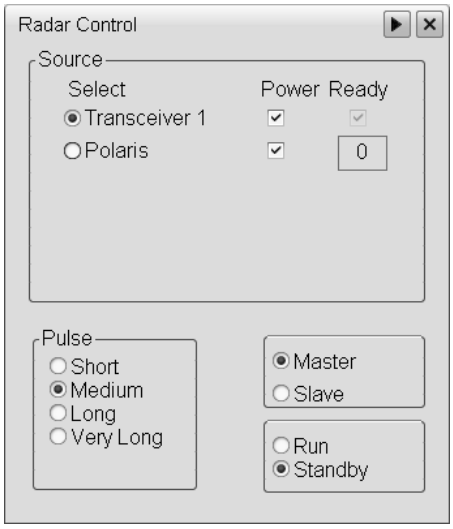


There can be up to six transceivers in a K-Bridge Radar system, and up to six display units. Only one console at a time, however, can be in control of the transceiver. This display unit is referred to as master in relation to the transceiver; the other display units are slaves in relation to it. They are also slaves in relation to the other display units connected to the same transceiver: they cannot alter any settings that affect the presentation of radar video on the other display units.

3.2.2.1 Selecting the transceiver for a display unit

When you select a transceiver for a display unit (by clicking one of the radio buttons underneath the word **Select** in the **Radar Control** dialog), that display unit will become master in relation to the transceiver if no master already exists; otherwise it will become a slave.

3.2.2.2 Making the display unit master of the transceiver



To make a particular console the master in relation to the transciever when it is currently a slave, select **Radar→Source**, and check the **Master** radio button (see *Radar Control* on page 539).

It is possible to prevent a display unit from becoming master in relation to one or more transceivers. However, this can only be done by editing the Registry and is therefore reserved for installation and service engineers. On a display unit whose Registry has been edited to prevent it becoming master, the **Master** and **Slave** radio buttons in the **Radar Control** dialog are greyed out.

Any display unit (assuming that it has not had its Registry edited in the way just described) can at any time be made master or slave in relation to any transceiver.

When you make a display unit master, all other units connected to the same transceiver as the new master (including the display unit that was previously master) immediately become slaves. This is indicated by the Scanner/Transceiver buttons on the radar dashboard (see *Radar dashboard: the Radar System Information panel* on page 83) and on the top bar.

There is no requirement for the transceiver to have a master display unit at all times. However, it is normal for example for one display unit to be master for the X-Band transceivers and another to be master for the S-Band transceivers.

The transceiver controls that are only available to the operator of a master display unit include:

- Standby/Run (see *Radar Control* on page 539)
- Pulse length selection (see *Tx Configuration* on page 653)
- Tuning (see *Rx Configuration* on page 654)
- Antenna alignment (see *Azimuth Configuration* on page 655)
- Inhibition of radar transmission (see *Tx Mute* on page 656)

Although slave display units cannot affect the display settings on other display units, they do have control over their local display settings. They control their own:

- Gain and clutter settings
- Display orientation and principle of stabilisation (ground or water)
- The current centre of the display
- Operation of the radar tracker
- Operation of trails
- Range scale (but note that pulse length selection can only be performed on the master display)
- Use of synthetic drawings or overlays

3.2.2.3 Automatic standby of radar antennas

The radar interswitch monitors the use of the radar antennas by the MFDs. If five minutes pass during which a particular antenna has not been selected as the source of radar input for any MFD, the radar interswitch automatically puts that antenna into standby. The antenna then remains in standby until an MFD that is set up as master in relation to the antenna starts it up again. This is a precaution to prevent antennas from running when they are not in use, for example, when a vessel has docked.

3.2.2.4 Fault tolerance in the design of the interswitch

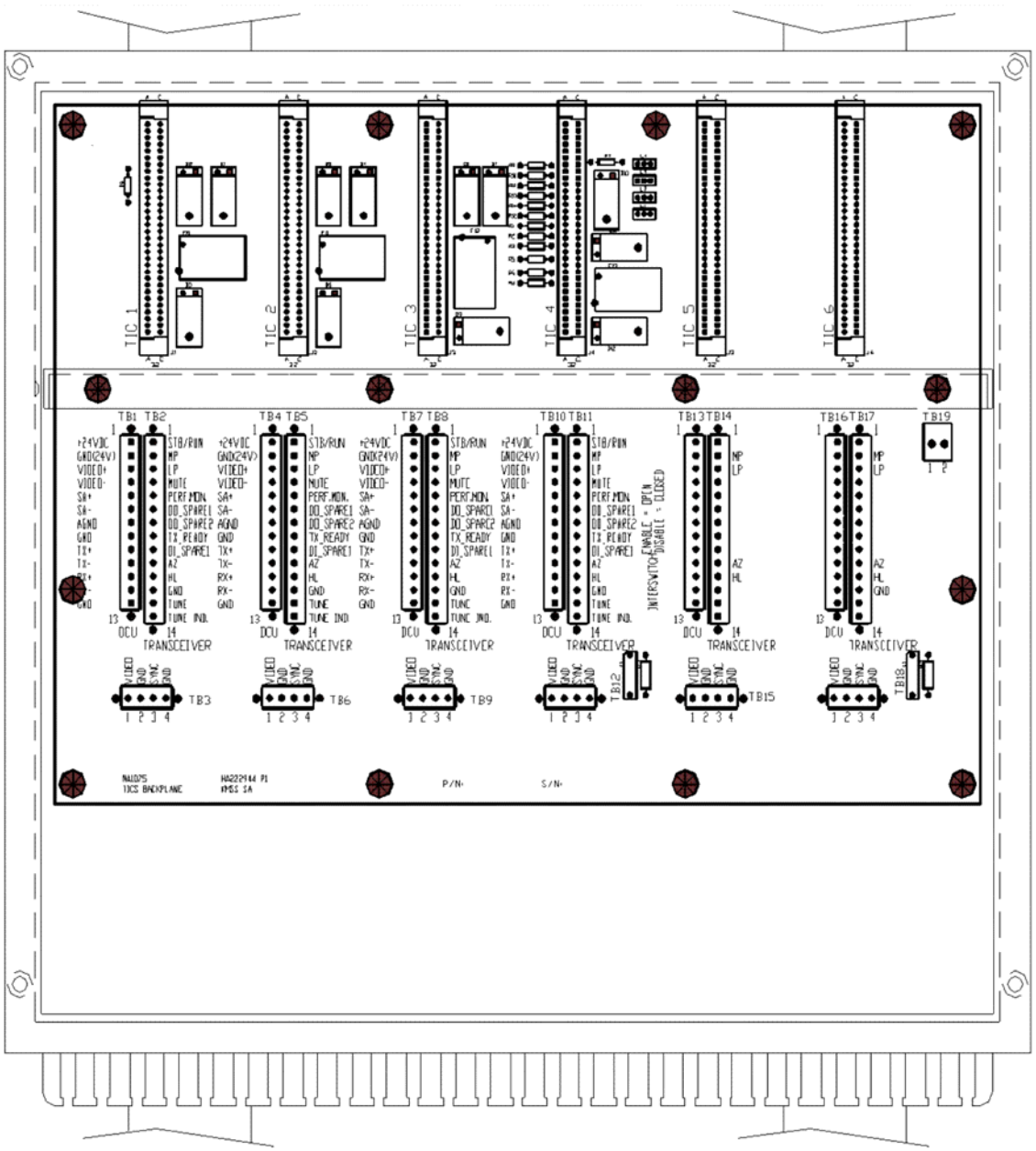
The design of the radar interswitch unit ensures that, in a configuration of multiple radar transceivers and display units, no single point of failure can bring down all communication between the transceivers and display units.

Inside the interswitch unit there is a single large PCB which contains terminal lists and connectors for up to six TIC (Transceiver Interface Control) boards. Each TIC interfaces between one display unit and one transceiver. If a display unit has the transceiver corresponding to its TIC selected, then only that TIC is involved in communication between the transceiver and the display unit. In this case, if a problem arises with the transceiver, the TIC or the display unit, the performance of the rest of the K-Bridge Radar system is unaffected.

If a display unit has a transceiver corresponding to another TIC selected, then two TICs are involved in the communication between the display unit and its transceiver. However, in this case the signals are sent over a bus connection that is implemented in back-wiring between the two TICs.

This means that, if there is a problem of communication between the two TICs, the display unit will not be able to select a transceiver belonging to yet another TIC but it will still be able to select the transceiver attached to its own TIC. Therefore its ability to operate as a free-standing radar set is maintained.

Figure 29 Layout of the radar interswitch unit



3.2.2.5 The interswitch unit's power supply

The power supply to the interswitch is 24V DC from the display units. Each display unit has sufficient power capacity to power all six TIC boards. Diode logic ensures that each TIC will draw power from its corresponding display unit if that unit is available and switched on, and from any other display unit if its own is switched off.

3.3 Starting up the MFD (including the radar scanner)

WARNING

Before you start check that no personnel are within the hazard zone around the radar antenna.

To start up the console, observe the following procedure:

1 Switching the power on

a Open the computer compartment door on the console.

b Locate the computer inside the console. The computer is attached to the computer door inside the console.

c Click the **POWER** button on the front of the computer. The **POWER** indicator on the ALC NAV panel is lit after approximately 2 seconds and the buzzer beeps twice during the start-up sequence. The start-up sequence takes about 3 minutes, and the console is then ready to operate.

- If a problem occurs or the application does not start within 4.5 minutes the **FAULT** and **ALARM** indicators on the ALC NAV panel are lit and the buzzer is activated.
- During start-up, the display will remain dark to avoid accidentally harming the operator's night vision.

2 Selecting the radar scanner/transceiver

a In the top left-hand corner of the screen (just beneath the Kongsberg Maritime logo), use the drop-down menu to select the Radar application (see *Switching between Radar, ECDIS and Conning* on page 120).

b In the radar application, click the radar **Scanner/Transceiver** button on the radar dashboard.

The button's text will vary with the system's state and configuration (see *Radar dashboard: the Radar System Information panel* on page 83).

When you click the scanner/transceiver button, the **Radar Control** dialog is displayed in the boarding area to the right of the main radar display (see *Radar Control* on page 539).

c Select the scanner/transceiver.

d Apply power to the selected scanner/transceiver unit by checking the **Power** check-box for the selected scanner/transceiver.

e Select **Master** or **Slave**. If the scanner/transceiver is not already controlled by another display, select **Master**.

f Pulse length is automatically selected for the range scale of the master console's display. You can select a different length if you are configuring the master console (short - SP, medium - MP, or long - LP).

- Pulse length can only be selected if you are at the master console.
- If the pulse length you select is not suitable for the range selected, the **Scanner/Transceiver** button turns yellow.

g Start the selected scanner/transceiver by selecting **Run** in the Radar Control dialog.

3 Selecting range rings

A set of fixed range rings, displayed as a number of equally spaced circles can be switched On or Off (see *Radar dashboard: the Navigation Tools panel* on page 86).

4 Changing range scale

The range scale is set by using the range up and down arrows in the Range panel of the dashboard (see *Radar dashboard: the range panel* on page 79). Ranges from 0.125 to 96 NM are available. For the best detection of small targets in sea clutter, always select the shortest range compatible with your operational requirements.

5 Turning range rings on and off

Turn range rings on and off by using the Rings button in the Navigation tool panel on the radar dashboard (see *Radar dashboard: the Navigation Tools panel* on page 86).

6 Setting the video gain control

Adjust the video gain as required (see *Radar dashboard: the Radar Signal Information panel* on page 85).

Always adjust the **Video Gain** control when using the longer range scales of 12 or 24 NM. A light background speckle must be present to make sure small targets are displayed. A temporary reduction in gain can be beneficial when searching for targets in rain or snow conditions. For more information, see *Setting the gain and clutter controls* on page 120.

7 Using the sea clutter controls

Use the sea clutter controls to reduce sea clutter to an operational level at which a little clutter speckle is present (see *Radar dashboard: the Radar Signal Information panel* on page 85). The setting must permit small targets to be detected that are of similar strength to the sea clutter returns.

Caution

Use the sea clutter controls with caution. Never completely remove sea clutter, because this reduces your capacity to detect small targets.

You can use the **AUTO** setting to suppress sea clutter in open sea conditions. This normally provides optimum detection by adapting sea clutter suppression to the varying characteristics of the sea clutter.

Note

To return to manual sea clutter control when the system is performing automatic sea clutter control, adjust the slider manually.

8 Using the rain clutter controls

Use the rain clutter controls to optimize the suppression of rain clutter (see *Radar dashboard: the Radar Signal Information panel* on page 85). Try to balance the detection of targets within the clutter area (under the rain) with detection of those outside the clutter area.

Caution

Always use the rain clutter controls with great care. Excessive suppression can cause loss of small targets. It is often advantageous to use this control to search for targets in the clutter region, returning the control to minimum after the search.

You can use the **AUTO** setting to suppress rain clutter in open sea conditions. This normally provides optimum detection by adapting rain clutter suppression to the varying characteristics of the rain clutter.

Note

To return to manual rain clutter control when the system is performing automatic rain clutter control, adjust the slider manually.

9 Using the tune control

The Tune slider control is on the Radar System Information panel on the Radar dashboard (see *Radar dashboard: the Radar System Information panel* on page 83).

Note

The tune control is only available on the console that is master in relation to the selected scanner/transceiver.

We recommend you click the **Auto** button so that the system tunes the transceiver automatically.

If you want to tune the transceiver manually, move the slider to the maximum setting (which is normally near the middle of the slider's scale) and then fine-tune using weak targets.

10 Choosing the presentation mode

Using the drop-down menus in the Range panel of the radar dashboard (see *Radar dashboard: the range panel* on page 79) select the combination of presentation modes you require:

- Orientation (north up, course up, or head up)
- Motion (true or relative)

Also specify whether you are using ground- or water-referenced sensors for the measurement of speed and course (see *Ground and water stabilisation* on page 739).

11 Setting the radar to standby

- Click the **Scanner/Transceiver** button (see *Radar dashboard: the Radar Signal Information panel* on page 85) and, in the **Radar Control** dialog, select **Standby**. For more information about the Radar Control dialog, see *Radar Control* on page 539.

12 Selecting the chart database to use

a In the top left-hand corner of the screen (just beneath the Kongsberg Maritime logo), use the drop-down menu to select the ECDIS application (see *Switching between Radar, ECDIS and Conning* on page 120).

b If you have more than one chart database installed, select the one you require.

Select **Chart→Chart type** (see *Chart Types* on page 477).

13 Specifying the safety contour

When the system is first started the safety contour is always set to 30 metres.

Select a safety contour that is appropriate to your ship's draught and to the depth contours in the vector charts available (see *Safety Depth* on page 479).

When the system is restarted, it will automatically re-use the previously specified safety contour.

14 Selecting the chart scale to use

The ECDIS application automatically starts monitoring in North Up, True Motion and with the best chart available for the own-ship's current position.

Normally several charts of different scales are available for a given position.

a Click the scale button in the ECDIS range panel (see *ECDIS range panel: viewing controls* on page 88) to bring up the Zoom dialog.

This dialog lists the available charts and states the nominal (that is, the optimal viewing) scale for each (see *Zoom* on page 370).

b Use the **Zoom In** and **Zoom Out** buttons in the Zoom dialog to try out the available chart scales:

- **Zoom In:** increases the chart range by a factor of two for each click of the button.
- **Zoom Out** decreases the chart range by a factor of two for each click of the button.

c Check the chart scale status indicator to see if the chart is displayed at over or under scale (see *The ECDIS range panel: chart indicators* on page 91).

d Select the chart you want to use.

The chart will then be displayed at nominal scale.

Note

To give the best view of the area you are sailing in, always select the largest scale that is compatible with your operational requirements.

15 Selecting radar video and target vectors

Both target vectors and radar video can be displayed as overlays to the chart.

In the ECDIS range panel, select **TGT** and/or **VID** (see *ECDIS range panel: viewing controls* on page 88).

16 Changing chart themes

Vector charts are constructed in a way that enables you to switch on and off different types of chart information belonging to them. Use the theme controls to avoid cluttering the screen with information that you do not need.

a Select: **View→Themes**.

17 Select the themes you require, or choose **Standard** or **Everything** (see *Chart themes in ECDIS* on page 374).

18 Changing presentation mode

Use the drop-down menus in the ECDIS range panel to configure the presentation mode you require (see *ECDIS range panel: viewing controls* on page 88). The possible combinations are:

- **NUP/TM** - north up true motion
- **NUP/RM** - north up relative motion
- **CUP/TM** - course up true motion
- **CUP/RM** - course up relative motion
- **HUP/RM** - head up relative motion
- **Browse** - for north up planning

3.4 Establishing a common reference system

To enable the system to provide an accurate correspondence between the symbols of the own-ship and the target and chart data displayed, it is necessary when setting up the console for the first time to establish a common reference system for all measurements of range and bearing.

Unless otherwise stated, all measurements of range and bearing used by the K-Bridge navigation system are relative to the vessel's Common Consistent Reference Point (CCRP); in other words, its conning position.

You can find the vessel's precise conning position by selecting **System→Parameter Settings →Ship (tab)** and inspecting the **Conning Pos** fields. (This data is only configurable by service engineers.)

For information about the behaviour of the radar bearing scale in relation to the conning position, see *The radar bearing scale and the conning position* on page 95.

The accuracy of the system depends on the following having been accurately specified during commissioning:

- The ship's dimensions. These are specified in the **Ship Parameter** dialog (see *Ship (tab)* on page 571).
- The conning position. The conning position is specified with a metric offset from the stern and the ship's center line. The conning position is the bridge reference point and is used for displaying the own-ship's position (unless otherwise specified). The conning position is specified in the **Ship Parameter** dialog (see *Ship (tab)* on page 571).
- The position of the receiving antenna for each position sensor. This is specified with a metric offset from the stern and the ship's centre line. The position receivers must also output geographic data using the WGS-84 datum. These two measures ensure the correct placement of the own-ship in the radar and chart displays.
- The position of the speed sensors (offset from centre-stern).
- The position of the radar antenna, for receiving radar targets.

- The position of the pivot point (offset from centre-stern). The pivot point is the point on the ship which follows a smooth curve when the vessel uses the rudder. Points astern of the pivot point will move outwards, and points ahead of it will move inwards when the rudder is used. Specifying the position of the pivot point accurately in the console's system software ensures that the Dead Reckoning calculations are correct during turns. It is also essential for the correct operation of the autopilot in track mode. (The pivot point is not in fact a constant point on the ship; it will vary with different load conditions and also during a turn. However, for simplicity it is configured as a constant location on the ship. And the location will be different for different types of ship. It is often found to be approximately 30% of the ship's length from the bow.)

In addition, the heading sensors must each be calibrated to provide the correct heading of the ship; this ensures that the ship is displayed at the correct angle.

3.4.1 The Ship parameters tab

To configure the ship parameters, select: **System→Parameter Settings→Ship (tab)**.

The ship parameters are:

- **Ship Name:** This is used for verification of the position log and it appears on printouts.
- **Ship Length/Width:** This is used for drawing the ship symbol in large scale charts.
- **Max Ship Draught:** This value is used by the system to inhibit the navigator from selecting a safety contour that is too shallow for the vessel.
- **Conning Position:** This is the common consistent reference point (CCRP) for all K-Bridge measurements (it is the position reported on the top bar as the vessel's position). This position should be defined on the centre-line of the ship and on a line through the bridge consoles. Normally the conning position will be the helmsman's position.
- **Pivot Point:** This is the reference point for track-keeping and for computing any cross-track distance (XTD). It needs to be a point near the gravitational centre of the ship.
- **Min. Ship Turn Radius:** This defines the sharpest turns available in Route Planning.
- **Max. Ship Turn Rate:** If set to a value above or below 0.0, this parameter defines the maximum turn rate for the vessel. During route monitoring, if the ship approaches a sharp turn at too high a speed, the turn rate will exceed this value and an alarm will be activated.
- **Turn Acceleration Length:** This is set for computing the Wheel-over Line; it corresponds to the **Acc. Length** setting in the K-Bridge Autopilot (see *K-Bridge Autopilot Operator Manual*, see *References* on page 45).
- **Offtrack Alarm Margin:** This is the distance from the Pivot Point to the Offtrack-Limit of the Route at which the XTD Alarm will be activated. To ensure that the whole ship stays inside the area of the validated route, the alarm margin should be larger than half the ship's width.

3.4.2 Verifying the ship parameters and sensor geometry against a chart

This section suggests two optional tests you can perform if you have good charts available for the own-ship's current location.

Preconditions:

- Have available a large scale chart (better than 1:50000) of the current ship area, check the geometry of the ship contour with relation to the fixed geometry in the chart.
- Make sure the ship parameters have been set up properly.
- Make sure the GPS antenna offset has been defined properly.
- Make sure the heading sensor has been set up properly.

Selecting in turn all available position sensors, make sure the placement of the ship symbol is correct with each sensor.

If a radar image is available, use the radar information to check the position of distinct elements in the chart.

3.5 Establishing the correct colour calibration on the monitor

1 If you are using:

- An ISIC 26" monitor, go straight to step 2.
- A Hatteland 27" TFT monitor (JH27T11, JH27T14) or a Hatteland 23" monitor (JH23T02, JH23T12, JH23T14) installed and you have replaced the monitor originally supplied with the console, you must upload the colour calibration table from the monitor to the MFD's main computer:

  a In the ECDIS application select: **System→Maintenance→Configure Monitor** (see *Select Monitor* on page 605).

  b Select the monitor type from the drop-down list.

  c Click **Load Calibration File from Monitor**.

2 Select **View→Palette/Intensity**, and click **Set Calibrated** (see *Intensity* on page 367).

This sets the back-light to the correct level for displaying chart colours in the current screen palette (day, dusk or night).

3 Select **Chart→Colour Differentiation and Calibration**.

To confirm that the monitor is functioning properly, make sure you can see a clear difference between the foreground colour lines and the background colours (see *Colour Differentiation and Calibration* on page 531).

4 Select **View→Palette/Intensity** and confirm that it is possible to adjust the backlight on the monitor by using the brilliance slide control (see *Intensity* on page 367).

Also confirm that it is possible to adjust the back-light by using the brightness controls on the monitor (see *The brightness controls on the monitor* on page 44).

If the foreground and background colours cannot be differentiated, or if it is not possible to adjust the backlight using the slide control and brightness controls on the monitor's housing, contact the Kongsberg Maritime service department.

On the 27" and 23" monitors, patterns displayed by the LEDs around the brightness knob indicate whether the backlight and brightness are at the ECDIS calibrated level or not. These patterns and their meanings are listed in the table below. For descriptions of the other LED patterns and activity associated with the brightness knob, see *The brightness controls on the monitor* on page 44.

Table 7 The calibration status LED patterns on the Hatteland 27" and 23" monitors

LED pattern	Calibration status	Description
	Status: Calibrated The back-light and brightness are at the ECDIS calibrated level.	Four green LEDs are on (not flashing). Each is directly opposite another LED, and between each is an LED that is off.
	Status: Over calibrated The back-light and brightness are above the ECDIS calibrated level. To return to the ECDIS calibrated level, turn the knob anticlockwise.)	Four green LEDs are on (not flashing). One is next to another LED on the right that is also on.
	Status: Under calibrated The back-light and brightness are below the ECDIS calibrated level. To return to the ECDIS calibrated level, turn the knob clockwise.	Four green LEDs are on (not flashing). One is next to another LED on the left that is also on.

3.6 Switching off the MFD console

The system can be switched off in either of two ways: by means of the **POWER** button on the main system computer (the computer is located inside the console), or using the **Shutdown** menu.

3.6.1 Switching off the system using the computer's power button

1 Open the computer compartment door on the console.

2 Locate the computer inside the console. The computer is attached to the computer door inside the console.

3 Press the **POWER** button on the front of the computer. This removes the power to the computer (the power light on the computer is switched off).

3.6.2 Switching off the system using the Shutdown menu

1 Select **System→Shutdown**.

2 The **Shutdown** dialog is displayed (see *Shutdown* on page 664).

3 Select the function you require:

- **Restart:** Select to stop and restart the Radar, ECDIS and Conning applications.
- **Restart Computer:** Select to stop all programs and restart the entire computer.
- **Power Off Computer:** Select to stop all programs and remove power to the computer.

4 To switch off the console, click the **Power Off Computer** button.

This stops all programs and removes power to the computer.

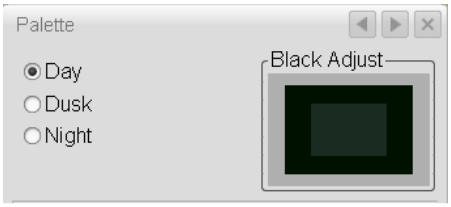
4 Basic operating information

This section contains the following topics:

4.1 Introduction

This chapter tells you how to control the brightness of the display, how to switch between the Radar, ECDIS and Conning applications, and how to perform certain other basic ECDIS and radar operating procedures.

4.2 Controlling the brightness of the display

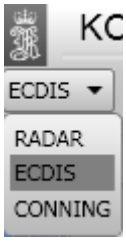


If the display is too bright and impedes your night vision from the bridge, select: **View→Palette/Intensity→Night**.

The brightness can be adjusted for both the display and the operator panel. Three levels of brightness are available, suitable for: Day, Dusk and Night.

For more information about controlling the brightness of the display, see *Intensity* on page 367.

4.3 Switching between Radar, ECDIS and Conning



In the top left-hand corner of the screen in all three applications (just below the Kongsberg Maritime logo) is a drop-down menu.

Next to the menu arrow is the name of the application you are currently using: RADAR, ECDIS or CONNING.

To switch to another application, click the arrow and select the application you require.

You can also switch between applications by using the Shutdown menu (see *Shutdown* on page 664).

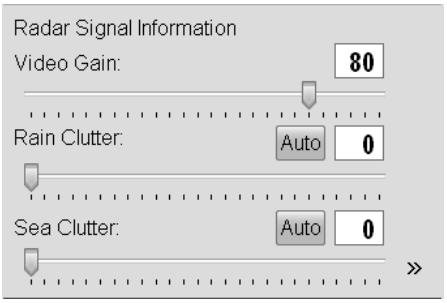
4.4 Setting the gain and clutter controls

The gain and clutter controls on the radar dashboard (see *The radar dashboard* on page 77) are designed to help you distinguish between echoes from targets and echoes from clutter. The radar displays all the echoes it receives and there is no essential difference between an echo from a target (such as a ship, buoy or other solid object) and an echo caused by waves or precipitation. (Echoes caused by the latter are called “clutter”.)

This section tells you how to use the gain and clutter controls to see targets more clearly.

For more information about radar video display issues, see *Concepts of video enhancement* on page 743 and *Minimising radar display problems* on page 751.

Figure 30 The gain and clutter controls (on the radar dashboard)



4.4.1 Setting the gain threshold

The video gain control on the radar dashboard (see *Radar dashboard: the Radar Signal Information panel* on page 85) enables you to set a threshold for the strength of echoes: any echoes whose strength is below the specified threshold will not appear on the display.

Broadly speaking, the gain and clutter controls have the following effects:

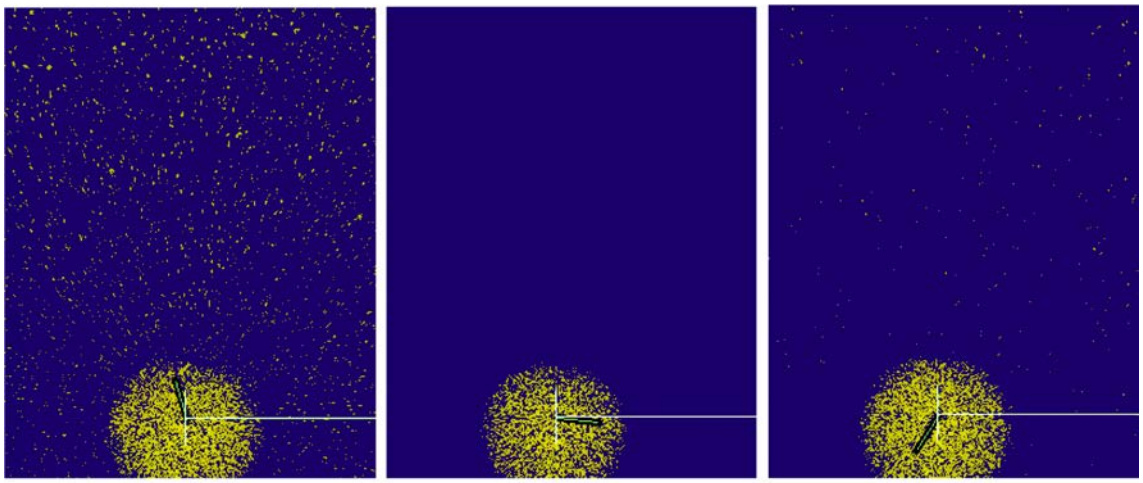
- The gain controls suppress noise and clutter across all ranges on the video display.
- The sea clutter controls suppress noise and clutter at close ranges.
- The rain clutter controls suppress noise and clutter at distant ranges. They also more specifically enable you to regulate the degree to which echoes are enhanced to differentiate them from local precipitation.

The minimum gain setting is zero and the maximum is 100.

There is no setting of either the gain or clutter controls that is optimal for all conditions. However, the gain setting is appropriate when the parts of the screen that are outside of the sea clutter area are neither too densely filled with speckles nor entirely empty of them (see the figures below).

The optimal range scale for setting the gain threshold is 12 or 24 NM. Gain can be adjusted by means of the rotary button on the operator panel, the Video Gain slider on the radar dashboard, or the numeric field on the radar dashboard (see *Radar dashboard: the Radar Signal Information panel* on page 85). The present gain setting is indicated by the position of the Video Gain slider and by the numerical field.

Figure 31 Gain setting too high (left), too low (middle), appropriate (right)



4.4.2 Using the manual sea clutter controls

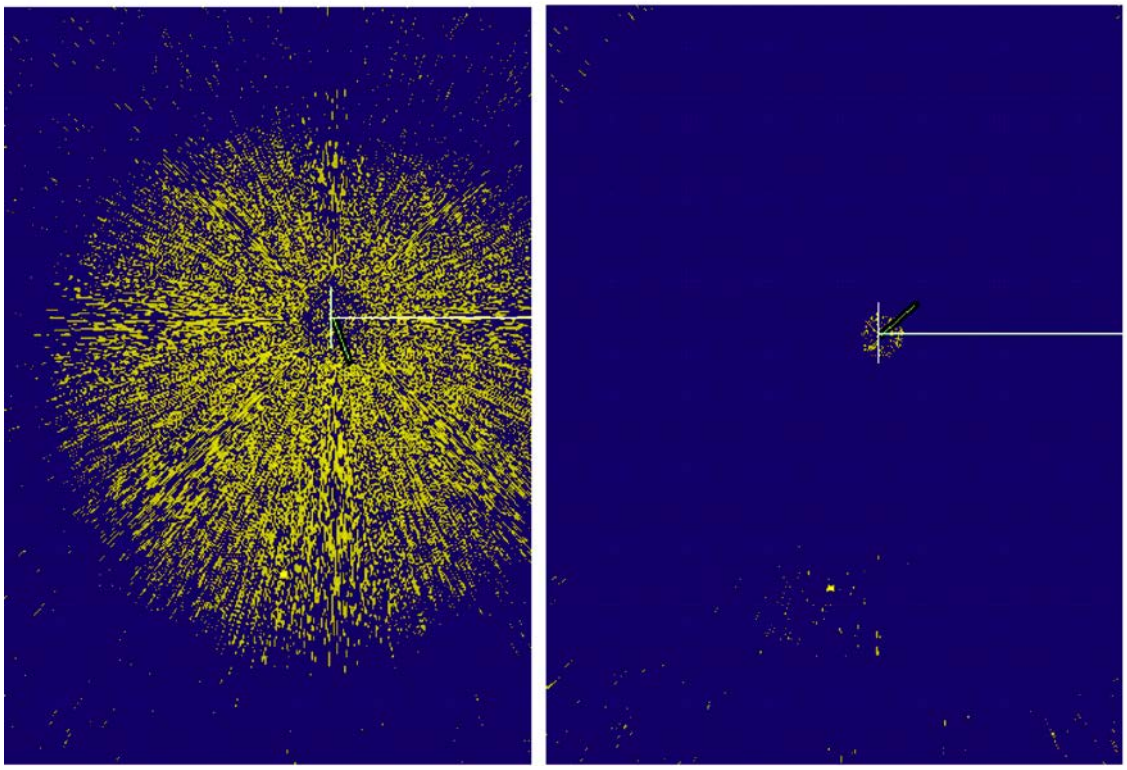
The proper procedure for controlling the sea clutter manually is to adjust the gain setting first (see *Setting the gain threshold* on page 121), then to adjust the sea clutter until the sea clutter area around the own-ship symbol is reduced to a size that leaves a substantial area of the screen free from clutter.

The minimum sea clutter setting is zero and the maximum is 100.

The current setting is indicated graphically by the position of the slider and numerically by the value in the adjacent number field (see *Radar dashboard: the Radar Signal Information panel* on page 85). Clicking the **Auto** button turns *automatic* sea clutter control on or off (when it is on, an **A** appears in the number field). When it is off, you can specify the setting manually by using the rotary button on the operator panel. Whether it is on or off, you can specify a setting manually simply by moving the slider or editing the number field.

Remember that sea clutter is caused by strong echoes from waves breaking in close proximity to the own-ship. If you adjust the setting to a level that eliminates these echoes, you risk also eliminating echoes from targets. It is often simply not possible to set the controls so that echoes from breaking waves are rejected while echoes from all the targets you are interested in show clearly.

Figure 32 Sea clutter settings too high (left) and appropriate (right)



4.4.3 Using the manual rain clutter controls

The current rain clutter setting is indicated graphically by the position of the slider and numerically by the value in the adjacent number field (see *Radar dashboard: the Radar Signal Information panel* on page 85). Clicking the **Auto** button turns *automatic* rain clutter control on or off (when it is on, an **A** appears in the number field). When it is off, you can specify the setting manually by using the rotary button on the operator panel. Whether it is on or off, you can specify the setting manually simply by moving the slider or editing the number field.

The minimum rain clutter threshold is zero and the maximum is 100. With a threshold of zero, a heavy rain-shower may appear so strongly enhanced on the display that it masks any targets within it. When the setting is correct, the front edge of the shower will be clear and so will the echoes from within the precipitation.

Caution

It is important to be aware of the possibility that a vessel may be "hidden" in the rain echo while another smaller vessel at a similar range is clearly presented.

4.4.4 Using automatic rain and sea clutter control

You can have the sea and rain clutter controlled automatically. To do this, click the **Auto** option for the **Sea Clutter** and **Rain Clutter** controls on the radar dashboard (see *Radar dashboard: the Radar Signal Information panel* on page 85).

When automatic rain clutter control is on, attempting to control the rain clutter manually using the rotary button on the operator panel will have no effect. The same is true for automatic sea clutter control. However, you can return to manual clutter control, either by turning off the automatic control explicitly by clicking the **Auto** button or simply by using the slider on the radar dashboard.

The automatic clutter thresholds (for determining which radar echoes to display) are dynamic: they are arrived at by a continuous sampling process based on the CFAR (Constant False Alarm Rate) technique. This process takes the average amplitude of the echoes in a 200 metre range and uses it as the clutter threshold within that range. The whole of the radar's range is continuously sampled in this way, with the 200 metre samples each starting 3 metres along from the start of the previous one (each sample overlapping its neighbours by 197 metres). This means that no sudden transitions occur from one clutter threshold to the next.

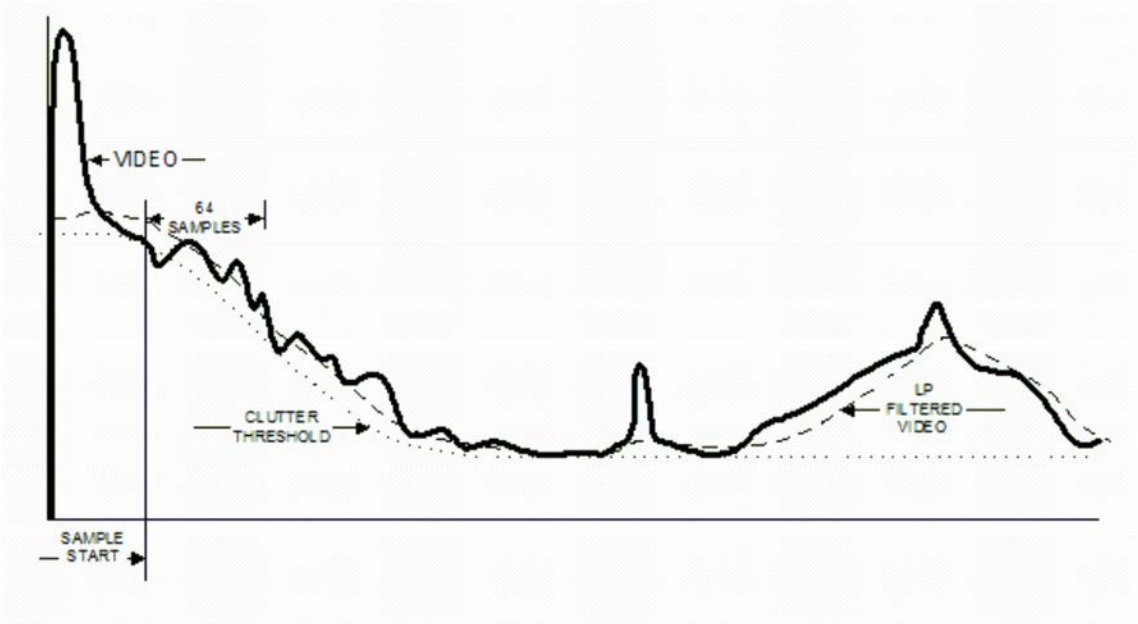
For automatic rain clutter control, the threshold at a given point on the screen is simply the average amplitude of the echoes in the most recent sample to include that point on the screen.

This is also true for automatic sea clutter control but with two exceptions:

- The sea clutter threshold is not allowed to increase with range.
- And the sea clutter threshold does not adapt to rising clutter levels that might be caused, for example, by a shower of rain or a land mass. The radar will therefore display land echoes fully (as opposed to representing them just by their front edges, which is how it displays an area of precipitation).

At close ranges, K-Bridge Radar uses special algorithms (including a fast recursive filter) to initialise the sea and rain clutter thresholds. These algorithms use an initial average amplitude of zero at distance 0 for the 200 metre window average. As distance increases, the average will build up. Finally, when the average for the 200 metre window has reached the level of the fast recursive filter, the clutter thresholds are determined purely by the averaging of real echo levels.

Figure 33 Automatic clutter thresholds in relation to real echo levels



4.5 Using and controlling chart objects on the screen

To make use of and control objects that appear on digital charts in either the radar or ECDIS applications, you must first select the object. Once it is selected, the object is displayed with a set of handles. Most of the control operations involve dragging one of the handles.

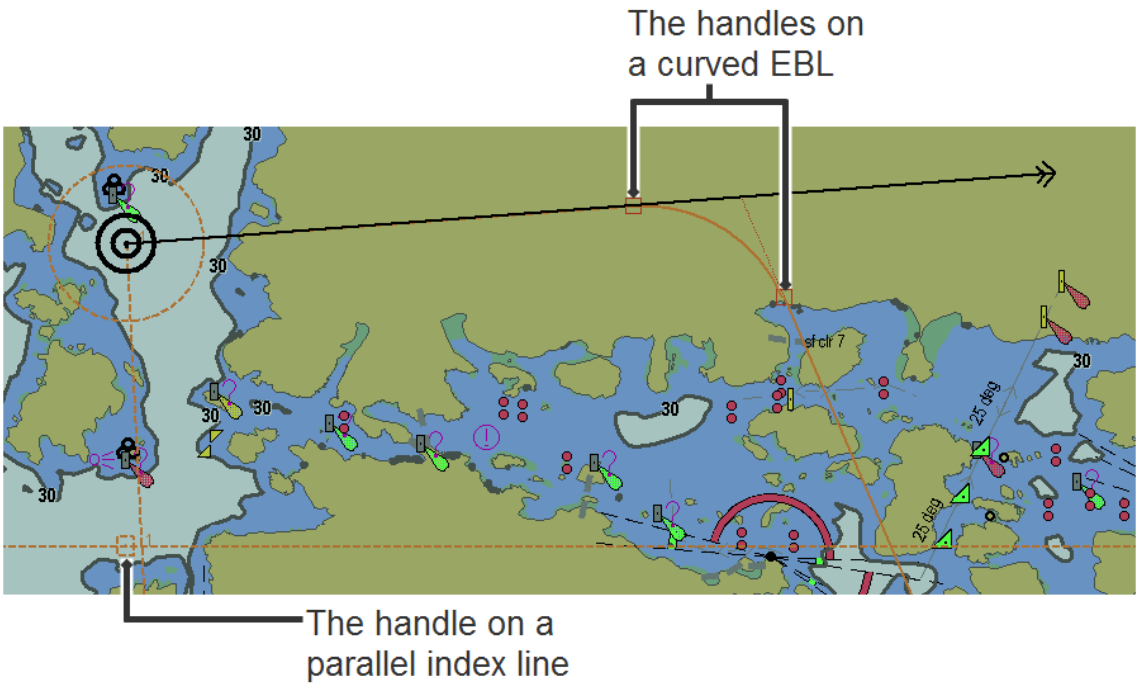
These principles apply to all the following objects on the display:

- Electronic Bearing Lines (EBL)
- Variable Range Markers (VRM)
- Parallel index lines
- Routes
- Mariners' Notes
- Distance Measures

Note

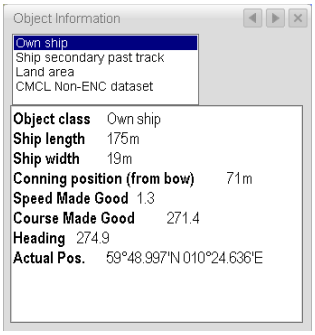
To make it easier to use the EBL and VRM facilities, EBL and VRM objects are pre-selected. Therefore you can edit them without selecting them.

Figure 34 Examples of handles on chart objects



4.5.1 Viewing data about an object

Use the track-ball and the **OBJECT INFO** button (on the operator panel, see *The CHART group buttons* on page 35) to display the object information dialog for an object, or double-click on the object with the left mouse-button.



The Object Info dialog displays data about one or more objects on the chart. Point to an object and double-click it using the **Left mouse button**. (You can also right-click objects for context-specific menus and information; see *Using an object's context menus* on page 128.)

Data for all objects under the marker (cursor) is shown in this dialog. Select an object from the list at the top of the dialog. All available information for the selected object is listed in the part of the dialog below the object list. Use the scroll bar if necessary to view all the information.

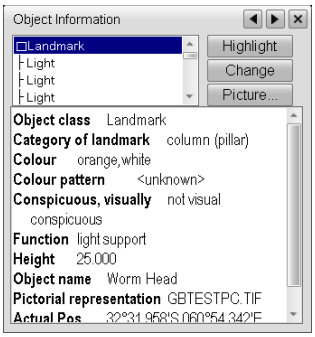
The information includes:

- Lights
- Depth contour
- Underwater rock
- Caution area
- Depth area
- Map source
- Chart identification
- Buoy

If you select **Auto Update**, then objects with changing data, for example, AIS targets, are automatically updated.

Note

*Unless you select the **Auto Update** option, all information in the Object Information dialog is static: the data you see is a snapshot taken when you brought up the dialog for the selected object.*



The Object Info dialog for an object can include the following buttons:

Highlight: If you click this button after selecting an object in the chart, the selected object is highlighted.

Change: If you click this button after selecting an object in the chart, the object can be manually updated.

Picture: (This button is available only if the selected object has graphical data associated with it.) If you click this button after selecting an object, another dialog is brought up containing a graphic associated with the object (see *Picture Dialog* on page 128).

4.5.1.1 Picture Dialog

In the dialog that comes up when you click **Picture** in the Object Info dialog, there are buttons for:

- Zooming in (+ button)
- Zooming out (– button)
- Toggling between showing the full picture and showing part of the picture at the fullest scale available (**14%** button).
- Showing the full picture inside a large window (**Full Picture** button).

4.5.2 Using an object's context menus

Right-click over an object on the screen to display its context menu.

Context menus provide convenient short-cuts for the most frequently used functions associated with an object. As their name suggests, however, these menus are context-specific, therefore the list of functions available depends not just on the object selected but on the current state of that object.

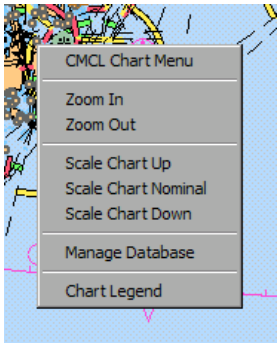
4.6 Zooming into and out of charts

The most convenient facilities for zooming in and out are the:

- **Range** + and **Range** – buttons on the operator panel (see *The NAV (navigation) panel* on page 33).
- The range up and down arrows on the on the range panel in the top left-hand corner of the radar and ECDIS displays (see *ECDIS range panel: viewing controls* on page 88).

However, this section tells you how to use some additional facilities for zooming in and out while viewing charts.

4.6.1 Zooming in and out using the chart's context menu



To zoom in or out:

1 Right-click over the point on the chart that you want to zoom in to or out from.

This brings up the chart's context menu.

2 Select **Zoom In** or **Zoom Out**.

The **Zoom In** and **Zoom Out** options on the chart's context menu have the same function as the **Range** + and **Range** – buttons on the operator panel.

4.6.2 Scaling up and down

You can also use the chart's context menu to change the scale at which you are viewing the chart. The **Scale Chart Up** and **Scale Chart Down** options are similar to the zoom functions. The difference, however, is that the scale functions use the same chart data at each scale, while the zoom function presents new chart data at each scale.

This has two important consequences.

- If you scale up fully from a fully zoomed out display, so little detail will be presented that the chart becomes of almost no use. As you can see from the figure below, if you zoom in instead, the data presented is appropriate to the scale at which you are viewing the chart.
- If you scale down fully from a fully zoomed in display, so much detail will be presented that the chart becomes cluttered and (for the opposite reason) of almost no use (see figure below).

Figure 35 Losing data by scaling up instead of zooming in

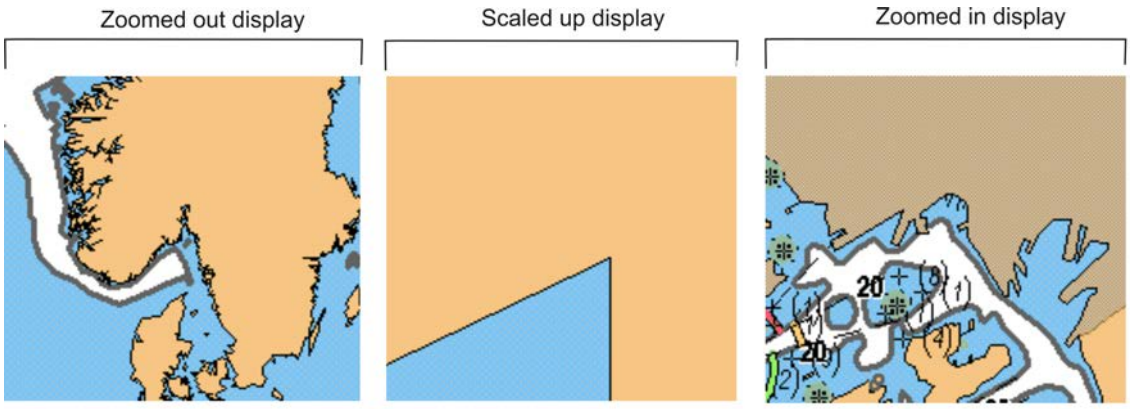
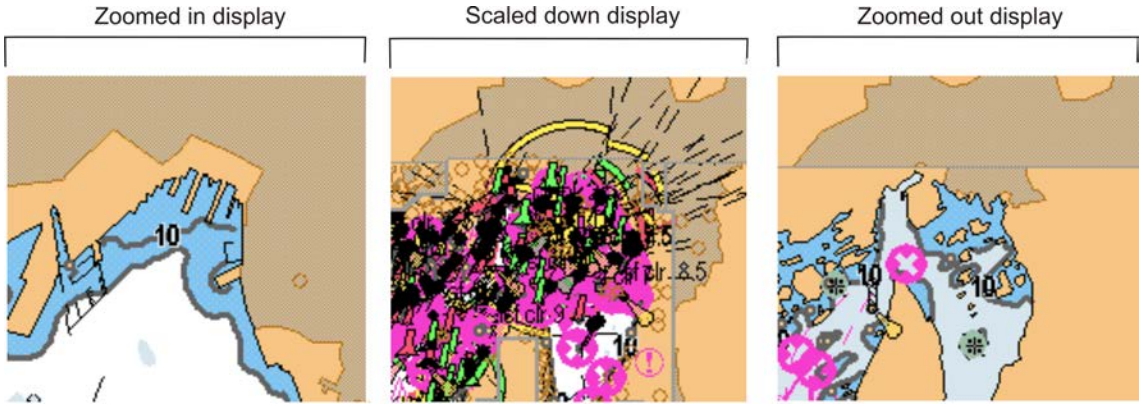


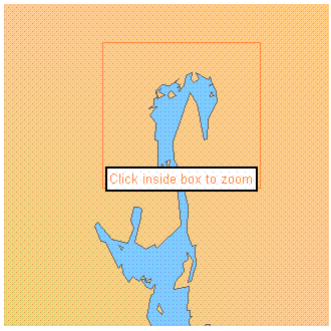
Figure 36 Cluttering the screen by scaling down instead of zooming out



Caution

If you scale down (instead of zooming out) from a zoomed in display, the enormous amount of chart data displayed at the lower scales can cause the system to slow down and eventually stop.

4.6.3 Zooming in on a particular chart area



To zoom in on a particular area of the chart (for example, a harbour you are planning to enter):

1. In the chart display, use the cursor (holding down the left button on the track-ball or mouse) to draw a rectangle defining the area you are interested in.
2. Click with the left mouse-button inside the rectangle.

   The view zooms to the centre of the rectangle you have drawn.

If you are using a mouse with a scroll-wheel, you can also:

- Zoom in by scrolling the wheel forward.
- Zoom out by scrolling the wheel backwards.

Note

For the scroll wheel to work in this way, the chart display needs to be the currently active window. If, for example, an alarm has just occurred, then the alarm window will be the active window. To make the chart display active when another window has taken over from it, just left-click anywhere on the chart.

When the ECDIS system is in any of the “monitoring” chart display modes, the scroll-wheel zooms in on the own-ship. When it is in “browse” mode (North Up), the scroll wheel zooms in to the centre of the screen. For information about these modes and how to specify the one you require, see *The top bar* on page 57.

4.7 Making one console the navigation master

You can configure one on the network as the navigation master. This means that it performs its own calculations for the own-ship's position, speed and heading (it also calculates the time on the own-ship) and then distributes the data over the LAN for use by all the other consoles on the network; the result is that all the operator stations operate with exactly the same data.

Also, if a sensor fails, the master automatically switches to an alternative sensor (if one is available) and causes all the other K-Bridge operator stations to switch to that sensor too.

To make one console the navigation master, do the following:

1 On a console that is at the front of the bridge, select **System→Integration Configuration**.

2 Check the **Master Enable** option.

   If you want the console to assert itself as the navigation master as soon as it starts up, click **Master at Start**. Otherwise, select **Own Ship→Data**, and check the **Master** box (see *Own-ship Data* on page 442).

3 On all the other consoles, select **System→Integration Configuration** and check the **Slave Enable** option.

   If you want the console to send a warning when it does not detect a navigation master on the network, check the **Enable** button underneath the label **Warning if No Master**. (You can specify a delay for this warning in case the master console is still starting up.)

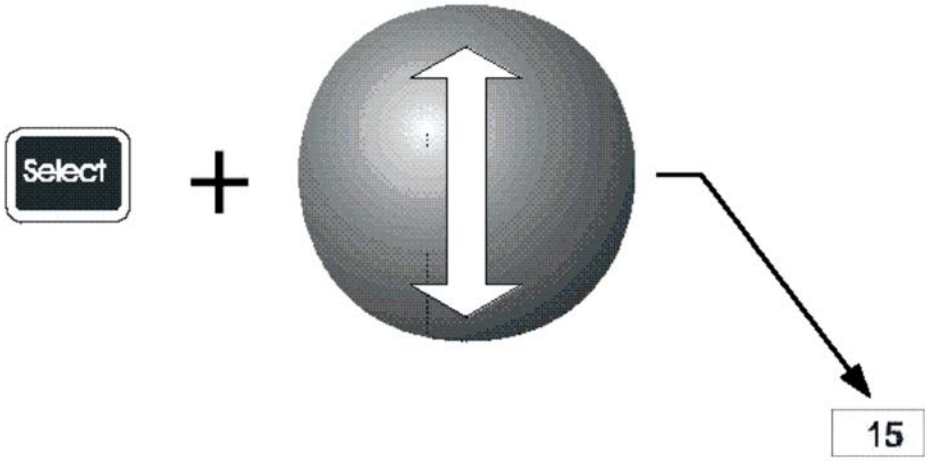
For more information, see *Integration Configuration* on page 659.

4.8 Using the console controls to make numeric data entries

There are two ways of entering numeric values into fields that require them:

1 Point the Marker to the entry field and click and hold the **Left mouse** button. Roll the track-ball up or down to increase or decrease the value.

Figure 37 Numeric entries using the left mouse button and the track-ball



2 Point the marker into the entry field and type in the value using the alphanumeric keyboard found in the drawer below the operator panel. If you type an illegal value, the closest legal value will be entered.

4.9 How an operator station responds to failures of the sensors

The operator station is dependent on input from the own-ship's sensors if it is to operate with full functionality. The most important external sensors are the:

- Heading sensor (typically a gyro compass)
- Speed sensor (typically a speed log; it must be able to measure speed through water)
- Position sensor (typically a Global Positioning System).

These sensors are vital for the quality, for example, of the radar presentation and for the tracking of radar targets. Without them the radar can only be operated in Head-up mode with relative motion, and target tracking capabilities will be greatly reduced.

The interfaces to all sensors are based on the international standard IEC 61162-1 which is very similar to NMEA 0183.

K-Bridge Radar operator stations do not support analog gyro interfaces (such as Syncro, Stepper or M-Type). These are subject to failures such as loss of alignment and must not be used.

K-Bridge Radar operator stations do not support pulsed log interfaces (200 pulses per mile). These cannot distinguish between a broken wire and zero-speed, and again they must not be used.

On a typical K-Bridge system there is a network of integrated operator stations, including Radar, ECDIS and Conning operator stations. One operator station will be designated the “navigation master”. This operator station provides all the other operator stations on the network with calculated (filtered) heading, speed, and position data. (Although the other “slave” operator stations all receive sensor input of their own, they do not use it but instead display the filtered measurements received from the master.)

It is only on the navigation master operator station that the operator can select alternative sensors.

For each measurement – heading, speed, and position – the currently selected sensor will be used and any alternative sensor will have no effect. (However, if there is a deviation between the data reported by the sensor in use and a redundant sensor, the navigation master operator station will issue an alert.)

If a sensor fails, it is the navigation master that automatically selects an alternative (if one is available). If there is not an alternative available, the operator station (whether it is the master operator station or a slave) continues to operate but with reduced functionality.

For more information about the operator station’s failure behaviour with respect to each sensor, refer to the sub-sections below. For simplicity, these sub-sections describe the behaviour of the navigation master operator station in response to sensor failures. Remember that all the other operator stations receive the heading, speed and position data that they display from the navigation master, and that only the navigation master can automatically switch (or be manually switched) to an alternative heading, speed or position sensor.

4.9.1 Failures of the heading source

The table below describes the NMEA sentences that the operator station receives from the heading source and also lists the error checks it performs on each sentence.

Table 8 The IEC 61162-1 sentences received from the heading source

Sentence:	Content:	Status of the heading information:	Error check performed by the operator station:
HDT	True Heading	None	• Was there a time-out? • Has a heading jump occurred?
THS	True Heading	• Autonomous (the heading message is normal) • Estimated (the heading message has been calculated on the basis of a dead reckoning) • Manual (the heading message has been entered manually) • Simulator (the heading message has been generated by a simulator) • Invalid	• Was there a time-out? • Has a heading jump occurred? • Has the heading data been generated autonomously (in other words, normally) by the heading sensor?

The table below lists the operator station's responses to the different heading errors that are possible.

Table 9 The operator station's responses to heading sensor failures

Heading sensor error:	The system's response:
Time-out	In the event of a time-out, the radar system does all of the following: • Issues an alert • Switches to an alternative heading sensor if one is available (and the deviation if any between it and the failed heading sensor does not exceed the deviation limit) • Uses the last received heading for its calculations (unless you input a new heading manually) • Turns the heading button red (in the top bar; see *Top bar: the HDG button* on page 72)

Table 9 The operator station's responses to heading sensor failures (cont'd.)

	• Reverts to Head-up, Relative Motion for the display mode • Switches off charts • Provides only relative bearing measurements
Heading jump	In the event of a heading jump, the operator station issues an alert.
The heading data has not been generated autonomously by the heading sensor. It has been: • Estimated (by dead reckoning) • Entered manually • Generated by a simulator • Or is simply invalid	If a heading measurement has not been generated autonomously by the heading sensor, the radar operator station: • Ignores the heading measurement. • Switches to an alternative heading sensor if one is available (and the deviation if any between it and the failed heading sensor does not exceed the deviation limit)

When there are two heading sensors available on the own-ship, the operator station issues an alert if the deviation between them exceeds a configurable limit.

The heading sensor can also send out the ROT (Rate Of Turn) sentence, and the operator station can receive it. When this happens the ROT gives a small improvement in the calculation of the own-ship's heading during turns. Also, if there has been a time lapse since the last message received from the heading sensor, the radar operator station will calculate the heading by using the last reported heading and the ROT. When there is no ROT message available, the operator station calculates the turn rate from the series of heading messages it has received.

If the operator station and the heading sensor are configured to communicate using the ROT sentence and a time-out occurs in respect of the ROT, the operator station issues an alert.

4.9.2 Failures of the speed log

The table below describes the sentences that the K-Bridge operator station receives from the speed source and also lists the error checks that the it performs on each sentence.

Table 10 The IEC 61162-1 sentences received from the speed log

Sentence:	Content:	Status of the speed information:	Error check performed by the operator station:
VBW	Water speed (longitudinal and transverse) Ground speed (longitudinal and transverse)	Water speed valid/invalid Ground speed valid/invalid	• Was there a time-out? • Are the water speed and/or ground speed valid?
VHW	• Water speed • Magnetic heading (note that the K-Bridge Radar system ignores this content if present). • True heading (note that the K-Bridge Radar system ignores this content if present).	None	Was there a time-out?
VTG	• Course over ground (true). • Course over ground (magnetic). • Speed over ground (absolute).	None	Was there a time-out?
RMC	Ground speed (longitudinal and transverse)	None	Was there a time-out?

Note

Although VHW sentences can contain heading information, note that the speed log cannot be used as a heading sensor by a K-Bridge operator station.

The table below describes what a K-Bridge operator station does in the event of a time-out in its communication with the speed log.

Table 11 The system's response to a time-out in its communication with the speed log

Speed log error:	**The system's response:**
Time-out	The radar operator station: • Issues an alarm if it receives no valid ground or water speed information within the time-out period. • Switches to an alternative sensor if one is available • Uses speed data (for its calculations) that has itself been calculated from changes in the own-ship's position. However, if you input new speed data manually, the system will base its calculations on the speed data that you provide. • Turns the speed button on the top bar red (see *Top bar: the SOG button* on page 72). • Disables AIS facilities (reliable speed data is a pre-requisite for the AIS facilities).

4.9.3 Failures of the position sensor

The table below lists the sentences that the K-Bridge operator station receives from the position sensor.

Table 12 The IEC 61162-1 sentences received from the position sensor

Sentence:	Content:	Status of the position information:	Error check performed by the operator station:
GGA	Time of position and position (latitude, longitude)	• GPS SPS • Differential GPS SPS • GPS PPS • Real Time Kinematic (satellite system used in RTK mode with fixed integers) • Float RTK (satellite system used in RTK mode with floating integers) • Estimated (the position has been calculated on the basis of a dead reckoning) • Manual (the position has been entered manually) • Simulated (the position has been generated by a simulator) • Position fix not available or invalid	• Was there a time-out? • Has a position jump occurred? • Is the input OK for use by the operator station? Only the following input can be accepted by the operator station: GPS SPS, Differential GPS SPS, GPS PPS, RTK, and Float RTK.

Table 12 The IEC 61162-1 sentences received from the position sensor (cont'd.)

Sentence:	Content:	Status of the position information:	Error check performed by the operator station:
GLL	Time of position and position (latitude, longitude)	• Autonomous (the position fix has been generated by the positioning system without any differential corrections being applied) • Differential GPS • Estimated • Manual • Simulated • Invalid	• Was there a time-out? • Has a position jump occurred? • Is the input OK for use by the operator station? Only the following input can be accepted by the operator station: Autonomous and Differential GPS.
GNS	Time of position and position (latitude, longitude)	• Autonomous • Differential GPS • Precise (the position has been generated by a satellite system operating in precision mode) • Real Time Kinematic • Float RTK • Estimated • Manual • Simulated • Invalid	• Was there a time-out? • Has a position jump occurred? • Is the input OK for use by the operator station? Only the following input can be accepted by the operator station: Autonomous, Differential GPS, Precise, RTK, and Float RTK.
RMC	Time of position and position (latitude, longitude)	• Autonomous • Differential GPS • Estimated • Manual • Simulated • Invalid	• Was there a time-out? • Has a position jump occurred? • Is the input OK for use by the operator station? Only the following input can be accepted by the

Table 12 The IEC 61162-1 sentences received from the position sensor (cont'd.)

Sentence:	Content:	Status of the position information:	Error check performed by the operator station:
			operator station: Autonomous and Differential GPS.

For GPS, the sentences that the K-Bridge operator station uses are GGA or GNS. For Loran C, the K-Bridge operator station uses the GLL sentence.

The table below describes the operator station's response to a time-out or other failure in its communication with the position sensor.

Table 13 The radar operator station's response to a time-out in its communication with the position sensor

Speed log error:	The operator station's response:
Time-out	The operator station: • Issues an alert if it has not received valid position data within the time-out period. • Switches to an alternative position sensor if one is available (and the deviation if any between it and the failed position sensor does not exceed the deviation limit) • Now bases its position calculations on dead reckoning. • Turns the position button on the top bar red (see *Top bar: the position and offset buttons* on page 74). • Disables the presentation of electronic charts.
The position data has not been generated autonomously by the heading sensor. It has been: • Estimated (by dead reckoning) • Entered manually • Generated by a simulator • Or is simply invalid	If a position measurement has not been generated autonomously by the heading sensor, the radar operator station: • Ignores the position measurement. • Switches to an alternative position sensor if one is available (and the deviation if any between it and the failed position sensor does not exceed the deviation limit)

The operator station performs continuous checking for position jumps. It compares the current position sensor input with a predicted position (calculated on the basis of the last known position, and the speed and course). If the deviation between the position sensor

input and the predicted position exceeds the alert limit, the operator station issues an alert. This continuous check for position jumps is performed only for the currently selected position sensor (not for any alternative but un-selected position sensors).

Where two position sensors are available, the operator station issues an alert if the deviation between them is greater than a specified limit. (This check is not a direct comparison between position sensors: instead each sensor's raw input is compared with the filtered position data that represents the own-ship's current official position measurement.)

4.9.4 The operator station's interface for the geodetic datum

The position sensor might also report the geodetic datum used by the positioning system. If so, it presents this using the DTM sentence. If it is available, we recommend that you use this sentence and set the datum to WGS84.

If the position sensor reports a datum other than WGS84 or does not report a datum at all, the operator station will issue an alert.

When you configure the position sensor, you will see an option enabling you to accept input from the sensor without a datum. Use this option only if the position sensor does not report the datum but nevertheless uses WGS84 at all times.

4.9.5 The operator station's interface to the time source

If the operator station is interfaced to a time source it needs to accept the ZDA sentence. This sentence is usually transmitted by the position sensor, and the operator station uses it to synchronise the radar clock with the clock of the positioning system.

If there is no ZDA input to the operator station, the time on the operator station is updated from the computer's crystal clock. The operator station uses the computer clock in any case between ZDA messages.

5 Tracking radar targets

This section contains the following topics:

5.1 Introduction

This chapter tells you how to acquire targets manually and automatically; it also describes generally how to use the radar tracking facilities.

For troubleshooting information, see *Concepts of video enhancement* on page 743 and *Minimising radar display problems* on page 751.

5.2 Limitations of the tracking system

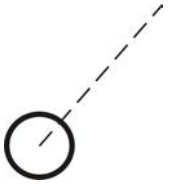
The performance of the tracking system is a function of many variables including clutter conditions, signal-to-noise ratios and the quality of gyro, speed-log and chart data. The design of the tracking system will minimise the effect of any errors in the input data. However, as a radar operator you must be aware that such errors will produce discrepancies in the readings that the system gives, for example, for the own-ship's speed, course, bearing, position, and for the CPA and TCPA with respect to targets.

You must also be aware of the following specific limitations in the operation of the tracking system:

- When the radar is switched to standby, all targets are cancelled automatically. No warning is given.
- The maximum number of radar targets is 100. When this limit is reached the "No Free Targets Left" alarm is issued.
- The tracking system will track targets having a speed of up to 100 knots. Above this speed tracking is stopped.
- The maximum tracking range depends on the pulse repetition frequency (PRF). For a PRF of less than 3200 the maximum tracking range is ~23.7 NM. For a PRF of 4500 it is ~16.7 NM.
- The tracking system uses rain- and sea-clutter rejection circuits that are independent of the display controls. These circuits automatically adapt to different conditions and allow tracking in conditions of heavy rain and sea clutter. Tracking will continue if target echoes are found for at least five out of twelve scans. When fewer than five echoes are found the lost target symbol is displayed and the system issues a "Lost Target" alarm.

5.3 Manual acquisition of targets

1. Position the cursor over the target.
2. Click the **ACQ** button on the operator panel (*The TARGET group buttons* on page 35).



- An initial tracking symbol is displayed centred on the target's position. After about 10 scans the initial tracking symbol is replaced by the target vector indicating speed and direction. This initial period is longer if the target echo is weak or unclear.

5.4 Automatic acquisition of targets

Targets can be acquired manually by the operator or automatically using a specified auto-acquisition area. When a target enters the automatic acquisition area, the target is automatically acquired and a "New Target Warning" is given. Auto-acquisition is available in all display modes.

When automatic acquisition is enabled the radar system automatically detects video above a detection threshold within the specified acquisition area (see *Turning automatic acquisition on* on page 144). It tests echoes above this threshold to see if they represent possible targets. If an echo passes this test for three successive antenna rotations the system starts tracking it. It also marks its position with the symbol for a new target (a flashing red dashed circle; see *Radar target symbols* on page 145).

At this point, the **NEW** button is displayed (as an indication only, not as a flashing alarm) in the Alarms and Message Area (see *Top bar: the alert area* on page 60).

After about 10 further scans that have included the tracked target the vector is displayed, the “NEW” button then flashes red and an alarm sound is given.

When the **NEW** button has been displayed (either as an indication or as a flashing red alarm) you can click it to acknowledge all the new targets that have been detected. Their symbols will then change to the normal target symbol (whether they are still in the acquisition phase or have become stably tracked targets).

If you acknowledge new targets in the acquisition phase, then no “New target alarm” will be issued for them when they are classified as stable tracked targets.

If new targets disappear when they are still in the acquisition phase, this will happen “silently” without any alarm or warning. (They probably represent erroneous detection attempts.)

New targets that move out of the auto-acquisition area before they have become stably tracked are also silently removed. This is because it is assumed that they are outside the area of interest.

When the **NEW** button is an indication only (signifying that all the new targets are still in the acquisition phase) and all the new targets are silently removed, the **NEW** button disappears.

When a “New target alarm” is issued, the **NEW** button and the target symbol (on the radar display) continue to flash until you acknowledge the alarm.

5.4.1 Turning automatic acquisition on

1 In the menu area click the following sequence of buttons: **Targets →Auto Acquisition Area**.

- The **Auto Acq** menu is displayed.

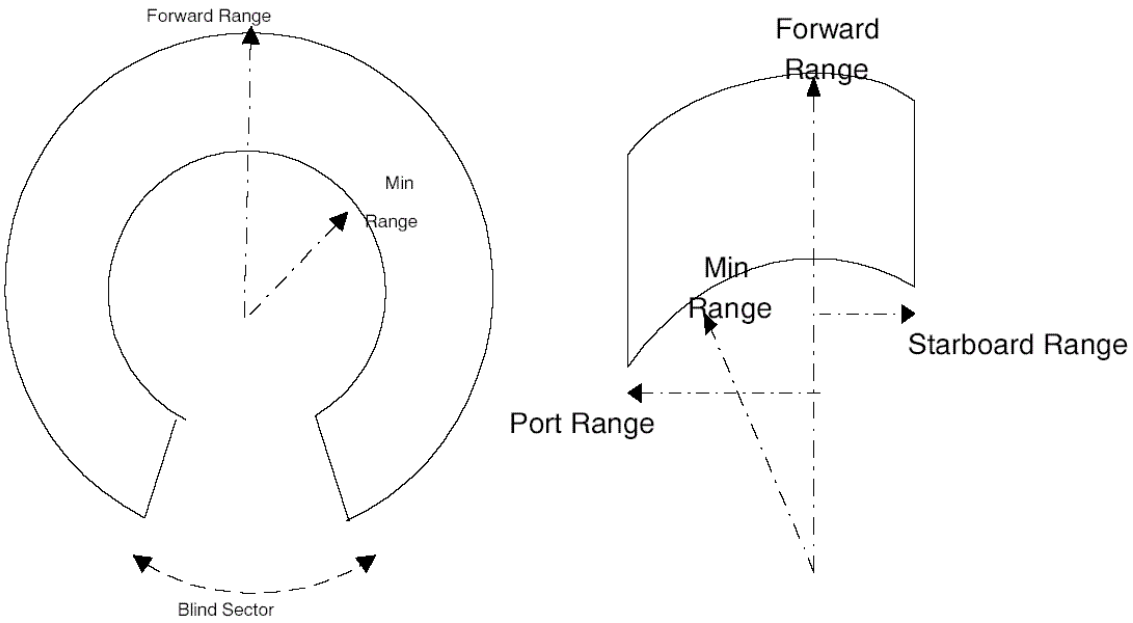
2 Check the **Auto Acquisition of Radar Tgt** option.

- The Auto-acquisition area is displayed in the radar area.

3 Use the parameters to set up the acquisition area according to the conditions.

See *Auto Acquisition* on page 396 for more information.

Figure 38 Auto-acquisition Area



Left figure: Auto-acquisition Area when Port Range, Starboard Range and Forward Range are identical.

Right figure: Auto-acquisition Area when Minimum Range > Port Range and Minimum Range > Starboard Range.

Note

The automatic acquisition area retains its parameters when automatic acquisition is turned off.

For information about turning automatic acquisition off, see *Ceasing the automatic acquisition of targets* on page 145.

5.5 Ceasing the tracking of targets

5.5.1 Ceasing to track a particular target

1 Position the cursor over the target.

2 Click the **Cancel** button on the operator panel.

The target vector and target number are removed from the target.

5.5.2 Ceasing to track all targets

1 Select **Targets**.

2 Click **Cancel All Radar Targets**.

5.5.3 Ceasing the automatic acquisition of targets

1 In the menu area, select **Targets→Auto Acquisition Area**.

2 Click **Cancel Auto Acq Targets**.

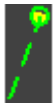
5.6 Radar target symbols

The following different target symbols are used to indicate target status and warning state.:

For information about AIS target symbols, see *AIS symbols* on page 174.

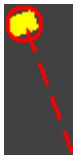
Acquisition Phase: Indicates that a target has been detected, and that initial target data is being established.

New target: Used for targets that have been detected automatically but not yet acknowledged by a click of the **NEW** button on the top bar. When you acknowledge new targets, the symbol is replaced by the normal target symbol either for the “Acquisition phase” (if the target is not yet through the acquisition phase) or for a “Tracked target” (if the target has become stably acquired).



Tracked target: The common symbol for targets being tracked.

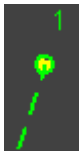
Lost target: Indicates the position where the target was lost. The symbol is flashing until the Lost Target alarm is acknowledged. The symbol is then cleared from the display.



Collision danger: The CPA and TCPA limits are violated. The symbol is red and flashes until the collision danger alert has been acknowledged. It then ceases flashing but remains displayed as long as the CPA/TCPA limits are violated. For more information about these limits, see *Alarm Limits* on page 411.

Target with target data displayed: The four-corner symbol indicates that data for this target is currently displayed in the **Target Info** dialog (see *Target Information* on page 404).

Past Position Indication: When position history has been switched on it will be displayed for all tracked targets. The interval between the dots is selectable (see *Radar dashboard: the Target Information panel* on page 81.



Target Identification: The target identification number or module appears close to the target symbol.

Associated target (showing as radar): This symbol indicates an associated (fused) AIS and radar target that is displaying as a radar target. For information about making associated targets display as either AIS or radar targets, see *AIS Association* on page 392.

Associated target (showing as AIS): This symbol indicates an associated (fused) AIS and radar target that is displaying as an AIS target. For information about making associated targets display as either AIS or radar targets, see *AIS Association* on page 392.

5.7 Adjusting tracking sensitivity

Although the tracking system has advanced rain and sea clutter rejection circuitry you may need to adjust the sensitivity of the tracker to reduce the number false targets in heavy seas or to increase the tracking range of weak targets.

1 In the menu area click **Targets**.

2 Use the **Tracker Sensivity** spin buttons to adjust the setting.

- Increase value to increase sensitivity.
- Decrease value to lower sensitivity.

5.8 Using barrier lines

In contrast with the automatic acquisition area – which moves with the vessel – barrier lines represent fixed limits for automatic target acquisition. Targets are not automatically acquired beyond the barrier lines. Barrier lines are stored for later use and can be created and edited from the **Barrier Line** menu (see *Barrier Line Menu* on page 398).

To work with barrier lines, select **Targets→Auto Acquisition Area→Edit**

5.9 Displaying target data

1 Use the track-ball to point to a radar or (AIS) target.

2 Click **Data** on the operator panel.

The selected target is indicated by a small "□" symbol centred on the target.

The data belonging to the target is displayed in the menu area (see *Target Information* on page 404). It includes:

- Target number
- Status
- Course
- Speed
- Bearing
- Range
- CPA
- TCPA
- Bow crossing range
- Time to bow crossing

Note

The range and bearing for a target is the range and bearing measured from the own-ship's conning position. All target calculations are made from here.

3 Select **Auto Update** to display continuously updated information.

When **Auto Update** is not selected the information remains static.

5.10 Using the radar positioning system

Radar positioning is a tool for calculating the position of the own-ship based upon the ship's distance (range) from and bearing to one or more tracked radar targets; the radar targets themselves must have known and fixed positions, and they must be physically small. (There is nothing in the system that prevents the use of such a target as an anchored boat, although this will obviously introduce errors if the target starts to sail away or drift.)

The accuracy of radar positioning is poor by comparison with electronic positioning systems such as GPS, Glonass, Galileo and LoranC. Its accuracy will vary with the character and geometry of the tracked radar targets in use, but radar positioning is much more error-prone than electronic positioning systems. In general, therefore, you should treat it as a low quality back-up system and never as a primary positioning system. (However, it does have the advantage that it is independent of any electronic system outside of the own-ship.)

Radar positioning cannot be used to estimate the own-ship's speed through water; it can only be used to estimate the speed over ground.

Because the own-ship's calculated speed may be influenced by an error in the data concerning one of the fixed reference targets, the relative speed calculated for other targets is also subject to error.

Caution

If you are making relative speed calculations for the purpose of collision avoidance, do so with extreme care.

Note

You cannot use radar positioning when the autopilot is performing automatic track steering.

Finally, radar positioning cannot be used in conjunction with the Automatic Identification System (AIS). This is because any disagreement between the position reference system used by AIS (AIS uses GPS) and the position reference system used for the positioning of the own-ship (in this case, radar positioning) would make the relative positioning data unreliable. This would be dangerous because it could cause errors in the K-Bridge Radar's anti-collision calculations.

5.10.1 Calculating the own-ship's position

1 Select a stable and stationary target to track.

You must track at least one fixed target but for the most accurate results we recommend that you:

- Track more than one target (you can track a maximum of four).
- Choose targets at close range that are small and distinct.
- Choose targets with a difference in bearing between each other of about 90°.

2 Click **Targets** in the main menu.

3 Click **Target Data** in the main menu.

4 Click **Radar Target Operations** and check the box **Fixed Reference Target** (see *Radar Target Operations* on page 406).

The target is now marked with an "R" and its identification data on the radar area. The "R" indicates that it is a "reference" target (although it is not yet being used in any radar positioning calculations).

5 Repeat the previous steps for as many fixed targets as you wish to use as position references.

6 From the main menu, select **Own Ship→Position**.

7 Click the **RadPos** button.

This brings up the Radar Positioning dialog which lists the targets you have designated as reference targets.

For a description of the Radar Positioning dialog, see *Radar Positioning dialog* on page 450.

8 In the Radar Positioning dialog, check the **Include** box for each target that you want to include in the positioning calculations.

The system calculates the own-ship's position based on its range and bearing in relation to the fixed co-ordinates of the reference targets you have included.

The own-ship position now appears in the top line of the Radar Positioning dialog, and a measure of the "uncertainty" of the calculation appears underneath it.

Note

The figure for the "uncertainty" of the calculations is itself only an indication. It is based on the geometry of the targets and on some fixed assumptions about the targets. If a target is not quite fixed or has considerable dimensions, the figure for the uncertainty of the calculations will be higher.

5.10.2 How radar positioning works

The radar positioning system is based on a Kalman filter which updates the own-ship's position data each time the radar's target tracker updates the range and bearing from the own-ship to one of the reference targets.

The Kalman filter also updates the own-ship position data in the intervals between updates from the target tracker: during these intervals it uses the own-ship's heading and speed to provide positioning data based on a dead reckoning.

When it receives new information from the target tracker, the Kalman filter automatically adjusts its calculations according to the likely accuracy of the data. This means, for example, that measurements for a target that is quite close will have more significance in the calculations than measurements for a distant target. The Kalman filter also takes into consideration any differences in the precision of the range and bearing data it receives.

5.10.3 Error behaviour of the radar positioning system

The loss of one tracked reference target

If tracking of one reference target is lost, the system issues a “Lost Target” alarm but continues to perform positioning calculations based on the remaining tracked reference targets. The accuracy of the calculations will be reduced, however, and this will affect the accuracy of the K-Bridge Radar's calculations of speed and course for the own-ship. This in turn will affect the accuracy of the radar's calculations of the speed and course of target vessels.

The loss of all tracked reference targets

If tracking of all reference targets is lost, the system issues a “Lost Target” alarm. It does, however, continues to perform positioning calculations, but these are now based on dead reckoning only and they will become gradually more and more inaccurate. This will result in progressively inaccurate calculations of speed and course for the own-ship. And this in turn will result in progressively inaccurate calculations of the speed and course of target vessels.

5.10.4 Warnings issued by the radar positioning system

Warning	Meaning	Action
`Fixed Target n Speed Limit Exceeded`	The calculated speed of the fixed target has exceeded the warning limit for “fixed” targets. This normally means that the target was not stationary after all. However, it might mean that the target has changed its aspect ratio, with the result that the centre of its radar echo has moved (even though the target itself is really stationary).	• Remove the offending target's designation as a fixed target. • Reset the radar positioning system's calculations.
`Fixed Target n Position Deviation`	The calculated position of the target deviates more than the warning limit permits from the position the target had when it was designated as a reference target. This can occur for the same reasons as the previous warning message.	• Remove the offending target's designation as a fixed target. • Reset the radar positioning system's calculations.
`Fixed Target n Update Time Limit Exceeded`	The target tracker has not updated the measurements for the fixed target within the required time period.	Remove this target from the list of fixed targets that are included in the positioning calculations.

5.11 Testing the radar's tracking capability

The system has a built-in target simulator and you can use this to test the radar's tracking capabilities.

The principle is that you enter some initial bearing and range information (relative to the own-ship) plus a constant speed and course for five simulated AIS targets (one of which may also have a synthetic radar echo).

This information forms the initial data for the test; because the speed and course of each target are assumed to be constant the simulator can maintain a table of the range and bearing values for each target that is mathematically correct at any given moment in time.

You can then use this table – which is maintained in the Known Solution dialog – as a benchmark against which to compare the target data presented by the radar for each simulated target. If the target data reported does not match the data in the Known Solution dialog for that target, then the radar's tracking system is not working.

Note

When you start the simulator, the presentation of real-time radar video is replaced with the simulated signals. A large green X appears at the bottom of the screen to indicate this, and a small green x appears at the position of each simulated target.

For more information about the Known Solution dialog, see *Known Solution* on page 413.

To perform the simulation, do the following:

1. From the main menu, select **Targets→Known Solution**.
2. Enter initial bearing and range data for as many simulated targets as you require.

   The bearing and range data is relative to the own-ship.
3. Enter SOG (Speed Over Ground) and COG (Course Over Ground) data for each simulated target.
4. Make one of the simulated targets a radar target (a target that generates a synthetic echo).
5. Click the **Apply** button to confirm the initial values you have entered.
6. Check the **Test Targets Active** box to start the simulation.
7. In the radar display area, select the radar target and track it.
8. Compare the tracked target's data with the data in the Known Solution dialog.
9. Compare the AIS target data with the data in the Known Solution dialog.
10. If you want to, you can simulate manoeuvres of the own-ship by selecting **Manual** for the radar's heading, speed and position input, and then entering values for them manually.

    To do this you need to go to the Heading, Speed and Position dialogs, respectively. These are accessed from the Own Ship menu *Own-Ship menu* on page 440).

Note

The simulated targets behave in the same way as real targets and you can perform the same operations on and with them as you can on real targets.

5.12 Displaying the past positions of targets

It is possible to display an indication on the screen of the past positionsof stably tracked targets and activated AIS targets.

To turn past position marks on or off, click the **Past Pos** button on the radar dashboard (see *Radar dashboard: the Target Information panel* on page 81).

Five past positions are shown for each target. You can specify the time interval represented by the distance between each past position. The available intervals are 0.5, 1 and 2 minutes. Corresponding to each possible interval is the total time represented by the past position indication.

Because there are five past positions displayed, the total past position time shown is five times the selected interval. The table below summarizes the available intervals and their corresponding total past position times.

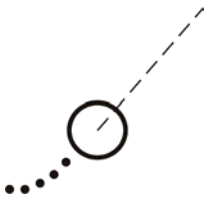
Table 14 Available intervals between past position rings

Available interval (minutes)	Corresponding total of past position time shown (minutes)
0.5	2.5
1	5
2	10

To specify the past position interval, use the drop-down menu beneath the **Past Pos** button (see *Radar dashboard: the Target Information panel* on page 81) and move the track-ball up or down.

Note

If there are many targets on the screen and you specify a long interval between past positions, you might find it difficult to identify the relationship between targets and their past position marks on the screen.



The past position plot-rings represent the target's past geographical positions. They are drawn on the screen (and in the chart if present) and they represent true, not relative, positions.

Past positions are built up from scratch when the tracking of a radar target passes from the acquisition phase to stable tracking. This transition takes less than one minute from the initial detection of the target. When it happens, it means that the target has satisfied the stability criteria for tracking. The target symbol changes from the symbol for a target in the acquisition phase to the symbol for a stably tracked target, and the vector is displayed.

Caution

The total past position time will be less than the indication in the Target Information panel until the target has been steadily tracked for at least the total past position time. Do not use the distance from the echo to the first past position ring to estimate the speed of the target.

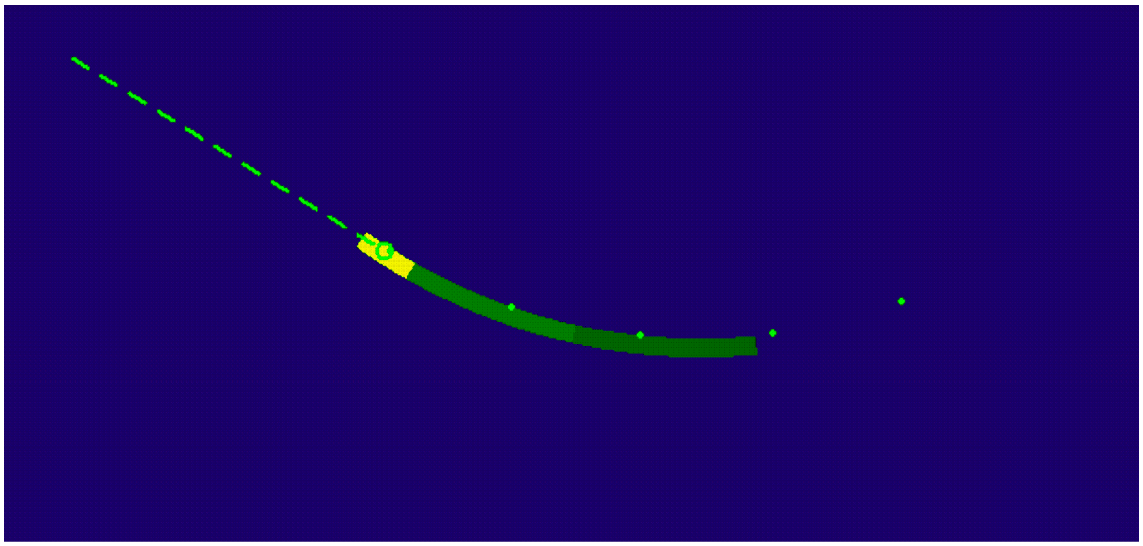
For information about how to display a trailing line with time markers indicating the past positions of the own-ship, see *Radar Themes* on page 371.

5.13 Using target trails

Target trails are similar to the CRT (Cathode Ray Tube) afterglow on old radar systems. They provide a trail showing where there have recently been echoes on the screen. Target trails are available only for radar echoes, not AIS targets. Also, only correlated video can support trails.

The trails are presented in green, and echoes are presented in yellow. The selected trail time is divided into two parts. The oldest part is presented in darker green and gives an indication of the direction of movement even if the video disappears for one or more scans.

Figure 39 A target trail with a vector and past position indicator



The K-Bridge Radar system stores target trails in x/y format with the same resolution as is used to present them on the screen. The system stores them even if you have not chosen to display them. It stores them in memory that is larger than the memory required to present them on the screen. It does this so that when the centre of the radar area is reset, the screen them further ahead than was previously presented.

When you increase or decrease the range scale by one step, the system recalculates the trails to match the new resolution.

When you:

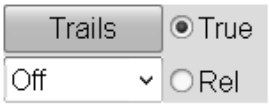
- Increase the range scale by one step, the trails will be shown closer to the own-ship. All previously presented trails will be maintained, but there will be parts of the screen (further out than previously presented) where the trails have to be built up from scratch.
- Decrease the range scale by one step, the trails will be shown further away from the own-ship. The entire screen will contain trails, but the trail resolution will be coarser until the system has had time to build up new trails for the new range scale.

- Increase or decrease the range scale by more than one step, the change of resolution is so large that the system will not recalculate the existing trails but will remove them instead. It will then have to be build them up again from scratch.
- Alter the gain, clutter, pulse length or scan correlation schemes, these alterations do not affect any trails that existed before you made the alteration.

Caution

Trails are built up from scratch both when the K-Bridge Radar system starts up and whenever the range scale is changed by more than one step. Do not use trails to estimate the speed of targets during either of these periods.

5.13.1 Turning trails on and off



Trails: To turn trails on or off, click the button (see *Radar dashboard: the Target Information panel* on page 81).

5.13.2 Specifying the duration of the afterglow

To specify the length of time for trails to survive on the screen, click the **Trails** button to turn trails on, then use the drop-down menu beneath the **Trails** button (see *Radar dashboard: the Target Information panel* on page 81).

The available lengths of time are 10s, 30s, 1min, 3min and 6 min.

Because the trails are stored constantly, the new setting will be used from the next time the target is updated (in other words, from the next time the antenna passes the target's echo).

5.13.3 Specifying true or relative trails

To choose between true and relative trails, select the **True** or **Rel** radio button to the right of the **Trails** button.

The default settings (if you do not specify true of relative trails) are:

- True trails when the display is in true motion.
- Relative trails when the display is in relative motion.

True trails are the best choice if you need to enhance the visibility of moving targets. Relative trails are the best when you are estimating whether any targets present a danger of collision.

You can select true or relative trails independently of your selection of true or relative motion and true or relative vectors.

Enhancement of stable echoes is possible only when true trails are selected. Technically this is done by making two sets of radar pictures; one is a picture in true motion (geographically stabilised) and one is a picture in relative motion (ship-stabilised). The picture on the screen is a selection from the true or relative picture inside the computer. The change on the screen is thus performed in one antenna rotation.

True trails may help you distinguish weak moving targets in clutter: both the clutter and the targets will leave trails, but the trails from the clutter will have a random character, while those from the moving targets will have a pattern that is easily perceived.

The trails display will be maintained after a change:

- Of the own-ship position on the screen
- Of orientation (north up, course up, or head up)
- Between true and relative trails
- Of range scale of one step (up or down). However, they will be cleared if the range is changed by more than one step. You can clear the trails from the screen (for example, if the gain and clutter settings have left too many trails) by changing range by more than one step: just press the **Range Up** arrow twice or the **Range Down** arrow twice (see *ECDIS range panel: viewing controls* on page 88), and the trails will be cleared (but they will automatically start to be rebuilt).

Note

True trails are not available when the display orientation is Head Up.

5.14 Collision avoidance

The proper procedures to adopt for avoiding collisions are described in text books for navigation. This section provides a brief introduction to the subject.

The radar does not suggest any actions to take; this is always the responsibility of the navigator.

The use of the radar must never be regarded as a substitute for other measures, such as looking through the windows and using radio communication.

The CPA, TCPA and proximity warnings

The K-Bridge system calculates the CPA (Closest Point of Approach) and TCPA (Time to CPA) for all tracked targets and AIS targets, and it issues a collision warning if the CPA is less than the specified warning limit and the TCPA is between zero and the specified warning limit. (For more information, see *Alarm Limits* on page 411, and also see *AIS collision warnings* on page 172.)

The warning limits must always be set to appropriate values. But since the warnings can be disabled or their limits given inappropriate values you must not use them as a substitute for making regular personal assessments of the situation.

Always be aware that vectors calculated by the radar may be inaccurate and that there may be dangerous targets nearby that are not being tracked.

Also remember that other vessels may make sudden manoeuvres. This is particularly important because the radar's vector and collision calculations assume that targets will not make manoeuvres. You must constantly consider the possible manoeuvres that target vessels will make, given for example the nature of the waters, the fairways, and any interactions that you know to be taking place between target vessels.

In addition to the collision warnings issued when the CPA and TCPA for a target are below the specified limits, the system also issues a proximity warning if a target is closer to the own-ship than the specified proximity alarm warning limit. This is because a target that is close to the own-ship may be a danger if a small manoeuvre is performed (or if the vector calculation is inaccurate) even though TCPA is calculated to be:

- negative because the calculated range to the target is increasing, or
- long because the relative range is calculated to decrease slowly.

In such cases, no collision warning will issued but there is nevertheless a danger of collision.

Target vectors and collision avoidance

You can use target vectors explicitly to estimate the danger of collision. A relative vector of a dangerous target will point directly towards the own-ship. A true vector of a dangerous target will cross the vector of the own-ship at some point in the future. With true vectors, you can make the vector longer to see if any target vector will be close to intersecting the own-ship vector at any time. (The ends of the vectors represent the calculated future positions of the ships at a given point in time.)

Target trails and collision avoidance

Relative trails also provide a useful indication of the danger of collision. If the relative trail of a target is close to a line through the own-ship, then there is a danger of collision.

True trails will often give a first indication that other vessels are starting to manoeuvre.

5.15 Trails compared to vectors and past position marks

Trails are available for all targets, whereas vectors and past position marks are available only for tracked targets and AIS targets.

True trails are an excellent indication of movement: echoes from moving targets leave a clear and distinct trail; and the patterns of their trails can in some conditions help you to distinguish targets from sea clutter.

Trails are updated for each antenna rotation. Therefore a manoeuvre by a target will often be clear earlier from the trails than from the filtered vectors or the non-contiguous past position marks.

However, bear in mind that you will lose the trails if you change the range scale by more than one step at a time, whereas vectors and past position marks persist through range scale changes.

Also trails will reflect changes you make to the settings for gain and clutter, whereas vectors and past positions marks are independent of these settings.

5.16 Special considerations for high-speed craft

There is likely to be some degradation in the performance of the radar when the own-ship is travelling at high speeds and you are operating at small range scales. This section explains why.

5.16.1 Smearing of echoes in head-up presentation

The vessel travels quite a distance between each rotation of the antenna. If the vessel's speed is 50 knots and the rotation speed of the antenna is 48 RPM, the vessel travels 25.7 m/s or 32 m/antenna rotation.

Because each point on the screen (pixel) is updated only when the antenna passes this point, a point will be drawn in a position 32 m away from the real position just before the antenna passes it (in Head-up presentation). This will lead to jumps in the presentation of targets and land masses.

These jumps will be even larger when the own-ship is turning in Head-up presentation mode.

5.16.2 Scan-to-scan correlation

Scan-to-scan correlation is not suitable in Head-up presentation because of this smearing. Scan-to-scan correlation is correlating in the display, and targets will therefore not correlate when travelling with high speed in Head-up. For the same reason, scan-to-scan correlation may mask small and fast targets so that they are more difficult to detect, also in stabilised presentation. Scan-to scan correlation is therefore not recommended when high speed traffic is of interest; even if there will be more noise on the picture.

5.16.3 Reduced quality of true motion stabilisation

When the own-ship is manoeuvring quickly, there will be more noise on the measurements of speed and position and obviously the vessel's movements will be faster than normal. Both of these factors mean that the quality of stabilisation will not be as good as when the vessel is travelling or manoeuvring slowly (or as good as it would be on large, slow vessels). In true motion, there will also be slightly more smearing of radar echoes than at slower speeds, especially at small range scales.

5.16.4 Reduced quality of tracking

The vectors for tracked targets will be slightly more unstable than for slower vessels (for the same reasons as described in the previous paragraph on stabilisation): the radar measurements are relative to the own-ship, and the noise caused by the vessel's own movements will be reflected in the vectors of the targets. In extreme cases, a target loss may occur.

5.17 Radar target error sources

5.17.1 Bearing errors

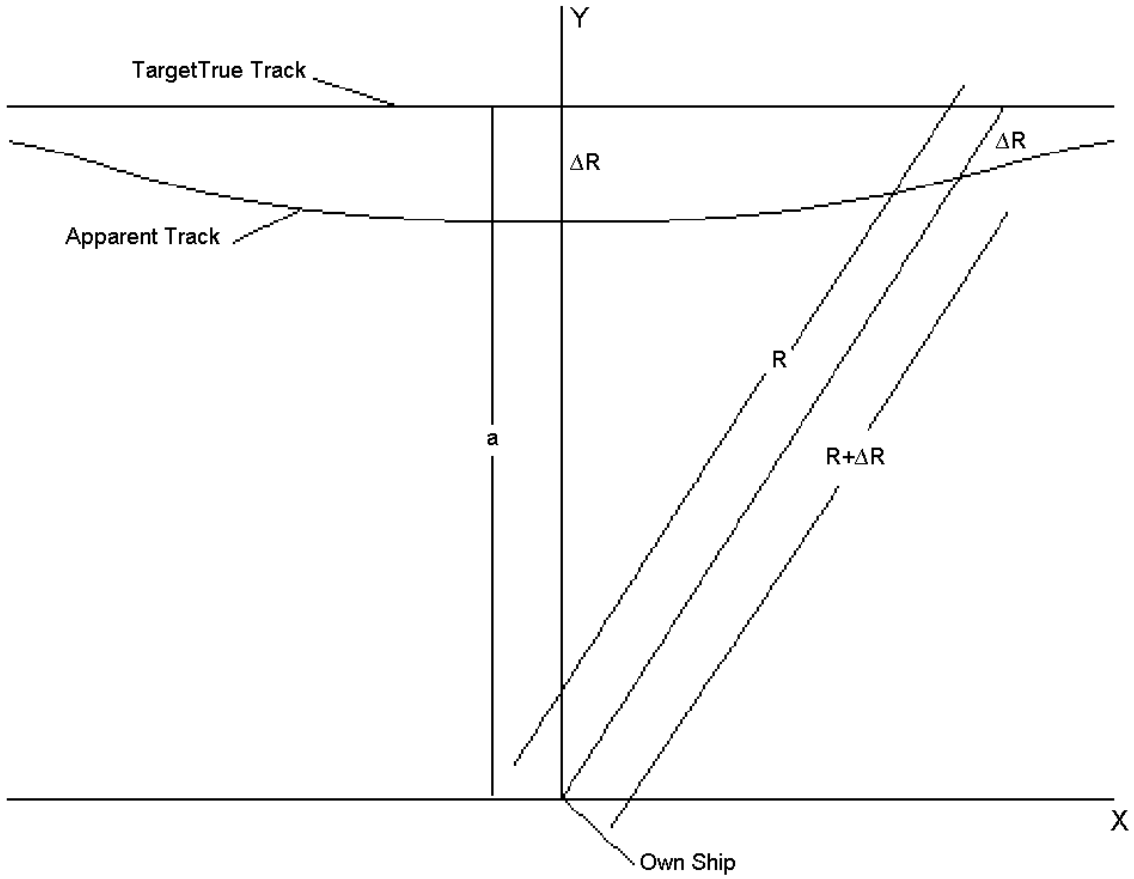
The radar antenna was aligned during installation. There is normally no need for realignment other when the antenna has been serviced. It is vital for the performance of both the radar display and the automatic tracking that the bearing error is as small as possible, preferably less than 0.5 degrees.

The antenna bearing alignment can best be checked when the vessel is heading straight towards a small object that is clearly visible both visually and on the radar screen. The object should then be exactly in the middle of the heading line on the radar display. If not, an adjustment is needed.

The influence of the radar display is more critical than the influence on the automatic tracking of a bearing error.

5.17.2 Biased range measurements

A biased range measurement (i.e. with a constant error) will result in a transient error in the estimated speed and course when the target passes through the CPA, in addition to the constant error in range. Such an error may occur if the trigger pulses from the radar transceiver are delayed in relation to the start of the sweep. This will result in a too short range measurement. To see the effect of such an error, see figure below:



The target passes the own-ship with a relative speed Vx and a minimum distance of a (CPA). The range at a given time is R, the range error is R, and the apparent range is R+ R (R is negative on the figure). Due to the range error, the target seems to follow a curved relative track instead of the straight line. The errors can be quite large. As an example, the maximum errors when the actual range a is 0.2 NM, the range error R is -0.1 NM, and the relative speed is 10 knots, can be shown to be 5 knots in X-direction and 1.9 knots in Y-direction. A range error is easiest to observe when sailing between two rows of buoys. The buoys will then have a vector when passed by the own-ship.

5.17.3 Weak signals

Sometimes tracking picks up targets that have a weak echo compared to the noise in the surrounding area. The weakness of the echo may be because the target is itself small (it might, for example, be the echo of a small vessel or a buoy at some range), or it may be because there is so much noise surrounding the target.

In these circumstances even when tracking is maintained its performance is reduced. The vector is more unstable, and the calculated values for CPA and TCPA fluctuate more than normally. This is because the noise makes it difficult for the tracker to define the limits of the real echo. Sometimes noise is included in the calculations at one end of the target echo, and this interferes with the position measurement for the target, which again interferes with the speed calculation for the target.

The noise may also lead to complete failure of the tracking. There is a possibility that the tracker will jump to the clutter instead of the real target. It uses the strongest echo it finds of the target's expected size and close to the target's expected position, and it treats the position of this echo as the target's new position. If the clutter is stronger than the target echo therefore, the tracker might mistake the echo from the clutter as marking the new position of the target.

This swapping by the tracker from target to clutter is especially likely in heavy clutter when a target is still new and the tracker has not yet established the real characteristics of the target.

Because of these possibilities, you must exercise special caution when tracking targets with weak echoes in conditions of heavy clutter.

5.17.4 Manoeuvres of the own-ship

During a manoeuvre of the own-ship, the track that the ship follows must be calculated very accurately. The deviation between the true track and the calculated one is actually transferred to all the targets as a manoeuvre of these targets.

A small deviation between the true track and the calculated one cannot be avoided completely, but it can be minimized with a good position calculation. The track is based on the series of calculated positions. Each position estimate is based on the position input from the navigation receiver (GPS) and a dead reckoning based upon gyro and log. The dead reckoning is based upon the pivot point of the vessel, not the conning position. The pivot point is defined as the point which the ship moves around during a manoeuvre.

In reality, the pivot position on the ship is not constant, but will vary with load conditions and speed (it moves forward as speed increases). However, for simplicity it is set to a fixed value during installation. Usually the pivot point is not far from the bow.

5.17.5 Errors in the own-ship's speed

An error in the speed of the own-ship will result in a similar error in the true speed of tracked targets, because the true speed of a target is calculated as the sum of the relative speed and own-ship's speed. The relative speed will not be influenced by a constant error in the own-ship's speed. A varying error will result in similar variations on tracked targets, and the resulting vectors will be difficult to understand. Note that it is the speed components in North/East that are reflected in the vector of a tracked target. This means that an error in the own-ship's speed along ship will result in the wrong direction of true vectors for all tracked targets that have a different course.

5.18 Monitoring the performance of the transceiver

This section tells you how to use the Performance Monitor option in the Decca radar transceiver. For general information about preventive maintenance of the transceiver, refer to the *Kongsberg Radar Sensors (Decca) Maintenance Manual* (part number 300552).

Note

The Performance Monitor must be calibrated by authorized personnel during radar installation and after replacement of any vital parts in the transceiver, such as the Magnetron or receiver circuitry.

5.18.1 The Performance Monitor

The Performance Monitor is an option for the Decca transceiver (it is a separate hardware unit inside the transceiver). It enables you to detect degradation in the performance of the transceiver.

The Performance Monitor consists of a receiver which detects and measures the transmitted pulse, and a small transmitter which transmits a response to the received pulse. The response is shown as 4 arcs on the screen. The arcs start at a range of 8 NM and are 0.3NM apart. They appear in a sector of approx. 290° to 320° for S-Band and 155° to 185° for X-Band. The first arc is the strongest one and the arcs decrease in strength by 5 dB from one arc to the next. This means that if performance is degraded by 5 dB only three arcs will be presented, if performance is degraded by 10 dB only two arcs will be presented, and so on.

The Performance Monitor can be operated in two modes, **Receive Mode** (Rx Mode) and **System Mode** (see *Performance Monitor* on page 540).

- In **Rx** Mode only the receiver of the Performance Monitor is used, and the response is sent to the rest of the transceiver through wires. This means that in **Rx** Mode the performance of the radar transmitter is tested.
- In **System** Mode, the Performance Monitor transmits the response through the air, so that the performance of both the transmitter and receiver are tested.

5.18.2 Checking the sensitivity of the Decca

We recommend that you run the Performance Monitor once a month.

To run it, do the following:

1 Set up the operating conditions required for the Performance Monitor:

a Set a range scale of 12 NM by using the range control (see *ECDIS range panel: viewing controls* on page 88).

b Set the transmit mode to On by clicking the **Scanner/Transceiver** button (see *Radar dashboard: the Radar System Information panel* on page 83) and selecting **Run** in Radar Control dialog (see *Radar Control* on page 539).

c Specify **Head Up** as the display's presentation mode (see *Radar dashboard: the range panel* on page 79).

d Select **Relative** as the display's motion selector (see *Radar dashboard: the range panel* on page 79).

e Select **Tune: Auto** (see *Radar dashboard: the Radar Signal Information panel* on page 85).

f In the main menu, select **Radar** and in the Radar dialog *Radar menu* on page 537:

i Un-check the box for **Scan Correlation**.

ii Check the box for **Sweep Correlation**.

iii Un-check the box for **Sweep Integration**.

iv Click the **Source** button, and select the radio button for **Long: Pulse**.

2 In the main menu, select **Radar** again, then select **Performance Monitor**.

3 Use the **Video Gain** control on the dashboard to adjust the gain until some background noise is visible in the range from 8 to 10 NM (see *Radar dashboard: the Radar Signal Information panel* on page 85).

4 In the Performance Monitor dialog (see *Performance Monitor* on page 540):

a Select **Mode: Rx**.

b Adjust the **PM Tune** setting until the arcs are presented at maximum intensity. Coarse adjustment is performed with the slider, and fine tuning with the spin buttons.

c Select **Mode: System**.

d Adjust the **PM Tune** setting until the arcs are presented at maximum intensity. Coarse adjustment is performed with the slider, and fine tuning with the spin buttons.

If fewer than three arcs are now visible, the performance of the radar has degraded by more than 10 dB and a service engineer must be contacted. The most likely reason is that the magnetron unit needs replacing.

The Performance Monitor will be automatically switched off when you leave the Performance Monitor dialog or after 15 seconds without operation.

If any mute sectors are set up, they are automatically disabled while performance monitoring is activated. They are re-enabled when performance monitoring is stopped.

6 Working with AIS targets

This section contains the following topics:

6.1 Introduction

This chapter tells you how to use the AIS facilities on the MFD system.

6.2 AIS and radar target vectors

The same length, presentation mode (True/Relative) and stabilisation mode are used for both AIS targets and radar targets. There are however some basic differences in the origins of the data used for presentation:

AIS vectors are based upon the reported Position, COG and SOG of the target. This means that the accuracy of the vectors depends on the (unknown) sensors of the target. The data reported is: Ground Stabilised, TRUE. Other presentations are calculated from the True Ground data. In these calculations, the speed, course, set and drift of the own-ship are used. This means that the accuracy of AIS vectors in other modes than True, Ground Stabilised depends on the sensors of both the own-ship and the target.

Position reports from AIS targets are irregular and their frequency depends on such factors as the speed at which the target is moving, its rate of turn and the class of vessel concerned. The radar system extrapolates from the position reports it has received for the target to represent a smooth movement for the target on the screen (obviously, because of the infrequency of the position reports, some of the target's movements might not be represented).

Radar vectors are based upon the relative positions of the own-ship and the target. First of all relative vectors are produced, and on the basis of these other calculations involving the speed, course, set and drift of the own-ship are performed. Radar vectors therefore depend more on the own-ship's position, heading and speed sensors than do AIS vectors (which depend largely on the sensors of the AIS target vessel).

You must be aware of these basic differences when assessing the traffic situation using the vectors.

Note that it is possible for a target to appear on two radar screens and to present AIS vectors (if available) on one and radar vectors on the other.

6.3 The association of target vectors and data

When a target is reporting AIS data as well as being tracked as a radar target, the speed vector is calculated in two different ways. This will give two slightly different results.

To improve readability, only one vector will be presented in these cases. This vector is normally the AIS vector, because AIS data is normally more accurate.

The criteria used to determine whether AIS and radar data are from the same or different targets are that the:

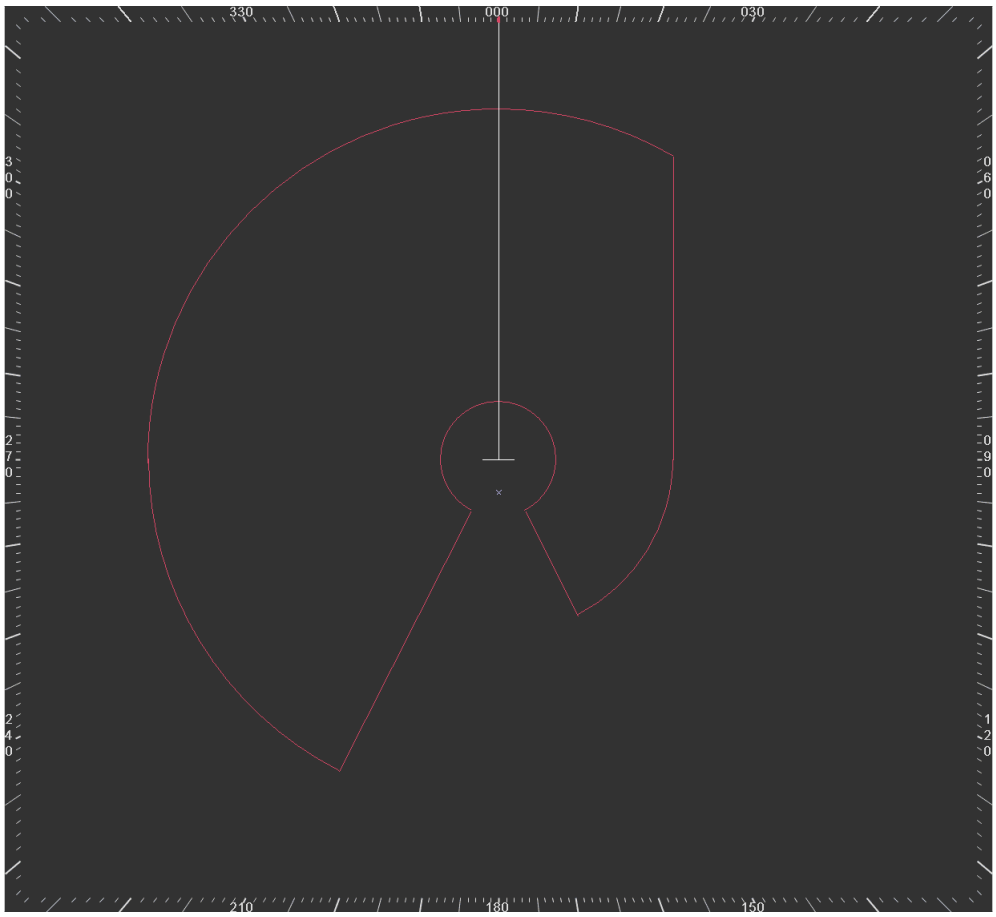
- Difference in position is less than a configurable limit.
- Difference in speed is less than a configurable limit.

Both criteria need to be fulfilled for the two sets of data to be treated as coming from a single target.

You can adjust the limit for the criteria in the AIS Association dialog (see *AIS Association* on page 392).

6.4 Automatic AIS target acquisition or activation

Figure 40 The automatic target acquisition zone



The same zone is used for the automatic acquisition of AIS targets as for that of radar targets. The dimensions of the zone are set in the "Auto Acq" dialog (see *Auto Acq* on page 389).

If barriers (which exclude geographical areas from automatic acquisition; see *Using barrier lines* on page 147) are in use for the acquisition of radar targets, they will also be valid for the automatic acquisition of AIS targets.

Automatic activation of AIS targets cannot be enabled without automatic acquisition of radar targets.

When a target enters the automatic acquisition zone, the response time will be a little different for the two target types. Automatic acquisition of radar targets requires there to have been a steady echo for at least three antenna rotations before tracking is initiated, while AIS targets are promoted from sleeping to active instantly. Furthermore, AIS targets have an instant vector, while several rotations must occur before a radar target vector is drawn and can be several minutes before the radar target's vector is stable.

6.5 Displaying AIS target data

1 Use the track-ball to point to the AIS target.

2 Press the **Data** button on the operator panel (see *The TARGET group buttons* on page 35).

The selected AIS target is indicated by a small "□" symbol centred on the target.

The data belonging to the target is displayed in a dialog box (see *Target Information* on page 404). It includes:

- Target number
- Status
- Course
- Speed
- Bearing
- Range
- CPA
- TCPA
- Bow crossing range
- Time to bow crossing

Note

The range and bearing for a target are the range and bearing measured from the own-ship's conning position. All target calculations are made from there.

3 Select **Auto Update** to display continuously updated information.

When **Auto Update** is not selected the information remains static.

6.6 Acknowledging lost AIS targets

1 Position the cursor over the target and do one of the following:

a Select: **Targets→AIS→Acknowledge Lost AIS Targets**, or

b Click the **Object Menu** button and choose **Acknowledge** from the list.

The target symbol is removed from the display.

Note

Lost targets that are closer than the specified lost-target distance or that are categorized as dangerous are not removed from the display. Instead they are indicated in their last known position using the lost target symbol.

6.7 Viewing the own-ship's AIS data

1 Select: **Targets→AIS→Display Own Ship Data**.

- A window displaying the own-ship's data is shown. It includes position data and static ship and voyage data (see *Display Own Ship Data* on page 385.

2 Use the scroll bar to view all available information.

6.8 Specifying the own-ship's AIS data

The following is used to specify own-ship information broadcast to other vessels and vessel traffic surveillance systems.

6.8.1 Static ship data

This is normally done during commissioning of the AIS system.

1 Click the following sequence of buttons in the menu area: **System→Passwords** and type in the service password.

2 Click the following sequence of buttons in the menu area: **Targets→AIS→Set Static Ship Data** (see *Set Static Ship Data* on page 383).

3 Type in the ship's **MMSI number** and click **Apply**.

4 Type in the **IMO number** and click **Apply**.

5 Type in the ship's **Call Sign**.

- The ship's name, length and width are taken from the Ship Parameters dialog (see *Ship (tab)* on page 571).

6 Type in the AIS antenna's distance **From Aft**.

7 Type in the AIS antenna's distance from the ship's centre line. Use negative values for distance to port.

6.8.2 Static voyage data

1 Click the following sequence of buttons in the menu area: **Targets→AIS→Set Static Voyage Data** (see*Set Static Voyage Data* on page 384).

2 Select **Type/Cargo** from the drop-down list.

3 Select **Nav.Status** from the drop-down list.

- Max Draught is taken from the Ship Parameters dialog (see *Ship (tab)* on page 571).

4 Select **Number of Persons Onboard** using the spin buttons.

5 Type in the **Destination**.

6 Select **Arrival (UTC)** time using the spin buttons.

7 Click **Apply**.

6.9 Sending and receiving text telegrams and safety messages

The AIS functionality allows you to transmit text messages to other ships and to vessel traffic surveillance systems. Text telegrams and safety messages can either be broadcast or sent to a specific ship. Only upper case characters can be used and the message is limited to approx. 160 characters, depending on type of message and transmission mode.

AIS messages can either be broadcast or addressed to a single recipient. Recipients and message senders are basically identified by their MMSI numbers. If the ship name corresponding to the MMSI number is available, the ship name is also displayed.

When messages are received from other ships or vessel traffic surveillance systems, the user will receive a notification. Messages are automatically stored in an **UnRead** folder, waiting for the mariner's attention.

6.9.1 Managing the telegram archive

All sent or received telegrams and messages are stored in the system until deleted by the operator.

1 Select: **Targets→AIS→Text Message List** (see *AIS Text List* on page 386).

- The displayed dialog enables you to manage the four message archives :
  - **Unread:** Stores all received messages not yet read.
  - **Read:** Stores incoming messages after they have been read.
  - **Predefined:** Stores predefined messages for frequent use.
  - **Sent:** Stores sent messages.

2 Select the archive you want to view.

6.9.2 Reading and answering telegrams

1 Select: **Targets→AIS→Text Message List** (see *AIS Text List* on page 386).

2 Select the **Unread** option button.

3 Select the telegram/message you want to read using the and **Left mouse** button.

- The telegram/message is displayed.

4 To compose an answer do the following:

a Click the **Reply** button.

b Type in your answer.

c Click the **Send** button.

- In some cases the sender may have requested that you acknowledge receiving the telegram/message.

5 To acknowledge it click the **Acknowledge** button.

6.9.3 Creating new telegrams

1 Select: **Targets→AIS→Text Message List** (see *AIS Text List* on page 386).

2 Select the **Text Telegram** or **Safety Message** option button.

3 Select **Broadcast** or type in the recipients **MMSI numbe**r.

4 Select **Acknowledge Req.** if you want the recipient to acknowledge receiving the telegram/message.

- Acknowledged messages will appear in the **Unread** message archive, when acknowledged. Broadcasts can not be acknowledged.

5 Type in your telegram/message.

6 Click the **Send** button.

6.9.4 Creating pre-defined telegrams

The system allows you to store a number pre-defined messages that you expect will be frequently used.

1 Select: **Targets→AIS→Text Message** (see *AIS Text Message* on page 387).

2 Select the **Text Telegram** or **Safety Message** option button.

3 Select **Broadcast** or type in the recipients **MMSI number**.

4 Select **Acknowledge Req.** if you want the recipient to acknowledge receiving the telegram/message.

- Acknowledged messages will appear in the **Unread** message archive, when acknowledged. Broadcasts can not be acknowledged.

5 Type in your telegram/message.

6 Click the **Save Predef.** button.

6.9.5 Sending pre-defined messages

1 Select the target you want to send a predefined message to using the track-ball and **Object Menu** button.

2 Select **Send Predef Message** from the displayed list.

- Your list of predefined messages is displayed.

3 Double-click on the message you want to send using the and **Left mouse** button.

4 Click **Send**.

6.10 AIS collision warnings

The same formula is used for calculations on AIS targets and radar targets.

The alarm limits are also identical for AIS targets and radar targets, so that a target should initiate a collision warning at the same time, whether it is a reported AIS target or a plotted radar target.

There may however be some differences, because different sensors are used: the CPA and TCPA calculations for AIS targets depend on the position, course and speed reported by the other ship; the calculations for radar targets are independent of the sensors on the target vessels.

For information about collision avoidance, see *Collision avoidance* on page 157.

6.11 The influence of the AIS target's sensors on CPA and TCPA

This section provides information that you need to consider in relation to the CPA and TCPA for AIS targets.

6.11.1 Position sensors (GPS)

The relative position of the AIS target as it appears on the screen depends on both the position of the own-ship and the position of the AIS target. Position data for both vessels also obviously affects the calculated CPA and TCPA.

6.11.2 Ground speed sensors (bottom log)

The vector of an AIS target is based upon the SOG and COG reported over the AIS system. The source and accuracy of this data are not directly known. The target's speed-log may contribute but position data from a GPS system will often have been used to calculate COG and SOG (Speed Over Ground): the own-ship's CPA and TCPA calculations are heavily dependent on this information from the AIS target.

6.11.3 Water speed sensors (water log)

The vector of an AIS target is based upon the SOG and COG reported over the AIS system. The source and accuracy of this information is not directly known. The speed-log may contribute but often position data from a GPS system will be used to calculate COG and SOG (Speed Made Good). An AIS target's water speed is not reported over AIS, therefore the influence of the AIS target's water log is not significant.

6.11.4 Heading sensors (gyros and compasses)

The heading sensor is normally not used for the calculation of SOG and COG, and will not influence the position or vector of the AIS target. The heading sensor of the other ship will be used to determine the heading line and turn indication of the AIS target, but it will not contribute to the CPA/TCPA calculations.

6.12 The influence of the own-ship's sensors on CPA and TCPA

For AIS targets, the data reported comes from each target's own sensors, not from the sensors belonging to the own-ship. The data used for vector presentation is the target's SOG, COG and position.

The presentation of true, ground-stabilized AIS vectors depends only on the target's sensors, and not at all on the own-ship's sensors.

Note

However, the relative location of the vector depends on the position of the own-ship.

The presentation of relative and/or water-stabilized AIS vectors is determined by data from both the target and the own-ship. The own-ship's sensors for speed, position and heading will be involved. They will also influence the CPA and TCPA calculations.

6.12.1 Position sensors (GPS)

The position of the own-ship and the position of the other ship obviously both play a role in determining the relative positions of the vessels as shown on the screen, and they both influence the calculated CPA and TCPA for AIS targets. Changes in the vessels' positions over time are also used as input to the navigations system's Kalman filter; they therefore affect the COG and SOG calculations for the own-ship.

6.12.2 Ground speed sensors (bottom log)

The own-ship's bottom log is used as input to the Kalman filter. Also, along with changes in the position data, the bottom log is used to calculate the own-ship's COG and SOG. The bottom log therefore influences the CPA and TCPA calculations in respect of AIS targets.

6.12.3 Water speed sensors (water log)

The water log is used as input to the Kalman filter and it is also used to calculate the course and speed through water. Because the CPA and TCPA calculations for AIS targets are based on ground-stabilised data, the water log does not affect the CPA and TCPA calculations. However, dynamic fluctuations in water speed measurements will affect the COG and SOG calculations indirectly through the Kalman Filter.

6.12.4 Heading sensors (gyro compasses)

The heading of the own-ship will not affect the vectors of AIS targets, although it will affect the vectors of ARPA targets. A permanent offset in the heading will not affect the calculation of the CPA and TCPA for AIS targets, although a dynamic error will cause a dynamic error in the CPA and TCPA calculations.

6.13 AIS symbols

If sensor failure on the own-ship or an AIS target (or if missing data for any other reason) causes the CPA and TCPA calculations to be uncertain, the AIS symbols for the affected targets will be dashed.

For information about the radar target symbols, see *Radar target symbols* on page 145.

Table 15 Some AIS symbols as they appear on the display

	**Sleeping AIS target:** Initial position reports received from other ships result in "sleeping" targets on the display. Sleeping targets display a minimum of information, revealing position and course.
	**Active AIS target:** Active targets reveal the ship's position, speed, heading and course. Vector length for other ships corresponds to the length set for the own-ship's vector.
	**Target with target data displayed:** The symbol indicates that data for this target is currently displayed in the **Target Info** dialog (see *Target Information* on page 404).
	**Lost target:** Targets lost from the air that are nearer than a set distance, or that are categorised as dangerous, will not be removed from the display. These are indicated in their last known position as a lost target.
	**Dangerous target:** Targets having a TCPA and a CPA of less than the user-specified values, are considered to represent a collision danger and will be indicated using a red blinking symbol.

Table 15 Some AIS symbols as they appear on the display (cont'd.)

	**Target Identification:** The name of the target vessel (if available) or its MMSI number appears close to the target symbol.
	**Associated target (showing as AIS):** This symbol indicates an associated (fused) AIS and radar target that is displaying as an AIS target. For information about making associated targets display as either AIS or radar targets, see *AIS Association* on page 392.
	**Associated target (showing as radar):** This symbol indicates an associated (fused) AIS and radar target that is displaying as a radar target. For information about making associated targets display as either AIS or radar targets, see *AIS Association* on page 392.
	**Aid to navigation:** This symbol indicates the location of a landmark or buoy that is signalling to shipping from an active transponder.
	**Aid to navigation (virtual):** This symbol is for a *virtual* aid to navigation: it contains a V (for virtual) in addition to the + sign inside the aid-to-navigation symbol. The symbol appears on the chart only; no active transponder at a physical location is associated with it.
	**Base station:** A shore-based station providing text messages, time synchronization, meteorological, hydrological or navigation information, or data on the positions of other vessels.
	**Search and rescue aircraft:** An aircraft flying with AIS equipment on-board.
	**Search and rescue (SAR) transponder:** To acknowledge the signal from a SAR transponder, select **Targets→AIS→Acknowledge SAR Transponder** (see *AIS* on page 382). For information about detecting search and rescue transponders, see *Operating marine radars for SART detection* on page 352. For information about search and rescue operations generally, see *Performing search and rescue operations* on page 351.

6.14 Limitations of the AIS system

The K-Bridge Radar has the capacity to handle 1000 AIS targets in addition to 100 ARPA targets. If more than 1000 AIS targets are received, the alarm "Too many AIS targets" is issued.

6.15 Installations with AIS on more than one radar

If AIS is enabled on more than one radar system on the bridge, the number of vectors displayed – and the vector types displayed – might be different on the different consoles. When you activate or de-activate a target, the effect of this is to activate or de-activate it only on the console you are using; targets displayed on any other consoles on the bridge are not affected. Similarly, target fusion occurs independently on each console.

7 Managing charts

This section contains the following topics:

For information about:

- Manipulating chart objects, see *Using and controlling chart objects on the screen* on page 126.
- Zooming into and out of charts (see *Zooming into and out of charts* on page 128).

7.1 Chart formats

The K-Bridge MFD system currently supports the following chart formats:

- S57 Ed.3 official vector charts (unencrypted)
- S57 Ed.3 official vector charts encrypted according to S-63 encryption scheme.
- CM93 Edition 2 vector charts from C-Map Norway.
- CM93 Edition 3 vector charts from C-Map Norway.
- C-Map ENC official vector charts distributed as a compact SENC (system ENC)
- HCRF raster charts: either ARCS charts from the United Kingdom Hydrographic Office or Seafarer charts from the Australian Hydrographic Office (ARCS charts are not available in the Radar application)
- NSKV vector charts from Norwegian Hydrographic office.
- PL2 vector charts, proprietary format.

Charts must be purchased/subscribed to from the individual suppliers. As charts are updated frequently, subscribing to updates will normally be essential.

Charts provided with the K-Bridge MFD system are a chart of the whole world at a scale of 1:20,000,000 and a chart covering the area to be used for the sea trial.

Follow the procedures in the next few sections for the particular formats you are using.

7.2 C-Map CM-93 edition 3 charts

Caution

Chart database maintenance may interfere with the radar display and should only be carried out when the radar picture is not needed.

CM-93 edition 3 conforms to the IHO S57 edition 3 format and is manufactured by C-Map. The C-Map CM-93 Edition 3 chart database contains the same charts as are available in CM-93 Edition 2, but the format is different and the handling inside the K-Bridge system is different. All CM-93 Edition 3 charts are available on a single CD-ROM or DVD. Both official HO ENC charts and unofficial non-ENC charts may be included.

The most common C-Map Edition 3 database is called "Professional+" and contains charts for the whole world. K-Bridge Radar allows you to install the whole database, and license only the charts that you want to use.

7.2.1 Configuring the chart database

To create the chart database for the CM-93 edition 3 charts, perform the following. This need only to be done once.

1 Select **System→Passwords**.

2 Type in the user password and click **Open**.

3 Select **Chart→Reconfigure Chart Database** (see *Chart Type Setup* on page 532).

- A list of available databases is displayed.

4 Click **Add New**.

- Available database types are shown, one button for each type.

5 Click **C-Map Professional+ (DVD)**.

- The C-Map CM-93 Edition 3 Database is added to the list of available databases. This databse is called **Professional+** and uses a two-letter mnemonic **CP**.

  If you need to use the CD version, the database is called **World** and uses the two letter mnemonic **CW**.

- By default the system is set up to load chart databases across the Local Area Network from a particular K-Bridge system. You can however configure the system to load from any K-Bridge system or from a CD or DVD. To check or change where the databases are loaded from, do the following:

6 Click **Change Mirror**.

7 Select **Install from Local CD** or **Install from Remote Station** and select unit from the drop down menu.

8 Click **Apply Changes** twice to confirm the new settings, or **Cancel** to return.

9 Power the console down and then power it up gain.

- This is necessary for the changes to take effect.

7.2.2 Installing charts

When the software has been set up properly, you must load the database must be loaded and enter the license code.

1 Select **System→Passwords**.

2 Type in the user password and click **Open**.

3 Select **Chart→Chart Types** (see *Chart Types* on page 477).

4 Click the **Mng** button next to **CP:Professional+**.

- The dialog you see contains several tabs. An **Install** tab is available if the system is configured to load charts from the DVD drive , and a **Mirror** tab is available if the system is configured to load charts from another console.

5 Installing from the DVD drive

Use this procedure if the Install tab is present in the dialog you are viewing; otherwise go to step 8.

6

- The systems checks the DVD and compares it with the installed version, if any. An information message is displayed.

a Insert the C-Map CM-93 edition 3 DVD into the drive.

b Select the **Install** tab.

c Click **Check CD**.

d Click **Install Chart Database**.

Note

This operation will disable normal operation of the MFD console for about 10 minutes. It might also temporarily affect the performance of other applications using the Local Area Network.

7 Go to step 9.

8 Installing from another console or from a K-Bridge Planning Station

Use this procedure if the Mirror tab is present in the dialog you are viewing. (The mirror tab is only displayed when the system is configured to load chart databases from a K-Bridge ECDIS, MFD or K-Bridge Planning Station system. On systems that are configured to load chart databases from a local CD-ROM or DVD drive, the Install tab is displayed instead; see *Install tab* on page 503.)

a Select the **Mirror** tab.

b Click **Chk**.

The system checks the database in the source system and compares it with the currently installed version (if any). An information message is displayed.

c Click **Install Charts**.

Note

This operation will disable normal operation of the MFD console for about 10 minutes. It might also temporarily affect the performance of other applications using the Local Area Network.

9 Select **Chart→Chart Types**.

10 Select the **CP:Professional+** database using the check box on the left side.

11 Switch back to the ECDIS application.

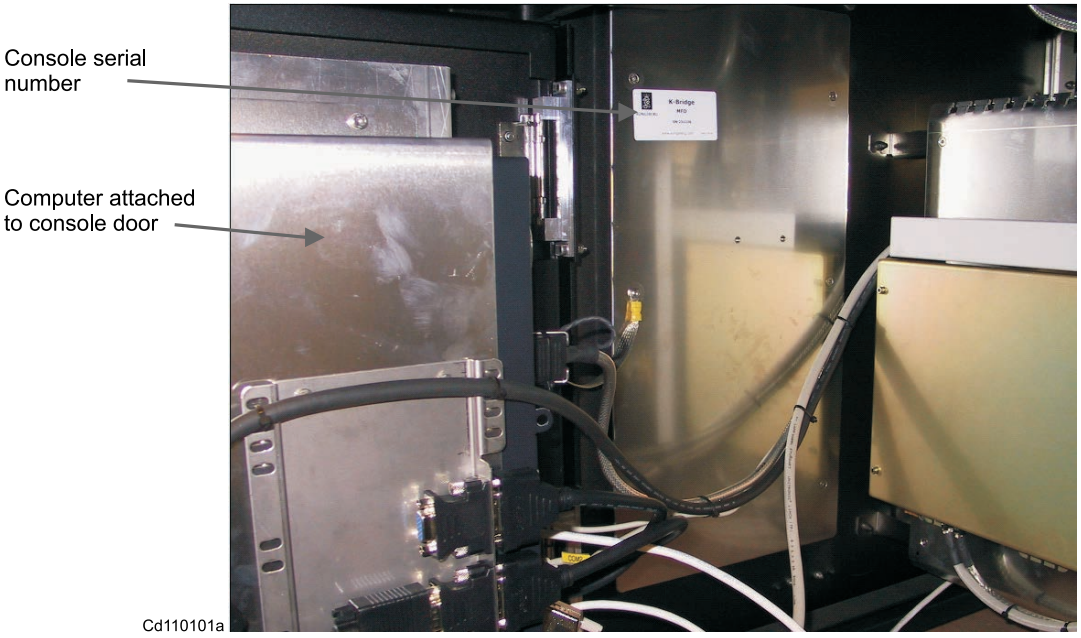
12 Click the **Chart** button in the range panel (see *ECDIS range panel: viewing controls* on page 88).

- Verify that a chart is displayed.

Overview charts at a scale of 1:20 000 000 and 1:3 000 000 are available without requiring a license code; these can be used as a background for larger radar ranges.

- If this is the first time a CM-93 Edition 3 database has been defined on the console, you will need to enter the serial number of the console. K-Bridge consoles have a six digit serial number (K-Bridge MFD SN.: 23xxxx).

Figure 41 Where to find the console serial number



13 Open the front cover of the console and note down the serial number found on the left side (see the figure above).

14 Select **Chart→Install C-Map SDK**.

15 Select the **Reinitialize License** option.

16 Type in the serial number.

17 Click **Install**.

This installs the C-Map edition 3 software into the system.

18 Select **Chart→Chart Types→CP Professional+→Mng**.

19 Select the **General** tab.

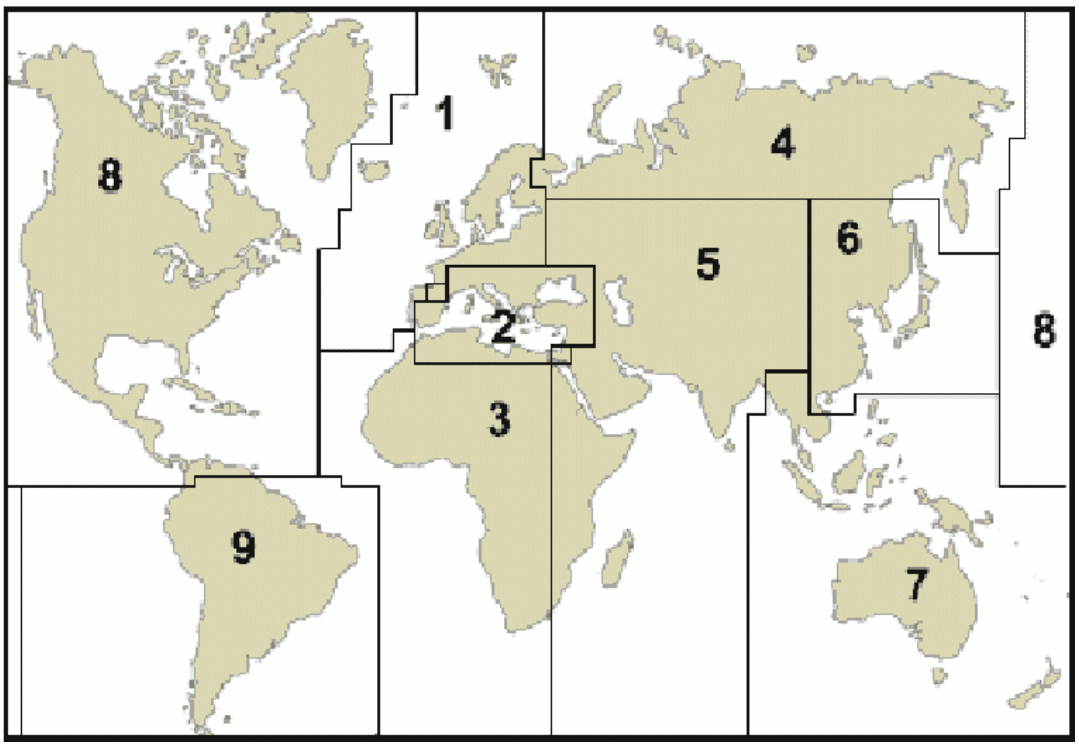
20 Click **License**.

21 Insert a USB memory stick into the computer.

22 Click **C-Map User ID to Medium**.

23 Select the area(s) you want to licence charts for.

Figure 42 C-map zone definition



The charts are grouped in Levels according to the scale:

Table 16 C-map chart level definition

Level	Scale
Z	1 : 20.000.000
A	1 : 3.500.000 – 1 : 1.500.000
B	1 : 1.500.000 – 1 : 500.000
C	1 : 500.000 – 1 : 150.000
D	1 : 150.000 – 1 : 50.000
E	1 : 50.000 – 1:15.000
F	1 : 15.000 – 1 : 5.000
G	Larger than 1 : 7.500

24 Send the file by e-mail to "license@c-map.no" and include information to tell them the area(s) you want to licence charts for. Or contact them at:

- C-MAP NORWAY A/S
  Hovlandsveien 52
  P.O.Box 212
  N-4379 Egersund NORWAY
  Tel.: +47 51 46 47 00
  Fax: +47 51 46 47 01

- C-Map will send you a licence code for each zone or area.

25 Insert the C-Map CM-93 edition 3 CD into the drive.

26 Select **Chart→Chart Types→CP Professional+→Mng**.

27 Select the **General** tab (*General tab* on page 497).

28 Select **Zone License** or **Area License** and the zone or area from the drop-down menu, and type in the 16-character code for the license into the text field.

29 Click **Add**.

- The new license code is registered.

30 Go back to step 30 and repeat this procedure for each license code.

Without license codes only Z-level and A-level charts are available for viewing.

31 If you do not see the new charts, restart the system.

7.2.3 Using multiple chart databases

When several chart databases are present, each database can be enabled/disabled to provide the desired chart selection. Based on the radar range the best matching chart from enabled databases are chosen. To enable or disable a chart, perform the following:

1 Select **Chart→Chart Types** (see *Chart Types* on page 477).

2 Use the check box on the left side of each database type to enable or disable it.

3 Select **Fill in Background Chart** to enable the background to be filled in for the display of lower scale charts. This is particularly useful when the foreground chart only covers part of the screen.

7.2.4 About CM-93 edition 3 chart options

A number of options are available to control the display of CM-93 edition 3 charts. Perform the following:

1 Select **Chart→Chart Types→CP Professional+→Mng**.

2 Select the **Settings** tab (see *Settings tab* on page 506).

- **Traditional Symbols:** Selects between simplified and traditional symbols.
- **Plain Boundaries:** Selects between complex and plain line styles to designate the boundary of an area.
- **Do Not Use S52 for C-Map Ch.:** When selected, dangerous objects are displayed using normal cartography symbols instead of S52 symbols, to reduce clutter in older charts.

7.2.5 Updating charts

Use the following procedure to install updates of the CM-93edition 3 database:

1 Select **System→Passwords**.

2 Type in the user password and click **Open**.

3 Select **Menu→Chart→Chart Types**.

4 Click the **Mng** button next to **CP:Profesional**.

- The dialog you see contains several tabs. An **Install** tab is available if the system is configured to load charts from the CD drive, and a **Mirror** tab is available if the system is configured to load charts from another console.

5 Updating from the DVD drive

Use this procedure if the Install tab is present in the dialog you are viewing; otherwise go to step 6.

a Insert the C-Map CM-93 edition 3 DVD into the drive.

b Select the **Install** tab.

c Click **Check CD**.

The system checks the DVD and compares it with the installed version, if any. An information message is displayed.

d Click **Install Chart Database**.

Note

This operation will disable normal operation of the MFD console for about 10 minutes. It might also temporarily affect the performance of other applications using the Local Area Network.

6 Installing from another console or from a K-Bridge Planning Station

Use this procedure if the Mirror tab is present in the dialog you are viewing. The mirror tab is only displayed when the system is configured to load chart databases from a K-Bridge ECDIS, MFD or K-Bridge Planning Station system. On systems that are configured to load chart databases from a local CD-ROM or DVD drive, the Install tab is displayed instead (see *Install tab* on page 503).

a Select the **Mirror** tab.

b Click **Chk**.

The system checks the database in the source system and compares it with the installed version (if any) on the target system. An information message is displayed.

c Click **Install Charts**.

Note

This operation will disable normal operation of the target MFD console for about 10 minutes. It might also temporarily affect the performance of other applications using the Local Area Network.

7.3 C-Map CM-93 edition 2 charts

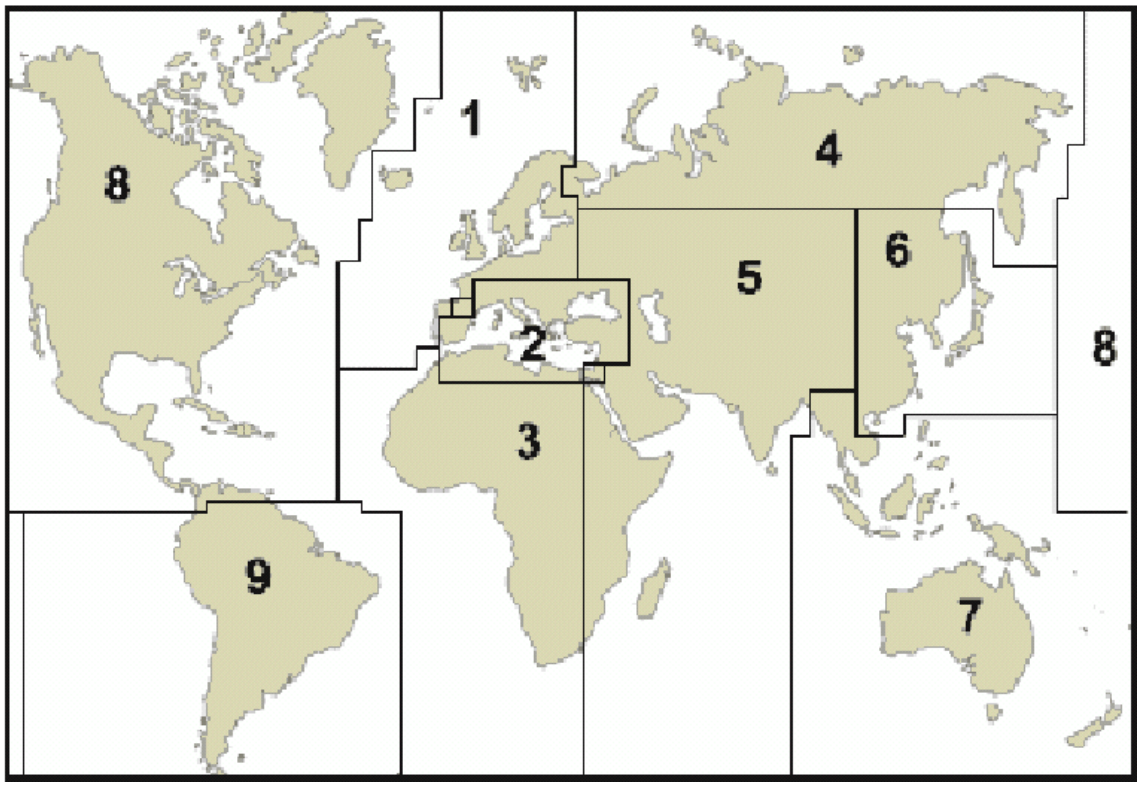
This section tells you how to install and manage C-Map edition 2 digital charts. It includes a reference section that describes the menus and dialogs for managing, removing and installing these charts.

Caution

Chart database maintenance may interfere with the radar display and should only be carried out when the radar picture is not needed.

CM-93 Edition 2 charts conforms to the IHO S57 edition 2 format and is manufactured by C-Map. All C-Map CM-93 edition 2 charts are available on three compact discs. To use the charts you need a authorization code from C-Map. The world is divided into nine zones (see below), and each zone is again divided into a number of areas. The license number defines which zones or areas you are able to use.

Figure 43 C-map zone definition



The charts are grouped in Levels according to the scale:

Table 17 C-map chart levels

Level	Scale
Z	1 : 20.000.000
A	1 : 3.500.000 – 1 : 1.500.000

Table 17 C-map chart levels (cont'd.)

Level	Scale
B	1 : 1.500.000 – 1 : 500.000
C	1 : 500.000 – 1 : 150.000
D	1 : 150.000 – 1 : 50.000
E	1 : 50.000 – 1:15.000
F	1 : 15.000 – 1 : 5.000
G	Larger than 1 : 7.500

Z level charts include functions for installing, updating and deleting charts.

7.3.1 Mirroring CM-93 edition 2 charts from the K-Bridge MFD Unit

You can mirror (in other words, copy) C-Map CM-93 edition 2 charts on to one console from another or from a K-Bridge Planning Station.

1 At the console that is to receive the new charts, select **Chart→Chart Types→C-Map→Mng**.

2 Select the Mirror tab (if not already selected).

- Before installing the new charts, you can modify the chart area graphically by using the cursor or by typing in the co-ordinates of the area required.
- The following functions are available:
  - Remove Charts Outside Area.
  - Remove Old Charts.
  - Force Regeneration (if you select this option, the console will clean up the chart database).
- To have the same database available in the console that is receiving the charts as in the source console:

  a Do not restrict the chart area.

  b Enable removal of Old Charts.

3 Click **Install charts**.

- The charts on the receiving console are updated to the latest versions available in the source console.

7.3.2 Maintaining a stand-alone chart database

7.3.2.1 Installing charts

To install C-Map CM-93 Edition 2 charts you will need CD-ROM(s) containing the charts and an authorization code from C-Map. To obtain the authorization code you must first define which chart zones or areas you need. Perform the following:

1 Contact C-Map to enter into an agreement with them and to obtain CD-ROM(s) for the zones relevant to you.

- C-MAP NORWAY A/S
  Hovlandsveien 52
  P.O.Box 212
  N-4379 Egersund NORWAY
  Tel.: +47 51 46 47 00
  Fax: +47 51 46 47 01
  E-mail: license@c-map.no

2 Insert the **C-Map CM-93 Edition 2** CD-ROM into the drive. If you received more than one you can use any of them at this point.

3 Select **Chart→Chart Types→C-Map→Mng**.

4 Select the zones or areas you need.

5 Click **Authorize**.

- The system generates a User code defining the zones or areas you have selected.

6 Write down the code.

7 Send the code by e-mail to "license@c-map.no", call them at +47 51 46 47 00, or fax them at +47 51 46 47 01.

- C-Map will respond by returning an Authorisation code. To enter the code into the system perform the following:

8 Select **Chart→Chart Types→C-Map→Mng**.

9 Click the **New License** button (with the CD-ROM still in the drive).

10 Enter the user code and the authorization code and click **Authorize**.

- The charts can now be loaded into the system.

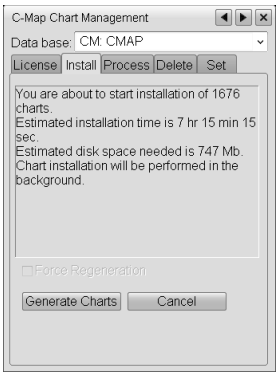
7.3.2.2 About navigation and overview working sets

When you install the C-Map CM-93Edition 2 charts, they are converted to a proprietary format. If there are a lot of charts this can take a considerable time - even hours. To reduce the time, charts that are not required need not be converted. For any given area several charts at different scales will normally be available. We have defined two categories of charts:

- **Navigational working set**: These are the charts you need to enable you to navigate on a particular voyage. Select all of the scale levels you require (Z, A, B, C, D, E, F and/or G).

- **Overview working set:** These are charts covering areas outside the areas covered by the navigational working set. For this category of charts, we recommend you install only charts of scale level A (1:3.500.000 – 1:1.500.000) and/or B (1:1.500.000 – 1:500.000).

7.3.2.3 Installing all charts in a zone



1 Select **Chart→Chart Types→C-Map→Mng**.

2 Select the **Install** tab.

3 Click **Set to Licensed**.

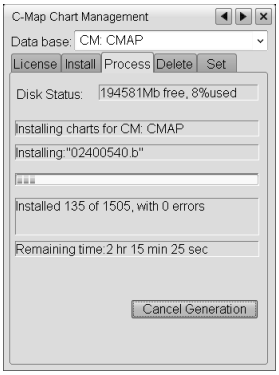
- This selects all charts available according to your Authorization Code.

4 Click **Set to Nav. Working Set**.

5 Click **Install charts**.

- The installation process may take some time, depending on the number of charts specified. An indicator is available to monitor the progress.

7.3.2.4 Installing a selection of charts



1 Select **Chart→Chart Types→C-Map→Mng**.

2 Select the **Install** tab.

3 Click **Set to Licensed**.

- This selects all charts available according to your Authorization Code.

4 Click **Set to Nav. Working Set**.

5 Click **Install charts**.

- The installation process may take some time, depending on the number of charts specified. An indicator is available to monitor the progress.

If you do not need all the charts in a zone to navigate on the up-coming voyage, specify the Working Set in the following way:

1 Select **Chart→Chart Types→C-Map→Mng**.

2 Select the **Install** tab.

3 Under Navigation Working Set; select **Edit**.

4 Select a large chart scale, for instance 1:20.000.000

- A grey grid is overlaid the chart.

5 Each rectangle in the grid can be selected by pointing to it and clicking the **Left mouse** button on the input panel. The rectangle is grey when selected.

6 Select the **Navigation Working Set**.

7 Select the required chart levels.

8 Under **Overview Working Set**; select **Edit**.

- A green grid appears as on overlay on the chart. Each rectangle in the grid is select-able; click in a rectangle with the **Left mouse** button to select it. The rectangle turns green when selected.

9 Select the **Overview Working Set**.

10 Select the required chart levels.

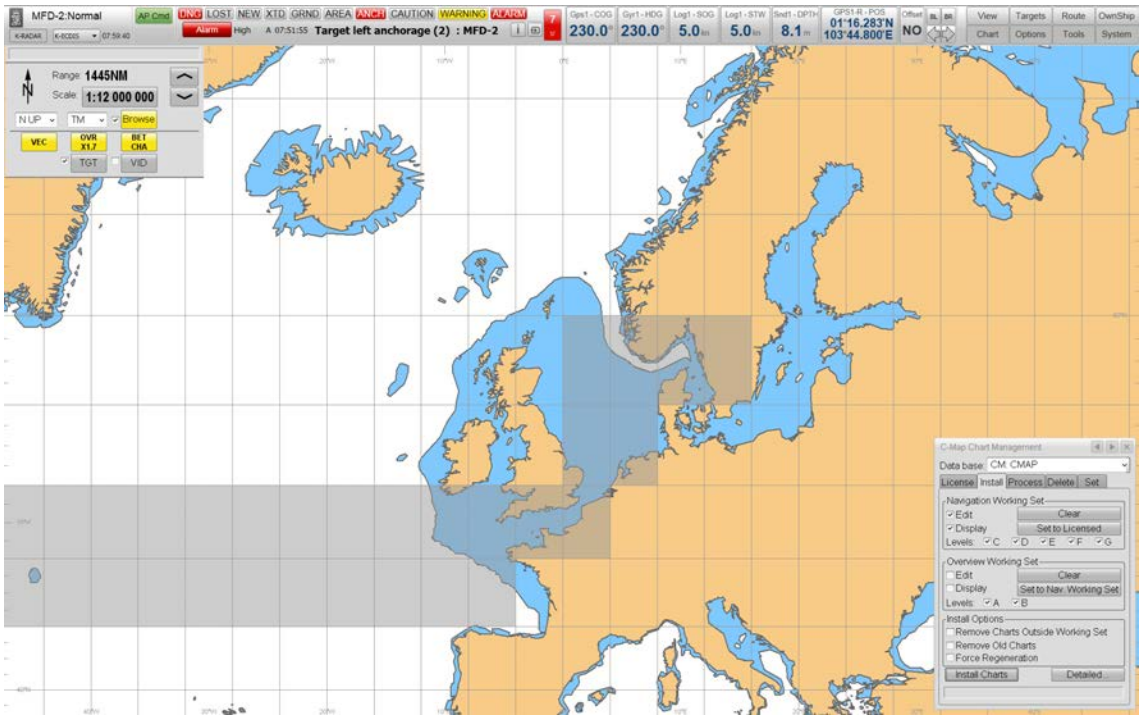
11 Click **Install charts**.

- The installation process may take some time, depending on the number of charts specified. An indicator is available to monitor the progress.

7.3.3 Updating charts

If you subscribe to chart updates, C-Map will from time to time send out new CD-ROMs. To install the chart updates perform the following:

Figure 44 Specification of a working set



1 Insert the new CD-ROM into the drive.

2 Select **Chart→Chart Types→C-Map→Mng**.

3 Select the **Install** tab (if not already selected).

- Before installing the new charts, you can modify the chart area graphically by using the cursor or by typing in the co-ordinates of the area required.
- The following functions are available:
  - Remove Charts Outside Area.

– Remove Old Charts.

– Force Regeneration (if you select this option, the console will clean up the chart database).

4 Click **Install charts**.

- The working set is automatically updated with the new charts from the CD-ROM.

7.3.4 Deleting charts

The chart delete function provides means to delete all charts, old charts or charts located outside the navigation working set. Perform the following:

1 Select **Chart→Chart Types→C-Map→Mng**.

2 Select the **Delete** tab.

3 Click the button for the selected option.

7.3.5 Reference information

This section describes the dialog for managing, removing and installing C-Map CM-93 edition 2 charts.

The path to the dialog is: **Chart→Chart Types→C-Map→Mng**.

The dialog contains four tabs. They are for:

- Copying charts from another navigator station on the same network, see *Mirror tab* on page 190.
- Monitoring the loading of a chart, see *Process tab* on page 192.
- Deleting charts from the system, see *Delete tab* on page 192.
- Configuring elements of the chart display, see *Set tab* on page 192.

7.3.5.1 Mirror tab

When the console is connected to a local area network, you can use this dialog to copy charts to the console from another console or from a K-Bridge Planning Station.

The path to the tab for this is: **Chart→Chart Types→C-Map→Mng→Mirror (tab)**.

The tab contains the following elements:

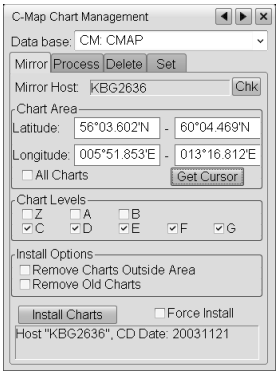


Chart Source: Select the unit (K-Bridge Planning or K-Bridge ECDIS) that you want to copy charts from.

Chart Area: Specify the chart area entering the latitude and longitude values for upper left and lower right corner of the area.

All Charts: Selects all charts available in the unit you are copying from.

Get Cursor: Click this button to specify a chart area by pointing and dragging a rectangle in the chart using the track-ball and **Left mouse** button.

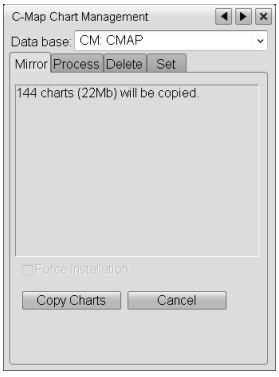
Chart Levels: Different charts are used for viewing at different scales. Select the scale ranges you want installed:

- A: 1:3.500.000 – 1:1.500.000
- B: 1:1.500.000 - 1:500.000
- C: 1:500.000 – 1:150.000
- D: 1:150.000 – 1:50.000
- E: 1:50.000 – 1:15.000
- F: 1:15.000 – 1:5.000
- G: > 1:7.500

Remove Charts Outside Area: Removes all charts outside the area specified above.

Remove Old Charts: Removes old charts when newer charts are available.

Install Charts: Installs selected charts.

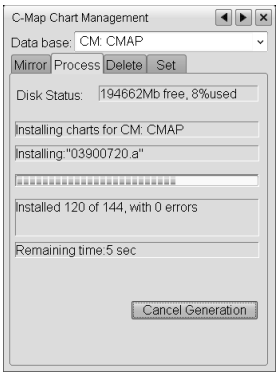


When you have clicked **Install Charts**, the tab changes to a statement of how many charts will be copied. The tab now contains the following buttons:

Copy Charts: Click to start the copying process.

Copy Charts: Click to cancel the copying process.

7.3.5.2 Process tab



Use the process tab to monitor the loading of charts (it includes a progress indicator).

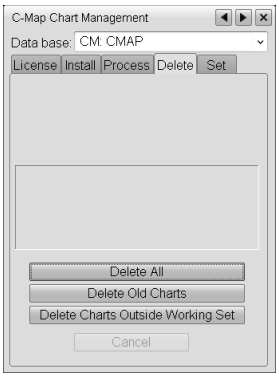
The path to the tab is: **Chart→Chart Types→C-Map→Mng→Proc. (tab)**.

The tab contains the following elements:

Information: Presents information about the ongoing chart operation.

Cancel Generation: Stops the installation of further charts after the chart that is currently loading has finished loading.

7.3.5.3 Delete tab



Use this tab to delete charts from the system.

The path to the tab is: **Chart→Chart Types→C-Map→Mng→Delete (tab)**.

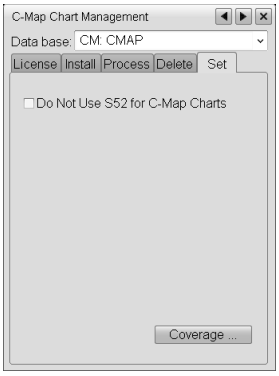
Delete all Charts: Deletes all loaded charts.

Delete Old Charts: Removes all charts that have not come from the CD currently in the CD-reader.

Delete Charts Outside Working Set: Click the button to delete all charts outside the current Working Set.

Cancel: Stops deleting of old charts.

7.3.5.4 Set tab



Use this tab to select S52 symbols and to configure chart coverage.

The path to the tab is: **Chart→Chart Types→C-Map→Mng→Set (tab)**.

The tab contains the following elements:

Do not use S52 for C-Map Charts: When selected, dangerous objects are displayed using normal cartography symbols instead of S52 symbols, to reduce clutter in older charts.

Coverage: Click the button to specify the levels of detail you require in the chart coverage.

7.4 S57/S63 charts from PRIMAR or AVCS

Regional Electronic Navigating Chart Coordinating Centres (RENCs) work on behalf of national hydrographic offices to provide coordinated chart distribution, quality assurance and service improvement. They normally provide ENC charts in a common encrypted format designated as S63. One of the most well-known RENCs is PRIMAR in Stavanger, Norway (see www.primar-stavanger.org).

PRIMAR and AVCS charts can be installed on to one or several operator stations.

If you choose to have PRIMAR or AVCS charts installed on several stations, a convenient way to deploy charts is to install them first on to a Planning Station and then to mirror (in other words, copy) them over the network to the individual operator stations.

7.4.1 Preparing your station(s) for the installation of S57/S63 charts

To install PRIMAR™ S57/S63 charts you will need a licence code from Kongsberg Maritime (for each station that you intend to use the charts on) and the charts and chart permits from PRIMAR (which will typically be contained on a CD-ROM or DVD).

This section will guide you through the process of obtaining the license codes from Kongsberg Maritime and the charts and chart permits from PRIMAR. It will also show you how to prepare the operator stations for the chart installation. Please follow all the instructions in this section for every station that you intend to have S57/S63 charts installed on.

If you intend to use the mirroring feature to load the charts on several stations, you must decide which station (for example, the Planning Station) will be the mirror host. Make sure you follow the procedures in this section for the host station before attempting to configure any of the clients.

7.4.1.1 Verifying software, hardware and licenses

To use S57/S63 charts, you must ensure that:

- The C-Map SDK is installed.
- A C-Map e-Token dongle is inserted. (The e-Token dongle must be inserted at all times while you are installing or using the charts. Do not remove it.)
- ECDIS (or Planning Station software) is running on the operator station you are using.

In addition to the software and the dongle you will need a license that is generated specifically for each e-Token dongle, based on a 16-character hexadecimal code. Each license belongs uniquely to one dongle.

Normally this will all be taken care of during commissioning of the vessel. However, to verify that the station is provided with the necessary license, follow these steps:

1 Make sure that the e-Token dongle is inserted.

2 Log into the system using the Service password.

3 Select **Chart→Chart Types**.

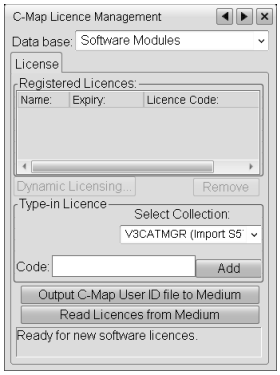
4 Click the **Mng...** button next to the label for the chart database you are updating.

A default chart database framework will normally be installed during commissioning, and an entry for PRIMAR charts will therefore be listed in the Chart Types dialog. However, if no PRIMAR database framework is listed, or if for any reason you are not certain whether the existing database framework is correct, create one now; see *Creating a database framework on the computer* on page 194. When you have finished, start this section again from step 1.

5 In the **Settings** tab, click the **C-Map Software License** button.

The license will be appear in the list of **Registered Licenses** with the name **V3CATMGR**.

If for any reason the S57/S63 license for your e-Token is missing, do the following:



a Request the 16-character hexadecimal code (if you do not have it yet) by sending an e-mail, quoting the company name and number printed on your e-Token, to `km.support@kongsberg.com`.

You can view the company name and number as printed on your e-Token by selecting **Chart→Install C-Map SDK** (you can do this without going on to re-install the SDK).

b When you have the code, select **V3CATMGR** from the **Select Collection** drop-down menu.

c Enter the 16-character hexadecimal code for the dongle and press the **Add** button.

d Make sure that the **V3CATMGR** license has appeared in the list.

If it has not, repeat the previous step in case you entered the 16-character code incorrectly.

7.4.1.2 Creating a database framework on the computer

1 Select **Chart→Chart Types**.

If there is a PRIMAR or AVCS database in the list, this indicates that a PRIMAR or AVCS database framework has already been created on the computer. If you are not certain whether this previous installation has been carried out correctly, we recommend that you remove the PRIMAR or AVCS database and re-install it. However, if you decide to keep the current installation you should verify the configuration of the station (as single station, mirror host or client), and whether the PRIMAR charts and chart permits are loaded. Then, resume the installation procedure where necessary.

2 Select **System→Passwords** and enter the User password.

3 Select **Chart→Reconfigure Chart Databases→Add New**.

4 Click on the database you want to install, for example, click **S63 Database (Primar/AVCS)**.

5 Configure the computer as a single station, a mirror host or a mirror client.

If you intend to:

- Install the charts on to a single operator station, or if you intend to use removable media (CD-ROM, DVD, USB stick) to load the charts on to multiple operator stations individually (this is an alternative to using the mirroring feature), then skip this step altogether and go to step 6.
- Use the operator station you are currently working at as a host for a mirror operation (in other words, if you intend to copy the charts from this computer to other computers on the network), do the following:
  a Click **Change mirror**.
  b Check the **Use as Mirror Host** checkbox.
  c Click **Apply Change**.
- If you intend to use the operator station you are currently working at as a mirror client (in other words, if you intend to copy the charts from the mirror host to this computer), do the following:
  a Click **Change mirror**.
  b Make sure that the **Use as Mirror Host** check-box is unchecked.
  c Click on the drop-down box under **Install from Remote Station**.
  d Select the host from the list.
  e Select the radio button **Install from Remote Station**.
  f Click **Apply Change**.

6 In the **Chart Type Setup** dialog:
a Click **Apply Changes**.
b Confirm by clicking **Apply Changes** again.
The system creates the database framework.

7 Restart the system:
a Select **System→Shutdown**.
b Click **Restart Computer**.
c Confirm by clicking **Restart Computer** again.

7.4.1.3 Obtaining chart permits from PRIMAR

1 In the ECDIS (or Planning Station) application, select **Chart→Chart Types**.

2 Click the **Mng...** button next to the label for the chart database whose permits you are updating (for example, **PR: Primar**).

3 In the **General** tab, click the **License** button.
The system generates the user permit for the computer. It is displayed as a 28-character string.

4 Write down the character string that appears in the **User Permit** field.
This character string will be used by PRIMAR™ – when you contact them – to generate a chart permit for each chart you intend to use on the computer.

Since this chart permit provided by PRIMAR™ will be machine-specific, you need to write down the user permit character string for every computer you are intending to use the charts on.

So before proceeding to the next step – which is to send the strings to PRIMAR™ – write down the user permit character string for each navigation operator station and Planning Station computer that you are going to use the charts on.

5 Send the character string(s) you wrote down to:

PRIMAR™
Lervigsveien 32
P.O.Box 604001 Stavanger, Norway
Phone:+4751939500
Fax:+4751939501
E-mail: info@primar.org

PRIMAR™ will send the chart permits you require either by post or e-mail. For each computer, the permits will be contained in two files called "PERMIT.TXT" and "ENC.PMT". (If you receive permits by e-mail, save the files on a disk or USB stick.)

7.4.2 Installing S57/S63 charts on to a single operator station or a mirror host from removable media

You should by now have received the chart permits and the charts themselves (typically contained on a CD-ROM) from PRIMAR. If so, you ready to install them on to your operator station(s).

If you intend to mirror the charts on to several operator stations, install them on to the mirror host first (by following the instructions in this section), then load them on to the clients (see *Mirroring S57/S63 charts on to several operator stations* on page 198).

Although it is not recommended, you can install the charts individually on to several stations (in other words, without mirroring). To do so, just follow the instruction in this section for each operator station and use removable media.

You might prefer to copy the charts from the CD-ROM or DVD on to a USB memory stick before starting the installation process. Both charts and permits can be loaded on to an operator station from a USB stick. Always make sure the USB stick is virus-free before inserting it in the computer.

7.4.2.1 Load the chart permits on to the computer

1 Insert the medium (for example, a CD-ROM, DVD or USB stick) containing the chart permits into the computer.

2 Select **Chart→Chart Types**.

3 Click the **Mng...** button next to the label for the chart database whose permits you are updating (for example, **PR: Primar**).

4 In the **General** tab, click the **License** button.

5 Use the drop-down menu to browse the specified medium for the folder containing the permits.

If you have licenses for several stations, make sure you know which license file belongs to which station.

When the system detects a folder containing permit files, the following text appears inside the dialog: `Chart Permit File Found`.

If you are satisfied that the permits are for the correct computer, click OK.

6 Click **Read Permits from**.

7 Click OK.

The system lists the chart permits that now exist on the computer.

7.4.2.2 Install the charts themselves

1 Insert the medium (a CD-ROM, a DVD or a USB stick) containing the base release of the PRIMAR™ charts.

2 Select **Chart→Chart Types**.

3 Click the **Mng...** button next to the label for the database whose charts you are installing (for example, **PR: Primar**).

4 Select the **Install** tab.

5 If you are using a:

- CD or DVD, click **Check CD**.

  This will make the system recognize the PRIMAR™ disk.

- USB stick, browse for the folder containing the charts.

When you select the correct folder a text status appears in the dialog, indicating that the charts have been found (e.g. `UKHO ENC BASE ...`).

6 Click **Import S57 Charts**.

a The system might notify you that the digital certificate for the new charts is different from the one for the previously installed charts. If this happens:

i Click the **Check** button.

The certificate you want to use appears by default under **New certificate**.

ii Click **Trust and Install** to install the specified certificate.

iii Click **Import S57 Charts**.

b The system might notify you that a new Primar Product List was found in the catalog. If so, click **Install**.

The system goes through all licensed charts on the CD, checks which to install, and gives you a time estimate for the installation.

7 Click **Install** to install the charts, and wait for the installation procedure to complete.

If you are installing a lot of charts, the process can take a considerable amount of time. The dialog displays progress information during the installation.

8 Click **OK**.

If any errors are reported at the end of the installation process, contact PRIMAR™ to resolve them.

9 Make the charts you have installed active:

a Select **Chart→Chart Types**.

b Check the check-box to the left of the name of the database whose charts you have installed (for example, **PR: Primar**).

If you found this check-box already checked, it is a good idea to uncheck it and then check it again. This ensures that all the charts in use will be the latest ones installed.

7.4.3 Mirroring S57/S63 charts on to several operator stations

This section tells you how to mirror (in other words, copy) S57/S63 charts from one computer (for example, a Planning Station or operator station computer) on to one or more operator stations over the network.

Before installing permits and charts, make sure that:

- You have set up the source computer as a mirror host and that the permits and charts have been loaded on to it (see *Preparing your station(s) for the installation of S57/S63 charts* on page 193 and *Installing S57/S63 charts on to a single operator station or a mirror host from removable media* on page 196).
- You have created an S57/S63 database framework for each mirror client (in other words, for each operator station that is to receive the new charts) . To do this, you must follow the procedure *Preparing your station(s) for the installation of S57/S63 charts* on page 193 for each client, taking care that the name of the S57/S63 database framework is the same on the mirror host and on each client.

To install permits and charts on your mirror client, you can choose whether initiate the transfer from the mirror host or from the mirror client. Perform one of the following procedures:

- *Mirroring charts on to the mirror client from the host (initiated from the client)* on page 198
- *Mirroring charts on to the mirror client from the host (initiated from the host)* on page 200.

7.4.3.1 Mirroring charts on to the mirror client from the host (initiated from the client)

1 To load the required permits from the mirror host, do the following:

a At the client station, select **Chart→Chart Types**.

b Click the **Mng** button for the S57/S63 database (for example,**PR: Primar**).

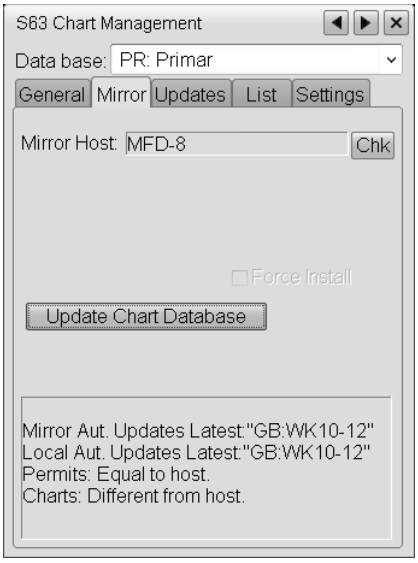
c In the **General** tab, click **License** (see *General tab* on page 482).

d From the **Read Permits from** drop-down list at the bottom of the dialog, specify the device (in other words, the mirror host computer) that you want to load the permits from.

(If you are installing the permits from a removable medium, specify that instead.)

2 To load the charts, check in the **Mirror** tab that the correct mirror host is specified, then click **Update Chart Database**.

Figure 45 Updating the chart database on the mirror client



The status window at the bottom of the dialog reports whether the chart permits and updates match those on the mirror host or not.

3 Activate the charts:

a Select **Chart→Chart Types**.

b Check the check-box to the left of the name of the S57/S63 database (for example, **PR: Primar**).

If you found this check-box already checked, it is a good idea to uncheck it and check it again to make sure all charts displayed are the very latest ones installed.

4 When you have installed the charts on to all the mirror clients, go to the mirror host computer again and view the state of the chart database and permits on both the host and client computers:

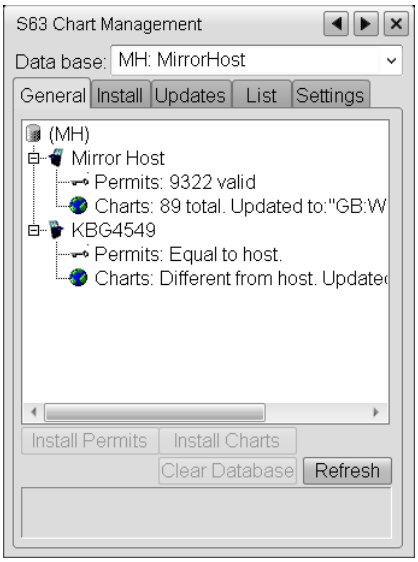
a At the mirror host, select **Chart→Chart Types**.

b Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

c In the **General** tab, click **Manage Mirrors**.

An overview is displayed of the permit and chart statuses for the mirror host along with indications for each mirror client of whether the permits and updates match those on the mirror host.

Figure 46 The status of the permits and updates on the mirror host and clients



7.4.3.2 Mirroring charts on to the mirror client from the host (initiated from the host)

1 At the mirror host, log into the system using the User password.

2 Select **Chart→Chart Types**.

3 Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

4 In the **General** tab, click the **Manage mirrors** button.

The list appears populated with the host and the clients (see *The status of the permits and updates on the mirror host and clients* on page 200), with the host clearly indicated. The status of permits and charts already installed on the clients is shown as well.

5 Select the client you want to install the charts on to by clicking its name.

6 Click the **Install Permits** button.

The system transfers the permits to the client (and a message appears on the screen of the client operator station to this effect).

7 Click the **Install Charts** button.

The system transfers the charts to the client (and a message appears on the screen of the client operator station to this effect).

While the installation of charts is taking place, a text box in the active window on the host will indicate “Charts Mirroring running”. However, if you suspect that the installation may have already finished, you can press the **Refresh** button at any time. If the “Charts Mirroring running” text is visible, the installation is still in progress.

8 Activate the charts:

a Select **Chart→Chart Types**.

b Check the check-box to the left of the name of the S57/S63 database (for example, **PR: Primar**).

If you found this check-box already checked, it is a good idea to uncheck it and check it again to make sure all charts displayed are the very latest ones installed.

7.4.4 Updating permits and charts on the mirror host

When the current permits on your operator station have expired, you must obtain new ones from PRIMAR and then follow the procedure *Load the chart permits on to the computer* on page 196.

To see the expiry date of your chart permits, do the following:

1 Select **Chart→Chart Types**.

2 Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

3 In the **General** tab, click the **License** button.

The system displays the chart permits currently loaded on to the operator station, along with their expiry dates.

To update the charts loaded on to the mirror host, use a removable medium (typically a CD-ROM or DVD from PRIMAR) containing the latest release of the charts. You may choose to have the charts copied on to a USB stick from which to load them on to the mirror host. If so, make sure it is virus-free before inserting it in the computer. Then do the following:

1 Insert the removable medium (CD-ROM, DVD, USB stick) in to the mirror host computer.

2 Select **Chart→Chart Types**.

3 Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

4 In the **Updates** tab, click the **Update by Disk** button.

5 Under **Chart CD Status**, choose the correct drive.

6 If you are using a:

- CD or DVD, click **Check CD**.

  This will make the system recognize the PRIMAR™ disk.
- USB stick, browse for the folder containing the charts.

When you select the correct folder, a text status appears in the dialog indicating that the charts have been found (e.g. `UKHO ENC UPDATE ...`)

7 Click **Import S57 Charts**.

a The system might notify you that the digital certificate for the new charts is different from the one for the previously installed charts. If this happens:

i Click the **Check** button.

The certificate you want to use appears by default under **New certificate**.

ii Click **Trust and Install** to install the specified certificate.

iii Click **Import S57 Charts**.

b The system might notify you that a new Primar Product List was found in the catalog. If so, click **Install**.

The system goes through all licensed charts on the removable medium, checks which to update, and gives you a time estimate for the update.

8 Click **Install** to update the charts, and wait for the update procedure to complete.

If you are updating a lot of charts, the process can take a considerable amount of time. The dialog displays progress information during the update.

9 Click **OK**.

If any errors are reported at the end of the update process, contact PRIMAR™ to resolve them.

10 Activate the charts:

a Select **Chart→Chart Types**.

b Check the check-box to the left of the name of the S57/S63 database (for example, **PR: Primar**).

If you found this check-box already checked, it is a good idea to uncheck it and check it again to make sure all charts displayed are the very latest ones installed.

7.4.5 Updating permits and charts on the mirror clients from the host

To check whether the permits on the client have expired or not:

1 Select **Chart→Chart Types**.

2 Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

3 In the **General** tab, click the **License** button.

The system displays the chart permits currently loaded on to the operator station, along with their expiry dates.

To update the charts on a mirror client, you must first update them on the host and then you can transfer the updates from the host to the mirror client. You can choose whether to initiate this transfer from the host or from the client:

- *Updating charts on the mirror client from the host (initiated from the client)* on page 202
- *Updating charts on the mirror client from the host (initiated from the host)* on page 203.

7.4.5.1 Updating charts on the mirror client from the host (initiated from the client)

1 At the mirror client, select **Chart→Chart Types**.

2 Click the **Mng** button by the name of the S57/S63 database (for example, **PR: Primar**).

3 In the **Mirror** tab, click the **Update Chart Database** button.

4 Click **OK** when the update process is completed.

5 Activate the charts:

   a Select **Chart→Chart Types**.

   b Check the check-box to the left of the name of the S57/S63 database (for example, **PR: Primar**).

   If you found this check-box already checked, it is a good idea to uncheck it and check it again to make sure all charts displayed are the very latest ones installed.

7.4.5.2 Updating charts on the mirror client from the host (initiated from the host)

1 At the mirror host, select **Chart→Chart Types**.

2 Click the **Mng** button by the name of the S57/S63 database (e.g. **PR: Primar**).

3 In the **General** tab, click the **Manage Mirror** button.

4 Select the client you want to update the charts on by clicking on its name.

5 Click the **Install Charts** button.

   When all charts have been updated, a message will appear on the host screen indicating that the update process was successful.

   While the installation of charts is taking place, a text box in the active window on the host will indicate “Charts Mirroring running”. However, if you suspect that the installation may have already finished, you can press the **Refresh** button at any time. If the “Charts Mirroring running” text is visible, the installation is still in progress.

6 Make the charts you have updated active:

   a Select **Chart→Chart Types**.

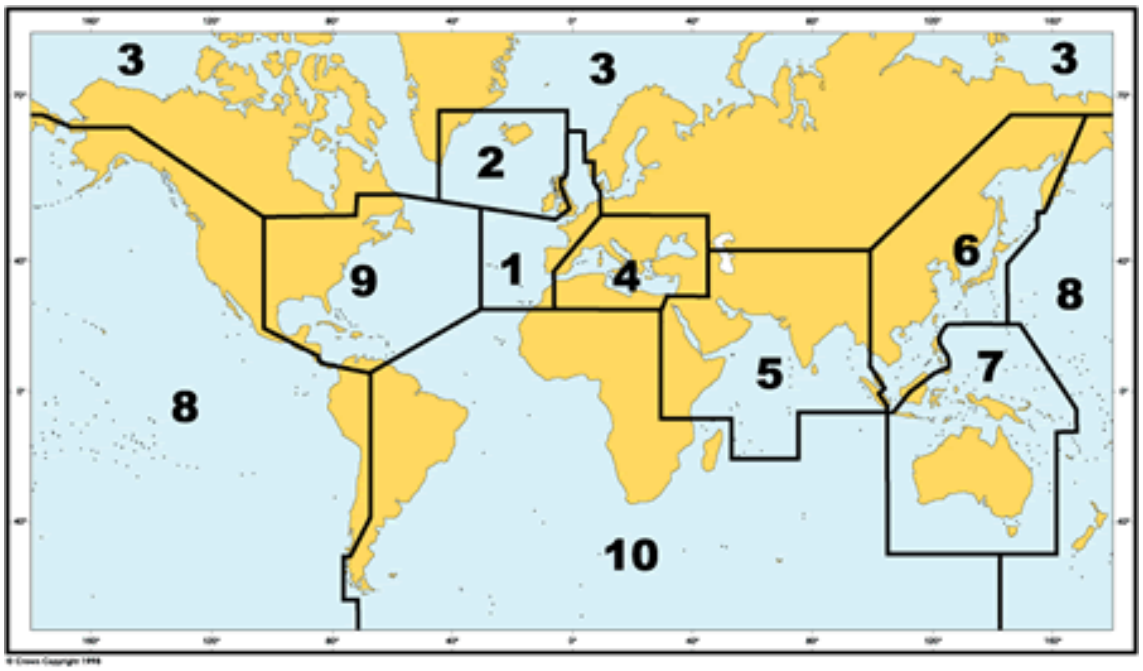
   b Check the check-box to the left of the name of the S57/S63 database (for example, **PR: Primar**).

   If you found this check-box already checked, it is a good idea to uncheck it and check it again to make sure all charts displayed are the very latest ones installed.

7.5 HCRF charts

Raster charts can be used in the ECDIS application but not the Radar application. They are either ARCS charts provided by the United Kingdom Hydrographic Office or Seafarer charts provided by the Australian Hydrographic Office. These are distributed in a common format but have slightly different licensing conditions. The term HCRF - Hydrographic Chart Raster Format - is used as a common term for ARCS and Seafarer charts. ARCS Navigator provides an annual supply of digital chart information, supported by the weekly issue of Update Discs for mariners whose vessels are mandated under Safety of Life at Sea (SOLAS) regulations or for other subscribers who require access to frequent updating.

Figure 47 ARCS charts broken down into individual Area Disc CD-ROMS



If you want to use HCRF charts and your ECDIS application has not been configured for HCRF chart you need to contact Kongsberg Maritime. Use the addressing information found at the beginning of this book.

7.5.1 Installing charts

To install ARCS charts you will need a CD-ROM containing the charts and a Chart Permit. Do the following:

1. Select **Chart→Chart Types**.
2. Under databases, see if there is an ARCS database.
3. If it is included, this indicates that the system has been initialised, go to step 18, otherwise continue at step 4.
4. Select **System→Password**
5. Enter the user password (see *Password* on page 593).
6. Select **Chart→Reconfigure Chart Databases**.
7. Click **ARCS Database**.
8. Click **Apply Changes** twice.
9. Select **Chart→Chart Types→Database: AR: ARCS**.
10. Select the **License** tab.
11. Click **Show User Permit**.
12. Write it down.
13. Contact an ARCS Chart agent providing the User permit and the PIN code "1234".
    - You will receive the Chart Permit on a disk.

14 Insert the disk in the selected device.

15 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

16 Select the **License** tab.

17 Click **Add Chart Permits from Medium**.

- Chart permits can also be inserted manually if obtained by telephone or fax.
- When the Chart Permit has been loaded, you can display the License information by clicking **Show Licence**.
- You can also take back-up and remove chart permits from here.
- The first time charts are loaded into the system, use the most recent chart catalogue.

18 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

19 Select the **Update** tab.

20 Click **Load Updates**.

21 You will be asked to insert the Update CD.

22 Click **Load Updates from CD**.

23 Select the **Load** tab.

- There are three ways of selecting the charts to be loaded:
  - By clicking **Select all**.
  - By selecting all charts within a geographic area. The area can be specified either by latitude and longitude values, or by clicking **Get Cursor** and drawing a rectangle in the overview chart on the screen.
  - By selecting individual charts listed under **Licensed**.

24 When the required charts are selected, start the loading by clicking **Load Selected Charts**.

- The user is requested to insert chart CDs as required by the loading process.

7.5.2 Updating charts

The United Kingdom Hydrographic Office issues chart updates on a weekly basis. From time to time they will also issue new chart CDs.

1 When you receive an update CD perform the following:

Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

2 Select the **Update** tab.

3 Click **Load Updates**.

4 You will be asked to insert the Update CD.

5 Click **Load Updates from CD**.

1 When you receive a new chart CD perform the following:

Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

2 Select the **Update** tab.

3 Click **Load Updates**.

4 You will be asked to insert the Update CD.

5 Click **Load Updates from CD**.

6 Insert the Chart CD.

7 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

8 Select the **Load** tab.

- In the Licensed window some charts will be listed as **Incompat**.

9 Select these.

10 Click **Load Selected Charts**.

7.5.3 Deleting and adding charts

The charts installed in the system may from time to time need to be changed, either because the sailing route is changed or for other reasons. Such changes may include both deleting and adding charts. If new chart permits are needed contact your ARCS chart agent, who will issue new chart permits.

7.5.3.1 To enter new chart permits

1 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

2 Select the **License** tab.

3 Click **Add Chart Permits from Floppy Disk**.

- Chart permits can also be inserted manually if obtained by telephone or fax.

7.5.3.2 To remove charts

1 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

2 Select the **Load** tab.

3 Select the charts you want to remove.

4 Click **Unload Selected Charts**.

- The charts are removed.

7.5.3.3 To add new charts

1 Select **Chart→Chart Types→Database: AR: ARCS→Mng**.

2 Select the **Load** tab.

3 Select the charts you want to add.

4 Click **Load Selected Charts**.

5 Install the CD as requested

6 Click **Load CD-ROM**.

- The charts are loaded.

7.5.4 ARCS demonstration charts

Three ARCS charts are normally available on the hard disk for demonstration purposes. A voyage through these charts has been recorded and can be replayed. To set up the demonstration, do the following:

1 On the monitor select **ChartReconfigure Chart Databases**.

2 Select **ARCS Demonstration Dataset**.

- The charts are installed in the system's chart database.

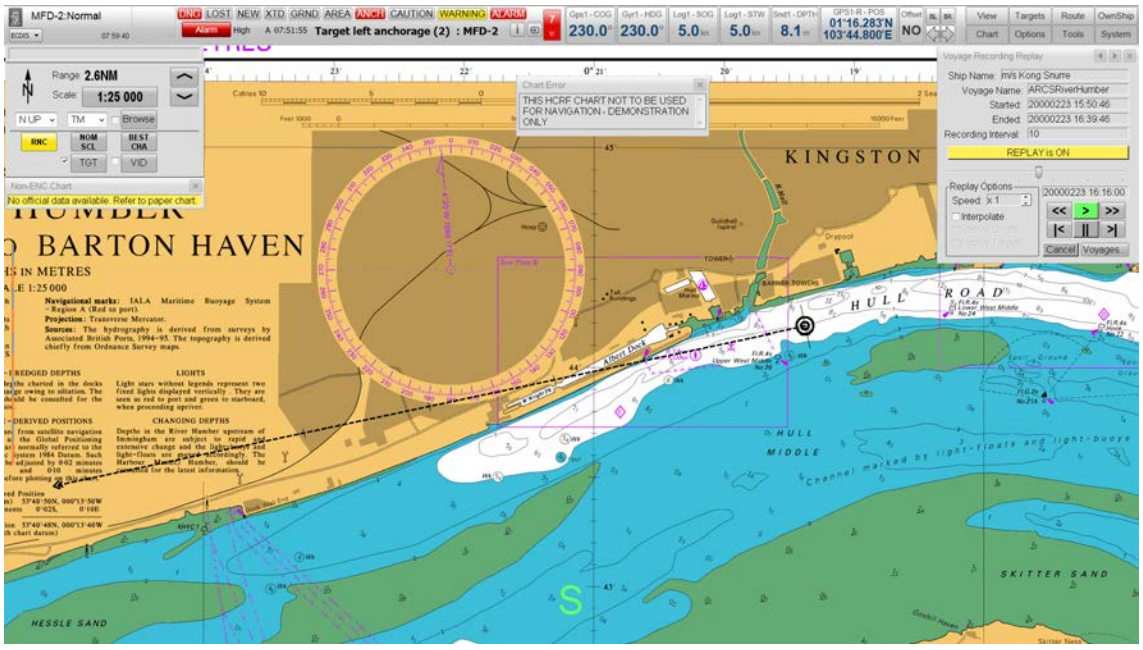
3 When the installation is finished, click **Apply Changes** .

4 Restart the system by turning it off and then on again.

5 On the monitor select **ChartChart Types**.

6 Select **AD;ARCS-DEMO**, and de-select all other databases.

Figure 48 Demonstration of ARCS raster charts



7 Set the chart scale to 1:50.000, and choose **N UP/TM**.

- The ARCS charts are now ready for display.

8 Select **Own Ship→Voyage Recordings List** (see *Logging the voyage details* on page 324).

9 Select **ARCSRiverHumber**, and then click **Replay**.

10 In the **Voyage Recording Replay** dialog, select **Interpolate**, click **Start** then click the > button.

11 Drag the **Voyage Recording Replay** dialog into the chart area.

- The own-ship is now sailing through the displayed ARCS charts.

12 To stop the demonstration, click the Close Button ("X") in the **Voyage Recording Replay** dialog.

7.6 Defining the chart regeneration area

When the system is operated in true motion the own-ship moves across the chart and as it approaches the edge of the display the chart needs to be regenerated. The operator can configure when this happens by defining a regeneration rectangle. To do this:

1 Select: **System→Parameter Settings**.

2 Select the **Display** tab.

3 Select **Chart Regeneration Area** (see *Chart regeneration area* on page 569).

4 The regeneration rectangle can be defined in three ways (use the marker to drag the sides of the rectangle or enter exact values using the keyboard):

- **Fixed Border Offset:** The chart is regenerated when the own ship gets closer than the set percentage from the edge. (In percent of the screen diameter).
- **Movable rectangle:** Allows you to define each side of the rectangle individually.
- **Minimum chart area ahead:** The chart is regenerated when the distance ahead of the own ship is less that the set percentage.

Figure 49 Fixed border offset

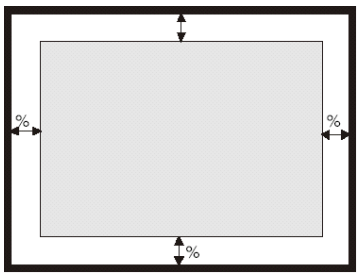


Figure 50 Movable rectangle

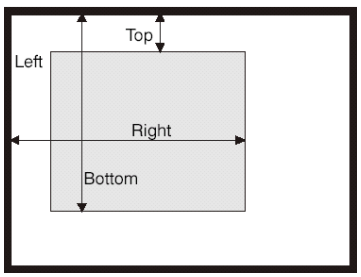
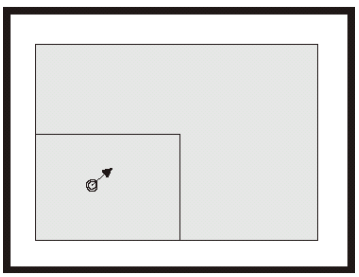


Figure 51 Fixed border offset with 50% minimum chart area ahead



The regeneration rectangle has its own object menu. To display it point to the rectangle and click **Object Menu** on the operator panel.

- **Reset to Left Area Default sets:** Sets a regeneration area that is not in conflict with the menu area on the right hand side of the display.
- **Reset to Full Area Default:** Sets a regeneration area that is 20% off the border of the chart area.

7.7 Displaying charts on the radar display

7.7.1 Introduction

The K-Bridge Radar can display official and unofficial electronic charts.

Official charts are charts that have been issued by an authorized hydrographic office.

Unofficial charts are charts that have not been issued by an authorized hydrographic office. Unofficial vector charts can be purchased from distributors of Jeppesen (C-Map).

Note

Even with official charts displayed, the K-Bridge Radar is a chart radar and not an ECDIS (neither is it an approved back-up for ECDIS). Displaying ENC on the K-Bridge Radar is an aid to navigation and not an alternative to viewing the chart on an ECDIS or using a paper chart.

You cannot use raster charts on K-Bridge Radar (or on any chart radar).

7.7.2 Switching chart presentation on and off

To switch chart presentation On or Off in the Radar application, click the **Chart** button on the range panel of the radar dashboard (see *Radar dashboard: the range panel* on page 79).

7.7.3 Presenting charts and radar video on the same screen

When radar video and charts are presented together on the radar screen, it is important to bear the following principles in mind:

The radar application is primarily an ARPA system, and the presentation of charts should not degrade or obscure the radar video. It is extremely important for example that an unexpected radar target is not difficult to observe because of the additional chart information. This has been guidance throughout the entire design of the system, but it has not been possible to test the system with all possible combinations of charts (some of which have not been published at the time of testing), range scales and radar echoes. It is important that the operator at all times estimates whether the selected chart information may degrade or obscure the readability of radar echoes. If so, he should reduce the numbers of presented chart themes, or even switch off chart presentation on the radar application completely until the situation has changed.

The localisation of the radar video and the chart data on the screen is in principle independent. Radar video is presented relative to the own-ship, while chart data is presented based upon its absolute geographical position. The relative position of the chart data is determined also by the calculated geographical position of the own-ship.

The following factors will influence the alignment of the radar video and chart presentation:

- Correct configuration of the position of the antennas on the own-ship, both for radar antenna and position receiver (GPS) antenna. After correct installation and commissioning, this should not be an influential error.
- The quality of the chart material. This is extremely difficult for the operator to estimate.
- The chart material and the position receiver (GPS) shall both use the same geographical datum. This shall be WGS84 for official electronic charts, and the GPS shall also be configured to transmit WGS84 to K-Bridge Radar.

- The accuracy of the calculated position of the own-ship. This is difficult for the operator to estimate, but the basic accuracy should be in the range of less than 10m when absolute GPS is used and less than 5 m when differential GPS is used.
- Correct input from the compass. An offset in heading will result in a rotation of the radar video relative to the chart.
- Correct radar azimuth alignment. If the heading line alignment is erroneous, this will result in a rotation of the radar video relative to the chart.

When land is included in the chart data and parts of the land are distinct radar echoes, the superposition of radar echoes and chart data may be used to assert the quality of the match. The radar echoes should be on the same location on the screen as the corresponding places on the chart. When doing so, it is essential to be aware that the strongest radar echoes may be from other parts of land than the coast line. As an example, a steep hill with a flat strip of land towards the sea will often have the strongest echo from the hill. It is also important to be aware of the opening angle of the radar beam, which will tend to enlarge radar echoes in azimuth.

An offset in compass reading may result in a small rotation of coast lines between radar echoes and charted coast lines.

7.7.4 Limitations on the display of chart themes

The presentation of chart is not permitted in Head Up. This is to avoid temporary mismatches between radar and chart when the chart is being recalculated. Recalculation is frequently necessary in Head Up. When chart is On and Head Up is selected, the chart is automatically switched Off.

Initially the primary chart items are displayed. Chart themes up to and including ECDIS standard display may be selected.

Figure 52 A radar screen with primary chart items displayed

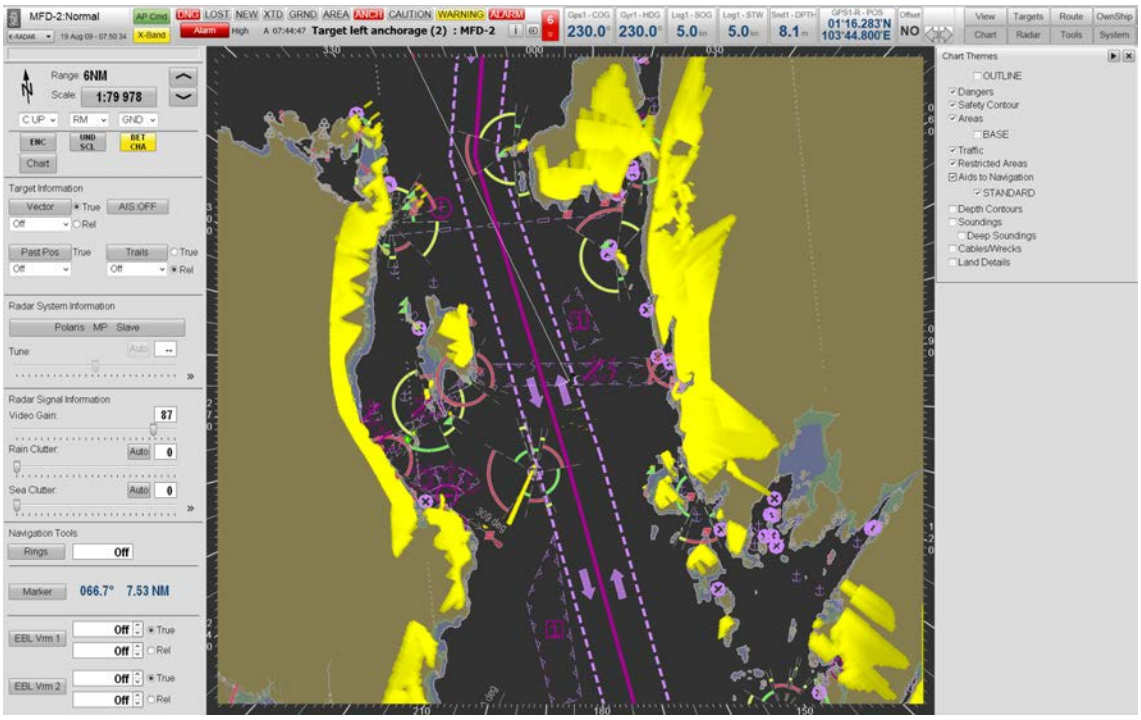
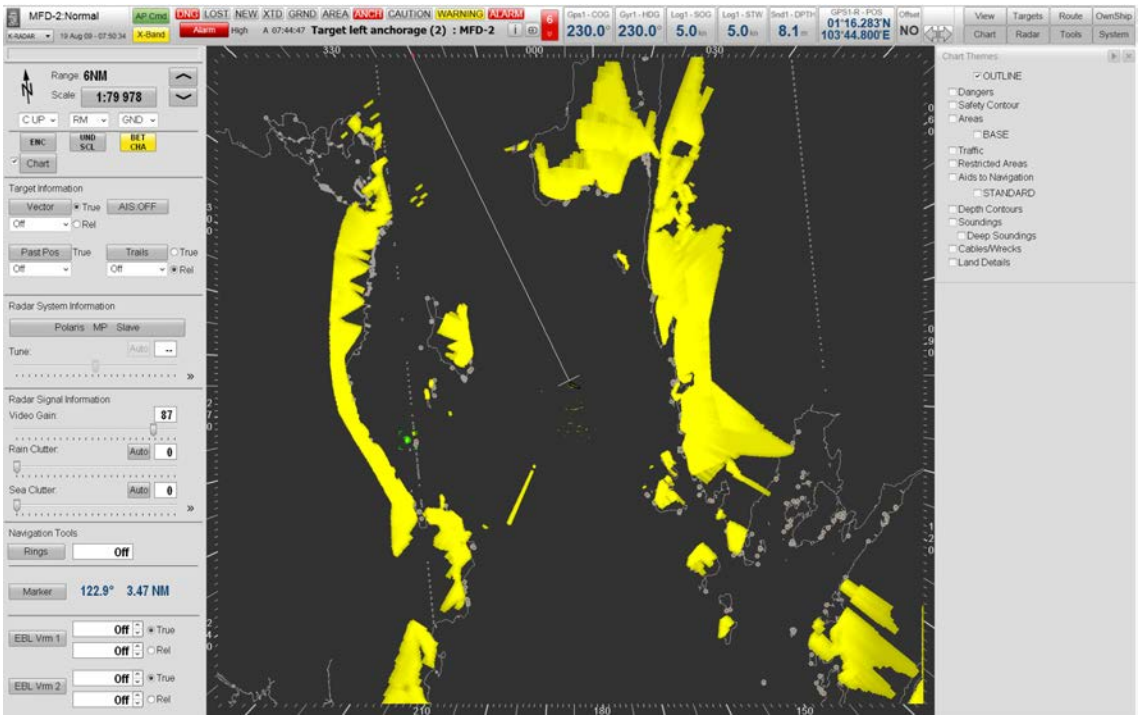


Figure 53 A radar screen with only chart outlines displayed



8 Using the Navtex hazard services

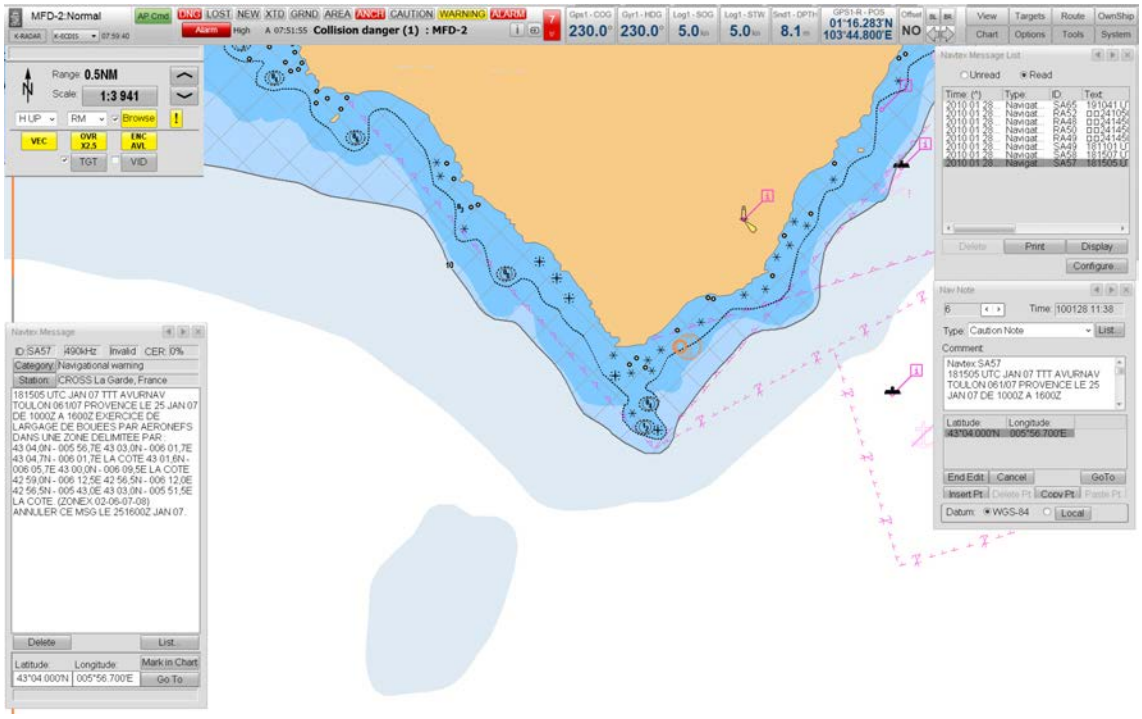
This section contains the following topics:

8.1 Introduction

All Navtex functions require a Navtex receiver to be installed and connected to the K-Bridge MFD system. Navtex is a maritime service that advises ships of navigational hazards, weather hazards, weather forecasts, vessels in distress and other important information. There are a number of coastal stations around the world that transmit Navtex messages on 518 kHz. Each station transmits messages every 4 hours. The service range is 200-400 nautical miles for each station, depending on terrain and transmitter power.

The K-Bridge system's Navtex interface stores telegrams in an archive on its hard drive and allows you to read and manage telegrams on the screen.

Figure 54 Navigational warning received on Navtex and annotated in the chart



The following functions are available:

- Store telegrams as files in a directory.
- Read and delete new and old telegrams.
- Extract latitude/longitude positions in telegrams and see that area in the chart or generate Mariners' notes at the specified position.
- Generate an alarm when critical Navtex telegrams arrive.
- Filter out certain telegram types and Navtex stations.

Note

The Navtex interface provides a receive-only type of interface to the Navtex receiver. User interface settings on the K-Bridge MFD display, such as coast station filter settings, do not affect the Navtex receiver.

8.2 Viewing Navtex messages

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Select either the **Unread** or **Read** list using the option buttons

- The corresponding Navtex message list is displayed.

3 Select the message you want to view using the track-ball and **Left mouse** button.

4 Click **Display**.

8.3 Configuring the navigation area

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Click **Configure**.

3 Select the **Stations** tab (for more information, see *Navtex Stations tab* on page 529).

4 Select the area you are in from the drop-down list.

5 Select an overlapping area, if any, from the drop-down list.

8.4 Filtering Navtex stations

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Click **Configure**.

3 Select the **Stations** tab.

4 If it is not already selected, select the area you are in from the drop-down list, and select an overlapping area (if applicable).

5 Select the Navtex stations whose messages you want to ignore.

8.5 Filtering message categories

To avoid receiving unwanted messages:

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Click **Configure**.

3 Select the **Categories** tab. See section 20.7.7 on page 524 for more information on the Stations tab.

4 Select message types to be ignored.

Note

Messages of categories A, B, D and L can not be ignored.

8.6 Creating Mariners' notes from Navtex messages

If the message you want to create a Mariner's note from is already displayed go to Step 5, otherwise do the following:

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Select either the Unread or Read list using the option buttons.

The corresponding Navtex message list is displayed.

3 Select the message you want to view using the track-ball and **Left mouse** button.

4 Click **Display**.

- The message is displayed. The text message is scanned for positional information. When found, it is displayed as Latitude and Longitude at the bottom of the dialog.

5 Click **Go To**.

- The chart jumps to show the position specified in the Navtex message.

6 Click **Mark in Chart**.

- A Mariners note is created in the specified position. The telegram text is automatically inserted into the note. If the text is too long it is truncated.

7 When multiple latitude/longitude pairs are displayed in the Navtex message, each position can be used for the **Go To** or **Mark in Chart** functions, by selecting the line with the position information in the telegram text.

8.7 Printing out Navtex messages

1 Click the following sequence of buttons in the menu area: **Chart→Navtex Messages** (see *Navtex Message List* on page 524).

2 Select a message to send to the queue for printing.

To select more than one message:

a First select a single message.

Use the trackball to position the mouse marker over the message, then click the left mouse-button

b Select another message but this time hold down the **Shift** key on the keyboard when you click the left mouse-button.

This selects all messages in the list between – and including – the first and second selections.

3 Click **Print**.

4 Select a printer from the drop-down list.

5 Select the message or messages that you want to print from the list of items in the queue for printing.

6 Click **Print**.

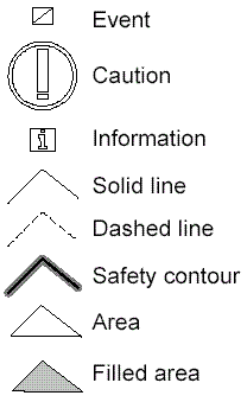
For more information about printing, see *Printer* on page 590.

9 Using mariners' notes

This section contains the following topics:

This chapter tells you how to use mariners' notes. These are items of graphical information that you can add to a chart or to the radar display and that have a fixed geographical position.

9.1 What are mariners' notes?



Mariners' notes are geographically fixed symbols, lines and areas that are used to complement charts or supplement radar information when charts are not used. Notes consists of lines, symbols and text. The different types of notes you can create are shown in the illustration to the left.

The Event note is automatically located at the own-ship's position at the time it was created. Pressing the MOB (man over board) button on the operator panel creates an Event note. For all other note types, the navigator specifies the location.

9.2 Turning mariners' notes on

To display notes in the radar area, perform the following:

1 Click the following sequence of button in the menu area: →**View** →**Main Radar Themes**.

2 Check the box for **Notes**.

9.3 Managing mariners' notes

1 From the main menu, select: **Chart→Manage Notes→List and Create Notes** (see section 20.7.5.1 on page 508).

- The **Nav Note List** menu is displayed.

2 Select **Type, Distance** or **Date** to sort the list by type of note, distance from own-ship's position, or date of creation/ modification.

3 Click the **List** button to display the full text and other information.

4 Click the **Edit** button to make changes to notes.

5 Click **Delete** to remove a note.

9.4 Creating point notes

A point note is a symbol placed at a specific position. There are three types of point notes: Event, Caution and Information notes. The Event note is automatically placed at the own-ship's position. Clicking the MOB (Man Over Board) button on the operator panel creates an event note.

1 Select: **Chart→Manage Notes→List and Create Notes**.

2 Click the **Info Note** button.

3 If the note position is specified using a local datum, select **Local** and specify the offset from WGS-84.

4 Type in the note text in the Comment field.

5 Specify the position by double clicking the latitude and longitude fields. Type in a new value or modify the existing value.

- Latitude and longitude formats are as follows:
  - **Lat:** 12 34.123 or -12 34.123
  - **Lon:** 123 45.123 or -123 45.123
- If the latitude is in the southern hemisphere or the longitude is westerly, use a "-" in front of the latitude or longitude.

6 As an alternative to typing in the latitude and longitude values use the track-ball and **Left mouse** button in the radar area to point to the position.

7 When the note is completely specified click **Apply**.

9.5 Creating line notes

Line notes are lines placed at fixed positions. There are three types of lines:

- Solid lines
- Dashed lines
- Safety Contour

1 Select: **Chart→Manage Notes→List and Create Notes**.

2 Click the **Solid Line, Dashed Line** or **Safety Contour** button.

3 If the note position is specified using a local datum, select **Local** and specify the offset from WGS-84.

4 Type in the note text in the Comment field.

5 Specify the position by double clicking the latitude and longitude fields. Type in a new value or modify the existing value.

- Latitude and longitude formats are as follows:
  - **Lat:** 12 34.123 or -12 34.123
  - **Lon:** 123 45.123 or -123 45.123
- If the latitude is in the southern hemisphere or the longitude is westerly, use a "-" in front of the latitude or longitude.

- Lines may be specified as either rhumb lines (RHL) or great circle (GC).

6 Click **Enter** on the keyboard to provide a new line for the next point. Continue entering points until the line is defined.

7 Click **Apply**.

8 As an alternative to typing in the latitude and longitude values use the track-ball and **Left mouse** button in the radar area to specify the position of the lines.

9.6 Creating area notes

Area notes are polygons placed at fixed positions. There are two types of areas:

- Areas
- Filled areas

1 Select: **Chart→Manage Notes→List and Create Notes**.

2 Click the **Area** or **Filled Area** button.

3 If the note position is specified using a local datum, select **Local** and specify the offset from WGS-84.

4 Type in the note text in the Comment field.

5 Specify the position by double clicking the latitude and longitude fields. Type in a new value or modify the existing value.

- Latitude and longitude formats are as follows:
  - **Lat:** 12 34.123 or -12 34.123
  - **Lon**: 123 45.123 or -123 45.123
- If the latitude is in the southern hemisphere or the longitude is westerly, use a "-" in front of the latitude or longitude.
- Lines may be specified as either rhumb lines (type in "RHL") or great circle (type in "GC").

6 Click **Enter** on the keyboard to provide a new line for the next point. Continue entering points until the area is defined.

7 Click **Apply**.

8 As an alternative to typing in the latitude and longitude values use the track-ball and **Left mouse** button in the radar area to specify the position of the corners in the area.

9.7 Modifying notes

1 Select: **Chart→Manage Notes→List and Create Notes**.

2 Select the note to be modified either in the list or in the radar area.

3 Click **Edit**.

4 The **NAV Note** menu will appear ready for editing.

5 To edit the latitude or longitude values, double click on the field using the track-ball and **Left mouse** button and modify the value.

- Use the Tab or Shift & Tab keys on the keyboard to move back and forth between the entry fields in the menu.

6 As an alternativ drag the symbol or any line end in the radar area using the track-ball and **Left mouse** button.

7 Modify the note text in the **Comment field**.

8 Click **Apply**.

9.8 Printing notes

1 Select: **Chart→Manage Notes→List and Create Notes**.

2 Select the note or notes to be printed.

To select more than one note to print:

a First select a single note.

Use the trackball to position the mouse marker over the note, then click the left mouse-button

b Select another note but this time hold down the **Shift** key on the keyboard when you click the left mouse-button.

This selects all notes in the list between – and including – the first and second selections.

3 Click **Print**.

4 Select a printer from the drop-down list.

5 Select the note or notes that you want to print from the list of items in the queue for printing.

6 Click **Print**.

For more information about printing, see *Printer* on page 590.

10 Using templates (ship-relative notes)

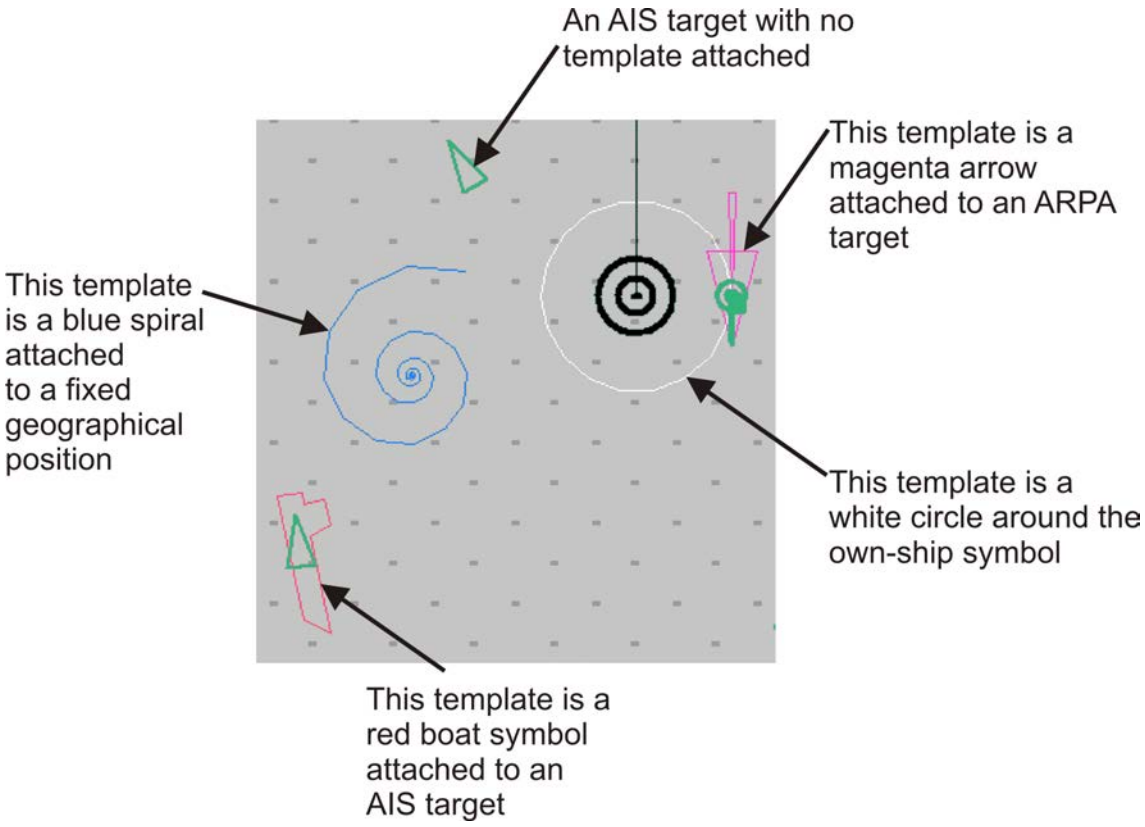
This section contains the following topics:

10.1 What are templates?

Templates (otherwise known as “ship-relative notes”) are graphical objects that you can design yourself and then attach to particular objects or locations on the radar display, for example, the own-ship, a target (radar or AIS), or a fixed geographical position. The template will then be displayed along with the object it is attached to on the chart or radar display.

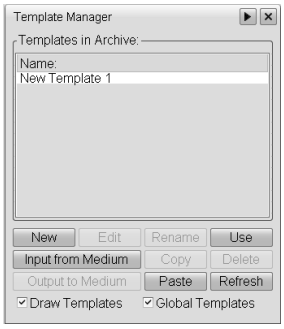
You can double-click a template to view information about it.

Figure 55 Some examples of templates attached to objects on a chart



10.2 Creating or editing a template

10.2.1 Selecting the template



1 Select **Chart→Manage Notes→Ship-relative Notes (Templates)**.

2 In the Template Manager dialog (see *Template Manager* on page 518), either:

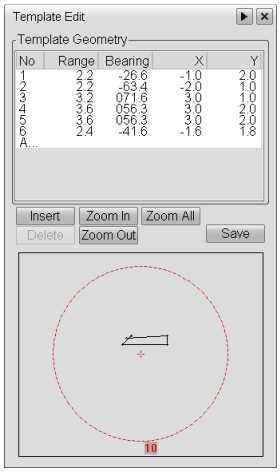
- Click **New** to create a new template.

  The name **New Template** will then be highlighted to indicate that it is edit-able. Specify the name you want to give the template you are creating, then, with that template selected, click **Edit**.

- Or select an existing template from the list and click **Edit**.

3 Follow the instructions below on defining the template (see *Defining the template* on page 227).

10.2.2 Defining the template



When you click the **Edit** button in the Template Manager dialog (see *Selecting the template* on page 227), the Template Edit dialog appears.

The Template Edit dialog enables you to draw the template you want to use.

1 Click **Insert** and put the cursor into the graphical window in the bottom half of the dialog; put it at the position that you want the first node to appear in your template design.

2 Click with the left mouse-button.

An unfilled black square appears at the position of the first node in the template's design.

3 Move the cursor to the position you want the next node to appear in and click again with the left mouse-button.

A line appears from the first node to the second.

4 Repeat the previous step until you have drawn all the lines that form the design of your template.

5 Click **End Insert**.

This stops the application from drawing a line to the point in the graphical window where you next click with the mouse button.

6 Select individual nodes either in the graphical window or in the node list in the top half of the dialog, and use the mouse to drag them into the exact positions you require.

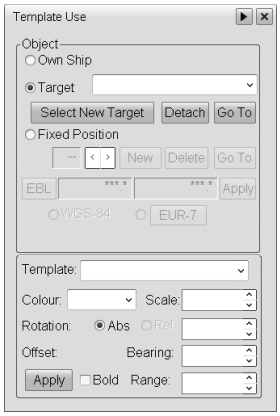
7 When you are ready, click **Save** to save the template design.

If you want to use the template you have drawn as a replacement for the own-ship symbol on the chart display, you must save the file with the name `$$OwnShip` and then check the **Use Template '$$OwnShip' as Outline** option in the Display tab of the Parameter Setup dialog (see *Display tab* on page 565). Skip the last step below.

8 Next attach the template to an object (see *Attaching the template to an object on the display* on page 228).

For more information about the Template Edit dialog, see *Template Edit* on page 520.

10.3 Attaching the template to an object on the display



When you click the **Use** button in the Template Edit dialog (see *Defining the template* on page 227), the Template Use dialog appears.

The Template Use dialog enables you to attach the template you have created to an object or fixed position on the chart or radar display.

1 In the Template Use dialog, specify whether the template is to be attached to the own-ship symbol, to a target, or to a fixed geographical position. If it is to be attached to a:

- Target, you must select the target by clicking **Select New Target** and then selecting the target in the chart or radar display with the cursor.
- Fixed geographical position, specify the precise co-ordinates. You can do this manually in the co-ordinate fields of the Template Use dialog or automatically by clicking the **EBL** button and moving the EBL to the position required.

2 Also in the Template Use dialog, specify the template's attributes (colour, size, orientation and position).

For more detailed information about using the Template Use dialog, see *Template Use* on page 522.

10.4 Copying templates

You can have all ECDIS, planning station, and radar systems on the bridge update each other automatically whenever new edits to their templates are saved. For information about how to do this, see *Treating templates as global* on page 229.

However, you can also copy templates from one vessel to another manually. For information about how to do this, see *Copying templates from one vessel to another* on page 229.

10.4.1 Treating templates as global

If you are editing templates on one workstation on the bridge, you can have your edits (each time you save them) automatically updated to all other ECDIS , planning station and radar systems on the same network.

To do this, enter a user password (see *Password* on page 593), then:

1 Select: **Chart→Manage Notes→Ship-relative Notes (Templates)**.

2 In the Template Manager dialog, select the **Global Templates** option.

3 Repeat the above steps for the other ECDIS, planning station and/or radar systems on the network (only those systems whose **Global Templates** option is selected will have their templates automatically updated).

10.4.2 Copying templates from one vessel to another

You might want to generate a template on one operator station and then copy it to an operator station on another vessel. One situation where this would be useful, for example, is if you were planning for a number of vessels to sail in formation. In this case, you could create templates on one workstation for each vessel in the proposed formation so that the navigator on each vessel involved would be able to see, on the chart or radar display, both:

- Where his or her own-ship needed to be in the formation,
- And how well the other vessels in the formation (which would appear on the chart or radar display as radar targets) were keeping to the formation as indicated by the template drawn on the chart or radar display for each vessel.

When you have created a template or a series of templates that you want to pass to another vessel, do the following:

1 Insert an external medium such as a USB memory stick into the operator station.

2 From the main menu, select **Chart→Manage Notes→Ship-relative Notes (Templates)**.

3 In the Template Manager dialog, select the templates you want to copy.

4 With the required templates selected, click **Output to floppy** and when prompted specify the target disk or drive.

5 When the template files have been copied, take the external medium (for example, the USB memory stick) to an ECDIS or radar system on the vessel that requires the templates.

6 Insert the external medium.

7 From the main menu on the receiving system, select **Chart→Manage Notes→Ship-relative Notes (Templates)**.

8 In the Template Manager dialog, click **Input from medium** and when prompted specify the source disk or drive.

11 Working with routes

This section contains the following topics:

For information about

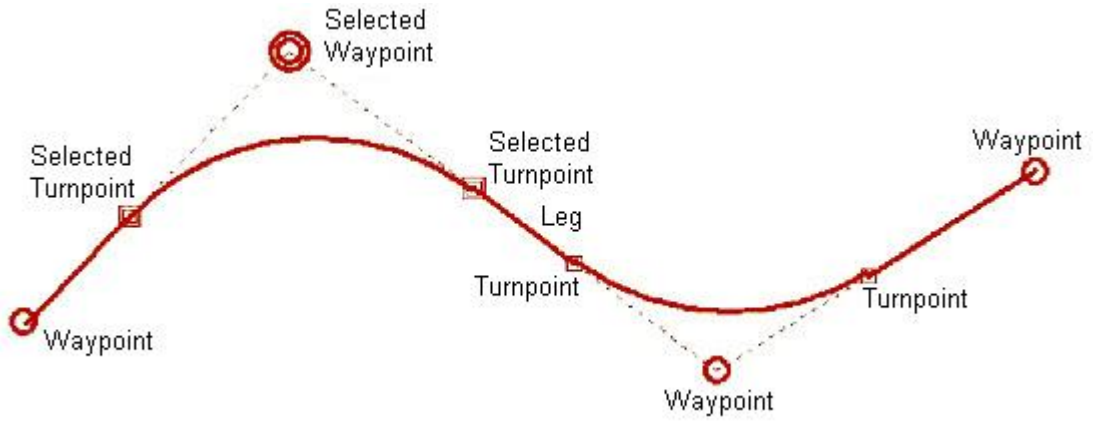
- Using routes to perform automated track steering, see *Using the K-Bridge Autopilot* on page 247.
- Generating routes automatically and using the tide prediction facilities, see *Generating routes, predicting tides, avoiding pirates* on page 767.

11.1 What is a route?

A route is a sequence of waypoints defining a geographical passage. A chart must be presented when you are working with routes. Therefore, although route functionality is available in both the Radar and ECDIS applications, it is normally best to work with routes in the ECDIS application. ECDIS is designed specifically for the purpose, and for example the dialogs you need to use are larger (they are not restricted by the need to avoid obscuring the radar display).

Each route must be assigned a unique name. Each waypoint in a route represents a change of course that takes place in a fixed-radius turn. The beginning and end points of the turn are called turnpoints. The straight line between two turnpoints is called a leg.

Figure 56 Route with waypoints, turnpoints and leg



A set of parameters are used to specify each waypoint and the following leg. The parameters are:

- **W:** Waypoint number.
- **Name:** Waypoint name (manually entered).
- **Lat:** Latitude (manually entered).
- **Lon:** Longitude (manually entered).
- **COG:** Course Over Ground.
- **Dist:** Length of leg.
- **Leg:** Rhumbline (RL) or Great Circle (GC) (manually entered).
- **TDist:** Distance from the start of route to a waypoint.
- **RDist:** Distance from a waypoint to the end of a route.
- **Spd:** Speed (manually entered).
- **ETA:** Estimated Time of Arrival at the waypoint.
- **Rtime:** Remaining Time, estimated time to reach the end of the route.
- **Wait:** Delay at waypoint (manually entered).
- **Radius:** Turn Radius (manually entered).

- **Offtrack:** Off track limit (manually entered).
- **Max:** Maximum speed (manually entered).
- **Message:** Message associated with waypoint (manually entered).

11.2 Creating routes

There are two ways of creating routes: using the waypoint list or graphically, using the display area. This section describes both.

11.2.1 Creating a route using the waypoint list

1 Select **Route→Manage Routes**.

2 Click the **New** button.

- If the radar area covers the area for the new route, the new route will be displayed as it is built.

  See section 20.4.2 on page 420 for more information.

3 If the route is specified using a local datum, select **Local** and specify the offset from WGS-84 (normally found in the chart).

4 In the menu select **Entry**.

- All the fields that can be changed are displayed in the menu (use the horizontal scroll bar). The difference between **Entry** and **Full** is that **Full** displays additional items in the waypoints list.

5 Click **Insert**.

- The first waypoint now appears with default values. These values are specified in **Parameter Setup** dialog (see *Parameter setup* on page 565).

6 Enter the values for the waypoint by double clicking each required field using the track-ball and **Left mouse** button.

- Type in a new value using the keyboard or modify the existing value.
- Latitude and longitude formats are as follows:
  - **Lat:** 12 34.123N or 12 34.123S
  - **Lon:** 123 45.123E or 123 45.123W
- Use the **Tab** or **Shift** + **Tab** on the keyboard to move back and forth between the entry fields in the menu.

7 When the waypoint is completely specified, click **Enter** on the keyboard.

- The next waypoint will appear in the list as a copy of the last waypoint.

8 Make the necessary modifications as described above.

9 When all waypoints have been specified, click **End Insert**.

10 Type a **Route Name** and click **Save**.

11.2.2 Creating a route in the display area

To specify waypoints in the radar area the radar display must cover the area for the route.

1 Select **Route→Manage Routes**.

2 Click the **New** button.

3 Click **Insert**.

4 Move the cursor into the radar area.

- The cursor changes shape to a cross.

5 Click **Left mouse** button when the cursor is in the position for the new waypoint.

- The position of the waypoint is specified.

6 Click **Left mouse** button when the cursor is in the position for the next waypoint.

- Create all waypoints in the route in this manner.

7 Click **End Insert**.

8 Type a **Route name** and click **Save**.

Note

All other parameters for the waypoint have default values. If you need to change these use the procedure above, under "How to create waypoints using the waypoint list".

11.3 Modifying routes

1 Select **Route→Manage Routes**.

2 Select the route you want to modify using the track-ball and **Left mouse** button.

3 Click **Edit WP**.

4 Select the waypoint field you want to modify by double-click the field using the track-ball and **Left mouse** button.

5 Insert your changes.

6 When the modification is carried out, select a new field until all modifications have been carried out.

7 Click **End Insert**.

11.4 Inserting waypoints

1 Select **Route→Manage Routes**.

2 Select the route you want to modify using the track-ball and **Left mouse** button.

3 Click **Edit WP**.

4 Select the waypoint after the one you want to insert.

5 Click the **Insert** button, and modify the parameters as appropriate.

6 Click the **Enter** button.

7 The new waypoint appears in the table.

8 Modify the waypoint parameters as required.

9 If more waypoints are to be inserted click **Enter** on the keyboard. Continue this procedure until all new waypoints have been specified.

10 Click **End Insert**.

11.5 Adding waypoints at the end of the route

1 Select **Route→Manage Routes**.

2 To add waypoints at the end off the route select the line after the last waypoint.

3 Click the **Insert** button and define the new waypoint(s) as described under inserting waypoints.

4 Click **End Insert**.

11.6 Modifying routes in the display area

1 Select **Route→Manage Routes**.

2 Select the route you want to modify using the track-ball and **Left mouse** button.

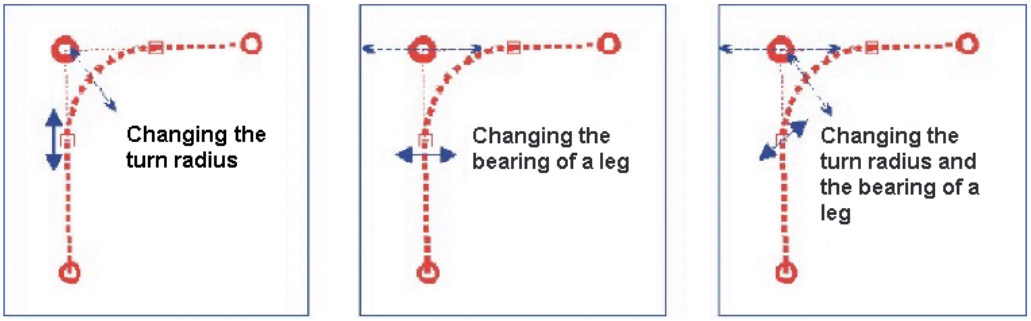
- The location of waypoints and turnpoints can be modified directly in the display.

3 To modify the position of a waypoint or turnpoint select it using the track-ball and **Left mouse** button.

4 Drag it to the new location.

- The effect of moving a turnpoint is shown in the illustration below.

Figure 57 Effects of moving waypoints



5 To insert a new waypoint select the waypoint after the one you want to insert. Click the **Insert** button in the menu, and point the cursor to where you want the new waypoint.

6 Click **End Insert**.

7 To add waypoints after last one, in the menu select the line after the last waypoint.

8 Click the **Insert** button, and add one or more waypoints by pointing and clicking in the radar area.

9 Click **End Insert**.

11.7 Copying waypoints

Waypoints existing in one route may be copied to a new route, see the illustrations below. The new route uses waypoints (marked with squares) defined in an existing route. This is done by copying the waypoints into the new route.

1 Select **Route→Manage Routes**.

2 Select the route you want to modify using the track-ball and **Left mouse** button.

3 In the **Route List** dialog (see *Route List* on page 416), select the same route.

4 Click the **List WP** button to display a list of the route's waypoints (see *Edit route* on page 420).

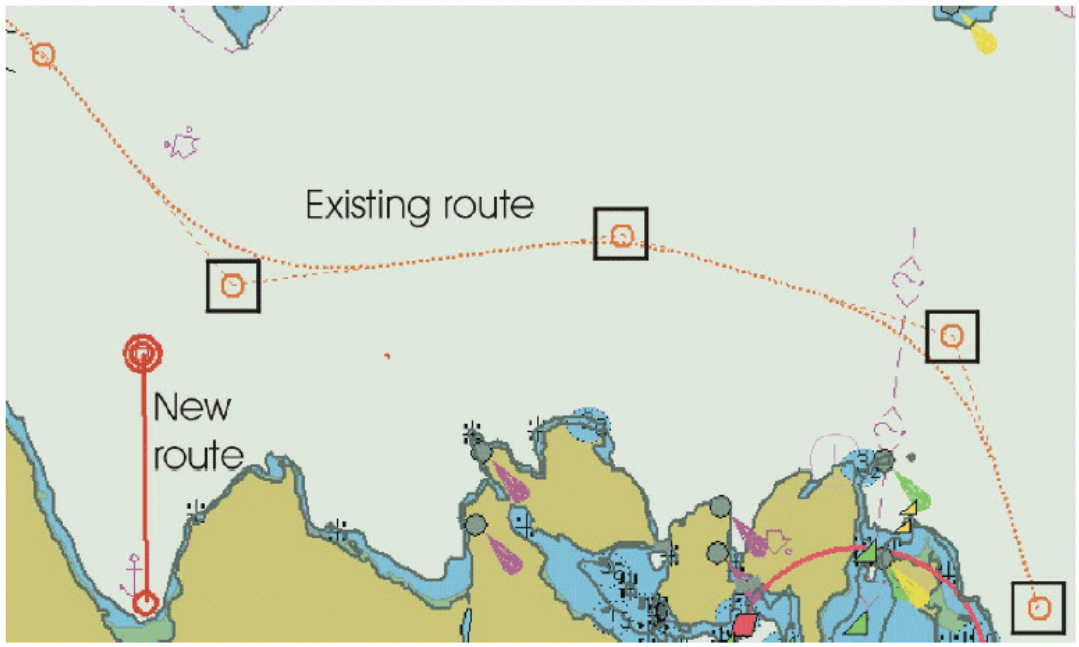
5 Select the waypoints to be copied (do this by highlighting the first waypoint and dragging the cursor down the list to highlight the other waypoints you require).

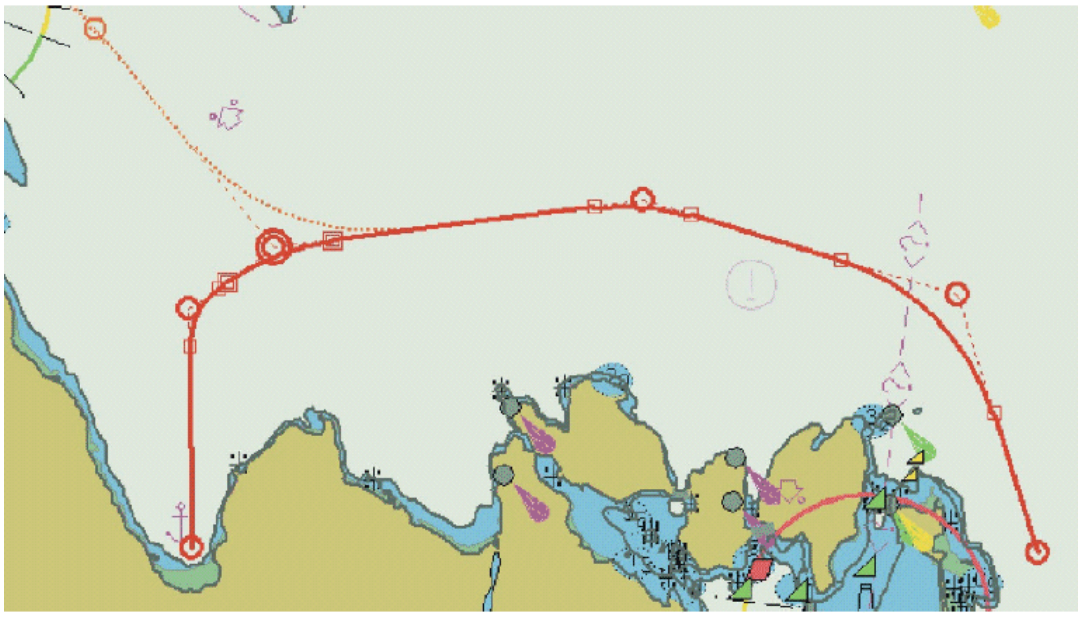
6 Click **Copy**.

- Use the **Mark** button to select several waypoints if the list needs to be scrolled between the first and last waypoint in the selection.

7 In the **Route List** dialog, select the new route, and click **Edit WP**.

- The waypoint list for the new route is displayed (see *Edit route* on page 420).





8 In the waypoint list select the point where you want the waypoints to be inserted, and then click the **Paste** button.

11.8 Monitoring routes

The system includes functionality to monitor the position of the ship against the planned route. Do the following:

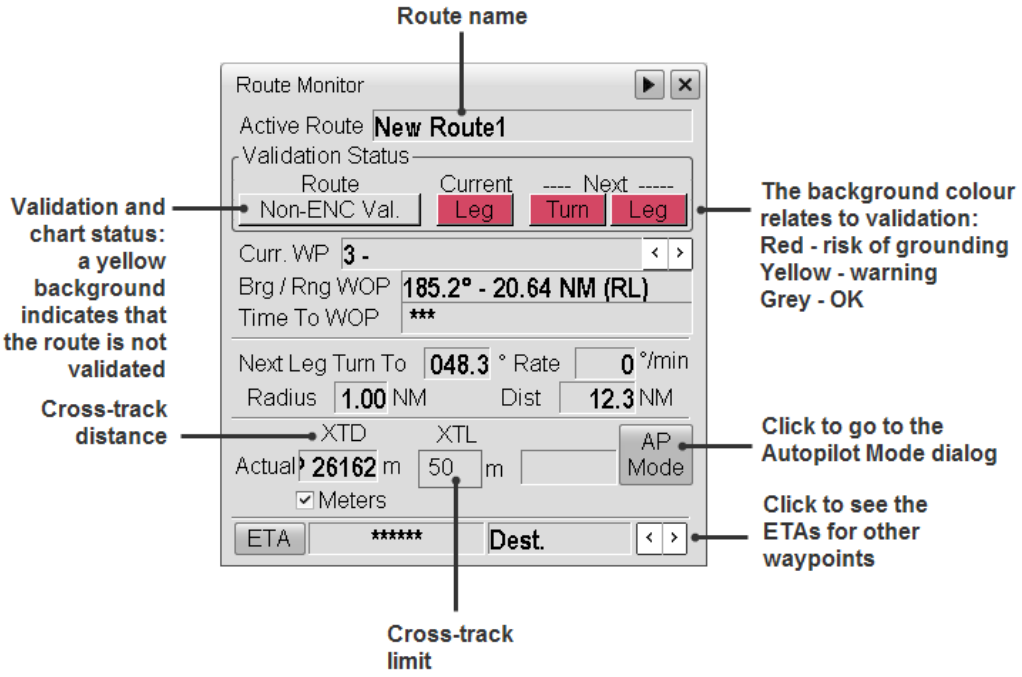
1 Select **Route→Manage Routes**.

2 Select the route to be monitored.

3 Click **Monitor**.

4 Select **Route→Monitor Route**.

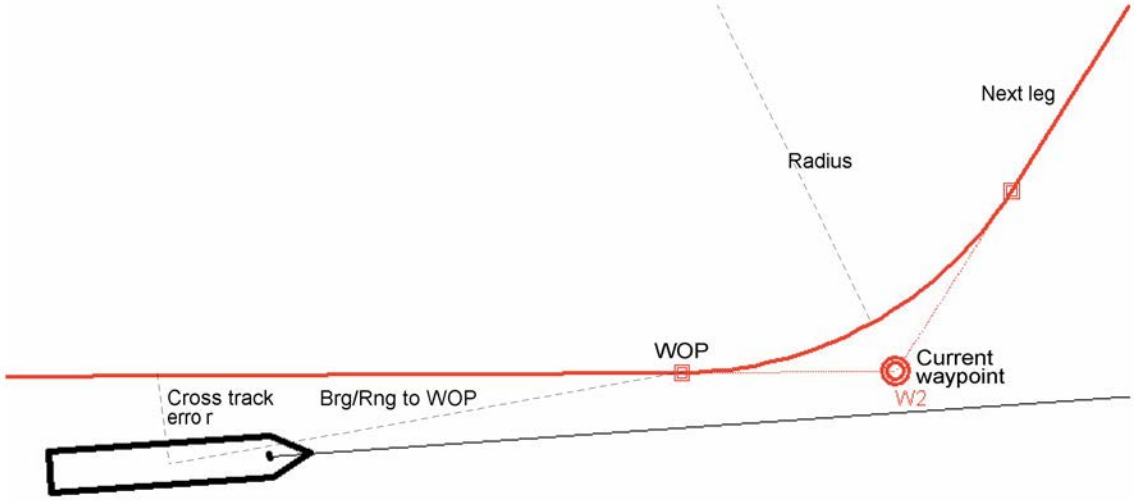
- The dialog provides information about the up-coming portion of the route (see *Route Monitor* on page 425).



- The information it contains includes:
  - The name of the route
  - The waypoint you are currently sailing towards
  - The bearing and range to the next wheel-over point (WOP)
  - The time to the next WOP at the current speed
  - The course of the next leg
  - The turn radius for the next turn
  - The distance to the start of the next turn
  - The current cross-track distance (if any) and the cross-track distance limit

5 Click **AP Mode** in the Route Monitor dialog when you want to go to the **Autopilot Mode** dialog (see *Autopilot Mode* on page 427).

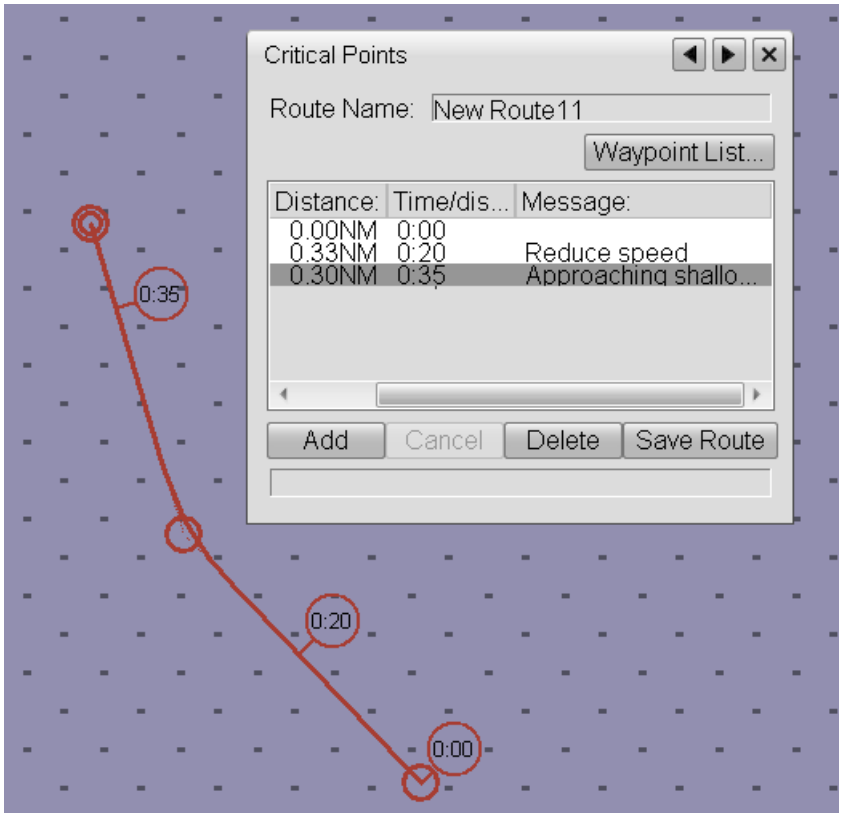
For full information about using the autopilot, refer to the *K-Bridge Autopilot Operator Manual* (for the document number, see *References* on page 45 at the front of this manual).



11.9 Inserting critical points into a route

Critical points are operator defined messages placed along the route. When reaching (or at a set time before reaching) a critical point, the system gives an alarm. Critical points can be defined in two ways; directly on the chart or through the menu system.

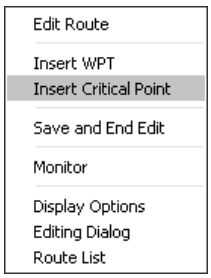
Figure 58 An illustration of critical points and the critical points menu

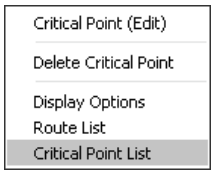


Note

Reaching a critical point means passing abeam of it.

11.9.1 Creating a critical point in the chart





1. The route must be displayed but not monitored in the chart area.
2. Select **Own Ship→Ship Parameters**.
3. Select the **Route** tab.
4. Make sure that **Critical Points** is selected both in the **Edited** and **Active** column of the dialog (see *Route (tab)* on page 570).
5. On the chart, point the marker to the place on the route that you want to insert the critical point and click the right track-ball button.
   - An object menu (as shown on the left side) is displayed next to the marker.
6. Select **Insert Critical Point**.
   - The critical point is created.
7. Use the marker and the **Left mouse** button to drag the symbol to the exact position you require.
   - A message text can be tied to each critical point.
   - If required an alarm can also be given at a set time before the critical point is reached.
8. On the chart, point the marker to the critical point and click the right track-ball button.
   - An object menu (as shown on the left side) is displayed next to the marker.
9. Select **Critical Point List**.
   - The **Critical Point** dialog is displayed (see the figure above).
10. Insert message text and time setting by double clicking the appropriate field in the dialog's table of critical points.
11. Click **Save Route**.

11.9.2 Creating a critical point using the menu

1. Click the following sequence of softkeys in the menu area: **Route→Manage Routes**.
2. Select the route you want to insert critical points for using the track-ball and **Left mouse** button.
3. Click the **List WP** button.
4. In the **Waypoint List** menu click the **Critical Points** button (see *Edit route* on page 420).

5 Click **Add**.

6 Type in the waypoint number, distance (to the waypoint), time (the alarm can also be given at a set time before reaching the critical point) and a message.

7 Click **Apply**.

8 Add critical point messages to all waypoint that require them in this way.

9 When completed click **Save Route**.

11.10 Importing and exporting route information

This section tells you how to import route information from another navigation console or Planning Station system and how to export route information to another navigation console or Planning Station system.

You can use a straightforward file copy process to transfer the route data between systems.

Alternatively, you can use the Exchange Protocol. In this case, the copy process is a client-server transfer. Two computer systems are involved: one acts as the client (either passively receiving route data from the server or passively allowing route data to be copied from it by the server) and the other acts as the server (actively transmitting route data to the client or actively copying it from the client). For a description of the implementation of this process, see *The implementation of the RRXP exchange process* on page 243.

Whichever of these processes you use, before you start the copy process, you need to specify the import (source) and export (target) directories in the Configure Route Export dialog box (see *Configure Route Export* on page 661). If you are using the Exchange Protocol process, you can also use this dialog box both to specify that you are using the Exchange Protocol and to make the system act as the client for the transfer (one of the systems has to be the client).

Note

Make sure that the two systems you want to transfer route files between are on the Local Area Network and that they each have the read and/or write access they require to the two directories involved:

- *A K-Bridge MFD system that is performing a route export in the role of server needs read-write access to the export (target) directory.*
- *A K-Bridge MFD system that is performing a route import in the role of server needs read access to the import (source) directory.*
- *The external client system must have read-write access to the import (source) directory.*
- *The external client system must have read access to the export (target) directory.*

11.10.1 Exporting

To export routes do the following:

1. On the console you are exporting from, make sure the system is configured to perform the export operation (see *Configure Route Export* on page 661).

   If you intend to use the Exchange Protocol for the transfer, specify this in the dialog and specify also whether the system is acting as the client or not.

2. Select: **Route→Manage Routes→Export** (see *Route Export* on page 419).

3. Select the routes you want to export.

   If no routes appear in the list, make sure you have specified the export directory correctly in the Configure Route Export dialog box (see *Configure Route Export* on page 661).

4. Click **Backup**.

11.10.2 Importing

To import routes do the following:

1. On the console you are importing to, make sure the system is configured to perform the import operation (see *Configure Route Export* on page 661).

   If you intend to use the Exchange Protocol for the transfer, specify this in the dialog and specify also whether the system is acting as the client or not.

2. Select: **Route→Manage Routes→Import** (see *Route Import* on page 418).

3. Select the routes you want to import.

4. Click **Restore**.

11.10.3 The implementation of the RRXP exchange process

This section describes how the RRXP process for transferring route plans between systems needs to be implemented.

Two sub-directories are used for the transfer of route plans:

- From an external “client” computer (or program on a PL-10 station) to the K-Bridge system (Import directory),
- Or from the K-Bridge system to an external client computer (Export directory).

The actual locations of the Import directory and the Export directory are defined through the K-Bridge configuration interface (see *Configure Route Export* on page 661) and stored in registry variables.

If you are transferring to and/or from an external computer, the two computers involved must both have network connections. The K-Bridge computer (program) must have read/write-access to the Export directory and read access to the Import directory. The client must have read/write access to the Import directory and read access to the write directory.

The process by which files are imported to the K-Bridge computer

On start-up the client clears all files in the Import directory.

1 The client writes route files to the Import directory with a ".rux" suffix.

It then writes a file named "ImportReady.txt" to the Import directory (the file will be empty or have only minimal content).

2 The K-Bridge computer checks for the existence of a file named "ImportReady.txt" in the Import directory on a regular basis (approximately every 10 seconds).

When it detects this file, it reads all files in the Import directory that have a ".rux" suffix.

3 When it has read all the ".rux" files in the Import directory, it writes a file named "ImportResult.txt" to the Export directory.

This file will be empty (but containing one space character) if the import is OK, or it will contain an error text if there were import errors.

4 When the client computer sees the "ImportResult.txt" file, it checks its contents.

If the file is non-empty, the client computer deletes all the files in the Import directory.

5 The K-Bridge computer detects that the "ImportReady.txt" file has been removed and it deletes the "ImportResult.txt" file from the Export directory.

Note

The client computer must not write any more files to the Import directory before the K-Bridge computer has deleted the "ImportResult.txt" file from the Export directory.

The process by which files are exported from the K-Bridge computer

1 The K-Bridge computer writes route files with a ".rux" suffix to the Export directory.

It then writes a file named "ExportReady.txt" to the Export directory (the file will be empty or have only minimal content).

2 The client computer checks for the existence of a file named "ExportReady.txt" in the Export directory on a regular basis (approximately every 10 seconds).

When the client computer detects this file, it reads all files in the Export directory that have a ".rux" suffix.

3 When the client computer has read all the ".rux" files in the Export directory, it writes a file named "ExportResult.txt" to the Import directory.

This file will be empty (but containing one space character) if the export is OK, or it will contain an error text if there were export errors.

4 When the K-Bridge computer sees the "ExportResult.txt" file, it checks its contents.

If the file is non-empty, the K-Bridge computer deletes all the files in the Export directory.

5 The client computer detects that the "ExportReady.txt" file has been removed and it deletes the "ExportResult.txt" file from the Import directory.

Note

The K-Bridge computer must not write any more files to the Export directory before the client computer has deleted the "ExportResult.txt" file from the Export directory.

12 Using the K-Bridge Autopilot

This section contains the following topics:

12.1 Introduction

This chapter tells you how to perform automated track steering, how to make the autopilot steer the vessel using a particular heading or course, and how to make it steer the vessel towards a particular waypoint.

However, the parts of the MFD user interface that concern the K-Bridge Autopilot are described fully in a separate manual and you must therefore read that manual (see the *K-Bridge Autopilot Operator Manual*, part number 372906) in conjunction with this chapter.

12.2 The autopilot's operating modes

When the MFD unit is interfaced to a K-Bridge Autopilot, routes created in the system can be used to steer the ship. The MFD unit sends the course, the turn radius for the next turn, the new course (after the turn), the off-track distance etc. to the autopilot, and the autopilot adjusts the steering accordingly. The K-Bridge Autopilot can be controlled from the MFD unit in four modes:

- **Heading mode:** The heading set-point for the ship is used as the course to steer. No route required.
- **Course mode:** The course set-point and the calculated drift are used to calculate the heading to steer. No route required.
- **Waypoint mode:** The route and the calculated drift are used to calculate the heading to steer. The system compensates for cross track distance in order to reach the waypoint. Waypoint mode is selected for one waypoint at a time. When the ship is close to the waypoint, the mode is changed to Course mode to avoid major course changes close to the Waypoint. Turns must be started manually.
- **Track mode:** The MFD unit steers the ship according to the programmed route with a minimum of cross-track distance (XTD), a minimum of course alteration, and optimum rudder usage. In this mode turns are executed automatically.

Figure 59 Waypoint mode compensates for drift

The following abbreviations are used:

TP - Turn Point

T.Rad - Turn Radius

WP - Waypoint

WOP - Wheel Over Point. Where the turn is started to reach the next waypoint

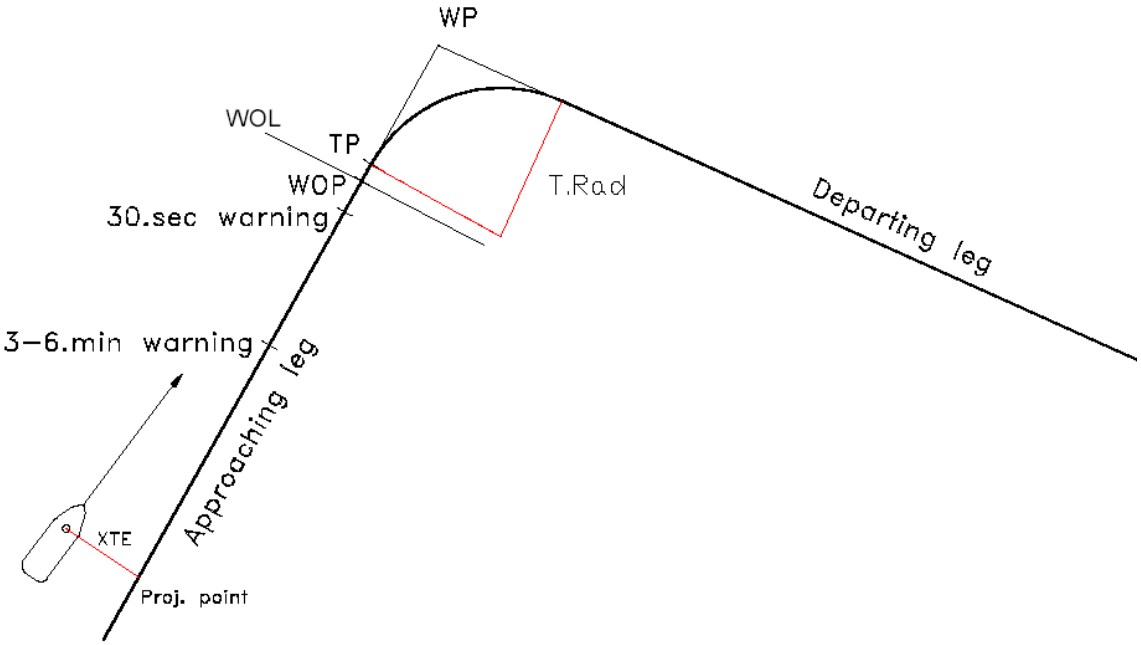
WOL - Wheel Over Line. Line through the WOP parallel to the departing leg

XTD - Cross Track Distance. The shortest distance between the own-ship and the intended route

Auto - Autopilot

Man - Manual

Stb Auto - Standby Autopilot



12.3 Adapting the autopilot to different conditions

For information about how to adapt the autopilot to various weather, speed and vessel-load conditions, refer to the *K-Bridge Autopilot Operator Manual*.

12.4 Making one console take command of the autopilot by default

One operator station must take control of the autopilot whenever the vessel's steering system switches from manual control to autopilot steering.

To make a particular radar operator station do this, perform the following steps:

1 At the chosen radar console, select **System→Passwords**.

2 Type the service password.

3 Select **System→AP Configuration** (see *Autopilot Configuration* on page 658).

4 Check the box labelled **AP In Command enabled**.

   This allows the autopilot to receive steering commands from this console.

5 Check the boxes labelled **Default In Command (Global)**, **Route Monitoring enabled**, and **Route Monitoring enabled**.

   This operator station is now the one that is in command of the autopilot by default whenever the own-ship's steering system switches from manual control to Autopilot.

   It controls the Autopilot in Heading mode until you select another operating mode.

   You can subsequently give command of the autopilot to another operator station either by:

   - Pressing the **IN CMD** button on the operator panel (see *The ALC (alarm and control) NAV panel* on page 36) belonging to the new operator station,
   - Or by selecting **In Command** in the Autopilot Mode dialog (see section 20.4.6 on page 427) on the new operator station.

Note

If you have a dedicated autopilot operator panel installed (in other words, an operator panel that is separate from any navigator operator station consoles), then the dedicated operator panel automatically takes command by default whenever the vessel's steering gear is put into autopilot mode from manual control.

12.5 Giving the autopilot control of the vessel's steering system

This section tells you how to give control of the vessel's steering system to the autopilot.

1 Put the vessel's steering system into autopilot steering mode.

   The autopilot will immediately take control of the vessel's steering gear in heading mode.

   When you first give the autopilot control of the steering gear it steers the vessel in heading mode, using the current heading as the heading set-point.

   At the same time the autopilot activates the relevant panel controls (and lights the **IN CMD** button; see *The IN CMD button* on page 37) on the Nav OS that is in command of it.

2 Use the heading wheel on the Nav OS's operator panel to control the vessel through the autopilot.

Note

If the Nav OS that has command by default is not operational, the autopilot will still take control of the steering gear; it will maintain the current heading but it will also generate a system alarm after 30 seconds to indicate that no Nav OS is in command. In this situation, you must take command of the autopilot at another Nav OS or return the vessel to manual steering control.

The autopilot can only be controlled from one Nav OS at a time. In other words, it can only be controlled from the Nav OS whose **IN CMD** lamp is lit. For information about transferring command to another Nav OS, see *Taking command of the autopilot at a new Nav OS* on page 251.

12.6 Taking command of the autopilot at a new Nav OS

To transfer command of the autopilot, do the following:

- Press the **IN CMD** button (see *The IN CMD button* on page 37) on the Nav OS at which you want to take command.

When you transfer control of the autopilot from one Nav OS to another (by pressing the **IN CMD** button at the new Nav OS), the autopilot continues operating in the steering mode it was in before you pressed the **IN CMD** button. Therefore, for example, there is no interruption of track steering when you transfer command of the autopilot between operator stations.

12.7 Operating the autopilot in track-steering mode

This section tells you how to put the autopilot into track-steering mode.

Before you follow the instructions in this section, make sure that one MFD (or dedicated radar or ECDIS) console on the bridge is configured to take control of the autopilot whenever the vessel's steering system switches from manual control to autopilot steering (see *Making one console take command of the autopilot by default* on page 249).

This section contains the following sub-sections:

12.7.1 Requirements for automated track keeping

The following requirements must be met for track steering to be possible:

- Position, gyro and speed log input must be present and available to the autopilot.
- A sailing route is displayed and being monitored. Both **AP in command enabled** and **Route Monitoring enabled** must be checked in the **AP Configuration** menu (see *Autopilot Configuration* on page 658).
- One console must be in command of the autopilot.
- The ship must be on a straight leg.
- The distance from the ship to the leg must be less than 1 NM (5 NM in WP mode).
- The difference between the heading of the ship and the direction of the leg must be less than 30º.
- The ship must be currently on a leg and the remaining part of that leg (before the next wheel-over-point) must be more than 500 meters.
- The pre-planned track must have been checked for its safety and for its observance of geometric and ship-dependent limits. (The system parameters on the **Ship tab** and **Route tab** must be set to safe and correct values; see *Ship (tab)* on page 571 and *Route (tab)* on page 570.)
- The difference between the heading of the ship and the bearing to the turn point must be less than 15º.
- Communication between the autopilot and the ECDIS must be established and working.
- A K-Bridge Conning display must be operative.

12.7.2 Selecting track mode

To use the autopilot to steer the ship in track mode:

1 On the navigator operator station that is in command of the autopilot, select **Route→Manage Routes**.

2 Select an existing route by using the track-ball and the **Left mouse** button.

For information on how to create routes, see *Creating routes* on page 233 and *Route List* on page 416.

3 In the Route List dialog, click the **Monitor** button.

The route is displayed on the screen and appears in the route list as active.

Note

Active routes cannot be modified as long as they remain active.

4 Make sure that the own-ship is currently at a position between two waypoints in the selected route, that it is actually on or almost on the selected route, and that its current heading is close to the course that the route takes between the two waypoints.

5 Verify that the next waypoint is the active waypoint.

The active waypoint is indicated by a pulsating ring in the display. It can also be verified in the **Route Monitor** dialog (see *Route Monitor* on page 425).

6 Switch the vessel's main steering control system from manual operation to autopilot.

- The console's **Autopilot Mode** dialog indicates **AP-Mode = Heading**.

  For more information see*Autopilot Mode* on page 427.

7 Select **Track** in the **Autopilot Mode** dialog.

After a few seconds the **Autopilot Mode** dialog indicates **AP-Mode = Track**, and course/heading and cross-track distance are monitored.

Track-steering is in operation.

12.7.3 Track steering using the curved EBL tool

1 Specify a planned turn using the curved EBL.

See *Specifying planned turns (planning mode)* on page 308 for information on how to set up a curved EBL on the main radar display area.

2 When you have specified a turn, click **Activate** in the **Curved EBL** dialog, or click the **ACT Turn** button on the console's operator panel (see *The ALC (alarm and control) NAV panel* on page 36).

3 Put the vessel's main steering system into **Autopilot** mode.

- The **Autopilot Mode** dialog on K-Bridge Radar indicates **AP-Mode = Heading** (see *Autopilot Mode* on page 427).

4 If you do not have the Autopilot Mode menu visible on the screen, in the K-Bridge Radar application click **Menu →Routes →Autopilot Mode**.

See *Autopilot Mode* on page 427 for more information.

5 On the K-Bridge Radar console panel, press the **In Cmnd** button.

- The K-Bridge Radar **Autopilot Mode** menu indicates **AP-Mode = Heading**.

6 Select **Track** in the K-Bridge Radar **Autopilot Mode** menu.

- After a few seconds the **Autopilot Mode** menu indicates **AP-Mode = Track**, and course/heading and cross track distance are monitored for the turn you have used the curved EBL to specify.
- Track-steering is in operation.

12.7.4 Stopping track steering manually

There are several ways to stop track-steering:

- By selecting **WP, CRS** or **HDG** mode in the **Autopilot Mode** menu (see *Autopilot Mode* on page 427).
- By switching the vessel's main steering system to manual control.

- By pressing the **IN CMD** button on the console's operator panel or Top Bar.

12.7.5 Stopping track steering automatically

The following conditions automatically switch the system from automatic track steering to a different steering mode:

- **Sensor failure:** A faulty sensor or a sensor monitoring alarm (indicating that the difference between the main and secondary sensor is greater than a pre-set limit).
- **ECDIS failure:** The K-Bridge ECDIS monitors the track and is needed for track steering.
- **Conning display failure:** Track steering is not allowed without a conning display available.
- **Communication error:** Communication error between the K-Bridge Radar and the autopilot.
- **Extreme changes:** Extreme changes in cross-track distance, heading or position. These can be caused by sensor failure.
- **Last waypoint:** When the vessel reaches the last waypoint in the route, the system will automatically come out of track steering mode and will continue in heading mode using the last heading from the just completed route.

12.7.6 Waypoint alarms

Two to five minutes before reaching the wheel-over line for the next waypoint, a pre-alert message is issued.

1 Acknowledge it.

- 30 to 60 seconds before reaching the wheel-over line for the next waypoint, a warning is issued.

2 Acknowledge it.

Note

The planned turn will be carried out in track mode if the warnings are left unacknowledged. To cancel the turn, you must exit track mode.

Note

For information about changing the settings for the waypoint alarms, see Autopilot Configuration on page 658).

12.7.7 Other track steering alarms

The following warnings related to the automatic track keeping are given:

- XTD-limit is exceeded.
- Time to Wheel Over Position (WOP) = 3 min (AP Turn Prewarn).
- Time to Wheel Over Position (WOP) = 30 sec (AP Turn Warn).

- Control of steering is taken by the K-Bridge Autopilot or by manual override.
- Communication failure between the K-Bridge Autopilot and the K-Bridge Radar.
- Power failure (signal from UPS).
- Time to last waypoint = 3 min.
- The last waypoint in route is reached (end of track).
- Loss of position data from Navigation Receiver.
- Loss of Gyro input.
- Loss of Speed Log input.
- Loss of communication with K-Bridge ECDIS.
- Loss of communication with Conning display.

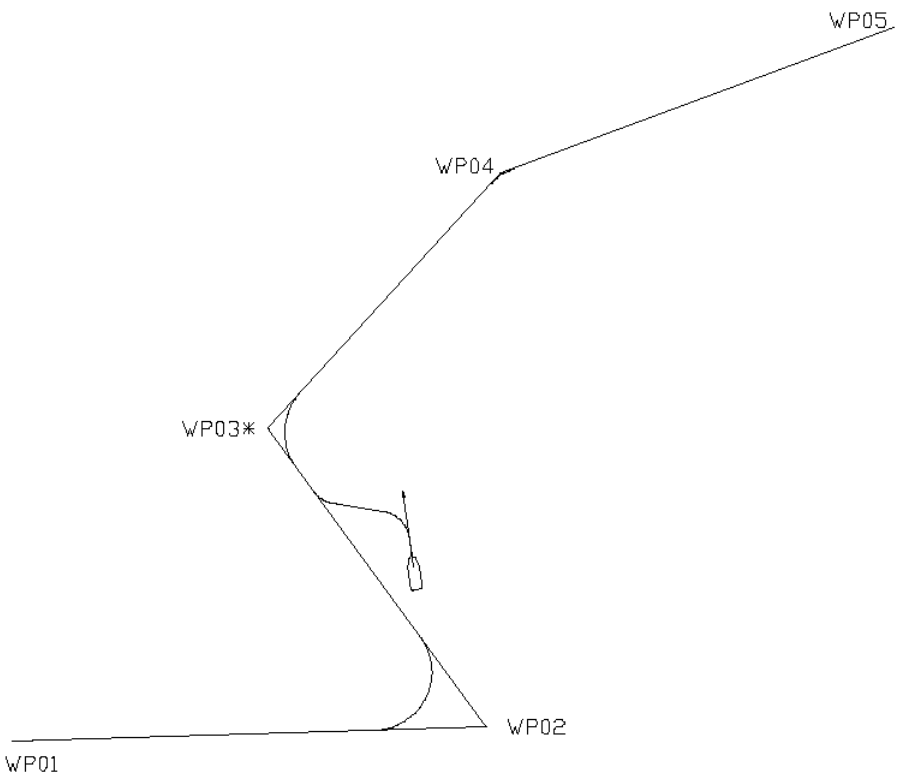
12.7.8 Accuracy and performance constraints

The effectiveness of the automated track-keeping function depends on the accuracy of the vessel's position, heading and speed sensors. For information about troubleshooting when track steering is poor, refer to the *K-Bridge Autopilot Operator Manual* (part number: 372906).

12.7.9 Practical hints

Before initiating track steering we recommend you steer manually (or using the autopilot) until the ship is approximately on a straight leg with its heading towards a selected waypoint on the track. This reduces the likelihood of sudden unexpected manoeuvres when you initiate track steering.

The illustration below provides an example: the ship steers towards waypoint 03 by making two turns and following a short straight leg between the turns. It initiates track steering after the second turn on the straight leg just before waypoint 03.



Note

The operator can change between WP mode and Track mode. In the above illustration it is also possible to select WP04 as the "approach waypoint", keeping the autopilot in WP mode until WP04 is reached and then changing to Track mode.

12.8 Operating the autopilot in other modes

This section tells you how to put the autopilot into heading, course or waypoint mode.

Before you follow the instructions in this section, make sure that one MFD (or dedicated radar or ECDIS) console on the bridge is configured to take control of the autopilot whenever the vessel's steering system switches from manual control to autopilot steering (see *Making one console take command of the autopilot by default* on page 249).

12.8.1 Selecting heading mode

Perform the following to steer the ship in heading mode using the autopilot:

1 Switch the vessel's main steering control system from manual operation to autopilot.

2 On the navigator operator station that is in command of the autopilot, select **Route→Autopilot Mode**.

- The **Autopilot Mode** dialog (see *Autopilot Mode* on page 427) indicates **AP-Mode = Heading**.

3 Click the **IN CMD** button on the operator panel or select **In Command** in the **Autopilot Mode** dialog.

4 Select **HDG** in the **Autopilot Mode** dialog.

- After a few seconds the **Autopilot Mode** dialog indicates **AP-Mode = Heading**.
- Heading mode steering is in operation using the own-ship's current heading as the course to steer.

For more information see *Autopilot Mode* on page 427.

12.8.2 Selecting course mode

Perform the following to steer the ship in course mode using the autopilot:

1 Switch the vessel's main steering control system from manual operation to autopilot.

2 On the navigator operator station that is in command of the autopilot, select **Route→Autopilot Mode**.

- The console's **Autopilot Mode** dialog indicates **AP-Mode = Heading**.

3 Select **In Command** in the **Autopilot Mode** dialog.

4 Select **CRS** in the **Autopilot Mode** dialog.

- After a few seconds the **Autopilot Mode** dialog indicates **AP-Mode = Course**.
- Course steering is in operation using the own-ship's current course as the course to steer.

For more information see *Autopilot Mode* on page 427.

12.8.3 Selecting waypoint mode

Perform the following to steer the ship in waypoint mode using the autopilot:

1 Switch the vessel's main steering control system from manual operation to autopilot.

2 On the navigator operator station that is in command of the autopilot, select **Route→Autopilot Mode**.

- The console's **Autopilot Mode** dialog indicates **AP-Mode = Heading**.

3 Select **In Command** in the **Autopilot Mode** dialog.

4 Select **WP** in the **Autopilot Mode** dialog.

- After a few seconds the **Autopilot Mode** dialog indicates **AP-Mode = Waypoint**.
- Waypoint steering is in operation.

For more information see *Autopilot Mode* on page 427.

12.9 Conditions resulting in an automatic switch-over to a different steering mode

12.9.1 Switch-over from track steering to local autopilot control

The system will automatically change from track steering to local autopilot control in the following cases:

- When the system does not receive valid signals from the position, heading or speed sensor.
- When the end of the route has been reached.
- When a jump in the calculated cross-track distance of more than the preset limit occurs.
- When a jump in the calculated cross-track distance corresponding to a cross-track velocity of more than the preset limit occurs.
- When the K-Bridge navigation software cannot detect at least one active radar, ECDIS and Conning system on the network. (The application you are currently using on the MFD is the “active” one. This means, for example, that if you are in the ECDIS application, then the Radar and Conning applications on the same MFD are not “active” for the purposes of track steering; other Radar and Connong systems must be available somewhere on the bridge for track steering to continue.)
- When the K-Bridge MFD system ceases to receive messages from the autopilot, due to a communication failure.
- When the autopilot cannot detect the presence of the K-Bridge MFD system, due to a communication or K-Bridge MFD system failure.

12.9.2 Switch-over from waypoint mode to local autopilot mode

- The system will automatically change from waypoint mode to local autopilot control when the K-Bridge MFD system is not receiving valid signals from the position, heading or speed sensor.

12.9.3 Switch-over from waypoint mode to course mode

- The system will automatically change from waypoint mode to course mode if the remaining distance to the wheel-over point is less than 0.5 NM.

12.9.4 Switch-over from course mode to local autopilot steering

- The system will automatically change from course mode to local autopilot control when the K-Bridge MFD system is not receiving valid signals from the position, heading or speed sensor.

12.9.5 Switch-over from heading mode to local autopilot control

- The system will automatically change from heading mode to local autopilot control when the K-Bridge MFD system is not receiving valid signals from the position, heading or speed sensor.

  Note

  There are no automatic transitions to track mode, waypoint mode or heading mode. The only automatic transition to course mode is from waypoint mode when the remaining distance to the wheel over point is small.

13 Using the Conning application

This section contains the following topics:

Note

When sensor input is missing, the affected data fields in the Conning application appear light red and show either the last value received from the sensor or no value at all.

For images of the Conning screen on displays of different aspect ratios, see *Radar, ECDIS and Conning: general layout* on page 48.

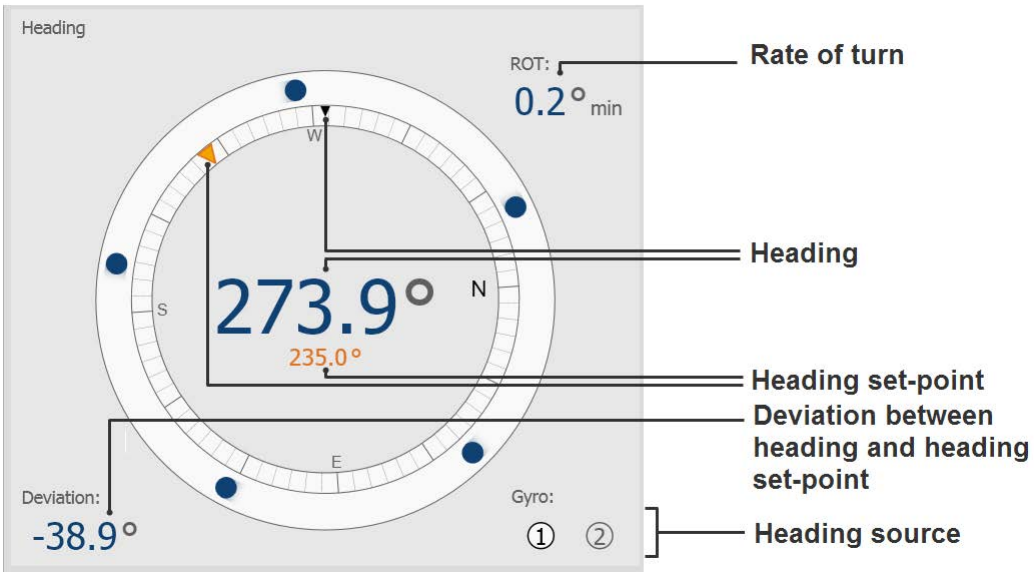
13.1 The Heading pane

The Heading pane shows the heading, the heading set-point, the rate of turn, and the deviation between the heading and the heading set-point.

The Heading pane appears in the top left-hand corner of the Conning display. You can also view it separately from the:

- ECDIS application. Select: **Options→Conning Panes→Heading Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Heading Pane**.

Figure 60 The contents of the Heading pane



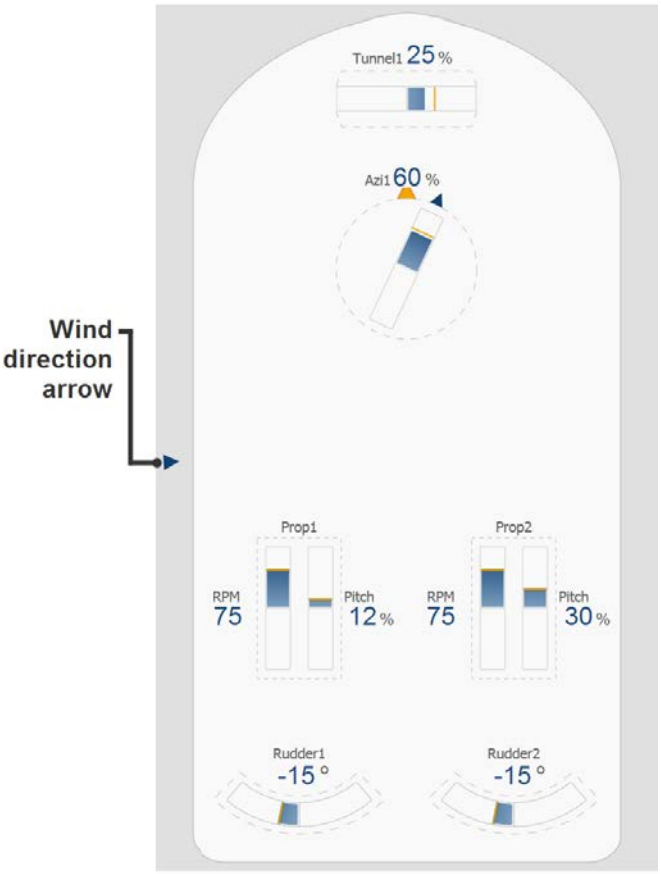
The information displayed in the Heading pane is as follows:

- **Heading:** The heading data is received from the gyro system. The large blue numbers in the centre of the dial give the heading.
- **Heading set-point:** When the autopilot is operating in heading mode, the Heading pane also includes the heading set-point. This is given both numerically (in small orange numbers beneath the heading itself in the centre of the dial), and on the dial (in the form of an orange pointer).
- **ROT:** The Rate of Turn for the turn in progress.

13.2 The Ship pane

The Ship pane displays the state of the ship's thrusters, propellers and rudders. It appears in the centre of the Conning display but you can also view it separately from the:

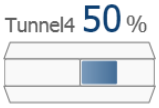
- ECDIS application. Select: **Options→Conning Panes→Ship Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Ship Pane**.



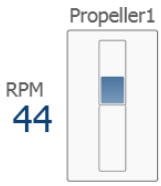
A blue wind arrow appears somewhere close to the outside edge of the ship symbol. The position of the arrow indicates the true direction from which the wind is blowing.

The ship pane provides at-a-glance status information (including the current set-point if available) for each thruster, propeller and rudder. Where the set-point is available, it is indicated by an orange line on each rudder scale symbol and on each bar graph for the propellers and tunnel thrusters. For the azimuth thrusters the set-point is indicated by an orange line on the symbol's rotatable bar graph and by an orange arrow on the symbol's outer circumference.

Whether the set-points are available or not, the following information is provided for each thruster, propeller and rudder:



Tunnel thrusters: The degree of thrust in either direction (port or starboard) is represented by a blue bar graph and by a figure for the percentage of maximum thrust currently deployed.



Main propellers: For each propeller, the amount of thrust is shown as a numerical value (a number of revolutions per minute) and is also indicated by a blue bar graph.

For forward thrust, the blue bar ascends from the central axis of the graph. For reverse thrust, the blue bar descends from the central axis.

Rudders: The rudder angle is shown numerically (in degrees) above a graphical indication of whether the angle is to port or starboard.

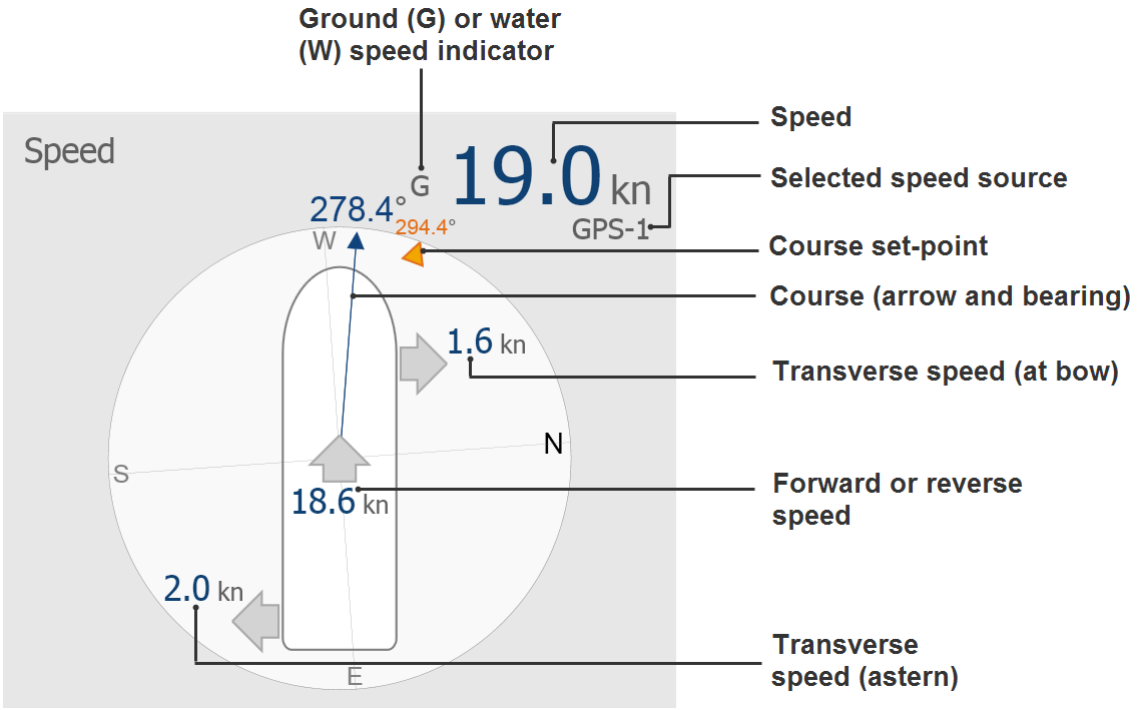
13.3 The Speed pane

The Speed pane gives the vessel's speed. It also contains an arrow (and a numerical reading) indicating the vessel's course along with the cardinal points of the compass. The points of the compass vary in relation to the fixed ship symbol, enabling you to gauge the direction of travel at the speed shown.

The Speed pane appears in the top right-hand corner of the Conning display. You can also view it separately from the:

- ECDIS application. Select: **Options→Conning Panes→Speed Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Speed Pane**.

Figure 61 The contents of the speed pane



The information displayed in the speed pane is as follows:

- **Speed:** The vessel's speed is given in the top right-hand corner of the speed pane. The direction of movement at this speed is given by the course arrow and bearing value on the dial. (Where water speed is shown, the reading for speed is the same as the value in the middle of the ship symbol for forward/reverse speed.)
- **Course set-point:** When the autopilot is operating in Crs, Track or Wpt mode, the speed dial includes the course set-point. It is shown as an orange pointer on the dial.
- **Forward/reverse speed:** The speed forwards or backwards is shown in the centre of the fixed ship symbol (where it appears beneath an arrow indicating forwards or reverse).
- **G/W:** The G or W indicator next to the reading for speed tells you whether ground (G) or water (W) speed is shown. To change the speed stabilisation setting, see *Radar dashboard: the range panel* on page 79. (Where water speed is shown, the course arrow and bearing do not appear on the dial.)

- **Transverse speed:** Transverse speeds astern and at the bow are also shown.
- **Course:** The own-ship's course is indicated by an arrow and bearing. (This does not appear if water stabilisation is selected.)

13.4 The Steering control mode pane

The Steering control mode pane tells you whether the steering system is being controlled manually or by the autopilot. If a route is being monitored, it provides route information. When the steering system is being controlled by the autopilot, this pane also contains the autopilot set-points.

The Steering control mode pane appears in the bottom left-hand corner of the Conning display.

Figure 62 The contents of the Steering control mode pane (in Conning)

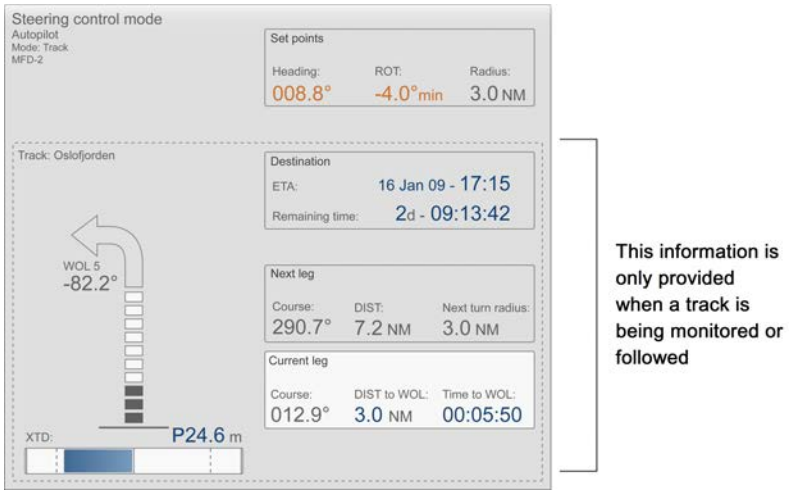
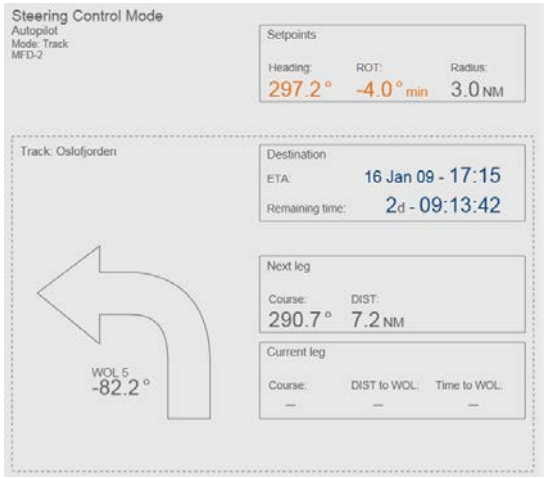


Figure 63 Example (in Conning) showing a turn in progress



The Steering control mode pane contains the following information at the top:

- **Steering control mode:** This value can only be either Autopilot or Manual.
- **Mode:** This is the autopilot mode. It is only displayed when the steering control mode is Autopilot. The autopilot mode can be any of the following:
  - Track
  - HDG (with the autopilot controlled from the heading wheel on the console's operator panel; *The heading wheel* on page 41)
  - Heading (with the autopilot controlled from a dedicated K-Bridge Autopilot operator panel)
  - CRS
  - WPT
- **Console name:** The name of the device that is currently in command of the autopilot. (The device might be another Multi-functional Display unit, a dedicated ECDIS or Radar operator station, or a dedicated autopilot operator panel.)

The top part of the Steering control mode pane also contains set-point information.

Set-points:

- **Heading:** The current heading set-point.
- **ROT:** When this value is given in orange, it is the set-point for the Rate of Turn for a turn that is currently in progress. When the value is grey, it is the calculated Rate of Turn for a turn that is currently in progress.
- **Radius:** When this value is given in orange, it is the set-point for the Turn Radius for a turn that is currently in progress. When the value is grey, it is the calculated Turn Radius for a turn that is currently in progress.

If the MFD console is monitoring a route, then the steering control mode panel contains the following information in addition to the set-points:

Destination:

- **ETA:** The estimated time of arrival at the route's destination.
- **Remaining time:** The time left until the estimated time of arrival.

Next leg:

- **Course:** The course of the next leg of the programmed route.
- **DIST:** The length of the next leg.
- **Next turn radius:** The radius of the up-coming turn (if you are on track).

Current leg:

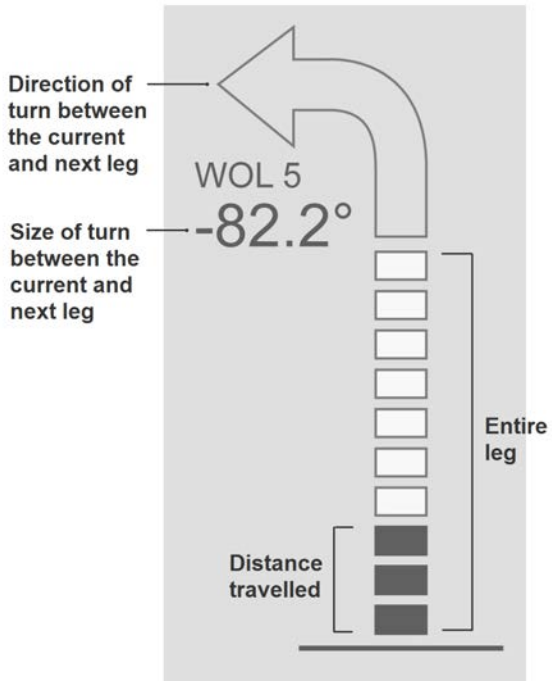
- **Course:** The course of the current leg of the programmed route.
- **DIST to WOL:** The distance to the next Wheel-over-Line.
- **Time to WOL:** The time left till arrival at the next Wheel-over-Line.

Course leg progress and turn indicator:

The Steering control mode panel includes a progress indicator, showing how much of the current leg has been travelled so far. The indicator is in the form of a vertical sequence of 10 rectangles: the filled ones each represent a tenth of the completed leg.

It also includes a turn indicator arrow, showing the general direction of the turn between the current and the next leg. The size of the turn in degrees is given too.

Figure 64 Current leg progress and turn indicator

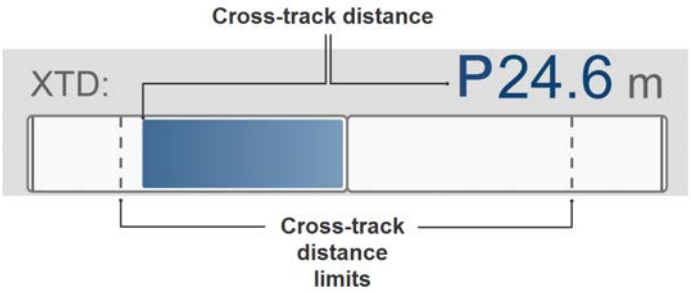


Cross-track distance information:

Any cross-track distance is indicated numerically in meters (with a P or an S to indicate distance to port or starboard) and graphically by a horizontal bar chart.

When the cross-track distance limit is exceeded, the cross-track distance indicator has a bright red border.

Figure 65 Cross-track distance indicator



13.4.1 Viewing the steering control data from outside Conning

You can also view the steering control data individually from the following applications:

- ECDIS. Select: **Options→Conning Panes→Track Pane**
- Radar. Select: **Tools→Options→Conning Panes→Track Pane**.

However, when you do this, the information is organized differently, and no graphical indication is given of progress on the current leg or turn.

Figure 66 The Track pane (showing the same data as the Steering Control Mode pane in Conning)

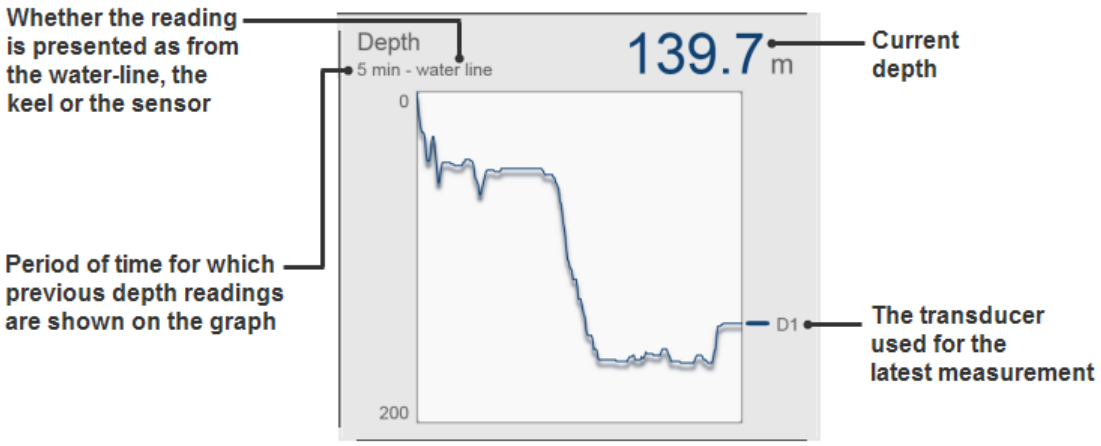
13.5 The Depth pane

The Depth pane gives a reading for the depth of the water at the own-ship's current position. It also contains a chart of the depth readings over the last 5 minutes. The most recent reading is the one furthest to the right.

The Depth pane appears towards the bottom right of the Conning display. You can also view it individually from the:

- ECDIS application. Select: **Options→Conning Panes→Depth Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Depth Pane**.

Figure 67 The depth pane



The vertical axis of the chart (the depth axis) is variable. If the current depth is:

- < 50 metres, the vertical axis will be 0-50m.
- 50-100 metres, the vertical axis will be 0-100m.
- > 100 metres, the vertical axis will be 0-200m.

The Depth pane indicates the following:

- The period of time for which previous depth readings are shown on the chart.
- Whether the depth is measured from the water-line, the keel or from the position of the sensor in the water. If the echosounder does not apply an offset (to enable the system to present the reading as from the water line), then the depth readings are given as from the sensor's own position in the water. In this case, instead of "water line" or "keel" the label will read "sensor".)
- Whether the transducer is located to the fore or aft of the vessel (if there are several transducers in use[1]).

The depth pane histogram covers only the last 5 minutes of sailing. For information about maintaining (and printing out) a log of depth data, see *Capturing depth data for other applications* on page 329.

1. If there are several transducers connected to one echosounder and there is one echosounder for each Depth pane in the Conning display, the system will be configured to use different transducers for different depths. The transducer used for the current depth reading is indicated on the right of the graph.

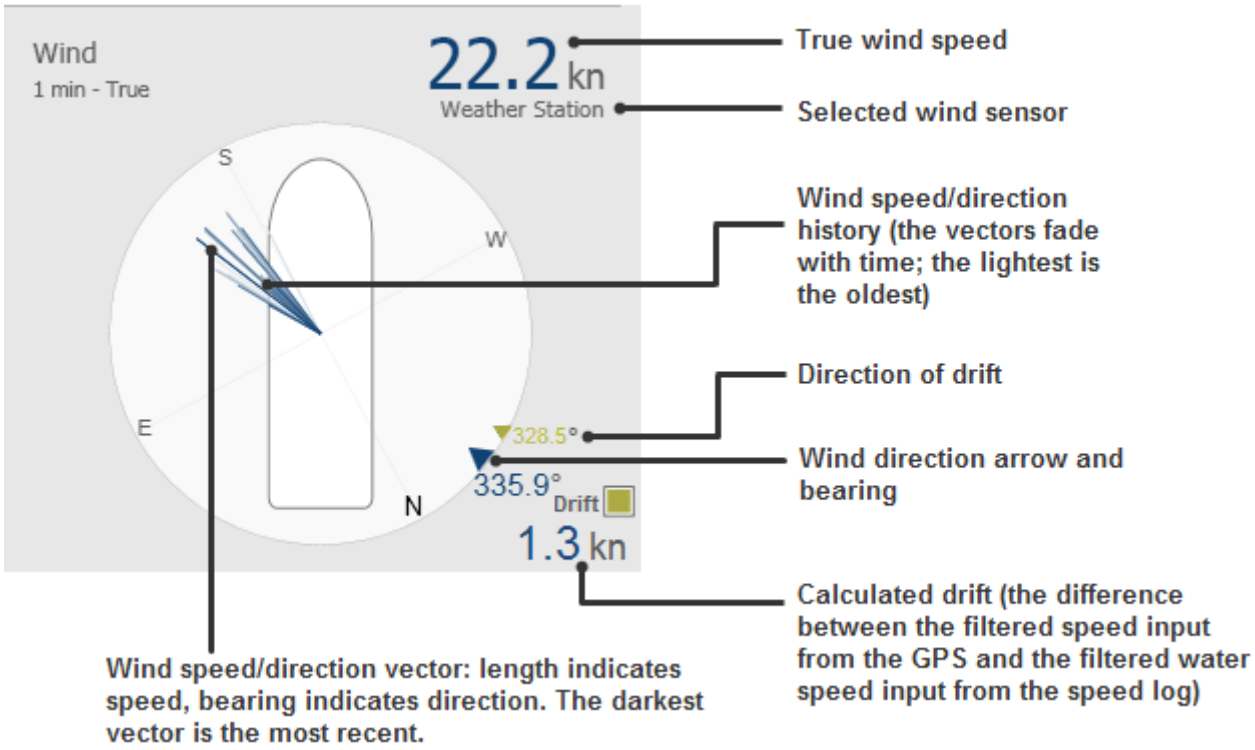
13.6 The Wind pane

The Wind pane gives a reading for true wind speed (relative to ground) and true wind direction (relative to north) from the selected wind sensor. The true wind speed, which appears in the top right-hand corner of the pane, is calculated by the system: it takes the reading from the wind sensor and applies a formula to it that takes account of vessel speed and heading. The true wind direction appears on the compass dial as a numerical value and a blue arrow indicating the direction graphically.

The Wind pane appears towards the bottom right-hand corner of the Conning display. You can also view it individually from the:

- ECDIS application. Select: **Options→Conning Panes→Wind Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Wind Pane**.

Figure 68 The Wind pane



The wind pane also presents a one-minute “history” of the wind data. The blue lines on the dial are speed/direction vectors. The system takes one reading per second and each line on the dial represents a single reading:

- the length of the line indicates the wind speed
- the bearing indicates the true direction of the wind
- the intensity of the colour blue indicates how recently the reading was taken (the darkest blue line represents the most recent reading, and the line colour fades from dark to light blue and finally to white to indicate the age of the data).

Finally the wind pane also includes a reading – in the bottom right-hand corner – for the “calculated drift”. This is effectively the speed of the current. It is calculated as the difference between the filtered speed input from the GPS and the filtered water speed input from the speed log. This data is only provided if it is available from the selected sensors, in other words if the currently selected position sensor is providing speed data and the currently selected speed sensor is providing speed-through-water (STW).

The direction of the current is indicated on the dial by a greenish arrow and accompanying numerical bearing.

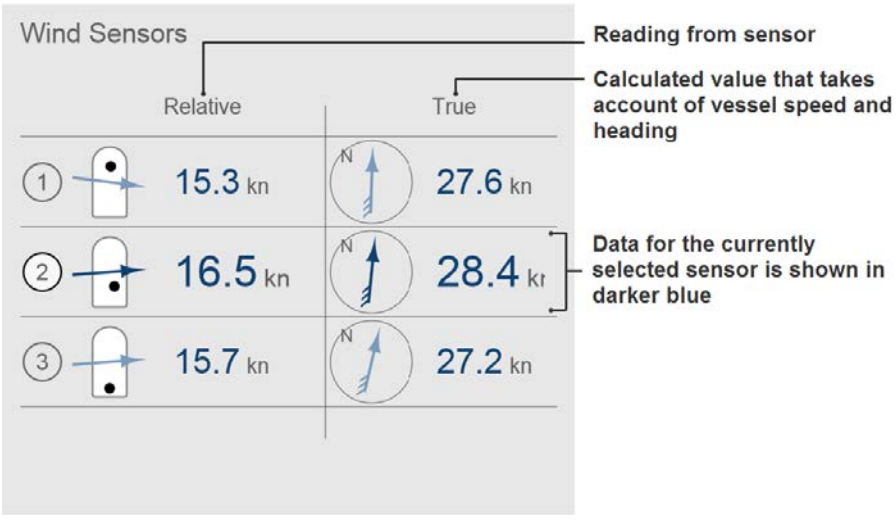
13.7 The Wind sensors pane

The Wind sensors pane gives relative and true wind speed readings from up to four wind sensors installed on the own-ship. It also shows the approximate location of each sensor (on a diagram of the ship).

The Wind sensors pane appears towards the bottom right-hand corner of the Conning display. You can also view it individually from the:

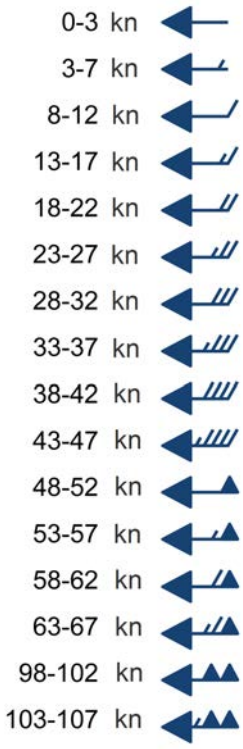
- ECDIS application. Select: **Options→Conning Panes→Wind Sensors Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Wind Sensors Pane**.

Figure 69 The Wind Sensors pane



The Wind sensors pane uses the internationally accepted arrow symbols for representing wind speed. The range of speeds that each arrow represents is shown below.

Figure 70 The wind-speed arrows used in the Wind sensors pane



13.8 The Weather pane

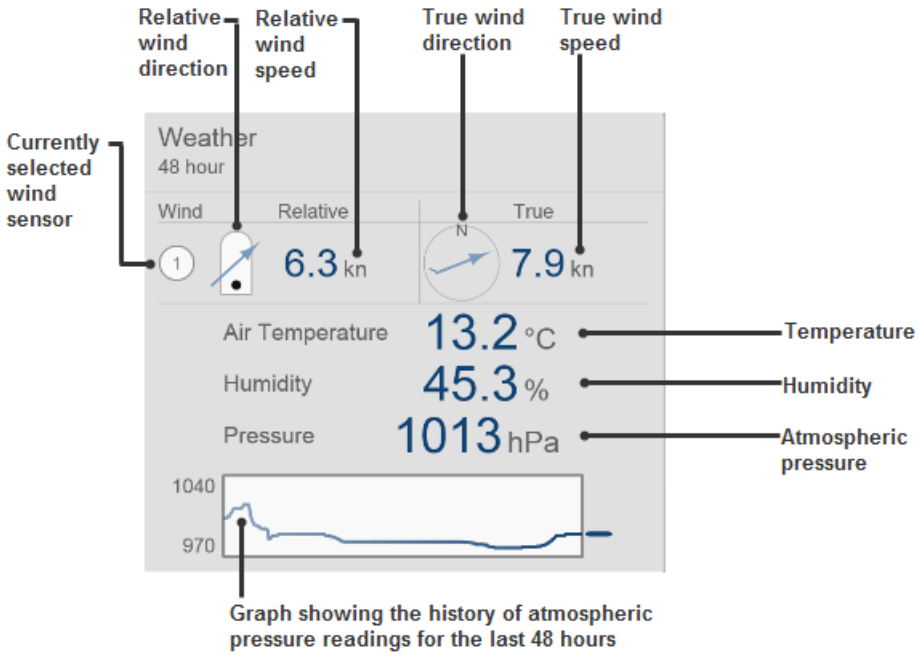
The Weather pane gives:

- A graphical indication of both relative and true (relative to north) wind direction from the selected wind sensor.
- A numerical reading for both relative and true (relative to ground) wind speed from the selected wind sensor. (The true wind speed is calculated by the system: it takes the reading from the wind sensor and applies a formula to it that takes account of vessel speed and heading.)
- Numerical readings for air temperature, humidity and atmospheric pressure.
- A chart of the atmospheric pressure readings for the last 48 hours.

The Weather pane appears near the right-hand edge of the Conning display. You can also view it individually from the:

- ECDIS application. Select: **Options→Conning Panes→Weather Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Weather Pane**.

Figure 71 The Weather pane



13.9 The Bridge Watch pane

The Bridge Watch pane provides the main user interface to the Bridge Navigational Watch Alarm System (BNWAS). This is the system that automatically raises the alarm amongst the captain and ship's officers if the bridge becomes unattended.

The Bridge Watch pane displays the operational state of the BNWAS and the countdown associated with its alarm timer. It also enables you to call for backup from one or more particular officers.

On some vessels, the Bridge Watch pane is included in the main Conning display. On others you must bring it up as a separate dialog.

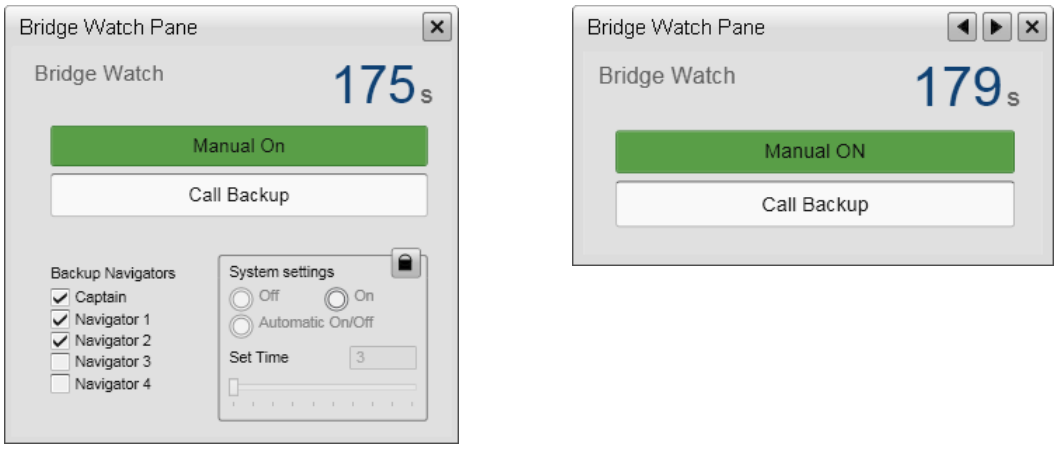
To bring up the Bridge Watch pane if it is not part of the main Conning display:

- Select **Options→Conning Panes→Bridge Watch Pane**.

You can also view the Bridge Watch pane from the following applications (although the list of Backup Navigators and the system settings area are then not displayed):

- ECDIS application. Select: **Options→Conning Panes→Bridge Watch Pane**.
- Radar application. Select: **Tools→Options→Conning Panes→Bridge Watch Pane**.

Figure 72 The Bridge Watch pane in Conning (left) and ECDIS and Radar (right)



For full information about using the BNWAS, see *Operating the Bridge Navigational Watch Alarm System* on page 275.

14 Operating the Bridge Navigational Watch Alarm System

This section contains the following topics:

14.1 Introduction

This chapter tells you how to use the K-Bridge Bridge Navigational Watch Alarm System (BNWAS) from Kongsberg Maritime.

The BNWAS is designed to monitor bridge activity and alert the ship's captain and/or other qualified navigators if the bridge becomes unattended.

If there has been no activity on the navigation operator stations and nobody has pressed a "Dead Man" reset button for a specified time period (of between 3 and 12 minutes) – or (where motion detectors are installed) if the motion detectors have picked up no movement on the bridge for a specified time period (of between 3 and 12 minutes) – then the alarm will be raised in the stages described below (see *The BNWAS alarm sequence* on page 276) and, unless timely action is taken, buzzers will sound on the bridge and around the vessel.

The BNWAS alarm will also be raised in response to certain priorities of alert.

14.2 The BNWAS alarm sequence

The BNWAS alarm sequence is as follows:

1 The BNWAS countdown reaches (or is set to) zero because:

- Nobody has used the controls on a navigation operator station or pressed a "Dead Man" reset button in the time required
- The BNWAS motion detectors (if installed) on the bridge have picked up no movement in the time required
- A category A emergency alert has been received by a navigation operator station or a category A alarm has been received or generated by a navigation operator station (for information about alert categories, see *The Alert priority button* on page 66)

2 The pre-warning lamps flash on the bridge. You must do one of the following:

- Press the **PRE-WARNING RESET**, **ALARM RESET** or **SOUND OFF** button (on any operator station located in a designated look-out point) to reset the timer
- Make a movement on the bridge that is picked up by a BNWAS motion detector (if installed)
- Use any of the controls on the navigation operator stations (or on third-party navigation equipment that is integrated with the BNWAS).

3 15 seconds later, if nothing has happened to reset the timer, a buzzer is sounded on the bridge.

4 15 seconds after that, if nothing has happened to reset the timer, buzzers are sounded in the selected backup navigators' cabins.

Once the cabin buzzers have sounded, you must press the red **ALARM RESET** button on the main alarm reset panel to reset the timer.

5 Finally, 90 seconds[2] after the buzzers have sounded in the selected backup navigators' cabins, if no one has pressed the red **ALARM RESET** button on the main alarm reset panel, buzzers are sounded in all backup navigators' cabins and in the common areas of the crew's accommodation.

You must press the red **ALARM RESET** button on the main alarm reset panel to reset the timer and stop the alarm sound.

For a list of the things you can do (before and during these stages) to reset the timer and so prevent the buzzers from sounding or stop them if they have started sounding, see *Resetting the alarm timer* on page 280.

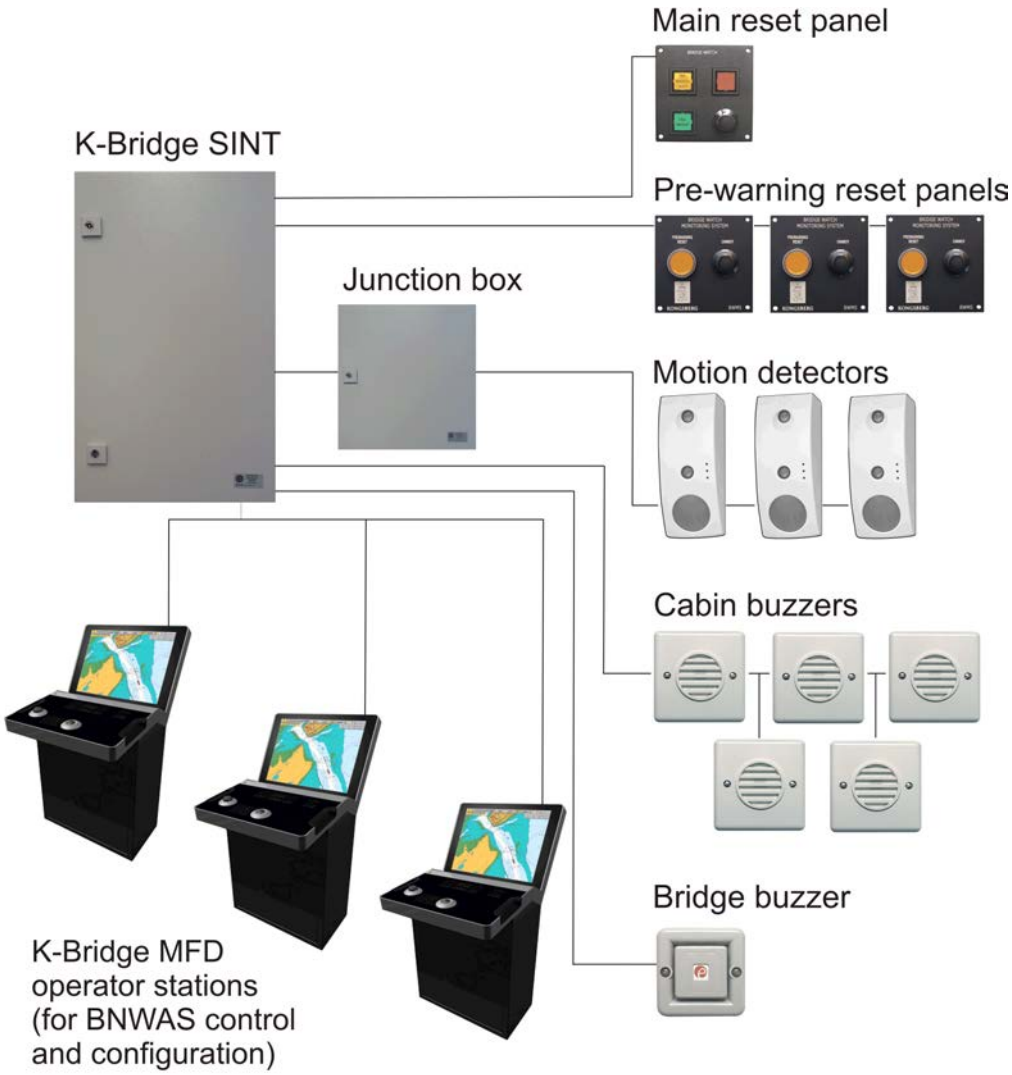
2. On some larger vessels it is possible that the time period between the cabin buzzers sounding and the common area buzzers sounding will be longer than 90 seconds. Where this is the case, it is to allow the captain and/or backup officers time to reach the bridge. (This time period is configured when the BNWAS is installed; it is not operator-configurable. The maximum permissible time period between the cabin buzzer alarms sounding and the common area buzzers sounding is 3 minutes whatever the size of the vessel.)

14.3 The architecture of the BNWAS

The main user interface to the BNWAS is provided by the Bridge Watch pane in the Conning application. The elements of the Bridge Watch pane are described below (see *The BNWAS user interface in the Conning application* on page 279), and the rest of this chapter tells you how to use it. (Note that you need a password to perform some tasks, including starting and stopping the BNWAS and setting a new value for the alarm timer.)

Before you begin your watch, you must familiarise yourself with the BNWAS alarm and pre-warning reset panels (see *Resetting the alarm timer* on page 280). Also make sure you know where they are located on the bridge.

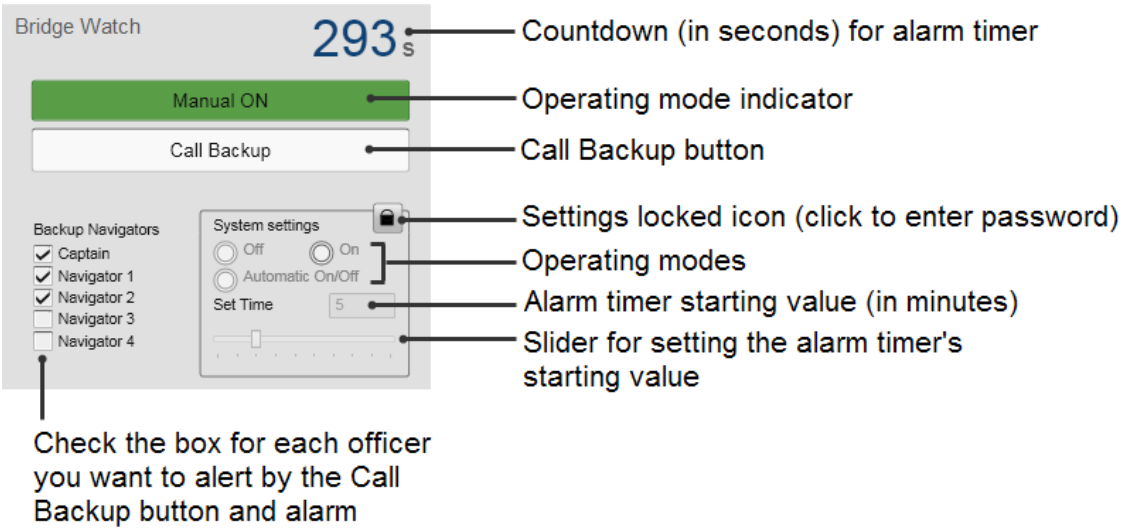
Figure 73 The hardware components of the BNWAS



14.4 The BNWAS user interface in the Conning application

The main user interface to the BNWAS is provided by the Bridge Watch pane in the Conning application. On some vessels this pane is part of the main Conning display. On others, you must bring it up as a separate dialog by selecting: **Options→Conning Panes→Bridge Watch Pane**.

Figure 74 The Bridge Watch pane in Conning



14.5 Resetting the alarm timer

This section tells you how to reset the alarm timer to prevent the buzzers from sounding or silence them if they have already sounded.

Main alarm reset panel

Pre-warning reset panel

Resetting the timer: Before the countdown reaches zero

- Make some movement on the bridge that is picked up by a motion detector installed for the purpose. (Not all vessels have motion detectors installed as part of the BNWAS.)
- Use any of the controls on the navigation operator stations (or on third-party navigation equipment that is integrated with the BNWAS).
- Press the **PRE-WARNING RESET** button or the red **ALARM RESET** button on the BNWAS main reset panel, or press the **PRE-WARNING RESET** button on a BNWAS pre-warning reset panel.
- Press the **SOUND OFF** button on any operator station (or on any piece of third-party navigation equipment that is integrated with the BNWAS and) that is located in a designated look-out point.

Resetting the timer: Before the buzzer sounds on the bridge

- Within 15 seconds of the **PRE-WARNING RESET** lamp flashing, press the **PRE-WARNING RESET** button or the red **ALARM RESET** button.
- Within 15 seconds of the **PRE-WARNING RESET** lamp flashing, press the **SOUND OFF** button on any operator station (or on any piece of third-party navigation equipment that is integrated with the BNWAS and) that is located in a designated look-out point.
- Make some movement on the bridge that is picked up by a motion detector installed for the purpose. (Not all vessels have motion detectors installed as part of the BNWAS.)
- Use any of the controls on the navigation operator stations (or on third-party navigation equipment that is integrated with the BNWAS).

Resetting the timer: Before the selected backup navigators' buzzers sound

- Within 30 seconds of the **PRE-WARNING RESET** lamp flashing, press the **PRE-WARNING RESET** button or the red **ALARM RESET** button.

- Within 30 seconds of the **PRE-WARNING RESET** lamp flashing, press the **SOUND OFF** button on any operator station (or on any piece of third-party navigation equipment that is integrated with the BNWAS and) that is located in a designated look-out point.
- Make some movement on the bridge that is picked up by a motion detector installed for the purpose. (Not all vessels have motion detectors installed as part of the BNWAS.)
- Use any of the controls on the navigation operator stations (or on third-party navigation equipment that is integrated with the BNWAS).

Resetting the timer: After pressing the CALL BACKUP button

- Press the red **ALARM RESET** button (see *Calling for backup* on page 283).

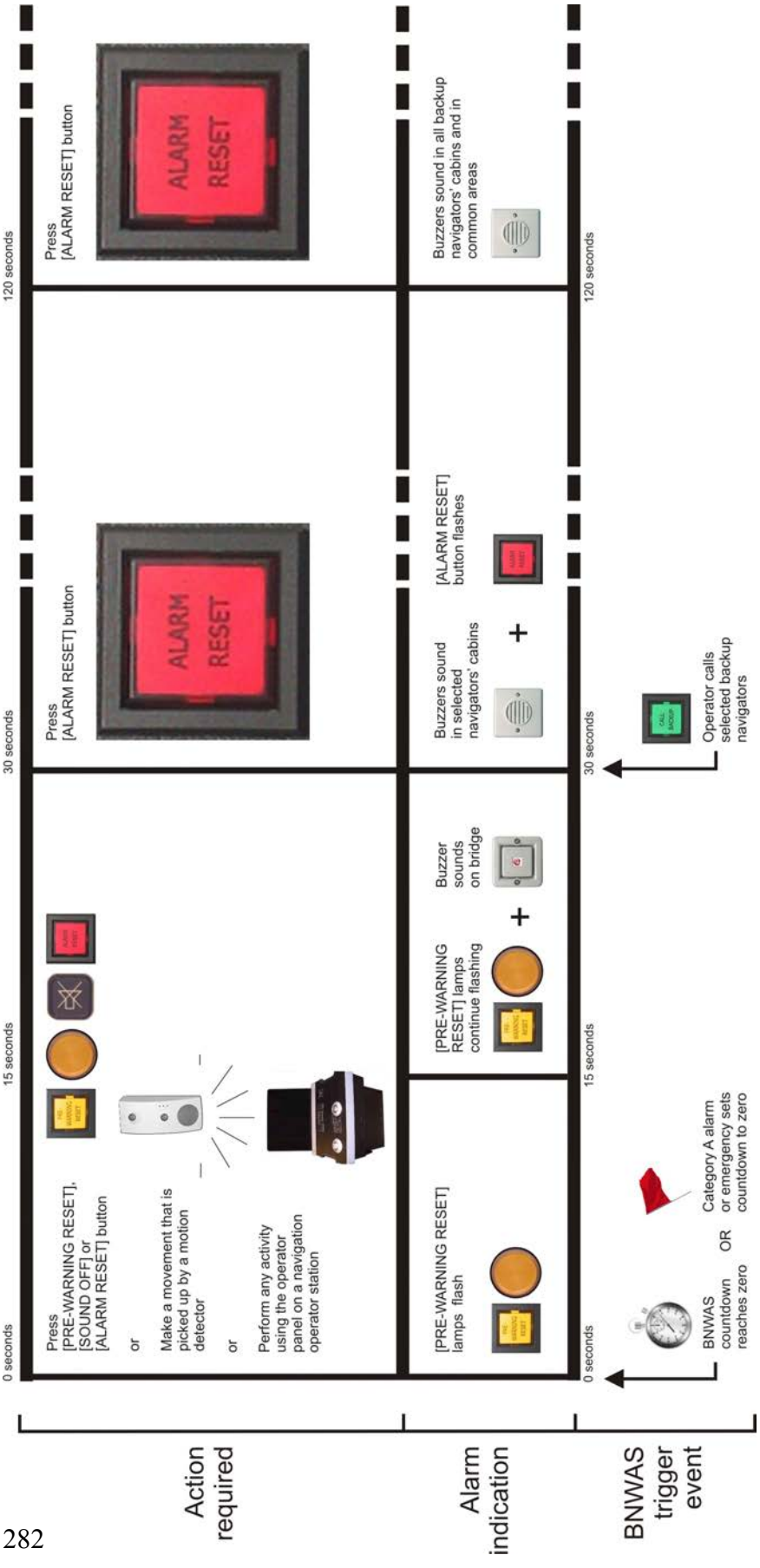
Resetting the timer: After the selected backup navigators' buzzers sound

- Press the red **ALARM RESET** button.

Resetting the timer: After the buzzers sound in all backup navigators' cabins and in the common areas

- Press the red **ALARM RESET** button.

Figure 75 BNWAS alarm timeline



14.6 Calling for backup

To call for backup, do one of the following:

- Click the white **Call Backup** button in the Bridge Watch pane.

- Alternatively, press **CALL BACKUP** on the main alarm reset panel for the BNWAS.

When you have called for backup, this is what happens:

- The BNWAS alarm sequence begins at the 30 second point on the timeline (see *BNWAS alarm timeline* on page 282).
- The alarm buzzers sound in the selected backup navigators' cabins.
- The red **ALARM RESET** button on the main alarm reset panel starts flashing.

- The **Call Backup** button in the Bridge Watch pane turns red and remains red until the BNWAS alarm timer has been reset.

14.7 Stopping the alarm sound in the backup cabins and beyond

For information about stopping the alarm sound before the buzzers sound in the backup navigators' cabins and the common areas of the crew's accommodation, see *Resetting the alarm timer* on page 280.

The alarm buzzers sound in the backup cabins 30 seconds after the BNWAS countdown reaches zero or whenever backup has been called.

To stop the alarm sound and reset the timer, press the red **ALARM RESET** button on the BNWAS main alarm reset panel.

90 seconds after the buzzers have sounded in the selected backup navigators' cabins, if this button has not been pressed, the buzzers will sound additionally in all the backup navigators' cabins and in the common areas of the crew's accommodation. The only way to stop the alarm sound and reset the timer after this remains to press the red **ALARM RESET** button on the BNWAS main panel.

14.8 Selecting backup navigators

When you begin your watch, you should if possible select one or more backup navigators.

The backup navigators you select are the people whose cabin buzzers will sound:

- 30 seconds after the BNWAS alarm countdown reaches zero (if the [PRE-WARNING] or main [ALARM RESET] button has not been pressed).
- 30 seconds after a category A alarm or emergency sets the BNWAS countdown to zero (if the [PRE-WARNING] or main [ALARM RESET] button has not been pressed).
- When backup is called.

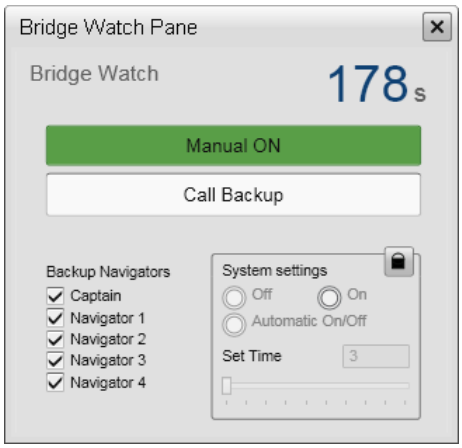
To select the backup navigators:

1 In Conning, access the Bridge Watch pane.

If this pane is not part of the main Conning display on your vessel then, in the Conning application, select **Options→Conning Panes→Bridge Watch Pane**.

2 In the Bridge Watch pane, check the box next to each backup navigator you want to select.

Figure 76 The Bridge Watch pane (with the captain and all backup navigators selected)



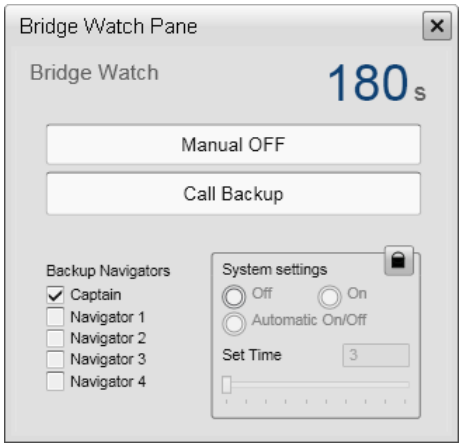
If there are no backup navigators selected, then after a few seconds the BNWAS system will automatically select the captain (who is always the first backup navigator in the list) and generate a warning to alert you of this.

If you have at least one other backup navigator selected, you can un-select the captain. In this case, buzzers will not sound in the captain's cabin until the final stage of the alarm when they sound in all backup navigators' cabins and in the common areas of the crew's accommodation.

14.9 Entering the password for the BNWAS system settings

You must enter a password for the system settings in the Bridge Watch pane to enable or disable the BNWAS or to set the countdown period. The only settings you can change in the Bridge Watch pane without entering a password are the selections for the backup navigators.

Figure 77 The Conning Bridge Watch pane (before a password has been entered)



To enter the password:

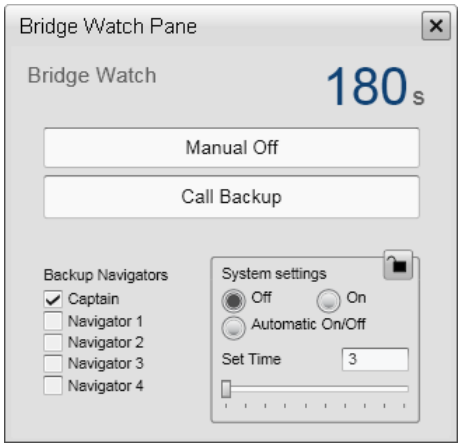
1 In the Conning Bridge Watch pane, click the locked padlock symbol.

The Passwords dialog appears.

2 In the User Password section of the Passwords dialog type the password for the BNWAS.

3 Click **Open**

If the password is accepted, when you click **Open** all elements of the system settings area in the Bridge Watch pane become available (they are no longer greyed out) and the padlock symbol shows as an open padlock:



4 Make the necessary changes to the system settings section of the Bridge Watch pane.

In other words, enable or disable the BNWAS, configure it to start automatically with the autopilot, or set the countdown period for the alarm timer.

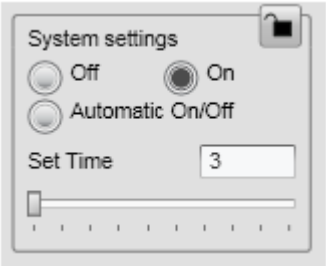
5 When you have finished, restore password protection to the system settings (see *Restoring password protection when you have finished* on page 289).

14.10 Starting the BNWAS

1 Enter the BNWAS password (see *Entering the password for the BNWAS system settings* on page 285).

2 In the system settings section, select **On**.

Figure 78 Turning the BNWAS on manually



This starts the BNWAS. To confirm that it has started:

- The alarm timer starts counting down in seconds from the start of the currently set countdown period.
- The operating status indicator on the Bridge Watch pane turns green and its text displays **Manual ON**.

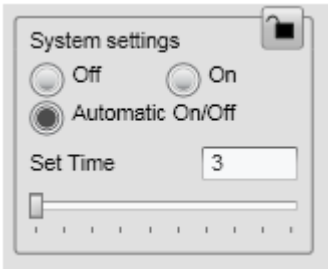
14.11 Making the BNWAS start automatically

To make the BNWAS start automatically when the vessel's autopilot is in operation, do the following:

1 Enter the BNWAS password (see *Entering the password for the BNWAS system settings* on page 285).

2 In the System settings section, select **Automatic On/Off**.

Figure 79 Making the BNWAS start and stop automatically

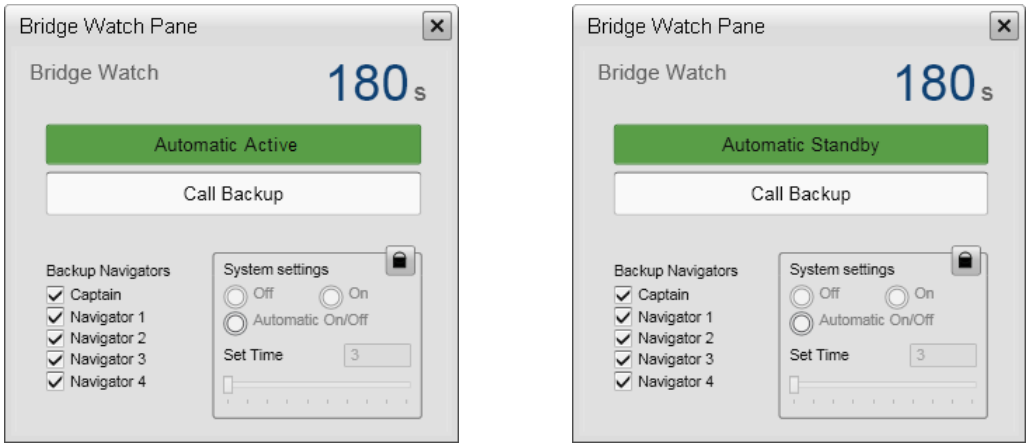


This starts the BNWAS automatically whenever the vessel's autopilot is in operation and disables it automatically whenever the autopilot is not in operation.

The operating status indicator on the Bridge Watch pane turns green and its text displays:

- **Automatic On** when you have the **Automatic On/Off** option selected and the autopilot is in operation.
- **Automatic Off** when you have the **Automatic On/Off** option selected but the autopilot system is not in operation.

Figure 80 The BNWAS in Automatic On (Active) and Automatic Off (Standby) operating modes

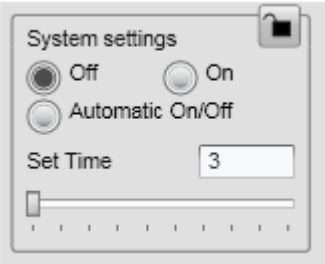


14.12 Stopping the BNWAS

1 Enter the BNWAS password (see *Entering the password for the BNWAS system settings* on page 285).

2 In the System settings section, select **Off**.

Figure 81 Turning the BNWAS off manually



This turns the BNWAS off. To confirm that it is off:

- The operating status indicator on the Bridge Watch pane turns white and its text displays **Manual OFF**.

Note

When the BNWAS is turned off, the countdown timer continues to operate. When it reaches zero, however, it starts again from the currently specified countdown period without causing any alarm buzzers to sound.

14.13 BNWAS operating statuses

The table below lists the four possible operating statuses of the BNWAS.

Table 18 BNWAS operating statuses

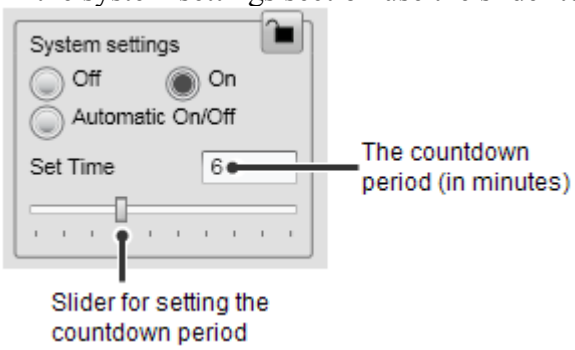
Operating status	System settings	Autopilot state
Manual ON	**On** selected	Not applicable
Manual OFF	**Off** selected	Not applicable
Automatic On	**Automatic On/Off** selected	Operating
Automatic Off	**Automatic On/Off** selected	Not operating

14.14 Setting the countdown period for the BNWAS timer

The default countdown period for the BNWAS timer is 3 minutes. However, you can change it to any period between 3 and 12 minutes.

1 In the Bridge Watch pane, enter the BNWAS password (see *Entering the password for the BNWAS system settings* on page 285).

2 In the system settings section use the slider to set the countdown period you require.



14.15 Restoring password protection when you have finished

When you have finished changing the BNWAS system settings, you must lock these settings again to prevent unauthorized access to them:

1 If the Passwords dialog has been closed, bring it back by doing one of the following:

- Click the unlocked padlock symbol in the system settings section of the Bridge Watch pane:

- Select **System→Passwords**

2 In the Passwords dialog, click the **Lock** button beneath the **User Password** field.

When you have done this, the text field at the bottom of the dialog reads “Passwords locked”.

15 Monitoring whether the vessel is off-course

This section contains the following topics:

15.1 Introduction

An optional Off-course Alarm System is available as part of the K-Bridge navigation system. The Off-course Alarm System enables you to monitor when – and by how much – the vessel is sailing off-course.

The system monitors the vessel's actual heading in relation to a required heading (effectively a heading set-point that is local to the Off-course Alarm System).

The heading set-point that the Off-course Alarm System uses can either be specified by you (if the vessel is being steered manually) or the system can receive it from the autopilot (if the autopilot is operating).

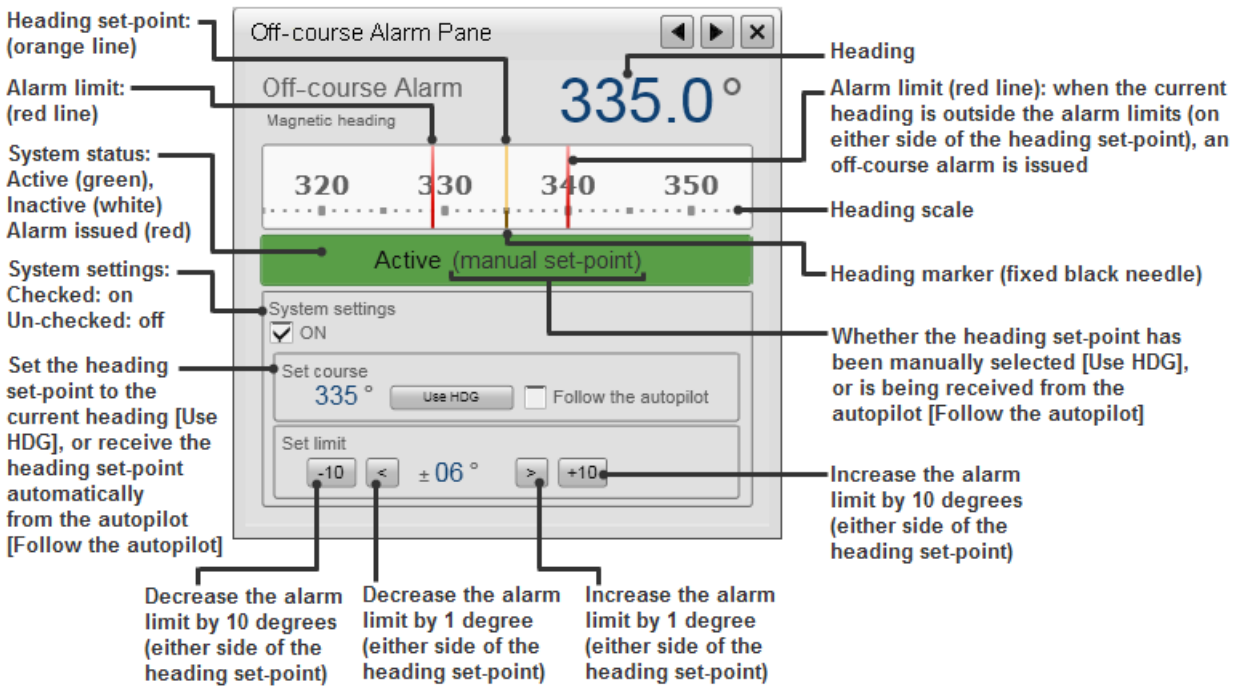
15.2 The Off-course Alarm pane

The user interface to the Off-course Alarm System is a single dialog called the Off-course Alarm pane.

If the Off-course Alarm System is installed for your vessel, you can access this dialog from the:

- ECDIS and Conning applications. Select: **Options→Conning Panes→Off-course Alarm Pane**
- Radar application. Select: **Tools→Options→Conning Panes→Off-course Alarm Pane**.

Figure 82 The Off-course Alarm pane



The heading set-point that the system is currently using appears as a vertical orange line on the heading scale in the Off-course Alarm pane.

On either side of it are two vertical red lines. These mark the limits of the range within which the vessel's heading is permitted to deviate from the heading set-point before the system issues an off-course alarm. You can increase or decrease these limits by using the buttons at the bottom of the Off-course Alarm pane (see *Specifying the permitted deviation* on page 294).

15.3 Using the off-course alarm system

To turn on and use the off-course alarm system:

1 Check the **ON** box under **System Settings** in the Off-course Alarm pane.

2 If the vessel is being steered:

- Manually, when the heading in the top right-hand corner of the Off-course Alarm pane represents the direction in which you want to sail, click the **Use HDG** button.

  The off-course alarm system then takes the current heading value (as it was at the moment when you clicked the **Use HDG** button) as its new heading set-point.

  You will see the vertical orange line indicating the heading set-point appear in a different position on the heading scale.

- By the autopilot, check the **Follow the autopilot** option.

  The Off-course Alarm System then takes the autopilot's current heading set-point as its new heading set-point.

  You will see the vertical orange line indicating the heading set-point appear in a different position on the heading scale.

  Whenever the autopilot's heading set-point changes, the Off-course Alarm System's heading set-point will change to the same value.

From now on the Off-course Alarm System monitors the vessel's heading in relation to the Off-course Alarm System's heading set-point. If the vessel's heading deviates from that set-point by more than the currently permitted limit, then the system issues an off-course alarm.

15.4 Specifying the permitted deviation

At the bottom of the Off-course Alarm pane is a section called **Set limit**. This section of the dialog concerns the "alarm limits": it displays the number of degrees by which the vessel's heading is currently permitted to deviate from the required heading (in other words, from the Off-course Alarm System's heading set-point) before the system issues an off-course alert.

You can adjust the number to suit your requirements. Use the:

- < and > buttons to increase or decrease the permitted deviation by 1° either side of the heading set-point.
- **+10** and **-10** buttons to increase or decrease the permitted deviation by 10° either side of the heading set-point.

Figure 83 The buttons for specifying the permitted deviation

15.5 Operating statuses

Table 19 Off-course alarm system operating statuses: manual steering

Operating status	System settings	Meaning
Active (manual set-point)	**On** **Set course: Use HDG**	The system is monitoring whether the vessel is off-course.
		The heading set-point is whatever the heading value was when the **Use HDG** button was last pressed.
		The vessel is either on-course or it is off-course within the currently permitted limits: no off-course alarm has been issued.
Inactive (manual set-point)	**Off** **Set course: Use HDG**	An operator has un-checked the **ON** box. The system is not monitoring whether the vessel is off-course.

Table 19 Off-course alarm system operating statuses: manual steering (cont'd.)

Operating status	System settings	Meaning
Active (manual set-point)	**On** **Set course: Use HDG**	The system is monitoring whether the vessel is off-course.
		The heading set-point is whatever the heading value was when the **Use HDG** button was last pressed.
		The vessel is off-course by more than the permitted limit: an off-course alarm has been issued.

Table 20 Off-course alarm system operating statuses: autopilot steering

Active (automatic set-point)	**On** **Set course: Follow the autopilot**	The system is monitoring whether the vessel is off-course.
		The system is receiving its heading set-point from the autopilot.
		The vessel is either on-course or it is off-course within the currently permitted limits: no off-course alarm has been issued.
Inactive (automatic set-point)	**On** **Set course: Follow the autopilot**	The system has temporarily stopped monitoring whether the vessel is off-course either because the autopilot is no longer operating or because the vessel is performing a turn. When the system receives a heading set-point from the autopilot that is outside the alarm limits associated with the previous heading set-point, it assumes that the vessel is performing a turn and stops monitoring. The system starts monitoring again as soon as the vessel's heading is inside the alarm limits associated with a new heading set-point received from the autopilot. (When the heading is inside the alarm limits, the system assumes that the turn is complete.)

Table 20 Off-course alarm system operating statuses: autopilot steering (cont'd.)

	**On** **Set course: Follow the autopilot**	The system is monitoring whether the vessel is off-course.
		The vessel is off-course by more than the currently permitted limit: an off-course alarm has been issued.

16 Some useful tools

This section contains the following topics:

16.1 Introduction

This chapter describes some useful tools and utilities available from the menus on the Multi-functional Display unit. Most of them are available from the Tools menu (see *Tools menu* on page 543), but note that the Tools menu is different in the different applications on the MFD unit. Others are available from the Own Ship and Chart menus.

16.2 Entering a position offset

If you need to specify an offset from WGS-84: do the following.

1 Click the **OFFSET/NO OFFSET** button in the top bar (see *Top bar: the position and offset buttons* on page 74).

- The **Pos. Offset** menu is displayed (see *Position Offset* on page 443).
- The offset can be entered either as a position offset (in latitude and longitude) or as a bearing and range offset.

2 Use the button to select the appropriate mode.

3 Enter the offset.

4 Click **Apply**.

16.3 Using the EBL/VRM tool

Two Electronic Bearing Lines (EBL) and Variable Range Markers (VRM) are available and can be displayed simultaneously. The EBL and VRM always appear in pairs. A number at the base of the EBL identifies each pair.

16.3.1 Creating and adjusting an EBL/VRM pair

1 Turn the EBL/VRM on using the buttons on the radar dashboard (see *Radar dashboard: the Navigation Tools panel* on page 86).

The EBL/VRM will appear centred on the own-ship.

2 Adjust the EBL direction by dragging the line using the track-ball and **Left mouse** button.

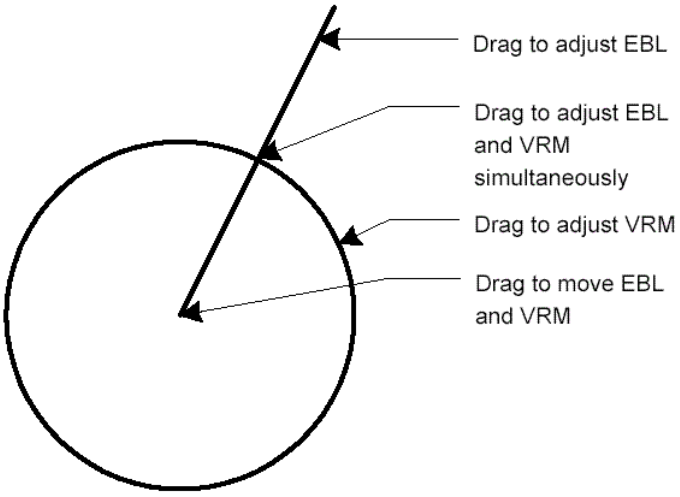
3 Adjust the VRM's diameter by dragging the circle using the track-ball and **Left mouse** button.

4 Adjust the EBL and VRM simultaneously by dragging the intersection between the two using the track-ball and **Left mouse** button.

5 Move the EBL/VRM pair by dragging the centre using the track-ball and **Left mouse** button.

- An EBL/VRM pair centred on the own-ship will move with the own-ship. An offset pair will either move with the own-ship or be geographically fixed, depending on whether the M (moving) or F (fixed) option is selected (see *Radar dashboard: the Navigation Tools panel* on page 86).

Figure 84 Adjusting an EBL/VRM pair



6 To obtain an exact bearing or range use the spin buttons for the bearing and range fields next to the **EBL, VRM** button.

7 To select true or relative bearing, use the radio buttons next to the **EBL, VRM** button.

Only relative bearings are possible in Head Up mode, which is selected automatically when heading input fails.

When the own-ship changes its heading, a true EBL/VRM pair will keep its 0° referenced bearing, and a relative EBL/VRM will keep its bearing relative to the heading line.

For important considerations about the accuracy of the EBL/VRM tool, see *The accuracy of the EBL/VRM tool in the Radar application* on page 302.

8 To remove an EBL/VRM pair, just click the **EBL VRM** button for the EBL/VRM pair you want to remove.

16.3.2 Displaying your EBL/VRM on another operator station

You can display your EBL/VRM pair or pairs (optionally along with the cursor and/or a curved EBL) on the screen of another operator station. For information about how to do this, see *Sharing your markers and viewing remote markers* on page 311.

16.3.3 The accuracy of the EBL/VRM tool in the Radar application

The accuracy of the EBL and VRM tool in the Radar application varies with the position of the line or marker on the screen and depends critically upon the precision with which the radar has been aligned during installation.

Measuring from the CCRP to radar targets

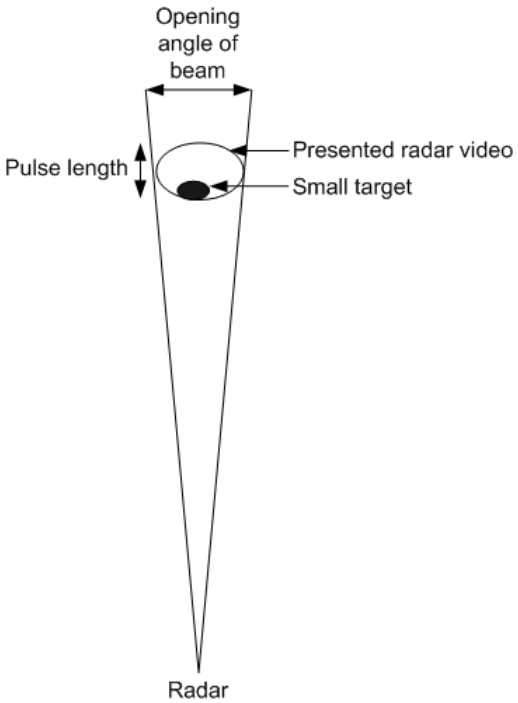
The EBL/VRM tool has been tested on a properly adjusted radar installation against known radar targets and the:

- EBL has been found to be accurate to within 1° for targets close to the edge of the display. For echoes closer to the centre of the display, the accuracy of the EBL is reduced.

  When you are working with true bearing measurements (referenced to north), you must allow for any known error in the gyro bearing as well as the EBL's relative error.
- VRM has been found to be accurate to within 1% of the selected range scale. For example, on a 3NM range scale the VRM has been found to be accurate to within 0.03NM, and on the lowest range scale it has been found to be accurate to within 30m or 0.016NM.

If the radar's heading line and range have not been properly adjusted during installation, these levels of accuracy will not be attained.

When you are using the EBL/VRM tool on radar targets, remember that the radar echoes are extended both in bearing and range beyond the targets' actual bearing and range. This is an effect of the opening angle of the radar beam and the pulse length of the radar transmitter (see diagram below).



Measuring from the CCRP to chart objects

If you are using the EBL/VRM tool to measure from the own-ship to objects in the chart, the uncertainties will be dominated by the uncertainty of the own-ship's position and by uncertainties in the chart itself. At high latitudes (close to the North or South Poles) additional uncertainties arise when you are using high range scales; this is because the chart is displayed in Mercator projection. When the combination of latitude and the selected range scale is significant in this regard, the radar system issues a “Chart projection mismatch” alarm.

16.3.4 The advanced EBL/VRM tool on ECDIS

In ECDIS more advanced EBL/VRM facilities are available, including great circle and rhumb-line geometry (see *EBL/VRM Advanced* on page 546).

16.4 Using parallel index lines

You can place up to four parallel index lines on the radar display to use as general purpose navigation guides.

A number in the middle of the line identifies the line that is selected.

Parallel index lines are either fixed relative to the own-ship's heading (relative mode) or they have a fixed orientation that is independent of the own-ship's heading (true mode).

In relative mode parallel index lines follow the heading line when the own-ship changes course.

In true mode the bearing of the parallel index lines is geographically fixed.

In both modes, the distance from the own-ship to the line is constant.

To create a parallel index line, do the following:

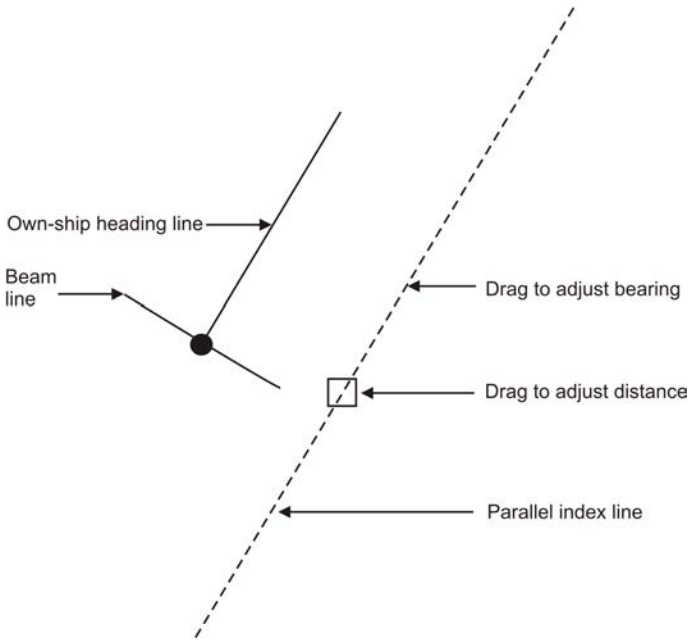
1 Select **Tools→Parallel Index Lines**.

2 Click **New** to insert a new parallel index line.

The parallel index line will appear to one side of the own-ship.

3 To change the distance the own-ship to the line, drag the rectangular handle using the track-ball and **Left mouse** button, or enter the required distance into the **Distance** field of the **Parallel Index Lines** menu (see *Parallel Index Lines* on page 548).

Figure 85 Parallel index lines



4 To change the bearing drag the line (not the rectangular handle) using the track-ball and **Left mouse** button, or enter the bearing into the **Bearing** field of the **Parallel Index Lines** menu.

5 To truncate a parallel index line, select it in the display (by using the track-ball and **Left mouse** button), check **Truncate** in the **Parallel Index Line** menu, then click the **Left mouse** button at the point on the line where you want it to end.

When you have truncated a line, you can stretch or contract it by dragging the ends.

16.5 Using position lines to estimate the own-ship's position

The position line facility (available only in the ECDIS application) allows you to make visual position fixes if you want to:

- Check that the automatic position fixing system (GPS or some other system) is working correctly,
- Get an approximate manual position fix because the automatic position fixing system has failed.

The facility is provided by the Position Line dialog which allows you to create two or three position lines on the chart. These can be (straight) bearing lines or (circular) range lines.

To bring up this dialog, select **Tools→Position Line**. For a description of the Position Line dialog, see *Position Line* on page 549.

To obtain a reliable position fix we recommend you measure the bearings to visually conspicuous objects on the horizon that are easily identifiable on the chart. The measured bearings should preferably intersect at right angles. Specify the bearing that changes fastest (i.e., the athwart ship movement) last.

1. Click the **New Bearing** button to create a new bearing measurement entry in the table and to fix the time for it.
2. Select the new table entry and click the **Get Cursor** button.
3. Click on the point in the chart that you intend to use as the reference point (choose a point that corresponds to the position of an identifiable object on the horizon).

   Its latitude and longitude appear in the table entry for the measurement.
4. In the **BRG/RAN** column, specify the bearing from the own-ship to the specified reference point.

   This creates a position line in the chart.
5. Repeat the previous steps once or twice (depending on whether you are using two or three reference points).

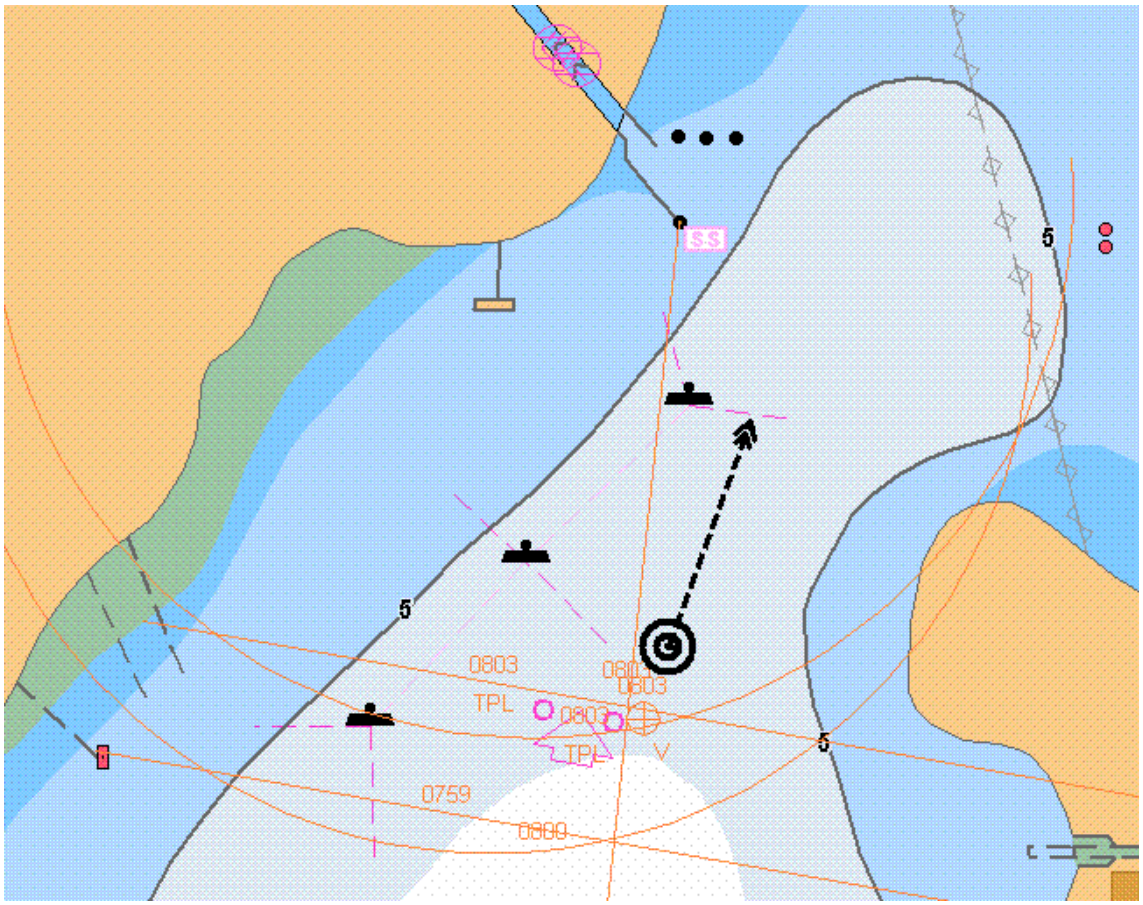
   The latitude and longitude that appear in the **Intersection** field give you a position fix.
6. To insert a position-fix object in the chart itself, click the **Define Position Fix** button.

When you use position lines whose measurements have been taken at different times, the system updates the old measurements by estimating the ship's movement since they were taken; this enables it to give a position fix appropriate to the time of the last measurement.

The figure below displays a position fix that has been obtained from two bearings and one range measurement.

The athwart bearing line (marked 0759) and the range position line (marked 0800) have been transferred to the last measurement time (marked 0803/TPL) before being intersected with the forward position line (marked 0803).

Figure 86 Sample position fix (using two bearings and one range measurement)



16.6 Using the curved EBL facility

The curved EBL is a tool that enables you to plan and execute a turn by specifying a fixed turn radius. The curved EBL tool can be operated in two modes: "Autopilot Mode" and "Planning Mode".

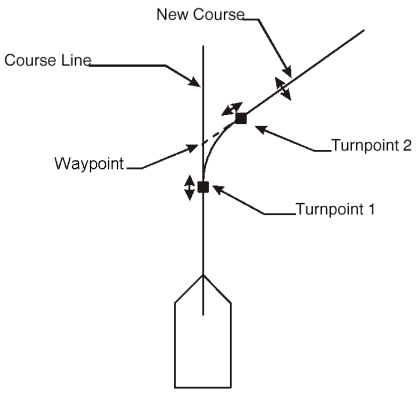
In Autopilot Mode, the turn will be executed immediately (or, if the Preset Turn box is checked, it will be executed immediately you click the **Activate** button in the Curved EBL menu; see *Trial Manoeuvre and Curved EBL* on page 473).

In Planning Mode, you can specify a particular time and distance to the beginning of the turn.

16.6.1 Specifying planned turns (planning mode)

1 Display the **Curved EBL** menu as follows: **Tools→Curved EBL**.

2 In the dialog select **Plan Mode** and **Enable** (see *Trial Manoeuvre and Curved EBL* on page 473.



3 Course after the manoeuvre

To set the course at the end of the manoeuvre drag the curved EBL using the trackball and **Left mouse** button, or in the **Curved EBL** dialog click the spin buttons for **New Heading** (see *The heading wheel* on page 41).

4 Distance to the manoeuvre

To set the distance to the start of the manoeuvre, drag the closest "▫" handle to the own-ship on the curved EBL, or in the **Curved EBL** dialog click the **Distance to Turn** spin buttons.

5 Turn radius

To set the turn radius for the manoeuvre drag the "▫" handle for Turnpoint 2 (see above) on the curved EBL, or in the **Curved EBL** dialog click the **Turn radius** spin buttons.

- The waypoint is not changed when you change the turn radius. This means that the time and distance to the start of the turn will change.

6 Start over again (if you want to)

Use the **Reset** button to set the parameters to their initial values if you want to start over.

7 Activate the route

- For systems fitted with an autopilot the curved EBL can be used as input to control the autopilot.
- The autopilot must be in command and operating in either heading or course mode.

Click **Activate** or press the **ACT TURN** button on the operator panel (see *The ACT TURN button* on page 38) to convert the curved EBL to an active route.

The autopilot will go into Track mode to execute the planned turn; the **Track** mode LED on the operator panel will be lit, and the **Route Monitor** dialog will be displayed.

Note

Execution of automatic steering along a track you have defined as a planned turn is not possible if another route is currently being monitored.

Also it is not necessary for planned turns to be verified before they are executed.

8 When you have completed the planned turn, exit Track mode (and revert to Heading mode, taking the current heading as set-point), by doing one of the following:

- Select **HDG** or **CRS** mode in the Autopilot Mode dialog.
- Press the **ACT TURN** button twice to enter Heading mode.

For more information, see *Track steering using the curved EBL tool* on page 253.

16.6.2 Aborting a planned turn

To abort a planned turn after activating it, press the **ACT TURN** button on the operator panel twice (see *The ACT TURN button* on page 38). This causes the autopilot to revert to Heading mode, using the current heading as its set-point.

16.6.3 Specifying preset turns (autopilot mode)

If you want to use the curved EBL as input to the autopilot, the autopilot must be in command of the vessel's steering gear, and the autopilot must be operating in either heading or course mode.

You can use the curved EBL to provide immediate input to the autopilot (on other words, to steer the vessel). Or by checking the Preset Turn box in the Curved EBL menu, you can delay the execution of the curved EBL until you click the **Activate** button (see *Trial Manoeuvre and Curved EBL* on page 473).

To use the curved EBL as input to the autopilot, do the following:

1 On the Nav OS console's operator panel, press **IN CMD** (see *The IN CMD button* on page 37).

2 In the Nav OS application, select **Route→Autopilot Mode**.

Then select either **Hdg** or **Crs** mode:

- **Hdg:** The selected heading and turn radius will be sent to the autopilot.
- **Crs:** The calculated drift is added to the heading order.

3 Press the **AUTO/PLAN** button once or select **Tools→Curved EBL**.

The **AUTO/PLAN** button is on the operator panel (see *The AUTO/PLAN button* on page 39). Press it once to bring up the Curved EBL dialog and to transition the display from the real-time view of the vessel to the view that enables you to plan a turn (press the button again to toggle back to the real-time view).

4 Select **ENABLE** in the Curved EBL dialog.

5 If you want the turn you specify to execute immediately, leave the **Preset Turn** box un-checked.

If you want to delay execution of the turn until later, check the Preset Turn box.

6 To set the course at the end of the manoeuvre drag the curved EBL using the track-ball and **Left mouse** button, or in the Curved EBL dialog click the spin buttons for **New Heading**.

During the period that the heading wheel and turn radius buttons are activated for the performance of an immediate turn, numeric values for the specification of the turn appear next to the curved EBL and the own-ship symbol.

7 To set the turn radius for the manoeuvre drag the "▫" handle on the **curved EBL**, or in the Curved EBL dialog click the **Turn radius** spin buttons.

The selected turn is executed either:

- immediately (if the **Preset Turn** box is un-checked),
- or (if the **Preset Turn** box is checked) as soon as you click the **Activate** button in the Curved EBL dialog or press the **ACT TURN** button on the operator panel (see *The ACT TURN button* on page 38).

The vessel's minimum and maximum turn radius are set in the **Ship** tab of the **Parameters Setup** dialog (see *Ship (tab)* on page 571). If you need to find out what they are, select either of the following:

- **OwnShip→Ship Parameters**
- **System→Parameter Settings→Ship (tab)**.

For more information, see*Using the curved EBL facility* on page 308.

16.6.4 Aborting an immediate or preset turn

With the autopilot operating in Heading or Course mode, you can abort an immediate or preset turn at any time either by:

- Changing the heading set-point (in other words, by performing a new immediate turn or a new preset turn)
- Or by pressing the **ACT TURN** button on the operator panel twice (see *The ACT TURN button* on page 38). This causes the autopilot to take the current heading as its set-point.

16.7 Sharing your markers and viewing remote markers

16.7.1 Letting other operator stations display your cursor, EBL/VRM and curved EBL

You can let people at other operator stations view the markers – that is, the cursor, EBL/VRM pair or pairs, and/or curved EBL – from your operator station on their screens.

This is useful, for example, if you are planning a turn using the curved EBL facility and before executing it you want someone else to see it who is standing at another operator station some distance from your own.

To make your markers available to other operator stations on the bridge:

1 Select **View→Remote Markers**.

2 Check the option to **Send Marker Data**.

3 Tell the person at the other operator station to follow the instructions for *Viewing the cursor, EBL/VRM and/or curved EBL from another operator station* on page 311.

16.7.2 Viewing the cursor, EBL/VRM and/or curved EBL from another operator station

To display the markers – that is, the cursor, EBL/VRM pair or pairs, and/or curved EBL – from another operator station on your screen, do the following:

1 Make sure the operator station whose remote markers you want to see is making them available to the other operator stations on the bridge (see *Letting other operator stations display your cursor, EBL/VRM and curved EBL* on page 311).

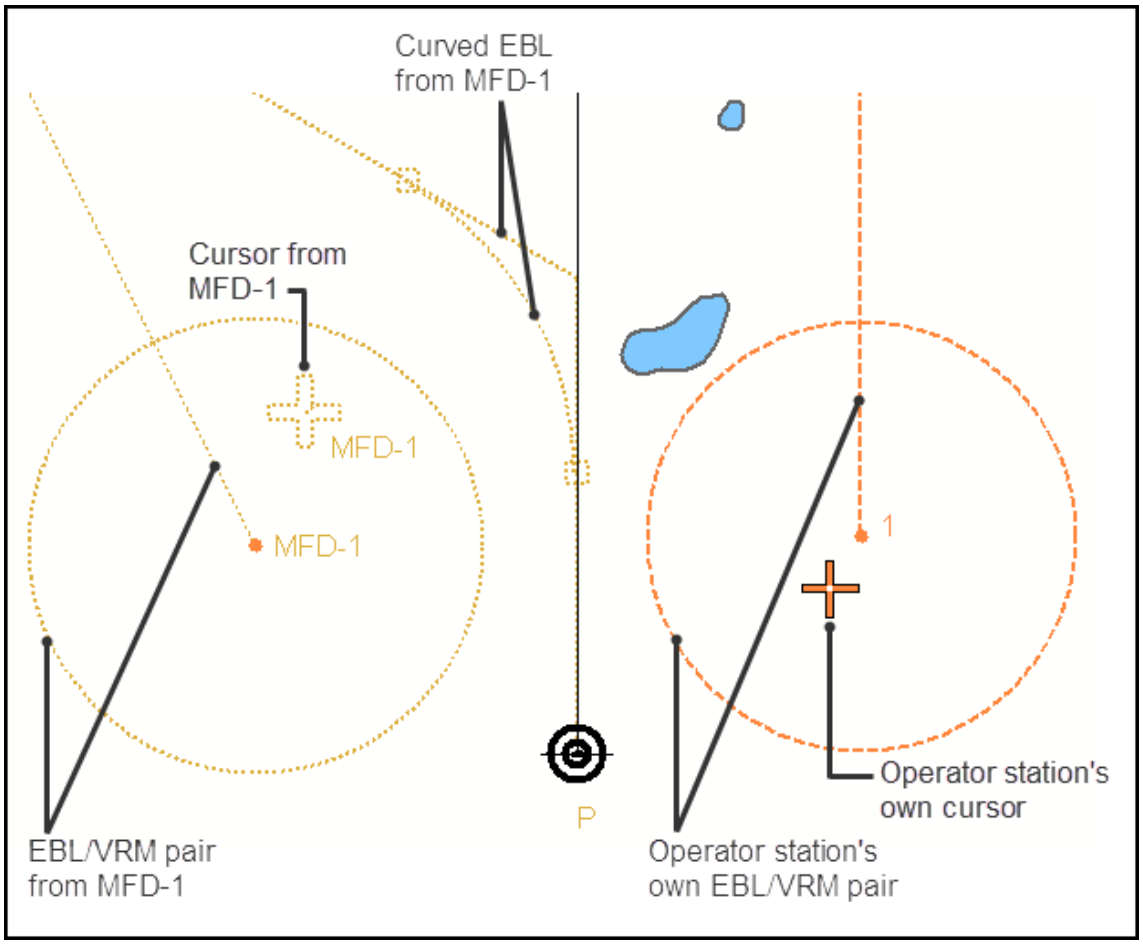
2 Select **View→Remote Markers**.

3 Select **Display Remote Markers**, and specify one or more of the sub-options **Cursor**, **EBL/VRM**, and **Curved EBL**.

4 From the **Source** drop-down menu, specify the operator station whose remote markers you want to see on your screen.

The remote markers you selected for the specified operator station now appear on your screen. They are labelled with the name of the operator station that provided them (for example, MFD-1) and their shapes are composed of faint yellow dots to distinguish them from the heavy orange lines and dashes used for the operator station's own markers.

Figure 87 Remote markers displayed alongside an operator station's own markers



16.8 Using the trial manoeuvre facility

The Trial Manoeuvre facility (available only in the Radar application) enables you to specify a point on the curved EBL at which to view the future position of the own-ship in relation to other vessels if the manoeuvre represented by the curved EBL is actually executed. (The Trial Manoeuvre facility shows the own-ship in relation to both tracked radar targets and reported AIS targets.)

In other words, the Trial Manoeuvre facility enables you to predict how close you will come to a collision with another vessel if you perform a specified turn.

16.8.1 Limitations

- The Trial Manoeuvre is available only when the own-ship has a speed of at least 1 knot.
- Only one manoeuvre of the own-ship can be simulated at a time. The manoeuvre can include both a course and speed change, but both must start simultaneously.
- It is assumed that the targets will continue at a constant course and speed. (Manoeuvres by the targets are not simulated.)
- You can move the trial distance point to any point on the manoeuvre's time/distance line. However, the maximum trial distance is the point that would be one hour's sailing from the own-ship's current position (given the specified New Speed and Speed Rates; see *Trial Manoeuvre and Curved EBL* on page 473).

16.8.2 Operation

1 Select true or relative motion for the display (see *ECDIS range panel: viewing controls* on page 88).

Note

Trial manoeuvre is most effective as a tool for collision avoidance when the radar is displaying in relative motion using water stabilisation.

2 Select ground or water stabilization by checking the Ground or Water radio button in the radar dashboard (see *Radar dashboard: the range panel* on page 79).

3 Click the following sequence in the menu area: **Own Ship→Trial**.

4 In the Curved EBL dialog (see *Trial Manoeuvre and Curved EBL* on page 473) select **Enable** and **Trial Man**.

- When the trial manoeuvre facility is running, a large green "T" flashes at the bottom of the radar area.

5 **Course after the turn**

To set the course after the turn, perform one of the following sequences:

- drag the curved EBL using the track-ball and **Left mouse** button

- in the **Curved EBL** menu click the spin buttons for **New Course**

- rotate the Heading wheel

- click the **Heading** buttons on the Heading wheel

See section 1.6 on page 41 for Heading wheel information.

6 Manoeuvre turn radius

To set the turn radius for the manoeuvre drag the second handle (marked "g" in the illustration) on the curved EBL, or in the **Curved EBL** menu use the **Turn radius** spin buttons, or click the **Turn radius** buttons on the Heading wheel.

- The waypoint is not changed when the turn radius is changed. This means that the time and distance to the start of turn will change.

7 Time or distance to the manoeuvre

To set the time or distance to the start of the manoeuvre, do one of the following:

- drag the first handle (marked "f" in the illustration) on the curved EBL
- in the **Curved EBL** menu use the **Time to Turn/Dist. to Turn** spin buttons
- click the **Distance To Turn** buttons on the Heading wheel

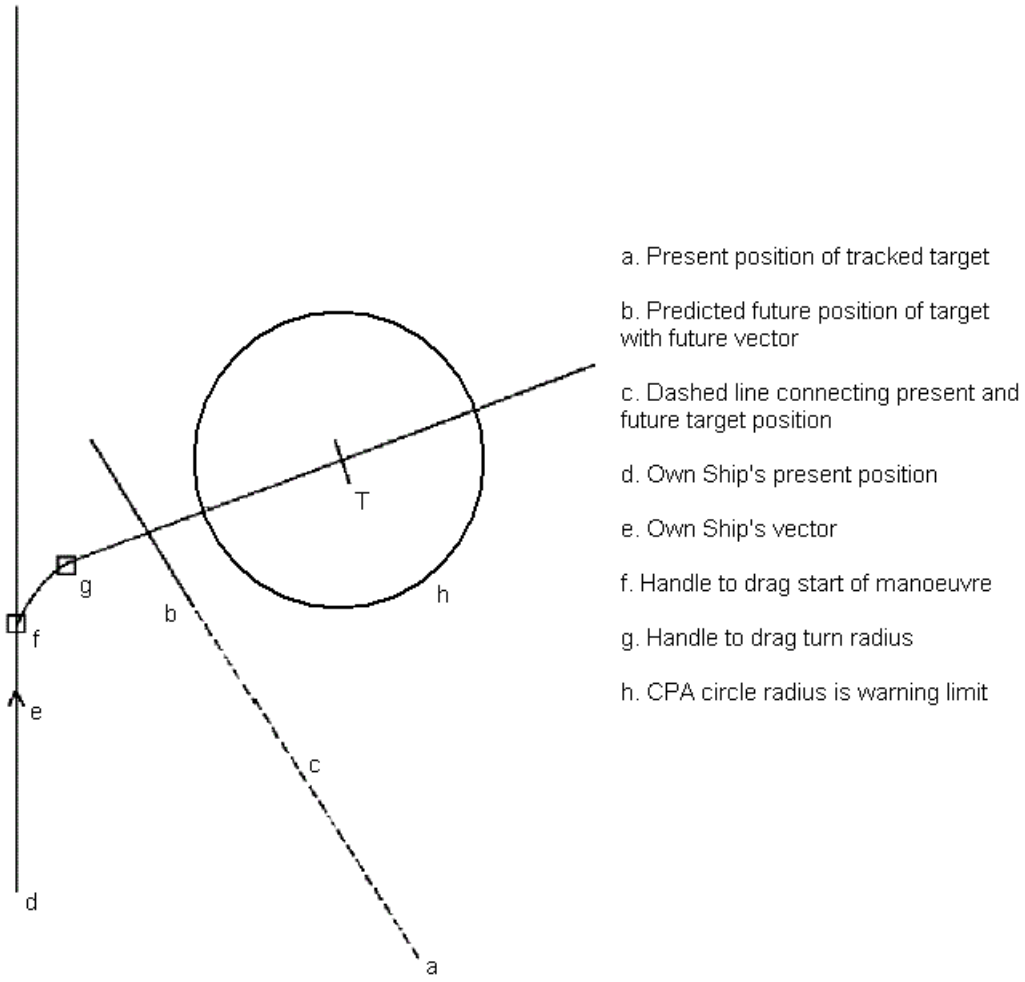
8 Speed to the Trial Manoeuvre point

To set the speed that the vessel is assumed to be travelling at for the purpose of the Trial Maneouvre calculations:

a In the **Curved EBL** menu use the spin buttons for **New Speed**.

b If the vessel is not currently travelling at the new speed, set a value for **Speed Rate**. This is the rate of acceleration or deceleration to be assumed from the vessel's current actual speed to the new speed

Figure 88 Example showing trial manoeuvre



9 Moving the Trial Manoeuvre point

The Trial Dist. value (in the Curved EBL menu) is a point on the time/distance line for the manoeuvre. It is marked by a "T" and a cross line on the radar display (see Figure 88 on page 315). Moving this point allows you to see the position of the own-ship and tracked targets at different points in the trial.

To move this point:

- Drag the cross line marked "T "on the curved EBL
- Or in the **Curved EBL** dialog use the spin buttons for **Trial Dist**.

Presentation of tracked targets

- Tracked targets are shown with a dashed line (marked "c" in the illustration) connecting their present position with their predicted position when the own-ship is at point “T”.

10 Target data

To see the data for a tracked target during trial manoeuvre, position the cursor at the present position of the target, and click **DATA** on the operator panel (see *The TARGET group buttons* on page 35). CPA and TCPA are the values for the trial manoeuvre.

11 CPA circle

Select **CPA Circle** in the **Curved EBL** dialog to draw a Closest Point of Approach circle around the own-ship symbol when it is at point "T".

The radius is the configured CPA limit.

To check if any targets will come closer than the CPA limit, drag the cross line representing the Trial Manoeuvre point and see if any targets come inside the CPA circle.

12 Activation of the trial manoeuvre

If the K-Bridge Radar is set up to control the autopilot, you can use the curved EBL from your Trial Manoeuvre to steer the ship. To do this, press the **ACT TURN** button on the ALC NAV panel (see *The ACT TURN button* on page 38) before closing the curved EBL window for the current Trial Manoeuvre.

The curved EBL is translated into a sailing route that the autopilot will follow. When the turn is completed the curved EBL is switched off.

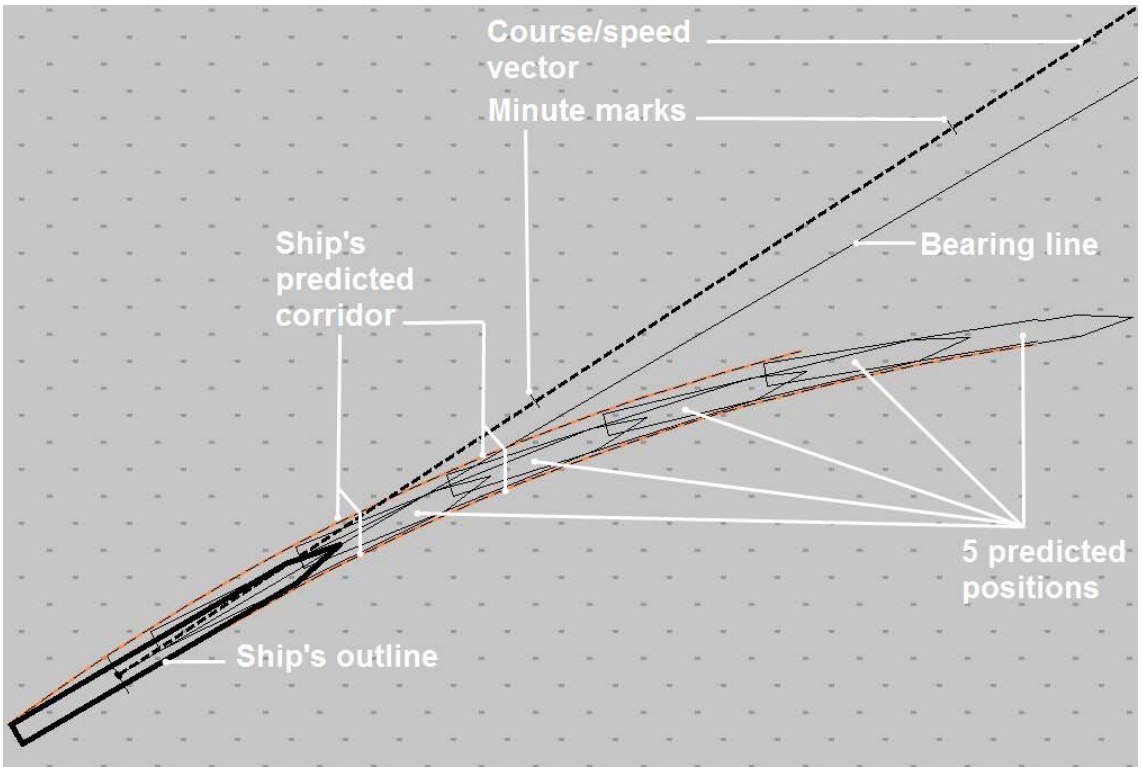
Caution

The predictions made by the Trial Manoeuvre facility assume that tracked targets continue at their current course and speed. This may not be the case. As a result of heavy sea or rain clutter, or for other reasons, the target vectors may be unstable. This will influence the quality of the CPA and TCPA predictions. Evaluate the situation carefully!

16.9 Displaying the own-ship's predicted movements

In the Radar and ECDIS applications you can display predicted positions for the own-ship, based on the its current heading, speed and rate of turn.

Figure 89 A ship's predicted "corridor" of movement and five predicted positions



To display the vessel's predicted movements:

1 If you are in the:

- Radar application, select **View→Main Radar Themes**, and check the **Display Ship Outline** option (see *Radar Themes* on page 371).

  Then select **System→Parameter Setup (Display tab)**.

- ECDIS application, select **System→Parameter Setup (Display tab)**, and check the **Display Ship Outline** option.

2 In the Display tab (see *Display tab* on page 565), check the **Predict Ship Movement** option.

The corridor of predicted movement and the predicted positions appear on the display.

3 Click **Setup** to specify the number of predicted positions you want to see, the interval (in seconds) between each predicted position, and the length (in seconds) of the corridor of predicted movement (see *Ship's movement predictor setup dialog* on page 568).

16.10 Identifying a target interception point

In both the Radar and ECDIS applications, you can identify a point at which to intercept a target, given the current speed and bearing of both the target and the own-ship.

The interception point can be based on either an absolute or a relative target position.

16.10.1 Using an absolute target position

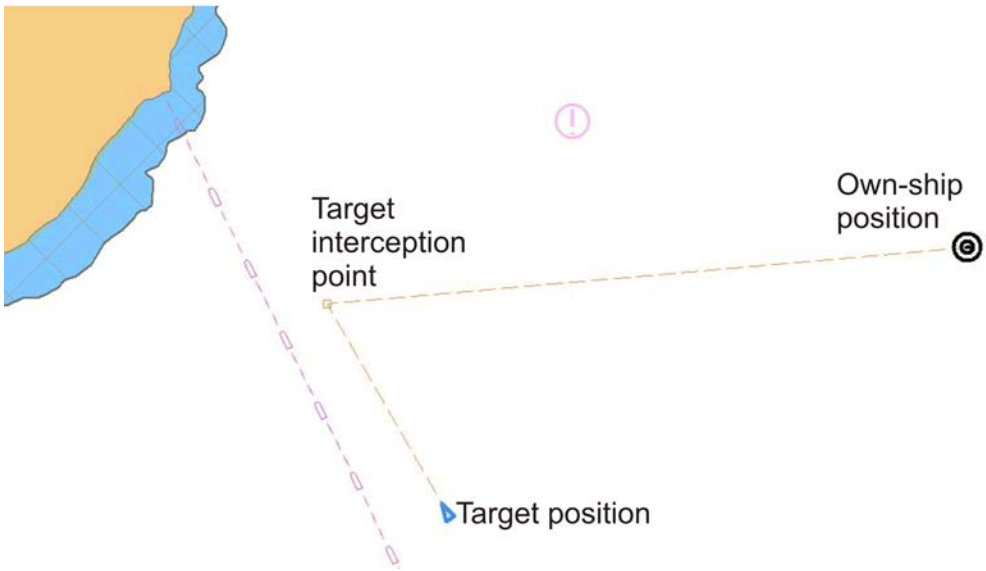
To find the point of interception between the target and the own-ship, do the following:

1 From the main menu select **Tools →Target Interception**.

2 Click **Select Target**.

This activates the Target Interception function. You can now use the cursor in the main area of the radar display to select a target.

When you have selected a target, the system computes a valid interception point (IP) and draws bearing lines from the own-ship to the IP and from the target to the IP. These lines will be updated once per second until you click the **Stop Tracking** button.



3 To stop tracking the IP for the selected target, click **Stop Tracking** in the Target Interception dialog.

For a full description of the Target Interception dialog, see *Target Interception* on page 558.

16.10.2 Using a relative target position

You can also use the Target Interception dialog to find out what the interception point would be between the target and the own-ship if the target were in a different position (relative to its current actual position). This can be useful, for example, for intercepting a target ahead of, behind or alongside the target.

1 From the Main Menu select **Tools →Target Interception**.

2 Click **Select Target** to activate the Target Interception function.

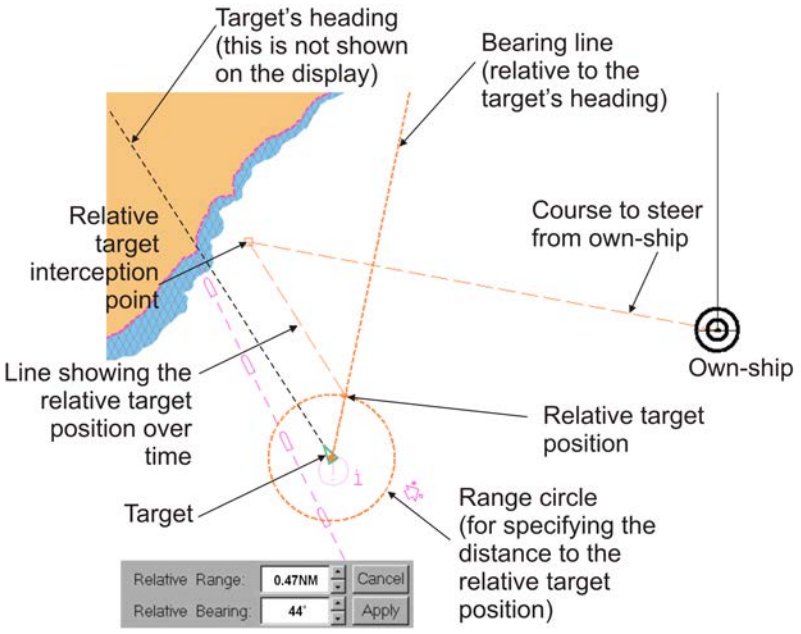
3 Specify the range and bearing values that define a position relative to the target's actual position.

Do this either by using the spin buttons for the relative range and bearing fields or by clicking the **R. Pos** (Relative Position) button.

Any of these three actions causes an EBL/VRM to be displayed with its centre on the selected target. Use the mouse or track-ball and left mouse-button to re-size the range circle and drag the bearing line (see *Using the EBL/VRM tool* on page 300). The EBL/VRM moves with the target.

Note

The relative range is given by the range circle, and when you re-size the range circle the new relative range is reflected in the Target Interception dialog. The relative bearing is given by the EBL. The bearing line is drawn on the chart relative to the target's heading, and when you move the bearing line the new value is reflected in the Target Interception dialog. The point at which the EBL intersects the range circle is the relative target position.



4 When you are happy with the range and bearing values, and with the relative target position you have specified, press the **Apply** button.

5 To stop tracking the IP for a particular target, click **Stop Tracking** in the Target Interception dialog.

For more information about the Target Interception dialog, see *Target Interception* on page 558.

16.11 Using the stopwatch and countdown facilities

The Radar, ECDIS and Conning applications all include a stopwatch and countdown facility.

16.11.1 Using the stopwatch

To use the stopwatch, do the following:

1. From the main menu, select **Tools →Stopwatch**.

   The Stopwatch dialog appears (for a description of this window, see *Stopwatch* on page 556).
2. To start the stopwatch, click the **Start** button.

   The clock starts counting in 1/100s of a second (and the **Start** button becomes a **Stop** button).
3. To record split times, click the **Split** button.
4. To stop timing, click the **Stop** button
5. To resume timing, click the **Start** button.
6. To reset the stopwatch to 00:00:00.00, click the **Reset** button.

16.11.2 Using the countdown facility

The countdown facility is available from the stopwatch dialog. It enables you to run the stopwatch in reverse, counting down in 1/100s of a second from a specified amount of time (instead of counting up from 00:00:00.00).

When the countdown reaches zero, it stops and an alarm is issued.

To use the countdown facility, do the following:

1. From the main menu, select **Tools →Stopwatch**.

   The Stopwatch dialog appears (for a description of this window, see *Stopwatch* on page 556).
2. Check the **Count down** box.
3. In the upper time field, type in the amount of time that you want to count down from.
4. Click the Start button.

   The clock starts counting down in 1/100s of a second (and the **Start** button becomes a **Stop** button).
5. To record split times, click the **Split** button.
6. To review split times, use the arrow buttons.
7. To stop counting down, click the **Stop** button.
8. To resume counting down, click the **Start** button.
9. To reset the counter to 00:00:00.00, click the **Reset** button.

When the countdown reaches zero, it stops and an alarm is triggered.

16.12 Calculating the time, distance and speed for a journey

To calculate the time, distance and speed for a planned journey, use the Time/Distance/Speed calculator.

To use this, from the main menu, select **Tools →Time/Distance/Speed calc**, then follow the instructions below.

For a description of the Time/Dist/Speed dialog, see *Time/Distance/Speed Calculator* on page 557.

16.12.1 Calculating the time a journey will take

To calculate the time that a journey you are planning will take:

1. Type in the journey's distance (check the 'm' box if you are using metres instead of nautical miles).
2. Type in the speed you expect to travel at (check the 'm/s' box if you are using metres per second instead of knots).
3. Click the **Time** button.

16.12.2 Calculating the distance of a journey

To calculate the distance of a journey:

1. Type in the speed at which you expect to travel on average (check the 'm/s' box if you are using metres per second instead of knots).
2. Type in the time you expect the journey to take.
3. Click the **Distance** button.

16.12.3 Calculating the speed required

To calculate the average speed you need to maintain to cover a specified distance in a specified time:

1. Type in the distance for the journey (check the 'm' box if you are using metres instead of nautical miles).
2. Type in the time you expect the journey to take.
3. Click the **Speed** button.

16.13 Using the trip meter

A trip meter is provided in the Tools menu to enable you to record the distance covered for a particular journey. You can also use it in reverse (by checking the **Count down** box) to measure the distance that remains to be covered for a journey of a specified distance.

For more information about the Trip Meter window, see *Trip Meter* on page 555.

16.13.1 Measuring the distance travelled

When you are ready to start measuring the distance travelled by the vessel, do the following:

1. From the main menu, select **Tools →Trip Meter**.
2. In the Trip Meter window, press the **Start** button.

   The trip meter starts recording the distance travelled in nautical miles (also the **Start** button changes into a **Stop** button).
3. To record split distances, click the **Split** button.
4. To review split distances, use the arrow buttons.
5. To stop the trip meter, click the **Stop** button
6. To resume, click the **Start** button.
7. To reset the trip meter to 0.00, click the **Reset** button.

16.13.2 Measuring the distance that remains to be travelled

To measure the distance that remains to be covered for a journey:

1. From the main menu, select **Tools →Trip Meter**.
2. Check the **Count down** box.
3. In the upper distance field, type in the total distance for the journey.
4. To start counting down the distance click the **Start** button.
5. To record split distances, click the **Split** button.
6. To review split distances, use the arrow buttons.
7. To stop the trip meter from counting down the distance, click the **Stop** button
8. To resume, click the **Start** button.
9. To reset the trip meter to 0.00, click the **Reset** button.

When the trip meter's distance countdown reaches zero, it stops and an alarm is triggered.

16.14 Using the anchor watch function

The radar system has a built in anchor watch function that can be applied either to the own-ship or to a target vessel.

16.14.1 The own-ship anchor watch facility

1 Select: **Own Ship→Anchor Watch**.

2 Click the **Bow To APOS** to set the own-ship's current position as the anchor watch position.

3 Enter a deviation limit using the track-ball and **Left mouse** button.

For more information, see *Own Ship Anchor Watch* on page 471.

4 Select **Active** to activate the alarm if the own-ship's position deviates more than the specified limit from the anchor watch position.

16.14.2 The target anchor watch facility

1 Click the following sequence of softkeys in the menu area: **Targets→Target Anchor Watch**.

2 Select the tracked target you want to watch using the track-ball and **Target Data** button.

3 Click the **Set Current** button to set the target's current position as the anchor watch position.

4 Enter a deviation limit using the track-ball and **Left mouse** button.

5 Select **Active** to activate the alarm if the target position deviates more than the limit from the anchor watch position.

See section 20.3.6 on page 410 for more information.

16.15 Logging the voyage details

16.15.1 Configuring and saving the past track log

The system keeps a continuous record of the ship's past track for the last 12 hours. It records the following details:

Table 21 Past track parameters

Past track	**Chart**
Time	ENC source
Position	Edition
Heading	Date

Table 21 Past track parameters (cont'd.)

Past track	Chart
Speed	Cell
	Update history

To change the settings or to save the past track log do the following:

1 To display the past track, select **View→Main Radar Themes** and select **Own Ship Past Track** (to display the track as a thick line) and **Past Track Labels** (to display the time at the various positions).

2 On the monitor select **OwnShip→12 hr Log Control**.

3 Select the **Track** tab (see section *Track tab* on page 573).

4 Use the **Log Interval** spin buttons to change the time between each logging (or select the box and type in the interval). In most cases the initial setting of logging every 10 seconds is sufficient (adjustable between 5 and 60 seconds).

5 Use the **Past Track Displayed** spin buttons to select how many minutes of track history you want displayed.

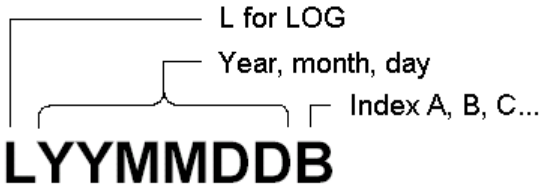
6 Use the **Past Track Label Interval** spin buttons to specify the interval between time labels on the past track line.

7 Click **Save to Folder** to save the track log to the system hard disk.

8 To select a filename or to reduce the interval for the log file click **Save As**. Specify the file name and the interval. Click **Save to Folder**.

9 Click **Save to Medium**.

10 Specify the filename and the interval.



11 Click **Save to Medium**.

16.15.2 Recording the voyage

The system can record the own-ship's track for the entire voyage. The navigator chooses the recording interval and defines the voyage by manually starting and stopping recording. Where a voyage includes several ports, the voyage recording can be paused on reaching a port and resumed on leaving it again.

Do the following:

1 Select **OwnShip→Voyage Recording**.

2 Select the **Voyage** tab. See section 20.10.2.5 on page 577 for more information.

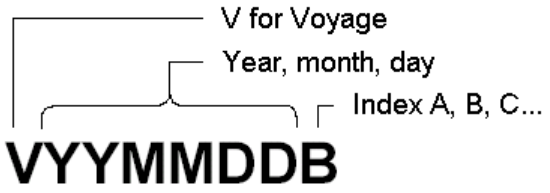
3 Use the **Voyage Display Label Interval** spin buttons to change the time between each logging (or select the box and type in the interval).

In most cases the initial setting which logs data every 10 seconds is sufficient (but you can choose a setting of between 5 and 60 seconds).

4 Use the **Past Track Displayed** spin buttons to specify how many minutes of track history you want displayed.

5 Use the **Past Track Label Interval** spin buttons to specify the interval between time labels on the past track line.

6 Click **Start New Voyage** to start saving voyage data to the system hard disk. The file name will be as follows:



7 Click **End Voyage** when you have reached port or want to end voyage recording.

8 Click **Resume Voyage** to continue the voyage after calling at a port.

9 Click **Voyage List** to display a list of recorded voyages and past track logs.

16.15.3 Replaying past track or voyage logs

Saved track and voyage logs can be replayed when required. Do the following:

1 Select **Own Ship→Recording List**.

2 Select the **Track Log** or **Voyage Log** you want to replay.

3 Click **Display**.

4 Click **Replay**.

Caution

When you click the Play button the displayed information comes from the log file. The yellow REPLAY is ON button is a warning that the own-ship's current position is not displayed. Click this button or click Cancel to display the own-ship's current position.

Note

The system keeps track of the best chart available for every position, but it does not keep track of the scale used or the chart that was actually displayed at each position during the voyage.

The progress indicator gives an impression of where in the log file the replay is currently located.

5 Drag the slider to move quickly to a different location in the file.

6 To replay faster or slower than the original recording use the **Speed** spin buttons.

7 Select **Interpolate** to view a smooth replay between recorded intervals.

16.15.4 Viewing the past track or voyage log as text

The past track or voyage log can be viewed as text. To view it this way, do the following:

1 Select **Own Ship→Recording List**.
2 Select the log file you want to view by clicking it.
3 Click **Show Text**.
4 Specify the start time for the part of the logged data that you want to see.
5 Specify the end time for the part of the logged data that you want to see.
6 Optionally specify the time interval you require between the items of logged data displayed.
7 Check the **Print AIS and ARPA Targets** button if you want to include AIS and ARPA Target data in the logged information displayed. (However, you need to be aware that this might produce a lot of output.)
8 Click **Show as Text**.

16.15.5 Printing out the past track or voyage log

The past track or voyage log can be displayed or printed on a separate PC. However the recorded data is protected against manipulation and requires a special program to be displayed. Do the following:

1 Insert a removable medium into the operator station computer.
2 Select **System →Maintenance**.
3 Click **Copy Log Decoding Program to Medium**.
   - The program is saved to the medium.
4 Do one of the following:
   - Select **OwnShip→Recording List**, then:
     a From the list, select the voyage log file that you want to view.
     b Click **Back-up**.
     c Note down the file name, for example, `V120822A.voy`.
   - Select **OwnShip→12hr Log Control**, then:
     a Click **Save to Medium**.
     b Note down the file name, for example, `L120909A.log`.
5 Click **Save to Medium**.
6 Take out the removable medium and insert it into a separate PC.
7 Open a command prompt window by selecting:

   Windows Start→Run...

   and typing:

   `cmd`

8 Go to the directory that you saved the log decoding program to and run the setup file (`ListLogInstall.exe`).

When prompted, specify an installation path for the program.

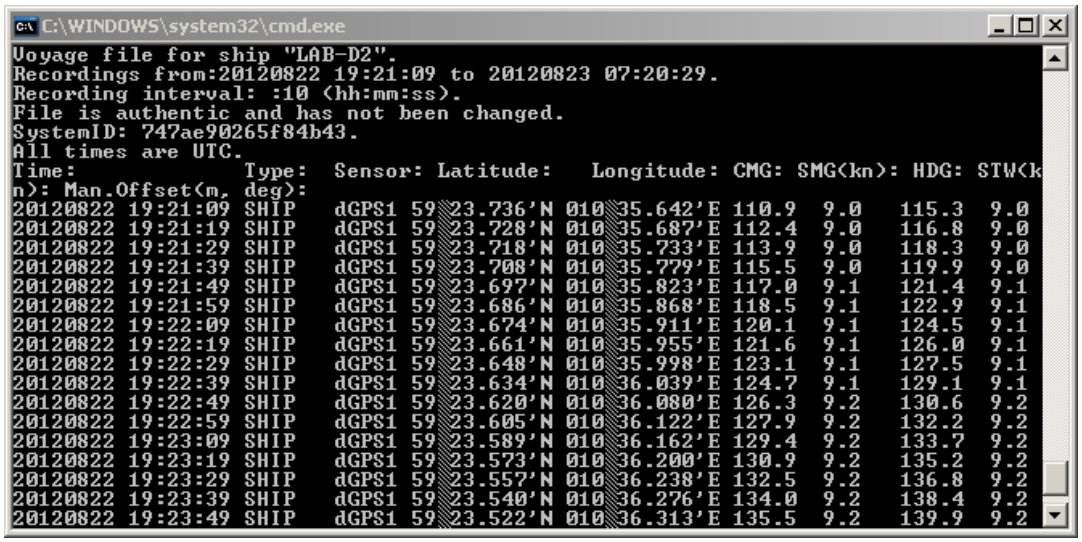
The program creates a bin folder at the destination you specified; the folder contains some executable files (one of which is called `ListLog.exe`).

9 When the installation finishes, copy the voyage or past track log file that you previously saved into the same folder as the new executables.

10 To display the file on the screen, run the `listlog` program from the command line, giving it the name of the log file as a parameter; for example:

```
listlog V120822A.voy |more
```

Use the `|more` parameter if the file is too long to view in the command window.



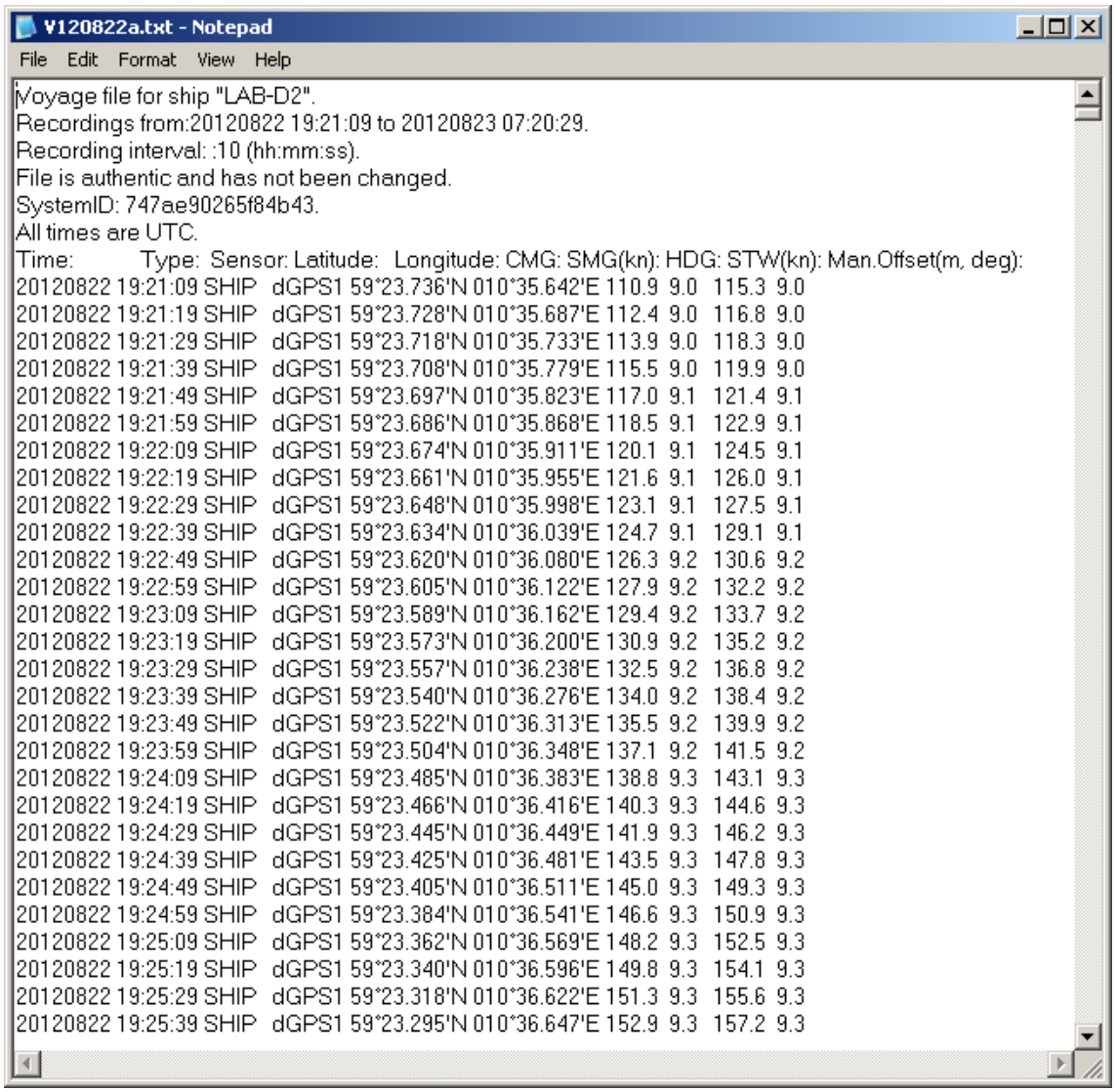
11 Before you can print out the log, you must create an ASCII text file containing it.

To do this, run the `listlog` program from the command line, but this time give it as parameters both the name of the log file and a name for the target text file (the target filename must have a > (greater than) sign before it). For example:

```
listlog V120822A.voy >V120822A.txt
```

12 The file can now be opened, viewed and printed from a text editor.

Figure 90 A sample voyage log converted to text and viewed in Windows Notepad



16.16 Capturing depth data for other applications

Depth recording is an option and is not available with all systems. Depth files are stored in binary format. If you want to use the depth recording for other purposes do the following:

1 Save the depth file to disk (see *Backup Depth Recording* on page 467).

2 Use the Voyage/Log printout program to read the file (see *Printing out the past track or voyage log* on page 327).

3 The data is converted to an alphanumeric format that can be interpreted by other programs.

Figure 91 Text output from depth file

```
A:\>listlog
Usage: listlog [-h] logfile [ fromtime totime ]


A:\>listlog  e011220a.ech
Sensor recording file for ship "d/s Southern Comfort".
Recordings from:20011220 12:14:36 to 20011220 12:26:21.

File is authentic and has not been changed.
All times are UTC.
Time:          ------>     Type:     Sensor: Latitude:       Longitude:
Value:
20011220 12:15:00 SENSOR Depth2 59¦29.948'N 179¦58.931'E  17.90
20011220 12:15:06 SENSOR Depth2 59¦29.953'N 179¦58.986'E  17.20
20011220 12:15:09 SENSOR Depth2 59¦29.959'N 179¦59.053'E  17.20
20011220 12:15:16 SENSOR Depth2 59¦29.969'N 179¦59.170'E  22.00
20011220 12:15:24 SENSOR Depth2 59¦29.979'N 179¦59.284'E  21.00
20011220 12:15:31 SENSOR Depth2 59¦29.989'N 179¦59.398'E  19.80
```

17 Alert handling

This section contains the following topics:

17.1 Introduction

This chapter describes the different ways of acknowledging – and also of viewing lists of – alerts on the MFD unit.

For descriptions of all the navigation alerts and system operator messages you might see on the operator station, see *Alerts and Operator Messages* on page 665.

17.2 Alerts that must be acknowledged from the station that generated them

Most category A alerts can only be finally acknowledged from the operator station that generated them.

The reason for this is that these alerts are associated with graphical information that you must see when you evaluate them. And, because you can only see the information at the operator station that generated the alert, maritime regulations dictate that you acknowledge the alert from that operator station.

There are some exceptions. For example, you can acknowledge **XTD** alerts (as well as **ALARM** group alerts that are associated with critical point notes on a chart) from any operator station. It is true that these alerts have graphical information associated with them. However, the graphical information is part of the route data that is distributed over the network to all operator stations. And, since you can see it on all operator stations, there is no need for the alerts associated with it to be acknowledged only from the operator station that generated them.

The following category A alerts can be acknowledged from operator stations other than the operator station that generated them (see *Navigation system alerts* on page 668):

- AP turn pre-alert, Ship will turn in nn min
- AP turn pre-alert, WOP will be passed in nn min
- AP turn, Ship will turn in nn sec
- AP turn pre-alert, WOP will be passed in nn sec
- Autopilot off course
- Critical point reached
- Deviation between heading sensors
- Position deviation
- Too many AIS targets
- XTD limit exceeded

Although you cannot finally acknowledge most category A alerts except from the station that generated them, you can use the alert group buttons to acknowledge these alerts locally: the alerts will then be acknowledged as far as the operator station you are using is concerned and as far as any other operator stations on the network are concerned

except for the originating one. Therefore any flashing and audible sound caused by those alerts on the local operator station (and on the other operator stations on the network, except the originating one) will cease.

17.3 Handling target alerts in ECDIS

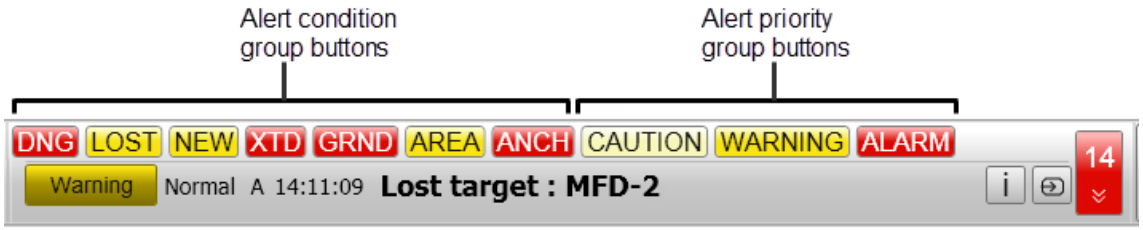
If you have radar targets and/or video displayed on the ECDIS charts or if your operator station is an MFD with both ECDIS and radar running on it, note that:

- Radar target alerts generated locally will not cause the alert group buttons to flash on the local ECDIS top bar.
- AIS target alerts will cause the **DNG**, **LOST**, and **NEW** buttons to flash on the local ECDIS top bar.
- Radar target alerts will only appear in the lists of alerts displayed in the local ECDIS if they have been generated by a Radar application running on another operator station.

17.4 Acknowledging alerts using the buttons on the top bar

For an explanation of how to use the alert group buttons to acknowledge alerts, see *The alert condition group buttons* on page 61 and *The alert priority group buttons* on page 65.

Figure 92 The alert group buttons on the top bar



The alert message on the top bar always presents the most recent unacknowledged alert.

17.5 Acknowledging alerts using the operator panel

When an alert group button is flashing on the top bar:

1 Press the **SOUND OFF** button on the operator panel to silence the audible sound associated with an alert (see *The Alarms group* on page 39).

2 Press the **ACK** button to bring up the Alert Group dialog.

Pressing the **ACK** button once brings up the Alert Group dialog if it is not already displayed (see *Acknowledging alerts in the Alert Group dialog* on page 336).

3 Press the **ACK** button again to acknowledge all unacknowledged alerts in the currently displayed group.

4 If the current alert list is longer than the Alert Group dialog box and contains unacknowledged alerts that have not been displayed, scroll down and display them.

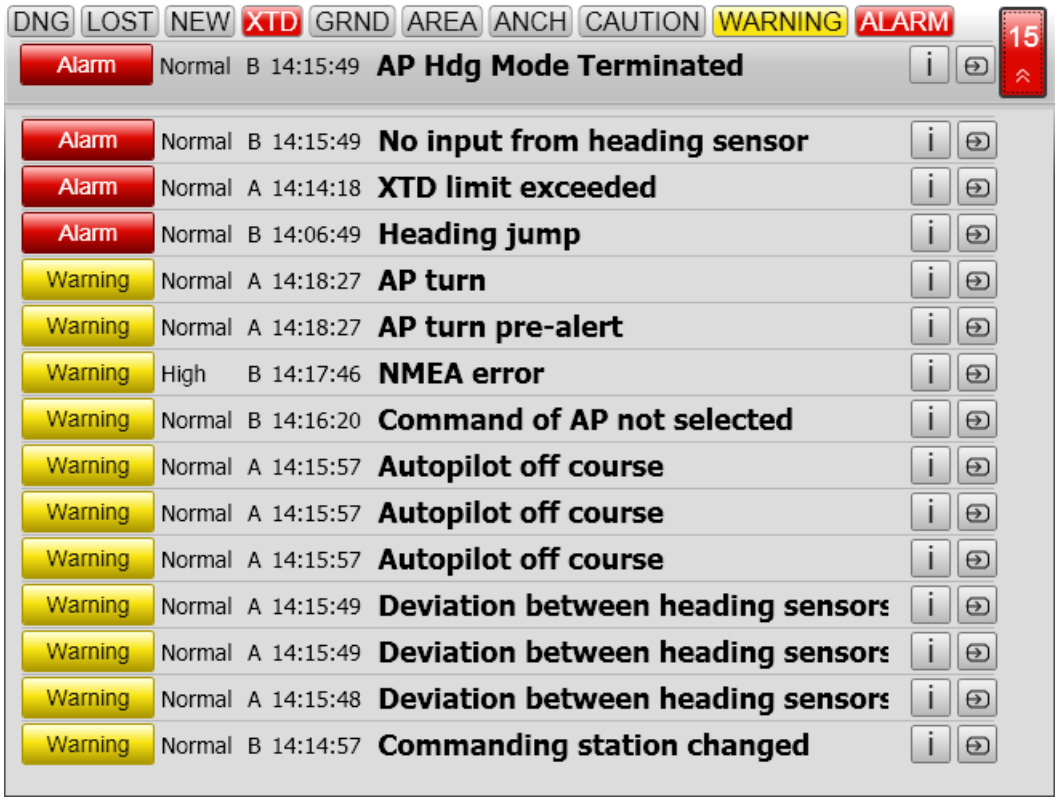
Note that you can only acknowledge alerts that have been displayed.

5 Use the **ALARM VIEW** button on the operator panel to cycle through the alert groups displayed in the dialog, and press the **ACK** button to acknowledge the alerts in each displayed group.

17.6 Acknowledging alerts using the unacknowledged alerts list

To see a list of all unacknowledged alerts, click the unacknowledged alerts button on the top bar (see *The Unacknowledged alerts button* on page 69).

Figure 93 The unacknowledged alerts list



To acknowledge:

- The alert at the top of the list (in other words, the alert currently displayed on the top bar), click the priority button to the left of the alert on the top bar (see *The Alert priority button* on page 66).
- An alert in the list, click the priority button to the left of the alert in the list (see *The Alert priority button* on page 66).

When you click the priority button for an alert, all alerts that have the same text as the one whose priority button you clicked are acknowledged (whichever operator station generated them).

17.7 Acknowledging several alerts at once

While the alert list for an alert group is displayed (in the Alert Group dialog), you can acknowledge all unacknowledged alerts in that group that have already been displayed with a single press of the **ACK** button on the operator panel.

To bring up the Alert Group dialog, click on one of the alert group buttons on the top bar or press the **ALARM VIEW** button on the operator panel (see *The Alarms group* on page 39).

You can only acknowledge alerts that have been displayed. If the list is longer than the dialog box and contains unacknowledged alerts that have not been displayed, you must scroll down and display them before they can be acknowledged.

For more information, see *Acknowledging alerts in the Alert Group dialog* on page 336

17.8 Acknowledging alerts that have been received by several consoles

Alert lists on a particular operator station will include alerts originating from that operator station as well as alerts originating from other operator stations. The origin of each alert is shown in the **Origin** column in the tables of alerts displayed in the Alert Group dialog and in the large Alert List dialog (see *Viewing current and past alerts* on page 336). You can always see which message you are acknowledging and which operator station (or other piece of equipment) issued it.

When a sensor is connected to more than one operator station, all operator stations will probably detect a malfunction related to the sensor. When an identical alert exists on different operator stations, you only need to acknowledge it on one of them.

There are also alerts that you can only acknowledge from the operator station that generated them, see *Alerts that must be acknowledged from the station that generated them* on page 332.

17.9 Silencing alerts from other consoles

If several K-Bridge consoles are connected together on a Local Area Network (LAN), an alert on one of them can be silenced from any of the others by means of the **SOUND OFF** button on the remote console's operator panel (see *The Alarms group* on page 39).

17.10 Viewing current and past alerts

The sub-sections below tell you how to use two dialogs – the Alert Group dialog and the large Alert List dialog – for listing current and past alerts.

These dialogs enable you to acknowledge particular alerts, view the entire alert history, and view the history of alert messages associated with a particular alert condition.

To access the:

- Alert Group dialog, click the button on the top bar for the alert group you require (see *The alert condition group buttons* on page 61 and *The alert priority group buttons* on page 65).

  For information about using the Alert Group dialog, see *Acknowledging alerts in the Alert Group dialog* on page 336.

- The large format Alert List dialog (containing all the current alerts), click the **All Active Alerts** or **Alert History** button in the Alert Group dialog.

  The large format dialog is not available in the Radar application, because it would obscure the radar image on the screen.

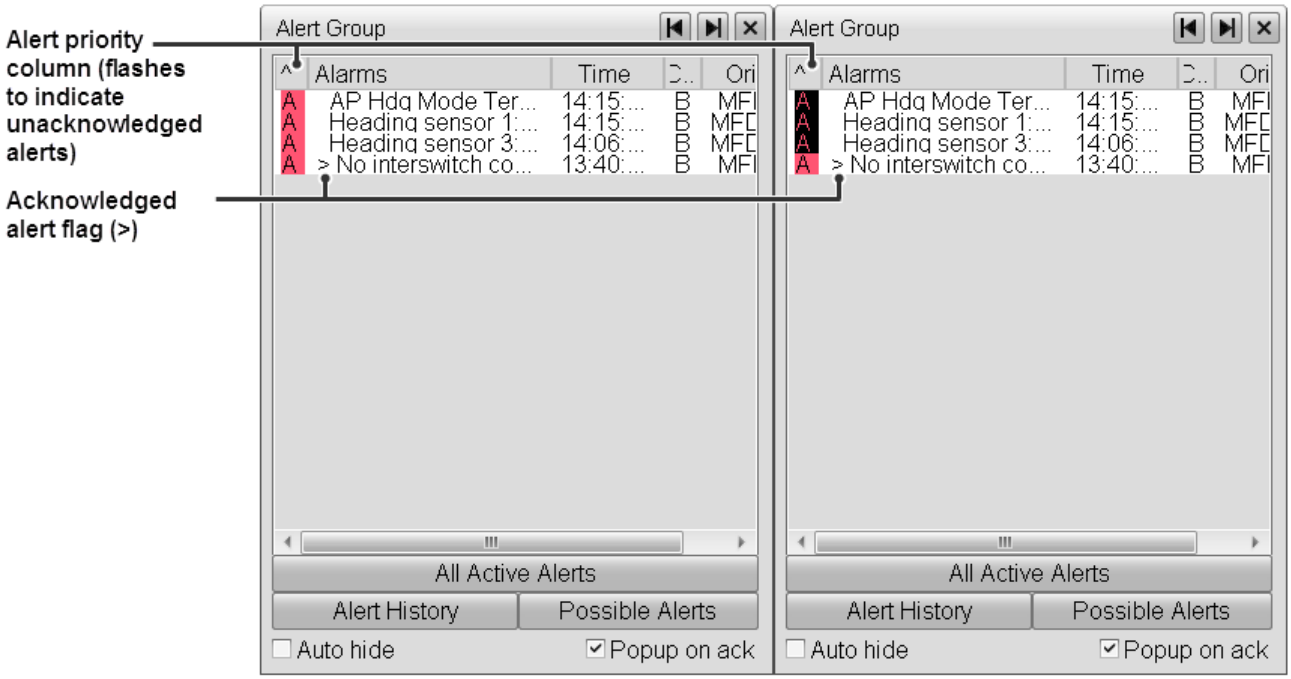
  For a description of the Alert List dialog, see *Acknowledging alerts in the large-format Alert List dialog* on page 339.

17.10.1 Acknowledging alerts in the Alert Group dialog

To view all currently unacknowledged alerts in an alert group, click the relevant alert group button on the top bar:

The Alert Group dialog appears, listing the active alerts for the group whose button you pressed.

Figure 94 Alert Group dialog (with flashing priority column)



The alerts in the list for each alert group button are all of a single priority. The leftmost field of each row in the dialog's table contains a letter indicating the priority: A for alarms, W for warnings, and C for cautions.

For:

- Unacknowledged alerts, the form of the priority letter alternates rapidly between black text on a coloured background and coloured text on a black background: the colours are RED for alarms, YELLOW for warnings, and OFF-WHITE for cautions.

  The effect for alarms and warnings is of a flashing indicator enabling you to identify unacknowledged alerts at a glance. (Caution alerts will not flash, because they are automatically acknowledged as soon as they are generated.)

- Acknowledged alerts, this letter is black on a solid (non-flashing) coloured background: the background is RED for alerts and YELLOW for warnings.

As well as a priority each navigation alert has a category of severity: A, B, or C (A is the most urgent). This appears in the fourth column of the table, to the right of the time-stamp. For a general description of the priorities and categories of severity, see *The Alert priority button* on page 66.

You can toggle the dialog between alert groups by pressing the **ALARM VIEW** button on the operator panel when the Alert Group dialog is already displayed. Alternatively, just click another alert group button on the top bar to see the list for another group.

To acknowledge all currently un-acknowledged alerts, press **ACK** on the operator panel (see *Acknowledging several alerts at once* on page 335).

To acknowledge an individual alert in the list, double-click on it, or right-click on it and select **Acknowledge**.

Note

You can only acknowledge alerts that have been displayed. If the list is longer than the dialog box and contains unacknowledged alerts that have not been displayed, you must scroll down and display them before they can be acknowledged.

To see a description of an alert, right-click on it and select **Info ...**. This brings up the Alert Information dialog: the explanation for the message you selected appears at the top of the Alert Information dialog (see *The Alert help button and the Alert Information dialog* on page 68).

To bring up the most relevant dialog for an alert, right-click on it and select **Navigate**.

The Alert Group dialog contains all or some of the following controls, depending on the application you view it in:

- **All Active Alerts:** In ECDIS and Conning, click this button to see a large-format list of all active alerts from all alert groups (see *Acknowledging alerts in the large-format Alert List dialog* on page 339).
- **Alert History:** In ECDIS and Conning, click this button to see a large-format history of the alerts in the group whose listing is currently displayed in the Alert Group dialog (see *Viewing the history for an alert group* on page 340).
- **Possible alerts:** In Radar, ECDIS and Conning, click this button to display a list of all the ECDIS, radar, autopilot and speedpilot alerts you can receive on the MFD system. The list appears in the Alert Information dialog. Click on one alert in the list to read an explanation of it (see *The Alert help button and the Alert Information dialog* on page 68).
- **Pop-up on ack:** Check this option to make the Alert Group dialog appear whenever you acknowledge an alert. Once it is displayed, the next time you press the **ACK** button on the operator panel, all un-acknowledged alerts that have already been displayed will be acknowledged.
- **Auto-hide:** Check this option to make the Alert Group dialog close automatically a few seconds after it has displayed.

17.10.2 Acknowledging alerts in the large-format Alert List dialog

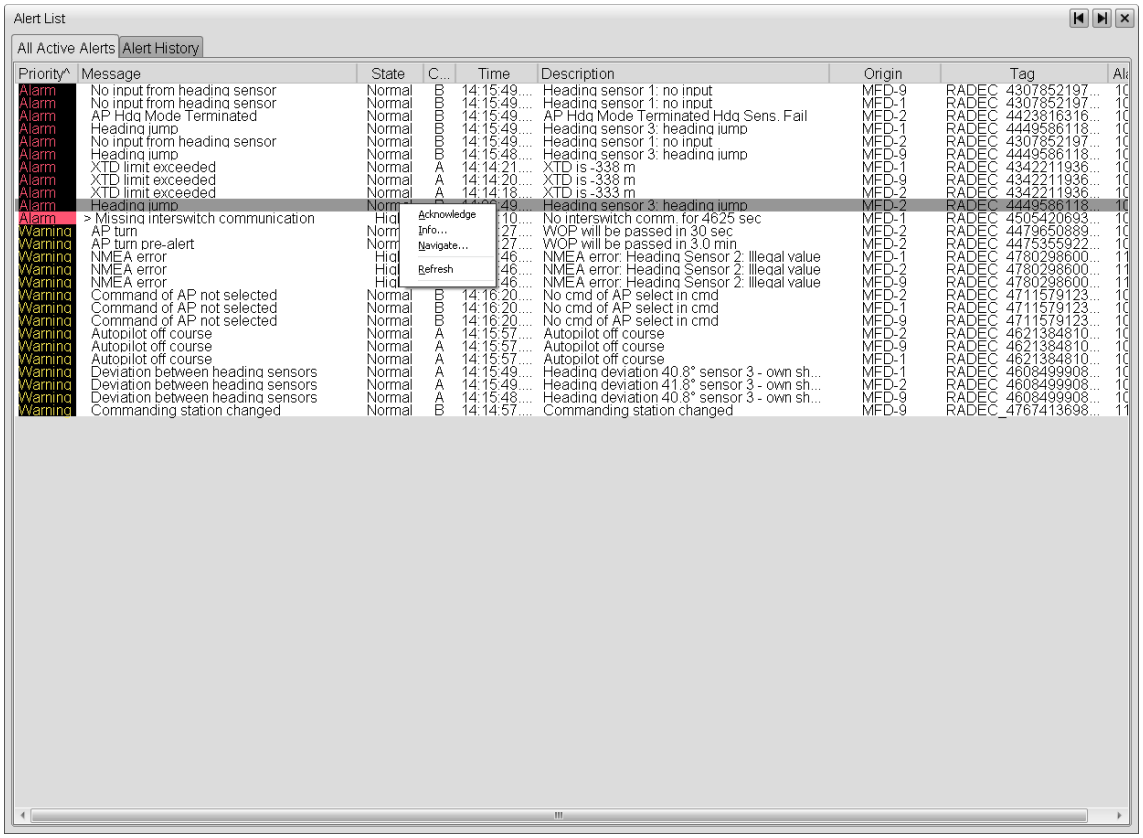
When you click the **All Active Alerts** button in the Alert Group dialog (see *Acknowledging alerts in the Alert Group dialog* on page 336), a list of all active alerts (from all alert groups) appears in a large new dialog and on a tab called **All Active Alerts**.

The colour coding, priority and category of severity indications are the same as for the Alert Group dialog except that the text of the priority label in the lefthand column uses the whole word instead of an initial letter.

The large-format alert list contains both the “Message” and a “Description” for each alert: the message text is the same as the text that appears for the alert in the top bar and in the unacknowledged alerts list (see *The Unacknowledged alerts button* on page 69). For some alerts the description provides additional and more specific information; for others it simply repeats the message text.

The same right-click menu functions are available for the large-format list as for the Alert Group dialog (see *Using the right-click menu for the Alert Group and Alert List dialogs* on page 340).

Figure 95 The large format Alert List (right-click menu showing)



17.10.3 Using the right-click menu for the Alert Group and Alert List dialogs

Select an alert in the small- or large-format list, and right-click on it to bring up a menu containing the following options:

- **Acknowledge:** Select this option to acknowledge the selected alert.
- **Info ...:** Select this option to see a description of an alert in the small- or large-format list. The Alert Information dialog comes up, with the explanation for the message you selected appearing at the top (see *The Alert help button and the Alert Information dialog* on page 68).
- **Navigate:** Select this option to bring up the most relevant dialog for an alert. The effect is the same as clicking the most-relevant dialog button (see *The Most-relevant dialog button* on page 68).

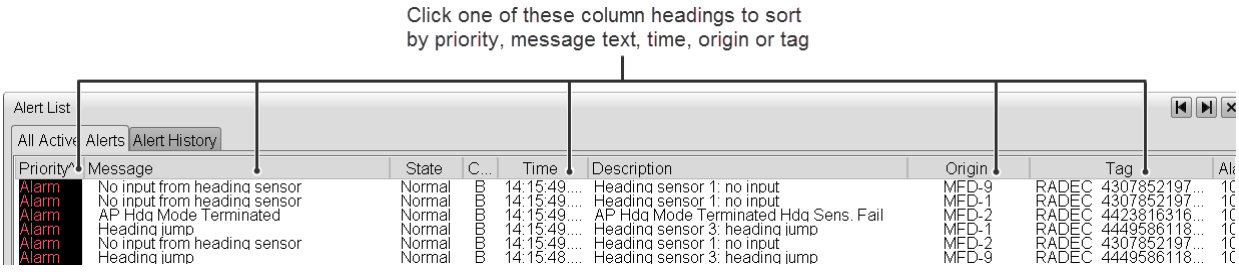
The **Info ...** and **Navigate** options only work for ECDIS, radar, autopilot or speedpilot alerts.

17.10.4 Sorting alerts in the Alert List dialog

In the All Active Alerts and Alert History tabs in the Alert List dialog, you can sort the alerts by priority, time, message text, origin, or tag number. To do this, click on the relevant column heading.

If you click on the Time column heading first and then click on one of the other column headings, the alerts will be sorted by priority, message text, origin or tag number (as appropriate), but the list for each priority, message, origin or tag number will be sorted chronologically.

Figure 96 The column-headings you can use to sort alerts in the list



17.10.5 Viewing the history for an alert group

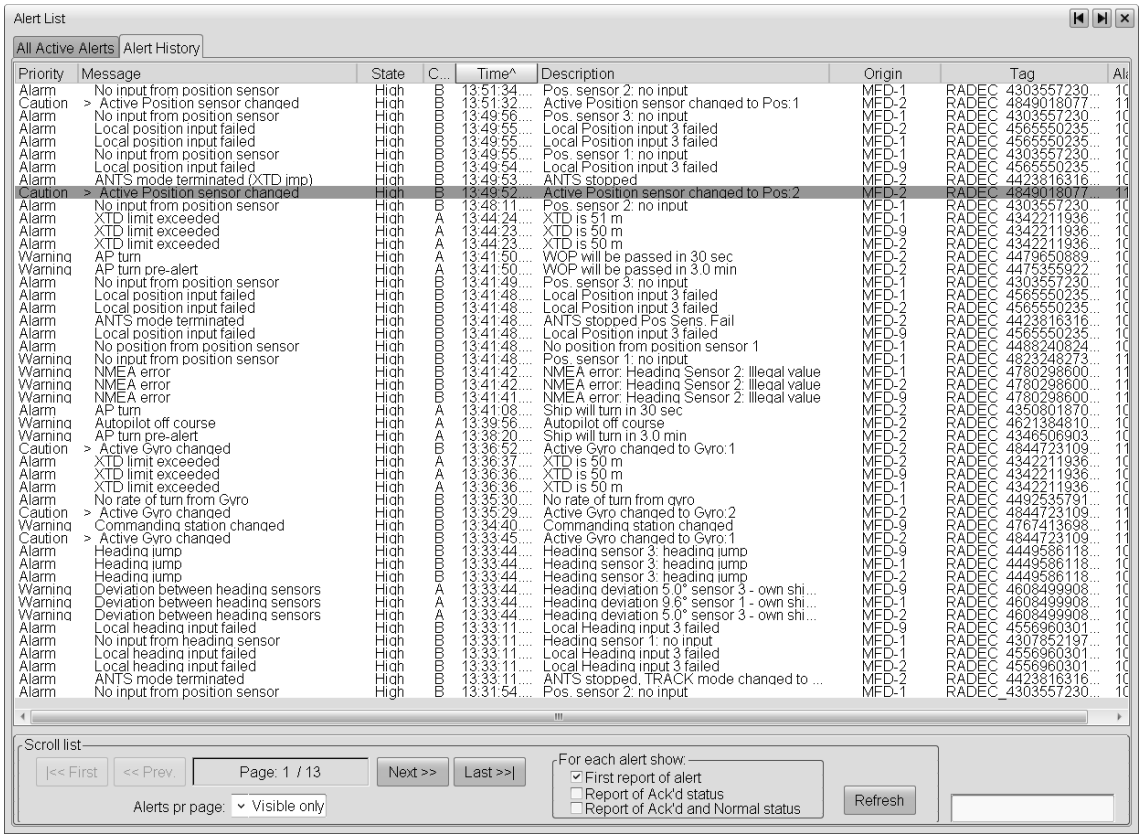
In the ECDIS and Conning applications, click the **History** button in the Alert Group dialog (see *Acknowledging alerts in the Alert Group dialog* on page 336) to bring up a large-format history of all alerts generated and/or received by the operator station.

Note that the priority column has the same format as the other columns: there is no use of colour to indicate the priority of an alert, and although unacknowledged alerts can appear in the Alert History tab, no flashing will indicate their presence. The priority column only flashes for unacknowledged alerts that are listed in the Alert Group dialog and the All Active Alerts list). Unacknowledged alerts in the Alert History tab are indicated in the Message column by a '>' character preceding the message text.

It is not possible to say how far back in time the alert history extends. The history is stored in a buffer that can store approximately 50,000 alerts. When the buffer is full the oldest alerts are over-written by the most recent.

For information about the right-click menu functions available for the alert history, see *Using the right-click menu for the alert history* on page 344).

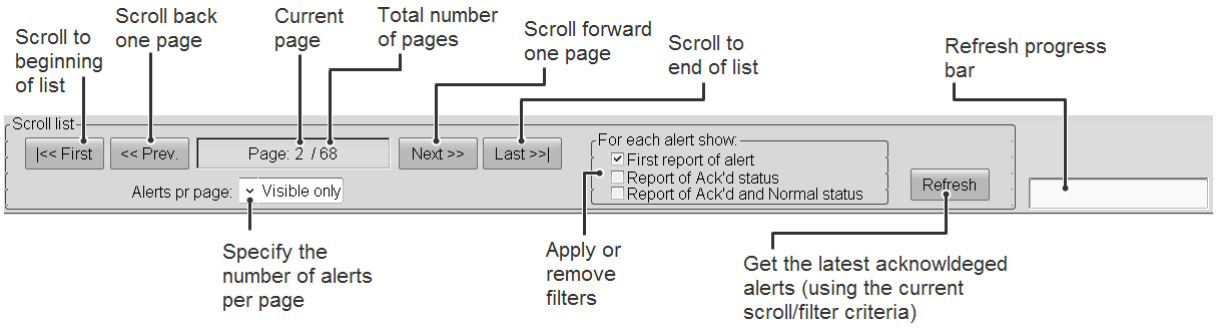
Figure 97 The alert history (sorted by time)



17.10.5.1 Scrolling and filtering the alert history list

At the bottom of the Alert History tab is a set of controls for scrolling and filtering the alert history list. These are summarized in the figure below:

Figure 98 Scrolling and filtering controls



Scrolling and refreshing the list

Use the **Refresh** button to populate the dialog with the latest acknowledged alerts. When you first view the Alert History tab, the list may be empty until you click **Refresh**. The process of populating the list can take some time, therefore, after you have pressed **Refresh** the button it turns into a **Cancel** button; this gives you the option to abort the process if it is taking too long. A progress bar to the right of the **Refresh** button indicates the progress of the refresh operation.

The list of alerts will display using the current scroll and filter criteria. This means that, for example, if the first alert in the current page is number 125, then the first alert in the refreshed page will also be number 125 although it may well be a different alert.

Scroll to the beginning or end of the list by using the **<< First** or **Last >>** arrow button (as applicable).

Scroll backwards or forwards one "page" at a time by using the **<< Prev** or **Next >>** arrow button (as applicable).

Specify the number of alerts to include in a "page" by selecting an option from the drop-down list. The **Visible only** option in the drop-down list makes a "page" equal to the number of lines that can be displayed in the dialog. If you select more alerts per "page" than can be displayed in the dialog (without scrolling), a scroll bar appears on the dialog's right boundary.

You can re-size the columns in the list by dragging the sides of the list headings using the mouse pointer. If you widen them so that not all the data can be shown in the dialog at once, a horizontal scroll bar appears at the bottom of the dialog.

Filtering the alert history

You can apply filters to the list of past alerts. Use the following check boxes to do this:

- **First report of alert:** Check this box to include for each alert the first report of the alert.
- **Report of Ack'd status:** Check this box to include for each alert the message confirming that the alert has been acknowledged.

- **Report of Ack'd and Normal status:** Check this box to include for each alert the message confirming that the alert has been acknowledged and that its state is now “Normal”. (Alerts that meet this criterion have all been removed from the list of active alerts.)

17.10.5.2 Viewing the history of a single alert condition

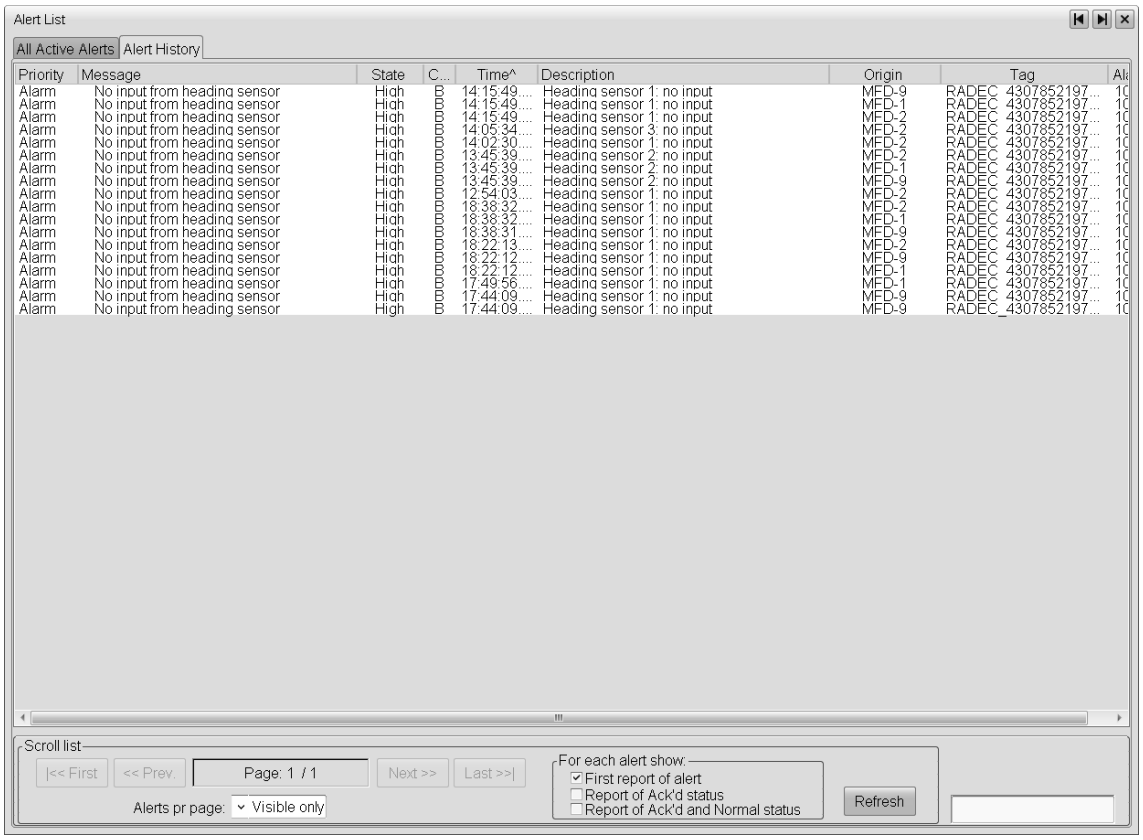
In the Alert History tab, you can view all messages associated with a particular alert condition in isolation from the rest of the list.

To do this in the Alert History tab select one instance of the alert condition you are interested in, then right-click on it and select **Isolate**.

A new list is presented of all the alerts associated with that alert condition.

To return to the main alert history list, right-click on any alert in the isolated list, and select **Cancel isolate**.

Figure 99 The isolated history of one alert message type



17.10.5.3 Using the right-click menu for the alert history

Select an alarm in the alarm history list and right-click on it to bring up a menu containing the following options:

- **Info ...:** Select this option to see a description of an alert in the small or large format list. The Alert Information dialog comes up with the explanation for the message you selected appearing at the top (see *The Alert help button and the Alert Information dialog* on page 68).
- **Navigate:** Select this option to bring up the most relevant dialog for an alert. The effect is the same as clicking the most-relevant dialog button (see *The Most-relevant dialog button* on page 68).
- **Isolate:** Select this option to view the history for one particular alert condition in isolation from the general list (see *Viewing the history of a single alert condition* on page 343).
- **Cancel isolate:** Select this option to return to the comprehensive alert history list after viewing the history of an alert condition in isolation from the comprehensive list.

17.11 Issuing alert output to an external alarm system

The K-Bridge console can be connected to an external alarm system so that K-Bridge alerts are then transmitted to and from the external alarm system.

There are several types of alert output from the MFD:

- **System alerts:** These are the alert messages themselves (and they can be acknowledged by the external alarm system). They are standard NMEA 0183 ALR messages (and the acknowledgements are ACK messages). If you are using a serial connection to communicate with the external alarm system, LOST and TARGET alerts will not be transmitted to it. However, you can set up a “TargetOut” interface to notify the external alarm system of these alerts (see *Target out interface* on page 632). (Operator stations that send alerts to the SINT over the LAN do send LOST and TARGET alerts and therefore do not use the “TargetOut” interface.)
- **System fail:** This is a digital output signal that simply indicates to the external alarm system that the MFD has issued an alert. (The MFD is not necessarily configured to transmit this digital output signal.)
- **System watchdog:** This is a digital output signal that indicates to an external alarm system that the MFD is no longer operational. (The MFD is not necessarily configured to transmit this digital output signal.)
- **System sound off:** This is a digital output and input signal. The output signal indicates to an external alarm system that the **SOUND OFF** button on the MFD's operator panel has been pressed (see *The Alarms group* on page 39). The input signal indicates to the

MFD that the **SOUND OFF** button on another device has been pressed and therefore that the MFD should execute its sound-off routine. (The MFD is not necessarily configured to transmit or receive this digital I/O signal.)

- **System user activity:** This is a digital output signal. It indicates to the external alarm system (and to the Bridge Navigational Watch Alarm System) that there is user activity on the console. The signal is triggered by, for example, a button being pressed on the MFD's operator panel or by a button in the user interface being clicked. If there is no activity, the external alarm system will issue a system watchdog alarm after a specified period. (The MFD is not necessarily configured to transmit this digital output signal.)

There are three possible types of connection between the MFD and the external alarm system:

- **LAN connection**

  Where a LAN connection exists from the MFD to the SINT, the external alarm system's event server will have a proprietary connection to the SINT and will receive alerts from the SINT. The operator stations on the LAN will be clients of the event server and can have filters applied that control which alerts they receive from it. Only service personnel can change this filter.

  In this configuration, the MFD transmits all alarms to the SINT. They are then forwarded by the SINT to the event server.

- **Serial connection**

  This type of connection is for MFD systems that are not connected to a Local Area Network or are not connected to a SINT but have separate connections to the individual sensors instead.

  Where a serial connection exists between the MFD and the external alarm system, the MFD transmits all alerts (except **NEW** and **LOST** target alerts) directly to the external alarm system over the serial connection.

  If there is a serial connection from the MFD to the external alarm system, then you must configure the interface to the alarm system in the Number of Sensors dialog (see *Number of Sensors* on page 617):

  1 Set the number for **Alarm** to 1 (from zero).

  2 Click **Details** and assign a port number to the interface you are specifying.

- **Digital I/O connection**

  This type of connection is not required for MFD systems that are connected to the LAN. However there are four digital output relays that can be used: they are for the system fail, system watchdog, system sound off, and system user activity signals. Although these four signals are possible, only two digital output lines are in fact available. Therefore the signals actually in use on your MFD will depend on the choices made when it was commissioned.

18 Accessing, saving, and restoring console data

This section contains the following topics:

For information about:

- Exporting ship-relative notes (templates), see *Copying templates* on page 229.
- Exporting route plans to other systems, see *Importing and exporting route information* on page 242.
- Exporting depth data for use by other applications, see *Capturing depth data for other applications* on page 329.

18.1 Accessing the system's configuration data

The K-Bridge MFD system has three access levels. The two higher levels are used to prevent unauthorised access to key system functions and parameters.

- **Operator access**: All functions that an officer on bridge watch will need are available with this level of access. This includes all functions stipulated by the IMO radar and ARPA performance standards. You do not need a password for this level of access.
- **User configuration access:** This level of access requires a "user" password. It enables you to perform all general operator tasks and procedures. For example:
  - Viewing and acknowledging alarms
  - Viewing route and ship parameters
  - Adjusting the video configuration
- **Service access:** This level of access requires a "service" password and is mainly for service engineers. It is for changing more permanent settings, such as the details of the display units connected, their characteristics and voltage levels. It also enables you to upgrade system software (see *System Upgrade Software* on page 596).

WARNING

If you have service-level access, do not change any service-level settings unless you are trained to do so. Changing these settings can render the system useless or seriously degrade its performance.

18.1.1 Gaining user-level access to the system

1 Select: **System→Password** (see *Password* on page 593).

2 Type in the password.
   - The user-level password is **user**.

3 Click the **Open** button.
   - You can now make the changes you need to make.

4 When you have finished, go back to the **Password** dialog and click **Lock**.
   - The system is now locked again. To prevent unauthorized access, always lock the system as soon as you have finished changing any settings.

18.2 Backing up mariners' notes, routes, and barrier lines

The system enables you to back up and restore certain user-generated data.

You can save this data to (and restore it from) an external medium, such as a USB memory device or CD-ROM.

The types of data you can back up are:

- Mariners' notes to charts (these are sometimes called “radar maps”; see *Note Save on Medium* on page 514 and *Note Load from Medium* on page 513).
- Sailing routes (see *Routes Backup/Restore* on page 424 and *Configure Route Export* on page 661).
- Target acquisition barrier lines (see *Save barrier lines to an external medium* on page 403 and *Load barrier lines from an external medium* on page 402).

18.3 Backing up the entire configuration to CD-ROM

The system's entire configuration (including the data referred to in the previous section) is stored on the hard disk in the system's main computer unit: some of it is stored in the Windows Registry and some in other system files.

To back up the entire configuration to a CD-ROM (or to restore it from a CD-ROM) requires service-level access.

To back up the system configuration, do the following:

1 Insert a write-able CD-ROM (not a DVD).

2 From the main menu, select **System→Maintenance→Backup→Backup (tab)**.

3 Check all the check boxes (except for the **Log** box; this is only required if you want to back up the K-Bridge Radar system's log files).

For the meanings of the options in the Backup tab, see *Backup/Restore – Backup tab* on page 607.

Note

Make sure the CD you insert has enough space left on it to store the configuration. Figures for the amount of data you have selected to back up and the space available on the CD are displayed in the dialog. (These figures are recalculated each time you check or un-check the selection boxes.)

4 Click the **Backup** button.

When you back up the system configuration, the settings are stored with the date and time of the backup. You cannot specify a particular drive for the backup to be written to: it is automatically written to the first available CD drive.

18.4 Restoring the configuration from CD-ROM

To restore a system configuration from a CD-ROM, do the following:

1 From the main menu, select **System→Maintenance→Backup→Restore (tab)**.

2 Insert the CD containing the configuration data you want to restore.

3 Check the boxes for the parts of the configuration you want to restore (check all three boxes to restore the entire configuration) and from the drop-down list for each box select the data you want to restore (it is labelled by date and time.

4 Click the **Restore** button.

For more information about the Restore tab, see *Backup/Restore – Restore tab* on page 608.

18.5 Restoring parameters after replacing hardware

If you replace the hard disk in the K-Bridge MFD system's main computer unit, or if you replace the entire main computer unit, then you need to restore the parameters from backup as described above (see *Restoring the configuration from CD-ROM* on page 349).

Note

If you replace the radar interswitch unit, you do not need restore any configuration data: no system configuration data is stored in the radar interswitch unit or transceivers. (For more information about the radar interswitch unit, see The radar interswitch unit on page 106.)

19 Performing search and rescue operations

This section contains the following topics:

This chapter includes guidelines for using your radar system in a search and rescue operation, and it describes the search patterns you can specify in ECDIS to conduct the search.

19.1 Operating marine radars for SART detection

The IMO sub-committee on navigation has prepared the following guidelines for use during search and rescue operations.

WARNING

A Search and Rescue Transponder (SART) will only respond to an X-Band (3 cm) radar. It will not be seen on an S-Band (10 cm) radar.

1 Introduction

A Search and Rescue Transponder (SART) may be triggered by any X-Band (3 cm) radar within a range of approximately 8 nautical miles. Each radar pulse received causes it to transmit a response which is swept repetitively across the complete radar frequency band, When interrogated, it first sweeps rapidly (0.4 microsec) though the band before beginning a relatively slow sweep (7.5 microsec) through the band back to the starting frequency. This process is repeated for a total of twelve complete cycles. At some point in each sweep the SART frequency will match that of the interrogating radar and be within the pass band of the radar receiver. If the SART is within range, the frequency match during each of the 12 slow sweeps will produce a response on the radar display, thus a line of 12 dots equally spaced by about 0.64 nautical miles will be shown.

2 When the range to the SART is reduced to about 1 n.mile the radar display may show also the 12 responses generated during the fast sweeps. These additional dot responses, which also are equally spaced by 0.64 nautical miles, will be interspersed, with the original line of 12 dots. They will appear slightly weaker and smaller than the original dots.

3 Radar Range Scale

When looking for a SART it is preferable to use either the 6 or 12 nautical mi1e range scale This is because the total displayed length of the SART response of 12 (or 24) dots may extend approximately 9.5 nautical miles beyond the position of the SART and it is necessary to see a number of response dots to distinguish the SART from other responses.

4 SART Range Error

When responses from only the 12 slow frequency sweeps are visible (when the SART is at a range greater than about 1 n.mile), the position at which the first dot is displayed may be as much as 0.64 nautical mile beyond the true position of the SART. When the range closes so that the fast sweep responses are seen also, the first of these will be no more than 150 metres beyond the true position.

5 Radar Bandwidth

This is normally matched to the radar pulse length and is usually switched with the range scale and the associated pulse length. A narrow bandwidth of 3-5 MHz is used with long pulses on long range scales, and a wide bandwidth of 10-25 MHz is used with short pulses on short ranges.

6 A radar bandwidth of less than 5 MHz will attenuate the SART signal slightly, so it is preferable to use a medium bandwidth to ensure optimum detection of the SART. The Radar Operating Manual should he consulted about the particular radar parameters and bandwidth selection.

7 Radar Side Lobes

As the SART is approached, side lobes from the radar antenna may show the SART responses as a series of arcs or concentric rings. These can be removed by the use of the anti-clutter sea control although it may be operationally useful to observe the side lobes as they may be easier to detect in clutter conditions and also they will confirm that the SART is near to the own-ship.

8 De-tuning the Radar

To increase the visibility of the SART in clutter conditions, the radar may be detuned to reduce the clutter without reducing the SART response. Radars with automatic frequency control may not permit manual detune of the equipment. Care should be taken in operating the radar in the detuned condition as other wanted navigational and anti-collision information may be removed. The tuning should be returned to normal operation as soon as possible.

9 Gain

For maximum range SART detection the normal gain setting for long range detection should be used i.e., with a light background noise speckle visible.

10 Anti-clutter sea control

For optimum range SART detection this control should be set to the minimum. Care should be exercised as wanted targets in sea clutter may be obscured. Note also that in clutter conditions the first few dots of the SART response may not be detectable, irrespective of the setting of the anti-clutter sea control. In this case, the position of the SART may be estimated by measuring 9.5 nautical miles from the furthest dot back towards the own-ship.

11 Some sets have automatic/manual anti-clutter sea control facilities. Because the way in which the automatic sea control functions may vary from one radar manufacturer to another, the operator is advised to use manual initially until the SART has been detected. The effect of the auto sea control on the SART response can then be compared with manual control.

12 Anti-clutter rain control

This should be used normally (i.e. to break up areas of rain) when trying to detect a SART response which, being a series of dots, is not affected by the action of the anti-clutter rain circuitry. Note that Racon responses, which are often in the form. of a long flash, will be affected by the use of this control.

13 Some sets have automatic/manual anti-clutter rain control facilities. Because the way in which the automatic rain control functions may vary from one radar manufacturer to another, the operator is advised to use manual initially until the SART has been detected. The effect of the auto rain control on the SART response can then be compared with manual control.

Note

The automatic rain and sea clutter controls may be combined in a single 'auto-clutter' control, in which case the operator is advised to use the manual controls initially until the SART has been detected, before assessing the effect of auto.

19.2 Specifying the search pattern

The aim of a Search And Rescue (SAR) operation is to locate a missing object as fast as possible. The Search and Rescue dialog in ECDIS (see *Search and Rescue* on page 437) allows you to select a search suitable for your requirements.

To specify the search pattern you must enter the following information:

- The search pattern type (flower/sector, expanding square, parallel track, or creeping line).
- Latitude and longitude.
- The initial bearing for the search.

To bring up the Search and Rescue dialog, select **Route→Search and Rescue**.

Click the **Apply** button, to generate the search pattern according to the parameters you have entered.

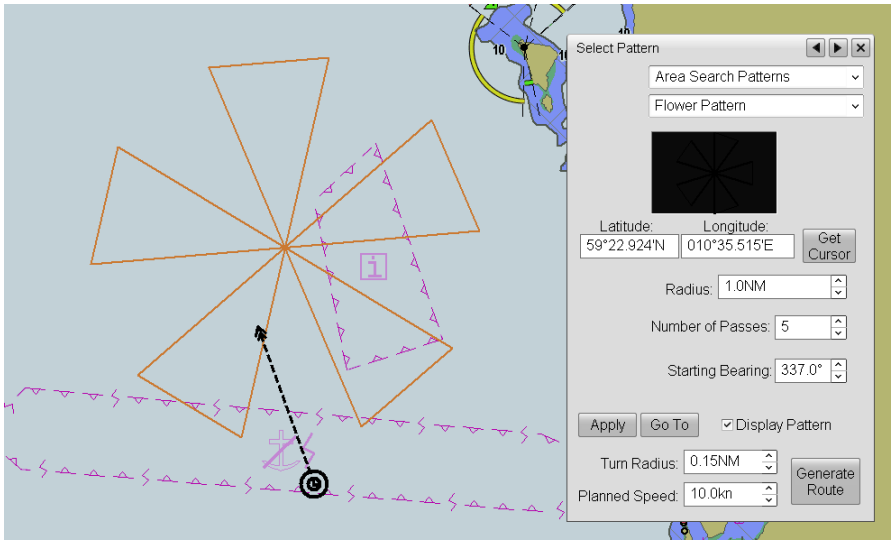
Click the **Go To** button to move in the display to the actual position of the defined search pattern and to change the screen scale to enable the pattern to be displayed optimally.

Check or un-check the **Display Pattern** toggle, the turn the display of the Search and Rescue pattern on and off.

19.3 Specifying the search area graphically

- By clicking the **Get Cursor** button, an EBL/VRM tool will be displayed. The tool can both be used for specifying the search centre (the VRM centre) and for specifying the Starting Bearing (the EBL direction) and the radius (the VRM radius).

Figure 100 Changing the position, radius and bearing of the search area graphically



19.4 Generating a search and rescue route plan

- By clicking the **Apply** button, the suggested parameters for the turn radius and the planned speed is displayed.

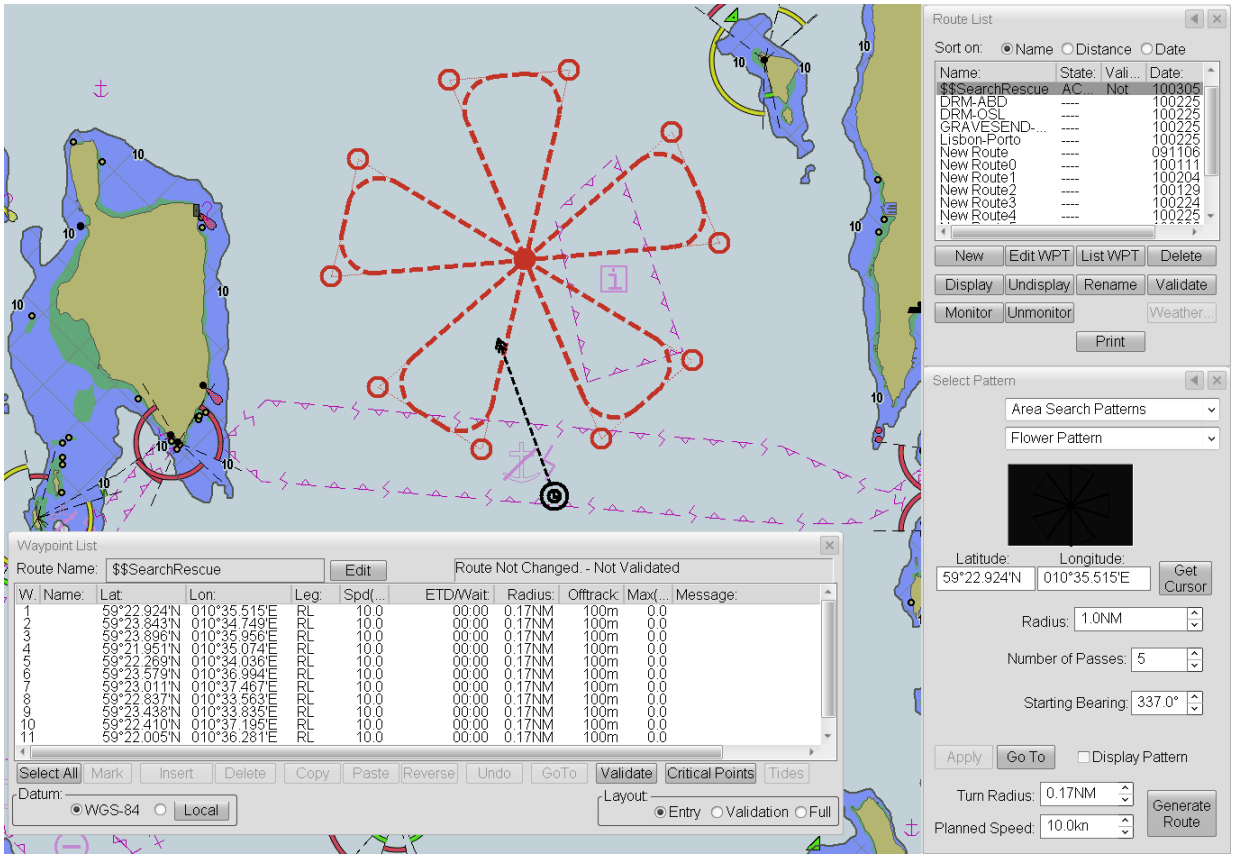
  The **Turn Radius** field is by default set to the default turn radius specified in the ship (route) parameter settings. However, if the pattern is such that this turn radius is too large, a smaller turn radius is computed. If this is smaller than the minimum turn radius specified in the ship (route) parameters, the minimum radius will be used.

  The **Planned Speed** field is by default set to the default speed (Cruise Speed) from the ship (route) parameters.

- By clicking the **Generate Route** button, a route plan named "$$SearchRescue" will be generated and automatically monitored.

  As this is a normal route plan object it can be renamed, edited, validated and printed just like any other route plan.

Figure 101 Showing details of the generated and monitored "$$SearchRescue" route



19.5 The flower/sector search pattern

- The “Flower” search pattern concentrates the search around a specific centre and searches a circular pattern with a specified radius. For the Flower pattern the **Number of Passes** field is used to specify the number of “petals” on the pattern.
- The “Sector” pattern is just a special case of the Flower pattern with three “petals”. For a second pass (or search unit) the sector pattern should be turned clockwise by 30 degrees.

Figure 102 The “Flower” search and rescue pattern

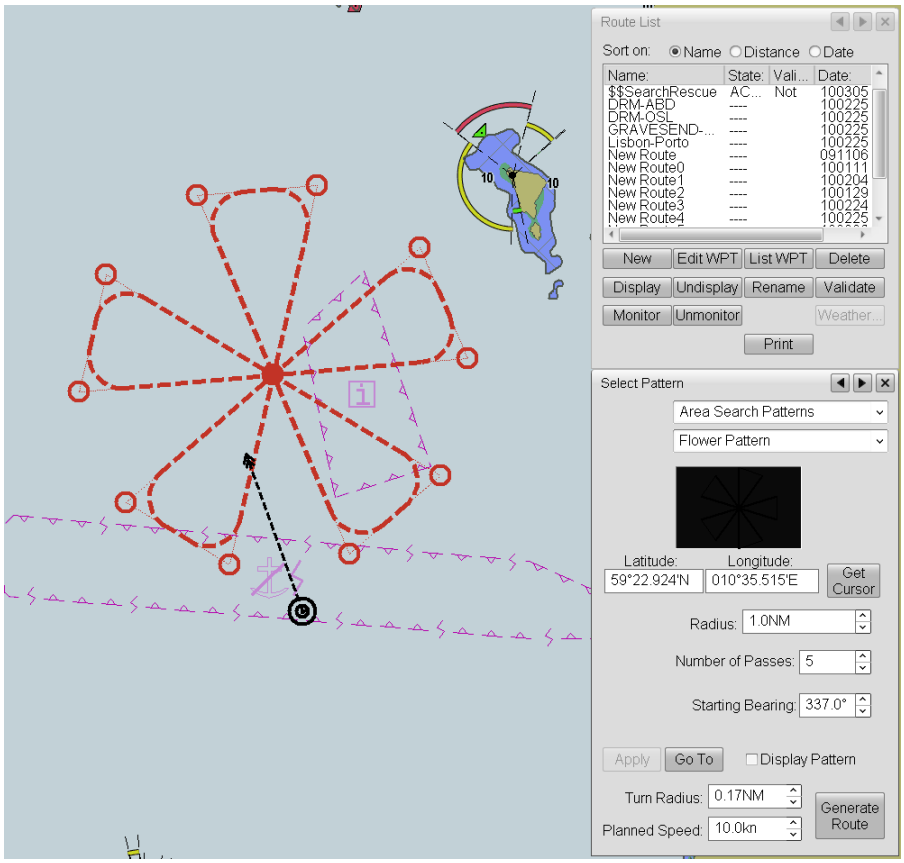
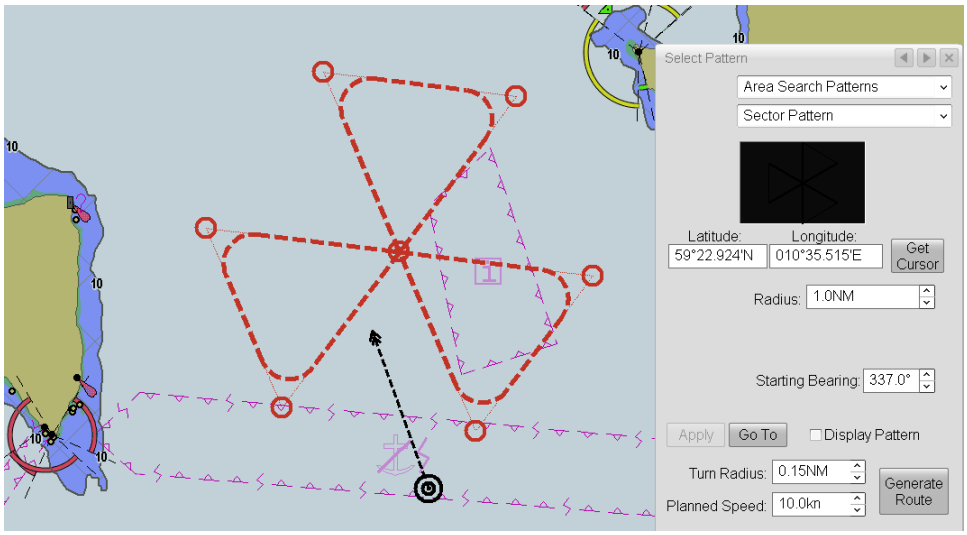


Figure 103 The "Sector" search and rescue pattern

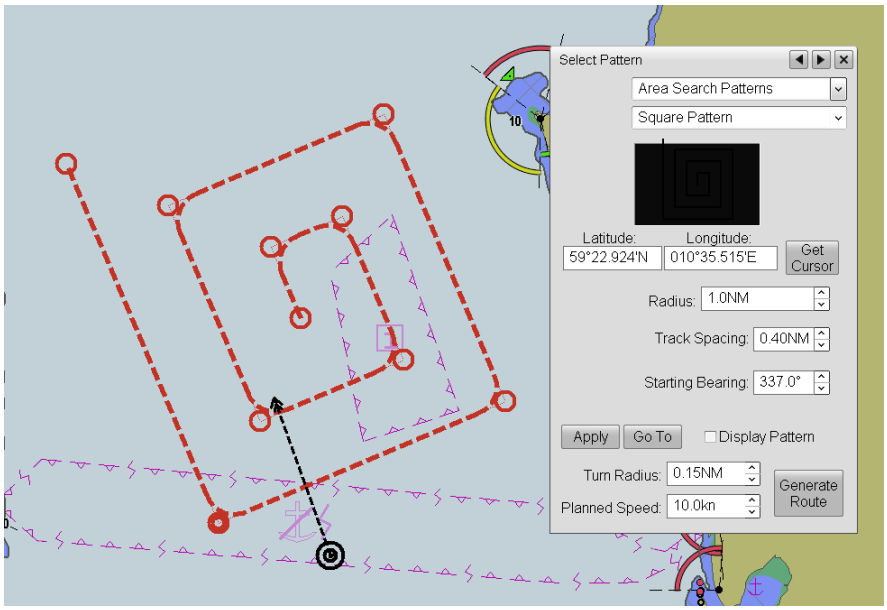


19.6 Expanding square search pattern

- The “Expanding Square” search pattern concentrates the search around a specific centre and searches a circular pattern with a specified radius.

  The **Track Spacing** field is used to specify the distance between search lines.

Figure 104 The Expanding Square search and rescue pattern



19.7 Parallel track search pattern

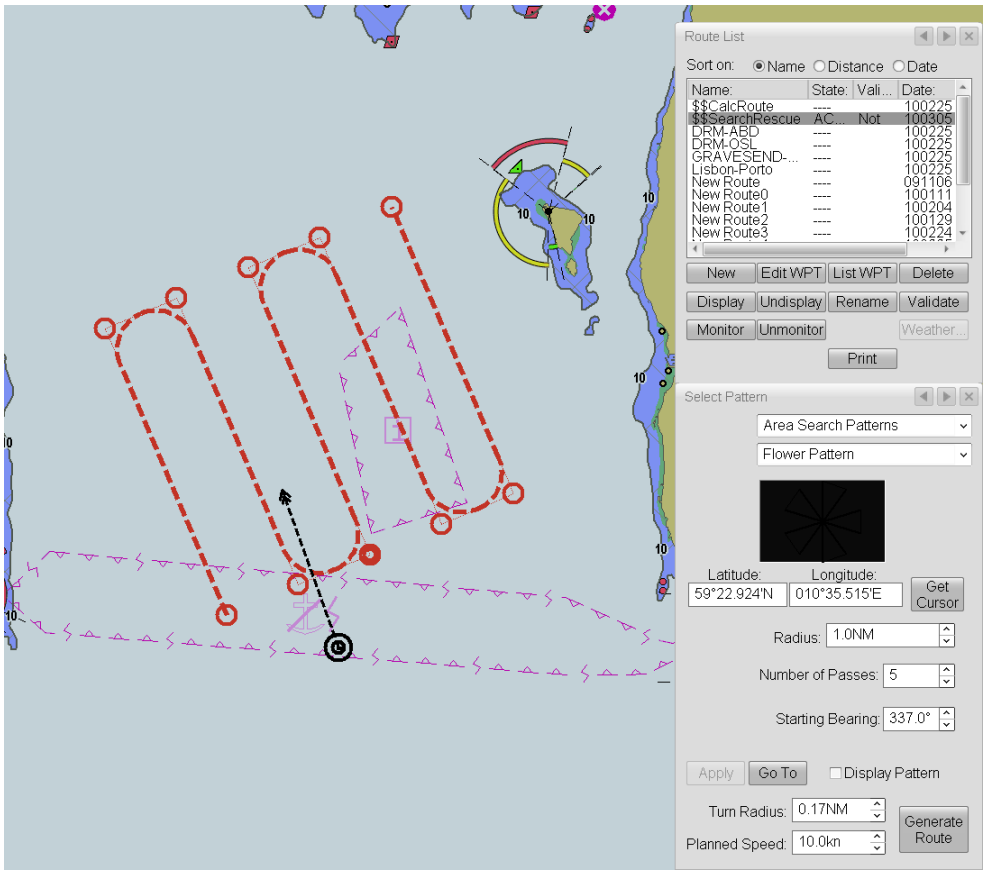
- The “Parallel Track” search pattern carries out a uniform search in a rectangular area.

  The **Starting Bearing** field defines the major axis of the area.

  The **Length** and **Width** fields defines the size of the rectangular area.

  The **Track Spacing** field is used to specify the distance between search lines.

Figure 105 The “Parallel Track” search and rescue pattern



19.8 Creeping line search pattern

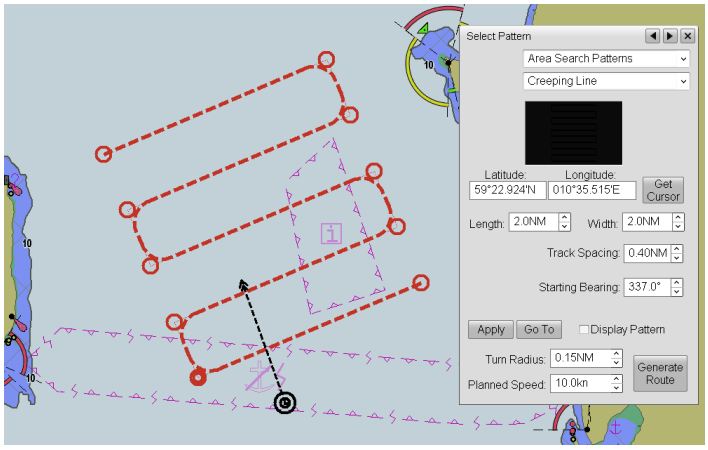
- The “Creeping Line” search pattern carries out a uniform search in a rectangular area, but starting at the short end.

  The **Starting Bearing** field defines the major axis of the area.

  The **Length** and **Width** fields define the size of the rectangular area.

  The **Track Spacing** field is used to specify the distance between search lines.

Figure 106 The “Creeping Line” search and rescue pattern



20 Reference Guide

This section contains the following topics:

20.1 The main menu

This chapter describes the menus and dialogs associated with the Radar, ECDIS and Conning applications. The menus and dialogs enable you to monitor, operate and configure the system.

On widescreen (16:10) displays, the main menu appears at the right end of the top bar.

On 4:3 displays its location is different for each application (see the figures below).

For more information about the presentation of the main menu and its associated buttons, see *The menu area* on page 75.

Table 22 The menu area on 16:10 (widescreen) displays

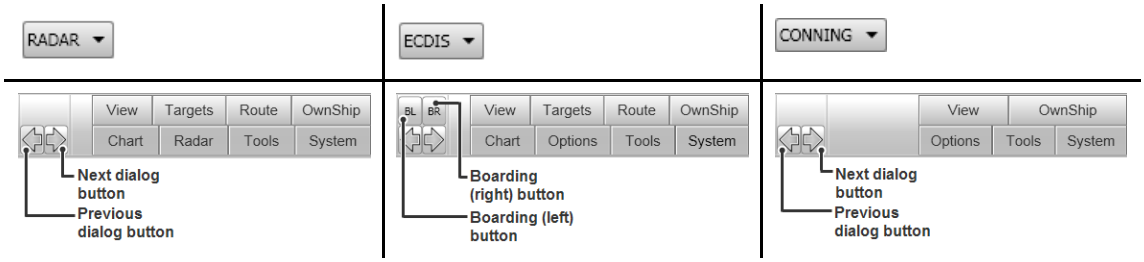
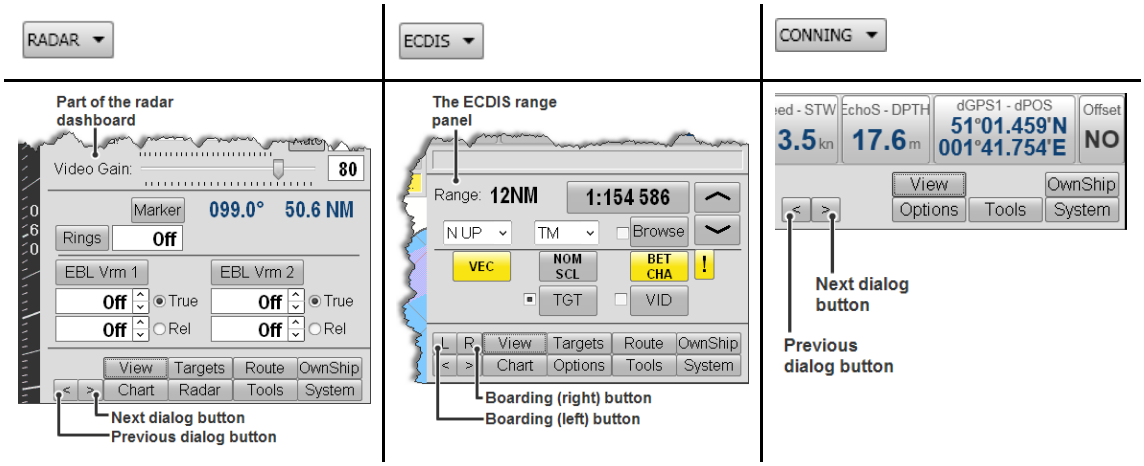


Table 23 The menu area on 4.3 (standard) displays



The main menu contains some or all of the following buttons (depending on the application):

- **View:** Click this button to regulate the amount of light emitted by the display and the operator panel, and to configure the tools, symbols and data that appear on the radar and chart displays (see *View menu* on page 366).
- **Targets:** Click this button to work with radar and AIS targets and to test the target tracker (see *Targets menu* on page 380).
- **Route:** Click this button to create, manage, use and monitor routes (see *Route menu* on page 415).
- **Own ship:** Click this button to access menus concerned with the vessel's position, heading, speed, general movement and sensors (see *Own-Ship menu* on page 440).

- **Chart:** Click this button to manage charts (see *Chart menu* on page 476).
- **Option:** Click this button to view the optional components enabled on the console (see *Options menu* on page 439).
- **Radar:** Click this button to set parameters for tuning the radar picture and also to monitor the radar's transceiver and Magnetron unit (see *Radar menu* on page 537).
- **Tools:** Click this button to use parallel index lines as a navigation aid or to specify a turn and programme it into the autopilot (see *Tools menu* on page 543).
- **System:** Click this button to access various system setup, maintenance and configuration menus.(see *System menu* on page 561).

20.2 View menu

This menu enables you to regulate the amount of light emitted by the display and the operator panel, and also to configure the tools, symbols and data that appear on the radar and chart displays.

To see this menu, click the **View** button on the main menu.

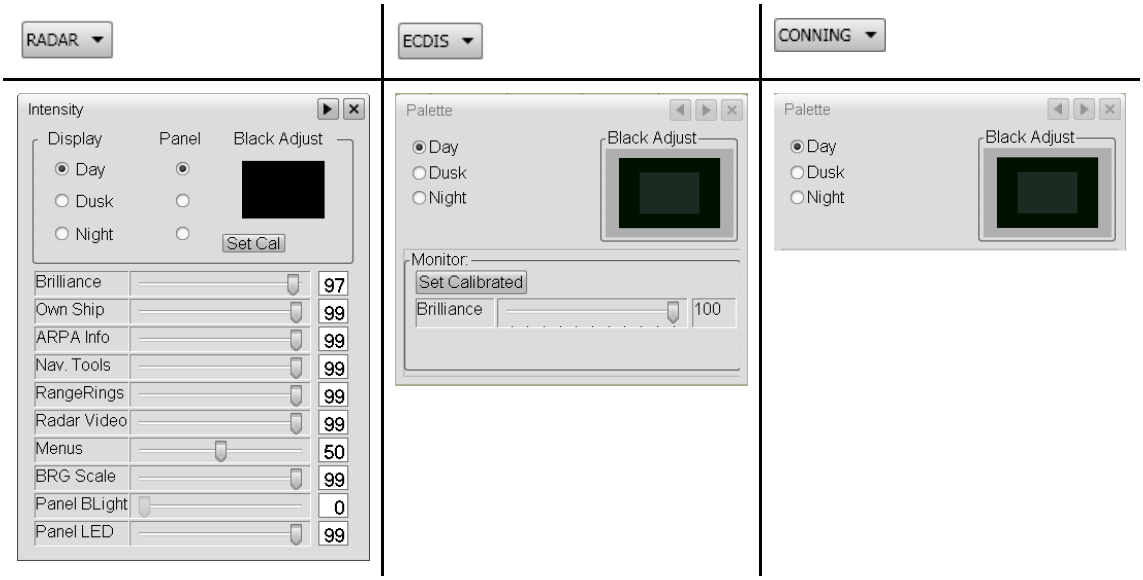
It contains contain some or all of the following buttons (depending on the application):

- **Palette/Intensity:** Click this button to regulate the amount of light emitted by the display and the operator panel (see *Intensity* on page 367).
- **Zoom:** Click this button to select the chart scale (see *Zoom* on page 370).
- **Main Radar Themes:** Click this button to control the visual tools, symbols and data that appear in the radar area (see *Radar Themes* on page 371).
- **Chart Themes:** Click this button to select the types of chart information to be displayed in the radar area (see *Chart Themes* on page 373).
- **Object Information:** Click this button to display information about an object in the chart that is near to the marker (cursor) (see *Object Info* on page 377).
- **Browse Position and Date:** Click this button to use the browsing facility for route planning (see *Browse Position and Date* on page 378).
- **Remote Markers:** Click this button to make the markers (cursor, EBL/VRM pair or pairs, and/or curved EBL) on your operator station available to other operator stations or to display the markers from another operator station on your screen (see *Remote Marker Setup* on page 379).

20.2.1 Intensity

This dialog enables you to regulate the light emitted by the display and the operator panel.

The path to the dialog is: **View →Palette/Intensity**.



Three levels of intensity are available: Day, Dusk and Night.

In radar, the light intensity can be adjusted for both the display and the operator panel.

Note

In the radar application, when you set the intensity for the Display, the Panel intensity is automatically set to the same value. However, changing the Panel intensity does not change the intensity setting for the Display.

The Intensity dialog also contains one or more of the following options and buttons, depending on the application:

- **Set Calibrated:** Clicking this button sets the monitor's backlight to the level at which the colours are correctly calibrated (for displaying charts) in the current palette. (The button is only present for certain monitors.)
- **Brilliance:** You can adjust the back-light level by operating the slider.
- **Own Ship:** Adjusts the intensity of the own-ship symbol and heading line.
- **ARPA Info:** Adjusts the intensity of all target symbols.
- **Nav. Tools:** Adjusts the intensity of EBL/VRM and parallel index lines.
- **Range Rings:** Adjusts the intensity of the range rings.
- **Radar Video:** Adjusts the intensity of radar echoes and trails on the display.
- **Menus:** Adjusts the intensity of those parts of the screen that are outside the radar or chart display area. Menu intensity will be reset to max (99) whenever the palette is changed; this ensures that the menus remain visible after palette changes.
- **BRG scale:** Adjusts the intensity of the bearing scale.

- **Panel BLight:** Adjusts the intensity of the backlight for the buttons on the operator panel.
- **Panel LED:** Adjusts the intensity of the status LEDs on the operator panel.

20.2.1.1 The colours in the display palettes

The tables in this section list the colours used in the different display palettes (day, dusk and night).

Table 24 The colours used for text (in the different palettes)

Text	Day	Dusk	Night
Normal text	Black on Grey	White on Black	Yellow on Black
Text indicating conditions other than normal operation	Black on Yellow	Black on Yellow	Black on Yellow
Alarm condition	Black on Red	Black on Red	Black on Red, or Red on Black

Table 25 The colours used for radar and chart items (in the different palettes)

Radar and chart items	Day	Dusk	Night
Radar echoes, strong	Yellow	Yellow	Yellow
Radar echoes, uncorrelated or weak	Darker Yellow	Darker Yellow	Darker Yellow
Radar trails	Green	Green	Green
Radar background (no chart)	Dark Blue	Black	Black
Deep water	Darker Blue	Black	Black
Shallow water	Light Blue	Light Blue	Light Blue
Filled land masses	Brown	Brown	Brown
User tools (EBL,VRM, Parallel index lines etc.)	Orange	Orange	Orange
Heading Line, Range Rings	White	White	White
Traffic information	Magenta	Magenta	Magenta
Target vectors	Green	Green	Green

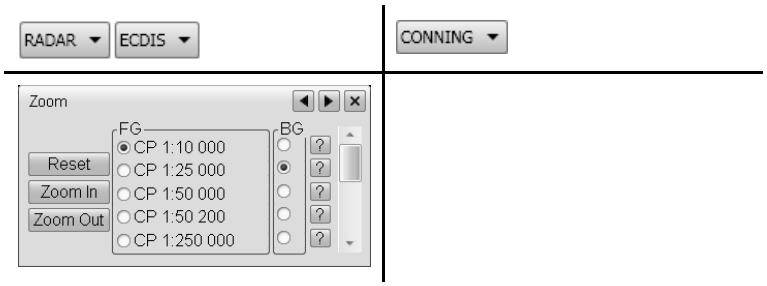
Table 25 The colours used for radar and chart items (in the different palettes) (cont'd.)

Radar and chart items	Day	Dusk	Night
Auto Acquisition Area	Red	Red	Red
Shoreline	Grey	Grey	Grey
Safety contour	Grey	Grey	Grey

Note

The colours used for elements in the chart display have been (as far as was practicable) based on the definitions in the IHO S-52 background colour schemes.

20.2.2 Zoom



This dialog enables you to set the chart scale.

The path to the dialog is: **View →Zoom**.

By default, the system automatically selects the best chart available for the own-ship's current position. To use a chart with a different scale:

- Select the required scale from the FG (foreground) chart list.
- Click the **Zoom In** or **Zoom Out** button.

The selected chart will sometimes not cover the whole display area. Rather than leave the area that is not covered blank the system can fill it with another chart, normally of lower resolution. The best chart is called the foreground (FG) chart and the other is called the background (BG) chart.

Reset: Resets chart selection to automatic chart mode (selection of the best chart available for the own-ship's position).

Zoom In: Increases the chart scale by a factor of two.

Zoom Out: Decreases the chart scale by a factor of two.

FG: (Foreground) Lists the available chart types and chart scales at the own-ship's position (in monitoring mode) or in the middle of the display (in browse mode). Select the chart you require.

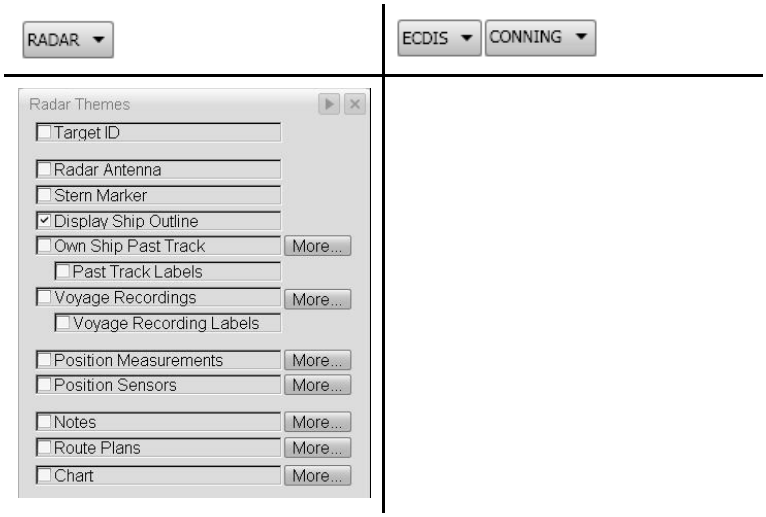
BG: (Background): If the selected foreground chart does not cover all of the display, the rest of the display can be filled with another "fill-in" chart, normally of lower resolution. When you select a new entry in the "BG" list, the system's choice for background chart is overridden.

?: Click to display the chart legend for each chart (see *Chart Legend* on page 478).

20.2.3 Radar Themes

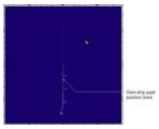
This dialog enables you to specify which visual tools, symbols and data appear in the radar area.

The path to the dialog is: **View→Main Radar Themes**.



The Radar Themes dialog contains the following options and buttons:

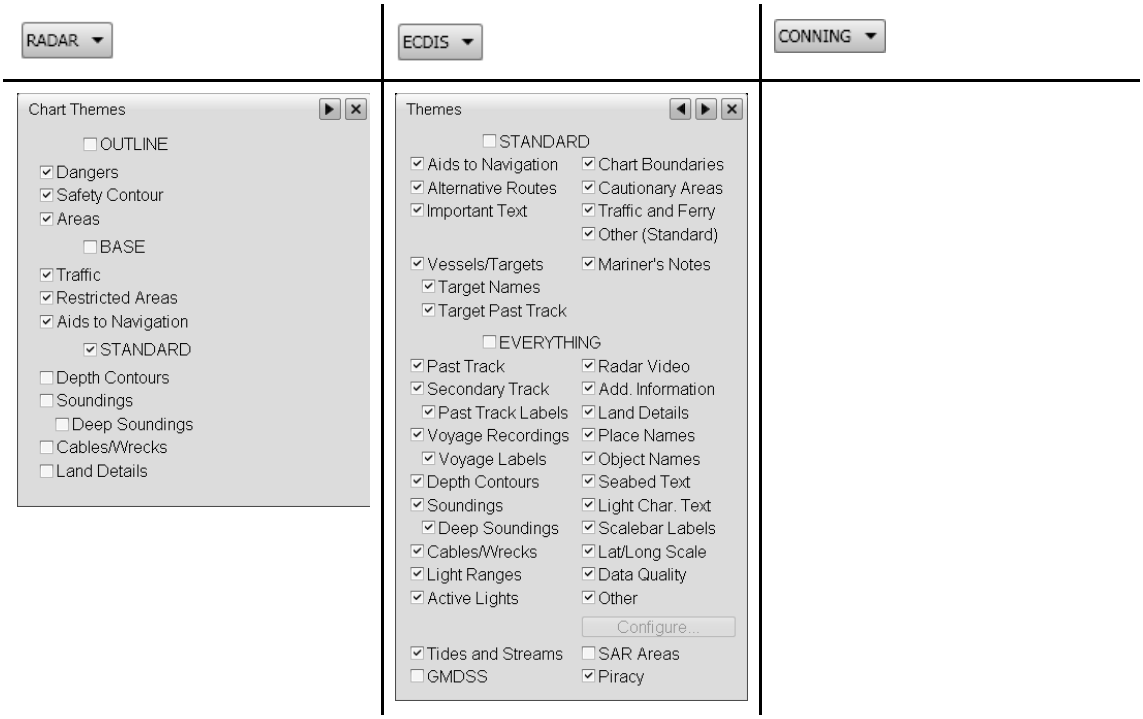
- **Target ID:** Turns target identification numbers on/off.
- **Radar antenna:** Turns on and off the cross symbol that indicates the position of the radar antenna (for more information, see *The radar antenna symbol* on page 94).
- **Stern Marker:** Turns the own-ship's stern marker on and off.
- **Display Ship Outline:** Causes the own-ship to be presented as a scaled outline at large range scales. When un-checked, the ship is represented by the heading- and beam-lines only at all range scales (for more information, see *The radar video area* on page 93). When this option is checked, you can also display the ship's predicted movements (see *Displaying the own-ship's predicted movements* on page 317).
- **Own Ship Past Track:** Enables you to display a trailing line with time markers (at two-minute intervals) indicating the past positions of the own-ship over the previous 30 minutes (see illustration below). Click the **More** button to configure the track display (see *Track tab* on page 573).



- **Past Track Labels:** Select to display past track time labels indicating the time the own-ship was at the various positions (for the past 12 hours). (**Own-ship Past Track** must be selected.)
- **Voyage Recordings:** Select to display the past track for an entire voyage. Click the **More** button to specify the intervals between the past positions displayed (see *Voyage tab* on page 577).

- **Voyage Recording Labels:** Select to display voyage time labels, indicating the time the own-ship was at the various positions. (**Voyage Recordings** must be selected.)
- **Position Measurements:** Select to display the line or lines associated with any distance measurements you are currently making using the Distance Measure tool (see *Distance Measure* on page 554). Click the **More** button to bring up the Distance Measure dialog.
- **Position Sensors:** Check this box to indicate the location of the position sensors that the vessel is currently using. Click the **More** button to select position sensors and/or to determine the exact position of your operator station (see *Position* on page 445).
- **Notes:** Turns the display of mariners' notes on and off. Click the **More** button to manage your notes (see *Manage Notes* on page 507).
- **Route Plans:** Check this box to turn the display of the route on and off. Click the **More** button to specify parameters for the display of route information (see *Route (tab)* on page 570).
- **Chart:** Turns the chart display on and off. Click the **More** button to choose the type of information to be displayed on the chart (see *Chart Themes* on page 373). Not all systems are fitted with charts.

20.2.4 Chart Themes



20.2.4.1 Chart themes in Radar

Use this dialog to select the types of chart information to be displayed.

In Radar the path to the dialog is: **View→Chart Themes**.

In Radar the dialog includes the following options:

- **Outline:** Displays only coastlines.
- **Dangers:** Displays dangerous objects in the chart area such as ship wrecks and so on.
- **Safety Contour:** Displays the safety contour line at the depth set in the **Safety Depth Setting** menu (see *Safety Depth* on page 479).
- **Areas:** Displays areas filled with colour (when not selected only boundary lines are shown).
- **Base:** Select to display all themes in the list.
- **Traffic:** Displays traffic separation zones and so on.
- **Restricted Areas:** Displays restricted areas such as where cables and pipelines are laid on the seabed.
- **Aids to Navigation:** Displays aids to navigation such as buoys and light sectors.
- **Standard:** Select this to display all themes in the list above the **Standard** check-box.
- **Depth Contours:** Select to display depth contour lines.
- **Soundings:** Select to display soundings that are less than the set safety depth.
- **Deep Soundings:** Select to display soundings that are deeper than the set safety depth.
- **Cables/Wrecks:** Select to display sea bottom related objects in the chart area such as ship wrecks and cables.

- **Land Details:** Select to display objects of interest on land.

20.2.4.2 Chart themes in ECDIS

In ECDIS the path to this dialog is: **View→Themes**.

Turning off all themes corresponds to Base Display in ECDIS terminology.

Note

Only vector charts have themes. The themes information available varies between chart suppliers.

In ECDIS this dialog includes the following options:

Standard: Select to display standard chart items.

- **Aids to Navigation:** Select to display navigation lights.
- **Alternative Route:** Select to display an alternative sailing route, if any.
- **Chart Boundaries:** Select to display chart boundaries.
- **Cautionary Areas:** Select to display cautionary areas.
- **Important Text:** Select to display important text related to charts.
- **Ferry Routes:** Select to display ferry routes.
- **Other (Standard):** Select to display various other standard information.
- **ARPA Targets:** Select to display tracked targets when the system is connected to a K-Bridge ECDIS.
- **Target Names:** Select to display identifiers for AIS and radar targets.
- **Target Past Track:** Select to display pasttrack for AIS and radar targets.
- **Mariners' Notes:** Select to display mariners' notes.

Everything: Select to display all available items.

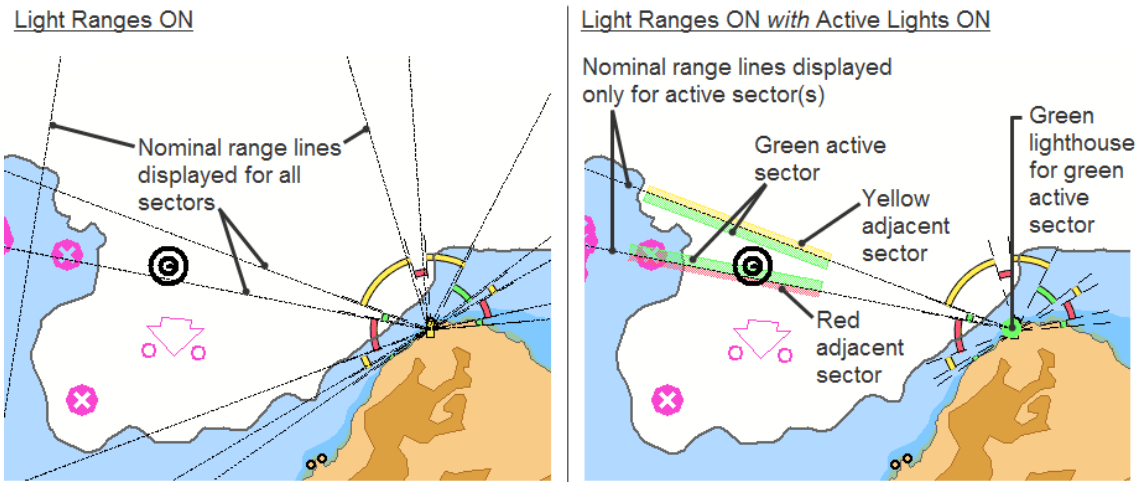
- **Past Track:** Select to display the own-ship's past track (for the past 12 hours; see *Track tab* on page 573).
- **Secondary Track:** Select to display the own-ship's past track related to a secondary position sensor (for the past 12 hours).
- **Past Track Labels:** Select to display past track time labels indicating the time the own-ship was at the various positions (for the past 12 hours). **Past Track** or **Secondary Past Track** must be selected.
- **Voyage Recordings:** Select to display the past track for an entire voyage (see *Voyage tab* on page 577).
- **Voyage Labels:** Select to display voyage time labels indicating the time the own-ship was at the various positions. Voyage Recording must be selected.
- **Depth Contours:** Select to display depth contour lines.
- **Soundings:** Select to display soundings that are less than the set safety depth.
- **Deep Soundings:** Select to display soundings that are deeper than the set safety depth.
- **Cables/Wrecks:** Select to display sea bottom related objects in the chart area such as ship wrecks and cables.

- **Light Ranges:** Select to display black lines indicating the nominal range of the navigation lights on the chart. (When **Active Lights** is also selected the black lines are shown only for the light sector or sectors inside which the own-ship is currently sailing.)
- **Active Lights:** Select to display the sector colour for each light sector as seen from the own-ship's position: a coloured rectangle appears (if you have **Light Ranges** selected) along the nominal range lines of each sector that the ship is currently sailing inside.

  Adjacent sectors are also indicated so that you can see when you will cross from a sector of one colour into a sector of another colour.

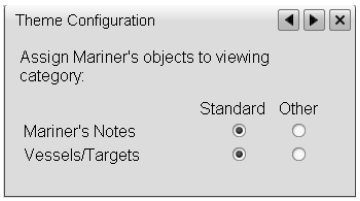
  Finally, the lighthouse point for the sector inside which the own-ship is sailing is indicated by a dot whose colour also indicates the sector colour.
- **Radar Video:** Select to display radar video as an overlay when the system is connected to a K-Bridge ECDIS.
- **Add. Information:** Select to display various additional information. If you do this, then objects that have additional text or graphics associated with them will be displayed on the chart with the following symbol:  . Click this symbol to view the additional text or graphics. (For more information, see *Object Info* on page 377.)
- **Land Details:** Select to display relevant details on land.
- **Place Names:** Select to display relevant place names.
- **Object Names:** Select to display object names such as for buoys.
- **Seabed Text:** Indicates seabed structure (sand, clay, stone, etc.).
- **Light Char. Text:** Select to display text related to navigation lights characteristics.
- **Scalebar Labels:** Select to display distance labels for the scalebar on the left side of the monitor. **Lat/Long Scale** must not be selected.
- **Lat/Long Scale:** Select to display a latitude/longitude scale and the outer edge of the monitor instead of the scale bar.
- **Data Quality:** Indicates the accuracy of the chart data.
- **Other:** Select to display various other information.
- **Configure:** Clicking the **Configure** button brings up the **Theme Configuration** dialog (see *Theme Congifuration dialog* on page 377).
- **Tides and Streams:** Select to display tide and stream data on the chart if you have the C-Map Services option enabled (see *Generating routes, predicting tides, avoiding pirates* on page 767).
- **GMDSS:** Select to display C-Map GMDSS data.
- **SAR areas:** Select to display C-Map SAR data.

Figure 107 Light Ranges and Active Lights



20.2.4.2.1 Theme Congifuration dialog

ECDIS | RADAR | CONNING

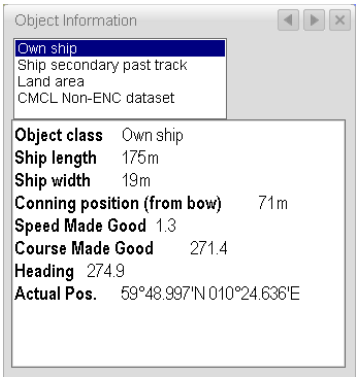


This dialog enables you to specify whether mariners' notes and radar/AIS targets are to be included among the Standard themes in the Themes dialog (see *Chart Themes* on page 373) or not.

The path to the dialog in ECDIS is: **View→Themes.→Configure**.

20.2.5 Object Info

RADAR | ECDIS | CONNING



This dialog enables you to view information about objects in the chart or on the radar display. Point to an object and double-click using the **Left mouse button**. (You can also right-click objects for context-specific menus and information.)

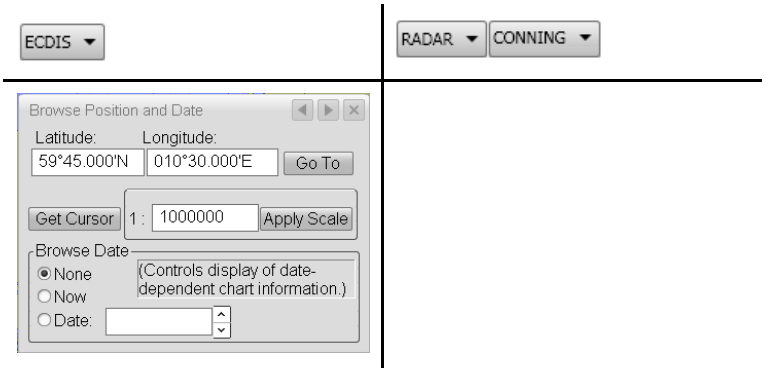
In ECDIS the path to the dialog is: **View→Object Information**.

In Radar the dialog is only available if you double-click an object.

Object information for all objects under the cursor is captured in the dialog.

For further information about this dialog, see *Viewing data about an object* on page 127.

20.2.6 Browse Position and Date



The dialog allows you to set a precise position for the centre of the screen while you are browsing the ECDIS chart. (Browsing means that the chart is displayed independently of the own-ship's position. The facility is useful for route planning.[3])

The path to this dialog in ECDIS is: **View→Browse Position and Date**.

Latitude/Longitude: Enter a latitude and longitude position for the area you want to view. The information is automatically updated during browsing. When you leave browse mode the last position is saved for later use.

GoTo: Click the button to start browsing and to centre the chart display at the specified position and using the specified scale.

Get Cursor: Click the button; then use the track-ball and **Left mouse** button to specify a rectangular area. This updates the Lat/Long and Scale fields. Click the **GoTo** button to zoom into the area.

Apply Scale: Enter a scale and click the button to set the chart to any scale. Can be used in both Monitoring and Browse modes.

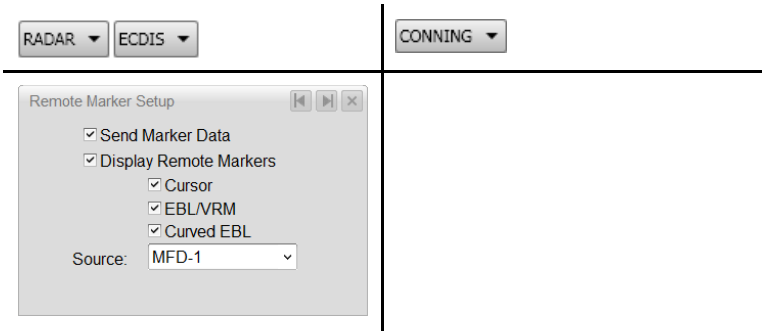
- **Hint:** When disrupting a route planning activity in Browse mode by clicking the **Monitor** button, the last position is remembered by this menu. Click the **GoTo** button will bring you back to your planning context.

Browse Date: This field controls the display of date-dependent chart information. Select one of the following to display the date:

- **None:** Select to present all date-dependent information
- **Now:** Select to present all information that is present today
- **Date:** Select to present all information present at a specified date

3. You can also turn browsing on and off by clicking the Browse button on the ECDIS range panel; see *ECDIS range panel: viewing controls* on page 88.

20.2.7 Remote Marker Setup



This dialog allows you to:

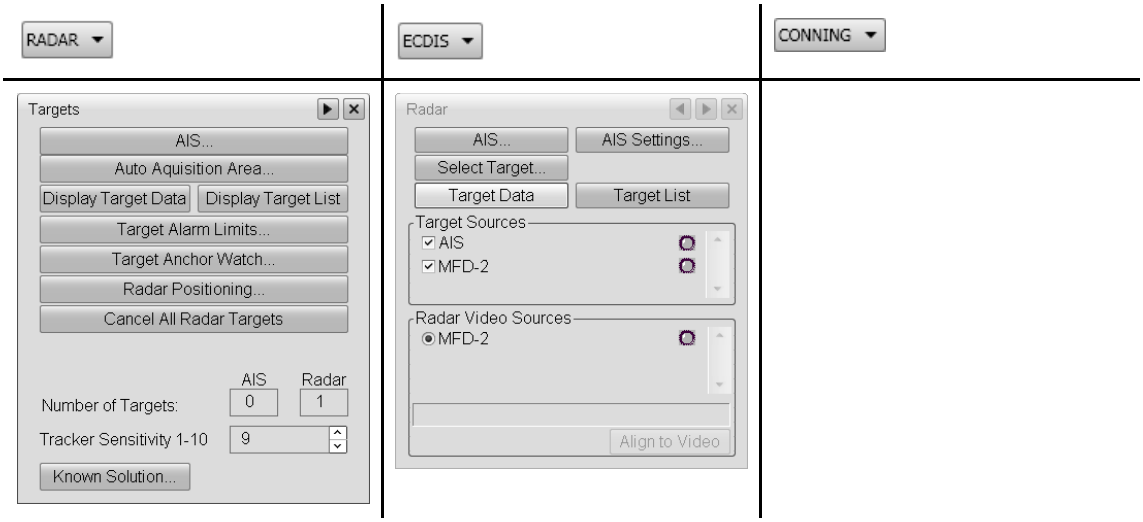
- Make the markers (that is, the cursor, EBL/VRM pair or pairs, and/or curved EBL) on your operator station available to other operator stations on the bridge.
- Specify an operator station on the bridge whose markers you want to display on your operator station.

The path to the dialog in ECDIS or Radar is: **View→Remote Markers**

- **Send Marker Data:** Check this option to make the cursor, EBL/VRM pair or pairs, and curved EBL on your workstation available to other operator stations on the bridge.
- **Display Remote Markers:** Check this option to display the cursor, EBL/VRM pair or pairs, and/or curved EBL from another operator station on your screen. You must then also select one or more of the sub-options **Cursor**, **EBL/VRM**, and **Curved EBL** and, from the **Source** drop-down menu, select the operator station whose remote markers you want to display.
- **Source:** Specify the operator station whose cursor, EBL/VRM pair or pairs, and/or curved EBL you want to display on your screen. Only operator stations on which the **Send Marker Data** option in this dialog has been checked will appear in the drop-down list.

For more information, see *Sharing your markers and viewing remote markers* on page 311

20.3 Targets menu



This is the main menu for working with radar and AIS targets. Depending on the application you are in, it enables you to:

- Manage and operate the AIS facilities (in Radar and ECDIS).
- Control the input sources for radar targets and radar video (in ECDIS only).
- Manage the automatic acquisition of radar and AIS targets (in Radar only)).
- View data about specific targets.
- Display a list of all targets known to the system.
- Set an alarm to notify you when a target vessel leaves its anchor position (in Radar only).
- Set alarms to notify you when targets come within a specified range of the own-ship (in Radar only).
- Use the radar's own facilities for estimating the position of the own-ship (in Radar only; this is provided as a backup to the GPS system).
- Cancel tracking of all targets (in Radar only).
- Configure the level of tracking sensitivity you require (in Radar only).
- Test the radar's tracking capabilities (in Radar only).

To see this menu, click the **Targets** button on the main menu.

The Targets menu in Radar

The buttons and options in the Targets menu in the Radar application are as follows:

- **AIS:** Click this button to use the radar system's AIS facilities and work with AIS targets (see *AIS* on page 382).
- **Auto Acquisition Area:** Click this button to define the area around the own-ship within which the tracker will acquire targets and to set up the automatic acquisition of targets (see *Auto Acquisition* on page 396).
- **Display Target Data:** Click this button to display data for the selected target (see *Target Information* on page 404).

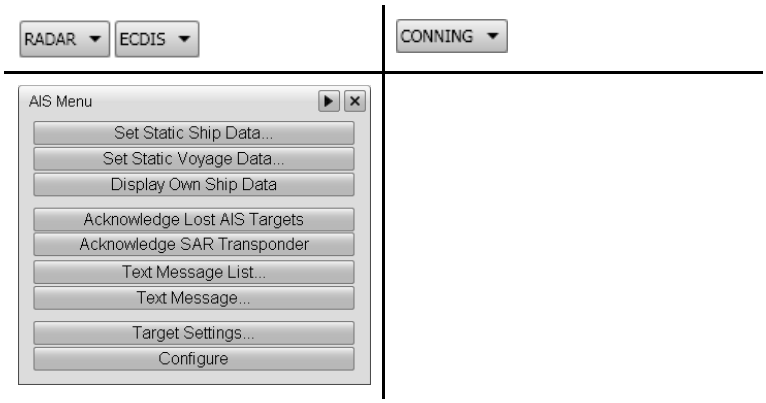
- **Display Target List:** Click this button to display a list of all targets (see *Target List* on page 408).
- **Target Anchor Watch:** Click this button to set up an anchor watch alarm with respect to a target that is currently at anchor (see *Target Anchor Watch* on page 410).
- **Target Alarm Limits:** Click this button to set or display CPA, TCPA and Proximity alarm limits (see *Alarm Limits* on page 411).
- **Cancel All Radar Targets:** Click this button to cancel tracking of all radar targets. For information, see *Ceasing the tracking of targets* on page 145.
- **Number of AIS Targets:** Displays the number of AIS targets being tracked.
- **Number of Radar Targets:** Displays the number of radar targets being tracked.
- **Tracker Sensitivity:** Specify the level of tracker sensitivity you require by using the spin buttons. (The higher the number the greater the sensitivity.) For more information, see *Adjusting tracking sensitivity* on page 146.
- **Known Solution:** Click this button to use the facilities for testing the tracker's capabilities (see *Known Solution* on page 413).

The Targets menu in ECDIS

The buttons and options in the Targets menu in the ECDIS application are as follows:

- **AIS:** Click this button to use the radar system's AIS facilities and work with AIS targets (see *AIS* on page 382).
- **AIS Settings:** Click this button to see an overview of the AIS target settings (see *AIS Target Settings* on page 388).
- **Select Target:** Click to bring up a dialog that enables you to select a target and view data about it (see *Select Target* on page 409).
- **Target Data:** Click this button to display data for the selected target (see *Target Information* on page 404).
- **Target List:** Click this button to display a list of all targets (see *Target List* on page 408).
- **Target Sources:** Select the sources of target data you want to use (the sources are radar systems or an AIS receiver). The lamp blinks when target data is being received.
- **Radar Video Sources:** Select one of the sources of radar video. The corresponding lamp blinks when radar video is received from the selected source.
- **Align to Video:** Click to align the electronic chart with the radar video. The presentation mode will be changed to the same presentation mode as is selected for the radar video source.

20.3.1 AIS



The sub-menus and dialogs described in this section enable you to:

- Set and display information describing the own-ship (including its MMSI and IMO numbers, its call sign, legnth and width, and the location of its conning position).
- Set and display information concerning the own-ship's current voyage (including the number of people onboard, and the vessel's maximum draught when fully laden).
- List the AIS data associated with the own-ship itself.
- Send and receive AIS text messages.
- Configure AIS target alarms and warning limits.

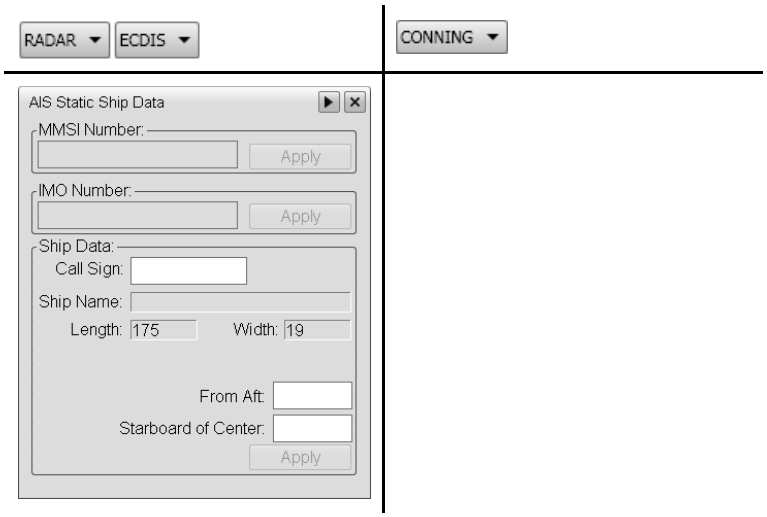
For information about viewing the AIS data for an individual target, see *Target Information* on page 404.

This is the AIS menu. The path to it is: **Targets→AIS**. It contains the following buttons:

- **Set Static Ship Data:** Click to view or specify static information about the own-ship (see *Set Static Ship Data* on page 383).
- **Set Static Voyage Data:** Click this button to set or display static information concerning the voyage that the own-ship is currently embarked upon.(see *Set Static Voyage Data* on page 384)
- **Display Own Ship Data:** Click this button to list the AIS data associated with the own-ship itself (see *Display Own Ship Data* on page 385).
- **Acknowledge Lost AIS Targets:** Click this button to acknowledge lost AIS targets (there is no dialog associated with this action).
- **Acknowledge SAR Transponder:** Click this button to acknowledge an alert from a search and rescue transponder (there is no dialog associated with this action). For information about detecting messages from search and rescue transponders, see *Operating marine radars for SART detection* on page 352.
- **Text Message List:** Click this button to view and send text messages (see *AIS Text List* on page 386).
- **Text Message:** Click this button to create and send text messages (see *AIS Text Message* on page 387).
- **Targets Settings:** Click this button to see an overview of the AIS target settings (see *AIS Target Settings* on page 388).

- **Configure:** Click this button to configure the handling of AIS alarms and messages (see *AIS Configure* on page 394).

20.3.1.1 Set Static Ship Data



This dialog is for setting and displaying static information describing the own-ship.

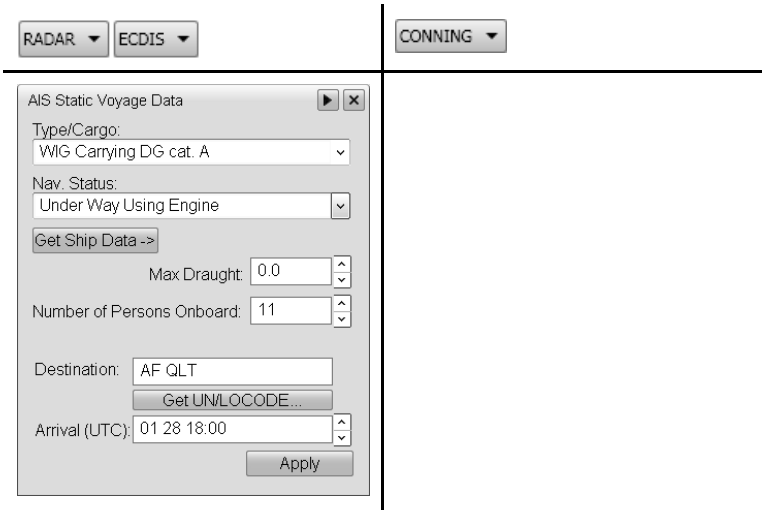
To edit some of the parameters in this dialog, you need to enter the service password; you must also be using the Kongsberg Seatex AIS receiver, and the interface to it must be configured for Seatex AIS messages (see *AIS interface* on page 636); finally the radar operator station must be set up to transmit to the AIS receiver.)

The path to this dialog is: **Targets →AIS →Set Ship Static Data**.

The dialog contains the following information:

- **MMSI Number:** The Maritime Mobile Service Identity number.
- **IMO number:** The International Maritime Organization number.
- **Call Sign:** The ship's call sign.
- **Ship Name:** The ship's name.
- **Length:** The ship's length.
- **Width:** The ship's width.
- **From Aft:** The ship's conning position, from aft.
- **Starboard of center:** The ship's conning position, starboard of center.
- **Apply:** Click to apply a data entry.

20.3.1.2 Set Static Voyage Data



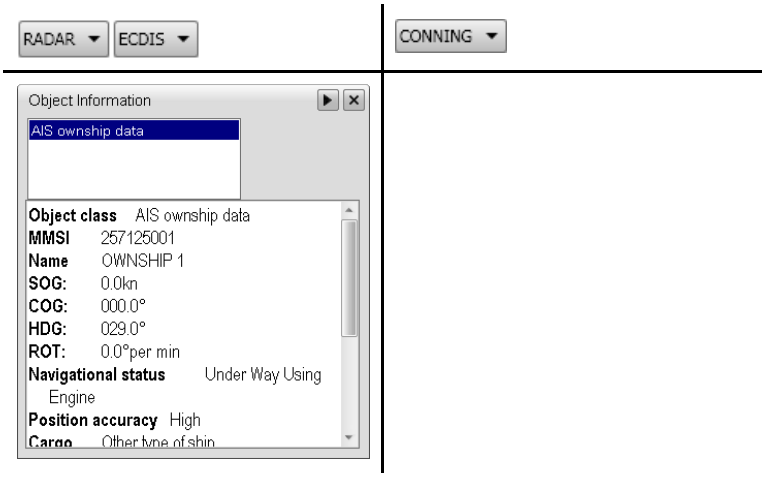
This dialog enables you to set or display static information concerning the voyage that the own-ship is currently embarked upon.

The path to the dialog is: **Targets→AIS→Set Static Voyage Data**.

The dialog contains the following information:

- **Type/Cargo:** The voyage type or the cargo the vessel is carrying.
- **Nav. Status:** The current navigation status.
- **Get Ship Data:** Click this button to retrieve the currently configured value for the vessel's maximum draught (see *Ship (tab)* on page 571).
- **Max Draught**: Use the up and down arrow controls to specify the maximum draught for the fully laden vessel on its current voyage.
- **Number of Persons Onboard:** Use the controls to specify the number of persons currently onboard.
- **Destination:** Enter the voyage destination into this field.
- **Arrival (UTC):** Use the control to specify the vessel's planned arrival time at the end of the voyage.
- **Apply:** Click to apply any data you have entered.

20.3.1.3 Display Own Ship Data



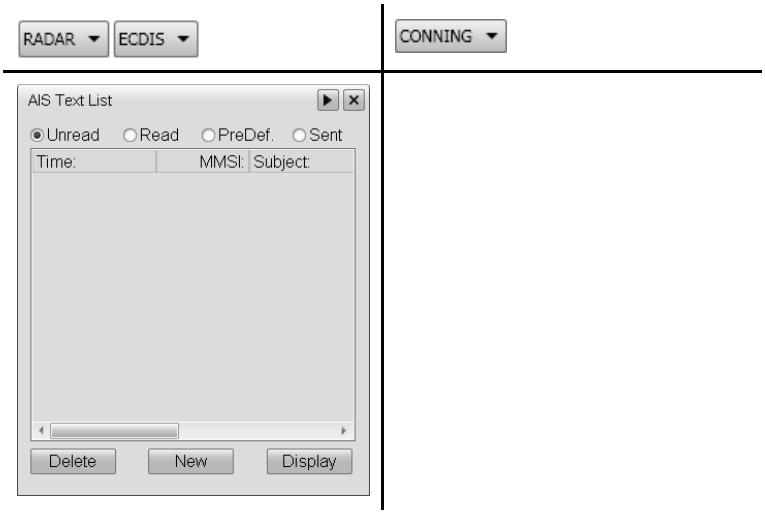
This dialog lists the AIS data associated with the own-ship itself.

The path to the dialog is: **Targets→AIS→Display Own Ship Data**.

The content of the dialog is as follows:

- **Upper part:** This part of the dialog displays the Maritime Mobile Service Identity (MMSI) name of the object.
- **Lower part:** This part of the dialog lists the own-ship's AIS data.

20.3.1.4 AIS Text List



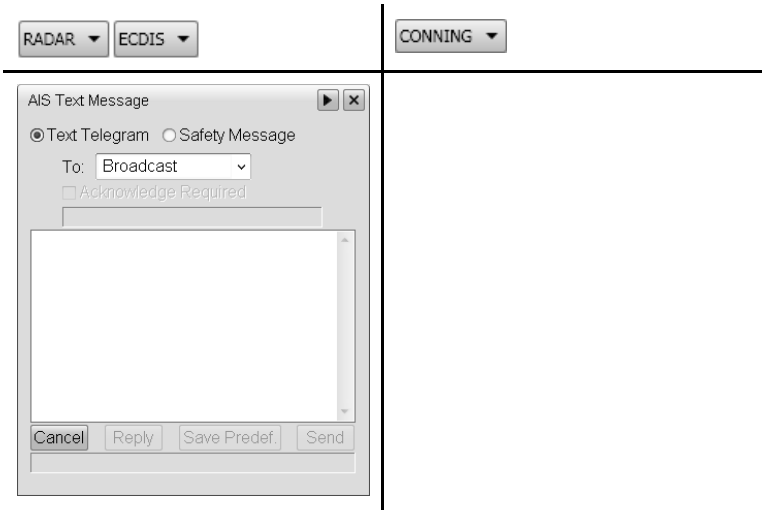
This dialog enables you to view any AIS text messages received.

The path to the dialog is:**Targets→AIS→Text Message List**.

The dialog contains the following elements:

- **Unread/Read/PreDef./Sent:** Select one of the categories of message to list.
- **Time:** The time at which the text message was sent.
- **MMSI:** The Maritime Mobile Service Identity.
- **Subject:** The subject of the text message.
- **Delete:** Click this button to delete an entry in the list.
- **New:** Click this button to create a new text message. It brings up the **AIS Text Message** menu (see *AIS Text Message* on page 387).
- **Display:** Click this button to list incoming AIS text messages from other vessels.

20.3.1.5 AIS Text Message



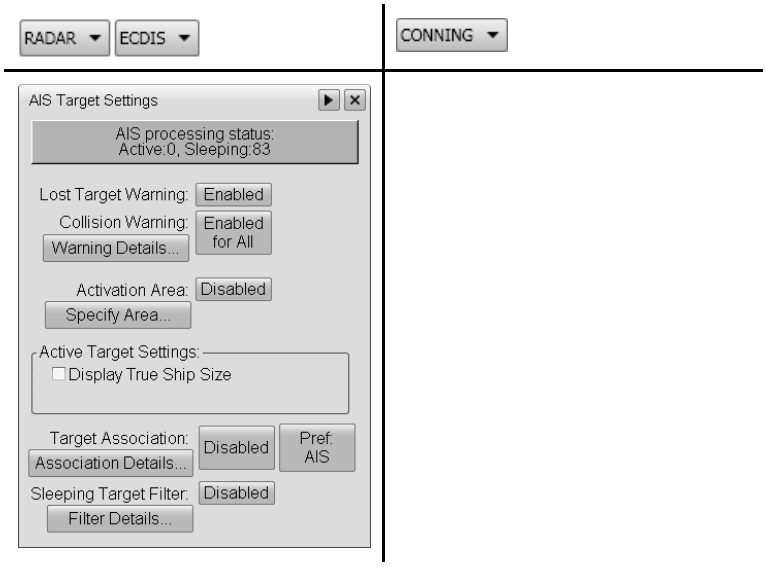
This dialog enables you to create and send AIS text messages.

The path to the dialog is: **Targets→AIS→Text Message**.

The dialog contains the following elements:

- **Text Telegram/Safety Message:** Select type of text message to be made.
- **To:** Select a distribution method for the text message (Broadcast/MMSI).
- **Acknowledge Required:** Select this box if the text message requires an acknowledgement.
- **Window:** This field contains the text message.
- **Cancel:** Click this button to cancel the text message.
- **Reply:** Click this button to reply to a text message.
- **Save Predef.:** Click this button to save a pre-defined text message.
- **Send:** Click this button to send the text message.

20.3.1.6 AIS Target Settings



This dialog gives an overview of the AIS target settings.

The path to the dialog is:**Targets→AIS→Target Settings**.

The dialog contains the following elements:

- **AIS processing status:** Indicates the AIS operating status. When the maximum number of targets has been exceeded, this area is red. When AIS is disabled, it is yellow. During normal operation, however, it is grey and provides the number of active and sleeping AIS targets
- **Lost Target Warning:** Indicates whether lost target warnings are enabled or disabled.
- **Collision Warning:** Indicates whether collision warnings are enabled for all targets, enabled for active targets only, or disabled.

  If they are enabled for active targets only, you will receive no warning when sleeping AIS targets come inside the collision warning limits.

  If they are disabled you will receive no warning when AIS targets come inside the collision warning limits (see *AIS Configure Warning Limits* on page 390).
- **Warning Details:** Click this button to configure the warning limits (see *AIS Configure Warning Limits* on page 390).
- **Activation Area:** Indicates whether a target acquisition area is enabled or disabled.
- **Specify Area:** Click this button to specify the auto-acquisition area (see *Auto Acquisition* on page 396).
- **Display True Ship Size:** Check this box if you want the target to appear on the screen along with a ship's outline that reflects the actual size of the target vessel according to the scale of the display. The ship symbol will be displayed with true dimensions if the K-Bridge MFD system has received the AIS telegram reporting the actual ship dimensions and if the display scale is larger than 1:15000 (which also triggers the display of the own-ship symbol with true dimensions). In accordance with AIS requirements, however, the true scaled outline is not available when a target's heading has not been received or when the beam of the outline is less than 7.5mm.

- **Target Association: Enabled/Disabled** Indicates whether AIS target association is enabled, enabled for active targets only, or disabled ("target association" was previously known as "target fusion").
- **Pref: AIS/Radar:** Indicates whether targets that have been associated are displayed as AIS or radar targets ("Pref" is short for "prefer").
- **Association Details:** Click this button to specify the conditions (if any) under which you want AIS and ARPA/Radar targets to be associated (see *AIS Association* on page 392).
- **Sleeping Target Filter:** Indicates whether filtering of sleeping AIS targets is currently enabled.
- **Filter Details:** Click this button to go to the **AIS Sleeping Target Filter** menu (see *AIS Sleeping Target Filter* on page 393).

20.3.1.6.1 Auto Acq

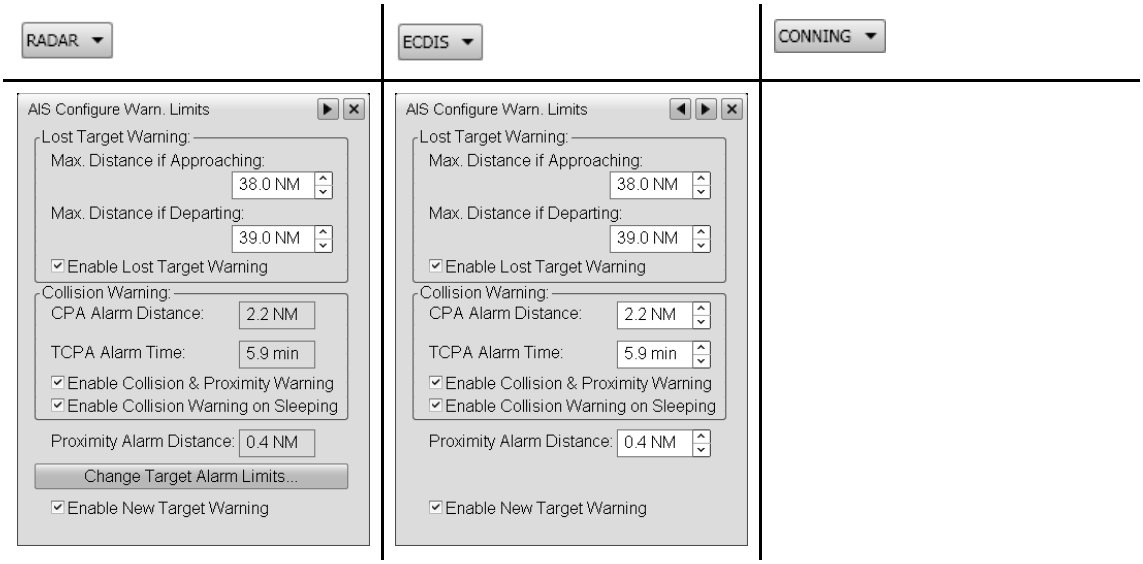
This dialog is for defining the area around the own-ship within which targets are automatically acquired.

There are two paths to the dialog:

- **Targets→AIS→Target Settings →Specify Area**.
- **Targets →Auto Acquisition Area**

For a description of it, see *Auto Acquisition* on page 396.

20.3.1.6.2 AIS Configure Warning Limits



This dialog enables you to configure the warning limits associated with AIS targets.

The path to the dialog is: **Targets→AIS→Target Settings→Warning Details**.

The dialog contains the following elements:

Lost Target Warnings

- **Max. Distance if Approaching:** Use the spin buttons to set the maximum distance at which a lost target warning will be issued for a target that was heading towards the own-ship when it stopped sending AIS position messages.
- **Max. Distance if Departing:** Use the spin buttons to set the maximum distance at which a lost target warning will be issued for a target that was heading away from the own-ship when it stopped sending AIS position messages.
- **Enable Lost Target Warning:** Select to enable "Lost" target warnings. A **LOST** alarm is issued when a target stops sending AIS position messages and either of the following sets of conditions are true:
  - The target's distance from the own-ship is less than "Max. Distance if Approaching" and the heading of the AIS target is towards the own-ship.
  - The target's distance from the own-ship is less than "Max. Distance if Departing" and the heading of the target is away from the own-ship.

  Either of these set of conditions will result in a **LOST** alarm being issued (see *The alert condition group buttons* on page 61).

Collision Warnings

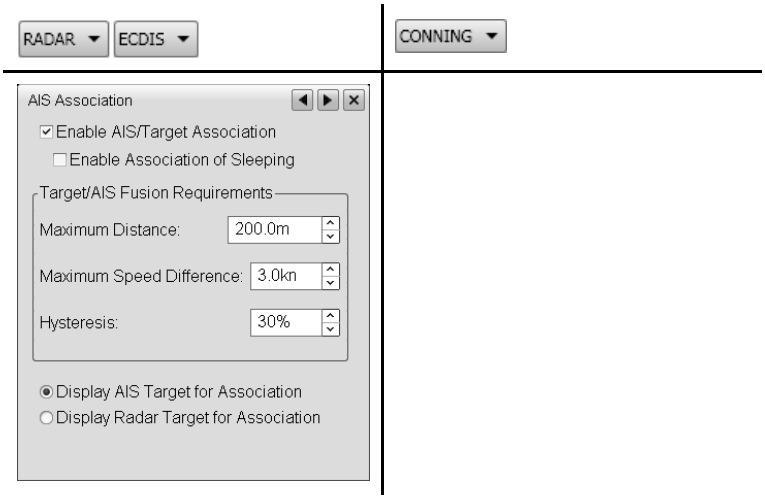
- **CPA Alarm Distance:** The CPA alarm distance (see *Alarm Limits* on page 411).
- **TCPA Alarm Time:** The TCPA alarm time (see *Alarm Limits* on page 411).
- **Enable Collision and Proximity Warning:** Select to enable collision and proximity warnings for active AIS targets. An alarm is issued if a target has a CPA smaller than the "CPA Alarm Distance" (nautical miles) and a TCPA smaller than the "TCPA Alarm Time" (minutes:seconds). This will activate the **COLL** alarm field.

- **Enable Collision Warning on Sleeping:** Select to enable collision warnings for sleeping AIS targets. An alarm is issued if a sleeping target has a CPA smaller than the "CPA Alarm Distance" (nautical miles) and a TCPA smaller than the "TCPA Alarm Time" (minutes:seconds). This will activate the **COLL** alarm field.

Other elements

- **Proximity Alarm Distance:** If you are in the ECDIS application, you can specify the proximity alarm limit in this dialog. For an explanation of the proximity alarm, see *Alarm Limits* on page 411.
- **Change Target Alarm Limits:** Select to specify the radar target alarm limits (see *Alarm Limits* on page 411). These limits apply to both radar and AIS targets.
- **Enable New Target Warning:** Select to receive a warning whenever the system acquires a new AIS target.

20.3.1.6.3 AIS Association



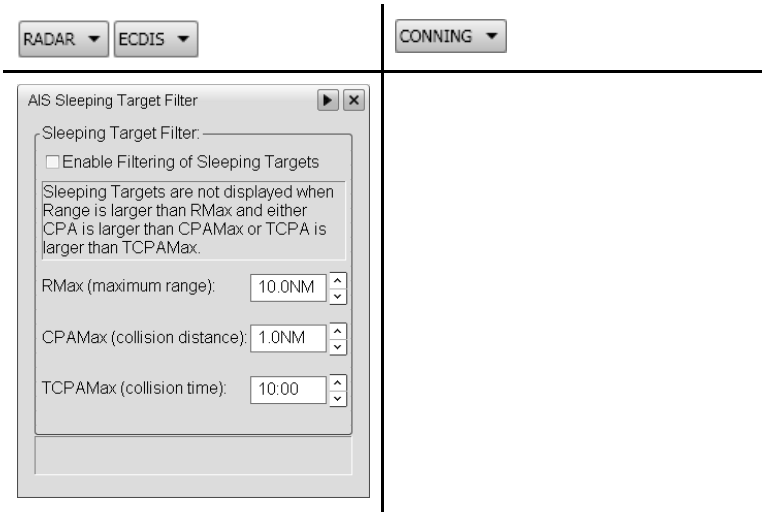
This dialog enables you to specify the conditions (if any) under which you want AIS and ARPA/Radar targets to be associated with each other (the term “association” now replaces the old term “fusion”).

The path to the dialog is: **Targets→AIS→Target Settings→Association Details**.

The dialog contains the following elements:

- **Enable AIS/Target Association:** Select this box to associate AIS and ARPA/Radar target symbols if the distance and the difference in speed between them are within the limits defined in this dialog.
- **Enable Association of Sleeping:** Check this box to enable target association where the AIS target is a sleeping target.
- **Maximum Distance:** Use the up/down controls to specify a maximum distance permissible between associated targets.
- **Maximum Speed Difference:** Use the up/down controls to specify a maximum (vector) speed difference permissible between associated targets.
- **Hysteresis:** Specify the amount of hysteresis to allow while the targets are associated (fused) with each other. The value you specify determines the frequency with which the symbols for associated targets jump on the display between appearing as a single target and appearing as two separate targets. If you specify a high percentage, there will be less of this jumping. However, bear in mind that the percentage of hysteresis you specify results in an equivalent percentage increase in both the maximum distance permissible between associated targets and in the maximum difference in speed permissible between the targets.
- **Display AIS Target for Association:** Select this box if you want the associated (fused) target to display as an AIS target (see *AIS symbols* on page 174).
- **Display Radar Target for Association:** Select this box if you want the associated (fused) target to display as a radar target (see *Radar target symbols* on page 145).

20.3.1.6.4 AIS Sleeping Target Filter



This dialog enables you to configure the filtering of sleeping AIS targets. The filtering criteria are: range, CPA (Closest Point of Approach) and TCPA.(Time to Closest Point of Approach).

The path to the dialog is: **Targets→AIS→Target Settings→Filter Details**.

The dialog contains the following elements:

- **Enable Filtering of Sleeping Tgts:** Check this box to enable filtering of sleeping targets.

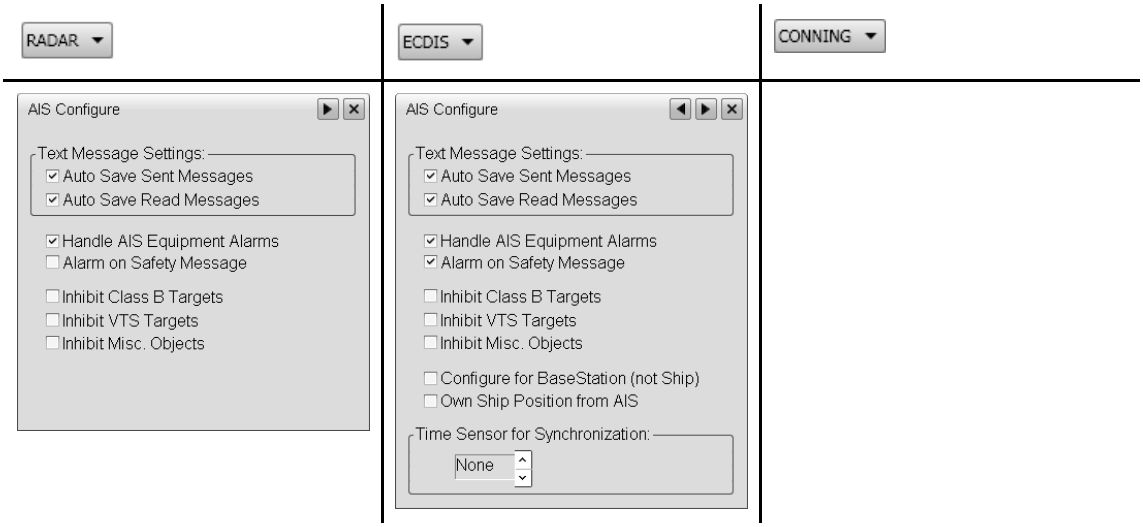
  Sleeping AIS targets will not be presented if their range is greater than the value specified for RMax (maximum range) and either:

  – the CPA is greater than the CPAMax value or

  – the TCPA is greater than the TCPAMax value

  In other words, sleeping AIS targets with a range of less than RMax will be presented. Sleeping AIS targets with a range greater than RMax will be presented only if the CPA is less than CPAMax and the TCPA is less than TCPAMax.
- **RMax:** Specify the range within which you want to filter out sleeping AIS targets.
- **CPAMax:** Specify the CPA (between the own-ship and sleeping AIS targets) beyond which you want to filter out sleeping AIS targets.
- **TCPAMax:** Specify the TCPA (between the own-ship and sleeping AIS targets) above which you want to filter out sleeping AIS targets.

20.3.1.7 AIS Configure



This dialog enables you to configure the handling of AIS messages and alarms.

The path to the dialog is: **Targets→AIS→Configure**.

The dialog contains the following elements:

- **Auto Save Sent Messages:** Check to store each outgoing message in a **Sent** mailbox.
- **Auto Save Read Messages:** Check to store each incoming message in a "Read" mailbox after it has been sent.
- **Handle AIS Equipment Alarms:** Check to allow AIS alarms to be presented inside the K-Bridge MFD's alarm system. If you check this option, you can also acknowledge AIS alarms from inside the K-Bridge MFD's alarm system.
- **Alarm on Safety Message:** When this is checked, safety messages will generate an alarm (the option is checked by default).
- **Inhibit Class B targets:** When this is checked, the display of class B targets is inhibited (the option is un-checked by default).
- **Inhibit VTS targets:** When this is checked, the display of class VTS targets is inhibited (the option is un-checked by default).
- **Inhibit Misc. Objects:** When this is checked, the display of AIS objects other than class B and VTS targets is inhibited (the option is un-checked by default).
- **Configure for BaseStation (not Ship):** This option must always be un-checked on K-Bridge systems that are installed on a vessel (the option is only available for demonstration or training purposes on a land-based installation).
- **Own Ship Position from AIS:** This option causes the system take the own-ship's position from AIS. The option must be un-checked during normal operation. However, you can check it in an emergency if all the ship's primary position reference systems have failed.

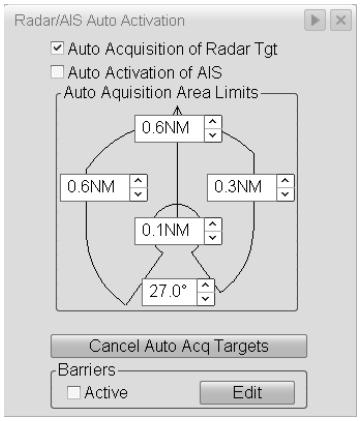
- **Time Sensor for Synchronization:** Select a time sensor to synchronize the AIS with. AIS messages can be subject to significant delay, but synchronizing the AIS with a GPS time sensor will ensure that the AIS system estimates the position of other vessels precisely (by extrapolating from the time, speed and position data received from them).

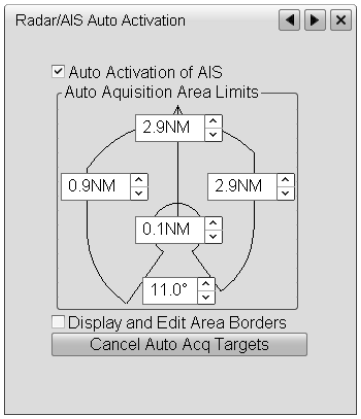
20.3.2 Auto Acquisition

The dialogs and sub-menus described in this section enable you to:

- Define the area around the own-ship within which ARPA and AIS targets will be automatically acquired.
- Turn on and off the automatic acquisition of radar targets.
- Define fixed geographical limits (barrier lines) beyond which targets will not be automatically acquired.

RADAR ECDIS CONNING





This dialog enables you to start the automatic acquisition of targets and to define the area around the own-ship within which the tracker will automatically acquire targets.

There are two paths to this dialog:

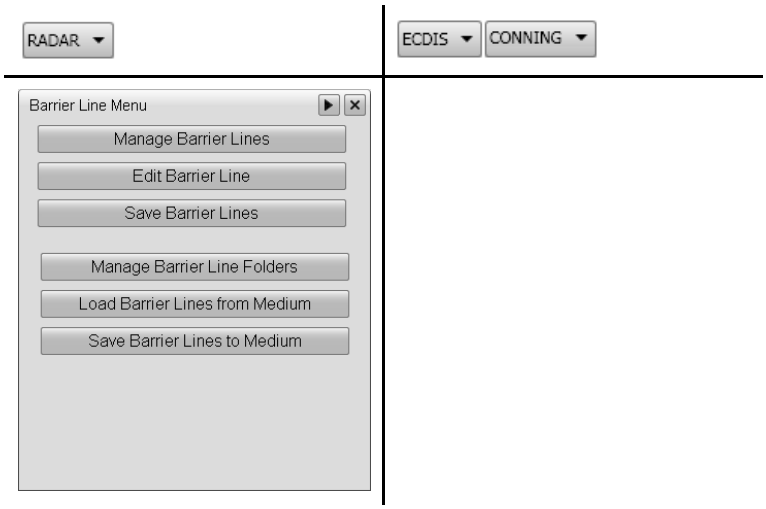
- **Targets →Auto Acquisition Area**
- **Targets →AIS →Target Settings →Specify Area**.

The dialog contains the following elements:

- **Auto Acquisition of Radar Tgt:** Click this box to turn on the automatic acquisition of targets. The acquisition area is displayed in the radar area.
- **Auto Activation on AIS:** Click this box to turn on the automatic activation of AIS targets.
- **Forward Radius:** Use the arrow controls to set the forward outer limit for automatic acquisition (range 0.1 - 24NM).
- **Port Distance:** Use the arrow controls to set the port outer limit for automatic acquisition (range 0.1 - 24NM).
- **Starboard Distance:** Use the arrow controls to set the starboard outer limit for automatic acquisition (range 0.1 - 24NM).
- **Minimum Range:** Use the arrow controls to set the inner limit for automatic acquisition (range 0.1 - 24NM).
- **Blind Sector:** Use the arrow controls to define the aft blind sector where no tracking will be performed (maximum ±90º).

- **Cancel Auto Acq Tracks:** Click this button to stop tracking all automatically acquired targets. (Targets inside the automatic acquisition area will be automatically re-acquired if auto-activation is still enabled.)
- **(Barriers) Active:** Check this box to start using and displaying radar barrier lines (if any are defined).
- **(Barriers) Edit:** Click to edit or create radar barrier lines (geographically fixed limits to automatic target acquisition; see *Barrier Line Menu* on page 398).

20.3.2.1 Barrier Line Menu



This sub-menu enables you to work with barrier lines. These are geographically fixed limits to the automatic acquisition of targets. You can define them yourself or use already existing ones.

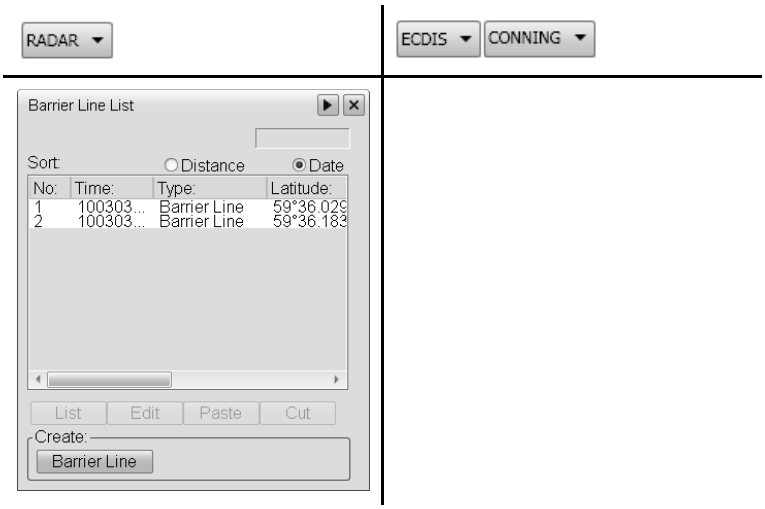
The path to the menu is: **Targets→Auto Acquisition Area→Edit**.

The automatic acquisition area moves and turns with the own-ship, but barrier lines are geographically fixed. They are limits to the automatic acquisition of land echoes or other echoes. Targets are not automatically acquired behind barrier lines. Barrier lines may be stored for later use and can be edited.

The sub-menu contains the following buttons:

- **Manage Barrier Lines:** Click this button to list existing barrier lines (see *Barrier Line List* on page 399).
- **Edit Barrier Line:** Click this button to edit barrier lines (see *Barrier Line* on page 400).
- **Save Barrier Lines:** Click this button to save new or edited barrier lines to the hard disk.
- **Manage Barrier Line Folders:** Click this button to organise your barrier lines into folders (see *Manage Barrier Line Folders* on page 401).
- **Load Barrier Lines from Floppy:** Click this button to load barrier lines from floppy disk (see *Load barrier lines from an external medium* on page 402).
- **Save Barrier Lines to Floppy:** Click this button to save barrier lines to floppy disk (see *Save barrier lines to an external medium* on page 403).

20.3.2.1.1 Barrier Line List



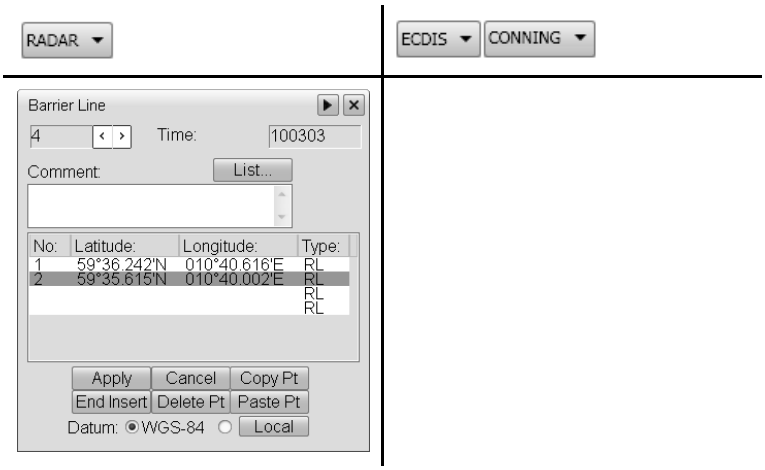
This dialog lists the barrier lines that are already defined. It also enables you to create new ones.

The path to the dialog is: **Targets→Auto Acquisition Area→Edit→Manage Barrier Lines**.

The dialog contains the following elements:

- **Folder list:** Select a barrier folder from the drop-down list to display the barriers in that folder.
- **Sort:** The barrier lines in the selected folder can be sorted by distance (from the own-ship) or by date of creation/modification. Select the sorting method you require by using the radio buttons.
- **List:** Click this button to display the **Barrier Line** menu showing the selected barrier line.
- **Edit:** Click this button to display the **Barrier Line** menu showing the selected barrier line, ready to be edited.
- **Cut:** Cut/paste is used to move a barrier line from one folder to another. Select the barrier line and click **Cut**.
- **Paste:** Cut/paste is used to move a barrier line from one folder to another. Go to the folder you want the barrier line pasted into and click **Paste**.
- **(Create) Barrier Line:** Click this button to display the **Barrier Line** menu, ready to insert lines (see *Barrier Line* on page 400).

20.3.2.1.2 Barrier Line



Use this dialog to edit an existing or newly created barrier line.

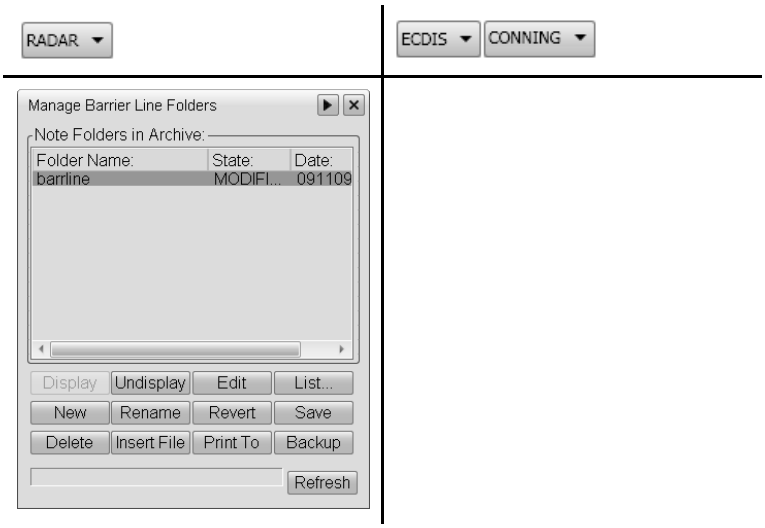
There are two paths to this dialog:

- **Targets→Auto Acquisition Area→Edit→Edit Barrier Lines**
- **Targets→Auto Acquisition Area→Edit→Manage Barrier Lines →(Create) Barrier Line**

The dialog contains the following elements:

- **Line number:** The line number of the selected barrier line. Use the up-down controls to specify line number.
- **Time:** The date the barrier line was saved.
- **List:** Click this button to display the **Barrier Line List** menu.
- **Comment:** Use this field to describe the barrier line for later use.
- **List of points:** List of the barrier segment end points (latitude and longitude) constituting the barrier line.
- **Apply:** Click to apply your changes to the barrier line.
- **Cancel:** Cancels text that was entered through the keyboard.
- **Copy Pt:** Copy/paste is used to copy selected points to other barrier lines. Select the points you want to copy, and click **Copy PT**.
- **Insert Pt:** Insert a new point before or between existing points.
- **Delete Pt:** Delete the selected point.
- **Paste Pt:** Go to the folder you want the points pasted into, and click **Past PT**.
- **Datum:** Select WGS-84 or Local datum.
- **Local:** Pressing this button allows you to select a datum from a list of commonly used datums. If you select a local datum, the name will shown as the button text (instead of “Local”). See section 20.9.9 on page 551 for more information.

20.3.2.1.3 Manage Barrier Line Folders



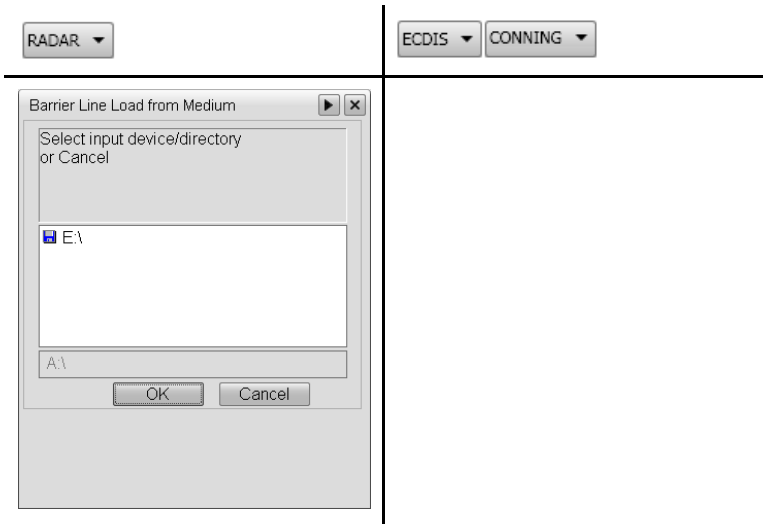
Use this dialog to organise your barrier lines into folders.

The path to the dialog is: **Targets→Auto Acquisition Area→Edit→Manage Barrier Line Folders**.

The dialog contains the following elements:

- **Folder List:** Lists all barrier line folders in the system. Select a folder from the list.
- **Display:** Displays the barrier lines in the selected folder in the radar area.
- **Undisplay:** Turns the display of barrier lines off.
- **Edit:** Allows you to edit the barrier line that is selected in the radar area.
- **New:** Click to create a new barrier line folder.
- **Rename:** Click to give a new name to the specified folder.
- **Insert File:** Click to insert barrier line files from an external memory device into this folder.
- **Revert:** Click to cancel un-saved changes and revert to the last saved version.
- **Delete:** Click to delete the selected folder.
- **Backup:** Click to save the selected folder to an external memory device.
- **Save:** Click to save the modified folder to the hard disk.
- **List:** Click to view the barrier lines in the selected folder (see *Barrier Line List* on page 399).
- **Refresh:** Refreshes the folder list (use this button when you have inserted a new external memory device).

20.3.2.1.4 Load barrier lines from an external medium



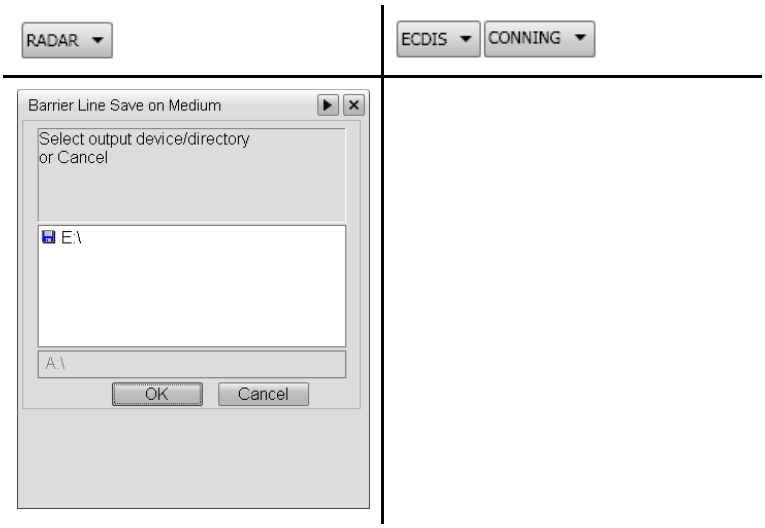
Use this dialog to load previously defined barrier lines from an external device.

The path to the dialog is: **Targets→Auto Acquisition Area→Edit→Load Barrier Lines from Medium**.

The dialog contains the following elements:

- **Select input device/directory or Cancel:** Window below lists the available device/directory. Select device/directory from the list.
- **Lower window:** Displays selected device/directory.
- **OK:** Click to list contents of selected device/directory.
- **Cancel:** Click to cancel selected device/directory.

20.3.2.1.5 Save barrier lines to an external medium



Use this dialog to save barrier lines to an external memory device.

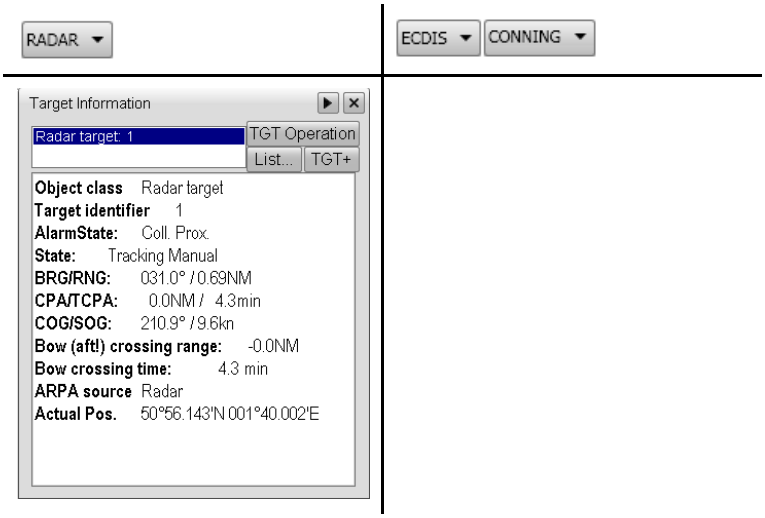
The path to the dialog is: **Targets→Auto Acquisition Area→Edit→Save Barrier Lines to Medium**.

The dialog contains the following elements:

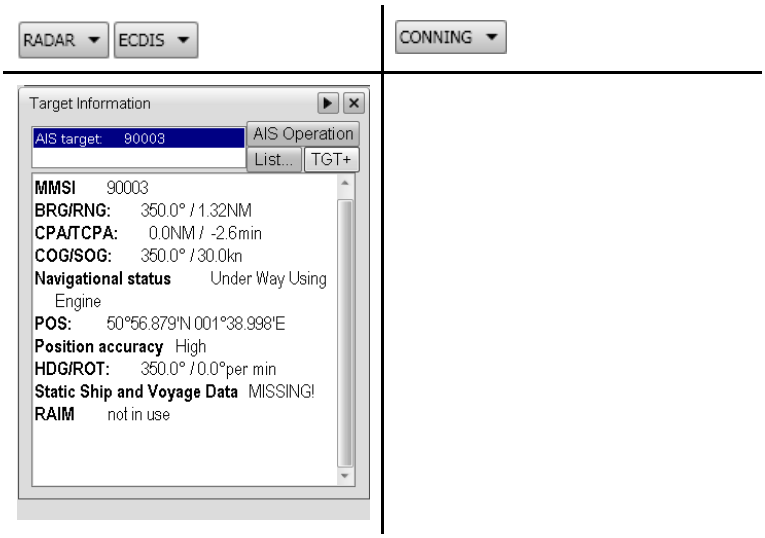
- **Select output device/directory or Cancel:** Window below lists the available device/directory. Select device/directory from the list.
- **Lower window:** Displays selected device/directory.
- **OK:** Click to list contents of selected device/directory.
- **Cancel:** Click to cancel selected device/directory.

20.3.3 Target Information

Radar: target information



AIS: target information



This dialog displays the object data belonging to a tracked radar or AIS target.

To bring up the dialog, point to the target you are interested in by using the track-ball, then press **DATA** on the operator panel (see *The TARGET group buttons* on page 35). (Trial manoeuvre data is displayed if a trial manoeuvre is in progress; see *Using the trial manoeuvre facility* on page 313.)

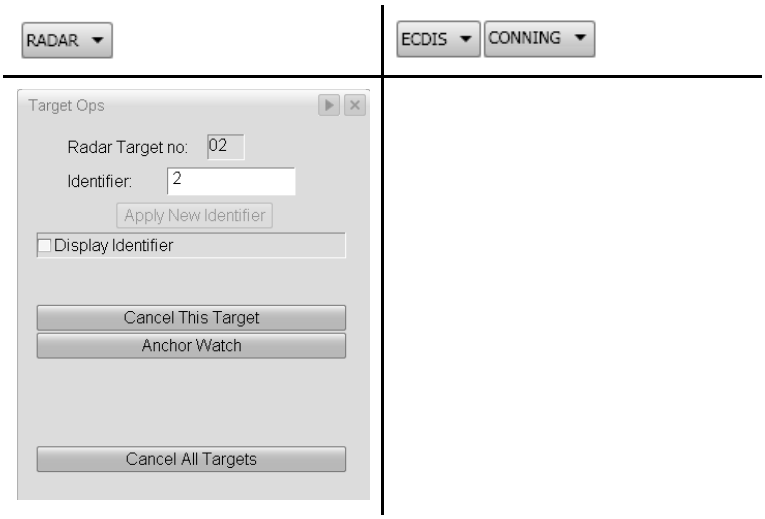
If there are two targets close together – perhaps one a radar target and the other an AIS target, and you want to view the radar data but it is the AIS data that is shown (or you want to view the AIS data but it is the radar data that is shown) – click the **Tgt+** button. This shows you the data for both targets. You can view data for up to four targets at the same time.

The data contained in this dialog can include the following:

- **Upper portion:** This part of the dialog displays the target identifier or the MMSI-number.
- **Lower portion:** This part of the dialog contains the target data.
- **List..:** Click to see a list of all targets currently known to the system *Target List* on page 408.
- **Tgt +:** Select a target from the list (see *Target List* on page 408) and then click **Tgt +**. The new target data always appears above the last target data view displayed. You can display a maximum of four target data views at once.

  Alternatively, click **Tgt +** to bring up data for the target closest to the marker (if you have clicked with the marker), or closest to the last target for which data was displayed, or closest to the vessel's own position (if you have not previously clicked with the marker or displayed data for a target).
- **Tgt -:** Click to close the target data that was added least recently (in other words, to close the target data view at the bottom.
- **Tgt Operation:** Click to bring up the **Radar Target Operations** menu (see *Radar Target Operations* on page 406).
- **AIS Operation:** Click to bring up the **AIS Target Operations** menu (see *AIS Target Operations* on page 407).

20.3.3.1 Radar Target Operations



This dialog enables you to perform some additional operations on a selected target.

To bring it up, click on a radar target and, in the Target Information dialog (see *Target Information* on page 404) for that target, click **Tgt Operation**.

The dialog contains the following elements:

- **Radar Target no:** Displays the radar target number.
- **Identifier:** Type an identifying name if you want the target to be identified by a name instead of the default number. Click **Apply New Identifier** to complete the action.
- **Apply new Identifier:** Click to apply the new identifier.
- **Display Identifier:** Select to display the identifier for this target in the radar area. To display the identifier for all targets, go to **MENU →Display** and select **Target ID** (see *Radar Themes* on page 371).
- **Cancel this track:** Cancels tracking of this target.
- **Anchor Watch:** Brings up the **Target Anchor Watch** dialog for this target (see *Target Anchor Watch* on page 410).
- **Fixed Reference Target:** Check this box to designate the target a fixed reference target to be used for radar positioning. For more information, see *Using the radar positioning system* on page 148.
- **Cancel All Tracks:** Cancels tracking of all radar targets.

20.3.3.2 AIS Target Operations

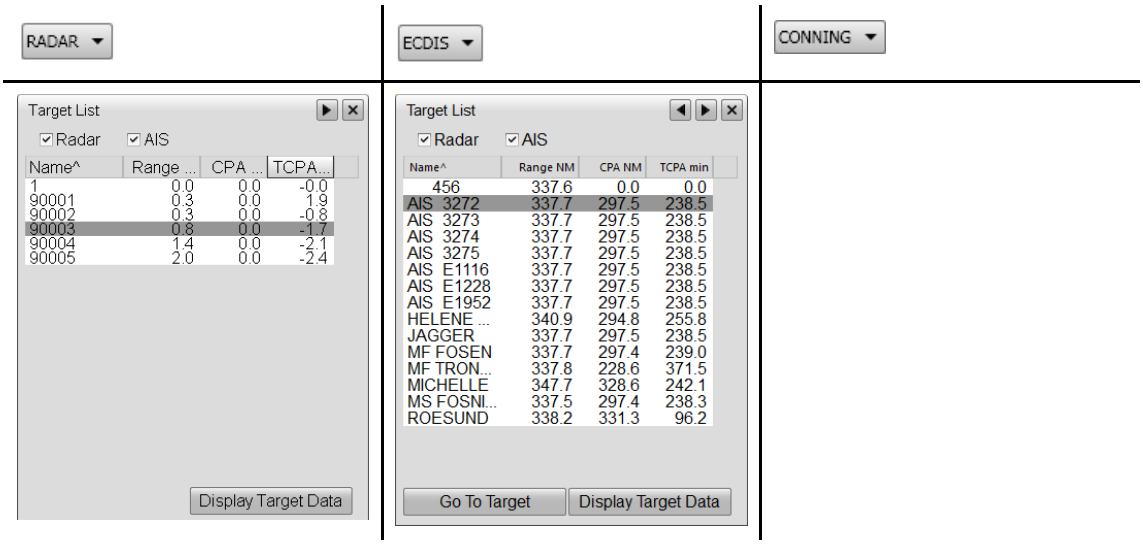
This dialog enables you to perform some additional operations on a selected AIS target.

To bring it up, click on an AIS target and, in the Target Inforomation dialog (see *Target Information* on page 404) for the target, click **AIS Operation**.

The dialog contains the following elements:

- **AIS Track MMSI:** Displays the AIS target's MMSI (Maritime Mobile Service Identity) number.
- **Name:** Displays the AIS target vessel's name if available.
- **Display Identifier:** Select to display the target's name (if available) on the screen.
- **Activate this Target:** Click to activate the target.
- **Deactivate this Target:** Click to deactivate the target.
- **Activate all AIS Targets:** Click to activate all AIS targets on the display.
- **Deactivate all AIS Targets:** Click to deactivate all AIS targets on the display.
- **Association & AIS Target Settings:** Click to go to the AIS Target Settings dialog (see *AIS Target Settings* on page 388).

20.3.4 Target List



This dialog lists all targets (optionally for both ARPA and AIS) currently known to the system (at whatever stage they happen to be at in the target lifecycle).

In Radar the path to the dialog is: **Targets→Display Target List**.

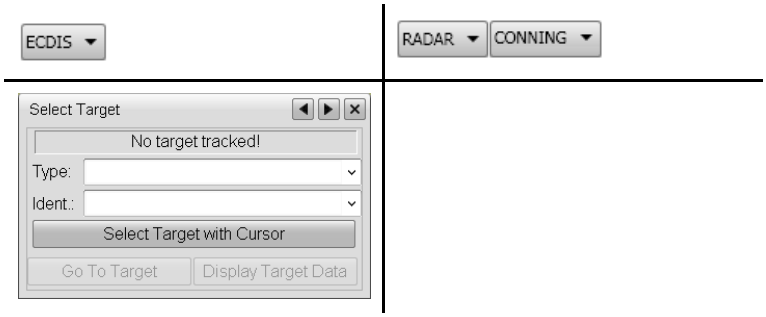
In ECDIS the path is: **Targets→Target List**.

The dialog contains the following elements:

- **Radar:** Check to include radar targets in the list.
- **AIS:** Check to include AIS targets in the list.
- **Column headings:** You can click on the column headings to determine how the list is sorted. By default, it is sorted alphabetically by name (and numerically by MMSI number for targets whose name is not available). But you can have it sorted by range, CPA (Closest Point of Approach; the closest target appearing first in the list), or TCPA (Time to Closest Point of Approach; the target with the shortest TCPA appearing first in the list). The circumflex appearing next to a column label indicates how the list is currently sorted.

  When the TCPA is close to zero, there is a danger of collision if the CPA is also close to zero. However, it is possible for the TCPA to be close to zero but for the target still to be at a safe range.
- When the TCPA is negative, the own-ship has already passed the CPA for the target and the two vessels are now moving further apart.
- **Go To Target:** Click this button to position the chart view with the selected target at its centre. The target will also be highlighted by a surrounding blue border.
- **Display Target Data:** Click to bring up the data for the selected target (see *Target Information* on page 404).

20.3.5 Select Target



This dialog enables you to select a target and view data about it.

The path to the dialog is: **Targets→Select Target**.

The dialog contains the following elements:

Type: Select the type of target from the drop-down list.

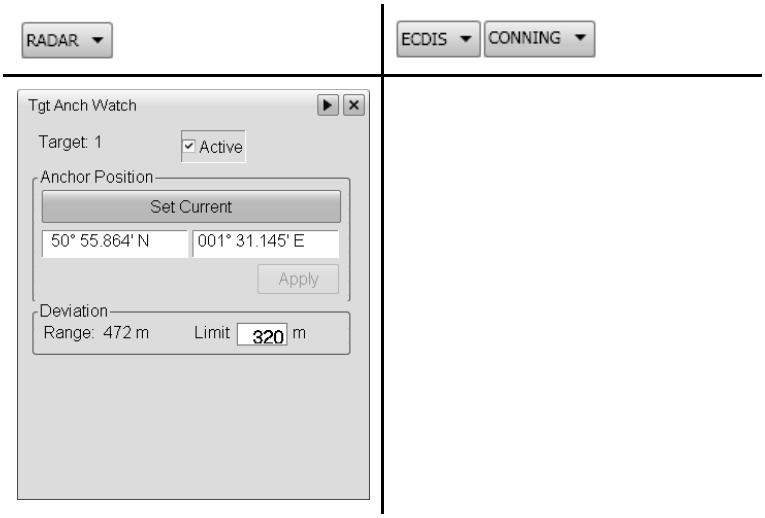
Ident: Select the target from a list of targets of the specified type.

Select Target with Cursor: Clicking this button you can identify the target by pointing to it on the screen.

Go To Target: Click this button to position the chart view with the selected target at its centre. The target will be highlighted by a surrounding blue border and data for the target will be displayed (see *Target Information* on page 404).

Display Target Data: Click this button to see data for the selected target (see *Target Information* on page 404).

20.3.6 Target Anchor Watch



Use this dialog to start the anchor watch on a selected target. For information about how to use it, see *Using the anchor watch function* on page 324.

The path to the dialog is: **Targets→Target Anchor Watch**.

The dialog contains the following elements:

- **Active:** Activates the anchor watch function for the selected target. The warning limit will be displayed in the radar area.
- **Set Current:** Sets the target's current position as the anchor watch position.
- **Anchor Position:** Enter the anchor watch position here (or use the **Set Current** button above).
- **Deviation:** The distance between the target's anchor watch position and its current actual position.
- **Limit:** Enter the limit for the anchor watch circle here. All information in the menu is cleared when tracking of the target is stopped.

20.3.7 Alarm Limits

This dialog is for setting alarm limits around radar and AIS targets and around the own-ship itself. If the limits are breached, either a collision danger or a proximity violation alert is generated. These alerts are of the highest priority (ALARM) and of the highest category of severity (category A).

Note

For integrated K-Bridge systems, all alarm limits (including the target alarm limits) that you specify are individual to each display unit. You must therefore configure each console individually to make them all agree with each other.

The path to this dialog is: **Targets→Target Alarm Limits**.

- **CPA:** The limit for the closest point of approach by a target to the own-ship before a collision danger alert is given.
- **TCPA:** The time limit for the CPA before a collision danger alert is given.
- **Prox:** Tracked targets closer to the own-ship than this limit will cause a proximity violation alert to be issued. The limit allows you to be alerted in cases where a target is close to the own-ship but the TCPA is so long that a collision danger alert is not issued. This can occur, for example, if the own-ship and the target are on a more-or-less parallel course. In this case the target can still represent a threat because even a small manoeuvre could cause a collision.

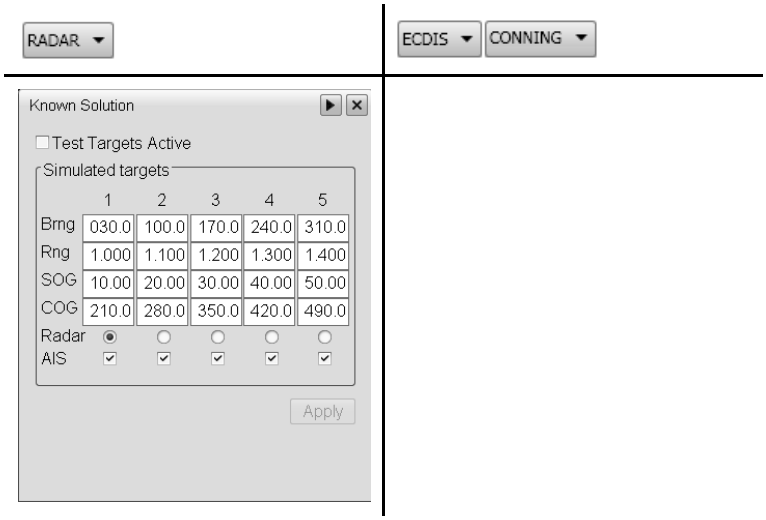
Note

On a Multi-functional Display system, the same target limits apply whether you are in Radar or ECDIS: changing the limits in one application causes them to change also in the other.

*Specify AIS target alarm limits in the AIS Configure Warn. Limits dialog (**Targets→AIS→Target Settings→Warning Details**; see AIS Configure Warning Limits on page 390).*

For more information on alarms, see *Collision avoidance* on page 157 and *AIS collision warnings* on page 172.

20.3.8 Known Solution



Use this dialog to create a synthetic echo for a single simulated radar target in order to test the performance of the radar's tracker. The simulated radar target must in fact be one of up to five simulated AIS targets. (Only a single simulated AIS target can be used for the purpose of testing the tracker – you cannot use the other simulated AIS targets to test it.) You can use the other simulated AIS targets for purposes of radar training and familiarization.

The path to this dialog is: **Targets→Known solution**.

For information about how to use this menu to test the radar's tracker, see *Testing the radar's tracking capability* on page 152.

Note

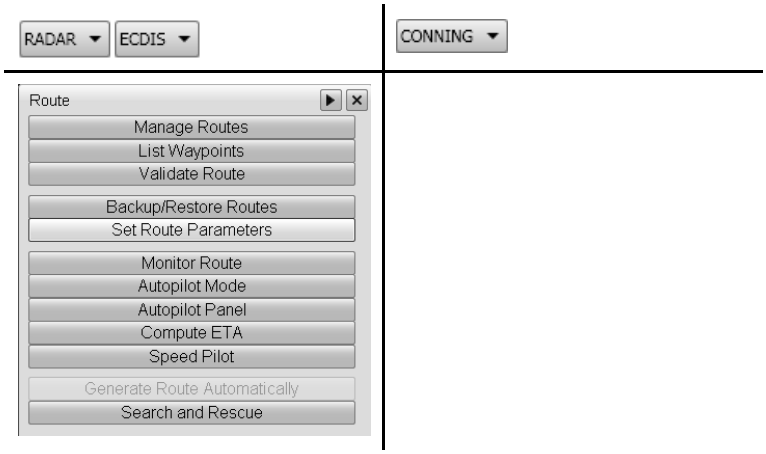
When you start the simulator, the presentation of real-time radar video is replaced with the simulated signals. A large green X appears at the bottom of the screen to indicate this, and a small green x appears at the position of each simulated target.

The Known Solution dialog contains the following elements:

- **Test Targets Active:** Check this box to start the simulation; clear it to stop the simulation.
- **Brng:** The initial bearing from the own-ship to the simulated target. When you start the simulation, this field provides the mathematically correct bearing at a given moment and given the other initial values you entered.
- **Range:** The initial range (distance) from the own-ship to the simulated target. When you start the simulation, this field provides the mathematically correct range at a given moment and given the other initial values you entered.
- **SOG:** Speed Over Ground of the simulated target (this remains constant during the simulation).
- **COG:** Course Over Ground of the simulated target (this remains constant during the simulation).

- **Radar:** Check this radio button to make the associated target generate a synthetic radar echo.
- **AIS:** Check this radio button to indicate that you want the associated target to be included in the simulation.
- **Apply:** Click this button to apply the values you have entered (in other words, to make them the initial values for the simulation). You must apply the initial values before checking **Test Targets Active** to activate the simulation.

20.4 Route menu



This menu enables you to create, manage and use routes. It also enables you to monitor a route that is currently being followed by the autopilot.

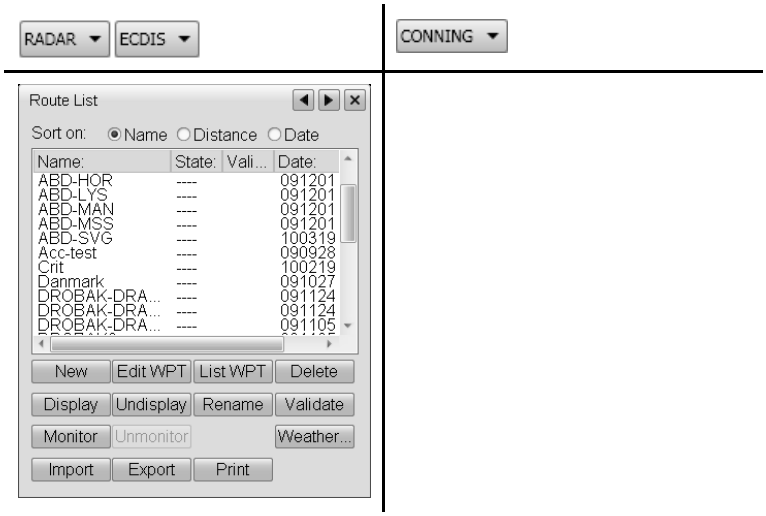
To see the menu, click the **Route** button on the main menu in the top bar.

The menu contains the following buttons:

- **Manage Routes:** Click to manage routes (see *Route List* on page 416).
- **List Waypoints:** Click to view the waypoints in a route and (if required) to make changes to them (see *Edit route* on page 420).
- **Validate route** Click to validate the currently selected route (see *Validate Route* on page 422).
- **Back-up/Restore Routes:** Click to back up or restore routes to or from an external medium (see *Routes Backup/Restore* on page 424).
- **Set Route Parameters:** Click to specify the route parameters (see *Route (tab)* on page 570).
- **Monitor Route:** Click to display information about the selected route and monitor the own-ship's progress along it (see *Route Monitor* on page 425).
- **Autopilot Mode:** Click to change autopilot modes or to start using the autopilot (see *Autopilot Mode* on page 427).
- **Autopilot Panel:** Click this button to view the status and properties of the autopilot panel (see *Autopilot Panel (option)* on page 430). If the autopilot is not enabled, this button is not enabled.
- **Compute ETA:** Click to calculate your estimated time of arrival (see *ETA Computation* on page 432). If you:
  - Have the Speed Pilot option configured, see *ETA Speed* on page 435 with Speed Pilot configured.
  - Do not have the Speed Pilot option configured, see *ETA Computation* on page 432.
- **Speed Pilot:** Click to configure the Speed Pilot (see *Speed Pilot (option)* on page 433).
- **Generate Route Automatically:** Click to use the route generation and tide prediction option (see *Generating routes, predicting tides, avoiding pirates* on page 767).

- **Search and Rescue:** Click to select a search pattern for a search and rescue operation (see *Search and Rescue* on page 437).

20.4.1 Route List



Use this dialog to manage the routes in your list.

The path to the dialog is: **Route→Manage Routes**.

You can sort the list of routes by the route name, by the distance to the start of the route (from the own-ship), or by the date of the route's creation.

The “state” of a route can be:

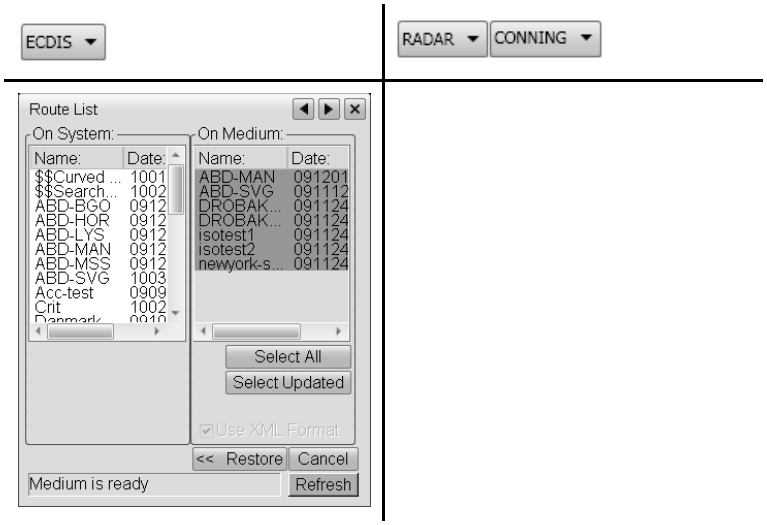
- Active: The ship is currently following this route.
- Alternate: This route is currently displayed in the chart as an alternative to the route on which the ship is currently sailing.
- Edit: This route plan is currently opened for editing.

The Route List dialog contains the following buttons:

- **New:** Clicking the new button brings up the **Waypoint List** dialog which allows you to specify a new route (see *Edit route* on page 420).
- **Edit WPT:** Allows you to edit the selected route (see *Edit route* on page 420).
- **List WPT:** Lists the waypoints for the selected route (see *Edit route* on page 420).
- **Delete:** Deletes the selected route.
- **Display:** Click to display the selected route within the radar area (if it is within the radar's range).
- **Undisplay:** Click to remove the selected route from the screen.
- **Rename:** Allows you to change the name of the selected route.
- **Validate:** Click to validate the selected route (see *Validate Route* on page 422).
- **Monitor:** The selected route is used to monitor that the ship is on track and to give off-track alarms.
- **Unmonitor:** The monitoring is turned off.

- **Weather:** Click to use the optional weather forecast services.
- **Export:** Click to export a route to another system (see *Route Export* on page 419).
- **Import:** Click to import a route from another system (see *Route Import* on page 418).
- **Print:** Click to print details of the selected route (the route details are then added to the list of items available for printing; you must select them from this list and press **Print** once more in the Printer dialog; see *Printer* on page 590).

20.4.1.1 Route Import



Use this dialog to import route plans from another navigation console or to export route plans to another system.

Note

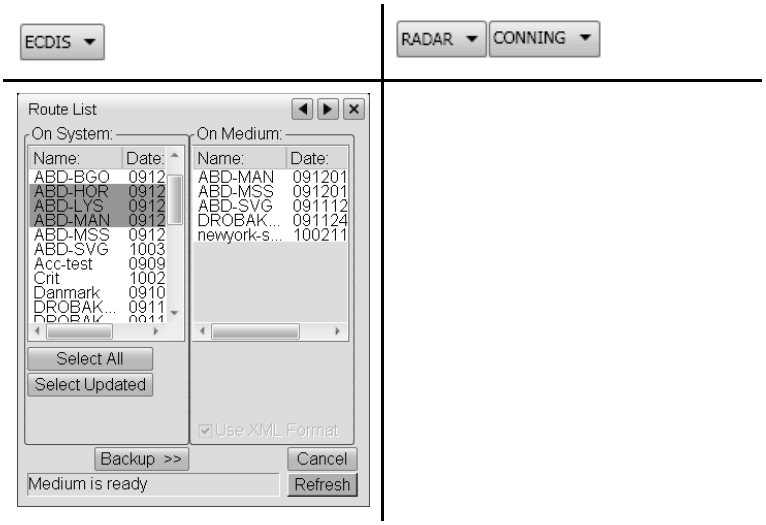
Before you can import or export route plans, you must configure the system to perform the route import and export operations. This includes specifying the source and/or target directories (see Configure Route Export on page 661). The service password is required to configure this.

The path to this dialog is: **Route→Manage Routes→Import**

The dialog contains the following elements:

- **On System:** This is a list of the route plans currently stored on your system.
- **On Medium:** This is a list of the route plans that are available for import on an external medium (such as a USB memory stick) that is connected to the system. You can select them individually or select them all by clicking **Select All**. Alternatively, click **Select Updated** to compare the route files on the external medium with those on the system itself and download any from the external medium that are newer than the version currently on the system itself.
- **Use XML Format:** Select to convert the selected route plans from XML format. (The file suffix is .rut for the old route format and .rux for the XML format. The system is also capable of importing some .rt3 files.)
- **Restore:** Select to import the selected route plans from the medium.
- **Refresh:** Click to cause the system to re-read the external medium (for example, if you have opened the dialog before inserting the USB memory stick).

20.4.1.2 Route Export



Use this dialog to export a route plan to another system.

Note

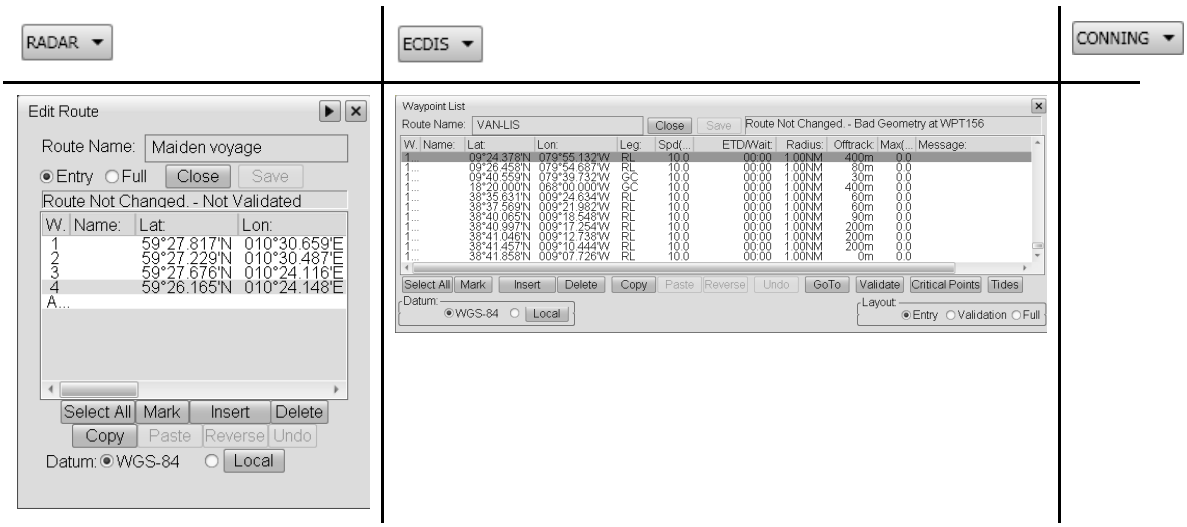
Before you can import or export route plans, you must configure the system to perform the route import and/or export operations (see Configure Route Export on page 661).

The paths to this dialog is: **Route→Manage Routes→Export**

The dialog contains the following elements:

- **On System:** This is a list of the route plans on your system that are available for export. You can select them individually or select them all by clicking **Select All**. Alternatively, click **Select Updated** to compare the route files on the system with those on the external medium and export any from the system that are newer than the versions currently on the external medium.
- **On Medium:** This is a list of the route plans already stored on the external medium.
- **Use XML Format:** Select to convert the selected route plans from XML format. (The file suffix is .rut for the old route format and .rux for the XML format. The system is also capable of exporting some .rt3 files.)
- **Backup:** Select to export the selected route plans to the medium.
- **Refresh:** Click to cause the system to re-read the external medium (for example, if you have opened the dialog before inserting the USB memory stick).

20.4.2 Edit route



This dialog enables you to view and edit the waypoints in a route.

Note

In Radar, the dialog is narrower than in ECDIS. This is because regulations do not permit dialog boxes to obscure the radar display area. In Radar, therefore, you must make more use of the horizontal scroll bar to view the table of waypoints.

For each waypoint in the list, you can edit specified fields, including the off-track limit. Just double-click the field to make it edit-able.

You can reach the dialog by various paths through the menus and dialogs:

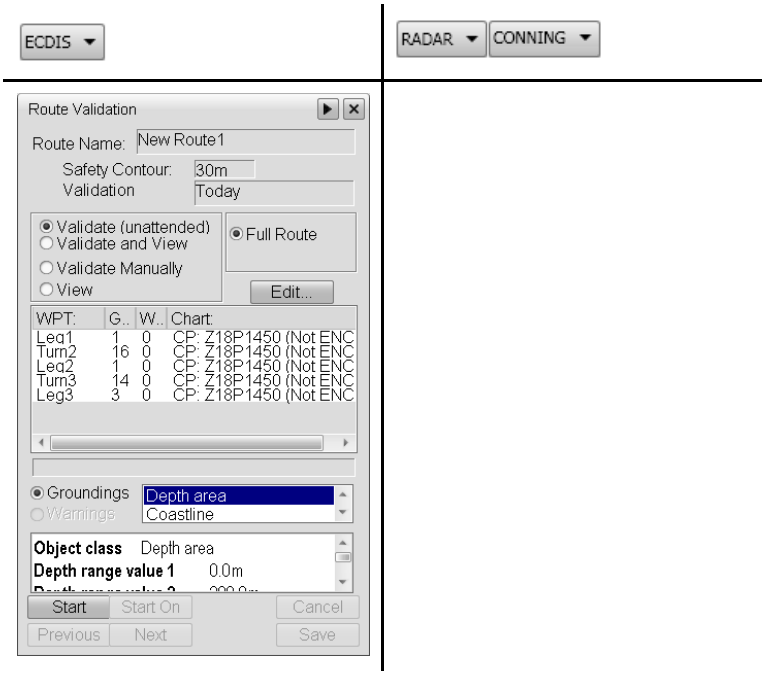
- **Route→List Waypoints**.
- **Route→Manage Routes→New**.
- **Route→Manage Routes→Edit WPT**.
- **Route→Manage Routes→List WPT**.

The dialog contains the following elements:

- **Route Name:** The name of the route being displayed. For new routes type in the name here.
- **Entry:** The waypoint list includes only information that can be changed by the operator.
- **Full:** The waypoint list includes items in addition to those set by the operator.
- **Edit:** Starts an edit session. When an edit session has been started, the **Edit** button is removed and **Close** and **Save** buttons are displayed. If no route is selected, **List** will be displayed.
- **Close:** Ends the edit session.
- **Save:** Save the route to the hard disk.

- **Message field:** Provides messages regarding the route status, and error situations. The K-Bridge ECDIS system can validate a route by checking to see if it is deep enough, do not violate dangers or restricted areas and do not exceed the own-ship's turn rate. This information is provided here.
- **List:** List the route waypoints. Use the scroll bar to view all information.
- **Select All:** Selects all waypoints in the list.
- **Mark:** Mark the start of a selection of waypoints.
- **Insert:** Insert new waypoint.
- **Delete:** Delete selected waypoint(s).
- **Copy:** Copy selected waypoint(s).
- **Paste:** Paste copied waypoints into the waypoint list.
- **Reverse:** Reverse the route, to sail it the other way.
- **Undo:** Undo last edit operation.
- **Datum:** Select WGS-84 or Local datum.
- **Local:** Pressing this button allows you to select a datum from a list of commonly used datums. If you select a local datum, the name will shown as the button text (instead of “Local”). See section 20.9.9 on page 551 for more information.

20.4.3 Validate Route



This dialog enables you to check if the route crosses the own-ship's safety contour or if it crosses the boundary of a prohibited area or a geographic area where special conditions exist.

The main paths to this dialog are:

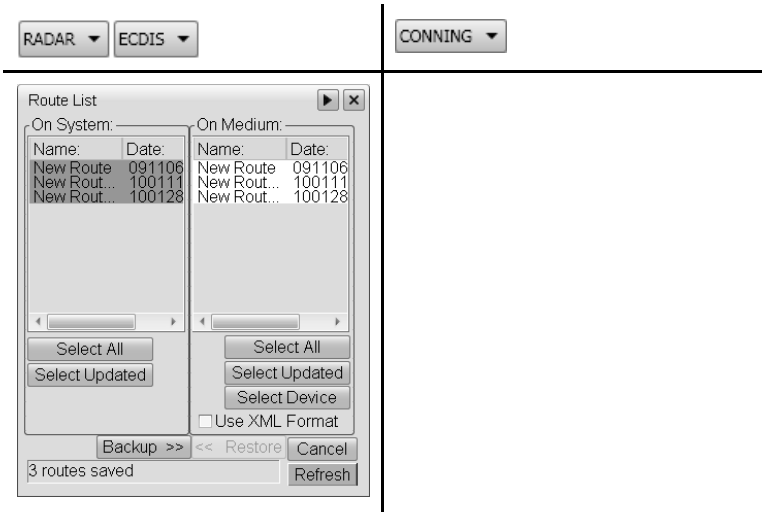
- **Route→Validate Route**
- **Route→Manage Routes→Validate**
- **Route→List Waypoints→Validate**

The dialog contains the following elements:

- **Route Name:** The name of the selected route.
- **Safety Contour:** The (current) safety contour value which will be used for route validation.
- **Validation Period:** For time-dependent chart information, the date used for validation can be of importance. If the actual date of sailing is specified in the ETD/Wait field of the first waypoint, this date is used for the validation. Otherwise the current date (today) is used.
- **Validate (unattended):** Validates the complete route and lists the results.
- **Validate and View:** Validates each leg and turn in the route separately. If a leg or turn covers two or more charts, the leg/turn is divided into parts so that only one chart is involved in the validation process at a time. The positions of potential grounding situations are indicated by blinking red "stars". In the menu the leg/turn is shown with information about the chart used and the number of potential grounding and warning situations that have been found.

- **Validate Manually:** Used when the available charts (raster charts) do not support automatic validation. Allows you to validate a route manually. For each leg and turn check the route against the chart and use the appropriate button to specify that it is either OK or that it has a possible grounding or warning condition.
- **View:** Steps through each leg and turn without validation. Possible groundings are displayed in the chart.
- **Full Route:** Select to validate the whole route.
- **WP77–WP79:** (selected set of waypoints) Select to validate this part of route only.
- **Edit:** Click the button to go to the **Route Edit** menu.
- **List:** Displays the available routes.
- **Groundings:** Lists the number of groundings detected on the leg/turn.
- **Warnings:** Lists the number of warnings detected on the leg/turn.
- **Start:** Click the button to start the validation.
- **Start On:** Click the button to start validation on the selected waypoint.
- **Warning:** Click during manual validation to indicate that the leg or turn has a warning situation associated with it.
- **Previous:** Click the button to redo validation for the previous waypoint.
- **Next:** Click the button to validate the next waypoint.
- **Grounding:** Click during manual validation to indicate that the leg or turn has a danger of grounding associated with it.
- **Cancel:** Click the button to cancel the validation.
- **Save:** Click the button to save the validation status with the route. For normal validation.

20.4.4 Routes Backup/Restore



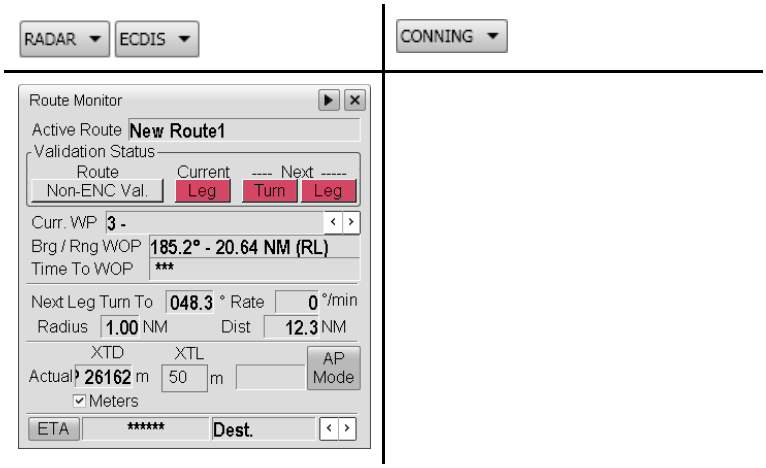
Use this dialog to back up (or restore) routes to (or from) a selected device such as a USB memory stick.

The path to the dialog is: **Route→Back-up/Restore Routes**.

The dialog contains the following elements:

- **On System:** List of route plans on this system. Select routes from the list when making a back-up.
- **Select All:** Selects all routes in the list.
- **Select Updated:** Selects only route that are newer than those already on the selected device.
- **Backup >>:** The selected routes are copied to the selected device.
- **On Medium:** List of routes on the selected media device. Select from the list when restoring routes.
- **Select All:** Selects all routes on the selected device.
- **Select Updated:** Selects only routes that are newer than those in the system.
- **<< Restore:** Selected routes are copied to the system.
- **Select Device:** Enables a menu to select a storage device
- **Refresh:** Click this button to refresh the lists such as when you have inserted a new storage device.
- **Message area:** Messages related to the back-up/restore process.

20.4.5 Route Monitor



Use this dialog to display information about the selected route and to monitor the own-ship's progress along it.

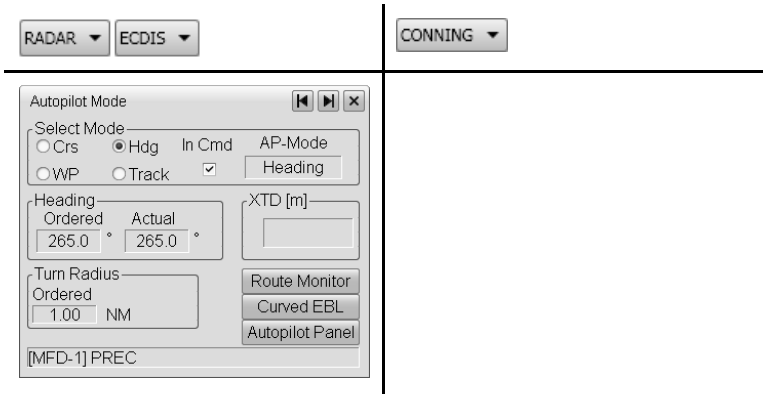
The path to the dialog is: **Route→Monitor Route**.

The dialog contains the following elements:

- **Active Route:** When a route is selected the name is displayed here.
- **AP Mode:** Click this button to display the **AP Mode** menu (see *Autopilot Mode* on page 427).
- **Validation status**: Information is available when a route has been selected for monitoring.
- **Route:** Validation status of the route: Not Valid/Man.Val. (the route is checked manually); Non ENC Val. (the route is validated using an unofficial chart); ENC Val. (the route is validated using an official chart).
- **Current Leg:** Background colour indicates the status for the current leg as selected using the forward and backward buttons below.
  - Red - grounding
  - Yellow - warning
  - Grey - OK
- **Next Turn:** Background colour indicates the status for the next turn as selected using the forward and backward buttons below.
  - Red - grounding
  - Yellow - warning
  - Grey - OK
- **Next Leg:** Background colour indicates the status for the next leg as selected using the forward and backward buttons below.
  - Red - grounding
  - Yellow - warning
  - Grey - OK
- **Curr.WP:** Approaching waypoint. This waypoint may be selected by the operator.

- **Brg/Rng WOP:** Bearing and range to the next wheel over point.
- **Time To WOP:** Sailing time to the next wheel over point.
- **Crs:** New course on the next leg.
- **Rate:** Turn rate to turn to the next leg.
- **Radius:** Turn radius to turn to the next leg.
- **Dist:** Distance of the next leg.
- **ETA:** Click to select **ETA Computation** menu.
- **XTD Actual:** Actual cross track distance.
- **XTL:** Cross track distance limit.

20.4.6 Autopilot Mode



This dialog is for selecting the autopilot mode. Use it in conjunction with the autopilot buttons on the operator panel (see *The ALC (alarm and control) NAV panel* on page 36).

There are various paths to this dialog:

- **Route→Autopilot Mode**.
- **Route→Monitor Route →AP Mode**.
- **Own Ship→Autopilot**.
- Or click the **In Command** button on the Top Bar (see *Top bar: the "AP in Cmd/In Cmd of AP" button* on page 59).

The dialog contains the following elements:

- **CRS:** Selects course mode steering.
- **HDG:** Selects heading mode steering.
- **WP:** Selects waypoint mode steering.
- **Track:** Selects track mode steering.
- **AP-Mode:** Displays the mode as reported from the Autopilot. The possible modes are: Course, Heading, Track, and Standby. If the text of the **AP-Mode** field reads:
  - `Heading`, and **In Command** is un-checked, then this MFD system is not currently in command of the Autopilot. The operator station that is currently commanding it is indicated in the message field at the bottom of the dialog.
  - `Standby`, then the Autopilot is not controlling the vessel's steering gear in any case. The steering gear is being controlled manually from the bridge or by a Dynamic Positioning system, or by some other steering control system.

  For more information about the different operating modes, see *Operating the autopilot in track-steering mode* on page 251.
- **In Cmd:** Check this box to put the console you are using in command of the autopilot (this is the equivalent of pressing the IN CMD button on the operator panel; see *The IN CMD button* on page 37). You can then specify the autopilot mode you require. For information about how to give command of the autopilot to a particular operator station whenever the vessel switches from manual steering to autopilot, see *Making one console take command of the autopilot by default* on page 249.
- **Course/Heading:** In Heading mode this field displays both the ordered and the actual heading. In Course Mode it displays the ordered and the actual course.

- **Turn Radius:** Displays the ordered turn radius transmitted to the autopilot.
- **Route Monitor:** Click the button to go to the **Route Monitor** menu (see *Route Monitor* on page 425).
- **Curved EBL:** Click to use the Curved EBL facility to specify a turn and then use it as input to the autopilot. In Radar, the Trial Manoeuvre facility is also available when you click this button; the Trial Manoeuvre facility enables you to test whether a turn can be executed without danger of collision (see *Trial Manoeuvre and Curved EBL* on page 473).
- **XTD:** Displays the cross track distance.
- **Autopilot Panel:** Click the button to enter the **Autopilot Panel** dialog (see *Autopilot Panel (option)* on page 430). If the Autopilot is not currently operating, this button does not appear in the dialog.
- **Message field:** Shows which K-Bridge Radar or K-Bridge ECDIS operator station is in command of the Autopilot (if any): this information is followed by the Autopilot's current sailing mode, which will be either of the following:
  - ECON: Autopilot in economy mode.
  - PREC: Autopilot in precision mode.

Note

An audible turn "pre-warning" alarm will be issued 3 minutes (by default) before the own-ship reaches the next Wheel-over Point (WOP). Also, an audible turn "warning" alarm will be issued 30 seconds (by default) before the own-ship reaches the next Wheel Over Point (WOP). For information about how to specify alternative time periods for these alarms, see Autopilot Configuration on page 658.

The following table summarizes the possible values for the AP-mode indicator.

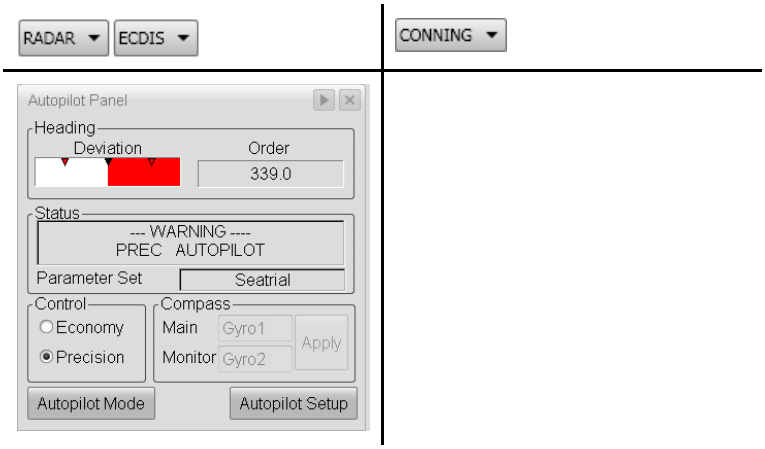
Table 26 Autopilot modes

Selected mode	AP-mode indicator	What is in command of the Autopilot?	Interpretation
CRS	Course	The K-Bridge MFD	The K-Bridge MFD is controlling the autopilot in course mode.
HDG	Heading	The K-Bridge MFD	The K-Bridge MFD is controlling the autopilot in heading mode.
WP	Waypoint	The K-Bridge MFD	The K-Bridge MFD is controlling the autopilot in waypoint mode.
TRK	Track	The K-Bridge MFD	The K-Bridge MFD is controlling the autopilot in track mode.
None	Heading	The K-Bridge MFD	The K-Bridge MFD is ready to take control and is waiting for you to specify the Autopilot mode.

Table 26 Autopilot modes (cont'd.)

Selected mode	AP-mode indicator	What is in command of the Autopilot?	Interpretation
None	******	Undetermined (another navigation or DP system could be controlling a third-party autopilot system, or the steering gear could be under manual control from the bridge).	There is no communication between the K-Bridge MFD and the Autopilot.
None	Standby	An Autopilot operator panel	The Autopilot is not active and is therefore not controlling the steering gear.
None	Heading	An Autopilot operator panel	A dedicated Autopilot operator panel is controlling the steering.

20.4.7 Autopilot Panel (option)



This dialog provides some optional autopilot facilities. It is not available with all systems.

The dialog enables you to specify whether the autopilot operates in economy or precision mode (in economy mode there is less rudder movement but also some loss of precision). The dialog also enables you to specify the primary and secondary compasses for the autopilot to use.

The path to this dialog is: **Route→Autopilot Panel**.

The dialog contains the following information and buttons:

- **Heading**
  - **Deviation:** Shows the deviation between current heading and the ordered heading.
  - **Order:** Shows current heading set-point issued as a steering order to the autopilot.
- **Status:** Displays the status reported from the autopilot.
- **Parameter Set:** Displays the active parameter set loaded into the autopilot.
- **Control**
  - **Economy:** Check this button to operate autopilot in **Economy** mode thus reducing rudder movement and also precision of the heading controller.
  - **Precision:** Check this button to operate autopilot in **Precision** mode thus have maximum performance of rudder and the heading controller.
- **Compass**
  - **Main:** Select which gyro to use as the main compass.
  - **Monitor:** Select which gyro to use as the monitored compass.

  Note

  To alter the selected main or monitoring compass, you must first put the vessel's steering system under manual control.
- **Apply:** Click the button to apply the selections.

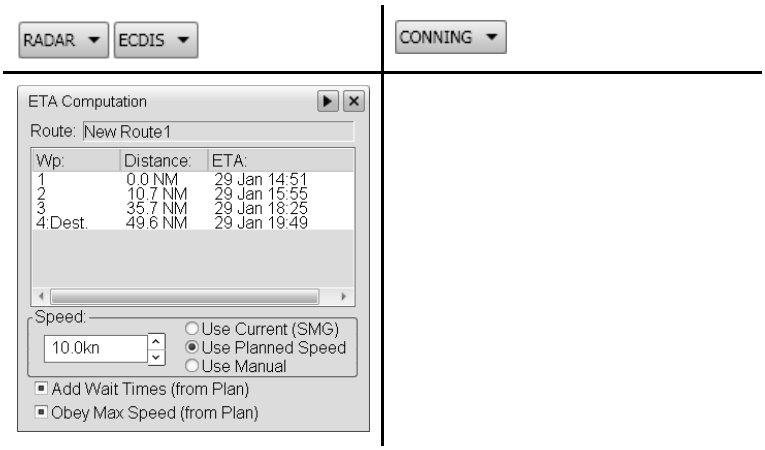
Autopilot Mode: Click to specify the autopilot mode (see *Autopilot Mode* on page 427).

Autopilot Setup: Click to configure the autopilot. The dialogs for doing this are not described in this manual (see note below)

Note

For a description of the autopilot setup dialogs, refer to the K-Bridge Autopilot Operator Manual (see References on page 45).

20.4.8 ETA Computation



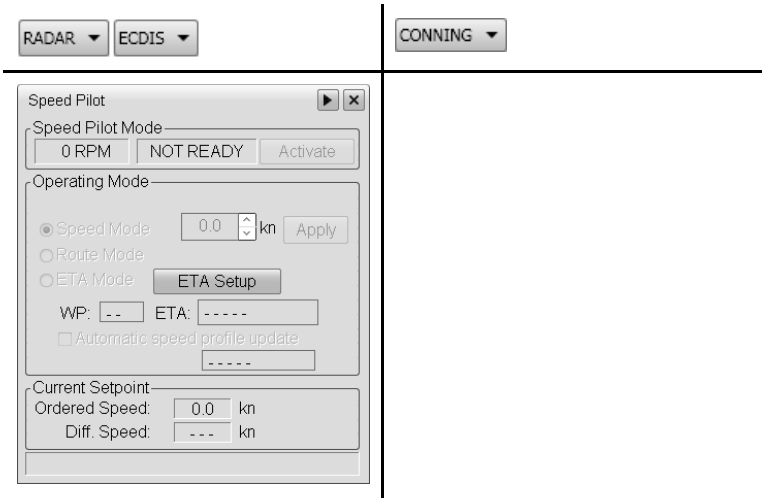
This dialog enables you to calculate your estimated time of arrival at a selected waypoint or at the end of the route. Use it if you do not have the Speed Pilot option configured. (If you do have the Speed Pilot option configured, see *ETA Speed* on page 435.)

The path to this dialog is: **Route→Compute ETA**.

The dialog contains the following elements:

- **Route:** Name of the monitored route.
- **Wp:** List of the remaining waypoints on the route
- **Distance:** Distance to the waypoint.
- **ETA:** Estimated Time of Arrival at the waypoint.
- **Speed:** Facility for specifying (using the spin box) the own-ship speed to be used for ETA calculations. Three options are available:
  - Use Current: own-ship speed, SOG, at any time is used.
  - Use Planned Speed: The speed which is entered during the planning of the route is used.
  - Use Manual: The speed to use is entered manually in the field to the left.
- **Add Wait Times:** Checked if the wait times which were included in the planning of the route shall be included (added) in the calculation of ETA.
- **Obey Max Speed:** Checked if the ETA shall take into calculations that the planning may have imposed speed restrictions on some legs.

20.4.9 Speed Pilot (option)



Use this dialog to configure the Speed Pilot. The dialog is only available on systems that have the Speed Pilot installed.

The path to this dialog is: **Route→Speed Pilot**.

For a description of the Speed Pilot option, see *Speed pilot* on page 761.

Speed Pilot Mode: Indicates the status of the speed pilot.

- The first text field displays current feedback from propulsion (RPM, Pitch, % of maximum propulsion).
- The second text field (Status field) displays the speed pilot command mode:
  - Not Ready: The speed pilot is not ready for communication.
  - In Cmd: The speed pilot is in command to be able to perform any Speed pilot settings.
  - Remote: The speed pilot is controlled by K-Bridge Radar.
- Command button
  - Active: If Active is displayed, the speed pilot is active.
  - Activate: Click button to activate the speed pilot.

Operating Mode:

- Speed Mode – Manual adjustment of speed setpoint using the spin buttons or the numeric field to the right.
  - Spin buttons: Speed can be set by using spin buttons to increase or decrease the speed order (1 knot step).
  - Numeric field: Speed can be set by entering numeric keys in the field. The **Apply** button must be clicked in order to initiate the new speed order.
- Route Mode – Automatic speed setpoint from active, monitored route. This mode takes speed order from the waypoint list speed attribute (Spd). The speed order is then picked accordingly and put out to the speed pilot. For more information, see *Edit route* on page 420.
- **ETA Mode:** Estimated Time of Arrival selections.

- **ETA Setup:** Click this button to calculate the estimated time of arrival using the Speed Pilot (see *ETA Speed* on page 435).
- WP: Displays the next waypoint.
- ETA text field: Displays the estimated time of arrival at the end of the selected route.
- Automatic speed profile update: Check to enable dynamic update of the speed of the route.

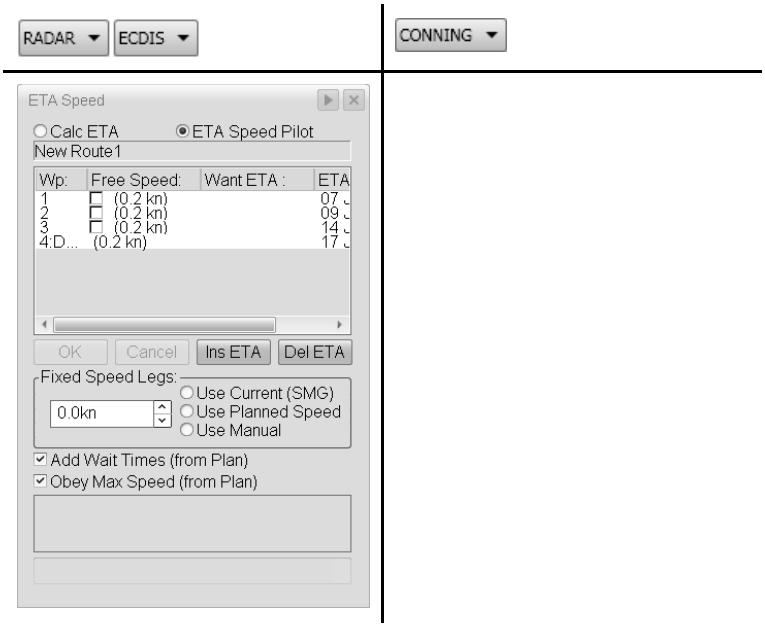
Current Setpoint:

- Ordered Speed – Speed setpoint sent to the speed pilot.
- Diff. Speed – Difference between current speed and ordered Speed.

Status field:

- On schedule – The trip is on schedule.
- No speed pilot – Communication failure with the speed pilot.
- No Active Route – Route mode has been selected without having an active route.

20.4.9.1 ETA Speed



This dialog enables you to calculate the estimated time of arrival when you are using the Speed Pilot.

The path to the dialog is: **Route→Speed Pilot→ETA Setup**.

Toggle the buttons to select the following:

- **Calc ETA:** Perform calculations without using the Speed Pilot (see *ETA Computation* on page 432).
- **ETA Speed Pilot:** Perform calculations using the Speed Pilot.

Route window:

- Text field: Displays mode and name of monitored route.
- Wp: List of the remaining waypoints of the route.
- Free Speed: Tick off to be able to change speed.
- Want ETA: Estimated Time of Arrival at the waypoint.
- ETA: Estimated Time of Arrival at the waypoint.

OK: Click to enter configured plan.

Cancel: Click to cancel configured plan.

Ins ETA: Click to insert configured estimated time of arrival data; (time format; DD <Month in 3 letter code> HH:MM).

Del ETA: Click to delete configured estimated time of arrival data; (time format; DD <Month in 3 letter code> HH:MM).

Fixed Speed Legs: (Note: If **Free Speed** not ticket off, see above).

Use the spin-box in conjunction with the following buttons to specify the vessel speed that you want to base the calculations on:

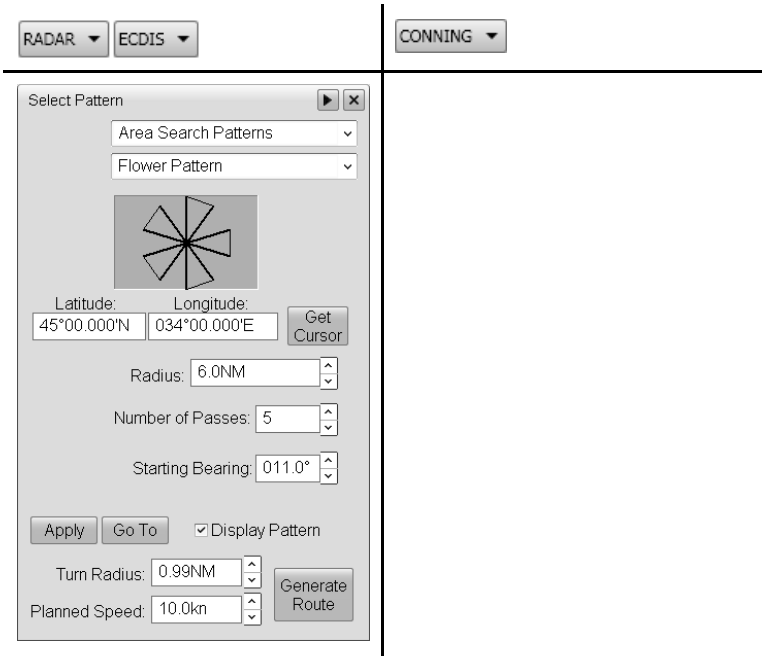
- **Use Current (SMG):** Get current speed. May be changed by using spin buttons in the field to the left.
- **Use Planned Speed:** The speed which is entered during the planning of the route is used.
- **Use Manual:** The speed to use is entered manually by using the spin buttons in the field to the left.

Add Wait Times (from Plan): Checked if the wait times which were included in the planning of the route shall be included (added) in the calculation of ETA.

Obey Max Speed (from Plan): Checked if the ETA shall take into calculations that the planning may have imposed speed restrictions on some legs.

Text field: Information text field for the dialog.

20.4.10 Search and Rescue



The aim of a search and rescue operation is to locate a missing object as fast as possible. This dialog enables you to select the search pattern most suitable for the conditions. For more information, see *Specifying the search pattern* on page 354.

The path to the dialog is: **Route→Search and Rescue**.

The dialog contains the following elements:

Selection Window1: Select pattern type.

Selection Window2: Select pattern for search (Flower-, Square-, Sector-, Parallel Track-, Creeping Line- Pattern).

The Flower Pattern, Square Pattern and Sector Pattern all cover a circular (or square) search area whose centre is a specified point. The Parallel Track Pattern and the Creeping Line Pattern cover a rectangular search area.

Note

The parameter fields displayed in the dialog depend on the search pattern selected.

Display of pattern window: This window displays and visualizes the search and rescue pattern selected.

Latitude and Longitude: These fields specifies the centre point (also called **Point datum**) of the search.

Get Cursor: The button is used to enter the point of search and operation graphically by means of an EBL/VRM tool.

Radius: For Flower, Sector and Expanding Square search patterns, this field is used to specify the radius of the search area.

Length / Width: For Parallel Track and Creeping Line search patterns, these fields define the size of the rectangular area.

Number of Passes: For Flower search pattern this field is used to specify the number of "petals" on the pattern.

Track Spacing: For Expanding Square, Parallel Track and Creeping Line search patterns, the field is used to specify the distance between search lines.

Starting Bearing: The selection field specifies the initial bearing of the circular search patterns and the major axis of the uniform area search patterns. This is normally set to the known drift direction.

Apply: By clicking the button a pattern is generated according to the textually changed parameter fields. Also, when the Apply button is pressed, the EBL/VRM will be removed from the display.

Go To: Clicking the button will move the chart display to the actual position of the defined search pattern and will change the screen scale so as to provide a reasonable display of the pattern. Also, the SAR pattern display will automatically be turned ON.

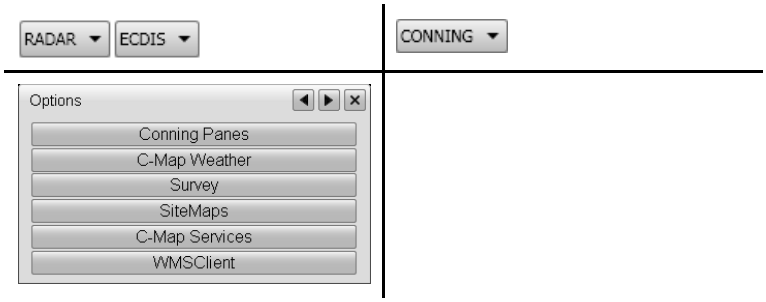
Display Pattern: The toggle button can be used to explicitly turn on and off the display of the Search and Rescue pattern. (It will not affect the display of the route which was generated.)

Turn Radius: The field is by default set to the default turn radius specified in the ship (route) parameter settings. However, if the pattern is such that this turn radius is too large, a smaller turn radius is computed. If this is smaller than the minimum turn radius specified in the ship (route) parameters, the minimum radius will be used.

Planned Speed: The field is by default set to the default speed (Cruise Speed) from the ship (route) parameters.

Generate Route: By clicking the button, a route plan named "$$SearchRescue" will be generated and automatically monitored.

20.5 Options menu



This menu contains buttons for any software option modules that are enabled on your K-Bridge system.

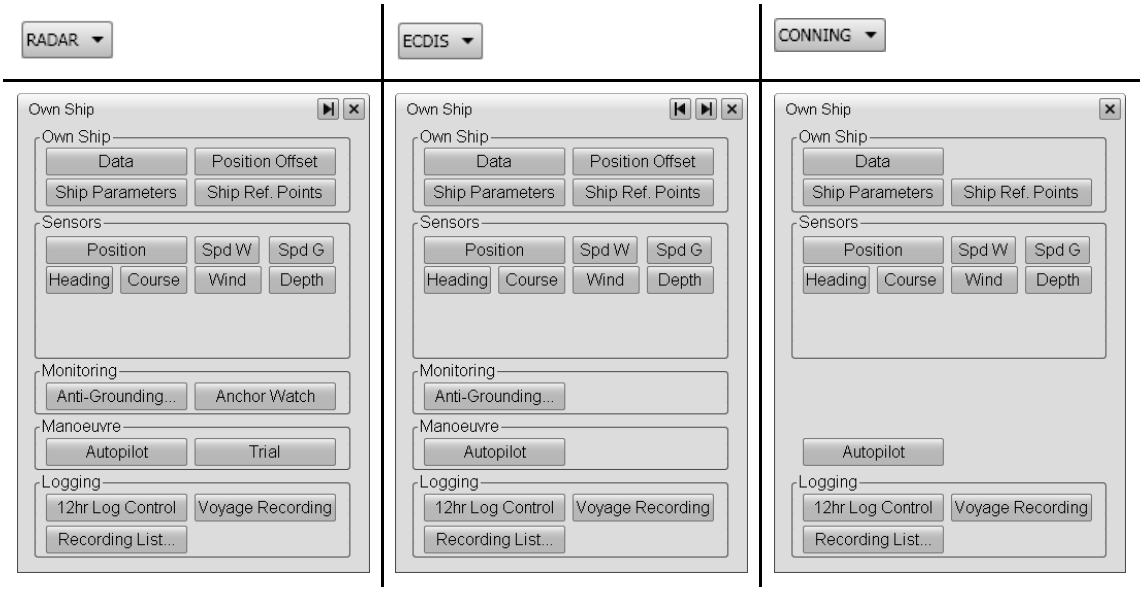
In Radar, the path to the menu is: **Tools→Options**.

In ECDIS, the path to it is: **Options**.

The Options menu contains the following buttons:

- **Conning Panes:** This button allows you to view individual panes from the Conning application without switching the screen to the Conning application. For a description of the individual Conning panes, see *Using the Conning application* on page 261.
- **C-Map Weather:** This option allows you to download worldwide meteorological and ocean data forecasts. It also makes available ice charts and cyclone paths and predictions. To use this option you must have a subscription for C-Map weather data but you do not have to use a C-Map chart database. The weather forecast functions have been integrated with the normal route planning functionality of the K-Bridge navigation software. Therefore you can use them to access weather data at different points in space and time along a route that you are planning.
- **Survey:** This option enables you to create survey lines to cover a sea area and to monitor survey operations.
- **Site Maps:** This option allows you to import and overlay your own constructions on to the chart. Currently, the import mechanism is able to handle common DXF file formats plus DAF and GeoTIFF formats.
- **C-Map Services:** Click this button to use the optional route generation, tide prediction, and piracy avoidance facilities (see *Generating routes, predicting tides, avoiding pirates* on page 767).
- **WMS Client:** The Web Map Services (WMS) Client is an option module for overlaying images defined by the WMS protocol on top of nautical charts. The functionality requires connection to the internet or to a ship network with WMS servers present.

20.6 Own-Ship menu



The menus and dialogs described in this section enable you to:

- View and select the sensors that the radar uses for its position, heading, speed, and (if applicable) wind data.
- Set an alarm to notify you if the own-ship drifts more than a specified distance from its anchor position.
- Set alarms to notify you if targets come within a specified range of the own-ship.
- Select the autopilot mode you require.
- Use the trial manoeuvre facilities to see how close you will come to a collision with a target if you perform a particular turn.

This is the Own Ship main menu. It gives you access to dialogs concerned with the vessel's position, heading, speed, general movement and sensors.

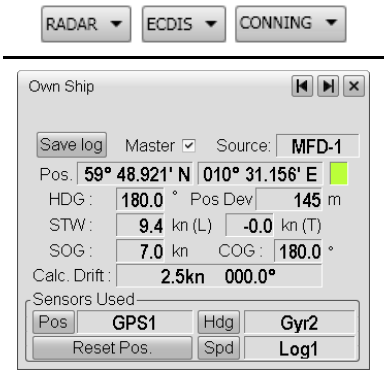
To see this menu, click the **Own Ship** button on the main menu.

The menu contains some or all of the following buttons, depending on the application you view it from:

- **(Own Ship) Data:** Click this button to see the own-ship's position, speed over ground and speed through water (see *Own-ship Data* on page 442).
- **(Own Ship) Ship Parameters:** Click this button to view details of the ship's characteristics (for example, its measurements, its pivot point, minimum and maximum turn rates, and its off-track alarm limit; see *Ship (tab)* on page 571).
- **(Own Ship) Position Offset:** Click this button to view (or specify) any position offset (see *Position Offset* on page 443).
- **(Own Ship) Ship Ref Points:** Click this button to see the list of reference points (for example, the conning position and the pivot position; see *Ship Reference Points* on page 444).
- **(Sensors) Position:** Click this button to see the available position sensors or (if required) to specify a new primary sensor (see *Position* on page 445).

- **(Sensors) Heading:** Click this button to view details of the heading source or specify a new primary heading sensor (see *Heading* on page 452).
- **(Sensors) Spd W:** Click this button to see details of the speed-through-water (STW) sensor or specify a new primary STW sensor (see *Water Speed* on page 455).
- **(Sensors) Spd G:** Click this button to see details of the speed-over-ground sensor or specify a new primary ground speed sensor (see *Ground Speed* on page 458).
- **(Sensors) Wind:** Click this button to view details of the wind sensor or specify a new wind sensor (see *Wind* on page 460; the wind sensor button will only be present if you have one or more wind sensors installed and connected to the radar system).
- **(Sensors) Depth:** Click this button to bring up the menus for working with depth data (see *Depth* on page 462).
- **(Monitoring) Anti-grounding:** Click this button to check the area around the own-ship for any risk of grounding (see *Grounding Alarm Setup* on page 470).
- **(Monitoring) Anchor Watch:** Click this button to configure the anchor watch function for the own-ship (see *Own Ship Anchor Watch* on page 471).
- **(Manoeuvre) Autopilot:** Click this button to select the Autopilot mode you require (see *Autopilot Mode (from Own Ship menu)* on page 472).
- **(Manoeuvre) Trial:** Click this button to bring up the dialog for using the trial manoeuvre and curved EBL tools. These enable you to see how close you will come to a collision with another vessel if you perform a particular turn.(see *Trial Manoeuvre and Curved EBL* on page 473).
- **12hr Log Control:** Click this button to bring up the dialog for controlling the logging of data (see *Position log control* on page 573).
- **Voyage Recording:** Click this button to record the own-ship's track over the course of a single voyage (see *Voyage tab* on page 577).
- **Recording List:** Click this button to view and manage the list of recorded voyages on the system (see *Voyage Recording List and related dialogs* on page 578).

20.6.1 Own-ship Data



This dialog enables you to view data about the own-ship's position, heading, speed, drift and sensors.

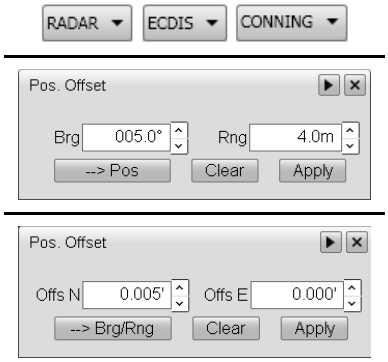
The path to the dialog is: **Own Ship→Data**.

The buttons, fields and options in the dialog are as follows:

- **Save log:** Click to copy the contents of the operator station's logged data buffer (which includes sensor input for up to the last three days) to the hard disk. The data from this buffer may be required by a service engineer if there is a system malfunction.
- **Master:** This box will be present and checked if the console you are using is the navigation master (in other words, if this console is the one that calculates the vessel's position, heading, and speed and distributes these to the other K-Bridge operator stations). Check the box to make the console the navigation master (see also *Integration Configuration* on page 659).
- **Source:** The console that is currently calculating the own-ship data and distributing it to the other consoles over the network.
- **Quality tag:** This tag indicates the accuracy of the position information:
  - Red: The position is based on dead reckoning (using gyro and log input).
  - Yellow: The position is calculated without differential correction (normally from GPS or Loran C).
  - Green: The position includes differential correction (from dGPS).
- **Own-ship's position**: The current geographical coordinates of the own-ship's conning position (or steering position). To locate the conning position on the own-ship, see *Ship Reference Points* on page 444.
  - **HDG**: Own-ship's heading.
  - **Pos.Dev.:** Deviation between filtered own-ship's position and sensor reading.
  - **STW:** Speed through water.
    * L: Longitudinal speed through water (filtered).
    * T: Transverse speed through water (filtered).
- **SOG:** Speed over ground (filtered).
- **COG**: Course over ground (filtered).

- **Calculated Drift:** Speed and direction of the calculated drift. Drift is only indicated when sensor information is available and in use.
- **Pos:** Click to reach the **Position Sensor** menu.
- **Reset:** The reset button resets the navigation filter providing the own-ship's data. Observe that the drift values are set to zero.
- **Hdg:** Click to bring up the **Heading** menu (see *Heading* on page 452).
- **Spd:** Click to bring up the **Water Speed** menu (see *Water Speed* on page 455).
- **Position Offset:** Click to bring up the **Position Offset** menu (see *Position Offset* on page 443).

20.6.2 Position Offset



This dialog enables you to specify a position offset to compensate for errors from the positioning system, or errors caused by using a chart with a different datum. You can specify the position offset either by using co-ordinates for latitude and longitude or by giving a range and bearing.

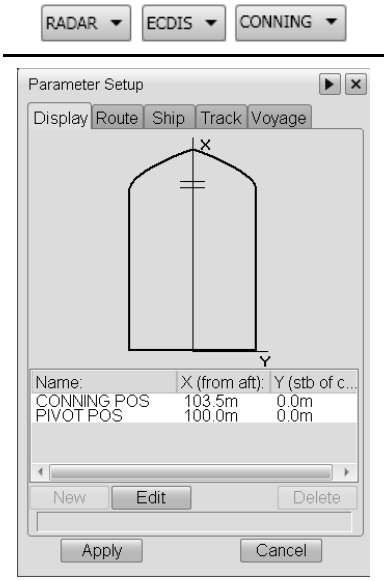
There are two paths to this menu:

- **Own Ship→Position Offset**
- **Own Ship→Data →Position Offset**

The dialog contains the following elements:

- **Position Offset:** The offset value entered will be added to the position calculated by the navigation filter. If the value is different from zero, the OFFSET indication will appear in the top bar as a filled yellow X to the right of the position fixing system used.
- **Offset (N/E):** Enter the north and east offset in minutes (for south and west use negative values).
- **Brg/Rng:** Enter the offset as bearing and range values.
- **–>Brg/Rng:** Use this button to toggle between "Brg/Rng" and "Offs N/E".
- **Clear:** Use this button to clear the position offset.
- **Apply:** Click to apply the specified offset.

20.6.3 Ship Reference Points



This dialog lists the ship's reference points and indicates the selected reference point on a graphical outline of the vessel. The dialog also enables you to add new reference points to the list and to edit existing entries.

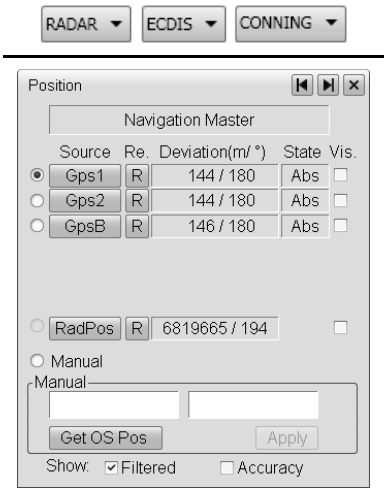
There are two paths to the dialog:

- **Own Ship→Ship Ref Points**
- **System→Parameter Settings→Ship (tab)→Ref Pts**

The dialog contains the following buttons:

- **New:** Click to define a new reference point on the ship. Type a new name for it and specify position relative to aft and to the ship's center.
- **Edit:** Click to edit the selected reference point..
- **Delete:** Click to delete the selected reference point from the list.
- **Apply:** Click to apply your changes.
- **Cancel:** Click to cancel your changes.

20.6.4 Position



This dialog enables you to view and select position sensors.

The path to the dialog is: **Own Ship→Position**.

The fields and buttons in the dialog are as follows:

- **Master/Slave text field:** The unlabelled text field at the top of the dialog declares whether the operator station is the navigation master or a slave of the operator station that is the master. (If there is no master, the text field is blank.)

  It is the navigation master that provides calculations of heading, speed, position and drift to all the other K-Bridge consoles on the network.

  Also, if the currently selected heading, speed, or position source fails, it is the master that automatically selects an alternative if one is available.

  If a navigation master has been appointed, you can only use this dialog to select a position source manually by going to the master operator station itself.

  To make an operator station the master, see *Making one console the navigation master* on page 130.

  For more information, see *Integration Configuration* on page 659.

- **Source:** This is a list of radio button and function button pairs.

  The selected radio button identifies the position sensor (or type of position input) currently being used by the operator station.

  The corresponding function buttons each bring up a dialog associated with the source named on the button.

  To switch to another positioning source, click the radio button for it. The input from that source is then used by the master operator station (after being passed through the operator station's Kalman filters), distributed to all the other operator stations, and displayed in the top bar of each operator station. (If you are configuring the master operator station, your selection causes the slave operator stations to select the same position source.)

  The possible sources of position input in a standard configuration are as follows (although the names of the sources might be different on particular vessels):

  - **Gps1/2:** Click the function button to bring up the dialog for the sensor named on the button (see *Position Sensor* on page 448).
  - **GpsB:** If you click the radio button to select this position source, the operator station uses the backup NMEA position input that it receives on its serial port instead of the position input that it receives over the LAN from the SINT.

    B stands for “backup”. This option is for use in the event of a LAN failure that prevents the operator station from receiving position input from the selected position reference system.

    Click **GpsB** to bring up the dialog for the sensor providing the backup NMEA positioning input (see *Position Sensor* on page 448).
  - **RadPos:** This radio button is greyed out when there are no fixed targets selected for it to use as references in its calculations (see *Calculating the own-ship's position* on page 148). If you select one or more reference targets, the radio button becomes selectable: check it when you intend to use radar positioning as the radar's system for calculating the own-ship’s position.

    The **RadPos** function button brings up the Radar Positioning dialog, which allows you to perform an own-ship positioning calculation based on the co-ordinates of one or more fixed reference targets (see *Radar Positioning dialog* on page 450).
  - **Manual:** Select this radio button to enter position input manually. Manual input is only accepted when the current own-ship position is based on a dead reckoning.
- **R:** The R in this button is an abbreviation for "Reset". Click it to reset the position filter for the corresponding sensor: the position is set immediately to the next position received from the position sensor; the drift is set to zero; and the speed is set to the newest value from the speed log.
- **Deviation:** The difference between the raw position input from the corresponding position sensor and the filtered position data that is currently displayed on the top bar and is based on input from the currently selected position sensor.

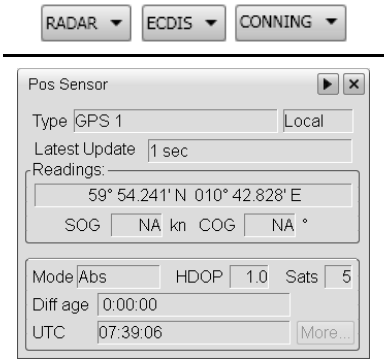
  The difference is presented as metres in a given direction. If the numbers were “1/234”, the deviation would be 1 meter and the angle of direction would be 234°.

  (The deviation referred to here is not between the corresponding position sensor and the currently selected position sensor. For information about that deviation – which must remain within a specified limit for an automatic failover from one position sensor to another to take place – see *Position sensor details* on page 623.)
- **State:** The operational state of the corresponding position sensor. The following states are possible:
  - Diff: Sensor operating in differential mode. The position source is dGPS.
  - Abs: Sensor operating without differential correction. The position source is GPS or Loran C.
  - D/R: Dead reckoning. There have not been any recent position messages. The position is updated by dead-reckoning.
  - N/A: The sensor is not available.
- **Vis:** If you check this box for one of the sensors in the dialog, the location according to the corresponding position sensor is presented graphically on the screen. Specifically it is the vessel’s conning position (according to the corresponding sensor) that is

shown. It appears as a small cross. To use this feature, you need to zoom in until the own-ship symbol appears as a scaled outline of the vessel. The small cross enables you to see how far the Conning position would shift if you switched position sensors.

- **Get OS Position:** Click to enter the current own-ship's position into the manual position fields.
- **Apply:** Click to input the manually entered own-ship position to the dead reckoning calculation.
- **Show Filtered:** Check this option to present the filtered position data on the display.
- **Show Accuracy:** Check this option to present an accuracy ellipse on the display: the current best estimate for the own-ship's position is the centre of the ellipse.

20.6.4.1 Position Sensor



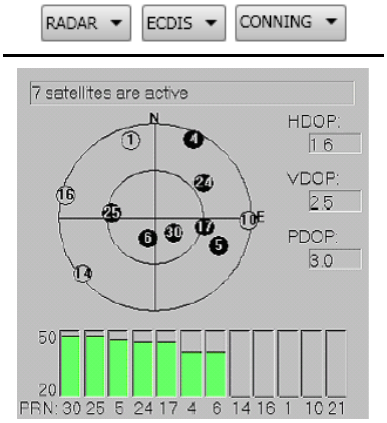
This dialog shows the information received from the selected position sensor before any navigation filters have been applied.

The path to the dialog is: **Own Ship→Position→GPS1/2**.

The dialog contains the following elements:

- **Type:** The name of the position sensor, as entered when the system was configured.
- **Latest Update:** Time since the last message was received from the position sensor.
- **Readings:** The contents of the last message from the position sensor:
  - Position
  - SOG: Speed over ground
  - Differential
- **Mode:** As received from the position sensor:
- **HDOP:** Horizontal Dilution Of Precision. Refer to the GPS manual for more information on this parameter.
- **Satellites:** The number of satellites used to calculate the position.
- **Diff.Age:** Time since the latest differential correction was received. Applies only to dGPS receivers in differential mode.
- **UTC**: Coordinated Universal Time, formerly known as GMT (Greenwich Mean Time).
- **More:** Click to view the Satellite display dialog (see *Satellite display dialog* on page 449).

20.6.4.1.1 Satellite display dialog



This dialog displays the current satellite configuration. A diagram in the middle of it illustrates the position of the satellites in the sky. All satellites expected to be seen over the horizon are shown in the diagram with the satellites used shown in black.

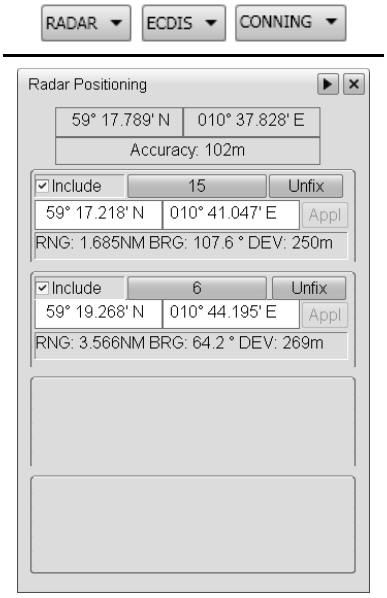
The text box at the top tells you how many satellites are being used for position fixing.

The path to the dialog is: **Own Ship→Position→GPS1/2 →More**.

The dialog contains the following information fields:

- **HDOP:** Horizontal Dilution of Precision.
- **VDOP:** Vertical Dilution of Precision.
- **PDOP:** Position Dilution of Precision.
- **PRN:** Satellite designated number.

20.6.4.2 Radar Positioning dialog



This dialog enables you to use the radar positioning tool to calculate the position of the own-ship.

The path to the menu is: **Own Ship→Position→RadPos**.

For more information, see *Using the radar positioning system* on page 148.

Caution

This tool performs rough calculations only. It is to be used as a back-up system only and must never be used as a substitute for an accurate electronic positioning system.

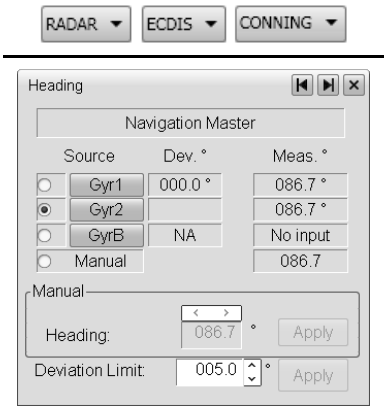
The dialog contains the following elements:

- **Co-ordinate fields:** The position (latitude and longitude) of the own-ship according the tool's calculations.
- **Accuracy:** The tool's estimate (in metres) of the accuracy of its positioning calculation.

  The remainder of this window contains details (including latitude, longitude, range and bearing) of up to four fixed reference targets. Each target described is identified by a select-able button numbered from 1 to 4. Details only appear for the fixed reference targets you have created. For information about creating fixed reference targets, see *Calculating the own-ship's position* on page 148.
- **Include:** Check this box to include the associated fixed reference target in the position calculation.
- **Button (numbered 1–4):** Click this button to activate the Target Data dialog for the target. If you want to include the target in the position calculation, you must check the **Fixed Reference Target** option. (Unless a target is marked as a fixed reference it cannot be included.)

- **Unfix:** Click this button to remove the associated target from the list of targets that are available to be used as fixed references in the positioning calculations. (When you click this button, the target's position on the chart is no longer marked with an 'R' and its details are removed from this menu.)
- **Position data:** These fields show the latitude and longitude of the associated target. If you have more precise data than is shown, you can edit these fields manually by using the keyboard. If you do this, then an **Apply** button appears; click this to apply the newly entered position.
- **RNG, BRG, DEV:** These un-editable fields display the:
  - Range (distance in nautical miles) of the target from the own-ship.
  - True bearing of the target from the own-ship.
  - Deviation between the position of the target as measured by the own-ship's main positioning system and the nominal fixed position of the target (as currently given in the latitude and longitude fields above the RNG, BRG, and DEV text).

20.6.5 Heading



This dialog is for selecting the heading source and comparing input from the available sources. When a gyro-compass is available, that is the recommended heading source.

The path to the dialog is: **Own Ship→Heading**.

The dialog contains the following elements:

- **Master/Slave text field:** The unlabelled text field at the top of the dialog declares whether the operator station is the navigation master or a slave of the operator station that is the master. (If there is no master, the text field is blank.)

  It is the navigation master that provides calculations of heading, speed, position and drift to all the other K-Bridge consoles on the network.

  Also, if the currently selected heading, speed, or position source fails, it is the master that automatically selects an alternative if one is available.

  If a navigation master has been appointed, you can only use this dialog to select a heading source manually by going to the master operator station itself.

  To make an operator station the master, see *Making one console the navigation master* on page 130.

  For more information, see *Integration Configuration* on page 659.

- **Source:** This is a list of radio button and function button pairs.

  The selected radio button identifies the heading sensor (or type of heading input) currently being used by the operator station.

  The corresponding function buttons each bring up a dialog associated with the source named on the button.

  To switch to another heading source, click the radio button for it. The input from that source is then used by the master operator station (after being passed through the operator station's Kalman filters), distributed to all the other operator stations, and displayed in the top bar of each operator station. (If you are configuring the master operator station, your selection causes the slave operator stations to select the same heading source.)

  The names of the available gyro-compasses will depend on the vessel. They will typically be, for example, **Gyr1**, **Gyr2** etc.

The gyro that is used by the navigation operator stations is determined by your selection in this dialog (for the master operator station). Therefore it is not necessarily the same as the gyro that is currently selected by the Navitwin panel. To make sure the heading repeaters display information that is consistent with the heading data displayed on the operator station top bars, make sure you select the same gyro in the Navitwin panel as is currently being used by the K-Bridge operator stations.

The possible sources of heading input are:

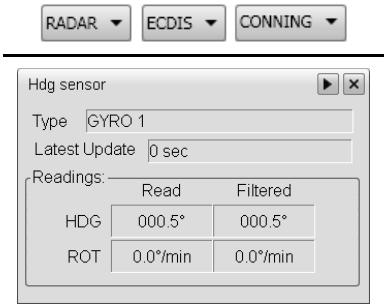
- **Gyr1/2 :** This button brings up a dialog containing (raw and filtered) heading and rate of turn readings from the selected heading source (see *Heading Sensor* on page 454).
- **GyrB:** If you click the radio button to select this heading source, the operator station uses the backup NMEA heading input that it receives on its serial port instead of the heading input that it receives over the LAN from the SINT.

  B stands for “backup”. This option is for use in the event of a LAN failure that prevents the operator station from receiving heading input from the selected gyro.

  Click the **GyrB** button to bring up a dialog containing (raw and filtered) heading data from the gyro providing the backup NMEA data (see *Heading Sensor* on page 454).
- **Manual:** If no heading input is available either over the LAN or from the backup NMEA source, you can select this option and enter a heading value manually.

- **Deviation:** The difference – presented as metres in a given direction – between the position according to the corresponding position sensor and the currently selected position sensor. If the numbers were “1/234”, the deviation would be 1 meter and the angle of direction would be 234°.
- **Dev:** The difference in degrees between the heading according to the corresponding heading sensor and the currently selected heading source.
- **Meas:** The current measurement from the heading source.
- **Manual Heading:** Allows you to enter manual heading data when manual heading is selected. Use the spin buttons to increase/decrease the heading value. Click **Apply** to make the new value take effect.
- **Apply:** Click the button to apply a manual heading entry.
- **Deviation Limit:** If the difference between a heading sensor and the currently selected heading source exceeds the deviation limit (default 5°), the operator station will issue an alert. If the currently selected heading source fails and the deviation limit between it and the alternative heading sensor has been exceeded, the operator station will not automatically switch to the alternative heading sensor.

20.6.5.1 Heading Sensor



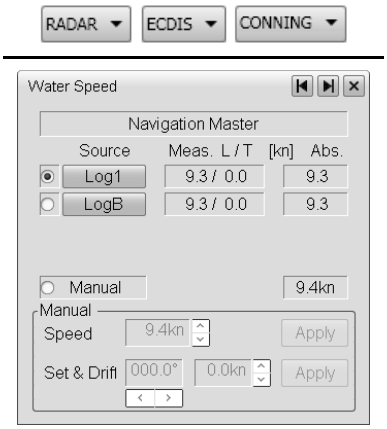
This dialog enables you to view heading sensor data.

The path to the dialog is: **Own Ship→Heading→Gyro1/2**.

The dialog contains the following elements:

- **Type:** Sensor type, as entered at system configuration.
- **Latest Update:** Time since the last sensor message was received.
- **Readings:** Shows actual heading read from the sensor and the filtered heading. If the sensor provides a rate of turn (ROT) measurement, this will be displayed. Otherwise, a calculated ROT will be displayed.

20.6.6 Water Speed



This dialog enables you to select the source of the speed through water (STW) value that is displayed on the operator station top bar. When the speed log is available, we recommend you select that.

The path to the dialog is: **Own Ship→Spd W**.

The dialog contains the following elements:

- **Master/Slave text field:** The unlabelled text field at the top of the dialog declares whether the operator station is the navigation master or a slave of the operator station that is the master. (If there is no master, the text field is blank.)

  It is the navigation master that provides calculations of heading, speed, position and drift to all the other K-Bridge consoles on the network.

  Also, if the currently selected heading, speed, or position source fails, it is the master that automatically selects an alternative if one is available.

  If a navigation master has been appointed, you can only use this dialog to select a speed source manually by going to the master operator station itself.

  To make an operator station the master, see *Making one console the navigation master* on page 130.

  For more information, see *Integration Configuration* on page 659.

- **Source:** This is a list of radio button and function button pairs.

  The selected radio button identifies the speed sensor (or type of speed input) currently being used by the operator station.

  The corresponding function buttons each bring up a dialog associated with the source named on the button.

  To switch to another water speed source, click the radio button for it. The input from that source is then used by the master operator station (after being passed through the operator station's Kalman filters), distributed to all the other operator stations, and displayed in the top bar of each operator station. (If you are configuring the master operator station, your selection causes the slave operator stations to select the same water speed source.)

  The possible sources of water speed input are:

  - **Log1:** Click this button to bring up the Speed Sensor dialog for the own-ship's speed log (see *Speed Sensor* on page 457).
  - **LogB** Click this button to bring up the Speed Sensor dialog for the NMEA backup data (see *Speed Sensor* on page 457).

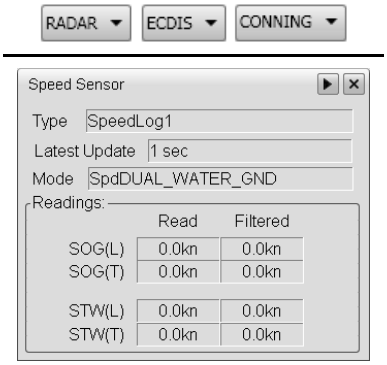
    If you select this speed source (by clicking the radio button to the left of the **LogB** button), the operator station uses the backup NMEA speed input that it receives on its serial port instead of the speed input that it receives over the LAN from the SINT.

    B stands for "backup". This option is for use in the event of a LAN failure that prevents the operator station from receiving speed input from the vessel's speed log.

    Click the **LogB** button to bring up a dialog containing (raw and filtered) speed data from the vessel's speed log provided by the backup NMEA connection from the SINT (see *Speed Sensor* on page 457).
  - **Manual:** Select this source if you need to enter speed input manually.

- **Measured L/T:** The current raw speed measurements (from the corresponding source) for longitudinal (L)/transverse (T) movement.
- **Abs.:** The vessel's actual speed through water, calculated according to the measured longitudinal/transverse values.
- **Manual Speed:** Allows you to provide speed input manually (when **Manual** is selected). Use the spin buttons to increase/decrease the value. To enter the value, click **Apply**.
- **Apply:** Apply your manually entered speed input.
- **Manual Set & Drift:** Enter manual set and drift values. Note that the values will only be used by the operator station's position filters when dead reckoning is in use. You can type in a value or use the spin buttons.
- **Apply:** Apply your manually entered set and drift input.

20.6.6.1 Speed Sensor



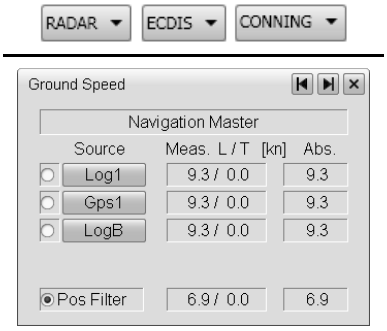
This dialog enables you to view speed measurements from a particular source of speed input.

The path to the dialog is: **Own Ship→Spd W/Spd G→<Speed source>**.

The dialog contains the following elements:

- **Type:** The type of sensor providing the speed input.
- **Latest Update:** Time since the last sensor input was received.
- **Mode:** The operating mode of the speed sensor, for example, Water Track or Bottom Track. The modes will vary for the different types of sensor.
- **Readings:**
  - Speed Over Ground: Displayed if available from sensor. Shows Longitudinal (L) and Transverse (T) speed.
  - Speed Through Water: Displayed if available from sensor. Shows Longitudinal (L) and Transverse (T) speed.

20.6.7 Ground Speed



This dialog enables you to view details of the ground speed sensor.

The path to the dialog is: **Own Ship→Spd G**.

The dialog contains the following options, buttons and data:

- **Master/Slave text field:** The unlabelled text field at the top of the dialog declares whether the operator station is the navigation master or a slave of the operator station that is the master. (If there is no master, the text field is blank.)

  It is the navigation master that provides calculations of heading, speed, position and drift to all the other K-Bridge consoles on the network.

  Also, if the currently selected heading, speed, or position source fails, it is the master that automatically selects an alternative if one is available.

  If a navigation master has been appointed, you can only use this dialog to select a speed source manually by going to the master operator station itself.

  To make an operator station the master, see *Making one console the navigation master* on page 130.

  For more information, see *Integration Configuration* on page 659.

- **Source:** This is a list of radio button and function button pairs.

  The selected radio button identifies the ground speed sensor (or type of ground speed input) currently being used by the operator station.

  The corresponding function buttons each bring up a dialog associated with the source named on the button.

  To switch to another ground speed source, click the radio button for it. The input from that source is then used by the master operator station (after being passed through the operator station's Kalman filters), distributed to all the other operator stations, and displayed in the top bar of each operator station. (If you are configuring the master operator station, your selection causes the slave operator stations to select the same ground speed source.)

  The possible sources of ground speed input are:

  – **Log1:** Click this button to view ground speed data based on the own-ship's speed log (see *Speed Sensor* on page 457).

  – **Gps1:** Click this button to view ground speed data based on the own-ship's position sensor (see *Speed Sensor* on page 457).

  - **LogB** Click this button to view ground speed data based on the NMEA backup data (see *Speed Sensor* on page 457).

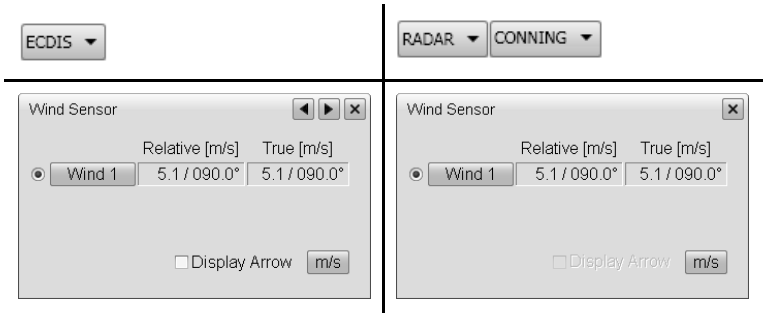
    If you select this ground speed source (by clicking the radio button to the left of the **LogB** button), the operator station uses the backup NMEA speed input that it receives on its serial port instead of the speed input that it receives over the LAN from the SINT.

    B stands for “backup”. This option is for use in the event of a LAN failure that prevents the operator station from receiving ground speed input from either the vessel’s speed log or position reference system.

  - **Pos Filter:** The operator station’s internal kalman filter is the default source of ground speed input. The position filter uses data from the selected GPS, speed log, and gyro (as well as other data) to produce an authoritative estimate of the vessel’s ground speed.

- **Measured L/T:** The current ground speed measurements (from the corresponding source) for longitudinal (L)/transverse (T) movement.
- **Abs.:** The vessel’s actual speed over ground (from the corresponding source), calculated according to the measured longitudinal/transverse values.

20.6.8 Wind



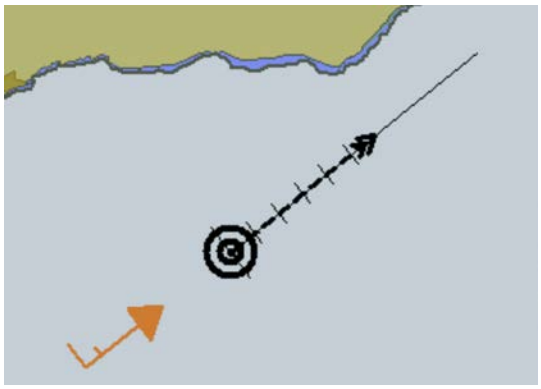
This dialog enables you to work with wind data. Anemometer (wind sensor) input can be displayed as a wind arrow on the radar/chart display. (Wind sensors need to be present and configured for this to work; see *Wind sensor interface* on page 626. The wind data can be received by the console on a serial line or over the local area network.)

The path to the Wind Sensor dialog is: **Own Ship→Wind**.

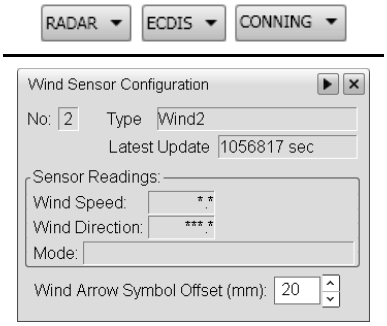
The dialog contains the following elements:

- **Wind No:** Wind sensor number. If there are multiple wind sensors select one. (The text of these buttons depends on the name of the wind sensor; see *Wind sensor interface* on page 626.)
- **Global selection:** Select (if the option is present and applicable) to make all other consoles on the network use the currently selected wind sensor.
- **Display Arrow:** Check to display an arrow on the ECDIS screen indicating wind direction. The arrow indicates the true wind direction. (This option is only available in ECDIS.)
- **Relative:** Wind direction and speed relative to the ship's heading and speed.
- **True:** Wind direction and speed relative to north and ground.
- **m/s or Knots:** Select the unit of measurement for the presentation of the wind sensor data.

Figure 108 Wind arrow display



20.6.8.1 Wind Sensor Configuration



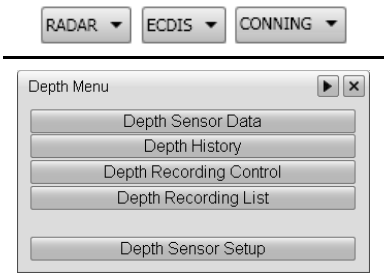
This dialog

The path to the dialog is: **Own Ship→Wind→Wind No.**.

The dialog contains the following elements:

- **No:** Wind sensor number. If there are multiple wind sensors select one.
- **Type:** Wind sensor name.
- **Latest Update:** Time since the last wind data was received.
- **Sensor Readings:**
  - Wind Speed: Raw wind speed received from the sensor.
  - Wind Direction: Raw wind direction received from the sensor.
  - Mode: The data as received from the wind sensor is relative to:
    * Ship heading and speed.
    * Ship heading and water speed.
    * Ground and north.
- **Wind Arrow Symbol Offset (mm):** Use the spin buttons to apply an offset to the wind arrow from the own-ship symbol in the display.

20.6.9 Depth



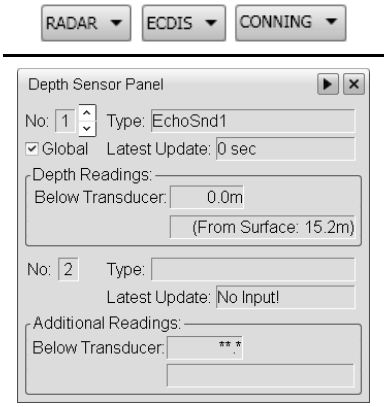
This is the sub-menu for working with depth data. Depth data input is an option and requires depth input to be received on a serial line or across the LAN.

The path to the depth sub-menu is: **Own Ship→Depth**

The menu contains the following buttons:

- **Depth Sensor Data:** Click to view raw depth sensor data (see *Depth Sensor data* on page 463).
- **Depth History:** Click to display depth history data for the past 50 minutes (see *Depth History* on page 464).
- **Depth Recording List:** Menu to display depth files (see *Depth Recording List* on page 466).
- **Depth Recording Control:** Menu to start and stop depth recording (see *Depth Recording Control* on page 465).
- **Depth Sensor Setup:** Menu to set up depth sensors (see *Depth Sensor details* on page 469).

20.6.9.1 Depth Sensor data



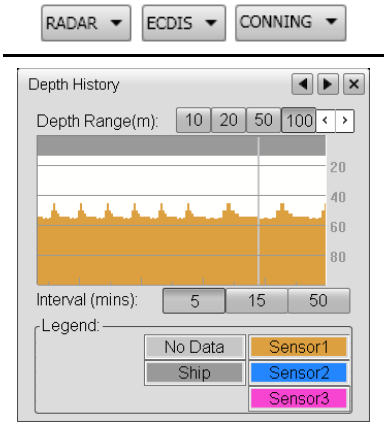
This dialog provides raw depth sensor data.

The path to the dialog is: **Own Ship→Depth →Depth Sensor Data**.

The dialog contains the following elements:

- **No:** Depth sensor number.
- **Global:** Select to make all other consoles on the network use the selected depth sensor.
- **Type:** Depth sensor name or type.
- **Latest Update:** Time since the last depth data was received.
- **Below Transducer:** Depth reading from the sensor. Dependent on the sensor, additional data can be displayed.

20.6.9.2 Depth History



This dialog displays depth history data for the past 50 minutes.

The path to the dialog is: **Own Ship→Depth →Depth History**.

The dialog contains the following elements:

- **Depth Range:** Select the depth range in diagram: 10m, 20m, 50m, 100m, or 300m.
- **Diagram:** Colour explanation:
  - Light grey: No data.
  - Dark grey: Depth of ship's hull.
  - Brown: Sea bottom as read from sensor1.
  - Blue: Sea bottom as read from sensor2.
- **Interval:** Click to select time scale axis: 5min, 15min or 50min.

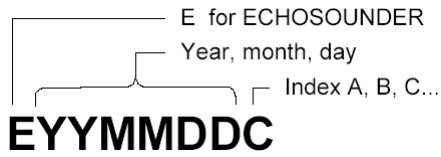
20.6.9.3 Depth Recording Control

This dialog enables you to start and stop depth recording.

The path to the dialog is: **Own Ship→Depth →Depth Recording Control**.

The dialog contains the following elements:

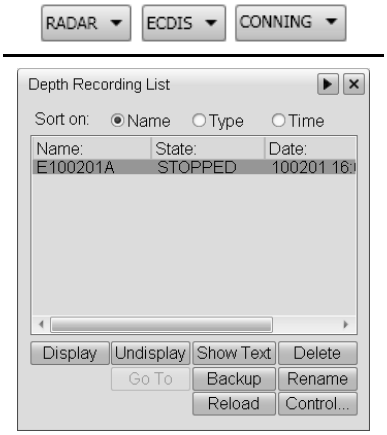
- **State:** Indicates if the system is recording or not.
- **Lamp:** Flashes green when the depth is recorded. A yellow light indicates NO DATA.
- **Record Now!:** Click the button to add a depth recording now.
- **Name:** The depth file name is constructed as follows:



  For example E020309F was created 09th March 2002. The default file name can be modified.

- **Started:** The time for the first recording.
- **Ended:** The time for the last recording, when the recording was stopped.
- **Start Recordings:** Click the button to start recording a new depth file. Automatic or manual recording depends on the settings in the **Depth Recording Setup** menu.
- **Resume Recordings:** Click the button to continue recordings in the last depth file.
- **End Recordings:** Click the button to stop recording of depth data.
- **Settings:** Click the button to go to the **Depth Recording Setup** menu.
- **List:** Click the button to go to the **Depth Recording List** menu.

20.6.9.4 Depth Recording List



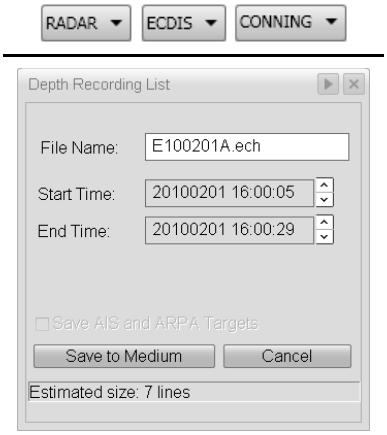
This dialog list the files of depth data on the system.

The path to the dialog is: **Own Ship→Depth →Depth Recording List**.

The dialog contains the following buttons:

- **Sort On:** Select to sort the list by name, type or time.
- **Name/Type/State/Date:** Each file is described by name, state, date and file size.
- **Display:** Click the button to display the selected depth file.
- **Undisplay:** Turns off display of the selected depth file.
- **Delete:** Click the button to delete the selected file.
- **Go To:** Click the button to display the chart covering the starting point of the displayed depth file.
- **Backup:** Click the button to save the selected file on a selected device (see *Backup Depth Recording* on page 467).
- **Rename:** Click the button to give the selected file a new name.
- **Reload:** Click the button to load a depth file from the selected device (see *Restore Depth Recording* on page 467).
- **Control:** Click the button to go to the **Depth Recording Control** dialog (see *Depth Recording Control* on page 465).

20.6.9.4.1 Backup Depth Recording



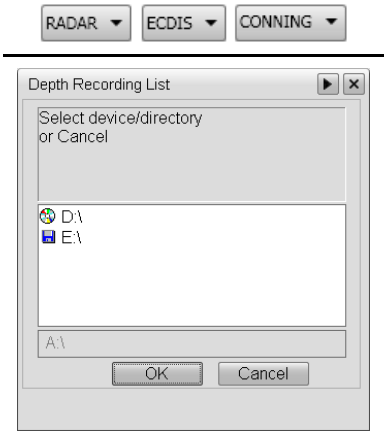
The dialog enables you to save depth data to a selected device.

The path to the dialog is: **Own Ship→Depth→Depth Recording List→Backup**.

The dialog contains the following elements:

- **File Name:** File name used on selected device. Can be modified.
- **Start time:** Use the spin buttons to specify the start time for the depth file.
- **End time:** Use the spin buttons to specify the end time for the depth file.
- **Save to Medium:** Click the button to save the depth file to a device.
- **Cancel:** Click the button to cancel the save operation.
- **Estimated file size:** Specifies the estimated file size and how much free space is available on the selected disk. If the file is too large, it will be split over several disks.

20.6.9.4.2 Restore Depth Recording

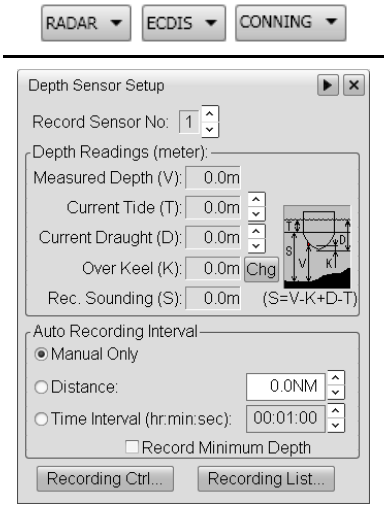


This dialog enables you to load depth data from the selected device.

The path to the dialog is: **Own Ship→Depth→Depth Recording List→Reload**.

Select the depth data you require from the device and click **OK**.

20.6.9.5 Depth Sensor setup



This dialog is for setting up the depth sensor. All measurements are in meters.

WARNING

Before you start using the depth data enter the current draught, the distance from the depth sensor to the keel, and the current tide. This enables the system to produce a "normalized" sounding value that is suitable for recording and for comparison with chart soundings.

The path to the dialog is: **Own Ship→Depth→Depth Sensor Setup**.

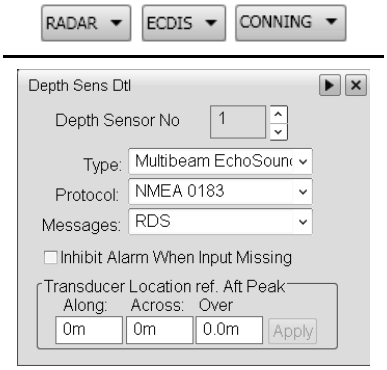
The dialog contains the following elements:

- **Record Sensor No:** The depth sensor number.
- **Depth Readings (meter):**
  - **Measured Depth:** Depth measured by the sensor.
  - **Current Tide:** Current tide value.
  - **Current Draught:** The ship's current draught. The value is added to the measured depth to find water line.
  - **Over Keel:** Sensor placement above the keel. The value is subtracted to give under keel clearance.
  - **Chg:** Click to go to the **Depth sensor details** dialog (see *Depth Sensor details* on page 469).
  - **Rec. Sounding:** The calculated sounding value used for history diagram and depth recording.
- **Auto Recording Interval:**
  - **- Manual Only**: Select to record the depth only when clicking the "Record Now" button.
  - **- Distance (NM):** Select to record the depth when the ship has moved the specified distance. Use the spin buttons to set the distance.

  - **- Time interval:** Select to record the depth at the set time interval. Use the spin buttons to set the interval.

- **Record Minimum Depth:** Select to record the minimum value in each interval. When not selected the last depth value is recorded.
- **Recording Ctrl:** Click the button to go to the **Depth Recording Control** dialog (see *Depth Recording Control* on page 465).
- **Recording List:** Click the button to go to the **Depth Recording List** dialog (see *Depth Recording List* on page 466).

20.6.9.5.1 Depth Sensor details



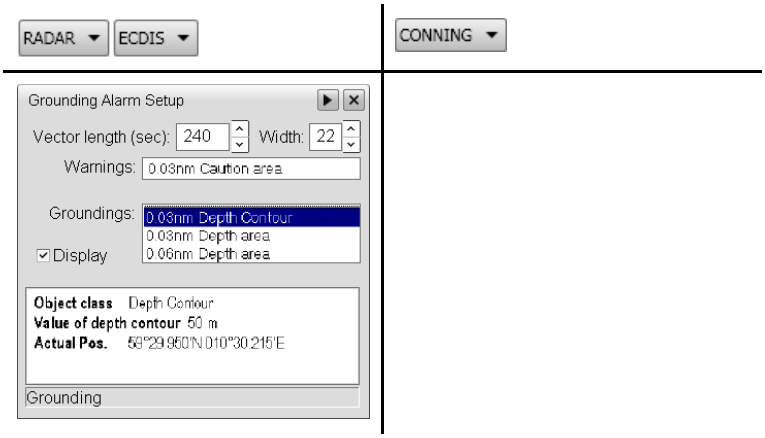
This dialog is for setting up communication with the depth sensor.

The path to the dialog is: **Own Ship→Depth→Depth Sensor Setup→Chg**.

The dialog contains the following elements:

- **Type:** Select echo sounder type from the menu.
- **Protocol:** Select communication protocol from the menu.
- **Messages:** Select message format from the menu.
- **Transducer Location ref. Aft Peak:** Specify position of the sensor over keel (necessary for computation of soundings) and along/across (necessary for exact positioning of sensor readings). Starboard is positive, port is negative.

20.6.10 Grounding Alarm Setup



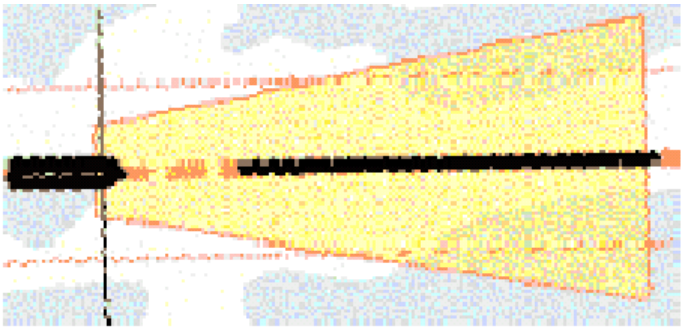
This dialog enables you to set up grounding checks for the own-ship. Whenever a risk is detected, a grounding alarm will be issued. The system performs the grounding check against the current chart data.

The path to the dialog is: **Own Ship→Anti-grounding**.

The dialog contains the following elements:

- **Vector length:** Use the spin buttons to specify how far ahead (in seconds) grounding checking is to be performed. When you specify 0, grounding checking is disabled.
- **Width:** Use the spin buttons to specify the width (in degrees) of the widest part of the grounding check area. The range is 0 - 30 degrees.
- **Warnings:** Lists of warning messages. Select one to see its details displayed in the text area.
- **Groundings:** Lists of grounding messages. Select one to see its details displayed in the text area.
- **Display:** Select to display the grounding check vector in the chart.

Figure 109 The grounding check vector as displayed on the chart



Note

To perform the grounding checks, the system will use the largest-scale chart available from the selected chart databases (see Chart Types on page 477).

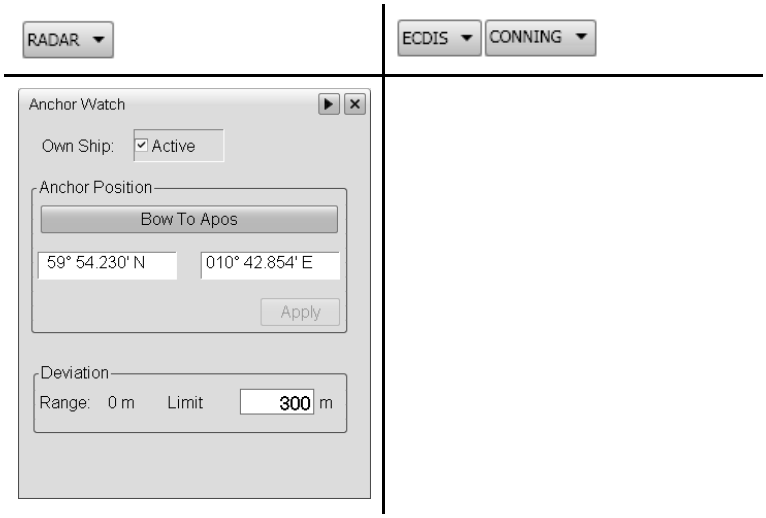
Note

In the Radar application, the grounding checks are only available when charts are being displayed (see Displaying charts on the radar display on page 208).

Note

Grounding checks are only enabled when the own-ship's speed (SOG) is above 1 knot.

20.6.11 Own Ship Anchor Watch



This dialog enables you to configure the anchor watch function for the own-ship.

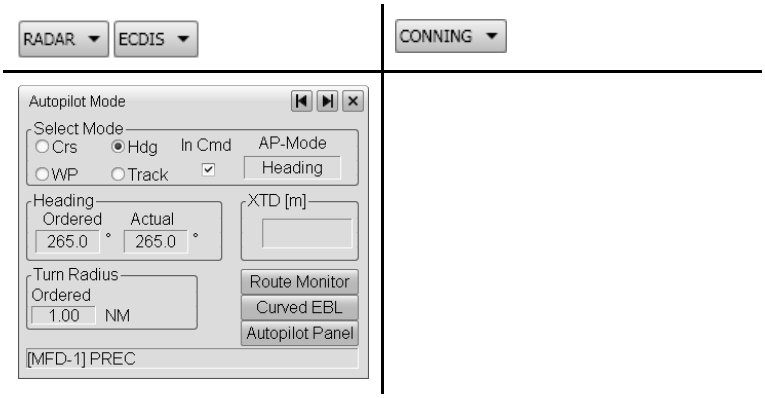
The path to the dialog is: **Own Ship→Anchor Watch**.

For more information about how to use this dialog, see *Using the anchor watch function* on page 324.

The dialog contains the following elements:

- **Active:** Select to activate the anchor watch. A warning limit circle will be displayed in the radar area as long as the anchor watch is active.
- **Anchor Position:** Enter the anchor watch position (the centre of the warning circle) here.
- **Bow To Apos:** Click to enter the own-ship's current bow position as the anchor watch position.
- **Deviation Range:** Presents the distance between the current bow position and the anchor watch position.
- **Deviation Limit:** Enter the radius for the warning circle.

20.6.12 Autopilot Mode (from Own Ship menu)

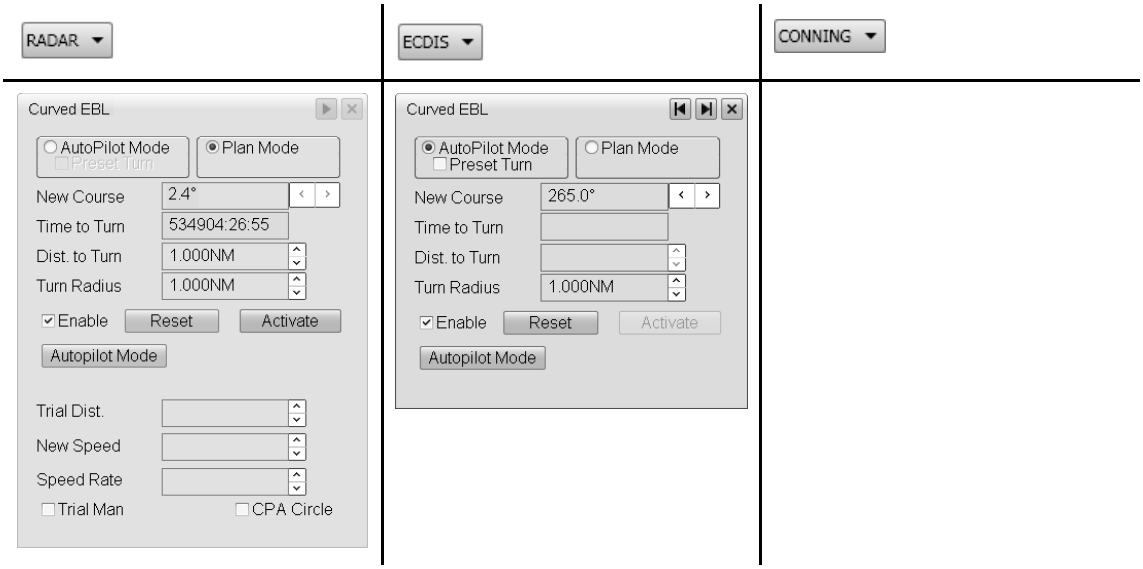


This dialog enables you to select the autopilot mode you require.

The path to it is: **Own Ship→Autopilot**.

This dialog is also available from the **Route** menu. For a description of it, see *Autopilot Mode* on page 427.

20.6.13 Trial Manoeuvre and Curved EBL



In the Radar application, the Curved EBL and Trial Manoeuvre options are combined in a single dialog called Curved EBL. The Curved EBL part of the dialog is only the top half. It specifes the course after the turn (New Course) and the radius of the turn (Turn Radius). The Trial Manoeuvre part of the dialog is the bottom half and is only available in the Radar application.

In the ECDIS application, the Curved EBL dialog contains only the curved EBL facilities.

The are two paths to the Curved EBL dialog:

- **Own Ship→Trial**
- **Tools→Curved EBL**

The Trial Manoeuvre facility – which is available only in radar – enables you to specify a point on the curved EBL at which to view the future position of the own-ship in relation to its tracked targets if the manoeuvre represented by the curved EBL is actually executed. In other words, this facility enables you to see how close you will come to a collision with another vessel if you perform a turn.

As well as the Trial Distance (which represents a future position of the own-ship on the curved EBL), you can specify both the:

- speed (New Speed) at which the own-ship is assumed to be travelling to the Trial Distance point
- and the rate of acceleration or deceleration (Speed Rate) by which the own-ship is assumed to reach the New Speed.

Caution

The Trial Manoeuvre facility calculates the future positions of other vessels (when the own-ship is at a given point on the curved EBL) by using their current bearing and speed. Of course in reality the target vessels might have changed their bearing and speed by the time the own-ship arrives at a given point.

For this reason, you must use this facility with caution.

For more information, see *Using the trial manoeuvre facility* on page 313.

Curved EBL

The elements in this dialog that concern the curved EBL tool are as follows:

- **Autopilot mode:** When this radio button is selected (and the dialog's Enable box is checked), the curved EBL is used as input to the Autopilot. In other words, the New Course and Turn radius you specify immediately determine the Autopilot's heading set-point.

  However, you can check the Preset Turn box. When you do this, the New Course and Turn Radius that you specify will not be activated until you click the **Activate** button.

- **Preset Turn:** Checking this box (when the operator station is in heading or course mode) enables you to specify (for example, using the heading wheel) a turn that you will not activate immediately. When you check this box, a 'PT' symbol appears near the own-ship symbol on the main radar display. You can then specify the New Course and Turn Radius. You can use the heading wheel to do this, or you can move the handles of the curved EBL on the main display. Neither of these actions will affect the heading set-point until you click the **Activate** button in the Curved EBL dialog or press the **Act Turn** button on the console.

- **Plan Mode:** When you select this radio button, the data you enter into the curved EBL dialog is used to create a route plan (but only if you activate it by pressing the **Activate** button).

  When you select Plan Mode, a 'P' symbol appears near the own-ship symbol in the main radar display. Also the heading wheel ceases to affect the vessel's heading; therefore you can use it to specify the planned turn. When (or if) you want to activate the turn, click the **Activate** button in this dialog. To exit Plan Mode without activating the turn, either press the **Auto/Plan** button on the console or select Autopilot Mode in this dialog.

- **New Course:** Course after the turn. Adjust using the up-down controls.

- **Time to Turn:** For a planned turn, this value is calculated on the basis of the vessel's current speed and the value you specify for the distance to the turn. (For a preset turn, the field is disabled.)

- **Dist. to Turn:** The distance from the vessel's current position to the start of the turn. For a planned turn, you can adjust this value by using the up-down controls.

- **Turn Radius:** The turn radius for the manoeuvre. Adjust this using the up-down controls.

- **Enable:** Check this box to display the curved EBL in the radar area. When you click this button with the Autopilot Mode radio button selected and the Preset Turn box un-checked, you are controlling the autopilot directly from the Curved EBL dialog.
- **Reset:** Reset the curved EBL to its default values. These are:
  - New course: the vessel's current heading
  - Distance to turn: 1NM
  - Turn radius: This default value is determined by the current setting for **Default Radius** in the **Route** tab for the **Ship and Route Parameters** (see *Route (tab)* on page 570). The factory default setting for **Default Radius** is 1NM.
- **Activate:** This button does one of two things:
  - It uses the curved EBL as direct input to the Autopilot to perform a Preset Turn.

    To activate a preset turn, the radar operator station must be in command of the Autopilot and operating in heading or course mode. It cannot be in track or waypoint mode.
  - It uses the curved EBL to create a route for a planned turn and then uses that route to perform (and monitor) the turn. If available, automated track steering will be activated.

    The radar operator station can only activate a planned turn if it is not monitoring a route.

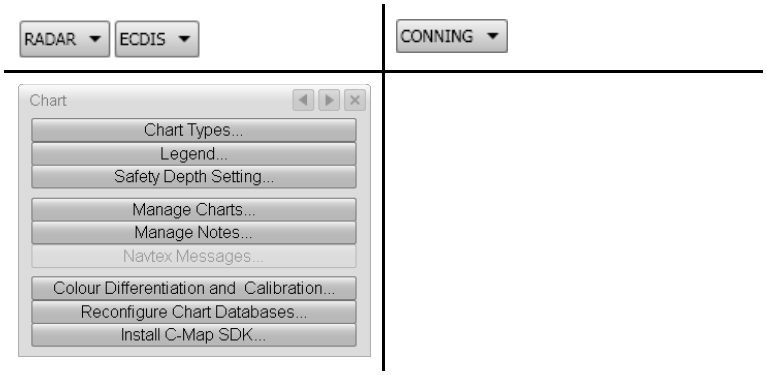
  For more information, see *Using the curved EBL facility* on page 308.

Trial Manoeuvre (available in Radar only)

In the Radar application, you can use a curved EBL as the basis of one or more trial manoeuvres. These enable you to see how close the own-ship will come to a collision with the radar and AIS targets it is tracking. The elements in the dialog that concern the trial manoeuvre tool are as follows:

- **Trial distance:** Trial distance is a point on the manoeuvre's time/distance line. It is marked by a 'T' and a cross line. To see the predicted position of tracked targets in relation to the own-ship during and after the manoeuvre, change the trial distance. (To change the trial distance, click the spin buttons.)
- **New Speed:** Sets the speed at which the own-ship is assumed to be travelling to the Trial Distance point. Adjust using the up-down controls. The default value is the vessel's current speed.
- **Speed Rate:** Sets the rate of acceleration or deceleration (Speed Rate) by which the own-ship is assumed to reach the New Speed. Adjust using the up-down controls. The default value is 2 knots/minute.
- **Trial Manoeuvre:** Check this box to use the trial manoeuvre facility (see *Using the trial manoeuvre facility* on page 313).
- **CPA Circle:** Check this box to display a CPA (Closest Point of Approach) circle around the own-ship symbol in the radar display area while you perform the Trial Manoeuvre. The radius is the selected CPA limit.

20.7 Chart menu



The menus described in this section are for setting up and working with charts. The chart facilities are provided as an option and are therefore not available on all systems.

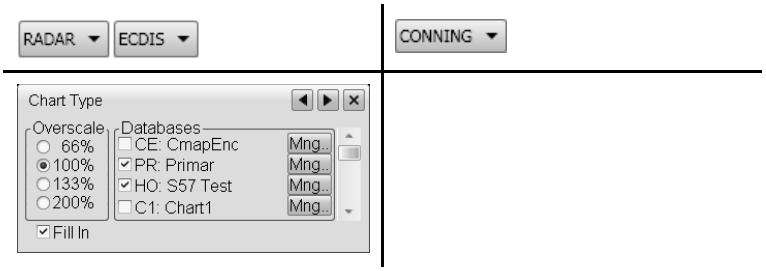
To see this menu, click the **Chart** button on the main menu.

This menu contains the following buttons:

- **Chart Types:** Click this button to select and manage the chart type to be used (see *Chart Types* on page 477).
- **Legend:** Click to inspect the chart's meta-data (see *Chart Legend* on page 478).
- **Safety Depth Setting:** Click this button to set the safety depth for the own-ship (see *Safety Depth* on page 479).
- **Manage Charts:** Click this button to manage the charts installed on your system (see *Manage Charts* on page 481).
- **Manage Notes:** Click this button create new mariners' notes and to view and manage currently stored notes (see *Manage Notes* on page 507).
- **Navtex Messages:** Click to view or send Navtex messages (see *Navtex Message List* on page 524).
- **Colour Differentiation and Calibration:** Click the button to check the colour reproduction quality of your charts (see *Colour Differentiation and Calibration* on page 531).
- **Reconfigure Chart Databases:** Click this button to reconfigure the chart databases (see *Chart Type Setup* on page 532).
- **Install C-Map SDK:** Click this button to install a C-Map Software Development Kit for managing the chart type in use (see *Install C-Map SDK* on page 536).

For information about specifying the types of chart information to be displayed in the radar area, see *Chart Themes* on page 373.

20.7.1 Chart Types



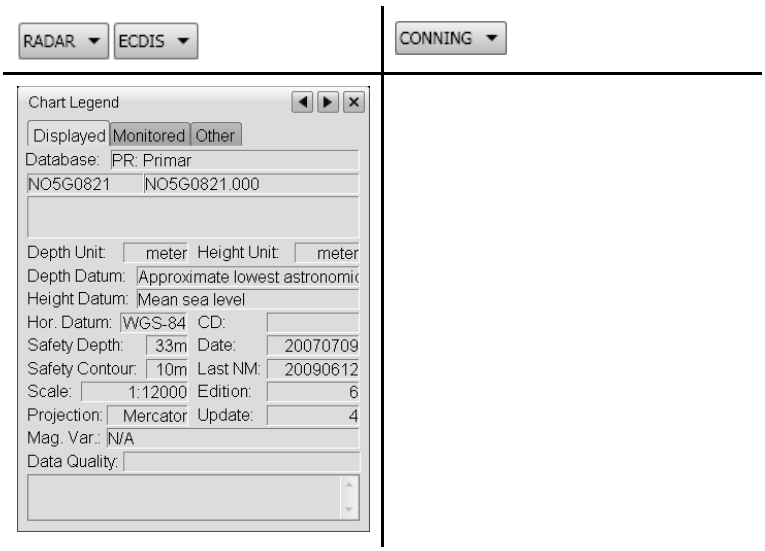
Use the Chart Types dialog to specify the type of chart to display and to manage your charts.

The path to the dialog is: **Chart→Chart Types**.

The dialog contains the following elements:

- **Databases:** This list shows which databases (chart types) are available. Individual databases must be selected to be displayed.
- **Mng...:** Click this button to manage the specified chart database. For information about chart management for:
  - PR Primar charts, see *S-57 and S-63 chart management dialogs* on page 481
  - C-Map 93 Edition 3 charts, see *CM93 Ed.3 chart management dialogs* on page 496
  - C-Map 93 Edition 2 chartsee *C-Map CM-93 edition 2 charts* on page 185
  - ARCS charts, see *HCRF charts* on page 203 (these charts are only available on ECDIS)
- **Overscale:** By default the overscale value is 100%, which means that a chart is displayed at its nominal scale. If you select 200%, charts will be displayed at twice their nominal scale.
- **Fill In:** This option is for use when a chart does not fill the display area. Check the box if you want the system to attempt to fill the area surrounding the chart with lower scale chart data.

20.7.2 Chart Legend

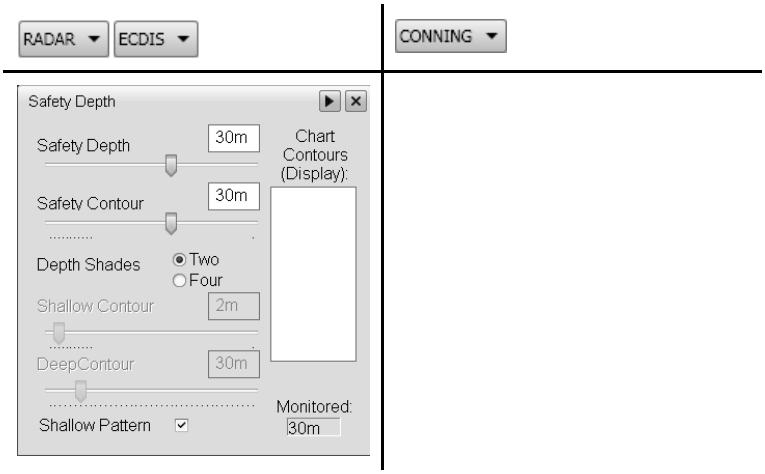


This dialog lists the chart's meta-data.

The path to the dialog is: **Chart→ Legend**.

Chart: Information identifying the chart. In the example on the left, the chart number is 04420031.e; the chart is a Vector Chart; and some source information is given: DK, KMS, graph, 101B.

20.7.3 Safety Depth



Use this dialog to specify the own-ship's safety depth setting and to select a safety contour line.

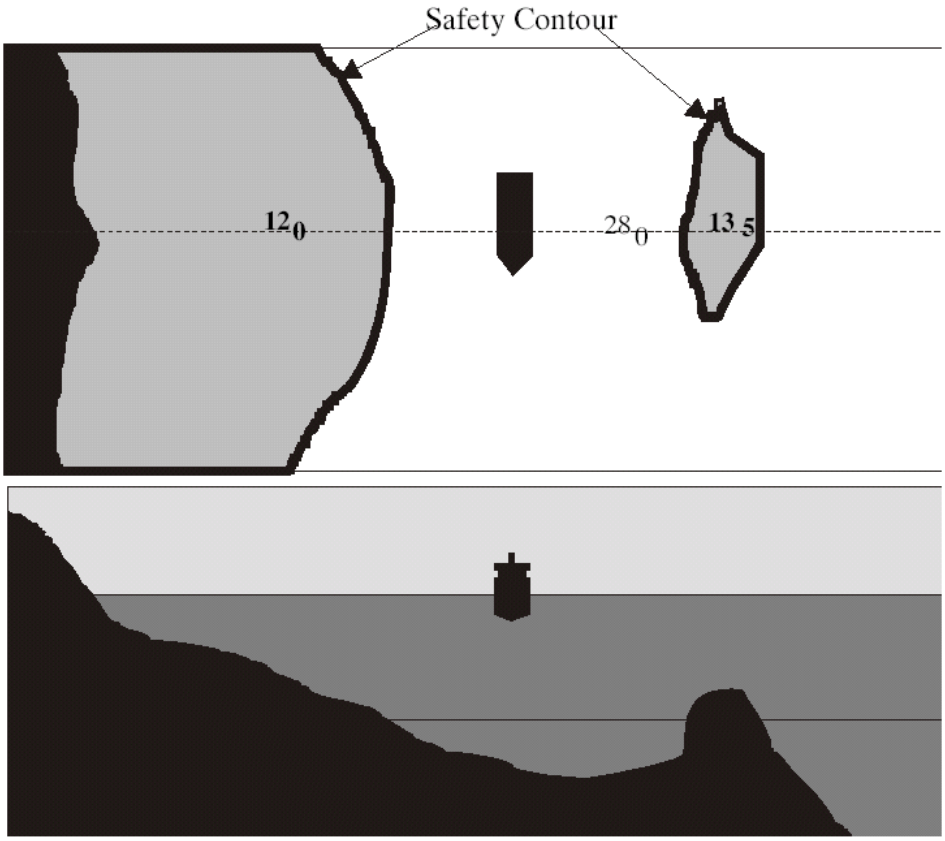
The path to the dialog is: **Chart→Safety Depth Setting**.

The elements contained in the dialog are as follows:

- **Safety Depth:** The safety depth is used to check the planned route to verify that it has sufficient depth. Enter a depth here that is slightly more than the draught of the ship. The default value is 30 meters. The safety depth will highlight spot soundings for depths that are less than the safety depth.
- **Safety Contour:** The safety contour is used to display the depth contour line for the set depth. The system will choose a contour from the chart that is equal to or greater than the value you specify. The safety contour is displayed in the radar area.
- **Chart Contours:** Lists the contour lines available in the currently displayed chart.

Contours designated as AC are area contours; those designated as C are simple contour lines.

Making a choice in this list will set the safety contour to the specified value and the safety depth to the next available setting that is deeper than the specified safety contour.


Safety Contour
12 0
28 0
13 5

20.7.4 Manage Charts

The dialog you see when you select **Chart→Manage Charts** depends on the chart database selected.

You can select a different database from the drop-down list at the top of the dialog. (This is the equivalent of selecting a database and clicking Mng in the Chart Type dialog (see *Chart Types* on page 477).

This section describes the dialogs for managing S-57 and S-63 charts, and the dialogs for managing C-Map 93 Edition 3 charts:

- *S-57 and S-63 chart management dialogs* on page 481
- *CM93 Ed.3 chart management dialogs* on page 496

20.7.4.1 S-57 and S-63 chart management dialogs

The path to the menus and dialogs for managing S-57 and S-63 charts is: **Chart→Chart Types→ (PR: Primar) Mng**.

The way you handle un-encrypted S-57 charts on the K-Bridge system is similar to the way you handle encrypted S-63 charts. The only exception is with respect to permits and licences. This section describes the chart management tabs and dialogs in the order in which you will encounter them when you are using the charts. However, a note is provided whenever this order is different from what it would be if you were using S-57 charts.

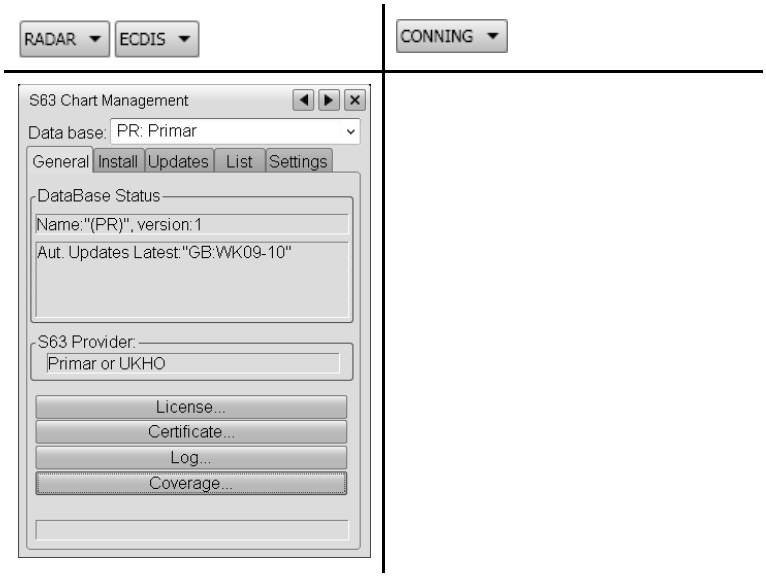
Note

If you receive charts from the Admirality ENC service or IC-ENC, they are likely to be in encrypted S-63 format.

For information about:

- The chart database provider and the status of the database, see *General tab* on page 482.
- Installing a chart database, see *Install tab* on page 489.
- Updating a chart database, see *Updates tab* on page 493.
- Listing the chart databases you have available, see *List tab* on page 494.
- Displaying chart database version numbers and configuring the display of symbols in the charts, see *Settings tab* on page 495.

20.7.4.1.1 General tab



This dialog contains information about the database provider and the status of the database.

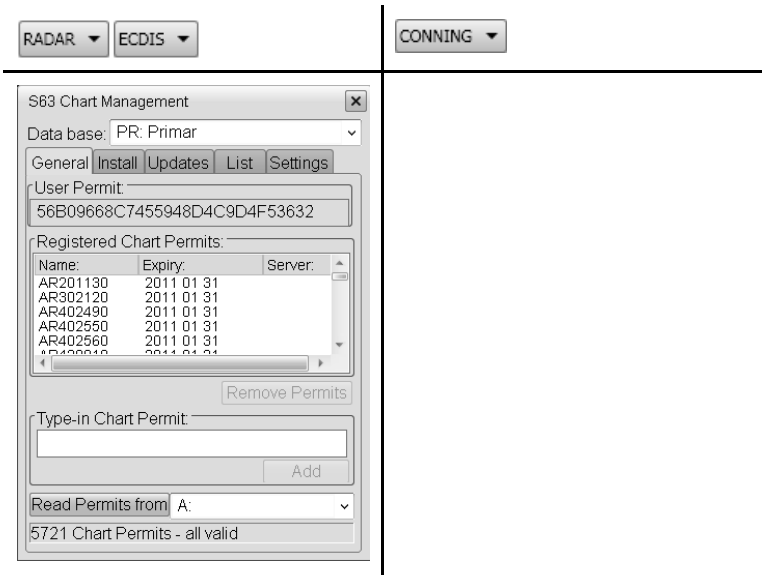
To see it you must enter a user level password (see *Password* on page 593).

The path to the dialog is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)**.

The dialog contains the following elements:

- **Data Base Status:** Displays the name and status of the chart database.
- **Provider:** Chart database provider (PRIMAR™ or Hydrographic Office).
- **License:** For encrypted databases. Click this button to insert your license code and manage your chart permits.
- **Certificate:** Click the button to display the current certificate for the S-63 database or to install a new certificate.(This button is not available if you are using S-57 charts.)
- **Log:** Click the button to display the **Database Log** dialog.
- **Coverage:** Click the button to display the **Chart Coverage** dialog.
- **Repair DataBase:** Click the button to run an automatic database maintenance process.

General (tab) —> License



Use this dialog to manage your chart permits.

For unencrypted S-57 chart databases licenses are not necessary.

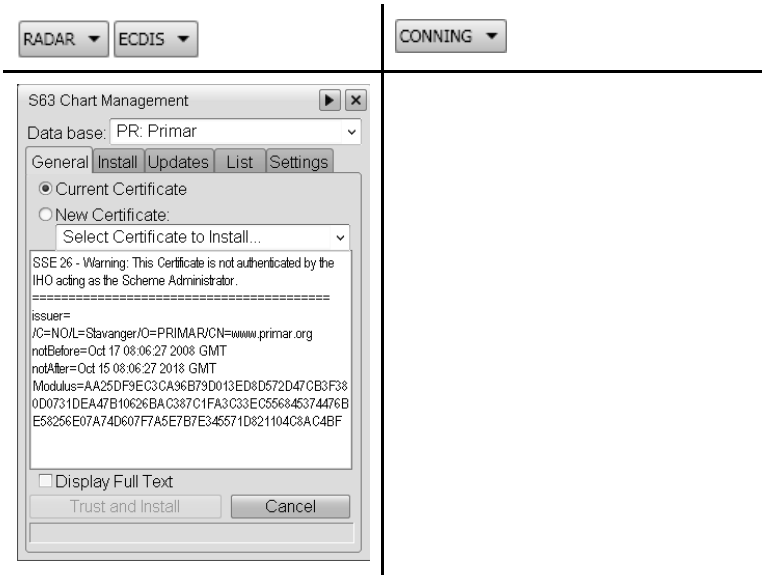
The description below is valid for PRIMAR™ charts.

The path to this dialog is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)→License**.

The dialog contains the following elements:

- **User Permit:** This 28 character code identifies your system. Provide it to PRIMAR™ to obtain your chart permits.
- **Registered Chart Permits:** A list of all chart permits entered for this database. The list contains information about the licensed charts, their edition and the expiry date.
- **Remove Permits:** Click this button to remove the selected chart permits. (The expired permits appear automatically in the list as selected once you have clicked **License** in the **General** tab.) Before installing charts from an update CD, you must remove any chart permits that have expired. Otherwise the installation of the up-to-date charts will fail.
- **Type-in Chart Permit:** Type in chart permits here. Each chart permit is a 64 character string.
- **Add:** Click the button to enter the chart permit into the system. In most cases chart permits are loaded from disk.
- **Read Permits from:** Click the button and select a drive or device to load chart permits from. The system will look for files named "PERMIT.TXT" or "ENC.PMT" in the root of the drive (or in the directory) you specify.
- **Status field:** Indicates if entered chart permits are accepted.

General tab —> Certificate



This dialog enables you to view the currently installed certificate or to view other available certificates that can be used to verify the signatures of S-63 chart distributions.

The path to this dialog is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)→Certificate**.

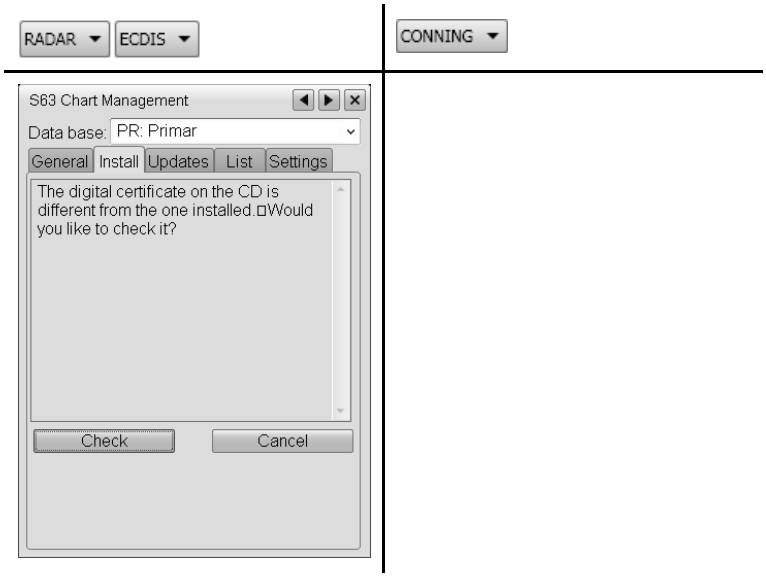
For each S-63 database there is one “current” certificate file.

Alternative certificate files can be distributed with the software or be available on the distributed chart CDs.

The elements in the dialog are as follows:

- **Current Certificate:** Toggle this button to view the currently installed certificate.
- **New certificate:** Use this button to view other certificates.
- **Display full text:** Toggle this button **on** to display the full text of certificate.
- **Trust and Install1:** Click this button to replace the current certificate with the one being viewed.
- **Cancel:** Return to the **General tab** without installing new certificate.

Certificate prompt



This menu is displayed when the system detects a new certificate on the CD. It contains the following buttons:

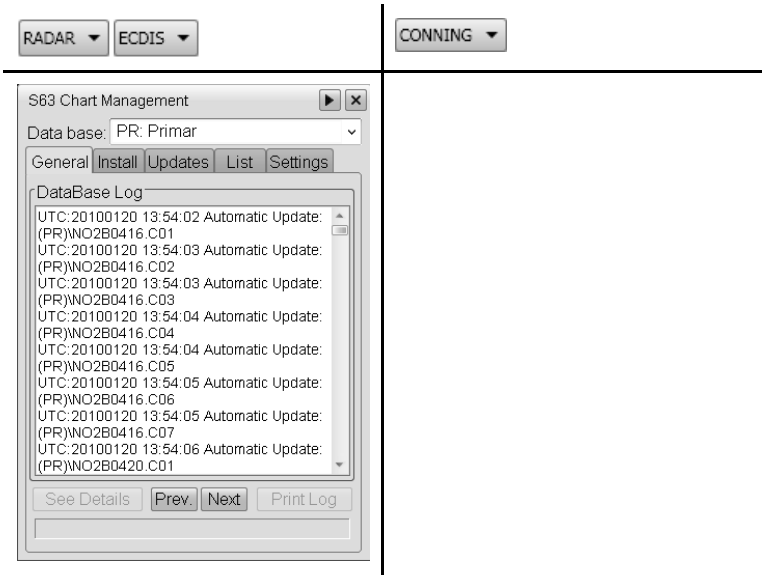
Check: Click this button to examine and possibly install the new certificate.

Cancel: Click this button to ignore.

Note

You will not be able to load S63 charts if the current certificate on your system does not match the S63 files on the distribution medium.

General tab —> Log



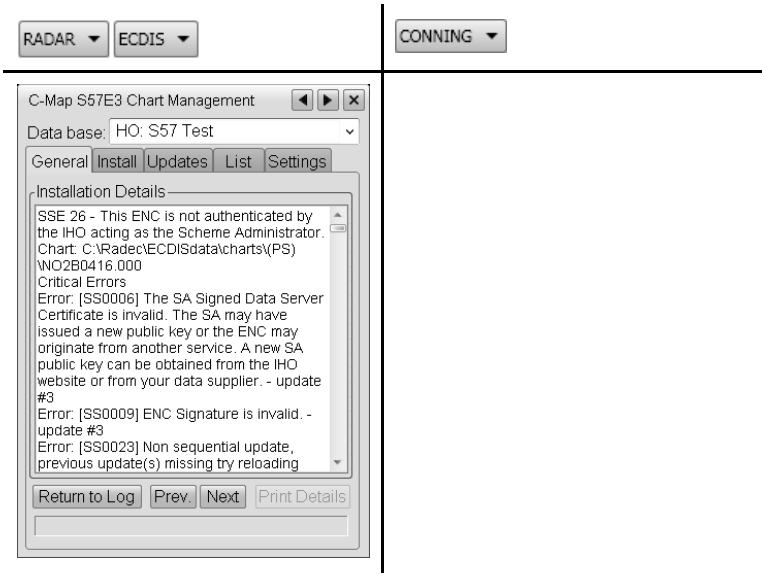
Use this dialog to view the database log file.

The path to it is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)→Log**.

The elements in the dialog are as follows:

- **DataBase Log:** Displays the contents of the log file, including chart installations and updates applied.
- **See Details:** Click the button to display detailed installation information for the selected chart entry. There is normally a details file for each installation batch.
- **Prev.:** Click the button to scroll log text to previous chart entry.
- **Next:** Click the button to scroll log text to next chart entry.

General (tab) —> Log —> See Details



This is the dialog you see when you click the **See Details** button in the Log dialog.

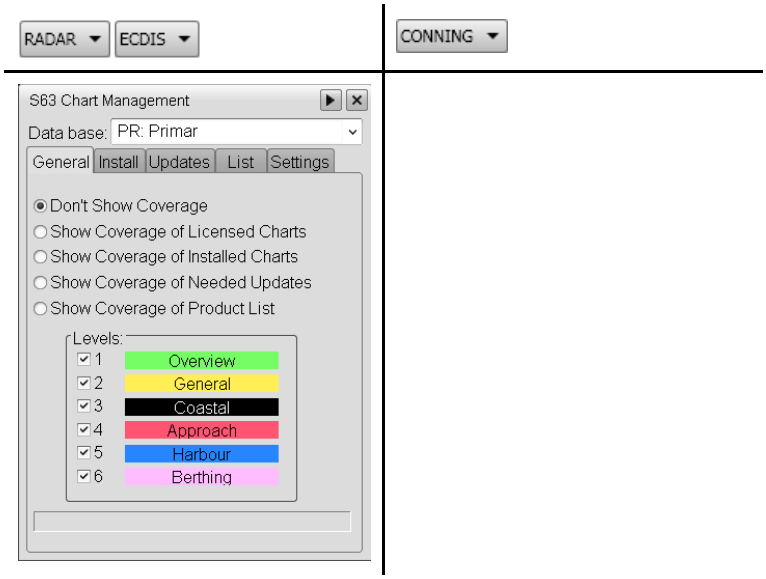
The path to it is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)→Log→See Details**.

Use this dialog to view details of the database log file.

The dialog contains the following elements:

- **Installation Details:** Displays detailed contents of the log file including charts installs and applied updates.
- **Return to Log:** Click the button to return to the less detailed log display.
- **Prev.:** Click the button to scroll the log text to the previous chart entry.
- **Next:** Click the button to scroll the log text to the next chart entry.

General (tab) —> Coverage



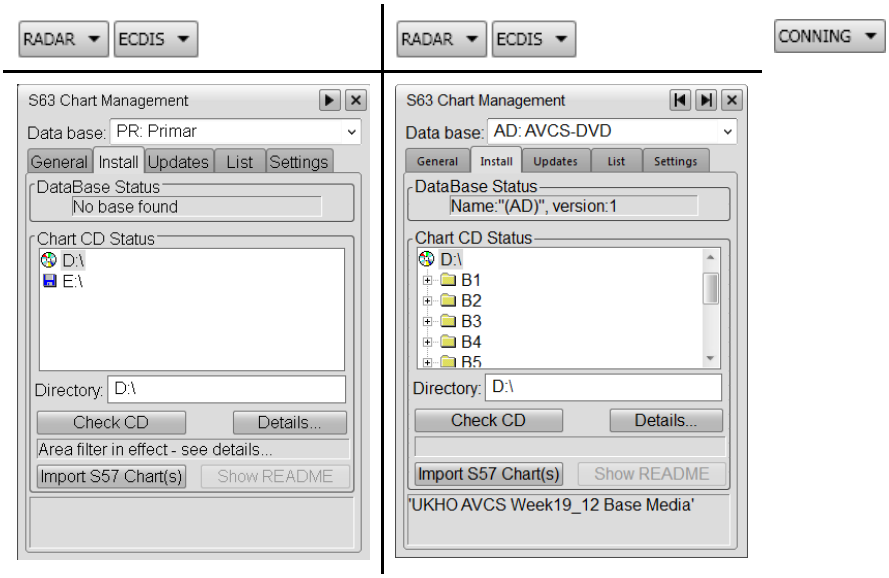
This dialog displays information about the level of detail for the different areas covered by the chart. Coloured rectangles with the size of the nominal chart cells are displayed. Note that for large-scale charts, the nominal rectangle will not correspond very well with the chart. Multiple harbour charts will be represented with a single coverage rectangle. Due to the semi-transparent technique that makes it possible to see the chart image through the colour, the colour will deviate from the pure colours shown in the menu.

The path to this dialog is: **Chart→Chart Types→ (PR Primar) Mng→General (tab)→Coverage**.

It contains the following elements:

- **Don't Show Coverage:** Turn off the chart coverage display.
- **Show Licensed Charts:** Shows the coverage for all the charts you are licensed to use. This is useful when not all licensed charts are currently loaded into the system.
- **Show Installed Charts:** Displays the coverage details of all the charts currently installed.
- **Show Needed Updates:** Installed charts are compared with the latest S-63 product list. All charts available in newer editions or with updates are listed. (This option is not available for S-57 charts.)
- **Show Product List:** Displays all charts listed in the S-63 product list. (This option is not available for S-57 charts.)
- **Levels:** Select the levels of detail you require.

20.7.4.1.2 Install tab



Use this dialog to install or update the chart database.

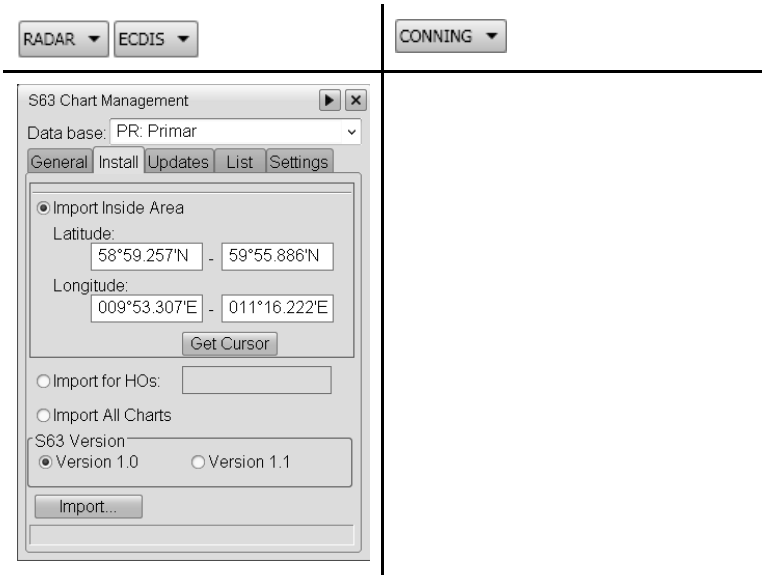
The path to this dialog is: **Chart→Chart Types→ (PR Primar) Mng→Install (tab)**.

The elements in the dialog are as follows:

- **Chart CD Status:** This area of the dialog contains a directory tree to enable you to locate the chart database on the inserted medium. When you select a directory, the system automatically checks to see if it contains a chart database. If it does, the database will be described at the bottom of the dialog.

  Some chart providers distribute their charts on DVDs or memory sticks using the so-called “large media format”. When they do this, the charts are stored in a structure containing “ENC folders” each of which is similar to a single CD: in the sample Install tab above for a DVD containing AVCS charts, each folder labelled B1 through B5 is an ENC folder. If you select the drive letter at the top of the directory tree, the system recognizes the contents of the medium and describes them in text at the bottom of the dialog (clicking **Check CD** has the same effect).
- **Directory:** The directory the chart database will be loaded from.
- **Check CD:** Click the button to cause the system to recognize the contents of the inserted base or update medium and describe them at the bottom of the dialog.
- **Details:** This button brings up a dialog that allows you to impose filtering on the charts that are imported.
- **Import S-57 Chart(s):** Click this button to install the selected charts.
- **Show README:** Click this button to display information from the distributor.

Install (tab) —> Details



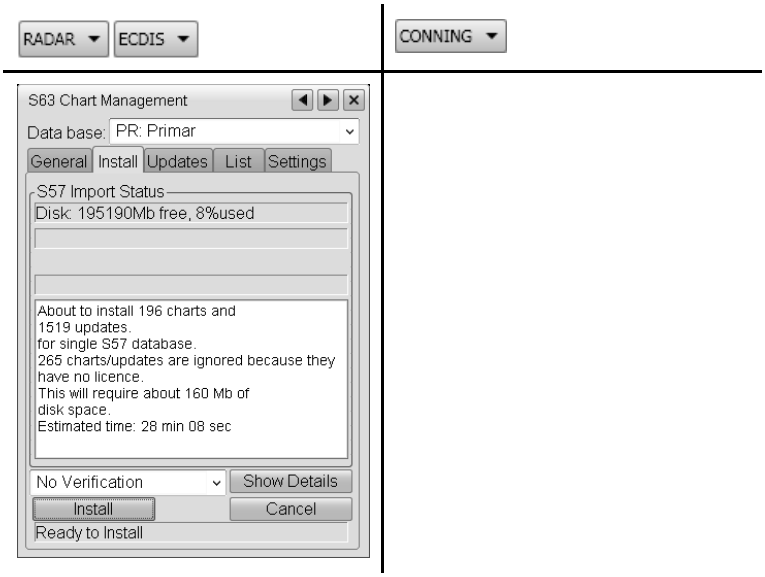
This is the dialog that is displayed when you click the **Details** button in the Install tab. It allows you to filter the charts that are imported.

The path to the dialog is: **Chart→Chart Types→ (PR Primar) Mng→Install (tab) →Details**.

The elements in the dialog are as follows:

- **Import Inside Area:** Select this option to limit the imported charts to ones that cover an area within the specified coordinates.
- **Latitude:** The minimum and maximum latitude of the limiting area.
- **Longitude:** The minimum and maximum longitude of the limiting area.
- **Get Cursor:** Click this button to define the limiting area by drawing a rectangle in the chart with the cursor.
- **Import for HOs:** Select this option and type in a comma-separated list of Hydrographic Office short names. For example, to limit the import to charts from the Norwegian, Danish and British Hydrographic Offices, you would type: NO,DK,GB.
- **Import All Charts:** Switch off all filtering.
- **Disregard S-57 Catalog:** This option only available if you are using un-encrypted S-57 charts.
- **Import:** Click this button when you have finished specifying the filtering you want to impose. It returns you to the main Install dialog.

Install (tab) —> Import S-57 Chart(s)



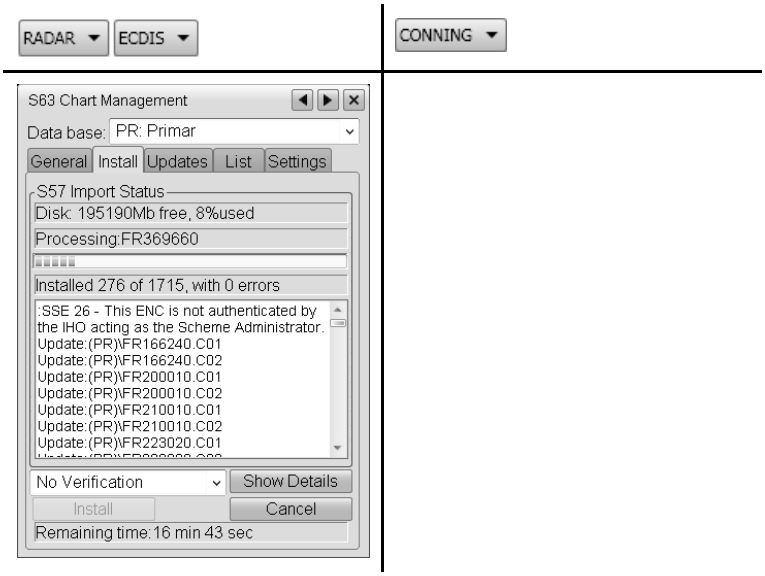
This dialog is for starting to install the charts.

The path to the dialog is: **Chart→Chart Types→(PR Primar) Mng→Install (tab)Import S-57 Chart(s):**.

The elements in the dialog are as follows:

- **S-57 Import Status:** Displays the number of charts and updates found in the specified directory. Installation time is roughly estimated.
- There are three verification choices for installing charts:
  - **Verify:** Select to verify charts and avoid installation of chart cells with less serious errors.
  - **Verify - Ignore Errors**: Select to allow installation of chart cells with less serious errors.
  - **No Verification (default):** Select to install charts without any verification. (We recommend this option when you are importing charts from a well-known distributor.)
- **Install:** Click to start chart installation.
- **Show Details:** Click the button to display a detailed list of errors and warnings from the verification and installation process. These are available on the log file.
- **Cancel:** Click the button to cancel chart installation.

Install (tab) —> Import S-57 Chart(s) —> Install

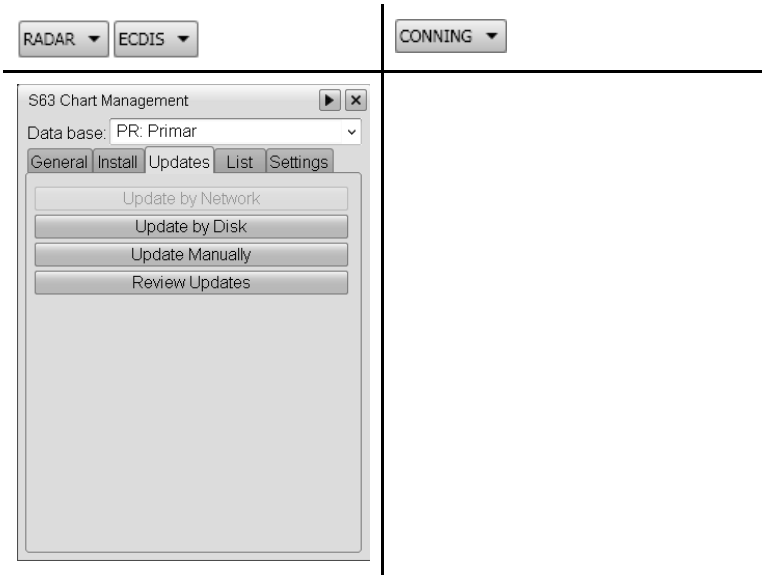


This dialog gives you progress information when you are installing the charts.

The elements in the dialog are as follows:

- **S57 Import Status:** The progress bar will show installation progress and estimate remaining time. When the installation is completed the status for the loaded charts is displayed.
- **Ignore Errors:** Select to allow installation of chart cells with less serious errors.
- **Install:** Click to start chart installation.
- **Show Details:** Click the button to display a detailed list of errors and warnings from the verification and installation process. These are available on the log file.
- **Cancel:** Click the button to cancel the installation.

20.7.4.1.3 Updates tab



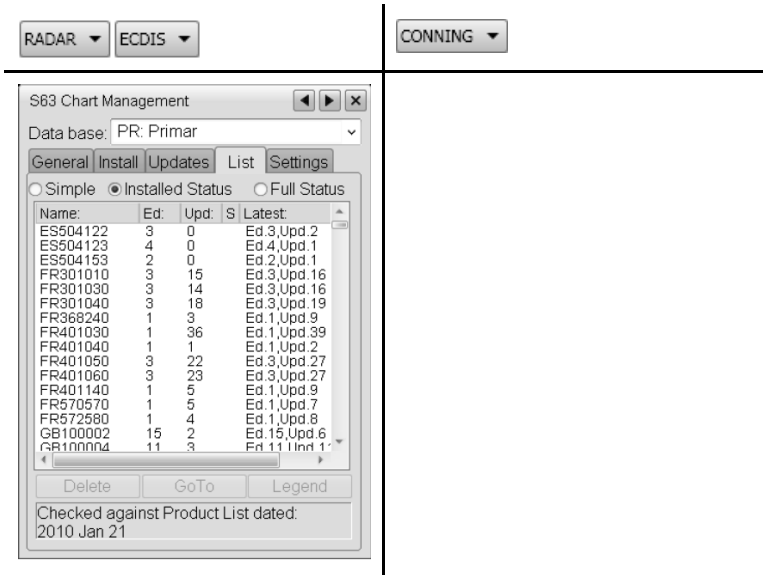
Use this dialog for updating your charts. Chart updates can be received over the internet, by e-mail or on CDs.

The path to this dialog is: **Chart→Chart Types→(PR Primar) Mng→Updates (tab)**.

The elements in the dialog are as follows:

- **Update by Network:** Click the button to display the **Network Update** menu. (Not available on the K-Bridge Multi-functional Display Unit.)
- **Update by Disk:** Click the button to display the **Disk Update** menu.
- **Update Manually:** Click the button to display the **Manual Update** menu.
- **Review Updates:** Click the button to **Review chart updates**.

20.7.4.1.4 List tab



This dialog lists the charts available in the database.

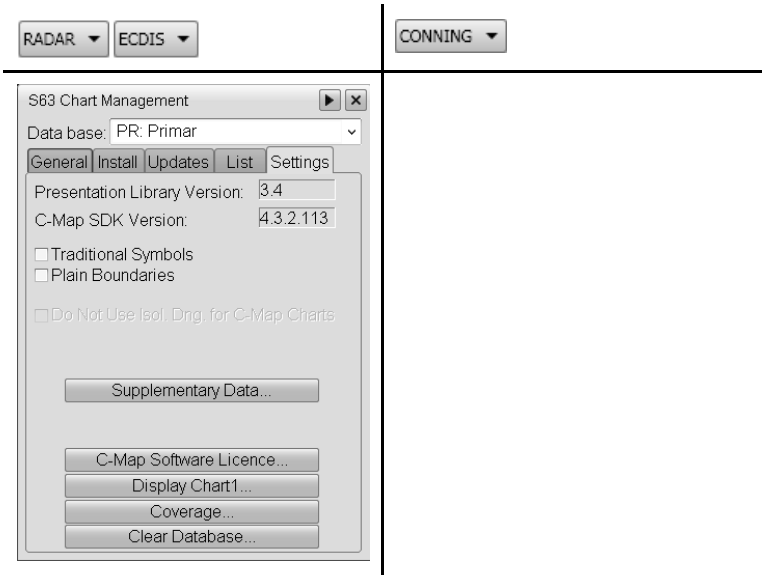
The path to the dialog is: **Chart→Chart Types→(PR Primar) Mng→List (tab)**.

The elements in the dialog are as follows:

- **List of Charts:** Displays a list of all the charts in the database.
- **Simple:** Select this option to display the names of the installed charts.

  When you have **Simple** selected and you double-click on a chart in the list, a full status is displayed for that chart.
- **Installed Status:** Select this option to display chart names and update status for the installed charts.
- **Full Status:** Select this option to display chart names and update status for all installed and licensed charts.
- **Name:** The column for chart names.
- **Ed:** The column for chart editions.
- **Upd:** The column for chart update numbers.
- **Status:** The column for chart statuses (for example, whether charts are OK, not loaded, or missing updates).
- **GoTo:** Click the button to go to the centre of the selected chart. The chart is displayed at nominal scale.
- **Legend:** Click the button to display the legend for the selected chart.
- **Delete:** Click the button to delete the selected chart from the database.

20.7.4.1.5 Settings tab



This dialog displays version numbers and enables you to configure the display of symbols in the charts.

The path to the dialog is: **Chart→Chart Types→(PR Primar) Mng→Settings (tab)**.

The dialog contains the following elements:

- **Presentation Library Version:** Displays the implemented version of the presentation library - chart symbols.
- **C-Map SDK Version:** Displays the version of the C-Map software installed in the system. (SDK - Software Development Kit).
- **Traditional symbols:** Select to display traditional chart symbols for chart objects. When not selected simplified symbols are used.
- **Plain Boundaries:** Select to displayed charts with plain boundaries. When not selected chart areas are displayed with annotated boundaries.
- **Display Chart1:** Click the button to display a resize-able window showing chart symbols used. Use the drop-down menu to select different views.
- **Coverage:** Click the button to display the **Chart coverage** menu which enables you to specify the levels of detail you require.
- **Clear Database:** Click this button to delete all charts or all charts and licenses from the database. You will be prompted to confirm your decision.

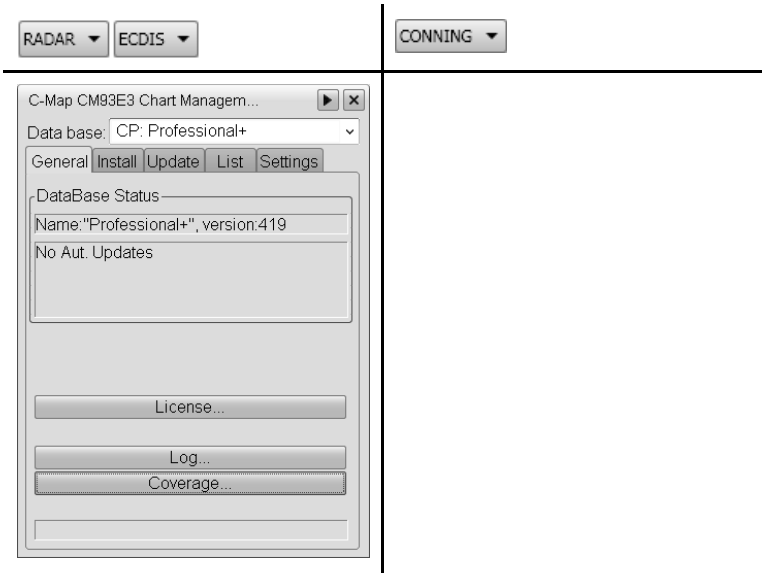
20.7.4.2 CM93 Ed.3 chart management dialogs

The path to the menus and dialogs for managing, removing and installing C-Map edition 3 digital charts is: **Chart→Chart Types→<database> Mng**.

For information about:

- The license status, the database installation and update log, or the database's coverage, see *General tab* on page 497.
- Copying charts from another navigator station on the same network, see *Mirror tab* on page 502.
- Installing charts from a CD, see *Install tab* on page 503.
- Updating the chart database, see *Update tab* on page 504
- Listing and deleting chart databases, see *List tab* on page 505
- Configuring how the chart is displayed, see *Settings tab* on page 506.

20.7.4.2.1 General tab



This tab provides general information about the installed chart database.

The path to the tab is: **Chart→Chart Types→<database> Mng→General (tab)**.

It contains the following elements:

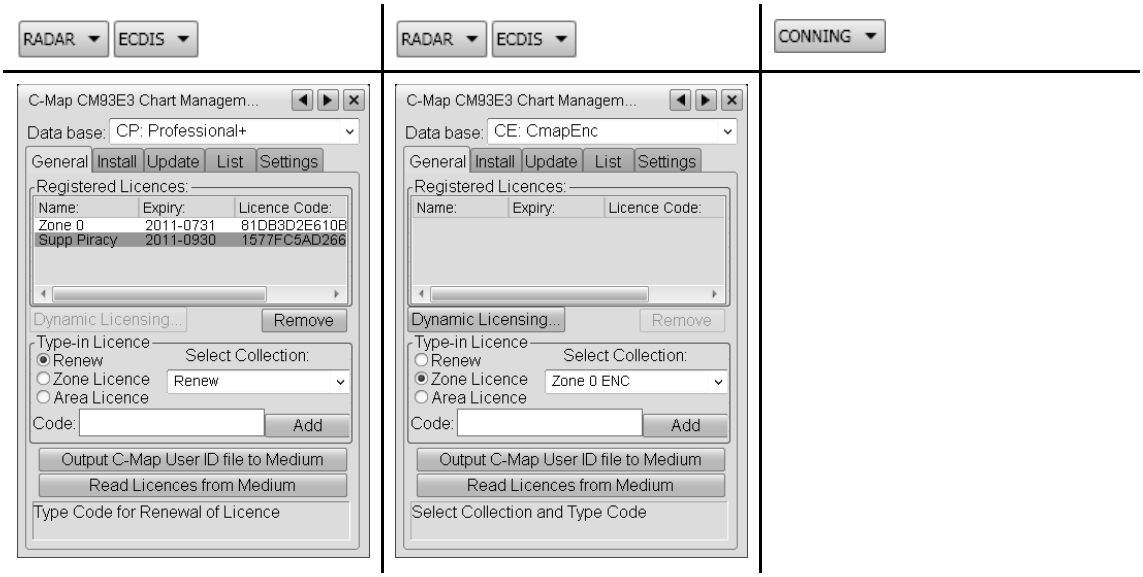
- **Database Status:** Displays the database name and version number.
- **Licence:** Brings up licence information.
- **Log:** Brings up database log information.
- **Coverage:** Brings up chart coverage data.

The dialogs that these buttons bring up are described in the next section (see *CM93 Ed.3 chart management dialogs* on page 496).

If the system is configured to load chart databases from:

- another K-Bridge system over the Local Area Network (LAN), then it is capable of mirroring (copying) chart databases from other systems on the LAN. In this case the Mirror tab appears in this dialog behind the General tab (see *Mirror tab* on page 502).
- a local CD-ROM or DVD drive, the Install tab appears behind the General tab (see *Install tab* on page 503)

Licence information



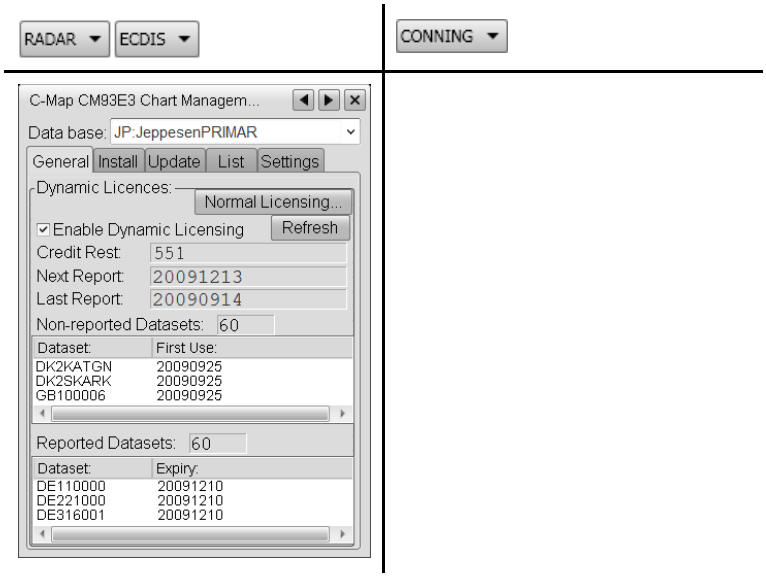
This tab provides information licences associated with the charts. Most CM-93 edition 3 charts require licence codes. If you do not have a licence code, only overview charts will be displayed.

The path to this information is: **Chart→Chart Types→<database> Mng→General (tab)→Licence**.

It contains the following elements:

- **Registered Licences:** A list of all licences registered for the CM-93 edition 3 charts. The list contains the licence name (which identifies the zone/area it covers or indicates whether it is a supplementary licence covering a particular service such as piracy avoidance), expiry date and licence code.
- **Dynamic licensing:** Click this button to bring up the dialog (see next sub-section) that enables you to pay for chart licences as you use them. (You need to have a credit arrangement set up with C-Map or your chart agent to perform dynamic licensing.)
- **Remove:** Click this button to remove the selected licence.
- **Type-in Licence:** To enter a new licence, select the zone/area or type of service, and type in the licence code that you have received from C-Map.
- **Code:** Type in the licence code.
- **Add:** Click this button to enter the license code into the system.
- **Output C-Map User ID file to Medium:** Click this button to save the file containing the licence codes to an external medium.
- **Read Licences from Medium:** Click this button to make the system input licences from a user ID file on an external medium.
- **Status field:** The status field prompts you to type in the code for a new licence, and indicates whether the license code was accepted or not.

Dynamic licensing information



This version of the General tab is for enabling dynamic licensing.

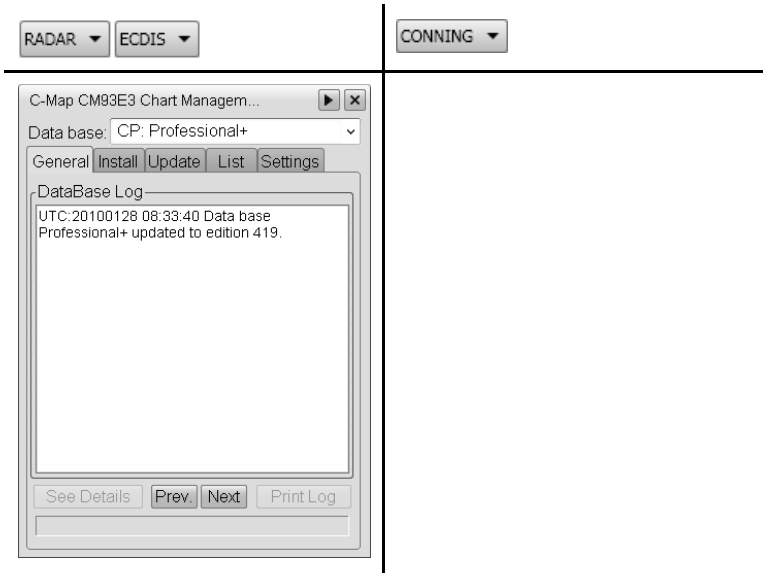
The path to this tab is: **Chart→Chart Types→<database> Mng→General (tab)→Dynamic licensing**.

C-Map allows dynamic ("pay-as-you-go") licensing for some databases as an alternative to normal (static) licensing. To take advantage of this, you must first make arrangements with C-Map or your chart agent for getting the proper licences. With dynamic licences, you start with a certain amount of chart credit and, as you use different charts, the system automatically registers them and decreases your credit accordingly. Your credit and chart usage are reported to and synchronized with C-Map whenever you perform chart updates for the database either on-line (if the system supports this) or by e-mail.

The tab contains the following elements:

- **Normal lice the nsing:** Click this button to return to the tab for non-dynamic licenses.
- **Enable dynamic licensing:** Check this box to enable dynamic licensing.
- **Refresh:** Click to refresh the licensing data.
- **Credit Rest:** Your remaining credit.
- **Next Report:** The date by which your next chart usage and credit report to C-Map is due.
- **Last Report:** The date of your last report to C-Map.
- **Non-reported Datasets:** The number of charts used since the last report.
  - **Dataset:** Chart name.
  - **First Use:** The date on which the chart was first used.
- **Reported Datesets:** The number of charts that have already been licensed.
  - **Dataset:** Chart name.
  - **Expiry:** Expiry date for the licence.

Log information



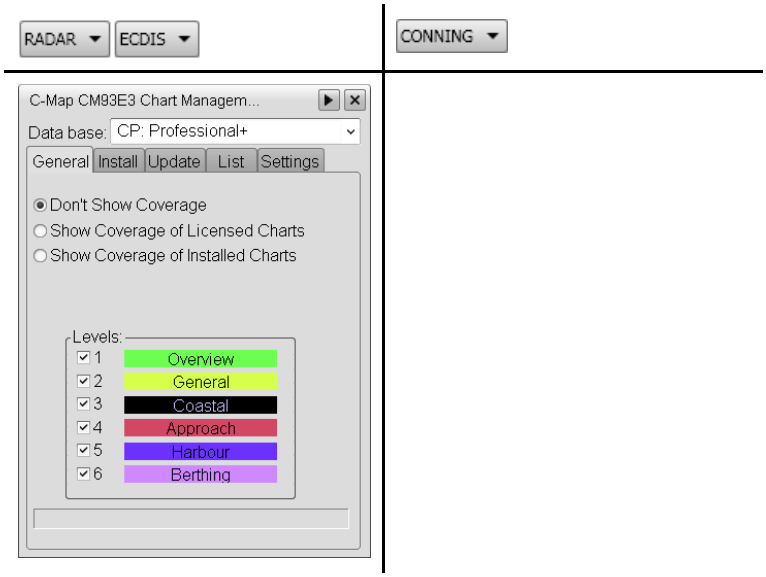
You can view the chart database's log file.

The path to this is: **Chart→Chart Types→(CP: Professional+) Mng→General (tab)→Log**.

The tab containing the log information contains the following elements:

- **DataBase Log:** Displays the contents of the log file including charts installed and applied updates.
- **See Details:** This option is not available for C-Map 93 Edition 3 charts.
- **Prev.:** Scroll Log text to previous chart entry.
- **Next:** Scroll Log text to next chart entry.
- **Print Log:** Allows you to print the log file if the system is fitted with a printer.

Coverage



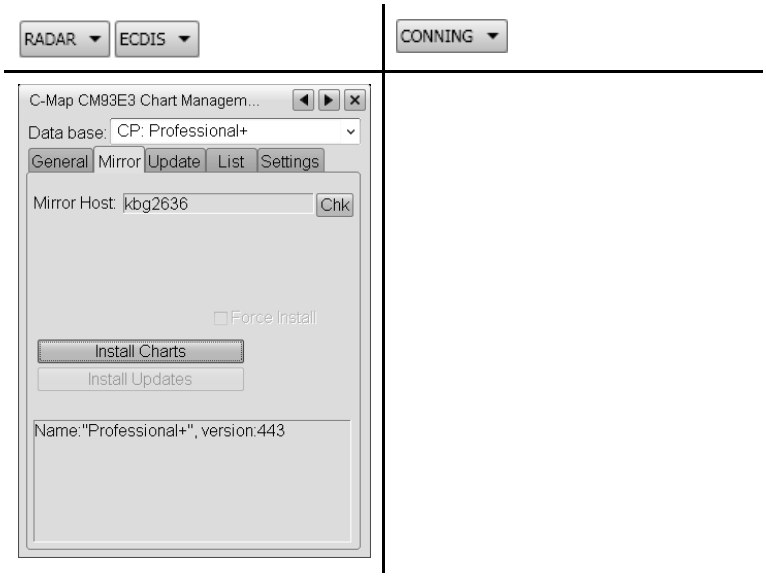
Information is available about the chart's coverage. Coloured rectangles with the size of the nominal chart cells are displayed. Note that for large-scale charts, the nominal rectangle will not correspond very well with the chart. Multiple harbour charts will be represented with a single coverage rectangle. Due to the semi-transparent technique that makes it possible to see the chart image through the colour, the colour will deviate from the pure colours shown in the dialog.

The path to the coverage information is: **Chart→Chart Types→(CP: Professional+) Mng→General (tab)→Coverage**.

The tab containing the coverage information contains the following elements:

- **Don't Show Coverage:** CM-93 edition 3 chart coverage display is turned off.
- **Show Coverage of Licensed Charts:** Displays all CM-93 edition 3 chart you have licensed. Used when not all licensed charts are loaded into the system.
- **Show Coverage of Installed Charts:** Displays all CM-93 edition 3 charts loaded into the system.
- **Levels:** Select the chart levels to be displayed in coverage presentation. The colour code is used in the coverage presentation.

20.7.4.2.2 Mirror tab



If the console is connected to a local area network, a mirror tab is available which enables you to copy charts from one display unit to an other.

Note

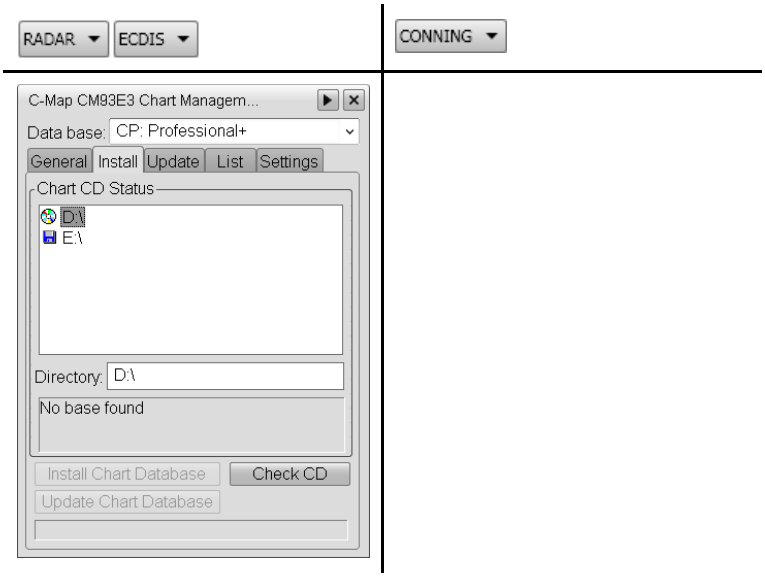
The mirror tab is only displayed when the system is configured to load chart databases from a K-Bridge ECDIS, MFD or K-Bridge Planning Station system. On systems that are configured to load chart databases from a local CD-ROM or DVD drive, the Install tab is displayed instead (see Install tab on page 503).

The path to the dialog is: **Chart→Chart Types→(CP: Professional+) Mng→Mirror (tab)**.

The dialog contains the following elements:

- **Chk:** Click to check the database against the database installed in the mirror host. An information message is displayed.
- **Install Charts:** Click to install charts from the mirror host. The mirror host will normally be a K-Bridge ECDIS or K-Bridge Planning Station.
- **Install Updates:** Click to install updates from the mirror host. The mirror host will normally be a K-Bridge ECDIS or K-Bridge Planning Station.

20.7.4.2.3 Install tab



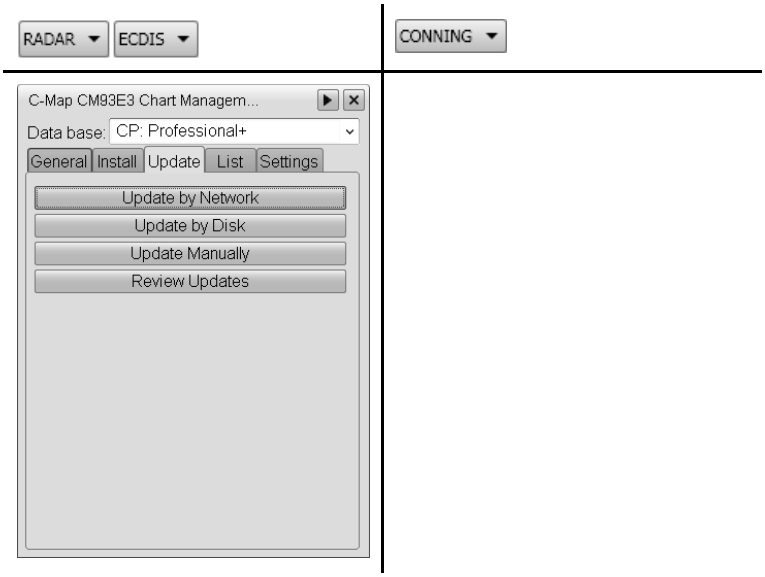
The install tab is only displayed when the system is configured to load from the CD drive.

The path to this tab is: **Chart→Chart Types→(CP: Professional+) Mng→Install (tab)**.

The tab contains the following elements:

- **Chart CD Status:** Allows you to select the drive letter for the CD drive, normally D:\.
- **Directory:** Lists the file directory for the database.
- **Install Chart Database:** Click to install the chart database from a CD-ROM. The installation will take about 10 minutes.
- **Check CD:** Click to check the CD against the installed version of the database. An information message is displayed.
- **Update Chart Database:** Click to update the chart database from the CD-ROM. The installation will take about 10 minutes.

20.7.4.2.4 Update tab



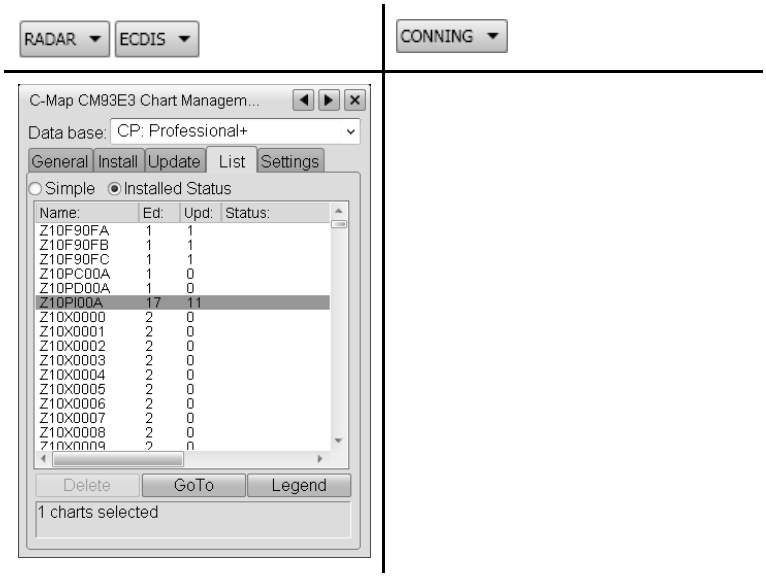
This tab enables you to update the chart database and review previous updates.

The path to this tab is: **Chart→Chart Types→(CP: Professional+) Mng→Install (tab)**.

The tab contains the following buttons:

- **Update by Network:** Click to update the charts from the network.
- **Update by Disk:** Click to update the charts from the CD drive.
- **Update Manually:** Click to edit an object in the chart manually (this is the same as clicking the **Change** button in the Object Info dialog; see *Object Info* on page 377).
- **Review Updates:** Click to review updates to the database.

20.7.4.2.5 List tab



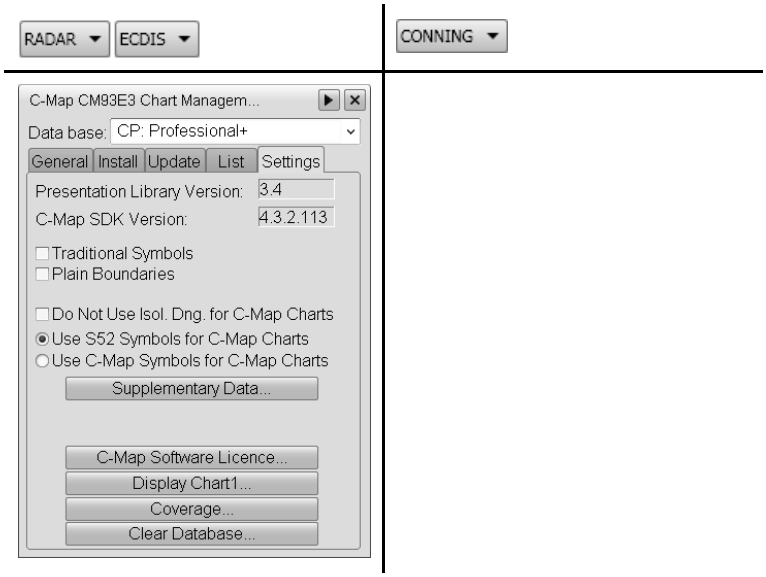
This tab enables you to list charts. It is more useful when you are using S63 charts (see *List tab* on page 494) than when you are using C-Map Professional charts.)

The path to this tab is: **Chart→Chart Types→(CP: Professional+) Mng→List (tab)**.

The tab contains the following elements:

- **Simple:** Select to list just the chart names.
- **Installed Status:** Select to see (in addition to the name) the edition number for each chart and also to see an indication of whether you have the latest version of the chart.
- **Full Status:** This option is only available for S63 charts. As well as the name of the chart and the installed status information, you also see an indication of the status of the license for each chart.
- **Go To:** Click to display the selected chart(s).
- **Legend:** Click to view the legend for the selected chart. The legend contains key information about the chart (see *Chart Legend* on page 478).

20.7.4.2.6 Settings tab



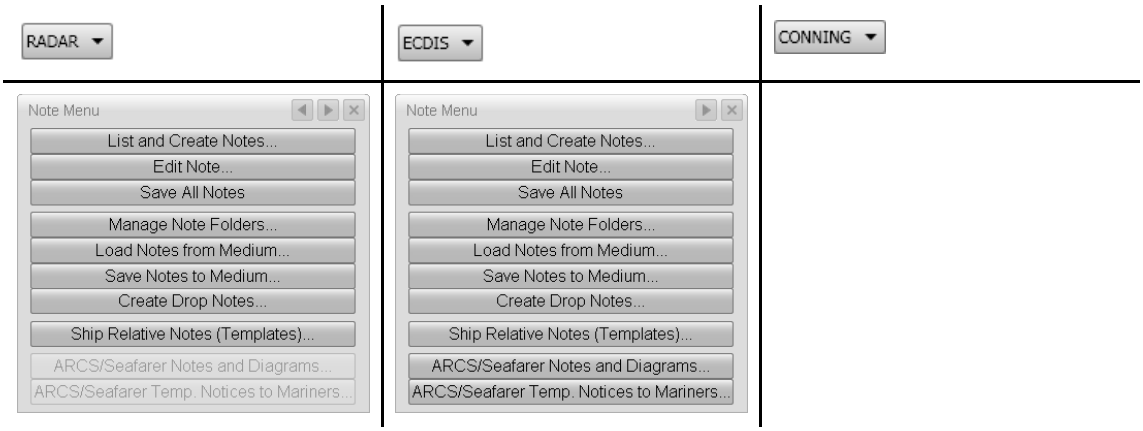
The settings tab is used to select how the database is displayed.

The path to this tab is: **Chart→Chart Types→(CP: Professional+) Mng→Settings (tab)**.

It contains the following elements:

- **Traditional Symbols:** Selects between simplified and traditional symbols.
- **Plain Boundaries:** Selects between complex and plain line styles to designate the boundary of an area.
- **Do Not Use Isol. Dng. for C-Map Charts:** When selected, dangerous objects are displayed using normal cartography symbols instead of ISODNG symbols, to reduce clutter in older charts.
- **Use S52 Symbols for C-Map Charts:** Display C-Map charts using S52 symbols.
- **Use C-Map Symbols for C-Map Charts:** Display C-Map charts using C-Map's own symbols.
- **Display Chart 1:** Click this button to display a resizable window showing the chart symbols used. Use the drop-down menu to select different views.
- **Coverage...** Click this button to view the chart coverage data.

20.7.5 Manage Notes



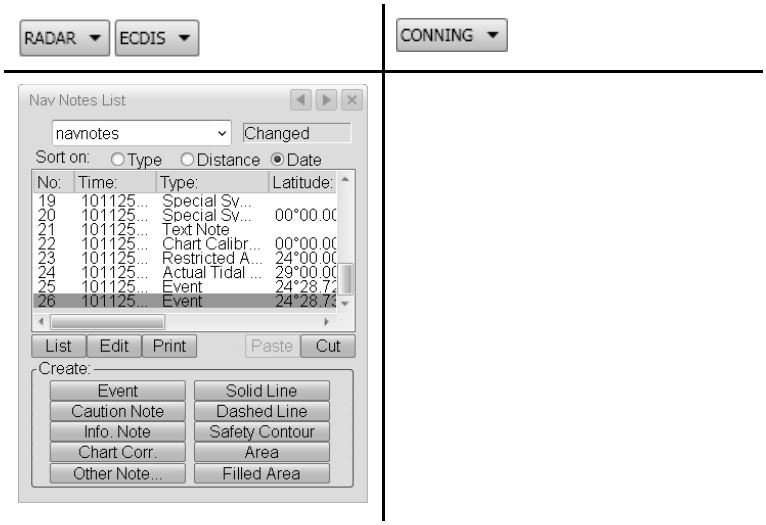
This menu enables you to create and manage mariners' notes. Mariners' notes are geographically fixed symbols, lines and areas that you can use to add information to charts or (if charts are not in use) to supplement radar information.

The path to this menu is: **Chart→Manage Notes**.

The menu contains some or all of the following buttons, depending on the application you are viewing it from::

- **List and Create Notes:** Click this button to access the folders containing the currently stored mariners' notes and to create new notes (see *Nav Notes List* on page 508).
- **Edit Note:** Click this button to edit a note (see *Edit Note* on page 510).
- **Save All Notes:** Click this button to save new or edited notes to the hard disk.
- **Manage Note Folders:** Click this button to manage your note folders (see *Manage Notes Folders* on page 512).
- **Load Notes from Medium:** Click this button to load notes from external media (see *Note Load from Medium* on page 513).
- **Save Notes to Medium:** Click this button to save notes to external media (see *Note Save on Medium* on page 514).
- **Create Drop Note:** Click this button to create notes concerning objects that have been dropped from the vessel into the sea (see *Drop Note* on page 515).
- **Ship Relative Notes (Templates):** Click this button to add your own graphical objects to the own-ship symbol or to targets; the graphical objects move with the object they are attached to on the radar display (see *Template Manager* on page 518).
- **ARCS/Seafarer Notes and Diagrams:** Click this button to view HCRF (Hydrographic Chart Raster Format) notes and diagrams (see *HCRF Notes and Diagrams* on page 516).
- **ARCS/Seafarer Temp. Notices to Mariners:** Click this button to view HCRF (Hydrographic Chart Raster Format) temporary notices to mariners (see *HCRF Temp. Notices to Mariners* on page 517).

20.7.5.1 Nav Notes List



This dialog gives you access to the folders where the mariners' notes are stored. Among other things, you can create new notes from this dialog, edit existing notes, and list and sort the contents of each folder.

The path to the dialog is: **Chart→Manage Notes→List and Create Notes**.

Folder list: Select a notes folder from the drop-down list to display the notes in that folder. To create a new folder, see *Manage Notes Folders* on page 512

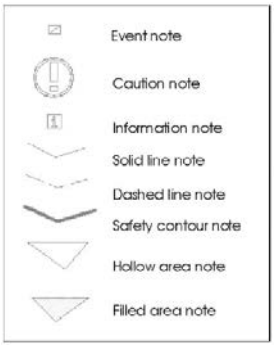
The dialog contains the following elements:

Sort on: Notes can be sorted by type, distance from the own-ship or date of creation/modification.

The list: A sorted list of notes. Select a particular note to edit. Use the horizontal scroll bar in the dialog to see all of the columns in the table. They have the following headings:

- No. - The note's number.
- Time - The time the note was created or last modified.
- Type - The following types of note are possible:
  - 1 Event
  - 2 Caution note
  - 3 Information note
  - 4 Chart correction note
  - 5 Other note
  - 6 Solid line
  - 7 Dashed line
  - 8 Safety contour
  - 9 Hollow area
  - 10 Filled area
- Latitude

- Longitude
- The first part of the note's text



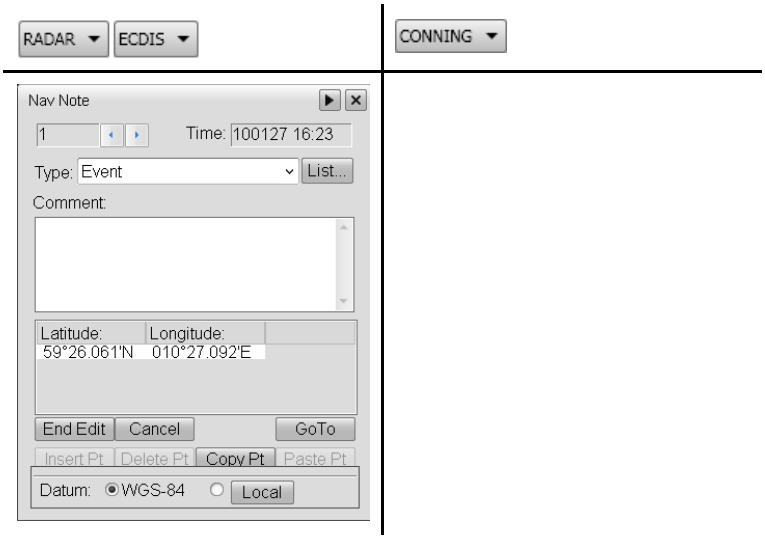
The remaining elements of this dialog are buttons:

- **List:** Click this button to view details of the selected note.
- **Edit:** Click this button to edit the selected note (see *Edit Note* on page 510).
- **Print:** Click the button to bring up a dialog for printing the selected note or notes (see *Printer* on page 590). The dialog that comes up enables you to specify a printer to use. It also lists the notes or other items currently available to be printed. You need to select an entry or entries once more to print them (either to a file or to a printer).
- **Paste:** Click this button to paste in data from the clipboard.
- **Cut:** Click this button to delete the selected note.

Click the following buttons to create a new note of the type you require (they take you to the Nav Note dialog for the particular type of note you select; see *Edit Note* on page 510):

- **Event:** Click this button to create an event note.
- **Caution Note:** Click this button to create a caution note.
- **Info Note:** Click this button to create an information note.
- **Chart Corr:** Click this button to create a chart correction note.
- **Other Note:** Click this button to create a note of a type not listed in this dialog. To see the other types of notes available, see *Other Nav Note Creation* on page 511.
- **Solid Line:** Click this button to create solid lines.
- **Dashed Line:** Click this button to create dashed lines.
- **Safety Contour:** Click this button to create a safety contour line. If a planned route crosses the line, a grounding warning will be generated during route validation. If the vessel crosses the line, a grounding warning will be generated during anti-grounding checking.
- **Area:** Click this button to create a polygon describing an area.
- **Filled Area:** Click this button to create a filled polygon describing an area.

20.7.5.2 Edit Note



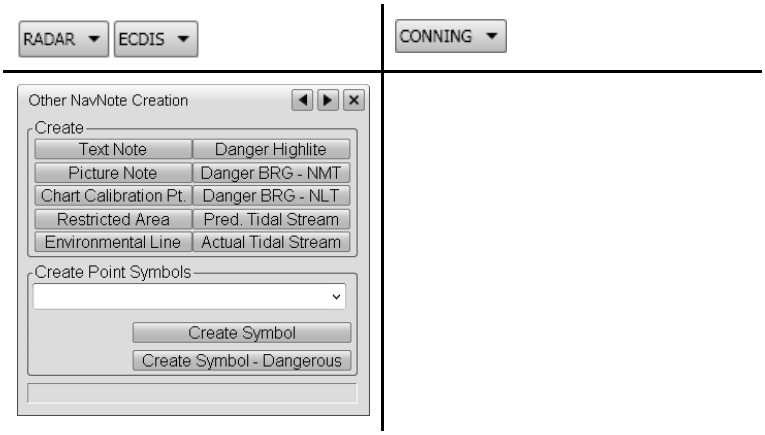
Use this dialog to edit mariners' notes.

The path to the dialog is: **Chart→Manage Notes→Edit Note**; or alternatively click on one of the buttons in the "Create" area of the Nav Notes List dialog (see *Nav Notes List* on page 508) or the Other Nav Note Creation dialog (see *Other Nav Note Creation* on page 511).

The elements in the Nav Note dialog are as follows:

- **Number:** The note's number in the list. Use the arrow buttons to select a note by its number.
- **Time:** The date and time that the note was last saved.
- **Type:** Select the note type from the drop-down menu.
- **Comment:** The text of the note. If necessary use the scroll bar.
- **Edit/End Edit:** Click to edit the note. The **Type**, **Comment** and **Latitude** and **Longitude** values are not edit-able until you click **Edit**. Then, to edit the **Latitude** and **Longitude** fields, double-click on them. To finish editing the note, click **End Edit**.
- **Cancel:** Click to cancel any unsaved changes to the note.
- **Copy Pt:** Click to copy selected points to an other note. Select points and click copy.
- **Paste Pt:** Click to paste the copied points into a list of points.
- **Insert Pt:** Click this button to insert a new point before or between existing points.
- **Delete Pt:** Click to delete selected points.
- **Datum:** Select WGS-84 or Local for the datum.
- **Local:** Pressing this button allows you to select a datum from a list of commonly used datums. If you select a local datum, the name will be shown as the button text (instead of "Local"). See section 20.9.9 on page 551 for more information.

20.7.5.3 Other Nav Note Creation



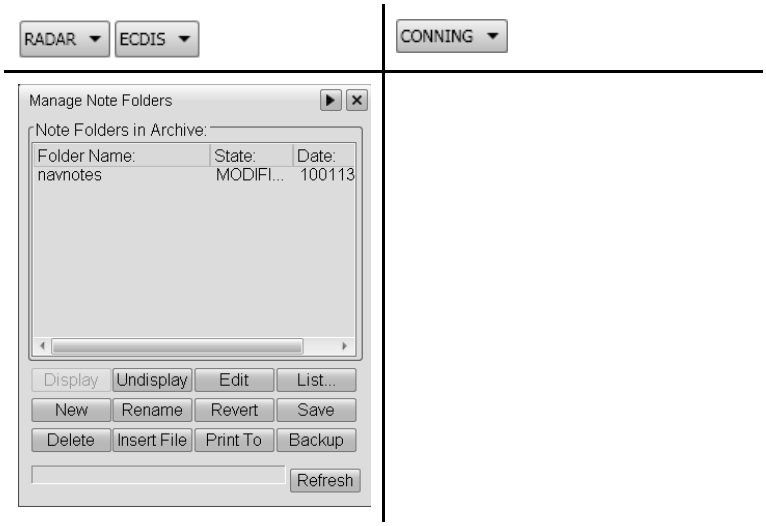
This dialog enables you to create another ten different types of navigation note in addition to the types available in the Nav Notes List dialog (see *Nav Notes List* on page 508).

The path to the dialog is: **Chart→Manage Notes→List and Create Notes→Other Notes**.

Click the following buttons to create a new note of the type you require (most of them take you to the Nav Note dialog for the particular type of note you select; see *Edit Note* on page 510):

- **Text Note:** Click to create a text note.
- **Picture Note:** Click to create a picture note by importing a graphics file from an external medium.
- **Chart Calibration Pt:** Click to create a chart calibration point.
- **Restricted Area:** Click to create a restricted area border. If a planned route crosses the border, an area warning will be generated during route validation. If the vessel crosses the border an area warning will be generated during anti-grounding checking.
- **Environmental Line:** Click to create an environmental area border. If a planned route crosses the border, an area warning will be generated during route validation. If the vessel crosses the border, an area warning will be generated during anti-grounding checking.
- **Danger Highlight:** Click to create a note that highlights some danger.
- **Danger BRG - NMT:** Click to create a bearing limitation line (Not More Than).
- **Danger BRG - NLT:** Click to create a bearing limitation line (Not Less Than).
- **Pred. Tidal Stream:** Click to create a note to indicate a predicted tidal stream.
- **Actual Tidal Stream:** Click to create a note to indicate an actual tidal stream.
- **Create Point Symbols:** Select the type of point symbol you require from the drop-down list.
- **Create Symbol:** Click this button to create and specify the characteristics of the point symbol.
- **Create Symbol - Dangerous:** Click this button to create a danger point symbol and specify its characteristics.

20.7.5.4 Manage Notes Folders



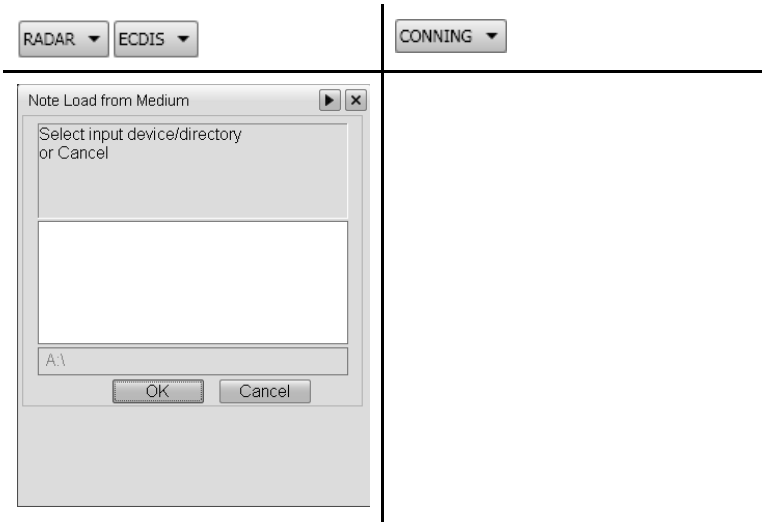
Use this dialog to manage your folders of mariners' notes.

The path to the dialog is: **Chart→Manage Notes→Manage Note Folders**.

The dialog contains the following elements:

- **Note Folders in Archive:** List of note folders in the archive. Select a folder.
- **Display:** Click to display the notes in this folder on the chart/radar display. The notes in the folder will be read-only.
- **Undisplay:** Click to hide the notes in this folder from the chart/radar display.
- **Edit:** Click to display the notes in the selected folder and allow them to be edited.
- **List:** Click to list the notes in the selected folder (see *Nav Notes List* on page 508).
- **New:** Click to create a new notes folder.
- **Revert:** Click to revert to an earlier version of the folder.
- **Save:** Click to save your changes to the folder.
- **Rename:** Click to rename the selected folder.
- **Delete:** Click to delete the selected folder.
- **Insert File:** Click to insert a file into the selected folder.
- **Print to:** Click to print the notes in the selected folder to an external medium. A dialog appears prompting you to specify the output device and path. The notes are printed as a single text file to the device you specify.
- **Backup:** Click to save the selected folder to an external medium.
- **Refresh:** This button updates the note lists for all the notes folders found on the computer. The system updates the note lists automatically but the **Refresh** button enables you to do it manually as well.

20.7.5.5 Note Load from Medium



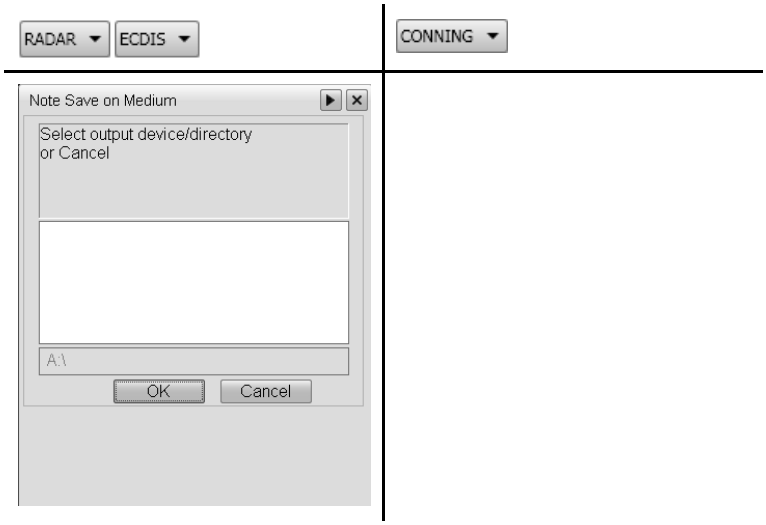
Use this dialog to load previously made notes from the selected device. Insert the external disk or memory device.

The path to the dialog is: **Chart→Manage Notes→Load Notes from Medium**.

The dialog contains the following elements:

- **Select input device/directory or Cancel:** Select from listed devices/directories.
- **OK:** Enters selection.
- **Cancel:** Cancels selection.

20.7.5.6 Note Save on Medium



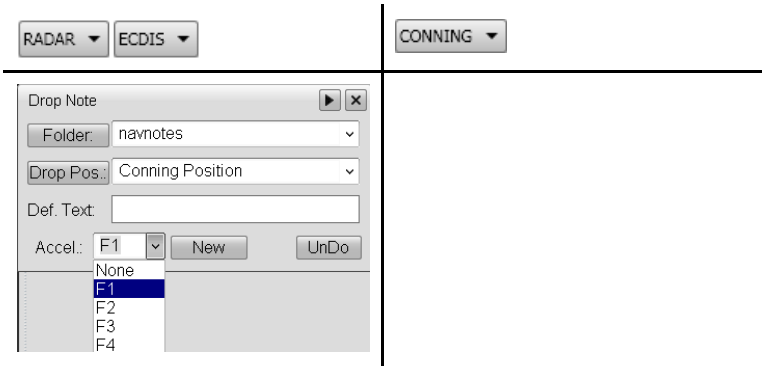
This dialog enables you to save notes to a selected device. Insert the external disk or memory device.

The path to the dialog is: **Chart→Manage Notes→Save Notes to Medium**.

The dialog contains the following elements:

- **Select input device/directory or Cancel:** Select from listed devices/directories.
- **OK:** Enters selection.
- **Cancel:** Cancels selection.

20.7.5.7 Drop Note



This dialog is specifically for creating notes concerning objects that have been dropped from the own-ship into the sea.

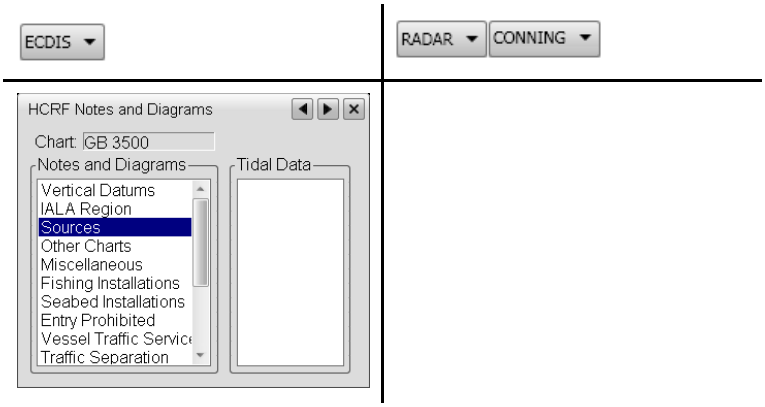
The path to the dialog is: **Chart→Manage Notes→Create Drop Notes**.

The dialog contains the following elements:

- **Folder:** The topmost drop-down menu allows you to select which folder the created drop notes should be added to. This button is a shortcut to the manage folder dialog (see*Manage Notes Folders* on page 512).
- **Drop Pos:** The second drop down menu allows you to select which reference point should be used for creating new drop notes. This button is a shortcut to the Ship Reference Points dialog (see *Ship Reference Points* on page 444).
- By clicking the **New** button, a new drop note is created at the defined reference position on the ship at the current UTC time.

  When a drop note has been created by the New button, the operation can be undone by clicking the **UnDo** button.
- **Def. Text:** This field allows you to define a text which is displayed together with the drop object symbol. If the text contains the special “macro” sequences these are replaced with the actual macro values:
  - **%n** This is replaced with the note number.
  - **%1d** This is replaced with the depth in meters from depth sensor number 1.
  - **%2d** This is replaced with the depth in meters from depth sensor number 2.
  - **%d** This is replaced with the depth in meters from the current depth sensor.
- **Accel.:** By this drop down menu, one can define any of the Function Keys **F1** to **F4** to be used as “Accelerators” for defining new object positions. That is, the function key can be used in stead of the **New** button in the dialog.
- The figure below shows screen with a note number 1 launched at the Stb Crane.

20.7.5.8 HCRF Notes and Diagrams



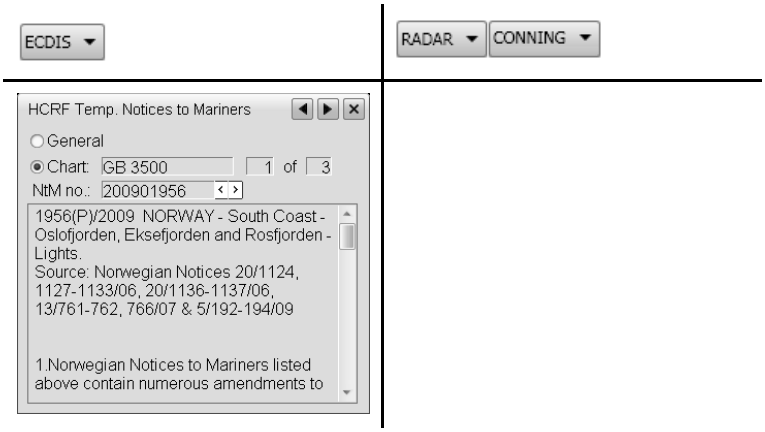
This dialog enables you to view HCRF (Hydrographic Chart Raster Format) notes and diagrams.

The path to the dialog is: **Chart→Manage Notes→ARCS/Seafarer Temp. Notices to Mariners**.

The dialog contains the following elements:

- **Chart:** Chart number.
- **Notes and Diagrams:** List of notes and diagrams available for this chart. By selecting an entry in the table, the note/diagram will be displayed in a separate window.
- **Tidal Data:** List of tidal data stations in the chart. Select one of the stations to display the data in a separate window.

20.7.5.9 HCRF Temp. Notices to Mariners



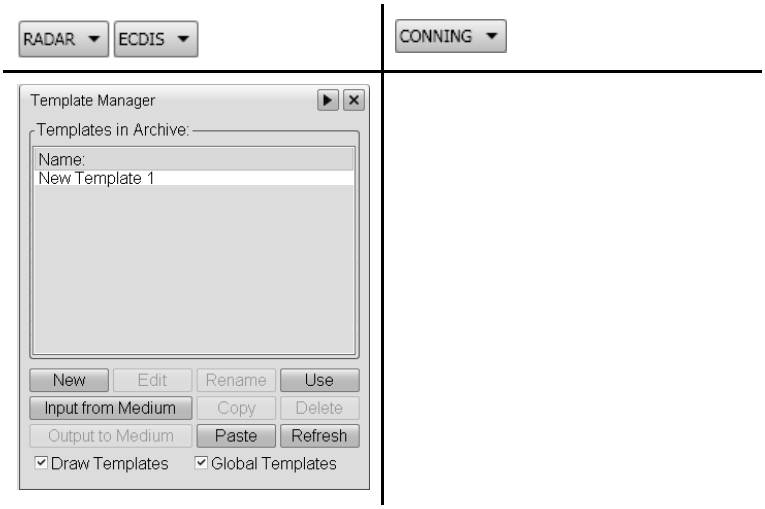
This dialog enables you to view HCRF (Hydrographic Chart Raster Format) temporary notices to mariners.

The path to the dialog is: **Chart→Manage Notes→ARCS/Seafarer Temp. Notices to Mariners**.

The dialog contains the following elements:

- **General:** Select to see general notices.
- **Chart:** Select to see notices for chart currently being displayed.
- **Arrow buttons:**Select specific notice by using buttons.
- **NtM no:** Notice to Mariners number.

20.7.6 Template Manager



This dialog is the main menu for the Templates tool. It lists all templates currently available, both those provided by the manufacturer and any that you (or other operators) have created. It also enables you to create, edit and apply templates.

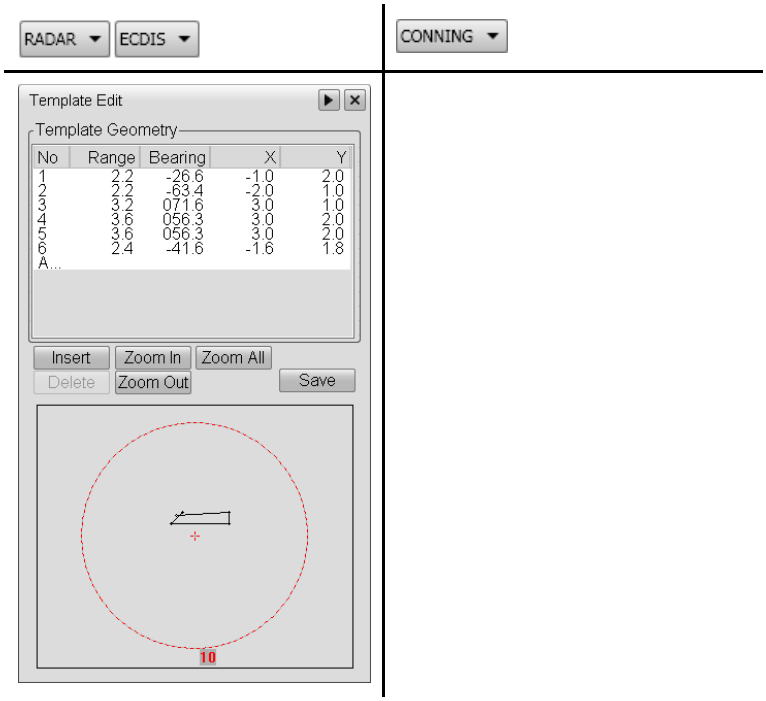
To reach this dialog, select: **Chart→Manage Notes→Ship Relative Notes (Templates)**.

The dialog contains the following buttons:

- **New:** Click this button to create a new template. The new template appears (with a generic name) in the list. It is highlighted to indicate that you can edit its name: specify the name you want to give the template. When you are ready to define the new template, select it in the list and click the **Edit** button.
- **Edit:** Click this button to edit the definition of the selected template. It brings up the Template Edit dialog; for a description of this dialog, see *Template Edit* on page 520). For more information about using the Template Edit dialog, see *Defining the template* on page 227. Before clicking this button, make sure the **Draw Templates** option is checked.
- **Rename:** Click this button to rename the selected template. When you do this, the name becomes editable: specify a unique name for the template.
- **Use:** Click this button when you are ready to attach the template to an object on the chart. It brings up the Template Use dialog; for a description of this dialog, see *Template Use* on page 522. For information about how to use the dialog, see *Attaching the template to an object on the display* on page 228.
- **Input from Floppy:** To copy templates from an external medium (for example, a USB memory stick) to the system's hard disk (so that they appear in the list in this dialog), insert the external medium, then click **Input from Floppy**.
- **Copy:** Click this button to copy the selected template. Then click the **Paste** button to paste it into the list. It will appear there as **Pasted Template**. Next select **Pasted Template** and click **Rename** to give the new template a name. Finally click **Edit** to edit its details, and click **Use** to attach it to a particular object or geographical position on the chart.

- **Delete:** Click this button to remove the selected template or templates permanently from the list of defined templates. You will be prompted to confirm that you want to delete the template or templates.
- **Output to Floppy:** To copy templates to an external medium insert the medium, then click **Output to Floppy**.
- **Paste:** Use this button in conjunction with the **Copy** button described above when you want to create a new version of a template that already exists.
- **Refresh:** Click this button to refresh the displayed list of templates. If you have a template currently open for editing, do not click the **Refresh** button unless you want to revert to the last saved version of that template.
- **Draw Templates:** Check this box to display templates on the chart. Un-check it to hide templates.
- **Global Templates:** Check this box to cause templates on this operator station to be automatically updated whenever a template is edited on another operator station on the same network. (The system on which the template is edited must also have its **Global Templates** option selected.)

20.7.6.1 Template Edit



Use this dialog to design the template. You can either draw in the nodes and vectors in the lower graphical window by using the mouse (or track-ball) and mouse-buttons, or you can enter values alpha-numerically in the top table (or of course you can use a combination of these methods).

To reach this dialog, select: **Chart→Manage Notes→Ship Relative Notes (Templates)→New** or **→Edit**.

Make sure you have checked the **Draw Templates** option in the Template Manager dialog (see *Template Manager* on page 518) if you want to use the drawing facilities in the Template Edit dialog.

The node that is selected in the upper list window is marked by an un-filled black square in the graphical window. You can also select a node by clicking on it in the graphical window, which causes it to be highlighted in the top window.

The range, bearing, and X/Y co-ordinate values for each node are displayed in the list window, and these are updated each time you move the node. You can also edit them manually and your edits will be immediately reflected in the shape displayed in the graphical window.

The Template Edit dialog contains the following buttons:

- **Insert/End Insert:** Click the **Insert** button to add a new node, then click with the left mouse-button at the position in the graphical window where you want the new node to appear: a line is then drawn from the selected node to the new one. Move the mouse and click again to draw a line from the previously added node to a new node. Click **End Insert** when you want to stop adding nodes and lines.

When you have clicked the **End Insert** button, you can use the left mouse-button to select individual nodes in the graphical window and drag them to new positions. Do this to refine the shape of the template.

To add a line from the very last node to a new node, select **A...** in the node list in the top half of the dialog box (the A stands for Append). Then click **Insert** and finally click in the graphical window at the position where you want the new node to appear .

- **Delete:** Click this button to delete the selected node or nodes.
- **Zoom In:** Use this button to zoom in on the image in the graphical window.
- **Zoom Out:** Use this button to zoom out from the image in the graphical window.
- **Zoom All:** Use this button to cancel the previous zooms and view the image in the graphical window at normal range.
- **Save:** Click this button to save the template definition. If you do not save the definition, it will be lost when another template is selected for editing.

  If you want to use the template you have drawn as a replacement for the own-ship symbol on the chart display, you must save the file with the name `$$OwnShip` and then check the **Use Template '$$OwnShip' as Outline** option in the Display tab of the Parameter Setup dialog (see *Display tab* on page 565).

For more information about using this dialog, see *Defining the template* on page 227.

20.7.6.2 Template Use

This dialog enables you to attach a template to a particular object or geographical position in the radar display.

To reach this dialog, select: **Chart→Manage Notes→Ship Relative Notes (Templates)→Use**.

The first half of the Template Use dialog contains the following elements:

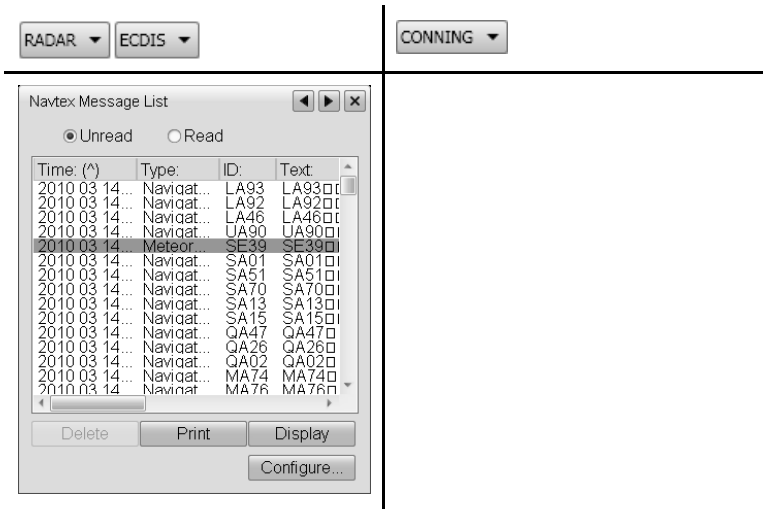
- **Own Ship:** Select this option to attach the selected template to the own-ship symbol on the chart.
- **Target:** Select this option to attach the selected template to a radar or AIS target on the display. Then click **Select New Target** and use the cursor to select the target in the radar display. There are four other elements associated with this option:
  - **Targets (drop-down list):** This is a list of all the targets in the system that have a template attached.
  - **Select New Target:** Click this button after selecting the **Targets** option, then use the cursor to select a target in the radar display to attach the template to.
  - **Detach:** Select a target from the drop-down list, and click this button to detach its template from it.
- **Fixed Position:** Select this option to attach the selected template to a fixed geographical position. Position-fixed templates each have a number, and you must use the spin buttons to specify the number for a new one that you are creating or for an existing one that you are editing. The following elements are associated with this option:
  - **New:** Click this button if you are creating a new position-fixed template. Specify its position by entering values into the co-ordinate fields, or by clicking the **EBL** button and moving the EBL to the position required. (The values in the co-ordinate field will change to show the position of the EBL.)
  - **Detach:** Click this button to detach the template from the fixed position identified by the number next to the spin buttons.
- **Apply:** Click this button to apply the changes you have specified.

The second half of the Template Use dialog is for specifying the attributes of the template as it appears on the radar display:

- **Template:** Select the template you want to attach from the drop-down list.
- **Colour:** Select a colour from the drop-down list. The colours are a subset of the S-52 (ECDIS) colours; they will change whenever you change the display palette.
- **Scale:** Specify the level of magnification you require for the display of the template (this is specified as a percentage of its size when you drew it in the Template Edit dialog). Note that the template will scale with the display whenever you change the scale you are using for the display.
- **Rot(ation):** Templates attached to a fixed geographical position have a rotation angle relative to North. Templates attached to the own-ship symbol or to a target can have an absolute angle (relative to North) or an angle relative to the associated own-ship (or target's) heading. To display the template relative to North, select **Abs**. To display the template relative to the associated own-ship (or target's) heading, select **Rel**.
- **Offset:** The Template can be drawn on the display at an offset (range and bearing) from the object to which it is attached. The angle of offset is always relative to the object's course (or relative to North for fixed-position templates). Specify the offset (if any) that you require for the drawing of the template in relation to the object (or location) on the radar display. The offset is expressed as a range and bearing from the object.
- **Bold:** Check this box if you want the template to be drawn using bold lines in the radar display.
- **Apply:** Click this button to make the template appear on the display according to your specifications.

For more information about how to use this dialog, see *Attaching the template to an object on the display* on page 228.

20.7.7 Navtex Message List



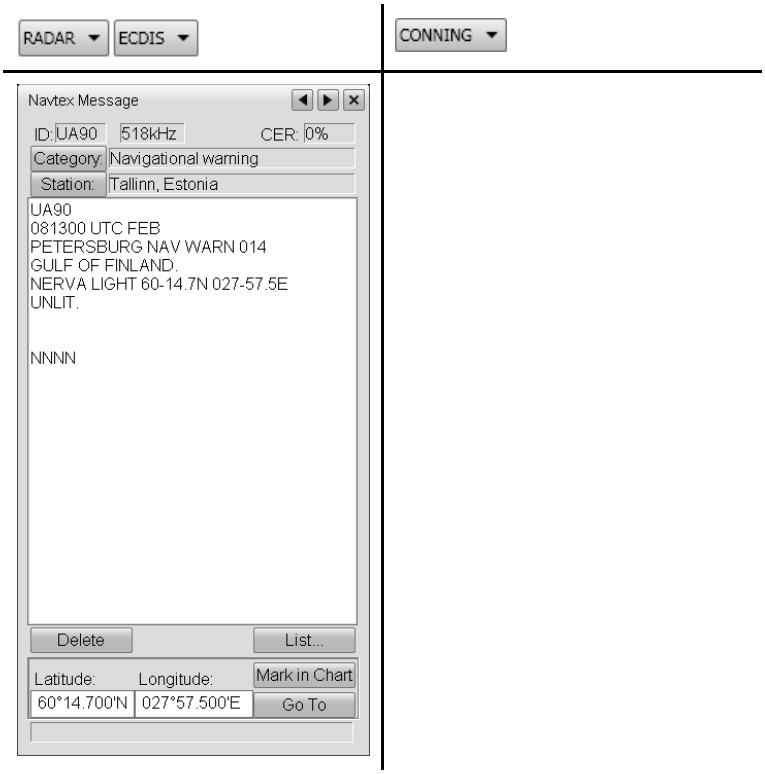
The dialog enables you to view unread and previously read Navtex messages.

The path to the dialog is **Chart →Navtex Messages**.

The dialog contains the following elements:

- **Unread:** Select to display a list of unread messages.
- **Read:** Select to display a list of previously read messages.
- **The list:** The list displays either unread or read messages dependent on the selection above.
- **Delete:** Click the button to delete one or several selected messages.
- **Print:** Click the button to bring up a dialog for printing the selected message or messages. The dialog that comes up enables you to specify a printer to use. It also lists the messages currently being sent to the selected printer and enables you to print the selected message or messages to a file instead.
- **Display:** Click the button to display the selected message (see *Navtex Message* on page 525).
- **Configure:** Click the button to configure the Navtex interface (see *Navtex Configure* on page 526).

20.7.7.1 Navtex Message



This dialog displays the selected Navtex warning message. When a Navtex message is displayed, the system checks the text for coordinate information and, if it finds any, it presents it in the Latitude and Longitude fields below the text. You can then use coordinates to create a mariner's note at the position indicated; or you can use them to browse to that position in the chart. If there are multiple coordinate pairs in the text window, you can select different parts of the text, and the coordinate pair in the Latitude and Longitude fields will change accordingly.

The path to the dialog is **Chart →Navtex Messages** (select message) **→Display**.

The dialog contains the following elements:

- **ID:** Message ID.
- **CER:** The percentage of this message that is accounted for by communication errors.
- **Category:** The category of message.
- **Station:** The station that transmitted the message.
- **Delete:** Click to delete the message.
- **List:** Click to return to the message list (see *Navtex Message List* on page 524).
- **Latitude:** The latitude coordinate of the place that is the subject of the Navtex message.
- **Longitude:** The longitude coordinate of the place that is the subject of the Navtex message.
- **Mark in Chart:** Click to create a mariner's note at the position indicated by the latitude and longitude values.
- **Go To:** Click to go to this position in the chart.

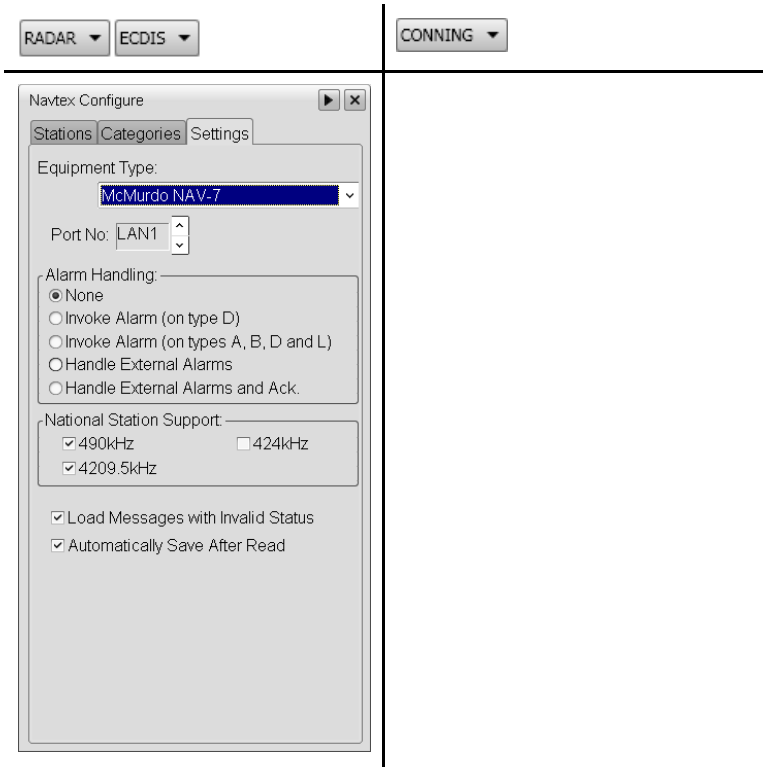
20.7.7.2 Navtex Configure

To configure Navtex services on your system, select: **Chart →Navtex Messages→Configure**.

This section describes the following tabs for configuring Navtex services:

- Navtex Settings (see *Settings tab* on page 526)
- Navtex Categories (see *Navtex Categories tab* on page 528)
- Navtex Stations (see *Navtex Stations tab* on page 529)

20.7.7.3 Settings tab



This dialog is for specifying the type of Navtex receiver connected. The parameters in the dialog box are normally only changed during commissioning. The system password is required to change them.

The path to the dialog is **Chart →Navtex Messages→Configure (Settings tab)**.

The dialog contains the following elements:

- **Equipment Type:** Select the type of Navtex receiver connected to the K-Bridge Radar from the drop down list.
- **Port No:** Select the serial port number the Navtex receiver is connected to. Settings for the serial port are done under **Menu→System→Serial Communication**. By default, the serial line is set to 4800, 8 bit data, 1 stop bit, no parity.
- **Alarm Handling:** The following alarm handling options are available:
  - **None:** Select this radio button to turn off Navtex alarms.

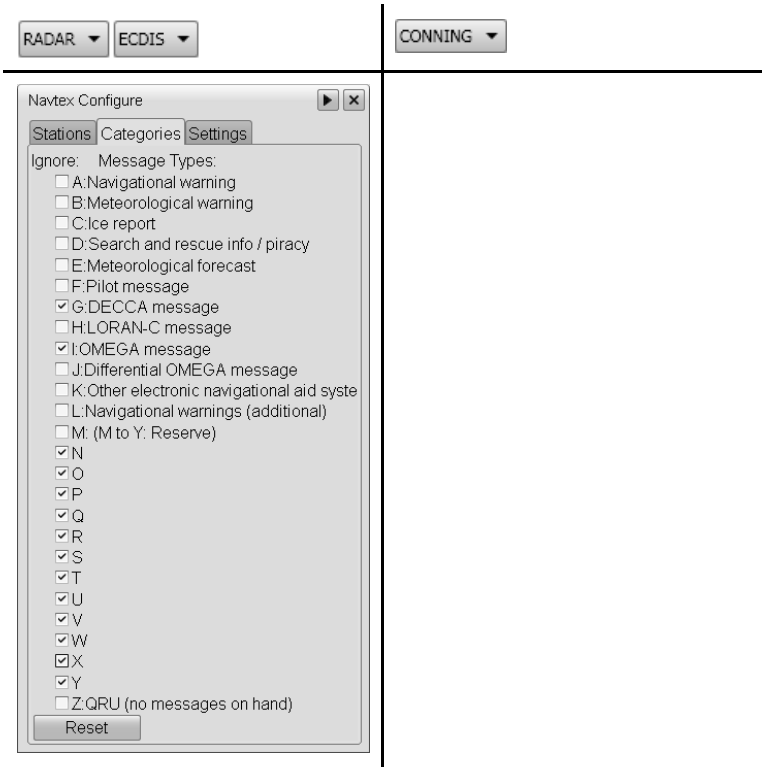
  - **Invoke Alarm (on type D):** Select this radio button to display alarms of type D on the ECDIS alarm and message area (see *Top bar: the alert area* on page 60). Type D is for distress, search-and-rescue and piracy alerts. (For a list of all the categories of Navtex messages, click the **Categories** tab.)
  - **Invoke Alarm (on types A, B, D and L):** Select this radio button to display Navtex alarms of categories A, B, D and L on the ECDIS alarm and message area (see *Top bar: the alert area* on page 60).
  - **Handle External Alarms:** Select this radio button to display all Navtex messages (received by the Navtex receiver) on the ECDIS alarm and message area (see *Top bar: the alert area* on page 60). You can filter them by using the **Categories** and **Stations** tabs.
  - **Handle External Alarms and Ack:** Select this radio button to display all Navtex messages on the ECDIS alarm and message area (see *Top bar: the alert area* on page 60), and in addition to enable them to be acknowledged from ECDIS.

- **National Station Support:** To receive Navtex messages in the national language for the waters you are sailing through, select **490kHz**. The other bands are not normally available.
- **Load Messages with Invalid Status:** Select to display messages that have not been correctly received as well as messages that have been correctly received.
- **Automatically Save After Read:** Select to automatically save incoming messages after they are read. Incoming messages are stored in an **Unread** directory, while messages are automatically transferred to the **Read** directory after the user has read them. Messages are retained in the **Read** directory until they are explicitly deleted. If not selected, messages are automatically deleted after they have been read, unless they are explicitly saved.

Note

The Navtex interface is mainly a passive "listening" interface. No signals are sent from the K-Bridge MFD system to the Navtex receiver unless you select the option ***Handle External Alarms and Ack*** *(in which case the K-Bridge MFD system sends acknowledgements to the Navtex receiver).*

20.7.7.4 Navtex Categories tab



This dialog is for specifying which Navtex message types are to be ignored.

The path to the dialog is **System →Navtex Messages→Configure (Categories tab)**.

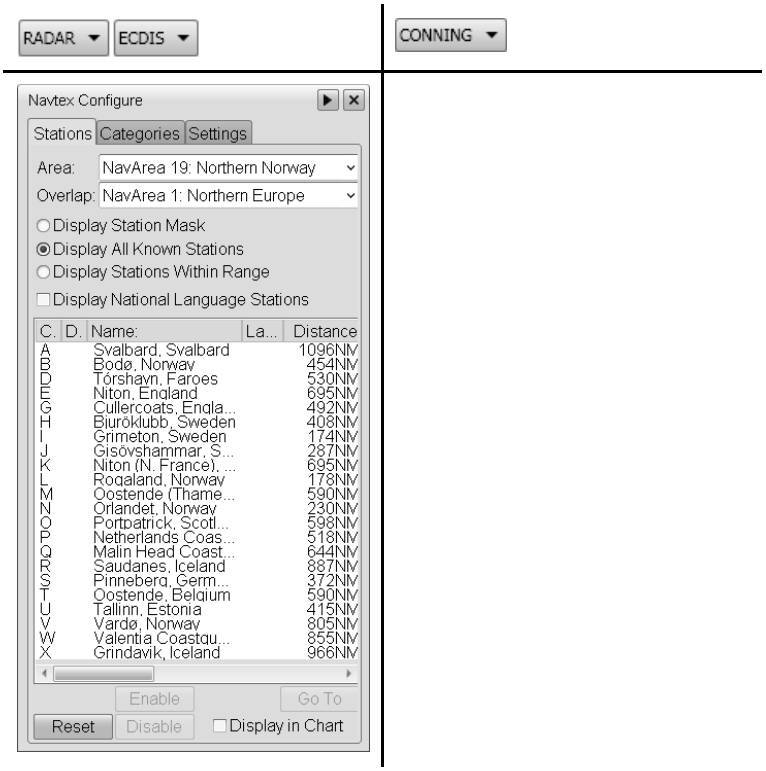
The elements in the dialog are as follows:

- **Ignore:** In this column check the box next to the message type that you want the K-Bridge Radar system to ignore. (Messages of categories A, B, D and L cannot be filtered out.)
- **Message Types:** This column lists all the categories of Navtex message available. Check the **Ignore** box next to a category to filter out messages of that category. (Messages of categories A, B, D and L cannot be filtered out.)
- **Reset:** Click this button to enable receipt of all Navtex messages.

Note

In addition to the filtering that you specify here the Navtex receiver might have its own message filtering configured. Note that the K-Bridge MFD system will only receive the messages that the Navtex receiver is configured to receive, and that the Navtex receiver's settings are not affected by the filtering you specify on the K-Bridge MFD system .

20.7.7.5 Navtex Stations tab



This dialog enables you to specify the Navtex stations that you want to receive messages from. The list contains the name and location of each station in the selected area (and overlap area); it also includes the station's distance from the own-ship and its broadcasting range and transmission times.

The path to the dialog is **System →Navtex Messages→Configure (Stations tab)**.

Note

The information in this tab is an unofficial compilation. You must refer to other sources for up-to-date official information. The British Admiralty List of Radio Signals is an excellent source of NAVTEX and GMDSS information.

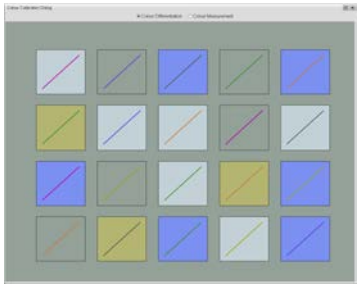
The elements contained in the dialog are as follows:

- **Area:** Select the area that you are currently sailing through. Transmitting stations are identified by a letter from A to Z. When you select the area (and overlapping area, if any) that you are currently sailing through, the system displays the names of the transmitting stations in that area.
- **Overlap:** Often you will be able to receive signals from areas that overlap the area you are sailing through. To list the stations in an overlapping area select the area from the drop-down list.
- **Display Station Mask:** Select this button to filter out messages with a particular letter code. To filter out unwanted messages by letter code, select the relevant letter from the list, and click **Disable**.
- Use the **Enable** button to re-enable messages with a particular letter code.

- When you sail into a new Navtex area, use the **Reset** button to re-enable messages with all letter codes. Then if necessary use the **Disable** button again to filter out unwanted messages by letter code.
- **Display All Known Stations:** Select to display the names of all known stations in the selected area and overlap area.
- **Display Stations Within Range:** Select to display the names of all stations that the own-ship is currently within range of in the selected area and overlap area.
- **Display National Language Stations:** Check this box to display (along with the other stations) those stations that broadcast in the national language (on band 490kHz) for the waters you are sailing through. The language is displayed in the **Language** column.
- **Reset:** Click the button to enable receipt of messages with all station letter codes.
- **Enable:** Click the button to enable receipt of messages from stations with the selected letter code.
- **Disable:** Click the button to disable receipt of messages from stations with the selected letter code.
- **Go To:** This button takes you to the location of the selected station on the chart.
- **Display in Chart:** Check this box to display in the chart the location and range of all listed stations.

20.7.8 Colour Differentiation and Calibration

RADAR ECDIS | CONNING

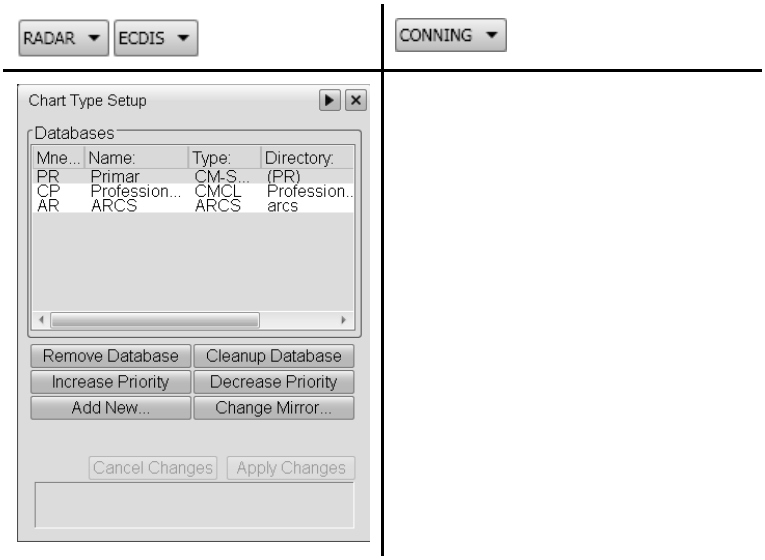


The colour differentiation and calibration dialog allows you to check the colour reproduction quality of your ECDIS system.

The path to the dialog is: **Chart→Colour Differentiation and Calibration**.

Before checking this, the monitor should be set to the calibrated state (see *Intensity* on page 367). Then, for each palette (day, dusk, night) the foreground line displayed in the Colour Calibration dialog should be clearly visible against the coloured background. Before checking the night palettes on a dark bridge, allow your eyes to adapt to the darkness for at least 10 minutes. If the foreground and background colours cannot be differentiated, contact the Kongsberg Maritime service department.

20.7.9 Chart Type Setup



The console can have a number of chart databases active at any time. The Chart Type Setup dialog enables you to set the priority for, clean up, and add and remove databases. For information about:

- Adding a new database, see *New Chart Type* on page 534.
- Copying (mirroring) a chart database from another operator station on the network, see *Chart Type Mirroring* on page 535.

The path to the Chart Type Setup dialog is: **Chart→Reconfigure Chart Databases**.

You can also reach it from: **System→Maintenance→Reconfigure Chart Databases**

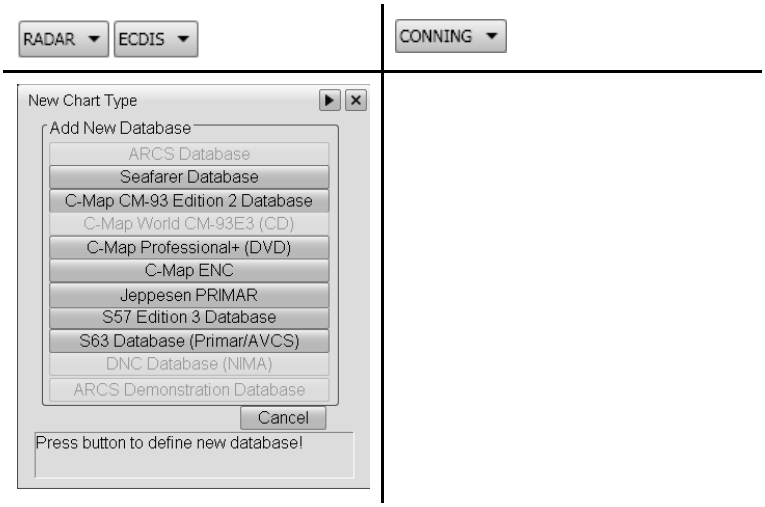
The dialog contains the following elements:

- **Databases:** A list of all chart databases in the system. The highest priority database is at the top of the list. Each database is identified by a two-letter mnemonic:
  - CM C-Map
  - PR Primar
  - AR ARCS
  - CW World
  - HO S57 HO data
  - CP C-Map Professional+
  - CE C-Map ENC
  - JP Jeppesen PRIMAR

  You can edit the two letter mnemonic by double-clicking it and typing in a new two-letter identifier.
- **Remove Database** Click the button to remove the selected database from the system. This is not normally necessary unless there is little hard disk space left. The action will also remove all licenses related to the database.

- **Cleanup Database:** Click the button to remove all charts in the selected database without removing the database from system.
- **Increase Priority:** Click the button to increase the priority of the selected database. The database moves upward in the table.
- **Decrease Priority:** Click the button to decrease the priority of the selected database. The database moves downward in the table.
- **Add New:** Click the button to add a new entry to the database list (see *New Chart Type* on page 534).
- **Change Mirror:** Is used to mirror a chart from a remote Radar, ECDIS or Planning operator station on to the local area network (see *Chart Type Mirroring* on page 535).
- **Cancel Changes:** Click the button to cancel the changes. Cleaned up or removed databases cannot be brought back.
- **Apply Changes:** Click the button to write the changes to the hard disk. In order for these changes to take place you will need to restart the system.

20.7.9.1 New Chart Type



Use the buttons in this menu to add a new entry to the database list; each database you select will be added with a default name and mnemonic.

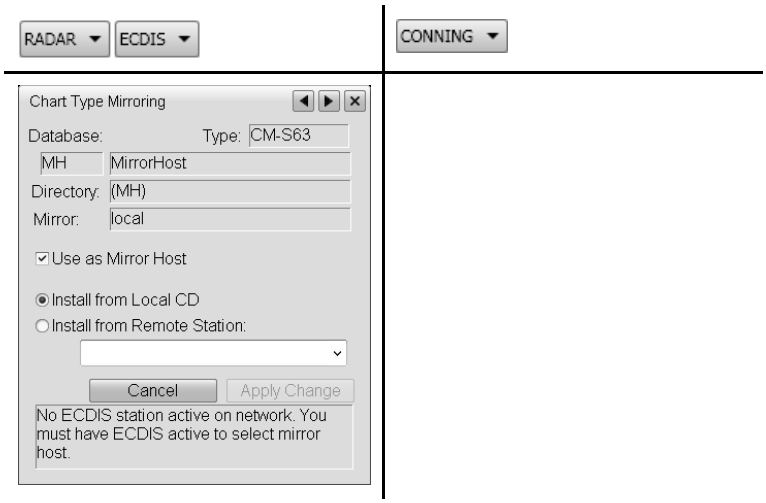
The path to the menu is: **Chart→Reconfigure Chart Databases→Add New**.

The menu contains buttons for different types of chart databases:

- **ARCS Database:** This option is not available when you are in the radar application.
- **Seafarer Database:** This option is not available when you are in the radar application.
- **C-Map CM-93 Edition 2 Database:** Add a new database for CM-93 Edition 2 charts. Note that this is the OLD C-Map format which is now rarely used. The main reason for using this is to provide charts for old DataBridge2000 radars.
- **C-Map World CM-93E3 (CD):** This is the main C-Map unofficial chart database, providing coverage worldwide with vector data.
- **C-Map Professional+ (DVD):** This is the same as the C-Map World database above. However, due to the additional space on the DVD, this database contains additional charts and other material.
- **C-Map ENC:** These are official charts from hydrographic offices but they are distributed by C-Map as so-called “SENC”.
- **Jeppesen PRIMAR:** This is a combination of C-Map and official ENC charts.
- **S57 Edition 3 Database:** This database type should be used if you receive **unencrypted** S57 data from a hydrographic office. You should normally have one database for each separate distribution.
- **S63 Database (PRIMAR/AVCS):** Add a new database for installing chart data **encrypted** according to the S63 formula. You should normally have one database for each separate distribution.
- **DNC Database (NIMA):** Add a new database for storing charts belonging to the DNC product. You should have one separate database corresponding to each DNC region. Please note that DNC databases require a special pincode from Kongsberg Maritime in order to be used.

- **ARCS Demonstration Database:** This option is not available when you are in the radar application.

20.7.9.2 Chart Type Mirroring



This dialog enables you to mirror (in other words, copy) charts from a remote Radar, ECDIS or Planning operator station on to another operator station via the local area network.

The path to the dialog is: **Chart→Reconfigure Chart Databases→Change Mirror**.

To designate the computer you are currently working at as the host for a mirroring operation (in other words, to designate it as the repository of the source database), check **Use as Mirror Host**.

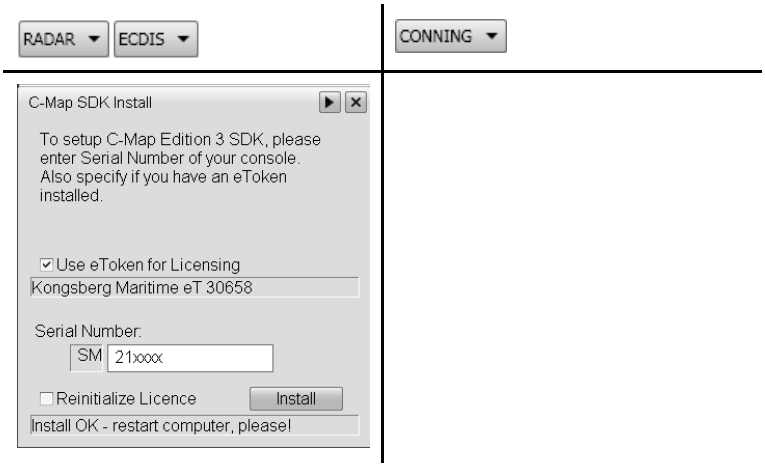
To mirror charts from a remote operator station, select **Install from Remote Station**, then select the source station from the drop-down list.

If you simply want to install the chart database from a locally mounted CD, select **Install from Local CD**.

Note

To select a remote station as a source for chart mirroring, you must make sure the remote station is operational and visible on the network.

20.7.10 Install C-Map SDK



Use this menu to install the C-Map Software Develpment Kit (SDK) into the system.

The path to the menu is: **Chart→Install C-Map SDK**.

The C-Map SDK installation dialog allows either eToken licensing or the traditional licensing using a computer "fingerprint" file. eTokens are hardware dongles obtained from C-Map and plugged into a USB port on the computer.

When eTokens are used, C-Map require you to report the number of the eToken to them if you want to obtain a licence. When a “fingerprint” file is used instead, the "fingerprint" file ("user.usr") must be e-mailed to C-Map.

SM: Insert the serial number of the system here. The serial number is found on the left-hand side, inside the console. Select **Reinitialize Licence** to enter the serial number.

Reinitialize Licence: Select to allow the serial number to be entered.

Install: Click to install the C-Map SDK into the system.

Note

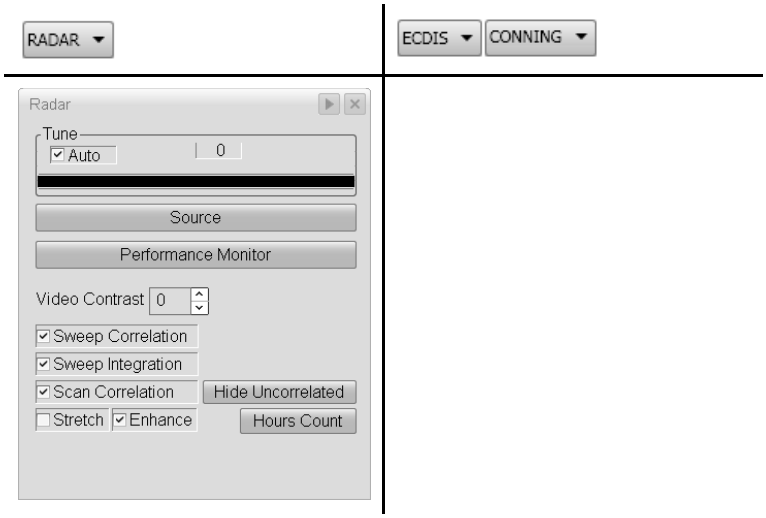
*When you click **Install** with **Reinitialize License** checked, your current license code will become void and you will need new codes from C-Map.*

20.8 Radar menu

The menus and sub-menus described in this section enable you to:

- Set parameters for tuning and noise suppression in the radar video. (For help understanding the concepts involved, see *Concepts of video enhancement* on page 743.)
- To monitor the performance of the transceiver (see *Performance Monitor* on page 540).
- To monitor the elapsed hours of operation of the Magnetron unit (see *Hours count* on page 541).

20.8.1 (Decca) Radar



This dialog enables you to set parameters for tuning and noise suppression in the radar picture.

To see this dialog, click the **Radar** button on the main menu.

The dialog contains the following elements:

- **Tune (Auto):** Select if you want automatic radar tuning. (This is normally checked.)
- **Tune indicator:** This indicator shows how well the radar receiver is tuned in relation to the transmitter. To adjust the tuning manually, see *Radar dashboard: the Radar System Information panel* on page 83.
- **Source:** Click this button to select the Decca radar transceiver that is to be used with the K-Bridge Radar (see *Radar Control* on page 539).
- **Performance Monitor:** Used to check the sensitivity of the transceiver. (see *Performance Monitor* on page 540).
- **Video Contrast:** Sets the contrast between weak echoes and the background. The range is from zero (the lowest contrast with the background) to 10 (the highest contrast with the background). If you specify the:

  - Highest contrast, all correlated echoes are shown with the same high contrast. This gives you the best visibility of weak targets, especially on a bright day. But any clutter present is also shown with the a high intensity.
  - Lowest contrast, weak echoes are shown with a lower intensity than the strong ones. And clutter is shown with lower intensity than strong targets. This makes it easier to operate with small amounts of clutter present.

For an explanation of the concepts behind the following options, see *Concepts of video enhancement* on page 743:

- **Sweep correlation:** Reduces the effect of electrical noise (such as interference from other radar transmitters) on the video displayed. Turn sweep correlation on and off by checking and un-checking the box.
- **Sweep integration:** Consolidates the results of all radar pulse repetitions that have occurred during a single antenna rotation to give the best quality video display. Turn sweep integration on and off by checking and un-checking the box.
- **Scan correlation:** Compares video from the current antenna rotation with video from previous rotations and uses a lower intensity to display targets that are not present in all the rotations. By default, this feature is on when you have true trails displayed, and off when you have relative trails displayed. Turn this feature on and off by checking and un-checking the box.
- **Hide uncorrelated:** Click this button (and continue to hold it down) to hide echoes that do not appear in all scans when scan correlation is on. The effect is to clean up the display. To see the echoes again, release the button. (For more information, see *Video Enhance* on page 643.)
- **Stretch:** Check the box to enable range stretching. This makes smaller echoes easier to see on the radar video (see *Video Enhance* on page 643).
- **Enhance:** Check the box to enable video enhancement (see *Video Enhance* on page 643).
- **Hours count:** Click this button to monitor the elapsed operational time of the radar's Magnetron unit (see *Hours count* on page 541).

20.8.1.1 Radar Control

This dialog enables you to select the radar transceiver to be used with the K-Bridge Radar. You can also use it to start the transceiver and to configure the pulse length.

The path to the dialog is: **Radar→Source**.

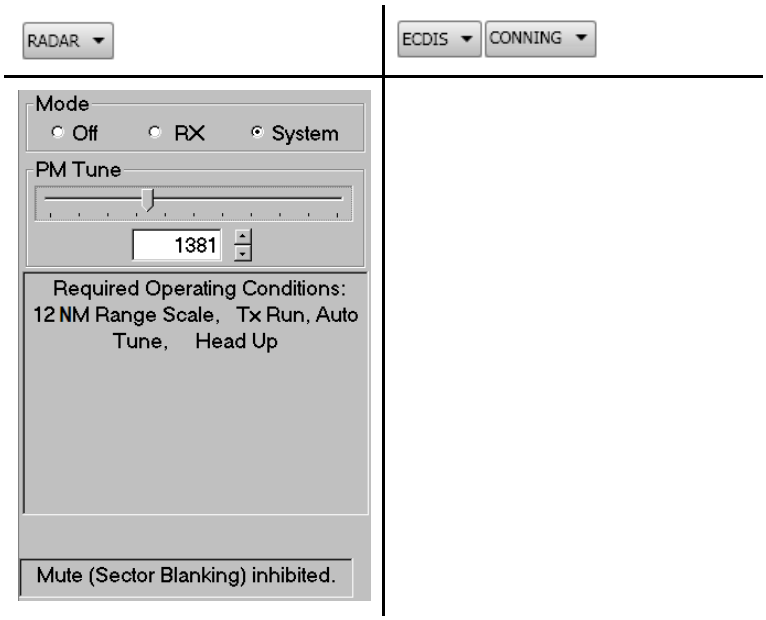
You can also bring up this dialog by clicking the **Scanner/Transceiver** button on the dashboard (see *Radar dashboard: the Radar System Information panel* on page 83).

The dialog contains the following elements:

- **Select:** Select the radar transceiver you want to use. For more information, see *Selecting the transceiver for a display unit* on page 106.
- **Power:** Select to power on the selected radar transceivers. (Power off by unchecking the radio button.) It is not possible to switch power off for a radar that is used by an other display unit. There is a warm-up period of about three minutes before the transceiver starts to rotate. This is to allow the Magnetron unit to warm up. The text and colour of the **Scanner/Transceiver** button indicate when the transceiver is warming up (see *Radar dashboard: the Radar System Information panel* on page 83).
- **Ready:** Indicates if the transceiver is ready to transmit or not. The warm-up time from when the power is switched on is about 3 minutes.
- **Pulse:** The pulse length is normally set to the default value for the selected range. If you have master control of the radar, you can override this default and specify short, medium or long as the pulse length.
- **Locked:** Locks the selected pulse length so the pulse length will not be changed with the range. This is indicated by a yellow background colour on the radar softkey. The pulse length is unlocked if another transceiver is selected, Master is changed to Slave, StandBy is selected, or the transceiver is switched off.
- **Master:** Select to give the display unit you are using master control of the chosen transceiver. (For more information, see *Making the display unit master of the transceiver* on page 107).

- **Slave:** Check to make the display unit you are using a slave in relation to the selected transceiver (another display unit is master). The new slave status is indicated on the **Scanner/Transceiver** button in the Radar System information panel of the dashboard (see *Radar dashboard: the Radar System Information panel* on page 83).
- **Run:** Select to take the radar transceiver from standby to run. Switching to Run requires Master status.
- **Standby:** Select to take the radar transceiver from run to standby. Switching to standby requires Master status. In a standby state, the Magnetron is kept at its operating temperature and the transceiver is powered, but the radar antenna does not rotate.

20.8.1.2 Performance Monitor



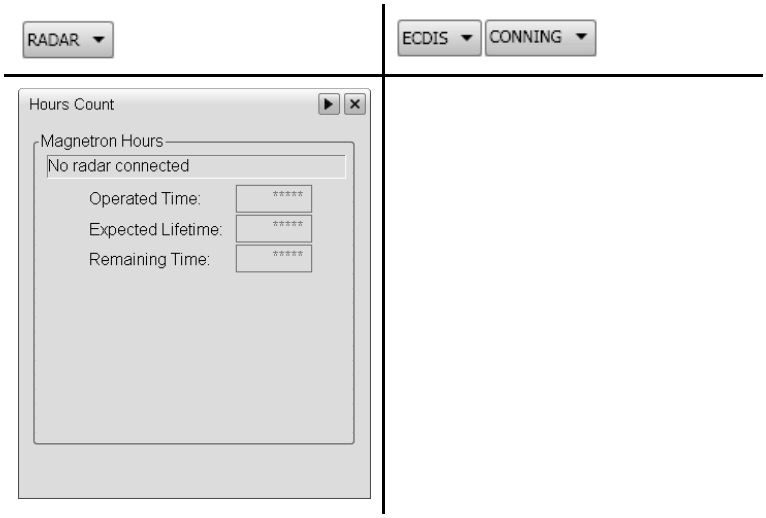
This dialog enables you to check the performance of the selected Decca radar transceiver (to see it you have to have a Decca radar transceiver connected).

The path to the dialog is: **Radar→Performance Monitor**.

The dialog contains the following elements:

- **Mode Off/RX/System:** Select one of the modes for performing monitor.
  - In RX mode only the receiver of the performance monitor is used, i.e. the performance of the radar transmitter is tested.
  - In System mode the performance of both the transmitter and receiver is tested.
- **PM Tune:** Use the slider for gross adjustment and the up/down controls for fine adjustment during PM tuning.
- **Text window:** The text windows displays extra information.
- **Text field:** The text field displays extra information.

20.8.1.3 Hours count



This dialog enables you to check the elapsed hours of operation of the radar's Magnetron unit.

The path to the dialog is: **Radar→Hours Count**.

The dialog contains the following elements:

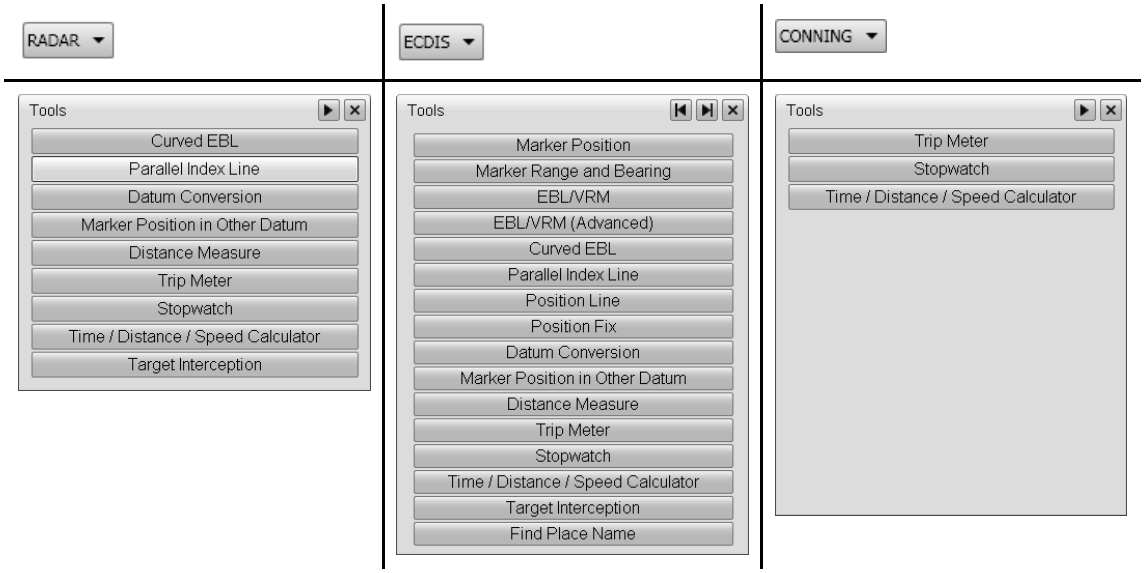
- **Radar Name:** Displays the name of the radar that is connected via the RIC/TIC. When no radar is connected, a “No radar connected” message is displayed..
- **Operated Time:** Displays the elapsed operational time of the Magnetron in hours or days. If you click the **Edit** button (see below) you can also use this field to enter a value for the elapsed operational time manually.
- **Expected Lifetime:** Displays the expected lifetime of the Magnetron. If you click the **Edit** button (see below) you can enter a value for this field manually. If you set it to zero, the next two fields disappear.
- **Remaining Time:** The difference between the expected lifetime and the elapsed hours of operation of the Magnetron. If the lifetime has expired, a negative number is displayed.
- **Remaining Time bar:** A graphical presentation of the elapsed time of operation and the expected lifetime of the Magnetron. The elapsed time is represented by a green bar when 0% - 90% of the expected lifetime has elapsed; it is shown by a yellow bar when 90% - 100% of the expected lifetime has elapsed; and it becomes red when more than 100% of the expected lifetime has elapsed.
- **Edit:** Click this button to enter manual values for the Operated Time and the Expected Lifetime fields. (This button is displayed only when a user password has been entered.) When you click this button to make the Operational Time and Expected Lifetime fields edit-able, the **Apply** and **Cancel** buttons are displayed.
- **Apply:** This button only appears if you click the **Edit** button (see above). It applies the values you have entered for the Operated Time and Expected Lifetime fields.
- **Cancel:** This button only appears if you click the **Edit** button (see above). It cancels any values you have entered for the Operated Time and Expected Lifetime fields. It is only effective as long as you have not clicked the **Apply** button already.

- **Hours/Days:** These radio buttons toggle between hours and days as the units of measurement for the elapsed and remaining time.

20.9 Tools menu

The menus described in this section enable you, amongst other things, to:

- Add parallel index lines to the radar display to use as general purpose navigational guides.
- Specify a turn (using the curved EBL tool) and then use it directly as input to the autopilot.
- Convert geographical positions that are specified according to different geodetic datums.
- Find a point at which to intercept a radar target.
- Use various timers, speed and distance calculators, and distance measuring tools.
- Design and add graphical objects to radar targets or to the own-ship symbol.



This is the main Tools menu.

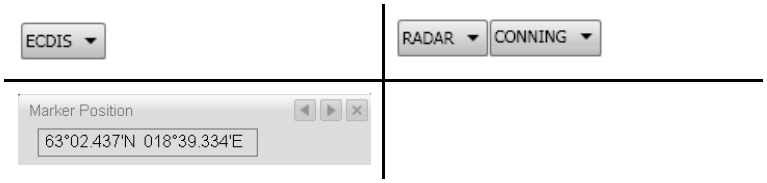
To see it, click the **Tools** button on the main menu.

The menu contains some or all of the following buttons, depending on the application you view it from:

- **Marker Position:** Click to display the geographic position of the marker (see *Marker Position* on page 544).
- **Marker Range and Bearing:** Click to display the marker's bearing and range from the own-ship (see *Marker Range & Bearing* on page 545).
- **EBL/VRM:** Click to set up and display an Electronic Bearing Line (EBL) and a Variable Range Marker (VRM) on the chart (see *EBL/VRM* on page 545).
- **EBL/VRM (Advanced):** Click to use the advanced features of the EBL and VRM facilities (see *EBL/VRM Advanced* on page 546).
- **Curved EBL:** Click this button to specify (and then perform) a turn using the curved EBL tool (see *Curved EBL* on page 547).

- **Parallel Index Lines:** Click this button to use parallel index lines as navigational guides (see *Parallel Index Lines* on page 548).
- **Position Line:** Click this button to calculate own-ship's position using the bearing to two or three objects with known positions (or using the bearing to objects shown in the chart; see *Position Line* on page 549).
- **Position Fix:** Click to display position fixes from different sources (see *Position Fix* on page 550).
- **Datum Conversion:** Click this button to convert positions specified according to different chart datum schemes (see *Datum Converter* on page 551).
- **Marker Position in Other Datum:** Menu to display the marker and own-ship's position in a chosen datum (see *Marker Position in other datum* on page 552).
- **Distance Measure:** Click this button to measure the distance from a reference point on the own-ship to a specified position or object (see *Distance Measure* on page 554).
- **Trip Meter:** Click this button to find out the distance you have already sailed on a voyage or the distance that remains to be sailed of the voyage (see *Trip Meter* on page 555).
- **Stopwatch:** Click this button to use the stopwatch and countdown facilities (see *Stopwatch* on page 556).
- **Time/Distance/Speed Calc:** Click this button to calculate the vessel speed for a planned voyage (based on time and distance), the distance to be covered (based on time and speed), or the time the journey will take (based on speed and distance); (see *Time/Distance/Speed Calculator* on page 557).
- **Target Interception:** Click this button to find a point at which to intercept or rendezvous with a radar target (see *Target Interception* on page 558).
- **Find Place Name:** Menu used for browsing to a specified place name on the chart (see *Find Port* on page 560).

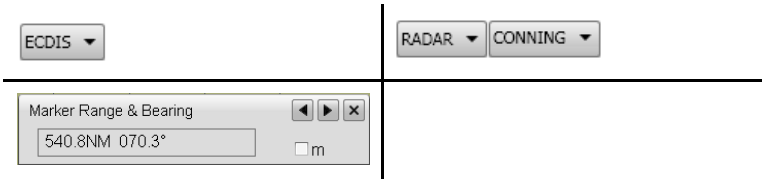
20.9.1 Marker Position



This dialog displays the marker (that is, the cursor) position in latitude and longitude.

The path to it is: **Tools→Marker Position**

20.9.2 Marker Range & Bearing



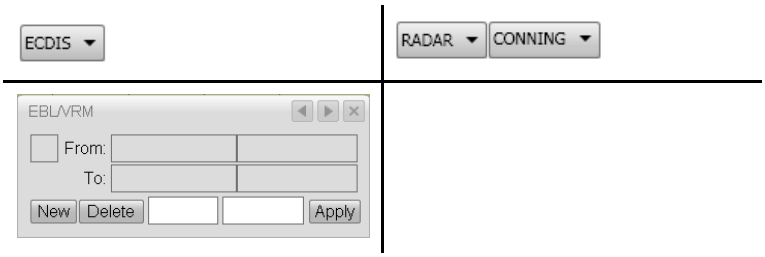
This dialog displays the bearing and range of the marker (that is, the cursor) from the own-ship

The path to the dialog is: **Tools→Marker Range and Bearing**

In addition the dialog contains the following element:

m: Select to display range in meters. When not selected range is displayed in nautical miles.

20.9.3 EBL/VRM



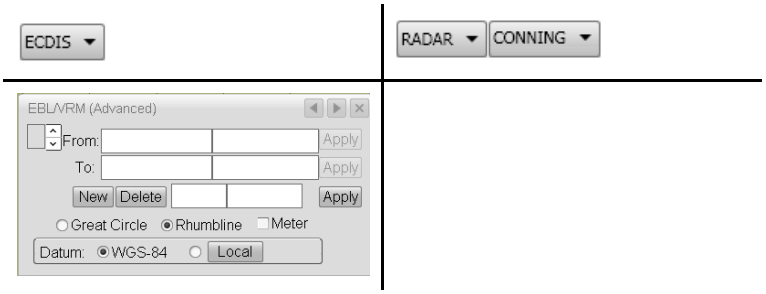
This dialog enables you to set up and display an EBL and VRM. There are three EBL/VRM pairs available. Each pair is identified by a number at the base of the EBL.

The path to the dialog is: **Tools→EBL/VRM**

The dialog contains the following elements:

- **No:** Displays EBL/VRM number.
- **From:** Position at the base of the EBL/VRM.
- **To:** Position at the intersection between the EBL and the VRM.
- **New:** Click the button to create a new EBL/VRM.
- **Delete:** Click the button to delete the current EBL/VRM.
- **Apply:** The displayed bearing and range can be edited numerically. Click **Apply** to enter new bearing and range values.

20.9.4 EBL/VRM Advanced



This dialog enables you to set up and display an EBL and VRM using more advanced features (for example, using Great Circle or Rhumbline geometry).

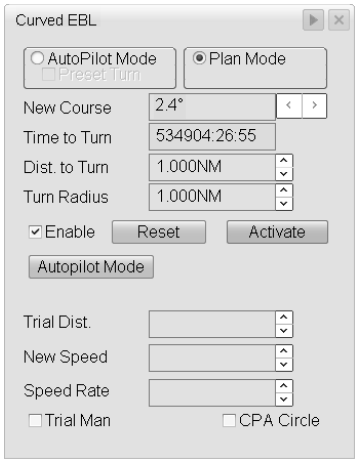
The path to the dialog is: **Tools→EBL/VRM (Advanced).**

The dialog contains the following elements:

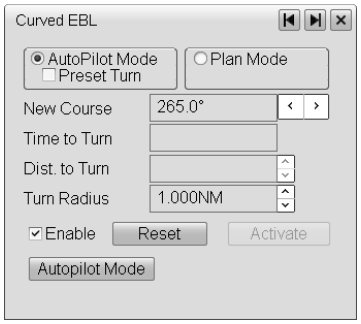
- **No:** Displays EBL/VRM number selected in the chart, or specified by using the up/down arrows.
- **From:** Position at the base of the EBL/VRM. Edit position as required and click **Apply** to activate.
- **To:** Position at the intersection between the EBL and the VRM.
- **New:** Click the button to create a new EBL/VRM.
- **Delete:** Click the button to delete the current EBL/VRM.
- **Bearing and range of EBL/VRM:** Edit bearing and range as required and click **Apply** to activate.
- **Great Circle:** Select to specify EBL/VRM with Great circle geometry.
- **Rhumbline:** Select to specify EBL/VRM with Rhumbline geometry.
- **Meter:** Select to display range in meters. When not selected range is displayed in nautical miles.
- **Datum:** Select WGS-84 or Local datum.
- **Local:** Pressing this button allows you to select a datum from a list of commonly used datums. If you select a local datum, the name will be shown as the button text (instead of "Local"). See section *Datum Converter* on page 551 for more information.

20.9.5 Curved EBL

RADAR



ECDIS



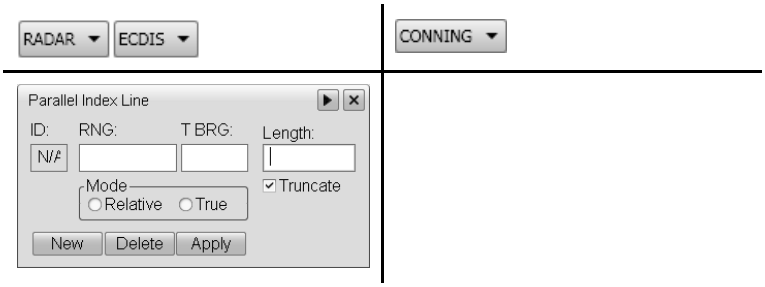
CONNING

Use this dialog to specify a turn and then use it as input to the autopilot.

The path to the dialog is: **Tools→Curved EBL**.

In Radar, the dialog includes the Trial Manoeuvre facilities which enable you to test whether a turn can be executed without danger of collision (see *Trial Manoeuvre and Curved EBL* on page 473).

20.9.6 Parallel Index Lines



Use this dialog to set up parallel index lines.

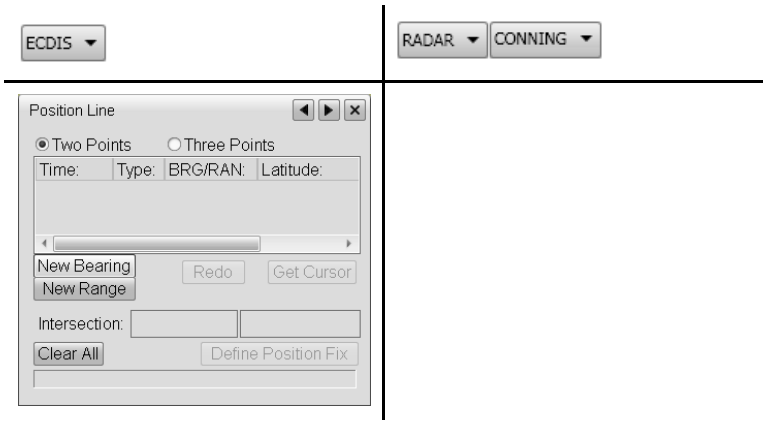
The path to it is: **Tools→Parallel Index Lines**.

Four parallel index lines are available. For more information, see *Using parallel index lines* on page 304.

The dialog contains the following elements:

- **ID:** Parallel index line number.
- **Distance:** The distance from the own-ship's conning position to each parallel index line.
- **Bearing:** The bearing of the parallel index line.
- **Length:** The length of the parallel index line.
- **Mode:** True or relative bearing. The parallel index line will turn with the ship when relative mode is selected.
- **Truncate:** To truncate a parallel index line, select it in the display (by using the track-ball and Left mouse button), check **Truncate** in this dialog, then click the Left mouse button at the point on the line where you want it to end.
- **New:** Creates a new parallel index line.
- **Delete:** Deletes the selected parallel index line.
- **Apply:** Applies the details specified in the fields above.

20.9.7 Position Line



This dialog enables you to estimate the own-ship's position using the bearing to two or three known fixed positions; one or more of the known fixed positions can be of an object displayed on the chart.

This dialog provides a fall-back method for estimating the own-ship's position if the main positioning system fails for any reason.

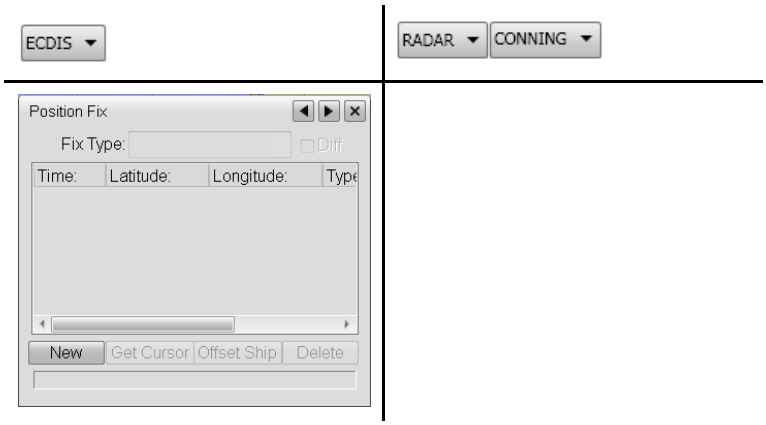
The path to the dialog is: **Tools→Position Line**

For instructions on using the Position Line dialog, see *Using position lines to estimate the own-ship's position* on page 306.

The dialog contains the following elements:

- **Two Points**: Select this radio button if you want to estimate the position using two reference points.
- **Three Points:** Select this radio button if you want to estimate the position using three reference points.
- **Table:** Table of parameters for two or three position lines. Edit Bearing, Latitude, and Longitude as required.
- **New Bearing:** Click to add a position line record with a new time stamp, then specify the bearing (in degrees) to a known position.
- **New Range:** Click to add a position line record with a new time stamp, then specify the range (in Nautical Miles) to a known position.
- **Redo:** Click to redo the last measurement.
- **Get Cursor:** Click the button and point to an object in the chart to identify the position of the object. This is an alternative to filling in the latitude and longitude fields.
- **Intersection:** The calculated position (in other words, where the lines intersect).
- **Clear All:** Click the button to clear all measurements in the table.
- **Define Position Fix:** Click the button to define a position fix from the calculated intersection.

20.9.8 Position Fix



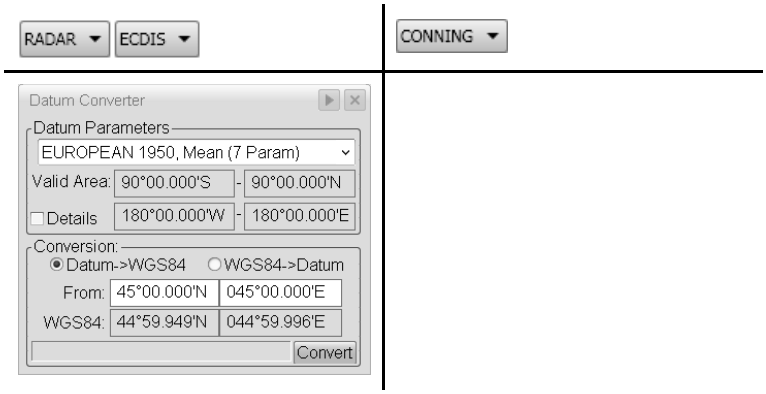
This dialog displays position fixes from different sources.

The path to the dialog is: **Tools→Position Fix**

The dialog contains the following elements:

- **Fix Type:** The source of the position fix. The following are available:
- Dead reckoning
- Visual
- Astronomical
- Radar
- GPS
- Glonass
- Loran/Tchaika
- MFDF
- Transit/Tchaika
- **Diff.:** Select if the position was received from a differential position sensor.
- **Table:** Table showing the different position fixes including time, latitude, longitude, fix type, offset and bearing from ship position. Scroll table to show all fields.
- **New:** Click to get a new position fix entry in the table.
- **Get Cursor:** Click to fill in the latitude and longitude fields from the cursor position.
- **Offset Ship:** The ship is given a manual offset to correspond with current position fix.
- **Delete:** Click the button to delete the position fix record.

20.9.9 Datum Converter



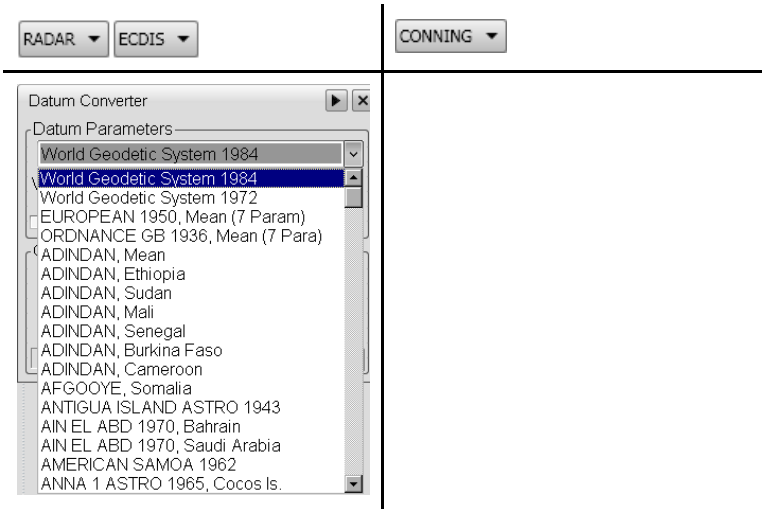
This dialog enables you to convert a position specified according to one datum to a position specified according to another. One of the datums has to be WGS84, which is the required operating datum for an ECDIS or radar system that is presenting charts.

The path to the dialog is: **Tools→Datum Converter**.

The dialog contains the following elements:

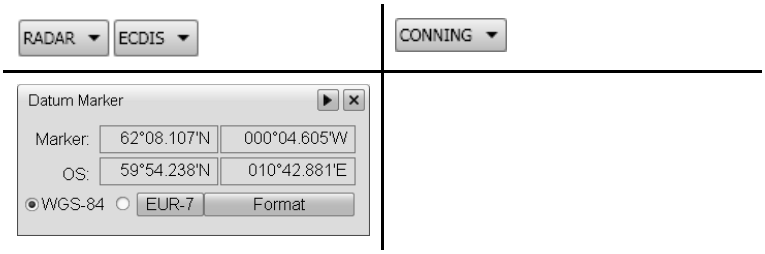
- **Datum Parameters:** Use the drop down list to select the actual geographical datum to convert to or from. The possible datums are included in the list (see *Datum Parameters (drop-down menu)* on page 552).
- **Valid Area:** Shows the limitations of validity in Lat / Lon for the selected datum. Some are world-wide, others are valid (properly defined) only for a region of the world..
- **Conversion:** Select one of the following to convert datums.
- **1. Datum->WGS84:** Select if the conversion will be from the selected Datum to WGS84.
- **From:** Enter the position in the selected datum as 59.05.123N and 010.33.650E, or
- **Convert:** Click to initiate the calculation.
- **WGS84:** The corresponding position in WGS84 appears after the calculation.
- **2. WGS84-> Datum:** Select if the conversion will be from WGS84 to the selected datum.
- **WGS84:** Enter the position in the WGS84 as 59.05.123N and 010.33.650E.
- **Convert:** Click to initiate the calculation.
- **To:** The corresponding position in the selected datum appears after the calculation.
- **Status Line:** Shows the result of the calculations as:
  - **Conversion OK!** The position is converted.
  - **Point outside valid datum!** The position is converted based on the equations for the selected datum, but it is outside of the region where the datum is valid.
  - **Please select datum:** No datum has been selected.
  - **Cannot convert (outside area?)!** The position conversion gave an illegal result, probably because the point is outside the valid area.
  - **Bad input coordinates!** The position is not entered as a legal position.

20.9.9.1 Datum Parameters (drop-down menu)



Datum Parameters: A list of possible datums is displayed when you use the drop down menu in the Datum Converter dialog (see *Datum Converter* on page 551).

20.9.10 Marker Position in other datum



Use this dialog to show the marker position and the current own-ship's position in the selected datum.

The path to the dialog is: **Tools→Marker Position in Other Datum**.

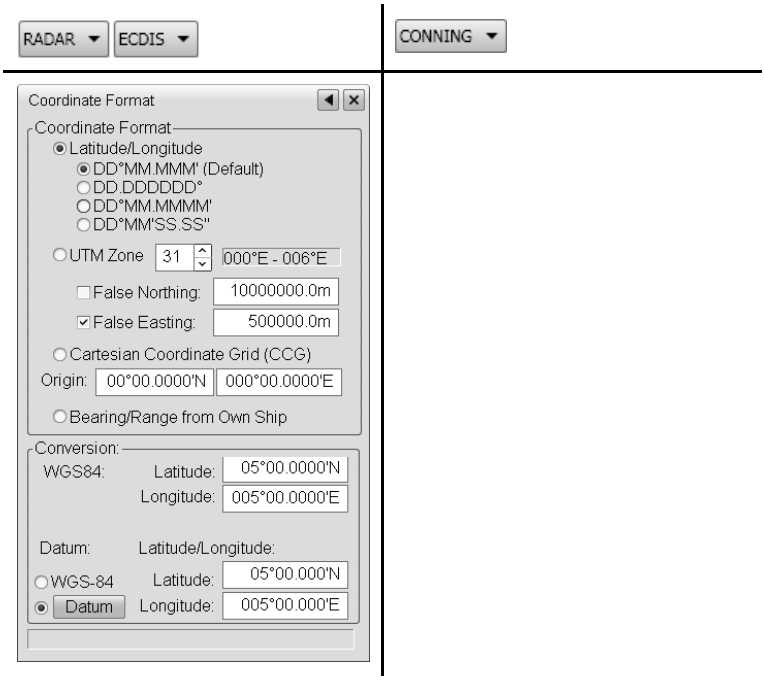
The dialog contains the following elements:

WGS-84: Select to display the marker position and the current own-ship's position using WGS-84.

Datum: Select to display marker and current own-ship's position using EUR-7. Click the **EUR-7** button to go to the **Datum Converter** dialog (see *Datum Converter* on page 551).

Format: Click this button to specify the format for presenting coordinates in the MFD dialog boxes (see *Coordinate format dialog* on page 553).

20.9.10.1 Coordinate format dialog



This dialog enables you to specify the format for the presentation of coordinates in the MFD dialog boxes.

The path to the dialog is: **Tools→Marker Position in Other Datum→Format**.

The Coordinate Format dialog allows you to choose between the following alternatives. You can:

- Select one of several different Latitude/Longitude formats.
- Use Universal Transverse Mercator coordinates by selecting **UTM Zone** and specifying the appropriate zone number.
- Use a Cartesian Coordinate Grid and specify an origin for it. This will give you distances (measured in NM) North and East of the specified origin.
- Specify **Bearing/Range from Own Ship**. This will give you bearing and range measurements in NM from the current position of the own-ship.

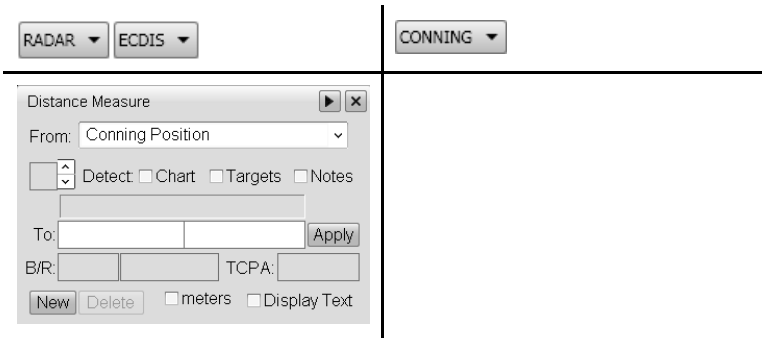
The lower part of the dialog (labelled **Conversion**) allows you to convert between common WGS 84 latitude/longitude coordinates and the same coordinates according to according to another datum.

To specify the target datum, click **Datum** and select the datum you require.

To convert from WGS84 to the specified datum, type the WGS84 latitude and longitude coordinates opposite the label **WGS84:**.

To convert from the specified datum to WGS84, type the latitude and longitude coordinates according to the specified datum opposite the label **Datum:**.

20.9.11 Distance Measure



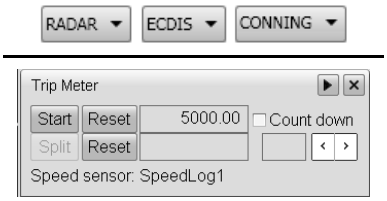
This dialog enables you to measure the distance from a reference point on the own-ship to a specified position or object.

The path to the dialog is: **Tools→Distance Measure**.

The dialog contains the following elements:

- **From:** Use this drop-down menu to select the reference point on the own-ship. By default, the measurement is taken from the Conning position.
- **Detect:** Specify whether the terminal point of the distance to be measured is the position of a chart object, target or mariners' note.
- **Read-only field:** This field displays the number of the chart, target or mariners' note whose position represents the terminal point for the distance measurement.
- **To:** This field displays the coordinates of the selected object. If you are measuring the distance to a specific position (and not to a chart object, target or note), enter the coordinates here, and click **Apply**.
- **Apply:** Click this button after entering the coordinates of a position that you want to specify as the terminal point for the distance measurement.
- **B/R:** Specify the bearing and range to the terminal point of the distance measurement.
- **TCPA:** This is the Time to the Closest Point of Approach. In other words, it is the time it will take for the own-ship to sail to the object, target note or specified position.
- **New:** Click this button to create a new instance of distance measure tool. A maximum of five tools can be generated. After clicking the **New** button, you can specify the destination position with the cursor. If the Chart/Target/Notes boxes are checked, a “gravity” field is enabled around all objects of the specified kind on the display making the selection easier.
- **Delete:** Clicking this button deletes the current instance of the distance measure tool.
- **Meters:** This field toggles between nautical miles and meters as the unit of measurement.
- **Display text:** Click this box to display bearing and range information.

20.9.12 Trip Meter



This dialog enables you to measure:

- The distance travelled for a particular journey (from the time you started the trip meter).
- The distance that remains to be travelled for a journey of a specified distance (from the time you started the trip meter with the **Count down** button checked).

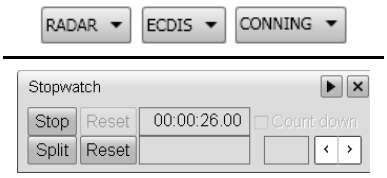
To reach this dialog, select: **Tools→Trip Meter**.

The dialog contains the following elements:

- **Start/Stop:** Press the **Start** button to start the trip meter. When you have started it, this button becomes a **Stop** button.
- **Reset:** Press the upper **Reset** button to reset the trip meter to 0.00.
- **Count down:** Check this box to use the trip meter's countdown function. Then type into the upper distance field the total distance you want to count down from. When you click **Start**, the trip meter starts counting down the distance in nautical miles.
- **Split:** Press this button (while the trip meter is running) each time you want to record a split distance. Use the arrow buttons to review the split distances.
- **Reset:** Press the lower **Reset** button to reset the split distance to 0.00.

For more information about the trip meter and distance countdown facilities, see *Using the trip meter* on page 323.

20.9.13 Stopwatch



This dialog provides a stopwatch and countdown function.

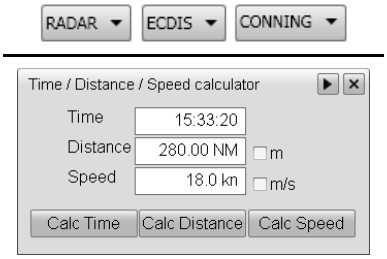
The path to the dialog is: **Tools→Stopwatch**.

The dialog contains the following elements:

- **Start/Stop:** Press the **Start** button to start the stopwatch. When you have started the stopwatch, this button becomes a **Stop** button.
- **Reset:** Press the upper **Reset** button to reset the stopwatch to 00:00:00.00.
- **Count down:** Check this box to use the countdown function, then type into the upper time field the number of hours, minutes and/or seconds you want to count down from. When you click **Start**, a clock is displayed in the upper time field, counting down in seconds.
- **Split:** Press this button (while the stopwatch is running) each time you want to record a split time.
- **Reset:** Press the lower **Reset** button to reset the split time to 00:00:00.00.

For more information about the stopwatch and countdown facilities, see *Using the stopwatch and countdown facilities* on page 321.

20.9.14 Time/Distance/Speed Calculator



This dialog enables you to calculate the following:

- The time it will take to travel a specified distance at a specified speed.
- The distance that will be covered in a specified time at a specified speed.
- The speed that must be maintained to travel a specified distance at a specified speed.

To reach this dialog, select: **Tools→Time/Distance/Speed Calc**.

The fields and checkboxes in this dialog are as follows:

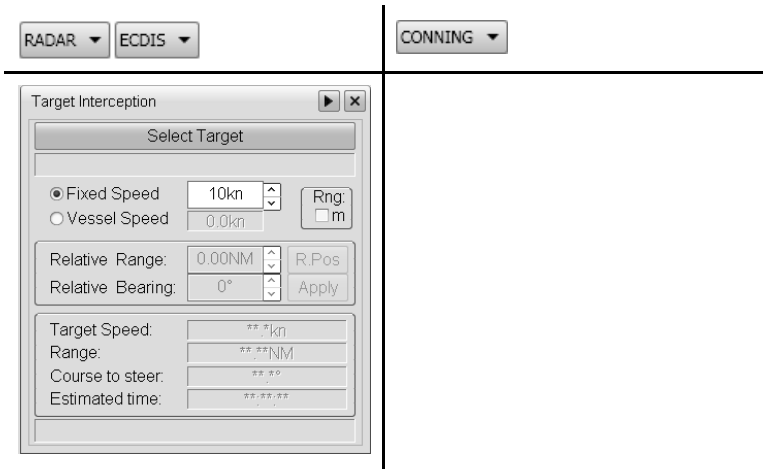
- **Time:** Specify the time you require the journey to take in this field.
- **Distance:** Specify the intended distance in this field (check the 'm' box if you want the calculator to use metres instead of nautical miles).
- **Speed:** Specify the desired speed in this field (check the 'm/s' box if you want the calculator to use meters per second instead of knots).

The buttons in this dialog are as follows:

- **Time:** Enter values for the distance and speed, then click the **Time** button.
- **Distance:** Enter values for the speed and time, then click the **Distance** button.
- **Speed:** Enter values for the time and distance, then click the **Speed** button.

For more information about the time, distance and speed calculator tool, see *Calculating the time, distance and speed for a journey* on page 322.

20.9.15 Target Interception



This dialog enables you to use the cursor to select a target and calculate a point at which to intercept it (see *Identifying a target interception point* on page 318).

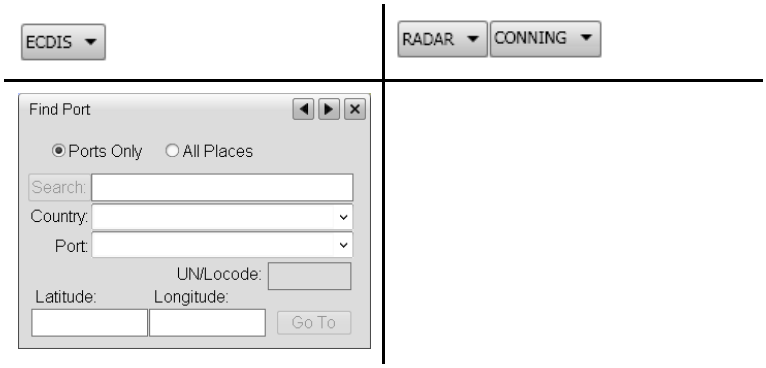
The path to the menu is: **Tools→Target Interception**.

The buttons, options and fields available in the Target Interception dialog are:

- **Select Target:** Press this button to activate the Target Interception function. When you have selected a target, the dialog changes: the **Select Target** button becomes a **Stop Tracking** button (see below), and the fields of the dialog are populated with IP (Interception Point) data for the selected target.
- **Text field:** This field contains the name of the target.
- **Stop Tracking:** Press this button to stop tracking the target.
- **Fixed speed:** The own-ship speed you want the calculation of the interception point to be based upon.
- **Vessel speed:** Select this option to use the own-ship's current speed (instead of entering a fixed speed) for the calculation of the interception point.
- **Rng m:** Check this box to use metres (instead of nautical miles) as the unit of measurement.
- **Relative Range** This field is for calculating a relative target interception point (in other words, for calculating what the interception point would be if the target's position were different). Specify the range relative to the target's actual position. Using the spin buttons for this field causes an EBL/VRM to be displayed with its centre on the selected target. Use the mouse or track-ball and left mouse-button to re-size the range circle and drag the bearing line (see *Identifying a target interception point* on page 318).
- **Relative Bearing:** Specify the bearing relative to the target's actual position. Using the spin buttons for this field causes an EBL/VRM to be displayed with its centre on the selected target. Use the mouse or track-ball and left mouse-button to re-size the range circle and drag the bearing line (see *Identifying a target interception point* on page 318).

- **R. Pos/Cancel:** Click the **R. Pos** (Relative Position) button to display an EBL/VRM with its centre on the selected target. If you are using the EBL/VRM method, use the mouse or track-ball and left mouse-button to re-size the range circle and drag the bearing line. For more information about using the EBL/VRM to specify a relative target position, see *Identifying a target interception point* on page 318).
- **Apply:** Click this button to accept the defined relative target position and start calculating the relative target interception point (the calculation is based on the range and bearing you have specified from the target's actual position).
- **Target speed:** The speed at which the target is travelling.
- **Range:** The distance to the target interception point.
- **Course to steer:** The course to steer for the target interception point.
- **Estimated time:** The estimated time before the own-ship arrives at the interception point.
- **System message text field:** If the system is not able to compute a target interception position, it displays a system message at the bottom of the dialog

20.9.16 Find Port



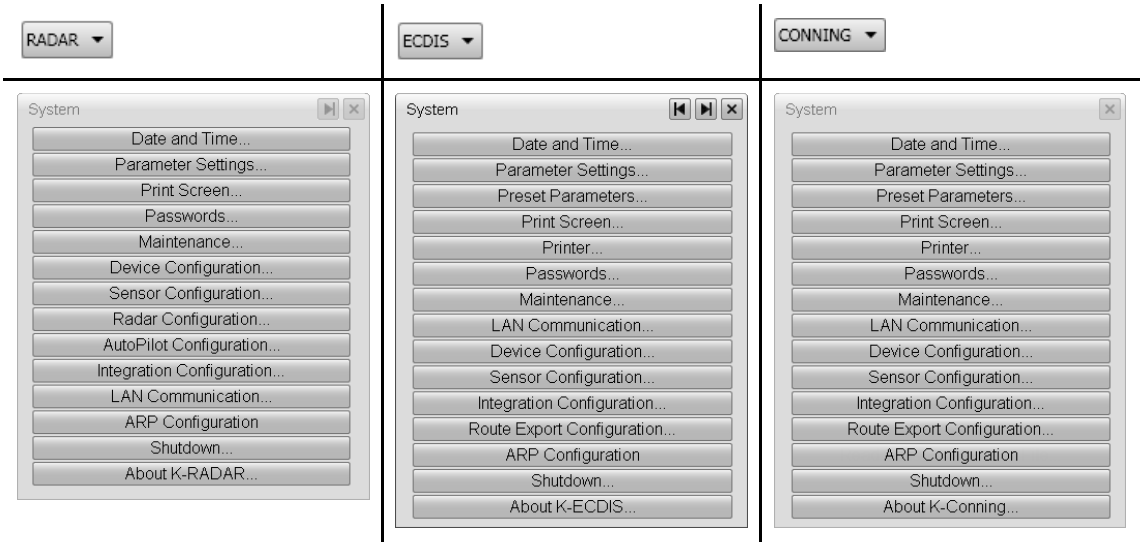
This dialog enables you to specify a place name to browse to in the chart.

The path to the dialog is: **Tools→Find Place Name**.

The dialog contains the following elements:

- **Ports Only:** Check this radio button to limit the search to port names in the database.
- **All Places:** Check this radio button to extend the search to all land and sea location in the database.
- **Search:** Type the first letter or the first few letters of the place name in this field, then click the **Search** button to start your search.
- **Country:** Lists the countries in the database. Select one to limit your search to that country.
- **Port:** Lists the ports available in the database.
- **UN/Locode:** This field provides the UN/Locode for the specified place name. UN/Locodes are city designations that were suggested by a committee of the United Nations to improve the efficiency of international transportation. The codes are similar and partly compatible with the airport codes used by air passengers for tagging luggage.
- **Latitude:** The latitude of the specified place.
- **Longitude:** The longitude of the specified place.
- **Go To:** Click this button to go to the specified place in the chart display.

20.10 System menu



This is the main System menu. It gives you access to various system setup, maintenance and configuration facilities (many of which do not appear in the menu unless the service password has been entered).

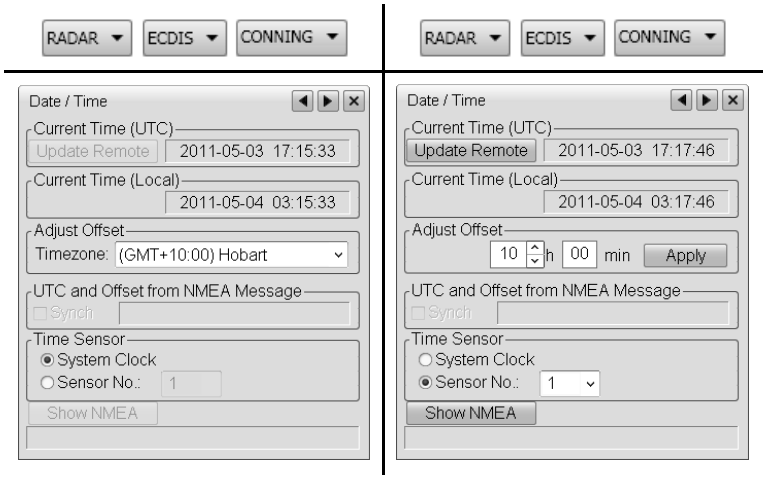
To see the menu, click the **System** button on the main menu.

The menu contains some or all of the following buttons, depending on the application you view it from:

- **Date and Time:** Click this button to configure the time on this and other operator stations on the network (see *Date and Time* on page 563).
- **Parameter Settings:** Click this button to set default parameters for route planning and to view own-ship data such as the vessel's precise conning position (see *Parameter setup* on page 565).
- **Preset Parameters:** Click this button to view and manage the system parameter sets (see *Preset Parameters* on page 585).
- **Print Screen:** Click this button to capture the contents of the display; the Printer dialog comes up so that you can send the screen capture to the printer (see *Printer* on page 590).
- **Printer:** Click this button to view the list of items currently available to be sent to the printer (see *Printer* on page 590).
- **Passwords:** Click this button to enter a password to access restricted functions (see *Password* on page 593).
- **Maintenance:** Click this button to upgrade system software, perform back-ups (or restorations from back-up) of route and parameter data, and to monitor the Transceiver Interface Control board and Radar Interface Card (see *Maintenance* on page 594).
- **LAN Communication:** Click this button to view the status of the Local Area Network (LAN) and configure the LAN (see *LAN Status* on page 609).
- **Device configuration:** Click this button to view, configure and monitor the data interfaces on the operator station (see *Device configuration* on page 612).

- **Sensor Configuration:** Click this button to view and configure sensors (see *Number of Sensors* on page 617).
- **Radar Configuration:** Click this button to view and configure the radar transceiver (see *Radar Configuration* on page 641).
- **Autopilot Configuration:** Click this button to set configuration parameters for the autopilot system (see *Autopilot Configuration* on page 658).
- **Integration Configuration:** Click this button if you want to specify a Navigation Master console (which will calculate the position, speed, heading and time for all K-Bridge consoles on the network (see *Integration Configuration* on page 659).
- **ARP Configuration:** Click this button to check – and if necessary reset – the mouse and keyboard connected to an Arm Rest Panel for remote control of an operator station *ARP (Arm Rest Panel) Configuration* on page 662
- **Route Export Configuration:** Click this button to set the system up to perform route import and export exchanges with another system (see *Configure Route Export* on page 661).
- **Shutdown:** Click this button for a choice of shutdown switch-over operations (see *Shutdown* on page 664).
- **About K-Bridge:** Click this button to view corporate information.

20.10.1 Date and Time



This dialog enables you to specify one of the following:

- The time zone for the MFD unit if the time source used by the MFD is the **System Clock**.

  The System Clock runs in the K-Bridge Sensor Integrator (SINT). The SINT receives the time from a GPS sensor and transmits it to the K-Bridge operator stations over the local area network.
- A new local time (specified as an offset to the current UTC time) if the time data is received directly from the time sensor as an NMEA ("ZDA") message time.

The path to the dialog is: **System→ Date and Time**.

The dialog contains the following elements:

- **Update Remote:** Sends the current UTC time on the operator station to any other K-Bridge operator stations on the local area network.
- **Current Time (UTC):** Current UTC time (UTC is the international abbreviation for Universal Coordinated Time).
- **Current Time (Local):** The current time in the local time zone.
- **Adjust Offset:** If you have selected:
  - **System clock** in the **Time Sensor** section, specify the local time zone. The time zone you specify will automatically be propagated to all other K-Bridge navigation operator stations (and any K-Bridge Autopilot operator panels) on the bridge.
  - **Sensor No.** in the **Time Sensor** section, use the up and down buttons or the keyboard to specify the difference between UTC and the current local time.
- **Apply:** Click this button to apply any offset you have specified.
- **Synch:** Check this box to synchronise the UTC and local offset on this operator station with incoming NMEA messages from the GPS. (Use this option if the operator station is not part of an integrated K-Bridge navigation system.)
- **System clock:** Check this radio button if you are using a K-Bridge integrated navigation system on the bridge. In this case, your time source is the system clock in the K-Bridge Sensor Integrator (SINT) which receives the time from a GPS sensor and distributes it to the operator stations.

- **Sensor No.:** Check this radio button if the time source for the MFD unit is not the system clock in the K-Bridge SINT. Then select a time sensor from the drop-down list. (In this case, there needs to be a serial port configured on the MFD unit to receive the NMEA (“ZDA”) time message (see *Number of Sensors* on page 617).
- **Show (Hide) NMEA:** Click the button to display the NMEA time message. (This button is used by service engineers for troubleshooting.)

20.10.2 Parameter setup

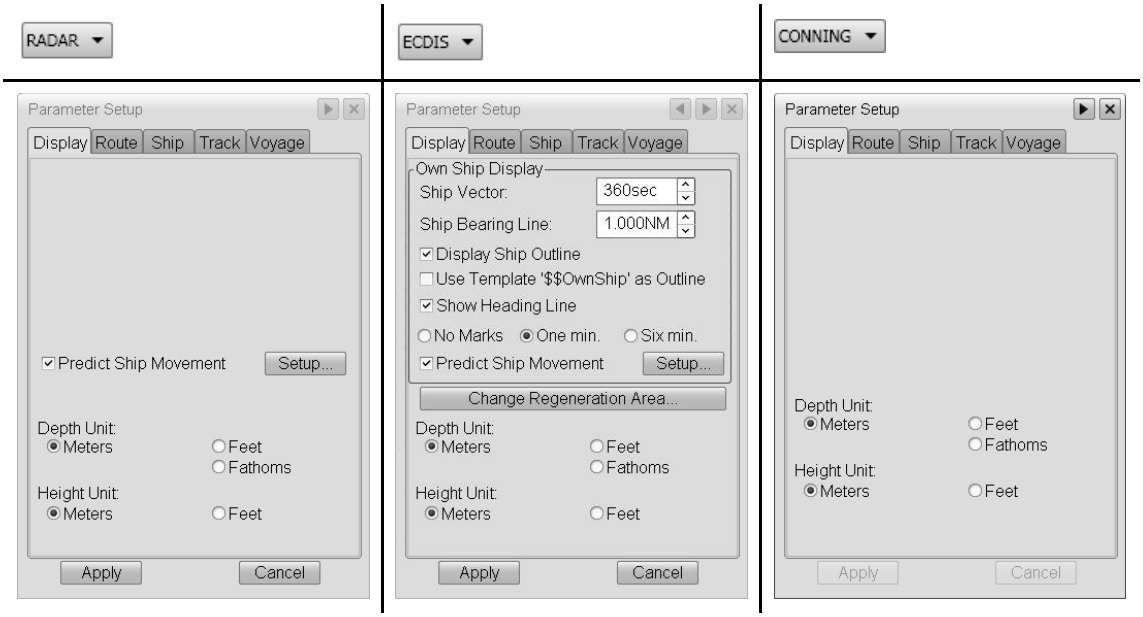
This dialog contains several tabs which enable you to set initial parameters: for representing the own-ship in the display, for route planning, and for recording and displaying route information. The parameters include the ship's dimensions and its default turn radius and off-track limit.

The path to the dialog is: **System→Parameter Settings**.

The dialog contains five tabs:

- Display (see *Display tab* on page 565).
- Route (see *Route (tab)* on page 570).
- Ship (see *Ship (tab)* on page 571).
- Track (see *Track tab* on page 573).
- Voyage (see *Voyage tab* on page 577).

20.10.2.1 Display tab



This tab enables you to configure how the own-ship is represented in the chart display, and also when and how chart regeneration is performed.

The path to this tab is either of the following:

- **System→Parameter Settings→Parameter Setup (Display tab)**.
- **Own-ship→Ship Parameters→Parameter Setup (Display tab)**.

The Radar Display tab

The tab contains the following elements when viewed from the Radar application:

- **Predict Ship Movement:** Check this option to display a graphical prediction of the ship's movement in the immediate future (the prediction is based on current heading, speed and rate of turn). You must have the **Display Ship Outline** option checked in

the Radar Themes dialog (see *Radar Themes* on page 371) to view the predicted movements: they appear when the range scale is large enough for the scaled outline of the ship to be displayed.

- **Setup:** Click this button to configure parameters for displaying the ship's predicted movement (see *Ship's movement predictor setup dialog* on page 568).

  For instructions about displaying the ship's predicted movements, see *Displaying the own-ship's predicted movements* on page 317.

- **Depth Unit:** Click to select meters, feet or fathoms.
- **Height Unit:** Click to select meters or feet.

The ECDIS Display tab

The tab contains the following elements when viewed from the ECDIS application:

- **Own Ship Display:**
  - **Ship Vector:** Specify the length of the own-ship's course/speed vector in seconds.
  - **Ship Bearing Line:** Specify the length of the own-ship's bearing line in nautical miles.
  - **Display Ship Outline:** Check this option to display the own-ship as a skeleton ship symbol that reflects the ship's true proportions at large range scales:

    Un-check the **Display Ship Outline** option to display the own-ship as a simplified symbol formed by two concentric rings at whatever chart scale is in use:

  - **Use Template '$$OwnShip' as Outline:** When you enable this option (with the **Display Ship Outline** option checked), the skeleton ship symbol is replaced by whatever shape is defined in the '$$OwnShip' template. For information about defining templates, see *Defining the template* on page 227.

    When you use your own design for the own-ship symbol on the chart display, the **Ship Length** and **Ship Width** parameters defined in the Ship tab of the Parameter Setup dialog (see *Ship (tab)* on page 571) do not affect the proportions of the displayed symbol.

  - **Show Heading Line:** Select to display the own-ship's heading line in the chart.
  - **No Marks/One min./Six min.:** You can display marks along the course vector, indicating where the own-ship will be every one or every six minutes. Select No Marks, One min. or Six min. as required. For an illustratrion, see *Ship's movement predictor setup dialog* on page 568.

  - **Predict Ship Movement:** Check this option to display a graphical prediction of the ship's movement in the immediate future (the prediction is based on current heading, speed and rate of turn). You must have the **Display Ship Outline** option checked to view the predicted movements: they appear when the range scale is low enough for the scaled outline of the ship to be displayed.
  - **Setup:** Click this button to configure parameters for displaying the ship's predicted movement (see *Ship's movement predictor setup dialog* on page 568).

    For instructions about displaying the ship's predicted movements, see *Displaying the own-ship's predicted movements* on page 317.

- **Change Regeneration Area:** Click this button to configure the chart regeneration area yourself.

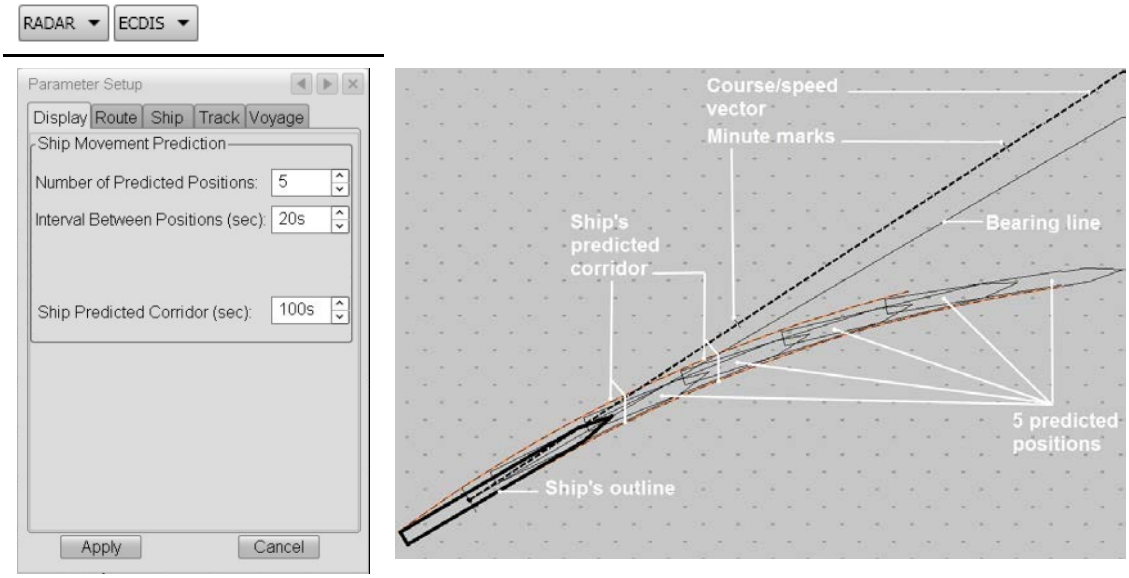
  When the system is operated in true motion the own-ship moves across the chart. As it reaches the edge of the display the chart needs to be regenerated. To provide a better overview you might want to control when the chart is regenerated; you can do this by defining a regeneration rectangle (see *Chart regeneration area* on page 569).
- **Depth Unit:** Click to select meters, feet or fathoms.
- **Height Unit:** Click to select meters or feet.

The Conning Display tab

The tab contains the following elements when viewed from the Conning application:

- **Depth Unit:** Click to select meters, feet or fathoms.
- **Height Unit:** Click to select meters or feet.

20.10.2.1.1 Ship's movement predictor setup dialog



This tab enables you to configure the display of the ship's predicted movement. You can vary the number of predicted positions shown, the interval (in seconds) between them, and the length (in seconds) of the ship's predicted "corridor" of movement.

The path to this tab is either of the following:

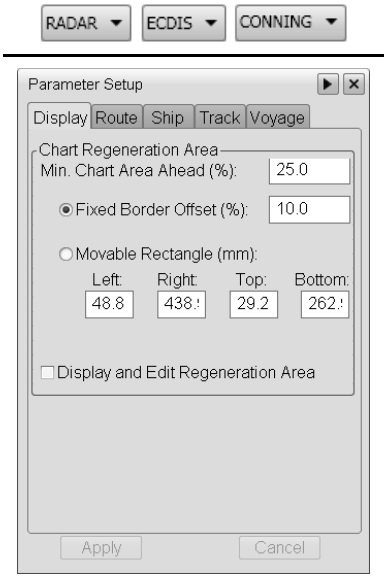
- **System→Parameter Settings→Parameter Setup (Display tab)→Predict Ship Movement→Setup**.
- **Own-ship→Ship Parameters→Parameter Setup (Display tab)→Predict Ship Movement→Setup**.

The tab contains the following elements:

- **Number of Predicted Positions:** Use the spin buttons to specify the number of predicted positions you want to see.
- **Interval Between Positions (sec):** Use the spin buttons to specify the interval in seconds you require between each predicted position.
- **Ship Predicted Corridor (sec):** Use the spin buttons to specify the length (in seconds) for the corridor representing the ship's predicted movement.
- **Apply:** Click the button to apply the changes you have made to the ship's movement predictor parameters.
- **Cancel:** Click the button to cancel all changes.

For further information, see *Displaying the own-ship's predicted movements* on page 317.

20.10.2.1.2 Chart regeneration area



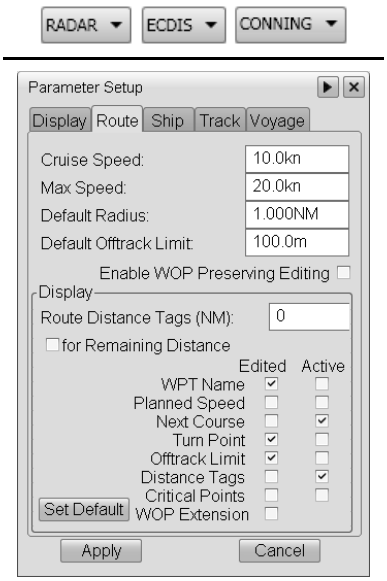
This tab enables you to configure the chart regeneration area.

The path to the tab is: **System→Parameter Settings→Parameter Setup (Display tab)→Change Regeneration Area**.

The dialog contains the following elements:

- **Min. Chart Ahead:** The chart is regenerated when the distance ahead of the own-ship is less that the set percentage.
- **Fixed Border Offset:** The chart is regenerated when the own-ship gets closer than the set percentage from the edge. (In percent of the screen diameter).
- **Moveable rectangle:** Allows you to define each side of the rectangle individually. The distance for left, right, top and bottom as specified below.
- **Left/Right/Top/Bottom:** Type distances for moveable rectangle
- **Display and Edit Regeneration Area:** Select to display the regeneration area in the chart. The area can be resized by dragging the sides.
- **Apply:** Click the button to save the parameter set-up.
- **Cancel:** Click the button to cancel all changes.

20.10.2.2 Route (tab)



This tab enables you to set some default own-ship parameters to simplify the task of creating routes.

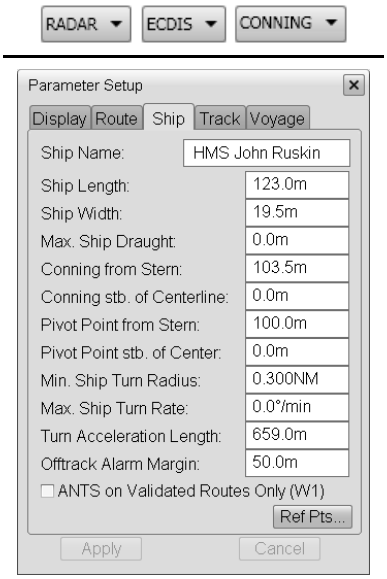
The path to the tab is: **System→Parameter Settings→Route (tab)**.

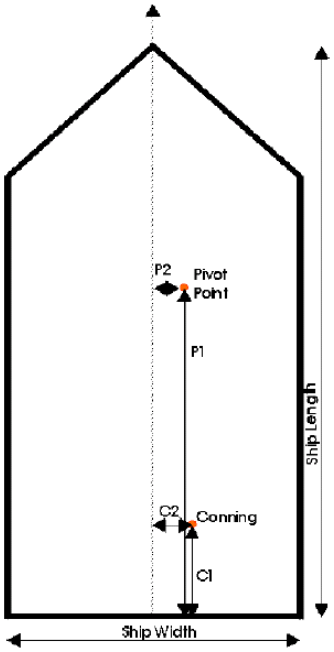
The tab contains the following elements:

- **Cruise Speed (kn):** Set the default speed for routes.
- **Max Speed (kn):** Enter the own-ship's maximum speed.
- **Default Radius (NM):** Enter the default turn radius.
- **Default Offtrack Limit (m):** Enter a default off-track alarm limit.
- **Route Distance Tags (NM):** Set the distance between the distance tags in routes.
- **For Remaining Distance:** Select to display the remaining distance rather than the sailed distance.
- **WOP Preserve:** Select to keep the Wheel-Over-Points (but not the Waypoints) fixed when editing legs.
- **Set Default:** Return to the system's default parameters.
- **WPT Name:** Select to display WPT name/number when route is edited or active.
- **Planned Speed:** Select to display planned speed when the route is edited or active.
- **Next Course:** Select to display next course when the route is edited or active.
- **Turn Point:** Select to display turn point when the route is edited or active.
- **Offtrack Limit:** Select to display the off-track limit when the route is edited or active.
- **Distance Tags:** Select to display distance tags when the route is edited or active.
- **Critical Points:** Check both the Edited and Active check-boxes if you want to insert critical points into a route.
- **WOP Extension:** Select to display extended line segments for aligning the WOP with an object ahead of or athwart the own-ship.

- **Apply:** Accept parameter changes done through the keyboard.
- **Cancel:** Cancel modifications done through the keyboard.

20.10.2.3 Ship (tab)





This tab contains own-ship-specific parameters that are normally set at commissioning time and will not normally need to be changed.

The path to the tab is: **System→Parameter Settings→Ship (tab)**.

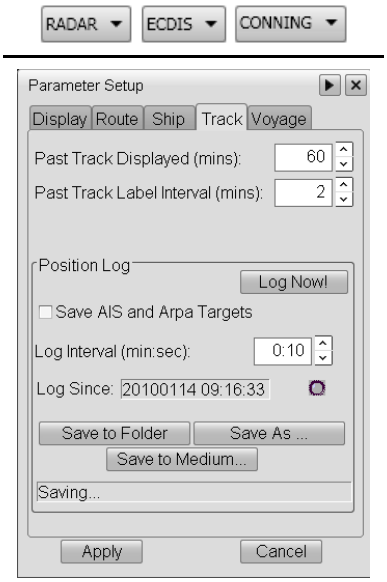
The tab contains the following elements:

- **Ship Name:** Name of the own-ship.
- **Ship Length:** Total ship length.
- **Ship Width:** Maximum ship width.
- **Max Ship Draught:** Maximum ship draught when loaded.
- **Conning Pos:** Conning or steering position, normally on the centre line. For port use negative values.
- **Pivot Point:** The own-ship's pivot point, normally on the centre line. For port use negative values.
- **Min. Ship Turn Radius:** The own-ship's minimum turning radius. The value is used to validate routes.
- **Max. Ship Turn Rate:** The own-ship's maximum rate of turn. If an upcoming turn exceeds this rate of turn, an alarm is given.
- **Turn Accel. Length:** Distance from Wheel Over Point to start of the turn * 2.0. This is the same value that is called Acc (Acceleration) Length in the *K-Bridge Autopilot Operator Manual* (see *References* on page 45).

- **Off-track Alarm Margin:** The distance to be subtracted from the Cross-track Distance limit before a Cross-track Distance alarm is issued. The distance you specify must be at least the distance from the own-ship's pivot point to the outer edge of the hull. This ensures that a Cross-track Distance alarm is triggered as soon as part of the vessel crosses the XTD limit; in other words, it ensures that the alarm is not delayed until the vessel's pivot point (which might, for example, be 15m from the edge of the vessel) has crossed the XTD limit.
- **ANTS on Validated Routes Only:** When selected, only validated routes will be allowed for use with the autopilot.
- **Ref Pts:** Click to view the ship's reference points such as its conning position and pivot point (see *Ship Reference Points* on page 444).
- **Apply:** Accepts any text changes made using the keyboard.
- **Cancel:** Cancels any text changes made using the keyboard.

20.10.2.4 Track tab

20.10.2.4.1 Position log control



This tab is for logging the vessel's position and controlling the behaviour of the vessel's track as it appears in the radar display.

There are various paths to the tab through the user interface:

- **System→Parameter Settings→Track (tab)**
- **View→Radar Themes→Own Ship Past Track→More→Track (tab)**
- **Own Ship→12hr Log Control**
- **Own Ship→Ship Parameters→Track (tab)**

The following options are for configuring the behaviour of the vessel's track in the display:

- **Past Track Displayed (mins):** Use the spin buttons to specify how many minutes of track history you want to display.
- **Past Track Label Interval (mins):** Use the spin buttons to specify the interval between past track labels.

The Position Log section of the tab contains the following fields, options, and buttons:

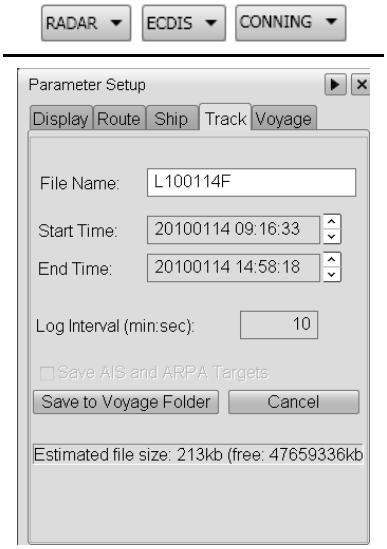
- **Log Now!:** Click to record the vessel's position at this moment.
- **Save AIS and Arpa Targets:** Check this box to record past track information for AIS and Arpa Targets.
- **Log Interval (min:sec):** Use the spin buttons to specify the time between each logging of data.
- **Log since:** The date and time of the oldest item in the log.
- **Save to Folder:** Click the button to save the logged data for the last 12 hours. The file is saved in the voyage folder. After you save it, the name of the file is displayed in the text field below.

- **Save As:** Click the button to specify a target filename or to reduce the interval for the log file. The **Saving Position Log** submenu will appear, as described in section 20.10.2.4.2.
- **Lamp:** Flashes when the position is recorded.
- **Save to Medium:** Click the button to save the log file on the selected device. Then **Save** to the **Selected Device** submenu which will appear, as described in section 20.10.2.4.3.

The following buttons are also available:

- **Apply:** Click the button to apply the entered values.
- **Cancel:** Click the button to cancel the entered values.

20.10.2.4.2 Save as ... (Saving the position log)



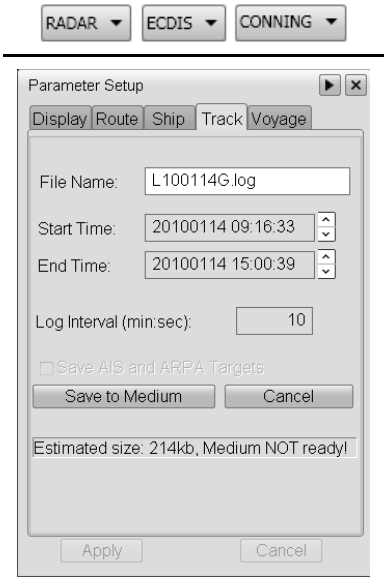
This tab enables you to start, and also to save the results of, the position logging.

The path to the tab is: **System→Parameter Settings→Track (tab)→Save As**

The tab contains the following elements:

- **File Name:** Enter a file name here or use the default file name.
- **Start time:** Use the spin buttons to specify the start time for the log file.
- **End time:** Use the spin buttons to specify the end time for the log file.
- **Log Interval:** Time interval between each logging.
- **Save AIS and ARPA Targets:** Toggle this button On if you would like to save AIS and ARPA targets together with the own-ship position. Note that saving other targets will need much more storage than only own-ship data.
- **Save to Voyage Folder:** Click the button to save the log file.
- **Cancel:** Click the button to cancel the save operation.
- **Apply:** Click the button to apply the entered values.
- **Cancel:** Click the button to cancel the entered values.

20.10.2.4.3 Save to Medium ... (Saving the position log to an external medium)

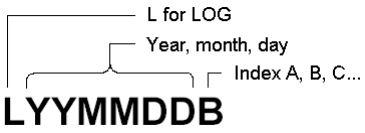


This tab enables you to save the logged position data to a selected device. The log file is sized to fit on the selected device. Depending on the log interval, the log file will store from 12 hours to several days of position data.

The path to the tab is: **System→Parameter Settings→Track (tab)→Save to Medium**.

The tab contains the following elements:

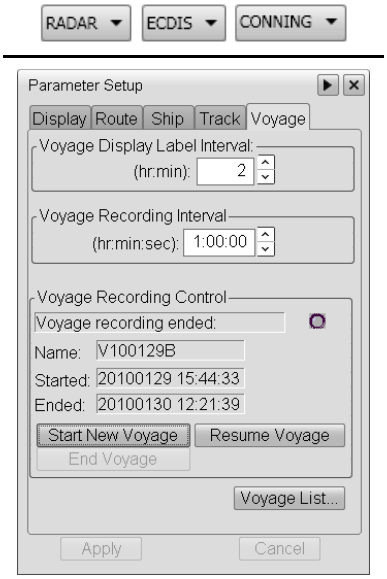
- **File Name:** The log file name is constructed as follows:

  For example L020218F was created 18th Feb. 2002. The default file name may be modified.

- **Start time:** Use the spin buttons to specify the start time for the log file.
- **End time:** Use the spin buttons to specify the end time for the log file.
- **Log Interval:** Time interval between each logging.
- **Save AIS and ARPA Targets:** Toggle this button On if you would like to save AIS and ARPA targets along with the own-ship position data. Note that saving other targets will need much more storage than only own-ship position data.
- **Save to Medium:** Click the button to save the log file to the selected device.
- **Cancel:** Click the button to cancel the save operation.

20.10.2.5 Voyage tab



This tab enables you to record the own-ship's track over the course of a single voyage. There are three paths to the tab:

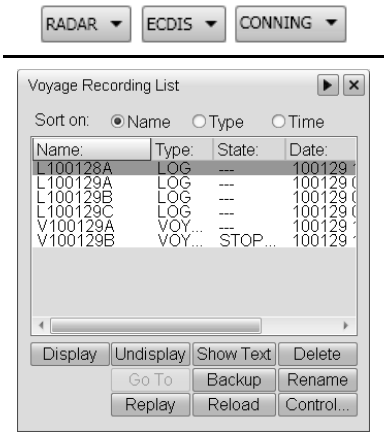
- **System→Parameter Settings→Voyage (tab)**
- **Own Ship→Voyage Recording**
- **Own Ship→Ship Parameters→Voyage (tab)**

This tab contains the following elements:

- **Voyage Display Label Interval:** Use the spin buttons to specify the interval between past positions displayed with a text label.
- **Voyage Recording Interval:** Use the spin buttons to specify the interval between recorded positions.
- **Voyage Recording Control:**
  - **Text field:** Displays voyage recording status.
  - **Lamp:** The lamp flashes when the position is recorded.
  - **Name:** The name of the voyage recording file.
  - **Started:** The date and time at which data recording for the voyage was initiated.
  - **Ended:** The date/time of the end of a voyage recording. Only displayed when the voyage is ended.
  - **Start New Voyage:** Click to start a new voyage recording.
  - **Resume Voyage:** Click to continue the last voyage recording.
  - **End Voyage:** Click the button to stop an ongoing voyage recording.
  - **Voyage List:** Click the button to display the **Voyage Recording List** dialog (see *Voyage Recording List and related dialogs* on page 578).
- **Apply:** Click the button to save the parameter set up.
- **Cancel:** Click the button to cancel all changes.

20.10.2.5.1 Voyage Recording List and related dialogs

Voyage Recording List



This tab enables you to view and manage the list of recorded voyages on the system.

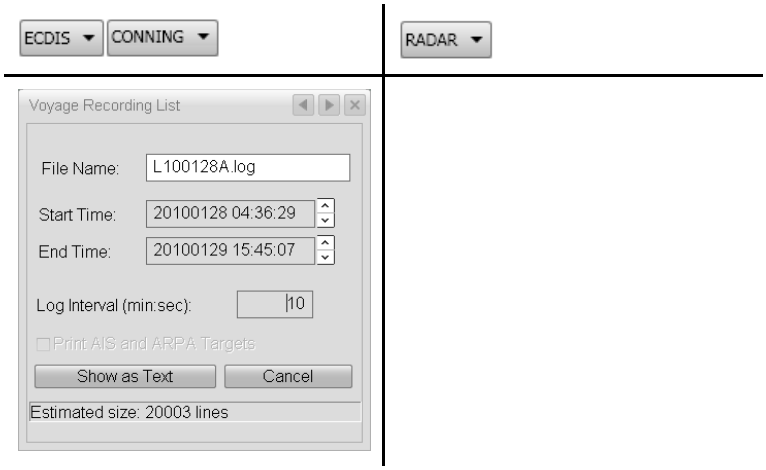
There are two paths to this tab:

- **System→Parameter Settings→Voyage (tab)→Voyage List**
- **Own Ship→Recording List**

The tab contains the following elements:

- **Sort On:** Select to sort the list by name, type or time.
- **Name/Type/State/Date:** Each file is described by name, type of file (LOG or VOY), state, date and file size.
- **Display:** Click to display the selected log or voyage recording file in the chart. Clicking this button will automatically turn on the **Voyage Recording** theme in the **Chart Theme** menu.
- **Undisplay:** Turns off display of the selected log or voyage recording.
- **Show Text:** (This button is not available when you are in the radar application.) In the ECDIS application, you can click the button to see a text version of the selected log or voyage recording file.
- **Delete:** Click to delete the selected file.
- **Go To:** Click the button to display the chart covering the starting point of the displayed log/voyage recording.
- **Backup:** Click the button to save the selected file on the selected device. The **Backup Voyage Recording** submenu will appear, as described below.
- **Rename:** Click the button to give the selected file a new name.
- **Replay:** Click the button to replay the log/voyage file displayed in the chart. The **Replay** submenu will appear, as described below.
- **Reload:** Click to load a log/voyage file from the selected device. The **Restore Voyage Recording** submenu will appear, as described below.
- **Control:** Click the button to display the **Voyage Recording Control** menu, as described above.

Voyage Recording List (text view) dialog



This dialog is for viewing logged voyage data as text.

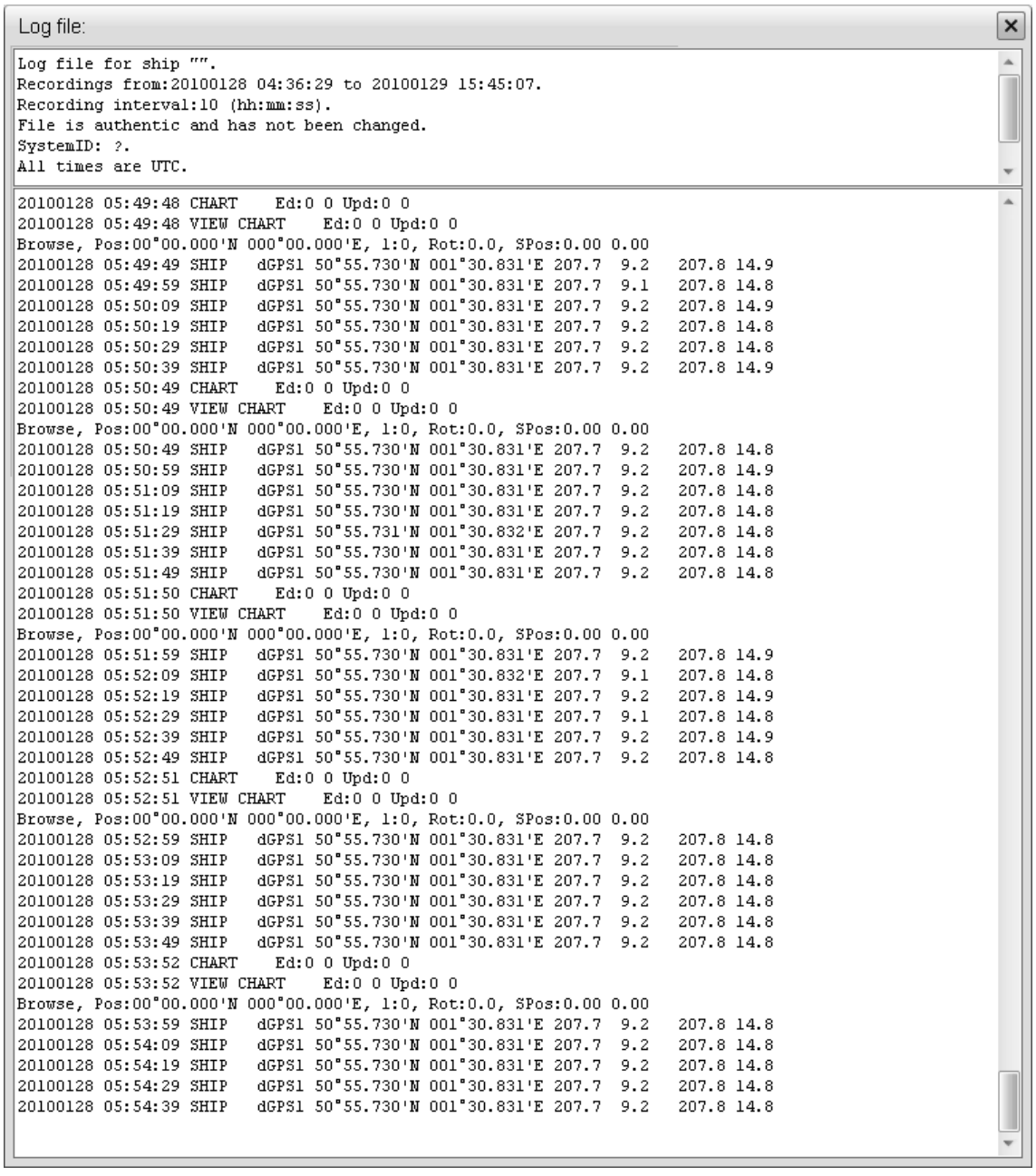
The path to this dialog is: **System→Parameter Settings→Voyage (tab)→Voyage List** (Select voyage) **→Show Text**

The dialog contains the following elements:

- **File Name:** The name of the log file you intend to view.
- **Start time:** Use the spin buttons to specify the start time for the part of the logged data that you want to view as text.
- **End time:** Use the spin buttons to specify the end time for the part of the logged data that you want to view as text.
- **Log Interval:** Optionally specify the time interval you require between the logged items in the display.
- **Print AIS and ARPA Targets:** Check this box to include data about AIS and ARPA targets in the text displayed. Be aware that this might produce a lot of output.
- **Show as Text:** Click this button to display the text version of the voyage file.
- **Cancel:** Click this button to return to the main Voyage Recording List dialog.

For more information about viewing the logged data as text, see *Viewing the past track or voyage log as text* on page 327.

Figure 110 Sample text view of a log

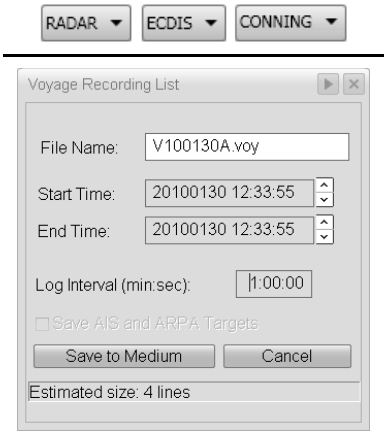


Log file:

```
Log file for ship "".
Recordings from:20100128 04:36:29 to 20100129 15:45:07.
Recording interval:10 (hh:mm:ss).
File is authentic and has not been changed.
SystemID: ?.
All times are UTC.

20100128 05:49:48 CHART    Ed:0 0 Upd:0 0
20100128 05:49:48 VIEW CHART    Ed:0 0 Upd:0 0
Browse, Pos:00°00.000'N 000°00.000'E, 1:0, Rot:0.0, SPos:0.00 0.00
20100128 05:49:49 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:49:59 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.1   207.8 14.8
20100128 05:50:09 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:50:19 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:50:29 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:50:39 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:50:49 CHART    Ed:0 0 Upd:0 0
20100128 05:50:49 VIEW CHART    Ed:0 0 Upd:0 0
Browse, Pos:00°00.000'N 000°00.000'E, 1:0, Rot:0.0, SPos:0.00 0.00
20100128 05:50:49 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:50:59 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:51:09 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:51:19 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:51:29 SHIP   dGPS1 50°55.731'N 001°30.832'E 207.7  9.2   207.8 14.8
20100128 05:51:39 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:51:49 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:51:50 CHART    Ed:0 0 Upd:0 0
20100128 05:51:50 VIEW CHART    Ed:0 0 Upd:0 0
Browse, Pos:00°00.000'N 000°00.000'E, 1:0, Rot:0.0, SPos:0.00 0.00
20100128 05:51:59 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:52:09 SHIP   dGPS1 50°55.730'N 001°30.832'E 207.7  9.1   207.8 14.8
20100128 05:52:19 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:52:29 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.1   207.8 14.8
20100128 05:52:39 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.9
20100128 05:52:49 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:52:51 CHART    Ed:0 0 Upd:0 0
20100128 05:52:51 VIEW CHART    Ed:0 0 Upd:0 0
Browse, Pos:00°00.000'N 000°00.000'E, 1:0, Rot:0.0, SPos:0.00 0.00
20100128 05:52:59 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:09 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:19 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:29 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:39 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:49 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:53:52 CHART    Ed:0 0 Upd:0 0
20100128 05:53:52 VIEW CHART    Ed:0 0 Upd:0 0
Browse, Pos:00°00.000'N 000°00.000'E, 1:0, Rot:0.0, SPos:0.00 0.00
20100128 05:53:59 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:54:09 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:54:19 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:54:29 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
20100128 05:54:39 SHIP   dGPS1 50°55.730'N 001°30.831'E 207.7  9.2   207.8 14.8
```

Voyage Recording List (backup) sub-menu



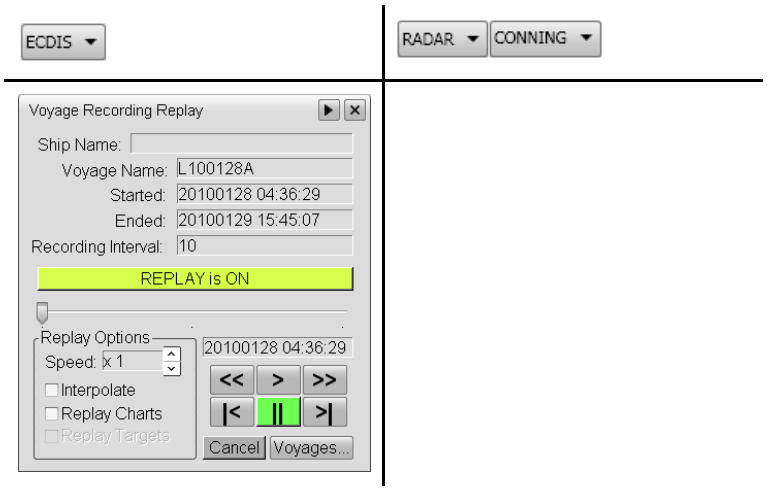
This dialog enables you to save a voyage recording to the selected device.

The path to this dialog is: **System→Parameter Settings→Voyage (tab)→Voyage List** (Select voyage)**→Backup**

The dialog contains the following elements:

- **File Name:** The name of the log file you intend to save. You can modify this file name.
- **Start time:** Use the spin buttons to specify the start time for the logged data you want to save.
- **End time:** Use the spin buttons to specify the end time for the logged data you want to save.
- **Log Interval:** Specify the time interval you require between the items of logged data that you want to save.
- **Save to Medium:** Click the button to save the voyage file to the selected device.
- **Cancel:** Click the button to cancel the save operation.

Voyage Recording Replay sub-menu



This dialog enables you to replay a voyage recording.

The path to the dialog is: **System→Parameter Settings→Voyage (tab)→Voyage List** (Select voyage)→**Replay**.

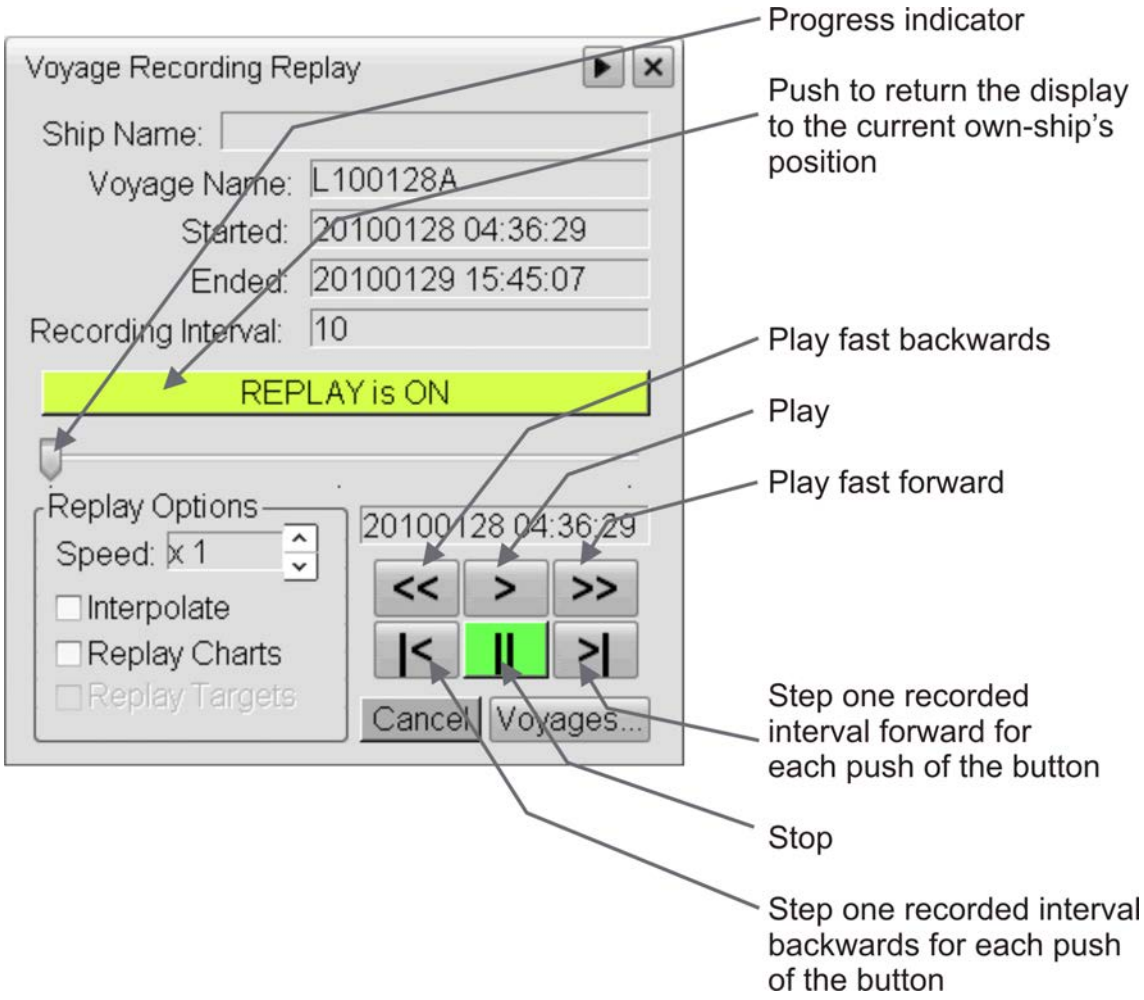
The dialog contains the following elements:

- **Ship Name:** The name of the ship where the recording was done. Obtained from Ship parameters.
- **Voyage Name:** The name of the replay file.
- **Started:** The start date/time for the voyage recording.
- **Ended:** The end date/time for the voyage recording.
- **Recording Interval:** The interval between each position recording.
- **REPLAY is ON:** Click the button to toggle replay off/on.
- **Speed:** Use the spin button to control the replay speed.
- **Interpolate:** To get a smoother replay select interpolate.
- Replay Targets: (If targets are present in the saved logfile). Display AIS and ARPA targets from the logfile with own-ship playback.
- **Cancel:** Click the button to cancel the replay.
- **Voyages:** Click the button to go back to the **Voyage Recording List** dialog.

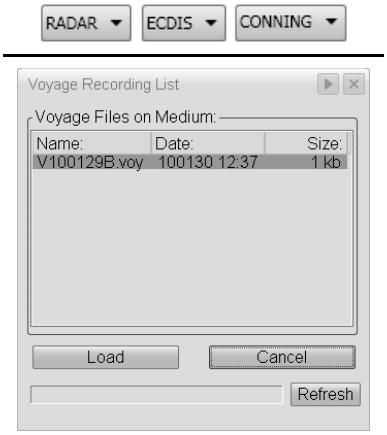
Note

All recordings are done in UTC. All times are displayed in current local time zone.

Figure 111 Summary of voyage recording replay controls



Restore Voyage Recording



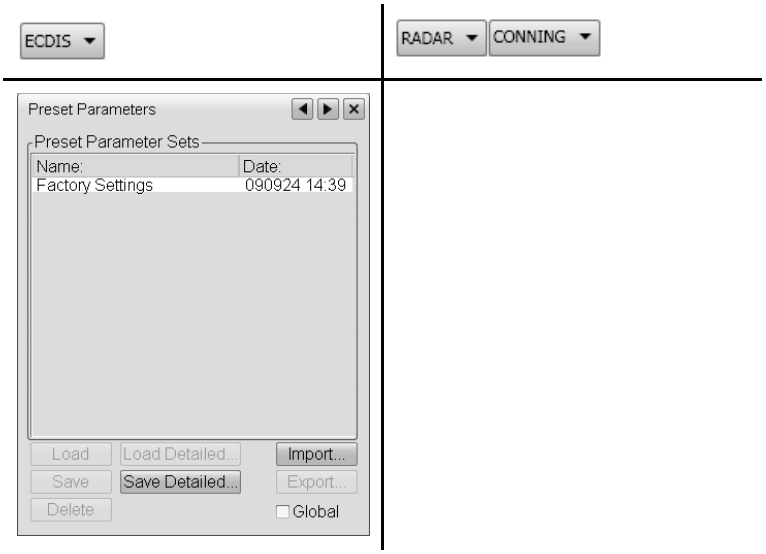
This dialog enables you to reload a voyage recording file from the selected device.

The path to the dialog is: **System→Parameter Settings→Voyage (tab)→Voyage List→Reload** (Select device) **→OK** (Select voyage file) **→Load**.

The dialog contains the following elements:

- **Voyage Files on Medium:** Select a voyage file from the list.
- **Load:** Click the button to load the selected file from the selected device to the K-Bridge Radar.
- **Cancel:** Click to cancel reloading.
- **Refresh:** Click to read and update the list of voyage files on the selected device.

20.10.3 Preset Parameters



This dialog lists the groups of preset parameters currently in use on the system. You can import new parameter group files from external media or export parameter group files from the system to external media. You can also load a parameter group (for example one that you have just imported) for immediate use. And you can save a parameter group to the system, over-writing the current group of the same name.

The path to the dialog is: **System→Preset Parameters**.

The dialog contains the following elements:

Preset Parameters Sets: Lists all the currently saved preset parameters groups with their name and the date and time they were saved.

Load: Click to load and start using the selected preset parameter group.

Load Detailed... : Click to see a list of the preset parameter groups available to be loaded (see *Load Detailed...* on page 586).

Save: Click to save the selected preset parameter group.

Saved Detailed... : Click to bring up a dialog displaying all the groups of preset parameters available (see 20.10.3.2).

Delete: Click to delete the specified group of preset parameters.

Import... : Click to import a preset parameter file from an external medium such as a CD-ROM or memory stick. The external file must have a file extension **.par* (see dialog *Import* on page 588).

Export... : Click to export a parameter file to a writeable external device medium. The external file must have the file extension **.par*.

Global: Click if you want parameter to sets to be automatically exchanged between the K-Bridge Radar and/or K-Bridge Planning systems on the bridge network.

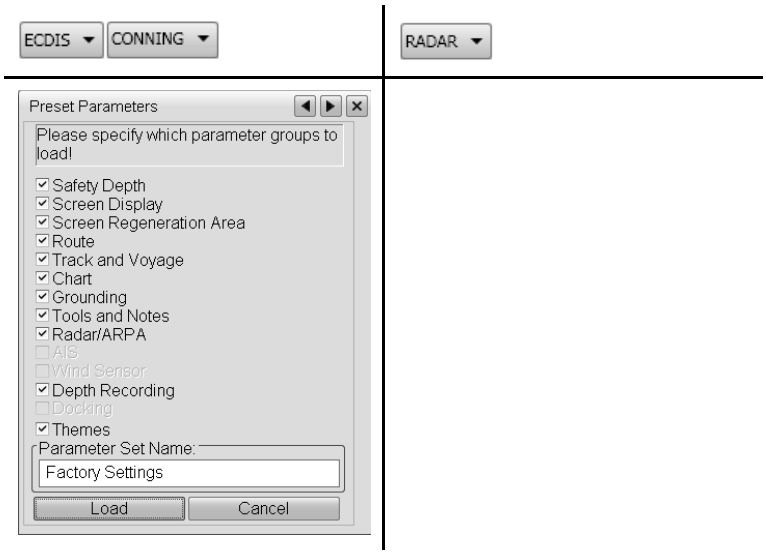
Files are automatically exchanged when they are created or modified, and files deleted from one station are automatically also deleted from all the others on the network.

Note

You must enter the service password to enable or disable the Global toggle.

The Global toggle must be enabled on all operator stations that are to exchange parameter files.

20.10.3.1 Load Detailed...



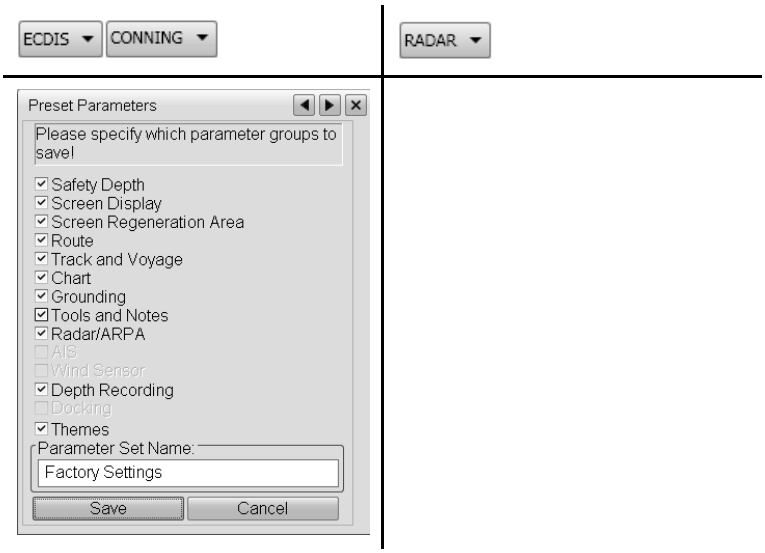
Use this dialog to select one or more groups of preset parameters to be loaded immediately on to the system.

The path to the dialog is: **System→Preset Parameters→Load Detailed**.

Load: Click to load the selected preset parameters.

Cancel Click to cancel the current load operation.

20.10.3.2 Save Detailed...



Use this dialog to select one or more parameter groups to save to the system.

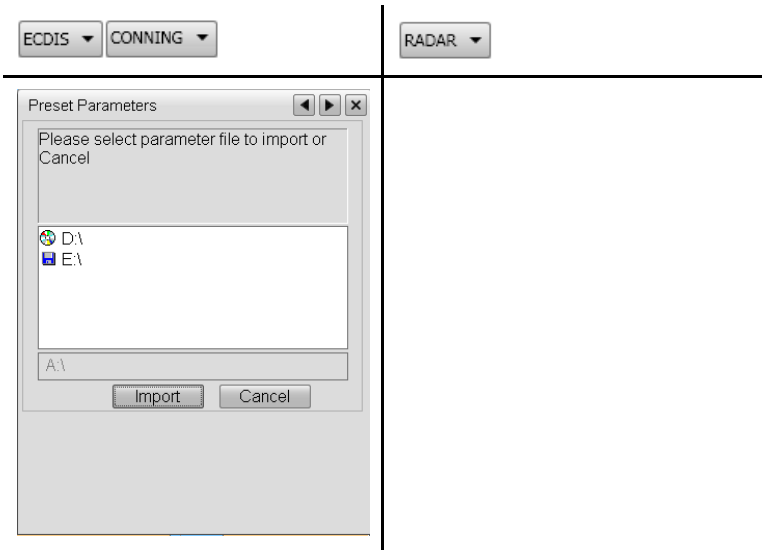
The path to the dialog is: **System→Preset Parameters→Save Detailed**.

You can select one or more groups of parameters (by using the check-boxes) and then specify a name for the new combined parameter set.

Save: Click to save the parameters.

Cancel Click to cancel the current save operation.

20.10.3.3 Import



Use this dialog to import a parameter file from a CD-ROM or memory stick.

The path to the dialog is: **System→Preset Parameters→Import**.

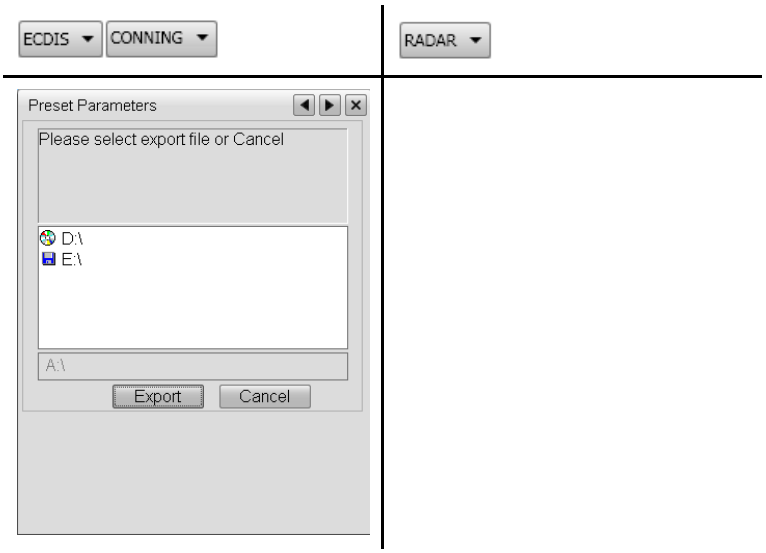
The dialog contains the following buttons:

- **Import:** Select a parameter file to copy to the internal directory. The file will then appear in the list in the Preset Parameters dialog (see *Preset Parameters* on page 585).
- **Cancel:** Click to cancel the import operation.

Note

*The parameter file is **not** loaded unless you explicitly load it from the Preset Parameters dialog (see Preset Parameters on page 585).*

20.10.3.4 Export



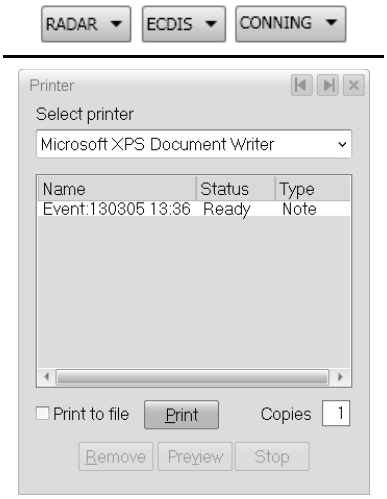
Use this dialog to export a parameter file to a CD-ROM or memory stick.

The path to the dialog is: **System→Preset Parameters→Export**.

The dialog contains the following buttons:

- **Export:** Select a parameter file to copy from the internal directory to the external medium.
- **Cancel:** Click to cancel the import operation.

20.10.4 Printer



Use this dialog to select items (such as a mariners' notes, routes, screen captures, and Navtex messages) from the list of items available for printing and send them to a specified printer.

There are different paths to the dialog, including:

- **System→Printer**
- **System→Print Screen**
- **Chart→Manage Notes→List and Create Notes→Print**
- **Chart→Navtex Messages→Print**
- **Route→Manage Routes→Print**

To select more than one item to print:

1 First select a single item.

  Use the trackball to position the mouse marker over the item, then click the left mouse-button

2 Select another item but this time hold down the **Shift** key on the keyboard when you click the left mouse-button.

  This selects all items in the list between – and including – the first and second selections.

The elements in the Printer dialog are as follows:

- **Select printer:** Select a printer from the drop-down list.
- **Name:** The identifier for each item in the list of items available for printing.
- **Status:** The status of the currently selected item in the list of items available for printing. The possible statuses are: `Ready` (meaning that the item is available to be printed), `Waiting` (meaning that the item is waiting to be printed after you have clicked **Print**), `Printing`, and `Done`. When an item in the list has been printed out and has therefore achieved the status `Done`, there is a short delay before the item is

removed from the list. An additional status is `Preview`, which is the status of the selected item(s) after you have clicked **Preview** (the status reverts to `Ready` when you close the Preview dialog).

- **Type:** The type of item: whether it is a mariner's note, a Navtex message or another item.
- **Print to file:** Check to print the selected item(s) to a file instead of to the selected printer. When you click **Print**, you will be prompted to specify a path.
- **Print:** Send the selected item(s) from the queue to the selected printer (or to an output file if you have checked the **Print to file** option).
- **Copies:** Select the number of copies you want printed.
- **Remove:** Click to remove the selected item(s) from the list.
- **Preview:** Click to see a preview of the printed output for the selected item(s) (see *Print preview* on page 591).
- **Stop:** Abort printing of the selected item(s) after you have clicked **Print**.

20.10.4.1 Print preview

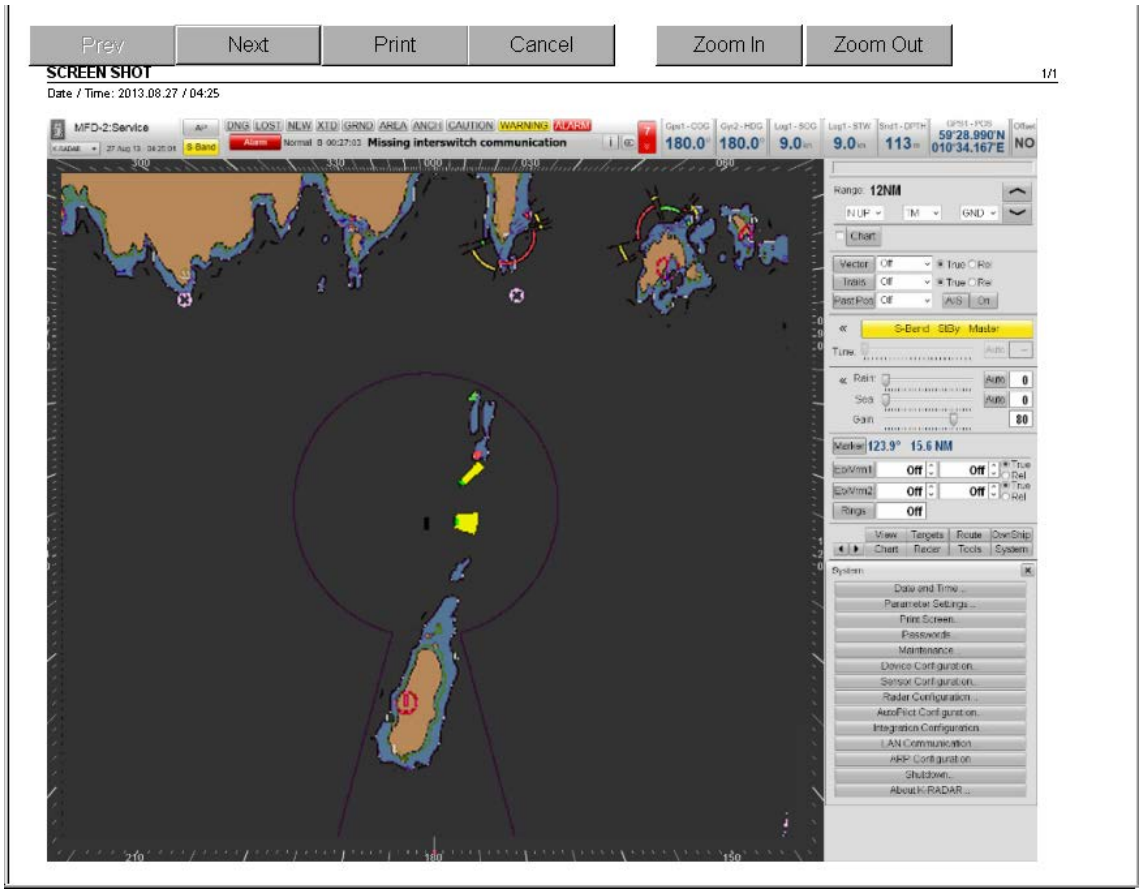
This dialog provides a date- and time-stamped preview of an item (such as a screen-capture) that has not yet been printed.

The path to the dialog is: **System→Print Screen→Preview**.

The dialog contains the following buttons (in addition to the preview image):

- **Prev:** Click to see the image of the previous screen-capture in the print queue.
- **Next:** Click to see the image of the next screen-capture in the print queue.
- **Print:** Click to print the previewed image.
- **Preview:** Click the button to view a preview of the selected screen capture.
- **Cancel:** Click the button to cancel the printing.
- **Zoom In:** Click to enlarge the preview image on the screen.
- **Zoom Out:** Click to reduce the size of the preview image on the screen.

Figure 112 The print preview dialog



20.10.5 Password

This dialog enables you to enter a password to access restricted parameters.

The path to the dialog is: **System→Passwords**.

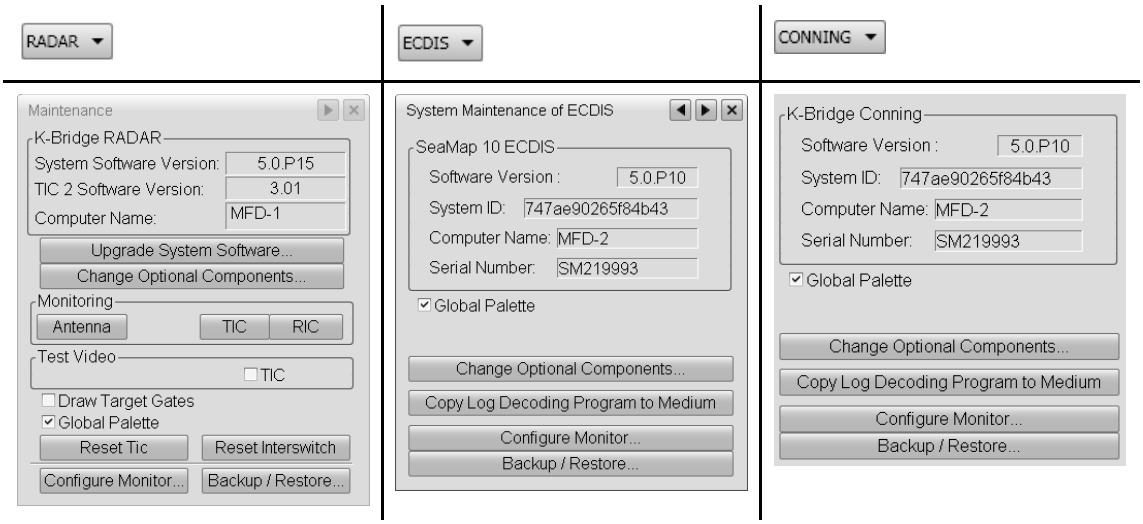
The dialog contains the following elements:

- **User Password:** Entering the user password allows you to change certain configuration settings.
- **(User Password) Open:** Click after entering the user password to allow changes to user-level parameters.
- **(User Password) Lock:** Click to inhibit further changes to user-level parameters.
- **Service Password:** Enter the service password to change more permanent configuration settings.
- **(Service Password) Open:** Click to allow changes to service-level parameters.
- **(Service Password) Lock:** Click to inhibit further changes to service-level parameters.

WARNING

Changing settings behind the passwords can render the system useless or seriously degrade its performance. Do not change any settings unless you are trained to do so.

20.10.6 Maintenance



Use this dialog to upgrade system software, perform backups (or restorations from backup) of route and parameter data, and to monitor the Transceiver Interface Control board and Radar Interface Card.

The path to the dialog is: **System→Maintenance**.

The dialog contains different elements, depending on the application you view it from.

The Radar Maintenance dialog

- **System Software Version:** States the version of the installed software.
- **TIC n Software Version:** States the version on the TIC (Transceiver Interface Control) software in use. For each transceiver there is one TIC board in the interswitch. The number *n* indicates the selected TIC board. For more information about the TICs, see *The radar interswitch unit* on page 106.
- **Computer Name:** The name by which the computer by which the computer is identified by other networked systems.
- **Upgrade System Software:** Click this button to upgrade the system software from an upgrade CD-ROM (see **Upgrade** dialog (see *System Upgrade Software* on page 596).
- **Change Optional Components:** Click to manage optional components (see *System Options* on page 597).
- **Antenna Monitoring:** Click to check the performance of the antenna (see *Antenna Monitor* on page 598).
- **TCVR:** Click this button to monitor the operation of a DECCA or Selesmar radar transceiver (the button is only present if you are using a DECCA or Selesmar transceiver; see *TxRx Monitor (DECCA)* on page 600)
- **TIC Monitoring:** Click to monitor the performance of the radar's Transceiver Interface Control board (see*TIC Monitor* on page 602).
- **RIC Monitoring:** Click to monitor the video handling performed by the radar's Remote Interface Card (see*RIC Monitoring Video* on page 603).

- **Test Video: TIC:** Check this option to view test video generated in the receiver. (This is for service engineers only.)
- **Draw Target Gates:** Check to see the tracking gates used to track radar targets. (This is for service engineers only.)
- **Global Palette:** Check this option to use intensity settings that are the same as the intensity settings on other consoles on the network. For information about display settings, see *Intensity* on page 367.
- **Reset Tic:** Resets the connected TIC board in the interswitch unit.
- **Reset Interswitch:** Resets all the TIC boards in the interswitch unit.
- **Reconfigure Chart Databases:** Click to set the priority for, clean up, or add and remove databases (see *Chart Type Setup* on page 532).
- **Configure Monitor:** Configure the display monitor, see *Select Monitor* on page 605.
- **Backup:** Click to back up or restore route information, user editable parameters, registry settings, or system log data (see *Backup/Restore* on page 607).

The ECDIS and Conning Maintenance dialogs

- **Software Version:** States the version of the installed software.
- **System ID:** This is unique means of identification for your system. It is the same as your ARCS user permit if you have ARCS charts installed.
- **Computer Name:** The name by which the computer by which the computer is identified by other networked systems.
- **Serial Number:** The serial number of the main computer.
- **Global Palette:** Check this option to use intensity settings that are the same as the intensity settings on other consoles on the network. For information about display settings, see *Intensity* on page 367.
- **Change Optional Components:** Click to manage optional components (see *System Options* on page 597).
- **Copy Log Decoding Program to Medium:** Click the button to save the decoding program to the selected device. This program is required for reading position log and voyage recording data from an external device (see *Copy Log Decoding Program to Medium* on page 606).
- **Configure Monitor:** Configure the display monitor, see *Select Monitor* on page 605.
- **Backup/Restore:** Click to back up or restore route information, user editable parameters, registry settings, or system log data (see *Backup/Restore* on page 607).

20.10.6.1 System Upgrade Software

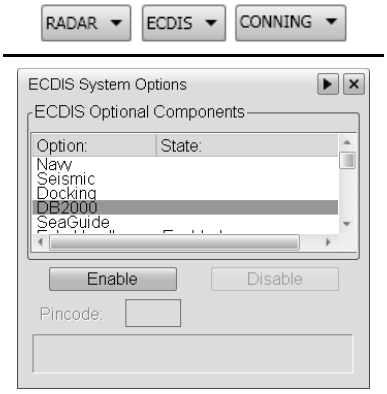
This dialog enables you to install a new version of the K-Bridge navigation software from an upgrade CD.

The path to this dialog is: **System→Maintenance →Upgrade System Software**.

The dialog contains the following button

- **Upgrade:** Insert the upgrade CD in the reader and click the button to start the upgrade.

20.10.6.2 System Options



Use this dialog to configure optional system software components.

The path to this dialog is: **System→Maintenance → Change Optional Components**.

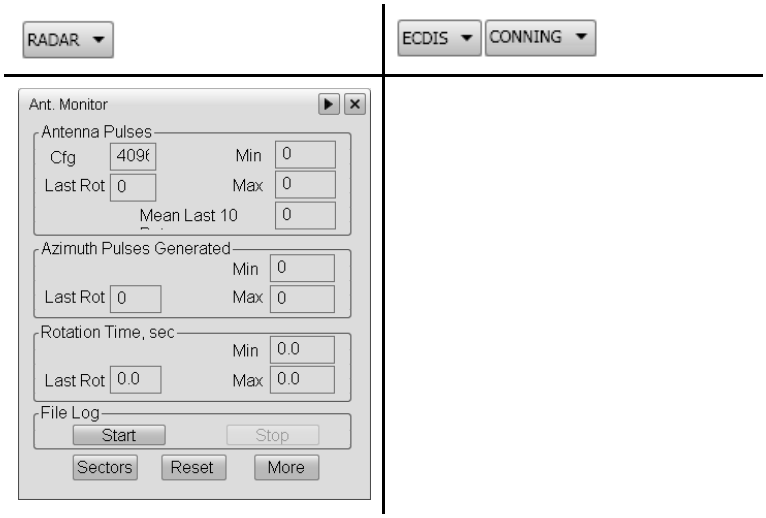
The dialog contains the following elements:

- **ARPA Optional Components:** List of available optional components. Select the option you want to enable or disable.
- **Enable:** Click to enable the selected option.
- **Disable:** Click to disable the selected option.
- **Pincode:** Type in the pin code provided by Kongsberg Maritime to enable the option.

Note

Your changes will take effect when you restart the system.

20.10.6.3 Antenna Monitor



Use this dialog to monitor the radar antenna rotation.

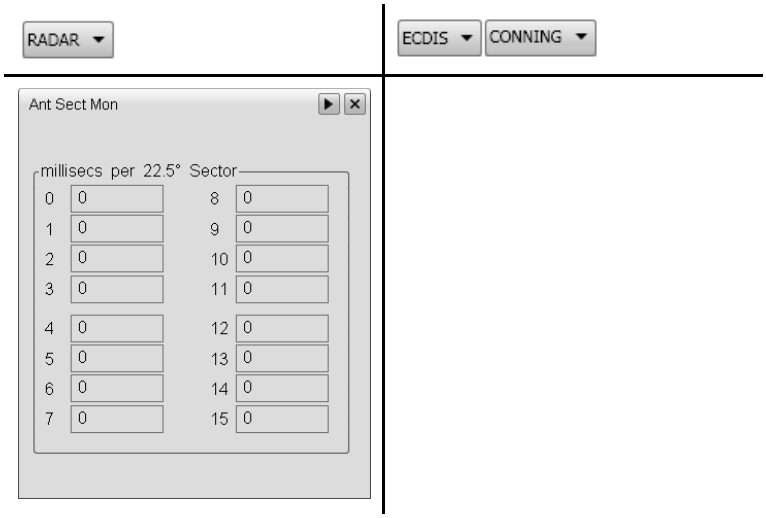
The path to the dialog is: **System→Maintenance →Antenna Monitoring**.

The dialog contains the following elements:

- **Antenna Pulses:** The number of antenna pulses for one rotation.
- **Cfg:** The configured number of pulses that should be received during a single antenna rotation.
- **Last Rot:** The number of pulses actually received during the last rotation.
- **Mean Last 10 Rot:** The mean number of pulses received for the last 10 rotations.
- **Min:** The lowest number of pulses received for a single rotation since the system was started up or since the last click of the **Reset** button in this dialog.
- **Max:** The highest number of pulses received for a single rotation since the system was started up or since the last click of the **Reset** button in this dialog.
- **Azimuth Pulses Generated:** The TIC (Transceiver Interface Control board) generates azimuth pulses based upon the incoming antenna pulses. The nominal number of azimuth pulses generated for a single rotation is 4096.
- **Last Rot:** The number of azimuth pulses in the last rotation.
- **Min:** The lowest number of azimuth pulses generated for a single rotation generated since start-up or since the last click of the **Reset** button below.
- **Max:** The highest number of azimuth pulses generated for a single rotation since start-up or since the last click of the **Reset** button below.
- **Rotation Time, sec:** The time taken for the antenna to complete a single rotation.
- **Last Rot:** The time taken to complete the last antenna rotation.
- **Min:** The lowest rotation time recorded since start-up or since the last click of the **Reset** button below.
- **Max:** The highest rotation time recorded since start-up or since the last click of the **Reset** button below.
- **File log:**

  - **Start:** Click to start logging Antenna Monitor parameters to the hard disk.
  - **Stop:** Click to stop logging Antenna Monitor parameters to the hard disk.
- **Sectors:** Click to see the amount of time the antenna is spending in each sector of its rotation (see *Antenna Sector Monitor* on page 599).
- **Reset:** Resets the maximum and minimum counters.
- **More:** For future expansion.

20.10.6.3.1 Antenna Sector Monitor

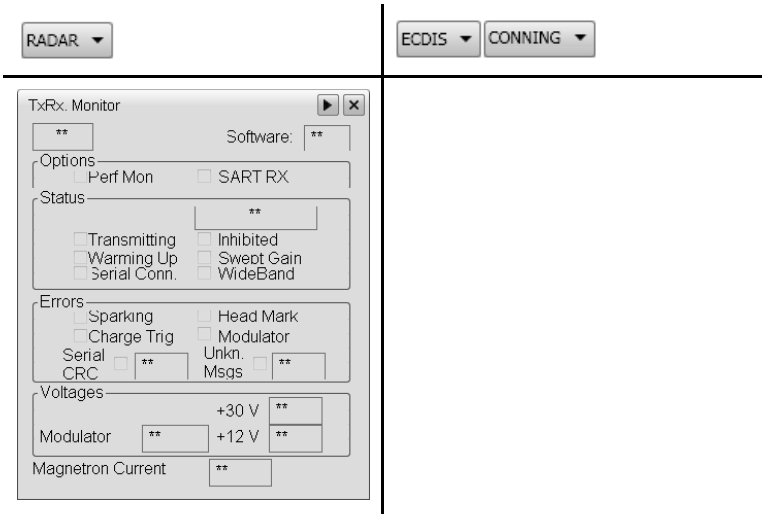


This dialog displays the time (in milliseconds) that the antenna spends in each of the 16 sectors of its rotation (1 sector is 22.5°).

It enables you to monitor variations in the antenna's speed during the rotation (some variation from sector to sector is normal).

The path to this dialog is: **System→Maintenance→Antenna Monitoring→Sectors**.

20.10.6.4 TxRx Monitor (DECCA)



This dialog enables you to monitor the operation of the DECCA radar transceiver.

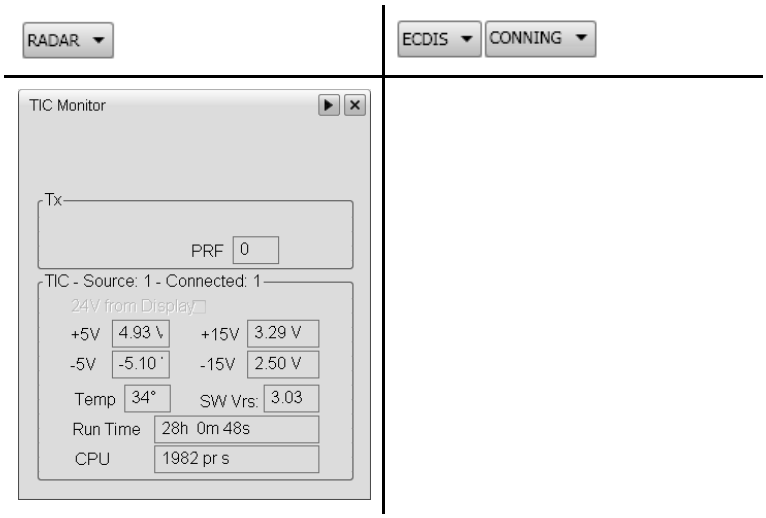
The path to the dialog is: **System→Maintenance→TCVR**.

The dialog contains the following elements:

- **Transceiver type:** X-10kW, X 25kW or S 30kW.
- **Software:** Displays the version number of the transceiver software.
- **Perf. Mon:** Checked if the transceiver has a Performance Monitor fitted.
- **SART RX:** Checked if the transceiver has SART specialised receiver fitted. This is not normally fitted.
- **Status:**
  - **- Text field, Pulse length:** Reported by transceiver (Short/Medium/Long).
    * If the transceiver is unpowered: "Off".
    * If the transceiver is warming up: "WarmUp".
    * If the transceiver is in StandBy: "StBy".
  - **Transmitting:** Checked if the transceiver is transmitting.
  - **Inhibited:** Checked if the transceiver is inhibited. NB: With mute sector(s) enabled, the two check boxes above will be alternating.
  - **Warming Up:** Checked when the transceiver is warming up, approx. 3 min after power on.
  - **Swept Gain:** Checked if the receiver operates with swept gain. This is not possible for most transceivers.
  - **Serial Conn.:** Checked if the transceiver reports that it receives serial signals from the interswitch unit.
  - **WideBand:** Checked if the receiver operates with wide band filter. This is not possible for most transceivers.
- **Errors:** The first four fields indicate status in the transceiver. The last four fields indicate the quality of the serial data communication between transceiver and interswitch.

  - **- Sparking:** Checked if the transceiver has detected sparking. The transmission will then be switched off. Most probable reason is aged magnetron, which needs replacement. Operation in Short Pulse may be possible until service man is on board.
  - **- Head Mark Err:** Checked if there is an error in the heading marker. Service should be called.
  - **- Charge Trig:** Checked if the transceiver has detected an error in charge trig operation.
  - **- Modulator:** Checked if the transceiver has detected an error in the operation of the modulator.
- **Serial CRC:** Checked if the transceiver has detected check sum errors on the messages from transceiver to interswitch. Number of messages from interswitch to transceiver on which there has been check sum errors.
- **UnKn. Msgs:** Checked if the transceiver has detected unknown messages on the messages from transceiver to interswitch. Number of messages from interswitch to transceiver which the interswitch does not recognise.
- **Voltages:**
  - **Voltage:** +30V: System Voltage +30V in transceiver.
  - **Voltage Modulator:** Modulator Voltage.
  - **Voltage:** +12V: System Voltage +12V in transceiver.
  - **Magnetron Current:** Current in magnetron.

20.10.6.5 TIC Monitor



Use this dialog to monitor the performance of the TIC board in the radar interswitch unit.

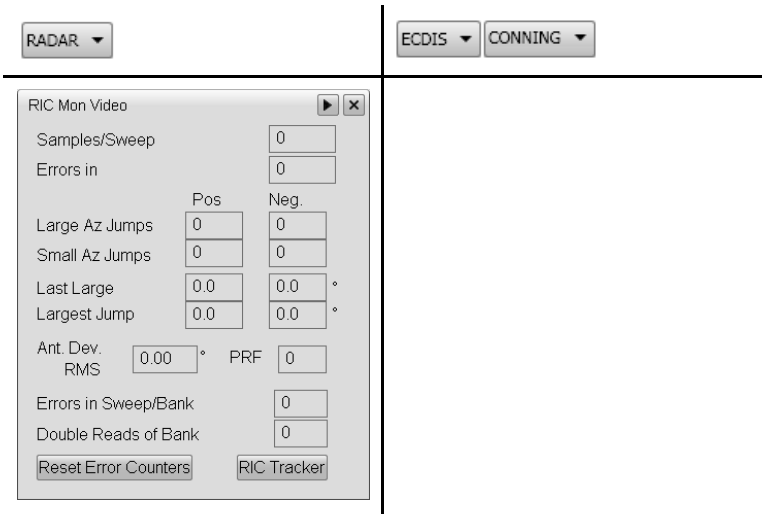
The path to the dialog is: **System→Maintenance→TIC Monitoring**.

The dialog contains the following elements:

- **PRF:** Current pulse repetition frequency as read on the TIC pcb.
- **TIC:**
  - Source:1: Data from TIC no. 1 (Source: 1).
  - Connected: 2: Wired to TIC no. 2 (Connected: 2).
- **24V from Display:** Checked if 24V from display.
- **TIC Voltages:** Nominal and actual voltage levels.
- **Temp:** Temperature on TIC.
- **Run Time:** The accumulated operation time for the TIC pcb.
- **CPU Loop:** Shows how many times per second the processor on the TIC pcb executes its program.

For more information about the TIC, see *The radar interswitch unit* on page 106.

20.10.6.6 RIC Monitoring Video



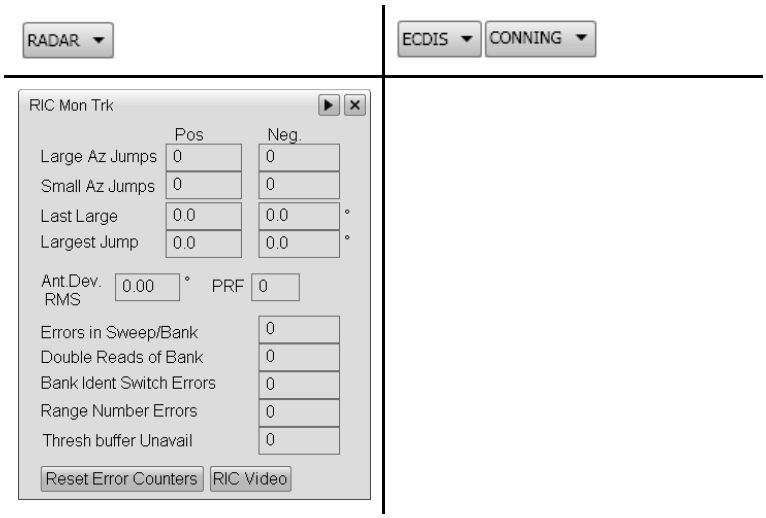
Use this dialog to monitor the operation of the Radar Interface Card (RIC). The dialog shows the parameters that are used by the radar scan converter:

The path to the menu is: **System→Maintenance→RIC Monitoring**.

The dialog contains the following elements:

- **Samples/Sweep:** Number of samples read from one sweep.
- **Errors in Samples/Sweep:** Number of errors in samples read.
- **Large Az Jumps:** Number of large jumps in antenna azimuth between two sweeps.
- **Small Az Jumps:** Number of small jumps in antenna azimuth between two sweeps.
- **Last Large Jump:** The size of the last large azimuth jump.
- **Largest Jump:** The largest recorded jump in azimuth.
- **Ant.Dev.RMS:** Deviation from smooth antenna rotation.
- **PRF:** The PRF (Pulse Repetition Frequency) as read by the RIC pcb.
- **Errors in Sweep/Bank:** Error counter.
- **Double Reads of Bank:** Error counter.
- **Reset Error Counters:** Click to reset all error counters to zero.
- **RIC Tracker:** Click to go to the **RIC Monitoring Tracker** menu.

20.10.6.6.1 RIC Monitor Tracker



Use this dialog to monitor the radar tracker.

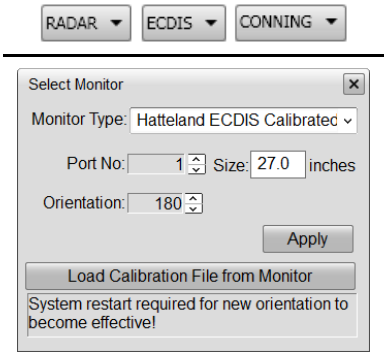
The path to the dialog is: **System→Maintenance→RIC Monitoring→RIC Tracker**.

The dialog contains the following elements:

- **Large Az Jumps:** Number of large jumps in antenna azimuth between two sweeps.
- **Small Az Jumps:** Number of small jumps in antenna azimuth between two sweeps.
- **Last Large Jump:** The size of the last large azimuth jump.
- **Largest Jump:** The largest recorded jump in azimuth.
- **Ant.Dev.RMS**: Deviation from smooth antenna rotation.
- **PRF:** The PRF (Pulse repetition Frequency) as read by the RIC pcb.
- **Errors in Sweep/Bank:** Error counter.
- **Double Reads of Bank:** Error counter.
- **Bank Ident Switch Errors:** Error counter.
- **Range Number Errors:** Error counter.
- **Thresh buffer Unavail.:** Error counter.
- **Reset Error Counters:**Click to reset all error counters to zero.
- **RIC Video:** Click to go back to the **RIC Monitoring Video** menu (see *RIC Monitoring Video* on page 603).

For more information about monitoring the capabilities of the radar tracker, see *Known Solution* on page 413.

20.10.6.7 Select Monitor



Use this dialog to configure the monitor (screen) type used.

The path to the dialog is: **System→Maintenance→Configure Monitor**.

The dialog contains the following elements:

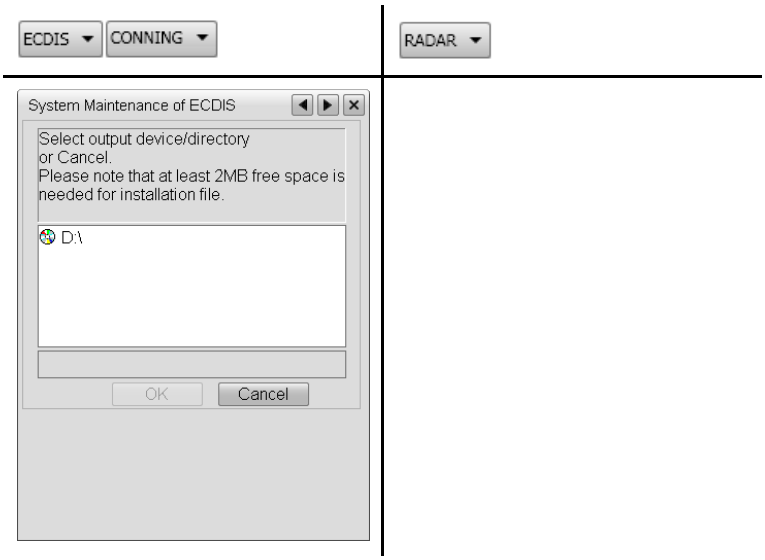
- **Monitor type:** Select the monitor type.
- **Port No.:** Select the serial port (on the operator station computer) that the monitor is connected to.
- **Size:** Specify the size of the monitor.
- **Orientation:** Specify the physical orientation of the operator station in degrees and in relation to a straight line drawn through the centre of the ship from bow to stern. This parameter determines the orientation of the Ship pane in the Conning application (see *The Ship pane* on page 263).

  The bow of the ship's outline in the Ship pane must point in the same direction as the bow of the ship. If the operator station is:

  – In the centre of the forward bridge (so that you stand at it and look straight ahead), then the orientation you specify must be 0: the Ship pane will then be vertical and the bow of its ship symbol will point upwards in the direction of the ship's bow.

  – On a bridge wing (so that you stand at it and look straight out to port or starboard), then the orientation you specify must be 180° or 270°: the Ship pane will then be horizontal and the ship symbol will point to your left or right in the direction of the ship's bow.
- **Apply:** Click to apply the entered data.
- **Load Calibration File from Monitor:** Click to download the colour calibration table from the monitor to the system's main computer. (This applies only to the 27" Hatteland TFT (JH27T11) monitor and is normally only necessary during system commissioning.) When you have downloaded the table, check the Colour Calibration dialog for the different display palettes (Day, Dusk and Night): there must be a clear difference between the foreground and background colours (see *Colour Differentiation and Calibration* on page 531).

20.10.6.8 Copy Log Decoding Program to Medium



This dialog is for copying the log decoding program to an external medium

The path to the dialog is: **System→Maintenance→Copy Log Decoding Program to Medium**.

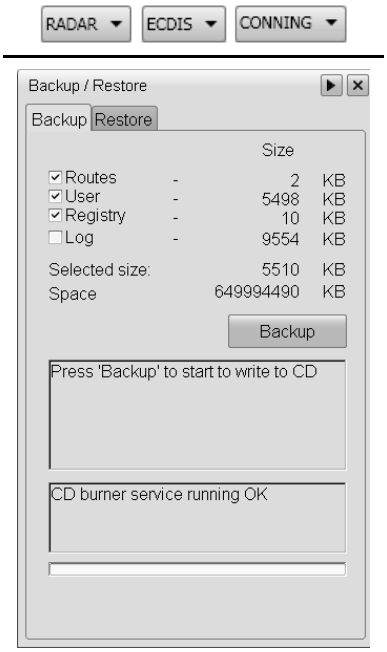
All removable output devices are displayed. Please select the one where the log decoding program should be written and click **OK**.

20.10.6.9 Backup/Restore

This two tabs in this menu enable you to:

- Back up routes, user-editable parameter settings, registry settings, and/or system logs (see *Backup/Restore – Backup tab* on page 607)
- Restore routes, user-editable parameter settings, registry settings, and/or system logs from previously backed up files (see *Backup/Restore – Restore tab* on page 608).

20.10.6.9.1 Backup/Restore – Backup tab



Use this tab to back up routes, user-editable parameter settings, registry settings, and/or system logs.

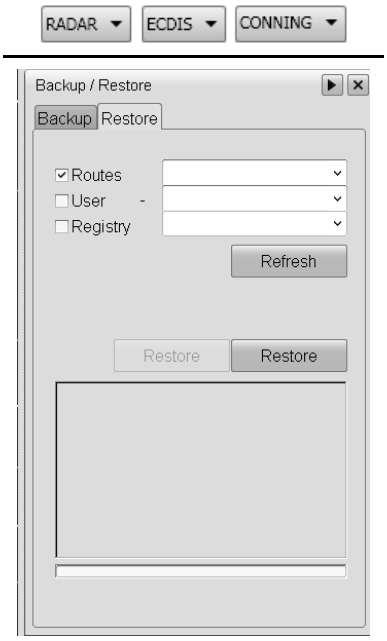
The path to the tab is: **System→Maintenance→Backup→Backup (tab)**.

The tab contains the following elements:

- **Routes:** Select if routes are to be backed up (this backs up the contents of the `C:/radec/RouteData` folder). The size is displayed to the right.
- **User:** Select if user edit-able parameters are to be backed up (this includes all mariners' notes, barrier lines and templates). The size is displayed to the right.
- **Registry:** Select if Windows Registry settings are to be backed up. The size is displayed to the right.
- **Log:** Select if the system's logged data is to be backed up (this backs up all files in the log directory located at `C:\radec\src\logging`; it includes serial log files, alarm list log files and the logbook). The size is displayed to the right.
- **Selected size:** Displays the amount of data (in kilobytes) to be backed up.
- **Space available:** Displays the space available on the CD.
- **Backup:** Click to perform the backup.

- **Message fields:** Displays information and error messages.

20.10.6.9.2 Backup/Restore – Restore tab



Use this tab to restore routes, user-editable parameter settings, registry settings, and/or system logs from back-up.

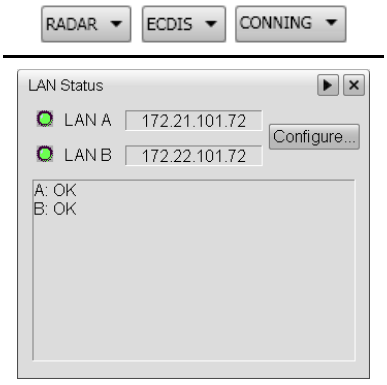
The path to the tab is: **System→Maintenance→Back-up→Restore (tab)**.

The tab contains the following elements:

- **Routes:** Select if routes are to be restored. From the drop-down list, select the data to be restored: it is identified by date and time.
- **User:** Select if user parameters are to be restored. From the drop-down list, select the data to be restored: it is identified by date and time.
- **Registry:** Select if the Windows Registry settings are to be restored. From the drop-down list, select the data to be restored: it is identified by date and time.
- **Restore/Cancel:** Click **Restore** to restore the selected data; the button's text changes to "Cancel" when you first click it. Then the other **Restore** button (which is grey in the picture) will be enabled. Press this other **Restore** button to continue restoring data.

  When the text of the original button says "Cancel", click it to stop the restore process.
- **Message fields:** Displays information and error messages.

20.10.7 LAN Status



This dialog tells you the status of the LAN.

The path to it is: **System →System →LAN Communication**.

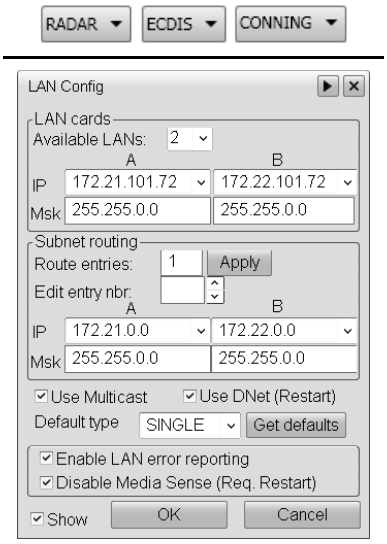
The dialog contains the following elements:

- **LAN A and LAN B status lamps:** The meanings of the status lamps are:
  - Green — the LAN is working correctly
  - Red — the LAN network has an error
  - Grey — the LAN is disabled
- **LAN A/B text field:** IP addresses are displayed in the text boxes.
- **Configure:** Click to configure the LAN (see *LAN Configuration* on page 610).
- **Status text field:** Displays the status and/or error messages for each LAN:

The possible error messages are:

- **OK** Every thing is working correctly.
- **Disabled** The LAN is not enabled.
- **Socket Error** Is the cable connected?
- **Not all configured LANs are available!** If dual LAN were configured, but the system only is running on one LAN.
- **The bound IP unequal configured IP!** The configured IP address could not be connected, so it has connected to another IP address.
- **Time-out receiving data!** Nothing is received on the LAN. Is the cable disconnected, or has all other machines stopped?

20.10.7.1 LAN Configuration



This dialog enables you to configure the LAN.

The path to it is: **System→LAN Communication→Configure**.

The dialog contains the following elements:

- **Available LANs:** Select available LAN (0-2):
  - 0 = Single LAN multi homed network service provider. Leave LAN card IP1 and LAN card IP2 empty (or disabled).
  - 1 = Single LAN with specified network service provider. Network adapter (LAN card IP1) must be specified. Leave LAN card IP 2 empty (or disabled).
  - 2 = Dual LAN with specified network service provider for each LAN A and B. Specify both LAN cards 1IP and LAN card 2 IP (Network adapter for each LAN).
- **LAN card IP A:** Displays IP address of LAN card 1 (Network adapter used for LAN A).
- **LAN card Mask A:** Displays Mask address of LAN card 1.
- **LAN card IP B:** Displays IP address of LAN card 2 (Network adapter used for LAN B).
- **LAN card Mask B:** Displays Mask address of LAN card 2.
- **Route entries:** Displays configured subnets (or networks that shall be used. Default = 1.) It is possible in the Advanced setup of the windows network TCP/IP setup, to specify several network addresses for the network card to use. If the application is supposed to send to one or more of these network addresses, the desired addresses have to be specified in the Subnet IP A and Subnet IP B. If you are using single LAN, the Subnet IP B is not in use, but it is advisable to set the Subnet IP B equal to the Subnet IP B, like if A = 192.168.7, then B=192.168.8 (always skip the last number including the dot).
- **Apply:** Click the button to enter the configured data
- **Edit entry:** Select to edit subnet. Select Subnet IP (A and B) to edit. Remember that each subnet comes in two; A and B. When changing this value the values in Subnet IP A and Subnet IP B changes.

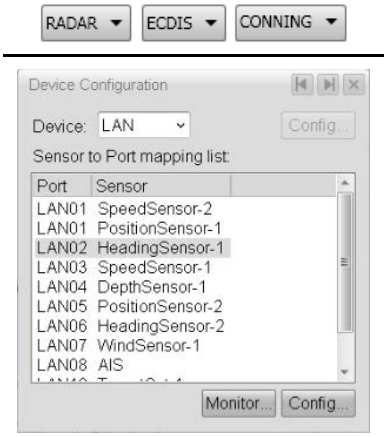
- **Subnet IP A:** Text field to input IP address of subnet A. Default 192.168.7.
- **Subnet Msk A:** Text field to input Mask address of subnet A. Default 255.255.255.0.
- **Subnet IP B:** Text field to input IP address of subnet B. Default 192.168.8.
- **Subnet Msk B:** Text field to input Mask address of subnet B. Default 255.255.255.0.
- **Use Multicast:** Select to enable for sending and receiving to a specific group of receivers (default adr.: 230.21.102.31 - may be edited in file Config > LAN_Socket.ini).
- **Use DNet (Restart):** Select to enable for use of KM DNet (dualLAN), where the DNet server must be read. (may be edited in Config>**LAN_Socket.ini** and Radec>Run>Config>Topology>**Hosts**.

  Note

  *Both **Use Muliticast** and **Use DNet** are mainly used for integration with DP and the SINT.*

- **Default type:** Select type of LAN (Single/Dual/Frigate).
- **Get defaults:** Click the button to get default values of selected type (Not available for single LAN yet).
- **Enable LAN error reporting:** Check LAN error reporting to prevent errors to appear in the alarm manager when something is wrong with the LAN. If this is a single station on the network, then you would get an alarm "LAN A ", and in the LAN status dialog an error text will be displayed.
- **Disable Media Sense (Req. Restart):**
- **Show:** Select to enable for editing of variable settings in the dialog.
- **OK:** Click the button to apply your changes.
- **Cancel:** Click the button to cancel your changes.

20.10.8 Device configuration



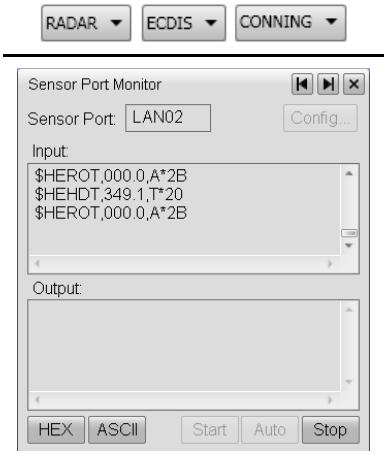
This dialog enables you to configure the I/O interfaces on the operator station. This is normally only done during commissioning and must only ever be done by qualified personnel. It is by means of these interfaces that the operator station receives its sensor data, so changing the settings can render the system useless.

The path to this dialog is: **System→Device configuration**.

The dialog contains the following buttons:

- **Device:** From the drop-down list, select the type of interface you want to configure. The choice includes the operator station computer's COM ports, its RIC2 (Radar Interface 2) card, and the virtual LAN ports on which K-Bridge operator stations receive sensor data from the SINT. The drop-down list also includes up to four LWE (Light-weight Ethernet) devices. This is either for operator stations that receive sensor data directly over an LWE connection or it is for operator stations that receive sensor data via a serial converter (inside the console) to which the navigation sensors are connected; the serial converter on such consoles communicates with the operator station computer using a single LWE connection.
- **Monitor:** Click to go to a dialog that enables you to see the messages coming in (and any going out) on the selected port (see *Serial Monitor* on page 613).
- **Config:** Click to go to a dialog that enables you to change the configuration parameters for the selected I/O interface. The dialog that comes up depends on the type of interface selected. For the:
  - COM ports, see *Serial Port Configuration* on page 614
  - RIC2 card, see *RIC2 Configuration* on page 614
  - LAN ports, see *Serial on LAN settings* on page 640
  - LWE ports, see *LWE port Configuration* on page 615

20.10.8.1 Serial Monitor



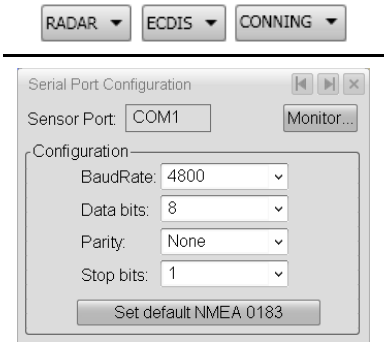
This dialog enables you to monitor the I/O messages on the operator station's interface to a sensor.

The path to the dialog is: **System→Device Configuration→Monitor**.

The dialog contains the following elements:

- **Sensor port:** The I/O interface you are monitoring.
- **Config:** Click to go to a dialog that enables you to change the configuration parameters for the selected I/O interface. The dialog that comes up depends on the type of interface you are monitoring. For the:
  - COM ports, see *Serial Port Configuration* on page 614
  - RIC2 card, see *RIC2 Configuration* on page 614
  - LAN ports, see *Serial on LAN settings* on page 640
  - LWE ports, see *LWE port Configuration* on page 615
- **Input:** Displays incoming messages.
- **Output:** Displays outgoing messages.
- **HEX:** Click to display the messages as hexadecimal numbers.
- **ASCII:** Click to display the messages as ASCII characters.
- **Start:** Click to start monitoring the messages on this port. Monitoring will continue until you click **Stop** or the log file has reached 1 Mbyte.
- **Auto:** Start monitoring of messages on this port. The monitoring will continue until you click **Stop**, until the log file reaches 1 Mbyte, or until you close the dialog.
- **Stop:** Click to stop monitoring the selected port. The logged data is written to a file in the following location: `c:\radec\logging`. (The filename indicates both the port number and the type of interface whose I/O log the file contains.)

20.10.8.2 Serial Port Configuration



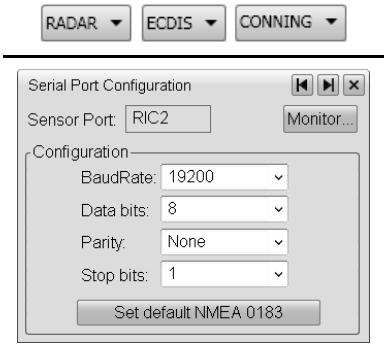
Use this dialog to configure the selected serial port.

The path to this dialog is: **System→Device Configuration (with a COM port selected)→Config**.

The dialog contains the following elements:

- **Serial port:** The port you are configuring.
- **Monitor:** Click to monitor the messages on the serial port (see *Serial Monitor* on page 613).
- **Baud rate:** Click to select the baud rate.
- **Data bits:** Click to select the number of data bits in each word.
- **Parity:** Click to select odd, even, or no parity.
- **Stop bits:** Click to select the number of stop bits after each word.
- **Set default NMEA 0183:** Click to configure the port with standard settings for an NMEA 0183 messages: 4800 bits/s baud rate; 8 data bits; no parity, 1 stop bit).

20.10.8.3 RIC2 Configuration



Use this dialog to configure the I/O interface on the RIC2 card.

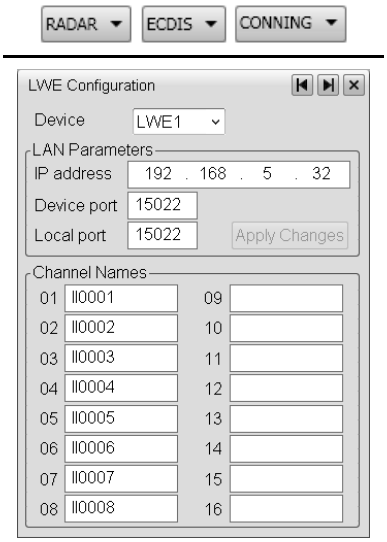
The path to this dialog is: **System→Device Configuration (with the RIC2 interface selected)→Config**.

The dialog contains the following elements:

- **Sensor port:** The I/O interface (in this case, the RIC2 card) that you are configuring.

- **Monitor:** Click to monitor the messages on the RIC2 card (see *Serial Monitor* on page 613).
- **Baud rate:** Click to select the baud rate.
- **Data bits:** Click to select the number of data bits in each word.
- **Parity:** Click to select odd, even, or no parity.
- **Stop bits:** Click to select the number of stop bits after each word.
- **Set default NMEA 0183:** Click to configure the port with standard settings for an NMEA 0183 messages: 4800 bits/s baud rate; 8 data bits; no parity, 1 stop bit).

20.10.8.4 LWE port Configuration



Use this dialog to configure a LWE (Light-weight Ethernet) interface between the operator station computer and either:

- an NMEA-to-Ethernet converter in the console (this is for consoles that receive sensor input on one or more NMEA-to-Ethernet converters) or
- a sensor that transmits to the operator station directly over a LWE connection

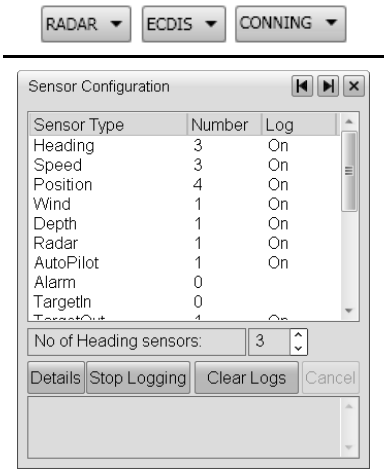
The path to this dialog is: **System→Device Configuration (with an LWE interface selected)→Config**.

The dialog contains the following elements:

- **Device:** From the drop-down list, select a Light-weight Ethernet (LWE) device that will transmit, or is currently transmitting, data to the operator station.
- **IP address:** The IP address of the selected device. Edit this field (and click **Apply Changes**) if you need to associate the name of the selected device (from the drop-down list) with a different device.
- **Device port:** The IP service port on which the selected device receives data from the operator station.
- **Local port:** The IP service port on which the operator station receives data from the selected device.

- **Apply Changes:** Click to apply any changes you have made to settings in the dialog.
- **Channel names:** The name of each channel that the selected device is using or will use to transmit data to the operator station. If the selected device is an NMEA-to-Ethernet converter inside the console, it will have multiple channels, one for each sensor. If the selected device is itself a sensor, it will have only one channel. The channel names in this dialog must match the names used by each channel on the selected device.

20.10.9 Number of Sensors



Use this dialog to configure the communication interfaces – including all the sensor interfaces – for the operator station.

The path to the dialog is: **System→Sensor Configuration**.

The dialog contains the following fields and buttons:

- **Sensor Type:** Select the type of sensor (or other equipment) whose interface you want to configure.
- **Number:** Indicates the number of each type of sensor (or other equipment) installed.
- **No of sensors:** Use the spin buttons to set the number of sensors (or other equipment, as applicable) installed.
- **Details:** Click to configure the interface between the operator station and the selected type of sensor or other equipment.
- **Stop Logging:** By default, the operator station logs sensor input continuously to its logged data buffer which stores it for up to three days (see *Integration Configuration* on page 659). Clicking this button stops the continuous logging of sensor data. Do not click it unless requested to by a KM service engineer.
- **Clear Logs:** Clicking this button clears the logged data buffer. Do not click it unless requested to by a KM service engineer.

The main interfaces you can configure are described in the following sections:

- *Heading sensor interface* on page 618
- *Position sensor interface* on page 622
- *Speed sensor interface* on page 624
- *Wind sensor interface* on page 626
- *Depth sensor interface* on page 628
- *Radar interswitch interface* on page 630
- *Autopilot interface* on page 631
- *Target out interface* on page 632

- *Serial route interface* on page 634
- *AIS interface* on page 636
- *NMEA output interface* on page 637

Some of the above interface configuration dialogs contain a **Settings** button. This is for configuring the LAN port if the serial data is to be transmitted over the LAN (see *Serial on LAN settings* on page 640).

20.10.9.1 Heading sensor interface

Use this dialog to configure the communication parameters for the heading sensor(s).

The path to the dialog is: **System→Sensor Configuration→Heading→Details**.

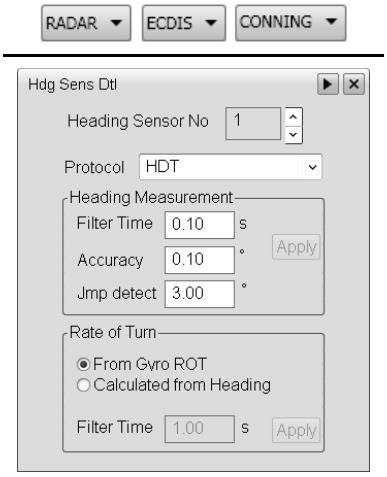
The dialog contains the following elements:

- **Type:** Select **Heading** from the drop-down menu.
- **No:** The operator station's identification number for the heading sensor interface that you are configuring.
- **Enable logging to disk:** When checked, this option ensures that input from the sensor is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Specify the sensor manufacturer/model.
- **Name:** Insert an identifying name, for example, "Gyr1" or "Gyr2" (for the primary and secondary gyros) or "GyrB" (for the NMEA backup heading data). The names you give determine the names of the buttons that the operator will for the heading sources (for example, on the top bar heading display and in the Heading dialog, see *Heading* on page 452).
- **Port No:** Select a port number between LAN1 and LAN15 corresponding to the number of the SINT port (from 1-15) that the heading sensor is connected to. In a standard configuration:
  - The primary heading sensor will normally be connected to port 2 on the SINT; therefore you must specify LAN port 2 as the operator station interface for data from the primary heading sensor.

  - The secondary heading sensor (if present) will normally be connected to port 6 on the SINT; therefore you must specify LAN port 6 as the operator station interface for data from the secondary heading sensor.
  - Backup heading sensor data will be received by the operator station from the SINT over a serial connection; therefore you must specify Serial Port 1 as the operator station interface for backup heading data.

- **Use Default Settings:** Click to use the factory default settings for this sensor. Click once and then confirm to apply this change.
- **Sensor Details:** Click to configure the heading sensor further (see *Heading sensor details* on page 620).

20.10.9.1.1 Heading sensor details



Use this dialog to perform more detailed configuration of the interface between the radar system and the heading sensor.

The path to the dialog is: **System→Sensor Configuration→Heading→Details→Sensor Details**.

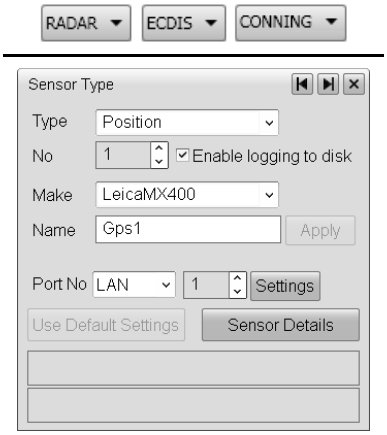
The dialog contains the following elements:

- **Heading Sensor No:** Select the heading sensor number, if there are more than one sensor of this type configured.
- **Protocol:** Select the protocol to be used for heading data from this sensor. We recommend you select HDT or THS.
- **Heading Measurement – Filter Time:** To reduce the effect of noise on the heading information it displays, the K-Bridge MFD system applies a low-pass filter to the gyro input before it uses the input in calculations. This parameter is the filter-time constant (expressed in seconds). If your vessel is large and takes a long time to turn, you can increase the filter time to reduce noise from the heading sensor. If the vessel is small and turns quickly, you might need to reduce the filter time to reduce latency in the display of heading information. Unless you have a particular reason to use a different filter time, specify 0.10 seconds.
- **Heading Measurement – Accuracy:** This field states the accuracy of the measurements sent to the K-Bridge MFD system by the heading sensor. The system takes this value into account when determining the accuracy of the own-ship's position and speed over ground (so that, if required, these can be displayed graphically at low range scales). The heading sensor's accuracy must be set correctly when the sensor is installed. Refer to the documentation supplied with your heading sensor to find out the accuracy of its measurements. Unless you have a particular reason to specify a different value, specify an accuracy of 0.10º.
- **Heading Measurement – Jump detect:** Heading sensors typically transmit measurements approximately 10 times per second. If the difference between one measurement and the next is greater than the amount you specify for this parameter,

an alarm will be issued. The default alarm limit is 3º. On a small fast vessel that can change its heading quickly, and on which the heading sensor sends measurements fewer than 10 times per second, you might want to specify a higher limit than this.

- **Rate of Turn – From Gyro ROT:** If the gyro is capable of sending rate of turn (ROT) messages, select the option to use rate of turn measurements from the gyro. No filtering is applied to ROT messages from the gyro. The option is not available with all heading sensors.
- If the gyro is not capable of sending ROT messages, the console must calculate the ROT from the change of heading. In this case, select **Calculated from Heading**. In this case, the Filter Time is normally 1.0 seconds but you can specify a higher value for large slow ships, or (if the heading report rate is faster than 8-10 messages per second) a lower value for faster ships).
- **Rate of Turn – Calculated from Heading:** Select to calculate the rate of turn using the heading measurements from the gyro. The calculation will use the filter time specified in the field below.
- **Rate of Turn – Filter Time:** Type in the filter time to be used by the system for calculating the rate of turn using heading measurements from the gyro. Then click **Apply**.

20.10.9.2 Position sensor interface



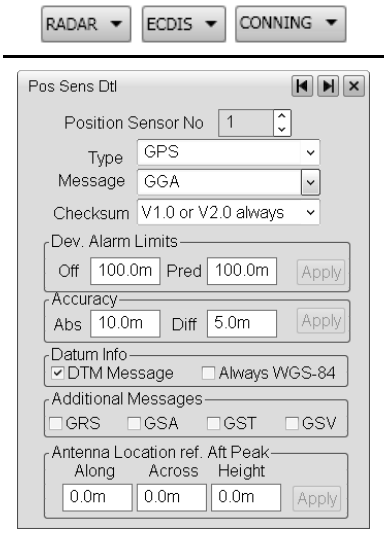
Use this dialog to configure the communication parameters for the position sensor.

The path to the dialog is:**System→Sensor Configuration→Position→Details**.

The dialog contains the following elements:

- **Type:** Select the sensor type.
- **No:** Select the sensor number (if there is more than one sensor of this type configured).
- **Enable logging to disk:** When checked, this option ensures that input from the sensor is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Select the sensor manufacturer/model.
- **Name:** Insert an identifying name.
- **Port No:** Select a port number between LAN1 and LAN15 corresponding to the number of the SINT port (from 1-15) that the position sensor is connected to.
- **Use Default Settings:** Click to use the factory default settings for this sensor. Click twice to apply!
- **Sensor Details:** Click to configure the position sensor(s) further (see *Position sensor details* on page 623).

20.10.9.2.1 Position sensor details



Use this dialog to perform more detailed configuration of the interface between the radar system and the position sensor.

The path to the dialog is: **System→Sensor Configuration→Position→Details→Sensor Details**.

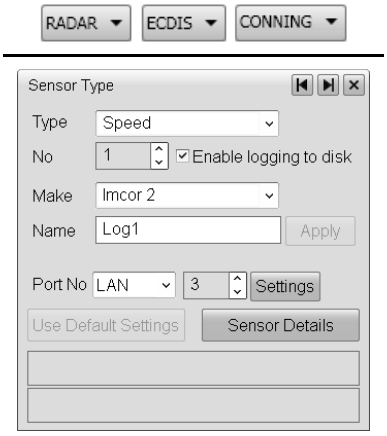
The dialog contains the following elements:

- **Position Sensor No:** Select position sensor number, if there are more than one sensor of this type configured.
- **Type:** Select the type of position sensor (GPS, Loran-C etc).
- **Message:** Select the NMEA position message format to be received (GGA, GLL, TIPY, GNS or RMC). GGA or GNS must be used for GPS. GLL must be used for LoranC.
- **Dev. Alarm Limit:** Type in the alarm limit for deviation between the currently selected position sensor and the alternative sensor, then click **Apply**. The default limit is 100m. If this limit is exceeded and the currently selected position sensor fails, the operator station will not automatically switch to the alternative position sensor.
- **Accuracy:** Type in the expected accuracy of the position sensors in their absolute and differential operating modes, then click **Apply**.
- **Datum Info: DTM Message:** Check this box if the position sensor is able to send DTM messages.

  If the position sensor is older and cannot output DTM messages, un-check the box. If you check the box in this situation, you will receive continuous "DTM missing" alarms); also make sure the position sensor is configured to send position messages using the WGS-84 datum.
- **Datum info: Always WGS-84:** Select this option if the position sensor outputs data using WGS-84 and cannot output DTM telegrams.
- **Additional Messages:** GRS, GSA, GST and GSV messages are supported. To display satellite overview data, GSA and GSV messages are required.

- **Antenna Location:** Specify the antenna location. along ship from stern and across ship from centre line. Height is above water. An antenna located on the port side will give a negative value across.

20.10.9.3 Speed sensor interface



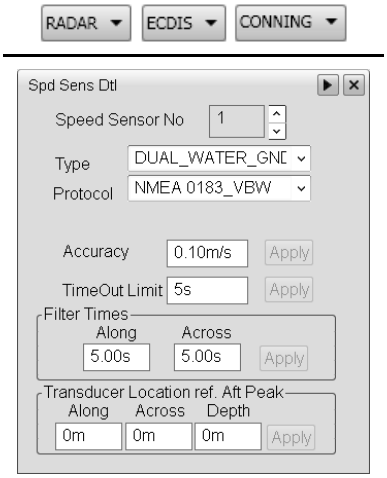
Use this dialog to configure the communication parameters for the speed sensor.

The path to the dialog is:**System→Sensor Configuration→Speed→Details**.

The dialog contains the following elements:

- **Type:** Select speed sensor from the drop down menu.
- **No:** Select the sensor number, if there is more than one sensor of this type configured.
- **Enable logging to disk:** When checked, this option ensures that input from the sensor is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Select the sensor manufacturer/model.
- **Name:** Insert an identifying name.
- **Apply:** Click to apply your changes.
- **Port No:** Select a port number between LAN1 and LAN15 corresponding to the number of the SINT port (from 1-15) that the speed log is connected to.
- **Use Default Settings:** Click to use the factory default settings for this sensor. Click once and then confirm to apply this change.
- **Sensor Details:** Click to go to configure the speed sensor(s) further (see *Speed sensor details* on page 625).

20.10.9.3.1 Speed sensor details



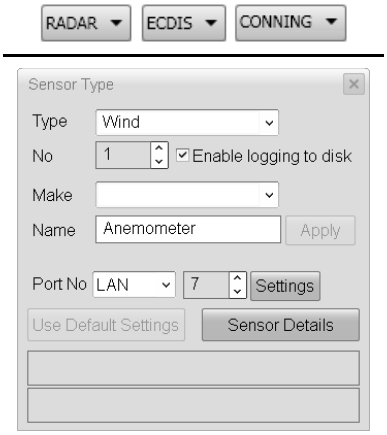
Use this dialog to perform more detailed configuration of the interface between the radar system and the speed sensor.

The path to the dialog is: **System→Sensor Configuration→Sensor Configuration→Speed→Details→Sensor Details**.

The dialog contains the following elements:

- **Speed Sensor No:** The number of this interface.
- **Type:** Select the speed sensor type from the drop down menu (single or dual axis, water or bottom speed).
- **Protocol:** Select the communication protocol to be used for speed outputs from this sensor. Select:
  - **NMEA 0183_VBW** if the log can transmit both Speed Over Ground (SOG) and Speed Through Water (SWT).
  - **SNMEA 0183_VHW** if the log can only transmit STW.
  - **NMEA 0183_VTG** or **NMEA 0183_RMC** if the log can only transmit SOG.
  - **NMEA 0183_RMC** for compatibility with an old satellite position receiver.
- **Accuracy:** Set a value for the accuracy of the speed sensor. (This affects the weight this sensor is given in the position filter. The log has more influence if the accuracy is set to a low number.)
- **TimeOut Limit:** Set a time-out limit (of, for example, 5 seconds) for speed input values. This limit is the maximum time between messages from the log before an alarm will be given. The limit applies only to pulsed log input. It does not apply to digital NMEA messages.
- **Filter Times Along:** Low-pass filter constant for speed along-ship.
- **Filter Times Across:** Low-pass filter constant for speed across-ship.
- **Transducer Location:** Specify the transducer location along-ship from the stern and across-ship from the centre line. A transducer located on the port side will give a negative value across.
- **Across:** Low-pass filter constant for speed across-ship.

20.10.9.4 Wind sensor interface



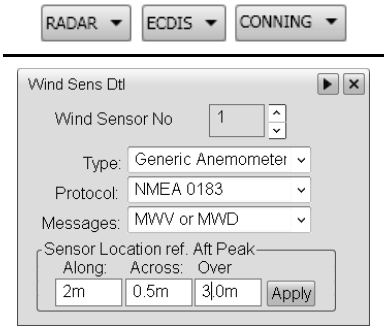
Use this dialog to configure the communication parameters for the wind sensor.

The path to the dialog is: **System→Sensor Configuration→Wind →Details**.

The dialog contains the following elements:

- **Type:** Select Wind from the drop-down menu.
- **Enable logging to disk:** When checked, this option ensures that input from the sensor is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **No:** Select the number of the wind sensor.
- **Make:** Select the sensor manufacturer/model.
- **Name:** Insert an identifying name (or edit the existing name) and click **Apply**.
- **Port No:** Select the port number this sensor is connected to.
- **Settings:** Click to configure the LAN port settings if you are using a LAN interface (see *Serial on LAN settings* on page 640).
- **Use Default Settings:** Click to use the factory default settings for this sensor. Click once and then confirm to apply this change.
- **Sensor Details:** Click to go to configure the speed sensor(s) further (see *Wind sensor details* on page 627).

20.10.9.4.1 Wind sensor details



Use this dialog to perform more detailed configuration of the interface between the radar system and the wind sensor.

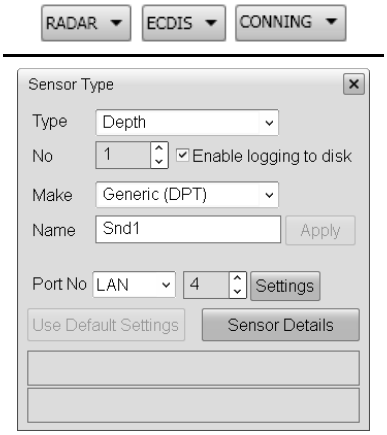
The path to the dialog is: **System→Sensor Configuration→Wind→Details→Sensor Details**.

The dialog contains the following elements:

- **Wind Sensor No:** Select the wind sensor number if there is more than one wind sensor configured.
- **Type:** Select “Generic Anemometer” or “AGI Weather Station”.
- **Protocol:** NMEA 0183 is the only communication protocol available for receiving wind data from this sensor.
- **Messages:** The available messages are:
  - MWV or MWD
  - MWV (includes wind speed plus true and relative direction)
  - MWD (includes true wind direction and speed referenced to earth)
  - MWV or XDR (XDR content includes transducer measurements of, for example, temperature, force, pressure, frequency, and angular or linear displacement)
  - MWD or XDR
  - MWV or MWD or XDR
  - VWR (includes relative wind speed and direction)

  If you select a message combination (for example, “MWV or MWD”), then both (or all) of the message types in the combination (for example MWV *and* MWD) will be accepted by the K-Bridge Radar system. If messages of both (or all) types are received and they conflict with each other, the readings will jump from one to the other.
- **Sensor location:**
  - **Along:** Specify the distance along-ship from the Aft Peak to the wind sensor.
  - **Across:** Specify the distance across-ship from the Aft Peak to the wind sensor.
  - **Over Keel:** Specify the distance over the keel from the Aft Peak to the wind sensor.
  - **Apply:** Click to apply any changes you have made to the specification of the wind sensor's location.

20.10.9.5 Depth sensor interface



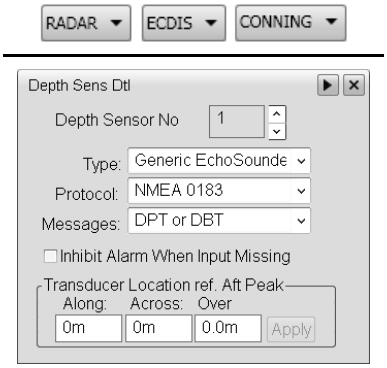
Use this dialog to configure the communication parameters for the depth sensor.

The path to the dialog is: **System→Sensor Configuration→Depth→Details**.

The dialog contains the following elements:

- **Type:** Select Depth from the drop down menu.
- **Enable logging to disk:** When checked, this option ensures that input from the sensor is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **No:** Select the number of the depth sensor.
- **Make:** Select the sensor manufacturer/model.
- **Name:** Insert an identifying name (or edit the existing name) and click **Apply**.
- **Port No:** Select the port number this sensor is connected to.
- **Settings:** Click to configure the LAN port settings if you are using a LAN interface (see *Serial on LAN settings* on page 640).
- **Use Default Settings:** Click to use the factory default settings for this sensor. Click once and then confirm to apply this change.
- **Sensor Details:** Click to configure the interface further (see *Depth sensor details* on page 629).

20.10.9.5.1 Depth sensor details



Use this dialog to perform more detailed configuration of the interface between the radar system and the depth sensor.

The path to the dialog is: **System→Sensor Configuration→Depth→Details→Sensor Details**.

The dialog contains the following elements:

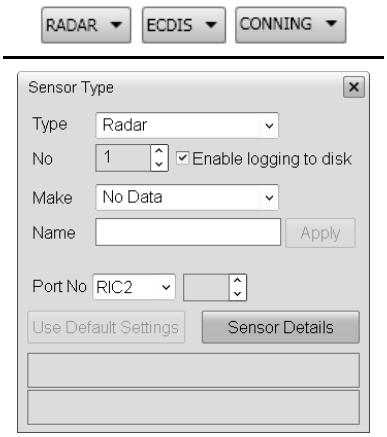
- **Depth Sensor No:** Select the depth sensor number, if there is more than one sensor of this type configured.
- **Type:** Select "Generic EchoSounder" (for an echo-sounder that is used in navigation) or "Multibeam EchoSounder" (for an echo-sounder that is used for charting and surveying).
- **Protocol:** The communication protocol that is used for outputs from this depth sensor. Select "NMEA 0183" (for an echo-sounder that is used in navigation) or "DESO 25" (for an echo-sounder that is used for charting and surveying) .
- **Messages:** The following messages are available if you are using the NMEA 0183 protocol:
  - DPT or DBT
  - DPT (includes depth relative to keel; requires transducer offsets to be correct)
  - DBT (Depth Below Transducer)
  - RDS
  - NONE

  If you select a message combination (“DPT or DBT”), then both the message types in the combination will be accepted by the K-Bridge radar system. If messages of both types are received and they conflict with each other, the readings will jump from one to the other.

  The following messages are available if you are using the DESO 25 protocol:
  - DA
  - DB
- **Inhibit Alarm When Input Missing:** Check the box to avoid receiving alarms when there is no valid output from the echo-sounder (for example, when sailing in deep seas).
- **Transducer location:**

– **Along:** Specify the distance along-ship from the Aft Peak to the depth sensor.
– **Across:** Specify the distance across-ship from the Aft Peak to the depth sensor.
– **Over Keel:** Specify the distance over the keel from the Aft Peak to the depth sensor.
– **Apply:** Click to apply any changes you have made to the specification of the depth sensor's location.

20.10.9.6 Radar interswitch interface



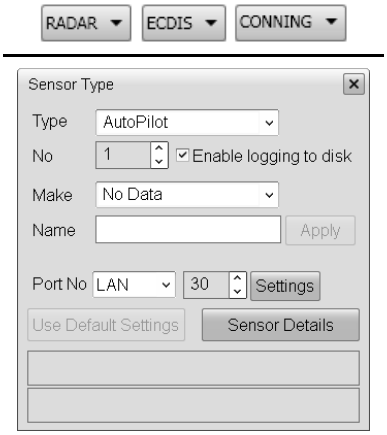
Use this dialog to change the port connection to the radar interswitch.

The path to the dialog is: **System→Sensor Configuration→Radar→Details**.

The dialog contains the following elements:

- **Type:** Select Radar from the drop-down menu.
- **No:** Not applicable.
- **Enable logging to disk:** When checked, this option ensures that input from the radar is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Not applicable.
- **Name:** Not applicable.
- **Port No:** Select the interface you want to use to communicate with the radar interswitch.
- **Use Default Settings:** Click to use the factory default settings for this interface. Click once and then confirm to apply the change.
- **Sensor Details:** Click to perform further configuration of the interface between the radar display unit and the interswitch unit *Radar Configuration* on page 641).

20.10.9.7 Autopilot interface



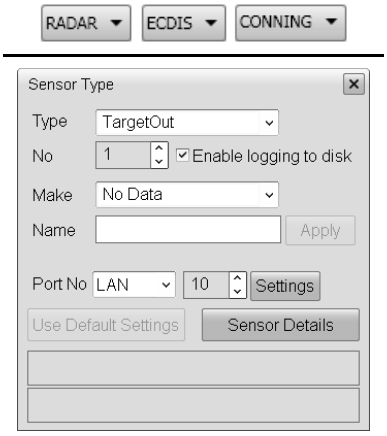
Use this dialog to configure the parameters for communication between the radar system and the autopilot.

The path to the dialog is: **System→Sensor Configuration→Autopilot→Details**.

The dialog contains the following elements:

- **Type:** Select Autopilot from the drop-down menu.
- **No:** Not applicable.
- **Enable logging to disk:** When checked, this option ensures that data sent to and received from the autopilot is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Select the sensor manufacturer/model.
- **Name:** Not applicable.
- **Port No:** Select the interface to use for communication between the radar system and the autopilot.
- **Settings:** Click to configure the LAN port settings if you are using a LAN interface (see *Serial on LAN settings* on page 640).
- **Use Default Settings:** Click to use the factory default settings for this interface. Click once and then confirm to apply this change.
- **Sensor Details:** Not applicable.

20.10.9.8 Target out interface



Use this dialog to set up a serial line for sending target information out to another operator station.

The path to the dialog is: **System→Sensor Configuration→TargetOut→Details**.

The dialog contains the following elements:

- **Type:** Select **Target Out** from the drop-down menu.
- **Enable logging to disk:** When checked, this option ensures that target data sent out on the serial line is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **No:** Not applicable.
- **Make:** Not applicable.
- **Name:** If you require, insert an identifying name for the device you are connecting to (or edit the existing name), and click **Apply**.
- **Port No:** Select the serial line you want to use to connect to the device that will receive the target information.
- **Use Default Settings:** Click to use the factory default settings for this interface. Click once and then confirm to apply this change.
- **Sensor Details:** Click to configure the interface further (see *Target out interface details* on page 633).

20.10.9.8.1 Target out interface details

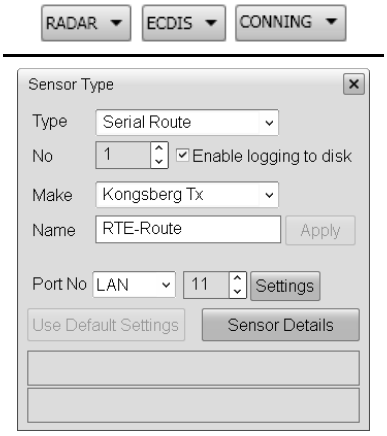
Use this dialog to perform more detailed configuration of the interface between the radar system and the operator station that is to receive target information over the serial line.

The path to the dialog is: **System→Sensor Configuration→TargetOut→Details→Sensor Details**.

The dialog contains the following elements:

- **Target Out Sensor No:** Select the Target Out interface you want to configure if there is more than one.
- **Protocol:** Select the communication protocol to be used:
  - TTD (enables you to send tracked targets and AIS targets)
  - TTM (enables you to send only tracked targets, not AIS targets)
  - GGA (enables you to send one selected target)
- **Export AIS targets:** Check to send AIS targets as well as radar targets (this option is only available if you are using the TTD protocol).
- **Export active AIS targets only:** Click to send active AIS targets but not sleeping ones.
- **TLB – Target Labels:** Check to include identifying labels for each target.
- **TLB Retransmit Interval:** Specify a time interval (in seconds) for re-transmission of the target label information.
- **Issue Alarm When Target Missing:** Check this box to receive an alarm when no target is selected or when a lost target has been selected.

20.10.9.9 Serial route interface



Use this dialog to configure a serial interface to use for sending route information to equipment that is not part of the navigation system (for example, to a Dynamic Positioning operator station).

The path to the dialog is: **System→Sensor Configuration→Serial Route→Details**.

The dialog contains the following elements:

- **Type:** Select **Serial Route** from the drop-down menu.
- **Enable logging to disk:** When checked, this option ensures that route data sent out on the serial interface is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **No:** You can have up to two serial interfaces for sending out route information. Select the one you want to configure.
- **Make:** Select one of the following protocol names: **Kongsberg Tx**, **Dual ALSTOM**, **Nmea RTE/WPL**. We recommend **Nmea RTE/WPL**.
- **Name:** The default name for the serial route interface is **DPS-Route**. If you have added a second serial route interface, specify a different name for it.
- **Port No:** The default port number is **LAN11**.
- **Settings:** Click to configure the LAN port settings (see *Serial on LAN settings* on page 640).
- **Use Default Settings:** Click to use the factory default settings for the protocol you selected when you configured the **Make** parameter. Click once and then confirm to apply this change.
- **Sensor Details:** Click to finish configuring the serial route interface (see *Serial route interface details* on page 635).

20.10.9.9.1 Serial route interface details

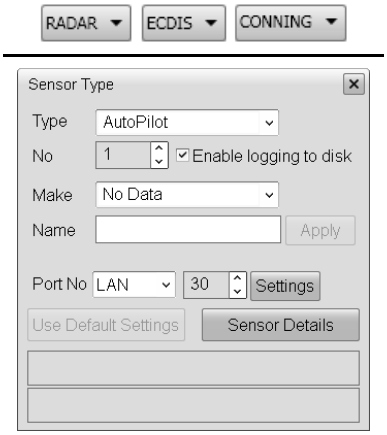
Use this dialog to finish configuring the interface you are using to send route information to an external system such as a Dynamic Positioning operator station.

The path to the dialog is: **System→Sensor Configuration→Serial Route→Details→Sensor Details**.

The dialog contains the following elements:

- **Serial route No:** The number (1 or 2) of the serial route interface whose configuration you are completing.
- **Type:** The value you specify from the drop-down list will depend on the protocol you specified for the **Make** parameter in the previous menu (see *Serial route interface* on page 634). For:
  - **Kongsberg Tx**, select **SERIAL_TX**.
  - **Dual ALSTOM**, select **SERIAL_DPS**.
  - **Nmea RTE/WPL**, select **SERIAL_WPL+RTE**, **SERIAL_RTE+WPL**, or **SERIAL_RTE (Ext, DP)**.
- **Protocol:** You must specify **Nmea 0183**.
- **Talker ID:** The Talker ID you select will depend on the protocol you specified for the **Make** parameter in the previous menu (see *Serial route interface* on page 634). For:
  - **Kongsberg Tx**, select **PR**.
  - **Dual ALSTOM**, select **PK**.
  - **Nmea RTE/WPL**, select **IN**.

20.10.9.10 AIS interface



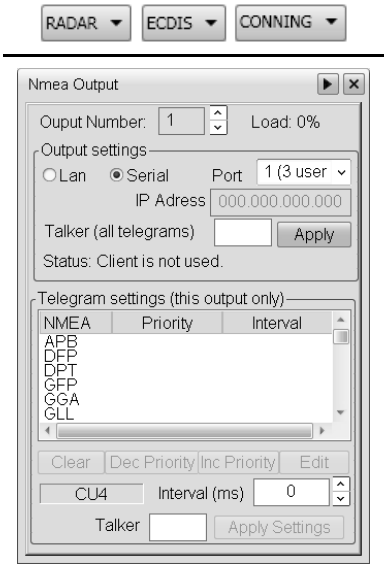
Use this dialog to configure the parameters for communication between the radar system and the AIS receiver.

The path to the dialog is: **System→Sensor Configuration→AIS→Details**.

The dialog contains the following elements:

- **Type:** Select AIS from the drop-down menu.
- **No:** Not applicable.
- **Enable logging to disk:** When checked, this option ensures that input from the AIS system is included in the operator station's continuously logged system data. Do not un-check the option unless requested to by a KM service engineer.
- **Make:** Select **Seatex AIS** if your AIS receiver is produced by Kongsberg Seatex (a subsidiary of Kongsberg Maritime). Otherwise, select **Generic AIS**. (Some added functionality is available if you use a Seatex AIS receiver in combination with K-Bridge; selecting the **Seatex AIS** option here supports that functionality.)
- **Name:** Insert an identifying name for the speed pilot if you require.
- **Port No:** Select the interface you want to use to communicate with the AIS receiver.
- **Settings:** Click to configure the LAN port settings if you are using a LAN interface (see *Serial on LAN settings* on page 640).
- **Use Default Settings:** Click to use the factory default settings for this interface. Click once and then confirm to apply this change.
- **Sensor Details:** Not applicable.

20.10.9.11 NMEA output interface



Use this dialog to configure the NMEA output interface.

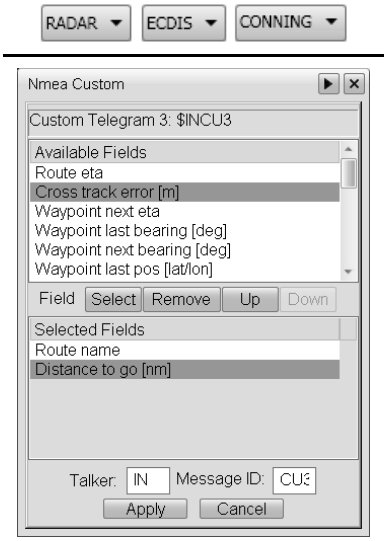
The path to the dialog is: **MENU →System →Sensor Configuration→NmeaOutput→Details**.

The dialog contains the following elements:

- **Output Number:** Select the number of the NMEA client device.
- **Output Settings:**
  - **LAN:** Select if you want to send NMEA data out on the LAN instead of on a physical serial line.
  - **Serial:** Select to send the data out on a serial line.
  - **Port:** Specify the port you want to send the data out on. If **LAN** is selected, then the port you specify is a UDP port in the range 1 to 65535. If **Serial** is selected then you are specifying a physical serial port. Also, if you selected **Serial** and you want to use the serial lines on the SINT (if applicable), select one of the ports between LAN1 and LAN15 (the SINT serial lines transmit UDP multicast telegrams on UDP ports in the range 15101 to 15115).
  - **IP address:** This field is only available if **LAN** is selected. Specify the IP address of the device you want to send the NMEA data to.
- **Talker (all telegrams):** Specify two characters as the talker ID for the NMEA messages sent out. All messages from this operator station will have the same talker ID (unless you specify an individual Talker ID when you configure a particular NMEA sentence; see the **Talker** button below). In this example HE is the talker ID: `$HEHDT,121.5,T,*34\n`.
- **Status:** Indicates the status of the connection between the serial or LAN port and the NMEA client device.
- **Telegram settings (this output only):** This table allows you to specify which NMEA sentences are to be sent to the client device on the connection you are configuring.

- **Clear:** Click to clear the edits you have made to the telegram settings for the selected NMEA sentence in the table.
- **DecPri:** Click to move the selected NMEA sentence down by one priority in the table.
- **IncPri:** Click to move the selected NMEA sentence up by one priority in the table.
- **Edit:** Select one of the four custom sentences (CU1 to CU4) at the bottom of the table, specify an interval for it and click **Apply Settings**. This activates the **Edit** button. Click the **Edit** button to specify the sentence's content. This brings up the NMEA Custom menu, which enables you to select the component fields for your custom sentence (see *NMEA Custom* on page 639).
- **Interval:** Use the spin buttons to specify the interval at which you want the selected NMEA sentence to be sent out.
- **Talker:** Specify an individual two-character Talker ID for the selected NMEA sentence. If you specify an individual Talker ID, then the selected message will use it instead of the global one set in the **Talker (all telegrams)** field (above).
- **Apply Settings:** Click to apply the changes you have made.

20.10.9.11.1 NMEA Custom



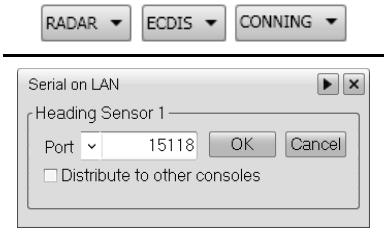
This dialog is for creating custom NMEA sentences. It is reached from the **Edit** button in the Nmea Output dialog (see *NMEA output interface* on page 637).

The path to it is: **MENU →System →Sensor Configuration→NmeaOutput→Details→CU1/2/3/4→Interval→Apply Settings→Edit**.

The dialog contains the following elements:

- **Select:** Select a field from the list in the top window of the menu, and click the **Select** button to include it in your custom sentence. It then appears in the bottom window of the menu.
- **Remove:** Click to remove a field that is selected in the bottom window from the list of components of your custom sentence. The selected component then disappear from the bottom window.
- **Up:** Click to move the field selected in the bottom window one place up in the list.
- **Down:** Click to move the field selected in the bottom window one place down in the list.
- **Talker:** Specify an individual (two-character) Talker ID for the custom sentence you are creating.
- **Message ID:** Specify a three-character alphanumerical Message ID for the custom sentence.
- **Apply:** Click to apply your edits.
- **Cancel:** Click to cancel your edits.

20.10.9.12 Serial on LAN settings



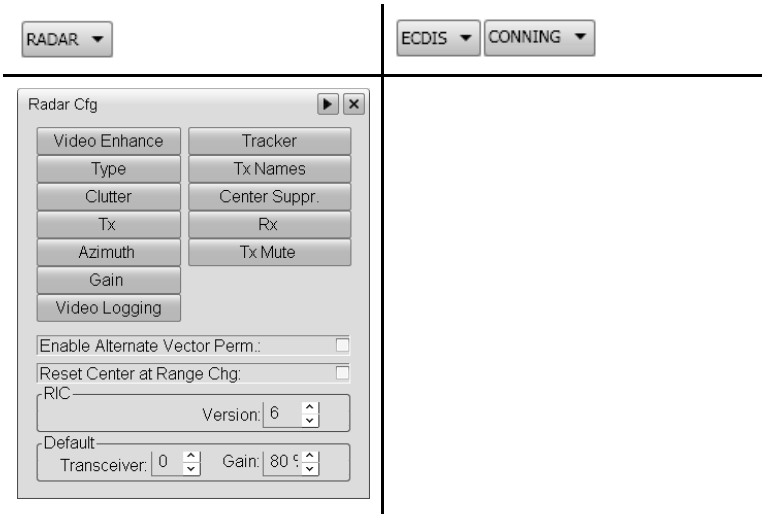
Some of the dialogs for configuring the interfaces between the MFD system and the vessel's sensors (or other peripheral devices) include a **Settings** button. This enables you to set up a network port on which to receive serial data (such as NMEA sentences).

If you click the **Settings** button (in those sensor type dialogs that include it), the dialog that appears will contain the following elements:

- **Port:** Specify the IP port you want to receive the serial data on.
- **Distribute to other consoles:** This option enables incoming messages from the LAN to be sent out again over the LAN to other consoles, using an internal communication protocol. If all the operator stations in your navigation system are connected to the LAN, then only one of them needs to be connected to a serial line: the one that is connected will automatically distribute any data it receives on its serial port to the other consoles on the LAN. The **Distribute to other consoles** option is therefore disabled by default because (for LAN-based navigation systems) there is no need to distribute the serial data again.

  This option takes effect immediately (in other words, before you click the **OK** button).
- **OK:** Click to confirm your changes to the port parameter.
- **Cancel:** Click to cancel your changes to the port parameter.

20.10.10 Radar Configuration



This is the main menu for configuring the radar transceiver that is currently displaying on the screen (when interswitch functionality is present).

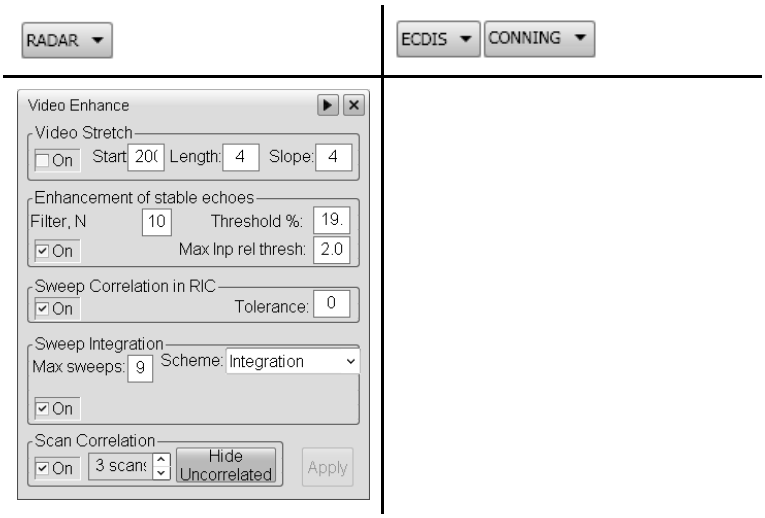
The path to the menu is: **System→Radar Configuration**.

The menu contains the following options:

- **Video Enhance:** Click to alter video enhancement settings. These include sweep and scan correlation, sweep integration, enhancement of stable echoes, and video stretching (see *Video Enhance* on page 643).
- **Tracker:** Click to configure the sensitivity of the radar tracker (see *Tracker* on page 646).
- **Type:** Click to view and configure the type of radar antenna and transceiver (see *Tx Type* on page 647).
- **Tx Names:** Click to configure transceiver names (see *Tx Names* on page 648).
- **Clutter:** Click to configure video clutter parameters (see *Clutter Configuration* on page 649).
- **Center Suppr:** Click to specify the suppression of video at the start of the antenna sweep (see *Center Suppress* on page 652).
- **Tx:** Click to configure radar transmitter parameters (see *Tx Configuration* on page 653).
- **Rx:** Click to configure radar receiver parameters (see *Rx Configuration* on page 654).
- **Azimuth:** Click to configure the antenna's azimuth parameters (see *Azimuth Configuration* on page 655).
- **Tx Mute:** Click to inhibit radar transmission in a specified sector (see *Tx Mute* on page 656).
- **Gain:** Click to configure video gain parameters (see *Gain* on page 657).
- **Enable Alternate Vector Perm.:** When checked, the combinations of either True Motion / relative vector or Relative Motion / true vector are possible.

- **Reset Center at Range Chg:** Select to reset the screen center automatically when changing range.
- **RIC Version:** The version of the firmware on the RIC card for K-Bridge Multi-functional Display Unit. It will be version 6 or later.
- **Default transceiver:** Select transceiver at start-up using the buttons.
- **Default Gain:** Video gain used at start-up. Modify using buttons.

20.10.10.1 Video Enhance



This dialog enables you to configure five different video enhancement facilities:

- Video stretching
- Enhancement of stable echoes
- Sweep correlation
- Sweep integration
- Scan correlation

For background information about these, see *Concepts of video enhancement* on page 743.

The path to this dialog is: **System→Radar Configuration→Video Enhance**.

Video Stretch area:

The elements in this area control video range stretching. When you turn video stretching on, radar echo is stretched in length to make it more visible. Stretching is applied at the specified start range (so as not to clutter the area closes to the own-ship), and will increase gradually with range.

The elements are as follows:

- **On:** Switches video stretching on. It is duplicated by the **Stretch** check box in the Radar menu (see *Radar menu* on page 537).
- **Start:** Specifies a range inside which video stretching will not be applied. The range is measured (in pixels) from the position of the radar antenna. You can specify values from 0 through 510.
- **Length:** Number of pixels by which echoes will be stretched. You can specify values from 0 through 7.
- **Slope:** This value has effect in the range just outside the area with no stretching (specified by the **Start** parameter): at the end of the non-stretched video, video is stretched by one pixel; then, after the number of pixels you specify for the **Slope**

parameter, the video is stretched two pixels; then after the same number of pixels the video is stretched by three pixels; and so on until the full stretch length is reached. You can specify values for the **Slope** parameter from 0 through 255.

Enhancement of stable echoes area:

- **Filter, N Scans:** Sets the number of antenna rotations for the filter. We recommend you set a value in the range 6 through 12.
- **Threshold %:** Specifies the presentation threshold (in percent) for each pixel. When the low pass filter is below the threshold, video will be presented in the normal way (in other words, without enhancement) for the pixel concerned. When video is above the threshold, the enhanced video colour will be shown for the pixel concerned. We recommend you set a value in the range 10% through 40%.
- **On:** Switches the video enhancement facility on. It is duplicated by the Enhance check box in the Radar menu (see *Radar menu* on page 537).
- **Max Inp rel thresh:**) Limits the input to the filter to a maximum level. The value is specified as a number relative to the threshold so that it automatically adapts to changes in the threshold level. The purpose is to restrict the effect of clutter spikes, which can be very strong but unstable. The value you specify must be greater than 1. We recommend a value in the range 1.2 through 1.6.

Sweep Correlation in RIC area:

- **On:** Switches the sweep correlation facility on. It is duplicated by the **Sweep Correlation** check box in the Radar menu (see *Radar menu* on page 537).
- **Tolerance:** The maximum percentage by which a sweep may be higher in amplitude than the previous sweep. We recommend you specify a value that is less than 20.

Sweep Integration area:

- **Max sweeps:** The maximum number of sweeps that may be used for sweep integration. The number is limited both by this setting and by the calculated number of sweeps within the radar beam. This calculation is based on the beam width specified for the vessel (**MENU →System →Radar Configuration →Azimuth**), the measured antenna rotation speed, and the measured pulse repetition frequency. A high number will give more noise reduction but also have a greater “banana effect” on presented targets. You can set the maximum number of sweeps to a value in the range zero (sweep integration off) through 20. Most of the noise reduction effect is achieved with a value of between 5 and 9, depending on the characteristics of the noise.
- **Scheme:** Specify the type of sweep integration required:
  - **Integration:** If you specify this scheme, the average value of all sweeps is used for presentation. This gives the best theoretical improvement of detection capabilities with the most usual noise distribution.
  - **Integration without max:** If you specify this scheme, the sweep with the highest value is removed, and the average value of the remaining sweeps is used for presentation. This may give a better detection under some noise conditions, especially when the noise is mainly spikes.

  - **Integration without 2 max:** If you specify this scheme, the sweeps with the two highest values are removed, and the average value of the remaining sweeps is used for presentation.

- **On:** Switches the sweep integration facility on (it is duplicated by the **Sweep Integration** check box in the Radar menu (see *Radar menu* on page 537). .

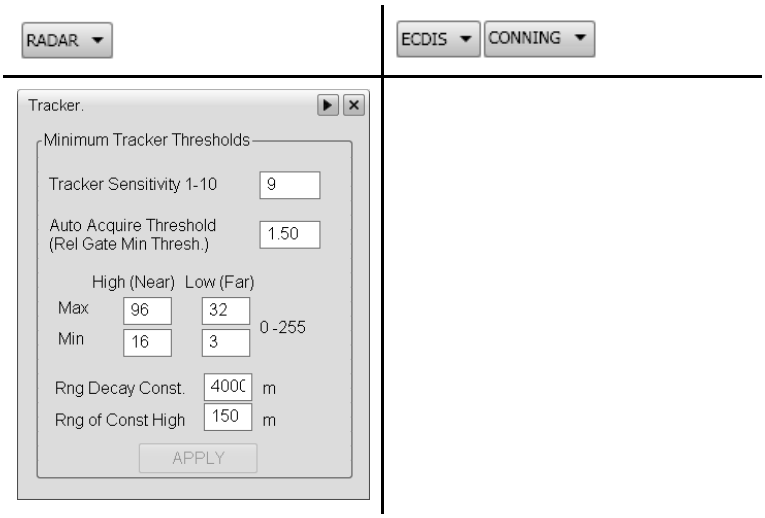
Scan Correlation area:

- **On:** Switches the scan correlation facility on. It is duplicated by the **Scan Correlation** check box in the Radar menu (see *Radar menu* on page 537). By default, this feature is on when you have true trails displayed, and off when you have relative trails displayed. Turn this feature on and off by checking and un-checking the box.
- **Scan number:** Specifies the number of previous rotations to be used in the comparison.
- **Hide uncorrelated:** Click and hold down this button to hide echoes that do not appear in all scans when scan correlation is on. The effect is to clean up the display. To see the echoes again, release the button.

General area:

- **Apply:** Click to apply the video enhancement settings.

20.10.10.2 Tracker



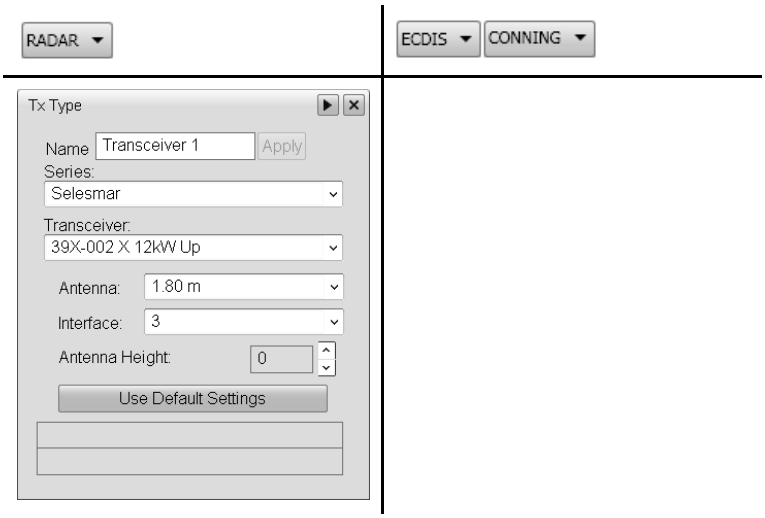
This dialog enables you to set the threshold characteristics for the radar tracker. If the tracker's sensitivity is too high it will be affected by noise and this will impair the tracking of the selected targets. If the tracker's sensitivity is too low, it will easily lose distinct targets. (These parameters are not to be set except by qualified personnel.)

The path to this dialog is: **System→Radar Configuration→Tracker**.

The dialog contains the following elements:

- **Tracker Sensitivity 1-10:** Sets the level of video amplitude to search for when tracking a target. If no echo is found above this level, the target is lost in this scan. This parameter is also found on the **Target** menu (see *Targets menu* on page 380).
- **Auto Acquire Threshold (Rel Gate Min Threshold):** For auto-acquisition, the threshold is set higher than the minimum threshold specified by the **Tracker Sensitivity 1-10** parameter. This parameter is used by the system to determine the threshold for auto-acquisition; higher values reduce the tracker's sensitivity to new targets.
- **High (Near):** Values at close range.
- **Low (Far):** Values at very long ranges.
- **Max:** Thresholds with tracker sensitivity 1.
- **Min:** Thresholds with tracker sensitivity 10.
- **Rng Decay Const:** Specifies the range decay for the transition from high thresholds (near the own-ship) to low thresholds (further from the own-ship).
- **Rng of Const High:** Range close to the own-ship where the thresholds are constant at high levels before decay starts.
- **Apply:** Click to apply the new values.

20.10.10.3 Tx Type



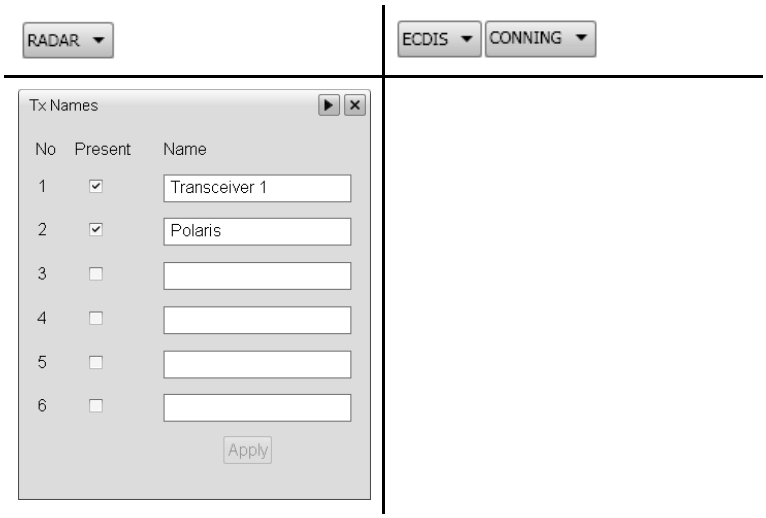
Use this dialog to view or configure the transceiver and antenna type.

The path to the dialog is: **System→Radar Configuration→Type**.

The dialog contains the following elements:

- **Name:** Insert an identifying name here. According to IMO requirements, an X or S, indicating the radar transmitting band, must be included in the identifier.
- **Series:** Different series of transceivers can be used with the K-Bridge Radar. This field specifies the applicable series.
- **Transceiver:** This field further describes the transceiver type within the selected series.
- **Antenna:** Specifies the antenna in use. If there is more than one antenna connected to the selected transceiver, there will be a drop-down list for this option.
- **Interface:** Specifies the interface type for this transceiver (if there is more than one possible interface).
- **Antenna Height:** Insert the antenna's height above sea level.
- **Use Default Settings:** Click to use the default settings (except for Antenna Height) for this transceiver type. Click once and then confirm to apply this change.

20.10.10.4 Tx Names



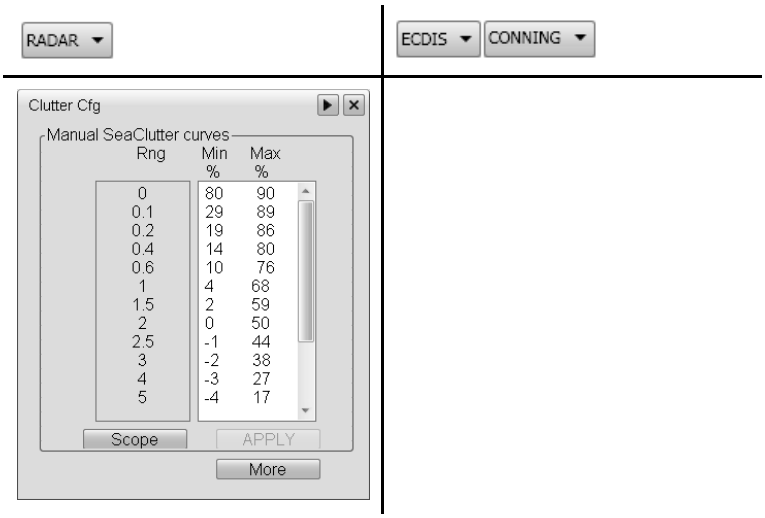
Use this dialog to set the number of radar transceivers connected through the interswitch, and the names used to identify each transceiver.

The path to this dialog is: **System→Radar Configuration→Tx Names**.

The dialog contains the following elements:

- **Present:** Check the box when this transceiver is connected.
- **Name:** Insert an identifying name here. According to IMO requirements, an X or S, indicating the radar transmitting band, must be included in the identifier.
- **Apply:** Click to apply the new names.

20.10.10.5 Clutter Configuration



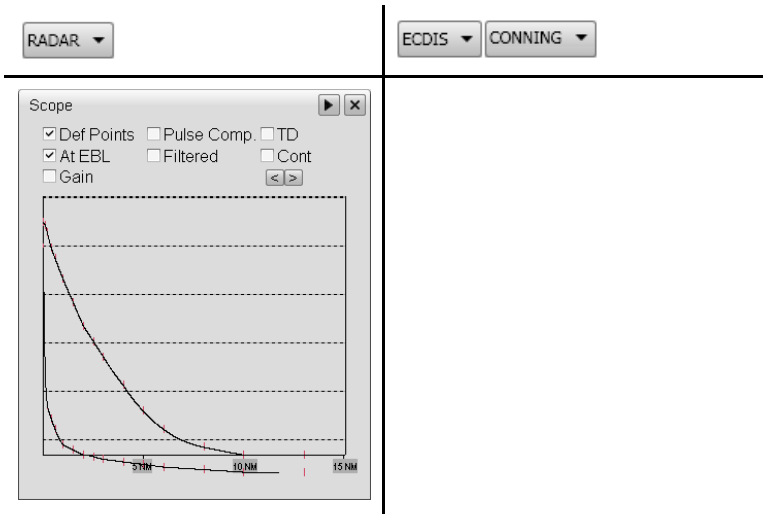
Use this dialog to configure manual anti-sea-clutter control. (This menu is for qualified service personnel only.) Minimum curve is used for the anti sea damping with manual anti sea set to 12. Maximum curve is used for the anti sea damping with manual anti sea set to 99. For anti sea set to less than 12, the minimum curve is scaled accordingly. For anti sea set to more than 12, the damping is found proportionally between the minimum and the maximum curves.

The path to this dialog is: **System→Radar Configuration→Clutter**.

The dialog contains the following elements:

- **Manual SeaClutter curves:** Set the minimum and maximum antisea amplitude the selectable ranges, and the antisea curve is drawn as a smooth curve through these points.
- **Min %:** Sets the anti sea rejection at sea clutter setting 12 in % of full video range.
- **Max %:** Sets the anti sea rejection at sea clutter setting 99 in % of full video range.
- **Apply:** Click to apply the minimum and maximum settings.
- **Scope:** Click the scope button to see the manual sea-clutter curve (see *Scope* on page 650).
- **More:** Click to go to the menu for more clutter and gain parameters (see *Radar Cfg More* on page 651).

20.10.10.5.1 Scope



Use this dialog to view the manual sea-clutter curve. It shows the effect of the manual sea-clutter control, as well as the resulting video after configuration of the gain and clutter controls (in red and green). Any echoes below the manual sea-clutter curve will not appear in the radar video.

The path to the dialog is: **System→Radar Configuration→Clutter→Scope**.

The upper curve displays maximum curve for anti sea clutter at Anti Sea 99. The lower curve displays minimum curve for anti-sea clutter at Anti Sea 10. Third black curve (not shown) displays the selected anti sea clutter with the applied manual anti sea clutter setting.

The dialog contains the following elements:

- **Def. Points:** When selected displays the points defining the curves as short red vertical lines. The curves may be adjusted graphically by dragging these points vertically. During dragging, the damping in % is shown in the lower left of the menu.
- **Pulse Comp.:** The curve starts at the end of the transmission pulse, while the range is from the start. This is compensated for when this is selected.
- **TD:** Sweep through the target which is selected for Target Data presentation.
- **At EBL:** Select to display view in EBL direction, shown in red.
- **Filtered:** Sweep in EBL direction filtered over several rotations. Shown in red
- **Cont:** Resulting view at intervals, shown in Green.
- <: Decrease the range scale.
- >: Increase the range scale.
- **Gain:** Shows the present threshold due to gain setting.

20.10.10.5.2 Radar Cfg More

Use this dialog to configure additional clutter and gain parameters.

The path to this dialog is: **System→Radar Configuration→Clutter→More**.

The dialog contains the following elements:

- **Auto Clutter CFAR Window:** Select the length of the CFAR window used to reduce clutter to the radar target extractor. The normal setting is 64 samples, 200m.
- **Auto Clutter Offset:** Applies an offset to the threshold in Auto Clutter (both Anti Sea and Anti Rain) to decrease the video presented in in clutter.
- **Rel Gain:** Applies an offset to the video into manual rain proportional to the gain, so that the anti rain will start from the same level as gain.
- **Rel Rain:** Applies an offset to video into manual rain, so that even more video is reduced than with just a differentiation. With this control set to more than 0, higher values of anti rain clutter will lead to removal of echoes with softer edges.

20.10.10.6 Center Suppress

Use this dialog to set the suppression of video at the start of each radar sweep.

The path to the dialog is: **System→Radar Configuration→Center Suppr**.

The dialog contains the following elements:

- **Center Suppress:** The range to be suppressed at the start of each sweep.

  The different transmitter pulse lengths are as follows:

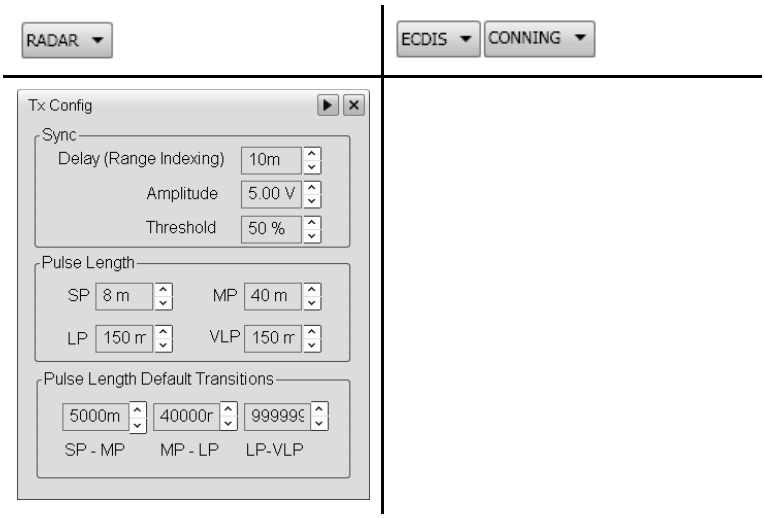
  – **SP:** Set video suppression for short pulses (in meters).

  – **MP:** Set video suppression for medium pulses (in meters)

  – **LP:** Set video suppression for long pulses (in meters).

  – **VLP:** Set video suppression for very long pulses (in meters).

20.10.10.7 Tx Configuration



Use this dialog to set the radar transmitter parameters. Values can only be changed when the K-Bridge Radar is master for the selected transceiver (see *Making the display unit master of the transceiver* on page 107).

The path to this dialog is: **System→Radar Configuration→Tx**.

The dialog contains the following elements:

- **Delay (Range Indexing):** Use this parameter to adjust the range of the radar video.
- **Pulse Length, SP, MP, LP:** Pulse lengths are adjusted separately for short, medium and long pulses.
- **Pulse Length Default Transitions:** Transition between SP and MP, and MP and LP in meters.
- **SP - MP:** Transition from SP to MP; adjust using the up-down controls.
- **MP - LP:** Transition from MP to LP; adjust using the up-down controls.

20.10.10.8 Rx Configuration

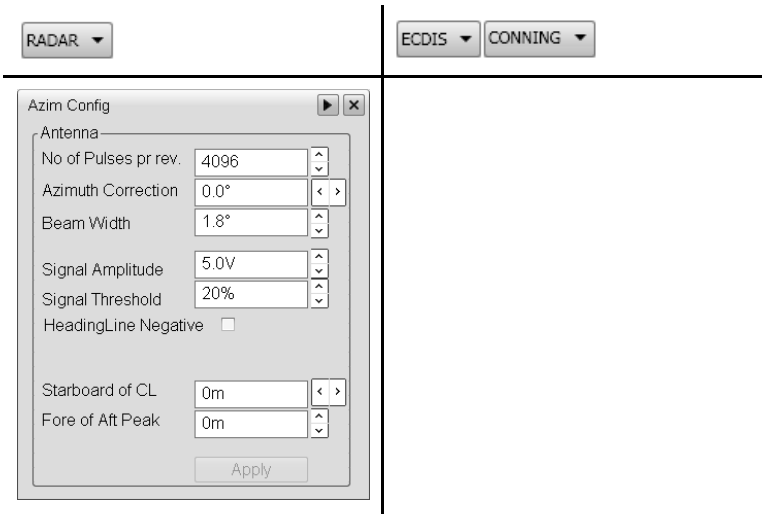
Use this dialog to configure Decca radar receiver parameters. Values can only be changed when the K-Bridge Radar is master for the selected transceiver (see *Making the display unit master of the transceiver* on page 107).

The path to the dialog is: **System→Radar Configuration→Rx**.

The dialog contains the following elements:

- **Ampl.:** The amplitude of the incoming video signal to the interswitch, for short pulse (SP), medium pulse (MP) and long pulse (LP).
- **Offset**: The offset of the incoming video signal to the interswitch, for short pulse (SP), medium pulse (MP) and long pulse (LP).
- **Coarse Tune Setting:** Used to set the operating range for Automatic Tune and Manual Fine Tune (Operator Tuning). Use slider for fast adjustment and spin buttons for fine setting. See commissioning documentation for details.
- **Tune:** Tune indicator to see the effect of Coarse Tune Setting.
- **Apply:** Applies the entered values.
- **Scope:** Click to bring up the **Scope** menu (see *Scope* on page 650).The video curve (with gain set to maximum and clutter rejection off) is used to verify the settings for video amplitude and video offset.

20.10.10.9 Azimuth Configuration



Use this dialog to configure the antenna azimuth. Values can only be changed when the K-Bridge Radar is master for the selected transceiver (see *Making the display unit master of the transceiver* on page 107).

The path to this dialog is: **System→Radar Configuration→Azimuth**.

The dialog contains the following elements:

- **No of Pulses pr rev:** Number of pulses per antenna revolution. For Decca 4096 is the default.
- **Azimuth Correction:** Align the radar with the own-ship's centre line by using the up-down controls.
- **Beam Width:** Horizontal 3dB width of the radar beam (main look).
- **Starboard of CL:** Location of radar antenna.
- **Fore of Aft Peak:** Location of radar antenna.
- **Apply:** Click to apply changes.

20.10.10.10 Tx Mute

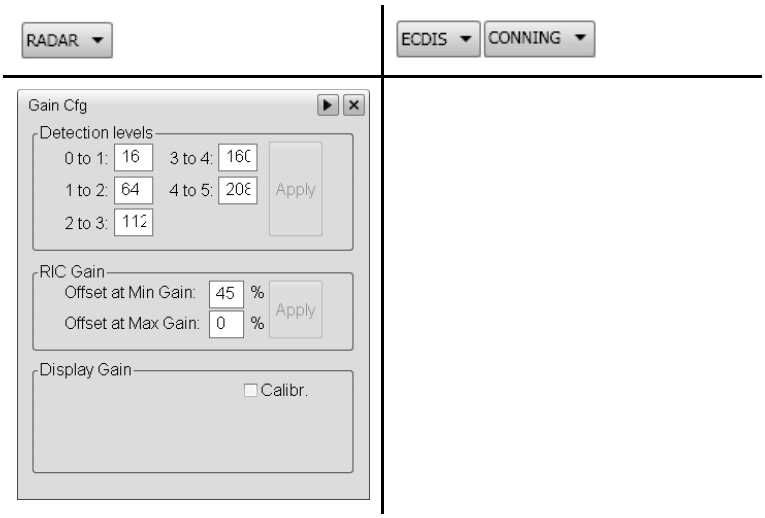
Use this dialog to inhibit radar transmission in a specified sector. Values can only be changed when the K-Bridge Radar is master for the selected transceiver (see *Making the display unit master of the transceiver* on page 107).

The path to this dialog is: **System→Radar Configuration→Tx Mute**.

The dialog contains the following elements:

- **Tx Mute Sector 1/2:**
  - **Active:** Select to switch the mute sector on/off.
  - **Start Bearing:** Relative to the own-ship's heading line.
  - **End Bearing:** Relative to the own-ship's heading line.

20.10.10.11 Gain



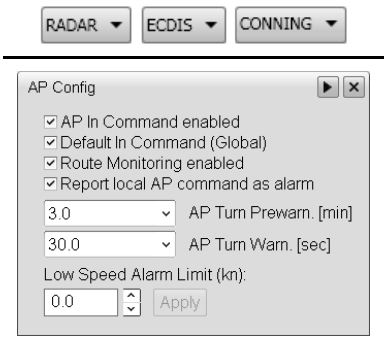
Use this dialog to configure video gain parameters

The path to this dialog is: **System→Radar Configuration→Gain**.

The dialog contains the following elements:

- **Detection Levels:** Sets the video detection levels, i.e. the video strengths used as limits between different video strengths.
- **RIC Gain:** Used to set the meaning of maximum and minimum gain.
- **Calibrate:** Sets offset to 0, gain to 1 and clutter off. Will show the input signal directly in the **STC Curve/Scope** menu.

20.10.11 Autopilot Configuration



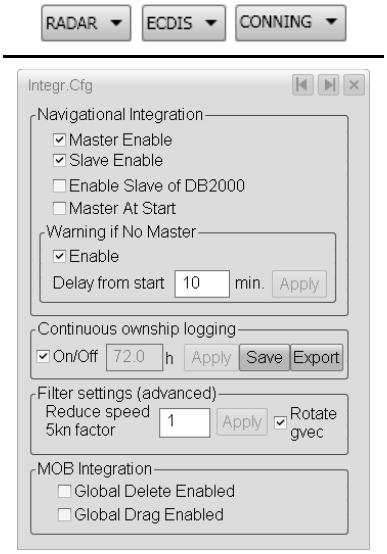
Use this dialog to configure the relationship between the autopilot and the K-Bridge Radar system.

The path to the dialog is: **System→AP Configuration**.

The dialog contains the following elements:

- **AP in Command enabled:** Check to allow autopilot control from this console.
- **Default In Command (Global):** Check the box to make this operator station the one that takes command of the autopilot whenever the vessel's steering system is switched from manual control to autopilot. (For more information, see *Making one console take command of the autopilot by default* on page 249.)
- **Route Monitoring enabled:** Check to allow route monitoring from this console.
- **Report local AP command as alarm**: Check to generate an alarm when the autopilot transitions from Track or Waypoint mode to Heading or Course mode. Such a transition means that command of the steering gear is now “local” to the autopilot, and the following alarm is therefore issued: `ANTS Mode Terminated, WPT/TRACK mode changed to LOCAL by AP!`. If this option is not checked, then no alarm will be issued when the transition occurs but an information-only message will be issued (appearing in the alarms and message area) and a beep sounded. The message will say: `Local Autopilot Command!`
- **AP Turn Prewarn.:** For setting the turn pre-warning alarm time. This is the amount of time before the next WOP (Wheel Over Point) that the turn pre-warning alarm sounds. You can set it to sound at 2, 3, 4 or 5 minutes before the next WOP. The default is 3 minutes.
- **AP Turn Warn.:** For setting the turn warning alarm time. This is the amount of time before the next WOP that the turn warning alarm sounds. You can set it to sound at 30, 45 or 60 seconds before the next WOP. The default is 30 seconds.
- **Low Speed Alarm Limit:** The speed limit below which track steering is not allowed.
- **Apply:** Click to apply the new values.

20.10.12 Integration Configuration



Use this dialog to specify the navigation master console: one of the consoles (it can belong to a K-Bridge Radar or a K-Bridge ECDIS system or to an MFD system) on the network can be defined as the Navigation Master. Then the calculated position, speed, heading and time from this console will be transferred over the LAN and used by all the other consoles on the network. The path to the dialog is: **System→Integration Configuration**. The dialog contains the following options and buttons:

- **Master Enable:** Check this box if this console is to be the master. Typically only the consoles at the front of the bridge have the **Master Enable** option enabled. If **Master Enable** is selected, the check box **Master** will appear in the Own Ship Data dialog (see *Own-ship Data* on page 442).
- **Slave Enable:** Check this box if the console is to receive its navigation data from the master console. Typically, a console that is located away from the front of the bridge, such as a PL10 station, will have its **Slave Enable** option checked and its **Master Enable** option unchecked.
- **Master at Start:** When this option is checked on a console, that console will make itself the navigation master at start-up, transmitting common position, speed, heading and time data to the other K-Bridge consoles. Make sure only one console is configured to be **Master at Start**.
- **Warning if No Master: Enable:** If no navigation master is detected by the console, it can send a warning about this to the other consoles on the network. Check the **Enable** box if you want the console to send such a warning.
- **Delay from start:** The delay in minutes after the console starts up, before it sends a warning that it has detected no navigation master on the network. (It only sends this warning if you have checked the **Enable** option under the label **Warning if no Master**.) The delay specify allows all operator stations to become operational (if they were started at the same time) before the console issues the warning that it has detected no navigation master.
- **Apply:** Click to apply the new values.

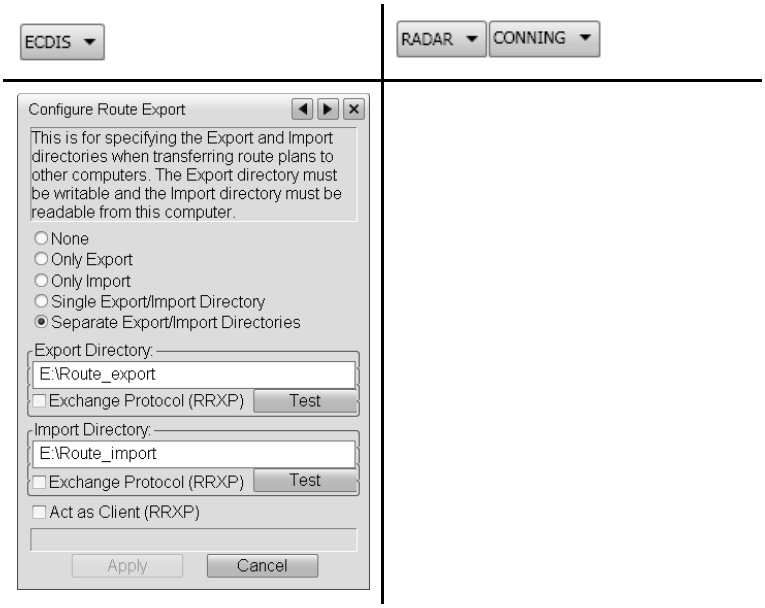
- **(Continuous own-ship logging) On/Off:** When this option is checked, continuous logging of internal system data is switched on. You can specify the number of hours for which data will be stored (before the buffer starts to overwrite previously stored data). The default (which is also the maximum) is 72 hours. Logging must be switch on at all times. Do not un-check this option unless requested by a KM service engineer to switch logging off.
- **Apply:** Click to apply your logging behaviour changes.
- **Save:** Click to save the current contents of the logged data buffer to the hard disk (`C:\radec\logging`). If you need to save the logged data, remember that the buffer overwrites itself after the time period specified in this dialog.
- **Export:** Save the contents of the logged data buffer to an alternative location, for example, a removable media device.
- **(Filter settings (advanced)) Reduce speed 5kn factor:** This parameter reduces the estimate that the filter makes of the speed log's accuracy when speed through water is below 5 kn. The default factor of reduction is 1. Do not change this value unless requested to by a KM service engineer.
- **Apply:** Click to apply any changes you have made to the advanced filter settings.
- **Rotate gvec:** When checked, this option causes the filter to use a particular simplified kinematic vessel model. By default, the setting is checked. Do not un-check it unless requested to by a KM service engineer.
- **(MOB integration): Global Delete Enabled:** Check to enable this operator station to reflect the deletion of a Man Over Board (MOB) event symbol by another operator station. By default the setting is checked.

  (To delete a MOB symbol on your screen, right-click over it and select **Delete**.)
- **Global Drag Enabled:** Check to enable this operator station to reflect the moving (dragging) of a Man Over Board (MOB) event symbol by another operator station. By default the setting is checked.

  (To be able to drag a MOB symbol on your screen, you must first right-click over it and select **Edit**. You can then drag it with the trackball.)

For more information about using this dialog, see *Making one console the navigation master* on page 130.

20.10.13 Configure Route Export



Use this dialog to configure the system to export and import route plans to and from other systems.

The path to the dialog is: **System→Route Export Configuration**.

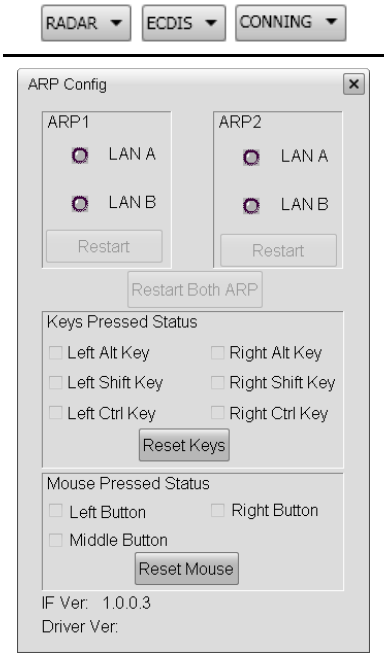
For information about how to perform the import and export procedures, see *Importing and exporting route information* on page 242.

This dialog contains the following elements:

- **None:** Select to prevent any importing or exporting of route plans from and to other systems.
- **Only Export:** Select if you want to permit the system to export route plans but not import them.
- **Only Import:** Select if you want to permit the system to import route plans but not export them.
- **Single Export/Import Directory:** Select if you want to use the same directory for both importing and exporting route plans.
- **Separate Export/Import Directory:** Select if you want to use different directories for importing and exporting route plans.
- **Export Directory:** Specify the directory to which you want to export route plans. (You can specify a directory on a USB memory stick, for example.) If you specify a directory on an external computer system, both that computer system and the one you are exporting from must be connected to the Local Area Network. The console you are exporting from must have read-write access to the export (target) directory on the external computer system.
- **Exchange Protocol (RRXP):** Select if you are using the RRXP exchange protocol (see *The implementation of the RRXP exchange process* on page 243) instead of a straightforward file copy.
- **Test:** Click to check whether the system is able to access the export directory.

- **Import Directory:** Specify the directory from which you want to import route plans. (You can specify a directory on a USB memory stick, for example.) If you specify a directory on an external computer system, both that computer system and the one you are importing to must be connected to the Local Area Network. The computer you are importing to must also have read access to the source directory on the external computer system.
- **Exchange Protocol (RRXP):** Select if you are using the RRXP exchange protocol (see *The implementation of the RRXP exchange process* on page 243) instead of a straightforward file copy.
- **Test:** Click to check whether the system is able to access the import directory.
- **Act as Client (RRXP):** Select to make this console the "client" in relation to the external system that it is exporting to or importing from.
- **Apply:** Click to save your configuration. The directories you specify will be used as the source and target locations when you import or export route plans.
- **Cancel:** Click to cancel your changes.

20.10.14 ARP (Arm Rest Panel) Configuration



This dialog concerns Arm Rest Panels that have a keyboard and/or mouse directly connected to them.

The Arm Rest Panels (if installed) enable you to use the main radar and ECDIS functions available on an operator station without leaving your seat. If a mouse and keyboard are connected to the arm rest panel, you can use these to navigate the user interface of an operator station remotely and enter input data to it.

This dialog enables you to reset the operator station's internal data concerning the panel-attached keyboard and mouse buttons. (It is provided because the operator station can occasionally fail to register that certain keyboard keys or mouse buttons have been released after they were pressed.)

Before using the dialog, make sure that nothing is physically preventing the release of any keys on a keyboard or any buttons on a mouse that is connected to an Arm Rest Panel (make sure also that no keys/buttons on the operator station's own keyboard/mouse are currently pressed).

The dialog contains a checkbox for the left, right and middle buttons on a mouse and for six keys on a keyboard (the left and right **Ctrl**, **Shift**, and **Alt** keys). If any of the checkboxes are checked and no keys or mouse buttons have been intentionally pressed, use the **Reset Keys** and **Reset Mouse** button to reset the operator station's internal data concerning the keyboards and mouse devices connected to it (both those connected locally and those connected remotely through an Arm Rest Panel).

You can also use the dialog to check the LAN communication between the operator station you are using and up to two Arm Rest Panels.

The path to the dialog through the menu system is: **System→ARP Configuration**.

The dialog contains the following indicators and buttons:

ARP1/2

- **LAN A/B:** LAN function indicators.
  - Green indicates that LAN communication between the operator station and the Arm Rest Panel is OK.
  - Red indicates that LAN communication has failed between the operator station and the Arm Rest Panel.
- **Restart:** Click to restart the Arm Rest Panel (ARP1 or ARP2).
- **Restart Both ARP:** Click to restart both Arm Rest Panels.

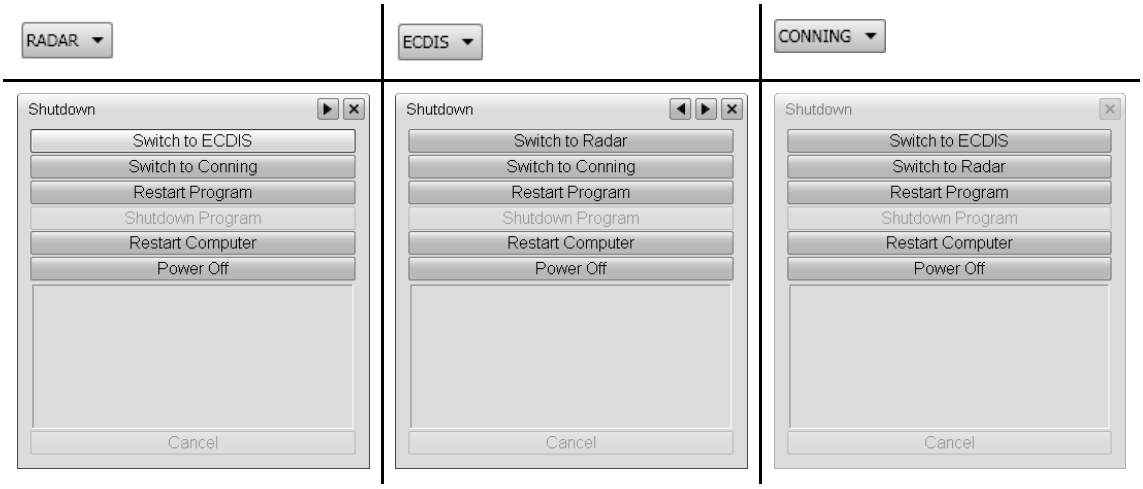
Keys Pressed Status

- **Left/Right Alt Key:** If an **Alt key** box is checked, press **Reset Keys** to reset the keyboard for both panels.
- **Left/Right Shift Key:** If a **Shift key** box is checked, press **Reset Keys** to reset the keyboard for both panels.
- **Left/Right Ctrl Key:** If a **Ctrl key** box is checked, press **Reset Keys** to reset the keyboard for both panels.

Mouse Pressed Status

- **Left Button:** If this box is checked, press **Reset Mouse** to reset the mouse for both panels.
- **Right Button:** If this box is checked, press **Reset Mouse** to reset the mouse for both panels.
- **Middle Button:** If this box is checked, press **Reset Mouse** to reset the mouse for both panels.

20.10.15 Shutdown



Use this menu to perform different switching, restarting and power-off operations.

The path to the menu through the menu system is: **System→Shutdown**.

It contains some or all of the following buttons, depending on the application you view it from:

- **Switch to ECDIS/Radar/Conning:** Click twice to switch to the application you require.
- **Restart Program:** Click twice to restart the MFD program (including the ECDIS, Radar and Conning applications).
- **Shutdown Program:** Click twice to shut down the MFD program (including the ECDIS, Radar and Conning applications).
- **Restart Computer:** Click twice to stop the MFD program (including the ECDIS, Radar and Conning applications) and restart the entire computer.
- **Power Off:** Click twice to stop all programs and remove power to the computer.
- **Cancel:** Use this button if you have clicked once on one of the other buttons in this dialog and then changed your mind. Clicking **Cancel** cancels the first click on one of the other buttons.

Note

*The buttons in this menu (except for the **Cancel** button) require a second click before they take effect. When you make the first click a confirmation prompt appears in the dialog's text window.*

Appendix A
Alerts and Operator Messages

This section contains the following topics:

A.1 Introduction

This appendix lists and describes the alerts that are generated by the K-Bridge navigation system, including the operator stations, the SINT (Sensor Integrator), the autopilot and the speedpilot.

It also lists the operator messages that can appear at the top of the range panel in the Radar and ECDIS applications (see *Radar dashboard: the operator message field* on page 78 and *ECDIS range panel: operator message the field* on page 88).

A.2 The MFD's behaviour in response to different priorities of alert

Alarm priority alerts

A new alarm priority alert will cause the following events to continue until the alert is acknowledged:

- Flashing (red) of the relevant alert group button (see *Top bar: the alert area* on page 60); once the alert has been acknowledged, the button will remain a constant red as long any acknowledged alarm priority alerts remain uncleared (and there are no new unacknowledged alarm priority alerts)
- Initiation of the BNWAS alarm sequence if the alarm's category of severity is A (see *The BNWAS alarm sequence* on page 276)
- Transmission of the alarm sound
- Flashing of the **ALARM** lamp on the operator panel (see *The Alarms group* on page 39); once the alert has been acknowledged, the lamp will remain a constant red as long any acknowledged alarm priority alerts remain uncleared (and there are no new unacknowledged ones)

Warning priority alerts

A new warning priority alert will cause the following events to continue until the warning is acknowledged:

- Flashing (yellow) of the relevant alert group button (see *Top bar: the alert area* on page 60); once the warning has been acknowledged, the alert group button will remain a constant yellow as long any acknowledged warning priority alerts remain uncleared (and there are no new unacknowledged ones)
- The transmission of a beep if the operator station has been configured to give a beep when a warning is received
- The flashing of the **ALARM** lamp on the operator panel (see *The Alarms group* on page 39); once the warning has been acknowledged, the lamp will remain a constant red as long any acknowledged warning priority alerts remain uncleared (and there are no new unacknowledged ones)

Caution priority alerts

A new caution priority alert will be automatically acknowledged by the operator station that generates it. Therefore it will never appear on the top bar or in the list of unacknowledged alerts (see *The Unacknowledged alerts button* on page 69). Similarly it will not cause the top bar button for the relevant alert group to flash, because only unacknowledged alerts cause this to happen.

For more information about alert priorities, see *The Alert priority button* on page 66.

A.3 Navigation system alerts

This section lists the navigation system alerts. For each alert, the following information is given:

- **Alert Message:** The text that appears in the alert area on the top bar (see *Top bar: the alert area* on page 60).
- **Alert Description:** The text that appears in the Alert Group dialog (see *The Alert list dialogs* on page 70).
- **Cause:** Possible causes of the alert condition.
- **Action:** Suggestions for solving the problem.
- **Priority:** Whether the alert is an alarm, warning or caution (plus its category of severity, A, B or C).

Message: Active gyro changed
Description: Active gyro changed, gyro n
Priority: Caution (category B)

Possible cause:	An automatic switchover from one gyro to another has been performed.
Acknowledge from:	No manual acknowledgement required (cautions are automatically acknowledged when generated).
Suggested action:	Check the gyro that appears to have failed.

Message: Active position sensor changed
Description: Active position sensor changed, position sensor n
Priority: Caution (category B)

Possible cause:	An automatic switchover from one position sensor to another has been performed.
Acknowledge from:	No manual acknowledgement required (cautions are automatically acknowledged when generated).
Suggested action:	Check the position sensor that appears to have failed.

Message: AIS alert
Description: AIS alert
Priority: Warning (category B)

Possible cause:	Alert received from the AIS.
Acknowledge from:	Any K-Bridge operator station from which it is possible to control the AIS system.
Suggested action:	Check the AIS for failures.

Message: AIS functionality switched off
Description: AIS functionality switched off
Priority: Warning (category B)

Possible cause:	Position calculation has been performed using dead-reckoning for 10 minutes. AIS functionality on the operator station has been switched off.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the position sensor.

Message: AIS safety message received
Description: AIS safety message received
Priority: Warning (category B)

Possible cause:	A safety message was received from the AIS system.
Acknowledge from:	Any K-Bridge operator station from which it is possible to control the AIS system.
Suggested action:	Read the AIS safety message and take appropriate action.

AIS target capacity
Description: AIS target capacity is at 90%: only nearest targets presented
Priority: Caution (category B)

Possible cause:	The number of AIS targets is about to exceed the capacity of the system. More distant AIS targets will be ignored.
Acknowledge from:	No manual acknowledgement required (cautions are automatically acknowledged when generated).
Suggested action:	Do not rely on the automatic detection of AIS targets.

Message: Anchor watch limit exceeded
Description: Anchor watch limit exceeded
Priority: Alarm (category B)

Possible cause:	The own-ship has activated the anchor watch facility, and the distance from the given anchorage point has exceeded the anchor watch limit.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Acknowledge the alert.

Message: ANTS mode terminated
Description: ANTS stopped, AP comm fail
Priority: Alarm (category B)

Possible cause:	An autopilot is configured and a route is being monitored, but the autopilot has not sent a communication message for the last 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check if the autopilot is functioning. **2** Revert to manual steering if necessary.

Message: ANTS mode terminated
Description: ANTS stopped, AP insufficient data
Priority: Alarm (category B)

Possible cause:	The autopilot has terminated track steering after receiving incorrect or incomplete data.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the connections between the autopilot and the sensors. **2** Check the connections between the autopilot and the commanding operator station. **3** Revert to manual steering if necessary.

Message: ANTS mode terminated
Description: ANTS stopped, AP sail data internal error
Priority: Alarm (category B)

Possible cause:	The autopilot has encountered an unexplained error.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try re-engaging track steering. **2** Revert to manual steering if necessary.

Message: ANTS mode terminated
Description: ANTS stopped, commanding DCU stopped
Priority: Alarm (category B)

Possible cause:	The operator station that was in command of the autopilot has shut down.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Engage track steering from another operator station.

Message: ANTS mode terminated
Description: ANTS stopped, ECDIS or conning missing
Priority: Alarm (category B)

Possible cause:	The autopilot has terminated track steering because it has detected that there is either no ECDIS or no Conning station currently active on the bridge.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Activate an ECDIS or Conning station (as applicable). **2** Re-engage track steering

Message: ANTS mode terminated
Description: ANTS stopped, hdg input failure
Priority: Alarm (category B)

Possible cause:	The input from the heading sensor has failed. The radar or ECDIS has aborted control of the autopilot, which is now under local control. The autopilot will maintain the heading it was keeping just before track steering was terminated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Select another heading sensor. **2** Re-engage track steering

Message: ANTS mode terminated
Description: ANTS stopped, pos input failure
Priority: Alarm (category B)

Possible cause:	Input from the position sensor has failed. The radar or ECDIS has relinquished control of the autopilot.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Select another position sensor. **2** Re-engage track steering

Message: ANTS mode terminated
Description: ANTS stopped, position jump
Priority: Alarm (category B)

Possible cause:	The autopilot has terminated track steering because there has been an input jump. An input jump means that the deviation between the actual input and the expected input (based on the filtered position readings) exceeds the alarm limit for the selected position sensor (see *Position sensor details* on page 623).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	XTD jumps normally occur because of position jumps. Check the GPS and the ship's position on the chart for position jumps.

Message: ANTS mode terminated
Description: ANTS stopped, route End
Priority: Alarm (category B)

Possible cause:	The radar or ECDIS has been in command of the autopilot, and the last waypoint in the monitored route has been passed. The radar or ECDIS has relinquished control of the autopilot.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Select another route to monitor. **2** Re-engage track steering

Message: ANTS mode terminated
Description: ANTS stopped, spd input failure
Priority: Alarm (category B)

Possible cause:	The radar or ECDIS station has been in command of the autopilot; a Route is being monitored. The steering mode is either Track or Waypoint. Input from the speed sensor has failed. The radar or ECDIS has aborted control of the autopilot, which is now under local control.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Select another speed sensor. **2** Re-engage track steering

Message: ANTS mode terminated
Description: ANTS Stopped, track mode changed to local by AP
Priority: Alarm (category B)

Possible cause:	Someone on the bridge has switched command of the autopilot from an operator station to the small K-AP operator panel. This has caused the autopilot to terminate track steering.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	You can re-engage track steering from the operator panel or take command again at an operator station and re-engage track steering from there.

Message: ANTS mode terminated
Description: ANTS stopped, track not allowed using selected position sensor
Priority: Alarm (category B)

Possible cause:	The selected position sensor is not accurate enough to be used for track steering.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another position sensor.

Message: ANTS mode terminated
Description: ANTS stopped, XTD jmp
Priority: Alarm (category B)

Possible cause:	The radar or ECDIS has been in command of the autopilot, and there has been a sharp increase in the XTD. The radar or ECDIS has aborted control of the autopilot, which is now under local control.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	XTD jumps normally happen as a result of jumps in the GPS readings. Check the GPS for position jumps.

Message: AP course/hdg/waypoint mode terminated
Description: AP course/hdg/waypoint mode terminated
Priority: Alarm (category B)

Possible cause:	Input from a heading, speed or position sensor (as applicable) has failed. The radar or ECDIS has aborted control of the autopilot, which is now under local control.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Select another heading, speed or position sensor (as applicable). **2** Re-engage the autopilot in the required operating mode.

Message: AP turn pre-alert
Description: Ship will turn in nn min
Priority: Alarm (category A)

Possible cause:	A route is being monitored, and radar or ECDIS is in command of the autopilot. Track steering is in operation (or was when the alert was issued). There are nn minutes till the ship begins its turn. (This alarm will be succeeded by an “AP turn” alarm.)
Acknowledge from:	If the autopilot is: • In track steering mode, you can acknowledge the alert from any K-Bridge operator station that is currently in command of the autopilot. • Not in track steering mode anymore but you are monitoring a route, you can acknowledge the alert from any K-Bridge operator station that does not currently have the ECDIS browse facility activated (for browsing away from the vessel on the chart).

	If you are not monitoring a route, you can acknowledge the alert from any K-Bridge operator station.
Suggested action:	Check that your planned route is safe.

Message: AP turn pre-alert
Description: WOP will be passed in nn Min
Priority: Warning (category A)

Possible cause:	A route is being monitored, and radar or ECDIS is in command of the autopilot. The steering mode is WP (Waypoint), CRS (Course), or HDG (Heading). There are nn minutes till the Wheel-over Point is reached. (This warning will be succeeded by an "AP turn" warning.)
Acknowledge from:	If the autopilot is: • In WP, CRS, or HDG mode, you can acknowledge the alert from any K-Bridge operator station that is currently in command of the autopilot. • Not in WP, CRS, or HDG mode anymore but you are monitoring a route, you can acknowledge the alert from any K-Bridge operator station that does not currently have the ECDIS browse facility activated (for browsing away from the vessel on the chart). If you are not monitoring a route, you can acknowledge the alert from any K-Bridge operator station.
Suggested action:	Check that your planned route is safe.

Message: AP turn
Description: Ship will turn in nn Sec
Priority: Alarm (category A)

Possible cause:	A route is being monitored. Radar or ECDIS is in command of the autopilot. Track steering is in operation. There are nn seconds till the ship begins its turn.
Acknowledge from:	If the autopilot is: • In track steering mode, you can acknowledge the alert from any K-Bridge operator station that is currently in command of the autopilot. • Not in track steering mode anymore but you are monitoring a route, you can acknowledge the alert from any K-Bridge operator station that does not currently have the ECDIS browse facility activated (for browsing away from the vessel on the chart).

	If you are not monitoring a route, you can acknowledge the alert from any K-Bridge operator station.
Suggested action:	Check if it is safe to turn, and, if it is, then allow the autopilot to proceed with the turn.

Message: AP turn
Description: WOP will be passed in nn Sec
Priority: Warning (category A)

Possible cause:	A route is being monitored. Radar or ECDIS is in command of the autopilot. The steering mode is WP (Waypoint), CRS (Course), or HDG (Heading). There are nn seconds till the Wheel-over Point is reached.
Acknowledge from:	If the autopilot is: • In WP, CRS, or HDG mode, you can acknowledge the alert from any K-Bridge operator station that is currently in command of the autopilot. • Not in WP, CRS, or HDG mode anymore, you can acknowledge the alert from any K-Bridge operator station that is monitoring the route and is not using the ECDIS browse facility (for browsing away from the vessel on the chart). If you are not monitoring a route, you can acknowledge the alert from any K-Bridge operator station.
Suggested action:	Check the planned course, and, if it is safe to do so, proceed with the turn. To execute the turn you must send new orders to the autopilot manually (for example, by using the heading wheel).

Message: Area
Description: Area
Priority: Warning (category A)

Possible cause:	The own-ship is near to a caution area.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Take action to avoid the specific danger associated with the caution area.

Message: Auto Acq off, few free targets
Description: Auto Acq switched off, few free targets
Priority: Warning (category A)

Possible cause:	There are fewer than five free targets in the target table. Auto-acquisition is switched off.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Remove targets that are no longer of interest. If required adjust the auto-acquisition area and/or the tracker sensitivity, and restart the auto-acquisition.

Message: Autopilot change steering mode
Description: Autopilot change steering mode
Priority: Alarm (category B)
Acknowledge from: any K-Bridge operator station

Possible cause:	This alert will be preceded by a "SINT gyro compass switch" alert. It means that the Grounding Avoidance System has detected that the heading sensor was failing and has triggered the selection of another heading sensor.
Suggested action:	If you are currently using track steering, track steering will continue uninterrupted by the system. However, you need to come out of track steering and check the operation of the new gyro before re-engaging track steering.

Message: Autopilot check system
Description: Autopilot check system
Priority: Warning (category B)

Possible cause:	Control of the vessel's steering gear has been switched from automatic to manual and then back to automatic within less than 5 seconds. This warning can be the result of a loose connection in the mode selector switch.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If the switch between steering modes was performed intentionally, just acknowledge the alarm and take no action. Otherwise, check the connection in the steering control system's mode selector switch.

Message: Autopilot comm. fail
Description: Autopilot comm. fail
Priority: Warning (category B)

Possible cause:	The Nav OS has not received any serial input from the autopilot controller in the SINT for at least 5 seconds. This may indicate that the autopilot controller is malfunctioning, a communication link is broken, or the communication hardware in the SINT is malfunctioning. This alarm is generated when the Nav OS detects a serial communication failure between the autopilot and the Nav OS. The serial communication might be over a physical serial connection or a virtual serial connection that uses the LAN.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try taking command of the autopilot from another Nav OS. **2** Check that the configuration of the autopilot sensor input is correct (select **System→Sensor Configuration→Autopilot→Details**). To perform this check, you need to use the service password. **3** Check whether the text field at the bottom of the Autopilot Mode dialog (**Route→Autopilot Mode**) contains the alarm message `!! Autopilot Comm. Fail !!`. If it does, this is evidence that there is no serial communication between the operator station and the autopilot. **4** Check the operation of the other Nav OSes. If the Autopilot Mode dialog on any other operator stations also contains the alarm message `!! Autopilot Comm. Fail !!`, then it is likely that there is a problem with the Local Area Network (LAN). If any K-Bridge operator station on the LAN has hung or is operating slowly, this could be causing a network traffic jam that is blocking the LAN-based serial communication between the OS that is in command and the autopilot. **5** Restart any K-Bridge operator stations that have hung or are operating slowly. **6** If your Nav OS is no longer in command of the autopilot, switch the vessel's steering control system to manual steering. **7** Restart the SINT.

Message: Autopilot communication failure
Description: Autopilot communication failure
Priority: Warning (category B)

Possible cause:	The Nav OS has not received any OPC signal from the autopilot controller in the SINT for at least 5 seconds. This may indicate that the autopilot controller is malfunctioning, a communication link is broken, or the communication hardware in the SINT is malfunctioning. This alarm is generated when the Nav OS detects a failure of communication using the OPC protocol between the autopilot and the Nav OS. The OPC protocol is used to pass configuration parameters – but not control commands – from the Nav OS to the autopilot (control commands are sent over a serial connection).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try taking command of the autopilot from another Nav OS. **2** Check that the fields of the Autopilot Panel dialog (**Route→Autopilot Panel**) contain valid data and not a series of star characters (****). If the dialog fields contain star characters, this is further evidence that there is no OPC communication between the operator station and the autopilot. **3** Check the operation of the other Nav OSes. If the Autopilot Panel dialog on another (or on more than one other) operator station also displays star characters (****), then it is likely that there is a problem with the Local Area Network (LAN). If any K-Bridge operator station on the LAN has hung or appears to be operating slowly, this could be causing a network traffic jam that is blocking the OPC communication between the Nav OS that is in command and the autopilot. **4** Restart any K-Bridge operator stations that have hung or are operating slowly. **5** If your Nav OS is no longer in command of the autopilot, switch the vessel's steering control system to manual steering. **6** Restart the SINT.

Message: Autopilot compass difference
Description: Autopilot compass difference
Priority: Alarm (category A)

Possible cause:	The difference between the heading on the main and monitoring compasses is greater than permitted. If one of the compasses is magnetic, this alarm is likely to have been caused by a change in its magnetic deviation. Alternatively it could be caused by transient reading differences due to yawing. The most serious possible cause is the failure of one of the compasses.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check that the heading **Compass Difference Limit** is set correctly (select: **Route→Autopilot Panel→Autopilot Setup→User (tab)**). **2** If both the main and monitoring compasses seem to be functioning correctly, try varying the combination of values for the **Compass Difference Limit** and the secondary **Compass Offset**.

Message: Autopilot configuration error
Description: Autopilot configuration error
Priority: Alarm (category B)

Possible cause:	One or more configuration parameters are invalid.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the parameter settings.

Message: Autopilot data logging fail
Description: Autopilot data logging fail
Priority: Warning (category B)

Possible cause:	The autopilot controller's internal data logging has failed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try restarting the SINT. **2** Then restart data logging by opening the Autopilot Panel, selecting the Service Parameters tab, and selecting the 1=TSF option in the logging list box.

Message: Autopilot data logging started
Description: Autopilot data logging started
Priority: Warning (category B)

Possible cause:	The autopilot controller's internal data logging has been started.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Continue normal operation. **2** If an abnormal situation occurs, collect all the log files by opening the Autopilot Panel and pressing the **Save** button (this enables you to save the files to a USB stick).

Message: Autopilot data logging stopped
Description: Autopilot data logging stopped
Priority: Warning (category B)

Possible cause:	The autopilot controller's internal data logging has been stopped.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Continue normal operation but be aware that no data inputs or outputs from the autopilot are now being logged. If an abnormal situation occurs, you will have no history of it. **2** You can start logging again by opening the Autopilot Panel, selecting the Service Parameters tab, and selecting the 1=TSF option in the logging list box.

Message: Autopilot ground log
Description: Autopilot ground log
Priority: Alarm (category B)

Possible cause:	The autopilot controller is receiving no data from the ground speed log. If the autopilot's **Ground Log** parameter (**Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**) is set to **NAV**, then the autopilot receives its ground speed log input from the Nav OS. Therefore, if the autopilot ever loses communication with the Nav OS, the `Autopilot ground log` alert will be generated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the ground speed log sensor and its network connection. **2** If the failure occurred while the autopilot was performing automated track steering, check the setup of the operator station.

	3 Check that the autopilot's **Ground Log** parameter has been set correctly (select: **Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**).

Message: Autopilot invalid nav data
Description: Autopilot invalid nav data
Priority: Alarm (category B)

Possible cause:	The autopilot controller (in the SINT) is not receiving valid data from the operator station. This usually means there is a problem either with the Nav OS or the with the network operating between the Nav OS and the autopilot controller.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the operator station setup. **2** Check the network. **3** If the failure persists, use another operator station to control the autopilot. **4** Restart the operator station and try using it again to control the autopilot.

Message: Autopilot main compass
Description: Autopilot main compass
Priority: Alarm (category B)

Possible cause:	Data from the main compass is not being received by the autopilot controller. This indicates a malfunctioning main compass or loss of communication between the autopilot and the main compass. This failure message will be followed by a “Switch to Manual Steering” message.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Switch to manual steering. **2** Check the main compass and the cable connected to it. **3** Select an alternative main compass. **4** Try restarting the SINT. **5** If the problem remains, do not use the autopilot.

Message: Autopilot monitor compass
Description: Autopilot monitor compass
Priority: Alarm (category A)

Possible cause:	Data from the secondary compass is not being received by the autopilot controller in the SINT. This indicates a malfunctioning secondary compass or loss of communication between the autopilot and the secondary compass.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Switch to manual steering. **2** Check the secondary compass and the cable connected to it. **3** Select an alternative secondary compass.

Message: Autopilot new waypoint
Description: Autopilot new waypoint
Priority: Warning (category B)

Possible cause:	The vessel is approaching a waypoint. The autopilot is operating in track mode. The vessel will turn as commanded by the Nav OS in 30 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Prepare for the vessel to turn in 30 seconds.

Message: Autopilot no nav comm
Description: Autopilot no nav comm
Priority: Alarm (category B)

Possible cause:	The operator station has lost contact with the autopilot controller in the SINT. This may indicate that the autopilot controller is malfunctioning, that a communication link is broken, or that the communication hardware in the SINT is malfunctioning.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try taking command of the autopilot from another operator station. **2** Switch the vessel's steering control system to manual steering.

Message: Autopilot no panel in command
Description: Autopilot no panel in command
Priority: Alarm (category B)

Possible cause:	No operator panel is in command of the autopilot.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Take command at an autopilot panel or a Nav OS.

Message: Autopilot off course
Description: Autopilot off course
Priority: Alarm (category A)

Possible cause:	The difference between the vessel's heading and its current set-point exceeds the **Off Course Limit**.
Acknowledge from:	You can acknowledge this alert from any K-Bridge operator station that is in command of the autopilot and is not using the ECDIS browse facility (for browsing away from the vessel on the chart).
Suggested action:	**1** Check the accuracy of the vessel's compasses, speed log, and rudder feedback. **2** Make sure the vessel's steering gear is functioning properly. **3** Check that the **Off Course Limit** parameter is set correctly for the waters you are sailing in (select: **Route→Autopilot Panel→Autopilot Setup→User (tab)**). **4** If the warning comes up frequently, it is probably caused by wave disturbance: **a** If you are using the autopilot's **Economy** mode (set in the Autopilot Panel dialog), try **Precision** mode. **b** If the user setup parameter **Wave Filtering** (in the User tab) is **ON**, try setting it to **OFF**. **c** If the autopilot is steering inappropriately in rougher waters, you may need to perform the sea-trial procedure again. For instructions about performing the sea trial, refer to the *K-Bridge Autopilot Operator Manual*.

Message: Autopilot panel no. n no contact
Description: Autopilot panel no. n no contact
Priority: Alarm (category B)

Possible cause:	The autopilot panel no. *n* is no longer reporting its presence on the network. Check if the panel is powered and if it is responsive.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check if the panel is powered and if it is responsive.

Message: Autopilot parameters need to be saved
Description: Autopilot parameters need to be saved. Check dockside setup
Priority: Warning (category B)

Possible cause:	This message appears if the autopilot's master parameters have been reset and the autopilot is now performing a sea-trial to find new adaptation parameters for the ship. The performance of the autopilot may vary or not be optimal until the sea trial is finished.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Since there is no 'auto-save' functionality, if you perform a sea-trial or master reset you must manually save the new current settings frequently during the sea-trial procedure and also once when the sea trial is finished. To save the parameters during the sea trial or when the sea trial has finished: **1** Open Dockside Setup tab in the Autopilot Setup dialog (select: **Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**). **2** Select the current active parameter set. **3** Click **Save**. The current active parameter set is then shown in the Autopilot Panel dialog. This warning will disappear when the sea trial is finished and the **Seatrial** parameter in the Autopilot Setup dialog's **Seatrial** tab is showing 0000. Note *During the sea-trial the ship must sail at +/- 80 percent of the service speed (specified in the Autopilot Setup dailog's Master tab).*

	If the autopilot parameters have not been saved correctly and you restart the autopilot, you might find that it does not perform as expected. In this case, try reloading the parameter set named **Seatrial** and saving it as the current parameter set (you can call it, for example, 'Operation'). You can also try doing this if you simply want to undo recent changes to the parameters or if you want to avoid performing a full sea-trial procedure. If you ever perform a master reset (or simply over-write the **Seatrial** parameter set) by mistake, then you must perform a full sea-trial procedure, saving the new parameter settings both during the procedure and after it. If you cannot perform the sea trial yourself, contact Kongsberg Maritime customer services. (For instructions about performing the sea trial, refer to the *K-Bridge Autopilot Operator Manual*.)

Message: Autopilot RPM difference
Description: Autopilot RPM difference
Priority: Warning (category B)

Possible cause:	This message results if the vessel has two or more rudder/propeller units or thrusters for steering and the RPM for each one is different. The performance of the autopilot's steering is reduced if the RPM is not equal for both (or all) of the vessel's rudder/propeller units or steering thrusters.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Make sure the units are operating at the same RPM as each other. For example, if the levers for each thruster are manually controlled, make sure they are level.

Message: Autopilot RPM input error [port/stbd]
Description: Autopilot RPM input error [port/stbd]
Priority: Warning (category B)

Possible cause:	The autopilot has received an invalid RPM measurement concerning a thruster or rudder propeller. Invalid RPM measurements will not be used by the autopilot. If the autopilot is not receiving valid RPM input concerning the thrusters or rudder propellers, steering performance can be reduced. (If applicable, the alert will indicate whether it concerns port or starboard thrusters or propellers.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If this warning persists, report it to Kongsberg customer service.

Message: Autopilot RPM too high [port/stbd]
Description: Autopilot RPM too high [port/stbd]
Priority: Warning (category B)

Possible cause:	The RPM of the steering thrusters is too high. RPM measurements that are too high will not be used by the autopilot. If the autopilot is not receiving valid RPM input concerning the thrusters, steering performance can be reduced. (If applicable, the alert will indicate whether it concerns port or starboard thrusters or propellers.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the RPM readings on the Conning display, and check the sensor that is monitoring the thrusters.

Message: Autopilot RPM too low [port/stbd]
Description: Autopilot RPM too low [port/stbd]
Priority: Warning (category B)

Possible cause:	The RPM of the steering thrusters is below 20% of maximum. This reduces the autopilot's steering capability. Increase the RPM to return the autopilot to full steering capability. (If applicable, the alert will indicate whether it concerns port or starboard thrusters.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Increase the RPM to return the autopilot to full steering capability.

Message: Autopilot rudder feedback
Description: Autopilot rudder feedback
Priority: Alarm (category B)

Possible cause:	This message will accompany another alert concerning rudder feedback I/O.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the SINT for possible failures. **2** Check the rudder feedback unit, the transmission link and the direction of rudder movement.

Message: Autopilot rudder feedback I/O error [port/stbd]
Description: Autopilot rudder feedback I/O error [port/stbd]
Priority: Alarm (category B)

Possible cause:	There is no rudder feedback signal. This indicates a malfunctioning rudder feedback or rudder command connection. Alternatively it might indicate a problem with the vessel's steering gear. (If applicable, the alert will indicate whether it concerns the port or starboard rudder.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the SINT for possible failures. **2** Check the rudder feedback unit, the transmission link and the direction of rudder movement.

Message: Autopilot rudder limit exceeded
Description: Autopilot rudder limit exceeded
Priority: Warning (category B)

Possible cause:	The additional rudder limit (set by the **Rudder Limit** parameter) has been exceeded. This warning can be caused by wave disturbance, an erratic speed log or simply incorrect parameter settings. It may also indicate a failure in the vessel's steering control system.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check that the user setup parameter **Rudder Limit** is set correctly (select: **Route→Autopilot Panel→Autopilot Setup→User (tab)**). **2** If the warning appears during an immediate turn, try tuning the sea-trial parameters that affect turning performance. For example, an increase in the value for **Accelerator Length** may solve the problem (select: **Route→Autopilot Panel→Autopilot Setup→Sea trial (tab)**). **3** If the warning comes up frequently, it is probably caused by wave disturbance: **a** If you are using the autopilot's **Economy** mode (set in the Autopilot Panel dialog), try the **Precision** mode. **b** If the user setup parameter **Wave Filtering** (in the User tab) is **ON**, try setting it to **OFF**. **c** If the autopilot is steering inappropriately in rougher waters, you may need to perform the sea-trial procedure again. For instructions about performing the sea trial, refer to the *K-Bridge Autopilot Operator Manual*.

Message: Autopilot rudder not ready [port/stbd]
Description: Autopilot rudder not ready [port/stbd]
Priority: Alarm (category B)

Possible cause:	The rudder is not ready to be controlled by the autopilot. This might mean that the steering system is not yet operational. (If applicable, the alert will indicate whether it concerns the port or starboard rudder.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check whether the steering control system is running. **2** Check that the steering control system has been switched to autopilot mode.

Message: Autopilot rudder ready I/O error [port/stbd]
Description: Autopilot rudder ready I/O error [port/stbd]
Priority: Alarm (category B)

Possible cause:	If the autopilot has a rudder-ready signal connection, this failure message indicates that it cannot receive the signal. (If applicable, the alert will indicate whether it concerns the port or starboard rudder.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the SINT for possible failures. **2** Check the rudder feedback unit, the transmission link and the direction of rudder movement.

Message: Autopilot rudder response
Description: Autopilot rudder response
Priority: Alarm (category B)

Possible cause:	The rudder is not responding properly to commands from the autopilot controller in the SINT. This alert is issued whenever rudder speed is less than 0.25°/sec while rudder lag is greater than 5° for more than five seconds at a time.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the operation of the steering gear pumps. **2** Check that the rudder signal is present at the input terminals on the SINT. Check the cabling between the SINT and the rudder.

Message: Autopilot rudder setpoint I/O error [port/stbd]
Description: Autopilot rudder setpoint I/O error [port/stbd]
Priority: Alarm (category B)

Possible cause:	When it issued a rudder command, the autopilot controller in the SINT received an error from the rudder set-point I/O card. (If applicable, the alert will indicate whether it concerns the port or starboard rudder.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the cabling between the SINT and the rudder set-point I/O card.

Message: Autopilot sharp turn
Description: Autopilot sharp turn
Priority: Warning (category B)

Possible cause:	This warning means that the sharp turn limit will be exceeded by the proposed turn.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Make sure that the **Turn Warning** limit parameter is set correctly (select: **Route→Autopilot Panel→Autopilot Setup→Track (tab)**). **2** Reduce the vessel's speed or increase the turn radius.

Message: Autopilot water log
Description: Autopilot water log
Priority: Alarm (category B)

Possible cause:	The autopilot controller in the SINT is receiving no data from the water-speed log. If the autopilot's **Water Log** parameter (**Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**) is set to **NAV**, then the autopilot receives water speed log input from the Nav OS. Therefore, if the autopilot ever loses communication with the Nav OS, the `Autopilot water log` alert will be generated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the water-speed log sensor and its network connection. **2** If the failure has occurred while the autopilot was performing Track steering, check the setup of the operator station. **3** Check that the autopilot's **Water Log** parameter has been set correctly (select: **Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**).

Message: Autopilot wrong nav data
Description: Autopilot wrong nav data
Priority: Alarm (category B)

Possible cause:	An NMEA data packet received from the operator station had an incorrect sentence structure. This may indicate a mismatch between the setup of the autopilot and the setup of the operator station. The autopilot has therefore refused to permit the operator station to control it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the operator station setup. **2** Check the network. **3** If the failure persists, use another operator station to control the autopilot. **4** Restart the operator station and try using it again to control the autopilot. **5** Restart the autopilot.

Message: Chart licensing error
Description: Chart licensing error for Radar mode
Priority: Warning (category B)

Possible cause:	There is a problem with the chart licence. It might only concern the presentation of the chart on a radar display.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check your chart licences or contact KM service or your chart provider.

Message: Chart mirrorclient missing update
Description: Chart mirrorclient missing update
Priority: Warning (category B)

Possible cause:	Mirror client is missing permits or updates that exists on mirror host.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Update mirror client from mirror host.

Message: Chart proj. mismatch
Description: Chart mismatch n pixels
Priority: Warning (category B)

Possible cause:	There is a mismatch of up to n pixels between the chart and the radar.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	When evaluating the screen, be aware of the mismatch at the corners especially.

Message: Close to barrier
Description: Close to barrier
Priority: Warning (category A)

Possible cause:	The distance to the closest point on a barrier line (for the automatic acquisition of radar targets) is less than 100 meters.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check whether the automatic acquisition area needs to be changed before the vessel crosses the barrier.

Message: Collision danger
Description: Collision danger: target breached CPA/TCPA limits
Priority: Alarm (category A)

Possible cause:	A tracked target has breached the CPA and TCPA limits. (This alert message will also include the number of targets that have breached the CPA/TCPA limits and the operator station that has generated the alert/s.)
Acknowledge from:	The operator station that issued the alert.
Suggested action:	**1** Check if immediate action is required to avoid danger. **2** Go to the operator station that generated the alert and acknowledge it from that operator station.

Message: Command of AP not selected
Description: Command of AP not selected
Priority: Warning (category B)

Possible cause:	The autopilot reports that no console currently has command of it. The autopilot will not now respond to immediate course changes but will continue to steer on its current course until you take command of it from a console or from the autopilot operator panel (if one is available on the bridge).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Take command of the autopilot from a console or operator panel.

Message: Commanding station changed
Description: Commanding station changed
Priority: Warning (category B)

Possible cause:	Command of the autopilot has been transferred to another operator station.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	To control the autopilot you must now use the new operator station. (The heading wheel on the operator station that was previously in command of the autopilot will not now have any effect.)

Message: Common sensor alert
Description: Common sensor alert
Priority: Warning (category B)

Possible cause:	Alert received from sensor.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Read the sensor alert message and take appropriate action.

Message: Critical point reached
Description: Critical point reached n
Priority: Warning (category A)

Possible cause:	The vessel has arrived at the location of a critical point on the chart.
Acknowledge from:	Any K-Bridge operator station that is currently monitoring the route and is not using the ECDIS browse facility (for browsing away from the vessel on the chart).
Suggested action:	Read the text associated with the critical point and take action accordingly.

Message: Deviation between heading sensors
Description: Heading deviation n.n°
Priority: Warning (category A)

Possible cause:	The deviation between the master operator station's filtered heading and the raw heading data from one or more of the available gyros has exceeded the alert limit.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the gyro readings. Make sure the autopilot is not making manoeuvres based on a faulty heading signal.

Message: Diff. corrections pos. resumed
Description: Diff. corrections pos. resumed on position sensor n
Priority: Warning (category B)

Possible cause:	The GPS receiver has been in absolute mode and has now changed to differential mode without differential corrections.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the ship's position on the chart. **2** If the steering mode is Track or Waypoint take special care: the system might make adjustments to compensate for a possible position jump due to reduced position accuracy.

Message: Display communication failure
Description: Display communication failure, error code n
Priority: Warning (category B)

Possible cause:	The serial line connecting the display (monitor) and the operator station computer has failed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	To check whether the display can receive control information from the operator station: **1** Go into the radar application and select View - Palette/Intensity. **2** Adjust the **Brilliance** setting. If the light intensity on the display does not change, the display is not receiving commands from the computer. **3** Check the cabling and connections.

Message: Display data channel driver not installed
Description: DDC driver not installed
Priority: Warning (category B)

Possible cause:	The selected monitor type requires a display data channel driver to be installed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service.

Message: Display stabilization changed to water
Description: Ground speed not available
Priority: Alarm (category B)

Possible cause:	The speed displayed by the speed log has changed automatically from ground to water speed because ground speed is not available.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the ground speed input readings.

Message: Display stabilization changed to ground
Description: Water speed not available
Priority: Warning (category B)

Possible cause:	The speed displayed by the speed log has changed automatically from water to ground speed because water speed is not available.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the water speed input readings.

Message: End of route
Description: End of route
Priority: Alarm (category B)

Possible cause:	You are monitoring a route. The ship has passed the last waypoint. Track steering mode will be terminated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select a new route to monitor.

Message: End of track pre-alert
Description: End of track in nn min
Priority: Alarm (category B)

Possible cause:	An alarm is given between 1 and 5 minutes (depending on the autopilot configuration) before the last waypoint of the track is passed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Acknowledge the alarm to inhibit the backup navigator alarm.

Message: Error in antenna azimuth pulses
Description: Error in azim pulses: nn avg: xx
Priority: Warning (category B)

Possible cause:	The selected radar antenna has sent an incorrect number of azimuth pulses: nn – number of pulses in the last revolution xx – average number of pulses in 10 revolutions
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Be aware that radar echoes may be unstable or erroneous in azimuth.

	2 If necessary, select another radar transceiver. Contact KM service to fix the problem.

Message: Fixed target *number* position deviation
Description: Fixed target *number* position deviation
Priority: Warning (category A)
Acknowledge from: the operator station that issued the alert

Possible cause:	The fixed reference target being used for Radar Positioning is calculated to have moved from its reference position by more than the alert limit, normally 300 metres. This may be because the target is not fixed at all. Or it may be because the aspect ratio has changed so that the centre of the echoes now relates to another point on the target.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Review the fixed reference targets that you are using for Radar Positioning (see *Using the radar positioning system* on page 148).

Message: Fixed target *number* speed limit exceeded
Description: Fixed target *number* speed limit exceeded
Priority: Warning (category A)

Possible cause:	The fixed reference target being used for Radar Positioning is calculated to have a speed above the acceptance limit, normally 6 knots. This may be because the target is not fixed at all. Or it may be because the aspect ratio has changed so that the centre of the echoes now relates to another point on the target.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Review the fixed reference targets you are using for Radar Positioning (see *Using the radar positioning system* on page 148).

Message: Fixed target *number* update time limit exceeded
Description: Fixed target *number* update time nn sec
Priority: Warning (category A)

Possible cause:	A fixed reference target being used for Radar Positioning has not been updated (in other words, has not reflected an acceptable echo) for the latesst nn seconds. It is therefore no longer being used for position calculations.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Review the fixed reference targets you are using for Radar Positioning (see *Using the radar positioning system* on page 148).

Message: Grounding
Description: Grounding
Priority: Alarm (category A)

Possible cause:	Grounding danger.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Take immediate action to avoid grounding the vessel or hitting an obstruction.

Message: Heading jump
Description: Heading Jump
Priority: Alarm (category B)

Possible cause:	The difference between two readings from the heading sensor (gyro compass) is more than 3 degrees.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the gyro readings. **2** Check the gyro readings. **3** Check whether the autopilot has made any manoeuvres based on a faulty heading signal.

Message: Head marker failure (turning unit)
Description: Head marker fail turning unit
Priority: Alarm (category B)

Possible cause:	The circuitry to detect the heading marker is malfunctioning.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service to fix the problem.

Message: LAN A/B failure or missing
Description: LAN A/B failure or missing
Priority: Warning (category B)

Possible cause:	The network is down or not able to transfer data over the bound socket. Alternatively, it could be that no other consoles are registered on the network (this operator station is alone on the network).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the network setup, network cable and hub/switch. **2** If this station is alone on the network, disable this alarm in your network configuration.

Message: Local ADF input failed
Description: Local ADF input failed
Priority: Warning (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the data source mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified data source, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local AIS input failed
Description: Local AIS input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the data source mentioned in the alert text can fail.

	Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified data source, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check if the AIS sensor is switched on and enabled. Check if its serial cable or power cable is loose or damaged.

Message: Local ARPA target input failed
Description: Local ARPA target input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the data source mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified data source, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local autopilot input failed
Description: Local autopilot input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the data source mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified data source, and that it has received no data on that serial connection for a

	specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local depth input failed
Description: Local depth input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the data source mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified data source, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local heading input failed
Description: Local heading input failed
Priority: Alarm (category B)

Possible cause:	This alert is most likely to concern heading input to the operator station that is provided on a backup serial connection from the SINT. It indicates that the serial connection is currently failing to provide backup input from the sensor mentioned in the alert text. (The backup sensor input is provided for use in the event of a network failure that prevents the operator stations from receiving sensor data over the LAN.)

	(This alert will also appear if the operator station has a non-standard configuration that includes a direct serial connection to a heading sensor, and that connection fails.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the backup sensor, verify its status, and if it is OK continue sailing as normal. **2** Check the serial connection from the backup sensor to the SINT. **3** Check the backup serial connection from the SINT to the operator station it is connected to (only one operator station has a direct serial connection to the SINT). **4** Check the backup serial connections between the operator stations. (The operator station that has a backup serial connection to the SINT will also have a serial connection to one other operator station, and it will forward the backup data to that operator station. The second operator station may also be connected to a third operator station, and so on).

Message: Local INS input failed
Description: Local INS input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the Inertial Navigation System. However, in standard configurations K-Bridge operator stations receive this data input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the INS can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the INS, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local opt. bearing input failed
Description: Local opt. bearing input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local position input failed
Description: Local position input failed
Priority: Alarm (category B)

Possible cause:	This alert is most likely to concern position input to the operator station that is provided on a backup serial connection from the SINT. It indicates that the serial connection is currently failing to provide backup input from the position sensor. (The backup sensor input is provided for use in the event of a network failure that prevents the operator stations from receiving critical sensor data over the LAN.) (This alert will also appear if the operator station has a non-standard configuration that includes a direct serial connection to a position sensor, and that connection fails.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the backup sensor, verify its status, and if it is OK continue sailing as normal. **2** Check the serial connection from the backup sensor to the SINT. **3** Check the backup serial connection from the SINT to the operator station it is connected to (only one operator station has a direct serial connection to the SINT).

	4 Check the backup serial connections between the operator stations. (The operator station that has a backup serial connection to the SINT will also have a serial connection to one other operator station, and it will forward the backup data to that operator station. The second operator station may also be connected to a third operator station, and so on).

Message: Local RPM input failed
Description: Local RPM input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local rudder input failed
Description: Local rudder input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data

	may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local scan. sonar input failed
Description: Local scan. sonar input failed
Priority: Warning (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local speed input failed
Description: Local scan. sonar input failed
Priority: Alarm (category B)

Possible cause:	This alert is most likely to concern speed input to the operator station that is provided on a backup serial connection from the SINT. It indicates that the serial connection is currently failing to provide backup input from the speed sensor. (The backup sensor input is provided for use in the event of a network failure that prevents the operator stations from receiving critical sensor data over the LAN.) (This alert will also appear if the operator station has a non-standard configuration that includes a direct serial connection to a speed sensor, and that connection fails.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the backup sensor, verify its status, and if it is OK continue sailing as normal. **2** Check the serial connection from the backup sensor to the SINT.

	3 Check the backup serial connection from the SINT to the operator station it is connected to (only one operator station has a direct serial connection to the SINT). **4** Check the backup serial connections between the operator stations. (The operator station that has a backup serial connection to the SINT will also have a serial connection to one other operator station, and it will forward the backup data to that operator station. The second operator station may also be connected to a third operator station, and so on).

Message: Local time input failed
Description: Local time input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Local wind input failed
Description: Local wind input failed
Priority: Alarm (category B)

Possible cause:	This alert is unlikely ever to be seen. It concerns the failure of a local serial connection between the operator station and the source of the data mentioned in the alert text. However, in standard configurations K-Bridge operator stations receive this input over the LAN not over local serial connections. This means that there are almost no circumstances in which a local serial connection to the source of the data mentioned in the alert text can fail. Nevertheless, if an operator station issues this alert, it means that the operator station does have a serial connection to the specified source of the data mentioned in the alert, and that it has received no data on that

	serial connection for a specified time, normally 5 seconds. The data may be being fed to the operator station on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source, verify its status, and if it is OK continue sailing as normal.

Message: Lost target
Description: Lost target
Priority: Warning (category A)

Possible cause:	A target has disappeared from the display.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	If the target is one that you need to continue to track, adjust the **Tracker Sensitivity** (select **Targets**) to see if this enables you to re-acquire the target (see *Targets menu* on page 380).

Message: Low DMA mem. – restart computer
Description: Low DMA mem. – restart computer
Priority: Warning (category B)

Possible cause:	The DMA buffer is low. This means that a limited number of switches between Radar and ECDIS are possible. Operation as Radar (or ECDIS) will continue as normal.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	No immediate action required. Restart the computer before the next time you change from radar to ECDIS (or from ECDIS to radar if ECDIS is the currently active application on the operator station).

Message: Low main bang amplitude
Description: Low main bang amplitude
Priority: Warning (category B)

Possible cause:	The main bang amplitude reported from the transmitter is lower than a preset limit.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the radar picture, if possible using the performance monitor. If the performance is poor, contact KM Service to fix the problem.

Message: Low peak current in magnetron
Description: Low peak current in magnetron
Priority: Warning (category B)

Possible cause:	The peak current reported from the transmitter's magnetron is lower than a preset limit.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the radar picture, if possible with the performance monitor. If the performance is poor, contact KM Service to fix the problem.

Message: Low power level in transmitter
Description: Low power level in transmitter
Priority: Warning (category B)

Possible cause:	The power level reported from the transmitter is lower than a preset limit.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the radar picture, if possible using the performance monitor. If the performance is poor, contact KM Service to fix the problem.

Message: Magnetron hours count failure
Description: Magnetron hours count failure: file format unknown
Priority: Warning (category B)

Possible cause:	There is a problem with the logging of the radar magnetron hours count. The content of the log file cannot be parsed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service.

Message: Magnetron (old) hours count failure
Description: Magnetron hours count failure: old file format unknown
Priority: Warning (category B)

Possible cause:	There is a problem with the logging of the radar magnetron hours count. The content of the old log file cannot be parsed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service.

Message: Magnetron lifetime expired
Description: Magnetron lifetime expired
Priority: Warning (category B)

Possible cause:	The Magnetron is reporting that it is at the end of its life.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Replace the Magnetron unit.

Message: Missing antenna pulses (TIC)
Description: No antenna pulses
Priority: Warning (category B)

Possible cause:	The TIC (Transceiver Interface and Control) card in the interswitch has not detected any sync pulses. Check the interswitch and restart it, or select another radar.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar and/or the interswitch. **3** Select another radar.

Message: Missing datum from pos. sensor
Description: Pos. sensor n: missing datum
Priority: Warning (category B)

Possible cause:	The position sensor is not sending the datum.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the position sensor configuration and the datum setup on the GPS operator panel.

Message: Missing head marker (TIC)
Description: No head marker
Priority: Warning (category B)

Possible cause:	The Transceiver Interface and Control (TIC) card in the interswitch has not detected any head marker pulses.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar or the interswitch.

	3 Select another radar.

Message: Missing interswitch communication
Description: No interswitch comm. for nn sec.
Priority: Alarm (category B)

Possible cause:	No data has been transferred on the serial-line from the interswitch during the last nnn sec.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar or the interswitch. **3** Select another radar.

Message: Missing sync pulses (RIC)
Description: Missing sync pulses (RIC)
Priority: Alarm (category B)

Possible cause:	The Radar Interface Card in the radar operator station has not detected any sync pulses.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the connection between the Radar Interface Card and the TIC card in the radar interswitch. **2** Check the radar. **3** Restart the radar or the interswitch. **4** Select another radar.

Message: Missing sync pulses (TIC)
Description: No sync pulses
Priority: Warning (category B)

Possible cause:	The Transceiver Interface Control (TIC) card in the radar interswitch has not detected any sync pulses.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the connection between the radar interswitch and the transceiver. **2** Check the radar. **3** Restart the radar or the interswitch. **4** Select another radar.

Message: Missing transceiver communication
Description: Missing transceiver communication
Priority: Alarm (category B)

Possible cause:	No data has been transferred from the transceiver to the interswitch.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar or the interswitch. **3** Select another radar.

Message: Modulator trig fail
Description: Modulator trig fail in transmitter
Priority: Warning (category B)

Possible cause:	The transceiver has detected a failure in the modulator trigger operation.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service to fix the problem.

Message: Navtex received important message
Description: Navtex received important message
Priority: Warning (category B)

Possible cause:	A new message has been received by the Navtext receiver. It is important that you check the message.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the Navtex messages.

Message: New target
Description: New target
Priority: Warning (category A)

Possible cause:	A new target has been acquired.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Monitor the target on the radar display.

Message: NMEA error
Description: NMEA error
Priority: Warning (category B)

Possible cause:	This message appears if there are any errors in the NMEA telegrams received by the operator station from a navigation sensor. The error may be any of the following: • `Illegal checksum`: A requested checksum at the end of the telegram is wrong or missing • `Missing field`: One of the mandatory fields in the telegram is missing • `Illegal value`: A value in the telegram is illegal, for instance a letter inside a numeric value (",34.b4,") • `Illegal lat/lon`: A latitude or longitude value is illegal, for instance a letter inside a numeric field ",1234N.45,N," or an illegal sphere ",1234.45,D," When one of these errors occurs, the whole telegram is rejected and will not appear in the alert lists: this generic `NMEA error` alert appears instead.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Start monitoring the port on which the sensor's input is received to see if any more faulty telegrams are received. To do this, select **System→Serial Communication** (the service password is required to access the necessary dialog box).

Message: No available watchcall group
Description: No available watchcall group
Priority: Warning (category B)

Possible cause:	The pool of available WatchCall Groups has been exhausted. Alerts required by external equipment will not be transmitted to that equipment if they have not been assigned a WatchCall group. For example, alerts that are supposed to trigger the BNWAS will not be sent to the BNWAS and so will not trigger it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Make sure the watchcall groups have been configured correctly. **2** Contact KM service.

Message: No conning display
Description: No conning display active
Priority: Alarm (category B)

Possible cause:	The radar or ECDIS is in command of the autopilot. A route is being monitored. No Conning display can be found on the network. (This alarm is initially a warning. But after 60 seconds, its priority escalates and it becomes an alarm.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the LAN connection for the Conning system. Do not attempt to run in Track mode without a Conning system on the network.

Message: No data from Polaris simulator
Description: No data from Polaris simulator
Priority: Warning (category B)

Possible cause:	The system is configured to receive data from a Polaris simulator and is not receiving data from it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If the system is expecting signals from a simulator (instead of real signals), try restarting the simulator. If this is a sailing installation, contact KM Service to correct the configuration.

Message: No diff. corrections pos.
Description: No diff. corrections position sensor (n)
Priority: Warning (category B)

Possible cause:	The GPS receiver (n) has been in differential mode and has now changed to absolute mode without differential corrections.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the ship's position in the chart. If the steering mode is Track or Waypoint take special care, because the system might make adjustments to compensate for a possible position jump due to increased position accuracy.

Message: No ECDIS to monitor route
Description: No Ecdis to monitor route
Priority: Alarm (category B)

Possible cause:	A radar operator station is In Command of the autopilot and a route is being monitored. Steering mode is Track or Waypoint. No ECDIS has been found on the network. (This alarm is initially a warning. But after 60 seconds, its priority escalates and it becomes an alarm.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If an MFD on the bridge has switched out of ECDIS (leaving no ECDIS operating on the bridge), switch it back to ECDIS immediately. If an ECDIS is connected, check its LAN connection. Do not attempt to run in Track mode without an ECDIS on the network to monitor the route.

Message: No input from heading sensor
Description: Heading sensor nn: no input
Priority: Alarm (category B)

Possible cause:	The selected heading sensor has not sent heading information for the last 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another heading sensor or use manually entered heading information.

Message: No input from INS sensor
Description: No input from INS sensor
Priority: Alarm (category B)

Possible cause:	The INS sensor has not sent position information within a specified time, normally 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal input. If the INS is used as a primary heading sensor, switch to use data input directly from the Gyro.

Message: No input from position sensor
Description: Pos. sensor nn: no input
Priority: (on master operator station) Alarm (category B)
Priority: (on slave operator station) Warning (category B)

Possible cause:	The selected position sensor has not sent position information during the last 5 seconds. When this alert is generated by the master operator station, the alert has priority Alarm (category B). When the alert is generated by a slave operator station, the alert has priority Warning (category B).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another position sensor or use dead reckoning.

Message: No input from speed sensor
Description: Speed sensor nn: no input
Priority: Alarm (category B)

Possible cause:	The selected speed sensor has not sent speed information during the last 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another speed sensor, or use manual speed.

Message: No input from tender tracker
Description: No input from tender tracker
Priority: Warning (category B)

Possible cause:	The connection from the tender tracker sensor is a serial line connection and it has not supplied this computer with data for a specified time, normally 5 seconds. The sensor data may be being fed to this computer on a different connection or it may be totally missing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the signal source.

Message: No navigation master selected
Description: No navigation master selected
Priority: Alarm (category B)

Possible cause:	All consoles are calculating and using own-ship filtered data for themselves (instead of one master console performing the calculations and distributing them to the other consoles).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Make one console the navigation master (see *Making one console the navigation master* on page 130), or un-check both the **Master Enable** and the **Slave Enable** options in the Integration Configuration dialog on all consoles (select **System→Integration Configuration**; see *Integration Configuration* on page 659). Alternatively, in the Integration Configuration dialog on the console or consoles that transmitted the warning, disable the warning (see *Integration Configuration* on page 659).

Message: No position from position sensor
Description: No position from position sensor: n
Priority: Alarm (category B)

Possible cause:	The selected position sensor has not sent position information during the last 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another position sensor or use dead reckoning.

Message: No rate of turn from gyro
Description: No rate of turn from gyro
Priority: Alarm (category B)

Possible cause:	The selected heading sensor has not sent rate of turn (ROT) information during the last 5 seconds.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select another heading sensor or configure the ROT to be calculated instead of read from the heading sensor (select **System→Sensor→Configuration→Heading→Details→Details**; see *Heading sensor details* on page 620).

Message: No sync or antenna rot. (RIC)
Description: No sync or antenna rotation (RIC)
Priority: Alarm (category B)

Possible cause:	The Radar Interface Card has not detected changes on the combined sync/azimuth input. The radar display will be made blank and a warning written across it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar or the interswitch. **3** Select another radar.

Message: No sync pulses (RIC)
Description: Missing sync pulses
Priority: Alarm (category B)

Possible cause:	The Radar Interface Card (RIC) has not detected any significant sync signals. The radar display will be blanked and a warning written across it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the radar. **2** Restart the radar or the interswitch. **3** Select another radar.

Message: No tracked target for targetout
Description: No tracked target for targetout
Priority: Warning (category B)

Possible cause:	The system has been configured to transmit selected radar or AIS targets to an external device. But either no target has been selected or the selected target is lost.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Select a target or configure the system not to transmit individually selected targets over the GGA protocol (select **System→Sensor Configuration→TargetOut→Details**; see *Target out interface details* on page 633).

Message: No video (RIC)
Description: No change in video
Priority: Alarm (category B)

Possible cause:	The Radar Interface Card has not detected any significant signals on the video input. The radar display will be made blank and a warning written across it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try increasing the gain setting. **2** Check the radar. **3** Restart the radar or the interswitch. **4** Select another radar.

Message: Position deviation
Description: Position deviation from receiver nn is x m
Priority: Warning (category A)

Possible cause:	The deviation between the master operator station's filtered position and the raw position data from one or more of the available position sensors has exceeded the alert limit. (This alert will not be issued if the "No Input From Position Sensor" alert has been issued and remains active.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try resetting the position filter on the master operator station. **2** Check the position reference systems.

Message: Power supply on battery
Description: On battery for nn seconds
Priority: Alarm (category B)

Possible cause:	The Power Input (220V AC) to the UPS (Uninterruptible Power Supply) has disappeared. The operator station is running on battery power. (The alert description indicates the period of time for which the operator station has been running on battery power; it also indicates which operator station generated the alert.)
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the ship's power source.

Message: Priority tender approach alert
Description: Priority tender approach alert
Priority: Warning (category B)

Possible cause:	The currently designated priority tender has come within a specified range of the yacht.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Prepare to receive the priority tender.

Message: Proximity violation
Description: Proximity violation: target breached ship's proximity limit
Priority: Alarm (category A)

Possible cause:	A tracked target is closer to the own-ship than the proximity alert limit permits (see *Alarm Limits* on page 411).
Acknowledge from:	The operator station that issued the alert.
Suggested action:	**1** Check if immediate action is required to avoid danger. **2** Go to the operator station that generated the alert and acknowledge it from that operator station.

Message: Radar display update failure
Description: Radar display update failure
Priority: Alarm (category B)

Possible cause:	The radar presentation software is not running. The radar echoes on the display will not be updated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Restart the radar. Contact KM Service.

Message: Radar tracker update failure
Description: Radar tracker thread update failure
Priority: Alarm (category B)

Possible cause:	The radar tracker software is not running. The tracked radar targets will not be updated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Restart the radar. **2** If it still does not update tracked targets, contact KM service.

Message: Radar update failure
Description: Radar tracker RIC2 FIFO update failure
Priority: Alarm (category B)

Possible cause:	The radar tracker software is not running. The tracked radar targets will not be updated.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Restart the radar. Contact KM service.

Message: SINT gyro compass switch
Description: Gyro is switched automatically
Priority: Alarm (category B)

Possible cause:	This alert will be followed by an “Autopilot change steering mode” alert. The Grounding Avoidance System has decided that the heading sensor was failing and has triggered the selection of another heading sensor.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Track steering will continue if you are currently using track steering. But you need to come out of it and check the operation of the new gyro before re-engaging track steering.

Message: SINT low power N1
Description: SINT low power N1
Priority: Alarm (category B)

Possible cause:	There is a problem with the power in the SINT cabinet.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the PSUs and fuses.

Message: SINT low power N2
Description: SINT low power N2
Priority: Alarm (category B)

Possible cause:	There is a problem with the power in the SINT cabinet.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the PSUs and fuses.

Message: SINT master switch to A/B
Description: SINT master switch to A/B
Priority: Warning (category B)

Possible cause:	This warning informs you that the master process station (PS) in a SINT configuration with redundant RCUs (Remote Computer Units) has been automatically switched.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** You can continue to use the autopilot with only one RCU working, but you must be aware that the SINT is not currently operating as a redundant system. **2** Try to restart the failed RCU. If that is not successful try to restart both RCUs together. **3** If that is not successful, contact the Kongsberg Maritime service department.

Message: SINT missing power N1
Description: SINT missing power N1
Priority: Alarm (category B)

Possible cause:	No power is being received by the SINT from one of its power supplies.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the power source and fuses.

Message: SINT missing power N2
Description: SINT missing power N2
Priority: Alarm (category B)

Possible cause:	No power is being received by the SINT from one of its power supplies.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the power source and fuses.

Message: Sparking in magnetron detected
Description: Sparking in magnetron detected
Priority: Warning (category B)

Possible cause:	The transceiver has detected sparking in the Magnetron circuitry. This is probably due to Magnetron ageing.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Transmission has been switched off automatically to protect the transceiver. Contact KM service to fix the problem. Transmission on short pulse may be possible until the problem is fixed.

Message: Speed below manoeuvring speed
Description: Speed below manoeuvre speed
Priority: Warning (category B)

Possible cause:	The vessel's speed is below the vessel's low-speed limit for track steering (see *Autopilot Configuration* on page 658).
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If it is safe to do so, increase the vessel's speed and continue in track steering.

Message: Speedpilot cannot hold set speed
Description: Speedpilot set speed not valid
Priority: Alarm (category B)

Possible cause:	A speed pilot is configured and connected. The difference between the actual speed and the set speed has been more than 1 knot for a period of 5 minutes without any significant acceleration having occurred. The speed pilot is unable to achieve the set speed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the speed pilot. If necessary disengage the speed pilot and then restart it.

Message: Speedpilot comm. fail
Description: Speedpilot comm. fail
Priority: Alarm (category B)

Possible cause:	This alert will only occur if the speed pilot controller in the SINT is configured to communicate with the Nav OS over a serial connection (as opposed to an OPC connection, which is the standard configuration). The serial connection might be a physical serial link or it might be a virtual serial connection that uses the LAN. The alert indicates that the Nav OS is not able to establish serial communication with the speed pilot controller in the SINT. The cause

	may be that the physical serial communication link is broken, or it may be that the speed pilot controller or some communication hardware in the SINT is malfunctioning.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try taking command of the speed pilot from another Nav OS. **2** Check that the configuration of the speed pilot sensor input is correct (select **System→Sensor Configuration→Speed pilot→Details**). To perform this check, you need to use the service password. **3** Check whether the text field at the bottom of the Speed Pilot dialog (**Route→Speed Pilot**) contains the alarm message `!! Speed Pilot Comm. Fail !!`. If it does, this is further evidence that there is no serial communication between the operator station and the speed pilot. **4** Check the operation of the other Nav OSes. If the Speed Pilot dialog on another (or on more than one other) operator station also contains the alarm message `!! Speed Pilot Comm. Fail !!`, then it is likely that there is a problem with the Local Area Network (LAN). If any K-Bridge operator station on the LAN has hung or appears to be operating slowly, this could be causing a network traffic jam that is blocking the LAN-based serial communication between the Nav OS that is in command and the speed pilot. **5** Restart any K-Bridge operator stations that have hung or are operating slowly. **6** Restart the SINT.

Message: Speedpilot comm. failure (OPC)
Description: Speedpilot comm. failure (OPC)
Priority: Alarm (category B)

Possible cause:	The Nav OS is not able to communicate with the speed pilot controller in the SINT. This may indicate that the speed pilot controller is malfunctioning, a communication link (over the Local Area Network) is broken, or the communication hardware in the SINT is malfunctioning. This alarm is generated when the Nav OS detects a failure of communication using the OPC protocol between the Nav OS and the

	speed pilot. The OPC protocol is used to pass configuration parameters and control commands between the Nav OS and the speed pilot.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Try taking command of the speed pilot from another Nav OS. **2** Check the operation of the other Nav OSes. If any K-Bridge operator station on the LAN has hung or appears to be operating slowly, this could be causing a network traffic jam that is blocking the OPC communication between the Nav OS that is in command and the speed pilot. **3** Restart any K-Bridge operator stations that have hung or are operating slowly. **4** Check the operating status of the SINT.

Message: Speedpilot ground log
Description: Speedpilot ground log
Priority: Alarm (category B)

Possible cause:	The speed pilot controller (in the SINT) is receiving no data from the ground speed log.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the ground speed log sensor and its network connection. **2** Check the setup of the MFD. **3** Check that the autopilot's Ground Log parameter has been set correctly in the Autopilot Panel's Dockside parameters tab (select **Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**).

Message: Speedpilot no speed input
Description: Speedpilot no speed input
Priority: Alarm (category B)

Possible cause:	The speed pilot is not receiving speed data from the operator station.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Disengage the speed pilot.

Message: Speedpilot no station in command
Description: Speedpilot no station in command
Priority: Warning (category B)

Possible cause:	The speed pilot is ready but no operator station is in command of the it.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Take command of the speed pilot at one of the operator stations.

Message: Speedpilot propulsion feedback error
Description: Speedpilot propulsion feedback error
Priority: Warning (category B)

Possible cause:	Either no feedback is being received from the propulsion sensor or the feedback deviates significantly from the order. The speed pilot will not be able to control the speed.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the propulsion feedback readings. **2** If necessary, disengage the speed pilot.

Message: Speedpilot speed order not obtained
Description: Speedpilot speed order not obtained
Priority: Warning (category B)

Possible cause:	The speed order and the actual speed have deviated more than a set limit. The speed pilot is not able to reach the desired speed. Heavy wind or waves might be the cause.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check that the speed set-point is reasonable and that the propulsion is working as expected. **2** If necessary, disengage the speed pilot.

Message: Speedpilot water log
Description: Speedpilot water log
Priority: Alarm (category B)

Possible cause:	The speedpilot controller (in the SINT) is receiving no data from the water speed log.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Check the ground speed log sensor and its network connection. **2** Check the setup of the MFD. **3** Check that the autopilot's Water Log parameter has been set correctly in the Autopilot Panel's Dockside parameters tab (select **Route→Autopilot Panel→Autopilot Setup→Dockside (tab)**).

Message: Station is starting up (booting)
Description: Station is starting up (booting). Computer or program is about to start
Priority: Warning (category B)

Possible cause:	The K-Bridge software is running for the first time after a reboot of the computer or after the application has been restarted.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Be aware of this situation and monitor possible alerts from sensors or other systems.

Message: Stopwatch time elapsed
Description: Stopwatch Time Elapsed
Priority: Warning (category B)

Possible cause:	The countdown belonging to the MFD's stopwatch facility has reached zero.
Acknowledge from:	Any K-Bridge operator station.

Message: Switch to manual - autopilot rudder freeze
Description: Switch to manual - autopilot rudder freeze
Priority: Alarm (category B)

Possible cause:	The autopilot is receiving no heading sensor information. This is a follow-up alarm that will be related to a "Main Heading Sensor" failure message issued earlier. It means that the rudders have been

	frozen by the autopilot because the main heading sensor is missing: You must switch to manual steering.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	**1** Switch to manual steering. **2** Check the main compass and the cable connected to it. **3** Select an alternative main compass. **4** Try re-starting the autopilot controller. **5** If the problem remains, do not use the autopilot.

Message: Target capacity
Description: Target capacity is at 90%: space left for n targets
Priority: Caution (category B)

Possible cause:	The number of targets is about to exceed the capacity of the system. There is now space left for n new targets. More distant targets will be ignored.
Acknowledge from:	No manual acknowledgement required (cautions are automatically acknowledged as soon as they are generated).
Suggested action:	Do not rely on the automatic detection of targets.

Message: Target left anchorage
Description: Target anchor watch limit exceeded
Priority: Alarm (category A)

Possible cause:	The anchor watch facility has been activated for a tracked target, and the target's distance from the anchorage point has now exceeded the anchor watch limit. This alarm therefore informs you that the target has left its anchorage.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	Acknowledge the alarm.

Message: Tender alert
Description: Tender x alert
Priority: Warning (category B)

Possible cause:	Someone on tender x has pressed its alert button.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If possible, contact the tender vessel.

Message: Tender out of range
Description: Tender x out of range
Priority: Warning (category B)

Possible cause:	Tender x has passed beyond the limit of its permitted range.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	If possible, contact the tender vessel.

Message: TIC missing 24 VDC from display
Description: TIC has not 24 VDC from own display
Priority: Warning (category B)

Possible cause:	The TIC card (in the radar interswitch) connected to this console is receiving no 24 V DC power from the console. It is using power from other consoles but may cease to operate if other consoles are switched off.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM Service. Do not switch off the other radar consoles until the 24V DC from the TIC's own radar console is re-established.

Message: Too many active AIS targets
Description: Too many active AIS targets: distant targets will be deactivated
Priority: Warning (category B)

Possible cause:	The number of active AIS targets has exceeded the capacity of the system. (The Active AIS target table is full.) More distant AIS targets will be deactivated.
Acknowledge from:	Any K-Bridge operator station from which it is possible to control the AIS system.
Suggested action:	**1** Deactivate auto-aquisition of AIS targets. **2** Check the list of active AIS targets, and deactivate targets that are safely out of range or that cannot affect the safe navigation of the vessel.

Message: Too many AIS targets
Description: Too many AIS targets: distant targets will be ignored
Priority: Warning (category A)

Possible cause:	The number of AIS targets has exceeded the capacity of the system. More distant AIS targets will not be detected.
Acknowledge from:	Any K-Bridge operator station from which it is possible to control the AIS system.
Suggested action:	Do not rely on the automatic detection of AIS targets.

Message: Too many plots
Description: Too many plots: auto acquisition off
Priority: Warning (category B)

Possible cause:	The number of automatically acquired targets has reached the system's maximum.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Reduce the tracker sensitivity settings (select **Targets** and use the **Tracker Sensitivity 1–10** spin button).

Message: Too many targets
Description: Too many targets: no space left to acquire new targets
Priority: Warning (category A)

Possible cause:	The number of tracked radar targets has reached the system's maximum.
Acknowledge from:	The operator station that issued the alert.
Suggested action:	**1** Make room for new targets by removing any targets that cannot affect the safe navigation of the vessel. **2** If necessary, switch off the automatic acquisition of new targets or reduce size of the auto-acquisition area.

Message: Transmitter: charge trig fail
Description: Transmitter: charge trig fail
Priority: Warning (category B)

Possible cause:	The transceiver has detected a failure in the charge trigger operation.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service to fix the problem.

Message: Trip meter distance elapsed
Description: Trip meter distance elapsed
Priority: Warning (category B)

Possible cause:	The distance set for the MFD's trip meter has now been travelled.
Acknowledge from:	Any K-Bridge operator station.

Message: Unident alert from scan converter
Description: Unident alert from scan converter
Priority: Warning (category B)

Possible cause:	An unidentified illegal scan conversion error has occurred.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service to fix the problem.

Message: Unident alert from tracker
Description: Unident alert from tracker
Priority: Warning (category B)

Possible cause:	An unidentified illegal tracker error has occurred.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Contact KM service to fix the problem.

Message: VDR alert
Description: VDR alert
Priority: Alarm (category B)

Possible cause:	This is a general alert indicating that the Voyage Data Recovery (VDR) system has issued an alarm.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Go to the VDR operator panel to inspect and investigate the alarm.

Message: WP mode changed to CRS mode
Description: Close to turn, WPT mode terminated
Priority: Alarm (category B)

Possible cause:	The autopilot has changed from Waypoint mode to Course mode.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	When it is safe to, start the turn manually.

Message: Wrong datum from pos. sensor
Description: Pos. sensor nn: wrong datum
Priority: Warning (category B)

Possible cause:	The position sensor is not sending the same datum as has been configured for the sensor.
Acknowledge from:	Any K-Bridge operator station.
Suggested action:	Check the position sensor configuration and the GPS datum setup.

Message: XTD limit exceeded
Description: XTD is nn m
Priority: Alarm (category A)

Possible cause:	An attempt has been made to select Track steering mode, but the cross-track distance is greater than 1 NM.
Acknowledge from:	Any K-Bridge operator station that is currently monitoring the route and is not using the ECDIS browse facility (for browsing away from the vessel on the chart).
Suggested action:	Approach nearer to the track before selecting Track steering mode again.

A.4 Radar and ECDIS operator messages

Radar and ECDIS operator messages are displayed on a yellow background in the message field just above the range panel (see *Radar dashboard: the operator message field* on page 78). They may be accompanied by an audible beep, and they require no acknowledgement. Their main purpose is to indicate to the operator when the system has been operated incorrectly.

Table 27 Operator messages

Text	Description
Autopilot Communication Failure	There is no communication between the K-Bridge Radar operator station and the K-Bridge Autopilot (SINT).
Another route being edited	You can only edit one route at a time. You will receive this message if you have edited a route and not saved it when you start to edit another route.
Bad Geometry - cannot validate	Before a route can be validated, its route geometry must be correct.
Can not be more than nnn sensors	In the **No of Sensors** dialog (see *Number of Sensors* on page 617) an attempt has been made to input a number that is larger than permitted.
Can't Acquire, No Free Targets	The **ACQ** button on the operator panel has been pressed (see *The TARGET group buttons* on page 35) but target acquisition cannot be initiated, because the target table is full. Cease tracking of some targets (see *Ceasing the tracking of targets* on page 145).
Can't Acquire, Too Large Range	The **ACQ** button on the operator panel has been pressed (see *The TARGET group buttons* on page 35) but target acquisition cannot be initiated, because the range to the cursor exceeds the maximum range of the tracker.

Table 27 Operator messages (cont'd.)

Text	Description
Cannot edit field!	In the Edit Route and Waypoint List dialogs (see *Edit route* on page 420), the Waypoint List will include some data that you can edit (such as co-ordinates or planned speed) and other data that you cannot (such as Course and Distance).
Cannot edit monitored route	You cannot edit the route plan while it is being used for monitoring.
Cannot set less than Ship Draught	You will receive this error message if you try to set a safety contour of less than the maximum value specified for the ship's draught (see *Ship (tab)* on page 571).
Cmd Request Denied	A request to take command of the autopilot has been refused because the **Route Monitoring** or **AP In Command** option is disabled in the **Autopilot Configuration** dialog (see *Autopilot Configuration* on page 658).
CRS-Mode Terminated!!	CRS mode has been terminated because the operator relinquished command of the autopilot.
Folder name already in use!	Note folders must have a unique name.
Ground Speed is Not Available!	Ground stabilisation has been selected but there is no speed sensor providing speed over ground.
HDG-Mode Terminated!!	HDG mode has been terminated by the operator relinquishing command of the autopilot.
Heading deviation too large	An attempt has been made by the operator to enter track steering, but the difference between the ship's heading and the bearing of the leg is more than 30 degrees.
Illegal Act. WP!!	An attempt has been made by the operator to enter track steering, but the calculated waypoint does not exist.
Illegal coordinate	Co-ordinates have been entered in an unrecognised format. The required format is "59°26.230'N" and "010°26.844'E" (or S or W), but it can be simplified to "59 26.3" and "10 26.8E".
Illegal geometry: too short leg or large radius	In route geometry, if a specified turn radius is too big there may not be any space for straight legs between waypoints.
Local Autopilot Command	The ECDIS or radar is no longer commanding the steering control system through the autopilot. HDG, CRS, WP or TRACK mode is terminated. Command of the steering control system is taken locally by the K-Bridge Autopilot.

Table 27 Operator messages (cont'd.)

Text	Description
Manual Drift must be <= 15 knots	The manual drift cannot be set higher than 15 knots.
Manual Drift must be >= 0 knots	The manual drift cannot be set to a negative value.
Manual Speed must be <= 70 knots	The manual speed cannot be set higher than 70 knots.
Manual Speed must be >= 0 knots	The manual speed cannot be set to a negative value.
Max Trial Time Exceeded	The trial simulation has been stopped. The maximum trial time is one hour. Therefore the end of the trial manoeuvre must be less than one hour's sailing time away.
Missing OwnShip Data!!	An attempt has been made to enter track steering, but calculations based on position, speed and heading have caused the attempt to fail.
Missing Sail Data!!	An attempt has been made to enter track steering, but calculations based on position, speed and heading in relation to the planned route have caused the attempt to fail.
Must be at least nnn sensors	In the **No of Sensors** dialog (see *Number of Sensors* on page 617) an attempt has been made to input a number that is smaller than permitted.
No Detail Menu is available	In the **No of Sensors** dialog (see *Number of Sensors* on page 617) (or in the dialog for a particular type of sensor interface) an attempt has been made to view **Details** where none are available.
No Free Targets Left	The **ACQ** button on the operator panel has been pressed (see *The TARGET group buttons* on page 35), and target acquisition has been initiated. However, the target table is now full and no more targets can be initiated. Cease the tracking of some targets (see *Ceasing the tracking of targets* on page 145).
No Monitored Route !!	An attempt has been made by the operator to put the autopilot into TRACK or WP mode. However, there is no route currently being monitored.
No Target is close to the marker	The **DATA** button on the operator panel has been pressed (see *The TARGET group buttons* on page 35), but there is no tracked target close to the cursor.

Table 27 Operator messages (cont'd.)

Text	Description
Not In Command!	An attempt has been made to select one of the autopilot steering modes. However, the attempt was made from an operator station that is not **In Command** of the autopilot.
Not passed 1. WP !!	An attempt has been made by the operator to enter track steering, but the ship has not yet reached the start of the route.
Only HeadUp Available - Hdg Error!	There is no acknowledged input from a heading sensor and the operator has attempted to use a presentation mode other than HEAD UP – RELATIVE MOTION. This is the only permitted mode when there is no heading sensor.
Only nnn Free Targets Left	The **ACQ** button on the operator panel has been pressed (see *The TARGET group buttons* on page 35), initiated, but there are only nnn free entries left in the target table. Cease the tracking of some targets (see *Ceasing the tracking of targets* on page 145).
Perf. Mon. Could not be activated!	An attempt has been made to start the performance monitor on a transceiver where the connection has timed out.
Remote AP-Mode Terminated!!	Remote control of the autopilot has been terminated by the operator relinquishing command of it.
Route Turn !!	An attempt has been made to select TRACK steering mode, but the ship is executing a turn on the route.
Route validation is busy	Route validation is handled as a single background process. If you have started one validation process, you cannot start another until the first has finished.
Route: BAD Geom!	The route has inconsistent geometry: the turn radiuses are too large, leaving no straight legs between turns. The route must have consistent geometry to be validated.
Route: Bad Geometry!	The route has inconsistent geometry: the turn radiuses are too large, leaving no straight legs between turns. The route must have consistent geometry to be validated.
Route: Gnd!	Route validation has detected grounding risks on the designated route segment.
Route: Not Validated!	The route has not passed validation.
Route: OK!	This part of the route has passed validation.
Route: Outside Chart!	The route validation process has detected that there is no valid chart coverage for this part of the route.

Table 27 Operator messages (cont'd.)

Text	Description
Select Manual Steering Please!	The autopilot is reporting that it has lost its heading input. TSwitch to manual steering and correct the problem.
Sensor type must be selected	In the **No of Sensors** dialog (see *Number of Sensors* on page 617) a sensor type must be selected before the number can be changed or details can be viewed.
Ship outside leg	An attempt has been made by the operator to select TRACK steering mode, but the ship is not on a straight leg.
Slave Can't Change Pulse Length	An attempt has been made to change the pulse length for the transceiver. However, the operator station from which the attempt was made was not Master in relation to the transceiver.
Slave Can't Change Run/StandBy	An attempt has been made to change the Run/Standby state of the transceiver. However, the operator station from which the attempt was made was not Master in relation to the transceiver.
Speed Control Terminated	The Speed Pilot did not respond to an activation attempt within 5 seconds, and the attempt was therefore terminated.
Threshold Parameters Outside Limits!	An attempt has been made to use unacceptable values for the tracker's minimum thresholds.
Too close to turn	An attempt has been made to select Track steering mode, but the difference between the bearing to the turn point and the heading of the ship is more than 15 degrees.
TRACK Refused: Route Not Validated	An attempt has been made to select Track steering mode, but the monitored sailing route has not been validated.
TRACK Steering refused. No Conning Display	An attempt has been made to select Track steering mode, but there is no Conning Display connected.
TRACK Steering refused. No ECDIS	An attempt has been made to select Track steering mode, but there is no ECDIS connected.
Track Steering Terminated!	The sailed route has become unmonitored. The steering mode has therefore been changed from Track to HDG Mode. The ship will continue straight ahead.
TRACK-Mode Terminated!!	Track mode has been terminated by the operator relinquishing command of the autopilot.
Trial is not permitted in Relative	The operator has attempted to use the trial manoeuvre facility in relative motion. It is only available in true motion.

Table 27 Operator messages (cont'd.)

Text	Description
Trial Speed Too Small	The trial simulation has been stopped because the simulated speed was less than 1 knot.
Trial stopped in Relative	The operator has attempted to use the trial manoeuvre facility in relative motion. It is only available in true motion.
Type must be "RHL" or "GC"	This message is issued during the editing of routes or Mariner's notes when the line/leg type field is set to something other than "RHL" (RhumbLine) or "GC" (Great Circle).
Values can't be changed as Slave	A dialog for changing radar parameters has been activated but the operator station is only a Slave in relation to the selected transceiver. The message informs the operator that this dialog is read-only until the operator station becomes the Master in relation to the transceiver.
Water Speed is Not Available!	Ground stabilisation has been selected but there is no speed sensor providing speed over ground.
WayPoint Steering Terminated!	The sailed route has become unmonitored. The steering mode has therefore been changed from WWaypoint mode to HDG Mode. The ship will continue straight ahead.
WP too close for TRACK Sailing	An attempt has been made to select Track steering mode, but the distance to the next wheel-over-point is less than 500m.
WP-Mode Terminated!	WP mode has been terminated by the operator relinquishing command of the autopilot.
XTD too large	An attempt has been made by the operator to select TRACK steering mode, but the cross-track distance is greater than 1 NM.

Appendix B Ground and water stabilisation

This section contains the following topics:

B.1 Introduction

This appendix explains the concepts of ground and water stabilisation.

The course and speed of the own-ship are measured with reference both to the ground and the water. The sensors used for this must be type approved. Vectors for tracked targets are also calculated with reference to both ground and water (although the vectors actually presented must be *either* ground or water stabilised: they cannot be both). The same selection of ground or water stabilisation on the radar dashboard (see *The radar dashboard* on page 77) applies to tracked targets, AIS targets, and the own-ship.

To select between ground- and water-referenced sensors, use the **Ground** and **Water** radio buttons (see 2.4 on page 77).

B.2 Ground-referenced sensors

Ground-referenced sensors are found in:

- Electronic Position Fixing Systems (EPFS) such as GPSs.
- Speed logs capable of measuring speed with reference to the sea bed.
- Radar positioning systems that track stationary radar targets.

An EPFS system will either transmit the speed data directly to the K-Bridge Radar system or it will transmit only position data.

If the K-Bridge Radar system does not receive speed data directly, it calculates the speed and course from changes in the position data it receives. GPS data is normally the most accurate basis for this but there are sources of error, including changing atmospheric conditions and changes between absolute and differential reception.

Ground-referenced speed logs work by analysing the echoes of sound transmitted through water and returned from the sea bed. Their speed measurements are also subject to error. In very deep water, for example, there may be no return of sound from the sea bed at all. In rough seas or when the own-ship's thrusters are operating, the return of sound from the sea bed can be blocked by bubbles. And, in the case of ground-referenced speed logs that use the Doppler principle (and therefore transmit their sound at an angle), the resulting speed measurements can be substantially affected by changes in temperature and salinity (these cause the sound ray to bend).

Finally some ground-referenced speed logs may use echoes from layers in the water instead of from the sea bed; where this is the case, it will introduce an error in the speed measurement that is equal to the speed of the water.

B.3 Water-referenced sensors

Water-referenced sensors are speed logs that are capable of measuring speed through the water close to the ship. Speed logs may be single axis (measuring only the along-ship speed), or dual axis (measuring also the athwart-ship speed). If a single axis log is used, it is assumed that the Course Through Water (CTW) is the same as the heading.

Water-referenced speed logs (like ground-referenced speed logs) can be affected by rough seas or the own-ship's use of its thrusters. These disturbances can cause changes in the local stream of water that make it impossible to measure what the speed through “unchanged” water would have been.

B.4 Ground- and water-referenced vectors

If you select “ground” as the principle of stabilization, this causes the vectors presented for tracked targets, AIS targets and the own-ship to be ground referenced. If you select “water”, the vectors presented for tracked targets, AIS targets and the own-ship are water referenced.

Water-referenced vectors are best for collision avoidance, especially at night. When there is a current in the water (as long as the current is the same at the own-ship as at the target) then the water-referenced vectors of targets that are heading towards the own-ship's’s starboard or port side will show directly. The colour of the navigation lights at night (and which side is visible at day) corresponds to the vector passing to the port or starboard. (This is correct only if both the target and the own-ship move through the water in the direction of their heading lines (and there is zero water speed athwart-ship).

AIS information is referenced to ground. The AIS vectors are recalculated based on the own-ship's’s water speed when they are shown referenced to water.

Measurement of the own-ship's ground speed is more accurate than measurement of its water speed, and – unlike water – the ground provides a fixed reference that is common to both the own-ship and its targets. Water-referenced vectors can be misleading when there is variable current in the water. Ground-referenced vectors provide better guidance as to where the targets are heading in relation to geographical features (for example, which side of a small island they are going to make towards), especially when the electronic chart is displayed.

CPA and TCPA calculations will give the same results irrespective of whether ground or water stabilisation is used.

Appendix C
Concepts of video enhancement

This section contains the following topics:

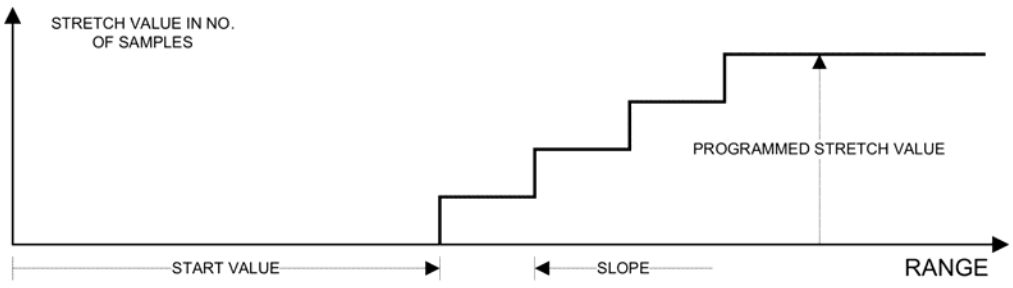
C.1 Introduction

This appendix provides background information about the video enhancement facilities available in the K-Bridge Radar system (particularly in the Video Enhance dialog; see*Video Enhance* on page 643).

For further information about how to minimize problems that you might encounter with the video display, see *Minimising radar display problems* on page 751.

C.2 Video stretching

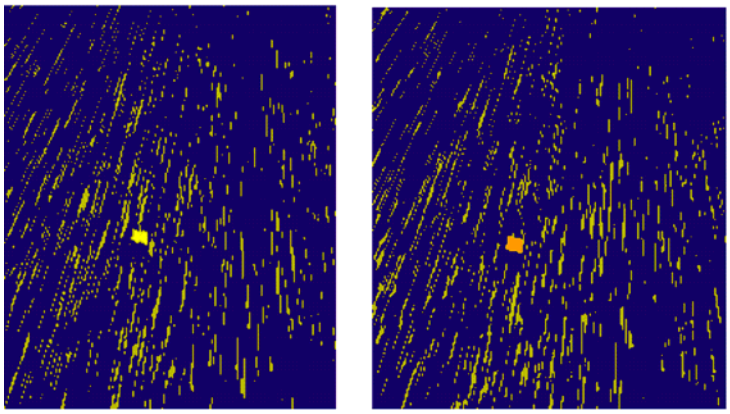
Video stretching is designed to make targets more visible by stretching them in range. When applied, the stretching is performed on all video presented on the screen. It does not distinguish between stable echoes and clutter, and it is best used in relatively clutter free conditions. Increasing the pulse length is often a better way to enlarge target echoes. However, the advantage of stretching is that it can be used to stretch echoes only at the outer part of the screen. The sea clutter close to the own-ship will then not be stretched (leaving the visible clutter unchanged), but the targets at longer range will be presented with larger echoes. The transition between non-stretched and stretched video is graduated to avoid the appearance of a distinct ring at the transition: at the end of the non-stretched range, video is stretched by one pixel, then by one more a bit further out, and so on until the full stretch length is reached.



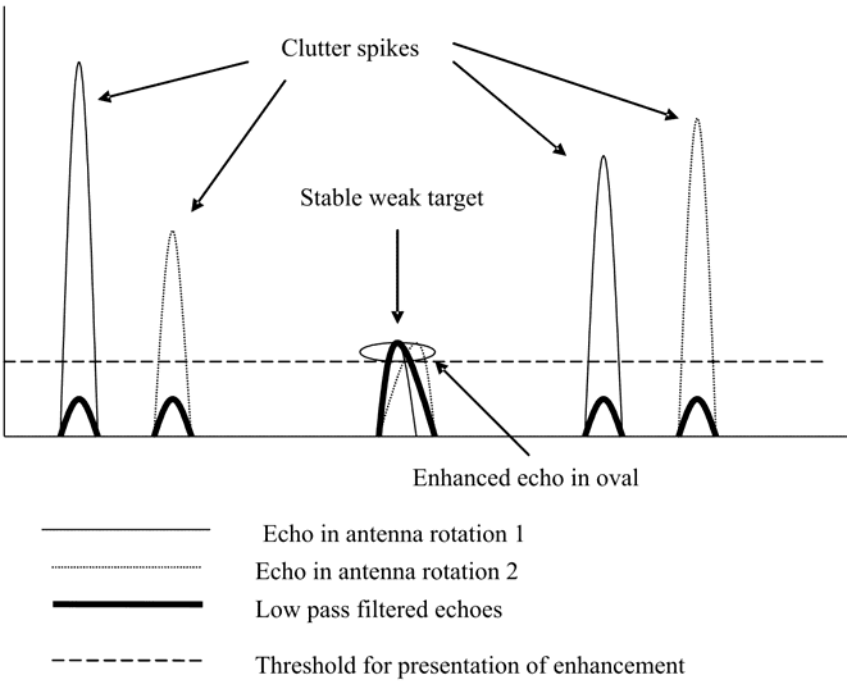
C.3 Enhancement of stable echoes

Video enhancement is designed to make stationary stable targets more visible than random noise or clutter. It does this by changing the presented colour, and by extending the size of the presented echoes by one pixel in each direction. The colour change and extension are performed only on stationary or slow-moving targets, so moving targets will not be presented in another colour. This enhancement is only presented when true trails are displayed. The technique can only enhance stationary and stable echoes that are presented on the screen. To get the full effect of this enhamcement, you must adjust the gain and clutter controls so that a small speckle of noise is present on the screen.

Figure 113 Target without (left) and with (right) video enhancement



The technique used by the system is to average (or more precisely to "low-pass filter") the video in each pixel on the screen over several scans. Strong clutter spikes that occur only in single antenna rotations will be reduced, while weak stable echoes will be enhanced (see diagram below).



Additionally, the presented size of enhanced video echo is extended by one pixel in each direction on the screen, to increase its visibility. The enhancement works only if the pixel represents the same geographical position in successive antenna rotations. The enhancement is therefore only displayed when True Trails are being displayed. The low-pass filtering is performed after adjustments for gain and clutter. If gain and clutter are adjusted in such a way that only the strong and stable echoes are visible, the enhancement will have no effect.

C.4 Sweep correlation

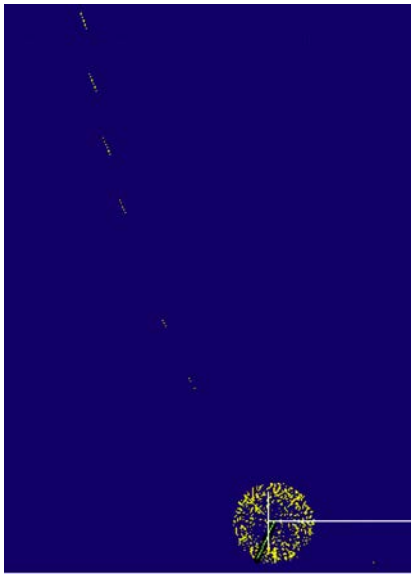
Sweep correlation is performed by comparing the incoming video with the video that was received in the previous sweep (in other words, the previous radar pulse). This comparison is performed on corresponding samples of the video. If the echo in the incoming sweep is more than a configurable percentage higher in amplitude than the echo in the corresponding sample from the previous sweep, then the value from the previous sweep is used.

This method of comparison suppresses an interference pulse while allowing slowly rising echoes to persist.

Echoes that are not sweep-to-sweep correlated are completely removed from the screen, because any real echo will repeat in several sweeps (due to the Pulse Repetition Frequencies and Antenna Rotation speeds used in K-Bridge Radars).

We recommend you keep sweep-to-sweep correlation on in normal conditions to hide transmitting pulses from other radar equipment.

Figure 114 Typical interference from another radar



C.5 Sweep integration

The pulse repetition frequency of the radar is so high compared to the rotation time that even a small target will be hit by several sweeps within the same antenna rotation. The number of sweeps that will hit a target in each antenna rotation varies between four (for an X-Band 2.4m antenna with a long pulse) and twenty four (for an S-Band antenna with a medium or short pulse). The number is lower for high-speed radar.

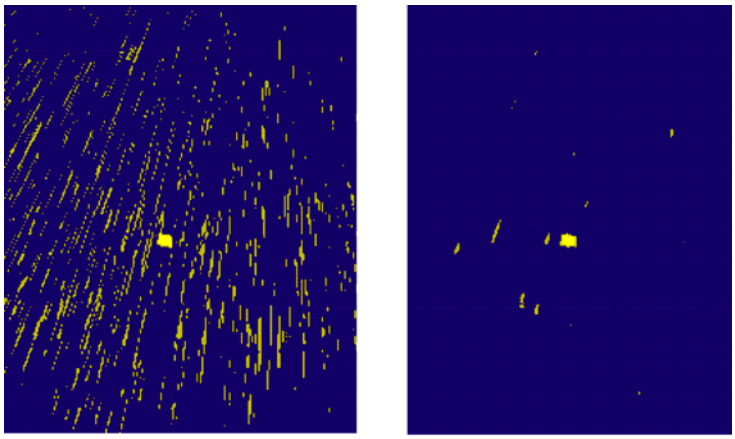
Integration over the sweeps within one radar beam width will remove noise but not echoes from targets that are stable for the 10-15 ms it takes the antenna to sweep across the target. This includes ships, land and waves. There is no risk of hiding a target by using sweep integration, but targets may appear wider in bearing. The theoretical improvement in signal-to-noise ratio is 3dB to 6.9dB. The actual results in K-Bridge Radar will be slightly lower, because sweep-to-sweep integration is performed after gain and clutter adjustment, not before.

Sweep-to-sweep integration can be performed with or without sweep-to-sweep correlation activated. However, sweep-to-sweep correlation is normally recommended, to reduce noise from other radar equipment without affecting the result of the sweep-to-sweep integration.

The number of sweeps within the opening angle of the radar antenna beam is calculated from the measured Pulse Repetition Frequency (PRF) and antenna rotation time, and the configured beam width for the selected radar. The resulting number is rounded down to give the nearest integer number of sweeps for integration; it is limited to a maximum value specified in the Video Enhance dialog.

Traditionally sweep-to-sweep integration has only included past sweeps in its calculations. However, this leads to a rotation of the presented picture by half a beam width. The K-Bridge Radar avoids this by performing integration over a number of sweeps on both sides of the presented sweep.

Figure 115 Target without (left) and with (right) sweep integration

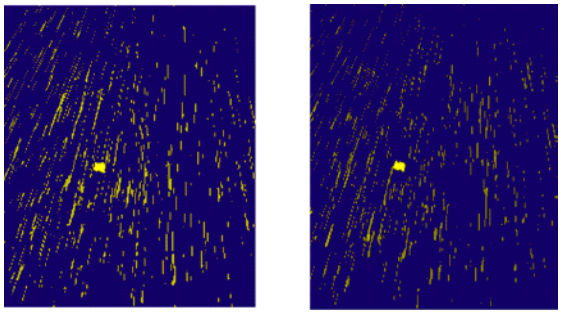


C.6 Scan correlation

Scan correlation is performed by comparing the incoming video with video from the previous rotation(s) of the antenna and using a lower intensity to display targets that are not present at the same position in all the rotations. (You can specify whether the comparison is performed over two or three rotations.)

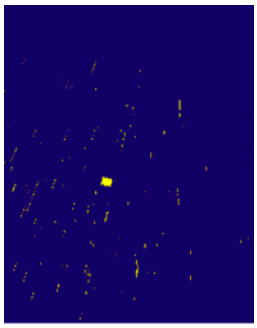
The echoes that are present at the same position for only one or two scans appear with a lower intensity but are not removed completely; this is because high-speed vessels may travel so fast over the screen that they are not present at the same position in more than one scan (but their echoes obviously need to be captured).

Figure 116 Target without (left) and with (right) scan correlation



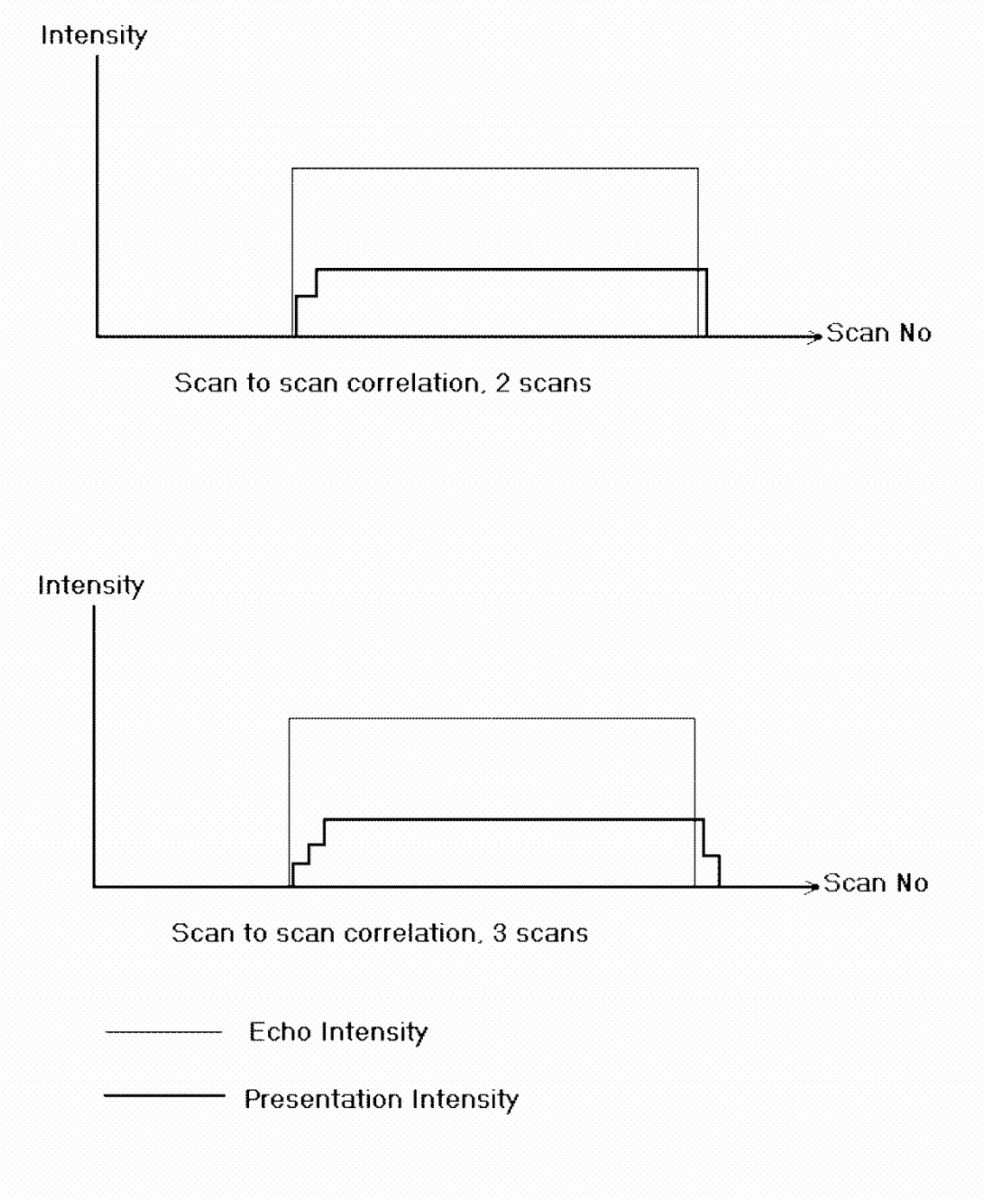
You can remove these targets from the picture by clicking and holding down the **Hide Uncorrelated** button; the targets will be visible again when you release the button (see *Video Enhance* on page 643).

Figure 117 Target with scan correlation on and "Hide Uncorrelated" pressed



When you configure the correlation to take place over three scans, the correlated video that disappears is permitted to survive on the screen for one further scan (although with reduced intensity). This makes the presentation of unstable echoes more stable.

Figure 118 Higher definition is achieved with correlation over three scans



In relative motion, stationary targets will move across the screen at the own-ship's speed. Scan-to-scan correlation is therefore best adapted for true motion display. We recommend you have it enabled with true trails (this is the default in true motion), and disabled with relative trails (which is the default in relative motion).

Appendix D
Minimising radar display problems

This section contains the following topics:

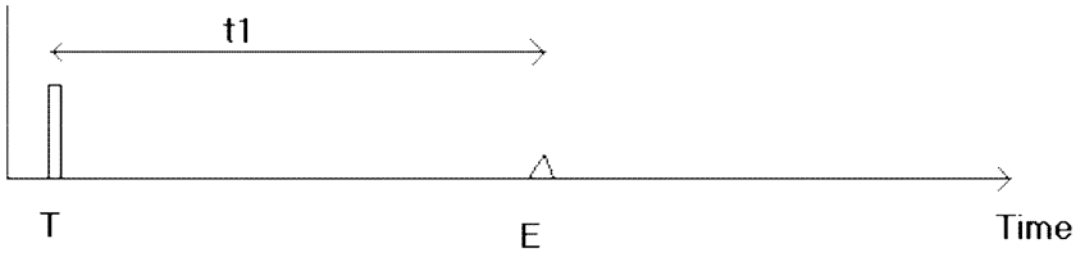
D.1 Introduction

This section describes some of the problems that radar video is susceptible to and provides tips to help you overcome them.

D.2 Second-time echoes

The radar uses a rotating antenna to transmit radio pulses, receive the echoes from these transmissions, analyse the echoes and present the result to the user on a video display unit. The time between transmission of the pulse and reception of the echo is used to calculate the distance to the target.

It is assumed that an echo is the result of the last transmitted pulse, as illustrated below:



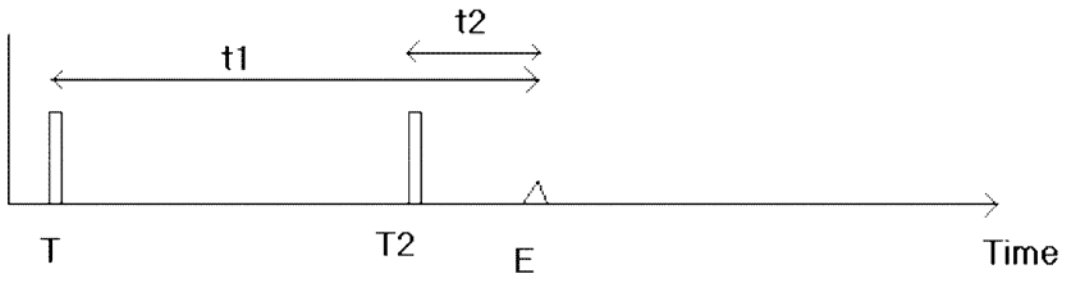
Key to diagram:

T- Transmitted pulse

E - Echo received

t1 – Time from transmission to reception (used to calculate distance)

If, however, the time taken by a transmission to reach a target is longer than the interval between that transmission and the next transmission pulse, the following situation arises:



Key to diagram:

E - Echo received

t1 – Time from first transmission to reception of echo.

T2 – Second transmitted pulse

t2 – Time from second transmission to reception (this interval is used to calculate distance).

We see that in the second case, the distance will be calculated from t2, instead of t1, and the echo will appear on the screen as too close.

D.2.1 Countering second-time echoes

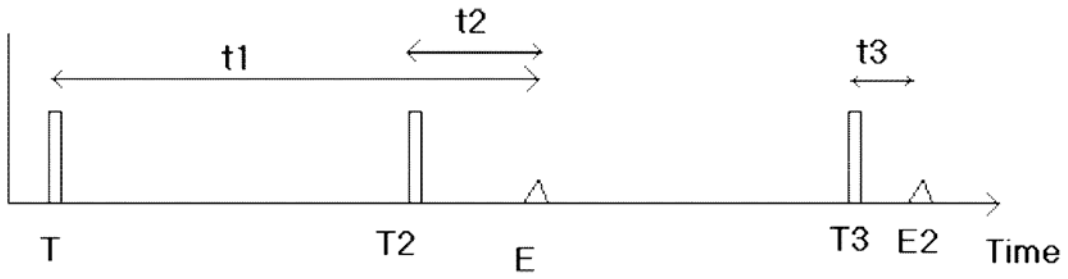
Automatic inter-sweep time handling

There is a delay between the end of reception for the selected range scale and the transmission of the next pulse. This reduces the strength of the distant echoes so that the second-time echoes are less frequent and weaker. They can not be removed completely, because of the need for frequent updating of the screen. Inter-sweep time is handled automatically by K-Bridge Radar.

Automatic staggering of transmission intervals

The time between transmission pulses is not constant but is subject to minor variations from one transmission to the next. In this way, the apparent distance t3 is different from the apparent distance t2.

If sweep-to-sweep correlation is on, the second-time echo from a small target will be removed. If the target is larger than the difference between t2 and t3, the echo will not be completely removed but will nevertheless be substantially reduced. It can be further reduced with sweep integration. This staggering is always active, and requires no user interaction



Changing the pulse length

You can change the pulse length (see *Radar Control* on page 539). When changing from a short or medium pulse to a long pulse, the pulse repetition frequency is changed from 1800 Hz nominally to 785 Hz nominally. Echoes that disappear from the screen as a result of a change of pulse length are probably second-time echoes. If they disappear after a reduction of pulse length, that may also be due to a reduction in echo strength. Changing the pulse length also changes the resolution of the radar picture (a shorter pulse gives a higher resolution).

D.3 Transmission pulses from other radars

When there are other radars transmitting with the same frequency in the same area, the transmitting pulses will be received through the antenna; they will then be perceived as echoes and presented on the screen. If the other radar has a different Pulse Repetition Frequency (PRF), the transmitting pulses will be shown as short lines in a spiral pattern. If the other radar has a PRF that is equal to the own-ship's radar, the lines will be shown in a more circular pattern. Staggered transmission intervals will make this circle appear broken and not perfect.

D.3.1 Countering pulses from other radars

Use weep-to-sweep correlation to remove other radars' transmission pulses from the presentation. We recommend you set sweep-to-sweep correlation to on in almost all circumstances.

D.4 Random electrical noise

There is always some electrical noise that reduces the signal-to-noise ratio and the radar's detection capabilities.

D.4.1 Countering random electrical noise

Random noise will be reduced by sweep-to-sweep correlation, sweep integration and scan-to-scan correlation. These will all contribute in different ways. Use gain adjustment to reduce the presented noise to a manageable level.

D.5 Mirrored (ghost) echoes

Radar beams will be reflected by reflecting materials. This is called mirroring. If the mirroring surface is nearly vertical, the radar beam will be reflected in another direction. If it then hits a target and is reflected back into the antenna, the radar will present the echo in the direction of the antenna and not in the direction of the mirrored beam. This can be very confusing for the radar operator.

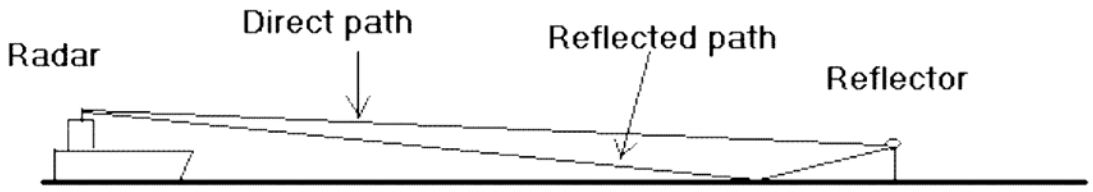
D.5.1 Countering mirrored (ghost) echoes

There is little to be done either in radar design or operation to reduce the effect or occurrence of mirrored echoes.

However, it is important to be aware of their possibility and also to try to establish at which bearings they may occur as a result of mirroring objects on the own-ship. Countermeasures must be performed at the ship-design stage to eliminate possible radar mirrors or at least to ensure that they are not vertical. Mirrors that reflect the radar waves into the open sky will normally not create a problem.

D.6 Dual paths and interference between the two paths

This is another mirror effect. It occurs mainly in calm seas and with small echoes from targets such as buoys and beacons.



There are two possible paths between the radar antenna and the small target: one direct path and one path that hits the sea surface and is reflected up to the target. The reflected path is longer than the reflected path and takes a little longer than the reflected path.

The signals in the direct path and in the reflected path will interfere, giving a received echo which is the sum of both signals.

If the difference in distance between the two lines is a multiple of the radar wavelength (3 cm for X-Band, 10 cm for S-Band), then the signals are “in phase”. This means that they will be added and a strong echo will be presented.

If the difference in distance is such that the signals are “in counter-phase” (half a wavelength from being in phase) then the reflected signal will be subtracted from the direct signal and weak echo (if any) will be presented.

When the ship sails towards the reflector, the distance between the direct path and the reflected path will vary between phase and counter-phase. Therefore the echo from the reflector will vary between a strong echo and no echo at all.

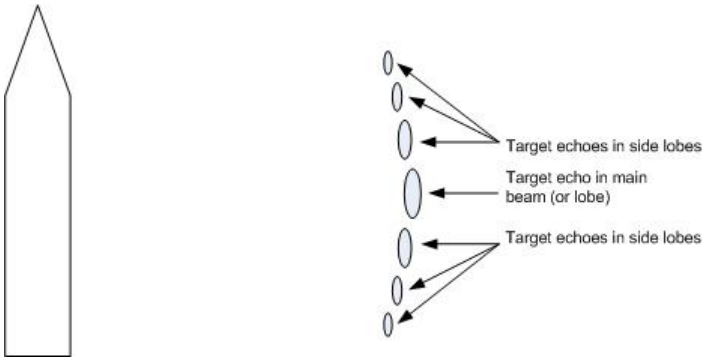
D.6.1 Countering interference between two paths

There is nothing you can do to stop this interference. If you have two radar antennas on board, however, there is a possibility (but not a certainty) that the target will not be weak for both radars at the same time.

If trails are switched on and configured to persist for one minute or more, the trails from the strong reflections will indicate the position of the unstable echo. This works best in true motion. If there is an electronic chart available, the chart will show the positions of fixed navigational aids.

D.7 Side lobes

The energy and sensitivity of the radar antenna is not restricted to the main beam but will produce some effect also outside the main beam. This effect is represented in an antenna's radiation pattern by local peaks to the sides of the main beam (or lobe) called side lobes. They are of reduced (and progressively diminishing) radiation intensity. Therefore they will not affect the radar display unless there are very strong echoes present such as might be produced for example by a steep cliff or the side of a large ship. The effect is to make the main echo appear to repeat in diminishing shapes at the same range but slightly different bearings. Sometimes the side lobes can cause the repeated images to merge on the display with the main echo, causing the target to appear larger.



D.7.1 Countering side lobes

There are no counter-measures for preventing side lobes from occurring. You can remove them from the screen by reducing the gain threshold, but this will affect the presentation of echoes in other parts of the screen. Therefore, only adopt this method of countering side lobes when you are looking at echoes in close proximity to an echo with side lobes.

D.8 Echoes from sea clutter

Echoes from waves may be strong compared to echoes from smaller ships and boats. The more perpendicular to the sea surface a reflecting object is, the stronger its reflections will be. The sea echoes will therefore be stronger and much greater in number close to the radar; their strength and number will decrease with range.

A radar mounted higher above the surface will have problems with sea echoes at a longer range than a radar that is mounted lower. As a general rule: If one radar antenna is mounted twice as high as another, it will have problems with sea clutter for twice the range.

Sea echoes will also be stronger facing into the wind than facing to the lee-side.

D.8.1 Countering sea clutter

For information about countering sea clutter, see *Setting the gain and clutter controls* on page 120.

D.9 Echoes from precipitation (rain clutter)

Precipitation (rain, snow, hail and combinations of these) will also influence the echoes. Parts of the radar beam will be reflected in each droplet and thus reduce both the echoes reflected from the target and the signal-to-noise ratio. The reduction of echo strength is difficult to predict, but the graphs below may give an indication. They are valid for S-Band and X-Band respectively.

Figure 119 First-detection ranges in rain (S-band)

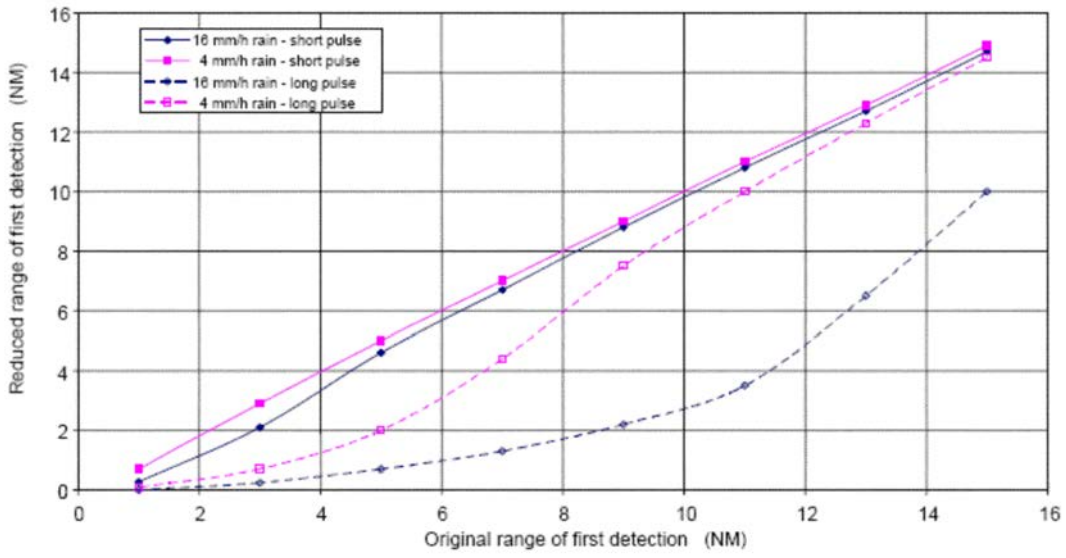
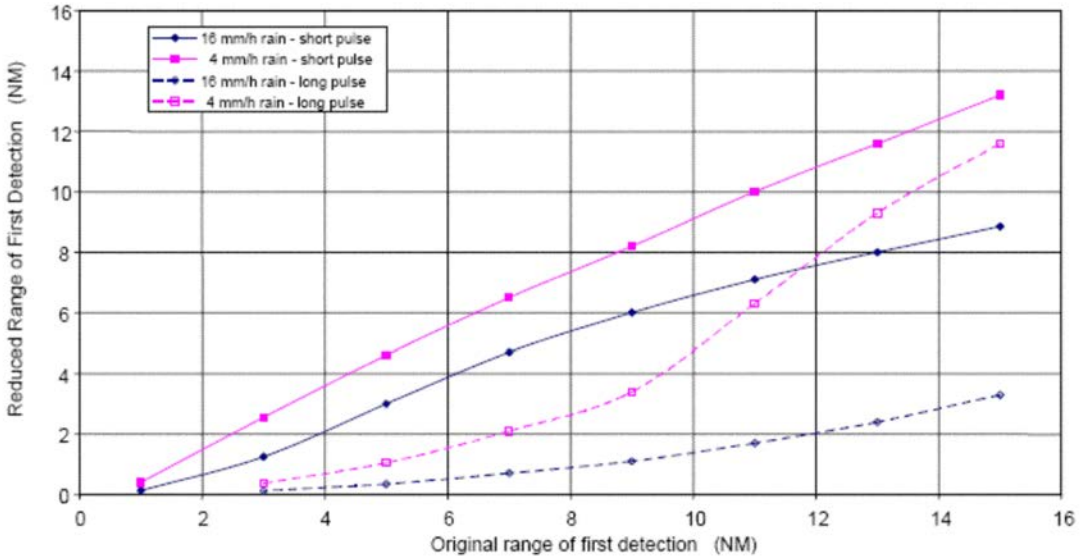


Figure 120 First-detection ranges in rain (X-band)



Both the above graphs assume that the rain density is constant in the area and give the reduction in detection range for two different densities of rain: 4mm/hour and 16 mm/hour. However, conditions with homogenous precipitation are unlikely to be encountered. The precipitation usually varies across the radar range, and the reduction of echo strength is not homogenous. This makes it difficult to find one setting of gain and clutter that is optimal for the entire radar range.

Whatever your rain clutter setting, it may not be optimal for all rain showers in the area, so you may need to adjust it when focusing on different areas.

Even with rain clutter adjusted properly, some targets will remain undetected in precipitation, even when other targets in the same precipitation are detected.

The graphs above give estimated ranges for the first detection of targets in different levels of precipitation (assuming an ideal setting of the gain and clutter controls). But of course real life may be different and conditions worse than the graphs allow for. According to the graph for the X-band radar, a target that should be detected at 5 NM without rain and using a long pulse will be detected for the first time at about:

- 1NM in conditions of 4 mm/h of rain, and at
- 0.2NM in conditions of 16mm/h of rain.

It is also possible to see from the graphs that weak targets will have a more significant degradation of detection range than strong targets. This is because strong targets have a higher rate of echo return than weak targets.

D.9.1 Countering rain clutter

For information about countering rain clutter, see *Setting the gain and clutter controls* on page 120.

D.10 Refraction of radar beams

These are effects caused by meteorological conditions that bend the radar beams either upwards or downwards. Under normal conditions the radar beams will be bent slightly downwards because of higher humidity close to the water. This results in a "radar horizon" that is a little further away than the optical horizon. It is usual to have a radar horizon that is approximately 4/3 of the optical horizon.

Under some conditions, the radar beams will be bent differently from normal, and differently at different heights. If the temperature increases with height, or the humidity decreases with height, the radar beams will be bent downwards.

In certain conditions the radar beams will not escape from the lower layers at all and they are then described as trapped in a "duct" (the duct may vary from 10 to 200 meters in height). This results in a significant increase in effective radar range across the sea surface and an increase in the occurrence of second-time echoes.

With a low layer of fog or warm air just above the water the radar beams will be reflected upwards. This results in a very low effective radar range across the sea surface. In extreme cases the beam from a radar mounted on top of the ship will not reach the surface of the sea at all.

D.10.1 Countering the refraction of radar beams

There is little to be done to counter the refraction of radar beams. However, you must be aware of the phenomenon and know when to expect the problems associated with it.

D.11 Suppression of fast-moving targets

Fast moving targets will move across the screen from one scan to another. This means that they will be suppressed by scan-to-scan correlation: they will still be visible but with limited intensity and they will not leave trails.

D.11.1 Countering the suppression of fast-moving targets

When you need to watch fast-moving targets carefully, turn off scan-to-scan correlation even though this means that it will be more difficult to distinguish weak and slow targets from noise.

Appendix E
Speed pilot

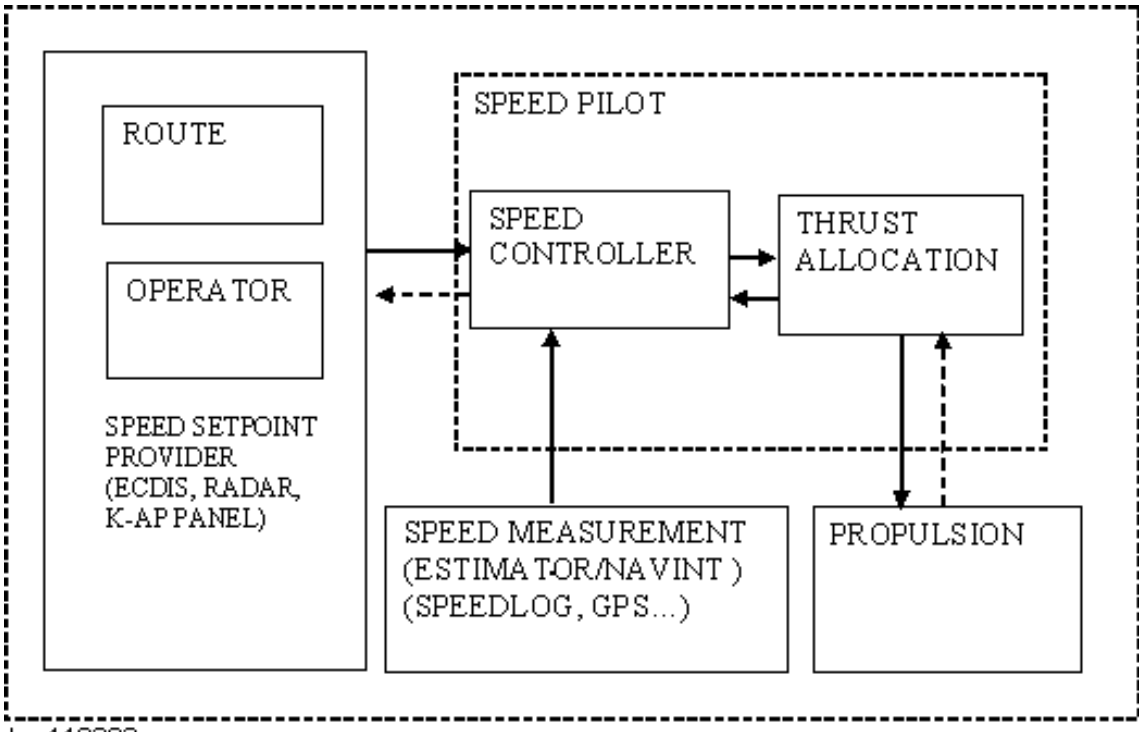
This section contains the following topics:

E.1 Speed pilot overview

This appendix describes the speed pilot option module for the K-Bridge navigation system.

The following figure shows the interfaces of the speed pilot. The main modules are as follows: Speed Setpoint Provider (e.g. ECDIS), Speed pilot, Speed Measurement and Propulsion.

Figure 121 Speed pilot overview



The output from the Speed Controller module is put into the Thrust Allocation unit, which based on Propulsion models and Allocation algorithms calculates revolutions per minute (RPM) or pitch set-points for the propulsion control system.

E.2 User interface

For the user interface (Speed Set-point Provider) and a description of the dialog box involved, see *Speed Pilot (option)* on page 433.

E.3 Setting speed – Speed mode

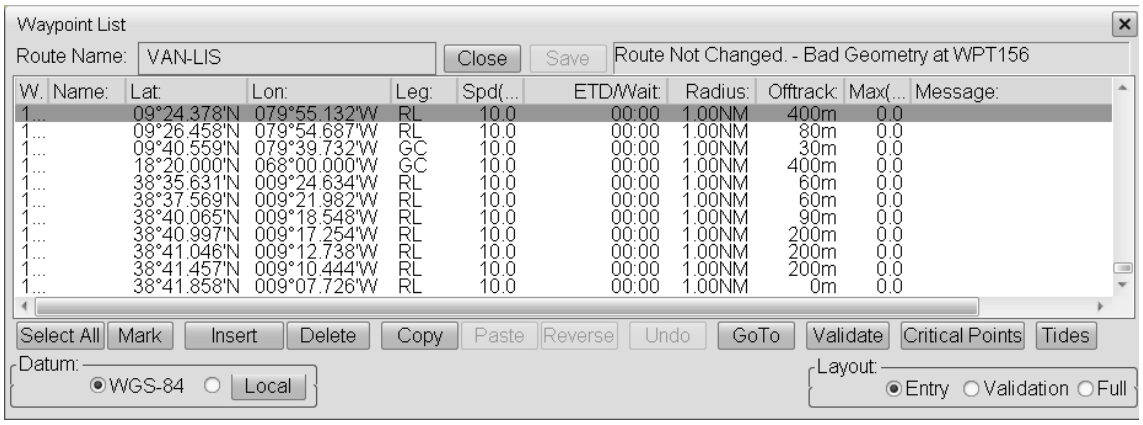
- The operator is to set ordered speed in the Operating Mode of the dialog, by either entering desired speed or using spin buttons to increase or decrease the speed order (1 knot step).

  If speed is entered by numeric keys the **Apply** button must be enabled to allow the operator to initiate the new speed order (see *Speed Pilot (option)* on page 433).

E.4 Setting route speed – Route speed mode

- The route speed mode takes speed order from the waypoint list speed attribute. The speed order is then picked accordingly and put out to the Speed pilot.

Figure 122 Example of Waypoint list



E.5 Setting ETA speed – ETA speed mode

The Estimated Time of Arrival (ETA) speed mode calculates the required speed on the legs to arrive at a desired time at the end of the route (or at an arbitrary waypoint). A new waypoint attribute is defined (Free Speed) which indicates that the Speed pilot (in ETA mode) is allowed to vary the speed order within a certain interval on the leg.

Some tips for setting up the ETA speed are listed below:

1 Bring up the **ETA Speed** dialog in one of the following ways:

- by pressing the ETA Setup button in the **Speed pilot** dialog (see *Speed Pilot (option)* on page 433), or
- by using the **Route→Compute ETA** button.

The detailed setup is now done in the opened **ETA Speed** dialog shown in section 20.4.9.1 on page 435.

2

a **If a route is being monitored**, the monitored route is shown in the **ETA Speed** dialog.

b **If no route is monitored**, a selection box is enabled in the bottom part of the dialog, enabling planning of the ETA for a certain route.

For each waypoint (Wp/leg) there is a checkbox which sets a **Free Speed** waypoint attribute. If this is set it indicates that the following leg is allowed to vary speed "freely".

Free speed is though within limits; the speed must be between 0.2kn and maximum ship speed set. (**System→Parameter Settings→Route tab→Max Speed**; see *Route (tab)* on page 570.)

If the **Obey Max Speed** is checked the speed is even limited by the maximum speed given by the waypoint max speed setting.

For all waypoints (Wp/legs) not checked as free speed, the speed is determined by the settings in the Fixed Speed Legs below in the dialog. Either the current speed (speed is fetched when selection is made), the planned speed (from route plan Spd attribute) or a manual set speed is used for all none **Free Speed** waypoints.

3 **To set a desired ETA for a waypoint**, select the row with the corresponding waypoint. In the **ETA Speed** dialog, select as follows:

- either double click in the wanted ETA column, or
- press **Ins ETA** button.

A suggested time pops up (based on the ship cruising speed set in **System→Parameter Settings→Route tab→Cruise Speed**; see *Route (tab)* on page 570).

You may now edit the ETA time as you wish (time format; DD <Month in 3 letter code> HH:MM).

If either the time you enter is not achievable or there is an insufficient number of Free Speed legs, a warning message is displayed in Status section of the dialog.

Once a legal setup is made, the **OK** button is enabled allowing you to save your ETA route settings.

4 **It is possible to change any ETA speed settings even if the route is monitored and used**.

When you do changes, the result of the changes are immediately checked and verified, but will not be used until you press **OK** (if they are found OK). It is possible to revert to your old setting pressing **Cancel** before **OK** button is pressed.

5 **Add Wait Times**

The **Add Wait Times** (from Plan) causes the ETA calculation to take into account the Wait Times from the plan. This setting will however not cause the Speed pilot to command a zero order for a certain time, so this should be taken care of by other means (e.g. manual speed control).

Once the ETA is setup correctly and your route is being monitored, you are able to select the **ETA mode** in Speed pilot dialog, see section 20.4.9 on page 433.

6 **Selection Calc ETA/ETA Speed pilot**

The **ETA Speed** dialog used as follows:

- can either be a setup dialog for ETA speed control (select **ETA Speed pilot**), or
- a tool displaying ETA at the various waypoints (select **Calc ETA**) on the monitored route (or selected route if planning mode).

Changing settings in **Calc ETA** while the Speed pilot is running in **ETA mode** will not affect the running of the Speed pilot. Reverting to **ETA Speed pilot** will change the settings to your active settings.

E.6 Automatic speed update profile

The **Automatic speed profile update** in the **Speed pilot** dialog enables dynamic update of the speed of the route.

If the speed for some reason is not achieved at earlier parts of the route adjustments may be necessary on the remaining parts of the route to achieve desired ETA. By enabling this option this recalculation is done automatically at regular intervals.

E.7 Activating the Speed pilot

To be able to perform any Speed pilot settings the Speed pilot must be in command, see section 20.4.9 on page 433 and Figure 123 below.

Some Speed pilot statuses are listed below.

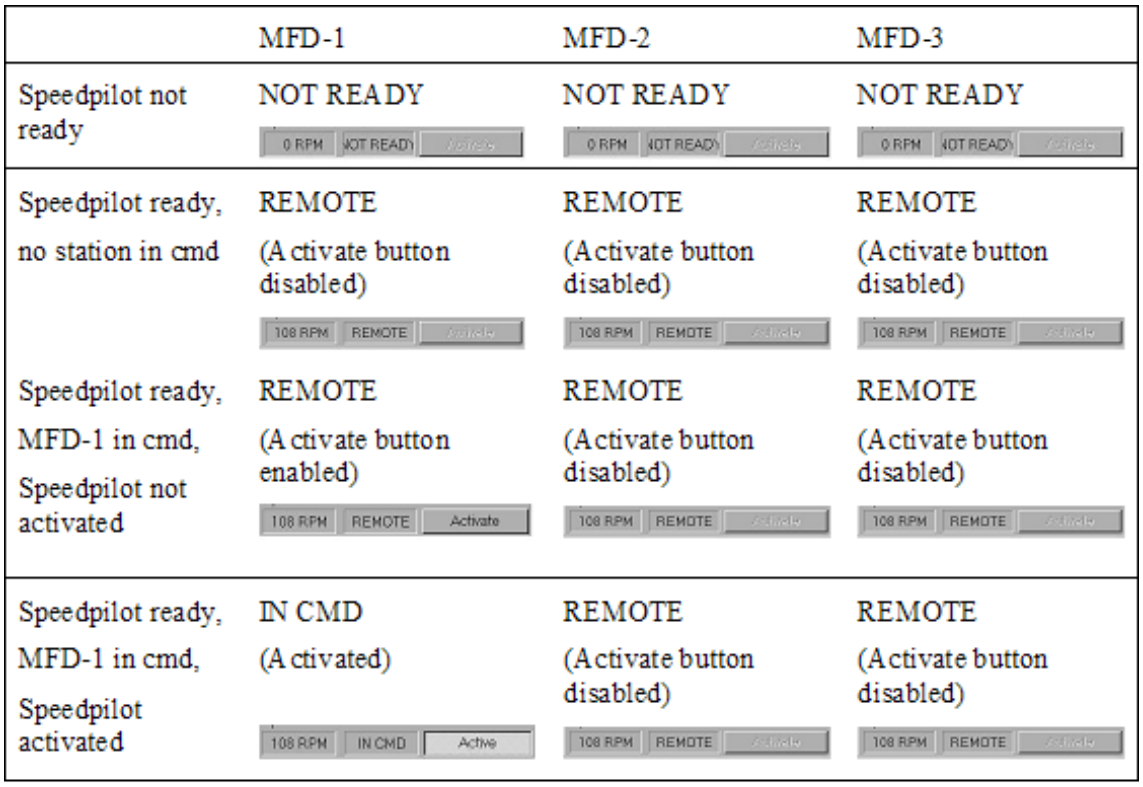
Command setting is common with the **Autopilot In Cmd** and is set as follows:

- either by dialog **Autopilot Mode** (see *Autopilot Mode* on page 427), or

- by the panel status text field **In Cmd**.

- If the station is **not In Cmd**, the **Speed pilot** dialog is disabled (except for the **ETA Setup** button) indicating that no active control can be performed.
- When **In Cmd**, all dialog selections (except **Activate** button) is enabled, making it possible to prepare the Speed pilot before activating it.
- When the Speed pilot is **Not Ready** for use (External Speed pilot On/Off-switch is **Off**) the **Activate** button is disabled (grey). The Speed pilot status text field shows **Not Ready**.
- When the Speed pilot is **Ready** for use (External Speed pilot On/Off-switch is **On**) the **Activate** button is enabled.
- If the **Activate** button is **not enabled**, the status text field shows **Remote**. This indicates that the Speed pilot is active controlling propulsion, but this station is not controlling it (not providing ordered speed).
- If the **Activate** button is **enabled** (displaying **Active**) the status text field shows **In Cmd** indicating that the Speed pilot is active controlling propulsion and this station is providing ordered speed.
- If no station is **In Cmd** the Speed pilot is running autonomously with the last given ordered speed.

Figure 123 Activation of Speed pilot



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E.8 Bumpless transfer

When the Speed pilot is switched **On** by a ready signal, the output from the Speed pilot controller is immediately used as order to the propulsion system. The speed at transfer time is fetched and used as setpoint.

To avoid large jumps and excessive loads on the propulsion system, a bumpless transfer is made possible. This is done by filtering (smoothing) the propulsion feedback and using this as the desired order at transfer time. To make the transfer as gentle as possible, it is important that the propulsion has been at a reasonable steady level for some time, otherwise propulsion jumps during the transfer may occur.

Appendix F
Generating routes, predicting tides, avoiding pirates

This section contains the following topics:

F.1 Introduction

This appendix tells you how to generate routes automatically between two ports, how to use the tide prediction facilities, and how to avoid known blackspots for piracy.

This option provides automatic route generation facilities (for generating a route between two specified ports) and tide prediction facilities.

To use this option, you must have a licensed C-Map Professional+ chart database installed.

The automatic route generation and the tide prediction facilities are integrated with the normal route planning functionality of the K-Bridge ECDIS and Planning Station applications. Therefore you can use them to access tide and stream data at different points in space and time along a route that you are generating automatically.

F.1.1 Route generation

The route generation tool:

- Suggests a route between two ports that you specify.
- Allows you to specify that the generated route must not pass through certain passages or canals.
- Allows you to specify that the generated route must maintain a minimum depth of clearance for the vessel for the entire length of the route.
- Checks the generated route's leg and turn-radius geometry. The route generation facilities can also be configured to correct the route automatically in this regard.
- Generates routes in a format that enables you to pass them through route validation in the ECDIS and Planning Station applications.
- Can be configured to generate route names automatically on the basis of the port names or port UN/Locodes that you specify.

F.1.2 Tide prediction

The C-Map Services option also provides tide prediction facilities. To use these you must also have a C-Map Professional+ database licence.

The tide prediction facilities are concerned with astronomical tides. They:

- Enable you to plot tide and stream symbols on the chart display. The tide symbols show the current level of the tide. The stream symbols show the speed and direction of tidal streams.
- Update the data associated with the tide and stream symbols dynaimcally, while you browse the chart.
- Enable you to display tide levels and daylight data for different times of the day (and going forward and backward in time) at specified positions around the world.
- Enable you to list the locations for tide and stream data that are nearest to a specified position.

- Enable you, when you are using the route planner (Route Editor), to display the tide data location that is closest to a selected waypoint. The tide prediction for that location will be given for the own-ship's ETA (Estimated Time of Arrival) at the waypoint.

F.2 Generating routes automatically

This section tells you how to generate a route automatically between two ports by using the C-Map route generator. Follow the steps in each sub-section in order.

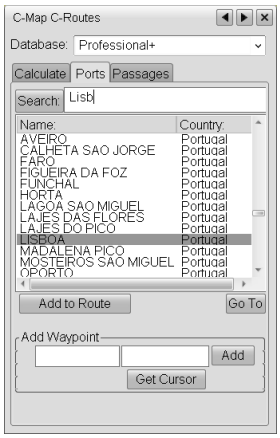
F.2.1 Enabling the C-Map Services option

1 Select **System→Maintenance→Change Optional Components**.

2 Select **C-Map Services** and click **Enable**.

3 Enter 0000 as the licensing PIN-code.

F.2.2 Specifying the departure and destination ports



1 Select **Routes→Generate Route Automatically**.

This brings up the C-Routes dialog (see left).

2 Unless you have a particular reason for selecting an alternative database, select the **Professional+** database from the drop-down list.

(Whichever database you select, it must be correctly licensed for your use.)

3 Select the **Ports** tab in the C-Routes dialog.

4 Select the name of the port at the start of the route.

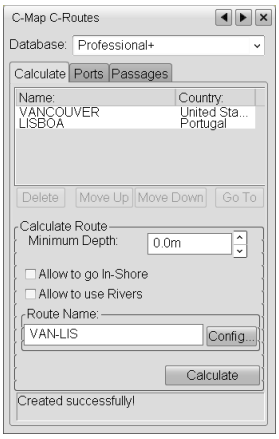
You can type in the first letters of a port name in the **Search** field and then press the **Search** button; this helps you to find a port quickly.

To confirm that a port is really the one you mean, press the **Go To** button. This takes you to the location of the selected port on the chart display.

5 When you have selected the port, click the **Add to Route** button.

6 Select the name of the route's destination port and click the **Add to Route** button.

F.2.3 Configuring and calculating the route



1 If the departure and destination ports appear in the list in the wrong order (because of the order you selected them in), use the **Move Up** and **Move Down** buttons to re-arrange them.

If you want to delete one of the ports because you have made a mistake, select it and click the **Delete** button.

Then select a new port instead by going back to the **Ports** tab and repeating the port selection process.

2 If you want to specify a minimum depth of water for the vessel to sail in along the route, use the arrow keys in the **Minimum Depth** field to do so.

Note

If you receive an error message later when you calculate the route, it may be because no route is possible given the minimum depth you have specified.

3 To allow the vessel to sail in-shore for part of the route, check the **Allow to go in-shore** option.

4 To allow the vessel to sail along rivers for part of the route, check the **Allow to use rivers** option.

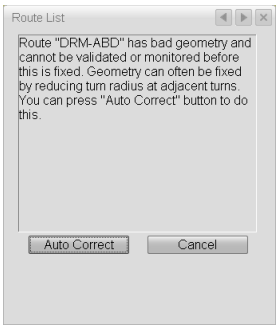
5 Give the route a name of your choice or accept the default name.

For information about configuring how the system generates route names, see *Configuring how the system generates route names automatically* on page 772.

6 If there are passages on the route that you want to avoid, then (assuming it is possible to avoid them) click the **Passages** tab and specify the passages to avoid (see *Avoiding passages and canals* on page 773).

7 Click the **Calculate** button to generate the route between the two ports you have specified.

F.2.4 Correcting the route geometry



The basic route database (which is part of the chart database) contains a list of waypoints that are connected by straight legs or great circles. When you generate a route for K-Bridge, the route geometry needs to be more well-defined than this otherwise it will not be possible for the automatic track steering facility to follow it.

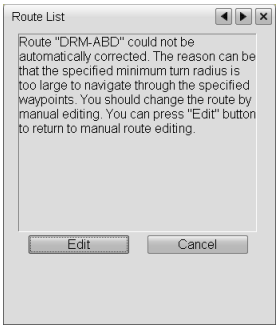
The ship's default turn radius is used for all turns in generated routes (for information about the turn radius own-ship parameter, see *Ship (tab)* on page 571).

However, in some places on a route – such as in narrow passages or along a river – course adjustments can be very frequent and the legs between waypoints therefore very short.

In these places, if the turn radius is too big for a waypoint that connects two short legs, the route geometry becomes illegal. And, because illegal routes cannot be sailed using automatic track steering, they cannot be validated until the geometry has been corrected.

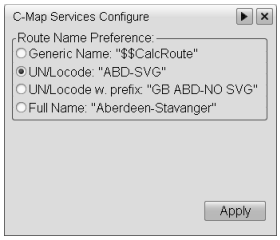
When you attempt to validate a route that has illegal geometry, a Route List prompt dialog is displayed. This dialog gives you the option to have the geometry corrected automatically. To do this, press the **Auto Correct** button.

If you do this, the system performs the correction by reducing the turn radius for each illegal turn to the maximum radius that will give correct geometry and not be smaller than the ship's minimum turn radius specified for the ship.



If the system is not able to correct the geometry automatically, you must inspect and edit the route manually to correct the geometry.

F.2.5 Configuring how the system generates route names automatically



The C-Routes dialog for calculating the route between two ports (see *Configuring and calculating the route* on page 770) contains a **Config...** button for configuring how the system generates route names automatically. (It only generates a name automatically if you do not specify a name in the **Route Name** field of the C-Routes dialog before pressing the **Calculate** button.) The **Config...** button brings up the C-Routes Services Configure dialog which contains radio buttons for the following four options:

- **Generic Name:** Select this option to have routes named with a generic default name.
- **UN/Locode:"** Select this option to have routes named with the UN/Locode (minus the country code) for the start and end ports. An example is "ABD>SVG", which names a route that starts at Aberdeen and ends at Stavanger.

  UN/Locodes are city designations that were suggested by a committee of the United Nations to improve the efficiency of international transportation. The codes are similar to and partly compatible with the airport codes used by air passengers for tagging luggage.

  The IMO has adopted these UN/Locodes for designating ports. The naming convention is that a two-letter country code is followed by a three-letter place code.

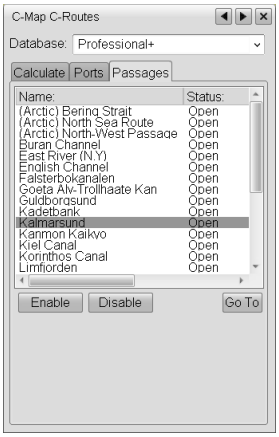
  If you want to include the country code in the automatically generated name, select the option **UN/Locode w. prefix"** (see below).

  If you select one of the UN/Locode naming schemes, the system matches port names against the UN/Locodes in the chart database. If it finds no match a default route name is used.
- **UN/Locode w. prefix:"** Select this option to have routes named with UN/Locodes that include the country code. An example is "GB ABD>NO SVG", which names a route that starts at Aberdeen (in Great Britain) and ends at Stavanger (in Norway).
- **Full name:** Select this option to have route names that contain the full names of each port. For example, "Aberdeen-Stavanger".

If the system does not produce a UN/Locode for one or both of the ports at each end of your route, it gives the route a default name.
If the system does not generate a name automatically that you are happy with, type a name of your own choosing into the **Route**

Name field of the C-Routes dialog before clicking the **Calculate** button.

F.2.6 Avoiding passages and canals



In some places you can choose whether to sail along a canal or passage or to go round it.

If there are canals or passages between the ports you have specified in the C-Routes dialog (see *Configuring and calculating the route* on page 770) and you want to avoid them because of the size of the ship or out of other considerations then (assuming it is possible to avoid them) do the following:

1. In the C-Routes dialog, click the **Passages** tab.
2. Select the passage you want to avoid and click the **Disable** button.

   This causes the passage's status to change from “Open” to “Closed”. (By default all passages are “Open”.)
3. If you want to check the location of a passage, select it and click the **Go To** button.

   This takes you to the location of the passage in the chart display.
4. To re-open a passage, select it and click the **Enable** button.
5. When you have closed any passages you want to avoid, click the **Calculate** tab and press the **Calculate** button to calculate the route (see *Configuring and calculating the route* on page 770).

   If a route is possible that avoids the passage, the system will generate a route that avoids it.

The figure below shows two routes from Karlskrona to Stockholm. The default route goes through Kalmarsund inside of Øland. When the Kalmarsund passage is CLOSED, the route is calculated to pass on the outside of Øland.

Figure 124 Avoiding Kalmarsund on the route between Stockholm and Karlskrona in Sweden

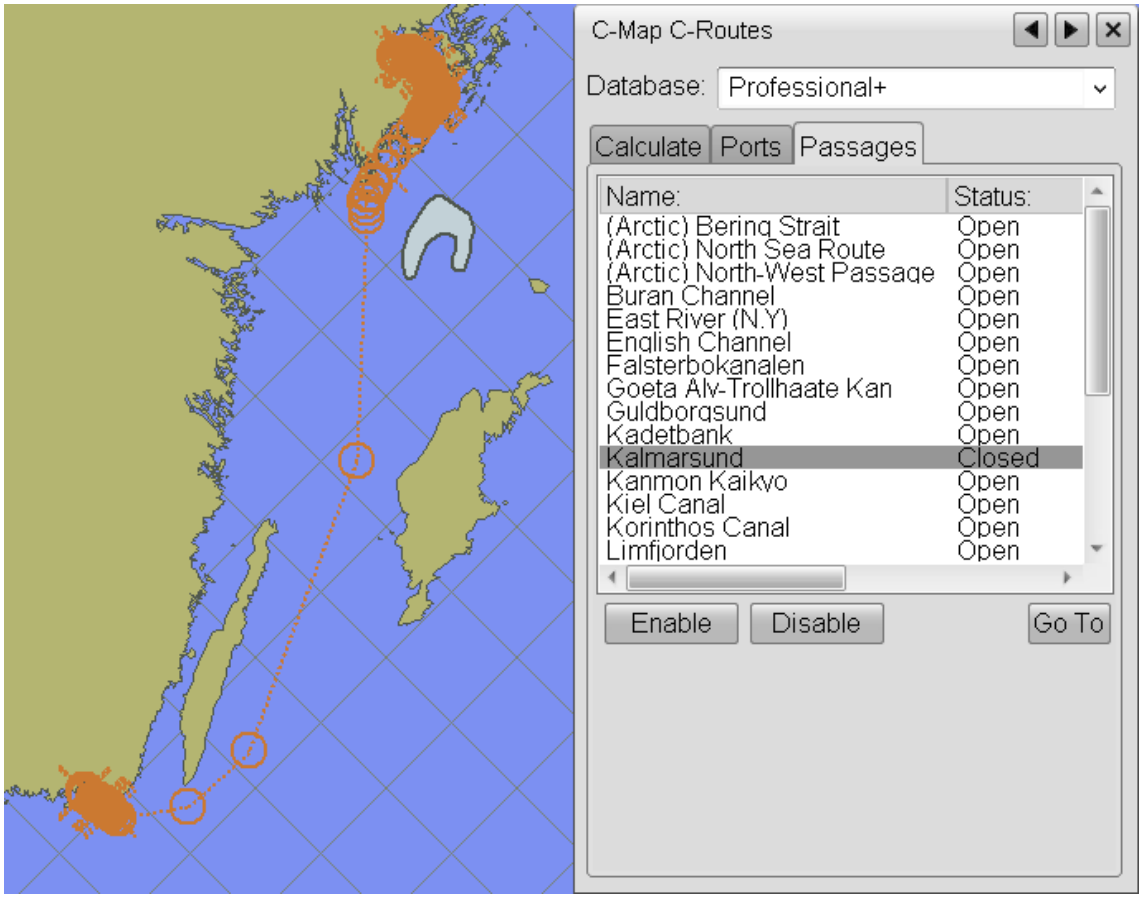
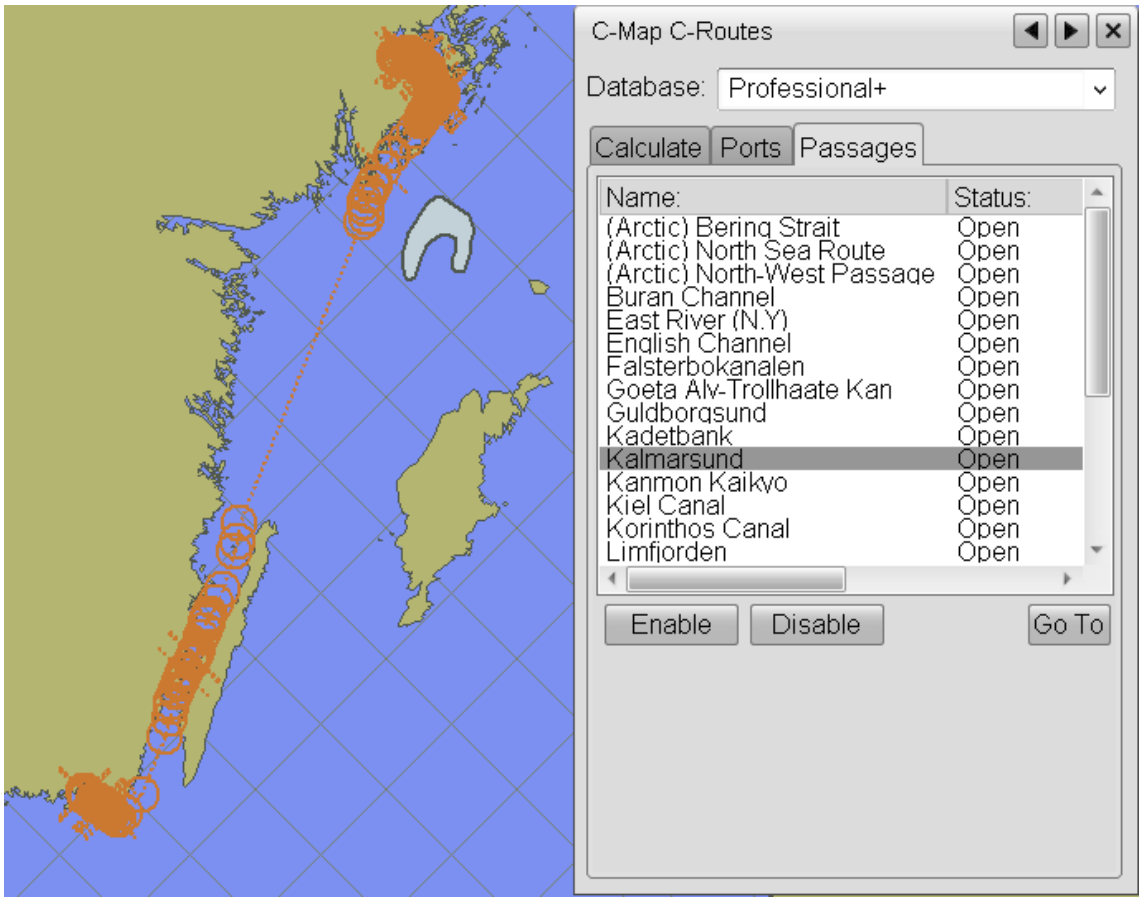


Figure 125 Not avoiding Kalmarsund



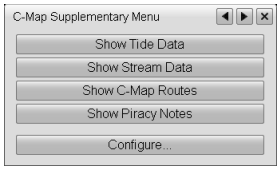
F.3 Using the tide prediction facilities

This section tells you how to find out the predicted tide levels at locations you are sailing to around the world.

To use the tide prediction facilities, you need to:

- Be using the Professional+ chart database (or another database that supports tide predictions).
- Have the C-Map Services option enabled on your system (see *Enabling the C-Map Services option* on page 769).

F.3.1 The C-Map Services main menu



To view the C-Map Services main menu (which is called the C-Map Supplementary Menu), select **Options→C-Map Services**.

Although this is the main menu for C-Map Services, you will find it more convenient to access the tide prediction facilities by working with particular tide and stream objects on the chart itself (see *Showing where tide and stream data is available on the chart* on page 776).

F.3.2 Showing where tide and stream data is available on the chart

1. In the ECDIS application, select **View→Themes**.

   This brings up the Themes dialog.

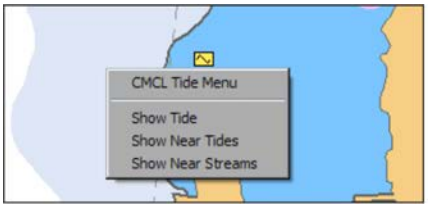
2. Check the **Tides and Streams** option that appears (among the supplementary themes supported by the databases you are using) at the bottom of the dialog.

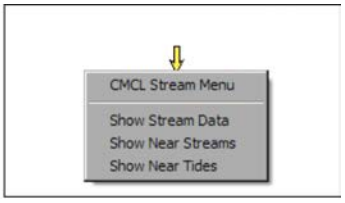
   (Note that, when you check the **STANDARD** option at the top of the dialog, the supplementary themes are toggled off.)

   This causes tide and stream objects to be displayed on the chart wherever tide and stream data is available.

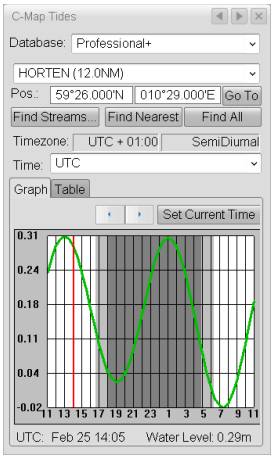
   Tide objects are represented by this symbol:  ; stream objects by this symbol:  .

3. Right-click on one of these symbols to bring up the Tide context menu or the Stream context menu (as appropriate).





F.3.3 Viewing tide and daylight data for a location



The C-Map Tide dialog displays the predicted tide and daylight data at a particular location (the location marked by a particular tide object on the chart).

To view the Tide dialog, do one of the following:

- Right-click on a tide symbol (see *Showing where tide and stream data is available on the chart* on page 776),
- Select **Options→C-Map Services→Show Tide Data**.

  If you access the tide data in this way, the system searches the chart database for tide objects near the own-ship and presents the data for the nearest it finds. To check the location described by the data, click the **Go To** button. This takes you to the location in the chart display.
- Select a waypoint from the Waypoint List for a planned route, and click the **Tides** button (see *Displaying tidal data for a waypoint in a planned route* on page 780).

The C-Map Tide dialog contains the following elements:

Database: The chart database you are using.

Location (drop-down list): The location of the tidal object whose data is displayed. (Use the arrow to select a new location from the list of locations for which data is available.)

Pos: The co-ordinates of the tidal object whose data you are viewing.

Go To: Click the button to go to the location of the tidal object on the chart display.

Find streams: Click this button to switch to the C-Map Streams dialog.

Find nearest: Click this button to see a list of the tide objects (sorted nearest first) within a certain radius of the position shown in the **Pos** field.

Find All: Click this button to view an alphabetical list of the available tide objects.

Timezone: The time zone at the tide object (note that there is currently no provision for daylight saving time).

Time: Select UTC or the time at the location of the tidal object.

Text field: The text field next to the Timezone field indicates whether the high tide is semidiurnal (twice daily) or diurnal (once daily).

Arrow buttons: Use these buttons to move backwards and forwards along the time axis in the chart.

Set Current Time: Click this button to restore the red line (the time marker) in the graph to the current time at the own-ship.

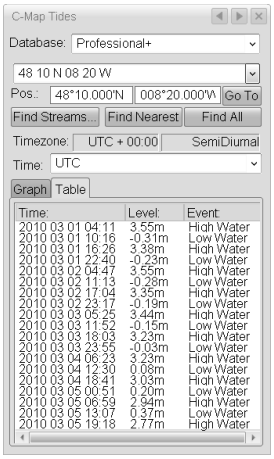
Tidal curve and daylight graph: The elements of this graph are as follows:

- The vertical axis represents height in metres.
- The horizontal axis represents hours of the day.

- The tidal curve is displayed as a green line.
- The daylight information is displayed as the background: each hour has a column that is coloured light grey for dawn and dusk, white for daylight, and dark grey for night.
- The red line is a time marker: use the arrow keys to move the time axis so that the red line is at different positions in time. This enables you to see clearly what the tides were or will be at different times. If you are sailing towards the tidal object, for example, you can put the red line at your ETA (Estimated Time of Arrival) so that it shows the predicted tide at that time.

  The time represented by the red line is also shown at the bottom left of the dialog, opposite the water level for the tidal object at the time indicated by the red line.

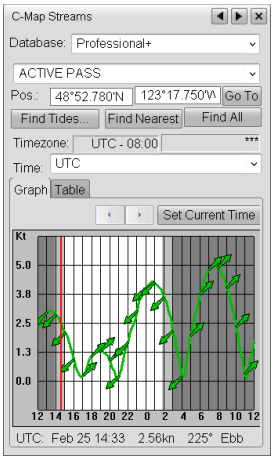
F.3.3.1 Viewing a table of high- and low-water events



The C-Map Tide dialog also includes a tide table. This lists the times and water levels for all the high- and low-water events at the selected tide object for the day.

To view the table of high- and low-water events, click the **Table** tab in the C-Map Tides dialog.

F.3.4 Displaying stream data



The C-Map Streams dialog displays the predicted tide and daylight data at a particular location (the location marked by a particular tide object on the chart).

To view the Streams dialog, either :

- Right-click on a stream symbol (see *Showing where tide and stream data is available on the chart* on page 776),
- Or select **Options→C-Map Services→Show Stream Data**.

  If you access the stream data in this way, the system searches the chart database for stream objects near the own-ship and presents the data for the nearest it finds. To check the location described by the data, click the **Go To** button. This takes you to the location in the chart display.

The C-Map Streams dialog contains the following elements:

Database: The chart database you are using.

Location (drop-down list): The location of the stream object whose data is displayed. (Use the arrow to select a new location from the list of locations for which data is available.)

Pos: The co-ordinates of the stream object whose data you are viewing.

Go To: click the button to go to the location of the stream object on the chart display.

Find streams: Click this button to switch to the C-Map Tide dialog.

Find nearest: Click this button to see a list of the stream objects (sorted nearest first) within a certain radius of the position shown in the **Pos** field.

Find All: Click this button to view an alphabetical list of the available stream objects.

Timezone: The time zone at the stream object (note that no provision is made for daylight saving time).

Time: Select UTC or the time at the location of the stream object.

Arrow buttons: Use these buttons to move backwards and forwards along the time axis in the chart.

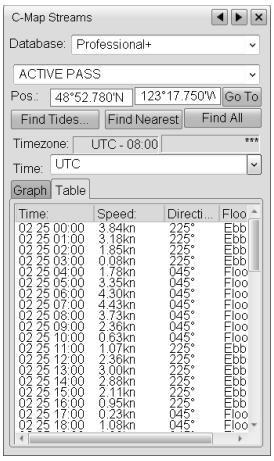
Set Current Time: Click this button to restore the red line (the time marker) in the chart to the current time at the own-ship.

Tidal curve and daylight chart: The elements of this chart are as follows:

- The vertical axis represents height in metres.
- The horizontal axis represents hours of the day.
- The water-level curve is displayed as a green line.
- The daylight information is displayed as the background: each hour has a column that is coloured light grey for dawn and dusk, white for daylight, and dark grey for night.
- The arrows represent the direction of the current (relative to north up).
- The red line is a time marker: use the arrow keys to move the time axis so that the red line is at different positions in time. This enables you to see clearly what the water levels and direction of current were or will be at different times. If you are sailing towards the stream object, for example, you can put the red line at your ETA (Estimated Time of Arrival) so that is shows the predicted water level and current direction at that time.

  The time represented by the red line is also shown at the bottom left of the dialog, opposite the water level for the stream object at the time indicated by the red line.

F.3.4.1 Viewing a table of tide flows

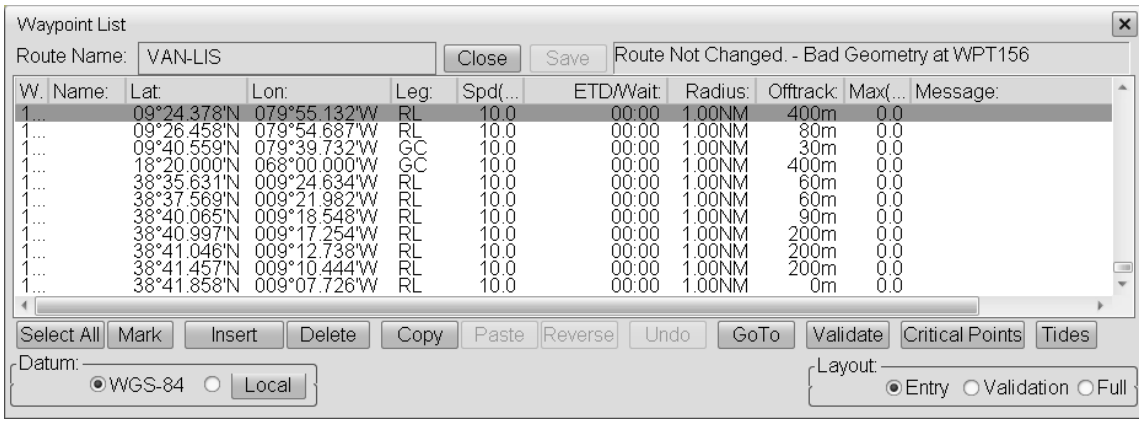


The C-Map Tide dialog also includes a table listing the speed and direction of tide flows for the selected tide object.

To view the table of tide flows, click the **Table** tab in the C-Map Streams dialog.

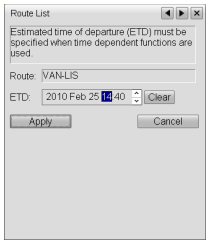
F.3.5 Displaying tidal data for a waypoint in a planned route

The most useful and convenient way of viewing tidal data is in relation to a waypoint in a planned route.



To do this, select **Route→List Waypoints**, and in the Waypoint List dialog (see *Edit route* on page 420) click the **Tides** button.

This brings up the data for the tidal object nearest to the selected waypoint. For information about interpreting the chart and tables displayed, see *Viewing tide and daylight data for a location* on page 777.



Note

The time that the system presents the tide prediction for (in other words, the position of the red line in the graph displayed) will be based on the Estimated Time of Departure (ETD) and the planned speed that are specified for the route to the selected waypoint.

If the Estimated Time of Departure (ETD) for the route to the waypoint is in the past, you will be prompted to specify a new ETD.

Use the spin buttons to do this, then do one of the following:

- Click **Apply** to apply the ETD to the route and view the weather data based on that ETD.

  Alternatively, you can alter the route's ETD directly yourself. To do this, in the Waypoint List dialog (see *Edit route* on page 420) edit the **ETD/Wait** column by specifying the correct ETD for the selected waypoint.
- Click **Ignore** to continue to the tide data without specifying an ETD for the system to base the tide prediction on.
- Click **Cancel** to cancel the request to view tide data for the route.

F.4 Avoiding piracy blackspots

This section tells you how to check for reported incidents of piracy at locations you are planning to sail to or through.

If there have been incidents then skull and cross-bones symbols are displayed on the chart, indicating both the location of each incident and its type. The type of incident is indicated by the colour of the symbol; see *Specifying which incidents of piracy to display* on page 783. Once you know when and where incidents of piracy have occurred, you can decide whether to take an alternative route.

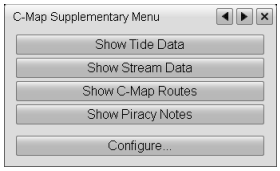
Note

Piracy symbols are only available at chart scales of below 1:1000000.

To use the piracy data facilities, you need to:

- Be using the Professional+ chart database (or another database that supports piracy reports).
- Have the C-Map Services option enabled on your system (see *Enabling the C-Map Services option* on page 769).
- Have a valid licence for piracy reports registered in the database (see *General tab* on page 497).

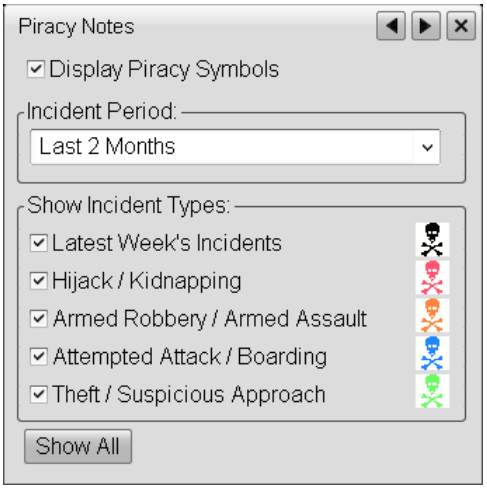
F.4.1 The C-Map Services main menu



To view the C-Map Services main menu (which is called the C-Map Supplementary Menu), in the ECDIS application select **Options→C-Map Services**.

This menu includes a **Show Piracy Notes** button. Click this to specify the type of incidents you want to display symbols for on the chart (see *Specifying which incidents of piracy to display* on page 783).

F.4.2 Specifying which incidents of piracy to display



To specify the type of piracy incidents you want to display symbols for on the chart, bring up the Piracy Notes dialog.

The path to this dialog is: **Options→C-Map Services→Show Piracy Notes**.

The Piracy Notes dialog contains the following elements:

- **Display Piracy Symbols:** Check this box to turn on the display of piracy incident symbols.
- **Incident Period:** Use the drop-down list to specify the time period for which you want to display symbols representing incidents of piracy.
- **Show Incident Types:** The types of incidents for which symbols are displayed are:
  - Incidents that have occurred in the last week (black skull and cross-bones)

    
  - Hijacking and kidnapping (red skull and cross-bones)
  - Armed robbery or assault (orange skull and cross-bones)
  - Attempted attack or boarding (blue skull and cross-bones)
  - Theft or suspicious approach (green skull and cross-bones)

  Check the box for each category of incident you want to display on the chart.

F.4.3 Finding out where incidents of piracy have occurred

1 Make sure you are viewing the chart at a scale of below 1:1000000.

2 In the ECDIS application, either:

- Select **View→Themes**, and check the **Piracy** option that appears (among the supplementary themes supported by the databases you are using) at the bottom of the dialog.

  Note that, when you check the **STANDARD** option at the top of the dialog, the supplementary themes (including Piracy) are all toggled off.

- Or select **Options→C-Map Services→Show Piracy Notes** and check the **Piracy** option in the Piracy Notes dialog (see *Specifying which incidents of piracy to display* on page 783).

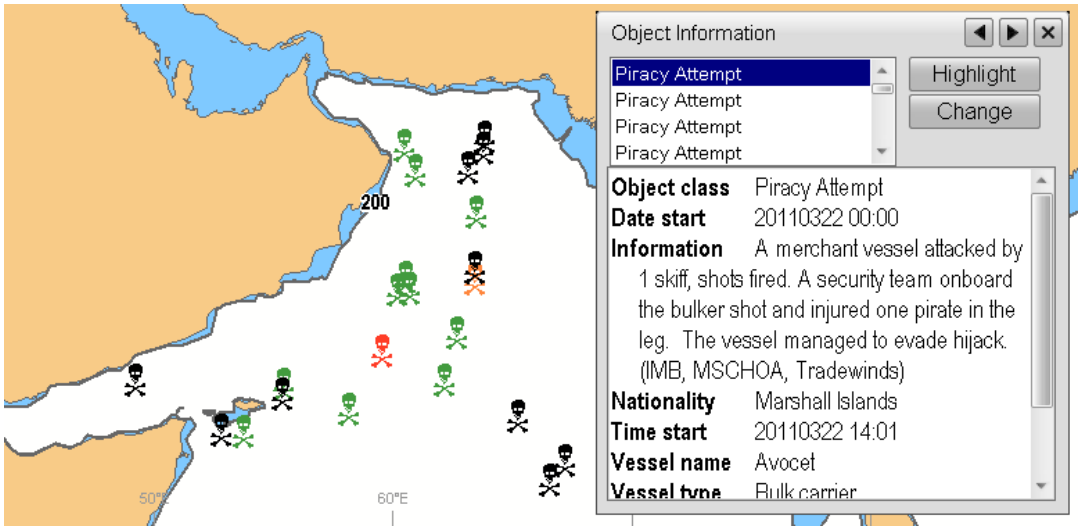
The piracy incident objects (skull and cross-bones symbols) are displayed on the chart at the locations where they have occurred.

3 Double-click on a piracy incident symbol to view details of the incident it represents (see *Viewing a piracy incident report* on page 785).

F.4.4 Viewing a piracy incident report

1 Follow the instructions in the previous section (see *Finding out where incidents of piracy have occurred* on page 784).

2 Double-click on a piracy incident symbol to view details of the incident it represents.



For a general description of the Object Information dialog, see *Object Info* on page 377.

Appendix G
Weather forecasts

This section contains the following topics:

G.1 Introduction

This appendix describes the C-Map Weather option module for the K-Bridge ECDIS and Planning Station applications.

The option allows you to download worldwide meteorological and ocean data forecasts. It also makes available ice charts and cyclone paths and predictions.

To use the option you must have a subscription for C-Map weather data (but you do not have to use a C-Map chart database).

The weather forecast functions have been integrated with the normal route planning functionality of the K-Bridge ECDIS and Planning Station applications. Therefore you can use them to access weather data at different points in space and time along a route that you are planning.

The C-Map weather facilities:

- Provide data from C-Map servers that has been received from different data providers. The data is downloaded to your system directly from the internet in a compressed and encrypted “grib” format (you need an internet connection to use the service).

  The data downloaded can vary as to the weather phenomena it describes and as to the extent of its geographical coverage.

  Different weather forecast sets will also have different intervals between predictions, and different overall forecast lengths (for example, one weather forecast might cover the next three hours, another the next five days).
- Enable you to overlay weather data on a chart and watch it change as you change the time that you want the information about.
- Enable you to co-ordinate and display weather forecasts with a route plan. This also means that you can specify weather alarm criteria for a route.

  For example, you might set an alarm for wind speeds of greater than 20 knots, and another for waves of more than 3 metres in height; you can also view on the chart the zone in which these criteria are in force.

G.2 Enabling the C-Map Weather option

1 Select **System→Maintenance→Change Optional Components**.

2 Select **C-Map Weather**, and click **Enable**.

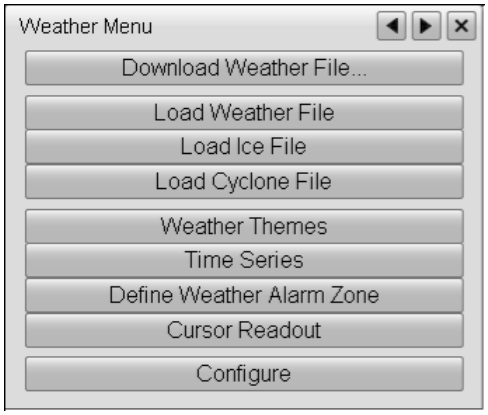
3 Enter the licensing PIN-code.

Note

To use the C-Map weather forecasting tools, you need a C-Map eToken. This plugs into a USB port, and you need to use it whenever you require access to the weather forecasting facilities.

G.3 Accessing the C-Map Weather main menu

To view the main menu for the C-Map weather forecast facilities, select **Options→C-Map Weather**.



This menu contains the following buttons:

Download Weather File: Click this button to go to the dialogs for downloading weather data from the C-Map server (see *Downloading weather data* on page 790).

Load Weather File: Click this button to display an existing weather file over the chart (see *Displaying the weather data on the chart* on page 795).

Load Ice File: Click this button to display an existing ice file over the chart.

Load Cyclone File: Click this button to display an existing cyclone file over the chart.

Weather Themes: Click this button to bring up the Weather Themes dialog which enables you to control the weather data that appears on the screen (see *Controlling the displayed data* on page 795).

Time Series: Click this button to see a chart of the weather data from the beginning to the end of the time period covered by the currently loaded weather forecast (see *Viewing a chart of weather activity* on page 799).

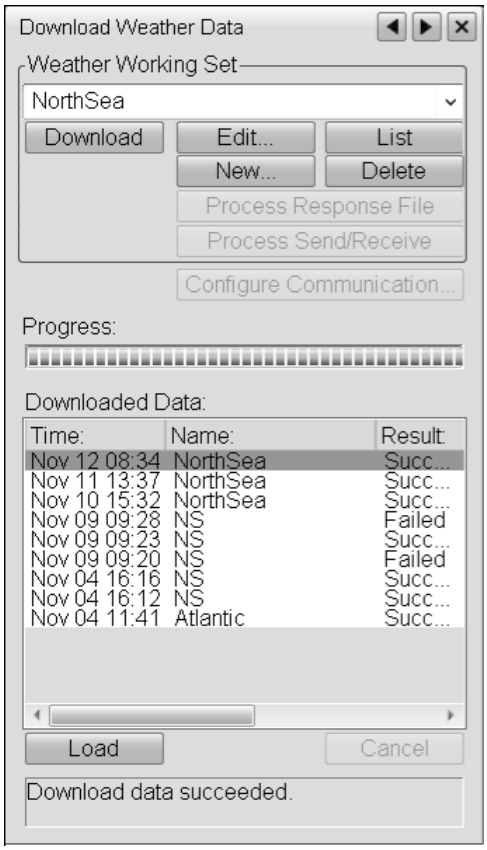
Define Weather Alarm Zone: Click this button to define alarm criteria for the alarm zone around the own-ship (see *Specifying alarm criteria* on page 800).

Cursor Readout: Click this button to enable a weather data dialog to be displayed whenever the cursor rests on a weather data object on the chart.

Configure: Click this button to configure the C-Map Weather option module (see *Configuring the C-Map weather module* on page 806).

G.4 Downloading weather data

This dialog enables you to download weather data for a particular geographical area from the C-Map server.



To reach the dialog, select **Options→C-Map Weather→Download Weather Data**.

The data you download is called a "working set". It is a combination of: a product that you have subscribed to from C-Map, a selection of weather parameters and a collection of time-specific weather forecast data.

The Download Weather Data dialog contains the following elements:

Weather working set: This is a drop-down list containing the names of the working sets that are available to download. Select the one you require.

The list includes an item called **Subscription**. Select this and click the **Download** button to view your most recent C-Map subscription file.

Download: Click this button to download the selected working set.

Edit: Click this button to edit the selected working set before downloading it (see *Defining a "working set" (before you can download it)* on page 791).

List: Click this button to list the contents of the selected working set.

New: Click this button to define a new working set to download (see *Defining a "working set" (before you can download it)* on page 791).

Progress: The progress bar indicates the progress of the current download.

Downloaded Data: This table logs details of the downloads you have performed. It records: the time of the download; the name of the working set downloaded; the result of the download (whether it was successful or not); the size of the download, and the name of the file downloaded. (Use the horizontal scroll bar or left and right arrows to view this data.)

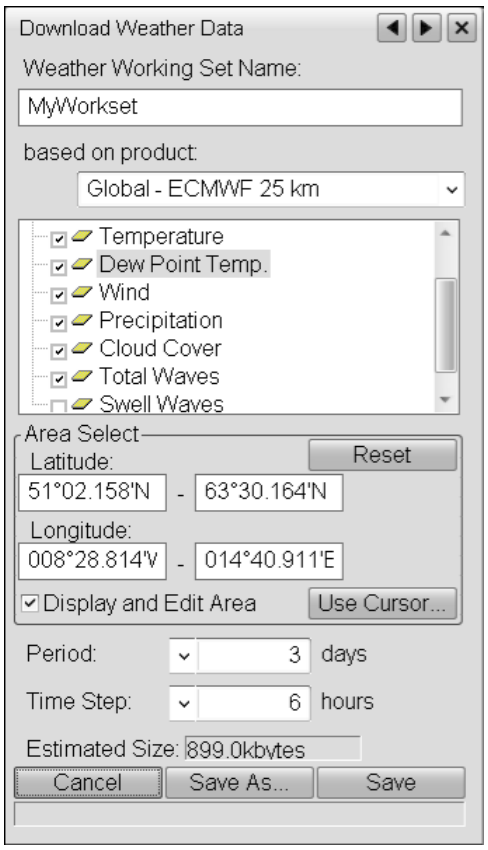
Load: To load a working set that you have already successfully downloaded from the C-Map server, select an instance of it in the table of downloaded data, and click the **Load** button to display it.

G.4.1 Defining a "working set" (before you can download it)

Before you download a working set, you need to specify the product whose features you will select from and download:

1 In the Download Weather Data dialog (described in the previous section, see *Downloading weather data* on page 790), click the **Edit** or **New** button.

This brings up another version of the Download Weather Data dialog.



2 In the **Weather Working Set Name** field, specify the name of the working set.

If you are editing an existing working set, its name appears in this field. You can edit the name.

If you are creating a new working set, specify a name for it.

3 The drop-down list contains the C-Map products you are subscribed to. Select the one you require.

4 From the tree structure, which lists the features available for the selected product, select the features you require.

Do this by checking or un-checking the box to the left of the feature's name in the tree.

5 Specify the geographical area you are interested in:

- You can define the area you require by using the cursor (controlled by the trackball) to draw a rectangle on the chart display.

To do this, check the **Display and Edit Area** box (to display the rectangle), then click the **Use Cursor** button.

- Click the **Reset** button if you have defined an area but have changed your mind and now require data for the whole area covered by the product.

The co-ordinates of the area specified are shown in the **Latitude** and **Longitude** fields.

6 Use the **Period** drop-down list to specify kthe number of days you want the weather forecast to cover.

7 Use the **Time Step** drop-down list to specify the number of hours between each forecast.

8 Check the **Download Size** field to see whether the working set is too large to be conveniently downloaded.

If you think it is too large, try:

- Removing some of the features you have included.
- Reducing the size of the area covered.
- Reducing the time period for which forecast data will be gathered.
- Increasing the size of the time step between the forecasts generated.

9 When you are satisfied with the parameters you have specified, click the:

- **Save** button to save the working set (over-writing the previous version of it if you have not given it a new name).
- **Save As** button to save the working set with a new name and to a new file.

The following figures shows sample weather data. The first shows sample ECMWF (European Centre for Medium-range Weather Forecast) data.

Figure 126 ECMWF data for a 25km range

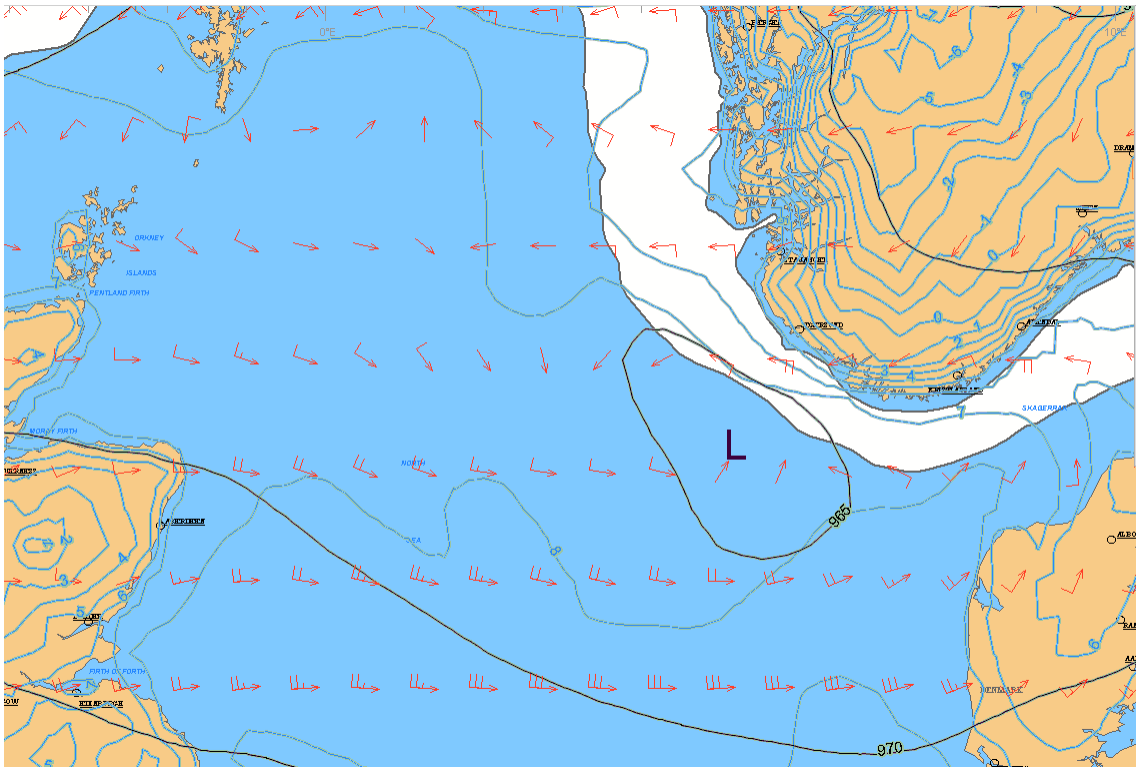


Figure 127 Mercator currents

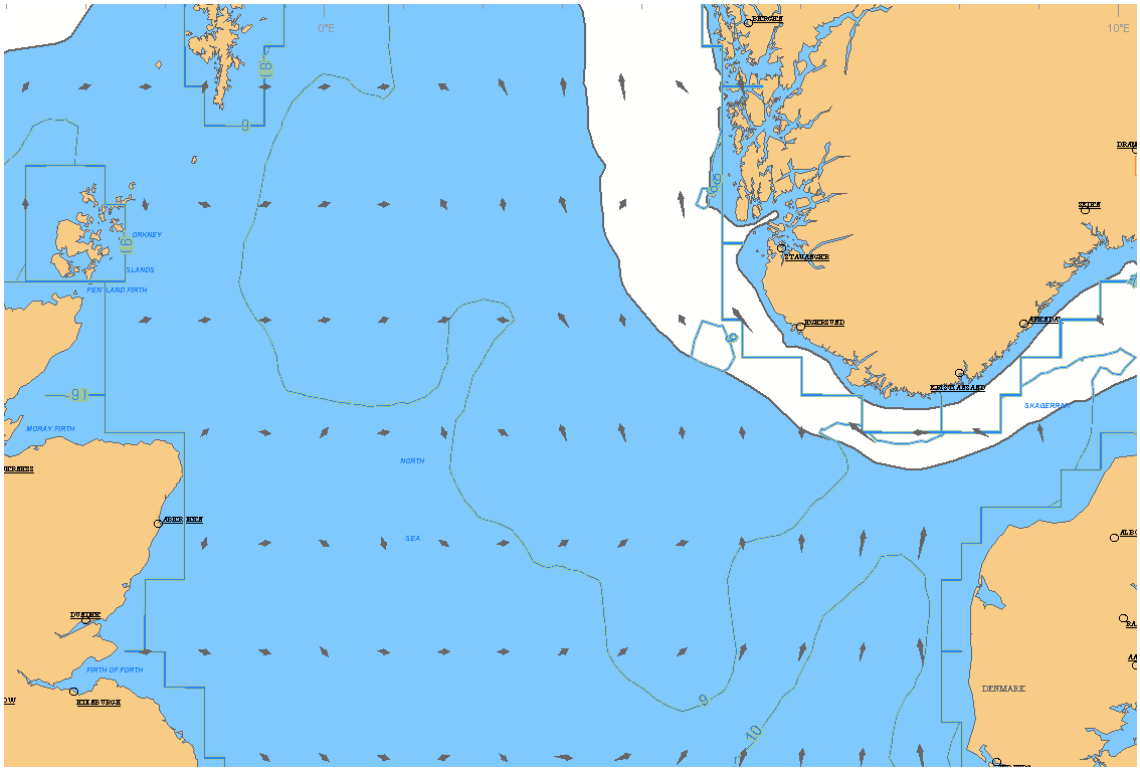


Figure 128 Ice concentrations

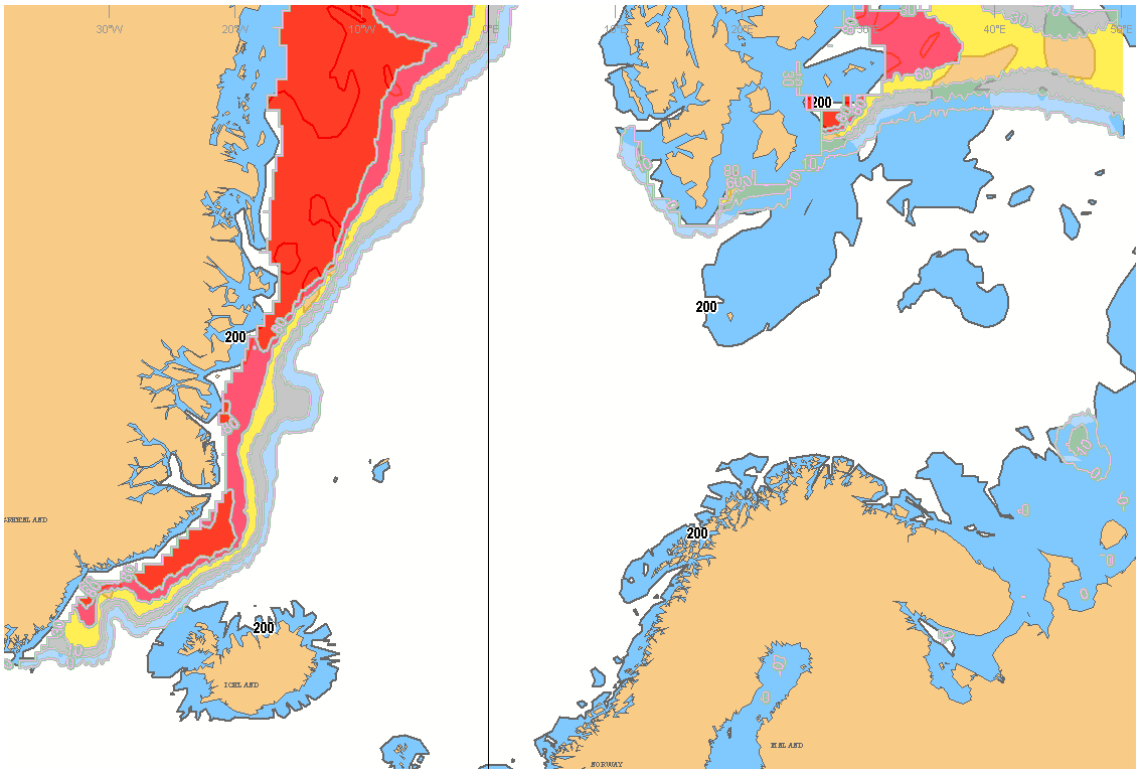
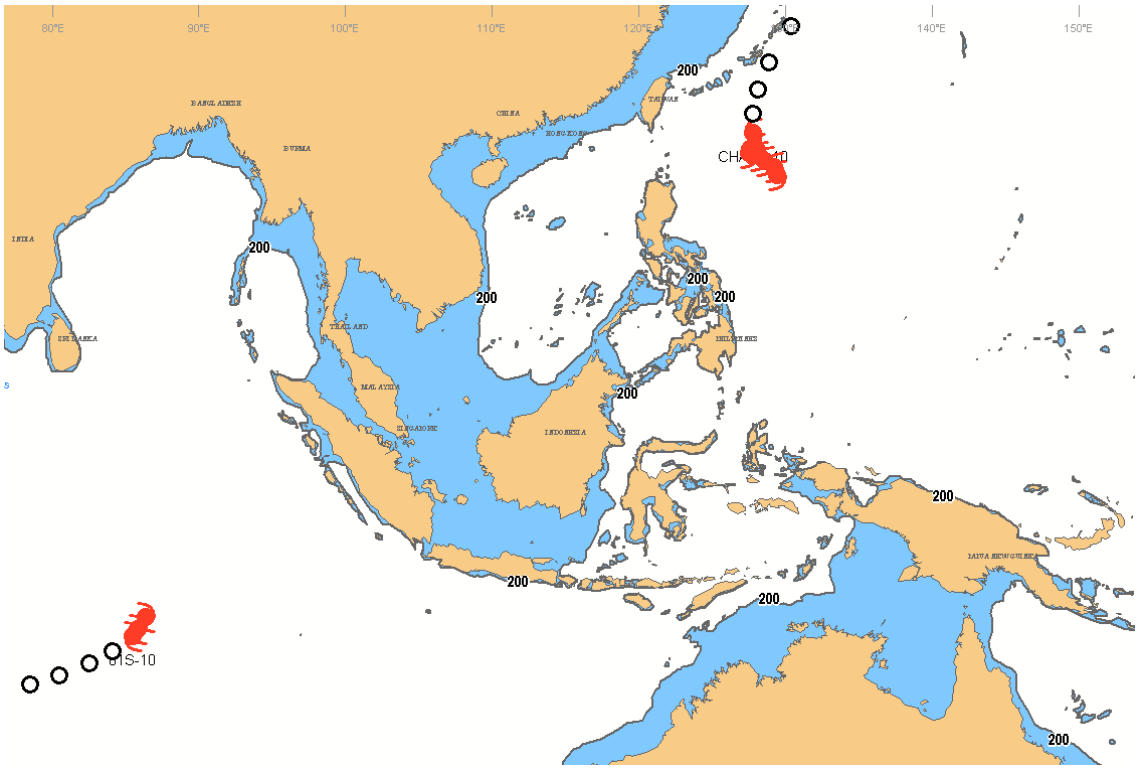


Figure 129 Cyclone data



G.5 Displaying the weather data on the chart

Only one weather data set can be displayed at a time.

To display a data set:

1 Select **Options→C-Map Weather→Load Weather File**.

2 In the Open dialog, select the file containing the data set you require.

(Data sets are given names indicating when they were downloaded.)

3 When the data set loads, the chart appears in the display with weather overlays and the Weather Themes dialog super-imposed.

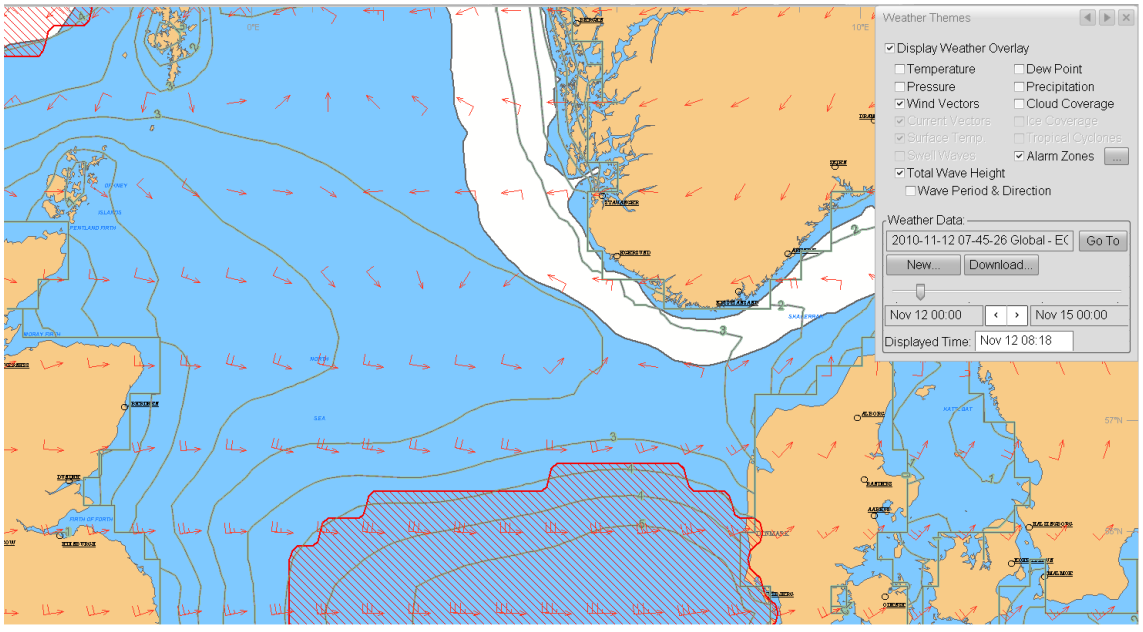
Use the Weather Themes dialog to control the weather data (see *Controlling the displayed data* on page 795).

(You can also view the Weather Themes dialog by selecting Weather Themes from the main weather menu; see *Accessing the C-Map Weather main menu* on page 789.)

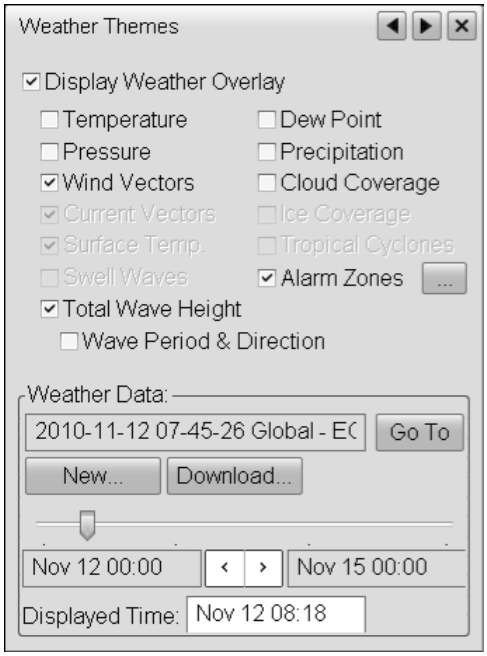
G.5.1 Controlling the displayed data

When you load a data set, the weather forecast data appears as overlays on the chart display.

Figure 130 The Weather Themes dialog and overlays



The Weather Themes dialog enables you to control the weather data shown on the chart. It contains the following elements:



Display Weather Overlay: Un-check this box to hide all weather overlays.

Note

*Checking the **Standard Display** option in the Chart Themes dialog (see Chart Themes on page 373) toggles OFF the display of weather data. If you have done this, you must explicitly check the **Display Weather Overlay** box in the Weather Themes dialog to re-enable the display of weather data.*

Exactly which weather themes are available depends on which features you selected when you specified the working set (see *Defining a "working set" (before you can download it)* on page 791).

Alarm Zones: Check this box to display the weather alarm zone around the own-ship. Click the **...** button to define alarm criteria (see *Specifying alarm criteria* on page 800).

Data set details: The first field in the **Weather Data** group contains the name of the downloaded data set and the date and start time of the forecast.

Go To: Click this button to go to an overview in the chart of the area covered by the weather data (a scale will be used that attempts to be comprehensive while at the same time presenting useful visual information).

New: Click this button to load another data set (see *Displaying the weather data on the chart* on page 795).

Download: Click this button to download another data set (see *Downloading weather data* on page 790).

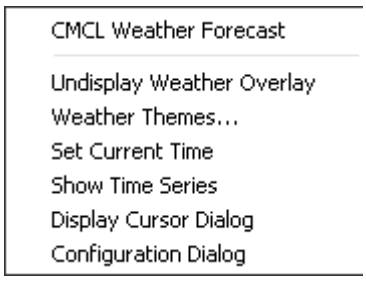
Date fields: The two date fields show the start and end dates for the forecast. Use the spin buttons to change these.

Spin buttons and slider: Use these to change the time that the displayed weather data relates to. The slider enables you to move backwards and forwards across the whole of the weather forecast. The spin buttons enable you to step from one data sample to the next. (You will see the overlaid data change as you use these time controls.)

Displayed Time: The time that the displayed weather forecast relates to. You can move the forecast backward and forward in time by using the spin buttons and slider.

G.5.2 Right-clicking on the area covered by the weather overlays

When you right-click (using the trackball buttons) in the area containing weather overlays, the CMCL Weather Forecast menu appears. It contains the following options:



Undisplay Weather Overlay: Select this option to clear the display of all weather data. To display it again, check the **Display Weather Overlay** option in the Weather Themes dialog (see *Controlling the displayed data* on page 795).

Weather Themes: Select this option to bring up the Weather Themes dialog (see *Controlling the displayed data* on page 795).

Set Current Time: Select this option to set the time of the weather forecast.

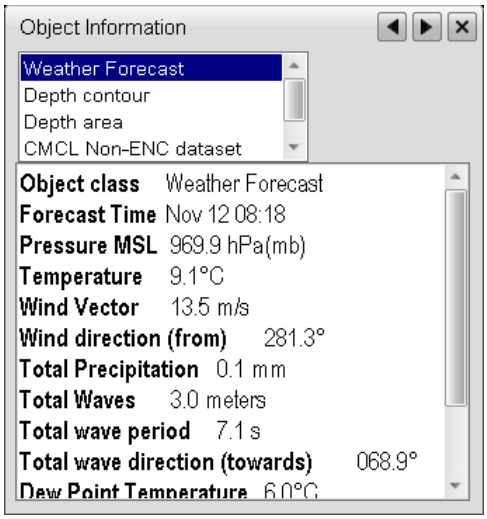
Show Time Series: Select this option to view a chart showing weather activity over the time covered by the forecast (see *Viewing a chart of weather activity* on page 799). The data is for the geographical location indicated by the position of the cursor.

Display Cursor Dialog: Select this option to cause a weather data dialog to be displayed whenever the cursor rests on a weather data object on the chart. This option is the equivalent of selecting **Options→C-Map Weather→Cursor Readout** (see *Accessing the C-Map Weather main menu* on page 789).

Configuration Dialog: Select this option to configure the C-Map weather module (see *Configuring the C-Map weather module* on page 806).

G.5.3 Double-clicking on the weather overlays to display object information

When weather data is being displayed in an overlay on the chart, you can double-click on it to view Object Information for the currently loaded weather forecast.

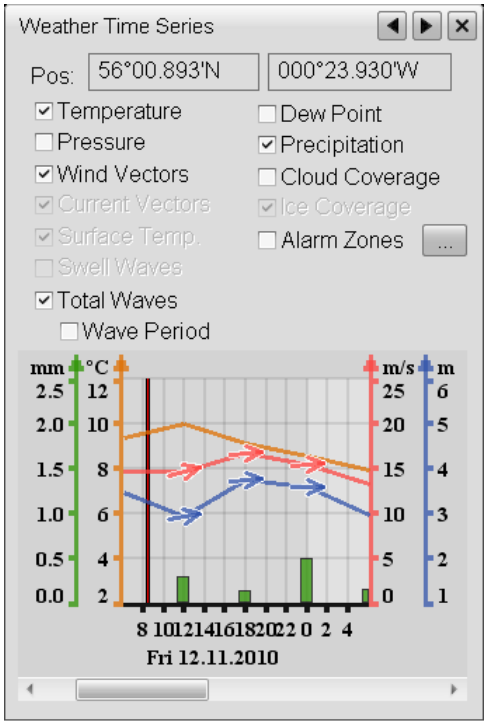


The information includes all features that you selected when you defined the data set before downloading it. It therefore may include features that are not displayed in the overlays.

Some of the presentation of the data, for example, the units of measurement for the wind speed, can be modified from the Configuration dialog (see *Configuring the C-Map weather module* on page 806).

G.6 Viewing a chart of weather activity

You can view a chart showing weather activity over the duration of the forecast at the position indicated by the cursor. This position is specified at the top of the **Weather Time Series** dialog (see left).



To view this data,

1 Put the cursor at the desired position in the area covered by the weather overlays, then:

- Either right-click and select **Show Time Series**.
- Or from the main menu select **Options→C-Map Weather→Time Series**.

2 Check the box next to each weather feature that you want to see data for plotted on the chart.

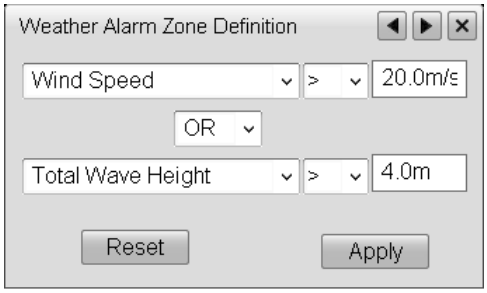
3 To display the alarm zone around the own-ship, check the **Alarm Zones** option.

Click the **...** button to define alarm criteria (see *Specifying alarm criteria* on page 800).

4 Use the horizontal scroll bar to move backwards and forwards in time over the course of the forecast.

G.7 Specifying alarm criteria

You can specify alarm criteria that cause an alarm zone to form around the ship. The criteria take the form of simple "and/or" expressions. The precise form and extent of the alarm zone depend on the criteria you specify and the conditions described in the weather forecast.



The sample dialog to the left causes an alarm zone to exist that covers an area where wind speed exceeds 20 knots OR total wave height exceeds 4 metres.

To specify an alarm zone around the own-ship, do the following:

1 From the main menu select **Options→C-Map Weather→Define Weather Alarm Zone**.

This brings up theWeather Alarm Zone Definition dialog.

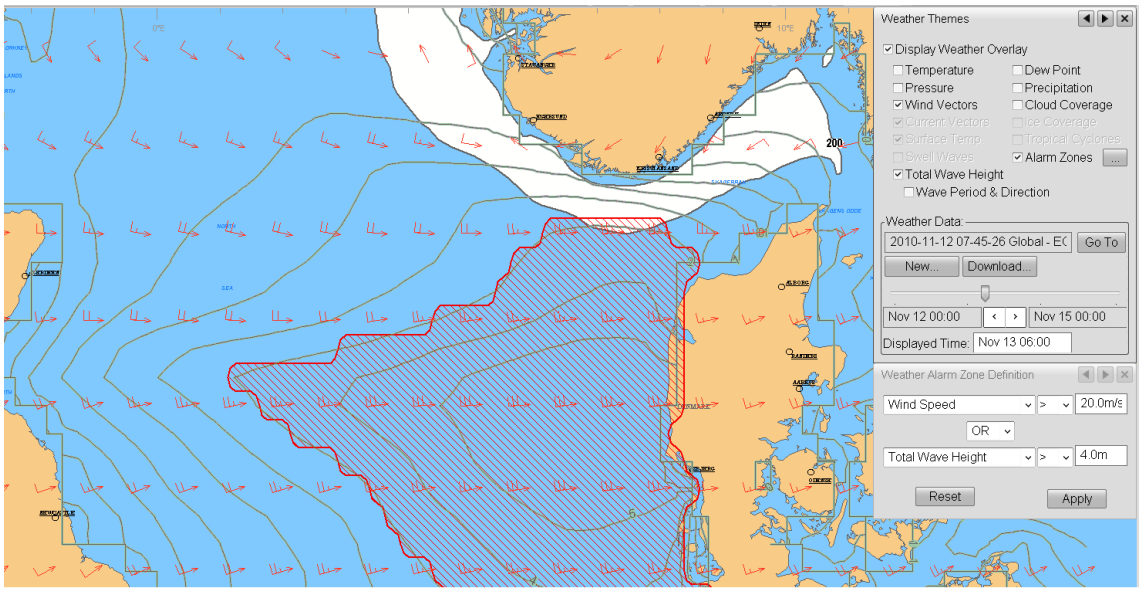
You can also bring up this dialog by clicking the **Alarm Zones** button in either the Weather Themes dialog (see *Controlling the displayed data* on page 795) or the Weather Time Series dialog (see *Viewing a chart of weather activity* on page 799).

2 Formulate an "and/or" expression by selecting one or two events from the drop-down lists of weather events and specifying (as applicable) the size, speed or intensity of each one as an alarm limit.

3 **Reset:** Click this button to reset the dialog to its default state (in which no alarm criteria are defined).

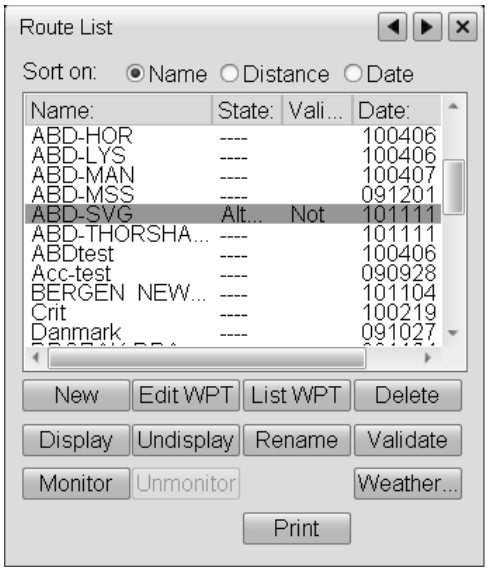
4 **Apply:** Click this button to apply the criteria you have defined.

Figure 131 The weather alarm zone (red shaded area)



G.8 Displaying the weather forecast for a planned route

It is useful to be able to view the weather forecast for a route that you are planning to sail.

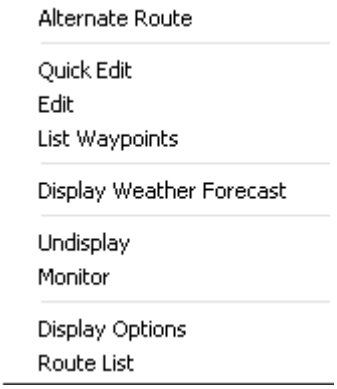


To do this, either:

- Select **Route→Manage Routes** then, in the Route List dialog (see *Route List* on page 416), select a route and click the **Weather** button.
- Or right-click on the route in the chart to bring up the context menu for the route (see below left), then select **Display Weather Forecast**.

This brings up the Weather Along Route dialog (see *Moving backwards and forwards in time* on page 803).

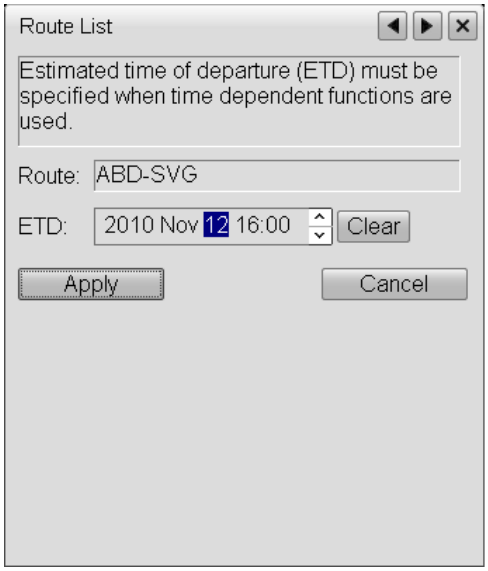
Figure 132 The context menu for a route



Note

The time that the weather forecast data relates to will be determined by the Estimated Time of Departure (ETD) and the planned speed that are specified for the route.

If the Estimated Time of Departure (ETD) for the route has not been defined or is in the past, you will be prompted to specify a new ETD.



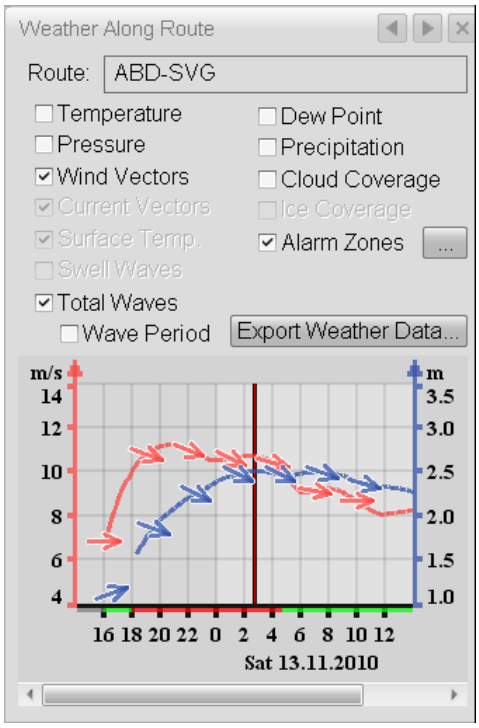
In the version of the Route List dialog containing this prompt, use the spin buttons to specify the ETD, then do one of the following:

- Click **Apply** to apply the ETD to the route and view the weather data based on that ETD.

  Alternatively, you can alter the route's ETD directly yourself. To do this, select **Route→Manage Routes**; in the Route List dialog, select the route and click **Edit WP**; finally select the first waypoint in the waypoint list (see *Edit route* on page 420) and in the **ETD/Wait** column specify the correct ETD.
- Click **Ignore** to continue to the weather data without specifying an ETD.
- Click **Cancel** to cancel the request to view weather data for the route.

G.8.1 Moving backwards and forwards in time

This section tells you how to view forecast data at different times along the route.



When you have defined the Estimated Time of Departure correctly for the route, the system computes estimated times of arrival at a series of positions along the route plan and fetches the weather forecast for each of these positions.

It then plots this information on a feature diagram for the route in the Weather Along Route dialog.

If you have specified an alarm condition (see *Specifying alarm criteria* on page 800), this is indicated by a green (=ok) or red (=alarm) bar at the bottom of the Weather Along Route diagram.

The alarm state is also overlaid on the route as green (=ok) or red (=alarm) dots (see below).

And overlaid on the alarm symbol itself is a "simulated ship" symbol with a time label (see below).

Drag this symbol along the route to change the forecast time and cause the weather overlays on the chart to be updated for the new time. Notice that the black time-line in the feature diagram of the Weather Along Route diagram also moves when you do this.

To remove the simulated ship symbol from the display, right-click on the symbol and from the context menu select **Remove Prediction**.

To export weather forecast data for the route, click **Export Weather Data** (see *Exporting the weather forecast for a planned route* on page 805).

Figure 133 The simulated ship symbol's context menu

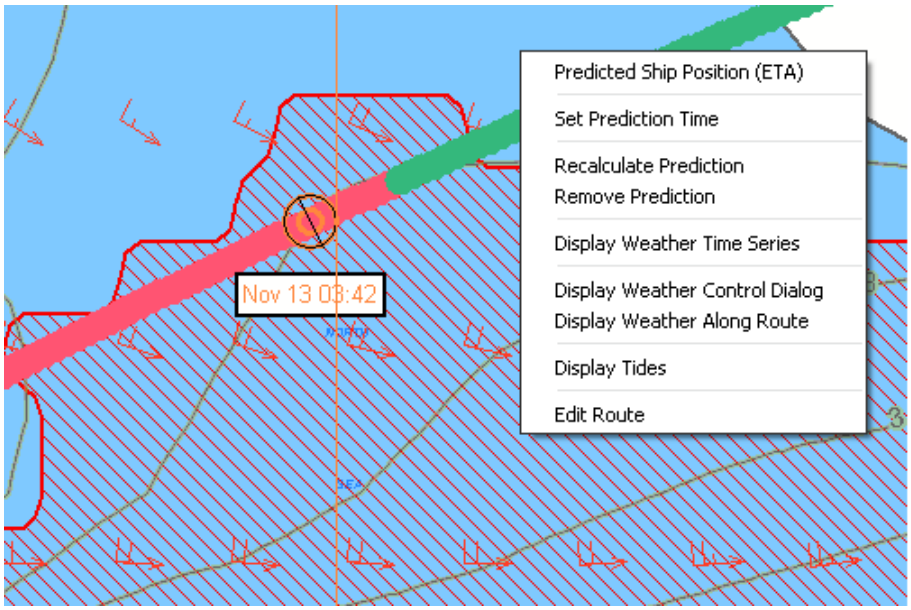
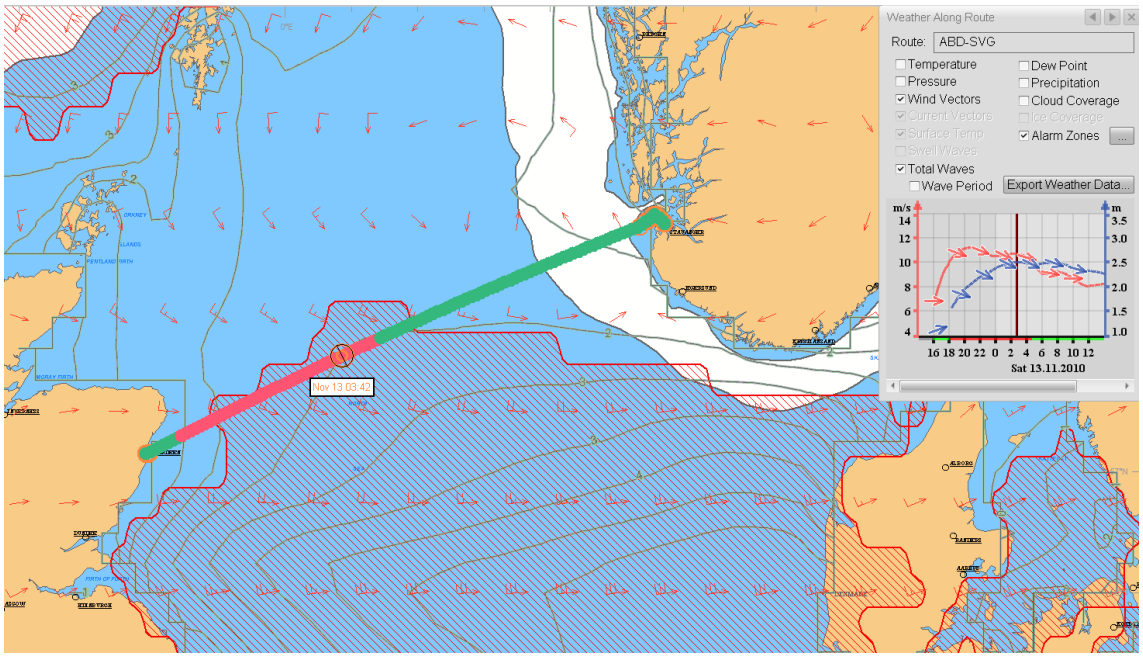
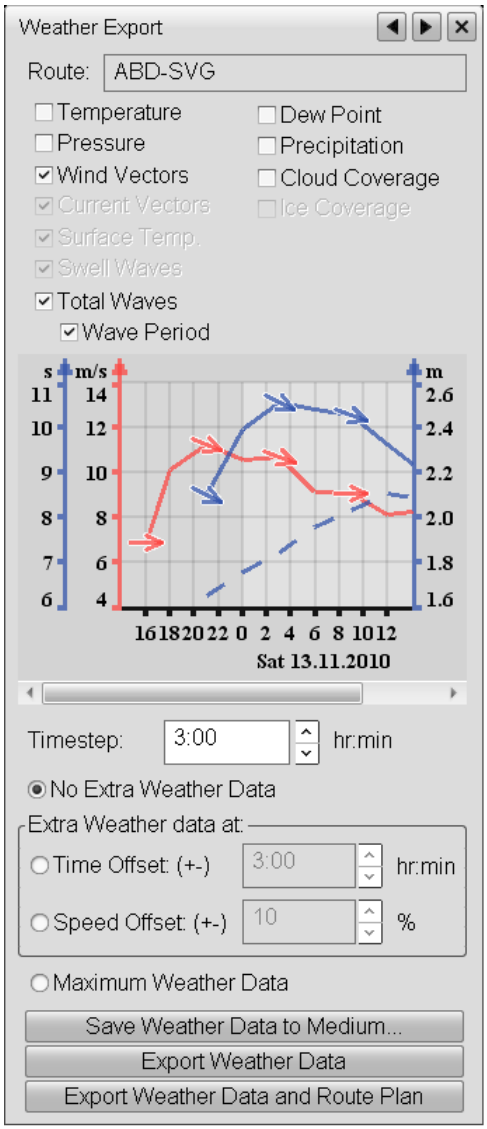


Figure 134 Weather data for a planned route



G.9 Exporting the weather forecast for a planned route

You can export the weather data for a route by clicking the **Export Weather Data** button in the Weather Along Route dialog. This is the dialog that comes up when you view the weather data for the route (see *Displaying the weather forecast for a planned route* on page 801).



When you click the **Export Weather Data** button, the dialog changes and the following options and buttons become available:

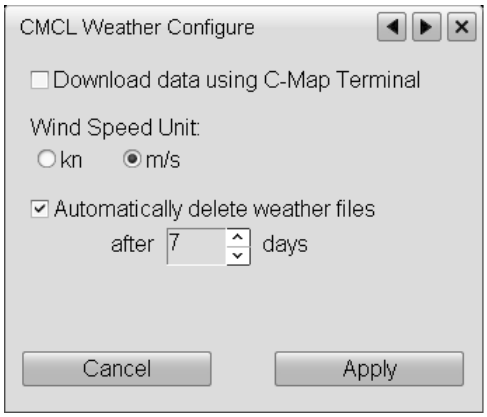
- **Timestep:** Use the spin buttons to specify the time interval between weather data positions along the route. (A weather data position is a position on the route for which weather data is produced.)
- **No Extra Weather Data:** If you select this option, weather data is produced only for the ETA (estimated time of arrival) at each weather data position along the route.
- **Extra Weather Data: Time Offset (+/-):** Select this option to receive weather data for the ETA *and* the ETA plus or minus a time offset at each weather data position along the route. Use the spin buttons to specify the time offset.
- **Speed Offset (+/-):** Select this option to receive weather data for the ETA *and* the ETA with a speed offset applied at each weather data position along the route. Use the spin buttons to specify the speed offset.
- **Maximum Weather Data:** Select this option to receive all available weather data for the weather data positions determined by the **Timestep** option.
- **Save Weather Data to Medium:** Click this button to save the weather data for the route to a USB memory stick or other medium.
- **Export Weather Data:** Click this button to save the weather data to the "export" location for the K-Bridge operator station.

  For information about configuring the "export" location for the operator station, see *Configure Route Export* on page 661.
- **Export Weather Data and Route Plan:** Click this button to save both the weather data and the route plan to the "export" location for the K-Bridge operator stations.

  For information about configuring the "export" location for the operator station, see *Configure Route Export* on page 661.

G.10 Configuring the C-Map weather module

There are a few configurable parameters associated with the C-Map Weather option module.



To bring up the dialog for configuring these parameters, from the main menu select **Options→C-Map Weather→Configure**:

This brings up the Weather Configure dialog which contains the following elements:

Download data using C-Map Terminal: Check this box to use the C-Map terminal program for downloading data. In this case, you need to contact your Kongsberg Maritime representative for details of how to proceed.

Wind Speed Unit: Select knots (kn) or meters per second (m/s) as the unit of measurement for wind speed.

Automatically delete weather files: Check this option if you want the system to delete old weather files automatically. Use the spin buttons to specify when the system should delete them. (You need to specify this as a number of days after the last date of the forecast contained in the files has passed.)

Cancel: Click this button to cancel any changes you have made to the C-Map module's configuration.

Apply: Click this button to apply the changes you have made to the C-Map module's configuration.

Appendix H
Keyboard Function Key Template

This section contains the following topics:

H.1 [F1] key functions

This appendix contains a template that you can print out, cut round the edges of, and place over the 12 function keys on the keyboard of your operator station or Planning Station computer (note that it is designed for standard-size keyboards, not miniature ones).

If, in combination with a single function key, you press the [Shift], [Ctrl], or [Alt] key, the [Ctrl] and [Shift] keys together, or the [Right Shift] key, the effect in each case will be equivalent to pressing a particular button on the operator panel (or in some cases to clicking a certain button on the screen).

The template, therefore, enables you – if necessary or convenient – to use the keyboard as an alternative to the operator panel.

The [F1] key enables you to:

- Zoom in: press [Shift][F1]

  This is equivalent to pressing **RANGE +** on the operator panel (see *The DISPLAY group buttons* on page 34).
- Zoom out: press [Ctrl][F1]

  This is equivalent to pressing **RANGE -** on the operator panel (see *The DISPLAY group buttons* on page 34).
- Return to the default zoom level: press [Alt][F1]

  This is equivalent to pressing **ZOOM RESET** on the operator panel (see *The DISPLAY group buttons* on page 34).
- Reset the centre of the screen: press [Ctrl][Shift][F1]

  This is equivalent to pressing **RESET CENTRE** on the operator panel (see *The DISPLAY group buttons* on page 34).

H.2 [F2] key functions

The [F2] key enables you to:

- Select the daylight display palette: press [Shift][F2]
- Select the night display palette: press [Ctrl][F2]
- View details of the chart object closest to the cursor on the screen: press [Right Shift][F2]

  This is equivalent to pressing **OBJECT INFO** on the operator panel (see *The CHART group buttons* on page 35).

H.3 [F3] key functions

The [F3] key enables you to:

- Increase the brightness of the display's backlight: press [Shift][F3]

This is equivalent to pressing **PALETTE +** on the operator panel (see *The DISPLAY group buttons* on page 34).

- Decrease the brightness of the display's backlight: press [Ctrl][F3]

  This is equivalent to pressing **PALETTE -** on the operator panel (see *The DISPLAY group buttons* on page 34).

H.4 [F4] key functions

The [F4] key enables you to:

- Restore the monitor's backlight to the level at which chart colours are correctly calibrated for the current display palette: press [Ctrl][Shift][F4]

  This is equivalent to clicking **Set Calibrated** in the Intensity dialog (see *Intensity* on page 367).

H.5 [F5] key functions

The [F5] key enables you to:

- Give the operator station command of the autopilot: press [Shift][F5]

  This is equivalent to pressing **IN CMD** on the operator panel (see *The IN CMD button* on page 37).

- Execute a planned turn: press [Ctrl][F5]

  This is equivalent to pressing **ACT TURN** on the operator panel (see *The ACT TURN button* on page 38).

- Adjust the course or heading (by reducing the angle of direction): press [ALT][F5]

  This is equivalent to pressing the lefthand (decrease) heading button on the heading wheel (see *The heading wheel* on page 41).

- Return the display to the real-time view (away from details of a planned turn): press [Right Shift][F5]

  This is equivalent to pressing **AUTO/PLAN** on the operator panel while a planned turn is being displayed (see *The AUTO/PLAN button* on page 39).

H.6 [F6] function keys

The [F6] key enables you to:

- Put the autopilot into Course mode: press [Shift][F6]

  This is equivalent to selecting **Crs** in the Autopilot Mode dialog (see *Autopilot Mode* on page 427).

- Put the autopilot into Waypoint mode: press [Ctrl][F6]

This is equivalent to selecting **WP** in the Autopilot Mode dialog (see *Autopilot Mode* on page 427).

- Increase the distance-to-turn: press [ALT][F6]

  This is equivalent to pressing the up button on the heading wheel (see *The heading wheel* on page 41).
- Decrease the distance-to-turn: press [Ctrl][Shift][F6]

  This is equivalent to pressing the down button on the heading wheel (see *The heading wheel* on page 41).
- Specify a planned turn: press [Right Shift][F6]

  This is equivalent to pressing **AUTO/PLAN** on the operator panel (see *The AUTO/PLAN button* on page 39).

H.7 [F7] key functions

The [F7] key enables you to:

- Put the autopilot into Heading mode: press [Shift][F7]

  This is equivalent to selecting **Hdg** in the Autopilot Mode dialog (see *Autopilot Mode* on page 427).
- Put the autopilot into Track mode: press [Ctrl][F7]

  This is equivalent to selecting **Track** in the Autopilot Mode dialog (see *Autopilot Mode* on page 427).
- Adjust the course or heading (by increasing the angle of direction): press [ALT][F7]

  This is equivalent to pressing the righthand (increase) heading button on the heading wheel (see *The heading wheel* on page 41).

H.8 [F8] key functions

The [F8] key enables you to:

- Turn off the browse facility (in other words, cause the display to track the vessel's movements again when you have finished browsing away from the vessel on the chart): press [Shift][F8]
- Browse away from the vessel on the chart: press [Ctrl][F8]

  This is equivalent to clicking the **Browse** button on the ECDIS range panel (see *ECDIS range panel: viewing controls* on page 88).
- Bring up the Docking facility (on vessels for which the Docking option is installed): press [ALT][F8]
- Stop tracking a target: press [Right Shift][F8]

  This is equivalent to pressing **CANCEL** on the operator panel (see *The TARGET group buttons* on page 35).

H.9 [F9] key functions

The [F9] key enables you to:

- Display the standard chart themes: press [Shift][F9]

  This is equivalent to pressing **STD DISPLAY** on the operator panel (see *The CHART group buttons* on page 35).
- Select the themes you want to display on the chart: press [Ctrl][F9]

  This key combination displays the Chart Themes dialog (see *Chart Themes* on page 373).
- Stop displaying targets and radar video on the charts: press [ALT][F9]

  This is equivalent to un-checking the TGT and VID options on the ECDIS range panel (see *ECDIS range panel: viewing controls* on page 88).
- Make the boarding area appear or disappear: press [Shift][Ctrl][F9]

  For information about the boarding area (see *The boarding areas in Radar and ECDIS* on page 99).
- Start tracking the target closest to the marker: press [Right Shift][F9]

  This is equivalent to pressing **ACQ** on the operator panel (see *The TARGET group buttons* on page 35).

H.10 [F10] key functions

The [F10] key enables you to:

- View data for the target closest to the marker: press [Right Shift][F10]

  This is equivalent to pressing **DATA** on the operator panel (see *The TARGET group buttons* on page 35).

H.11 [F11] key functions

The [F11] key enables you to:

- Test the lamps on the operator panel: press [Ctrl][F11]
- Mark the position of a Man-Over-Board incident: press [ALT][F11]

  This is equivalent to pressing **MOB** on the operator panel (see *The MOB (Man Over Board) button* on page 36).
- Acknowledge one or more alerts: press [Ctrl][Shift][F11].

  This is equivalent to pressing **ACK** on the operator panel (see *The Alarms group* on page 39).
- Silence the sound associated with an alert: press [Right Shift][F11]

  This is equivalent to pressing **SOUND OFF** on the operator panel (see *The Alarms group* on page 39).

Shift	Zoom +	Day +	Brill +		In Cmnd	Crs	Hdg	Monitor	Std. Display			
Ctrl	Zoom -	Night -	Brill -		Act. Turn	WP	Track	Browse	Themes		Lamp Test	
Alt	Zoom Reset				Port -	Up +	Starboard +	Docking	Radar Off		MOB	
Ctrl Shift	Reset Centre			Calib		Down -			Board		Ack	
Rt Shift		Object Info			Autopilot	Planning		Cease Tgt	Acquire Tgt	Target Data	Sound Off	

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