

SIMRAD

Maris ECDIS900 System Operator Manual

ENGLISH



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General ECDIS900

ECDIS900 is designed to **display vessel information** received from on board sensors such as GPS, Gyro, Log, radar and AIS together with geographical information retrieved from Electronic Charts. ECDIS900 is a core navigation tool that satisfies the marine standards ECDIS (Electronic Chart Display Information System) and RCDS (Raster Chart Display System). ECDIS900 is designed to run under Microsoft Windows Operating Systems (XP or Windows7).

ECDIS900 is designed to secure navigation at sea by combining the vessel information from several sensors, information from Electronic Charts in the area and the use of powerful navigation functions.

The system has the ability to display and use both official and unofficial **raster and vector charts**.

Official charts types supported are:

- Electronic Navigation Charts (ENC, provided by Primar; AVCS, provided by UKHO; C-MAP ENC DB in the SENC format), which are official Vector Charts
- ARCS - Raster Charts from British Admiralty

ENC data does not contain any information concerning symbolizing. The presentation of charts on the screen and it is implemented via the presentation library (PRESLIB) published in the Publication No. 52 (S52).

ECDIS900 is Wheelmark Type approved but is used as ECS system when non official charts are displayed. Data settings and ECDIS mode are **protected** by passwords.

Each ECDIS900 system includes:

- **MARIS User Interface**
- **The main window** displaying the chart, sensor information, and SW tools.
- Sensors Interface and Integration (Sensor Monitor application).
- **Chart manager**
- **Route planning and safety checking**
- Edition of **Search And Rescue module**
- **Route Monitoring**
- **Alarm manager**
- **Logbook management**
- **User data edition facilities**
- **Tide calculation**
- **Weather forecast**
- **Navtex modules**
- **Radar overlay facilities**
- **AIS interface**
- **ARPA**

When the computer is started, ECDIS900 and the application Sensor Monitor are launched automatically. To start manually ECDIS900, double-click on the icon called ECDIS900 or select the start up menu ECDIS900.


Technical manual contains more details about installation, architecture, and troubleshooting. Customer support is provided via **MCP (Maris Customer Portal)** or via e-mail or phone. See the Support section for details.

Application Manager

Application Manager is a software application which works as a Shell on MARIS computers and restricts the access to the computer in order to protect the PC and to run ECDIS900 in Approval mode.

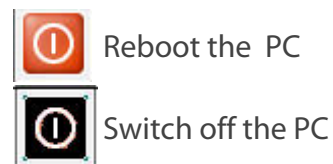
In Approval mode the PC is protected against any changes which may affect the Operating system and it is impossible to install any third party software. In this mode ECDIS computer access is restricted to mandatory ECDIS functions and to others MARIS applications which are selected during configuration. AM replaces Windows Explorer and all standard shortcuts such as Ctrl-Alt-Del are disabled.

The configuration of Application manager is done by authorized technician and described in the ECDIS900 installation manual..

Click in the grey rectangle .

- The applications listed on the left under Auto are always running and cannot be stopped.
- The applications listed on the right under Other title are the applications the user is allowed to run and stop.

Using the top icons the user can reboot or stop the PC and access to the Security settings described in the Installation manual :



Basic Operational Procedures

GENERAL

The ECDIS900 is a window based Human Machine Interface (HMI) where requested information is obtained from menus, message boxes, dialogue boxes and other standard window controls in the display.

A mouse is the main operating tool for the system.

A keyboard is also necessary to input alphanumeric data.

STANDARD MOUSE FUNCTION

Terminology and descriptions of the operator's standard mouse functions:

Cursor	The cursor is a small mobile icon. The shape depends on its position on the screen and on selected function
Locate cursor	Move the cursor to position on the screen by moving the mouse
Click the left button	Quickly press and release the left mouse button
Click the right button	Point the object of interest, press the right mouse button and a contextual menu, depending on the object type, is displayed
Double click the left button	Quickly press twice and release the left mouse button

Throughout this manual, the terms 'click' and 'double click' assume the left button. It is specifically stated when the right button is applicable.

PROMPT WINDOW

For some objects (target, buoys with name, weather and ocean current data) the ECDIS provides direct access to main properties of the object. Move the cursor on top of the object and after two seconds a prompt window displays information.

DIALOGUE BOXES

The ECDIS900 is window based application. that means the operated by the selection and activation of graphic windows using the cursor. When the cursor is located inside a window, the window becomes active. Left mouse click activates the window function.

The following standard controls are used:

- Bookmarks(tabs)
- Option button
- Check Box
- Input box
- List Box
- Information_Box
- Drop_Down_List_Box
- Text box
- Push button

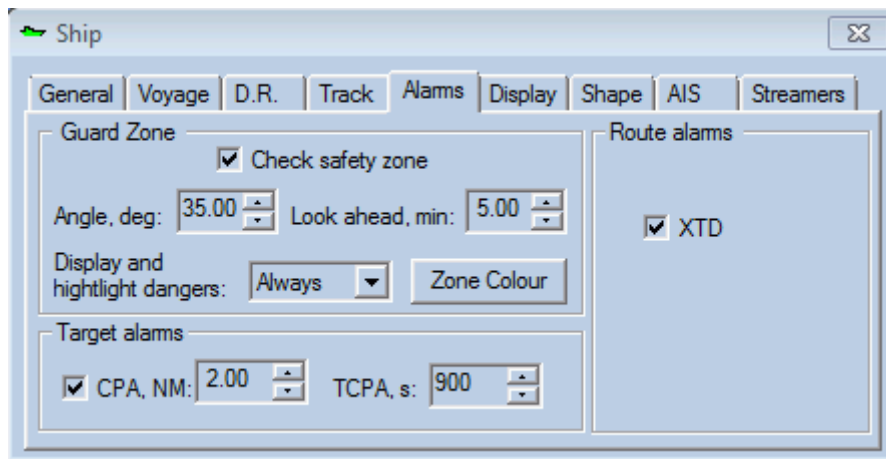
To activate any of the functions, locate the cursor on the appropriate control button and click.

NOTE A dialogue box may be moved around by clicking on the top of the box and dragging it to any suitable location on the screen

Hot keylist

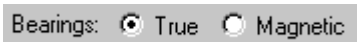
Several hot keys allow access to basic functions of ECDIS and makes possible operating the ECDIS directly from a keyboard.

BOOKMARKS (TABS)



To define multiple pages for the same area of the dialogue box the tab controls are used. Switching between the pages is performed by clicking on the tab.

OPTION BUTTON



An option button (radio button) selects one and just one option from a set of alternatives. Option buttons may be switched **on** or **off**, but only one button from the group may be on at any one time.

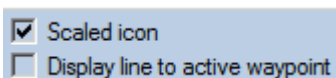
When an option button is activated by either clicking the text or the round indicator, the corresponding text is highlighted and a filled circle appears in the round indicator.

CHECK BOX

A Check Box control allows selection of the multiple options from the set.

To toggle (change state), click on the check box and its value will change from on to off or vice versa.

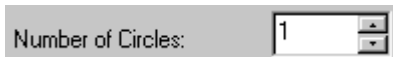
Status on (checked) is indicated by a check mark in the left square window.



In case the option is disabled the check box looks like the picture below:



INPUT BOX



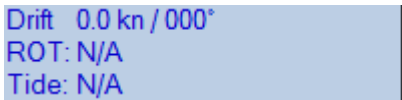

An Input Box also known as Spinner consists from an increment button, a decrement button, and an edit control. The box is used to enter alphanumeric values.

To activate the input box, click on it. Click on the “up” button to increase the value and on the “down” button to decrease the one, or type the value directly into the field.

Note, that in some cases values are limited so it is not allowed to input the out of range value. Most of input boxes have default values

INFORMATION BOX

Parameter monitoring is performed with set of Information boxes. Usually they are located on the side console but it is possible to take them out as a float window.

On a side console	As a float window
	

NOTE Information is read only.

TEXT BOX

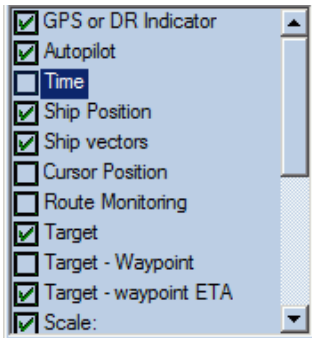


With a Text Box the following action a performed:

- Display text/numerical value
- Enter text/numerical value
- Edit text/numerical value

To enter a text, click inside the text box and type in some data.

LIST BOX



The control lists values or parameters. To select item from the list, click on the proper one. The selected item is ticked on. To deselect the one, click on the selected item. The item is ticked off.

DROP-DOWN LIST BOX



A type of combined Text box and List box. The box contains the current value and the list is initially not displayed. To view the whole list click on the <Down> arrow.

The whole list may be scrolled by use of the <Up> and <Down> arrows

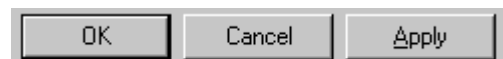
PUSH BUTTON

A Push button is a rectangle containing an application-defined text label, an icon, or a bitmap that indicates the action that will be performed after the button has been pressed (pushed).

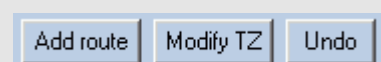
The following kinds of buttons are used in the ECDIS900:

Control buttons:

- **OK** – save changes and close a dialogue
- **Cancel** – close a dialogue without saving changes
- **Apply** – save changes without closing a dialogue

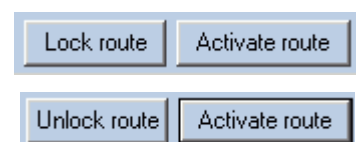


Action buttons call dialogue box or perform other action when pressed



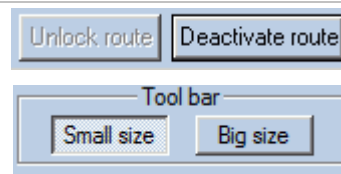
Toggle button defines one of two values of the corresponding parameter. There are two kinds of the toggle buttons:

- buttons that change the text depending on the value



- buttons that change the state (pressed vs normal)

The second ones usually used with buddy buttons.



Toolbar buttons provide access to the main functionality of the ECDIS application.

Note, that some buttons have right-click function



HOT KEY LIST

F1	Zoom in
F2	Zoom out
F3	Follow the ship and Autoloading
F4	Properties access
F5	Show/Hide targets
Ctrl+F5	Hide radar overlay
F6	Route plan access
F7	ENC Standard mode or Raster chart original scale
F8	Switch the color scheme
F9	Other chart type (Ctrl + F9 Settings)
F10	Anchor (Ctrl + F10 Settings)
Arrows	Chart scroll in 4 directions
Esc(escape)	Close the window
+	Load better raster chart
-	Load smaller scale raster chart
Delete	Suppress selected waypoints or range and bearing display or user selected objects
Shift+V	true/relative vectors
Shift+R	Display black rectangle for back light adjustments
Ctrl+A	Access to AIS messaging window
Ctrl+H	Activated Harbour mode (Press Enter or Space or Click to escape)
Ctrl+D	Docking mode
Ctrl+N	List chart 1 cell for Type Approval
Ctrl++	Backlight control: Brightness + 1
Ctrl+-	Backlight control: Brightness - 1
Ctrl+space	Magnifying Glass

Hot key list

Ctrl+space+Shift or Mouse Wheel	Zoom In/out in Magnifying Glass
T	Access to the Tidal data for NHO zone. (Pilot version only)
B	Show ARCS update tiles
N	Send XML request to get near real time tide data
V	Change the target vector from True to Relative or vice versa
Enter	Acknowledge the alarm

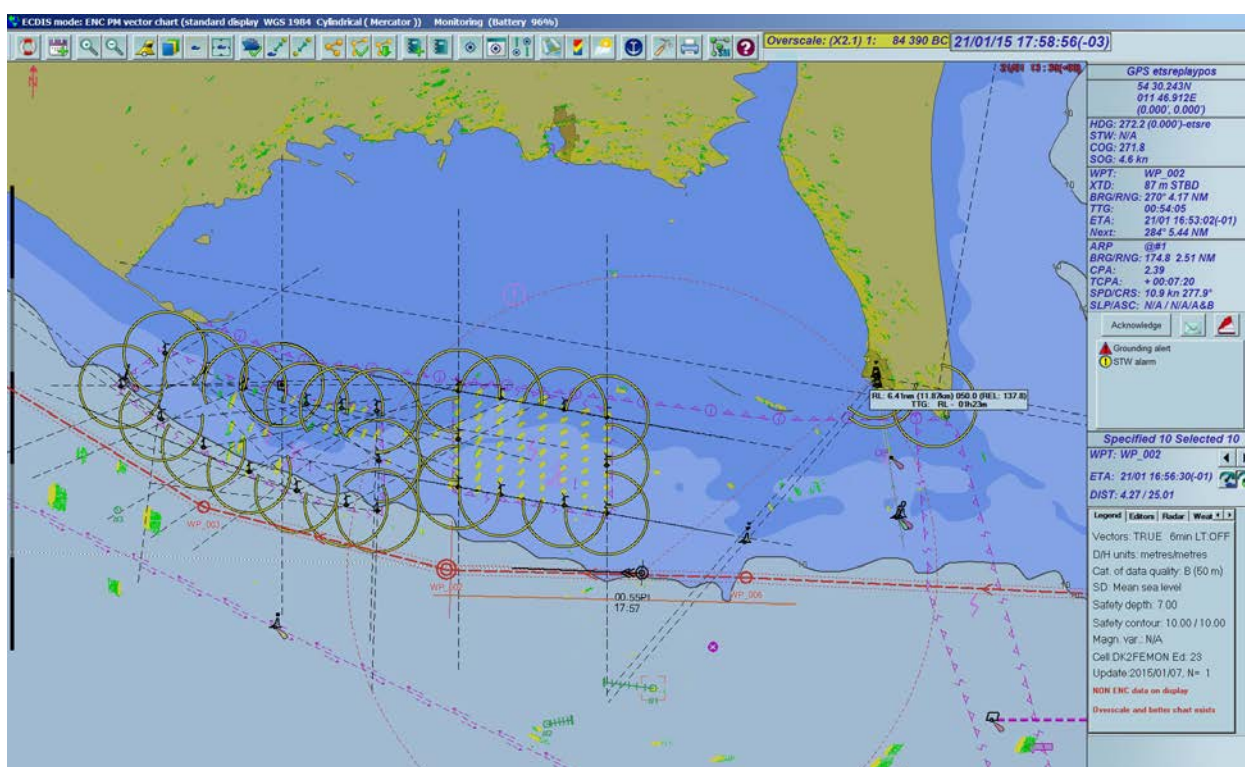
Main Window

ABOUT MAIN WINDOW

The main window is divided into four different areas:

- WindowTitle
- Chart Area
- Toolbar Panel
- Console Area

A typical ECDIS900 screen may look like this:



WINDOW TITLE

The window title shows the application name. The following information is also displayed in the title:

- ECDIS mode: S57 HO ENC, RCDS or CMAP depending on which chart database is in use.
- When S57 ENC or C-MAP mode is active:
 - Type of display: Base, Standard or All Display. By default Standard is selected. To change the display mode see **Chart Settings**.
 - Datum in use. WGS 1984 is by default in use.
 - Type of projection: to change the projection see the **Chart Depth** section
 - Battery charge
- When raster charts are in use:
 - The name of the active chart

- The chart number
 - The datum of the chart
 - The datum shift with WGS84
 - Battery charge
- The type of ECDIS workstation (Planning or Monitoring). To select the type of the ECDIS workstation, right double-click in the menu bar and select the type of workstation: Monitoring or Planning. For more details see **Route Monitoring**.

RCD5 mode: Oslofjorden - Southern Part (3159) - European 1950 (-0.03, -0.08) Monitoring

ECDIS mode: HO ENC vector chart (full information display WGS 1984(Global Definition) Cylindrical) Monitoring (Battery 100%)

CHANGING THE WORKSTATION MODE (PLANNING OR MONITORING)

Right double click in the title bar and activate the menu Set as Planning station or Set as Monitoring station.

To access to the module called **System Protection** that allows a password protection of ECDIS900 operating, right double-click in the window title.

SYSTEM PROTECTION

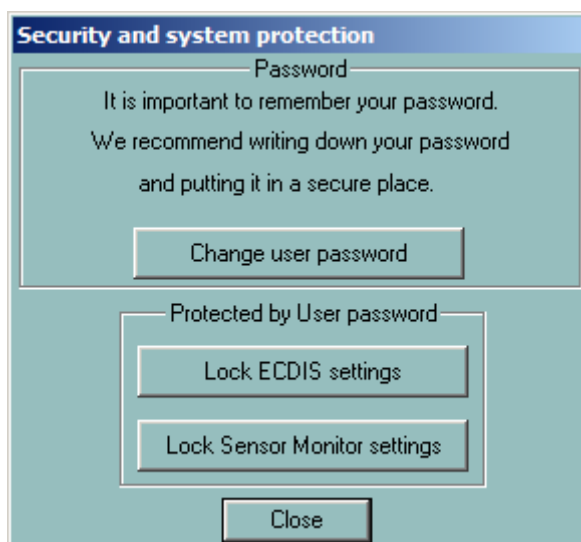
Right double-click in the title of the main window and activate the menu **System Protection**.

PRINCIPLES

The user password is used to protect the most sensitive settings of ECDIS and Sensor Monitor against any changes.

When ECDIS900 is installed, no password is predefined and the system is not protected.

To protect the system a user shall enter the appropriate password via the dialogue **Change user password**.



TYPE APPROVED MODE

In Operational type approved mode the Windows file system is not accessible, the system function keys are disabled..

When the administrator protection is activated via **Application Manager**, the change of ECDIS mode requires entering the proper password.

After the mode is switched on and the password is confirmed, it is required to restart the system.

ECDIS SETTINGS AND USER PASSWORD

When the user password is not empty, locked ECDIS settings and Sensor Monitor Settings can be changed only if the proper password is entered.

When ECDIS settings are locked, it is impossible to modify the following parameters:

- Ship parameters
- GPS and radar antenna positions
- Alarm settings
- Ship display parameters
- Safety settings (safety contour, safety depth, safety height, deep contour)
- Console options

When Sensor Monitor settings are locked it is impossible to change settings of the sensors, to create or delete any sensor.

FORGOT YOUR PASSWORD?

If one of the password is lost it is required to contact MARIS to get access to a meta password allowing to unlock the system

CHART AREA

Charts are displayed in the chart area of the screen. According to IEC standard, the screen size must be larger than 270 * 270 mm.

ECDIS900 supports two chart formats: Vector and Raster. The system operates the vector cartography under a seamless mode whereas the raster cartography, such as ARCS from the British Admiralty, is operated under the chart by chart mode. The following seamless modes are available:

- ~~ARCS seamless mode~~: in this case the system displays the available charts of the closest scale
- ~~ENC/ARCS combined seamless mode~~

SCALE BARS

If chart scale is smaller than 1:80 000, the latitude bar is shown on the left side of the chart area (Length 10 nm).

For scales bigger than 1:80 000 the scale bar is shown in different colours on the left side of the chart area (Length 1 nm).

NORTH UP SYMBOL



North up symbol is shown in the top left corner of the chart area.

TOOLBAR PANEL

The toolbar panel contains buttons that allow affecting changes to the chart, controlling navigation and customising the ECDIS application according to OOW (officer on watch) needs. If Toolbar is not visible on the screen right click on the chart and select the item menu Show ToolBar.

The various options are:



Man over board



New logbook record



Event



Logbook



Zoom In



Set target



Zoom Out



Target list



Standard Display mode



Target prediction



Select Area



Chart handling



Auto centring



Load/Unload objects



Centre on Ship



Tide information



Ship properties



Weather



Ship to point, range and bearing



Port Database



Point to point, range and bearing



ECDIS900 options



New route



Print



Route plan



Sensor Monitor (switch to)



Help

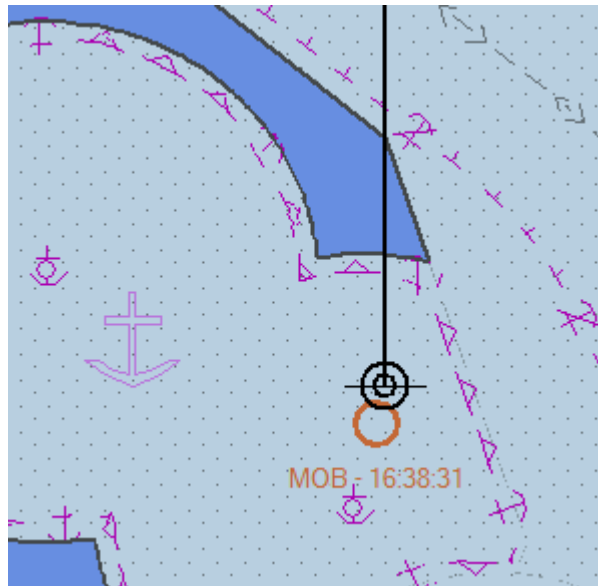
MAN OVER BOARD

In the case of a man over board (MOB) click on the **Man Over Board** icon



NOTE This function is available in the Monitoring mode only.

A MOB waypoint is created, showing the time the incident was originated.



The MOB waypoint

- The chart is automatically centred on the MOB point.
- A new entry is stored in the logbook with the MOB position and navigation parameters.
- The current route, if any, is deactivated.
- The autopilot function is cancelled.

Log										
Settings										
Log book Recording ON				Starting date/time: 10/19/2014 14:11:44		Settings		Load	Print log	
15 sec recording frequency						VDR replay		Replay	Close	
Time (UTC)	LAT	LON	Event type	Comment	COG	SOG	HDG	STW	Range	Bear.
16:36:44	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:36:59	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:37:14	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:37:29	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:37:44	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:37:59	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:38:14	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:38:29	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:38:31	32 31.241S	060 55.178E	-	Man over board ...	-	-	-	-	-	-
16:38:44	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:38:59	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:39:14	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:39:29	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-
16:39:44	32 31.241S	060 55.178E	Ship watch	Cell: GB5X01S...	0.00	0.0	0.00	0.0	-	-

The MOB Logbook entry

A route defined by the waypoint and plotted from the MOB point is created and the information required to return to the MOB point (bearing and distance from the ship to the MOB point) is immediately displayed in the static information console.

To view and amend the properties of the waypoint, locate the cursor on the waypoint, right click and select **Properties** from the pop-up menu.


DEACTIVATE MOB

Locate the cursor on the MOB waypoint and click right. Select **Deactivate** on the pop-up menu.

DELETE MOB


Locate the cursor on the MOB waypoint and click right. Select **Delete** on the pop-up menu.

EVENT

To plot a new point on the chart at the ships location, click on the **Event** icon . The geographical point is displayed on the chart with a special icon and stored in the user data active layer.

A detailed overview of user data can be found under **Object Editor**.

Zoom

Click on the **Zoom in**  icon to zoom in one step.

HOT KEY

Press Hot Key **F1** to zoom in.

IMPORTANT

In RCDS mode (Raster charts) clicking with the right button of the mouse in the **Zoom in** button loads and displays another raster chart with a better scale under, if it exists.

Other methods of zooming can be found in **Charts-Zooming**.

Click on the **Zoom out**  icon to zoom out one step.

HOT KEY

Press Hot Key **F2** to zoom out.

STANDARD DISPLAY



- Click on the **Standard Display** icon to set the ENC or C-MAP display to standard mode.
- Click on the **Standard Display** icon to display ARCS chart at the original scale.

NORWEGIAN PILOT:


Right click on the icon to select Extended Standard and Norwegian presentation.

HOT KEY

Press Hot Key **F7** to select the standard mode.

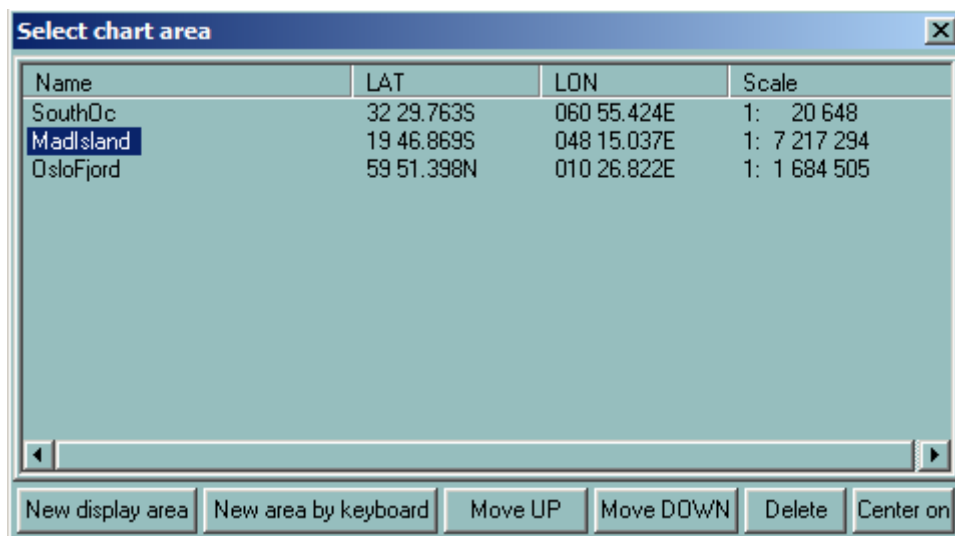
SELECT AREA

The **Select area** function allows the user to define chart areas and to select an area to be displayed.

To select an area click on the **Select area** icon .

A chart area is defined by:

- Name
- Lat (latitude)
- Lon (longitude)
- Scale



CHANGE SELECTED AREA

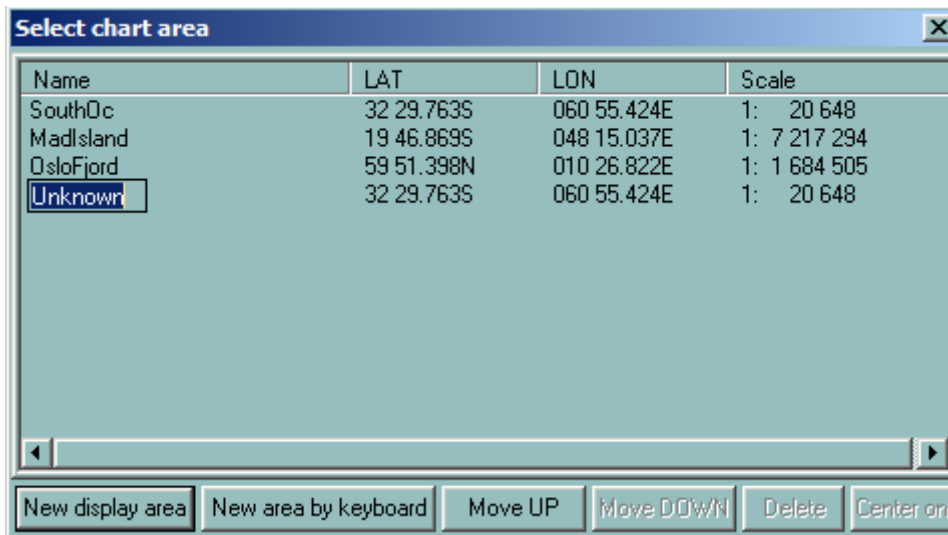
To change the selected chart area either:

- Double-click on the area name or
- Click on the name and then click on the Set area button
- The chart is displayed at the selected scale and centred on the defined point

SET NEW DISPLAY AREA

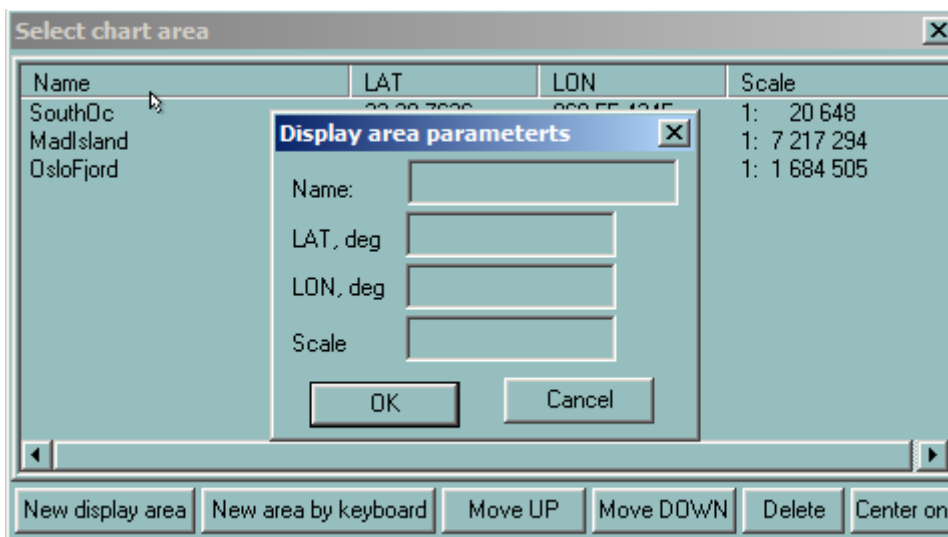
- Move the chart to the desired position and select a scale.
- Click on the Select area icon.

- Click on the **New display area** button - a new area named **Unknown** is created with the geographical centre and scale automatically stored.
- To change the name, click on the name 'Unknown' and enter a new name via the keyboard.
- Close the window.



SET NEW AREA BY KEYBOARD

- Press the button **New Area by keyboard**.
- Enter the name, the latitude and longitude of the point centre of the screen and the scale.



DELETE CHART AREA

- Click on the Select area icon.
- Click on the name of the area to be deleted.
- Click on the Remove display area button.

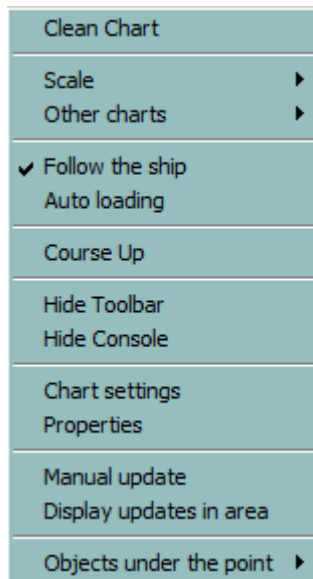
IMPORTANT

A list of chart areas is created for one type of chart; the list created for S57 chart is valid only for this type of charts and cannot be used with ARCS charts.

AUTO CENTRING

Click on the **Auto centring** icon  to define a **centring zone**.

When the chart auto-scrolling mode is selected (Follow Ship Ticked ON), the chart will automatically move following to the ship motion when it out of the **centring zone**.



There are two types of centring zones: static or dynamic according to the ship's heading.

STATIC CENTRING ZONE

The Auto Centring button allows the user to define the 'centring zone' according to the ship's heading. For example, when a ship is heading north, the operator will define a rectangle located at the bottom of the window in order to display a chart area as large as possible in front of the ship. This zone is defined by default as a rectangle located in the middle of the screen.

DYNAMIC CENTRING ZONE

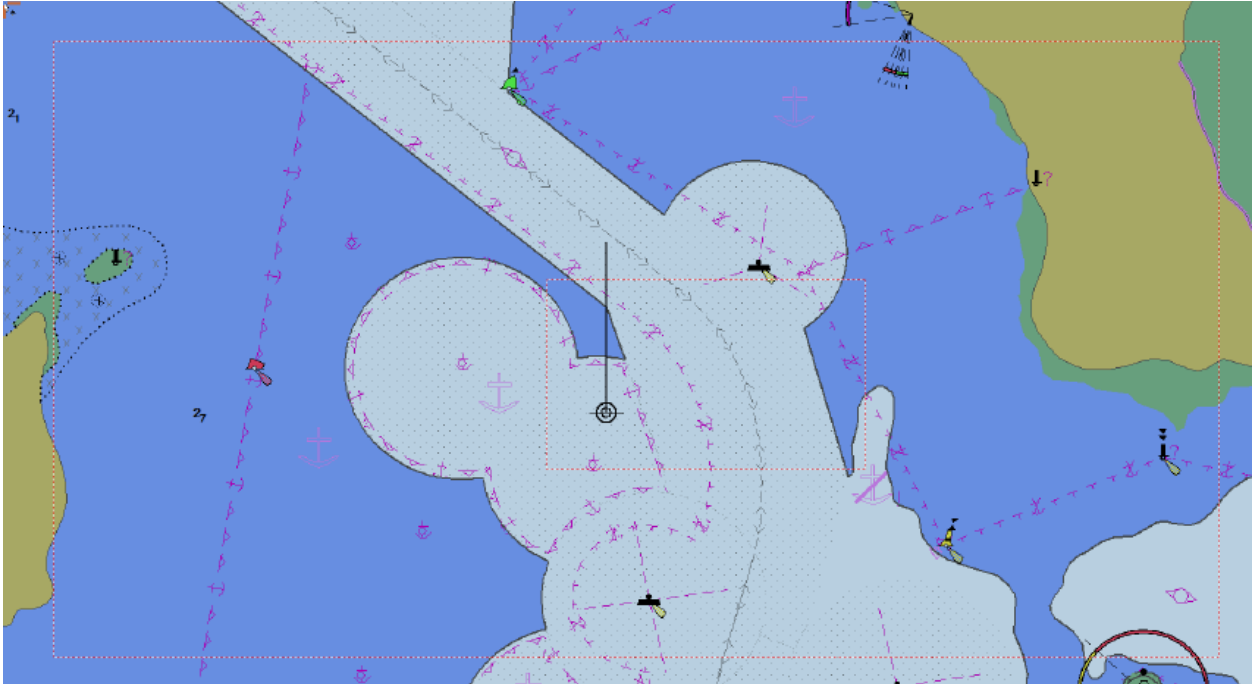
Using a dynamic centring zone guaranties that the navigator always has the largest chart displayed in front of his ship, even when the heading changes. Indeed, after the zone is defined, the ECDIS900 will dynamically position the centring zone according to the heading. For instance, if the ship sails North East the ECDIS900 will move the centring zone to the bottom left of the screen and if the ship changes course to South the zone will be moved to the centre top of the screen.

Click the **Auto Centring** button to display the current centring rectangle.

- Two red dotted line rectangles are drawn on the chart: the current centring zone (the smaller rectangle) and the rectangle defining the limits of the dynamic zones.
- To leave the centring rectangle unchanged and to erase it, click on the Auto Centring button again.
- To define a new centring rectangle, locate the cursor at one corner of the desired zone then hold and drag to draw the appropriate zone.

- If a new rectangle meets the rectangle that defines the limits of dynamic zones, a dynamic centring zone is defined.

NOTE After the new rectangle is defined the **Auto centring** function is off. So press the Auto centring button again.



CENTRE ON SHIP

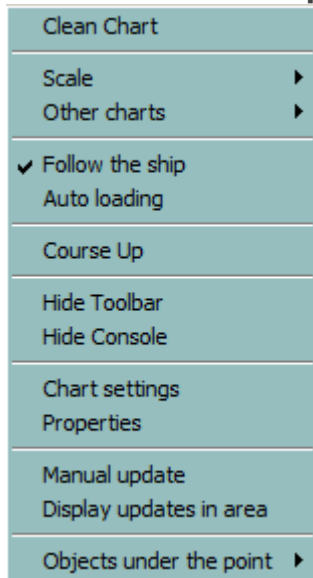
To centre the chart on the ship click on the **Centre on ship** icon . The chart will automatically be centred on the ship.

NOTE Centre on ship is a one-time action

For scrolling the chart automatically according to the ship's movements:

- Right click anywhere on the chart to display the pop-up menu.

- Tick on **Follow the ship**.



HOTKEY

Press the **F3 hot key** to centre the chart on the ship's position and activate the Follow the ship function.


SHIP PROPERTIES

To view or change ship's properties, click on the **Ship properties** icon .

Alternatively, click right on the ship's icon and select **Properties** from the pop-up menu.

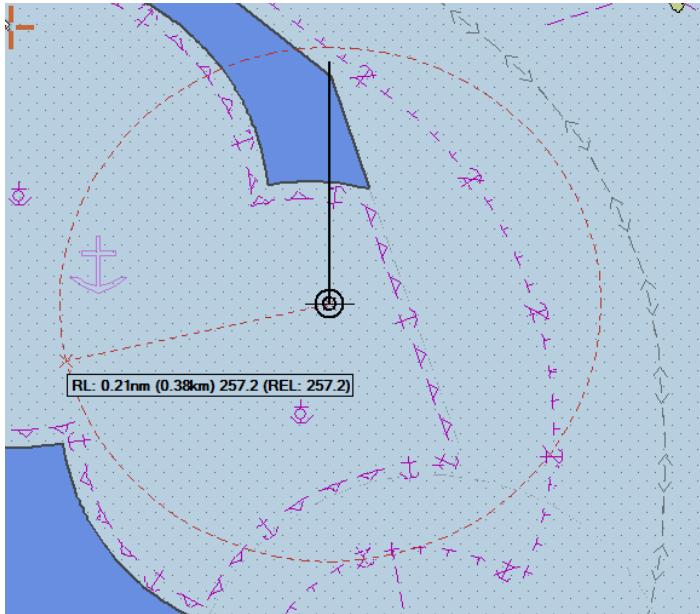
The **Ship** parameter window appears. For detailed overview of the ship's parameters, see **Ship - Ships Properties**.

SHIP TO POINT, RANGE AND BEARING

To set a point at a fixed range and bearing from the ship click on the **Ship to point, range and bearing** icon .


The cursor will appear as a cross with a circle attached to it plus the actual range and bearing data, measured from the Conning Position defined in ship parameter (Shape/GPS and radar/Conning position).

Move the cursor to the desired position (range and bearing) then click left to fix the point.

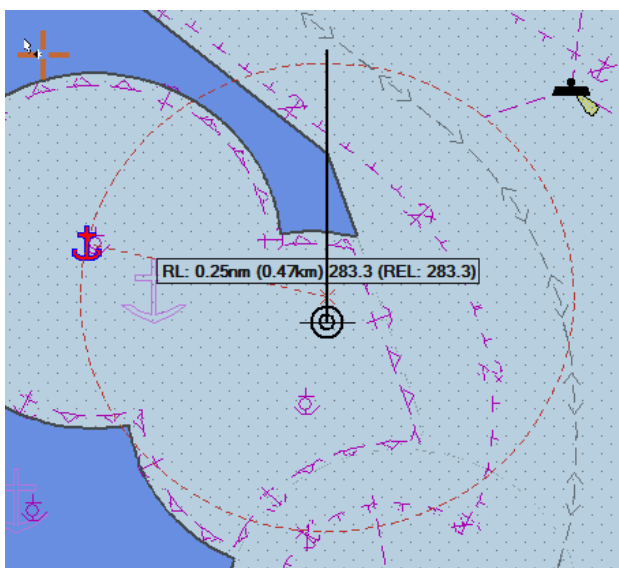


REMARK Use the object menu for removing a single VRM/EBL. To remove all VRM/EBL use the 'Del' key or the 'Clean chart' function from the chart menu.

SHIP TO ANCHORING POINT, RANGE AND BEARING

Right click on the **Ship to point, range and bearing** icon  and plot an anchoring point on the chart.


The information window displays the Range and Bearing from the bow of the ship to the Anchoring point and the ETA.



The position of the pop window, of the VRM/EBL is user adjustable.

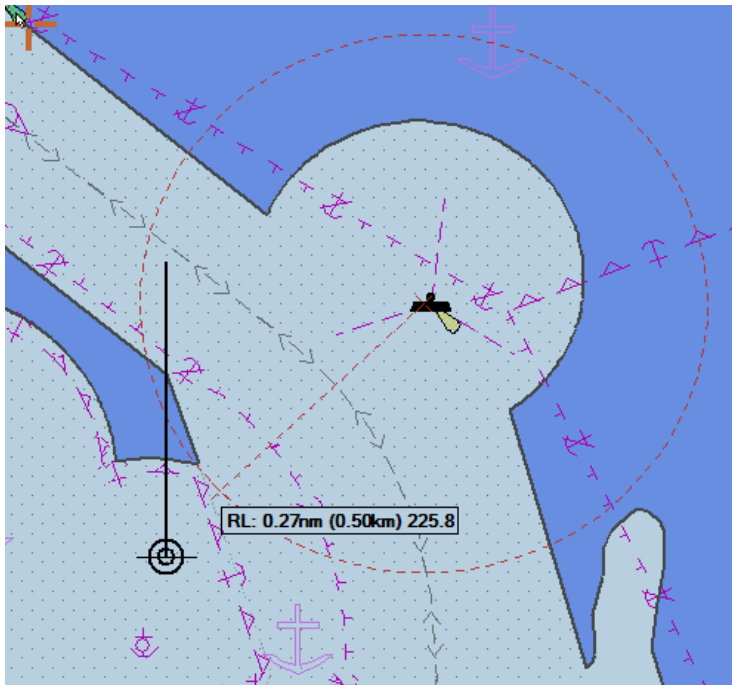
Left click and drag to reposition the prompt window.

POINT TO POINT, RANGE AND BEARING

To set two points at a fixed range and bearing from each other click on the **Point to point, range and bearing** icon .

The cursor appears as a cross. Move it to the first desired position and click left to fix the point. When the cursor is in motion, it has a circle attached to it plus the actual range and bearing data, measured from the first point.

Move the cursor to the desired second position (range and bearing) and click left to fix the second point.



REMARK Use the Object menu for removing a single VRM/EBL. To remove all VRM/EBL, press the **Del** key or select the **Clean chart** function from the chart menu.

TARGET TO POINT, RANGE AND BEARING

To set a point at a fixed range and bearing from the target:

- Select the target with Right Click.
- Select **EBL/VRM tool** with left click.

The cursor appears as a cross with a circle attached to it plus the actual range and bearing data, measured from the target position.

- Move the cursor to the desired position (range and bearing)
- Left click to fix the point. A new position can be defined
- Select the crossing line with circle
- Left click and drag.

REMARK 1 VRM / EBL is available per target.

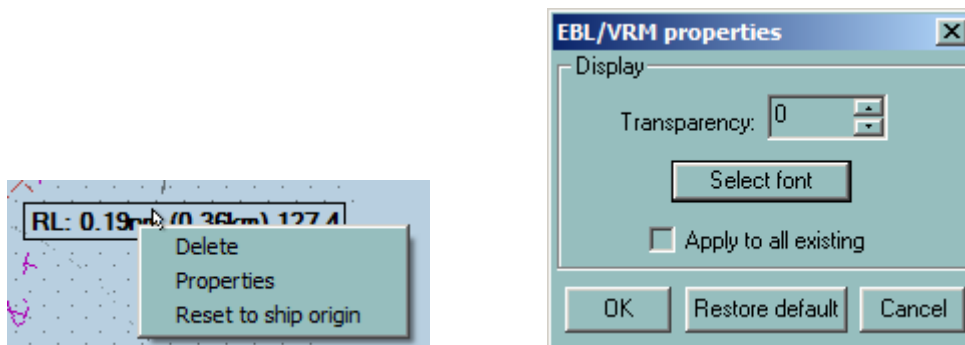
VRM/EBL OBJECT MANAGEMENT

This is available for Ship/Anchoring/Point/Targets-To-Point VRM/EBL facilities. The range and bearing will now be updated according to the ship's movement. To set the point to a position outside of the current viewing window:

- move the cursor outside of the window in the desired direction and the chart will move automatically in that direction.

The fonts of the prompt window values, size, window transparency, VRM/EBLs and the anchoring facility are user defined.

- Right click on the prompt window
- Select Properties and use the dialogue box and different adjustments



To delete one VRM/EBL point and the associated prompt window:


- Right click on the prompt window to be deleted.
- Select Delete

The same action can be used for all VRM/EBL displayed points

To delete all the VRM/EBL points and the range and bearing values:

- Right click anywhere on the screen to display the pop-up menu.
- Click on Clean Chart.
- Alternatively press the key **Del**.


NEW ROUTE

Click on the **New Route** icon  to create a new route and to plot waypoints on the chart with the mouse.

The waypoints can be plotted on the chart with the mouse or entered by keyboard in the route plan window which is activated by clicking the button **Route Plan**.

For a detailed overview of the route management, see **Chapter Route-Planning**.

ROUTE PLAN

Click on the **Active Route plan** button  to display the Route planning window of the active route.

REMARKS

If the uploaded route is not active the route plan is opened in the **Create new route** mode.

HOT KEY

Press the **F6** hot key to access the route plan of loaded routes. Press several times to change the selected route.

For a detailed overview of the Route planning window, see Chapter **Route**.

NEW LOG BOOK RECORD

To enter a new record in the log book click on the **New Logbook record** icon .

For a detailed overview of this procedure, see Chapter Logbook - **Event**

LOGBOOK

Click on the **Log Book Window** button  to display the logbook window and list the entries of the active logbook.

It will now be possible to change the settings, print the logbook, load an historical book and replay it.

For a detailed overview of the Log book window, see Chapter **Logbook**.

SET TARGET

To plot a manual target click on the **Set target** icon .

For further details about manual targets, see Chapter Radar - **Manual Target**.

TARGET LIST

To display the target list click on **Target List** button .

- Double clicking on the target name centres the chart on the target.
- Clicking on the title sorts out the targets.

ECDIS900 acquires targets via serial line from ARPA radar connected to the system or using MARIS' radar interface kit. In addition ECDIS receives by serial line the targets from AIS when AIS is interfaced to ECDIS.

CENTRE THE CHART AND ACCESS PROPERTIES

- Double click on the target name to centre the chart on the target.
- Right click on the target's name to access to the properties.

SHOW HIDE TARGETS

Press Hide target to hide targets. All targets are hidden except the target on CPA/TCPA alarms which are displayed anyway.

RELATIVE VECTOR

Press the Draw relative vector button to display targets with relative vector. A relative vector is displayed in a dotted line to distinguish from an absolute vector.

Relative vectors are displayed in dotted lines while True vectors are displayed in solid line.

HOT KEY

Press **V** to switch from True vector to Relative vector and vice versa.

AIS MESSAGE AND START/STOP AIS SERVER

See **AIS** chapter, paragraph **Message**.

CUSTOMIZE TABLE

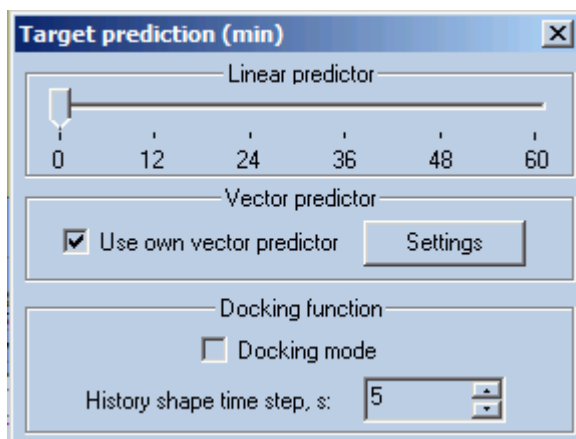
Press Customize Table to select parameters to be displayed in the table/

TARGET PREDICTION

To predict the position of the ship and any ARPA targets click on the **Target prediction** icon




The display the ship and targets positions according to their current course and speed move the slider along the bar to the desired time point (in minutes).



Use own vector predictor Linear predictor to calculate future positions according to current course and speed. The displayed positions on the screen are predicted.

CHART HANDLING

To manage chart catalogues click on the **Chart Handling** icon .

This function allows the user to list the charts installed in the chart catalogue, to install new charts and to delete charts from the catalogue. For a detailed overview of the Chart Handling, see Chapter Charts - **Chart Handling**

LOAD/UNLOAD OBJECTS

Routes and tracks are stored in a database.

The following actions are available:


- Load - displays routes or tracks on the chart
- Unload - erases routes or tracks from the chart

To load/unload routes or tracks click on the **Load/Unload objects** icon .

For full details on Load/Unload see chapters:

- **Routes** – Load/Unload/Delete routes,
- **Lock/Unlock a route**,
- Localize a route,
- **Import – Export Routes**
- **Tracks** - Load/Unload/Delete tracks

TIDE AND CURRENT INFORMATION

Push the button **Show/Hide tide stations and ocean current**  and icons showing the tide level are displayed at the tide stations locations. More than 2000 main tide stations are available in ECDIS900.

IMPORTANT The icons are visible when the chart scale is bigger than 1/2 000 000.

Select the Tide type by Right clicking on the Tide button when it is activated.

Select the mode:

- **Ecdis mode** (optional)
- **Real Tide** (Norwegian HO)
- **Total tide** (UKHO)

TIDE DATA FOR SHIP SAILING IN NORWEGIAN WATER

Tide is calculated in real time under the ship's position and tide data displayed in the Drift panel in the console area.

PORT DATABASE

To display the port icons on top of the chart click on the **Port database** icon .

Access to the port information is possible only if the user has subscribed to Fairplay database.

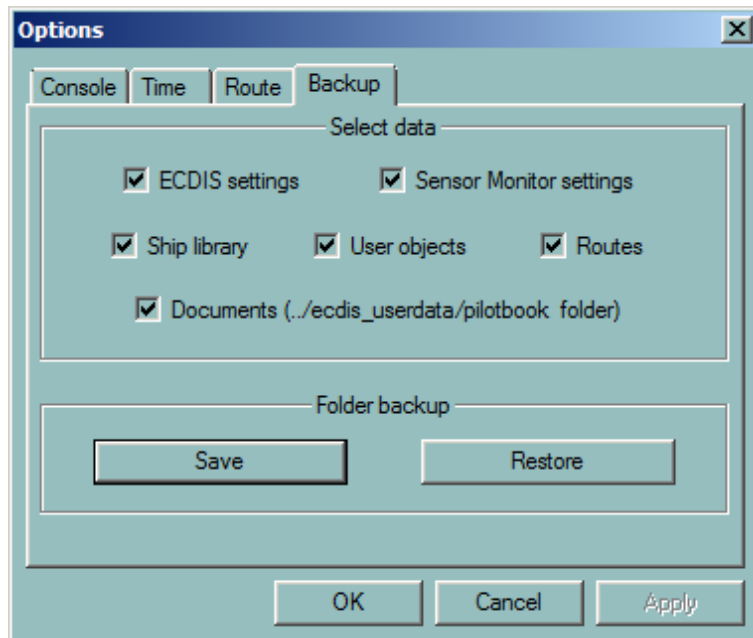
Right click on the port icon to access to all information stored in Fairplay database.

ECDIS OPTIONS

ECDIS OPTIONS

To effect changes to the settings of the console, the time, the route parameters or the security

click on the **Options** icon

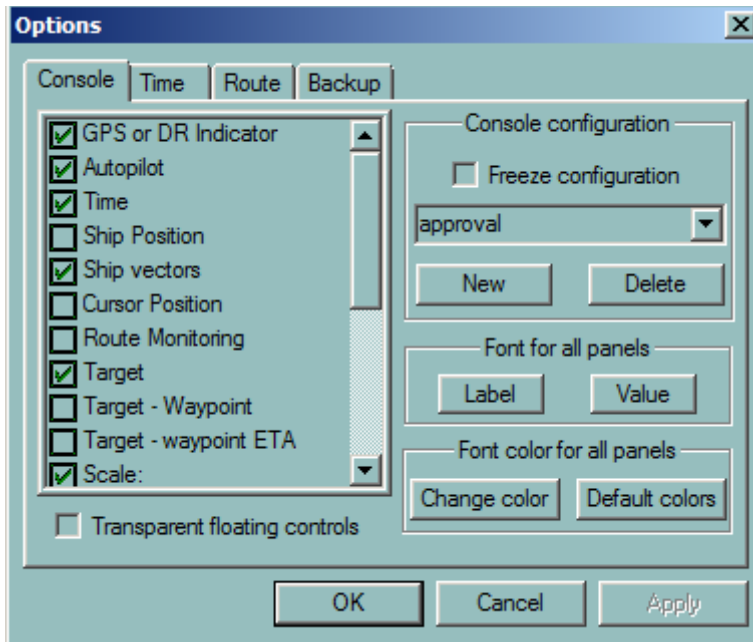


The Options dialogue box has with 4 tabs:

- **Console:** to customize the console layout
- **Time:** to adjust ECDIS local time and chart time
- **Route:** to select the route parameters by default. For more details see Chapter Route paragraph **Route Options**
- **Back up:** to back up and restore user data.

OPTION CONSOLE

Data acquired from sensors connected to ECDIS is displayed in the console area together with additional ECDIS tools. The layout of the console area can be adjusted according to available sensors and selected tools according to OOW preferences and task at hand.



It is possible to predefine several configurations of the console layout in order to use an appropriate layout according to the current type of work. For example a configuration can be defined for route monitoring displaying only active waypoint, drift and target information and another one for docking including Ship's parameters, drift and cursor position.

CREATE A CONFIGURATION

Two configurations called Default and Approval are installed by default. To create a new one proceed as follow:

- Press the **New** button
- Enter a name
- Select in the list on the left side the panels to be displayed
- Adjust the size, type and colours of the font
- Click OK
- Adjust eventually the position of the panels directly in the console area by clicking and dragging them at the proper place

REMARK

If the panel is dragged outside of the console area it is displayed as a floating window.

TRANSPARENCY FLOATING CONTROL OPTION

Select the option to display the panel with transparency on the chart.

LOCK A CONFIGURATION

Once the configuration is properly defined, check on the box "Freeze Configuration" to avoid unwanted changes.

LOAD A CONFIGURATION

The configuration pop up menu gives access to the different configuration defined in the system.

IMPORTANT

The console configuration cannot be modified if the ECDIS user data is password protected. For more information about the protection schemes in ECDIS900 see the paragraph System Protection.

OPTION TIME

ECDIS900 operates and displays the **local time**, which is calculated from UTC time and time zone information.

The operator can adjust the UTC time manually or choose UTC time to be automatically adjusted from the GPS. Usually this is default settings and it synchronizes time in the ECDIS LAN.

The operator is responsible for the manual selection of the time zone.

The screenshot shows the 'Options' dialog box with the 'Time' tab selected. The 'Date' is set to 'Wednesday, December 03, 2014'. The 'Local' time is '12:37:08', the 'Time zone' is '-1.0', and the 'UTC' time is '11:37:08'. There are checkboxes for 'Adjust from GPS' and 'Use PC time', both of which are currently unchecked. Below these, there is a section for 'Chart time (used by tide and weather module)' with a 'Local' date of '12/ 3/2014', a 'Time zone' of '0', and a time of '12:08:48'. At the bottom are 'OK', 'Cancel', and 'Apply' buttons.

NOTE The time zone is by default displayed with the sign + in West hemisphere and the sign - for the East one.

CHART TIME

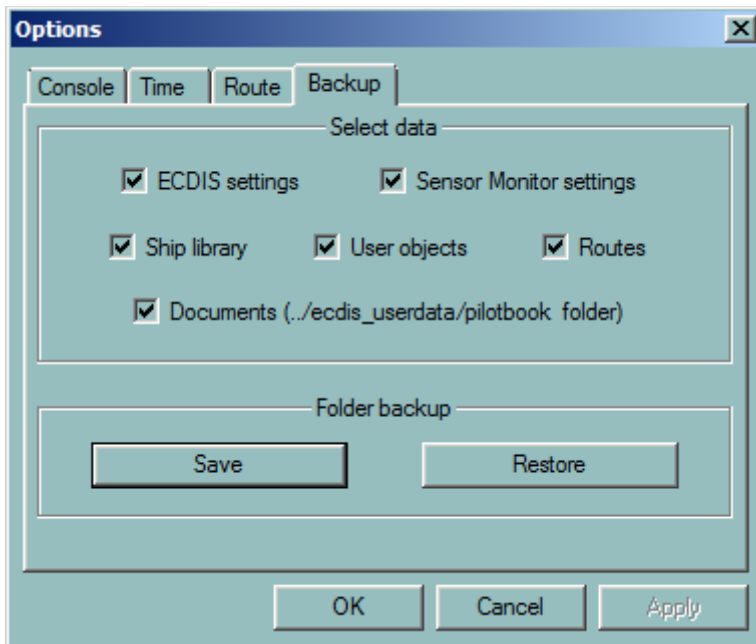
The chart time is used when a weather forecast file is loaded in ECDIS to select a date in order to display the weather situation in the future.

It is also used in the same way when the tide information is displayed on the chart

OPTION BACK UP

Select the data to back up in on the top panel.

Data can be saved on the hard disk or on any PC of the LAN.



RESTORING DATA

Press **Restore** and select the back up folder to restore all data.


IMPORTANT

The restored data replaces the current data used by ECDIS and data created after the back up will be lost.

PRINT

To print the ECDIS screen click on the **Print** icon .

HELP

To display the software version and to access the on-line user manual click on the **Help** icon .

CONSOLE AREA

CONSOLE AREA

In the console area, several indicators or panels display information about ship's position, speed and direction, time, active waypoint, targets, cursor position, alarms and other important data.

The **Navigation Mode Indicator** shows the current navigation mode, the time indicator displays the local time and gives access to the **time dialogue**.

The **scale indicator** displays the current scale of the chart and indicates whether the chart is overscaled or not. The **wind indicator** displays the alphanumeric values of the wind (True or Relative). The **Depth indicator** displays either the Depth under the keel, the Transducer or surface according to user's selection.

Alarm panel displays the alarms and warning and includes the alarm acknowledge function.

Legend panel displays a legend and information about the loaded S57 cells under the ship's position and provides indication for 'Better chart exists' and 'NON-ENC data on display'.

Editors panel gives access to edition tools to work on the electronic chart and with a user defined data.

Route monitoring panels (Active Waypoint, Fixed ETA and Waypoint ETA) are described in the Chapter **Route Monitoring**.

TIME INDICATOR

Time information is displayed in the panel **Time**.

ECDIS900 operates and displays the local time, which is calculated from UTC time and time zone information. The ECDIS900 time format is encoded and is not linked with the Windows settings.

The operator can adjust the UTC time manually or choose UTC time to be automatically adjusted from the GPS.

The operator is responsible for the manual selection of the time zone.

EXAMPLE

The Japanese time zone is +9 meaning that the local time is calculated from UTC by adding 9 hours.

ECDIS always displays the local time with the time zone information.

ROUTE AND LOCAL TIME

According to the time zone map, ECDIS900 automatically assigns a time zone for each waypoint and calculates the ETA in local time.

NOTE The operator can adjust the time zone manually for each waypoint in the **Waypoint Properties** window

USE PC TIME OPTION

Toggle on the check box **Use PC Time** to use as ECDIS the time set up in the Windows time settings.

SCALE INDICATOR

CURRENT SCALE

Displays the current scale of the chart.

SCALE WARNINGS WITH VECTOR CHARTS

- When the current scale is more than two times the compilation scale of the ENC cell the scale indicator is displayed in yellow together with the warning "Overscale". This warning is also displayed in the Legend panel.
- If own ship's position is covered by an ENC with a larger scale than the scale in use the warning "BC" in the scale indicator indicates a better chart available and "Better chart exists" is displayed in the Legend panel.

SCALE WARNINGS WITH RASTER CHARTS

- When the current scale is bigger than the original scale the scale indicator is displayed in yellow together with the warning “**Overscale**”. This warning is also displayed in the Legend panel.
- When the current scale is smaller than the original scale the scale indicator is displayed in yellow together with the warning “**Underscale**”. This warning is also displayed in the Legend panel.
- If own ship’s position is covered by an chart with a larger scale than the scale in use the warning “**BC**” is displayed in the scale indicator and “**Better chart exists**” in the Legend panel.

NAVIGATION MODE INDICATORS

GPS INDICATOR

The GPS or D.R. (Dead Reckoning) indicator shows the current navigation mode.

The GPS mode is the normal mode, the ship’s position being acquired from the GPS, however, when no more data is received, the system automatically warns the navigator and switches to the D.R. (Dead Reckoning) mode. Once communication with the GPS is restored the system reverts to the GPS mode.

GPS QUALITY

When the GPS sends the information about quality of the positioning, the quality is displayed in the GPS indicator as a red bar graph.

MULTI GPS

ECDIS900 can receive information from several different GPS sensors and the master GPS may be selected by clicking right button in the Navigation mode indicator.

MASTER GPS AND QUALITY CONTROL

When the slave GPS has a better position quality than the master one, the ECDIS900 warns the navigator by displaying a yellow rectangle around the GPS indicator. Then the master GPS can manually be selected as described above.

DEAD RECKONING MODE

When the GPS fails, ECDIS900 switches automatically to the D.R. mode and calculates the ship positions using log/gyro data. See Chapter Ship - **DR mode**.

SIMULATION MODE

When the GPS fails and no log/gyro data are available the system switches to the simulation mode and the indicator displays “No Position”. The ship position panel displays dotted line and a red cross on top of the ship’s icon indicates the simulation.

REPLAY MODE

The REPLAY indicator shows that an historical logbook is being replayed. At the end of the replay the navigation mode indicator is switched back to the appropriate GPS or D.R. status.

For a detailed overview of the replay function, see Chapter Logbook - **Replay**.

OTHER PANELS

SAFETY CONTOUR PANEL

When vector charts are in use ECDIS displays in the Safety contour panel two values of the depth:

- The user selected value for safety contour.
- The safety contour available in the chart cell located under the ship's position. If ECDIS does not find a safety contour equal to the selected value it selects the contour with the nearest bigger value.

To change the value for safety contour see the **Chart Depth** tab.

WIND PANEL

The wind panel displays either True or Relative values of the wind.

To switch between the two values right click in the panel and activate the appropriate item menu.

It is also possible to display a graphical wind indicator on top of the chart by right clicking in the panel and selecting "Show graphical display".

DEPTH PANEL

The depth panel displays either the depth below transducer, below the keel or below the surface.

To switch between the values right click in the panel and activate the appropriate item menu.

See the Sensor Monitor manual to set the correct parameter for depth calculation.

WAYPOINT PANELS

For a complete description of the different panel related to waypoint and route monitoring see **Route monitoring**.

TARGET PANEL

The target panel displays information regarding the selected target.

To select a target (ARPA or AIS) click once on the target and a dotted line rectangle highlights the target.

LEGEND PANEL

The Legend panel displays information about the loaded ENC cells or Raster chart under the ship's position and gives different warnings.

It also displays:

- The vector type (True/Relative).
- Warning "Better chart exists".
- The last applied ENC update. Edition number and cell name under ship position.
- Quality of the data.
- The depth and height units.

- The safety contour information.
- The magnetic variation.
- The sounding datum.
- Warning if non ENC data is displayed.

QUALITY OF THE ENC DATA

- A11: Chart of 5m accuracy with sea floor coverage.
- A21: Chart of 20m accuracy with sea floor coverage.
- B01: Chart of 50m accuracy from standard survey.
- C01: Low accuracy or incomplete chart.
- D01: Unreliable chart.
- U01: Chart with quality not assessed.

SAFETY CONTOUR

Two values for the depth are displayed:

- The user selected value for safety contour.
- The safety contour available in the chart cell located under the ship's position.

These two values are also displayed in a special panel coloured in yellow when the contour specified by the navigator is different from the selected one.

WARNINGS

- When the chart is overscaled the warning "Overscale" is displayed.
- When the ship position is covered by an ENC at a larger scale than that provided for the display the warning "Better chart exists" is displayed.
- When the displayed area includes waters for which no HO ENC are available, the area is symbolised with green colour which means that the mariner has to refer to the paper charts.
- When ARCS is used in an area where ENC data is available under the ship position the warning "ENC data available " is displayed.

In addition, the area covered by non ENC data is marked by appropriate line style and the indication non-ENC data is displayed.

COLOUR TABLE AND BACKLIGHT CONTROL

In the Presentation Library VS52 3.3 three color schemes are available:

- Day bright
- Dusk
- Dark night.

Selecting the colour scheme is possible by pressing F8 or in the Chart setting dialogue.

BACKLIGHT ADJUSTMENTS

The monitor backlight level is automatically adjusted to the calibrated value when a color scheme is selected. (see Technical manual and Sensor Monitor configuration).

Three levels of backlight corresponding to the three color tables have been defined during the color calibration process.

MANUAL ADJUSTMENT

The monitor Pot meter is disabled. To adjust the backlight level press the key combination "Ctrl +" or "Ctrl -" to increase or decrease the backlight level from the pre defined backlight value.

It is also possible to use Sensor Monitor:



Press Change and use pop up window



Any time it is possible to go back to 1 of 3 standard colour scheme pressing F8.

WARNING

Changing manually the backlight level may alter the colours used in ECDIS.

WEATHER

To access to the weather module, on top of the chart click on the **Weather Module** icon

Weather module displays different weather layers including Wind force and direction, pressure, swell, waves, typhoon history and forecasts and temperature.

Weather forecasts may cover several days depending on the source of the data.

For a detailed overview of the weather module, see Chapter **Weather Management**.

Charts

GENERAL

ECDIS900 supports two chart formats: **Vector** and **Raster**. The system displays vector charts under a seamless mode whilst raster charts, such as ARCS from the British Admiralty, are displayed by default in chart-by-chart mode. When raster charts are in use ECDIS runs in **RCDS mode**.

ECDIS900 also provides the option to display **ARCS charts in a seamless mode** and another option to display **ENC/ARCS in seamless mode**.

A type approved ECDIS uses official ENC data (Electronic Navigation Charts) produced by National Hydrographic Offices. In areas not covered by ENC data, an ECDIS is authorized to display Official Raster charts (ARCS).

CHART TYPES

- **ENC GMAP** ENC DB in the SENC format - official Vector charts
- **ARCS** - official Raster charts

USING ELECTRONIC CHARTS

In this chapter the user will learn how to:

- **Scroll and centre the chart**
- **Zoom and change scales**
- **Switch between different chart databases**
- Set the **Follow Ship** and the **Automatic chart selection** features
- Modify the content and the layout of the chart with the **chart settings**
- Access to the **chart properties**
- **Print the chart**
- Manage the chart database installed on your hard disk, install or uninstall charts, add new chart permits, check the permits status with the **Chart handling** dialogue
- **Update official charts via the Internet**

RCDS MODE

When an ARCS chart is selected (Right click on the chart and in the pop-up menu Click Other charts/ARCS) the relevant chart will appear on the display and the RCDS mode is indicated in the windows title bar at the top left hand corner of the screen.

 **RCDS mode: Oslofjorden - Southern Part (3159) - European 1950 (-0.03, -0.08) Monitoring**

In addition to the name and ID of the charts ECDIS900 displays the datum of the chart and the datum shift between this datum and WGS84.

REMARK


When no datum information is available for the chart, the system displays a message "Undetermined" in the window title.

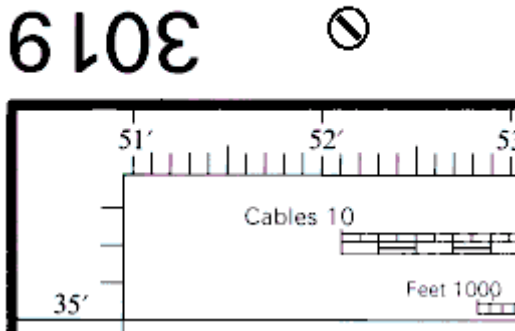
ENC DATA AVAILABLE INDICATOR:

When a route is checked for danger, an indication is given when the route crosses an area covered by ENC data. When a route is being monitored (See **Route Monitoring**) an alarm is generated when the ship enters into area covered by ENC data.

MOVING AROUND THE CHART

MANUAL SCROLLING

- Locate the cursor near the chart edge area and a 'pan' pointer will appear , pointing in one of eight directions, depending on where the cursor is located along the chart edge. Click the left mouse button to scroll the chart in the direction of the pointer.
- Double click the left mouse button while pointing at the chart and the chart will be centred in that position.



- When displaying raster charts, place the cursor outside of the active raster chart and double click the left button to automatically load the chart located under the cursor. If several charts are available under the cursor, the system will load the chart with the most precise scale.
- **Hot keys:** the four Arrows keys allow scrolling of the chart to the North, , East, South or West.
- Hot keys are active when the focus is on the chart window.(If the keys are not active, click once inside the chart area to change the focus)
- **Localize in Load/Unload** dialogue centres the chart on the selected object
- Double click on target in the target table centres the chart on the target
- Double click on WP in route plan centres the chart on the waypoint.

AUTOMATIC SCROLLING

ECDIS900 automatically scrolls the chart in the following cases:

ROUTE OR USER OBJECT PLOTTING

To plot a waypoint or a user defined object outside the current S57 chart area, move the cursor in the desired direction, and the chart scrolls in that direction automatically. With a raster chart, move the cursor in the desired direction and the chart scrolls automatically in that direction until it moves outside the current chart. Clicking on the black screen area outside of the chart border loads automatically the chart with the most precise scale.

DISTANCE MEASURING

To measure the distance from one point to another point located outside of the chart, move the cursor in the required direction, outside of the chart area clicking on the black screen area outside of the chart border loads automatically the chart with the most precise scale.

WAYPOINT MOVE

To move a waypoint outside of the chart area, proceed in the same way as automatically scrolling the chart. With Raster charts, the waypoint appears on the next chart. Pick up the waypoint again by placing the cursor above it and holding down the Left mouse button. Move the waypoint to the chosen location and release the L mouse button.

FOLLOW THE SHIP

Use the "Follow Ship" function, to automatically scroll the chart under the moving ship (Relative motion).

For a detailed overview of the "Follow Ship" option, see [Automatic Chart Selection](#).

SELECT AREA

Clicking the Select Area icon in the tool bar and choosing a chart area name, moves and zooms the chart according to the pre-defined parameters (Scale and geographical location).

For a detailed overview of the "Select Area" option, see [Select Area](#).

CENTRING THE SHIP ON THE CHART

Clicking the **Centre on ship** button centres the chart view on the ship. If using ARCS charts or if the ship is not inside the current chart, a new chart will be loaded.

LOAD A CHART DIRECTLY FROM CHART HANDLING DIALOGUE

Double click on the chart name to load the chart.

WARNING Do not confuse 'Centre the ship' with 'Follow ship'.

Centre the ship is a single command causing the ship will be centred on the display with the relevant chart area under it. The ship will then normally move away from the centre (True motion). Unless the user re-centres the ship when it reaches the display edge it will move out of view.

The **Follow Ship** command causes the chart to scroll automatically under the ship. (Relative motion)

ZOOMING

SCALE

The current scale is displayed in the static information console.

Overscale: 1: 6 517

The ECDIS offers several ways of zooming in and out:

- Click on the Zoom in / out icon on the toolbar to zoom in or out one step.

- Hot keys: **F1** and **F2** keys allow zooming in and out when the focus is on the chart window.
- Click the right mouse button anywhere within the chart and a pop-up menu will appear.

The scale menu depends on the type of chart:

VECTOR CHARTS

1:	45 000
!	1: 30 000
1:	22 000
✓	1: 20 000
1:	15 000
!	1: 12 000
1:	8 000

The list of scales includes the current scale in use displayed with a check mark.

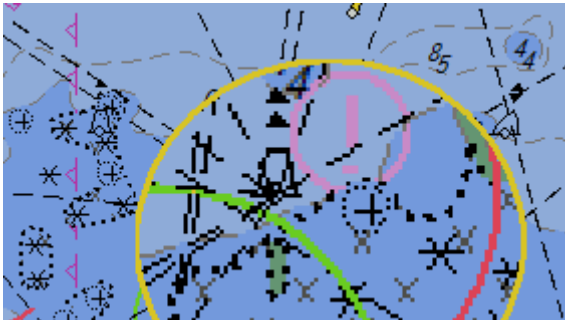
The mark ! placed in front of certain scales indicates that an ENC cells with this compilation scale is available under the click.

RASTER CHARTS

Highest resolution
High resolution
✓ Original scale
Medium scale
Low resolution

The list of scales includes the current scale in use displayed with a check mark

MAGNIFYING GLASS



(refer to hot keys list) CTRL+Space

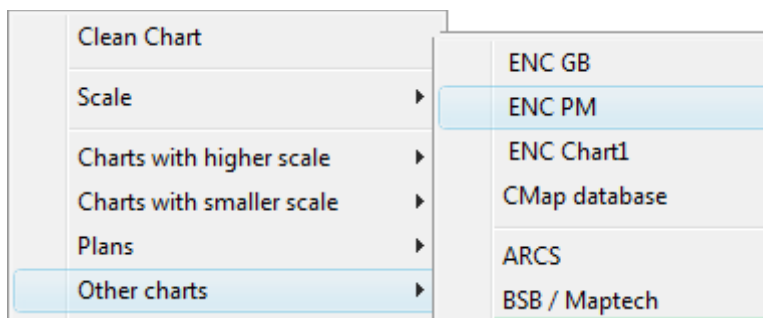
Zoom In Out

Mouse wheel or + CTRL+Space Shift

SWITCHING BETWEEN CHARTS

Locate the cursor anywhere on the chart and click right.

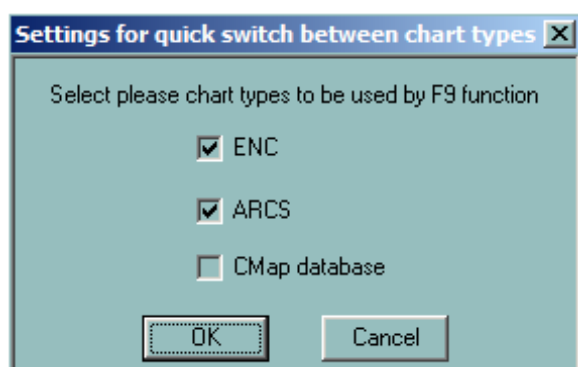
When the pop-up menu appears select Other Charts and the appropriate chart type.



HOT KEY

Press **F9** to select another type of chart.

The choice of alternative chart types displayed is configured in the dialogue box activated by pressing the **Ctrl and F9** keys together.

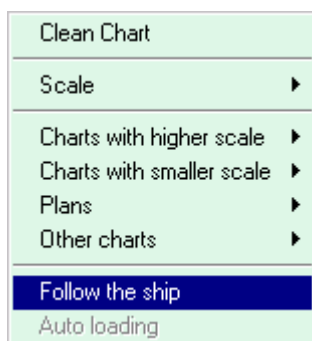


In the setting given as example pressing F9 will switch from ENC to ARCS and vice versa.

AUTOMATIC CHART SELECTION

SET FOLLOW SHIP

To activate the **Follow Ship** mode, right click anywhere on the chart and select the menu item **Follow the ship**.



Operating in the Follow Ship mode, the ECDIS900 automatically moves the current chart or loads new cells according to the ship's movements.

AUTO LOADING MODE

When the **Auto Loading** mode is **ON**, ECDIS900 automatically loads and displays the chart with the best scale at the ships' current position.

To activate the "Auto loading" mode, right click anywhere on the chart and select the menu item **Auto loading**.

NOTE Auto Loading can only be activated after the Follow Ship mode has been activated

HOT KEY

The key **F3** activates **Follow Ship** and **Auto loading** when the focus is on the chart window. (If the key is not active, click once inside the chart area to change the focus).

USING S-57 VECTOR CHARTS

- If the Auto Loading mode is OFF, the system moves the chart under the ship without changing the scale.
- If the Auto Loading mode is ON, the chart scale will be changed if the system can load a chart with a scale more suitable for navigation.

USING RASTER CHARTS

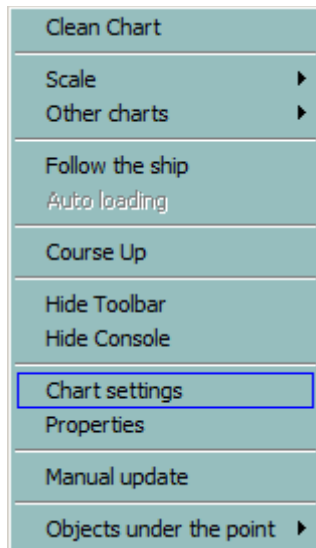
- If the Auto Loading mode is OFF, the system will load a chart with the same scale as the current one. If no chart of the same scale is available, the system will load a chart with a scale smaller than the current one (Zoom out).
- If the Auto Loading mode is ON, the system will load a chart with a higher scale when available (Zoom in). If no such a chart is available, the loading process will continue as described above.

NOTES Deactivating the Follow Ship mode automatically deactivates the Auto Loading mode.
The Follow the ship mode is deactivated if the chart is scrolled using any available function.

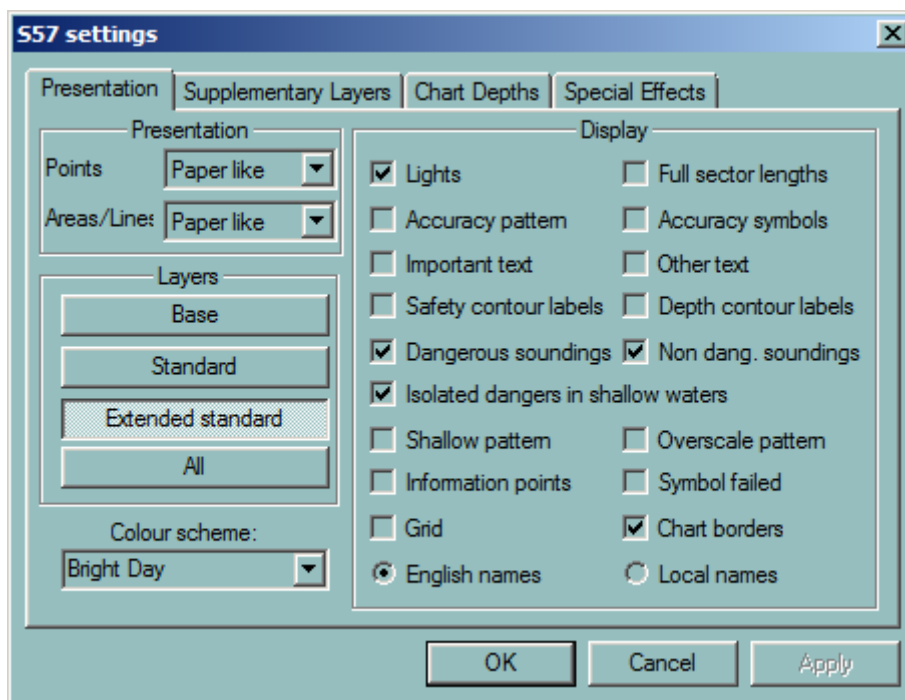
CHART SETTINGS

SETTINGS

To select different chart settings click right on the chart and select the item Chart settings.



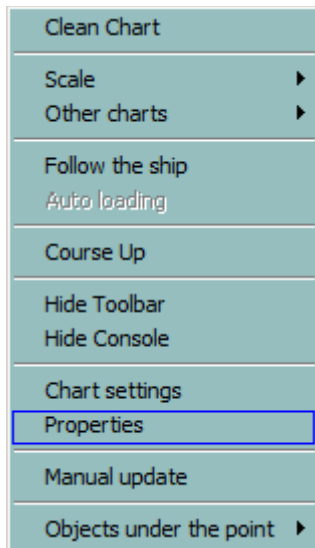
Several display parameters can be adjusted depending on the type of charts.



For more detailed information about the different chart settings refer to the next chapters.

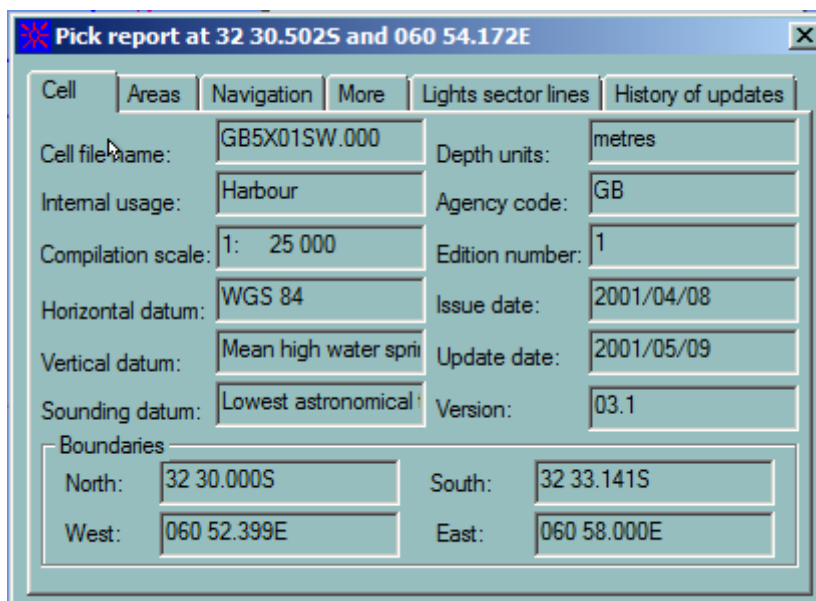
PROPERTIES

To view the cell's properties or to display information about an object on the chart, right click on the chart or on that object and select Properties.



HOT KEY

Locate the mouse on the object of interest and press **F4**. Press again **F4** to get the properties of other objects located under the mouse location.



Press **Ecs** key to close the dialogue.

For **vector charts**, the ECDIS900 scans the chart database to find all objects present under the clicked point, highlights these objects on the chart and displays information concerning them. With raster charts ECDIS900 gives information about the loaded chart.

CHART HANDLING

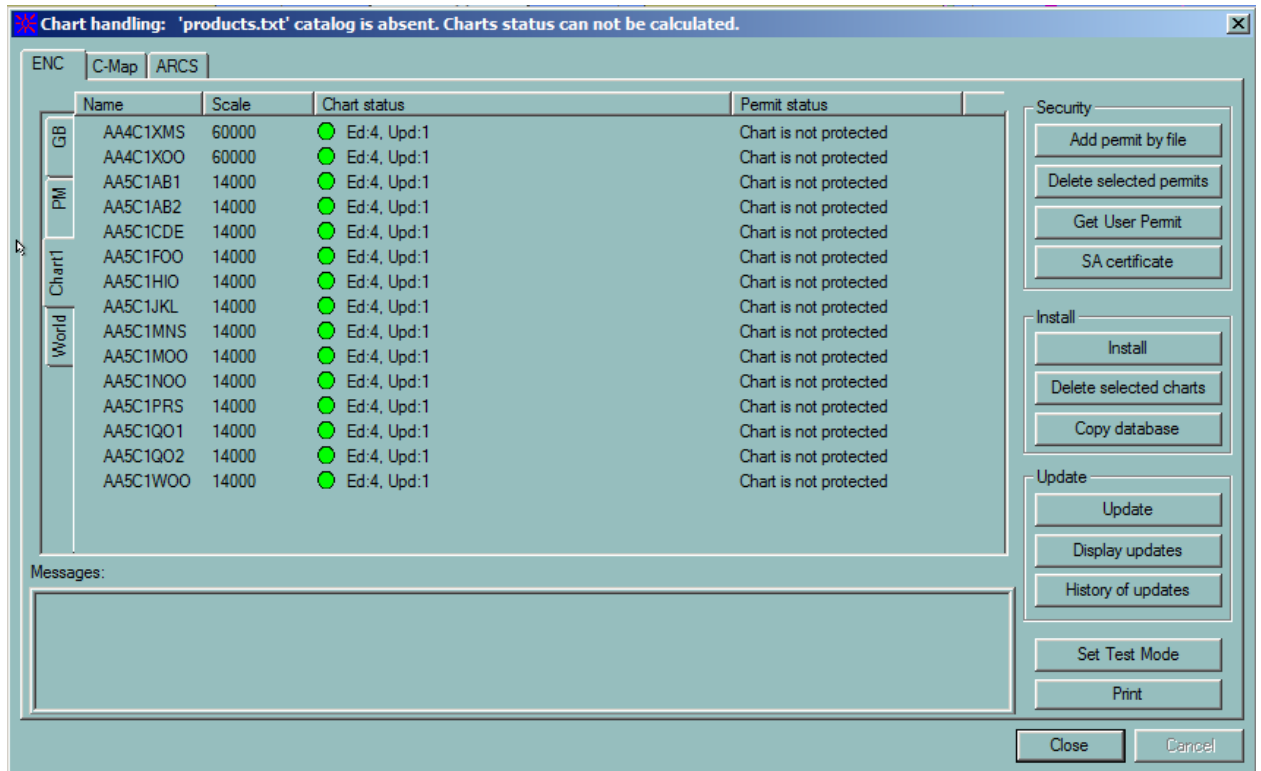
The Chart Handling facility within ECDIS900 allows the user to list the charts installed in the chart catalogue, to install new charts or new permits, to update charts and to delete charts from the catalogue.

To load the Chart Handling facility, click on the **Chart handling** icon located in the Toolbar



The chart handling windows contains several tabs:

- ENC
- ARCS
- C-Map



PRINCIPLE

To select a chart database, click the tab and access the functions dedicated to this chart database.

ERRORS

The possible errors that might occur during installation of permits or charts or during the update procedure are listed in the paragraph **Errors and Troubleshooting**.

PRINTING

To print the active window, click on the Print icon on the toolbar .

CHART UPDATE VIA INTERNET

ECDIS900 uses ENC and ARCS charts delivered by the Hydrographic Offices and weekly updated.

The charts can be updated from CD ROM provided from HOs or C-MAP.

To get the latest ENC or ARCS updates via Internet with HTTPS connection the MBA software must be installed.

UPDATE REQUEST AND RESPONSE

The online update is possible when the PC is connected to Internet. This can be done in different ways:

- The ECDIS PC is connected to the LAN and a PC on the LAN is the Internet access server with the MBA software installed
- The ECDIS PC has the MBA software installed and uses a modem and the connection with the Internet provider is established manually.
- A GSM is connected to the PC with the MBA software installed and the connection with the Internet provider is established manually.

REMARK

It is also possible to use ARCS and ENC update services even when the ECDIS900 PC is not connected to Internet. Then it is necessary to use either a removable drive.

When the connection is established, the user activates the dialogue Chart Handling in ECDIS900 and presses the button Update by email.

The user can select to update:

- Only selected charts
- All charts necessary for a specific voyage
- All charts included inside the screen area
- All charts installed on board.

Automatically the ECDIS900 checks the status of all installed charts and the last applied updates for each chart.

A file containing all information concerning the status of all charts and updates is created and sent by email to the chart server.

RESPONSE

After few minutes the user receives an answer by email.

ECDIS900 detects automatically answer from the chart server and applies the update to the database after informing the user.

ARCS

ARCS OVERVIEW

By default, ECDIS displays charts in a chart-by-chart mode. However the option **ARCS in seamless mode** is available making it possible to display the active ARCS chart together with adjacent charts in a seamless way.

ARCS charts are scanned copies of paper charts. A displayed ARCS chart includes the same information as appears on the copied paper chart. Source information about each chart is accessible from the dialogue ARCS Properties.

COPY PROTECTION

ARCS charts are copy protected with a dongle. In order to use and display ARCS charts in ECDIS it is necessary to:

- Enter a valid ARCS PIN code when required.
- Install ARCS chart permits.
- Install the charts from the Cds and update them.

ARCS AND MULTI ECDIS WORKSTATIONS

Where several ECDIS workstations are installed on board a ship, duplicate dongles can be provided using the same ARCS license. The chart licenses and updates have to be installed and updated locally on each workstation.

USING ARCS CHARTS

In this chapter the user will learn how to:

- Access to the **Chart handling** dialogue to get all information about the chart database, to install, delete or update charts
- **Install chart permits**
- **Install new charts**
- Update the charts. **Update the database manually** or use real time MARIS email service
- Interpret **errors** that may occur during installation or update
- **Switch to ARCS charts**
- **Zoom and change scales**
- Modify the layout of the chart with the **chart settings**
- Access to the **chart properties**.
- **Update paper charts with the aid of ARCS updates**
- Check the **chart collection status** including all applied updates references and dates of updating

CHART HANDLING

The ECDIS900 software is copy protected with a dongle. Additionally ARCS are PIN protected (Personal Identification Number).

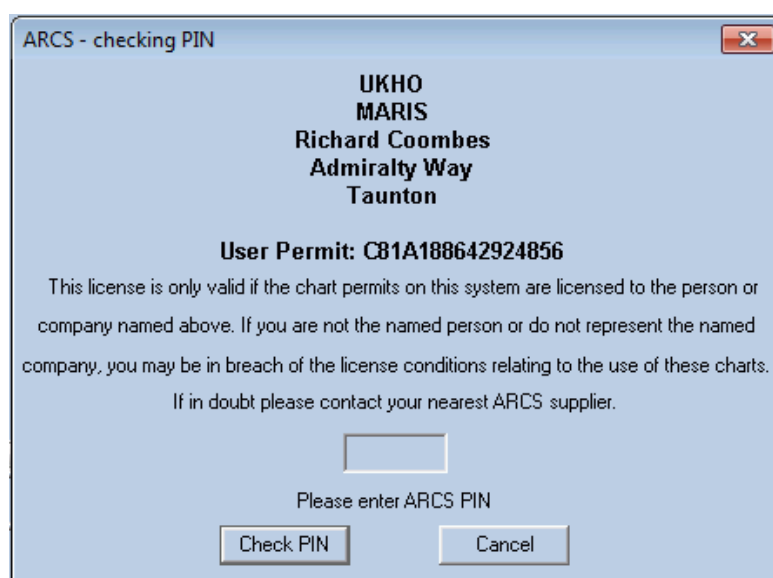
Each ARCS chart permit has a unique 40-digit code linked to a UKHO User Permit Number.

The PIN number must be entered when asked on the first occasion ARCS charts are installed.
The ARCS User License Number (6 digits) is required when ordering charts.

ENTERING PIN CODE

If the PIN is invalid a warning appears and the mariner has to re-type the PIN code.

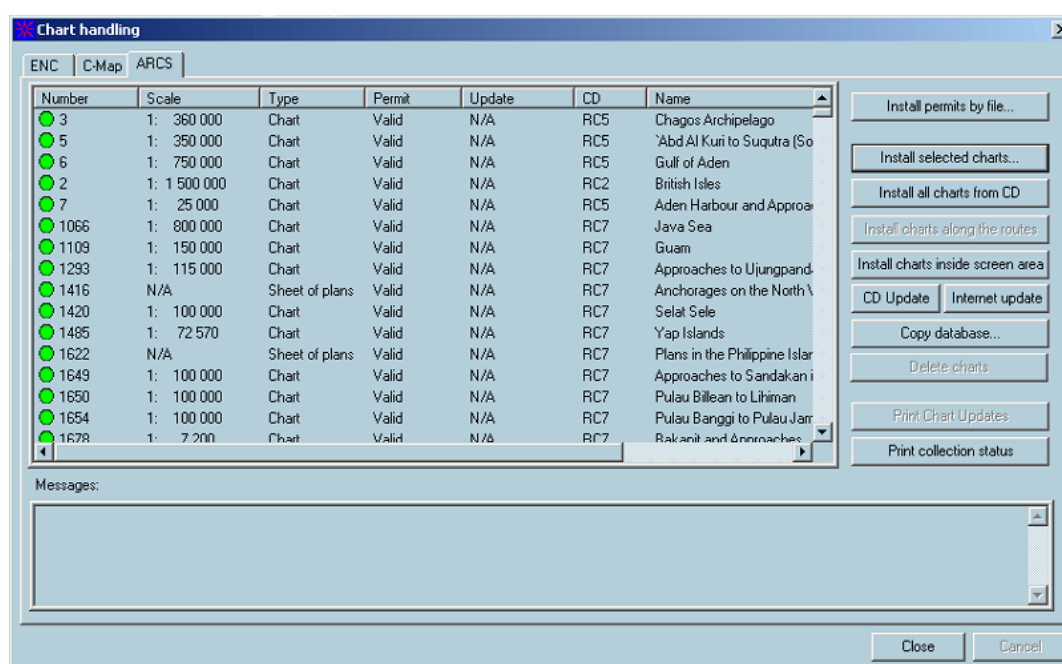
If, after the three attempts the user has still failed to enter the correct PIN, the system does not allow the user to enter the PIN again for a certain time.



If the problem persists contact MARIS support

CHART HANDLING

Management of the ARCS chart database is carried out within the Chart Handling dialogue. Select the ARCS tab and install permits or charts or delete charts or update the database or access the collection status from this dialogue.



PERMITS

To display charts in ECDIS900, it is necessary to enter a permit for each chart. Each ARCS chart permit is encrypted and linked to the licensed users "User Permit Number". Chart permits can be delivered as a file containing the code for each chart or as a 40-digit text message sent by email or fax. In both cases the first step towards installing new charts is to install the chart permits.

The UK Hydrographic Office (UKHO) has eleven ARCS area CDs (with about 300 charts on each) available for users. Area chart CD's are issued free to licensed users by the UKHO distributors. These area CD's are re-issued when a sufficient number of charts on the CD have been re-issued as new editions or cancelled.

Until the area CD is re-issued, the new edition charts are provided for the user on the weekly update CD.

In addition to new edition charts, each weekly Update CD contains the cumulative correctional data for all ARCS charts.

Two types of ARCS license are available:

- **Navigator Service.** This service is designed for commercial ships that require a fully up to date chart outfit. The user will be licensed to a specified chart holding for a defined period of time. Within this period the user will be entitled to freely access all Notice to Mariners and New Editions that relate to the licensed chart holding. At the end of the licensed period the user will have to renew the license or will no longer be able to access any of the charts.

INSTALL PERMITS BY FILE

Click the **Install permits by file** button and browse the computer to select the appropriate folder **CONTAINING** the permit files. The Navigator files are named **gb.lcn** and **gb.ncp**. The new files are automatically sent to the correct folders in the ECDIS software.

Users normally receive permit files in a folder sent by email, or on a memory stick sent by post.

WARNING

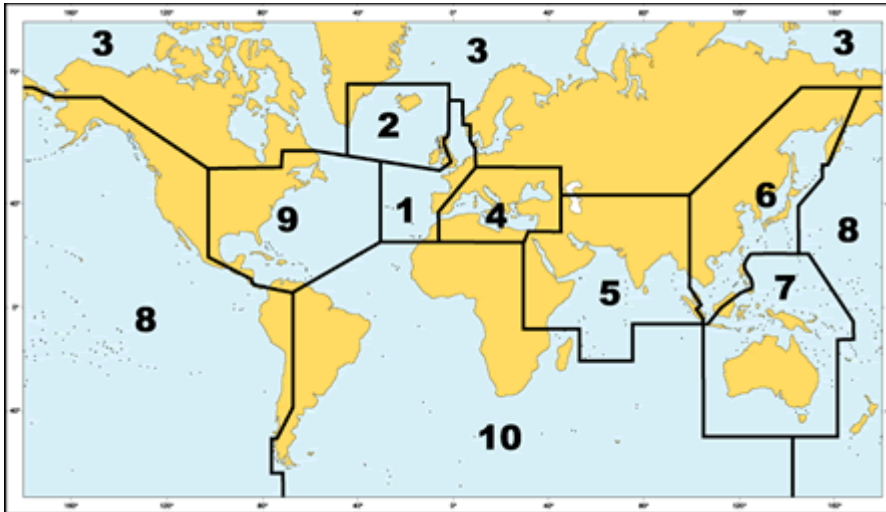
Clicking the **Install permits by file** button installs permits. This function deletes the existing chart permit file, overwriting it with the new one and therefore should only be run the first time that permits are installed.

IMPORTANT

When new permits are ordered or when the permits are reissued, the files received from UKHO by email or memory stick contain all permits, the new and the old ones.

INSTALL CHARTS

ARCS charts are delivered on 11 Area CD's (RC1 to RC11). Each Area CD covers a defined geographic area. (See ARCS Area diagram). New Edition charts for all areas are initially placed on the Weekly Update CD. When a sufficient number of charts on an area CD have been replaced by New Editions, a new Area CD is released with all the New Editions included.



IMPORTANT

At any time, up to ten per cent of the charts on an area CD may have been replaced by New Editions contained on the latest Update CD. Users should always install relevant New Edition charts from the Update CD before applying the Updates. The update CD contains the latest ARCS chart catalogue plus cumulative updates for all charts in the catalogue. Each Area CD and Update CD has the date on the label. Only the latest CD of either type should be retained on board and used with the system.

INSTALL SELECTED CHARTS

Install selected charts...

Click the Install selected charts button and the system will list all charts on the CD-ROM along with the parameters: Number, Scale, Permits, Status and Name.

Make a selection, using standard windows procedures, and press Install.

CTRL +

Install selected charts...

Click CTRL + "Install selected charts" button to select CD in a shared drive in the LAN.

The charts with a valid installed permit are displayed with a green spot in the left hand column. If the permit is not valid the spot is red. Select the chart or charts to be installed and then click the button Install charts. The charts are copied onto the hard disk.

The list of charts can be sorted, either ascending or descending, by each parameter. By default, charts with a valid permit are displayed on the top of the list.

To perform a sort, click on the column headings. Alternative clicks will sort ascending and then descending.

IMPORTANT

The user may install charts with without permits (or with invalid permits) and then install permits later. It is recommended that if sufficient disk space is available, the user installs all the charts in the trading area and only purchases the chart permits needed. Chart permits for charts not normally used or covering routes to ports of refuge or diversion can be ordered by phone, fax or email with immediate response in an emergency.

INSTALL ALL CHARTS FROM THE CD

In order to speed up the installation procedure the system can install the full CD.

Install all charts from CD

Click the **Install all charts from CD** button and the system will list all charts on the CD-ROM along with the parameters: Number, Scale, Permits, Status and Name. Highlight all the charts, using standard windows procedures, and then click the Install button.

INSTALL CHARTS ALONG THE ROUTES OR INSIDE SCREEN AREA

In order to reduce the number of ARCS charts installed on the hard disk, ECDIS900 can automatically select the charts on the loaded Area CD that either intersects the loaded routes or the screen area.

To achieve this, before activating the **Chart Handling** dialogue, load the routes or zoom and scroll the chart at the desired location and then press the appropriate button.

Install charts along the routes

Click the **Install charts along the route** button and the system will install the charts along the loaded route.

Install charts inside screen area

Click the **Install charts inside screen area** button and the system will install all permitted charts within with the screen area.

DELETE CHARTS

Select a chart or charts and press the Delete Charts button to remove the chart/s from the collection.

WARNING

When deletion is confirmed the chart is deleted from the hard disk.

The **possible errors**, which may occur during the installation, are listed below.

UPDATES

In order to provide the navigation safety the navigator has to update chart collection with the latest corrections. HO issues the Update CDs with the Notice to Mariners corrections and the new charts editions each week.

There are two ways to update the chart collection:

- Updates can be installed from the Update CD issued by UKHO.

UPDATE BY CD

The UKHO issues an Update CD with the New Edition charts and Notice to Mariners corrections each week.

Insert the update CD ROM in the CD reader and click the **Apply update** button.

Apply updates

The system will automatically update the charts that have a valid permit.

IMPORTANT

If there are new edition charts on the update CD for which the user has valid permits, then ECDIS offers to install the charts.

REMARKS

Information regarding the update process is displayed in the **Messages** area.

To check if ARCS charts are up to date, the date of the last update is displayed in the chart handling dialogue.

NOTE If a large number of charts are involved the process may take some time.

CHECKING UPDATED OBJECTS ON THE CHART

To check what has been updated it is possible to switch temporarily between the display of updated chart and original chart.

- Select the option **Display updated tiles borders** in the **Chart settings** dialogue to display the borders of updated tiles.
- Press and hold **B** to display the base chart before updating.
- Release the key to display the updated chart.

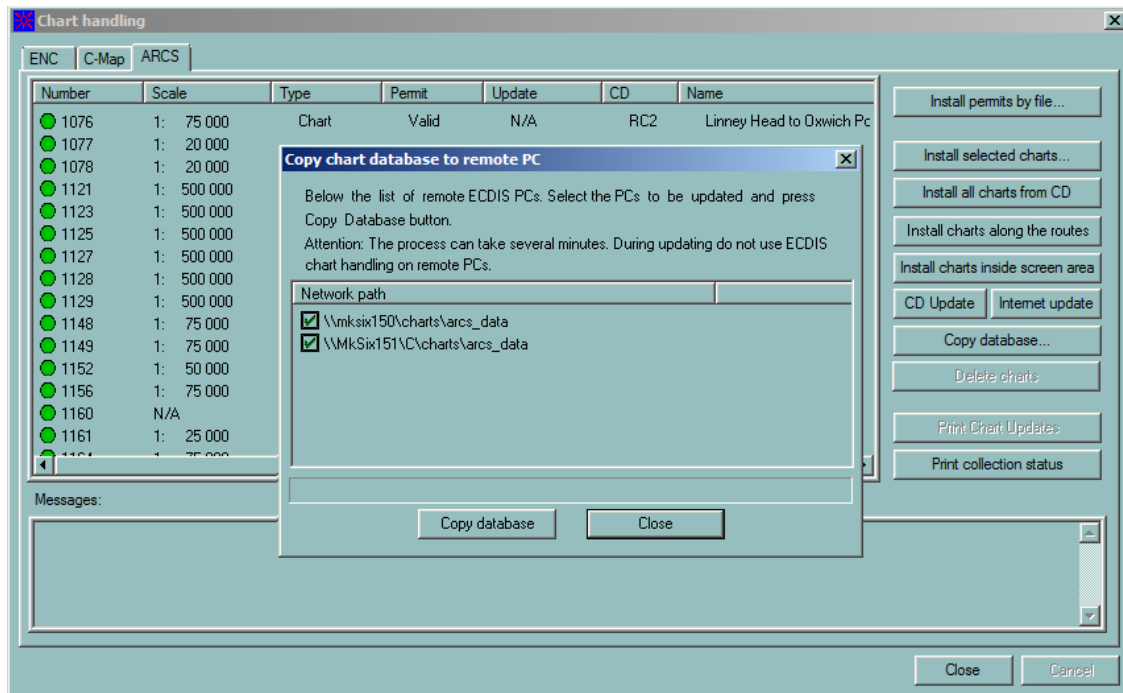
COPY DATABASE - MULTI ECDIS

As it is for ENC charts, when ARCS chart installation and update is completed on one station, ECDIS gives the possibility to copy the updated database over the network, from this station to other stations. This transfer is optimized.

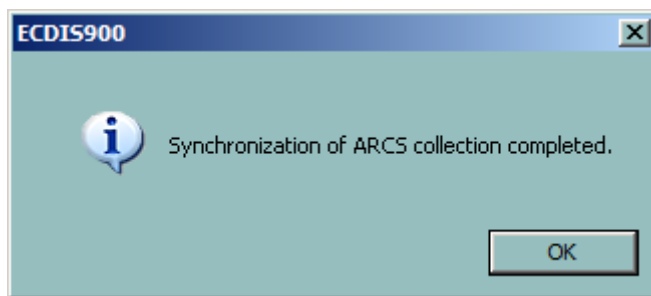
Proceed as follow:

- Install and/or update ARCS database on the planning station
- In Chart handling dialogue press the button "Copy database"
- The list of remote PC running ECDIS and connected to the LAN is listed in the dialogue
- Select the PC(s) on which the ARCS should be copied and press Copy Database.

On the remote station, ARCS are deactivated in case ARCS charts are used.



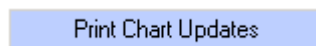
After transfer is completed, popup window is displayed:



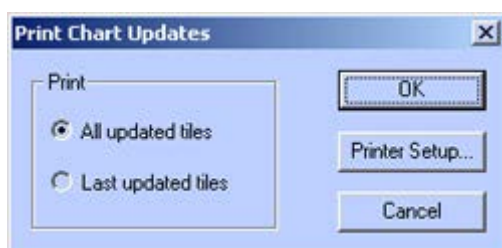
ARCS: THE HELP FOR PAPER CHART CORRECTION

In order to facilitate the correction of paper charts, updated tiles (NM corrections) for a chosen chart can be printed on a black/white or colour printer. These tiles may be stuck on the chart in the appropriate place or used to augment the relevant NM chart correction, by showing the user how the correction should be applied by hand.

Click the **Print Chart Updates** to print the paper copy of the chart updated tiles.



Select the tiles to be printed:



- All tiles that have been updated since the base chart was issued.
- The tiles have been updated only in the latest update procedure.

CHECKING THE UPDATED OBJECTS ON THE CHART

- Select the option **Display updated tiles borders** in Chart settings dialogue to display the borders of updated tiles.
- Press and hold **"B"** to display the base chart before updating.
- Release the key to display the updated chart.

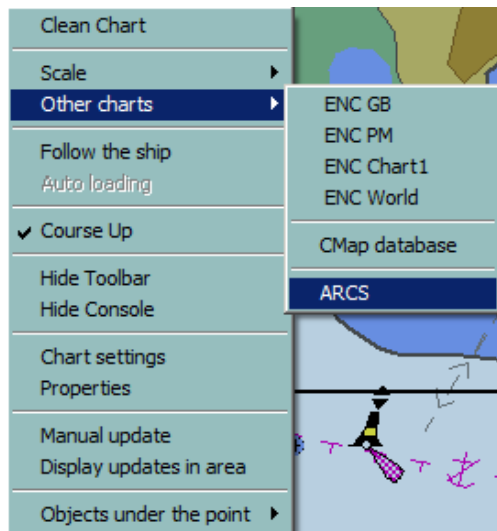
EXAMPLE OF PRINTING

SWITCHING TO ARCS

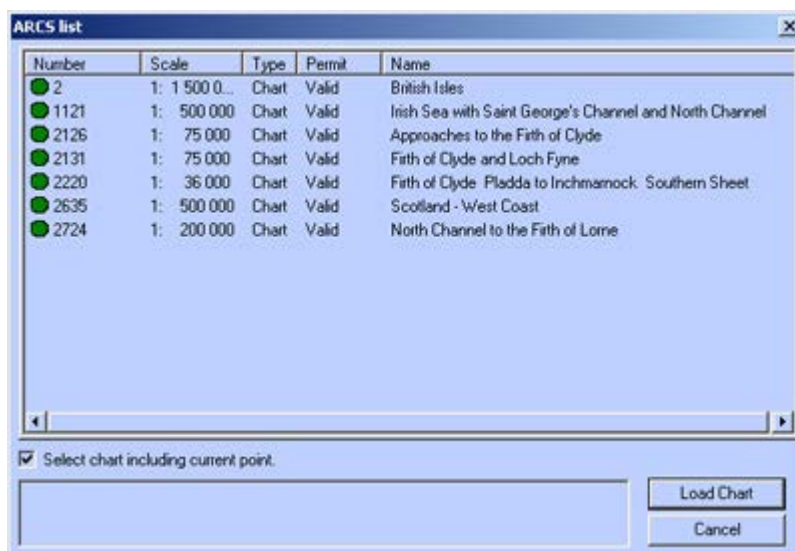
It is possible to switch between chart types available in ECDIS by using a menu and dialogue or a hot key.

BY MENU AND DIALOGUE

Right click on the chart and select **Other charts** and then ARCS in the menu.



ECDIS lists all available ARCS charts that contain the position on the chart where the cursor was located when starting to switch charts.



The colour of the icon displayed in front of each chart indicates the chart permit status:

- **Green** – the chart permit is valid.
- **Yellow** – permit warning. The chart permit must be updated.
- **Red** – the chart permit is not valid.

To select a chart to be loaded either:

- Click on the chart number and click **Load Chart**.
- Double click on the chart number.

To list all available ARCS charts Toggle off the check box **Select chart including current point**.

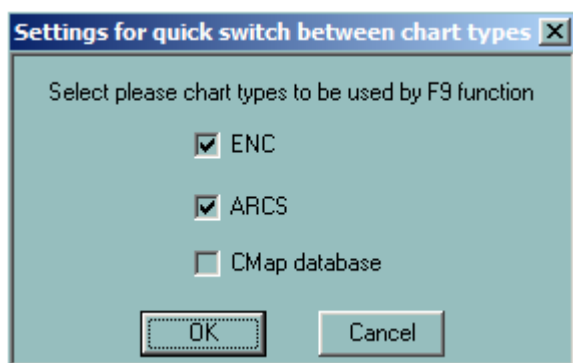
NOTE

In order to facilitate the speedy selection of charts the contents of the columns in the Chart Handling window may be sorted, either in ascending or descending order, by clicking on the column heading. Alternate clicks will change the sort sequence.

BY HOT KEY

Press **F9** to select another type of chart. If ARCS is selected, the chart with the best scale and centred in the middle of the current screen will be loaded automatically.

REMARK: To customize the way chart types are switched press the keys Ctrl + F9 to access to the set up dialogue and select the chart to be used.



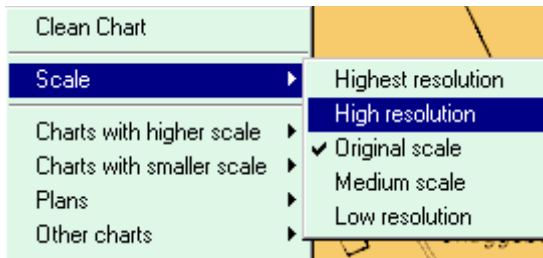
SWITCHING FROM CHART HANDLING DIALOGUE

Double click on the chart number to load the ARCS chart directly from the Chart Handling dialogue.

ZOOMING

ARCS charts are produced in their original scale, such as 1:50,000.

The ECDIS900 will always open a chart at its surveyed scale. (Original scale).



- The user can zoom out to show half the chart area on the screen (medium scale) and out again to show the whole chart in overview (low resolution).
- The user can also zoom in to display the chart at High resolution (Original scale * 2), Highest resolution (Original scale * 4).
- A warning will appear on the screen when the chart is displayed at any scale other than the original scale. **Only the original scale should be used for navigation.**



Zooming can be achieved by using the **two buttons** or hot key **F1** to zoom in and **F2** to zoom out.

When operating ARCS in seamless mode, zooming is achieved by selecting a new chart from the catalogue.

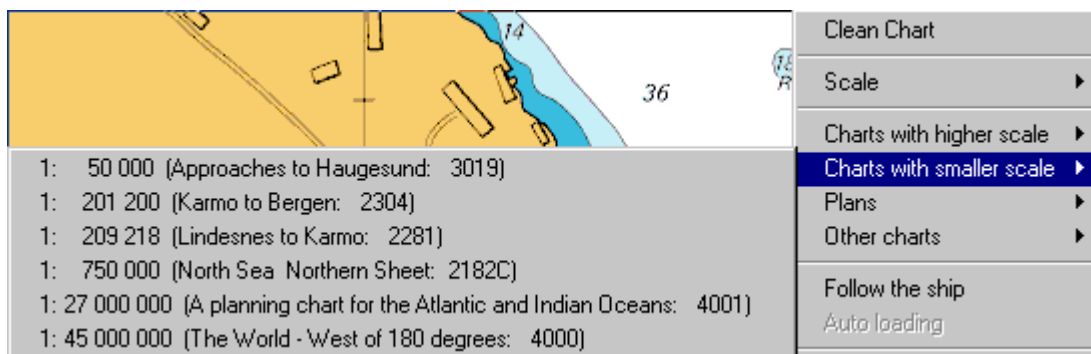
CHOOSING A NEW ARCS CHART

BY MENU

To select another ARCS chart or a plan included on the current chart, move the cursor to an appropriate point on the chart and right click to bring up the menu.

Locate the cursor on either Charts with higher scale or Charts with lower scale to display the list of available charts.

ECDIS scans the chart catalogue to find all available charts containing the point where the cursor was located and displays these charts.



To move to a plan, click Plans and a menu of available plans relating to the current chart appears. Select a plan and the system displays it.

BY DIALOGUE

To load any other ARCS chart, not containing the point clicked on, locate the cursor anywhere on the chart, click right, locate the cursor on Other Charts, select ARCS and toggle off the check box Select chart including current point as described in the previous paragraph.

BY MOUSE

In chart-by-chart mode, locate the cursor outside the chart and double click. ECDIS scans the catalogue to find all available charts containing the point where the cursor was located. The best scale chart is loaded and displayed.

In seamless mode double click on the inactive chart to make it active.

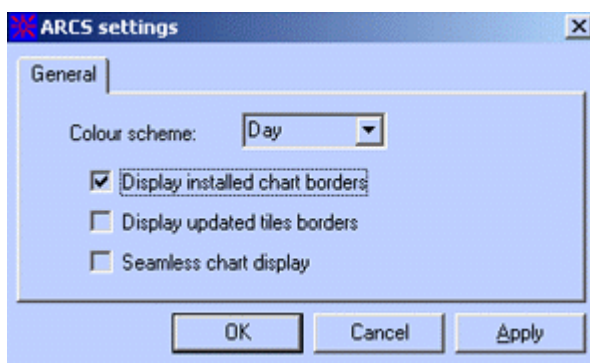
BY HOT KEYS OR BUTTONS

Press "+" or "-" to load the chart containing the center of the screen with higher or lower scale.

Alternatively right click on the zoom in zoom out buttons to achieve the same.

CHART SETTINGS

To change the colour scheme, select the relevant item in the colour menu.



Toggle the box **Display Chart Borders** to highlight the charts available on the hard disk.

NOTE Click on the borderline of the chart displays information about the chart

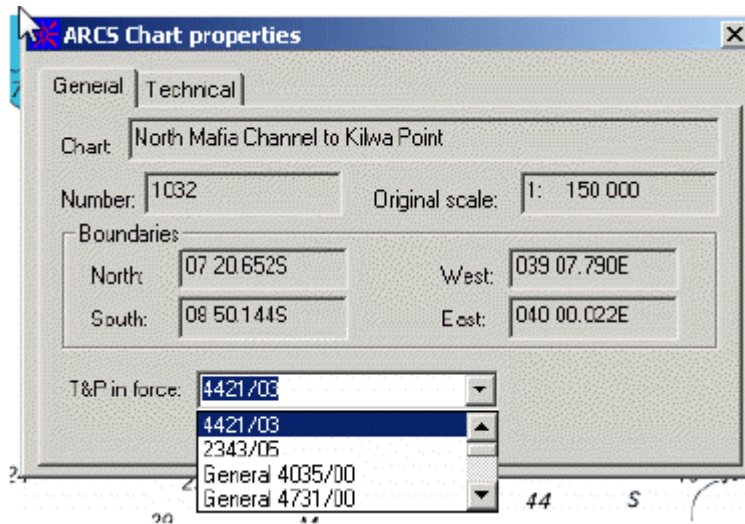
Toggle the box **Display updated tiles borders** to highlight the tiles, which have been updated since the original chart was issued, check on Display updated tiles borders box.

Toggle the box **Seamless chart display** to switch on the seamless mode.

CHART PROPERTIES

The ARCS Properties dialogue provides information about the paper chart used to produce the electronic chart and also provides direct access to the notes included in the paper chart.

The properties dialogue box for an ARCS chart has 2 tabs: General and Technical.



The General page gives general information about the paper chart used to compile the loaded ARCS chart.

TEMPORARY AND PRELIMINARY NOTICES

The Temporary and Preliminary Notices to Mariners still in force are issued every week by the British Admiralty and are copied from the ARCS update CD to the hard disk each time ARCS charts are updated in ECDIS900.

There are two types of T&P notices:

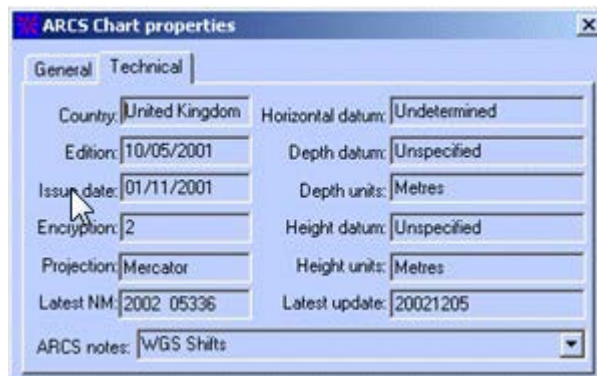
- General, applying to an area
- Specific, linked to one specific ARCS chart.

To access, after update, the list of T&P still in force, right click on the ARCS chart and select Properties.

Select the T&P in the pop up menu located at the bottom of the window (Error! Reference source not found.) and a text window displays the text of the NtM.

REMARK: For each chart, the list includes the specific notices that apply to the selected chart only plus all general T&P Notices.

The **Technical** page displays additional information about the chart and provides direct access to the chart notes.



The notes belonging to the current charts are listed in the ARCS notes menu. Selecting one of the notes opens a window and shows the notes.

ARCS note							
Tidal Levels referred to Datum of Soundings							
Place	Lat N	Long W	Heights in metres above datum				Datum and Remarks
			MHWS	MHWN	MLWN	MLWS	
Mumbles	51°34'	3°58'	9.3	6.9	3.1	0.9	5.00m below Ordnance Datum (Newlyn)
Swansea	51 31	3 55	9.5	7.2	3.2	1.1	5.00m below Ordnance Datum (Newlyn)
Port Talbot	51 35	3 49	9.6	7.3	3.3	1.0	5.20m below Ordnance Datum (Newlyn)

CHART COLLECTION STATUS

In Chart Handling dialogue click the button **Print collection status** to get the current chart collection status

The two files are displayed in Notepad:

- The file **ARCS_status.txt** contains the state of the chart collection. The first part contains licence details, hardware ID, User Permit and PIN code. The second part contains all installed charts description: chart number, chart title, permit diagnostic, chart original scale, source CD, update CD date, permit expiry date, permit and chart encryption number. The third part contains the all installed permits descriptions: expiry date and encryption number.
- The file **ARCS_Hndl.log** records all chart handling operations: operation type, date and time of the operation, the CD identification for chart installation and updating, the chart list with successful result, the chart list with failure result.

IMPORTANT

Both the above files are saved in the folder..\\ECDIS_UserData\\Chart_log. If a problem occurs with chart handling, send these files to the MARIS Technical Support team.

ARCS SEAMLESS MODE

When ARCS seamless mode is active, ECDIS displays the current active chart together with adjacent charts (where possible) as detailed below:

Only ONE chart is active at a time, the surrounding charts are shown in the same datum and at the same scale as active one but are shadowed.

NOTE

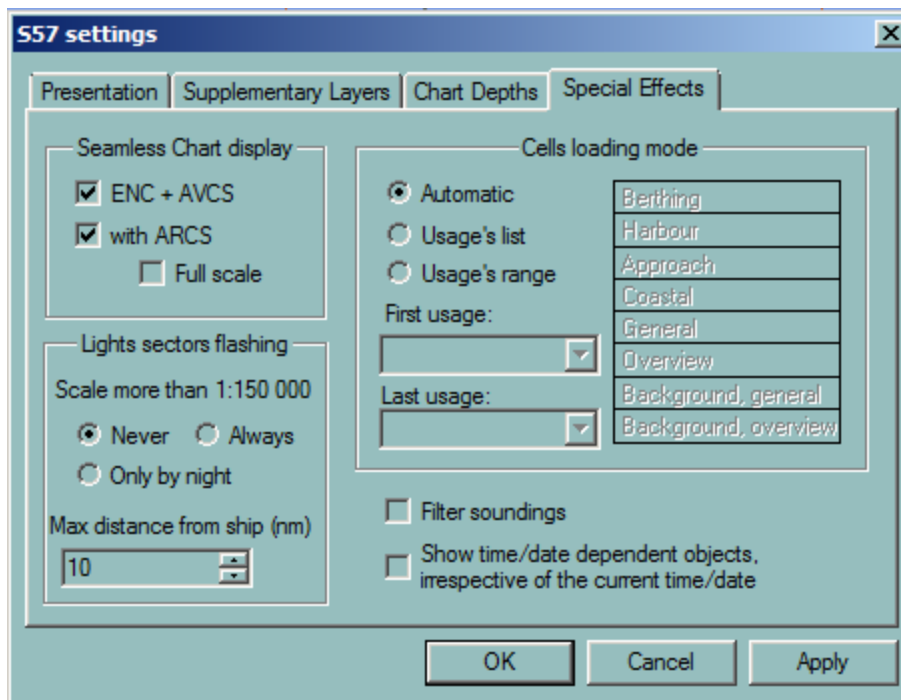
Whilst the surrounding charts are displayed at the same scale, this may not be their natural scale. The surrounding charts shown could be built from several different scale charts zoomed to the scale of the chart in use. In some cases the charts will not merge exactly. It should be understood that the surrounding shadowed charts are displayed for information only and should not be used for navigation.

When ECDIS needs to fill in a part of the screen with another chart, the search starts with charts of the same scale and then if no chart with the same scale is available the search is extended to charts with higher and lower scale.

The system stops searching if there is no chart available at a scale between 1/4 and 4 times the active chart scale.

The user should click on a shadowed chart to get all information about the chart and double click on a shadowed chart to activate it.

To switch on the seamless mode tick the “with ARCS” check box in the Seamless Chart display group. The default state is **Simple scale**. To get the best scaled ARCS displaying for the chart area tick on the **Full scale**.



ERRORS

The following is a list of errors that can occur during ARCS chart management.

ECDIS ERROR MESSAGE	Description	What to do	BA error code
Invalid (altered) gb.lcn-file	License is invalid and a checksum error is detected while reading the GB.LCN file.	Re-install permits. If this does not help contact MARIS to correct the error. WARNING: The user must not change the expiration date of the license using text editor.	ARCS01
Chart permit corrupted. Please reload from the original media.	The installed chart permit file is corrupted.	Re-install the chart permits from the latest BA floppy disk using the chart handling function.	ARCS02
The update relates to a newer version of	The update relates to newer version of	This means that a newer	ARCS03

the chart.	the chart.	<p>edition of the chart has been issued and you are still using the old edition. There are two cases:</p> <ol style="list-style-type: none"> 1. A new edition of the chart is located on the update CD. 2. The Area CD containing the chart has been re-issued. 3. Chart should be installed and updated from the appropriate media. 	
The chart is newer than the update.	The chart is a newer version than the update.	<p>The chart data already includes a New Edition of this chart and the update CD selected is older.</p> <p>It is necessary to use the latest update CD.</p>	ARCS04
The nav. Licence has expired no update is made.	The license has expired	Licence expired – updating is not permitted. Please contact MARIS to renew licence.	ARCS05
Warning! Licence expires in less than one month.	The navigation permit for the chart will expire in less than one month.	Please contact MARIS for a licence renewal.	ARCS08
Licence expired in the last month.	The navigation permit for the chart expired within the last month.	Please contact MARIS for a licence renewal.	ARCS09
Nav. Licence expired more than 1 month ago.	The navigation permit for the chart has expired more than one month ago.	Contact MARIS for a licence renewal.	ARCS10
Chart is too old for this nav. licence.	The chart permit relates to a newer chart edition.	The loaded version of this chart is too old to be used with the permit. Please load a more recent version of the chart from the area CD or the Update.	ARCS11

No error message	The specified permit types do not match (when merging permits).	Proper permit (Navigator or Skipper) option should be selected while merging permits.	ARCS_DIFFERENT_PERMITTYPE
No Licence File or Chart Permit File found!	There are no files called gb.lcn or gb.ncp in the folder selected by the user.	Select correct folder in which the files gb.lcn and gb.ncp are located	ARCS_NO_PERMITS
The Licence File is invalid.	The format of the chart permit file doesn't match gb.lcn-file structure.	Install permits from the original BA CD containing the permits.	ARCS_INVALID_LCN
No error message is displayed but it is impossible to install or update permits or charts.	The catalogue files or chart files are corrupted.	<p>Delete manually the following files:</p> <ul style="list-style-type: none"> • All files located in the folder C:// Ecdis/ Data/ Arcs_data/ Chartcat • All folders located in the folder C:// Ecdis/ Data/ Arcs_data/ Rachts • C:// Program files / Ecdis_2/ Data/ Arcs_data/ Chartcat/ Config.arcschart.cfg 	

GUIDELINES FOR TROUBLESHOOTING DURING ARCS CHART MANAGEMENT

Problem

The chart permit for a chart has been successfully installed but the chart from the CD cannot be installed (invalid permit).

Try this

Most likely the chart has been re-issued and the new version of the chart is stored on the update CD.

AVCS

AVCS OVERVIEW

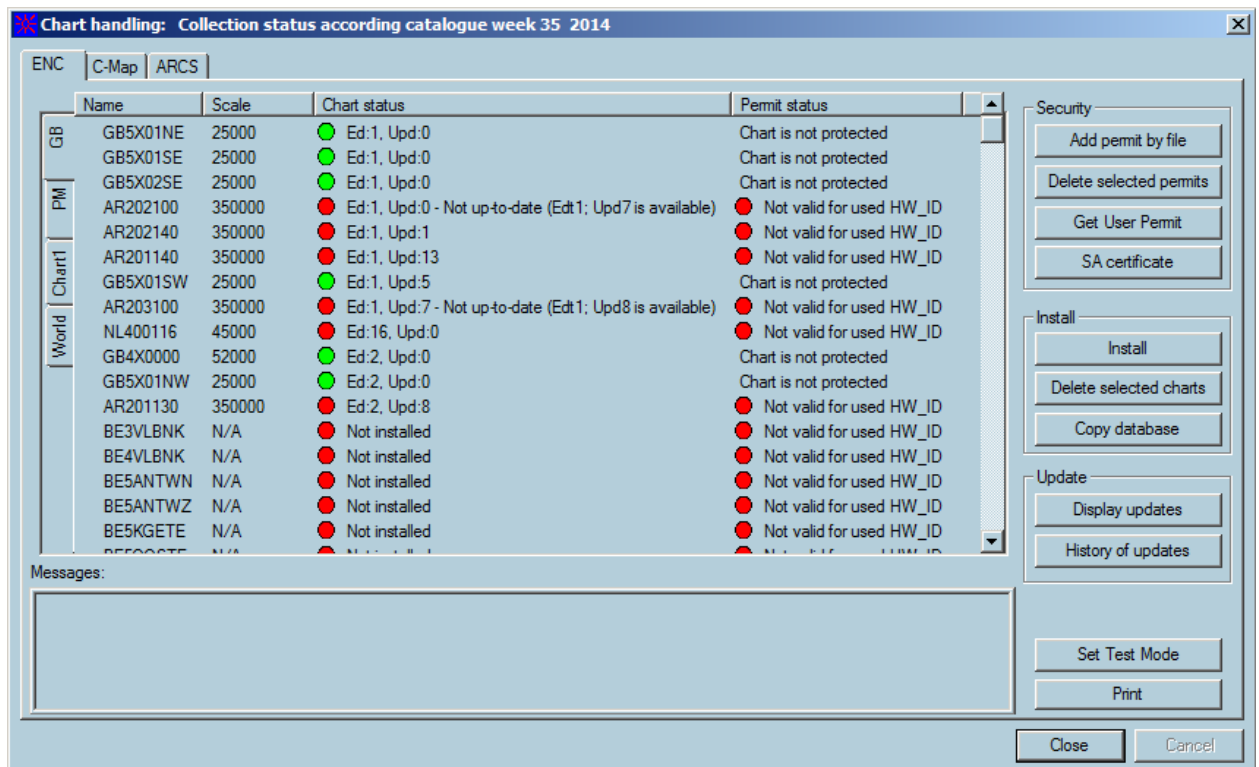
The Admiralty Vector Chart Service (AVCS) brings together Electronic Navigational Charts (ENCs) from national Hydrographic offices around the world and new ENC coverage produced by UKHO in co-operation with Foreign Governments to provide comprehensive, official, worldwide coverage.

AVCS contains only ENC data that meets SOLAS Carriage Requirements for use within Electronic Chart Display and Information Systems (ECDIS).

Electronic Navigational Charts (ENCs) are digital vector charts produced to the International Hydrographic Organization's (IHO's) standards (S57 Version 3.1 and ENC Product Specification). They are referred to World Geodetic System 1984 Datum (WGS84) and are regularly updated with official update information distributed digitally.

Hydrographic offices do not take any responsibility for the accuracy or reliability of privately produced, unofficial charts.

AVCS are present in ECDIS GB tab.



Charts have the following statuses:

- installed, up-to-date - displayed as green
- installed, not protected - displayed as green
- installed, out-of-date - displayed as red
- not installed - displayed as red

Permits statuses are the following:

- Valid -displayed as green
- Expired not more than 1 month - displayed as yellow
- Not valid (or expired more than one month) - displayed as red

The statuses correspond the current product.txt, that displayed as the title of window.

AIO Layer is available in areas covered by ENC Cells issued by UKHO

AIO LAYER

A specific Information Layer, AIO (Admiralty Information Overlay) is available in areas covered by ENC cells present in AVCS collection.

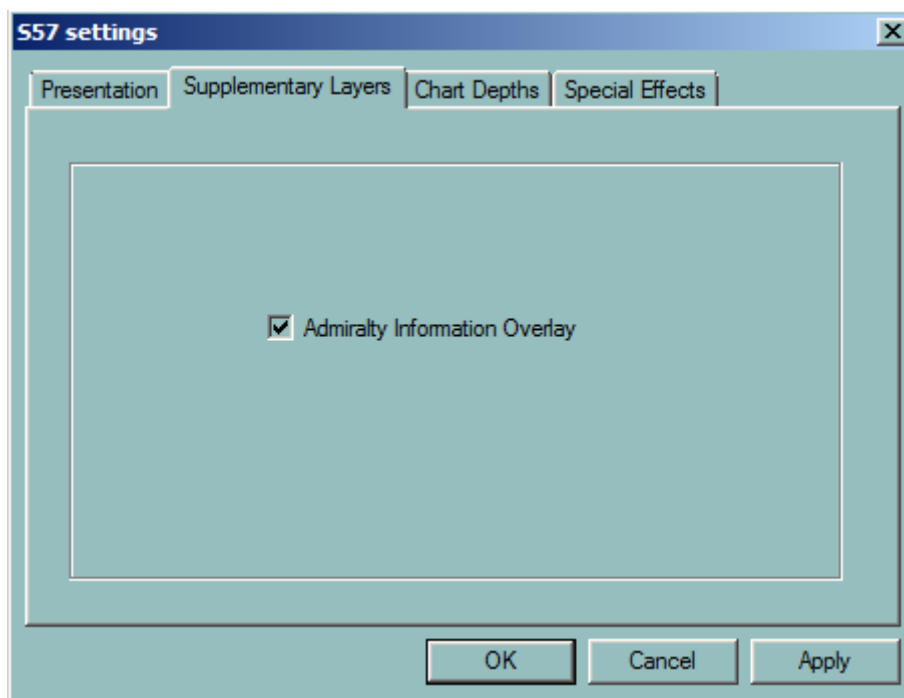
INSTALLATION

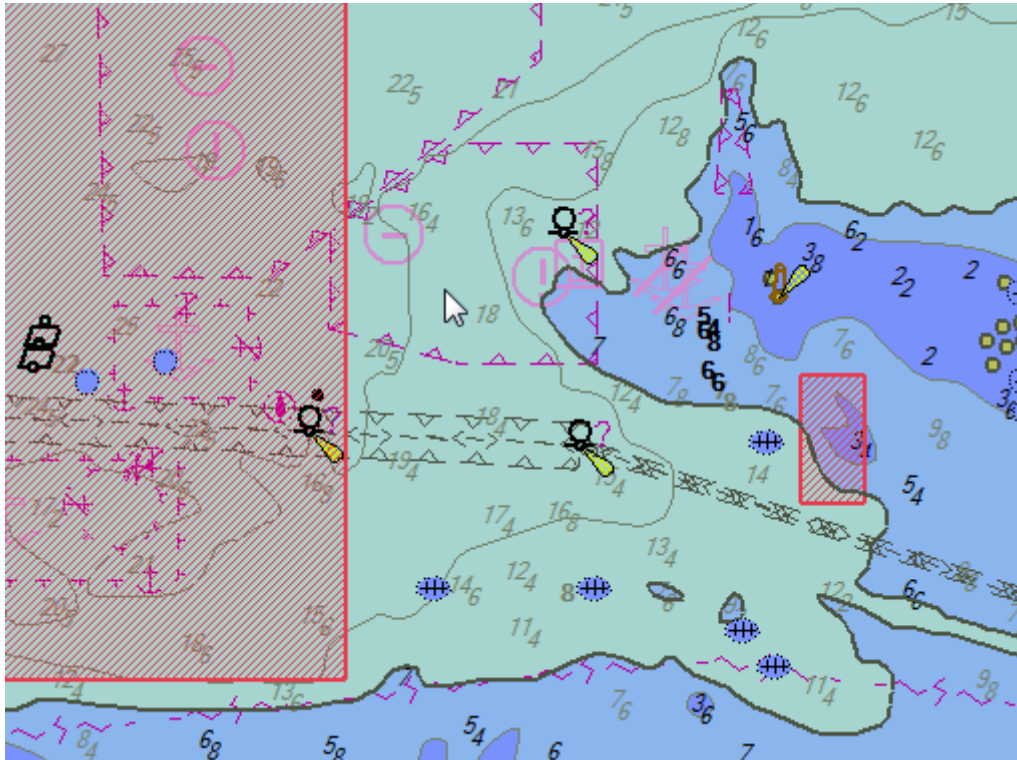
This cell, GB800001 is worldwide and data will be displayed in areas covered by ENC cells present in AVCS collection

A permit is necessary to install it, and it is displayed in Chart Handling as others cells.

ACTIVATION

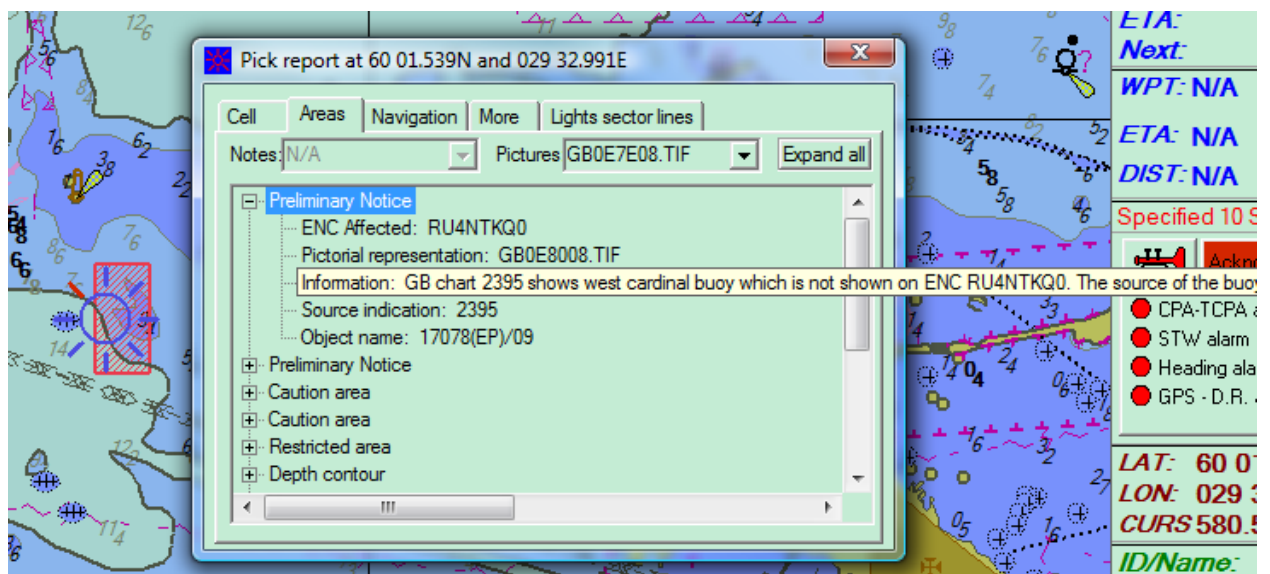
AIO Data Display is activated from S57 Settings menu, tab Supplementary Layers:





INFORMATION

Right click on red area and display T&P notice information in "Areas" tab.



S57

S57 OVERVIEW

Official vector charts produced by National Hydrographic Offices are called ENC, Electronic Navigation Charts and delivered in S-57 format. For more details about S57 charts see **ENC S57 charts technical features** at the end of the chapter.

S-57 is a public format used for data exchange and transfer but the charts in this format cannot be used directly in ECDIS. Therefore ECDIS converts ENC data with S-57 format to proprietary format. The converted charts are called SENC.

There are several sources providing ENC data: Primar in Stavanger distributes ENC data for North European countries and France, UKHO for other European countries, Japan HO for Japanese areas, MPA for Singapore harbour etc.

MARIS chart service includes several services to help the user including:

- Delivering charts from different sources
- Information on ENC availability
- Quotation and ordering facilities for specific areas or for charts along ship's routes
- Handling and sending updates from several sources.

ENC data from one source are delivered on 2 CDs:

- One base CD containing the charts issued at a certain data
- An update CD containing updates for the charts, new charts and new edition of charts.

ENC are in general encrypted and chart permits are required to be able to use them. The permits are ordered directly to MARIS.

ECDIS operates ENC under a seamless mode and automatically loads new cells when scrolling or zooming all over the world.

When the chart area cannot be covered with ENC data for the selected navigational purpose, the remaining part of the chart area is filled with data based on a more navigational general purpose.

ECDIS900 is compliant with IEC61174 ed3 regarding ENC chart Installation and Update from:

- Single Media using Multiple Exchange data sets
- Multiple exchanges set across multiple media sets.

IMPORTANT

The chart information to be used in ECDIS should be the latest edition of information originated by the government HOs and conform to IHO standards.

USING S57 CHARTS

ENC chart display is done according to official Presentation library. The following actions are available:

- **Zoom and select other scales**
- Modify the content and the layout of the chart with **chart settings** dialogue.
- **Select another projection** or enter depth values defining the safety limits.
- Get more information about the chart and object with the **chart properties** dialogue.
- **Manage the chart database** including installation of chart **permits** or **charts**, **updating** chart database, **checking the last updated objects**, or the **update history**. When errors occur during chart handling a message window displays the type of error.
- Install and update ENC charts on the Planning station and **copy the chart database** onto a remote PC.

CHART DISPLAY

COLOURS AND SYMBOLS

The implementation of the SENC information display has been done in accordance with IHO regulations; colours and symbols used are compliant with "IHO Special Publication S52 Appendix 2 V3.4" and "IEC publication 61174 Annex E".

COURSE UP DISPLAY MODE

ENC may be displayed in two different modes, Course up or North up.

To select the display mode, right click on the chart and check on or off the item menu Course up. North up symbol is shown in the top left corner of the chart area.

CELLS BORDERS

The cell boundaries are displayed on request using the dialogue "Chart Properties".

A plain grey line or a dashed line is displayed inside the chart boundary: it is the border of the "Administration Area". When the display is set to "Display Base" or "Standard", the area border is plain.

ECDIS draws the boundary between navigational purposes (also called "Usages"). For example, a boundary is shown around the total outline of all cells that belong to usage "Approach".




CHART BORDERS

Chart borders display the chart status and permit status for the particular chart.

IMPORTANT

In case the chart is out of date or not installed its border is displayed as dashed line. The colour of line corresponds to the permit status.

The chart borders have colour that corresponds to their status as follows:

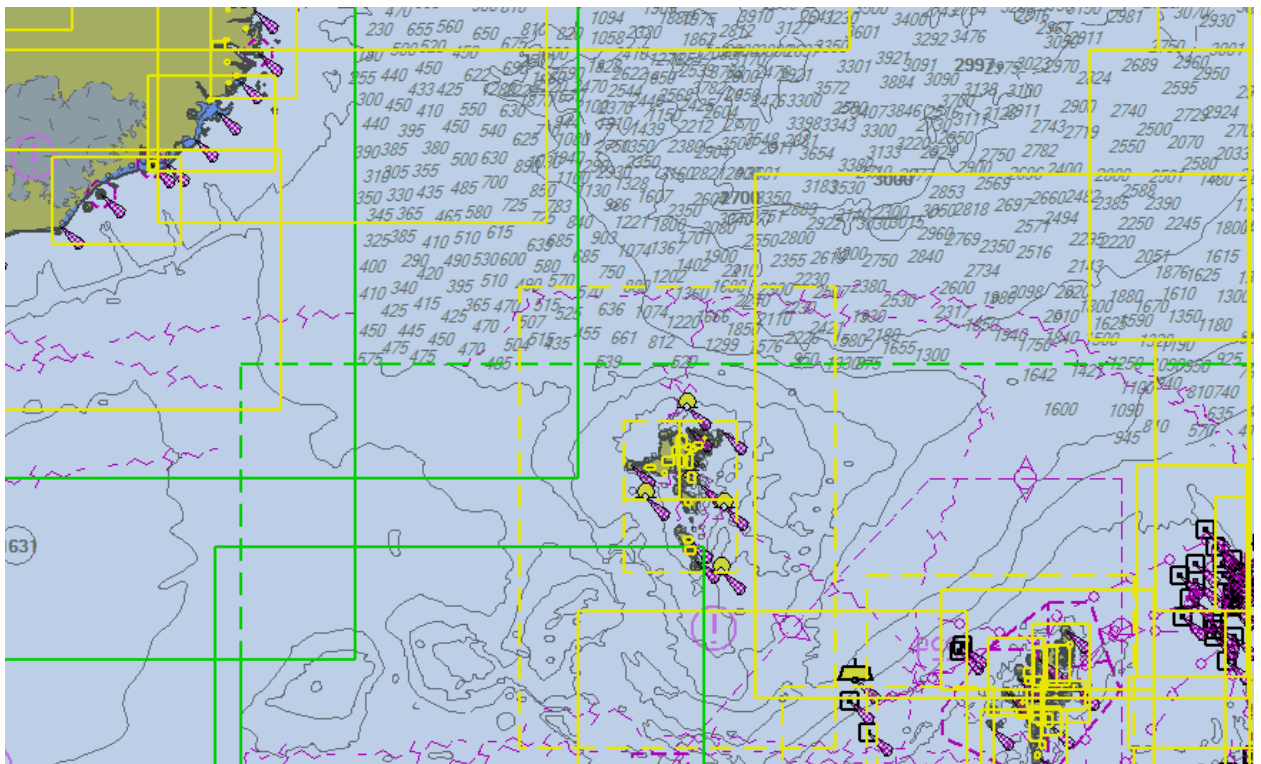
	solid red line	permit is expired or invalid for current HWID
	solid yellow line	permit will be expired in less than one month
	solid green line	permit is valid



solid black line chart doesn't need a permit

In the picture below the following charts are represented:

- **green** solid border - up-to-date chart with the valid permit
- **green** dashed border - out-of-date chart with the valid permit (or chart is not installed but the permit is valid)
- solid **yellow** border - up-to-date chart with the permit that will be expired in less than a month
- dashed **yellow** border - out-of-date chart with the almost expired permit (the permit will be expired in less than a month), or chart is not installed at all and the permit is almost expired.



Zooming

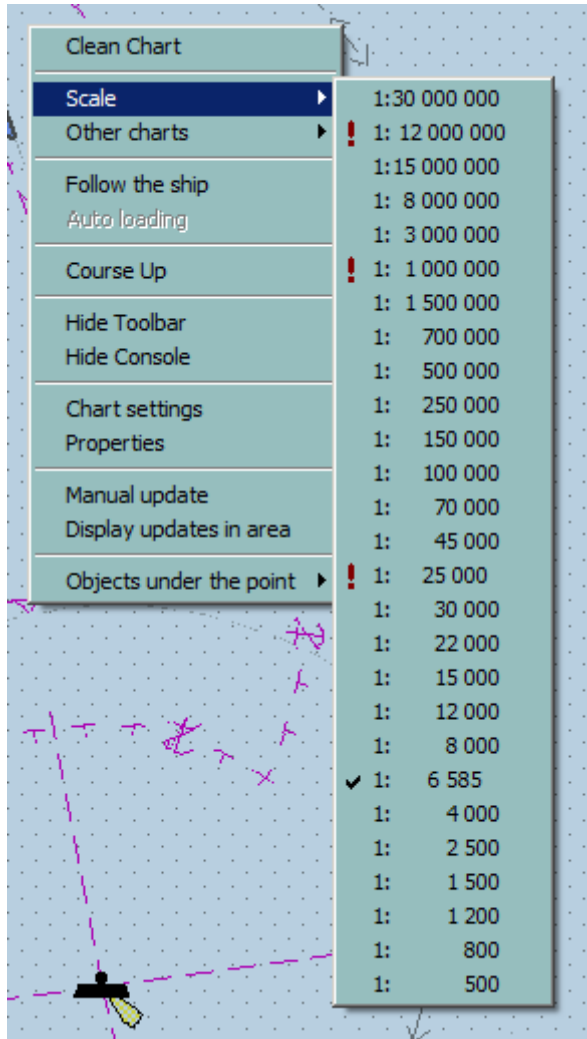
ENC cell contains geographical data to be used between a minimal scale and a maximum scale. Vector data in an ENC is sorted both by data types (chart layers) and by scale, thus the more precise the selected chart scale, the more details are displayed.

ECDIS includes a very important safety feature called 'Over-zoom Notification'. If at any time a chart or portion of a chart is displayed on the screen at a resolution greater than its maximum scale (Over-zoom), the user will be visually notified by the chart scale indicator being displayed with a yellow background. In addition a grey pattern will overlap the cell when the scale of the display is two times the compilation scale of the cell. (Example: if the compilation scale of the cell is 1/ 50 000 the grey pattern will be used for the scale bigger than 1/ 25 000).

Zoom in from Chart

Locate the cursor anywhere on the chart. Click and drag the cursor in any direction, drawing a rectangle. Release the button and the chart will be re-drawn with the area inside the rectangle filling the screen.

Change the Scale



- Click the right mouse button anywhere within the chart and a pop-up menu will appear.
- Select the item Scale and a list box will appear with a list of scales. (The current scale is indicated with a check mark).
- Click on the desired scale. The chart will now be re-drawn to the chosen scale, which will also be displayed in the static information console.

Zoom in / Zoom out

Use the tool Zoom In or Zoom out to change the scale of the chart. Alternatively use the hot key F1 or F2.

Usage

Each chart is allocated to a navigational purpose, depending on its scale.

During production, official ENC's are assigned a compilation scale based upon the nature of the source data they are based on, and are allocated to a navigational purpose band related to this.

Table 1 lists the 6 navigational purpose bands (scale ranges are indicative only). Data are extracted from the Compendium 'Facts about charts and carriage requirements' by Primar – IC-ENC, November 2004.

NAVIGATIONAL PURPOSE	NAME	SCALE RANGE
1	Overview	< 1 : 1 499 999
2	General	1 : 350 000 - 1 : 1 499 999
3	Coastal	1 : 90 000 - 1 : 349 999
4	Approach	1 : 22 000 - 1 : 89 999
5	Harbour	1 : 4 000 - 1 : 21 999
6	Berthing	> 1 : 4 000

Table 1 S57 charts, usage and scale

CHART SETTINGS

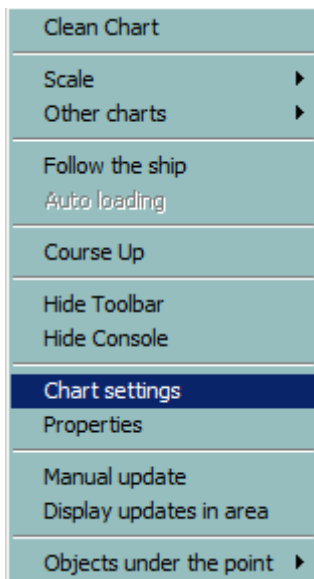
When a S57 chart is first displayed, the cell is displayed at the largest scale available in the SENC for the displayed area and the standard display provided. When several cells appear on the display the boundaries between cells are displayed.

NOTE It is not possible to remove information contained in the display base

The tab **Presentation** allows customizing the chart display according and the tab **Safety** allows selecting the chart projection but also entering several safety depths values dependant on the ship characteristics. These values are extremely important because they will change the chart display and be used for the anti grounding calculation. The tab **Special Effects** allows to select the options ENC/ARCS/AVCS seamless mode, flashing lights and manual chart band usage.

The **Supplementary Layers** tab is described in the AVCS section.

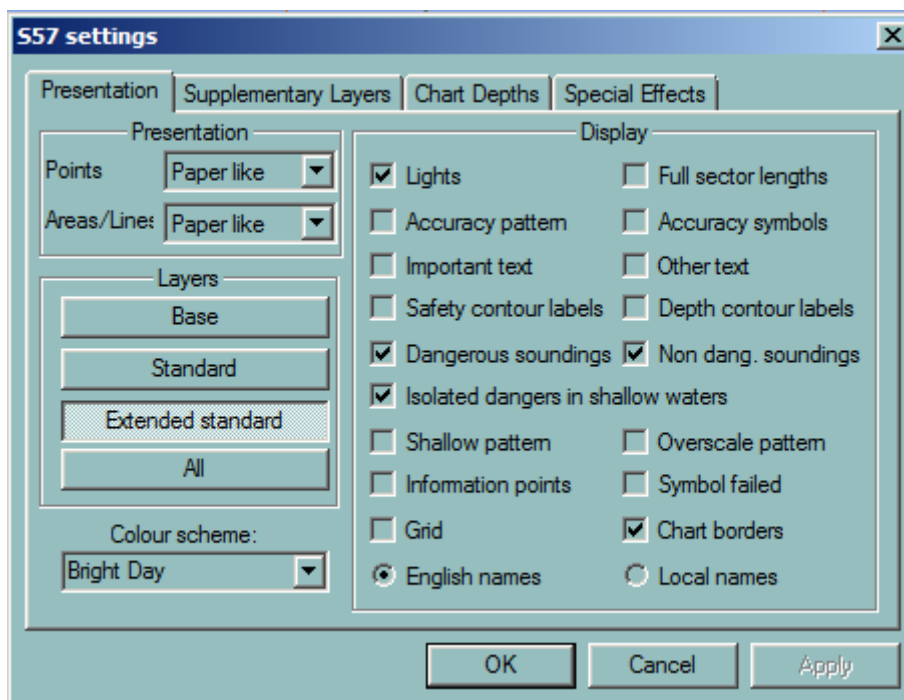
Right click anywhere on the chart and select Chart settings.



PRESENTATION

With the Simplified presentation symbols are displayed in a synthetic way.

In “Paper like” presentation, the presentations of floating buoys are presented in their actual colours. Buoys and beacons shall have a shape that corresponds to INT 1, Chapter IQ.



Points-Areas/Line options are the following:

- Paper like
- Traditional
- Simplified

GRID AND BORDERS

To make the grid and borders visible tick on the **Grid** and **Chart borders** check boxes in the Display group.

LAYERS

In compliance with the requirements of International standards for ECDIS class systems, the display is divided into three categories:

- **Base** Includes those classes of information which must not be turned off under any circumstances: coastline, Safety contour, isolated danger, aid to navigation, recommended routes and traffic separation schemes.
- **Standard** Includes classes of objects important for navigation and route planning: areas, limits of fairways and channels, landmarks, warnings.
- **All** Additional information including classes of other information: depth spots, cables and pipelines, ferry crossing, names, depth contours deeper than the safety contour.

Extended Standard

In addition a new category called Extended Standard is available. This category includes the same basic layers than the Standard category with in addition:

- All shoals
- All cables pipelines, fish farms and nature of seabed

The pink circle symbol with a white X inside, that supersedes the shoal digits of dangerous, pronounced shoals, when the Safety Contour exceeds the depth of the shoal, is deactivated in Norwegian Pilots Category and the shoal depth is always shown.

All soundings are presented with italic digits, with an inclination of 17 degrees. All rocks awash between chart datum and 0,5 m below chart datum shall be presented, with the symbol shown in INT 1, Chapter IK, number 12.

All rocks that covers and uncovers shall be presented, with the symbol * in accordance with INT 1, Chapter IK, number 11.

REMARK Depth information is not adjusted by tidal height.

COLOUR SCHEME

Click on the down arrow and select a colour scheme. Alternatively press the hot key F8 to switch from one colour scheme to another.

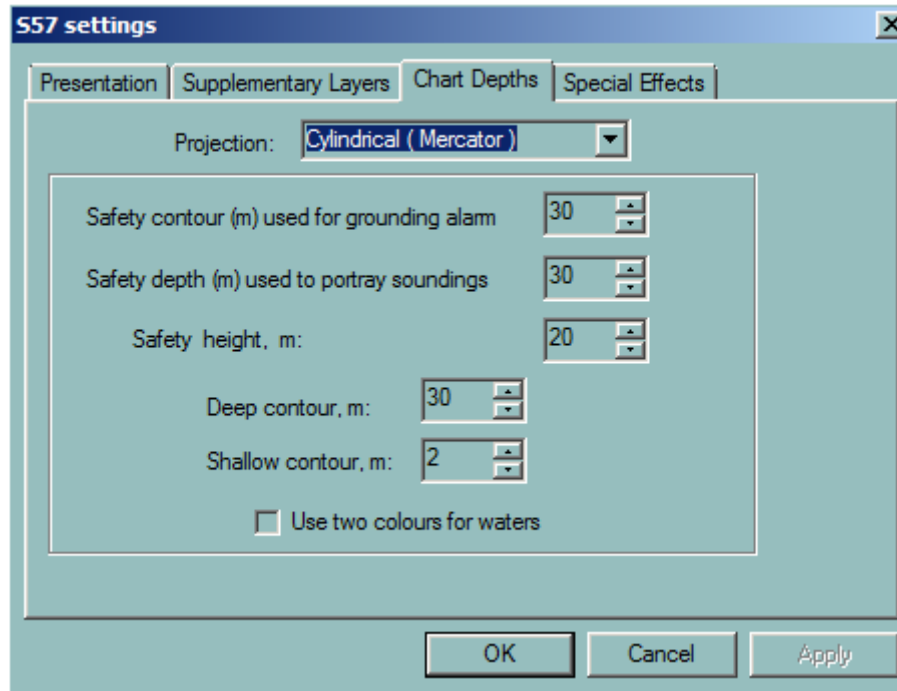
DISPLAY

A list of display options, any combination of which may be switched on or off. This option, used in combination with the layer Option, allows selecting the objects to be displayed.

CHART DEPTH

PROJECTION

ECDIS can display charts in different projections and guarantees the consistency between the datum used by GPS and the datum used in ECDIS for display and storage of routes, tracks and other objects.



The default projection is Cylindrical, which allows displaying a chart in a proper way even in high latitude areas.

DEPTHS

Deep and shallow contours can be displayed in two different colours. Switch the setting on by toggling the box.

- **Deep contour:** This function is used for setting deep-water contour highlighted in the display of S-57 charts.
- **Safety contour:** This function is used for setting a safe depth range for the given ship. The calculated safety contour is equal to or larger than the entered value if the depth contour chosen is not available on the chart. Safety contour highlights the safe navigation waters (See example below) on the chart and ECDIS gives an alarm if the ship is going to cross the safety contour within the time limits specified in the safety guard zone parameters. By default the safety contour is 30 m. If the safety contour specified by the mariner is not in the SENC, the safety contour shown is the next deeper contour and the mariner is informed in the Legend panel. ECDIS emphasises the safety contour with a wide grey line on the chart.
- **Shallow contour:** This function is used for setting a shallow water contour highlighted in the display of S-57 charts.
- **Safety Depth:** This is the depth, in meters, below sea level that is considered to be safe for the ship. This is very important when the ship is approaching isolated dangers. On the

chart the soundings with a depth value lower than the Safety depth are displayed in dark grey but the soundings with a depth value bigger are displayed in light grey colour. Both soundings can be displayed or hidden by checking on or off the check boxes "Deep Soundings" and "Shallow Soundings" in the Presentation panels described above.

- **Safety height** This is the height, in meters, above sea level that is considered to be safe for the ship.

NOTES

The safety depth must not be less than the safety contour value.

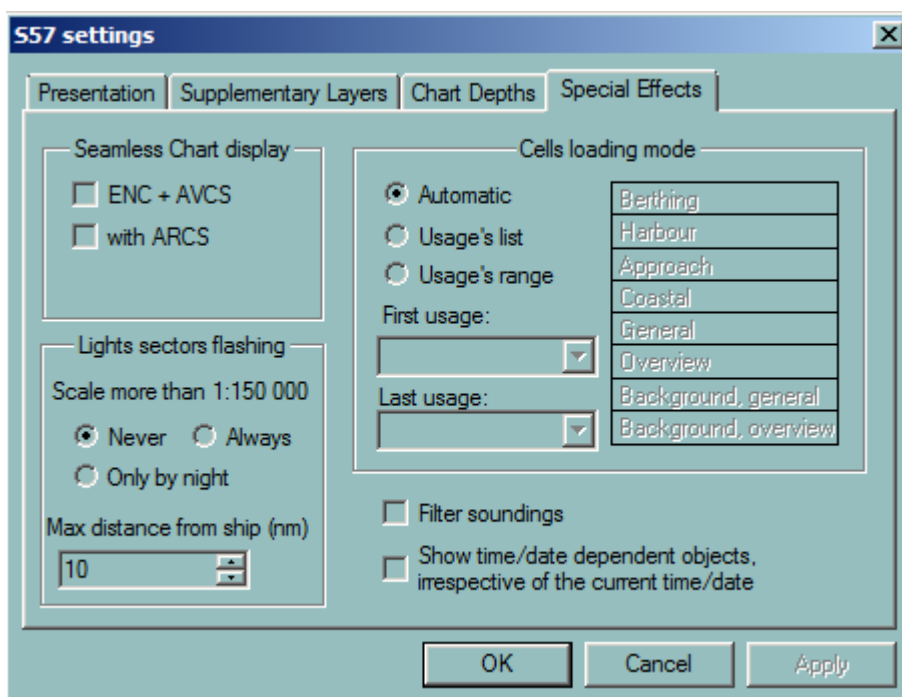
Depth information provided by ENC is not adjusted by tidal height.

Chart display depends on selected depth parameters.

In the following **example**, one chart has two different presentations according to different safety contour and shallow contour values.

SPECIAL EFFECTS

ECDIS can make the light sectors flashing when the ship is closer to the lights than a fixed distance.



SEAMLESS ENC/AVCS

If AVCS charts are installed together with ENC both kinds of charts can be displayed in seamless mode, meaning that for the area of the screen not covered by ENC charts, AVCS charts are used to complete the coverage.

SEAMLESS ENC/ARCS

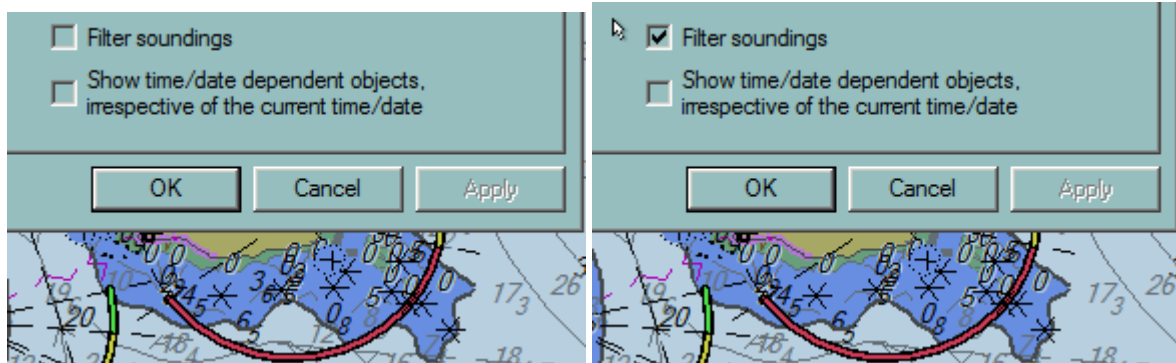
If ARCS charts are installed together with ENC both kinds of charts be displayed in seamless mode, meaning that for the area of the screen not covered by ENC charts, ARCS charts are used to complete the coverage.

For more information see the paragraph Seamless ENC / ARCS.

FILTER SOUNDINGS

For some charts the number of displayed soundings is too big making unreadable the figures on the chart.

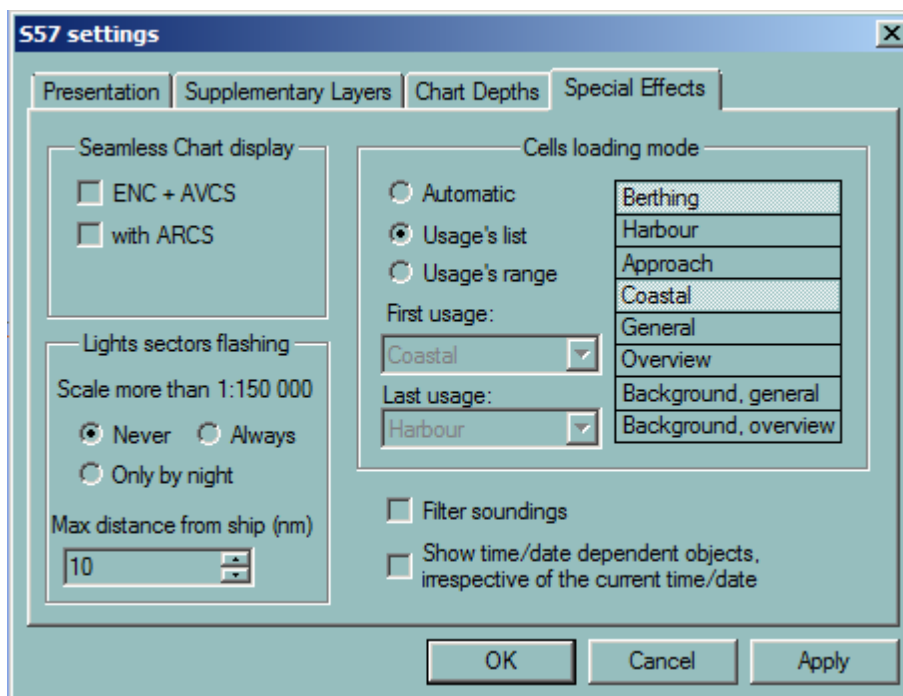
Filter sounding function reduces the number of soundings in such a way that in case of ambiguity the shallower sounding is always used.



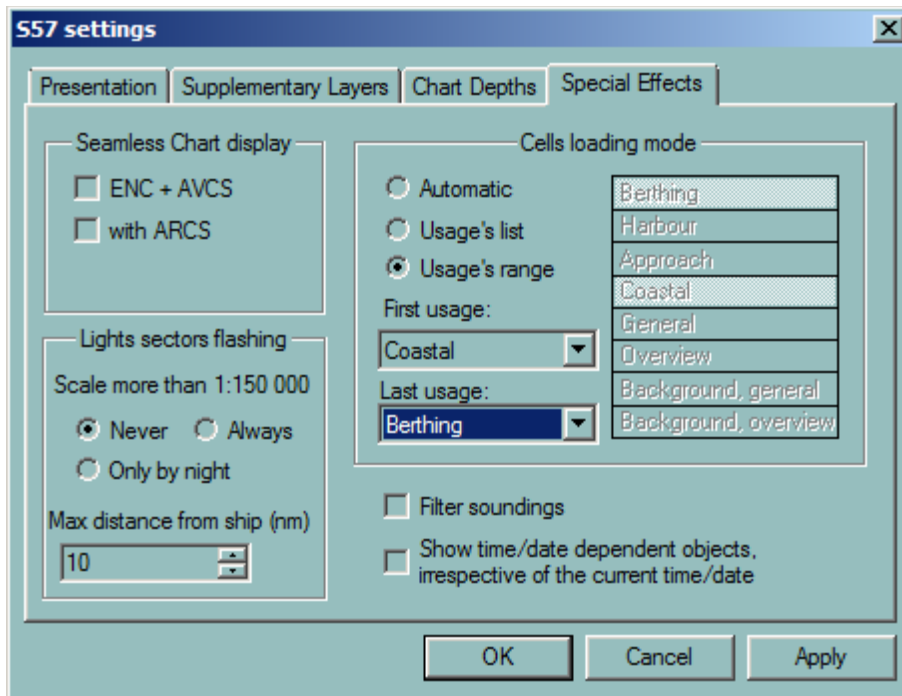
CELLS LOADING MODE

The **Automatic** mode is default mode. When Automatic mode is activated, ECDIS900 scans all ENC database to load and display the proper cells for the scale in use.

When **Usage's list** is activated the scan of the ENC database is limited to the selected cell usages in the left list (Only Berthing and Coastal cells are used in the example below).



When **Usage range** is selected the scan of the cells is limited by the two usages selected by the user (From coastal to berthing in the example below).



EXAMPLES

Two chart display with different values of depth settings

CHART PROPERTIES

To view the chart cell's properties or to display information about an object of the chart, click right somewhere on the chart or on that particular object and select Properties. Alternatively press F4 when the cursor is on the chart.

ECDIS scans ENC database to find all objects present under the clicked point, highlights these objects on the chart and displays information concerning them and the cell the objects belong to.

NOTE

The properties of other points on the chart can be viewed, without closing the properties window, by clicking on selected points

CELL

The screenshot shows a dialog box titled "Pick report at 32 31.1425 and 060 54.523E". It has several tabs: "Cell", "Areas", "Navigation", "More", "Lights sector lines", and "History of updates". The "Cell" tab is active. It contains the following fields:

Cell file name:	GB5X01SW.000	Depth units:	metres
Internal usage:	Harbour	Agency code:	GB
Compilation scale:	1: 25 000	Edition number:	1
Horizontal datum:	WGS 84	Issue date:	2001/04/08
Vertical datum:	Mean high water spri	Update date:	2001/05/09
Sounding datum:	Lowest astronomical	Version:	03.1

Below these fields is a section labeled "Boundaries" with four input fields:

North:	32 30.000S	South:	32 33.141S
West:	060 52.399E	East:	060 58.000E

The **Cell** tab displays information about the Cell and in particular the Compilation scale, the edition number, the version and Issue, the Issue and last update dates, etc.

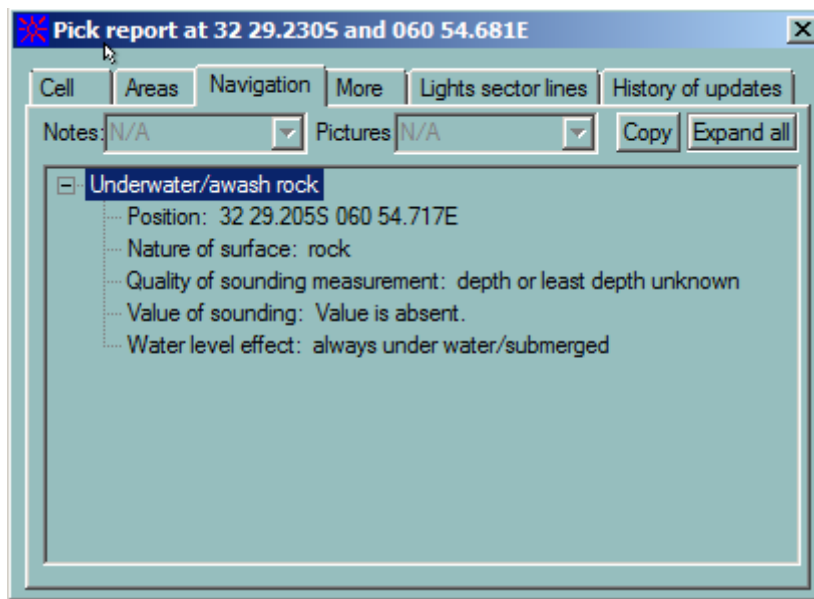
AREAS

The screenshot shows a dialog box titled "Pick report at 32 29.2305 and 060 54.681E". It has the same tabs as the previous dialog. The "Areas" tab is active. It contains the following elements:

- Notes: N/A (with a dropdown arrow)
- Pictures: N/A (with a dropdown arrow)
- Buttons: Copy, Expand all
- A list of area objects with expand/collapse icons (+/-):
 - Coastline
 - Depth area
 - Depth area
 - Depth area
 - Depth area
 - Depth contour
 - Harbour area (administrative)
 - Land area
 - Magnetic variation
 - Obstruction
 - Sea area/named water area
 - Sea area/named water area

The **Areas** tab displays administrative information and area object data. To copy entire list of area properties press the **Copy** button.

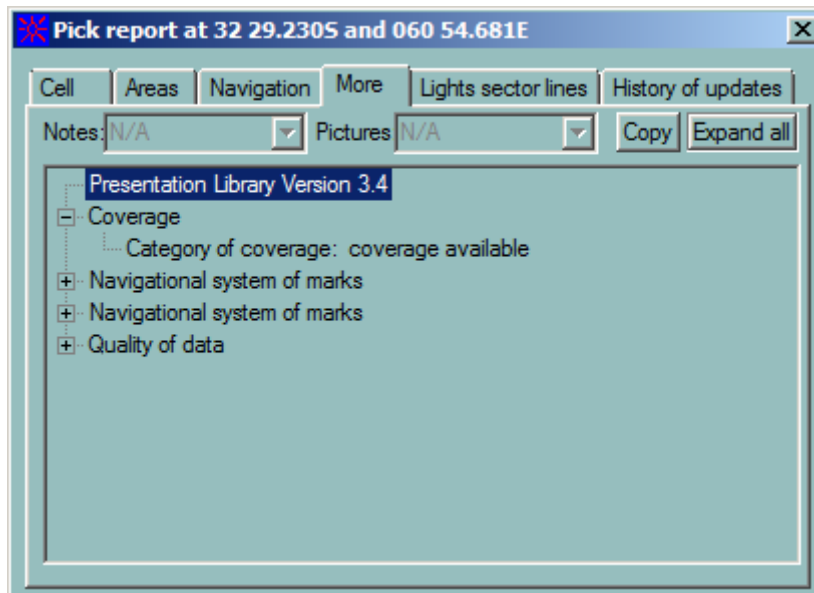
NAVIGATION



The **Navigation** tab displays information about Navigation aids, Lights, Beacons, Buoys etc. In addition, when notes or pictures containing text or drawing information are associated with the cell two pop-up menus display the list of available notes or drawings. Select the note or the picture in the menus to display it.

To copy the entire information of the tab, press the **Copy** button.

MORE



The **More** tab shows additional information about objects found under the clicked point and displays the S-52 Presentation Library version.

To copy the entire list press the **Copy** button.

LIGHT SECTOR LINES

The **Light sector lines** tab allows the user to expand one or several sector lines of interest. The display of extended sector lines allows the user to control very precisely the navigation

when sailing towards a light or within selected chart sectors.

REMARK: These lines are displayed on the screen even the light is not visible on the screen.

HISTORY OF UPDATES

The **History of updates** tab displays the list of updates for the cell (or cells if there are more than one cell is under the cursor).

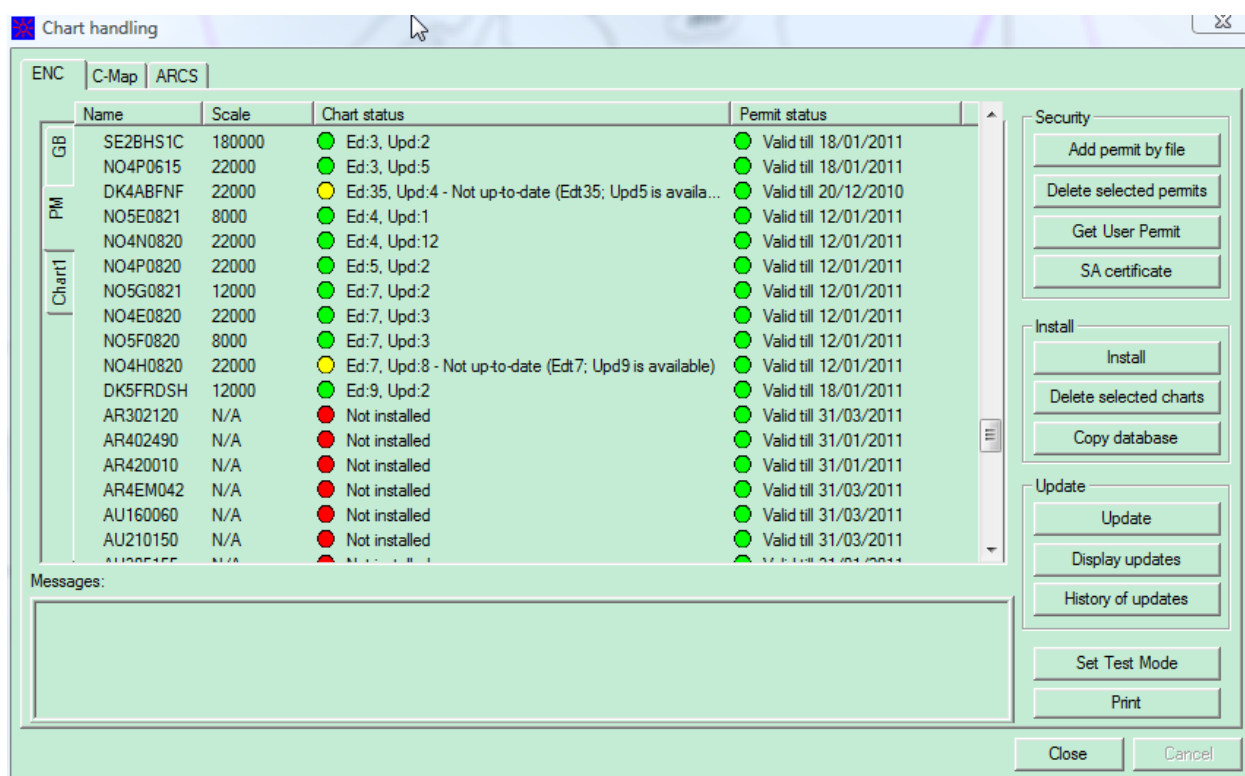
NOTE When moving the mouse on top of a buoy displays, when it exists, the name of the object.

CHART HANDLING

The management of the chart database is done from the dialogue Chart Handling.

One panels for the each chart's type:

- ENC
- C-Map
- ARCS



ECDIS handles several ENC collections like Primar or AVCS. Each collection is independently maintained.

For ENC Charts, different sub tab are used for each provider, GB for UKHO, PM for Primar (normally, only one provider will be used for each installation), and Chart1 for test set.

Select ENC panel, provider tab (GB or PM) to **install permits** or **charts** and **update the database**. The **last updates can be highlighted** on the chart and **the history of all applied updates** is stored in a log file.

The possible errors, which may occur during installation or update are listed below.

ENC SECURITY

Security frame give access to the 4 following possibilities:

- Add permit by file
- Delete selected permits
- Get User Permit
- SA certificate

ENC cells are in general copy protected and therefore require permits.

NOTE Some Data providers deliver S-57 cells without copy protection and therefore permits are not required

PERMITS

ENC cells are in general copy protected and therefore require permits.

NOTE Some HO's deliver S-57 cells without copy protection and therefore permits are not required

ORDERING THE PERMITS

To order permits send to MARIS the list of ENC cells of interest or a precise description of the area to be covered by ENC or a description of the routes you would like to be covered by ENC. Then MARIS chart service can establish the list of necessary charts and after confirmation the charts are purchased and the permits sent on board.

ADD PERMIT BY FILE

The permits are delivered as 2 files:

- If the permit was received on a memory stick, plug in the memory stick and select the directory containing permits files.
- If the permit was received by e-mail browse the hard disk folder, open the permit file.

A message window gives information about the status of the installed permits and about eventual errors.

PERMITS FROM SEVERAL PROVIDERS

If ENC cells are delivered by two different providers (Primar and UKHO for example) two permit files are received on board. It is required to run two times the installation procedure with the two different permit files.

NEW PERMITS

When additional permits for new charts have been ordered, a new permits file is sent on board. This file contains the complete list of permits purchased by the user and must be installed as described above. The new permits are added to the old ones.

PERMITS AND CHART VERSION

When a chart is reissued (Old version is replaced by a newest one, stored in general on the chart update CD) a new permits file is sent on board. This file contains the complete list of permits purchased by the user and must be installed. The old permits are removed and replaced by the new ones.

ATTENTION

A permit is valid for a specific version of the chart:

- If the chart is too old for the permit, the user is informed and the new edition of the chart has to be installed.
- If the permit is too old for the chart, the chart cannot be installed and updated and a new permit has to be ordered.

REMARK

When the permit of one expires the chart is still usable in ECDIS but cannot be updated and therefore cannot be used in Type Approved ECDIS mode.

DELETE PERMIT

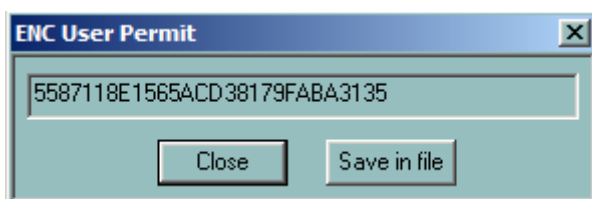
Permit Status is set as not found. (example IN3222QK after permit deletion)

Name	Scale	Chart status	Permit status
BR400051	45000	● Ed:1, Upd:0	● Valid till 25/04/2009
FR166230	1500000	● Ed:1, Upd:0	● Valid till 13/04/2009
IN3222QK	150000	● Ed:1, Upd:0	● Not found

Chart is not deleted, but it is not usable.

GET USER PERMIT

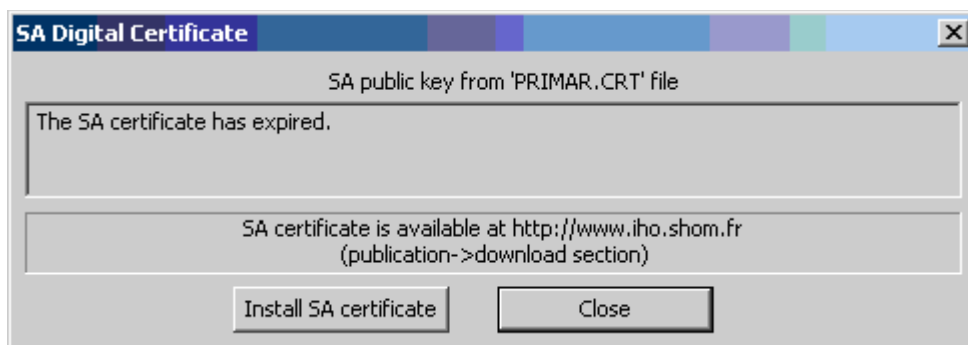
Press button **Get User Permit** to display or save User permit.



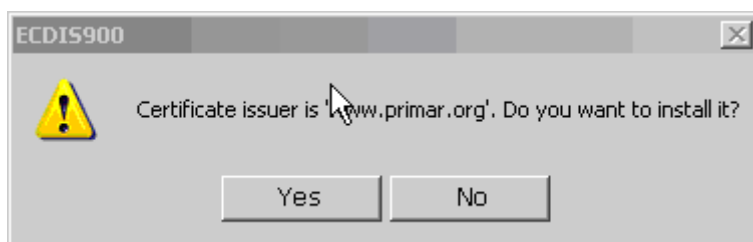
GET SA CERTIFICATE

Certificate need to be installed.

Press button **SA certificate** - either to install, either to display SA certificate.



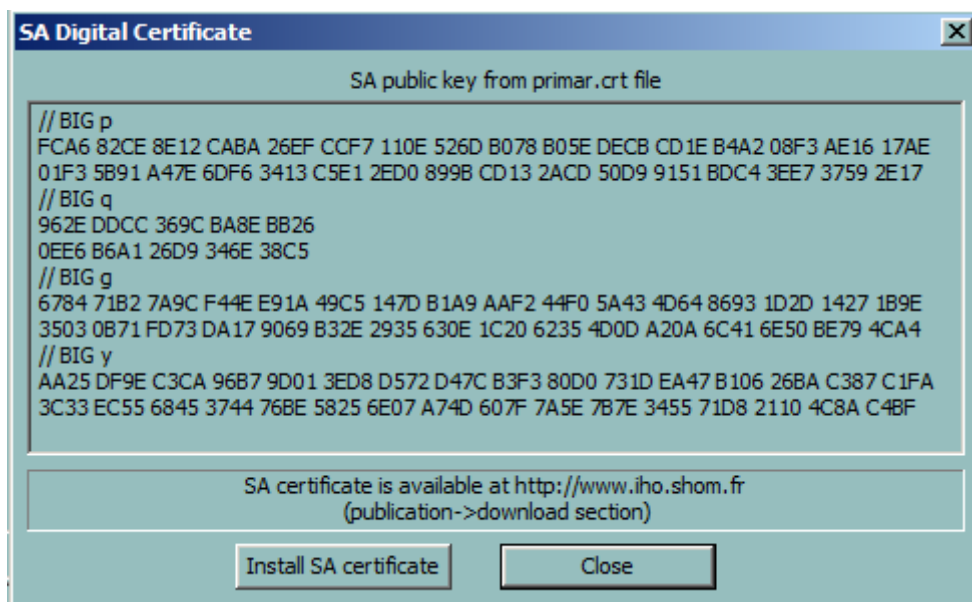
Press **Install SA certificate**, and browse folder to get *.crt file certificate.



Confirmation window is displayed.



SA Certificate view



INSTALL CHARTS

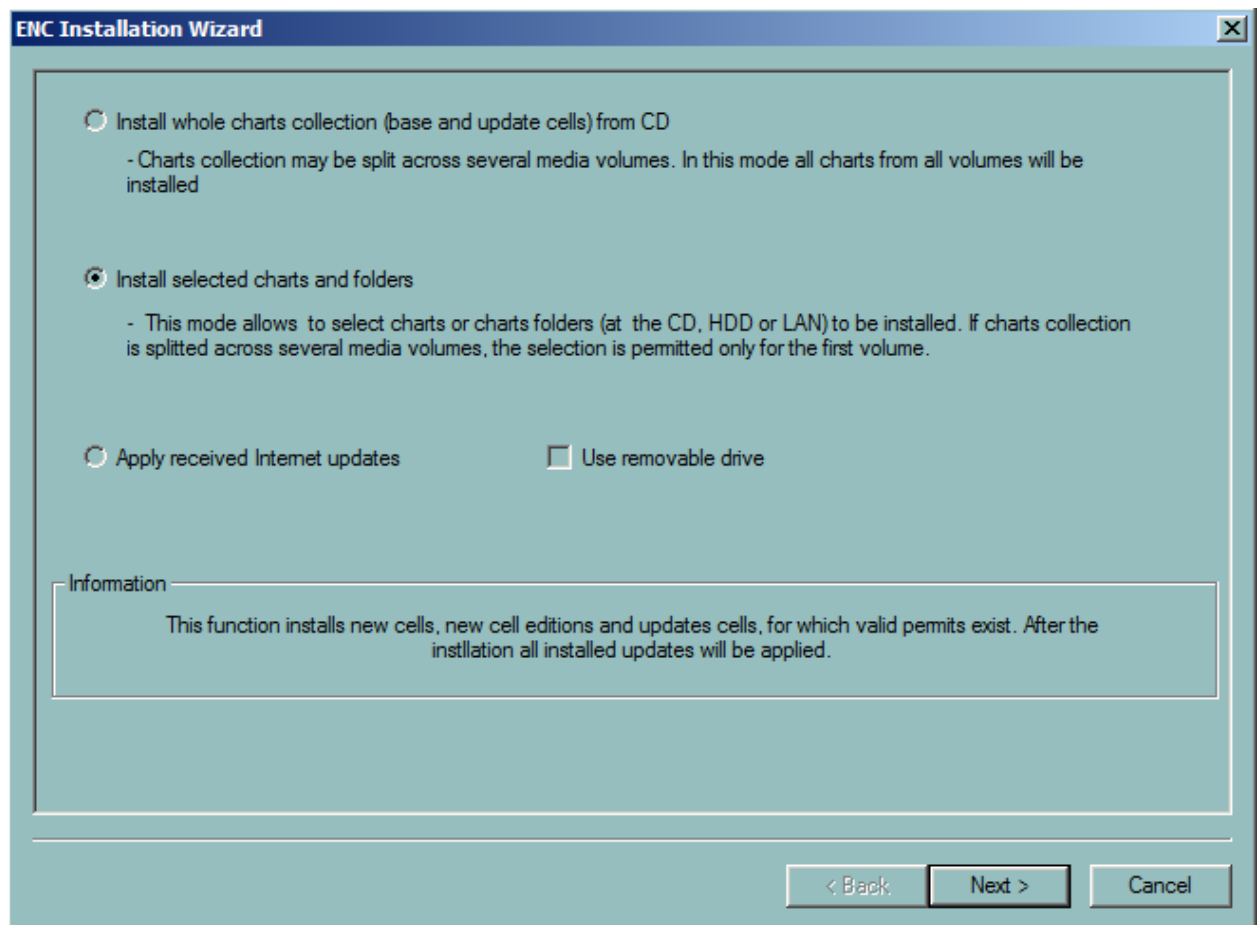
ENC charts can be installed from a CD or from a folder located on a remote PC.

REMARK: Before the installation make sure that the permits are installed.

All collection of charts stored on a CD can be installed at once by choosing the first option of the installation wizard.

The second option allows the user to make a selection of charts to be installed and the source of the data (CD or HD).

Make a selection of charts in the second dialogue and press **Next** to start with the installation.



IMPORTANT

European ENC charts and Updates distributed by Primar and UK HO, are delivered on two CDs: a Base CD containing the chart database issued at the time indicated on the label and an update CDs containing the updates for those charts.

The update CDs contain also new chart edition issued since the Base CD was printed. The new charts and the new editions of chart stored on the update CD are automatically installed and updated during the update process.

INSTALLATION AND UPDATE

After the charts are installed ECDIS tries to find updates of the charts on the same media. If the updates are found and have a correct sequence ECDIS automatically applies the update to the charts.

For a complete installation and update of European ENCs proceed as follow:

1. Insert Base CD
2. Press Install, select the charts to be installed and press Install.
3. Insert the Update CD

4. Press Update.

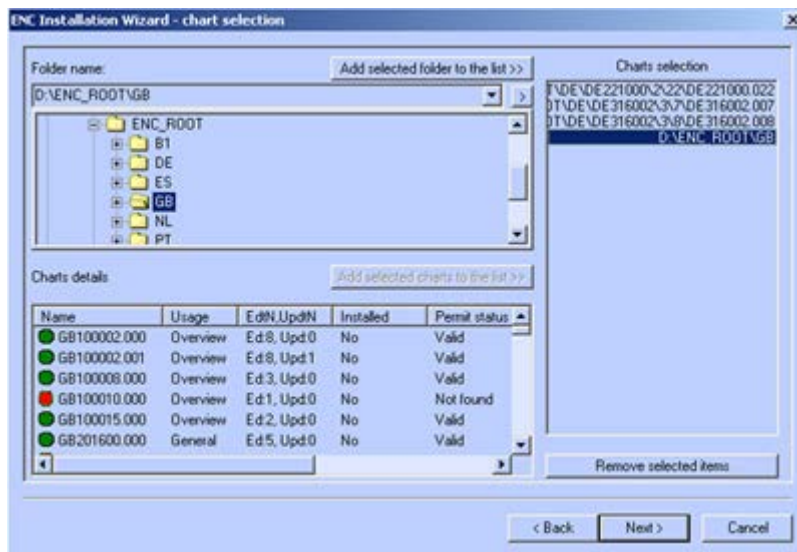
DELETE CHARTS

After confirmation the selected charts are definitively deleted from the chart database.

The **possible errors**, which may occur during installation are listed below.

CHART SELECTION

Select the chart one by one by double clicking on the name or select a folder containing chart and press Add folder to selection.



UPDATE

Use the Installation wizard to update charts. See the **Install charts** section for details.

NOTE If a large number of charts are involved the process may take quite some considerable time

The function **See Updates** allows checking the last updated objects and the function **Update History** maintains a log of all applied updates.

When a **Cancellation update** is applied the cell is removed from the collection.

ERRORS WHILE UPDATE IS IN PROGRESS

If the updates are not correctly loaded or if an error is detected during the update procedure, the user is informed and the error message displayed in the message area.

- ECDIS rejects updates if the update issuing authority is different from the cell issuing authority.
- ECDIS rejects corrupted update files and files with wrong extension or wrong name.
- ECDIS checks that updates are applied in the right sequence. If one update is missing the next updates are rejected.

EXAMPLE:

Single charts have update files with a specific order number, which is the suffix of the file: for example **Jp54nvpr.002** is the second update file for the Japanese chart called Jp54nvpr.

The file **Jp54nvpr.002** is a complement of the update information contained in the file **Jp54nvpr.001** but does not contain all update information that was included in the file **Jp54nvpr.001**.

In order to correctly update chart **Jp54nvpr** it is mandatory to first update the chart with file **Jp54nvpr.001** and then with file **Jp54nvpr.002**.

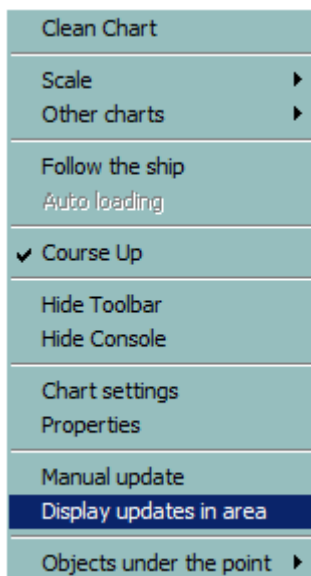
REMARKS

- An update CD-ROM contains in general all available updates for all ENC cells. ECDIS will automatically run all updates in the right order for all cells.
- Updates not relating to a cell within the set of installed cells are discarded.
- ECDIS rejects an update related to a new edition of the cell.
- ECDIS rejects an update related to an older edition to the cell.

UPDATE DISPLAY

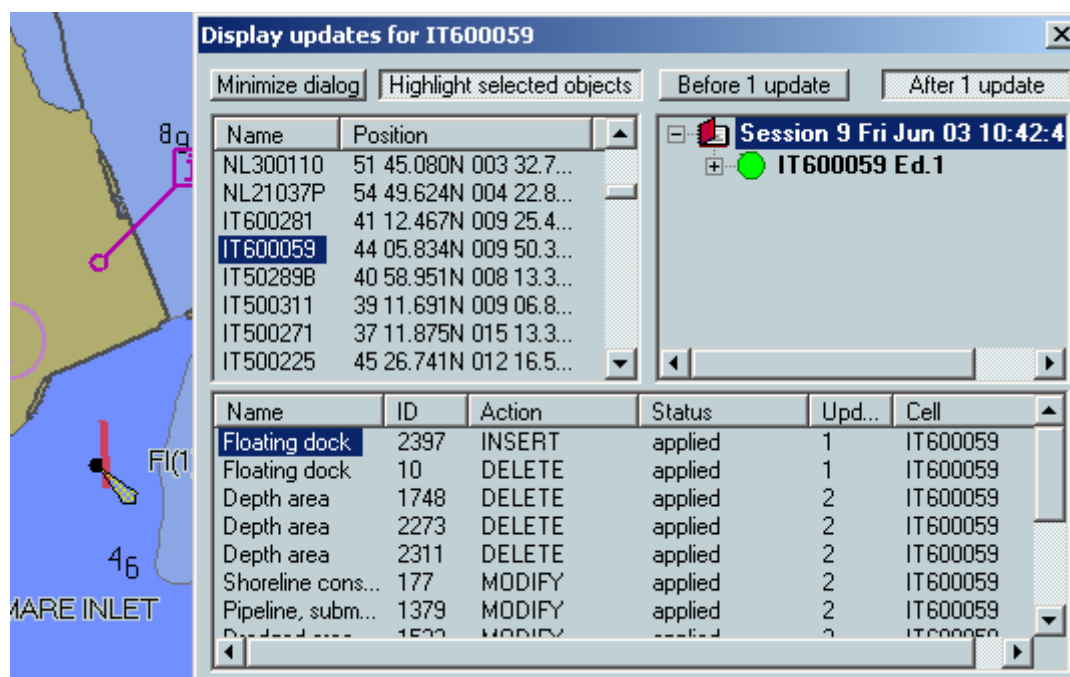
It is possible to display updates for selected objects only: screen area or route.

Right click and select the **Display updates in area** item from the list

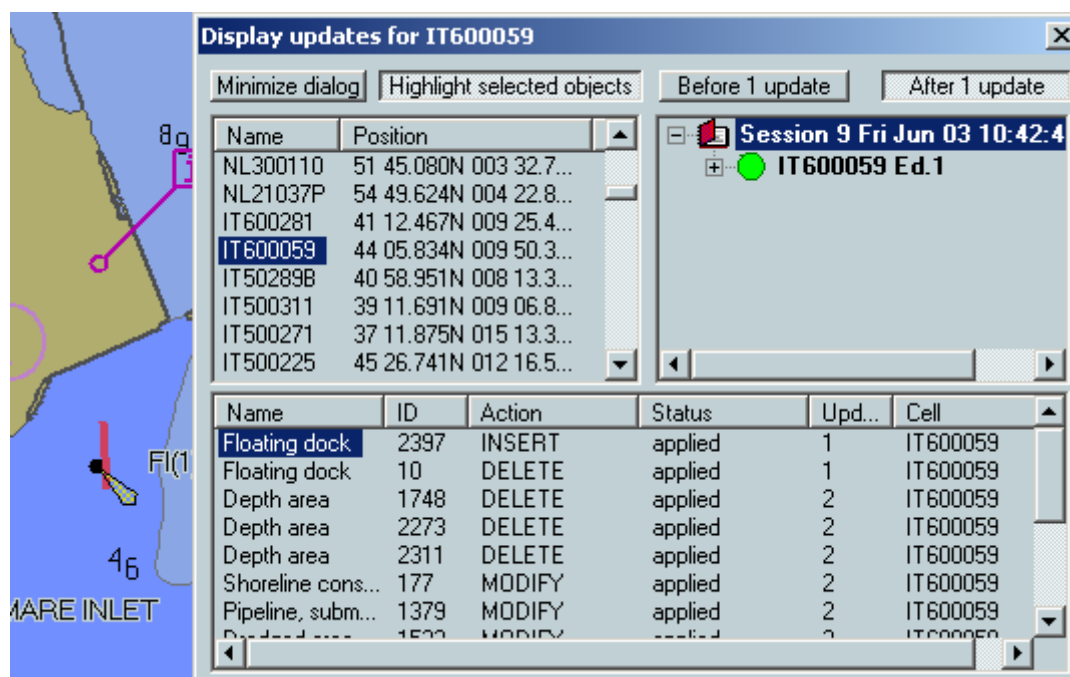


Then the list of updates in the displayed area appears. To see updates under a route, right click on the route and select the **Display updates under the route** item. This function displays the list of cells of the ENC database which have been updated and for each cell the list of updates applied to it. The history of updates is also available by activating the button **History** located in the left panel.

Select a cell in the left panel and all update sessions applied to the cell are listed in the right panel. The list of updated objects is displayed in the lower part of the dialogue. Double click on one object to centre the chart on the object.

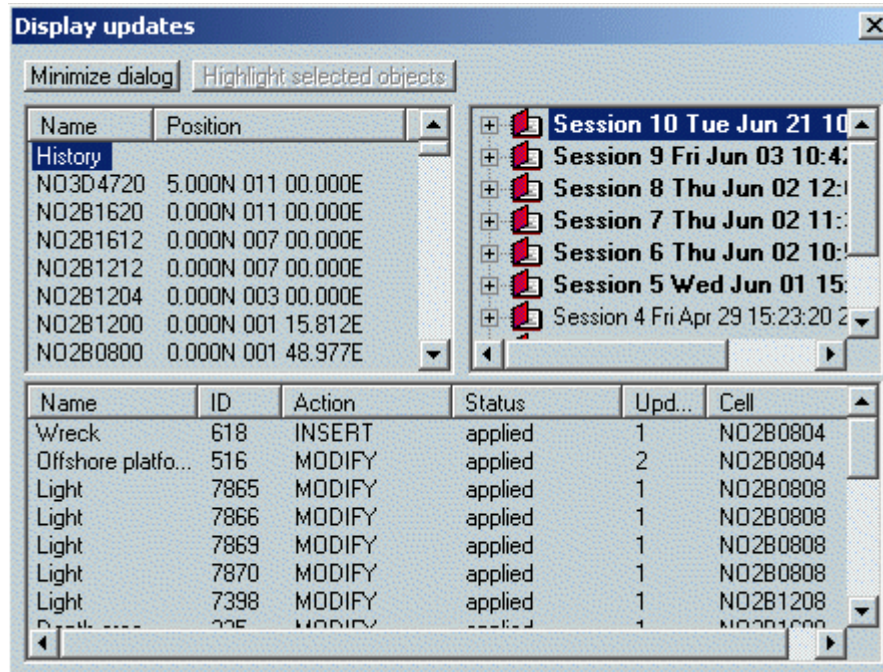


Press the button **Before x update** to see the original chart before update has been applied.

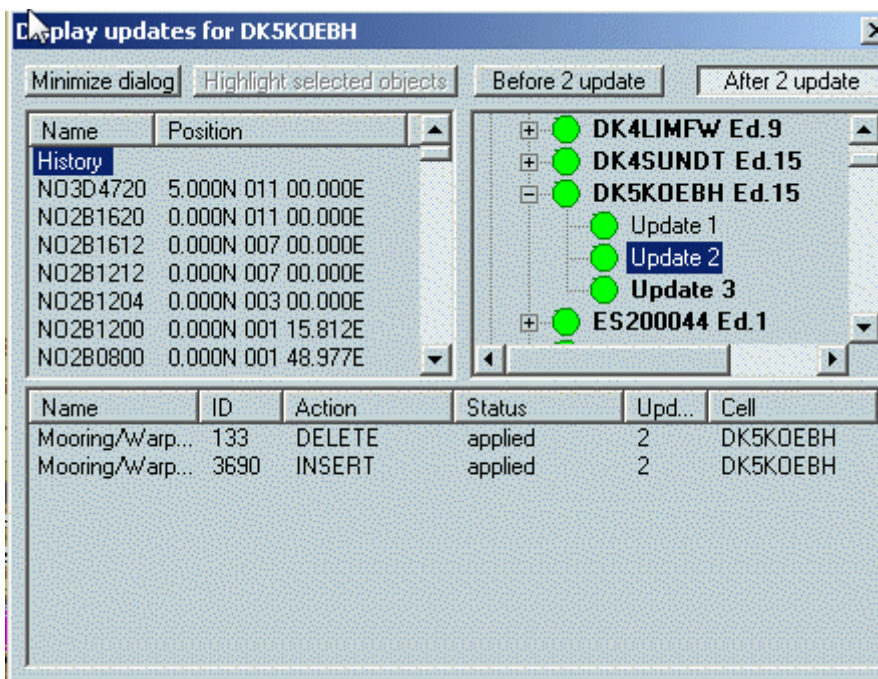


REMARK: The list of cells can be sorted by name by clicking on the column title.

Select **History** to display the list of applied update sessions.



Select one session and expand to display the list of cells updated during the session.





When all updates for one chart or one session are reviewed the name of the chart or the session is no more bold.

To review an update select the update name as it is done on the picture.

ICONS DISPLAYED IN FRONT OF THE CELL NAME

- Deleted cells are marked by red circle with a cross.
- New cell editions which are installed are marked with the sign *, for example: NO2A0404 Ed 3*
- Old cells edition are marked with red circle.
- Current cell editions are marked with green circle.

ICONS DISPLAYED IN FRONT OF THE UPDATE NAME

-  circle in front of the update shows that information about this update is available making possible to review this update.
-  icon is used when update are not available.

UPDATE HISTORY

UPDATE HISTORY OF A COLLECTION

To display the update history of entire collection, press the History of updates button in the Chart Handling dialogue. An individual cell update history is available in the **ENC properties** dialog.

The following list appears:

'FI29GFWP.001.001'	applied	-	on Tue Jun 10 14:09:07 2003
'FI29GFWP.002.001'	applied	-	on Tue Jun 10 14:09:19 2003
'FI29GFWP.003.001'	applied	-	on Tue Jun 10 14:09:30 2003
'FI29GFWP.004.001'	applied	-	on Tue Jun 10 14:09:43 2003
'FI29GFWP.005.001'	applied	-	on Tue Jun 10 14:09:55 2003
'FI3EIR1.001.001'	applied	-	on Tue Jun 10 14:09:55 2003
'FI3EIR1.002.001'	applied	-	on Tue Jun 10 14:09:55 2003
'FI3EIR0.001.001'	applied	-	on Tue Jun 10 14:09:55 2003
'FI3EIQZ.001.001'	applied	-	on Tue Jun 10 14:09:55 2003

Display the update history with information about when the updates have been applied and which cells were updated.

Utility: "Load PL test edition".

The test edition of the Presentation Library allows checking the monitor colour performance with the test data set called ECDIS Chart1. See Technical Manual .

The possible errors, which may occur during the update are listed below.

CANCELLATION UPDATE

When an ENC chart is replaced by another chart a special update file is included in the updates. After update of the ENC chart database the old chart is automatically removed from the collection.

MULTI ECDIS WORKSTATIONS IN LAN

When ENC (or ARCS) chart installation and update is one workstation ECDIS gives the possibility to copy the updated database over the network making automatic the update of all ENC databases of installed together with ECDIS on the LAN.

Proceed as follow:

- Install and/or update ENC database on the planning station
- In Chart handling dialogue press the button **Copy database**
- The list of remote PC running ECDIS and connected to the LAN is listed in the dialogue
- Select the PC(s) on which the ENC should be copied and press Copy Database

ERRORS

The following is a list of errors that can occur during S57 chart management.

Error codes	ID	Error messages	User actions
SSE01, SSE02	-1, -2		Not used
SSE03	-3	Certificate is invalid	Corrupted file with digital signature
SSE04	-4	Format of Certificate is incorrect	
SSE05	-5	SA Digital Certificate file is not available	Get Primar (SA) certificate by Internet
SSE06	-6	SA Digital Certificate is invalid	Get Primar (SA) certificate by Internet
SSE07	-7	Certificate file is not available	User try to install the chart from not licensed media
SSE08	-8	Format of private key is invalid	
SSE09	-9	Signature is invalid	Corrupted file with digital signature
SSE10	-10	Files are different (check after decryption).	
SSE11	-11	Cell Permit file not found	Get permits from Primar
SSE12	-12	Cell Permit format is incorrect	Get new permits from Primar
SSE13	-13	Cell Permit is invalid (checksum is incorrect).	Corrupted file with permits (enc.pmt or permits.txt)
SSE14	-14	Incorrect system date	Not used
SSE15	-15	Subscription license has expired	Renew license
SSE16	-16	ENC CRC value is incorrect	Corrupted ENC file
MERR_CHART_TOO_OLD_FOR_PERMIT	-29	Chart is too old for used permit	Chart is too old for used permit
MERR_CELL_FILE_NOT_AVAILABLE	-17	Cell file is not available	System can not open cell file
MERR_CANNOT_CREATE_ZIPFILE	-18	Decryption process error	Contact MARIS
MERR_PKZIP_NOT_FOUND	-19	At least one service of encryption system is not found. Run Setup program.	Run setup program
MERR_CANNOT_RUN_PKZIP	-20	Decryption process error	Contact MARIS

MERR_CANNOT_UNZIP_CELL	-21	Decryption process error	Contact MARIS
MERR_AUTENT_CELL_ERR	-22	Cell Authentication error	System error. Contact MARIS
MERR_CANNOT_READ_CATALOG	-27	Cannot read Catalogue file	User try to install the chart from not licensed media
MERR_ENVVAR_NOTFOUND	-28	Environment variable not found. Run Setup program	Run setup program
WARNING_SUBS_WILL_EXPIRE	2	Subscription service will expire in less than 30 days	Contact your ENC chart agent or distributor for a subscription renewal.

ENC s57 CHARTS TECHNICAL FEATURES

STANDARDS

ECDIS comprises several hundred software components that are compliant to the IMO Performance Standard for ECDIS, the IHO Standards S-52/ S-57, and the IEC standard 61174.

All high level functions developed by MARIS on top of the chart kernel are also compliant with the regulations listed above.

ENC

It is impossible to alter the contents of the ENC. If an ENC cell is modified the ECDIS detects the modification and rejects the cell during installation procedure.

Official ENC are converted and stored with a proprietary format. The conversion maintains the precision of the data and does not alter the accuracy of the data.

UPDATE

Updates are stored independently from ENC. See User Guide Ch 14 paragraph 3 for the complete description of the folders used to store cells and updates.

CHART AREA AND RESOLUTION

The chart area size in ECDIS is bigger than 270 * 270 mm.

The pixel size of the screen is about 0.28 mm.

PRESENTATION

The ECDIS chart information has been designed to be clearly visible for more than one observer in different light conditions. The symbols are always drawn with the size described in the presentation library.

All superimposed windows are temporary and can be moved and hidden at any time.

The 64 colours used for chart and MMI displays are compliant with S52 Publications.

The redraw of the chart, including scales change or scroll of the chart takes never more than 5 seconds. During the re-generation of the data the display is maintained until the new display is ready for re-draw.

DANGERS AND WARNINGS

The Route Checking function (Route Planning and Route Monitoring) checks all dangers inside the safety zone against the ship's draught and air draught.

ECDIS senses alarms related to both ENC cells and manual updates.

The list of object classes to be warned about by ECDIS is displayed below:

Object	Type	Comments
ACHBRT	ANCHOR	WARNING
ACHPNT	ANCHOR	WARNING
BCNCAR	BEACON	WARNING
BCNISD	BEACON	WARNING
BCNLAT	BEACON	WARNING
BCNSAW	BEACON	WARNING
BCNSPP	BEACON	WARNING
BERTHS DEPTH DRVAL1	BERTHING	DANGER
BOYCAR	BUOY	WARNING
BOYINB	BUOY	WARNING
BOYISD	BUOY	WARNING
BOYLAT	BUOY	WARNING
BOYSAW	BUOY	WARNING
BOYSPP	BUOY	WARNING
BRIDGE HEIGHT VERCCL	BRIDGE	DANGER
BRTFAC	BERTHING	WARNING
CAUSWY	CAUSEWAY	WARNING
CBLOHD HEIGHT VERCLR VERCSA	CABLE	DANGER
CHNWIR	CHAIN	WARNING
COALNE	COAST	WARNING
#CONVYR HEIGHT VERCLR DANGER	CONVEYOR	DANGER
CTNARE	CAUTION	WARNING
CTSARE	CARGO	WARNING

DEPARE DEPTH DRVAL1	DEPTHAREA	DANGER
DEPCNT DEPTH VALDCO	DEPTHCONTOUR	DANGER
DIFFUS DEPTH VALSOU	DIFFUSOR	DANGER
DRGARE DEPTH DRVAL1	DREDGEDAREA	DANGER
DRYDOC	DOCK	WARNING
FAIRWY DEPTH DRVAL1	FAIRWAY	DANGER
FLODOC	DOCK	WARNING
FSHFAC	FISHING	WARNING
FSHHAV DEPTH VALSOU	FISHING	DANGER
GATCON DEPTH DRVAL1	GATE	DANGER
HULKES	HULK	WARNING
ICNARE	INCINERATION	WARNING
ITDARE	INTERTIDAL	WARNING
LIGHTS	LIGHT	WARNING
LITFLT	LIGHT	WARNING
LITMOI	LIGHT	WARNING
LITVES	LAND	WARNING
LNDPLC	LAND	WARNING
LNDSTS	LAND	WARNING
LOGPON	POND	WARNING
MONUMT	MONUMENT	WARNING
MORFAC	MOORING	WARNING
MSTCON	MAST	WARNING
OBSTRN DEPTH VALSOUN	OBSTRUCTION	DANGER
OFSPLF	PLATFORM	WARNING
OILBAR	BARRIER	WARNING
PILPNT	PILE	WARNING
PINGOS	OBSTRUCTION	DANGER

DEPTH VALSOU		
PIPOHD HEIGHT VERCLR	PIPELINE	DANGER
PIPSOL DEPTH DRVAL1	PIPELINE	DANGER
PONTON	PONTON	WARNING
PRDINS	INSTALLATION	WARNING
PYLONS	PYLON	WARNING
RESARE	RESTRICTION	WARNING
RSCSTA	RESCUESTATION	WARNING
RTPBCN	BEACON	WARNING
SLCONS	CONSTRUCTION	WARNING
SLIPWY	SLIPWAY	WARNING
#SOUNDG DEPTH VALSOU	DEPTH	DANGER
#SPLARE	SEAPLANES	WARNING
SWPARE DEPTH DRVAL1	SWEPTAREA	DANGER
TELPHC HEIGHT VERCLR	HEIGHT	DANGER
TOWERS	TOWER	WARNING
TSELNE	TRAFFICZONE	WARNING
TSEZNE	TRAFFICZONE	WARNING
TSSBND	TRAFFICZONE	WARNING
UWTROC DEPTH VALSOU	OBSTRUCTION	DANGER
WIRLNE	WIRE	WARNING
WRECKS DEPTH VALSOU	WRECK	DANGER
ZEMCNT	ZEROMETER	WARNING
dnghlt	DANGERZONE	DANGER
vessel	VESSEL	WARNING
aistar	VESSEL	WARNING

TIME DEPENDENT WARNING

Each ENC object may have a time dependent behavior. Indeed, a specific object can be dangerous during a limited period of time starting and ending at times specified by the data producers.

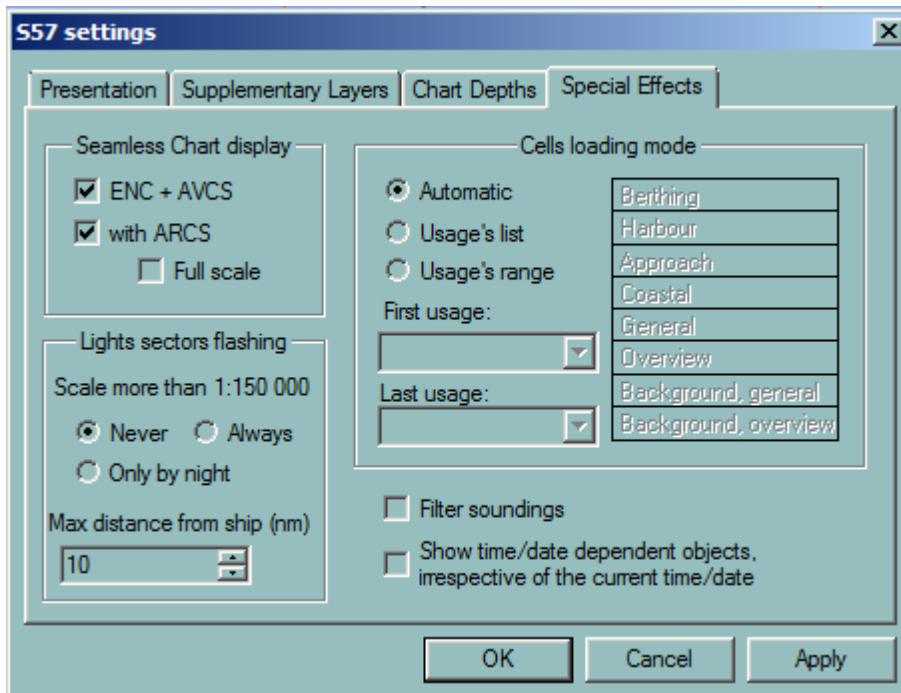
ACCURACY

The accuracy of calculations performed by ECDIS is independent of the characteristics of the display and the calculation error is always less than the data accuracy of the most accurate SENC.

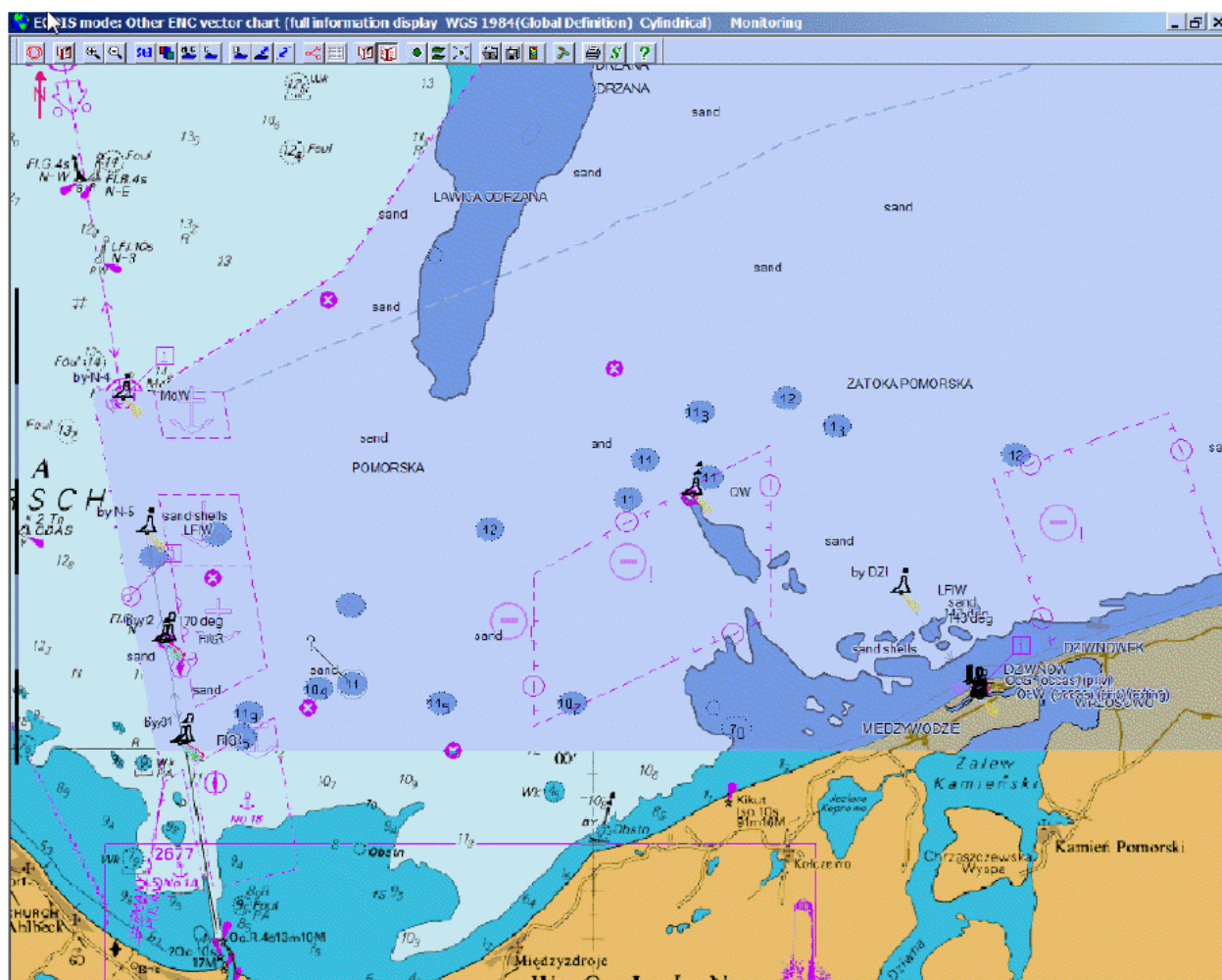
The resolution of the screen gives the limits of the accuracy of the displayed bearings and distances.

SEAMLESS ENC/ARCS

It is possible to display the best chart coverage for the area using all available chart collections. In general the ENC, AVCS and ARCS can be displayed at the same time if **ENC+AVCS** and **with ARCS** are ticked on.



If ARCS charts are installed together with ENC the chart on the screen can be displayed in seamless mode, meaning that for the area of the screen not covered by ENC charts, ARCS charts is used to complete the pictures.



DISPLAY STRATEGY

When ENC cells do not cover all the screen, ECDIS900 looks for an ARCS chart with the closest scale within the limits of 4 times the current scale. ARCS chart is then eventually shifted according to its datum and zoomed according to the scale in use.

If no ARCS chart is found the general ENC background chart is used to complete the coverage.

NOTE See the **ARCS Seamless mode** for more details

C-MAP

C-MAP OVERVIEW

NOTE

Other charts, not official charts, have not been tested by DNV during ECDIS900 Type Approval

ECDIS is compatible with the C-MAP charts, version CM-93 Edition 3, Professional, Professional +, and C-MAP ENC. C-MAP database is vector based charts and the use of C-MAP charts in ECDIS is very similar to the use of ENC data.

C-MAP database covers a large part of the world and is divided in 9 different zones covering a limited geographical area, each of them being divided in smaller areas.

The charts are copy-protected and the user has to order and install the permits for the charts before using them.

For a detailed description of the C-MAP chart coverage and services, access C-MAP web site: http://www.c-map.no/cm93_3.asp and read the chapters C-MAP subscription and chart updates.

Seamless mode can be activated between CMAP ENC and either C-MAP Professional or Professional+

ECDIS is delivered together with a dungle, which is unique and defined by a public ID displayed on top of the dungle.

ATTENTION

During installation of ECDIS be careful to enter the proper the public dungle ID. The ID is essential when CMAP license is ordered.

CHART DATABASE INSTALLATION

The C-MAP database is delivered on a CD called CM93 Edition 3.

To install the C-MAP database proceed as follow:

- Insert the CD in the PC.
- Press the button "ChartHandling" and select the panel CMAP.
- Press the button "Install new database".
- Select the file called CM93-3 located on the C-MAP CD ROM.
- The version number of the database is displayed on the top of the window.
- Press "Install".
- Then the charts are copied on the hard disk and the copy process takes 5-10 minutes.

CHART PERMITS

C-MAP permits are available for a limited period (One year in general) and give access to one or several areas and zones or to the complete database. At any time it is possible to extend the permits by ordering permits for another zone.

A single C-MAP CD contains all world charts and is defined by a version number of the database.

IMPORTANT

The permits are valid for a dongle installed on the PC.

If several ECDIS use C-MAP on board several permits are required (One set per PC) even the user has only to pay for one C-MAP license.

IMPORTANT

When the installed C-MAP database is updated or a new version of the database reinstalled the permits are still valid and can be used with the new version of C-MAP database.

ORDERING THE PERMITS

Prior to the order of the permits the CMAP database has to be installed in ECDIS.

To order the chart permits, send an email with the vessel needs descriptions to chartservice@navico.com

The chart permits are sent back to the ship either by email, by fax or directly by phone.

EXAMPLE OF CHART PERMITS: EFD0CC87C2071FD0

It is the permit for the zone 0 for a unique installation and a C-MAP database version.

INSTALLING THE PERMITS MANUALLY

To install the permits proceed as follow:

- In "ChartHandling" select the panel CMAP.
- Press the button "Add license manually".
- Select the zone or area related to the permits.
- Enter the permits (16 characters)
- Press "Add license".

REMARKS

If several zones or areas have been ordered several codes have been received then repeat the operation for each zone.

The code contained 16 characters and the application activates the button Add License only if the entered code contains 16 characters.

INSTALLING THE PERMITS BY FILE

To install the permits received by file select the file xx.usr and the installation is automatic.

C-MAP SUBSCRIPTIONS AND UPDATE SERVICE

COVERAGE AND ZONES



Zone 0 is the world wide coverage.

User subscribing to CM-93/3 database receives a new CD-ROM every four months. During one subscription cycle i.e. one year the user receives three CD-ROM from C-MAP.

The user shall perform the installation of the database and use the same permits all along the year for each new CD.

LICENSE STATUS

In ChartHandling dialogue the status of the installed license is displayed including:

- Zone or area ID
- Permits
- Expiry date for the permits

To renew the chart permits before expiry date send to MARIS an order for license renewal. A renewal code will be sent back and entered using the button "**Renew All Licenses**".

CHART UPDATE

There are different possibilities to update C-MAP chart database

- **Update by CD**
- **Update by Internet** (http connection)
- Update by Email

Copy Database function allows update other ECDIS station by LAN after Update is completed.

COMMUNICATION CHANNELS

The channel used for the communication depends on the communication system architecture.

The updating service has been tested by using:

- Satellite systems Iridium or Inmarsat
- GSM communication
- High speed Internet connection

UPDATE BY CD(DVD)

A new C-MAP CD containing all updated C-MAP charts is automatically sent to each C-MAP subscriber. Proceed as described in **Chart update**.

REMARK

The chart permits are still valid and must not be re installed.

UPDATE VIA THE INTERNET (HTTP)

Proceed as follow:

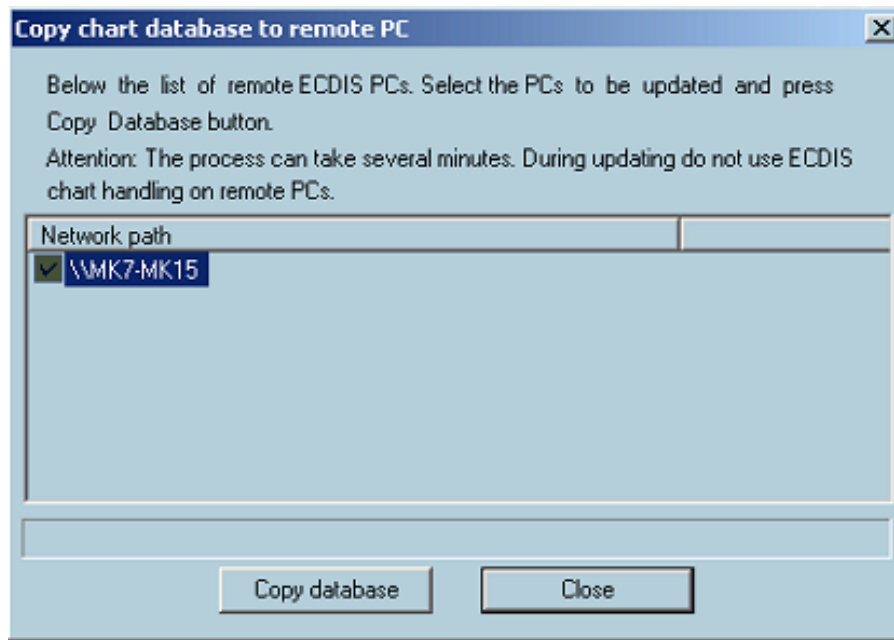
- Establish the communication to your Internet provider.
- Press the button "Get update from Internet" in "Chart Handling".
- Then the procedure is automatic and several messages displayed in the Messages part of the dialogue give information about the process.

Copy Database function allows updating other ECDIS station by LAN after Update is completed.

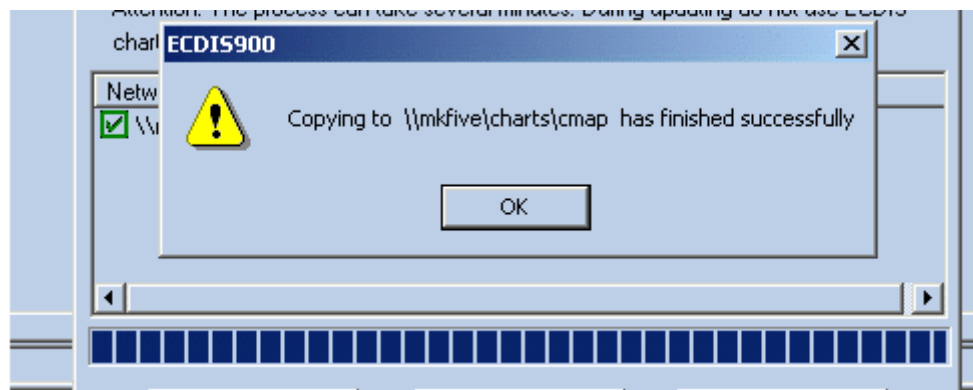
COPY DATABASE

After Internet or Email update is completed, in case of dual ECDIS configuration, Copy database function allows synchronising remote ECDIS by LAN.

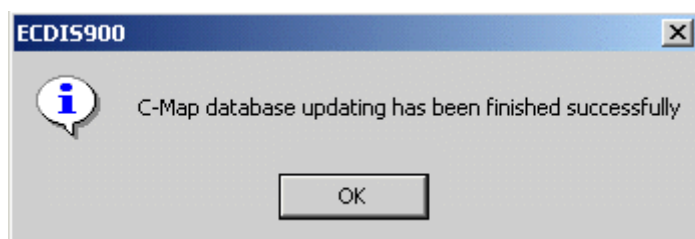
- Select Accessible path and press "Copy database"



- Press OK when finished



- Acknowledge Database transferred on the remote ECDIS



REMARK

On Remote ECDIS, after Copy Chart Database is used :

"Updated Objects of Database" can be displayed.

"History of Updates" is not available.

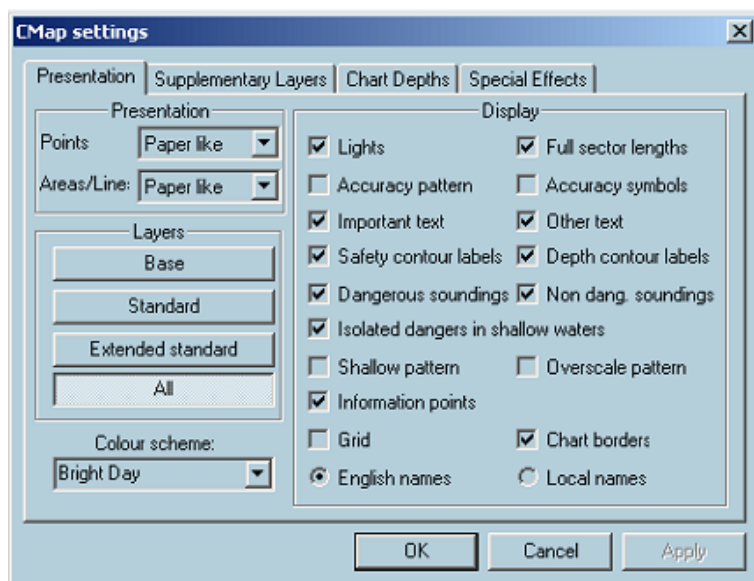
USING C-MAP CHARTS

Select C-MAP by either right click menu "Other charts" and selection of CMAP or by using the hot key F9 properly pre programmed or by double clicking on the world database name in the ChartHandling dialogue panel CMAP.

C-MAP database is used in the same way than official ENC data with very little difference. For more information about vector chart in ECDIS refer to the chapter S-57 charts.

CHART SETTINGS

Select S52 view to display the vector char using official Presentation Library or C-MAP view to display with C-MAP presentation.

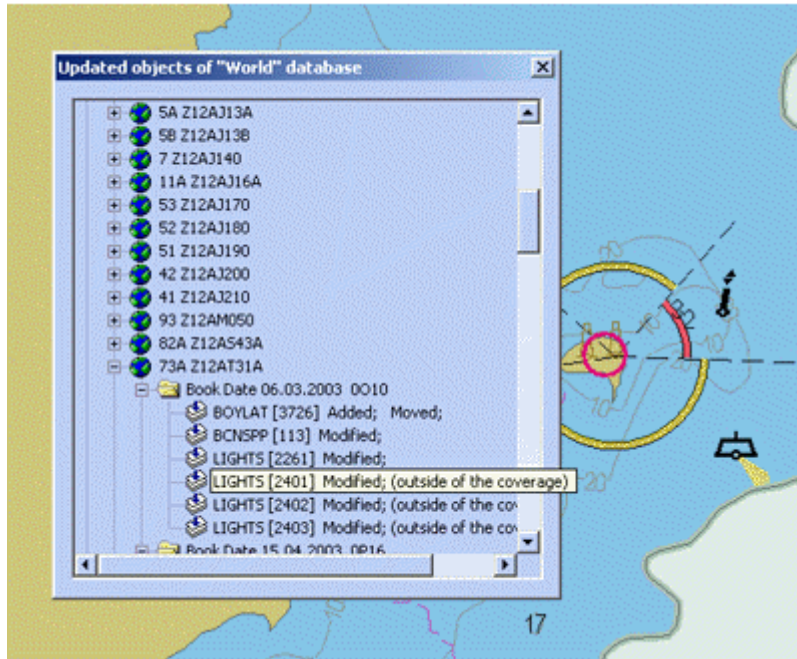


HISTORY OF UPDATES

Press the button "History of updates" to get all information regarding the updates applied to the database

DISPLAY UPDATED OBJECTS

Press the button "Display updated object" in Chart Handling to see the changes on the chart. Select the update ID to be displayed by choosing the HO and the ID of the update.



The selected update is highlighted with pink circle and color.

SEAMLESS

It is possible to display two C-MAP databases with official (ENC from C-MAP) and non-official ENC data (C-MAP Professional or C-MAP Prof. Plus) in seamless mode.

Both databases:

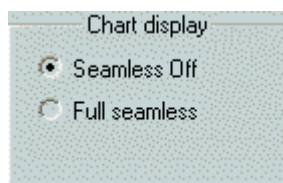
- ENC from C-MAP (SENC format).
- C-MAP World Professional or C-MAP Professional. Plus (SENC format).

have preliminarily to be installed in usual way from "C-MAP" page of "Chart handling" dialogue.

If both World Professional or C-MAP Professional. Plus are installed, only Professional Plus database will be used in chart display in seamless mode.

If C-MAP Professional Plus database is not installed then World Professional database will be used in chart display in seamless mode.

Seamless mode can be switched on in "Special effects" page of "Chart settings" dialogue by "Full seamless" radio button and switched off by "Seamless off"



Ship

SHIP OVERVIEW

POSITIONING MODE

The ECDIS receives the position information from the GPS and course and speed data from gyro/log sensor. In case of sensor failure the ECDIS switches automatically to the **Dead reckoning** or the simulation mode. The **Predictor module** calculates and displays the future position of the ships

SHIP PROPERTIES

The **Ship properties** dialogue allows customizing the display of the **ship's icon** and setting different parameters.

GPS AND DATUM

The GPS (or dGPS) installed on board ship sends information about ship's position to the ECDIS.

IMPORTANT

GPS sensors send the positions calculated with a datum selected by the user.

- **When the GPS sends the NMEA message DTM including information about the datum used by the GPS, ECDIS converts automatically the GPS positions to the datum used in the current chart.**
- **When the GPS does not send datum information ECDIS assumes that the GPS uses the WGS84 Datum and converts the ship's position to the datum used in the chart.**

S-57 charts are displayed in a Datum / Projection selected by the operator and ECDIS ensures the consistency between the datum used by the chart and the position system within the limits described above. To modify the datum or the projection of the S-57 chart, see chapter S57.

ARCS charts are displayed in the Datum / Projection of the paper source charts and ECDIS automatically converts the ship's position to the current Datum / Projection.

POSITION OFFSETS

The position of the ship is monitored in the ship's position panel.

To adjust the position manually, click right button in the panel and activate the appropriate menu and enter the latitude and longitude shifting (Negative values for South and West).



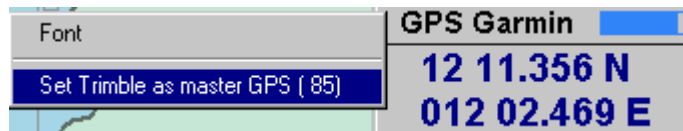
When offsets are entered, the ship's position panel is displayed in yellow and the latitude and longitude offsets are clearly indicated.

Lat: 44 19.310 N
Lon: 002 01.600 E
Offset: (0.010', 0.200')

To cancel the position offset activate the menu **Clean position offset**.

MULTI GPS

ECDIS may receive information from several different GPS sensors and the master GPS may be selected by clicking right button in the Navigation mode indicator.



All calculations are made using the position of the master GPS. The second GPS position is used to check the accuracy of the master GPS positioning.

GPS QUALITY

When the GPS sends the information about quality of the positioning, the quality is displayed in the GPS indicator as a bar graph.



When the bar is entirely blue the quality is optimal.

MASTER GPS AND QUALITY CONTROL

When the slave GPS has a better reception quality than the master one, ECDIS warns the navigator by displaying a flashing red symbol in the GPS indicator. Then the master GPS can manually be selected as described above.

MULTI ECDIS WORKSTATIONS AND SETTINGS SYNCHRONIZATION

When ~~several ECDIS~~ are connected on the LAN ECDIS900 the ship's parameters and safety values are synchronized.

SHIP'S LIBRARY

This module is specially designed to suit the Pilot needs. The Pilot builds his own Ship's profile database and can select the proper profile when entering a ship.

DEAD RECKONING

The GPS mode is automatically switched to Dead Reckoning (D.R.) mode in the case of loss of signal from the GPS.

In the D.R. mode, ECDIS calculates the ship's position according to the last position received and the course and speed acquired by ECDIS.

IMPORTANT

Dead Reckoning is possible only when ECDIS receives course and speed information from the gyro/log sensor.

When ECDIS does not receive any course and speed information the Dead Reckoning mode is deactivated and the Simulation mode can be used to plot the position of the ship.

ECDIS automatically switches back to the GPS mode when communications with the GPS are restored.

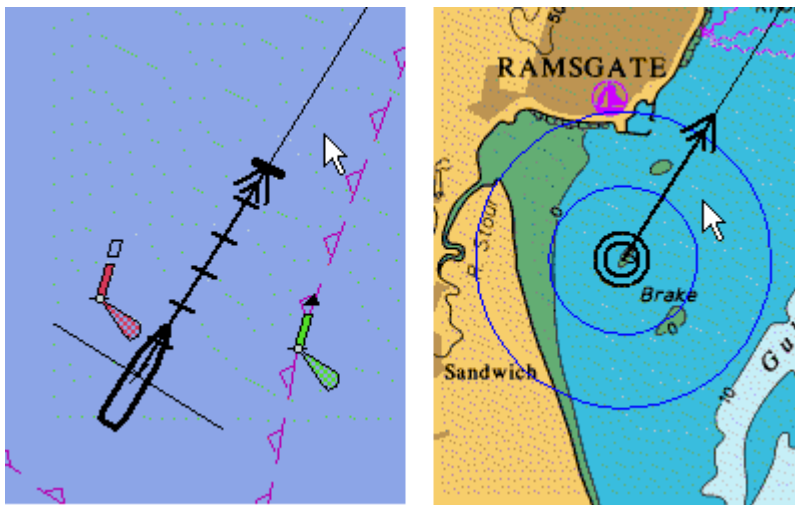
For additional information about Dead Reckoning see the paragraph **Ship Properties DR** and for complete information about the ship, see **Ships Properties**.

SHIP SYMBOLS

The ship's symbol is displayed either with a scaled icon or with ECDIS symbol.

The length of the vector is six minutes and each circle indicates one minute.

The GPS antenna is located at the lines cross.




When a second GPS is connected, it is possible to select which GPS is the master. Then the ship's icon is displayed at the Master GPS position. The second position given by the other GPS is displayed on the chart using a small cross.

SHIP PROPERTIES

SHIP PROPERTIES

To view or amend ship's properties, either

- Click on the Ship properties icon on the toolbar .
- Or click right on the ship's icon and select Properties from the pop-up menu.
- Or locate the cursor and top of the ship and press F4 twice.

The Ship parameter window has the following tabs:

- General
- Voyage
- DR
- Track
- Alarms
- Display

- Shape
- AIS

GENERAL

Enter the name and select the type of the ship with the pop up menu.

Type the ship's parameters: Length, Width, Draught and Air Draught.

The two fields **Call Sign** and **IMO number** can be edited but they are protected by password. See **System protection** for details.

The ship parameters are transferred to AIS if ECDIS is interfaced to an AIS.

VOYAGE

Select the current Navigation Status and the Type of cargo with the pop up menus.

Enter the number of persons on board.

The two fields Destination and ETA are editable when the option Manual entry is activated.

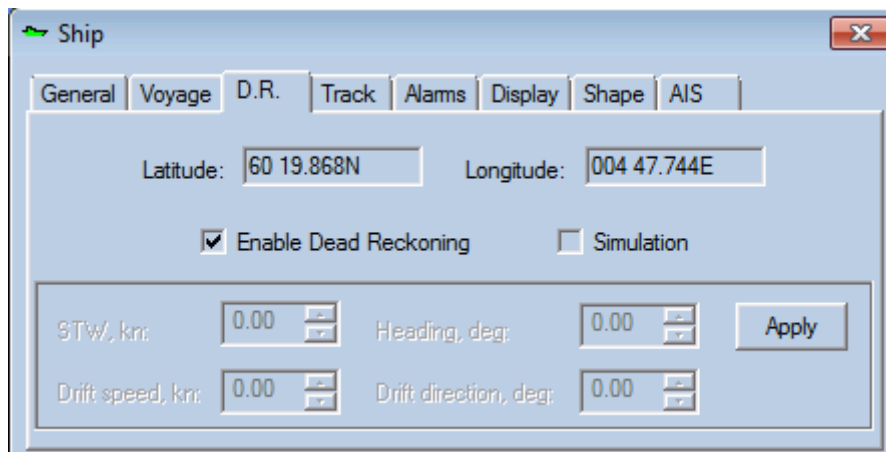
When Manual entry option is OFF the Destination and ETA are automatically filled in when a route is activated. The destination is the destination entered in the Route Properties and the ETA is continuously updated by ECDIS.

This information is transferred to AIS if ECDIS is interfaced to AIS device and if the option "Send data to the transponder" is activated in Sensor Monitor, sensor AIS Transponder.

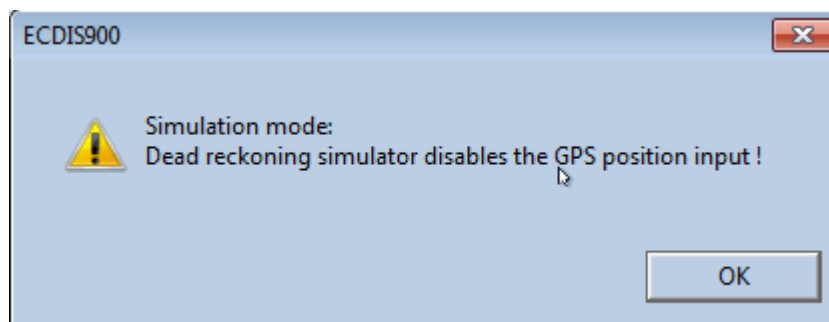
DR

Click on the D.R. bookmark to bring the D.R. page to the front.

Toggle **Enable Dead Reckoning** to switch D.R. ON or OFF.



When the Dead Reckoning mode is enabled the following warning is displayed:



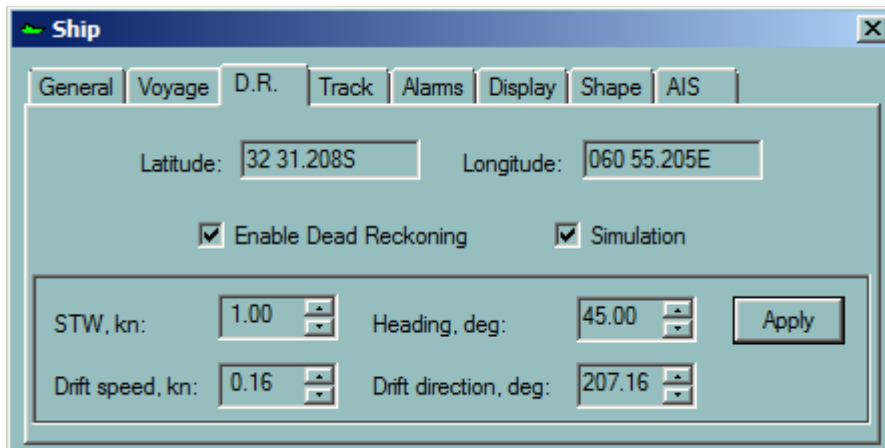
In the D.R. mode, the ship's position is calculated from the last position acquired from the GPS and from the current values of heading and speed. When the heading and speed values are no longer available, the D.R. mode is no more available and ECDIS switches to Simulation mode.

When the D.R mode is active, the values Ship Position can be adjusted at any time on top of the page.

SIMULATION MODE

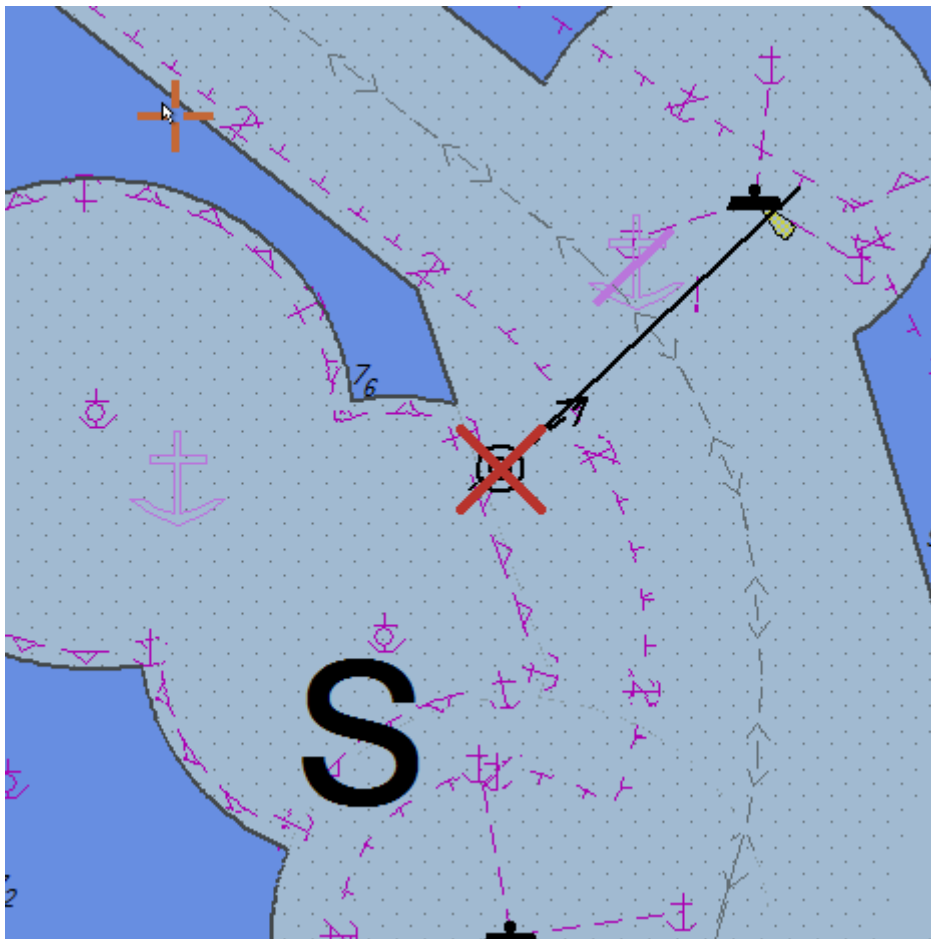
Simulation must be toggled ON before Heading and Speed can be changed.

Adjust Headings, STW, Drift Speed and direction by entering new values using the keyboard or toggling the up and down arrows. From these values, the COG and SOG are calculated.



The 'Ship' configuration window has tabs for General, Voyage, D.R., Track, Alarms, Display, Shape, and AIS. The 'Track' tab is active. It displays Latitude: 32 31.208S and Longitude: 060 55.205E. There are checkboxes for 'Enable Dead Reckoning' and 'Simulation', both of which are checked. Below these are input fields for STW, kn: 1.00, Heading, deg: 45.00, Drift speed, kn: 0.16, and Drift direction, deg: 207.16. An 'Apply' button is located to the right of the heading field.

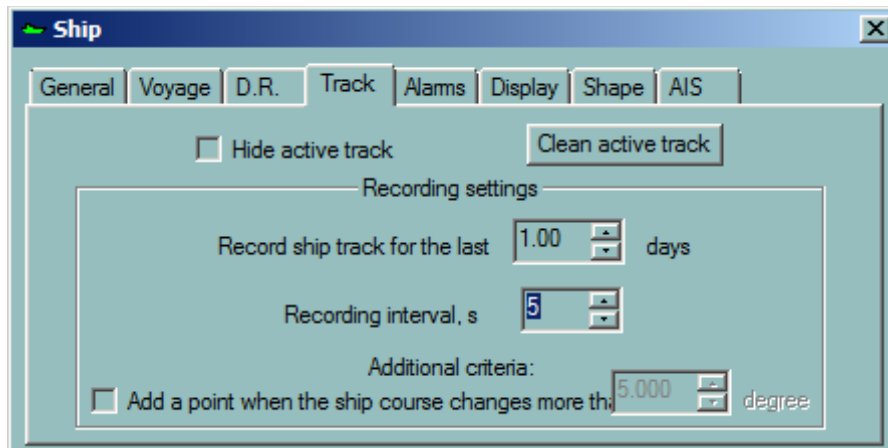
In simulation mode the ship icon is displayed with a red cross on top of the icon to underline the simulated position and the ship position is no more displayed in the position panel.



TRACK

Click on the **Track** tab to bring the Track page to the front.

Adjust **Interval**, the time between recordings, via the keyboard or pressing up and down arrows.



ADDITIONAL CRITERIA

Tick **Add a point when the ship's course changes more than** ON and enter a value in degree (an angle) in order to control more efficiently the track recording as and when the course changes

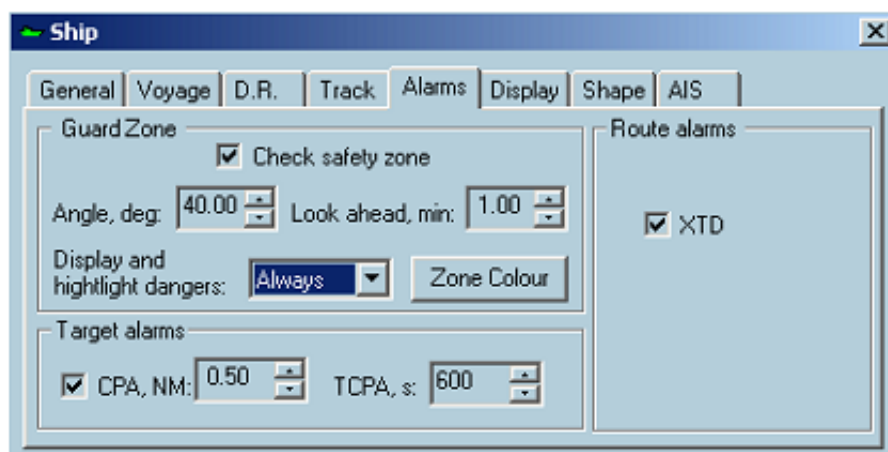
In the example, ECDIS records one point every 15 seconds plus a point each time the ship's course changes by more than 5 degrees.

NOTE

Selecting a small time interval will generate a very big track file containing lots of points that are time consuming to display. The above example avoids making such a big file, without losing important ship track information.

ALARMS

Click on the **Alarms** tab to bring the Alarms page to the front.



The **Check safety zone** alarm is generated when the **Checking ship alarm zone** is crossing a safety contour and/or dangerous chart objects. The alarm is always active when operating in the **Monitoring mode**. See the **Check route** section for details.

The ECDIS regulations admit to disable the **Collision avoidance alarm** since it is the ARPA system function. See the **Target** section for details.

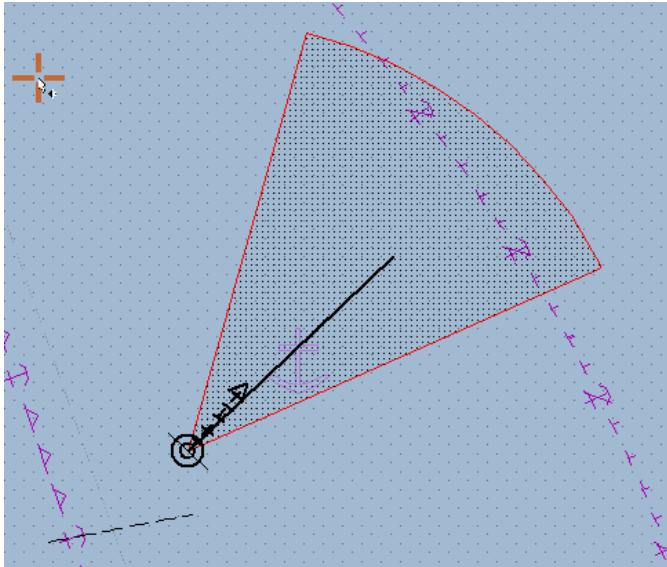
The **XTD alarm** (cross track distance) is always active when operating in the **Operational mode**.

GUARD ZONE

A safety zone can be set in front of the ship for automatically monitoring inside the defined zone and the vessel's crossing. The different dangers are:

- ENC chart object which triggers alarm according to the safety values entered by the operator
- User defined alarm

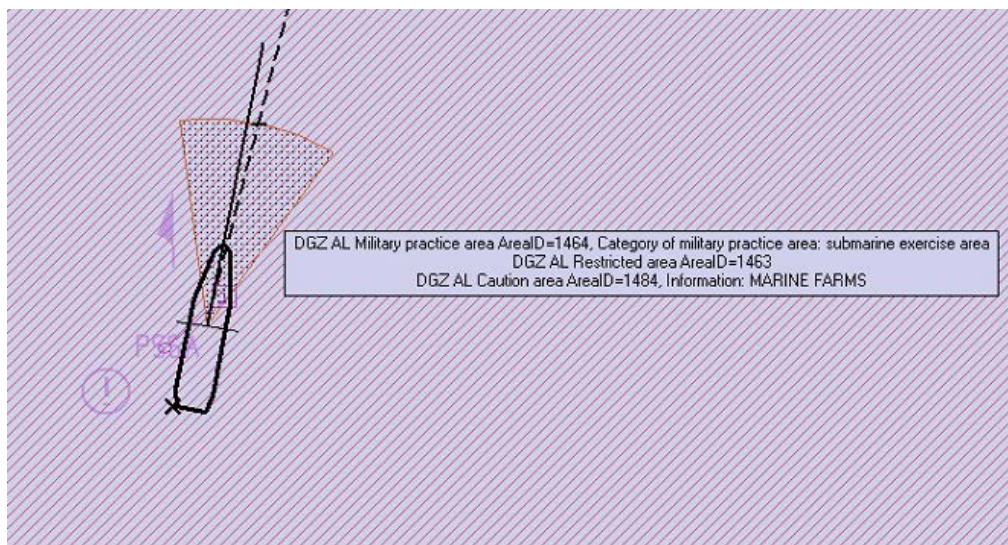
The zone is defined as a cone by an angle and a distance.



Switch Check safety zone ON to activate this function.

Set values for Angle and Distance to define the shape of the zone, a cone.

IMPORTANT Click inside a ship guard zone to display a list of dangers and simplify understanding of alarm reasons.



DISPLAY AND HIGHLIGHT DANGERS

- Click on field to display menu of options of when to activate alarms
- Click on the Zone Colour button to set the colour of the zone.

OTHER ALARMS

- CPA Closest point of approach
- TCPA Time to closest time of approach
- XTD Cross Track Distance

To enter the alarm criteria (XTD limits, the waypoint arrival limit, the first and second alarms time) activate the dialogue Option, panel Routes.

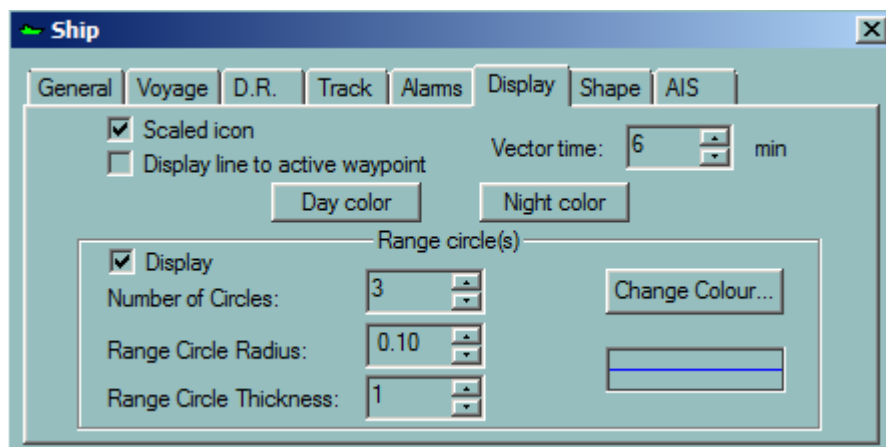
For a detailed description of alarms see chapter **Alarms**.

DISPLAY

SCALED ICON

Check on the check box Scaled Icon to display the ship icon with its right scale.

Choose to display or not a line to the active waypoint.



Set the desired Vector time by toggling the up and down arrows. The length of both the ship's vector and the target's vector depends on the ship's speed and the Vector time.

Check on Display to display Range Circle(s) around the ship.

Set values for:

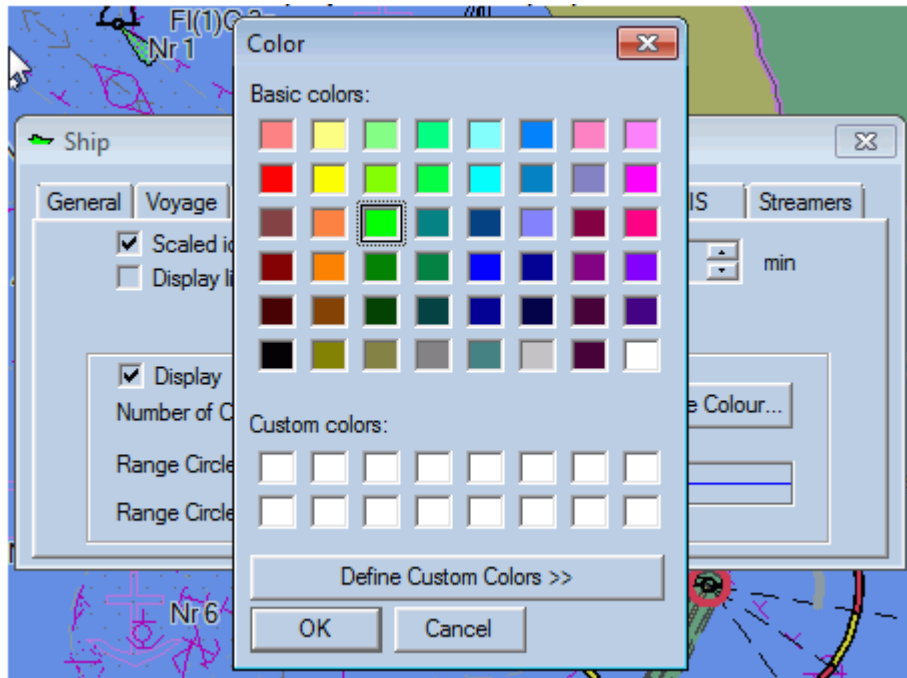
- Number of Circles
- Range Circle Radius
- Range Circle Thickness

Click Change colour and set the colour of the line for the circles. The current colour and thickness are visible in the display box.

When operating in the Service mode, the ship display color can be modified.

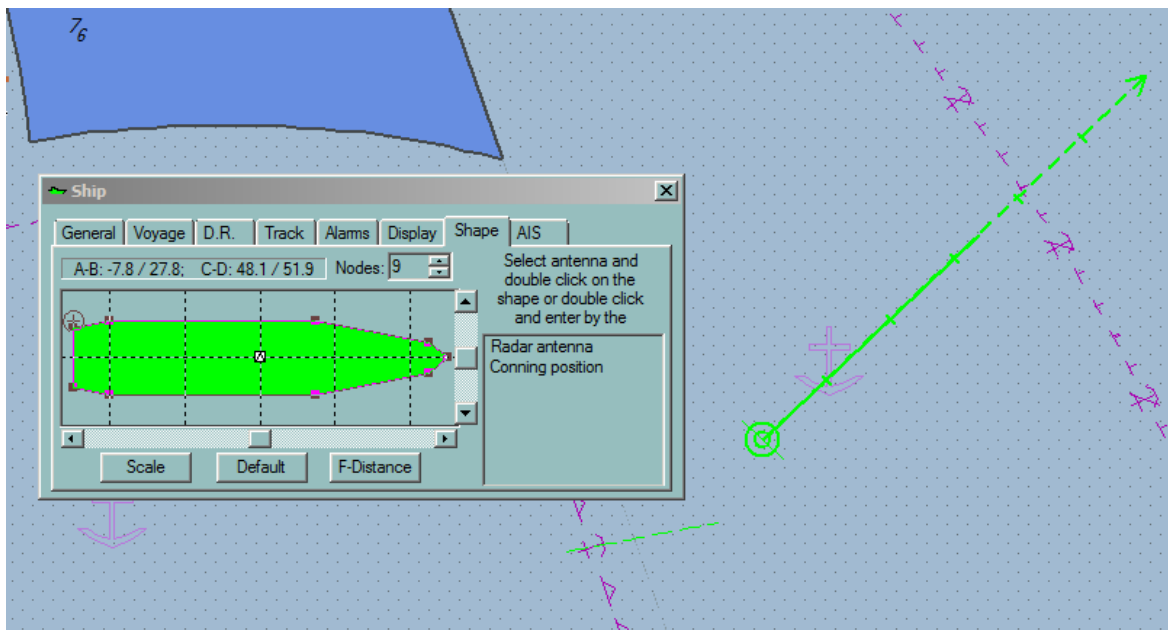
COLOUR SETTINGS

The colour of the ship symbol and shape plot are user defined. To set the colour click the **Day color** button. The colour dialogue appears



Select the desired color and press OK.

As the result the ship symbol colour and shape plot colour are changed.

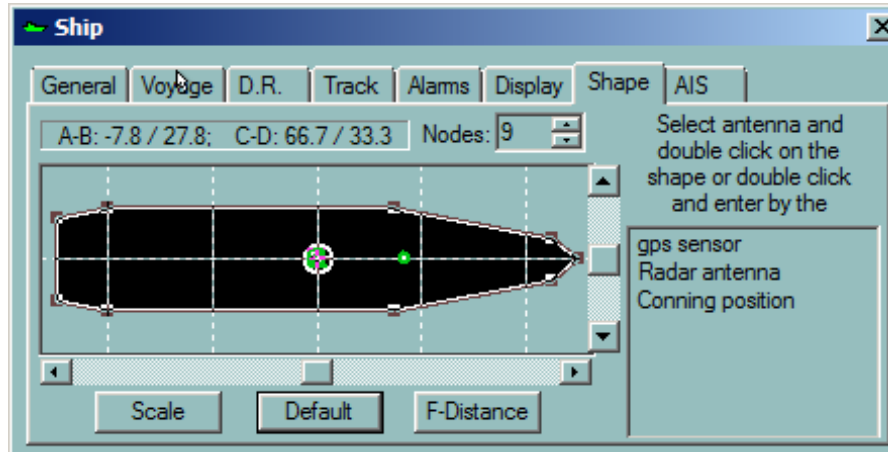


To change the colours for the night mode repeat these actions pressing the **Night color** button. Keep in mind that the changes will be visible when the night mode is on.

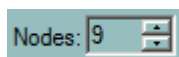
SHAPE

GPS ANTENNA POSITION

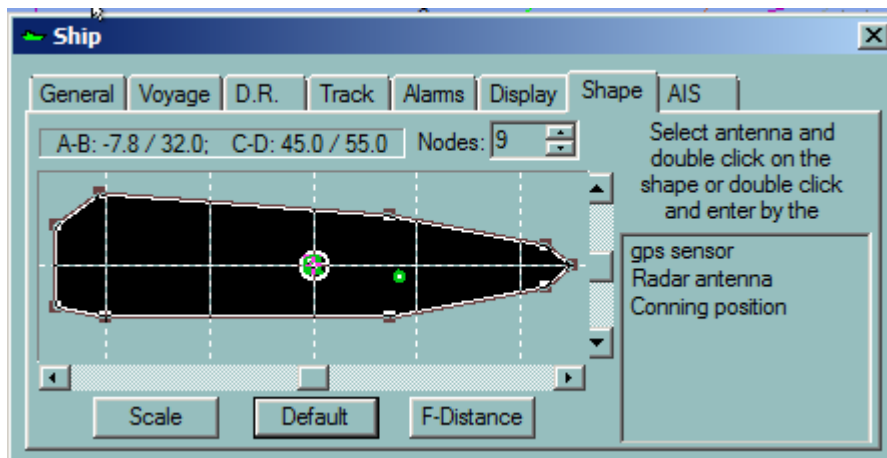
Click on the **Shape** tab to bring the Shape page to the front.



Set number of nodes manually.



To change a node location, click on the node on the shape plot and drag it. The node coordinates will change.



Click **Default** to set values to the default values.

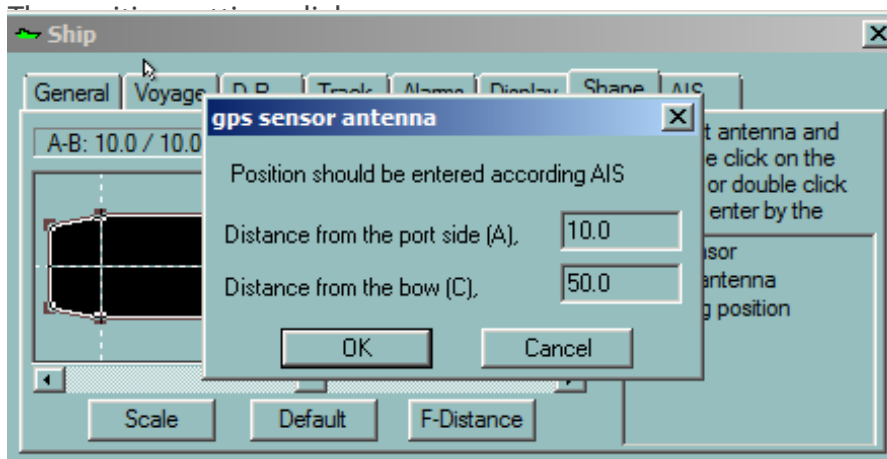
Click **Scale** to reset the scale of the window to enable the ship to fit inside.

GPS ANTENNA

The **GPS antenna** is displayed as a circle with a cross inside it.

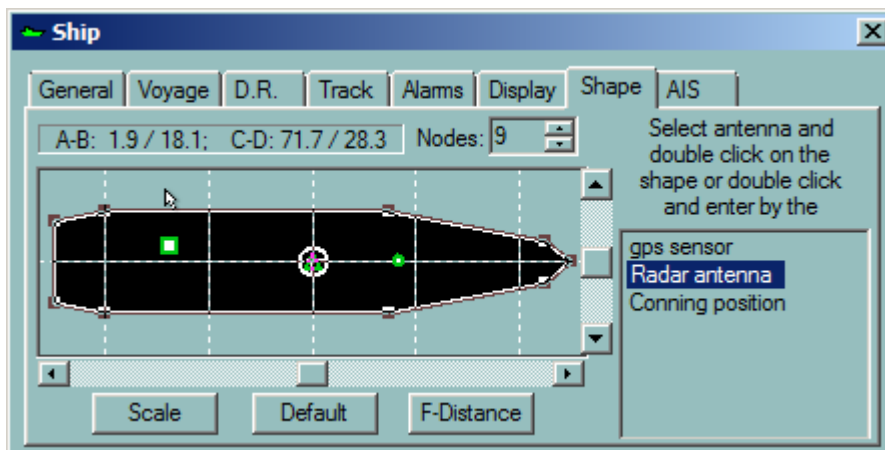
There are two ways to change the antenna position:

1. Double click on the antenna's name in the list.



Set the position and click OK

2. Click on the antenna's name in the list selecting it.



When the item is selected double click on the desired position within the shape plot . The antenna's symbol changes its position.

The position of the antenna can be monitored within the box located at top right-hand corner of the window.

A-B: 28.3 / -8.3; C-D: 70.9 / 29.1

Where:

- **A** is the distance from the portside
- **B** is the distance from the starboard
- **C** is the distance from the bow
- **D** is the distance from the stern

Fixing a precise GPS antenna position is very important with regard to displaying the ship in her correct position, particularly when the chart is displayed with a precise scale and the ship at her correct scale.

IMPORTANT

In case of **two GPS** connected to ECDIS, the selected GPS offset applies only to the master GPS. To enter an offset for the second GPS, first select the second GPS as a master and then enter the offset. ECDIS will automatically use the appropriate offset when the master GPS is selected.

NOTE This operation is available in the Monitoring station mode only

RADAR ANTENNA

The Radar antenna is displayed as a white square. Its position changes the same way as the GPS antenna's one.

CONNING POSITION

The conning position is used as origin for VRM/EBL tool, origin of ship vectors. The conning antenna's symbol is triangle. Its position changes the same way as the GPS antenna's one.

AIS TRANSPONDER

The AIS transponder symbol is cross.

TURNING

Click on the **F-Distance** button to enter the value of the distances the ship makes before turning.

Please fill in the table of distances the ship makes from the time you activate a turn til time the ship actually starts to turn. This distance is used in Active Leg tool for precise navigation in narrow waters and depend from the ship speed.

Select loading profile: Ballast

	Ballast	Medium	Loaded	
Speed 5 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="50.0"/>	m
Speed 10 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="100.0"/>	m
Speed 15 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="120.0"/>	m
Speed 20 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="150.0"/>	m
Speed 30 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="180.0"/>	m
Speed 40 kn	<input type="text" value="70.0"/>	<input type="text" value="70.0"/>	<input type="text" value="200.0"/>	m

Pivot point distance from the bow
It's used as origin for XTD calculation

metr from the bow

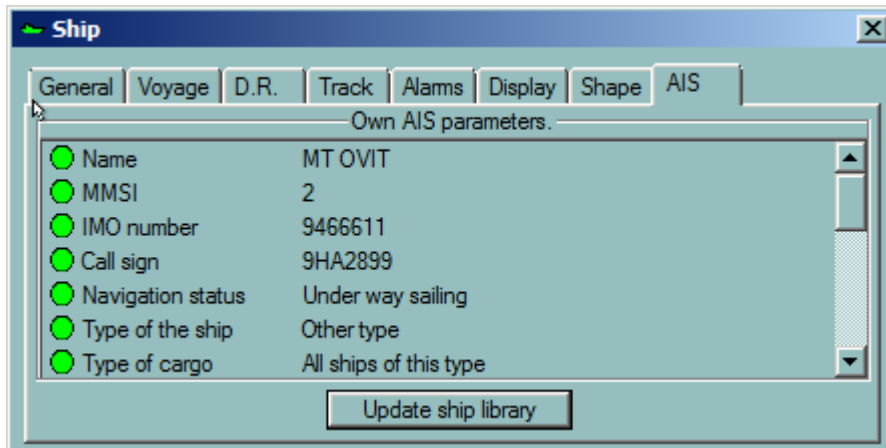
This table is used in the Predictor module to calculate the future position of the ship when it turns.

For more details see the chapter **Predictor**

AIS

If AIS is connected to the ECDIS workstation, ECDIS900 receives from the transponder the own ship's parameters set up in the AIS transponder.

The information is displayed in the AIS panel and the green icon displayed in front of the parameter means that ECDIS900 setting is the same than AIS setting for the selected parameter. If the icon is red the parameter in AIS is different from the parameter in ECDIS900.



If any discrepancy occurs, ECDIS900 proposes to synchronize the data by using in ECDIS900 the data setup in AIS.

SHIP PARAMETERS SYNCHRONIZATION

When several ECDIS workstations are connected in a network, ship's parameters and chart settings are synchronize regularly.

The following list of parameters is broadcasted from the monitoring station to planning stations:

- Ship identification (ship name, call sign, IMO number)
- GPS name and GPS position offset
- Ship dimensions and shape
- GPS and radar position
- Alarm settings
- Safety settings (Draught and Air Draught).

SHIP PROFILE MANAGEMENT

This module is specially designed to suit the Pilot needs. The Pilot builds his own Ship's profile database and can select the proper profile when entering a ship.

A ship's profile contains all ship's and safety parameters settings including:

- Ship's name, call sign, length, width, draught etc.
- Position of GPS and Radar antennas
- Alarms settings
- Safety contour, depth, height...

CREATING A SHIP'S PROFILE

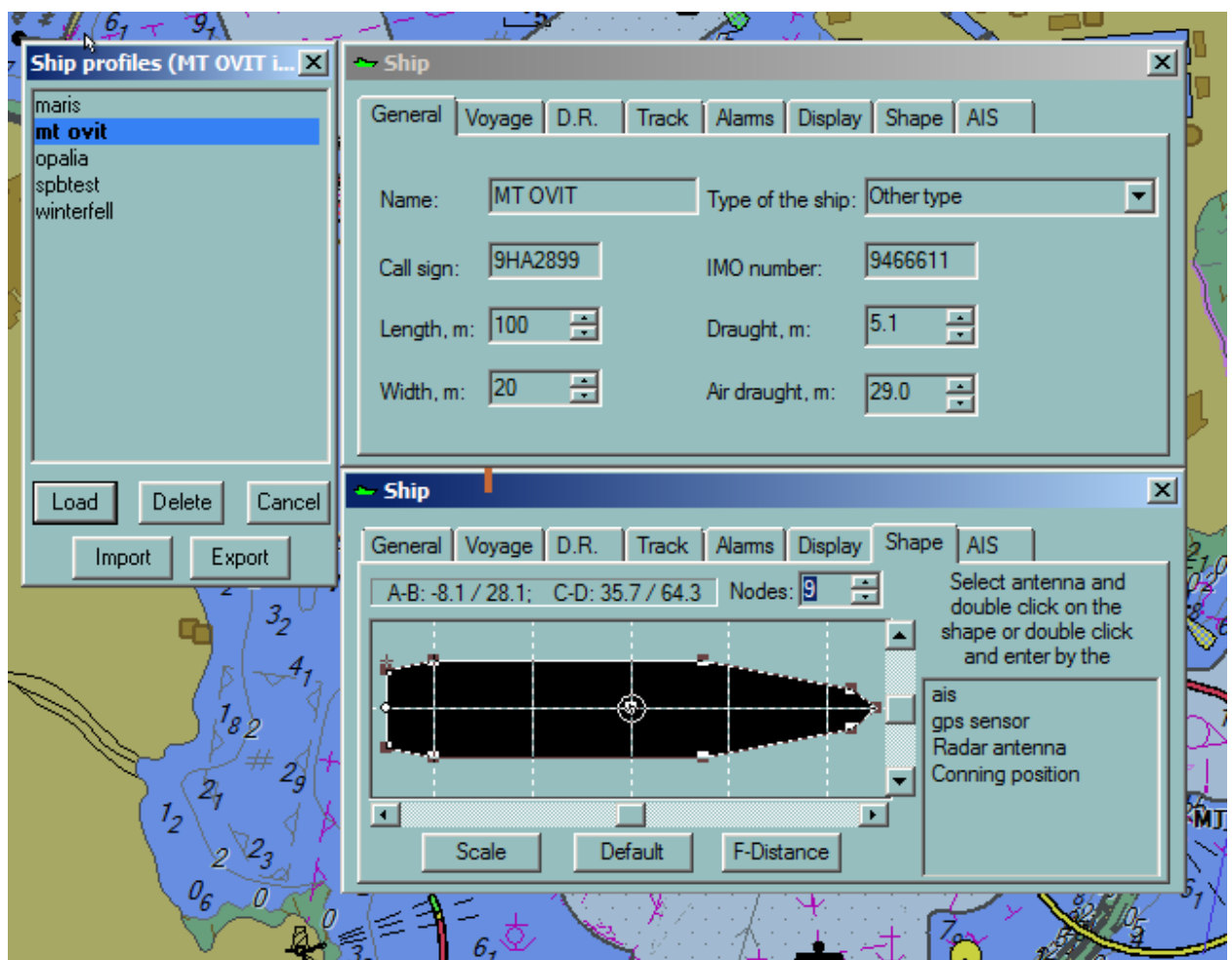
Each profile is defined by the ship's name.

To create manually a new profile:

- Enter in the ship's parameters dialogue, panel General all information related to the ship:
 - Name
 - Call sign
 - Draught...
- In the panel Alarm select the appropriate Alarm settings.
- In the panel Display select the way the ship will be displayed.
- In the panel Shape define the GPS antenna and radar antenna position, the shape and colour of the ship.
- In the Chart Setting dialogue, panel Technical enter the values for the safety parameters.

When a new ship's name is entered in the system, ECDIS900 creates automatically a new record with is accessible by ship's name.

It is possible to create automatically a new profile from AIS target data when ECDIS900 is interfaced with AIS transponder. Right click on the AIS icon and select the item menu **Save in the ship library**.



SHIP'S PROFILE EDITION

To check the ship parameters of each ship stored in the ship's profile database move the cursor on top of each name and a window will displays the main parameters.

To edit the ship's profile double click on the name or select the name and press Load to edit the ship in the ship's properties dialogue.

SHIPS' PROFILE SELECTION

Right click on the button Ship's parameters gives access to a list of ship's profiles. To select a ship, select its name in the list and press load.

Then all settings are changed and the chart is displayed accordingly to the safety parameters.

UPDATE OF OWN SHIP'S DATA

It will be possible to update ship data in the ship library by own-ship data received from the pilot plug of the ship's AIS transponder.

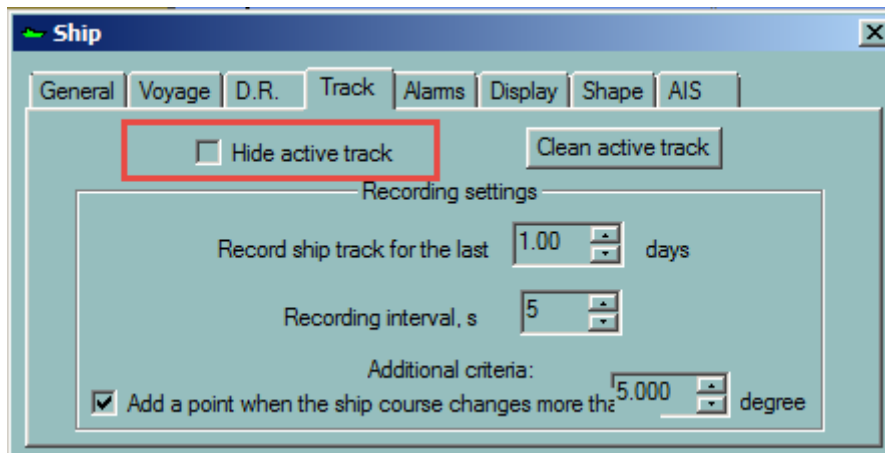
When receiving own ship data from the pilot plug for the first time after connecting to an AIS-transponder, the software checks whether there are any discrepancies between these data and the data (if any) of the same ship stored in the ship library.

If there are any discrepancies, or if the ship is not already present in the ship library, the software presents data and discrepancies to the user, and ask whether the data in the ship library shall be updated. The user has the option of selecting whether either existing data in the ship library, or data received by the AIS shall be used as own-ship data for the following pilotage.

Tracks


TRACK OVERVIEW

The Track function is always active, but can be invisible with ticking on the Hide active Track checkbox



Track data is recorded within the time interval defined by a user. The period can be set from 0.1 to 15 days

REMARK

To access the **Ship Properties** dialogue either click right on the ship's icon or press the button  on the toolbar.

The Ship parameter window is displayed.

ADDITIONAL CRITERIA

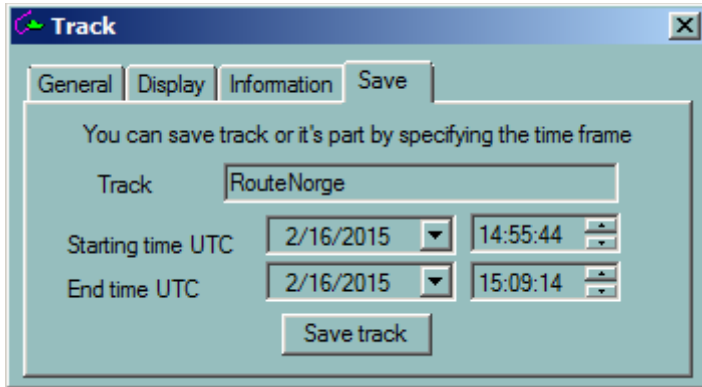
Switch **Add a point when the ship's course changes more than** ON and enter a value in **degree** (an angle) in order to control more efficiently the track recording as and when the course changes.

A track is a set of points recorded from the ship's positions at regular interval. The **tracks can be saved** on the hard disk and **historical tracks can be loaded** and displayed on the chart on request.

Recording additional information with the track is possible with **Track Properties** facilities and a **route can be created** from an historical track.

SAVING TRACKS


To save the selected track, right click on the track and select the **Properties** item from the menu. Then select the **Save** tab.



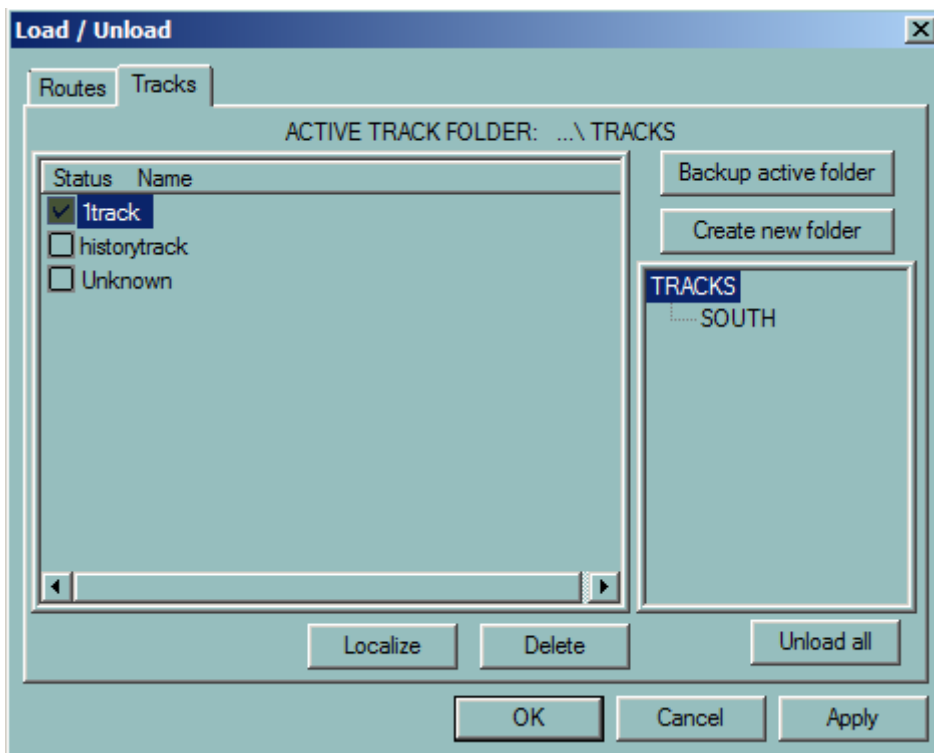
By default the saved track has the name of the route last used by the ship. Change the name and correct the dates if needed. Then press **Save**.

The track is saved and available to download from the **Load** dialogue.

LOAD/UNLOAD/DELETE TRACKS

To load/unload routes or tracks click on the **Load/Unload objects** icon 

The list of tracks may be sorted, either ascending or descending, by name or date, by clicking on the column headings. Alternate clicks will sort ascending and then descending.



The tracks can be arranged in different folders, which can be created with the button **Create Folders**.

A track can be copied from one folder to another one. See **Route Folder** paragraph.

LOAD A TRACK

To load a track(s), select one or more tracks from the list displayed by either clicking on the name or in the check box and then click either OK or Apply.

To centre the chart on the selected track select the track by clicking once on the name and press Localize.

UNLOAD A TRACK

To unload a track(s), select one or more tracks from the list displayed by either clicking on the name or in the check box and then click either **OK** or **Apply**.

NOTE Unload can also be performed by clicking right on the actual track line and clicking Unload in the pop-up menu

DELETE A TRACK

To delete one or more tracks from the database, select the track(s) from the list displayed by either clicking on the name or in the check box. Click Delete to delete the track(s) and to leave the Load/Unload window on the screen.

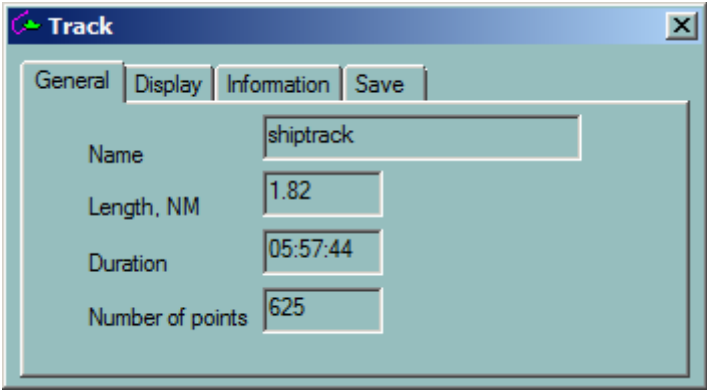
NOTE Unloading the current track is not possible. The current track must first be disabled from track recording before it can be unloaded.

TRACK PROPERTIES

To view or amend the properties of a track, click right on a track and select **Properties** from the pop-up menu. A panel containing three bookmarks will be displayed.

GENERAL

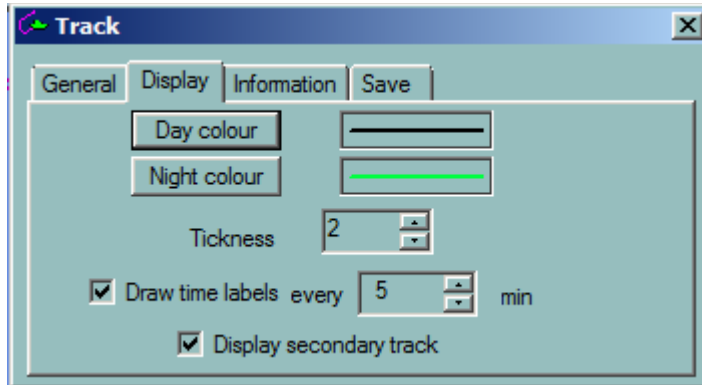
- **Name:** identifying the track, including the date and time the track was recorded
- **Length(NM):** the length of the track
- **Duration:** the time to sail the length of the track
- **Number of points:** the number of points recorded along the track



Track	
General Display Information Save	
Name	shiptrack
Length, NM	1.82
Duration	05:57:44
Number of points	625

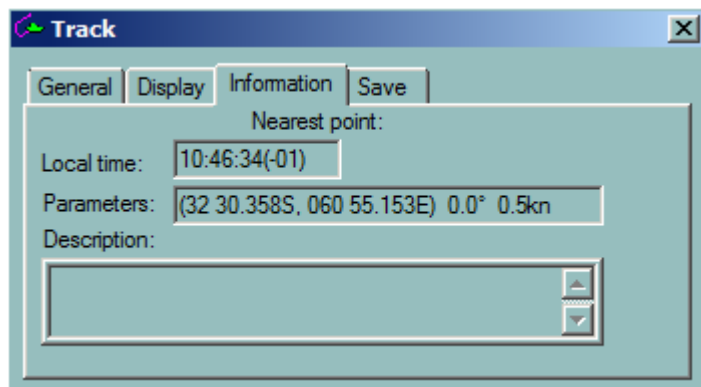
DISPLAY

- **Thickness:** toggle the up and down arrows to set the thickness of the line
- **Draw time labels:** set the marker 'on' to display time markers along the track. The markers are automatically adjusted according to the chart scale
- **Colours:** set the day colour and the night colour



INFORMATION

The bookmark Information allows entering free text and displays the ship's speed and course at the recorded point of the track which is the closest one from the clicked point.



SAVE

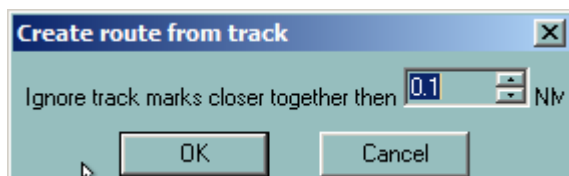
The tab Save allows saving the current track or its specified part. See the **Saving tracks** section for details.

CREATE ROUTE FROM TRACK

The ECDIS900 gives the ability to create a route from any track. This feature makes it possible to re-navigate a path already followed before.

Select the track from which a route is to be created and select Create route from track from the pop-up menu.

To minimize the number of waypoints, key in the following dialogue the minimum distance between two waypoints.



For more details about routes, see chapter **Route**.

Route

ROUTE OVERVIEW

A route is defined as the chosen path between two ports. A route consists of a start waypoint, an end waypoint, and a number of turning waypoints between. The segments between waypoints can be either Great circle or Rhumb line legs.

There are several ways to create a route:

- Directly on the chart using **graphictools**
- **By keyboard** using the route plan window
- **From a selection of existing waypoints**
- By **importing route** from different ECDIS systems
- **By downloading from GPS**

ECDIS provides the user with a variety of facilities for voyage planning and **route monitoring**.


Once the route is created, it can be saved on hard disk for further use along with other routes. The route can be edited and modified, unloaded or deleted, locked and the safety of the route can be checked against dangers that may be present along the segments.

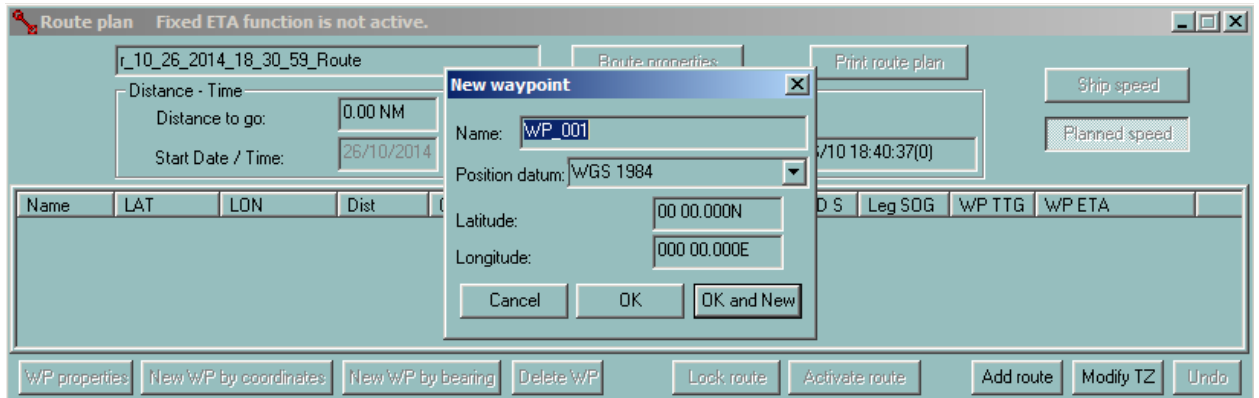
The panel **Route Properties** contains general information about the route and the dialogue **Route options** displays the default parameters for the new route: alarm settings, turning radius, default SOG, type of passage plan.

Several planned **routes can be loaded**, edited and displayed at the same time but only one route can be activated and used to monitor the vessel's position. The active route is displayed on the chart by a dashed red line.

ECDIS can instruct an autopilot or a Track Pilot properly connected to steer along the route.

CREATE A ROUTE BY KEYBOARD

- Select the icon **Route Plan**  in the toolbar.
- Enter first waypoint position in the dialogue box.
- Press **OK and New** button and enter the second and subsequent waypoint positions.
- Press **OK** to complete route.
- Change the name of the route in the **Route Plan** dialogue box.



NOTE If only one waypoint is entered the route is cancelled

FORMAT

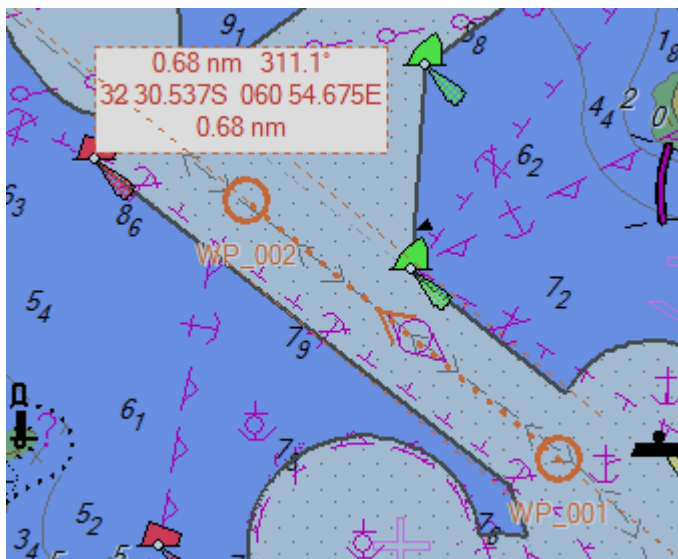
ECDIS accepts the delimiter "space", "." or "," in the inputs. For instance the following strings for the latitude are compliant: 12 12.23N or 12 12 23N or 12,12,13N or 12,12 13n.

CREATING A ROUTE BY MOUSE

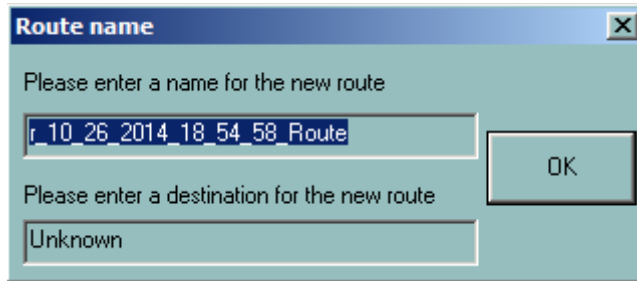
A route can be created graphically using the **New Route**  tool on the toolbar or directly by keyboard entry of the waypoint co-ordinates in the Route Plan window.

CREATE A ROUTE GRAPHICALLY

Click the **New Route** tool on the toolbar and then click on the chart at the point where the route should begin. A waypoint (WP 001) indicated by an orange circle is placed at this point.



Double click to set the end point of the route. The **Route name** dialogue appears.

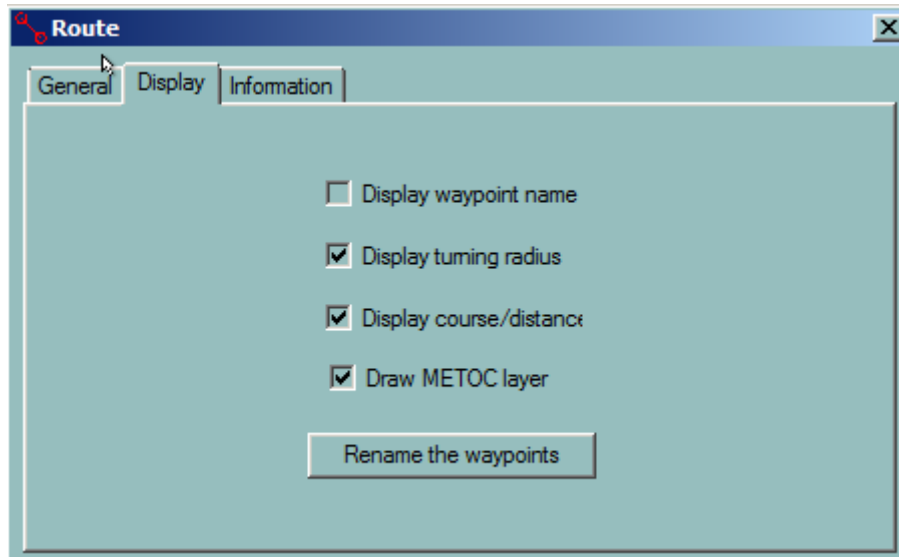


A dialog box titled "Route name" with a close button (X) in the top right corner. It contains two text input fields and an "OK" button. The first field is labeled "Please enter a name for the new route" and contains the text "r_10_26_2014_18_54_58_Route". The second field is labeled "Please enter a destination for the new route" and contains the text "Unknown".

Type the route name and destination (or leave it as is) and click **OK**. The new route is added to the list and can be unload, download, edited etc at any moment.

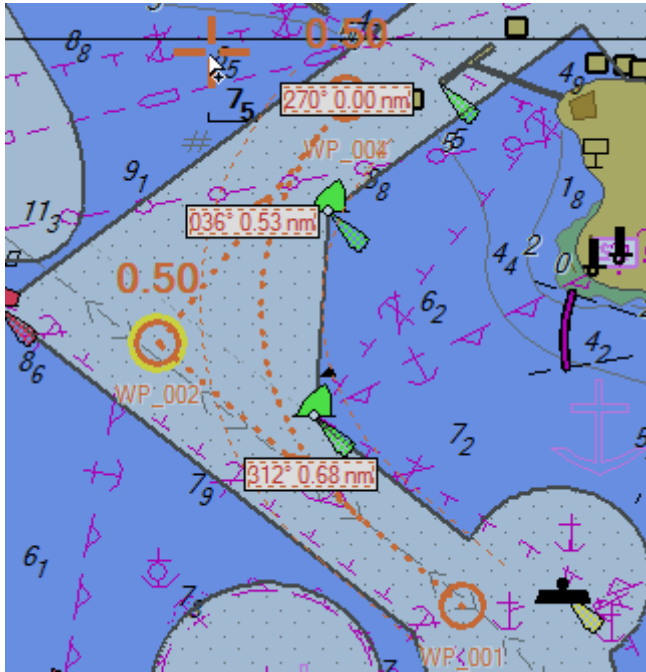
DISPLAYED INFORMATION

Click on the chart at the first turning point along the route. A waypoint (WP 002) is placed at this point. To set the information that should be displayed for the route, right click the route and open the Display tab



A dialog box titled "Route" with a close button (X) in the top right corner. It has three tabs: "General", "Display", and "Information". The "Display" tab is selected. Inside the "Display" tab, there are four checkboxes: "Display waypoint name" (unchecked), "Display turning radius" (checked), "Display course/distance" (checked), and "Draw METOC layer" (checked). At the bottom of the tab is a button labeled "Rename the waypoints".

Then tick on the necessary parameters to display.



The screen covers a limited part of the chart. When a new waypoint has to be plotted outside of the screen area in view ECDIS gives the user the possibility to scroll and zoom without deactivating the New Route tool:

- With S57 or C-MAP charts, click right button on the chart to select another scale from the drop down menu. Move the cursor outside of the chart area to scroll the chart in that direction
- With raster charts, click right button on the chart to load another chart located under the cursor. Move the cursor outside the chart area or click outside of the chart borders to load another chart located under the click.

To zoom and scroll the chart during waypoint plotting it is easier to use the hot keys F1 and F2 to zoom in and out and the keyboard arrows to move the chart.

NEW WAYPOINT AND LOCAL TIME

ECDIS automatically calculates time zone for each waypoint. The time zone for a selected waypoint can be changed in the **Waypoint Properties**.

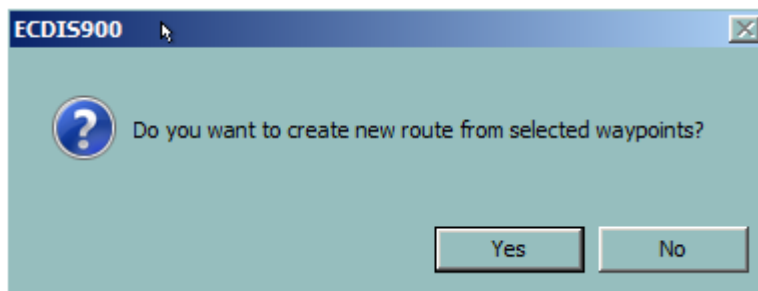
SELECTING WAYPOINTS

- Click once on a waypoint to select it. The waypoint is then highlighted.
- To add a waypoint to a selection click on the waypoint with the **Ctrl** key held down.
- To de-select a waypoint from a selection, click the selected waypoint with the **Ctrl** key held down.
- To add a complete route to a selection, click on one waypoint of the route with the **Ctrl** and **Shift** keys held down.
- Click once on a waypoint to select it. With Shift key down click on another waypoint: all waypoints of the located between the 2 clicks are selected.
- Using together with **Ctrl** the selection with the **Shift** key allows to build complex select of waypoint from existing routes.

Press the **Delete** key to delete a selection. Move a selection as described in **Modifying a route** or create a new route from the selection.

CREATE A ROUTE FROM A SELECTION OF EXISTING WAYPOINTS

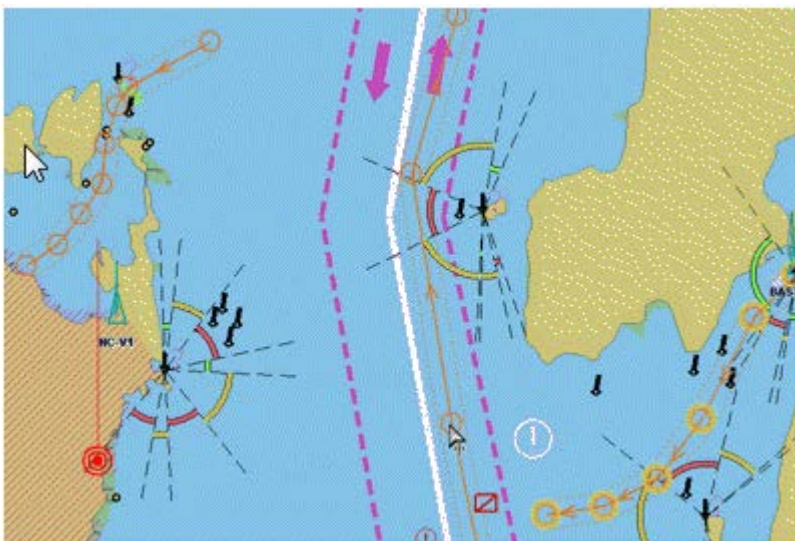
- Load one or several routes.
- Make a selection of waypoints.
- Press the **New Route** and **OK** buttons in the confirmation dialogue.
- Enter a name for the new route.
- The newly created route is displayed and selected.
- To continue plotting waypoints, right click on the route and activate the menu item Append waypoint.

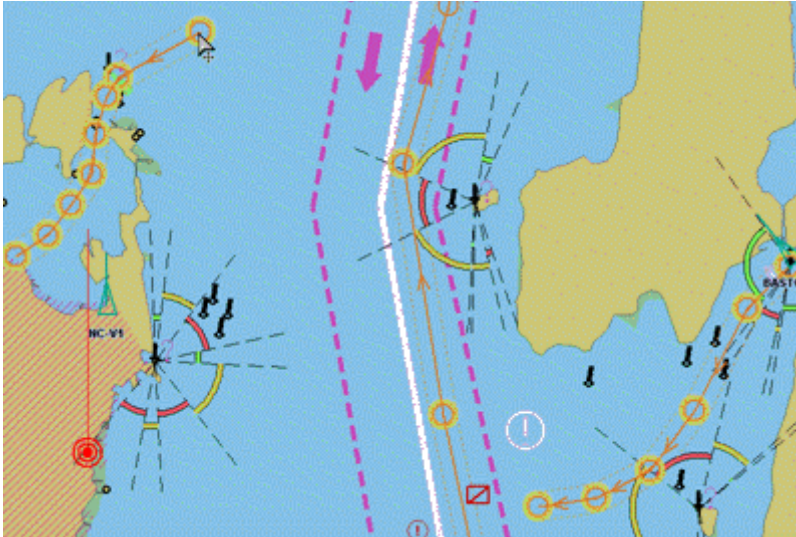


EXAMPLE

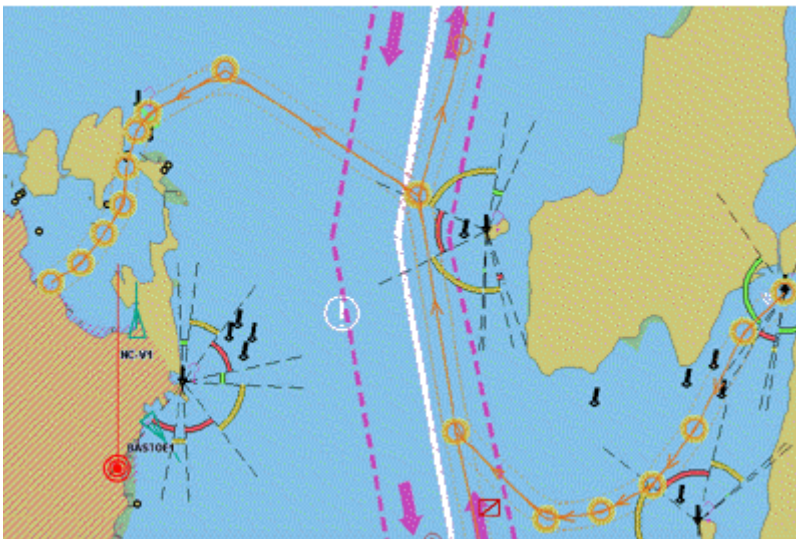
Creation of a new route from three existing routes.

- The first route describes the way out of a harbour, the second one a sea passage and the third a harbour entrance.
- Press the **Ctrl** and **Shift** keys down and click on one waypoint from the first route: the first route is added to the selection.
- Press **Ctrl** and click on one waypoint from the second route as shown in the picture.
- Press **Ctrl** and click on the next waypoint from the second route.
- Press the **Ctrl** and **Shift** keys down and click on one waypoint from the last route: the last route is added to the selection.





- The selection is complete. Press the button **New Route** and answer **YES**.
- Enter the name of the new route.

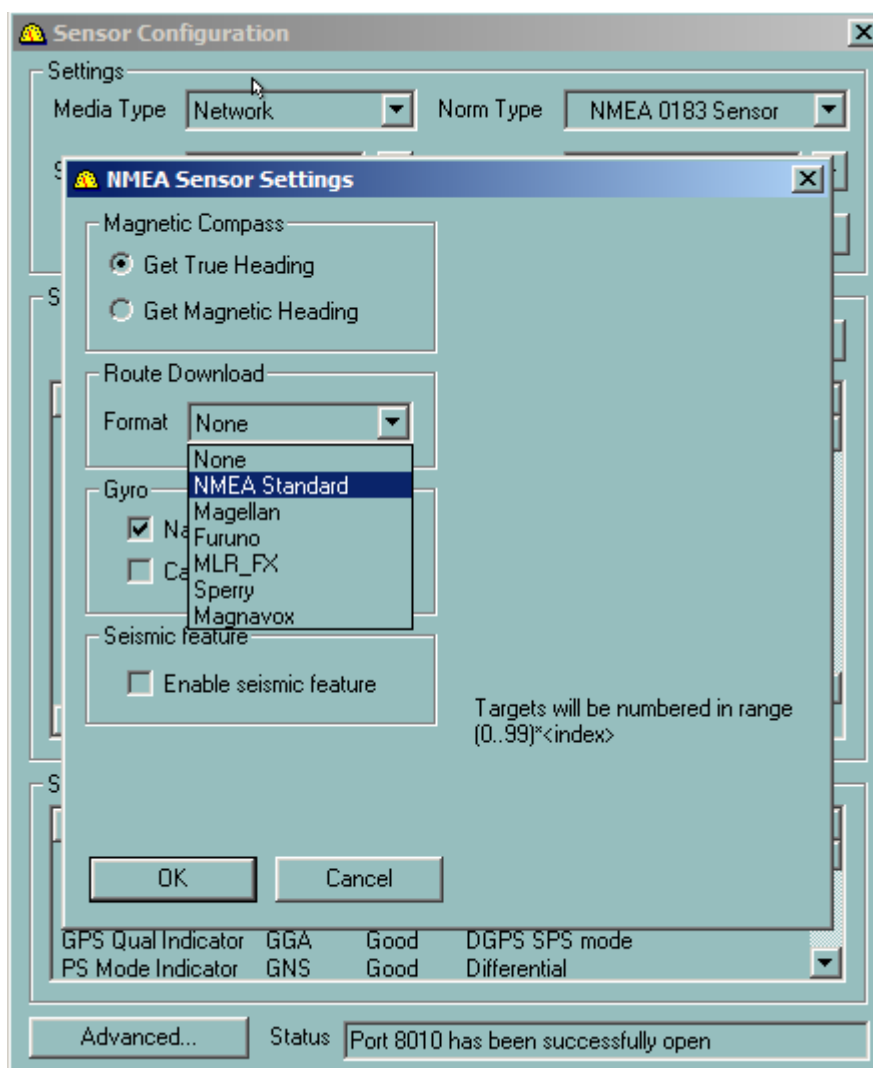


DOWNLOAD FROM GPS

A route can be downloaded from a GPS. The downloading process is controlled in the **Sensor Monitor** program.

To be able to download routes from GPS it is necessary to set up the communication parameters correctly. For more details see the Sensor_Monitor chapter.

Depending on the GPS in use select the appropriate route format.



Two different types of routes can be downloaded from the GPS:

- A complete route
- A working route commencing with the "Active waypoint"

The downloaded routes are automatically stored in the ECDIS route database with a default name.

- When a working route is downloaded, the route is loaded automatically in ECDIS.
- When a complete route is downloaded into the ECDIS routes database it is stored in the current route folder. The route should be given a name and then stored/used accordingly.

PLOTTING A WAYPOINT OUTSIDE THE SCREEN

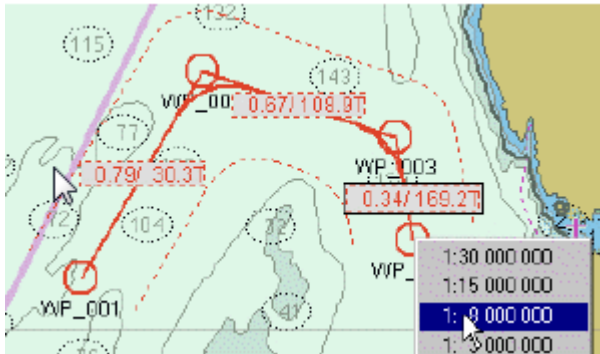
SCROLL

Scrolling the chart is achieved by moving the mouse outside of the chart area in the direction of the desired scroll or by pressing one of the arrows on the keyboard.

CHANGE SCALE

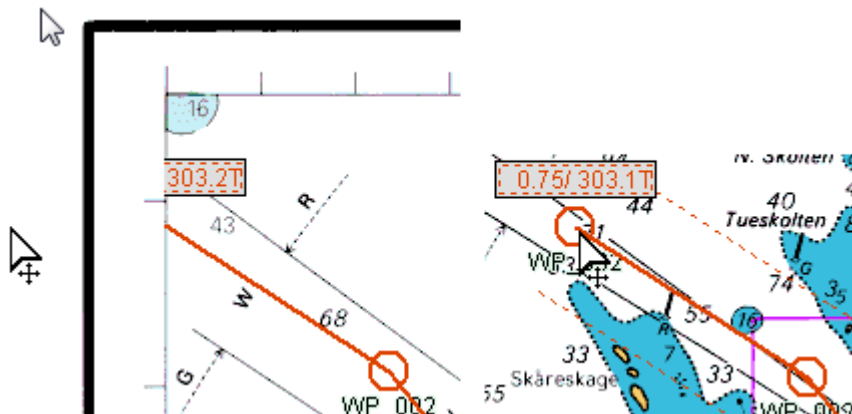
At any time during the route creation process, it is possible to zoom (in or out) or to change the scale of the chart by clicking right anywhere on the chart and selecting the desired scale. It is also possible to use the hotkeys F1 and F2 to zoom in and out.

Remark: the scale menu depends on the type of chart in use.



LOAD ANOTHER RASTER CHART

When the waypoint is outside the current raster chart, move the cursor outside the chart in direction of the waypoint and click once: the raster chart below the cursor will automatically load and be displayed. The plotting can then continue on the newly loaded chart.



To display another raster chart with a smaller scale, press the "-" key and the chart will load automatically.

To display another raster chart with a larger scale, press the "+" key and the chart will load automatically. ECDIS searches the database to find a chart with a larger scale displaying the screen area of the current chart. If no chart is available on the hard disk the system does nothing.

LOAD ANOTHER TYPE OF CHART

Press **F9** to switch from ARCS to ENC or to CMAP when plotting the route.

MODIFYING A ROUTE

A route may be modified in several ways, but cannot be modified whilst **locked** or **active**.

MOVE A WAYPOINT

- To move a waypoint on the chart, locate the cursor over the waypoint, click and hold and then drag the waypoint to the new position.
- To move a waypoint via the keyboard, see **Waypoint properties** or **Route Plan**.

IMPORTANT

In case of a mistake it is possible to go back a step. Right click on the route and select the menu item “Undo”. The waypoint is put back at the original position.

MOVE A SELECTION

- To move a selection of waypoints, locate the cursor on one of the selected waypoints, click and hold and then drag the selection to the new position.

INSERT A WAYPOINT

- Locate the cursor on a segment where a new waypoint is desired and click right.
- Select Insert new mark on the pop-up menu.

To insert a waypoint via the keyboard, see **Route Plan**.

APPEND A WAYPOINT

- Locate the cursor on the last leg. Right click and select **Append new waypoint** from the drop down menu. A new waypoint will be appended to the end of the route. Move the cursor to the desired position. The new segment will display the appropriate length and heading
- To stop adding new waypoints double click on the last waypoint entered.

DELETE A WAYPOINT

- Locate the cursor on a waypoint that is to be deleted, right click and select the menu item **Delete**.
- Alternatively select the waypoint by clicking once on it and press the **Delete** key.
- To delete a waypoint via the keyboard, see **Route Plan**.

IMPORTANT “Undo” can be used to recover a route.

SPLIT A ROUTE

- Locate the cursor on a leg, right click and select **Split** on the pop-up menu. The leg disappears and two independent routes are created. Note that the two new routes are given different names.

REVERSE A ROUTE

- Locate the cursor on any route leg, right click and select **Reverse** in the pop-up menu.

- The direction of the route will now be reversed and an arrow displayed on each leg shows the direction of the route.

NOTE The Reverse function also re-numbers the waypoints.

LOCK/UNLOCK A ROUTE

- Locate the cursor on a route leg, right click right and select **Lock** on the pop-up menu.
- Locking and Unlocking the route is also possible in the **Route Plan** and in **Route Properties**.

The route will now be protected from unauthorized alterations.

NOTE Keyboard modifications in the Route plan window are also impossible when the route is locked.

UNDO

- Undo function is applicable only for route modification. All modifications made to a route can be undone except for the function "Split the route". Press several times to undo several modifications made to the route.
- Access "Undo" by right clicking on the route and selecting the "Undo" from the pop-up menu.

IMPORTANT when the function Undo is activated several times the modifications made to the selected route will be cancelled one by one.

WAYPOINT PROPERTIES

Locate the cursor on a waypoint, right click and select **Properties** from the pop-up menu. Alternatively move the cursor over the waypoint and press F4 several times to access the waypoint **Properties** dialogue.

The properties dialogue displays two tabs: **General** and **Information**

In the tab General the waypoint's position and relative parameters can be adjusted.

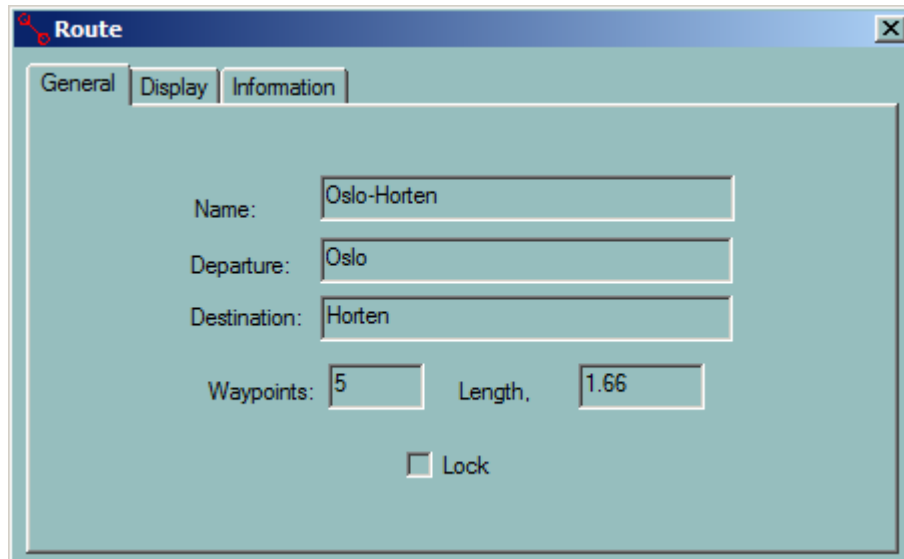
- **Name** name of the waypoint, can be changed via keyboard.
- **Latitude** it is possible to edit the value manually
- **Longitude** it is possible to edit the value manually
- **Time Zone** To set the time zone of the waypoint if different from the system calculated TZ.
- **Display name** Toggle to display or not display the name on the chart.
- **Display description** Toggle to display or not display the description on the chart.
- **Lock Toggle** to lock or unlock the details of the waypoint.

The Information tab contains information of the nearest forecast station and linked files.

ROUTE PROPERTIES

For route properties, locate the cursor on any leg of the route, right click and select **Properties** from the pop/up menu. Alternatively move the mouse on top of the route and press F4 several times to access the route **Properties** dialogue.

GENERAL TAB



Route

General Display Information

Name: Oslo-Horten

Departure: Oslo

Destination: Horten

Waypoints: 5 Length: 1.66

☐ Lock

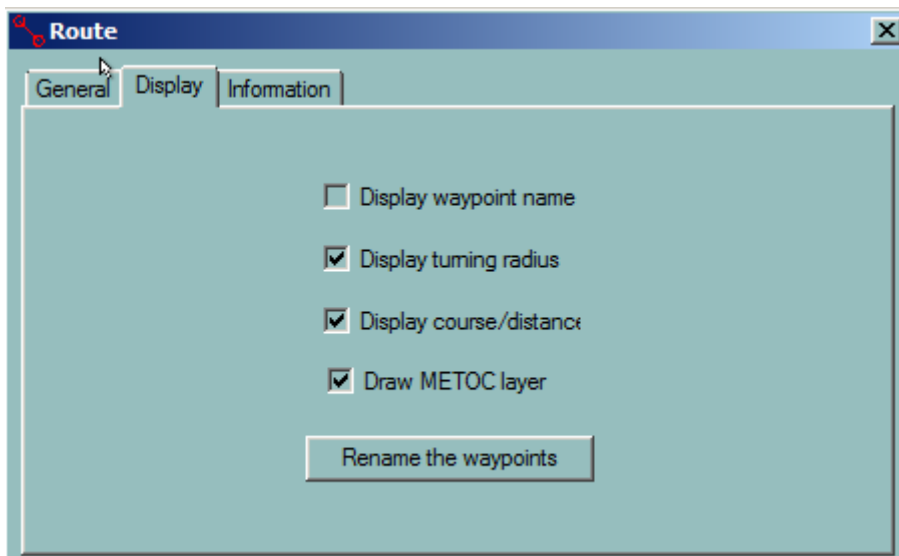
- **Name:** name of the route that can be edited
- **Departure:** name of the departure port
- **Arrival:** name of the arrival port
- **Waypoints** number of waypoints
- **Length** the overall length of the route
- **Lock** toggle to lock or unlock the route. Locking the route will protect it from unauthorized editing

NOTE

Entering the port names is important, as this information will be transferred to the AIS for use as part of the static data broadcast by VHF

DISPLAY TAB

The tab contains settings of the information displayed on the chart.



Route

General Display Information

☐ Display waypoint name

☒ Display turning radius

☒ Display course/distance

☒ Draw METOC layer

Rename the waypoints

- **Display waypoint name** Toggle on/off to display the waypoint name.
- **Display turning radius** Toggle on/off to display the turning radius along with the WP symbol.
- **Display range/bearing** Toggle on/off to display the range and bearing on the segments.
- **Draw METOC layer**

REMARK

In the case of the GC leg, several courses are provided at intervals along the leg to allow the Navigator to closely follow the GC leg.

TURNING RADIUS

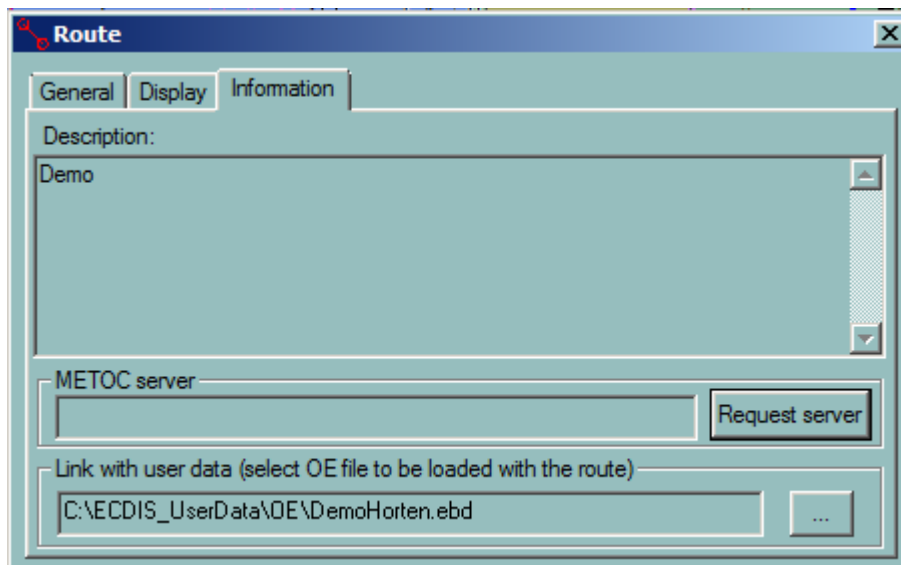
To activate the display toggle appropriate checkbox in the route / display panel. It is also possible to change the turning radius of WP by clicking +/- hot keys when mouse cursor is on top of waypoint.

RENAME THE WAYPOINTS

Re-numbers the waypoints after a waypoint has been added to or deleted from the route. The bookmark Information allows entering additional information about the route.

INFORMATION TAB

This is an information panel.



LINK WITH OE FILE

Create a file with Object Editor tools including points, line, areas or text. Link the file with the Route.

LOADING A ROUTE

When the route is loaded and activated the OE file linked with the route is automatically displayed.

When the OE file is loaded with the route, all objects of the file are defined as user alarm. For example if the ship enters an area defined in the OE file loaded with the route an entering zone alarm is triggered.

See more details in **Properties of OE objects**.

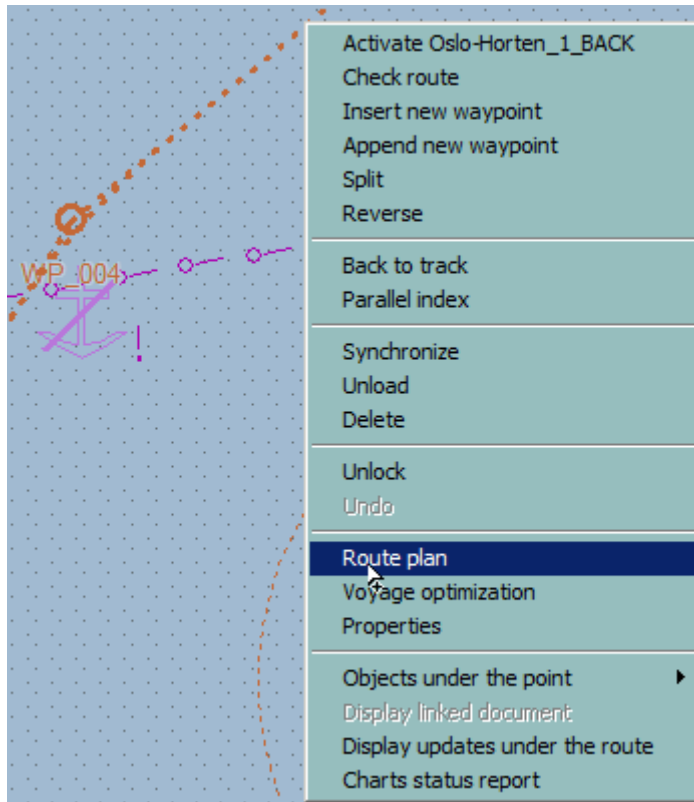
UNLOADING THE ROUTE

The OE file is automatically unloaded when the route is unloaded.

Route Plan

GENERAL

Locate the cursor on any segment (leg) of the route, right click and select **Route Plan** from the pop-up menu.



Alternatively press **F6** to get the route plan. If several routes are loaded press **F6** several times until the route plan dialogue box for the selected route is displayed.

Route plan Fixed ETA function is not active.

RouteNorge

Distance - Time

Distance to go: 5.80 NM

Start Date / Time: 28/10/2014 09:37:40(-01) TTG: 00:31:35 ETA: 28/10 09:09:15(0)

Ship speed

Planned speed

Name	LAT	LON	Dist	Crs	Leg	Radius	ROT	XTD P	XTD S	Leg SOG	WP TTG	WP ETA
Bergen	60 23.180N	005 18.405E	0.65 NM	322.00	RL	N/A	N/A	185 m	185 m	11.00 kn	N/A	N/A
WP_002_3	60 23.690N	005 17.600E	1.63 NM	284.64	RL	0.20 NM	53.1°/min	185 m	185 m	11.00 kn	00:03:32	28/10 08:41:12(0)
Karven	60 24.100N	005 14.430E	1.54 NM	242.11	RL	0.20 NM	53.1°/min	185 m	185 m	11.00 kn	00:08:51	28/10 08:50:03(0)
Hjelteskjeret	60 23.380N	005 11.680E	1.14 NM	230.90	RL	0.20 NM	53.1°/min	185 m	185 m	11.00 kn	00:08:25	28/10 08:58:28(0)
Strongi	60 22.660N	005 09.890E	0.83 NM	175.56	RL	0.20 NM	53.1°/min	185 m	185 m	11.00 kn	00:06:14	28/10 09:04:42(0)

WP properties New WP by coordinates New WP by bearing Delete WP Unlock route Activate route Add route Modify TZ Undo

The **Route plan** dialogue box displays information concerning the waypoints, the legs and the route. Several buttons and tools allow working within the **Route plan** dialogue box. The user may edit waypoints or route information, simulate the voyage, print a document or access a Passage Plan function.

Double clicking on a waypoint name **centres the chart** on that waypoint. Right clicking on the waypoint name allows the user to **Move that waypoint in the list** or to set the waypoint as **Waypoint pilot**.

Several values are editable (Waypoint's position, type of leg, XTD Port, XTD Starboard, ROT etc). Other values are calculated and therefore not modifiable (Distance to go, TTG, Range and bearing ...).

There are three ways to modify editable values:

- Press "Waypoint properties" button to access editing dialogue
- Click on a value in the list and edit that value in the pop-up box.
- Click the column title of an editable value to change all values in the column at the same time (SOG, Turning radius, XTD).

IMPORTANT

When the route is locked the buttons are disabled and fields cannot be edited. Unlock the route to make the components editable.

NOTE

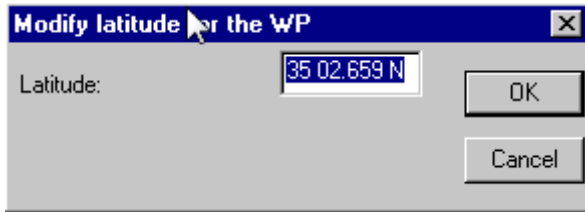
Modifications carried out in the route plan dialogue box are immediately displayed on the chart and the changes can be graphically checked

List of available functions:

- **Change the Route name**
- **Set a new waypoint latitude/longitude**
- **Change waypoint's name**
- **Rename the waypoint**
- **Change the type of leg**
- **Delete a waypoint**
- **Centre the chart on a waypoint's location**
- **Print the Route Plan**
- **Set a waypoint as Pilot waypoint**
- **Set a new turning radius**
- **Set a new XTD**
- **Set a new SOG**
- **Set a new ETA**
- **Add a new waypoint by coordinates**
- **Add a new waypoint by range and bearing**
- **Modify the waypoint time zone**
- **Add an existing route to the current route**
- **Move a waypoint in the list**

SET A NEW WAYPOINT LATITUDE/LONGITUDE

Click on the latitude and modify the value.



The longitude modification is performed by the same way. Click on the longitude value in the list and input the proper longitude.

CHANGE TYPE OF LEG

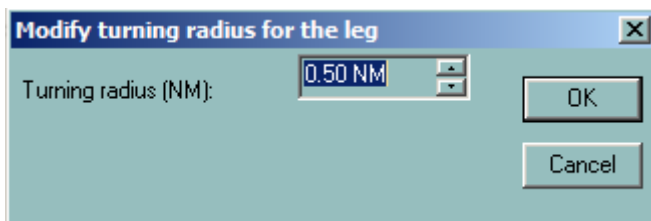
A leg is defined by two waypoints and the leg type is stored in the properties of the first waypoint.

Click on the leg type value RL (Rhumb Line) to change to GC (Great Circle) and vice versa.

SET A NEW TURNING RADIUS

Click on the Turning Radius for the chosen leg and enter the new value in the pop-up dialogue box

The Turning Radius value may also be entered in the Waypoint Properties dialogue box.



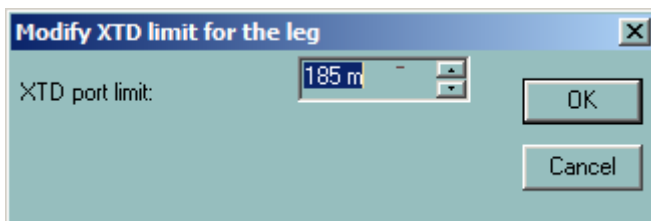
IMPORTANT When the Turning radius is changed the ROT is also changed according to the selected speed and vice versa.

IMPORTANT To change the turning radius value for all legs click in the title Radius.

SET XTD

Use the same procedure as for **Set new turning radius**.

By default the XTD value is entered in the Option dialogue panel Route.



IMPORTANT Click in the title XTD to modify XTD for all legs.

SET SOG

Use the same procedure as for Set new turning radius.

By default the SOG value is entered in the Route Properties dialogue box.

IMPORTANT Click the title SOG to modify SOG for all legs.

SET ETA

Click on the ETA value of the leg and enter a new ETA. Then the leg SOG will be re-calculated.

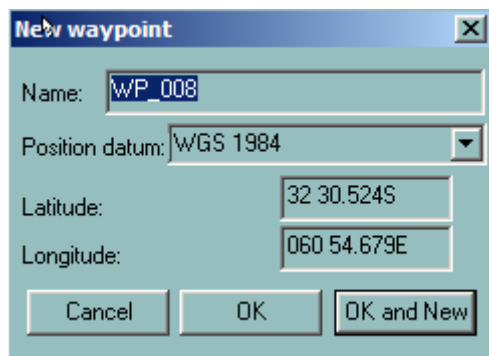
IMPORTANT Click on the title ETA to enter a new ETA for the last waypoint. In this case the SOG will be recalculated and constant for all legs.

NEW WAYPOINT BY COORDINATES

Press the **New WP by coordinates** button.

New WP by coordinates

The dialogue box appears



Amend the latitude and longitude if necessary then click **OK** to enter the new waypoint.

Click **OK and New** to enter more than one new waypoint.

The waypoint(s) will be added after the previously selected one and the details for the route will be updated accordingly.

It is not possible to enter a new waypoint before the first waypoint with this method. To add a new waypoint at the start proceed as follow :

- NOTE**
- Select the first waypoint.
 - Press the **New Waypoint by co-ordinates** button and enter the name and co-ordinates for the new waypoint.
 - Right click on the first waypoint and select the menu **Move after** and select the number of the newly created waypoint.

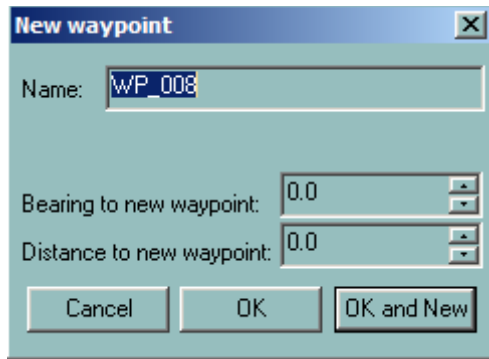
NOTE when a new waypoint is created a default number is given. In order to have a consistent list of numbers for the waypoints it is necessary to re-number the waypoints by clicking once in the column title called **Name**

NEW WAYPOINT BY BEARING

Press the **New WP by bearing** button.

New WP by bearing

The input dialogue box appears



New waypoint

Name:

Bearing to new waypoint:

Distance to new waypoint:


Input the range and bearing then press **OK** to enter the new waypoint.

Press **OK and New** to enter more than one new waypoint.

The waypoint(s) will be added after the previously selected one and the details for the route will be updated accordingly.

NOTE when a new waypoint is created a default number is given. In order to have a consistent list of names for the waypoints it is necessary to re-number the waypoints by clicking once in the column title called **Name**

DELETE A WAYPOINT

Select a waypoint in the list by clicking on its name and press **Delete waypoint** button  or push the key **Delete**.

IMPORTANT

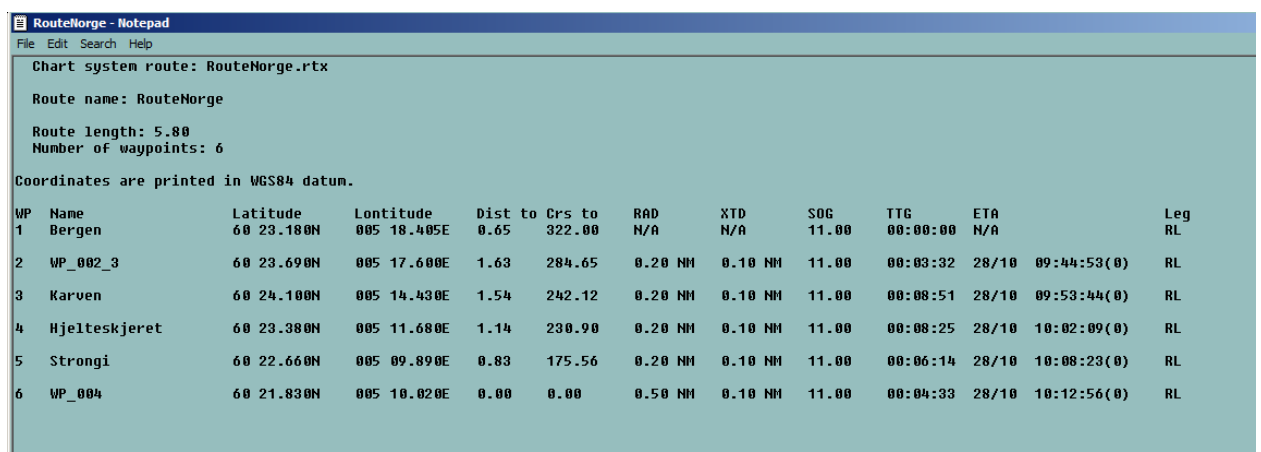
A route is defined by at least two waypoints. If the route contains less than two waypoints the route is deleted and the route plan window closed.

NOTE Keep in mind that the selected waypoint will be deleted immediately, but in case of mistake press **Undo** button to recover the deleted waypoint

PRINT

Press the **Print route plan** button 

The route plan is transferred to the text file, opened immediately



RouteNorge - Notepad

File Edit Search Help

Chart system route: RouteNorge.rtx

Route name: RouteNorge

Route length: 5.80

Number of waypoints: 6

Coordinates are printed in WGS84 datum.

WP	Name	Latitude	Longitude	Dist to	Crs to	RAD	XTD	SOG	TTG	ETA	Leg
1	Bergen	60 23.180N	005 18.405E	0.65	322.00	N/A	N/A	11.00	00:00:00	N/A	RL
2	WP_002_3	60 23.690N	005 17.600E	1.63	284.65	0.20 NM	0.10 NM	11.00	00:03:32	28/10 09:44:53(0)	RL
3	Karven	60 24.100N	005 14.430E	1.54	242.12	0.20 NM	0.10 NM	11.00	00:08:51	28/10 09:53:44(0)	RL
4	Hjelteskjeret	60 23.380N	005 11.680E	1.14	230.90	0.20 NM	0.10 NM	11.00	00:08:25	28/10 10:02:09(0)	RL
5	Strongi	60 22.660N	005 09.890E	0.83	175.56	0.20 NM	0.10 NM	11.00	00:06:14	28/10 10:08:23(0)	RL
6	WP_004	60 21.830N	005 10.020E	0.00	0.00	0.50 NM	0.10 NM	11.00	00:04:33	28/10 10:12:56(0)	RL

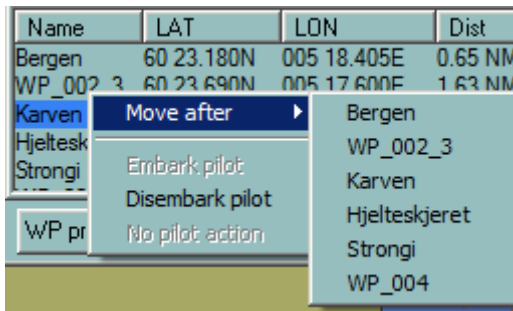
Modifications are possible before printing.

REMARK

The Notepad document can be stored in file.

MOVE A WAYPOINT IN THE LIST

Right click on the waypoint's name and select the menu Move after. Then select the destination waypoint and the waypoint will be moved after the selected waypoint.

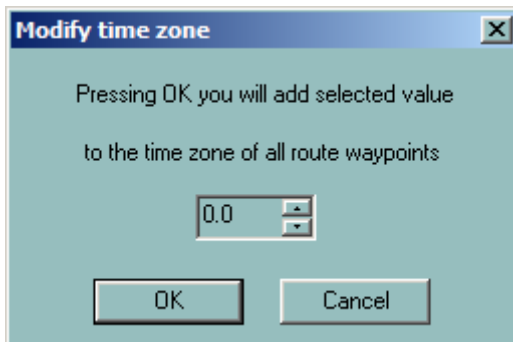


MODIFY TIME ZONE

To modify the time zone to the selected waypoint, press the **Modify TZ** button

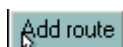


Then set the value

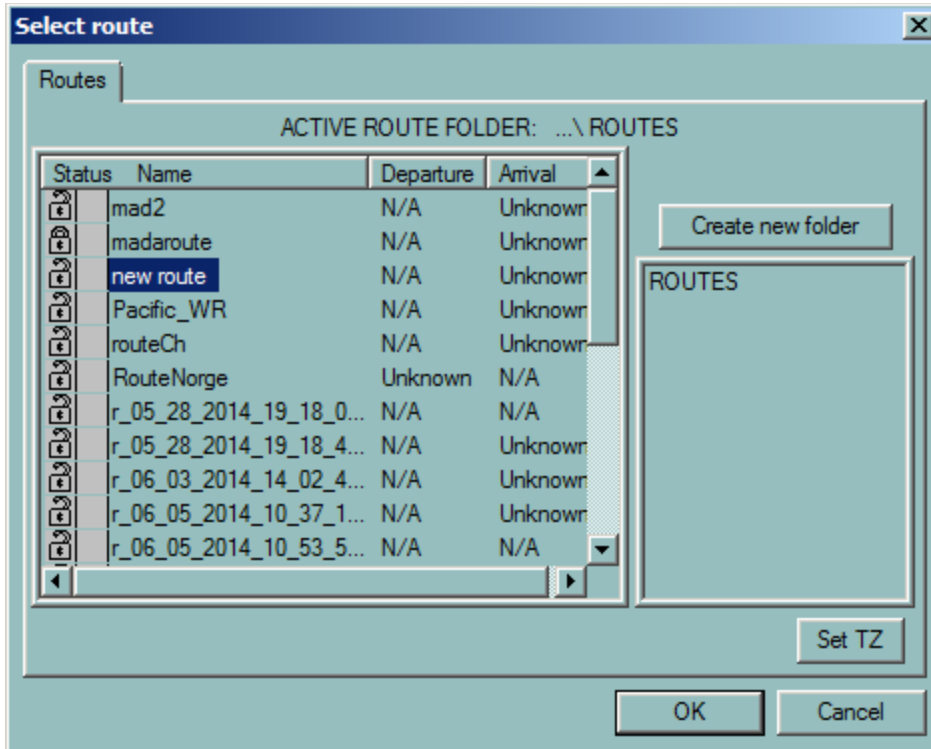


ADD A ROUTE

Press the **Add route** button



The list of routes appears



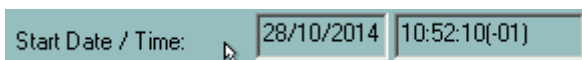
Select the route and press **OK**.

The selected route will be added to the current route.

NOTE No more than one route in one time can be selected for this operation

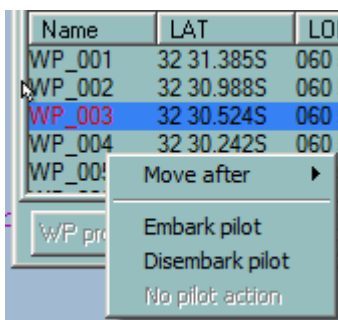
SET DATE/TIME

To change the date and time of start just input the value into the proper fields



SET A WAYPOINT AS A PILOT WAYPOINT

To set waypoints of embarking/disembarking a pilot, right click on the waypoint name and select the proper item.



The waypoint name becomes red coloured.

To cancel this waypoint property, select the **No pilot action** item.

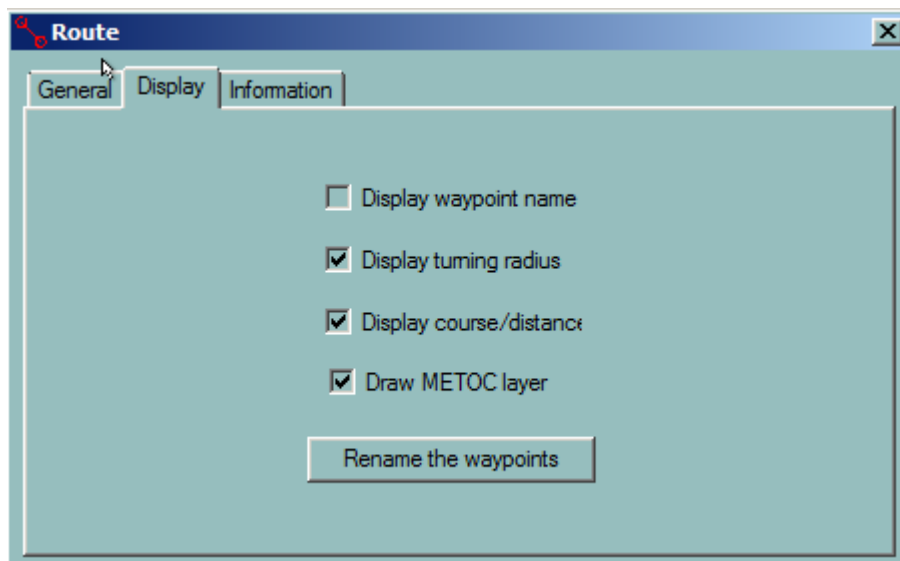
RENAME WAYPOINTS

By default ECDIS numbers waypoints consecutively. (WP_001, WP_002, etc)

If a new waypoint is inserted between two existing waypoints or a waypoint is deleted it is useful to re-number the waypoints from WP_001 again.

To re-number the waypoints shown in the route plan dialogue box click the column title **Name**.

Alternatively it is possible to re-number the waypoints in the Route Properties dialogue box by pushing the button "**Rename the waypoints**".

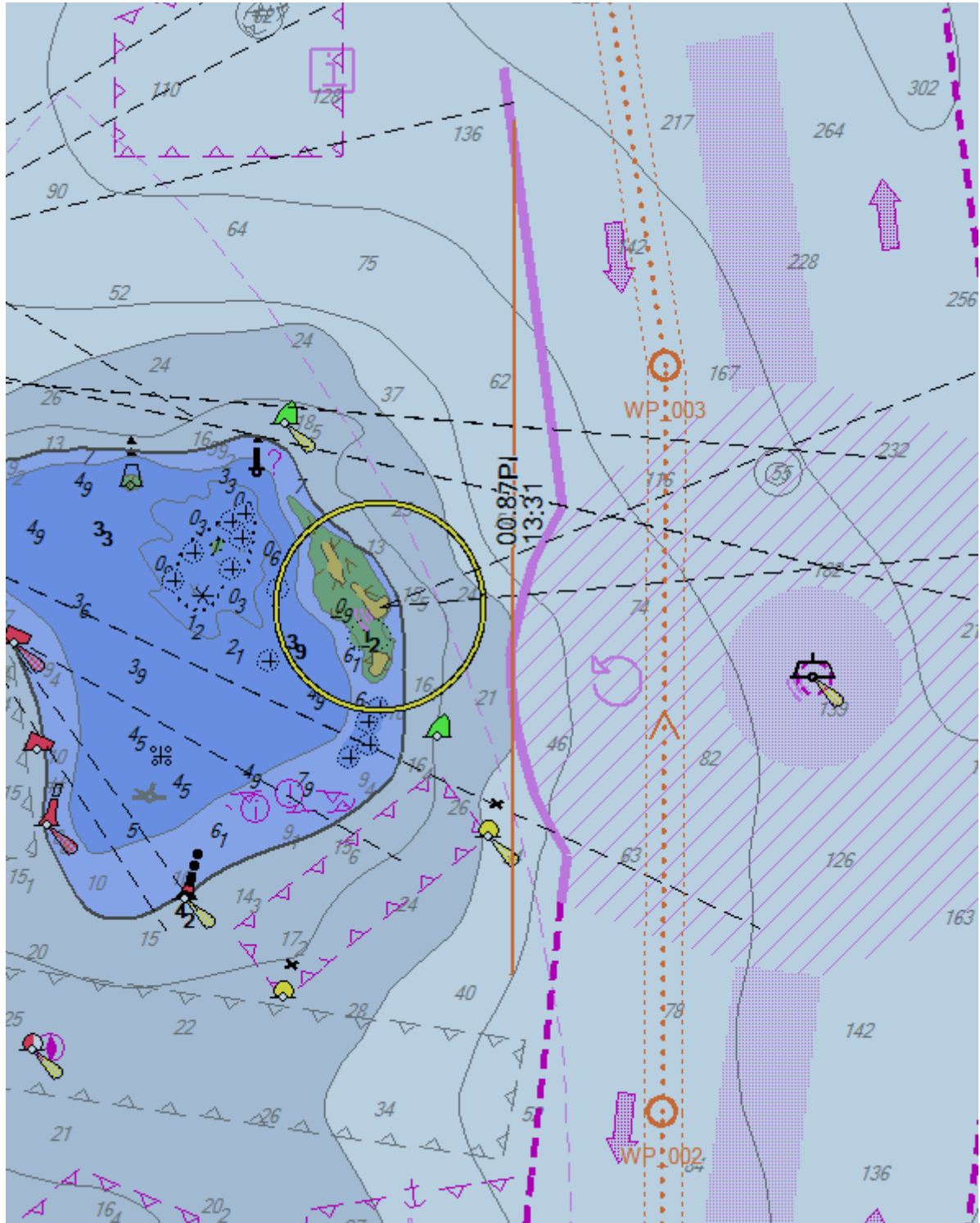


IMPORTANT the function **Rename the waypoints** is applicable only to the waypoints with a number given by default: WP_001, WP_002 etc. Any waypoint number changed (to another name) by the user is ignored during the renaming process. Where the user wishes to name the waypoints, this is best done once the route has been approved.

PARALLEL INDEX

To create a route parallel index, right click on the route and select the Parallel Index item from the menu.


It's possible to draw line parallel to the selected route leg. Distance from the leg in NM and time of creation are clearly displayed in the label of the line. This line is part of navigational editor and therefore it's possible to edit it at any time: change position and length. Parallel index is recorded in the logbook.

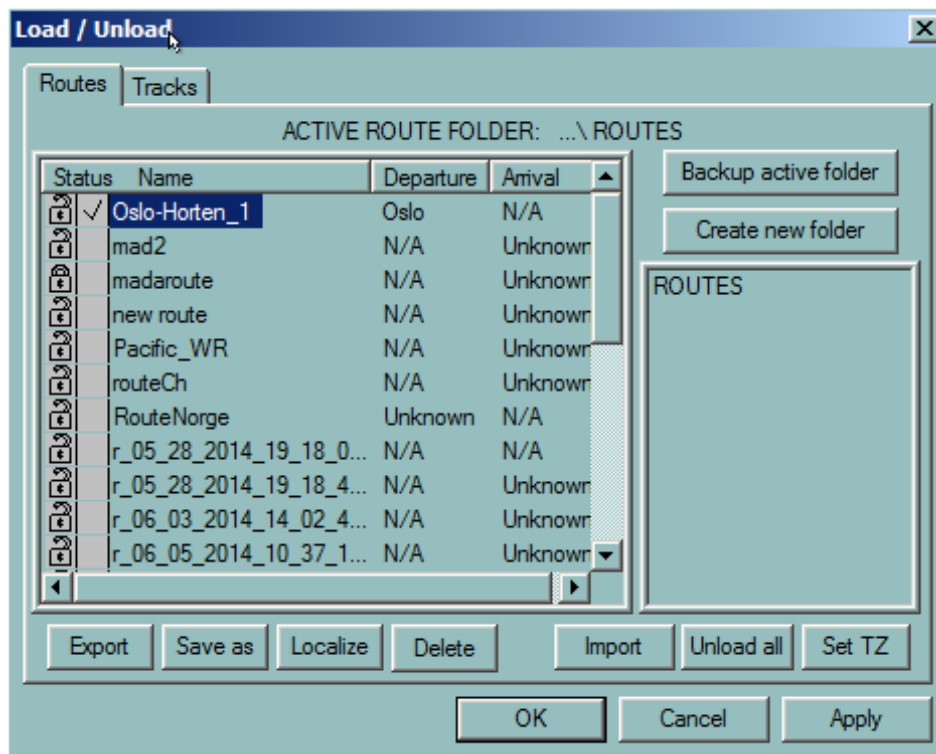


CENTRE THE CHART DISPLAY ON THE WAYPOINT LOCATION

Double click on a waypoint's name to centre the chart on the waypoint location.
This function allows a graphical checking of the positions of the waypoints and legs.

LOAD/UNLOAD/DELETE ROUTES

To load/unload routes or tracks click on the **Load/Unload objects** button  in the toolbar. Click on the **Routes** tab to display the list of routes.



The list of routes may be sorted, either ascending or descending, by name by clicking on the column headings. Alternate clicks will sort ascending and then descending.

The routes can be arranged in different folders, which can be created with the **Create a New Folder** button.

- **To load a route:** tick on the box located in front of the route name and click OK or Apply.
- **To unload a route:** highlight the name and click OK or Apply. Press the **Unload All** button to unload all routes from the chart.

NOTE Another way to unload a route is: right click on a route, then click on the **Unload** item in the popup menu.

- **To duplicate a route:** select it by clicking on the name and press "Save As" button.
- **To Export a route:** highlight the name, press the **Export** button and choose where to send the file.
- **To Import a route:** press the **Import** button and choose where to pick up the file.
- **To Delete a route:** highlight the name and press the **Delete** button.

NOTE Another way to delete a route is: right click on a route, then click on the **Delete** item in the popup menu.

Locked routes cannot be deleted!

- **To centre the chart on a selected route:** highlight the name and press the **Localize** button.
- **To Backup the Active Routes folder to a memory stick:** make sure the to be backed up are shown in the Active Routes folder, plug in a memory stick and press the button **Backup Active Folder**; all selected routes will be copied on the memory stick in a folder marked Routes.
- **To Lock\Unlock a route:** click the small **Padlock** icon located in front of the name.

IMPORT/EXPORT A ROUTE

FORMAT DESCRIPTION

Name of the route

Name of the waypoint / Latitude / Longitude / Planned speed for the leg / Type of the leg (1 Rhumb line, 2 Great circle)

IMPORT

ECDIS can import routes with different formats:

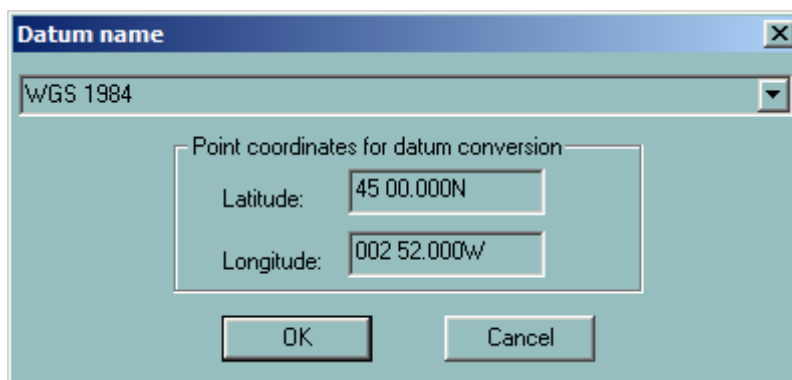
- ECDIS routes (Files with the file suffix .rou)
- Route saved as a text file with the appropriate format (See format description above)
- Sperry routes (Files with the file suffix .vp)
- MaxSea routes (Files with suffix .wpt)
- MARIS text format file

The imported routes are stored in the active folder.

To import a route press the **Import** button and select the route to import.

IMPORTANT

Routes are stored in ECDIS using WGS84 datum. When a route is imported, it is extremely important to select the datum that has been used for the route creation so that ECDIS to be able to calculate the exact co-ordinates of the waypoints. If the datum is not correctly selected the waypoints are shifted.



EXPORT

To export a route, select the route from the list and press the **Export** button. Then select the location where the route will be stored.

Routes are exported to the text file format described above.

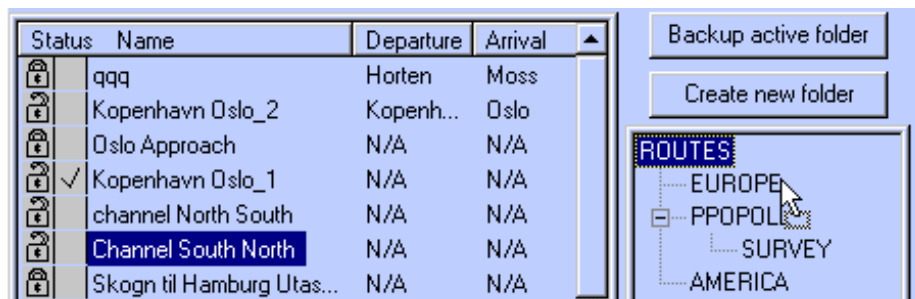
ROUTE FOLDERS

The routes can be ranged in different folders. This function is useful mainly when a lot of routes are created.

To create a new sub-folder proceed as follow:

- Select the parent folder by clicking once on the name
- Push the button Create Folder
- A new sub folder is created

To copy a route from one folder to another, click on the route name and drag the name on top of the destination folder. When the folder is correctly selected the cursor changes as shown in the following picture, the route called Channel South North is copied from the folder Routes to the sub-folder Europe.

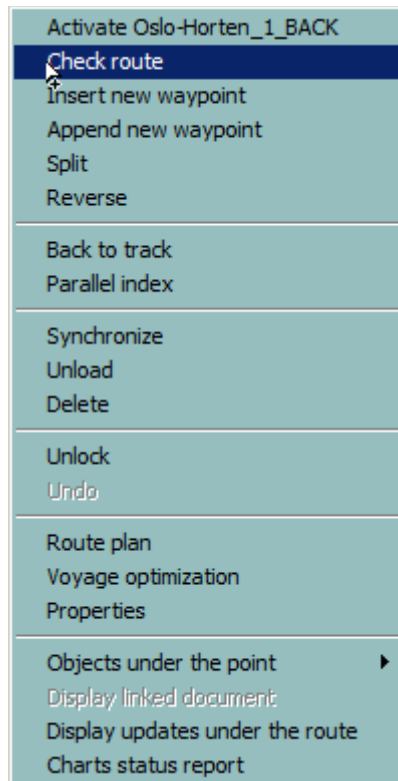


IMPORTANT if the Shift key is pushed down when the route name is dragged to the destination, the route is duplicated.

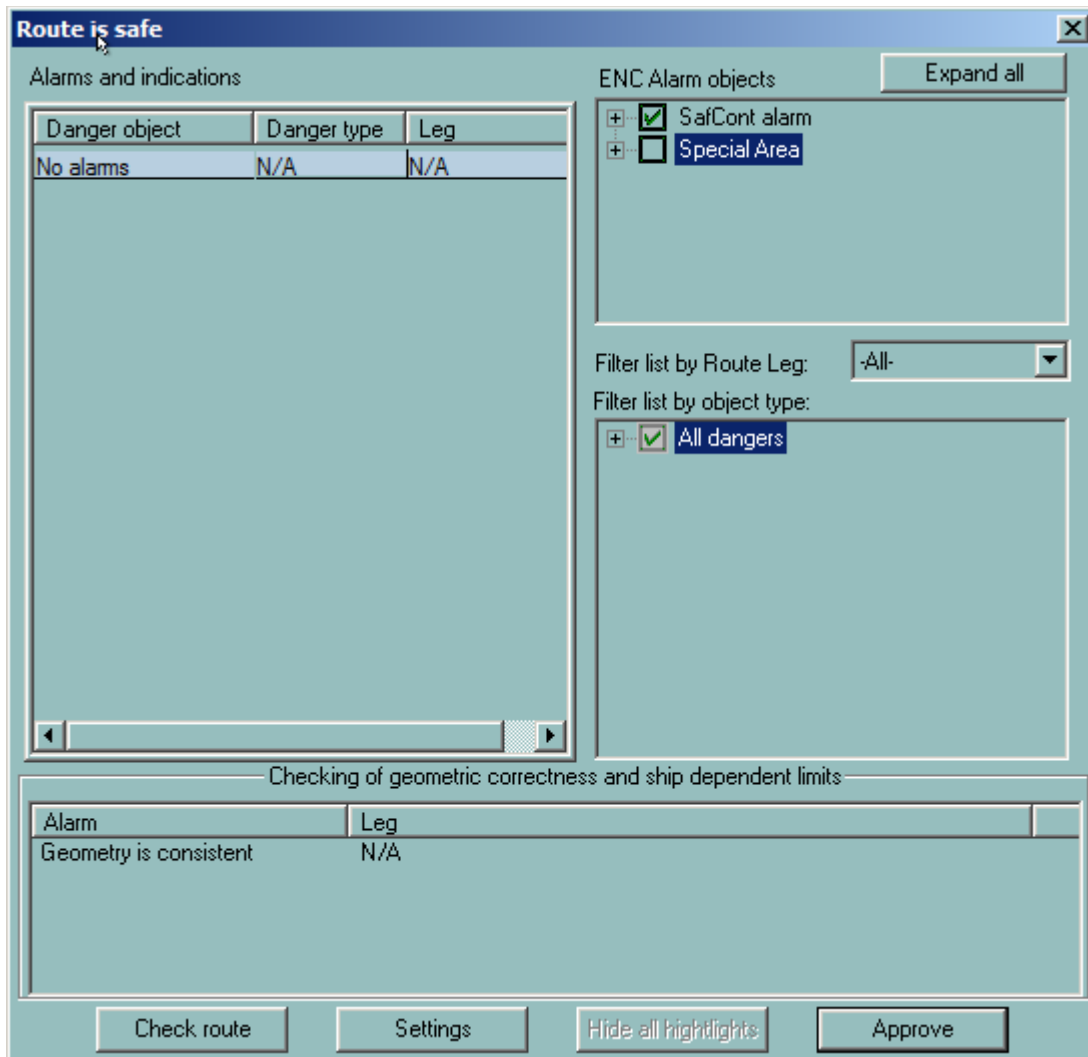
CHECK A ROUTE

The **Check route** function checks the routes against dangers of the chart and against user defined objects when vector charts are in use, but only against user defined objects when raster charts are used.

To activate the **Check route** function, locate the cursor on a route leg, right click and select Check route from the pop-up menu.



The function checks the route against all charted dangers that may be present along the route legs. It scans the vector database including manually updated objects and user data objects loaded on the chart and calculates the dangers inside the safety passage defined by the XTD values and according to the settings - Safety contour and height. A list of dangers is then displayed in the window.



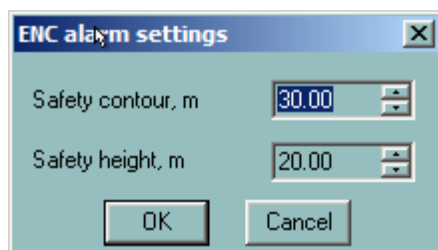
The top right frame contains two lists of ENC alarm objects. the Safety Contour Alarms are ticked on by default and can not be off by user. The Special Area Alarms list is configured by the user.

The second frame on the right side of the window contains entire list of danger object types and the user can filter the object type to alarm.

Route can be checked leg by leg. The user can select the leg to check in the **Filter list by Route Leg** drop-down list.

The bottom frame contains results of the route geometry checking

To change the Guard Zone settings, press the **Settings** button.



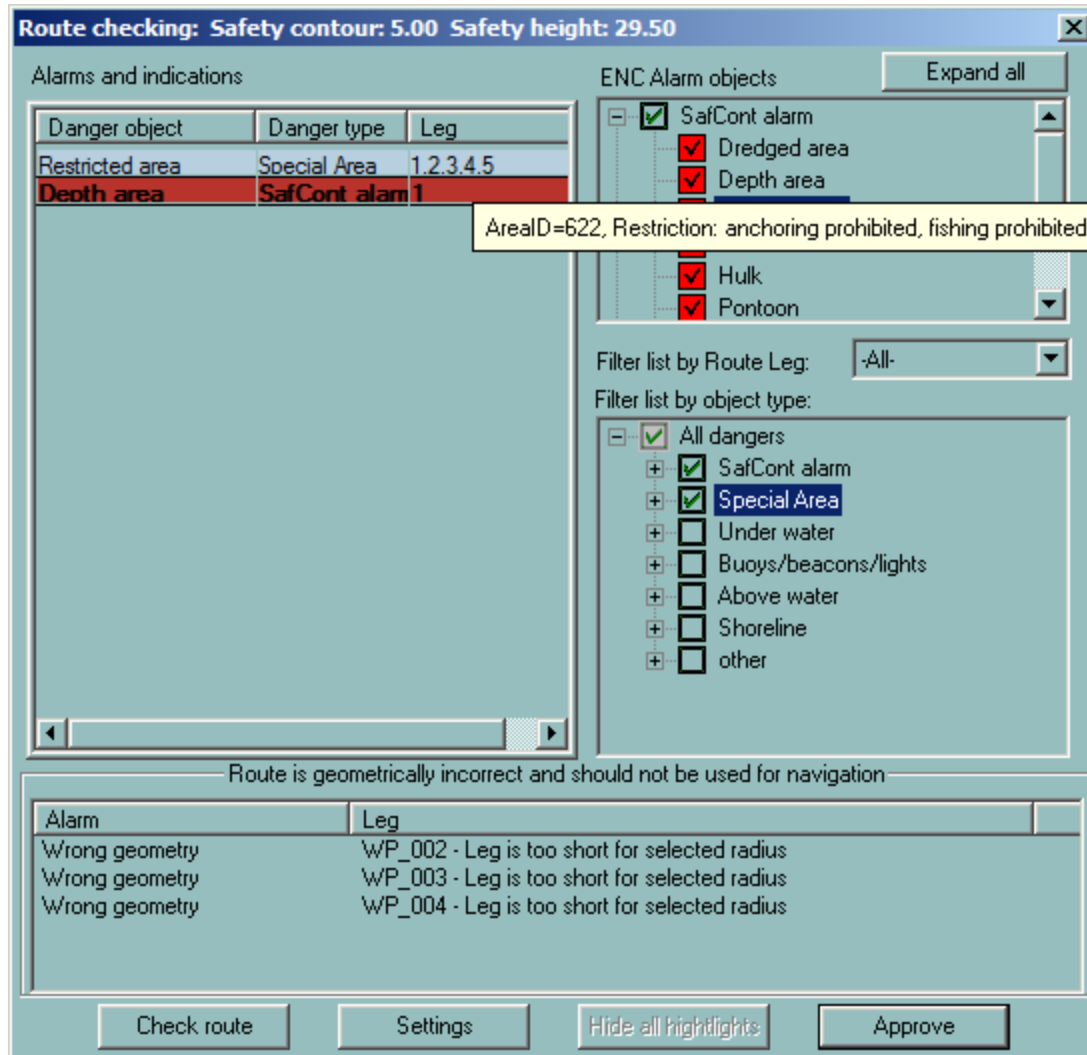
Adjust the settings in the Guard Zone window as required.

In case the checking result contains one or more danger objects the Guard Zone settings are displayed in the caption of the window and the objects are listed in the left frame.

An alarm is **red** highlighted and a warning is **grey** highlighted.

NOTE Selected objects from the Filter list are considered as warnings.

Additional information about the danger displayed in the tooltip after the item is hovered by the cursor.



IMPORTANT To approve danger, click on the danger in the list. The approved **alarm** change highlight colour to **green**, an approved **warning** change colour to **yellow**. Clicking on an item makes the chart centred on the selected danger.

Danger object	Danger type	Leg
Restricted area	Soecial Area	1,2,3,4,5
Depth area	SafCont alarm	1

NOTE It is possible to approve the route without approving displayed dangers. The warning message is displayed in this case.

IMPORTANT

It is strongly recommended to check all dangers and edit the route before approval!

RCDS MODE AND ROUTE CHECKING

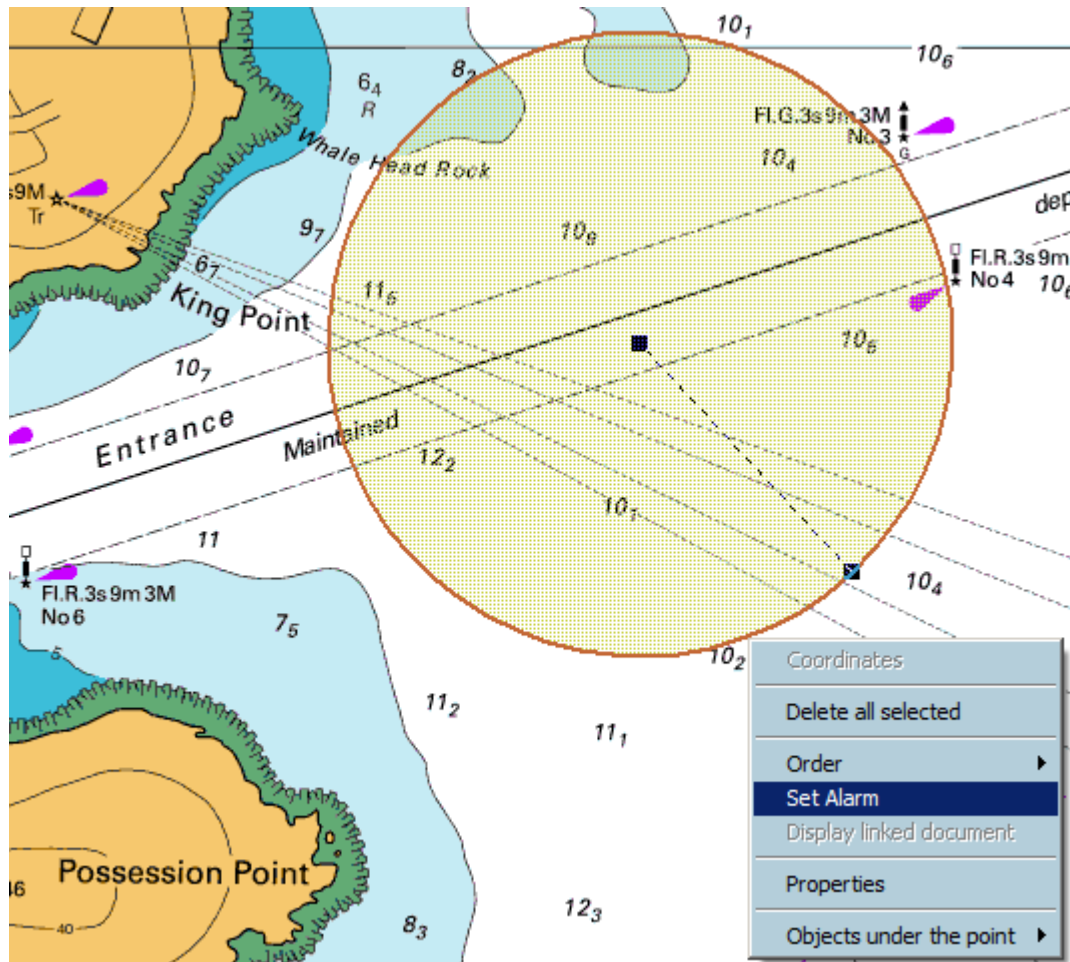
ALARM OBJECT

The object editor (OE) is used to plot user data on the charts: simple point, lines or areas (For more details see the chapter **Editors**).

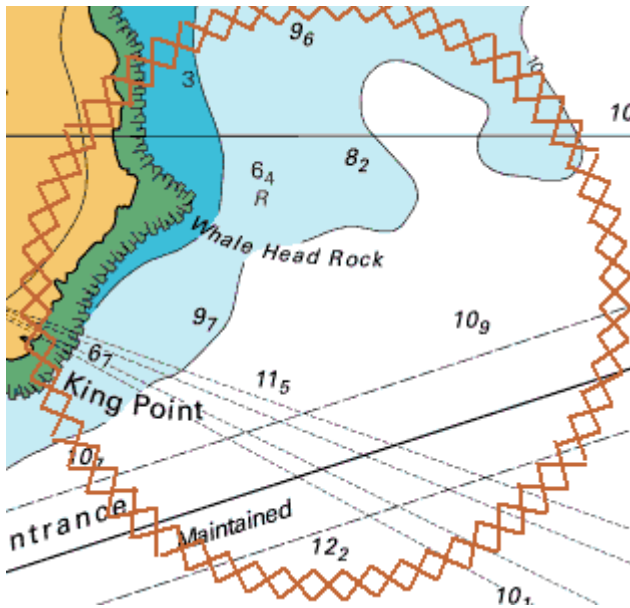
An alarm object is a geographical area, which triggers an alarm when the ship sails into it or when a planned route crosses it.

DEFINE ALARM OBJECT

Right click on the object outline, plotted on the chart, and click **Set alarm** in the pop-up menu.



The object outline changes to red to underline that it has become an **alarm object**. (One pixel wide and no filling for area).



Where the alarmed object is a point, this is surrounded by a red rectangle



MONITORING USER ALARM

When the ship's guard zone intercepts an alarmed object an alarm is triggered. The alarm is displayed as long as the alarmed object remains inside the ships guard zone.

REMARK

The guard zone depends on time and speed. For more details see **Ship**.

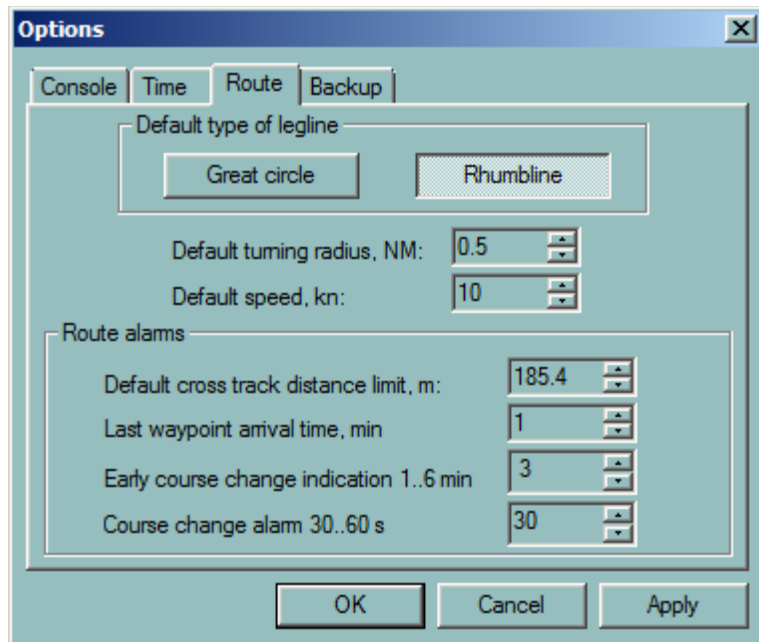
ROUTE PLANNING USER ALARM

In RCDS mode, route checking against chart data is not possible but the function **Check route** checks the planned route against user defined alarms and notifies the user if an alarmed area is violated.

ROUTE OPTIONS

The user sets and stores the default values for route and waypoint parameters in the **Route Options** dialogue box.

To view or effect changes to the route parameters click on the Options icon on the main toolbar and then select the **Route** tab.



- **Default type of legline:** Select either Great circle or Rhumbline.
- **Turning radius (NM):** default value for route creation.
- **Speed (kn):** default speed value for route creation.

ROUTE ALARMS:

- **Cross Track error (m):** Toggle up or down to set the appropriate value or input it via the keyboard
- **Waypoint arrival distance (NM):** Toggle up or down for the appropriate value or input it via the keyboard
- **Early CC indication (mn):** when approaching the active waypoint, an indication is triggered when the ship arrives at between 1 and 6 minutes from the waypoint (at the current speed). The time is set by the user. NO ALARM generated.
- **CC indication(s):** The second indication is given between 30 and 60 seconds before arrival to the active waypoint WOP.

For a complete description of waypoint arrival criteria see paragraph **Waypoint Arrival** in the chapter Route Monitoring.

Route Monitoring

ROUTE MONITORING OVERVIEW

A standard ECDIS installation includes a Monitoring workstation located on the ships bridge and a Planning station on the chart table.

NOTE The ECDIS software can run in either Monitoring mode or in Planning mode. The current mode is displayed in the title bar in the caption of the chart window. The route activation is available in the **Monitoring mode** only.

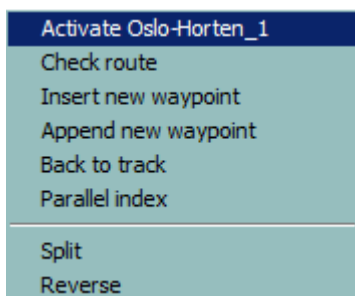
The route activation is disabled on Planning station. To switch a workstation from Monitoring mode to Planning or vice versa, right double click in the title bar of the chart window and activate the menu Set as Planning station or Set as Monitoring station.

ACTIVATING A ROUTE

When activating a route the user designates it as the route to be navigated. The ECDIS changes the route legs to pecked lines, highlights the next waypoint and switches the monitoring mode on.

To activate a route and switch on the route monitoring function on the Monitoring workstation:

- Load the route to be activated.
- Click right button on one of the legs of the route.
- Select Activate xxx from the pop-up menu.



Alternatively a route can be activated from the Route Plan window with the button **Activate route**.

REMARK

When an OE file is linked with the route the file is automatically loaded and all alarms of the file activated.

DISPLAY

Only one route can be active at any time. An active route is displayed differently than other routes on the chart inasmuch as the segment path is drawn dotted and the active waypoint flashes making it more prominent on the screen.

ACTIVE ROUTE AND PLANNING STATION

When a route is activated on the Monitoring station all Planning stations connected to the LAN receive and display the same active route. Then all ECDIS workstations display the same active route but only the Monitoring workstation can actively handle it.

MAKING A NEW ACTIVE ROUTE

A new route can be activated even if another route is already active. When the new route is activated the previous active route will be de-activated.

ACTIVE ROUTE AND PLANNING STATION

When a route is activated on the Monitoring station, all Planning stations connected to the LAN receive and display the same active route.

ROUTE GEOMETRY CHECKING

IMPORTANT To be activated, the route has to be geometrically correct.

This means that regarding the length of the leg and the turning radius (by default the turning radius is defined in **Options/Route/Default turning radius**) the turn should be displayed (valid) for all Way Points (except for the first and the last)

Acceptable range for Turning Radius can be modified in Console **Autopilot**, TCS options, Maximum radius, Minimum radius can be adjusted ().

Rate of Turn (ROT) can be also changed manually in Route planning.

ROUTE CHECKING IN ENC CHART MODE

When activated the route is automatically checked against the dangers of the ENC database including manually updated objects and user defined dangers. If any leg is dangerous, the dangers are listed in the Route Checking window and highlighted on the chart.

ROUTE MONITORING

When a route is activated, route monitoring is automatically switched on. The ECDIS900 continuously calculates and displays **data about a vessel's approach to the active waypoint, ETA to a selected waypoint** and on request the calculated speed to sail to reach a particular waypoint at the **fixed ETA**

The ECDIS triggers **alarms** for waypoint arrival or XTD out of limits.

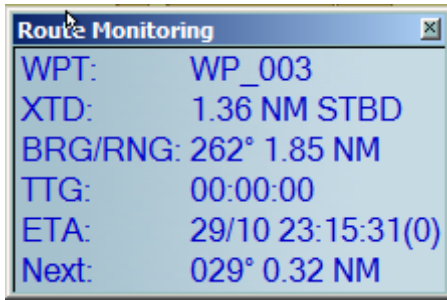
IMPORTANT

The Wheel over Point (WOP) is calculated according to the turning radius value entered by the navigator. It is extremely important to enter this value during route planning.

Manual selection of the active waypoint is possible by right/clicking over the chosen waypoint on the chart or highlighting the waypoint in the route monitoring plan.

ACTIVE WAYPOINT INFORMATION

This data is displayed on the **Route Monitoring** console. To set it visible tick on it in the list in the **Console Options** tab.



- **WPT:** The active waypoint name
- **XTD:** Cross Track Distance
- **BRG/RNG:** Bearing/Range to the active waypoint
- **TTG:** Time To Go to the active waypoint
- **ETA:** Estimated Time of Arrival
- **Next:** B/R for the next leg

BEARING TO THE ACTIVE WAYPOINT ON A GREAT CIRCLE ROUTE LEG

The displayed value of bearing to the active waypoint is changed in line with the position of the vessel and the ECDIS900 calculation to follow a great circle to the active waypoint.

WAYPOINT ETA INFORMATION

The panel WP ETA displays the ETA value for any waypoint selected by the user. The required waypoint is selected by clicking the small arrows on the RHS of the panel.

Select between Ship Speed and Planned speed by clicking the two buttons located under the arrows.

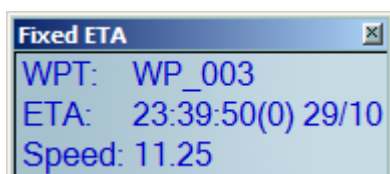
If the panel is not displayed, the user can make it visible by clicking the button Option and checking on the box "WP ETA" in the console configuration panel.

NOTE

ETA for an active waypoint is always calculated using the ship' speed.

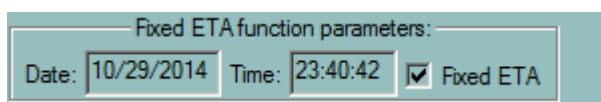
FIXED ETA FUNCTION

The panel Fixed ETA displays the Waypoint number, the ETA required by the user and the speed to be maintained to reach the selected waypoint on time.



The fixed ETA function can be used for any waypoint after the active waypoint. There are two ways to select the waypoint and enter the ETA:

Click right button on the waypoint, select Properties, check on the box Fixed ETA and enter the ETA value.



In the route plan, click on "ETA of the selected waypoint" and enter the ETA value.

A dialog box titled "Enter fixed ETA for the WP" with a close button (X). It contains three input fields: "Fixed ETA date" with the value "10/29/2014", "Fixed ETA time" with the value "23:30:37", and "WP time zone" with the value "-0.0". There are "OK" and "Cancel" buttons on the right side.

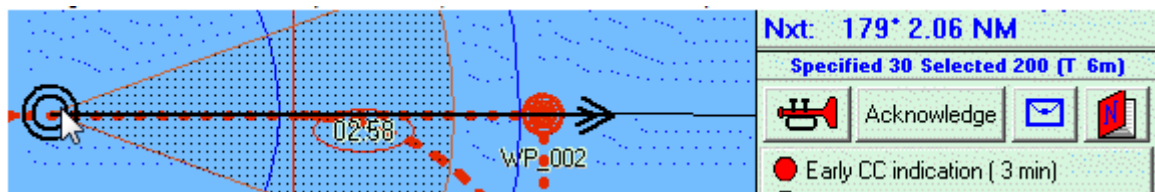
WAYPOINT ARRIVAL INDICATION AND ALARM

When the ship arrives at a certain point close to the waypoint the system automatically makes the next waypoint active.

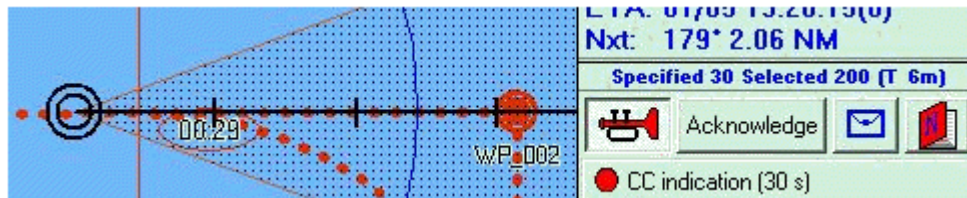
When the ship reaches the WOP (Wheel Over Point), the current waypoint is de-activated and the ship commences a turn onto the new course.

When the ship reaches the End Of Turn point, the turn is finished and the next waypoint is activated.

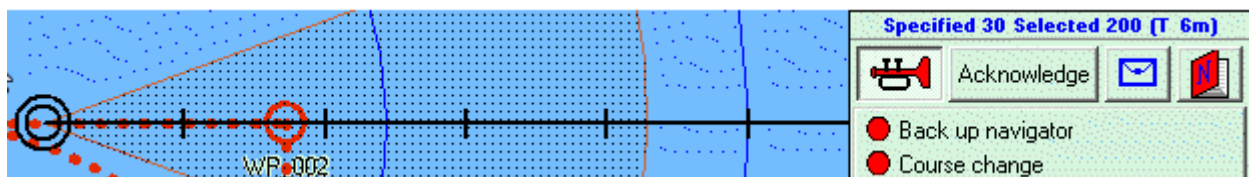
Early CC Indication (no alarm, default value 3 mn)



CC Indication (no alarm, default value 30 s)



Course Change Alarm: Alarm is triggered.

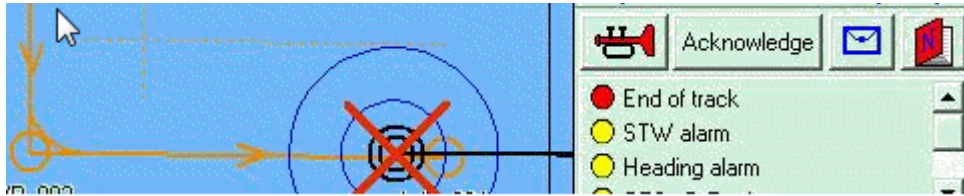


In case Alarm is not acknowledged, **Back up navigator** alarm is generated after 30 seconds:

it's a suspicion that something has happened with him and ship is out of control

Then alarm is triggered to make sound in other rooms of the ship to inform navigators out watch that something is wrong on the bridge. (refer to TCS regulation)

End of Track alarm: this alarm is triggered when last Waypoint is reached. The route is deactivated then.

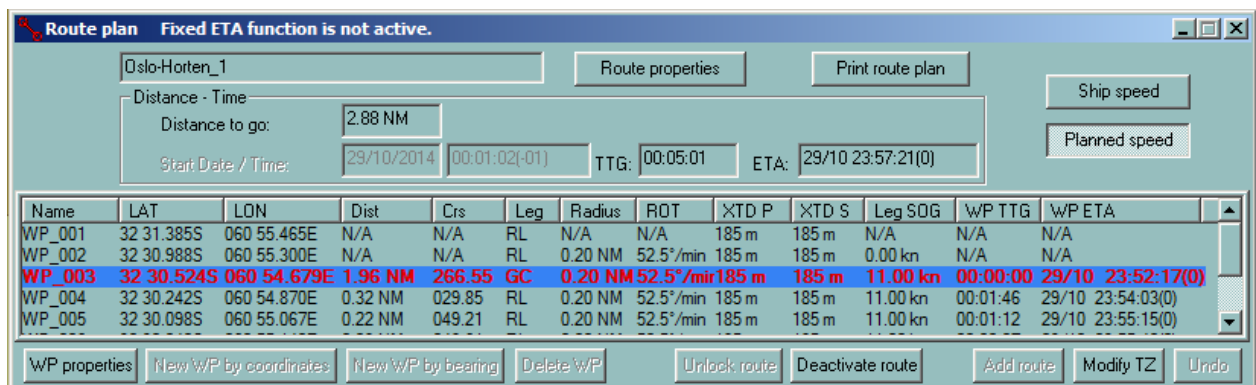


CHANGE ACTIVE WAYPOINT

The active waypoint is selected automatically when the ship arrives at the waypoint. But at any time the current waypoint can be changed manually.

There are two ways to select another active waypoint:

- Click right on the waypoint to be activated and select Activate in the pop-up menu.
- In the route plan, click right button on the name of the waypoint and select Activate.



ALARMS

When the XTD or Waypoint arrival alarms are active the ECDIS900 will trigger an alarm each time the alarm parameters are met.

SETTING ROUTE ALARM PARAMETERS

- In the **Ship Properties** dialogue, under the Alarms tab tick the boxes to activate the XTD alarm.
- In **Waypoint Properties** set the appropriate XTD parameters.
- In **Options/Route**, the Waypoint arrival indication and alarm distances are preset.

ROUTE MONITORING PLAN

When the active route is locked it cannot be edited. The user can only change the planned speed for the remaining legs.

The active waypoint line is displayed in red, the selected waypoint line in blue.

To modify the route it is necessary to deactivate the route and then unlock it before editing.

DISTANCE TO GO

The Distance To Go in the console is measured from the ship to the last waypoint.

ETA

The ETA shown in the console area and in the Route Plan dialogue box is calculated using either the current (actual) "Ship Speed" for the remaining distance or the "Ship Speed" for the current leg and the "Planned Speed" (inserted by the user in the Leg SOG column) for the remaining legs.

To insert the planned speed for each remaining leg, R/Click on the relevant Leg SOG box and complete the pop-up "Speed box".

When the "Ship Speed"/"Planned Speed" button in the Route Plan dialogue box shows "Ship Speed" the ETA calculation is made using the ship speed to the final waypoint.

When the button is toggled to "Planned Speed" the ETA calculation is made using the ship speed for the current leg and the "Planned Speed" for each remaining legs.

REMARK in the picture above, planned speeds are used to calculate ETA.

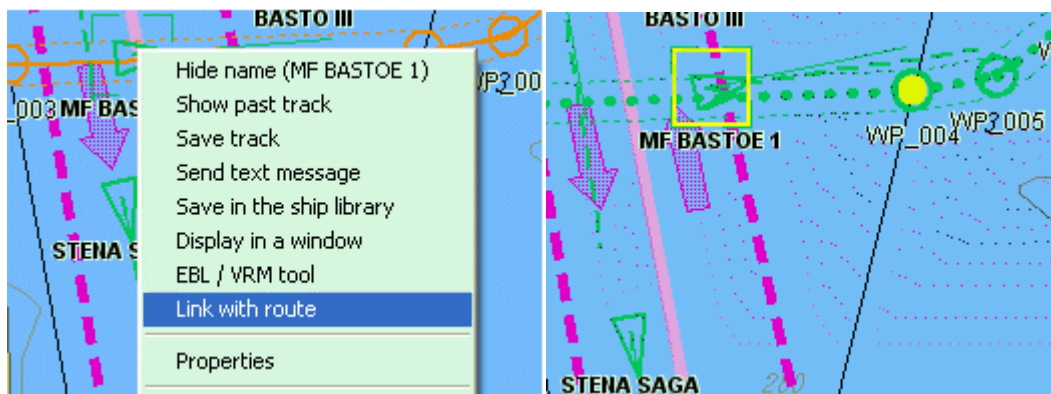
WAYPOINT ETA

The console panel **WP ETA** displays the ETA at the selected waypoint.

- Select the appropriate waypoint number with the small arrows.
- Select the speed to be used for the calculation of ETA (between Ship Speed and Planned speed) with the two buttons located top right in the panel.

TARGET LINKED TO A ROUTE

One AIS target can be linked to a route. Right click on the target to open AIS target menu. Choose the option "Link with route". Select the route. A yellow square point out the target and route is displayed in green.



Target is linked to the route. The route plan can be displayed as it is for the own ship. The same values are given, Bearing, Range.... TTG and ETA are indicated for planned speed.

The route is unlinked by Target menu "Deactivate linked route" or when target arrived to the last Way Point.

RESTRICTION: Route plan can not be used as activated route for Own ship.

3 windows are dedicated to target route information.

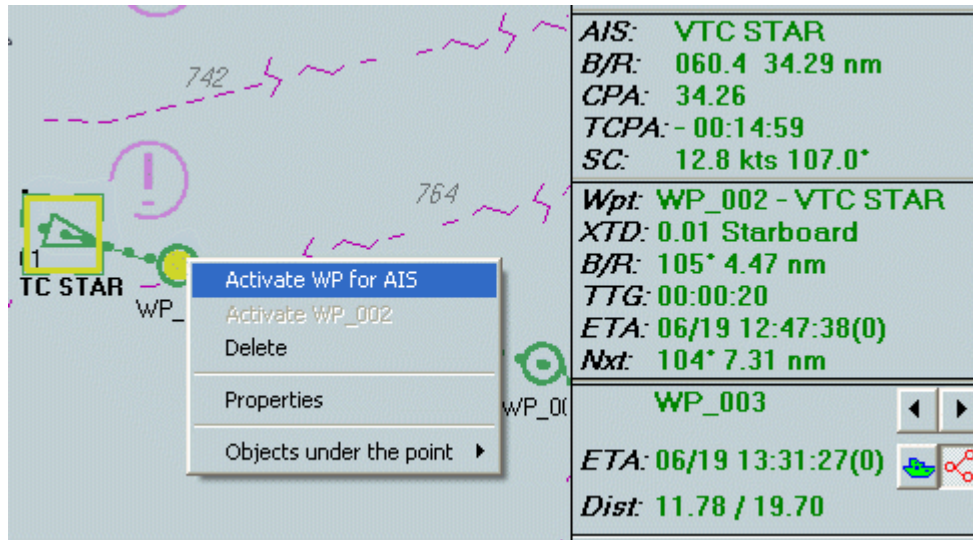
TARGET IN CONSOLE

Target windows in console

3 windows are dedicated to selected target

Target (when target selected)

Target Waypoint – Target Waypoint ETA (when selected target linked to a route)



Target

(VTC STAR selected)

Target-Waypoint

(Activated WP_002)

Target-Waypoint ETA

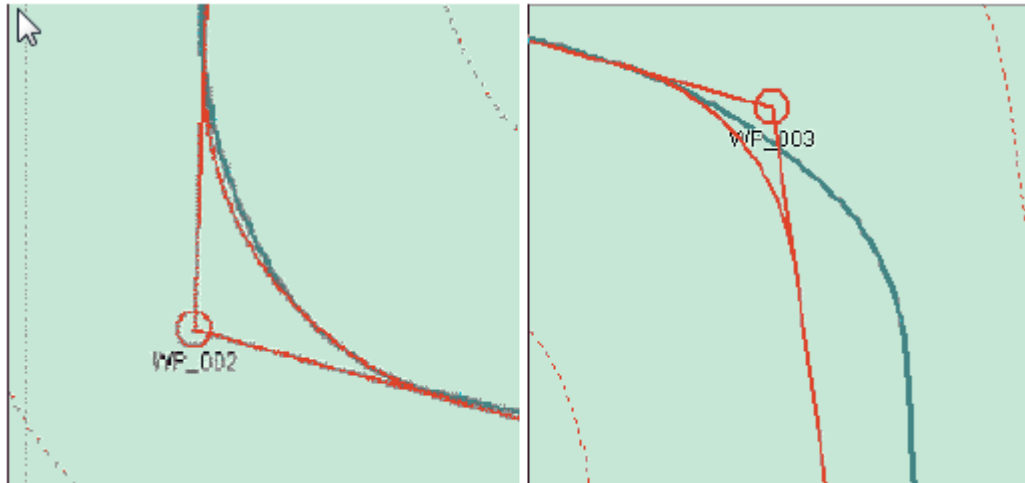
(Selected WP_003)

ROUTE PLANNING AND TURNING RADIUS

The turning radius of a ship depends upon design, loading and environmental characteristics. The user must carefully select the appropriate turning radius taking into account these parameters.

The ECDIS can be linked to the ships autopilot to automatically alter course at each waypoint. The amount of helm ordered by the ECDIS900 will vary according to turning parameters set in the system.

The helm ordered and rate of turn value NEVER exceed the limits defined by the user. To complete a prescribed turn at a waypoint it is essential for the turning radius to be set into the system accurately.



First picture: the Turning radius is good and ECDIS900 is able to follow the planned route during the turn.

Second picture: the Turning Radius is wrong and ECDIS900 is not able to follow the planned route.

AUTOPILOT - TRACK PILOT

The data sentences to be sent to the auto pilot / Track pilot are selected in the application Sensor Monitor paragraph Autopilot.

When a route is active and the option Track Steering or Autopilot is activated, the ECDIS sends regularly the selected sentences to the autopilot or trackpilot.

CHECKOUT BEFORE THE TCS ACTIVATION:

- valid GPS, GYRO and LOG
- difference between HDG and active leg course
- ship should be within XTD limit and some distance in front of wheel over line

TRACKPILOT OPTION

Right click in the panel "Auto Pilot" in the console area and select the item TCS Options to display the **TCSoptions** dialogue

TCS options

Steering parameters

Velocity to come back to the track: 1

CTS speed limit, degr/sec: 0.5

Steering accuracy, degr: 1.0

Maximum radius, NM: 2.0

Minimum radius, NM: 0.2

F - Distance

Alarm settings

Course difference limit for starting, degr: 30.0

Low speed limit, kn: 5.0

Heading monitoring threshold, degr: 25.0

Position monitoring threshold, m: 100.0

XTD calculation while turning

☒ XTD from ROT curve ☐ XTD from straight line

OK Cancel

TCS OPTIONS

STEERING PARAMETERS

VELOCITY TO COME BACK TO THE TRACK

The parameter controls how fast the ship comes back to the track. The yellow point displayed on the route is the point the ship tries to reach. Bigger is the value, faster the ship will try to get back on the route but more intensive will be the rudder usage when the ship is sailing along the track.

CTS SPEED LIMIT

It is the maximum of course change per second that the TCS can accept. Is not used anymore for TCS, but can be used as reference to control ROT limit and in simulation mode.

STEERING ACCURACY, DEGR

The parameter has influence on the rudder usage. The meaning is the minimum deviation from the current leg course, which is ignored. Used only on straight part of the route.

MAXIMUM RADIUS, NM

It is the limit for maximum turning radius that used to check planned route against the ship dynamics

MINIMUM RADIUS, NM

It is the limit for maximum turning radius that used to check planned route against the ship dynamics

F-DISTANCE

Press the F-Distance button to set or adjust distances to start turn for the ship. The **Distance to start turn** table of distances dependent from the ship speed, which is used to calculate WOL position. Parameter is very important to setup properly to reach precise steering.

ALARM SETTINGS

COURSE DIFFERENCE LIMIT FOR STARTING, DEGREE

It is the limit of difference between ship heading and active leg course which makes impossible to activate TCS. Use the **Back on track** function to build temporary route, which makes possible to join the planned route using TCS function.

LOW SPEED LIMIT, KN

The parameter is used to trigger alarm in case TCS is active and vessel speed is less then specified threshold. Meaning that autopilot is not able to provide proper steering quality under specified conditions.

HEADING MONITORING THRESHOLD, DEGR

The parameter is used to monitor two GYRO values. difference. Alarm is triggered in case difference exceed the specified threshold.

POSITION MONITORING THRESHOLD, M

The parameter is used to monitor two GPS positions difference. Alarm is triggered in case difference exceed the specified threshold.

XTD CALCULATION WHILE TURNING

- Select **XTD from ROT curve** when using (new) autopilot type which need XTD calculation during turning not from turning curve.
- Select **XTD from straight line**, using (old) autopilot type which need calculation from straight line.

F-DISTANCE

The settings of turning distances.

Distance to start turn

Please fill in the table of distances the ship makes from the time you activate a turn til time the ship actually starts to turn. This distance is used in Active Leg tool for precise navigation in narrow waters and depend from the ship speed.

Select loading profile: **Ballast**

	Ballast	Medium	Loaded	
Speed 5 kn	70.0	70.0	50.0	m
Speed 10 kn	70.0	70.0	100.0	m
Speed 15 kn	70.0	70.0	120.0	m
Speed 20 kn	70.0	70.0	150.0	m
Speed 30 kn	70.0	70.0	180.0	m
Speed 40 kn	70.0	70.0	200.0	m

Pivot point distance from the bow
It's used as origin for XTD calculation

100.0 metr from the bow

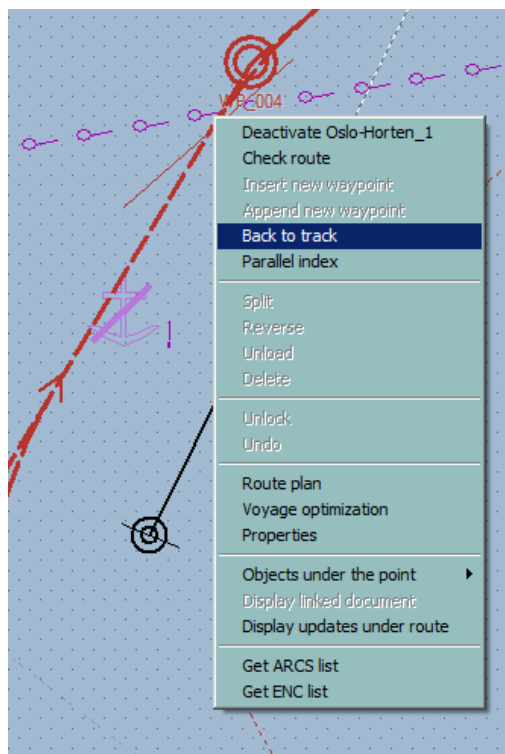
OK Cancel

NOTE The function is also available from the Ship properties **Shape** tab.

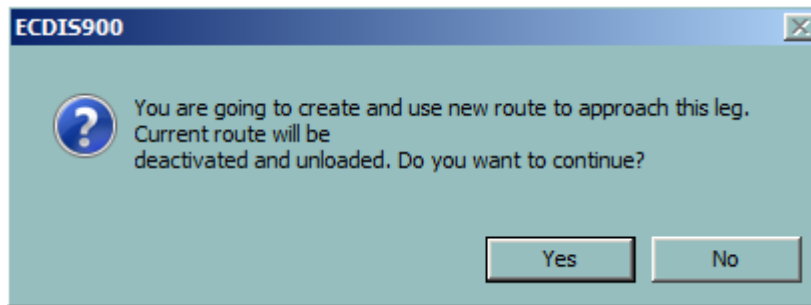
BACK TO TRACK FUNCTION

This function allows to create a new route including new way points to go back on a activated route, after the ship has to deviate from original route. This original route is not deleted.

Right click on the route and select **Back to track** menu.

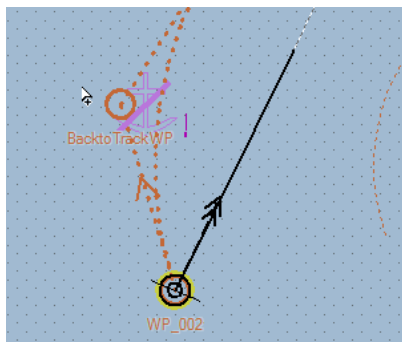


The warning message is displayed.

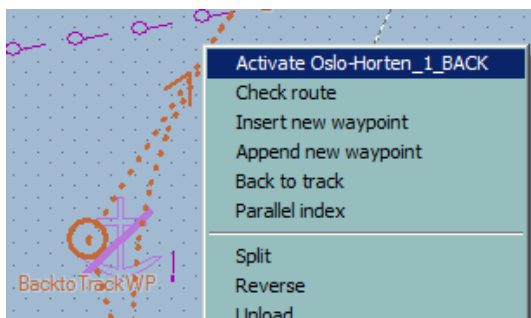


The more appropriate Waypoint is selected as the Start Waypoint.

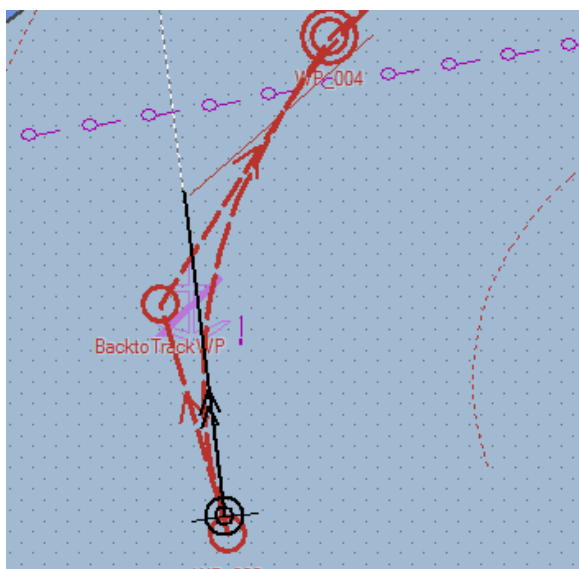
When route is finished, double click to finish the route creating the first waypoint at the ship position.



A new route is created; name is suffixed by "_BACK". Right click to activate.



The new route is activated.



Alarms

ALARM MANAGEMENT

DISPLAY

When an alarm is triggered, an alarm message is displayed in the alarm area located in the console and the danger is highlighted on the chart or in the console area.

By default a sound signal accompanies an alarm message that does not acknowledge and the pulse frequency of the flashing of the alarm button is 1 Hz.

IMPORTANT







Switching the audible signal off by clicking the Sound Off button is possible for warnings but it is not possible to turn off the alarm sound in case of alarm. See the **List of alarms** for details.

To avoid Alarm in harbour and berthing condition, activate **Harbour mode**

ACKNOWLEDGEMENT

To acknowledge an alarm double click on the alarm message or click the **Acknowledge** button after selection of the message.

The following icons indicate the current state of alarms and warnings.

	Active and Not Acknowledged	Rectified	Silenced	Responsibility transferred	Acknowledged
Alarm					
Warning					

Alternatively press the **Return** key to acknowledge all alarms.

REMARK

Alarms should not disappear automatically in case alarm condition is not applicable. It is a requirement from DNV and BV based on IMO resolution A.830.

ECDIS IN NETWORK

When several ECDIS workstations are connected in a network, acknowledgement of alarm is synchronized, i.e. when an alarm is acknowledged on one PC this alarm is acknowledged on all PCs with the exception of user defined alarms which are local on the PC.

LIST OF ALARMS

LIST OF ALARMS

The following alarm messages may appear during the operation of the ECDIS900:

SAFETY ALARMS

Grounding alert

Danger in safety zone

Danger in streamer zone

User defined alarm

User defined anchor alarm

TARGET ALARMS

CPATCPA

Lost Target Alarm

SENSORS ALARMS

GPS failure

Heading alarms

STW alarm

ROUTE ALARMS

XTD out limits

Course Change alarm

End of Track alarm

TCS ALARMS

Stop Track control

Low speed alarm

Back up navigator alarm

Change to manual steering

SAFETY ALARMS

GROUNDING ALARM

The ECDIS900 checks the safety of the navigation and triggers an alarm when the value of the sea depth at the current ship position is lower than the Safety Contour value entered in the Chart Settings, **Safety** tab.

IMPORTANT

The grounding alarm function is available only when S57 vector chart are used.

- The largest scale data available for the area given is always used by ECDIS900 to generate the grounding alarm.
- ECDIS is also capable of sensing indications and alarms related to manual update objects.

DANGER ALARMS IN THE SAFETY ZONE

GUARD ZONE

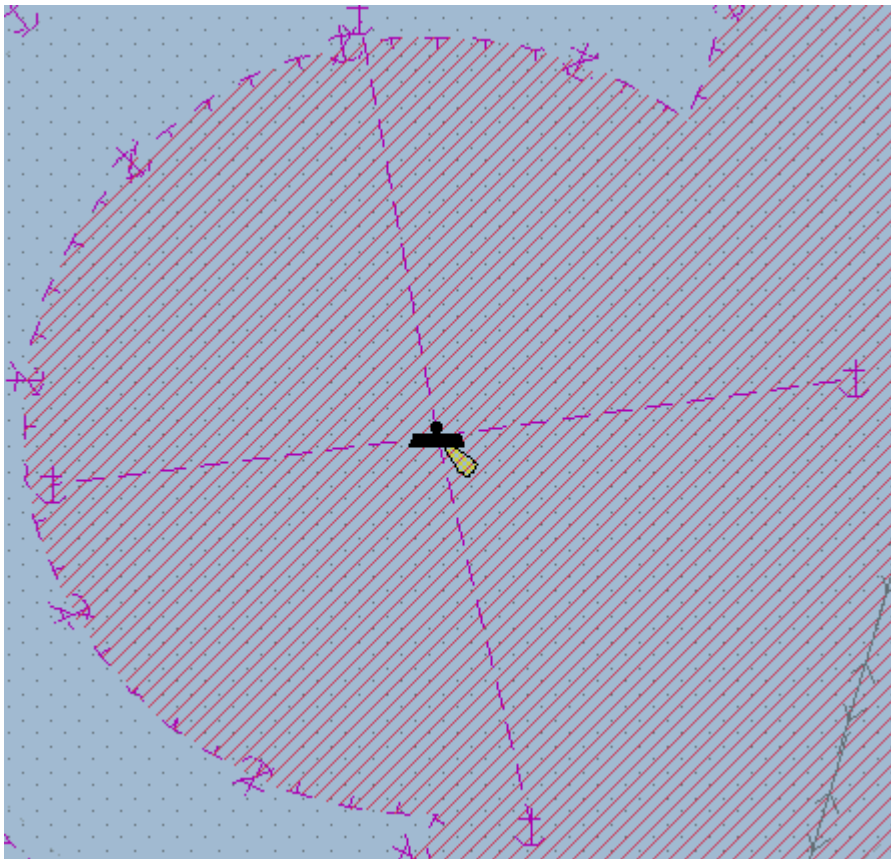
The ECDIS900 checks the planned position prior to the start of the voyage as well as the ship's position during the voyage in relation to the planned route and the surrounding dangers. The system checks the dangers in a guard zone defined in front of the ship.

SETTING THE GUARD ZONE

To activate the guard zone alarm function, toggle the Check safety zone function ON on the **Alarm tab** of the Ship Properties. The safety zone is portion of circle centred on the ship's position and defined by an angle and a distance in front of the ship. The distance is calculated according to the speed of the ship and a specified time set by the mariner.

DISPLAY

When a danger alarm is triggered in the guard zone, the danger is highlighted in the chart.



After the alarm has been acknowledged, the alarm message will be displayed in yellow and remain displayed in the alarm area for as long as the danger exists. However the danger is still highlighted on the chart. If another danger is triggered in the guard zone, a new red flashing message will be displayed in the alarm box.

DANGERS

ECDIS shall give an alarm or indication if the ship is going to cross the safety contour or cross the boundary of areas for which special conditions exist within the specified time.

IMPORTANT

The Safety zone function is available only when S57 vector chart or C-MAP are used.

- The largest scale data available for the area given is always used by ECDIS900 to generate the danger alarm.
- ECDIS is also capable of sensing indications and alarms related to manual update objects.

USER DEFINED ALARM

Each user defined object plotted using Object Editor may be defined as a danger and therefore may trigger an alarm:

- An isolated object when the point is inside the ship's guard zone or inside the safety corridor of a route.
- A line when the line intercepts the guard zone or the safety corridor of a route.
- An area when the area intercepts the guard zone or the safety corridor of a route cross the line.
- User defined "alarmed" areas will be considered as "No go" area in VDS module

ASSIGN ALARM

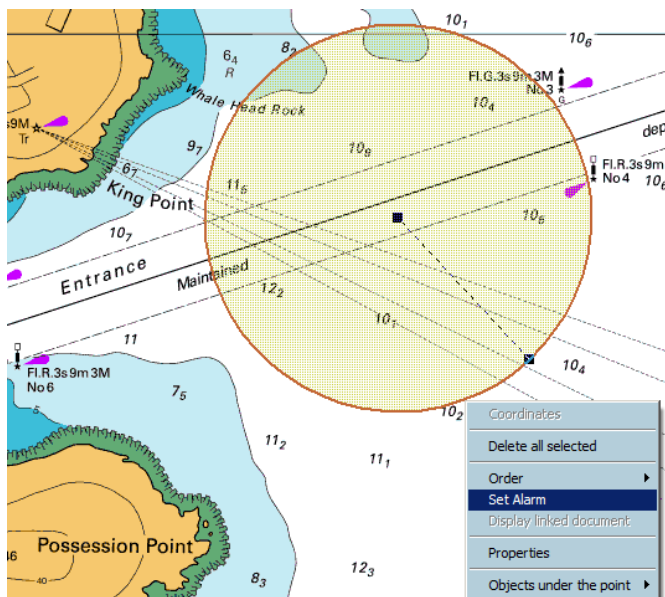
ALARM OBJECT

The object editor (OE) is used to plot user data on the charts: simple point, lines or areas (For more details see the chapter **Editors**).

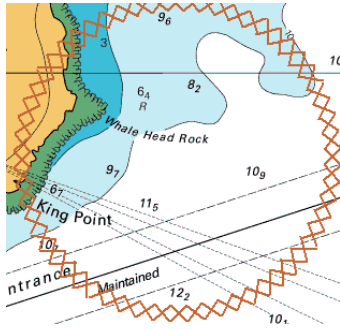
An alarm object is a geographical area, which triggers an alarm when the ship sails into it or when a planned route crosses it.

DEFINE ALARM OBJECT

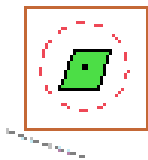
Right click on the object outline, plotted on the chart, and click **Set alarm** in the pop-up menu.



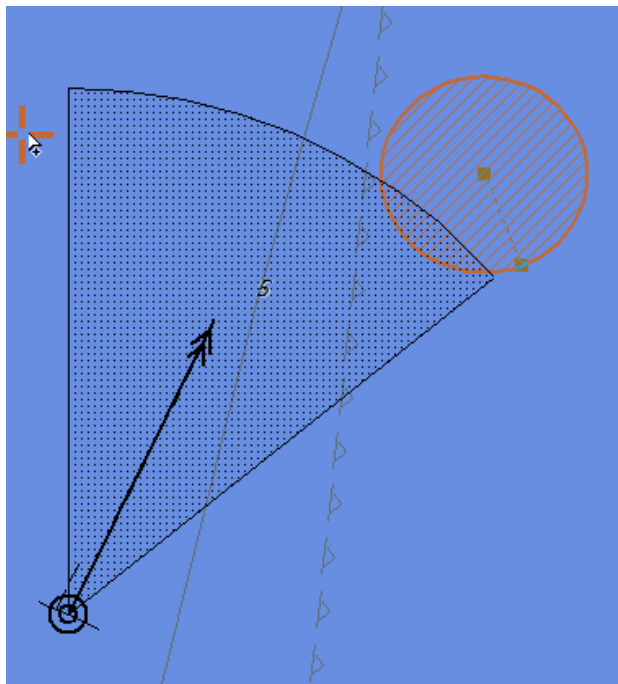
The object outline changes to red to underline that it has become an **alarm object**. (One pixel wide and no filling for area).



Where the alarmed object is a point, this is surrounded by a red rectangle



When the object triggers an alarm the display changes, the lines are drawn in red, 2 pixels wide.



MONITORING USER ALARM

When the ship's guard zone intercepts an alarmed object an alarm is triggered. The alarm is displayed as long as the alarmed object remains inside the ships guard zone.

REMARK

The guard zone depends on time and speed. For more details see **Ship**.

RELEASE ALARM

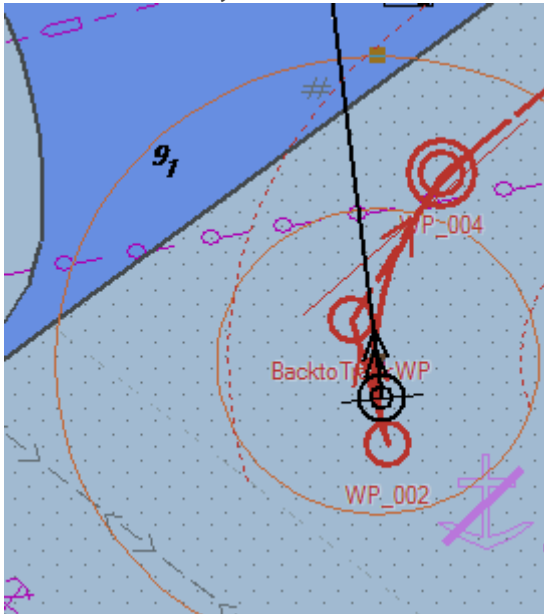
To release the alarm on one object right click and activate the item **Delete alarm** or select all alarm object using the item menu **Select all alarm object** in the menu Edit in the editor panel and press the **Delete selected objects** button.

USER DEFINED ANCHOR ALARM

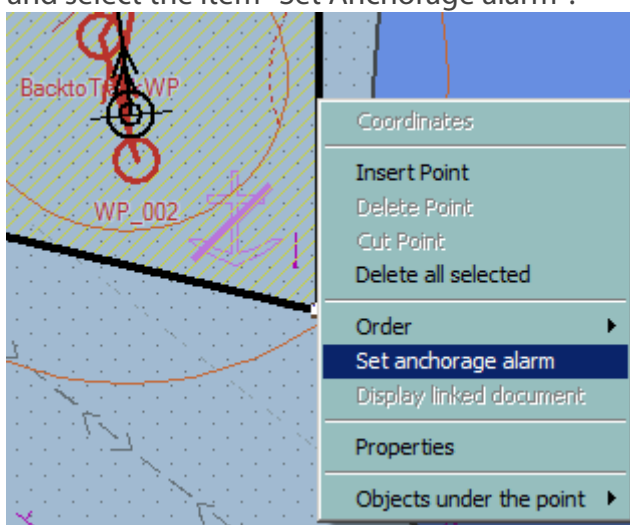
An anchor alarm or several anchor alarms may be set in the ECDIS.

To define anchor alarms proceed as follow:

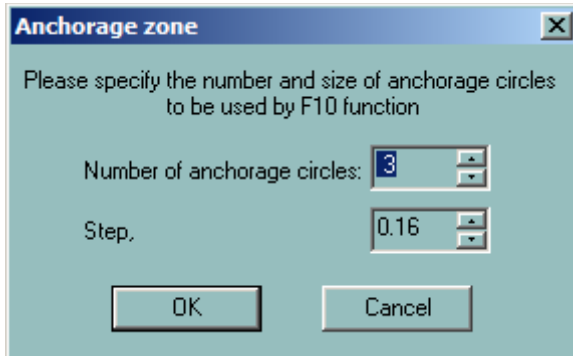
- Press F10 hot key and several circle anchor zones are created.



- Plot an area, a circle or an arc with the ship inside the area. Then right click on the object and select the item "Set Anchorage alarm".



To define the anchor circles F10 creates around the ship press the key Ctrl and the button F10 together. Select the appropriate parameters.



To release the anchor circle alarms press a second time F10.

To release other anchor alarm right click on the alarm and select **Delete alarm**.

TARGET ALARMS

CPA/TCPA ALARM

The CPA (closest point of approach) and TCPA (time to the closest point of approach) limits are editable in the panel Alarm of the Ship Properties dialogue.

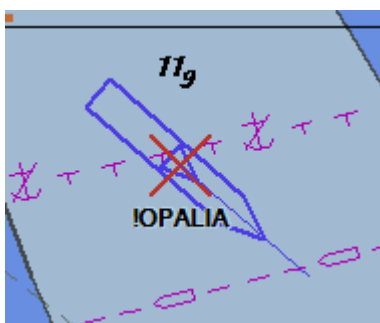
If both limits are exceeded an alarm will be triggered and the target in question will be marked and its icon set to flash white.


After the alarm is acknowledged, the alarm message will disappear the icon will continue flashing for as long as the CPA/TCPA limits are exceeded or until the target is lost.

If another target triggers a CPA/TCPA alarm, a new flashing message will be displayed in the alarm box.

LOST TARGET ALARM

ECDIS manages both ARPA and AIS lost targets. If no position is received within 3 minutes a target is considered as lost and ECDIS displays the lost target on the chart with a special icon (triangle with a cross line and no vector): **Lost Target Alarm** is raised.



1 targets in the table, (AIS: 1)							
Vessel name	MMSI	CPA	TCPA	Range/Bearing	Ship type	Call sign	Na
 AIS IOPALIA	1	0.40nm	42.6min	0.53nm 304.5°	Tanker	MZFC4	Uni

Then if no data is received within the next 30 seconds the target is deleted from the target table.

SENSORS ALARMS

GPS FAILURE

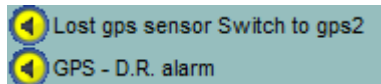
No settings.

If the only one

If GPS1 and GPS 2 are active,

GPS1 is lost : alarm "Lost gps sensor Switch to GPS2"

GPS2 is lost : alarm "GPS – D.R. alarm"



Indicator GPS switched to D.R.

POSITION MONITORING ALARM

If Position values given by the 2 different active GPS source are different, alarm is generated if difference is more than threshold (100m by default) defined in TCS Options.

HEADING ALARMS

If Gyro1 and Gyro2 are active,

Gyro1 is lost : alarm "master GYRO changed alarm" is generated.

Gyro2 is lost : alarm "Heading Alarm" is generated.

HEADING MONITORING ALARM

If Heading values given by the 2 different active Gyro source are different, alarm is generated if difference is more than threshold (20degrees by default) defined in TCS Options.

STW ALARM

When STW data are lost, "STW alarm" is generated.

ROUTE ALARMS

XTD OUT OF LIMITS

SETTINGS

To get a warning when the XTD exceeds the limit, toggle the XTD ON located in the **Alarms** tab from the Ship Properties or in the **Route** tab from the Option dialogue.

The XTD limit for each leg can be adjusted either in the **Waypoint properties** dialogue or in the **Route plan** window.

After acknowledgement, the message XTD out limits will remain displayed for as long as the XTD exceeds the XTD limit value defined in the system or until the route is deactivated.

COURSE CHANGE ALARM

The alarm message is generated when the ship is arriving to the active Waypoint of activated route.

END OF TRACK ALARM

The alarm message is generated when the ship is arriving to the last waypoint of the active route.

TCS ALARMS

STOP TRACK CONTROL

The alarm message is generated when the Track steering function is stopped due to the reasons which make impossible to control ship by autopilot. It can be sensor failure or loosing connection with autopilot.

LOW SPEED ALARM

The alarm message is generated when the ship speed is less than the user defined limit value (**TCSOptions**).

BACK UP NAVIGATOR ALARM

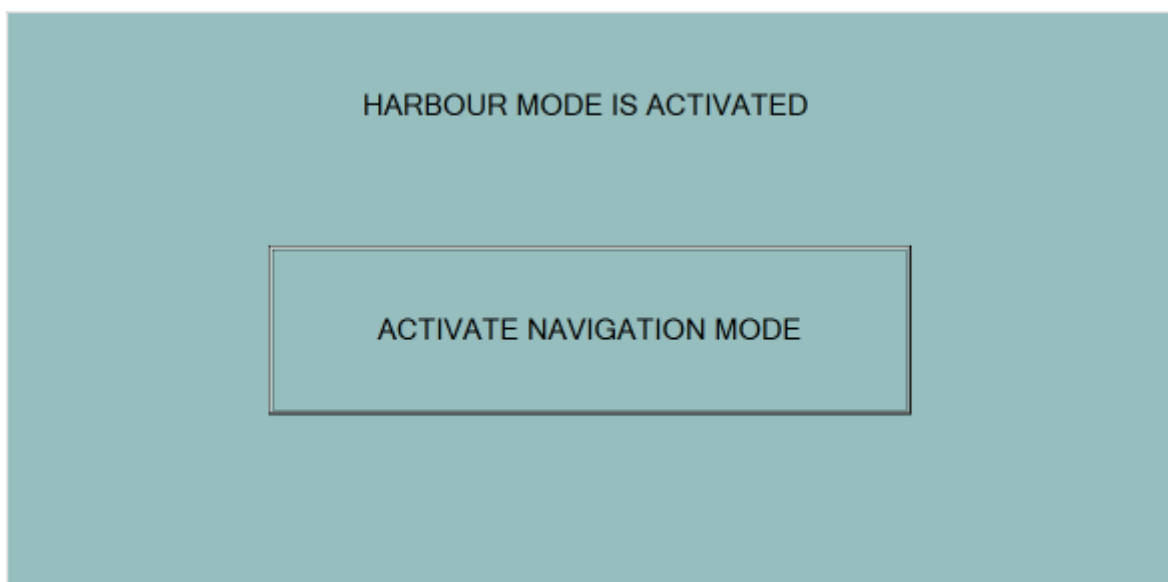
Navigator does not acknowledge course change alarm or End of Track alarm or Stop Track Control alarm.

CHANGE TO MANUAL STEERING

With failure of heading sensor user is advised to switch autopilot mode to manual steering.

HARBOUR MODE

To suppress alarms (buzzer and external BAS) when vessel is in the harbour (berthing or whatever) ecdis can be switched in so called Harbour mode. Alarms are disabled and chart area is hidden by big panel indicating that ECDIS is OUT of navigation mode.



CTRL+H hot key is used to activate the function. Pressing the button on the harbour panel revert system in the navigation mode.

AIS

AIS - AUTOMATIC IDENTIFICATION SYSTEM

INTERFACE

The AIS transponder communicates with the ECDIS via a serial cable (NMEA 422 protocol).

The duplex link between the AIS and ECDIS allows two-way communication:

- The ECDIS receives dynamic data (targets' positions and information) and **messages** from AIS.
- The ECDIS transfers own ship's static and voyage data to the AIS.
- The ECDIS may also be used to send **messages** to selected recipients.

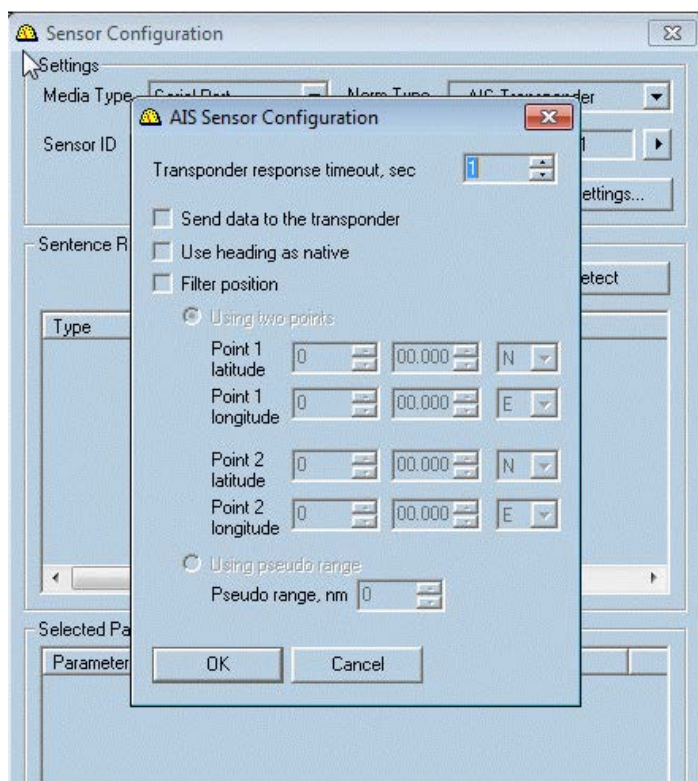
IMPORTANT

Ship's static data including Ship's name, length, etc....are used in both AIS transponder and ECDIS900 and can be entered either in AIS device either in ECDIS900.

The AIS transponder sends regularly ship's static data to ECDIS900 and vice versa ECDIS900 may send ship's static data to the AIS device.

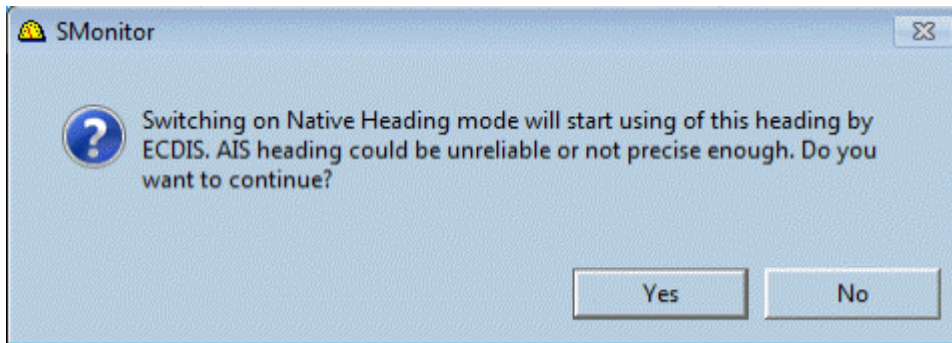
If the user decides to use in ECDIS900 the static data entered in the AIS transponder, ECDIS900 should not send the static data to the AIS. Therefore, when setting up the communication in Sensor Monitor tick off the flag "Send data to the transponder".


Two kinds of filters can be applied to the sensor data.

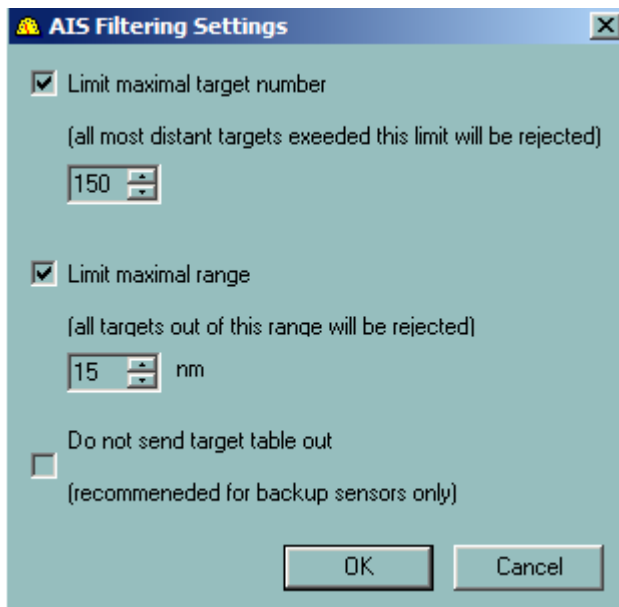


AIS Sensor can be switched to the Native Heading mode but the AIS heading could be unreliable or not precise enough. So the proper warning appears if the "Use heading as

native" item is ticked on. Press "Yes" to switch on the mode or "No" to back to the previous state.



To optimise the number of displayed targets, press the AIS filtering button  and set the filter criteria in the dialogue.



BROADCASTED DATA

The AIS transponder broadcasts three different types of data to other AIS installations or base stations:

- Static ship data including Ship's name, IMO number, call sign etc.
- Voyage related data including Destination and ETA.
- Dynamic data including position, heading and speed, ROT (Rate of Turn if available) etc.

Static ship and voyage related data is sent every 6 minutes.

The dynamic data sending rate depends on the ships speed. The dynamic data is sent every 5-10 seconds when the ship is making more than 3 knots but the delay is increased up to 3 minutes when the ship is making less than 3 knots.

TARGETS

AIS targets are displayed on the chart with a special symbol. On request the **name of the target** and the **past track** can be displayed and the **track can be saved** on the hard disk. In the dialogue Properties of AIS target all information about the selected target is displayed and the **target list** contains the list of targets currently being tracked.

The **prediction tool** allows the user to display the future position of the targets.

AIS sleeping parameters and **target associations** allows the user to adjust the target display.

LOST TARGETS

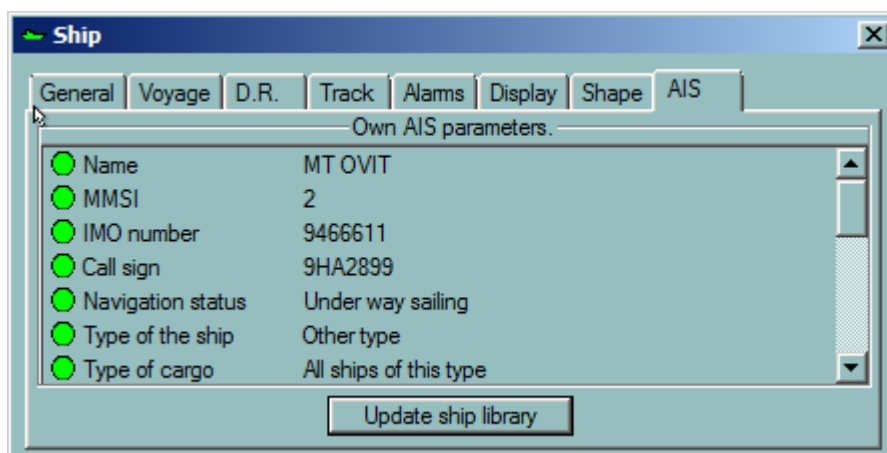
ECDIS manages both ARPA and AIS lost targets. If no position is received within 3 minutes a target is considered as lost and ECDIS displays the lost target on the chart with a special icon (triangle with a cross line and no vector). Then if no data is received within the next 30 seconds the target is deleted from the target table.

OWN SHIP DATA

VOYAGE DATA

When ship's static data received from AIS device are used in ECDIS900 it is displayed in the Ship's properties, **AIS tab**.

A green icon displayed in front of the parameter means that ECDIS900 setting is the same than AIS setting for the selected parameter. If the icon is red the parameter in AIS is different from the parameter in ECDIS900.



If any discrepancies ECDIS900 proposes to synchronize the data by using in ECDIS900 the data received from AIS transponder.

Voyage data has to be entered in the AIS transponder for each voyage.

When a route is activated in ECDIS900 the voyage data are calculated by the ECDIS.

These data can be sent automatically to the AIS transponder but the user can decide to manually enter and send the data to the AIS.

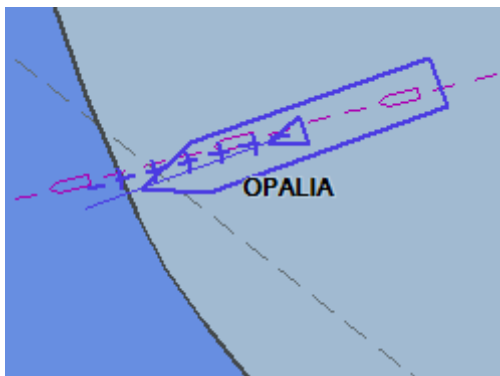
The voyage information is displayed and entered in the **Voyage tab** in the Ship Properties dialogue and the option Manual Entry must be checked to be able to enter manually the voyage data.

Ship and voyage data is automatically sent via the serial link to the AIS.

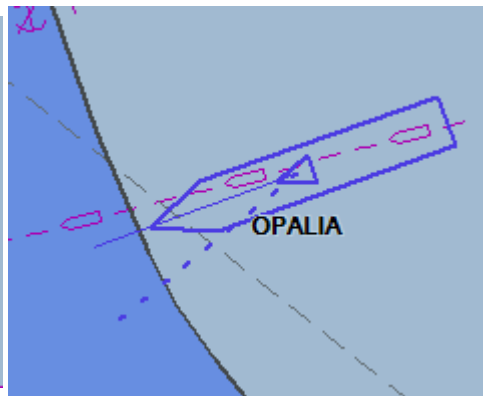
AIS TARGET DISPLAY

The AIS Target symbol is a blue triangle with a speed vector (dotted line) and the COG vector (continuous line). The speed vector length depends on the speed of the target (true vector) or on both own ship and target speed (relative vector). Keep in mind that according to standards the AIS target must display the ship scaled icon.

True vector

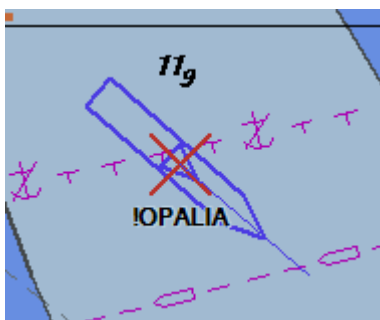


Relative vector



When a target is lost, the vector is no longer displayed and a small line crossing the green triangle shows the status of the target in the table. On the chart the blinking red cross appears over the AIS symbol indicating the lost target .

1 targets in the table, (AIS: 1)							
Vessel name	MMSI	CPA	TCPA	Range/Bearing	Ship type	Call sign	Na
▲ AIS IOPALIA	1	0.40nm	42.6min	0.53nm 304.5°	Tanker	MZFC4	Un

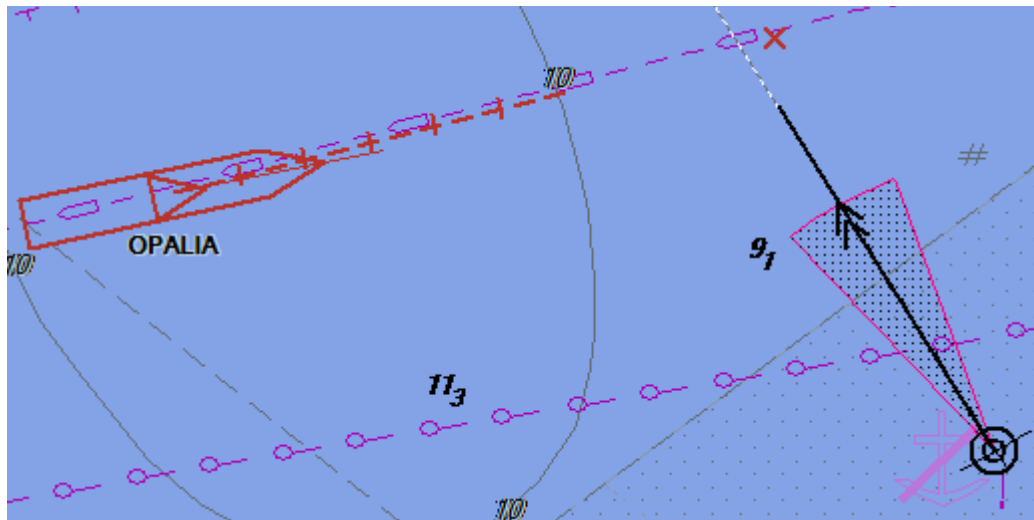


When the set CPA/TCPA alarms are activated the icon blinks.

NOTE If the Rate of Turn (ROT) is received for a specific target, a small bar is displayed at the end of the target vector indicating the direction of the turn.

CPA TCPA ALARM

When the CPA TCPA alarm is generated, the target symbol becomes red and it blinks.

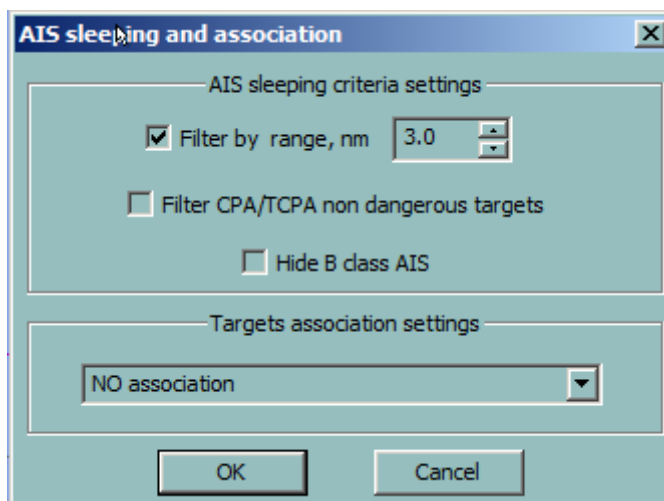


SLEEPING TARGET

It is possible to display name of targets only in a specified range around ship.

Select options in "AIS sleeping criteria settings"

In Target Console, Right click and open dialogue window to adjust range or CPA Alarmed targets.



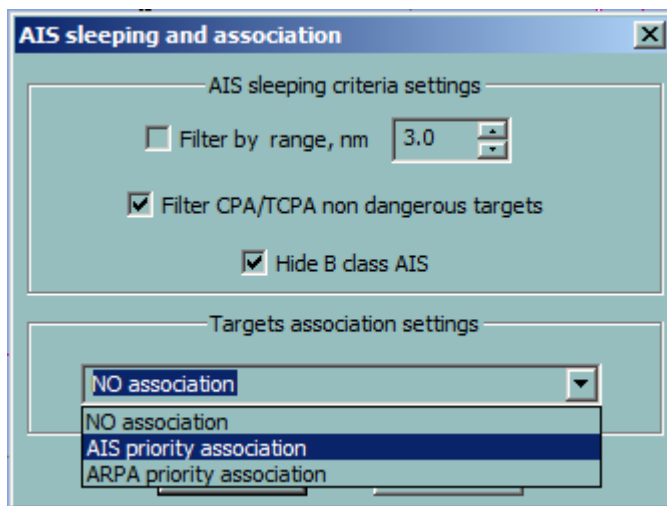
TARGET ASSOCIATION

According the ARPA regulation an automatic target association function is provided based on harmonised criteria. When the function is enabled, it avoids the presentation of two full target symbols for the same physical target.

If the target data from AIS and radar tracking are both available, and if the association criteria (for example position, motion) are fulfilled such that the AIS and radar information are considered as one physical target, the activated AIS target symbol and the alphanumeric AIS target data shall be automatically selected and displayed, with the provision of an alternative priority in below.

The user has the option to change the default condition to the display of tracked radar targets and shall be permitted to select either radar tracking or AIS alphanumeric data. Once a TT target and AIS target have become associated, hysteresis shall be applied to the criteria to set the new criteria or disassociation. For practical applications, it shall be permitted to vary the association and disassociation criteria by up to 300 % of the default values. Association for Class A and Class B AIS targets are permitted but the lower update rate on Class B AIS targets may limit or prevent association.

Select option in the **Target association settings** list



It's possible to choose one of 3 options:

- No association
- AIS priority association
- ARPA priority association.

it's possible to change it at any time, but only operating in the Monitoring station mode. Option selected by user is distributed by LAN among planning stations.

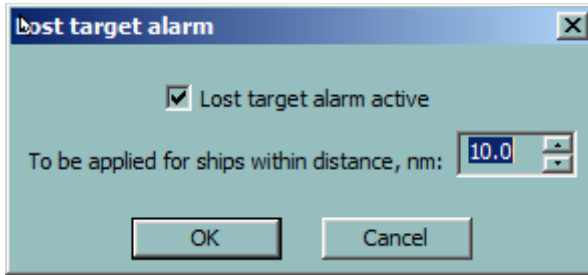
- Selected option is displayed in target console. (SLP/ASC)
- Display of associated targets is done according IEC 62288.

Name of associated target displayed on the chart in brackets after the name of main target. This makes possible to get access to appropriate target properties in the target table. In the target table no association is used and data is displayed as it is.

LOST TARGET ALARM

Press button to configure Alarm when a target is lost within a given Range around ship position. This alarm is available for both AIS and ARPA targets.

Press the Lost target button to open the dialogue



- Check box to activate alarm
- Set the value of the range

REMARK

When Alarm is active, lost targets are not remove automatically from the list after normal timeout (1mn). Alarm acknowledgment will remove lost targets from the list.

SHOW/HIDE AIS TARGET'S NAME

To display or hide a target's name, click right on the target icon and select Show name or Hide name on the pop-up menu.

REMARK

The user may also select to hide or show the name from the target's properties dialogue.

SHOW/HIDE PAST TRACK

All AIS tracks are automatically recorded in memory (Up to 3 hours).

To display or hide a track click right on the target icon and select **Show past track** or **Hide past track** in the pop-up menu.

REMARK

The user may also select to hide or show the track from the target's properties dialogue.

SAVE THE TRACK

To store a target's track in the route / track database on the hard disk, click right on the target icon and select Save track from the pop-up menu. The track is recorded for 3 hours with 30s time stamp.

The saved AIS tracks are stored in the same database as the own ship and saved ARPA tracks. To load/Unload a recorded target track see chapter Track.

AIS TARGET PROPERTIES

To view the properties of a target click right on the target and select Properties from the pop-up menu.

It is also possible to view to the properties from the target list dialogue by right clicking on the name of the target.

The General panel displays static information about the target and the Navigation panel displays information about the voyage and the dynamic data.

OPALIA AIS properties

General | Navigation

ID: IMO number: 9172844

Call sign: MZFC4 Draught: N/A

Navigation status: Under way using engine

Ship type: Tanker

Cargo type: All ships of this type

Dimensions: Length 300 m Width 50 m

Display

☒ Name visible ☐ Past track visible

OPALIA AIS properties

General | Navigation

Destination: ROYAL DOCK ETA: N/A

Latitude: 32 30.100S Longitude: 060 54.300E

COG: 130.0 SOG: 0.0

HDG: 131.0 ROT: 0.0 deg/min

CPA: 0.37 TCPA: +00:47:28

Bearing: 306.6 Range: 0.5

BCD: N/A BCT: N/A

MESSAGES

The AIS messaging system allows the user to send short messages to and receive messages from another AIS.

There are two kinds of messages:

- Safety Related Message (SRM), which can be either pre-formatted text or free text
- Text messages (Limited to 160 characters)

ECDIS provides an elegant and efficient interface to this messaging facility

AIS messaging

Recipients

Name	R/B
● ID:7	58.73 NM 359.4°
● IOPALIA	0.65 NM 283.0°
● ISPBTEST	2.28 NM 114.7°

New message

FIRE, EXPLOSION

FIRE, EXPLOSION 146 ☒ SRM

☐ Broadcast

☐ Inside the circle 11.50 NM

History

Save last 1 hours

To	Sent (UTC)	Message
✉ ISPBTEST	30/10 21:56	FIRE, EXPLOSION
✉ IOPALIA	30/10 21:56	FIRE, EXPLOSION
✉ Broadcast	30/10 21:55	FIRE, EXPLOSION

RECEIVING MESSAGES

When a new message is received by the AIS, it is automatically transferred to ECDIS and the user is notified by the blinking small blue envelope icon (displayed next to the acknowledgement button in the alarm panel).

- Click on the envelope icon to display the messaging dialogue and click the “Incoming” button to see incoming messages.
- New messages are listed in the lower part of the window with the senders name and the time of reception.
- Click on the line to display the full message in the upper part of the dialogue.
- Double click on the message to acknowledge it or push the “Acknowledge” button to acknowledge all messages. The messages that have not been acknowledged are displayed as bold.
- Right click on the message to delete it from the list or click “Clear” to delete all messages.
- Select how long you want to keep the messages in the log with the “Save last” parameter.
- Print all messages with the button “Print History”.
- Display Incoming messages from only the active recipients, i.e. the current received AIS signals.

NOTE When a received message is not acknowledged, the message is displayed on the chart next to the target name of the AIS sender.

TIP: Right double click on the message centres the chart on the AIS target.

SENDING MESSAGES

Click on the blue envelop icon located in the Alarm panel or use the keys Ctrl + A or click the button “AIS messaging” in the target list or right click on the target and select the menu “Send text message” to bring the AIS messaging window in front.

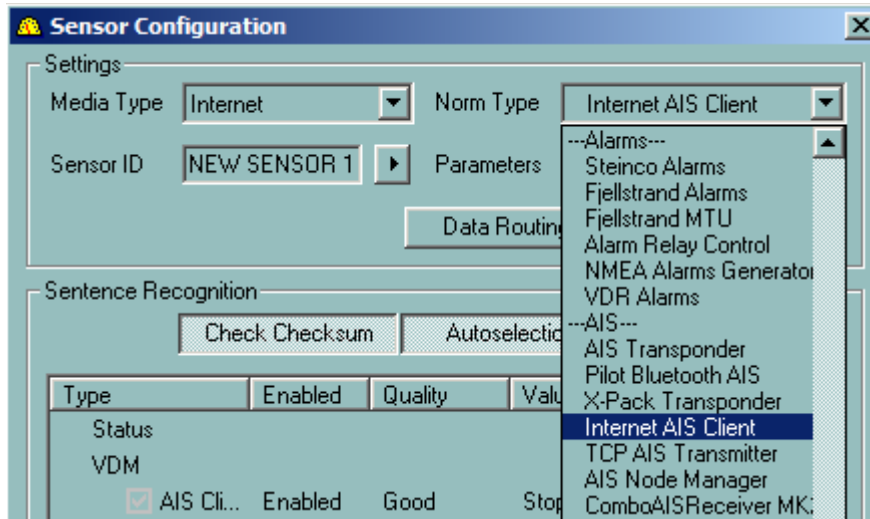
- Select “Outgoing message”. The list of sent messages is displayed in the lower part of the window.
- Type a new message in the new message text box or select a pre-formatted message with SRM pop up.
- Select a recipient or check on the Broadcast box and click “Send” button. It is also possible to send broadcast message within a circle defined by the radius “Inside the circle”.
- When the MOB button is pushed an AIS SRM message is automatically broadcast.

AIS DATA SERVER

Scandinavian AIS traffic is accessible via Internet. To connect to the dedicated WEB site login name and password are required.

SET UP

In Sensor Monitor create a sensor, norm Internet AIS Client.



START/STOP AIS DATA RECEIVING

In ECDIS900 access to the target list window and activate or de activate the reception. Enter the login name and password when required.

After few seconds AIS targets are displayed on the chart.

Seatracs

SEATRAC TENDER TRACKING

The SeaTrac Tender Tracking System is a stand-alone Radio Frequency Transmission System designed specifically for tracking watercraft as they operate around a Superyacht. The SeaTrac System operates without the requirement for land-based infrastructure. SeaTrac transmissions are without cost, and operate on either US or European license-free frequency bands. Dedicated NMEA sentence allows close Target or Tenders to be tracked around the own ship. Different alarm can be setup target per target.

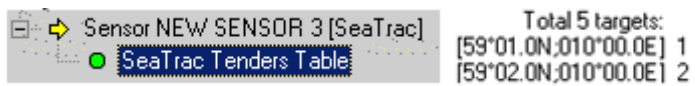
- SeaTrac **configuration** in ECDIS
- SeaTrac **Display** in ECDIS

ALARMS

There are 2 types of SeaTrac targets alarms: SeaTrac **external** alarms and SeaTrac **internal** alarm

SEATRAC CONFIGURATION

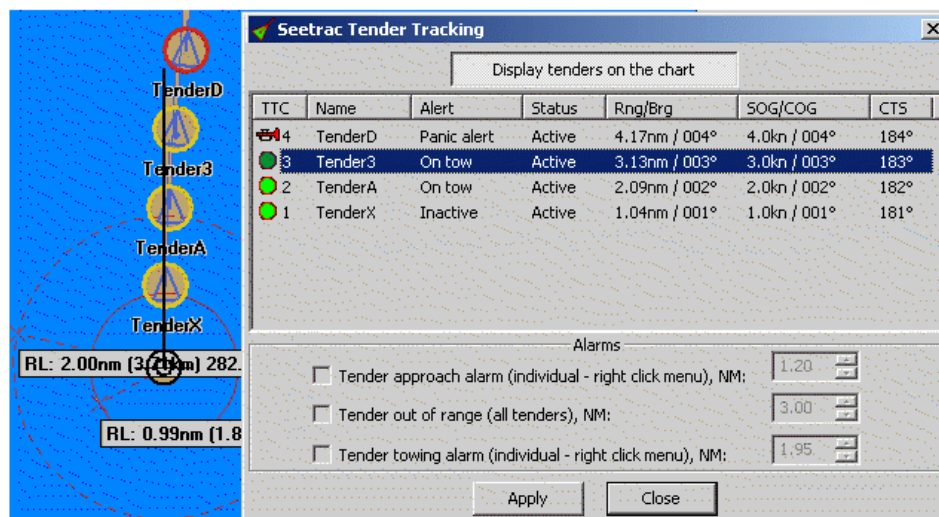
Create dedicated special sensor **SeaTrac** is created in Sensor Monitor



SEATRAC TARGET DISPLAY

Right click on the **Target Table** button  to open SeaTrac tender tracking dialog.

Toggle ON **Display tenders on the chart** to display targets (the default state is OFF).



Targets are displayed as AIS target except size of shape is fixed, and with.

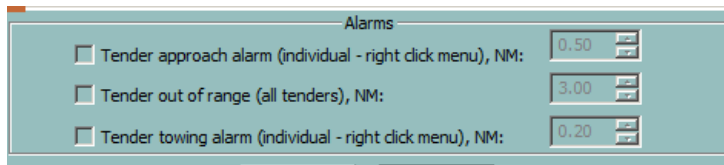
- yellow circle around target shape(no alarm)
- red blinking circle together with Horn icon in TTC column (if alarm)
- Track available by right click menu for each target.

SEATRAC EXTERNAL ALARM

This alarm is raised up by the Tender itself through NMEA when "Alert" field is setup to "Panic alert" (see example above for TenderD when no internal alarm is activated).

SEATRAC INTERNAL ALARM

Three types of alarm can be activated regarding distance from own ship to Target.

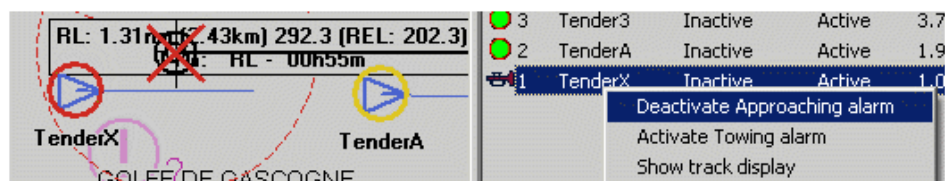


The box should be checked to get given alarm, and Distance threshold adjusted.

But in addition, for Tender Approach and Tender towing, alarm should be activated target by target (Right click menu option "Activate" or "Deactivate"). For each target, track can be display, same menu, option "Show track display".

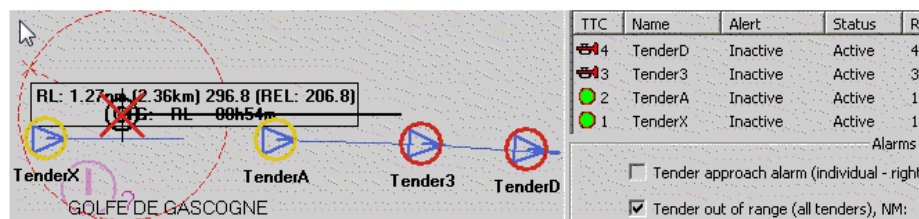
TENDER APPROACH ALARM FOR TENDERX

(Alarm if Range < Distance)



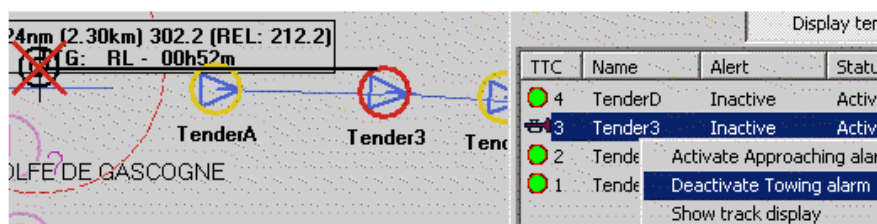
TENDER OUT OF RANGE ALARM FOR TENDER3 AND D

(alarm if Range > Distance)



TENDER TOWING ALARM FOR TENDER3

(Alarm if Range > Distance)



Radar

RADAR OVERVIEW

INTERFACE

There are two ways for the ECDIS900 to interface with radar:

- Connection to the ARPA radar via serial line.
- Connection directly to the radar transceiver with the MARIS' radar kit that delivers the radar target table and the radar video.

All acquired targets are displayed on the electronic chart and the ECDIS900 manages the CPA / TCPA alarms.

TARGETS

The targets are displayed on the chart with **special symbols**. On request the **name of the target** and the **past track** can be displayed, the **track can be saved** on the hard disk and the target deleted in case of **manual target**. The **target Properties** display all information about the actual target and the **target list** contains the list of tracked targets.

The **prediction tool** allows calculating the future position of the targets.

REMOVE TARGET INFORMATION

The target icons can be removed from the display by pressing the hot key **F8**.

RADAR ANTENNA POSITION

The Ship's parameters dialogue, the **Shape tab**, allows the user to set the exact position of the Radar antenna.

IMPORTANT

The targets' positions are calculated from this reference point.

MARIS RADAR KIT

By using **MARIS PC radar kit**, the PC can be transformed into an advanced radar system. Combined this with ECDIS900, the radar picture can be shown on the chart and by means of the built-in radar tracker you will now have the most common ARPA functions available.

The system to be installed on one or two machines which may operate on a local network onboard the ship. MARIS radar tracking system has a unique capacity of tracking simultaneously up to 300 targets, making it capable of searching for and showing data much faster than any other system.

TARGET DISPLAY

Target symbols are small circles with a speed vector, the vector length being dependent on the speed of the target.

In case of CPA/TCPA alarms the target's icon flashes.

SHOW / HIDE

Target icons may be hidden or shown.

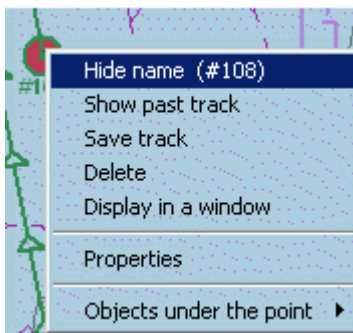
- Press the hot key **F5** to Show/Hide the targets.
- Alternatively press the button Hide target in the target list.

REMARK

The target on CPA / TCPA alarm are always displayed on the chart.

SHOW/HIDE NAME

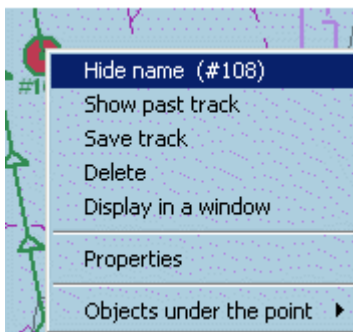
To display or hide a target's name, click right on the target icon and select **Show name** or **Hide name** on the pop-up menu



SHOW/HIDE PAST TRACK

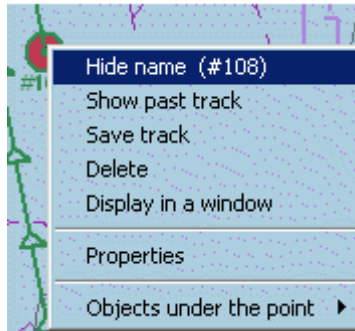
The target's track is continuously recorded in memory.

To display or hide a track click right on the target icon and select Show past track or Hide past track on the pop-up menu.



SAVE THE TRACK

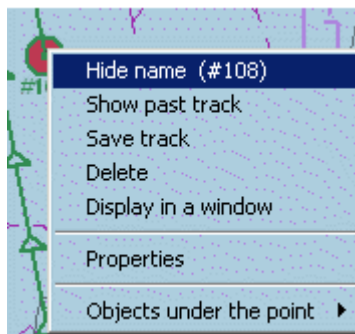
To store a target's track in the route database on hard disk click right on the target icon and select Save track from the pop-up menu.



To load/unload a recorded target track see chapter **Tracks**.

DELETE TARGET

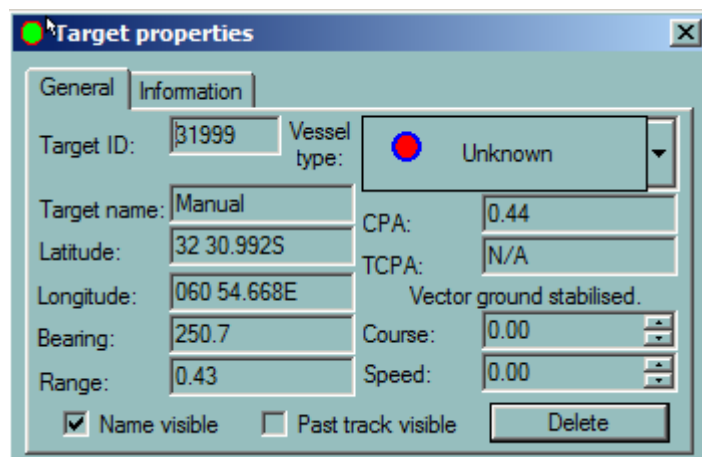
To delete a target, click right on the target icon and select Delete on the pop-up menu.



NOTE Only manually created targets can be deleted.

TARGET PROPERTIES

To view a target's properties click right on the targets and select Properties from the pop-up menu.



- Target ID: Unique identity of the target
- Target name: Target name
- Latitude: Latitudinal position
- Longitude: Longitudinal position
- Bearing: Bearing of the target from the ship
- Range: Range of the target from the ship
- Vessel type: Type of target

- CPA: Closest point of approach of the target to the ship
- TCPA: Time of closest point of approach of the target to the ship
- Course: Course of the target
- Speed: Speed of the target

MANUAL TARGET


The ECDIS900 offers the possibility of creating manual targets and maintaining their dead reckoning. These manual targets are managed the same as normal targets acquired from the ARPA.

To plot a manual target click on the **Set target** button  on the toolbar

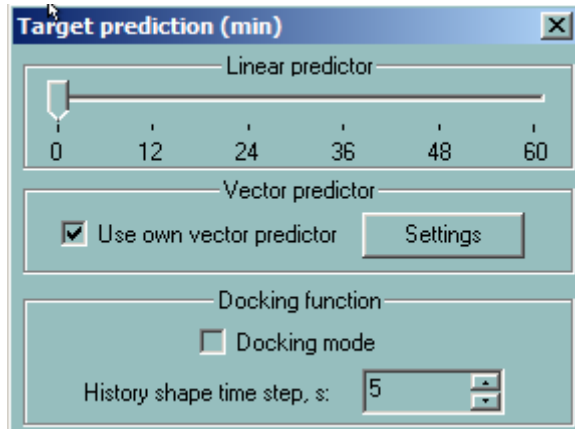
Place the cursor at the desired position and click. Targets will be drawn to the same colour code as described above.

The Target properties dialogue box allows to adjust Latitude and Longitude if necessary and enter a Course and Speed for the target if applicable.

TARGET PREDICTION

To predict the position of the ship and any targets press the **Target prediction** button  on the toolbar

The Target prediction window will appear with a time slide bar (in minutes).

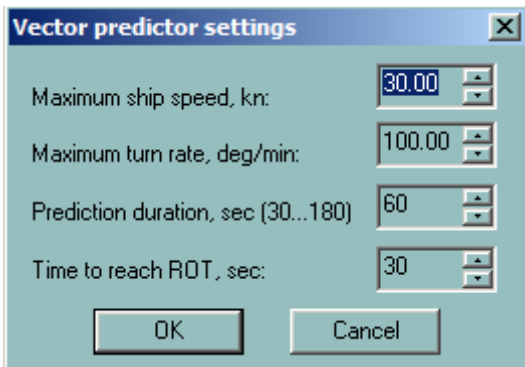


Moving the slide bar will move the ship along its scheduled course by the corresponding time margin.

USE OWN VECTOR PREDICTOR

Linear predictor calculates future positions according to current course and speed. The screen shows the predicted positions.

Press the **Settings** button to adjust the values if needed



TARGET LIST

To display the list of the tracked targets click on the Target List button.

- A double click on the target name will centre the chart on the target.
- A double click on the CPA title sorts out the targets by CPA values. Same with TCPA values.

ECDIS900 acquires targets via serial line from ARPA radar connected to the system or using MARIS' radar interface kit. In addition ECDIS receives by serial line the targets from AIS when AIS is interfaced to ECDIS.

CENTRE THE CHART AND ACCESS PROPERTIES

- Double click on the target name centres the chart on the target.
- Right click on the target's name to access to target's properties.

SHOW HIDE TARGETS

Press Hide target to hide the targets. All targets are hidden except the target on CPA/TCPA alarms which will always been displayed.

RELATIVE VECTOR

Press Draw relative vector button to display the targets with relative vector. The relative vector is displayed with a dotted line to make a difference with the absolute vector.

AIS MESSAGE

See AIS chapter, paragraph **Messages**.

AIS SERVER

This function is dedicated Norwegian Pilots and allows connecting to AIS server providing the AIS traffic around Scandinavia.

In **Sensor Monitor** create a **sensor** called Client AIS Server, start and stop the display of AIS data in ECDIS using the button Start or Stop AIS server.

TARGET WINDOW

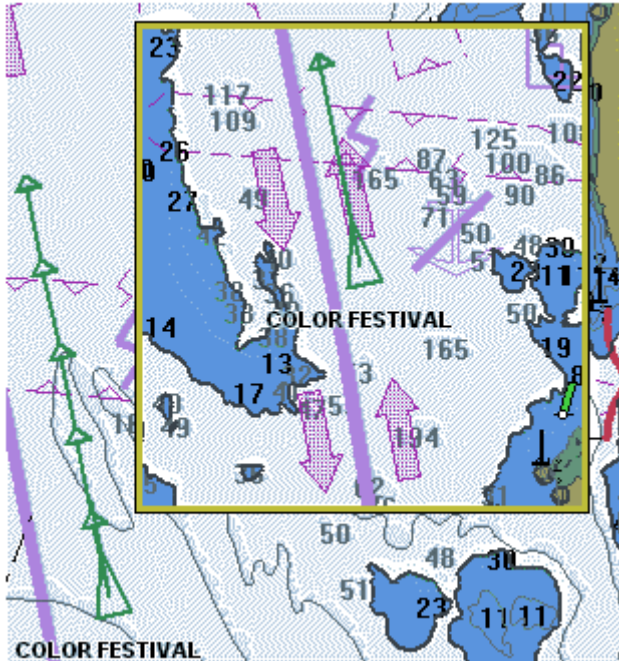
Right click on the target (ARPA or AIS) and select the menu "**Display in a window**".

A floating window centred on the target and following automatically the target is displayed.

It is possible to drag the window and different scale may be selected by right clicking inside the window. The window is closed by double clicking inside or selecting the menu "Close".

REMARK

This feature is available on vector charts only.



MARIS RADAR KIT

GENERAL

MARIS PC Radar Kit consists of two parts: hardware and software.

Hardware, software and set up are described in document RadarKit MK6 Installation manual delivered together with the PC Radar Kit.

Software part includes the following applications:

- Extractor/Tracker (VarpPCI.exe).
- Sensor Monitor (Sensor Monitor.exe).
- ETS Agent (ETSAgent.exe).
- PCI Board Adjustment (SetupETS.exe).
- Remote PCI Board Adjustment (RemoteSetupETS.exe).
- Oscilloscope (Oscilloscope.exe).
- MARIS ARPA-2000 (ARPA2000.exe).

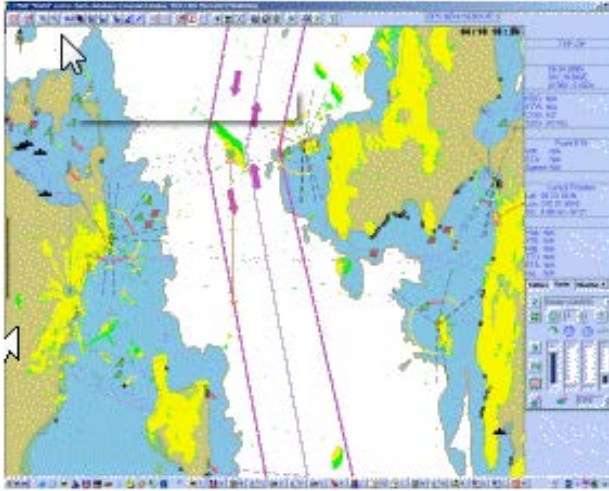
NOTE

MARIS PC Radar Kit provides the ability of combining Radar operations with the ECDIS and is fully approved to IEC 61174 for overlay function. The Radar function ARPA2000 has not been tested.

The Sensor Monitor processes the navigational information from ship's sensors and sends it to Extractor/Tracker. In case if Extractor/Tracker does not react on change of heading check SMonitor.ini file.

RADAR OVERLAY

The PC Radar kit allows the radar picture to be shown on top of the chart but also to automatically track Radar targets.



IMPORTANT

To suppress the overlay of the radar video on top of the chart proceed as follow:

- Press F5.
- Select the item "No overlay" in the Radar pop up menu.

REMARK

When using the two first methods the targets will also be hidden.

The Radar panel contains buttons and menus allowing to:

- Select radar source
- Activate radar overlay option
- Adjust the **radar parameters**,
- Initiate and stop the **tracking of targets**,
- Define an **automatic acquisition** zone in front of the ship
- **Adjust the ship's position and compensate eventual gyro drifting.**



Typical problems with the Radar overlay are described at the end of the chapter.

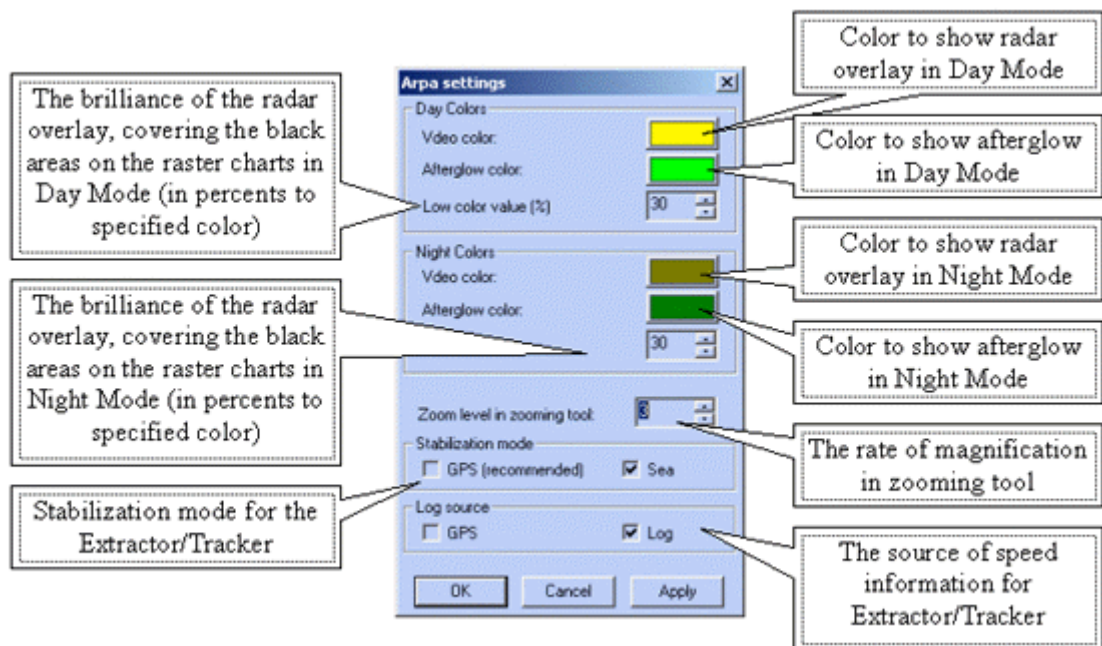
DISPLAY SETTINGS

To show the Radar picture on top of the chart activate the menu Overlay

The Radar picture does not hide any chart information and is displayed in transparency mode. According to the regulations, the Radar picture is displayed between two chart layers and essential chart information (Land contours, lights and buoys etc) are displayed on the top of the Radar picture.

To adjust the radar parameter and display options press the button Settings

--



The specified colours are used in vector charts exactly as it is. In raster charts the specified colour will be used for drawing the transparent radar video overlay over the white areas of the chart. The colour used for drawing the video over the black areas of the chart will have the specified percentage of brilliance relating to the specified colour (30% by default).

To modify the referenced colour, press the coloured button, and the dialogue with 3 sliders for Red, Green and Blue components adjustment will appear. Use "Apply" button to see the result of modifications without closing the dialogue.

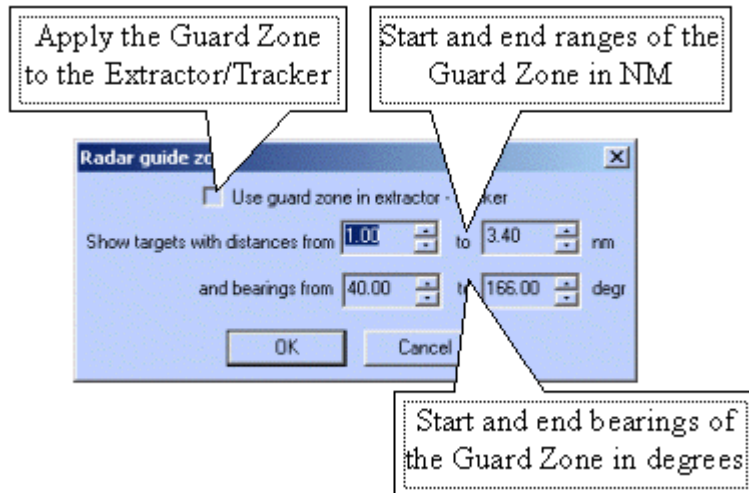
The stabilization mode and speed sources could be adjusted in case when not all ordinary sensors are available. The recommended combination is GPS stabilization and Log speed source.

TARGET TRACKING

MARIS PC Radar kit tracks automatically the radar targets but displays them only on request.

There are two ways to acquire targets:

- Manually, press the button Acquisition and click on a radar echo. If a target is tracked the system will immediately display the target icon and the speed and heading vector.
- Automatically when an automatic acquisition zone in front of the ship is defined. Press the button Zone and enter the different parameters defining the zone.



The targets automatically detected by the system inside the zone will be displayed as long as they are inside the acquisition area.

REMARK

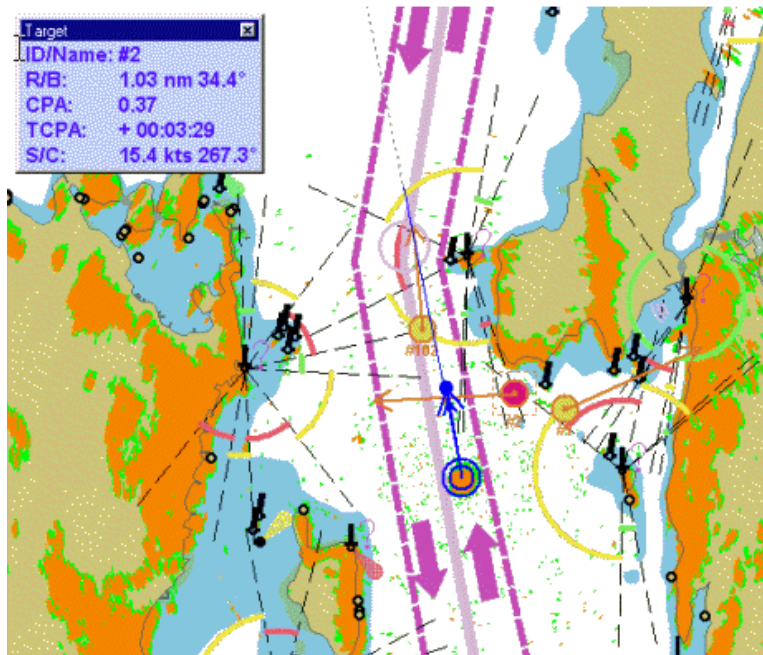
When an automatic acquisition zone is defined it's also possible to track at the same time target outside of the zone.

To delete a target, click right button of the mouse on the target and activate the item "Delete".

TARGETS AND RADAR VIDEO

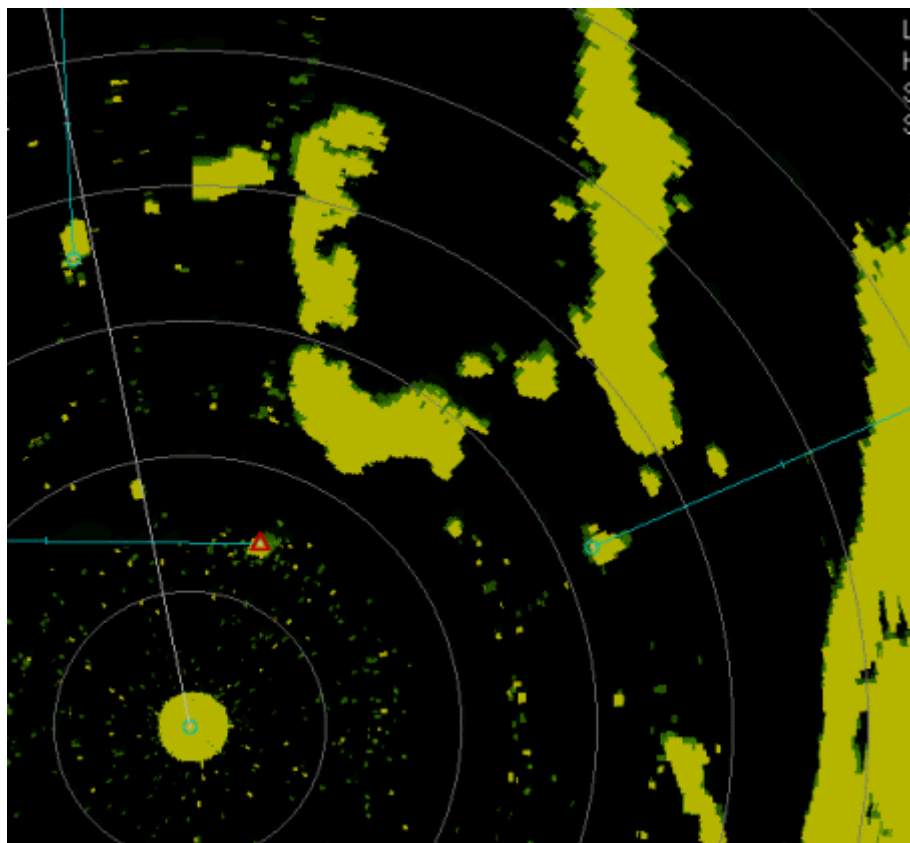
ECDIS900 acquires targets from one or two radars connected by serial line to ECDIS900. It triggers alarm when a target enters the safety zone.

MARIS Radar kits have been installed on board. The Radar kit, connected to the transceiver, allows displaying the Radar video on top of the chart.



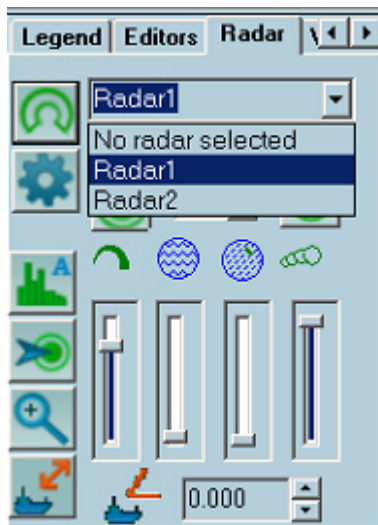
Overlaying the radar video on the chart gives the operator the possibility to check the accuracy of the positioning system and moreover in case of bad weather improves the security of the navigation.

It also gives the possibility to use the application ARPA2000 on any remote PC connected to the LAN. For example ARPS2000 installed on the PC in the captain's cabin gives him the possibility to check the navigation from his cabin.



SELECTION OF THE RADAR SOURCE

In the panel radar select the source by clicking in the menu Overlay:



TOOLS

Several tools activate the functionality connected with the cursor:

MANUAL ACQUISITION

After pressing the "Aq" button with left mouse button, the next left mouse button click over the chart area will be assumed as Manual acquisition command for the Extractor/Tracker. If the "Aq" button was pressed with right mouse button, all next left mouse button clicks over the chart area will be assumed as Manual Acquisition commands until the "Aq" button will be released.

MANUAL POSITION OFFSET

GPS adjustments: Overlapping the radar picture on the chart allows controlling the accuracy of the GPS position. Indeed when, for example, a buoy displayed on the chart and its radar echo do not match this is probably due to the ship's position calculation accuracy.

To adjust the position of the ship use the tool "Ship position offset" .

Click on the radar echo on the chart, then drag the mouse and click on the corresponding chart object.

Then GPS is shifted and the values of the shifting are displayed in the position panel .

To release the shifting values click right button in the position panel and activate the menu "Clean position offset".

GYRO DRIFT

When the radar picture is slightly rotated compared to the chart, the drifting of the gyro is probably the cause of the problem. To adjust the gyro in ECDIS900 enter the corrective value of the heading with the small arrows . Then the radar picture will be rotated accordingly and the gyro shifting value displayed in the Heading panel.

ZOOMING TOOL

- Press the referenced button the cursor is changed to prompt for the zoomed area selection.
- The square zooming window appears after the left mouse button click over the chart area.
- The window represents the zoomed area below the central point.
- The zooming rate could be specified in “**ARPASettings**” dialogue in range 2 – 6.

The zooming window could be dragged using the mouse, and zoomed content will be updated after fixing the window on certain position for a while.

The radar video in zooming window is updated synchronously with the radar antenna rotation. The zooming window disappears automatically if not moved in 15 seconds. Also it could be closed manually with pressing the referenced button on the “Radar” property page second time.

TYPICAL PROBLEMS

The most of problems with the radar overlay are somehow related to the network connection, but not only. In case of a network connection problem, please, see the RadarKit Manual.

THE COLOURS OF VIDEO OVERLAY ARE NOT SATISFACTORY

Use the “**ARPASettings**” dialogue to modify the colours. In case, if the video overlay is too dark in the raster charts, try to increase the “Low color value (%)”. This will decrease the “transparency” of the radar overlay, but the brilliance of radar video layer over the dark parts of the chart will be increased.

THE RADAR OVERLAY DOESN'T CORRESPOND TO THE CHART

It's necessary to check if the system gets proper information from all necessary sensors. The Gyro is most important. Compare the information displayed on the ECDIS with information available on the sensor displays.

- If ECDIS doesn't have this information, check the data in Sensor Monitor.
- If ECDIS gets proper navigational information, but the radar overlay is not properly arranged proceed as follow:
 - Run the ARPA 2000 application (usually it's available in Start->Programs->Maris->ARPA 2000)
 - Check if Own Ship parameters is displayed correctly, mainly heading and speed.
 - If there are zero values for all navigational parameters and referenced alarms are displayed in ARPA 2000 Alarm Box, it means that the Extractor/Tracker doesn't receive the navigational information:
 - ◆ Check that at least one of Sensor Monitors in the system is in MASTER mode. If not, set one Sensor Monitor as master.
 - ◆ Check, that the proper IP port is specified for sending the data to Extractor/Tracker (Menu: Options->Settings..., then “Send Data To IP Port” parameter on the “Extractor/Tracker Settings” property page). This port must be the same as specified in [LAN], “NavigationInPort” parameter of VarpPCI.ini file situated in C:\Program Files\Maris\PC Radar Kit\ on the computer with the PC Radar Kit hardware installed.

- If ARPA 2000 shows proper navigational parameters, but the radar overlay is not correctly arranged:
 - ◆ Activate "System" dialog in the ARPA 2000 (see the ARPA 2000 user manual)
 - ◆ Click the "►" or "◄" buttons until the Extractor parameters page is displayed
 - ◆ Modify the "Headup" parameter to adjust the orientation of the radar overlay (check it in ECDIS after each modification)
 - ◆ Modify "Sync Delay" parameter to adjust the distances to objects (the distance to certain radar echo is back-proportional to the "Sync Delay" value).

REMARK after modification The Extractor/Tracker will automatically store the new specified parameters.

Logbook

LOGBOOK OVERVIEW

During the process of its operation, ECDIS automatically maintains two different electronic logbooks:

- Voyage record
- Twenty four hours logbook

The voyage record stores every two hours the position, speed and course of the ship for half a year.

REMARK This logbook is copy protected and cannot be deleted.

The twenty-four hours logbook records both navigational events and system events. It is also possible for the navigator to make manual entries in the logbook.

The logbook entries are divided into 24 hours. Automatically at 24.00 hours each day the current logbook is closed and stored in the logbook database and a new one created.

Recorded events include:

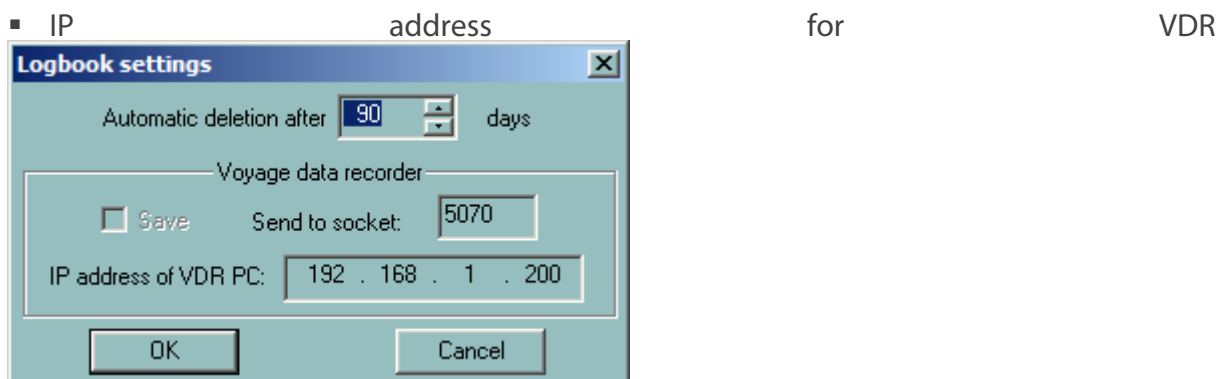
- Ship position, course and speed
- Chart in use together with the scale and central point of the screen
- The GPS position offset
- Route events (Active route and waypoint)
- Target events: creation, position, and deletion
- Target positions
- AIS target position, name and status
- Triggered alarms
- Acknowledged alarms
- Manual event
- Manual plotting (Navigation Editor)

The **logbook window** lists all entries of the current logbook and allows **printing** and to replay **historical logbooks which have been first loaded**.


LOGBOOK SETTINGS

The logbook recording cannot be stopped by user but the following parameters can be set:

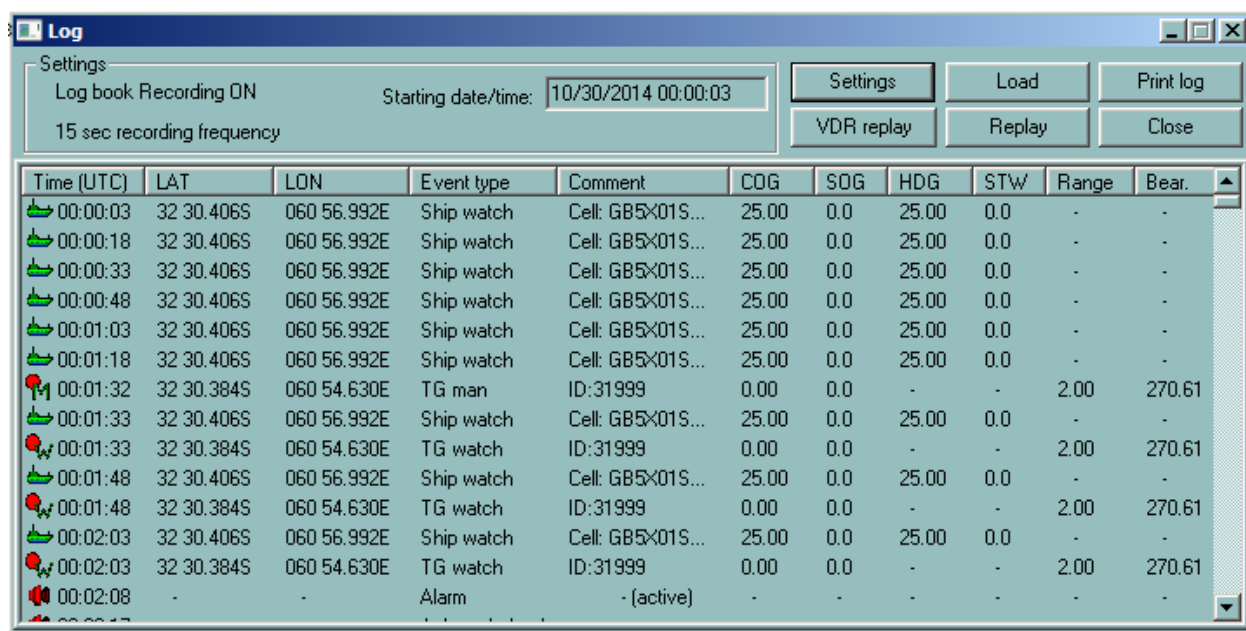
- Automatic deletion – no less than 90 days
- VDR parameters
 - Socket to send



DISPLAYING THE LOGBOOK

Select the **Logbook** tool  on the toolbar to display the logbook window and list the entries of the current twenty-four hours logbook. It is now possible to print the logbook, load an historical book and replay it.

The **VDRreplay** button allows replaying recorded data from VDR recording.



The 'Log' window displays the following settings and data:

Settings: Log book Recording ON, Starting date/time: 10/30/2014 00:00:03, 15 sec recording frequency.

Buttons: Settings, Load, Print log, VDR replay, Replay, Close.

Time (UTC)	LAT	LON	Event type	Comment	COG	SOG	HDG	STW	Range	Bear.
00:00:03	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:00:18	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:00:33	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:00:48	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:01:03	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:01:18	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:01:32	32 30.384S	060 54.630E	TG man	ID:31999	0.00	0.0	-	-	2.00	270.61
00:01:33	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:01:33	32 30.384S	060 54.630E	TG watch	ID:31999	0.00	0.0	-	-	2.00	270.61
00:01:48	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:01:48	32 30.384S	060 54.630E	TG watch	ID:31999	0.00	0.0	-	-	2.00	270.61
00:02:03	32 30.406S	060 56.992E	Ship watch	Cell: GB5X01S...	25.00	0.0	25.00	0.0	-	-
00:02:03	32 30.384S	060 54.630E	TG watch	ID:31999	0.00	0.0	-	-	2.00	270.61
00:02:08	-	-	Alarm	-(active)	-	-	-	-	-	-

Each entry in the logbook is defined by the following attributes:

- Time
- Position (Latitude and Longitude)
- Event type
- Comment
- Other parameters depending on the event type.
- COG (Course over ground)
- SOG (Speed over ground)
- HDG (Heading)
- STW (Speed through water)
- Range
- Bearing

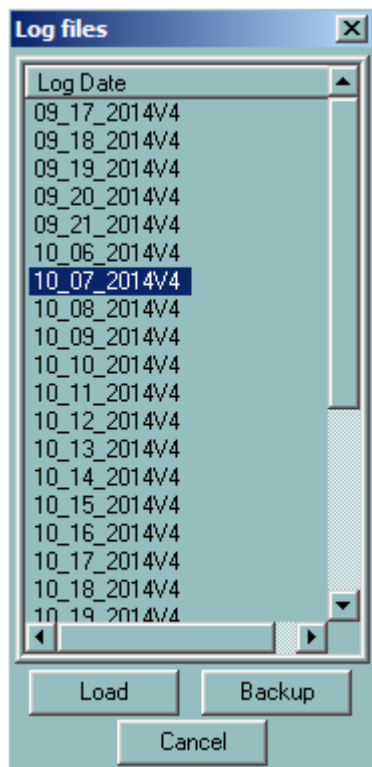
The entries are not editable however the operator can sort the list by Time or Event type by clicking on the relative column headings. Alternative clicks will sort ascending then descending.

NOTE

The comment field contains information about the event. Together with the position of the ship the chart in use and the position offset is available. To display the full text, move the cursor onto the comment field and a small window will display the information.

VOYAGE RECORD

To display the voyage record press the button **Load** and select the file called MM_DD_YYYYV3.lgf.



EVENT

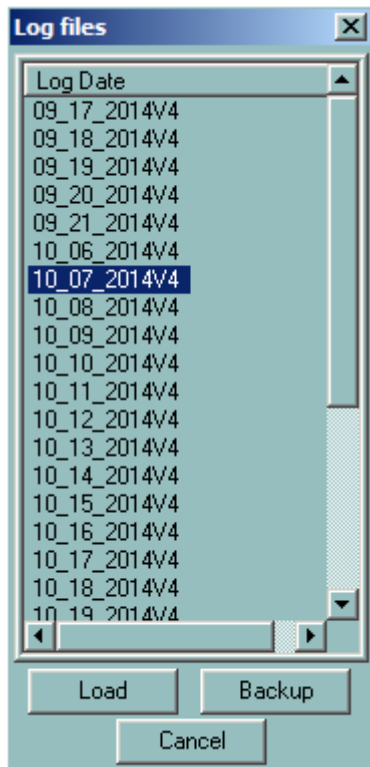
In case of a special event, the operator can record the event in the logbook manually.

To enter a new record in the logbook press the **New Logbook record** button .

Enter details via the keyboard and click OK.

LOADING A LOGBOOK

The current logbook is closed every day at 24:00 hours and stored in the logbook database. A logbook is defined by a name, which is by default the date, and can be loaded from the database to be displayed and replayed.



The loaded logbook will be shown in the logbook window, replacing the current logbook. When unloaded, the current logbook is re-displayed in the window.

BACKUP A LOGBOOK

Select the logbook name, push the button Backup and select the folder in which the logbook will be stored.

REPLAY

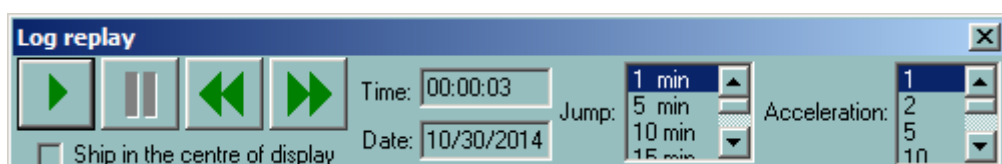
This function allows replaying exactly the main events which occurred during the navigation, in particular ECDIS loads and scales automatically the charts as they were and triggers and acknowledges alarms as it has been done during the voyage.

To initiate replay click on the **Replay** button in the **Log** window .

WARNING

The replay function must be used carefully, preferably only when the ship is in harbour. During replay all navigation functions are deactivated, the ship is no longer monitored and the logbook recording is suspended.

The Log replay window allows the user to control the replay.



START REPLAY

- To start the replay click on the Start Replay button .
- By default, the start time for replay is the time of the first logbook entry.
- To suspend replay click the Suspend button .

NOTE

During replay most of the navigation functions are available however the route planning / monitoring functions are not enabled.

During the replay the chart is automatically loaded, scaled and scrolled and the logbook window scrolls automatically to display the replayed data.

ADJUSTING THE REPLAY STARTING TIME

Three different methods are available:

- Use of the 'Backward' and 'Forward' buttons allows scrolling the logbook to adjust the start time .
- One click of a button will adjust the time by one Jump step.
- Click in the text box time, select the appropriate field and enter the desired value .
- In the Logbook window, before starting the display double click on the line you want the logbook to start.

JUMP STEP

The size of the Jump step, the amount of time to move for each click of the 'Backward' and 'Forward' buttons, can be adjusted by use of the 'Up' and 'Down' arrows.

NOTE

If the recording track function is active when rewinding or jumping, the track recording will be stopped. To restart recording the track during the replay, it is necessary to activate the track recording function again

ACCELERATION

Acceleration allows the operator to choose the acceleration rate for the display, the rate being adjusted with the 'Up' and 'Down' arrows.

An acceleration value of 5 = replay in real time multiplied to 5.

PRINT

Click the **Print log** button on the Log dialogue box and the Notepad will be displayed showing the content of the logbook.

10_30_2014V4 - Notepad

File Edit Search Help

Chart system log (v 4.0).

Date: 10/30/20
Start time: 00:00:03

Time	LAT	LOn	Event type	COG	SOG	HOG	STW	Range	Bearing	Depth
00:00:03	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:00:18	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:00:33	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:00:48	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:01:03	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:01:18	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:01:32	32 30.384S	060 54.630E	TG man	0.00	0.00	-	-	2.00	270.61	-
Comment: ID:31999										
00:01:33	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:01:33	32 30.384S	060 54.630E	TG 31999 watch	0.00	0.00	-	-	2.00	270.61	-
00:01:48	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:01:48	32 30.384S	060 54.630E	TG 31999 watch	0.00	0.00	-	-	2.00	270.61	-
00:02:03	32 30.406S	060 56.992E	Ship watch	25.00	0.00	25.00	0.00	-	-	-
00:02:03	32 30.384S	060 54.630E	TG 31999 watch	0.00	0.00	-	-	2.00	270.61	-
Alarm (active)										
00:02:08	-	-	Alarm	-	-	-	-	-	-	-
Alarm										
00:02:17	-	-	Acknowledged	-	-	-	-	-	-	-

NOTE

The Notepad application gives the user all possibilities to save the file, change the document presentation and to search in

RUN VDRCDDisplay

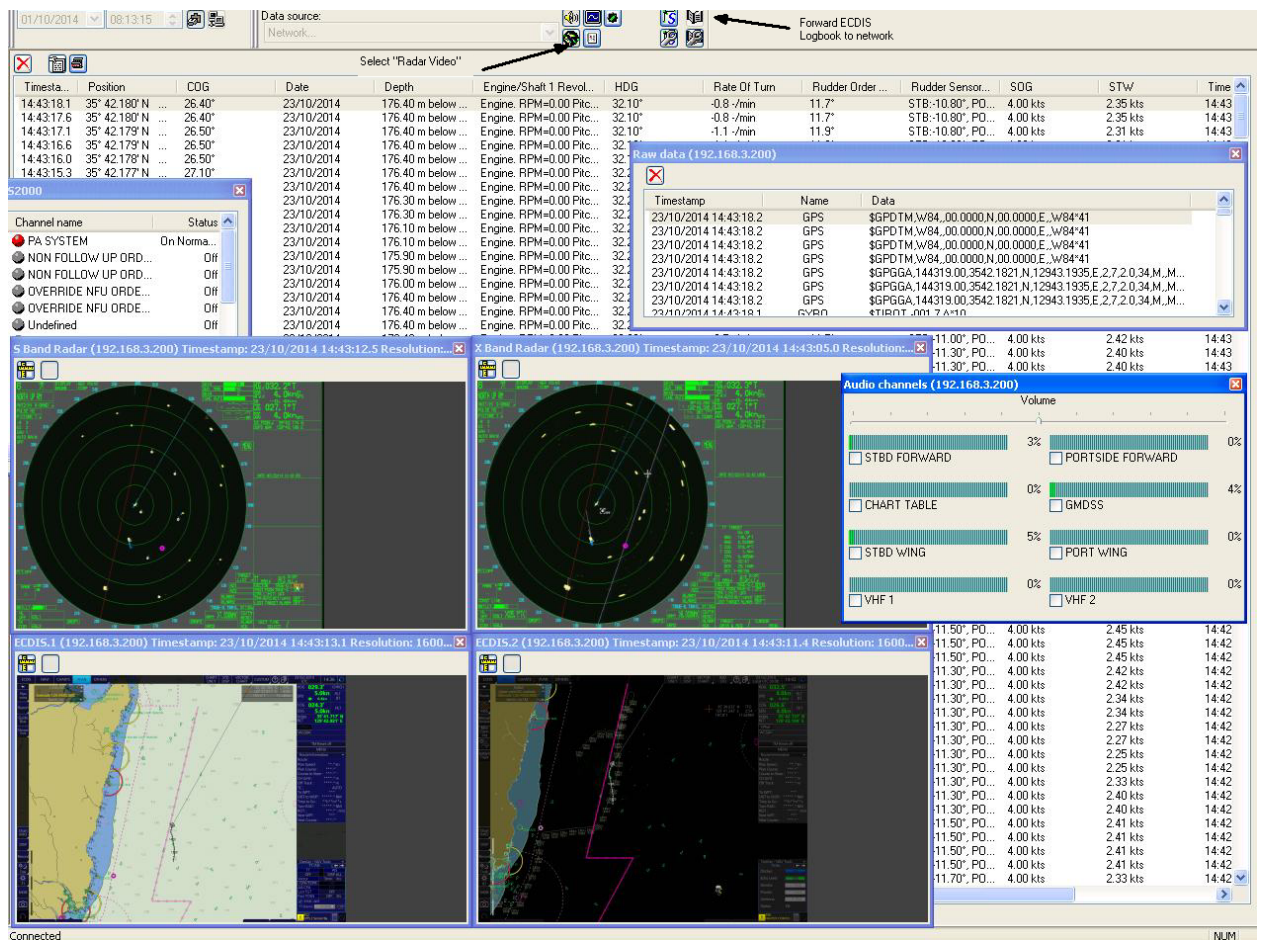
From memory stick :

Run application directly from memory stick

From External Hard Drive

- Install VDRCDDisplay in any folder on ECDIS PC
- Run VDRCDDisplay from the PC.
- Select the external source drive "X:"
- Data are displayed.
- Push button "Forward Logbook to network" to activate VDR Replay function in ECDIS
- Push button "Video Source" and select "Radar Video" to activate Radar Replay Window

VDR Replay

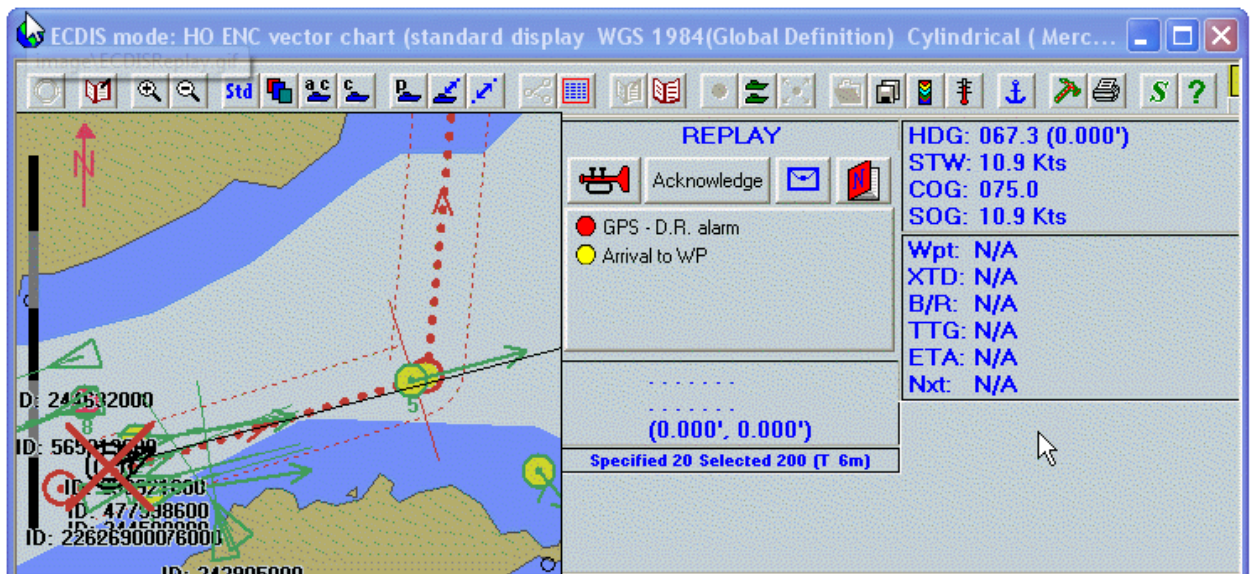


VDR REPLAY

First: Run VDRCDDisplay application

- either from VDR replay from Memory Stick
- either from an external hard drive
- either from an Network drive

In ECDIS, Logbook management window, push button VDR Replay.



NAVTEX

NAVTEX OVERVIEW

ECDIS900 can manage data received from different Navtex receivers. Only Navtex receivers able to send data on serial line can be interfaced to MARIS ECDIS900.

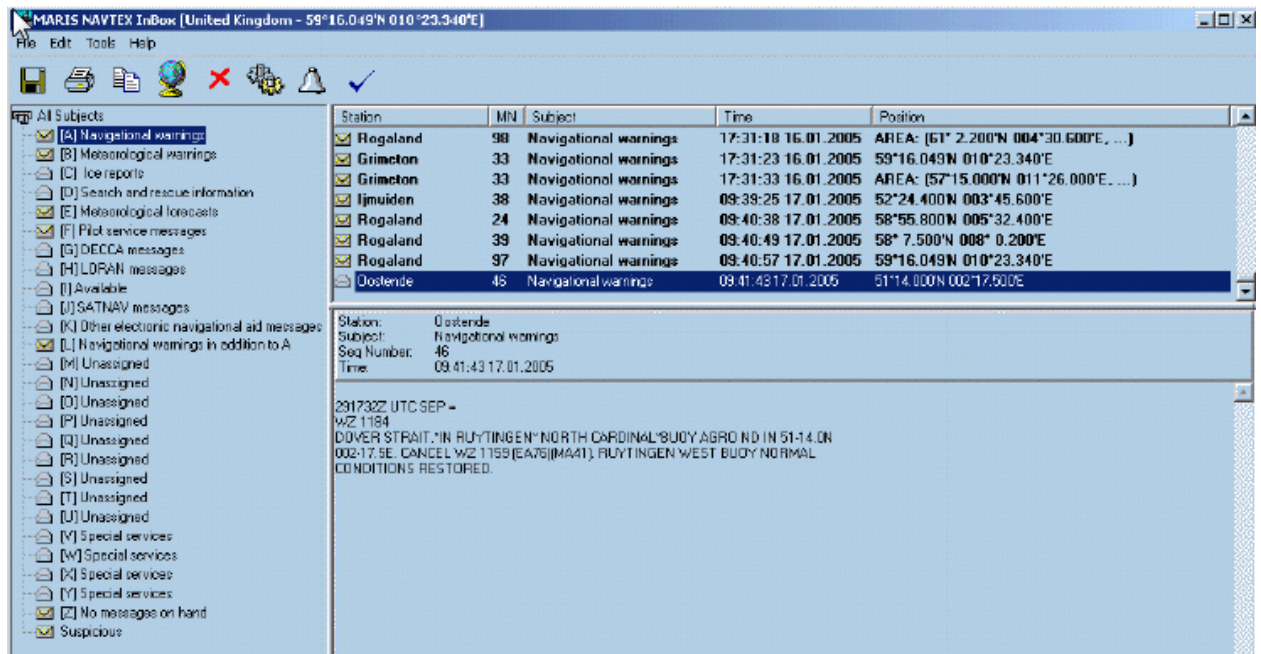
When MARIS Navtex module is installed two applications are launched:

- MARIS Navtex Server
- MARIS Navtex Inbox

Messages received from the Navtex are automatically and continuously processed by the "MARIS Navtex Server" application.

The messages are sorted by type and displayed in the application "MARIS Navtex Inbox".

MARIS Navtex Server

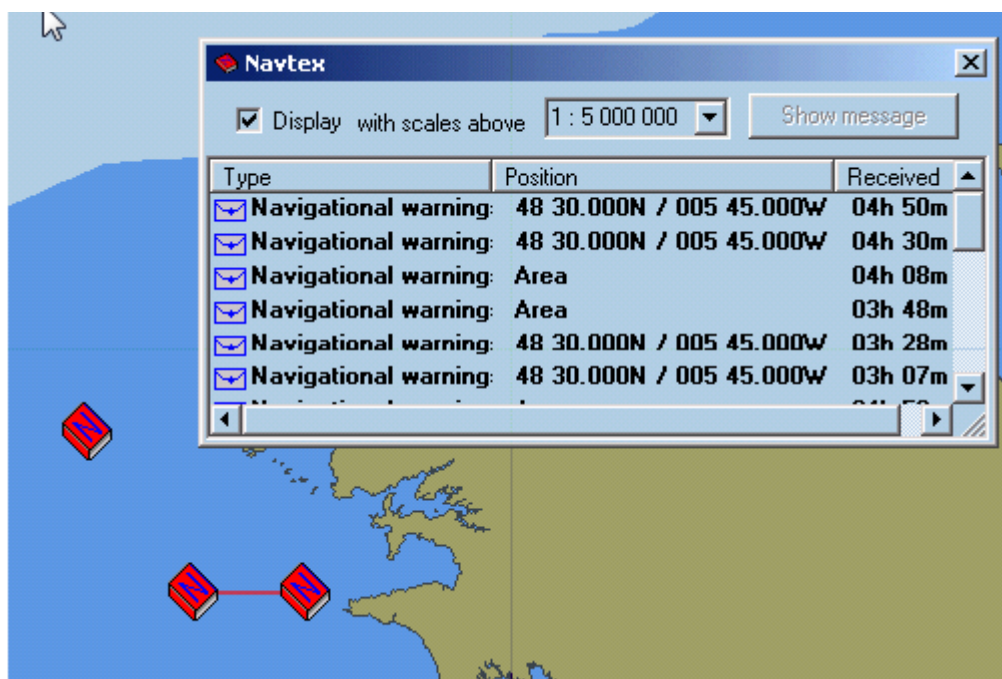


GRAPHICAL DISPLAY

For each geo referenced message an icon or several linked icons are displayed on the ECDIS charts.

Click in the icon Navtex located in ECDIS900 Alarm panel to access to the Navtex' window.

This window lists the messages which are currently displayed on the chart. When the chart is scrolled or zoomed the content of the window may change.



The display of the messages on the chart is activated by the check box “Display” and controlled by the parameter “With scales above”. Indeed the icons will be displayed on the chart when the scale in use is bigger than the selected scale.

ACCESS TO NAVTEX MESSAGE

In ECDIS double click on the message listed in the window to display the full text message in the application MARIS Navtex inbox. Alternatively select the message and push “Show message” button.

From the chart right click on the icon and activate the menu.

MESSAGE STATUS

A message is either read either unread. Closed envelop icon displayed in front of the message and bold characters shows unread messages.

The icon Navtex in ECDIS900 is either opened either closed .

Closed icon means that unread Navtex messages exist on the screen. Opened icon means that all messages from the area have been read.

Editors

EDITORS OVERVIEW

THE ECDIS has been designed by navigators and for navigators to help the user in his everyday tasks in order to increase safety of navigation. The ECDIS therefore provides, in addition to the standard ECDIS functions described in this document, powerful tools allowing the user to work on electronic charts in the same way as on paper charts.

The user may:

- Draw bearing lines, parallel or perpendicular lines and range circles just as he did with pencil, compass and a ruler on the paper chart.
- Add temporary text information to the chart.
- Maintain the dead reckoning in case of GPS failure by manually plotting DR or Radar positions.
- Add user data information to the chart such as wrecks, survey areas, marks etc.
- Manually update the S57 chart database by deleting, moving or adding chart objects.

NOTE The 'Tools Panel' contains different panels depending on the the ECDIS configuration: the Editors panel is always present, the Radar panel is available only when the optional Radar Kit is installed.

GENERAL TOOLS

General tools refers to both NE and OE objects while specific tools refers to either NE (those accessible in user's data panel area and dedicated NE) or OE.



- The tool "Select OE objects" allows selecting OE objects.
- The tool "Select NE objects" allows selecting NE objects.
- Then the selection can be moved or deleted.


The tool "Delete selected object" delete the selection of NE or OE objects.

The tool "Show/Hide objects list" displays the list of objects currently loaded. Double click on the object to centre the chart on the object.

Select the object and push the key Del to delete the object.

SELECTION

A selection is a collection of selected objects of the same type, NE or OE.

To make a selection of NE objects press the button "Select NE object" , click on the chart and drag the mouse to define a rectangle.

Use the tool "Select OE objects"  to select OE objects.

OTHER METHODS TO SELECT OBJECTS

- Select a single object: click on the object.
- Select two or more objects (Selection containing several objects): click on each object whilst keeping the <Shift> key pressed.
- Activate the menu Select All Object Editor from the menu Edit.
- Activate the menu Select All Navigation Editor from the menu Edit.
- Activate the menu Select All Alarms objects from the menu Edit.

IMPORTANT selection and locked layer

When an OE object resides in a locked OE layer, that particular object is not selectable. For more information about layers see chapter OE - Layers.

MOVE THE SELECTION



- Move the cursor over one of the selected points and when the cursor changes to the hand shape, drag the whole selection to the desired position.



- When the cursor changes to the large arrow only the selected point will be moved.

DELETE THE SELECTION

Select the object(s) and push the delete button .

OTHER METHODS OF DELETING THE SELECTION:

- Press the **Delete** key.
- Select 'Cut 'from the Edit menu.
- Select 'Delete all selected' from the Edit menu.

EDIT MENU

Undo Delete Object	Ctrl+Z
Cut	Ctrl+X
Copy	Ctrl+C
Paste	Ctrl+V
Paste to Position	Shift+V
Delete all selected	Del
Select all Object Editor	
Select all Alarm Objects	
Select all Navigation Editor	
Connect two polylines	
Order	►
Change to Rhumblin mode	

UNDO

Allows the most of the actions performed on NE or User's data objects to be undone.

When Undo is not possible, the menu is disabled.

There are up to ten levels of undo, meaning that the ten last functions applied on objects can be cancelled.

NOTE The Undo function is applicable only on NE and OE functions

CUT / COPY

Delete or Copy the selection and copy it to the clipboard.

PASTE

Copy the selection added to the clipboard to the active layer.

With NE objects, the selection is simply copied in the NE layer.

For OE objects the functions Cut/Copy/Paste are used to copy objects from one layer or one file to other one. See Chapter OE - Layers.

PASTE TO POSITION

Select 'Paste to Position': the cursor changes and the selection will be pasted at the mouse click location. This function is equivalent to the move selection action performed with the mouse.

DELETE ALL SELECTED

Delete the Selection

SELECT ALL OBJECT EDITOR

Empty the selection and select all OE loaded objects that do not belong to a locked layer.

SELECT ALL ALARM OBJECTS

Empty the selection and select all alarm objects defined by the user.

SELECT ALL NAVIGATION EDITOR

Empty the selection and select all NE loaded objects.

CONNECT POLYLINES

Select two polylines, activate the item Connect Polyline: the two lines are then connected.

ORDER

User's data objects loaded in the ECDIS are displayed with a priority controlled in two different and complementary ways:

Layers order: the files and the layers are displayed in an order defined by the user. See chapter OE paragraph Layers.

Inside each OE layer the user can control the order the objects are displayed.

The item menu 'Order' allows changing the priority of the display of the selected object by sending it 'to back', 'to front' or moving it one step forward or backward in the layer's list of objects.

IMPORTANT

The function Order is applicable only on the active layer. To change the display priority of objects belonging to other layer the user must first activate the layer. See Chapter OE, paragraph Layer.

SWITCHING TO THE RHUMLINE MODE OR SWITCHING TO THE GREAT CIRCLE MODE

Display all lines either in Rhumline mode either in Great Circle.

NAVIGATION EDITOR

NAVIGATION EDITOR

The Navigation Editor gives the user the possibility of working with the electronic chart in the same way as with the paper chart:

- Preparation of a harbour arrival or a passage through a dangerous area by adding temporary information on the chart.
- Planning the route more safely by drawing restricted or dangerous zones.
- Manually plotting the position of the ship.



Information and objects plotted with the NE (Navigation Editor) are stored and presented in a special layer called NE layer that is displayed on the top of the electronic chart.

NE layer contains objects (lines, arcs, chart annotations, current information) that are temporary objects, displayed on the chart until such time as they are deleted.

The ECDIS does not allow the possibility of storing these objects to file and reloading them in the system on request.

The different objects available are:

- **LOP Function**
- **Arcs**
- **Points**
- **Current Information**
- **Compass**
- **Polylines**
- **Parallel and Perpendicular Lines**
- **Chart annotation and caution**

The **Multi-plotting mode** allows plotting several objects without having to select the plotting tool for each object.

MULTI PLOTTING MODE

- To plot an object requires:
- Select the appropriate tool, Bearing line, Arc, Point...
- Enter eventually additional information.
- Click on the chart.

In the current plotting mode, the plotting tool is deactivated when the object is defined.

To plot other objects of the same type requires selecting the same tool for each object.

When the tool is selected with the right button of the mouse it remains active after the object is plotted and other object of the same type can be plotted on the chart without tool selection.

This facility is available for the Arc, Point, Polyline and Chart annotation.

To de-select the tool click again on the tool button or select another tool.

LOP FUNCTION

This function is implemented according to **IEC 61174 edition 3**, and it allows using Line and Arcs in order to calculate a Fix Position (Using 3 or more Line or Arcs, or a Estimated Position, using 2 Lines or Arcs

Press the button "LOP/Clearing line"  in the Console, Tools, Editor tab.

Select "Line of position bearing,degr " for a Line :

- Enter bearing in degrees
- Enter LOP label displayed on the map.

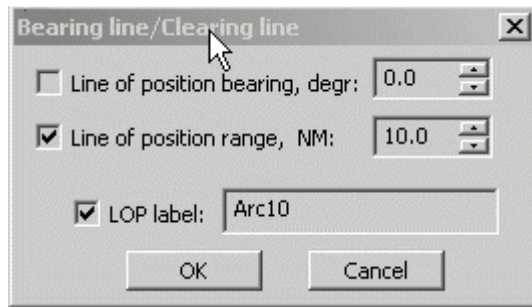
The cursor will change to a cross "+".

Click on the bearing point and drag the mouse as far as is necessary. The time Stamp is saved and displayed.



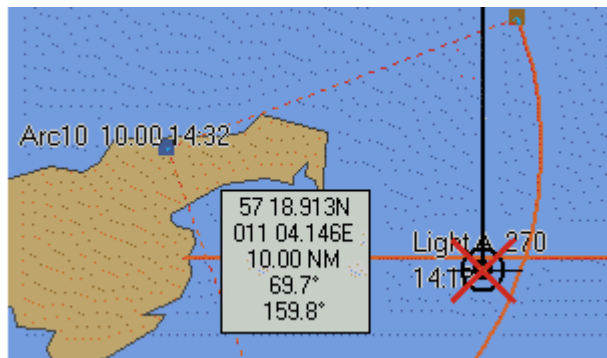
Select "Line of position, range,NM " for an arc :

- Enter range in NM
- Enter LOP label displayed on the map.



The cursor will change to a cross "+".

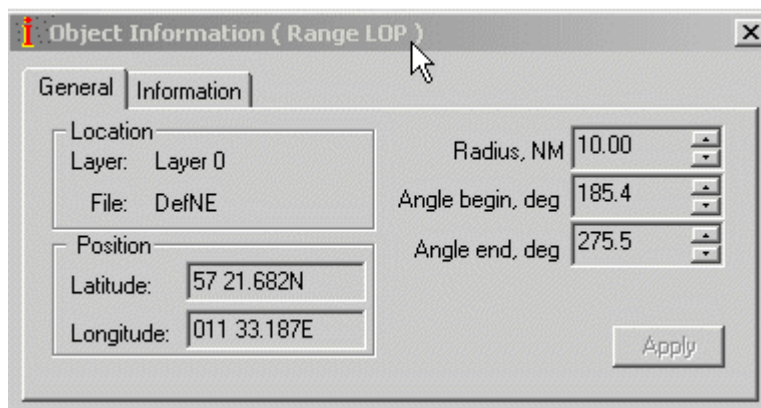
Move the cross on the point centre of arc and Click on the position.



OBJECT MODIFICATION

It is possible to adjust Lines or Arcs after creation:

- Use Mouse cursor by drag or extend.
- Right click and open Properties dialog box, and adjust parameters.

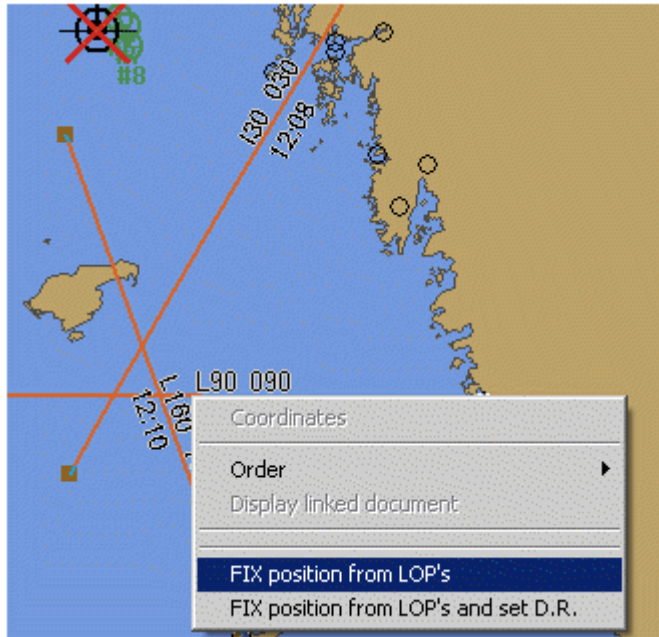


CALCULATE POSITION

Select 3 objects (or more) to get a "FIX position from LOP.

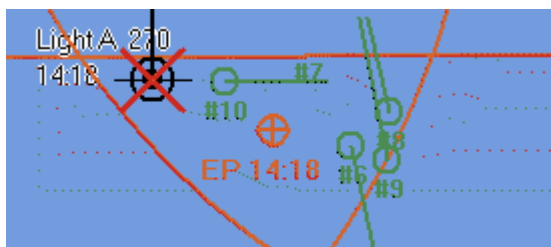
(Use CTRL for multiple selection)

Here 3 lines are used.



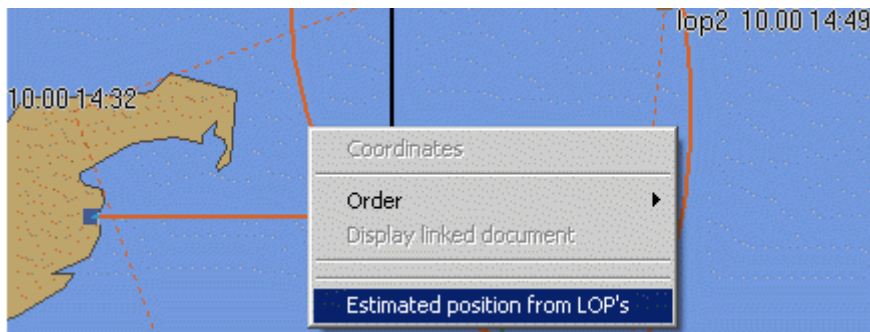
The FIX point is added.

Use Right click and Properties to get details.



Select 2 objects (or more) to get a "FIX position from LOP.

Here 1 line and 1 arc are used.



OPTION SET DR

Create the Fix point and select D.R. mode at the same time.

Selecting a bearing line

- Either click left button on the line.
- Either select the tool Selection with the left button of the mouse, click on the chart and drag the mouse: all NE objects included inside the rectangle are selected.

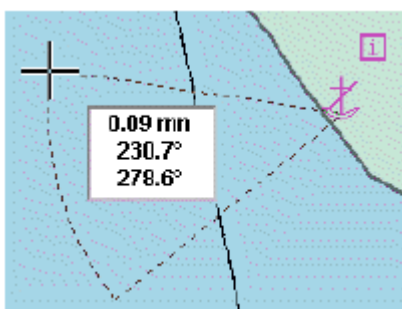
Deleting a bearing line

- Click right button on the line and activate the menu Delete All Selected.
- Select the line and press the key Del.
- Select the line and press the Delete button.

ARC

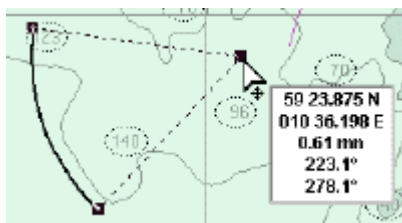
PLOTTING AN ARC

- Press the Arc button, the cursor on the chart changes.
- Click to plot the centre of the arc, drag the mouse and click one time: the origin point of the arc is plotted. Move the mouse in the appropriate direction and click a second time to define the arc extremity.

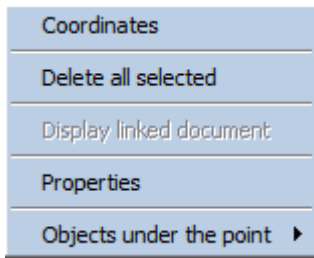


MODIFYING AN ARC

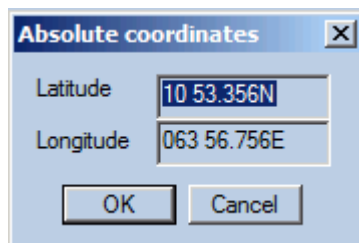
- Select the arc, click on the centre and drag the mouse: the centre and the arc are translated.
- Select the arc, click on one of the arc points and drag the mouse: the arc is modified in range and angle.
- Click right button on the arc, access the menu Properties and modify position, radius, start or end angle



- Click right button on the centre, access the menu Absolute Coord and change the position of the point.



- Click right button on one of the arc point, access the menu Absolute Coord and change the radius, start or end angle.



Deleting an ARC

Click right button on the arc and activate the menu Delete All Selected.

Select the arc and press the key Del.

Select the arc and press the Delete button.

Tips: Double click on the tool ARC deletes all displayed ARCS

POINT

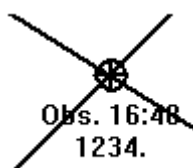
The Point tool allows plotting isolated points on the chart in particular the positions of the ship calculated manually from bearing lines, Radar, Dead reckoning or Astronomical calculations.

IMPORTANT

The plotted points are stored in the logbook and therefore displayed / hidden in real time on the chart during the replay of the logbook.

PLOTTING A POINT

- Select the tool Point and click on the chart.
- The ECDIS first tries to find an intersection point under the click between, two lines or a line and an arc. Then the co-ordinates of the plotted point are made equal to the co-ordinates of the intersection point.
- If no intersection is found under the click, the co-ordinates are not adjusted.
- In the Properties dialogue, select the type of point and enter time and log information.



MODIFYING A POINT

- Select the point, click on the point and drag the mouse to the new location.
- Click right button on that point, open the dialogue Properties and modify position, type of point, time or log values.



DELETING A POINT

- Click right button on the point and activate the menu Delete All Selected.
- Select the point and press the key Del.
- Select the point and press the Delete button .

TIPS: Double click on the tool Point deletes all displayed points.

CURRENT INFORMATION

- Select the Current tool .
- Click on the chart and insert manually on the chart information about force and direction of the current at the time the ship will pass that point.



DELETE CURRENT INFORMATION

- Click right button on the current arrow and activate the menu Delete All Selected.
- Select the current and press the key Del.
- Select the current and press the Delete button .

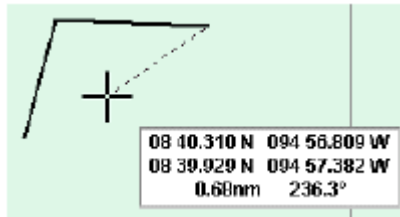
RANGE AND BEARING CALCULATION

- Select the Compass tool to measure distance and bearing between two points.
- To erase the information on the chart double click on the button.

POLYLINE

PLOT A LINE

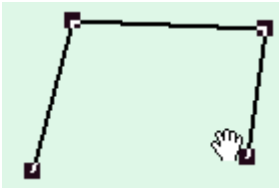
- Select the Polyline tool .
- A double click ends the line.



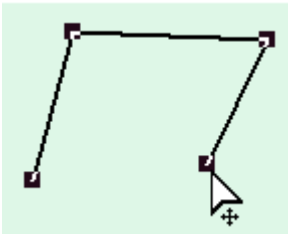
MODIFYING A LINE

Select the line and either move the entire line or a point of that line

- when the cursor has a hand shape the line is selected and moved according to the mouse movements.



- otherwise the point is dragged



Change by keyboard the co-ordinates of one point of the line by clicking right button on the point and selecting Absolute Coord.

Add a point by clicking right button at the desired location on the line and activating the item 'Insert a point'. Other method: select the line, move the mouse at the desired location on the line and press the keyboard key I.

Delete a point by selecting the line, clicking right button on the point of the line and activating the item 'Delete point'. Other method: select the line, move the cursor on the desired point of the line and press the keyboard key D.

Split the line in two lines by selecting the line, clicking right button on the point of the line and activating the item 'Cut point'. Other method: select the line, move the cursor on the desired point of the line and press the keyboard key C.

DELETING A POLYLINE

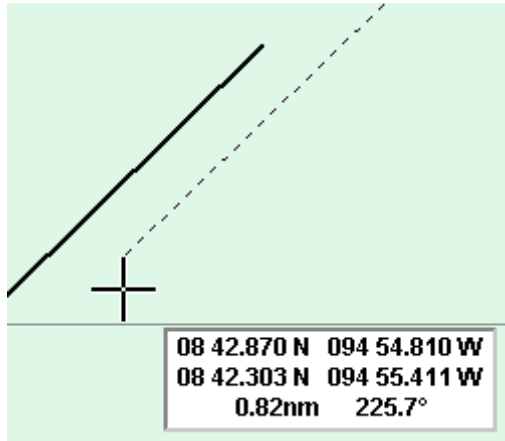
See paragraph ~~Delete an~~ARC

PARALLEL LINE

Press the Parallel line button.

Select a bearing line: the button Parallel line is then activated.

Select the tool, click and drag the mouse to define the length of the parallel line (control the distance from the selected line with the distance information drawn on the chart).



To modify or delete the line see paragraph Bearing line.

Press the Perpendicular line button

Same procedure as for the parallel line.

CHART ANNOTATION

Chart annotation

Allow inserting text annotations on the chart.



REMARK: to show the text on the chart toggle on the button Display in the Properties dialogue of the Information point.

DELETING CHART ANNOTATION

- Click right button on the Chart Annotation and activate the menu Delete All Selected.
- Select the Chart Annotation and press the key Del.
- Select the Chart Annotation and press the Delete button .

TIPS: Double click on the tool Chart Annotation deletes all displayed Chart Annotations.

OBJECT EDITOR

OBJECT EDITOR

User data consists of geographical objects such points, lines, areas, that are displayed on the chart to enrich it. The Object Editor (OE) allows plotting, importing, manipulating and saving user data.

Data are saved in files that can be loaded or unloaded on request. Each files contains 8 different layers called by default Layer 0,1,2,3,4,5,6,7 and the user can select in which layer he wants data to be stored.

Each layer may be shown or hidden, locked or unlocked and defined as visible between editable minimum and maximum scales.

This feature is extremely powerful because it gives the user the tools to build up its own user data charts in the same way than vector chart databases are built. For instance, a general layer, visible in small scales, could include synthetic description of objects while a harbour layer could contain the full description of the objects.

PLOTTING OBJECTS

The different available object types are:

- Polyline
- Surface
- Circle
- Arc
- Isolated point
- Text



Select the appropriate Plotting tool, place the cursor on the chart at the required position and click.

To end a line or close an area, double click when plotting the last point or select another tool.

To plot a circle or an arc, click, and drag the cursor with the mouse button down.

NEW OBJECT BY KEYBOARD

To create an object by keyboard:


- Select the object type (Polyline, area...).
- Move the mouse on the chart area.
- Press the key "O".
- Enter the co-ordinates of the point (s) and object parameters (Radius...)

MULTI PLOTTING MODE

In a normal plotting mode, the plotting tool is deselected after the object is plotted on the chart.

To be able to plot several objects of the same type without having to activate the same tool each time, select the tool with the right mouse button. Then deselect the tool by selecting another tool or pressing again on the tool button.

OBJECT PROPERTIES

A newly created object is drawn on the chart with the selected display attributes shown in the bar .

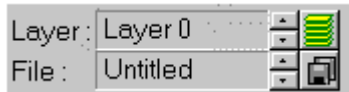
Choose different default display settings by clicking on the appropriate button, Line type or width for the lines or icon type for the isolated point.



In the same way **change the display characteristics** of a selected object by choosing different display attributes after the object has been selected.

Control the **display priority** amongst the objects of a same layer with the Order menu.

FILES

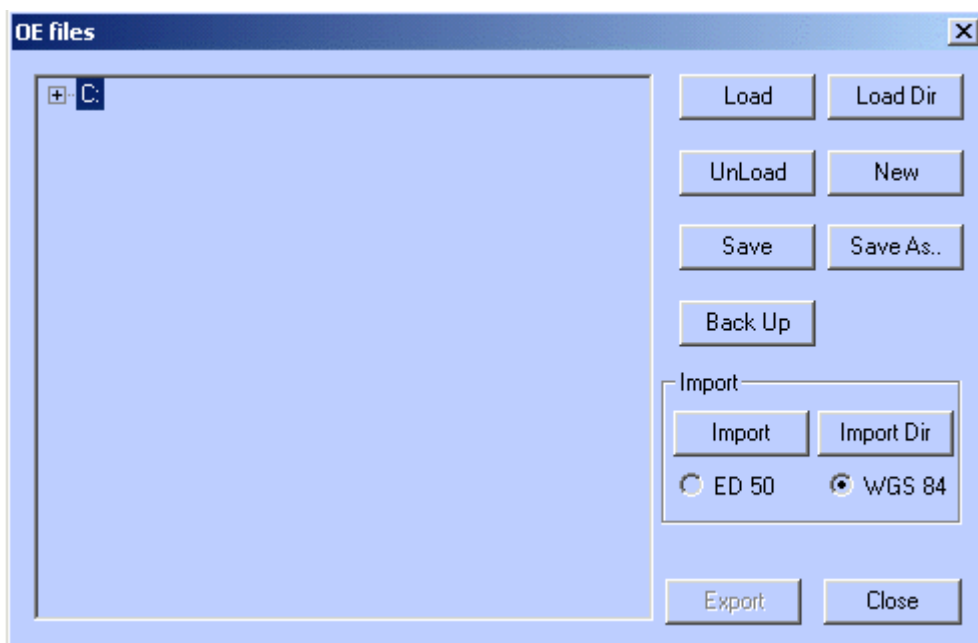
Data that are plotted on the chart are stored in the active layer of the active file: the active layer and file names are displayed on the top of the OE area.



By default the user data are saved in a layer called Layer 0 in a file called Untitled but the user can select at any time other active file and layer with the files and layers management dialogues activated by the buttons:  and .



The file management system allows selecting the active file, to load or unload a file or a set of files, to save or save as the files, to create a new file and to back up loaded files on floppy disk.

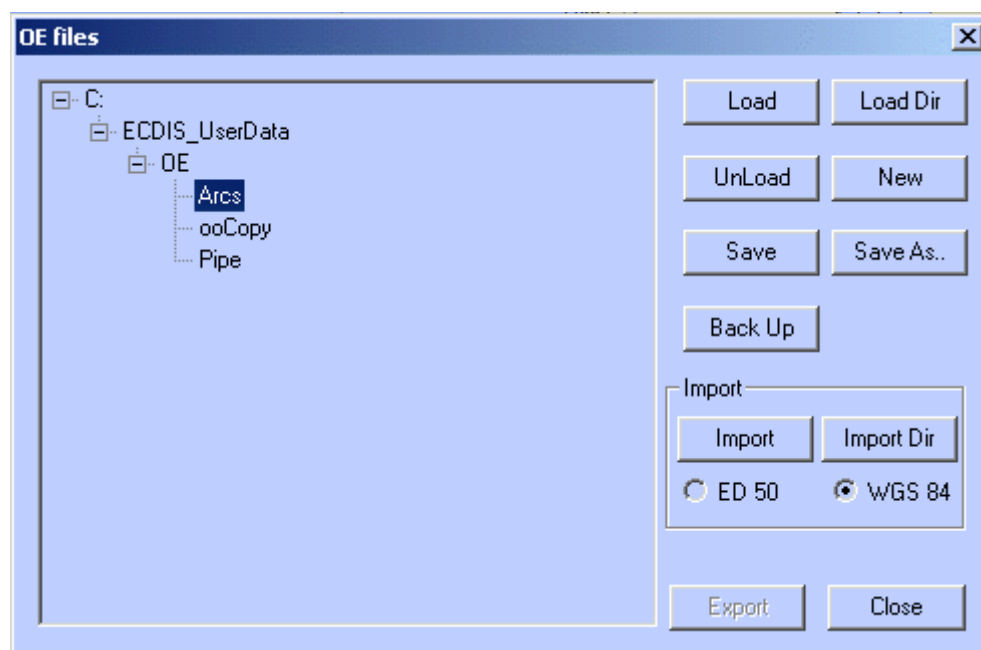
Import allows converting files with specific format.



ACTIVE FILE

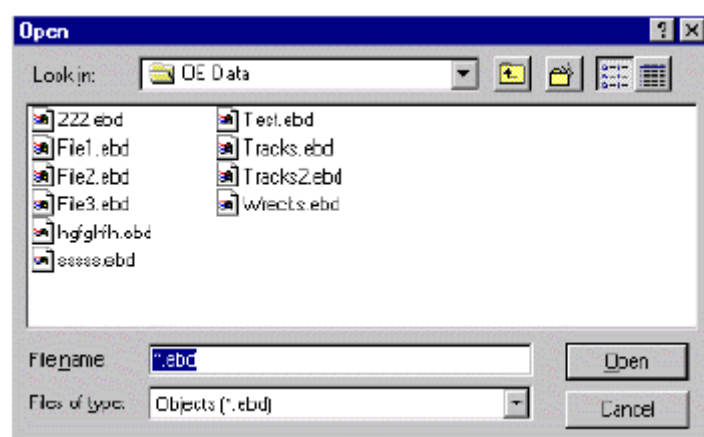
There are three ways of selecting a new active file:

- To make active a file that is already loaded in the system, use the small arrows next to the file name until the right file's name is displayed.
- To make active a file that is not loaded, press the button , access to the file selection dialogue, press the load button and select the file to be loaded: the selected file read from the hard disk will become the active file.
- To make active a file that is already loaded in the system, press the button , access to the file selection dialogue and double click on the file's name.

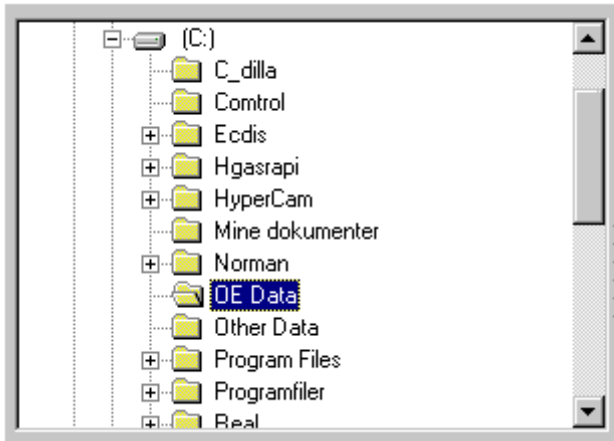


LOAD/UNLOAD FILES

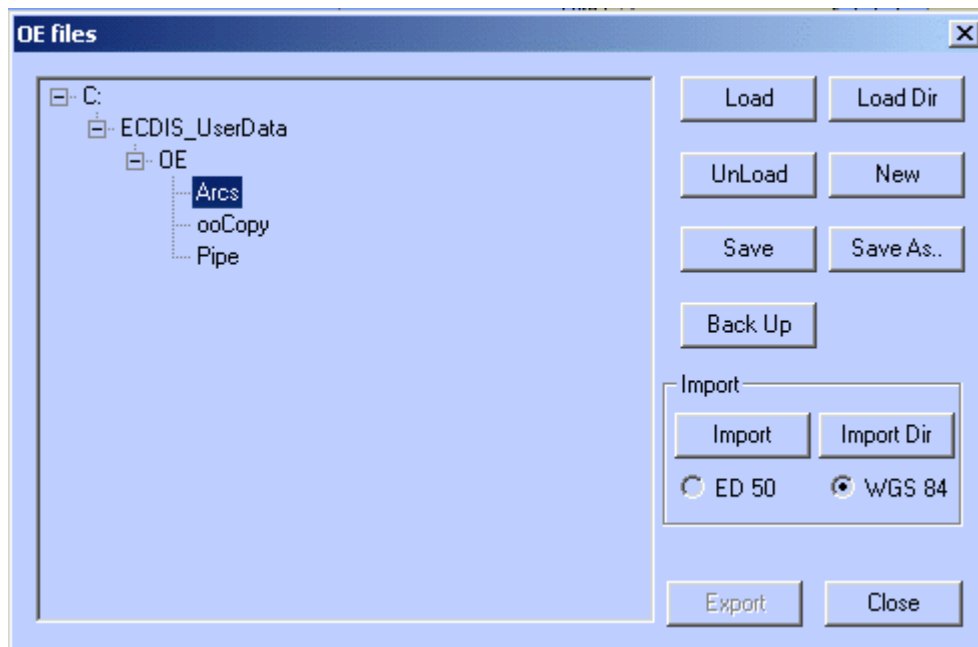
- To load a file, push the button Load and select the file name in the appropriate folder.



- To load simultaneously several files stored in the same folder, push the button Load Dir and select the folder containing all files.



- To unload a file or a set of files belonging to the same directory, select a file or a directory name and press Unload. The file or all files contained in the selected directory will be unloaded.



SAVE FILES

When a file is modified it is not automatically saved on hard disk. To save the modifications, activate the file management dialogue, select the file and press the button Save or Save As to save the file with a different name.

REMARKS

When a directory is selected, all files of that directory are saved.

The function Save As is not applicable on directories.

CREATE A NEW FILE

Press the button New to create a new empty file. By default this file is called Untitled and contains five layers called Layer 0,,, Layer 7.

Untitled is a reserved name and the file Untitled cannot be saved with that name. A new name has to be entered to store the newly created Untitled file on hard disk.

BACK UP FILES

To back up files on a memory stick, select a file's or a directory's name and press Back Up. The file or all files contained in the selected directory will be copied on the memory stick.

IMPORT FILE

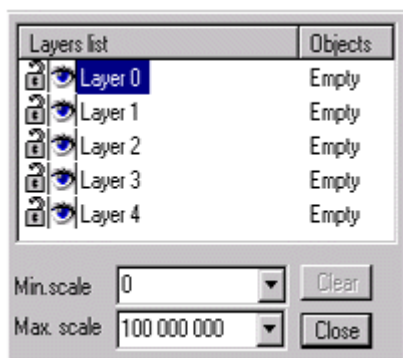
The ECDIS can convert different types of files with proprietary format and display the data as object editor data.

The ECDIS is compatible with Statoil data stored in files with extension .xy (pipelines), .dat (Platforms) and .txt (Fixtar).

LAYERS

Each file contains 8 layers and the user selects the layer to store its data in.

Each layer has a display priority and the layer list control in which order the layers are displayed: the first layer of the list is displayed the first.



Each layer's name can be changed and the order the layers are displayed can be adjusted. Moreover, each layer can be made locked or unlocked, shown or hidden and minimum / maximum scales can be edited, meaning that the layer is displayed only when the chart scale is comprised between these two scales.

User's data can be copied and pasted from one layer to another.

LAYER'S NAME

Changing name of the layer is done by clicking on the name once and entering the new name.

LAYER DISPLAY PRIORITY

In the list, the layer "General" is displayed first, Approaches in second etc.

To modify the display priority select a layer name and drag it up or down the list.

LOCK/UNLOCK

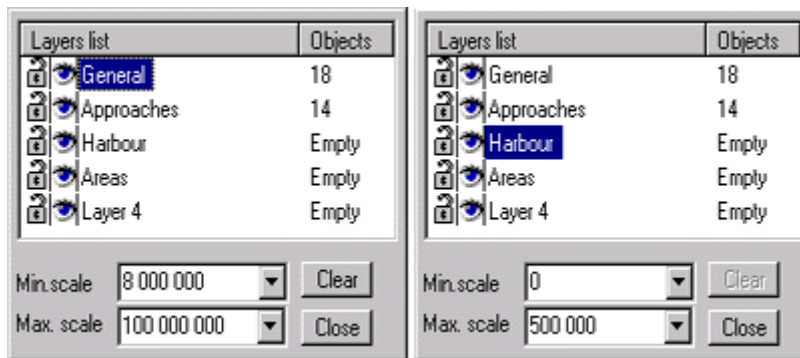
Click on the locker on the left side of the list to make the layer locked . Thus objects belonging to that layer are no more editable.

SHOW/HIDE

Click on the eye button on the left side of the list to hide the layer locked. Then the layer is made invisible and locked.

MINIMUM/MAXIMUM SCALES

In the picture the layer General is visible when the chart scale is comprised between 1 / 100 000 000 and 1 / 8 000 000 and the layer Harbour when the scale is bigger than 1/ 500 000.

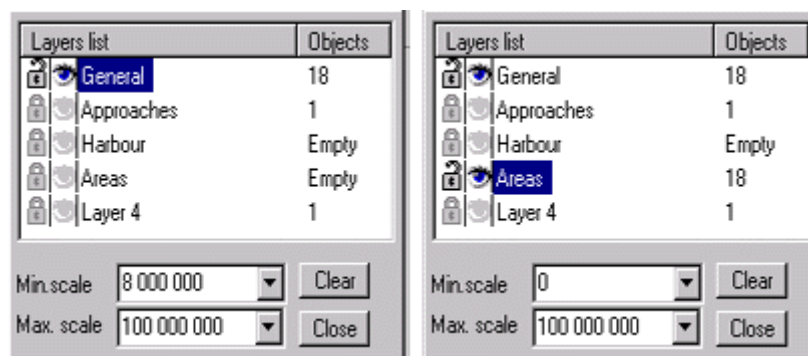


REMARK

When the chart scale is not within the scale limits of the active layer it is impossible to plot any object on the chart. For instance, if the current chart scale is 1/1 000 plotting a point in the layer Harbour is impossible. Therefore to be able to plot a point change the chart scale or the active layer.

COPY/PASTE

To copy objects from one layer to other one, make a selection of objects (hide eventually other layers to make the selection easier as done in the picture below), activate the item Copy from the menu Edit, activate the destination layer and Paste item.



CLEAR

Select a layer and push the button Clear: all object of that layer will be deleted.

DISPLAY ATTRIBUTES

A newly created object is drawn on the chart with the selected display attributes shown in the

bar

Choose different default display settings by clicking on the appropriate button, Line type or width for the lines or icon type for the isolated point.

In the same way change the display characteristics of a selected object by choosing different display attributes after the object has been selected.

Control the display priority amidst the objects of a same layer with the Order menu.

COLOURS

In the colour dialogue, click left button on the desired colour to set the colour for the lines and right button for the colour of the filling patterns (area, circle or arc).

LINE WIDTH

Select in the line width menu the line width for both lines and areas.

LINE TYPE

Select in the line type menu the line type (plain, dotted etc.) for both lines and areas.

PATTERN

Select in the pattern menu the pattern to be used to fill up areas, circles or arcs.

ICON

Left click and select in the list the standard icons to be used for isolated point.

IMPORTANT

Right click in the button displays the list of official S57 icons making possible to manually update the chart.

CHARACTER STYLE

Select the character type, style and size to be used for the free text displayed on the chart.

MODIFYING DISPLAY ATTRIBUTES

A newly created object is displayed with the current display settings, colour, line width or icon type.

To change the way an object is drawn and change its display attributes:

- Select the object.
- Select other display attributes with the setting tools.

FOR EXAMPLE:

- To change an isolated point icon, select the point and choose another icon from the icon list.
- To change the filling colour of a circle, select the circle, click in the colour setting button and choose the new colour with the right button.

DISPLAY PRIORITY

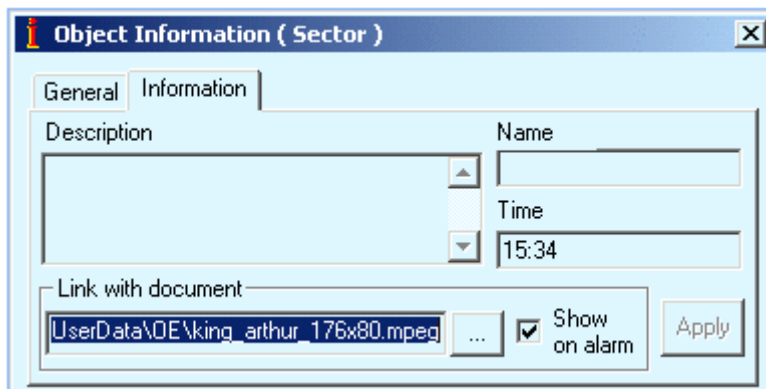
The objects of the same layer are drawn in the order which they have been created. But the display priority between two objects can be modified: for example when a plain coloured area, plotted after an isolated point, hides this point. To make it visible, select the area, click right button on that area, activate the menu Order and select the item To back.

To Back sends the object at the end of the object list of the layer while Back One moves back one step the object in the list.



PROPERTIES

Each OE object has different attributes depending on its type and there are presented in the properties dialogue.



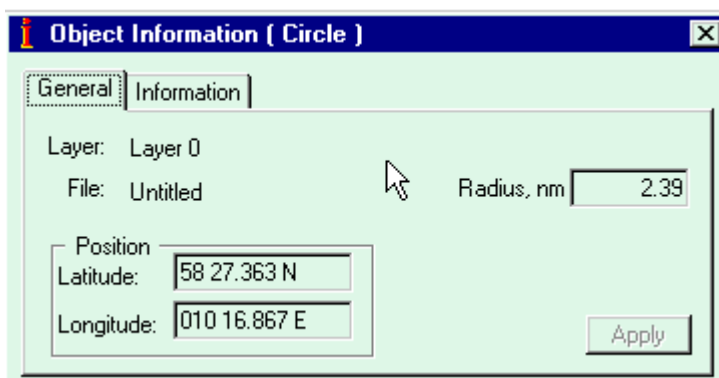
Access the Properties dialogue by clicking right button on the object.

Enter or consult free text information concerning the object in the information panel.

REMARK: when description field is filled in, the information is displayed on the chart in a prompt window when the cursor is located on top of the object.

Edit object attributes in the panel General. The attributes are dependent on the object type.

EXAMPLE circle properties: The position of the centre and the radius are editable.



LINK WITH ADDITIONAL INFORMATION

An object can be linked with a file containing text, picture, video but also pdf file.

In object properties dialogue select the file linked with the object.

The information contained in the file is presented in the application used to create the file. For example a pdf file will require Acrobat Reader to be installed on the hard disk to be able to display the information.

The file can be displayed in two different ways:

- Manual by Right clicking on the object and selecting the item menu Display linked document (name of the document).
- Automatically if the attribute "Show on alarm" is set on and the object triggers a user alarm.

MODIFYING OBJECTS

Each OE object loaded in the memory can be selected , deleted and moved to other position.

- A new point can be added to a line or to an area.
- A point of a line or surface can be deleted or moved.
- A line can be closed and transformed in an area or cut in two pieces.
- Two lines can be connected.

IMPORTANT

All modifications applied on objects as described below can be cancelled with the item Undo from the menu Edit. See paragraph Edit Menu.

SELECTING OBJECTS

A selection is a group of selected OE objects.

Select one object: click on time on the object or on one of its edge.

Select two or more objects (Selection containing several objects): click on each object maintaining the keyboard key Ctrl down.

Activate the menu Select All OE objects from the menu Edit: all loaded objects are added to the selection.

Use the tool "Select OE objects" to select OE objects.

IMPORTANT: selection and locked layer

When an object belongs to a locked layer that object is not selectable. For more information about layer see paragraph Layers.

DELETE OBJECTS

Select an object and push the button . If several objects are selected, the entire selection is deleted.

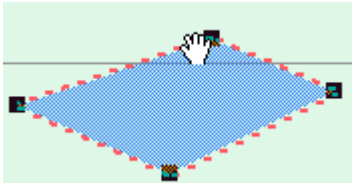
Other methods to delete a selection of objects:

- Press the Del key.
- Activate the item 'Cut 'from the menu Edit.
- Activate the item 'Delete all selected' from the menu Edit.

MODIFY POSITION

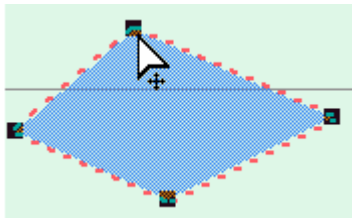
OBJECT LOCATION

To change the object's position on the chart, select it, move the cursor on that object near a selected point and when the cursor has a hand shape click and drag the object.

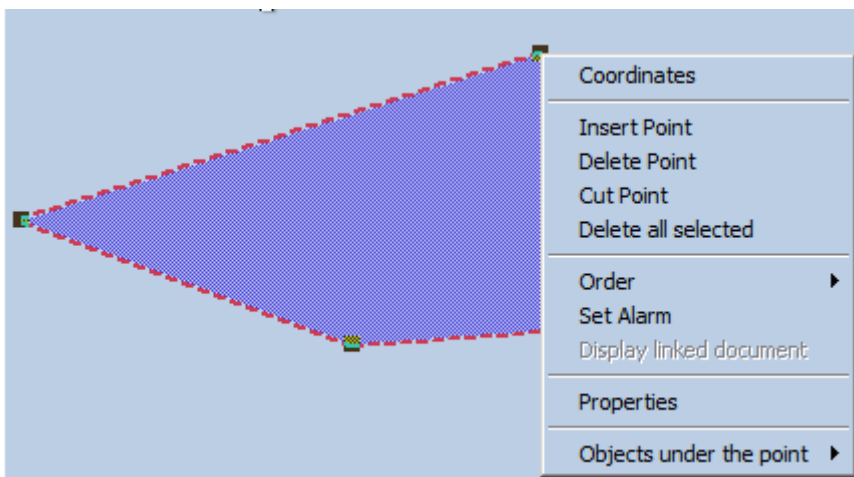


POINT'S CO-ORDINATES

When the cursor has the following shape the point under the click will be moved and then the object shape modified.



To modify the co-ordinates of a point by keyboard, select the object, click on that point and activate the item Absolute Coord.



REMARK

The dialogue Absolute Coord does not allow modifying the position of the centre of a circle. To modify it by keyboard access the Properties dialogue of the circle and enter the new position.

OTHER OPERATIONS

INSERT A POINT IN A LINE OR AN AREA

Click right button on the line / area at the desired location and activate the item 'Insert Point'.

Another method:

Select the line / area, move the mouse at the desired location on the line / area and press the keyboard key I.

DELETE A POINT IN A LINE OR AN AREA

Click right button on the line / area on the point and activate the item 'Delete Point'.

Another method:

Select the line or the area, move the cursor on the point and press the keyboard key D.

CUT A LINE IN TWO

Click right button on the line / area on the point and activate the item 'Cut Point'.

Another method:

Select the line or the area, move the cursor on the point and press the keyboard key C.

CLOSE A LINE

Activating the item Close Polyline from the menu Edit on a selected line transforms the polyline in a surface.

CONNECT TWO POLYLINES

Select two polylines and activate the item Connect two polylines from the menu Edit to join the two lines.

S57 MANUAL UPDATE EDITOR

The ECDIS supports the automatic updating of S 57 data as described above but also allows the data to be manually corrected. The change can be visualised and do not restrict the ability of automatic updating.

There are three different ways of changing objects by manual updating:

- **Deleting and annotating objects**
- **Modifying objects**
- **Inserting objects**

All manual updates applied in the cell are stored in a log file and can be review on request.

In ECDIS the modification of objects is limited to adding text information or moving objects. The latter is implemented as deleting the object and afterwards inserting a copy.

The ECDIS provides functions to cancel or withdraw manual updates and to query objects, which have been inserted by manual updates.

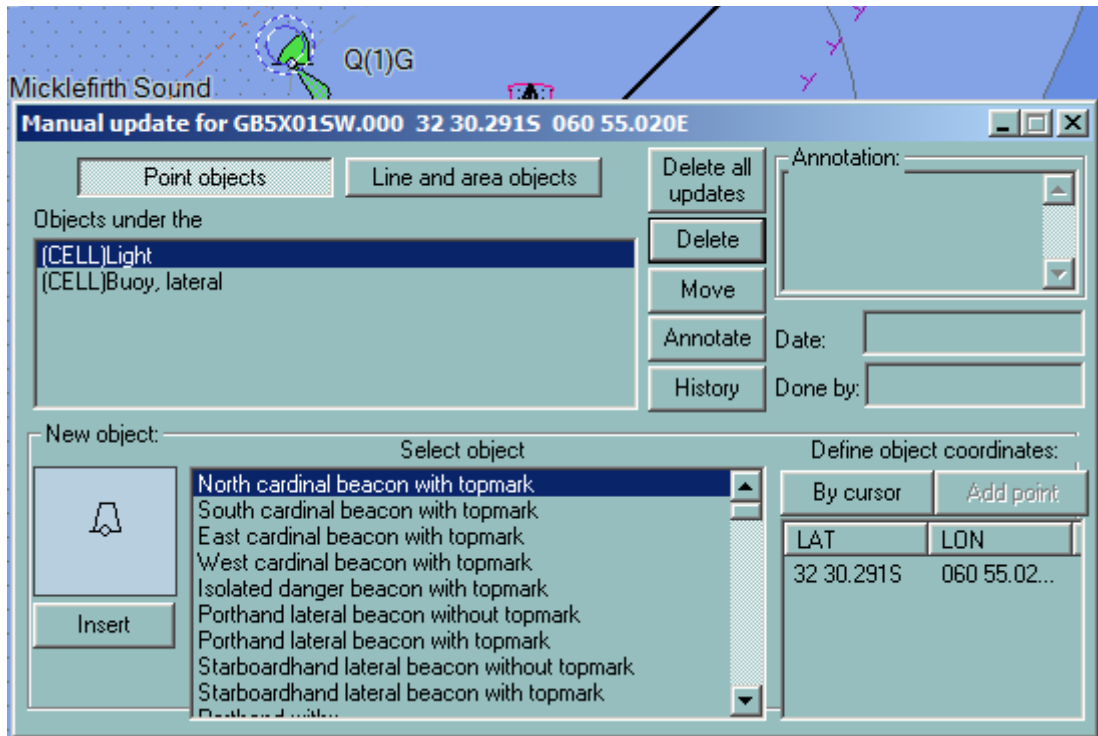
A manual update always has effect on only one particular cell. This cell has to be assigned to the view.

SELECT OBJECTS

Click on the object with the right button and activate the menu Manual Update.

The selected object is highlighted in the chart.

Select the type of object to be selected under the click: point or line / area.



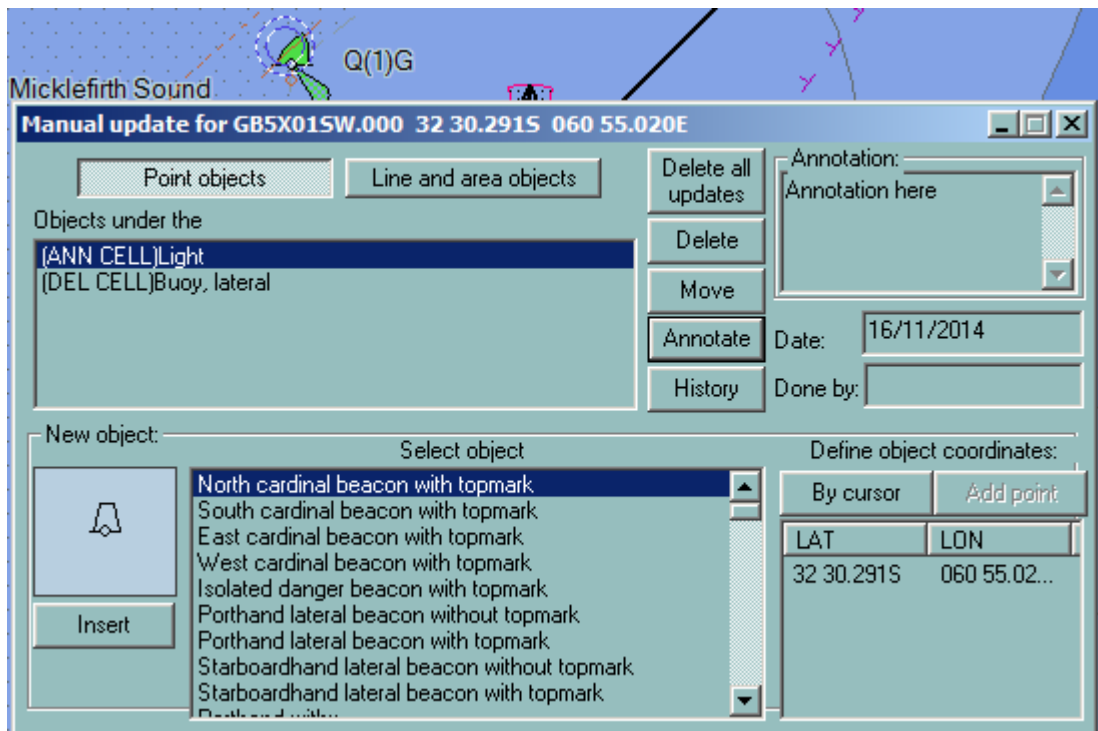
DELETE AND ANNOTATE OBJECTS

DELETE OBJECTS

To delete an object in the sense of manual update:

- Select the object.
- To delete only one component, select the element of the object and press Delete.

A deleted object is highlighted on the chart as shown in the picture.



To annotate an object, i.e. to add text information to the object:

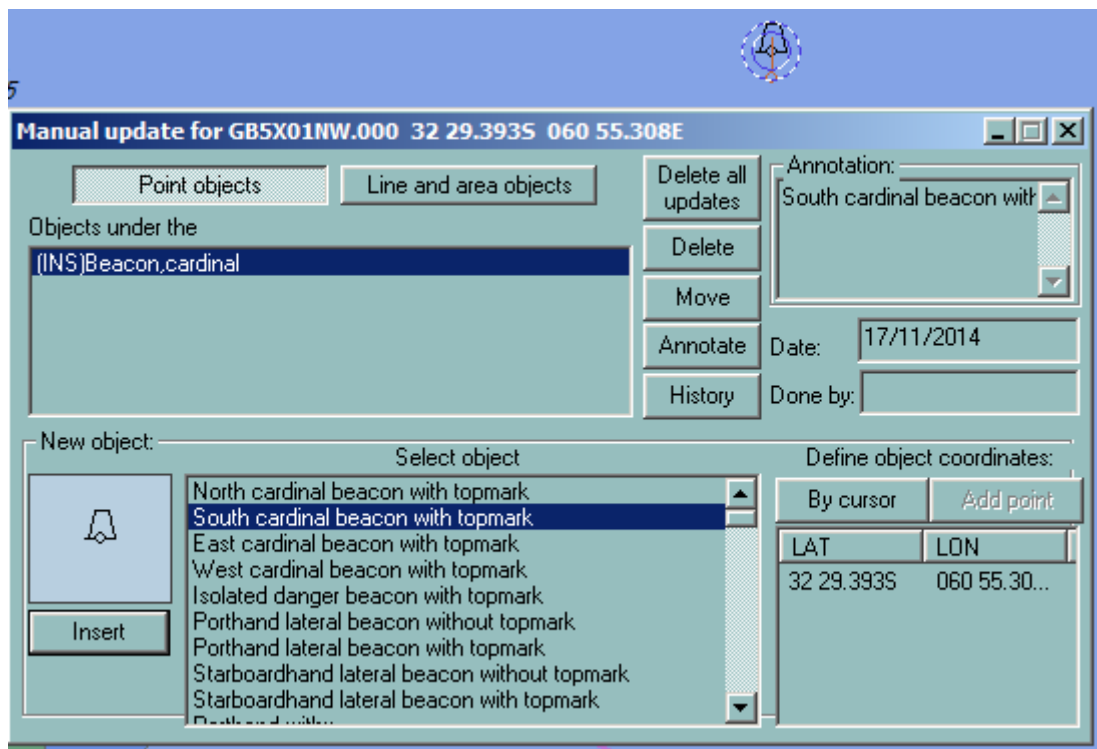
- Select the object and one component.
- Enter the text and press the button Annotate.

INSERT OBJECT

INSERT POINT OBJECTS

Click right button on the chart at the appropriate position and activate the menu Manual update.

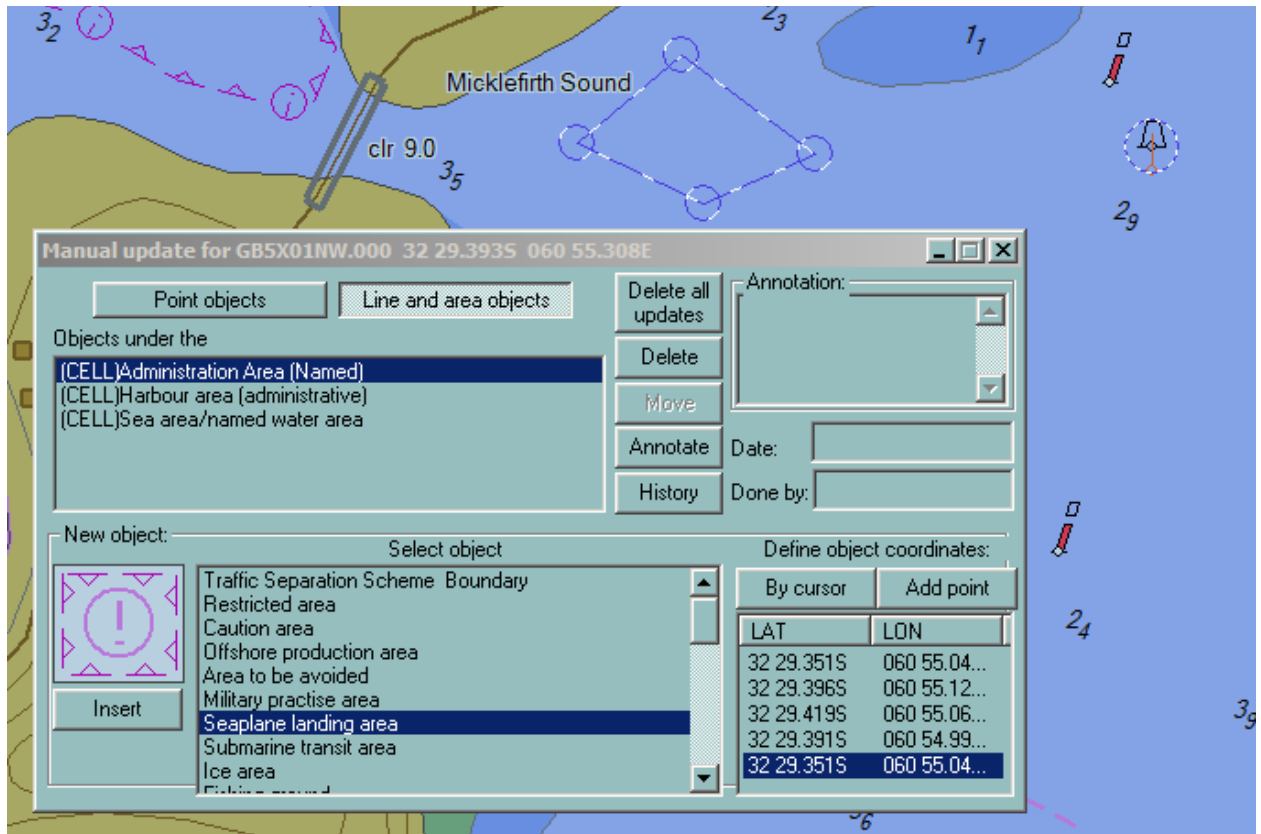
- Select the object type: point object.
- Select the type of point object you want to insert.
- Adjust by keyboard the coordinates of the point and press Insert.



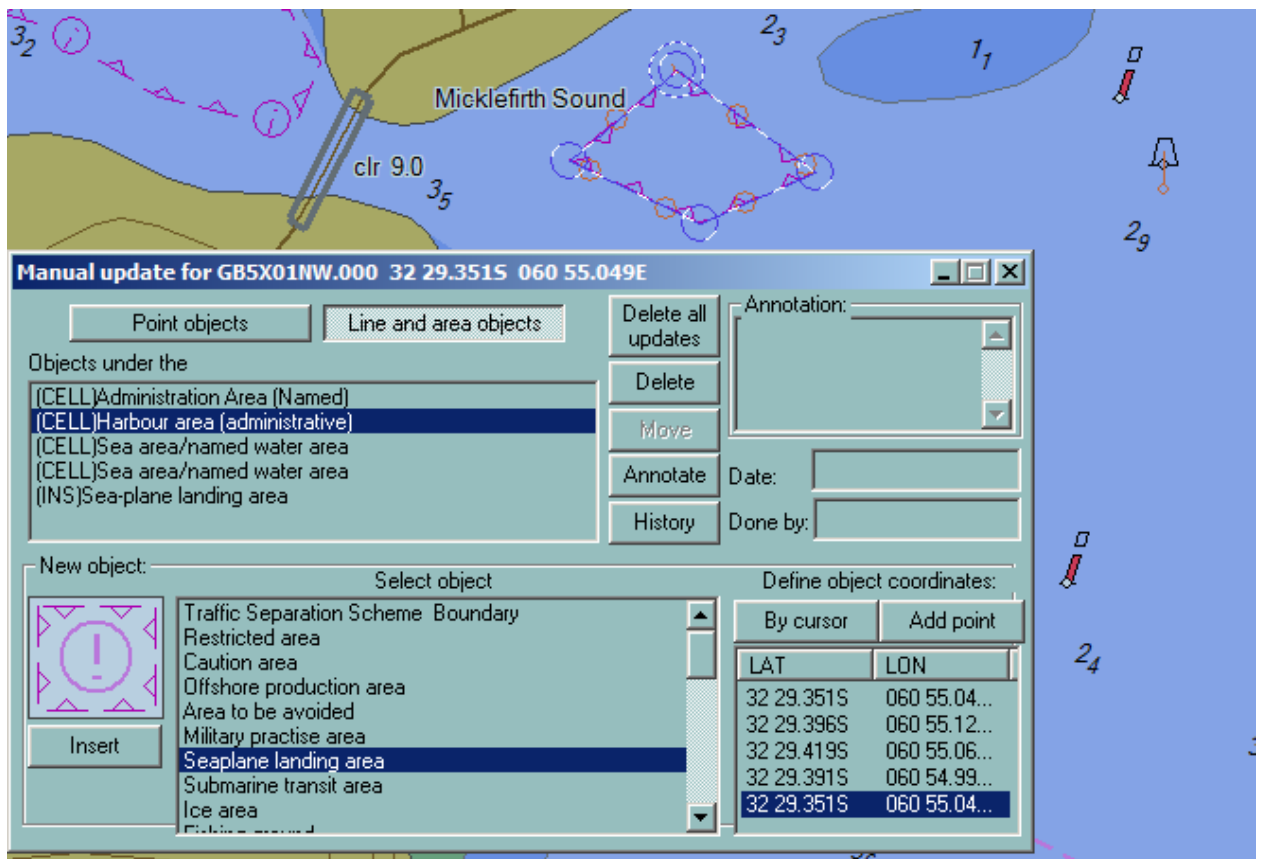
INSERT LINE/AREA OBJECTS

Click right button on the chart at the appropriate position and activate the menu Manual update.

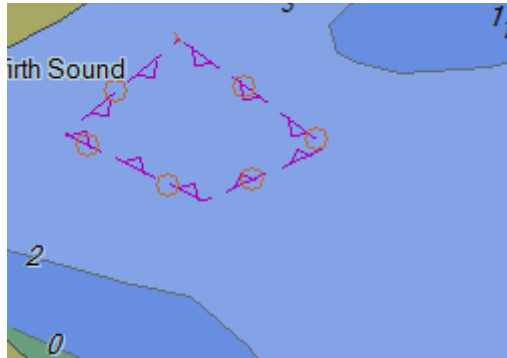
- Select the object type: Line/area objects.
- Select the type of line or area object you want to insert.
- Insert the list of coordinates of the line or area points or make the area by cursor



- and press Insert.



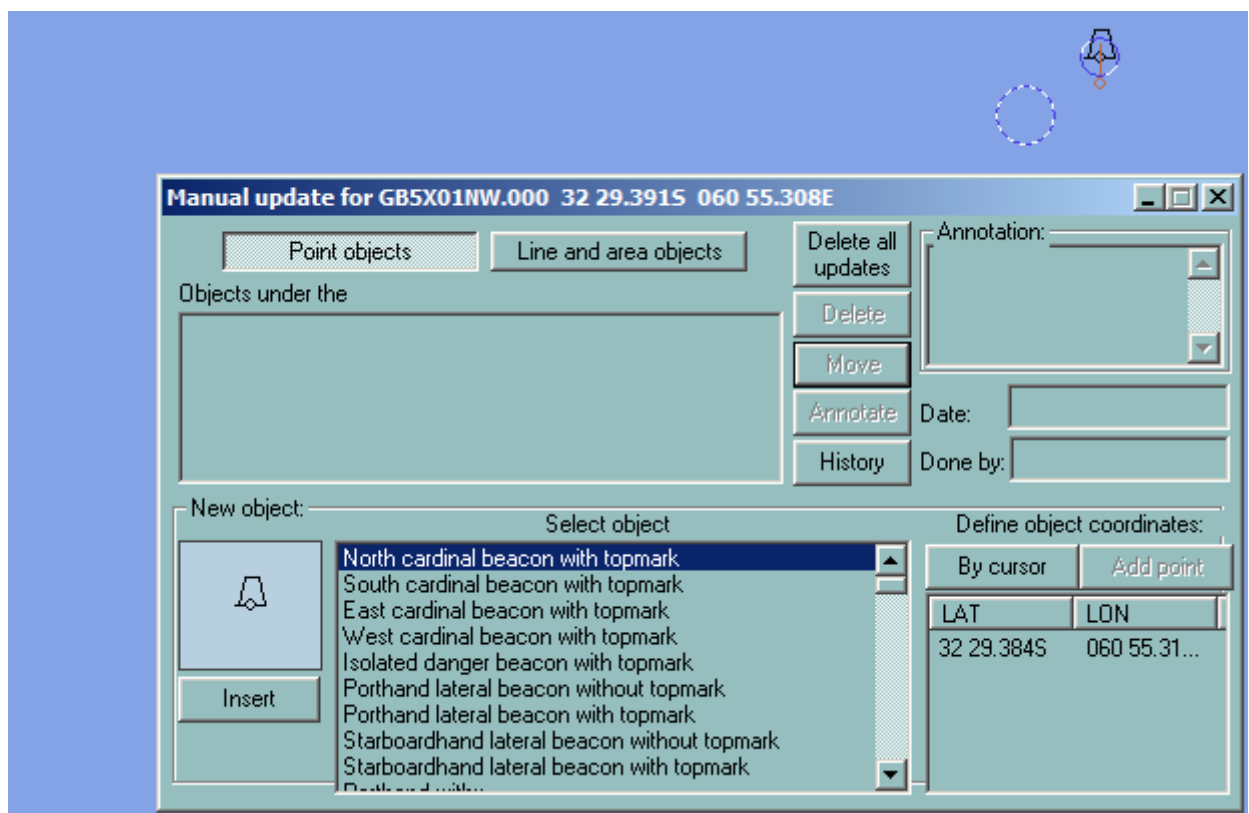
After the Manual Update dialogue is closed the inserted object is displayed as follows



MOVE OBJECT - REMOVE UPDATES

MOVE POINT OBJECTS

- Click right button on the object
- Activate the menu Manual update
- Select the object type: point object
- Select one component of the object
- Enter the new coordinates
- Press Move
- Repeat the operation for all components



REMARK

The ECDIS does not allow moving a line or an area.

REMOVING MANUAL UPDATES

Manual updates of all kind can be removed with the functions "Delete all update" available in the manual update window.

IMPORTANT

The function is applicable only on the loaded cells.

UPDATE HISTORY

Press the button History to get the list of all manual updates applied on the cells.

Predictor

PREDICTOR OVERVIEW

Predictor and Docking function are activated within the ECDIS toolbar.

The Predictor functionality in ECDIS900 allows for the display of the future position and the historical position of the ship. This position is calculated based on former ship data and applying some user defined settings. The Predictor is a navigation aid to be used for continuous dynamic ship's position prediction within 15 – 60 secs.

The predictor calculations are base on a vector prediction algorithm that uses the latest historical data: ship's position, speed over ground, course over ground and heading. Rate of Turn and ROT acceleration are calculated from historical values and are used to predict ROT and heading.

The user has to enter proper ship's parameters and settings for a accurate calculation.

To run the function, an interface to GPS and Gyro must be available.

N.B. The heading input value should at least contain one decimal.

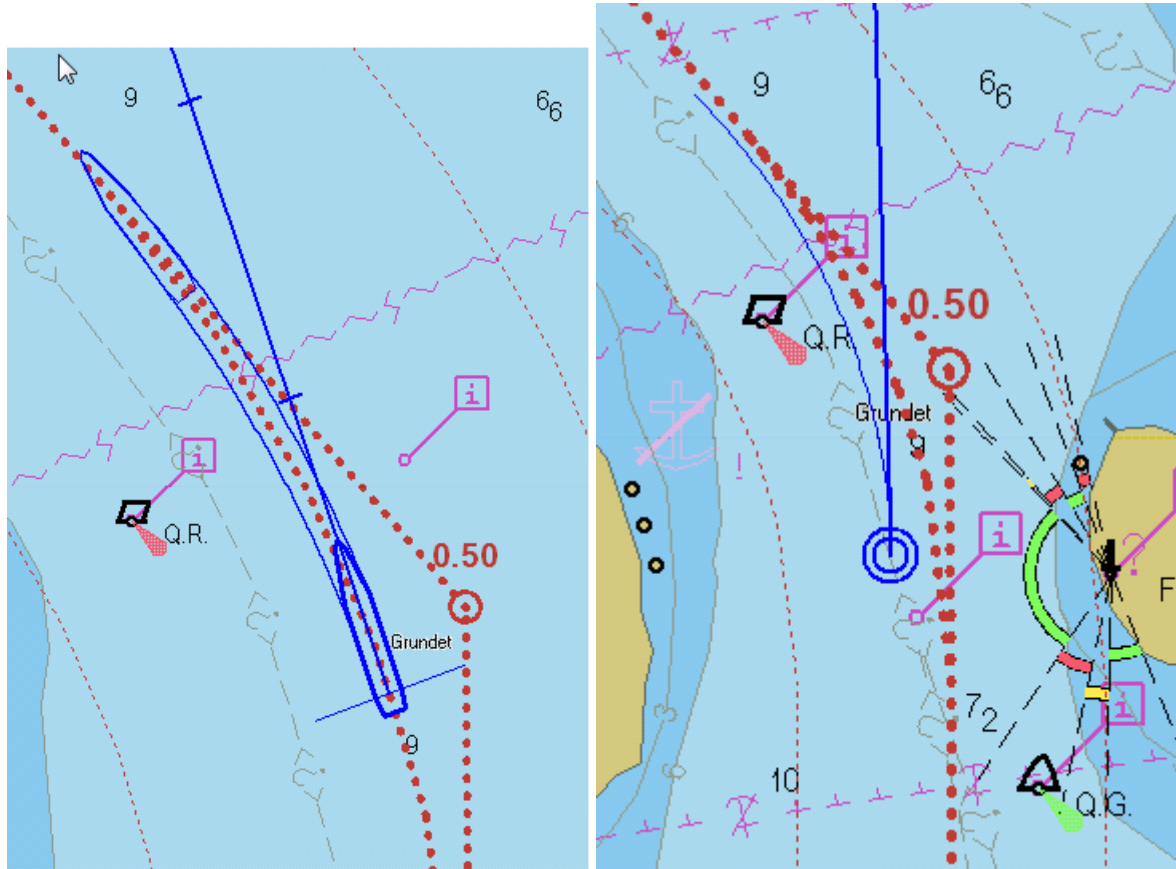
To activate the function press the button Target Prediction and toggle the check box "Use vector predictor" On.

The active leg window available in the console area allows the user to control the position of the ship against the active route

PRINCIPLE

To be able to calculate the future position, ECDIS must be connected to GPS, gyro and log.


Depending from the chart scale the Predictor displays either prediction corridor (ship shape displayed), either prediction line (ship icon displayed).

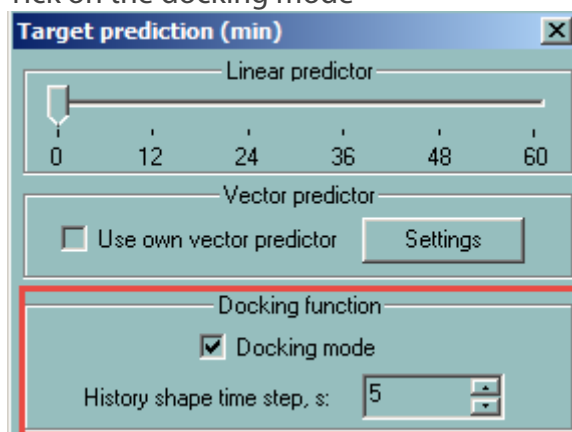



DOCKING

NOTE The Docking mode available for speed lower than 6 knt

To use the docking mode do the following:

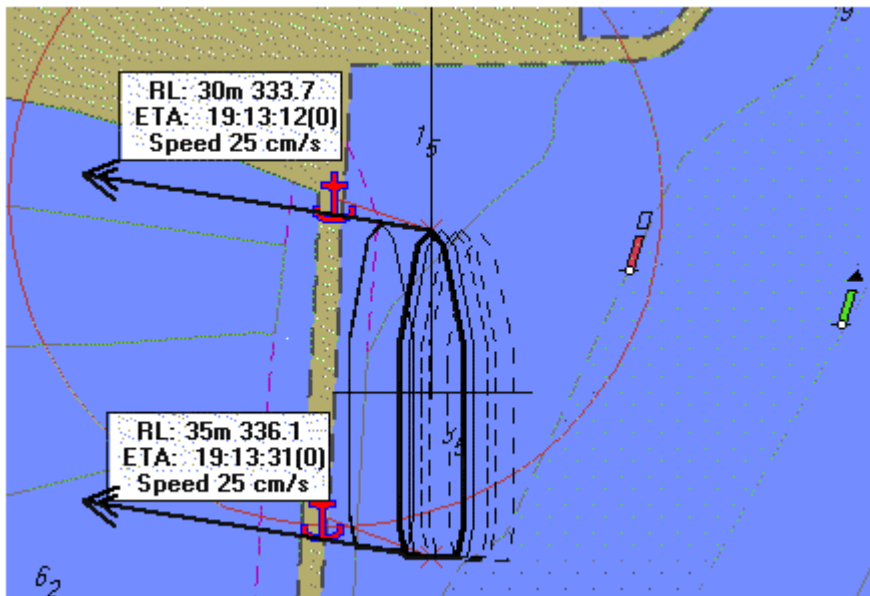
- Click the Target prediction  button
- Tick on the docking mode



- Right click on the  button
- Create the first anchoring point attached to the bow.
- Create the second anchoring point attached to the stern taking in account that the circle radius is equal to the vessel length

When operating the Docking mode the following data is displayed:

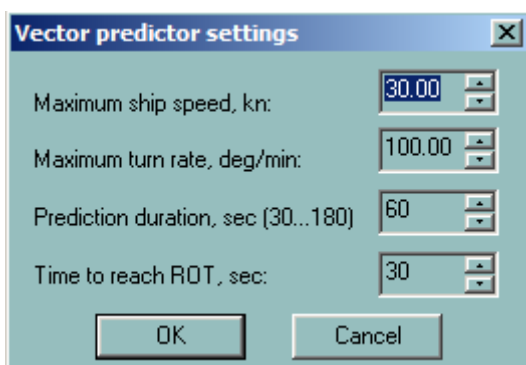
- distance to anchoring point and speed for both bow and stern.
- 4 historical positions (step adjustable from 3 to 15 seconds)
- predicted position (see **Predictor**)
- For each anchoring point, course, distance and speed (cm/s) are displayed.
- 2 speed vectors are displayed from bow and stern.



SETTINGS

The following user defined settings are used during the calculation:

- Maximum ship speed: limit used in the calculation
- Maximum turn rate: limit used in turn rate calculation
- Prediction duration: ship symbol plot interval
- Time to reach ROT: sets limit to turn rate acceleration in the calculations. After rudder change, the ship starts turning, and ROT accelerates till constant ROT is reached. (Time to reach ROT = 0 means that using turn rate acceleration in the calculations is disabled)



Historical values (heading, position and speed) are continuously recorded and processed:

- ROT value is calculated from historical values of the heading
- Acceleration of the ROT is calculated from the same set of values
- Acceleration of the speed is calculated from STW values.
- The PP (Pivot point) of the ship is calculated from GPS positions, speed and heading values
- The future positions are calculated by iteration (every second) as follow:
 - Last position
 - Last heading, ROT and speed
 - Time interval
- The new position of the PP is calculated from the above values, and the ship's orientation is displayed according to the new heading (Last heading received + ROT applied for the time interval within the limit of ROT and time to reach the ROT).

ACTIVE LEG WINDOW

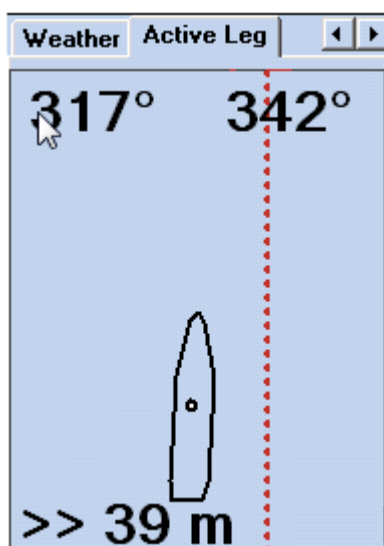
This tool is designed to help the navigator during navigation in narrow waters, where precise following along the planned route is essential.

The ship's shape is displayed in the middle of the window together with the active leg and turning curves using a scale from 3500 – 10000 depending on the ship's dimensions.

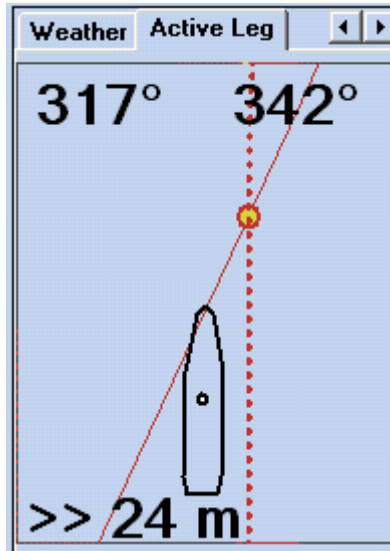
The picture is leg bearing oriented. In the top left and right corners of the window current leg bearing and next leg bearing are displayed.

In the bottom part of the tool XTD value is displayed together with indicator of direction to go to follow exact the route.

In case of ship turning this value is calculated for the end of turn showing how far away from the leg the ship will end its turn for the next leg.



Moving along the leg

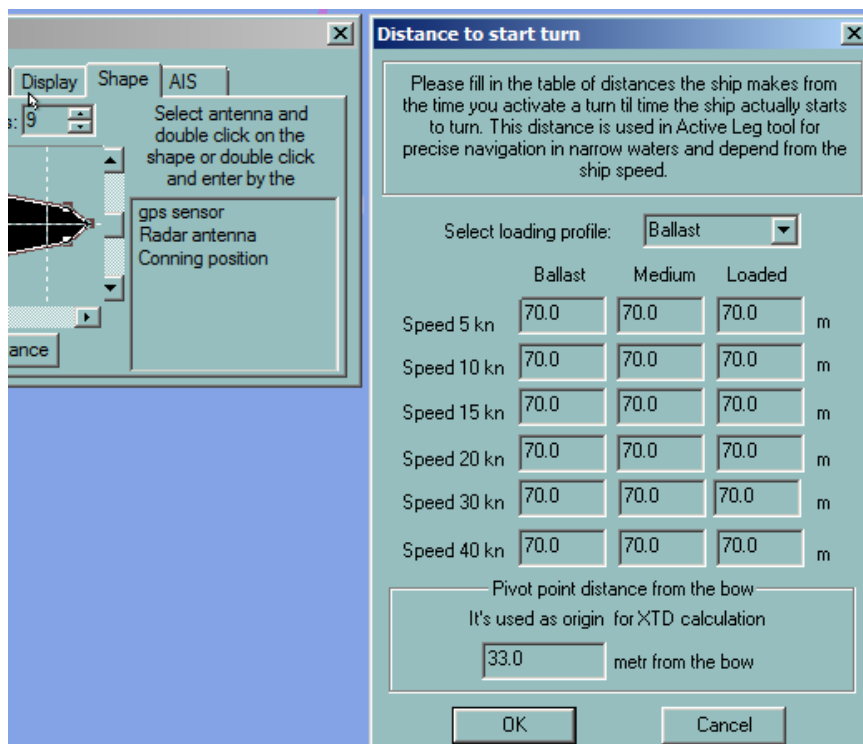


Approaching turning point.

The tool is designed to help the user to decide when to start turning to be able to follow exactly the active route.

It takes into account the distance the ship makes from the time navigator activates a turn till time the ship actually starts to turn. Those values can be adjusted in the dialog "Distance to start turn".

To access the settings push the button "Turning" in ship properties – page shape. If ship is for some reason away from the active route the decision to start turn should be done using the criteria of crossing the line passing through WOP and parallel to next route leg.



SAR module

SAR MODULE OVERVIEW

GENERAL

The purpose of the module is to help navigator to create SAR routes using selected options meaning help to plan SAR operation. Depending on the user needs it is possible to create three types of routes:

- Expanding square
- Sector
- Parallel line

ACCESS TO THE SAR MODULE

Right click in the button Create Route activate the following dialogue.

SAR route

Type of search pattern

☒ Expanding square

☐ Sector

☐ Parallel track (OE area should be selected)

Start point

Latitude: 32 30.848S

Longitude: 060 55.153E

By cursor

Drift

Direction, deg: 0.0

Speed, kn: 0.0

Use calculated ship drift

Route

Route name: SAR_31/10/14_01_05_55

Radius of search: 5.0

Route spacing: 0.50

Clear the route Create the route Close

EXPANDING SQUARE OPTION

- The start point of the route is either the position of the ship or selected manually by pressing the button By Cursor and plotting the starting point directly on the chart.
- Select the direction of search with the parameter Direction in the Drift panel.
- Select the speed to proceed the route in the Drift panel.
- Select the search area with the parameter Radius of search.
- Select the space between leg with the parameter Route spacing.

SECTOR OPTION

- The start point of the route is either the position of the ship or selected manually by pressing the button By Cursor and plotting the starting point directly on the chart.
- Select the direction of search with the parameter Direction in the Drift panel.
- Select the speed to proceed the route in the Drift panel.
- Select the search area with the parameter Radius of search.

PARALLEL LINE OPTION

- Plot an area with Object Editor tools.
- Select the area.
- Right click on the button Create Route.
- The start point of the route is either the closest point located on the edge of the area from the ship either selected manually by pressing the button By Cursor and plotting the starting point directly on one edge of the area.
- Select the speed to proceed the route in the Drift panel.
- Select the space between leg with the parameter Route spacing.

Seismic

SEISMIC MODULE OVERVIEW



This module acquires streamers and buoys data from the system called TRINAV and processes them.

Then the positions of streamers and the different buoys are displayed on the electronic charts. In addition the seismic module calculates and triggers alarms when targets enter the security zone defined around the streamers or when the seismic vessel is sailing in dangerous areas.

The Radar kit necessary to overlay the Radar video on top of the chart is installed on a remote NetPC and should be configured as described below. A configuration drawing is given as example of installation.

SEISMIC DATA

DATA ACQUISITION

Data is acquired from a central unit called TRINAV on board Western Geco vessels.

The data includes:

- Buoys positions
- Streamers positions
- Own vessel position, course and speed

- Survey area
- Survey lines

BUOYS

The buoys are equipped with GPS and send their position course and speed every second or every two seconds.

There are three types of buoys:

- Buoys located at the end of the streamers.
- Buoys located at the start of the streamers . These buoys are very rare for the moment.
- Buoys located at the shooting place close to the ship.

The most important buoys are the two buoys located at the end of the two outlier streamers. The buoys are named from starboard to port 1,2 ..X

- F001 is the starboard buoy
- F0xx is the port buoy.

DISPLAY

Buoys are handled by ECDIS900 as targets and displayed with special icon and vector (as the normal target but in addition ECDIS900 calculates the course and speed for each buoy) and which does not trigger any CPA alarms.

Icon: a big triangle with different color (except white) for each buoy and name.

TRACK

It is possible to display on request the track trail of each buoys

Two pixels line width by default with the same color than the buoy is used for the track line.

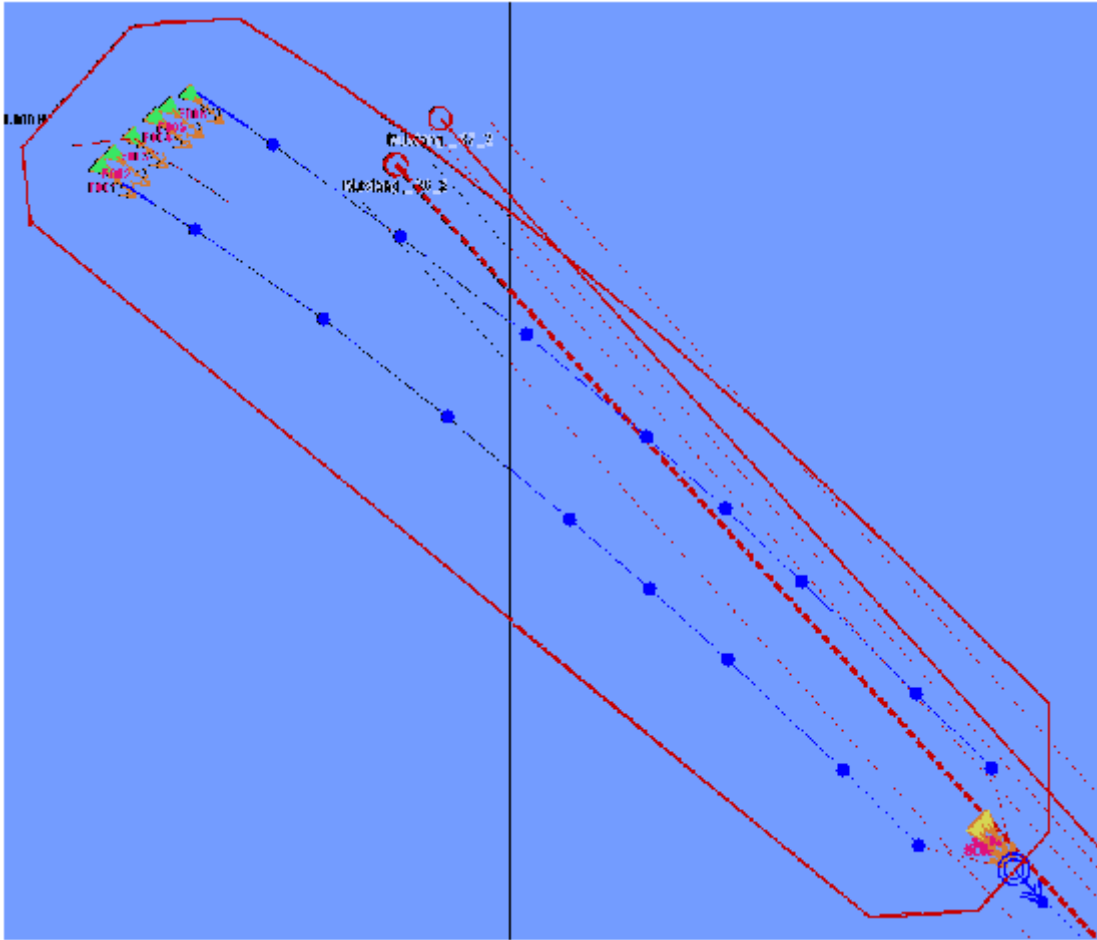
STREAMERS

ECDIS900 receives information about the streamers every 20 seconds and displays the shapes of the streamers.

- There is no limitations for the number of streamers (1 to 16).
- Maximum of captors for one streamers: 9, i.e. the shape of a cable can be defined by up to 11 positions.

REMARK

To avoid the positions to jump between two receptions, ECDIS900 calculates every second intermediate positions of the buoy, which are derived from the previous position of the buoy, the speed, the course and the time from the last reception.



On the picture the ship's icon and buoys located at the shooting place are displayed. In addition two streamers and 6 tail buoys are shown.

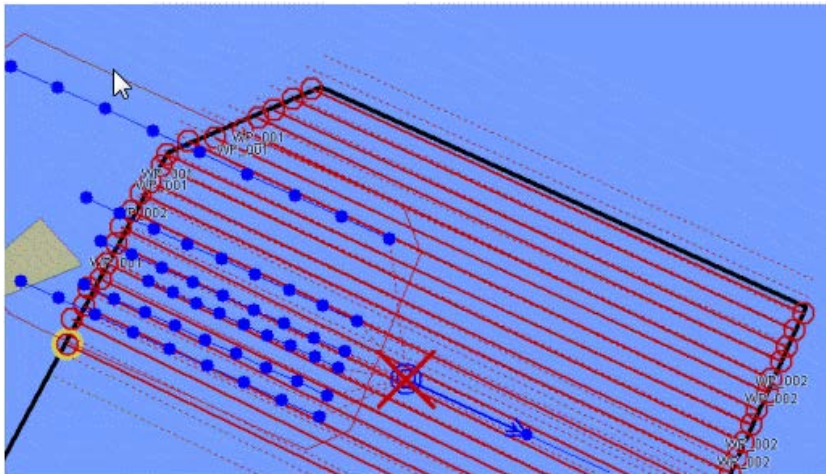
The red area displayed around the streamers is the safety zone. This area is defined and configured by the user.

Note the vectors displayed in front of the ship and the buoys, the ending points show the future positions (according to the user selection: from 1 minutes to 60 minutes) of the objects.

DISPLAY CUSTOMIZATION

In the Ship's properties dialogue the panel Streamers allows to customise the display of the streamers and select different options.

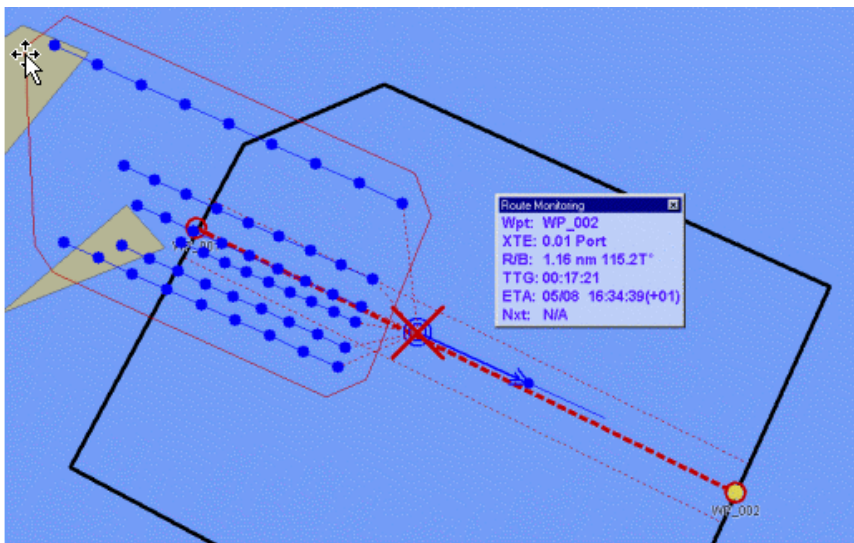
Several survey lines, downloaded from the TRINAV system are displayed as planned route.



Note that a survey area can include up to 1000 different survey lines.

MONITORING MODE

During survey operation, one survey line is selected as active in the TRINAV system, i.e for the seismic calculation department.



It is important to display the same active route in ECDIS900. The active survey line has to be manually selected by the navigator in ECDIS900 (In the dialogue Load \ Unload objects) and then becomes the active route for ECDIS. The application calculates displays the XTE (Cross Track Error) and the ETA to the end of the survey line.

SAFETY ZONE

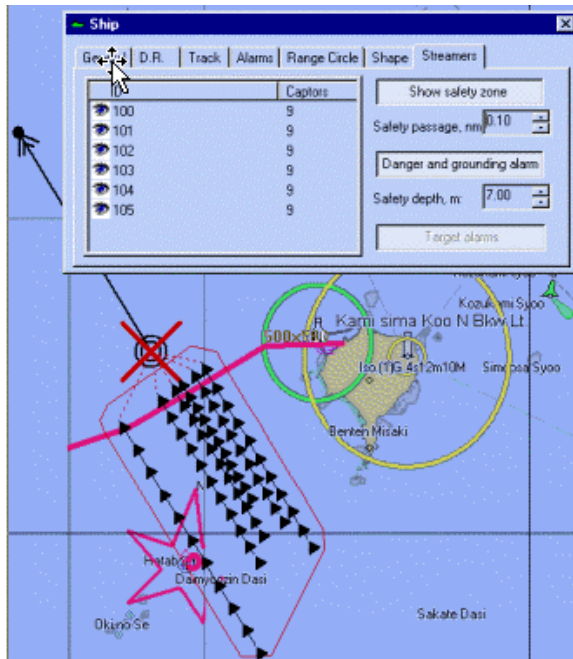
The safety zone is an area defined around the streamers in which special alarms functions apply.

ECDIS900 calculates in dynamic the safety area from:

- the position of the external cables
- the safety distance entered by the user in the text box "Safety passage".

DISPLAY

ECDIS900 displays on request the safety zone in the following dialogue.



GROUNDING AND DANGER ALARMS

In addition to the standard ECDIS alarms, ECDIS900 manages the alarms of the dangers against the chart objects located inside the safety zone.

The user can select the parameters used to determine the different alarms:

- the safety distance
- the safety depth.

Then ECDIS900 checks grounding and danger alarms inside the safety area and triggers alarms when necessary.

REMARK: the alarms are very clearly displayed on the chart with red colours (star around the isolated dangers and wide line).

SYSTEM CONFIGURATION

ARCHITECTURE

The MARIS system installed onboard seismic ship is based on two workstations installed in the bridge called ECDIS900 Monitoring station and NetPC.

The ECDIS900 station is used to display the electronic chart or the Radar video and the NetPC is used as Radar Video server. Then it has no monitor and no keyboard.

The two workstations acquire navigation data from different sensors connected by serial lines and the NetPC acquires the raw Radar video from the two Radar transceivers with MARIS PC Radar Kit.

The two PCs share and exchange data using TCP IP messages on LAN.

Other workstations connected to the ship's LAN can run ECDIS900 or ARPA2000 applications and share and display the same data than the workstations installed in the bridge.

NAVIGATION DATA

Navigation data are acquired by serial lines connected either to the Monitoring station or to the NetPc.

Two applications called Sensor Monitor running on the two workstations are in charge of analysing and transmitting the analysed data.

All analysed data (Position, time, Course and speed, Depth, Targets etc..) are sent on the LAN in broadcasting mode and all computers of the Network running ECDIS900 can use them.

SET UP

The set up of the serial input to the Monitoring station is done by the installer and can be modified at any time using SMonitor application.

The set up of serial input to the NetPC is done when the system is set up. Because there is no monitor and keyboard the set up cannot be modified easily.

There are two ways to change it:

- Connect a monitor and mouse\keyboard and access the application SMonitor
- Use the application WinVNC on the Monitoring station and access to the NetPC remotely. This requires that WinVNC is installed as server on the NetPC and as client on the Monitoring station.

RADAR VIDEO DATA

Radar video is acquired on the NetPC using the PC Radar Kit and the application Extractor\Tracker (E\T). The video is digitised on the NetPC and sent on the LAN.

In normal mode the video is sent on the ship's LAN in broadcasting mode and all PCs of the LAN can use and display the Radar video picture using the application ARPA2000 or overlay the Radar video on top of the electronic chart in ECDIS900.

However the traffic on the LAN increases significantly and in some cases the traffic increase is not acceptable. Then there are three different solutions to reduce the traffic:

1. Configure Extractor\Tracker to send the Radar video to a particular IP address (The IP address of the Monitoring station). Then the traffic on the LAN does not increase but the other PCs of the LAN cannot use anymore the Radar video.
2. Use a sub network as ECDIS sub network. This requires the network administrator of the ship to set up the network with appropriate configuration and routers.
3. Install a separate network for the PCs using ECDIS900 and ARPA2000. This requires to install Network cables (and eventually additional Network cards) to link of the Monitoring station and the NetPC but also other PCs using ECDIS900 and ARPA2000 in the instrument room or elsewhere.

Weather

WEATHER FORECAST

GENERAL

The Weather module is for displaying weather forecasts overlaying navigation charts. The data can be ordered with MBA (see MBA User Manual, chapter 18). Also you can find the Weather service management on the <http://www.chartservice.no>

The following file formats are supported:

- grib&grib2 for waves, current, temperature, wind force and direction, pressure, swell, etc.
- additional data typhoon&ice (proprietary formats of providers)

NOTE Local area forecasts are 5-7 days only. The 9 days forecasts are for ocean areas

IMPORTANT: MARIS disclaims responsibility for grib&grib2 files supplied by the non-recommended providers if these data is not displayed correctly.

A weather file includes several layers with data of defined period. For instance 5 days forecasts for wind and pressure situations, with weather data every 12 hours.

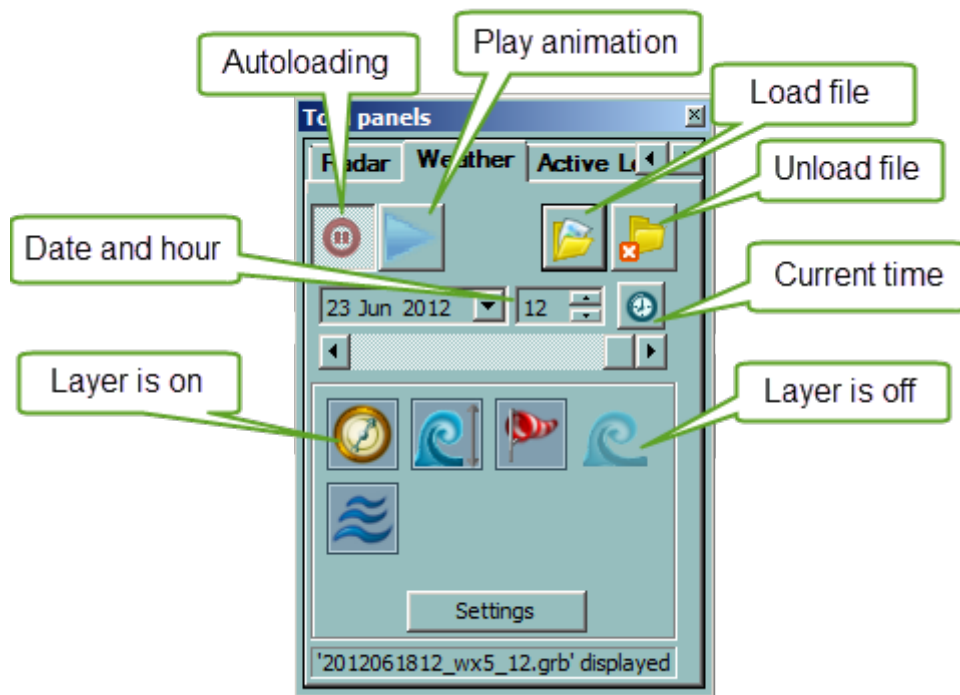
The ECDIS interpolates the data in time and position making possible to display continuously over a period of time and a geographical area all data included in the file.

RECOMMENDED WEATHER PROVIDERS

- Sat Ocean
- Meteo Consult
- SMHI
- Epson Meteo

WEATHER TAB

The Weather module options are displayed on the **Weather** tab on the console.

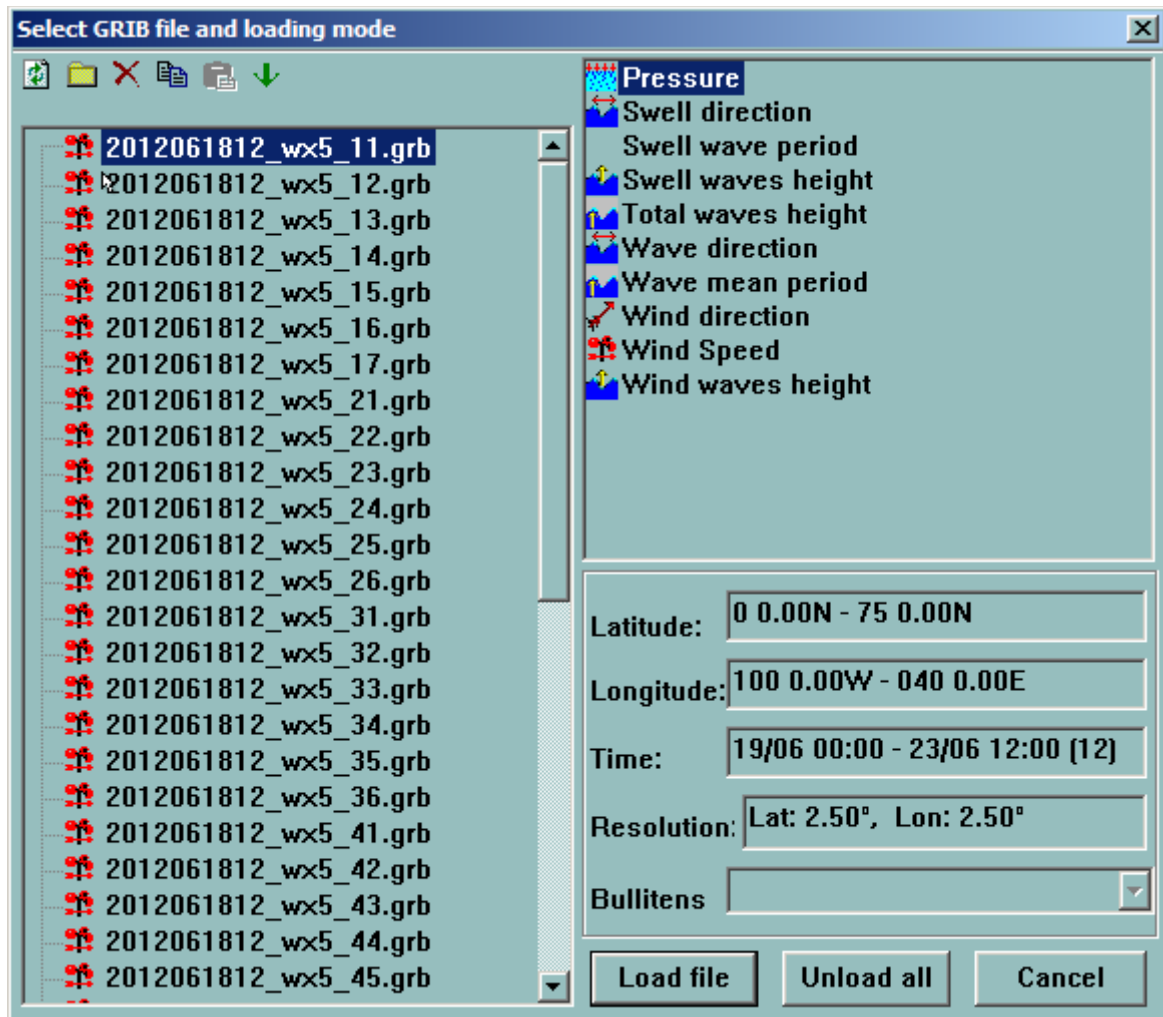


The following controls are available:

- Load file - calls the **Weather file management** window for loading files
- Unload file - unload the loaded weather file
- Autoloading - select the files with current data and load it automatically
- Play/stop animation - plays the downloaded forecast in fast play mode
- Date and hour - fields for selecting date of the forecast and hour inside the selected day
- Current date - **set the current date and hour** (in case of historical data the slider jumps to the end of the period)
- Layers buttons - make the layers visible or invisible
- Settings - calls the **Wether layers settings** dialogue

WEATHER FILES MANAGEMENT

All weather files are stored in the sub-folder called **Weather** in the folder ECDIS_Userdata and are automatically listed in the file management window.



When a file is selected the content of the file is described in the right “File preview” panel, with the different parameters recorded in the file.

The toolbar gives fast access to the main file management functions (refresh folders content, create/delete folder, delete, copy / paste files).

WEATHER LAYER SETTINGS

The following layers can be available:



current



pressure



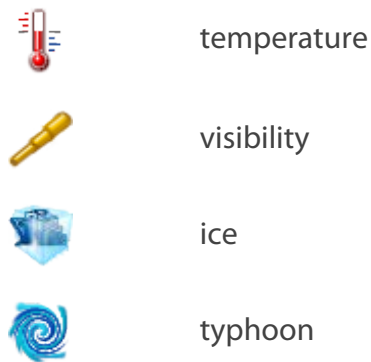
waves



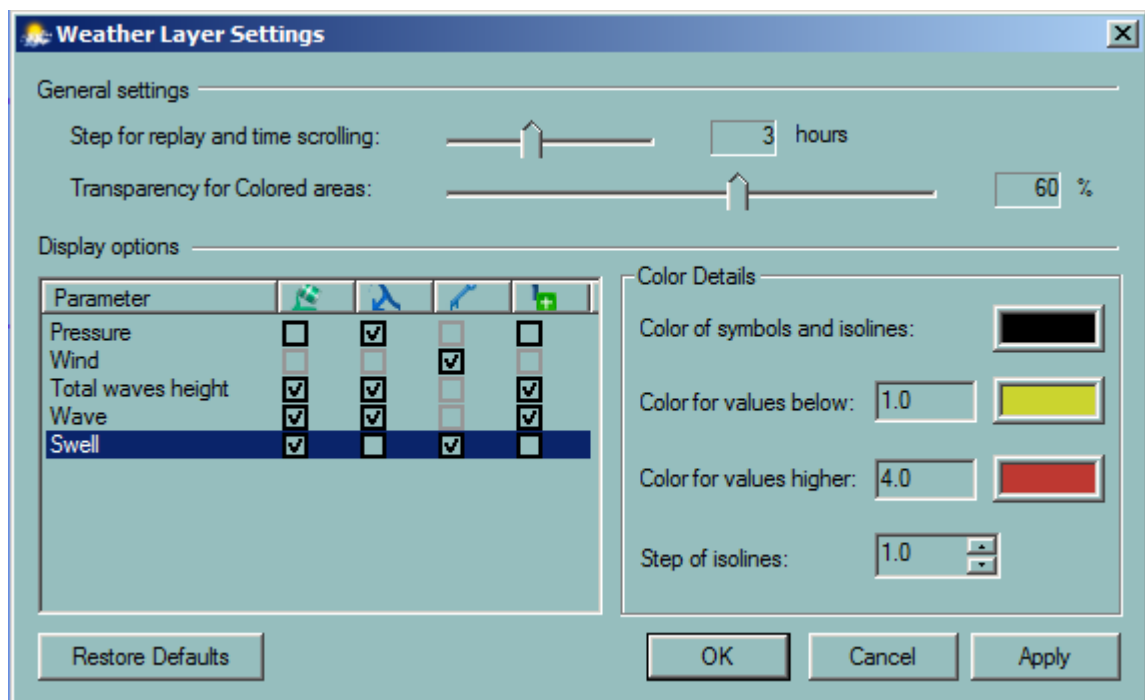
wind



swell



Use the settings dialogue to define colours and other layer parameters.



WEATHER TIME

When file is loaded the date and hour are displayed at the time bar. The slider position set the exact point within the forecast period.

The clock button sets the current time.



The date and hour can be set with calendar and slider.

WEATHER ANIMATION

Use the switch button to play and to stop animation.

To precise the time use the **time bar**.

LAYERS ILLUSTRATION

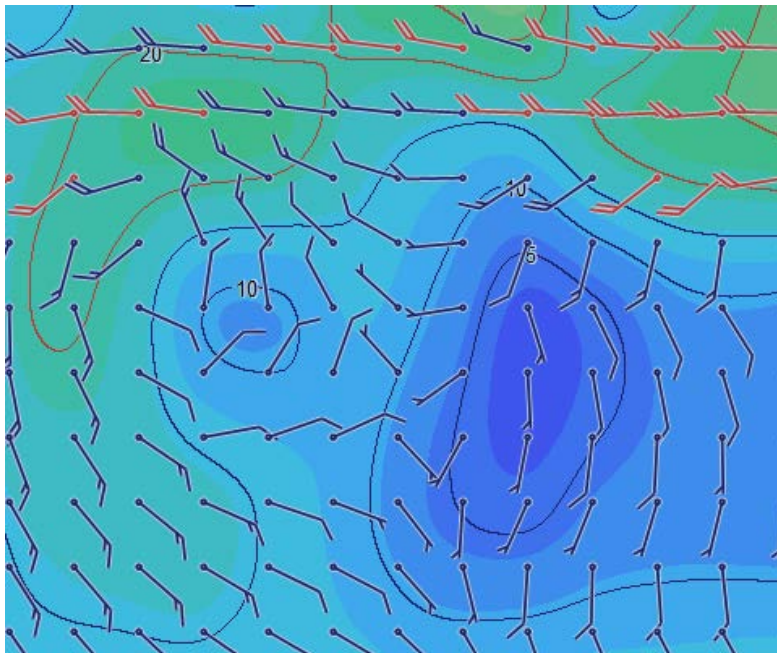
It is possible to display one or more forecast layers. Each layer has four parameters to display that can be switched on or off:

- Fill
- Isoline
- Direction
- Text info

- NOTE**
- No more than one layer can be filled in.
 - Some layers have the "Direction" parameter unavailable

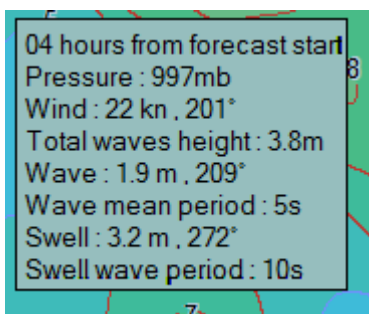
EXAMPLE

The wind display with all parameters switched on looks like that




IMPORTANT

To see the entire text information put the cursor on the selected location and wait about several seconds. The tip with information appears.



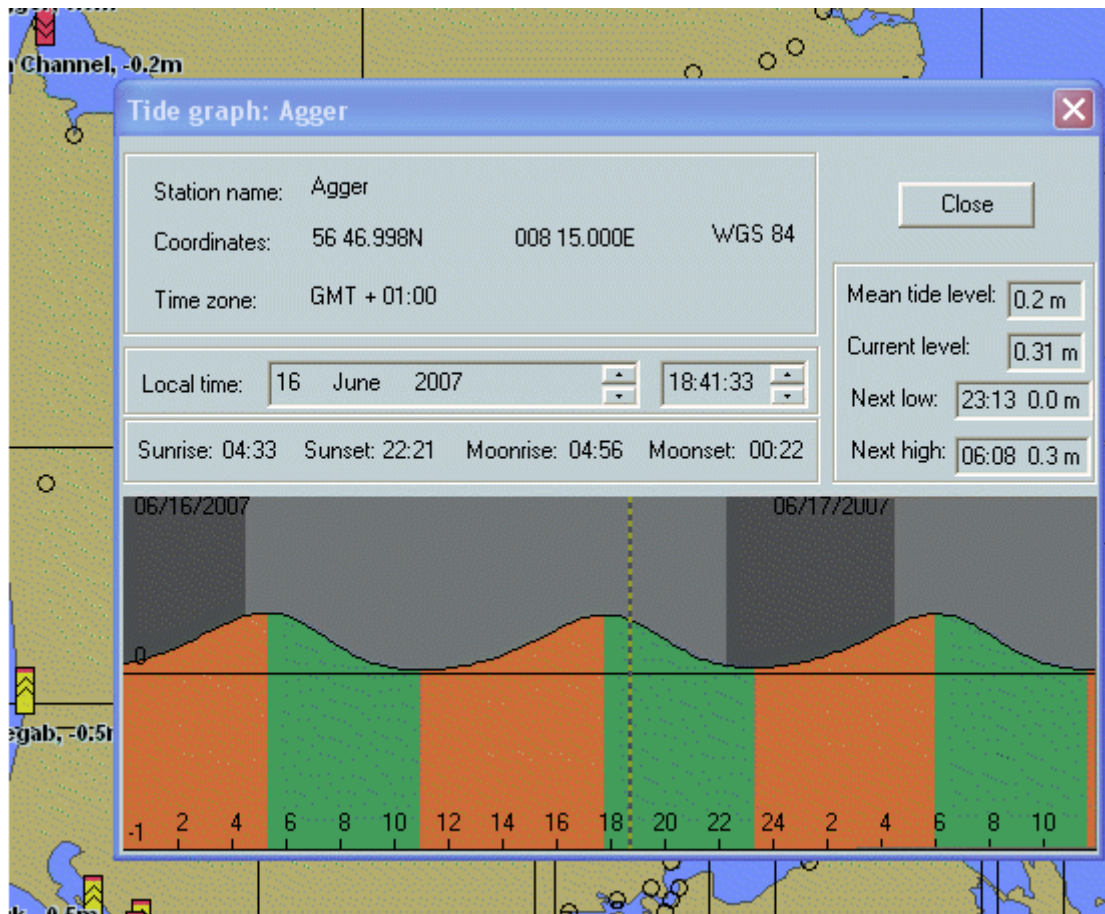
Tide

ECDIS TIDE

Push the button **Show \ Hide tide stations and ocean current**  and icons showing the tide level are displayed at the tide stations locations. More than 2000 main tide stations are available in ECDIS900.

IMPORTANT The icons are visible when the chart scale is bigger than 1/2 000 000.

The small Tide icon displays in red the tide level at the current chart time and small black oriented arrows indicate rising or falling tide. Right click on the icon gives access to detailed description of the tide but also to the moon and sun rise and set hours for the selected station.



TIDE DATE

The tide is calculated for the current ECDIS time.

TIPS

Right double click in the Tide button to display a window listing the tide stations displayed on the chart. Click to highlight the tide station and double click to open the property of the station.

TIDE DATA FOR SHIP SAILING IN NORWEGIAN WATER

Tide is calculated in real time under the ship's position and tide data displayed in the Drift panel in the console area.

TOTAL TIDE MODULE

Total Tide Module allow to access to different functions.

REAL TIDE

The real tide function allows to get precise tidal prediction in each zone of the Norwegian sea; Press T key inside the yellow surrounded area to get Real Tide sea level for this tide zone.

Real tide is based on:

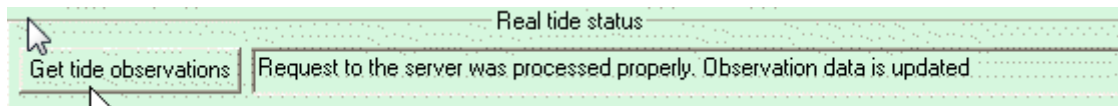
- astronomical tide,
- real time tide observation,
- weather forecast.

The 3 series of data are computed to give the more precise tide prediction in Norwegian waters.

(Option available with "Pilot" installation only).

Only Astronomical tide is displayed when no data downloaded.

Press button to get data from Norwegian HO server and get the status.



Real tide is computed from Astronomical prediction and loaded data (example).

The difference between Astronomical and Real tide can be more than 1 meter and be really usefull for many areas.

Observations are updated on server each hour.

24 hours of historical data are downloaded back and 36 hours prediction are downloaded. Therefore Meteo prediction is available for -24 h ... + 36 hours.

All this data is saved on HD and will be restored later after access to the function.

TOTAL TIDE

This module should be installed and requires licence key and activation key.

Different kind of ports are defined:

Standard Ports - These are ports where the tidal predictions are calculated from a set of harmonic constants

Secondary Ports – same as Standard port, however the observations made to collect this information generally were not as extensive as with standard ports and so the tidal predictions are of secondary quality.

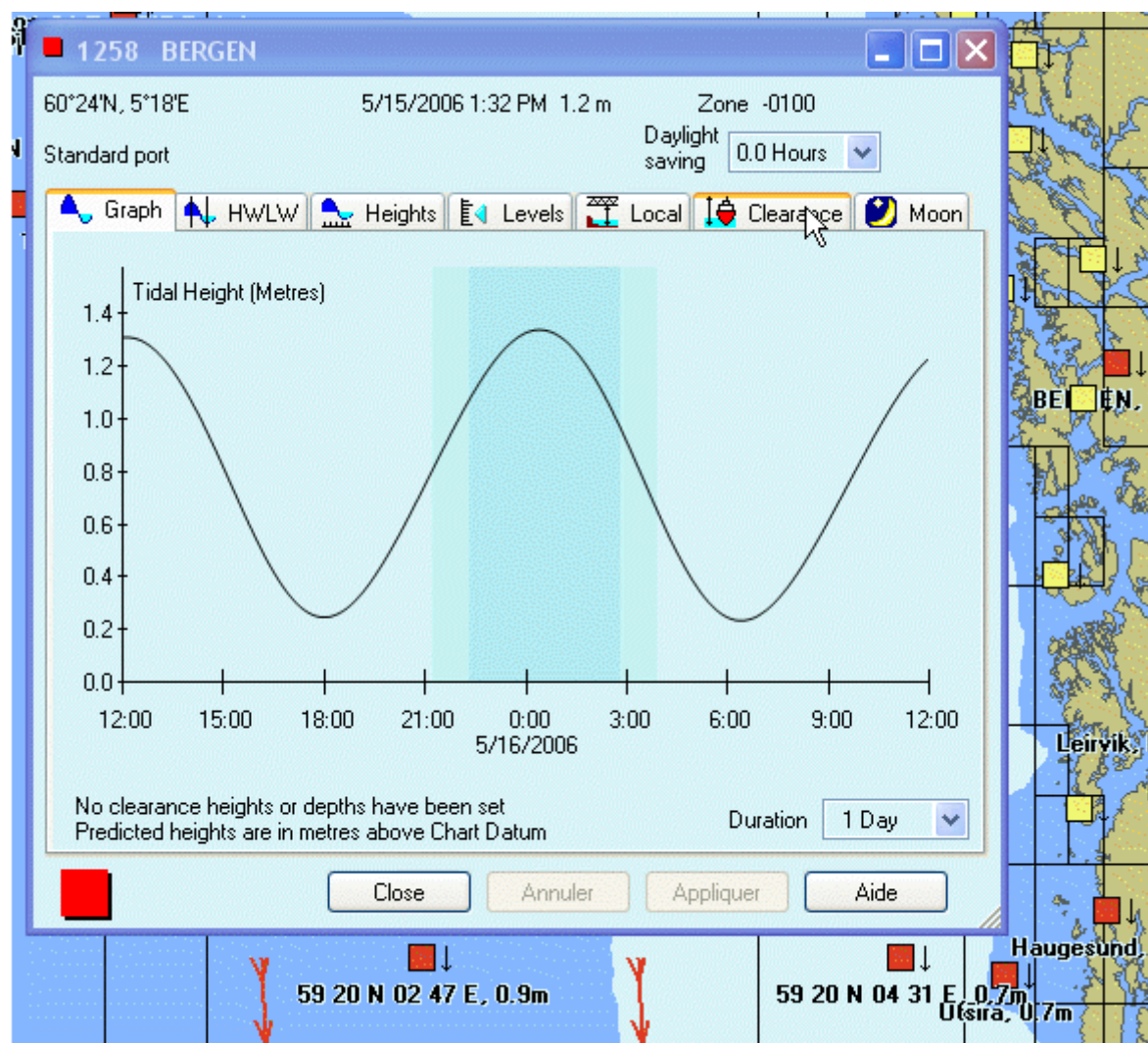
Secondary Ports (non-harmonic) - These ports do not have any harmonic constants, instead their tidal predictions are calculated by taking the prediction for a reference port and applying time and height differences.

Main tide stations are represented by a red square icon, and secondary stations by a yellow one. In this case, click the link to open the main station window.

U Custom Ports - These ports are ones that are defined by the user by manual input of a set of harmonic constants.

The chart date is displayed in local time. It can be adjusted in the time setting dialogue or synchronise with ECDIS time using the button Time Synchronisation located in the weather panel.

Select the different view.



VDS

GENERAL

The Voyage Optimization is a software module which calculates the optimal route in term of sailing time and fuel consumption to go from departure point to arrival point.

The ship model used for the calculation is defined during the set up of the system, from a library delivered by MARIS and adjusted with the ship trial data. The ship model describes the fuel and power consumption for the different speeds but also, how much the wind and waves affect the performances of the ship.

From weather and current forecasts received on daily basis and from the ship model, the module evaluates different options and proposes the most economical safe route.

The Voyage Optimization Module is a part of a comprehensive system called VDS, Voyage Decision System which addresses the needs of the ship owner regarding implementation of an energy saving plan (SEEMP regulation).

The MARIS optimization module has unique and powerful functionality:

1. **Most accurate current forecasts:** unique in resolution and precision, unique by integrating the tide effect in areas with important tide such as English Channel or Malacca strait.
2. **Advanced wave impact calculation:** the wave impact algorithm (speed reduction due to waves) has been developed by BMT in UK, company recognized as one of the best expert in ship optimization.
3. **Integration and seamless:** The optimization module is integrated in ECDIS900 and very simple to use: the optimized route is shared on the LAN, automatically displayed and used on all ECDIS900 workstations.
4. **Optimization is done against the ENC charts:** Optimized routes are always safe, away from the safety contour of the ship. Note that there are no additional costs for the ENCs in VDS when ENCs are used in ECDIS.
5. **The module is universal:** It can work together with any ECDIS; the master creates the route on ECDIS, transfers it by memory stick to VDS, optimizes it in VDS and exports the route result to ECDIS.
6. **Maris voyage optimization module is not only a weather routing module** which guaranties the ship to stay away from the heavy weather as all companies in the market propose. In addition to calculate a safe route against the weather forecasts, VDS optimizes the fuel consumption, thanks to accurate current forecasts and powerful wave impact algorithm.
7. **VDS is not only an optimization module:** it is an ECDIS with voyage optimization module which, used together with Log4000, provides efficient performance monitoring and report tool accessible by the ship owners on the WEB using **MCP, MARIS CUSTOMER PORTAL**

GLOSSARY

- **ECDIS900:** ECDIS system developed by MARIS.
- **MBA:** Master Bridge Assistant. Software application installed on board allowing the navigator ordering and updating paper and electronic charts and publications and ordering weather and current forecasts.
- **MDS:** Maritime Digital Service. Same application and services than MBA which is the new version of MDS.
- **Voyage Optimization module:** This module is an ECDIS900 module. This module is integrated in ECDIS900 and gives the possibility to calculate the optimal route from the ship model, weather and current forecasts and ECDIS electronic charts.
- **VDS4000:** VDS4000 designates ECDIS900 with the Voyage Optimization module activated. Note that ECDIS900 is delivered by default with the Voyage Optimization module deactivated. The activation is done remotely.
- **NAS, Network Attached Storage:** high capacity storage device installed on the LAN.
- **Log4000:** long term storage system installed on board. It consists of a NAS and a software called Log4000. The Log4000 includes a report module sending data to shore.
- **MCP, MARIS CUSTOMER PORTAL:** MCP is the MARIS WEB site available for all MARIS customers, ship and ship owners and providing access to all data related to the ship including charts, services and installation reports and Log4000. MCP is also an efficient performance monitoring and report tool accessible by the ship owners
- **VDS, Voyage Decision System:** VDS designates the complete system including VDS4000 and Log4000 installed on board and MCP services on shore. VDS is addressing the needs of energy saving for the ship and also for the ship owner.

SHORT DESCRIPTION

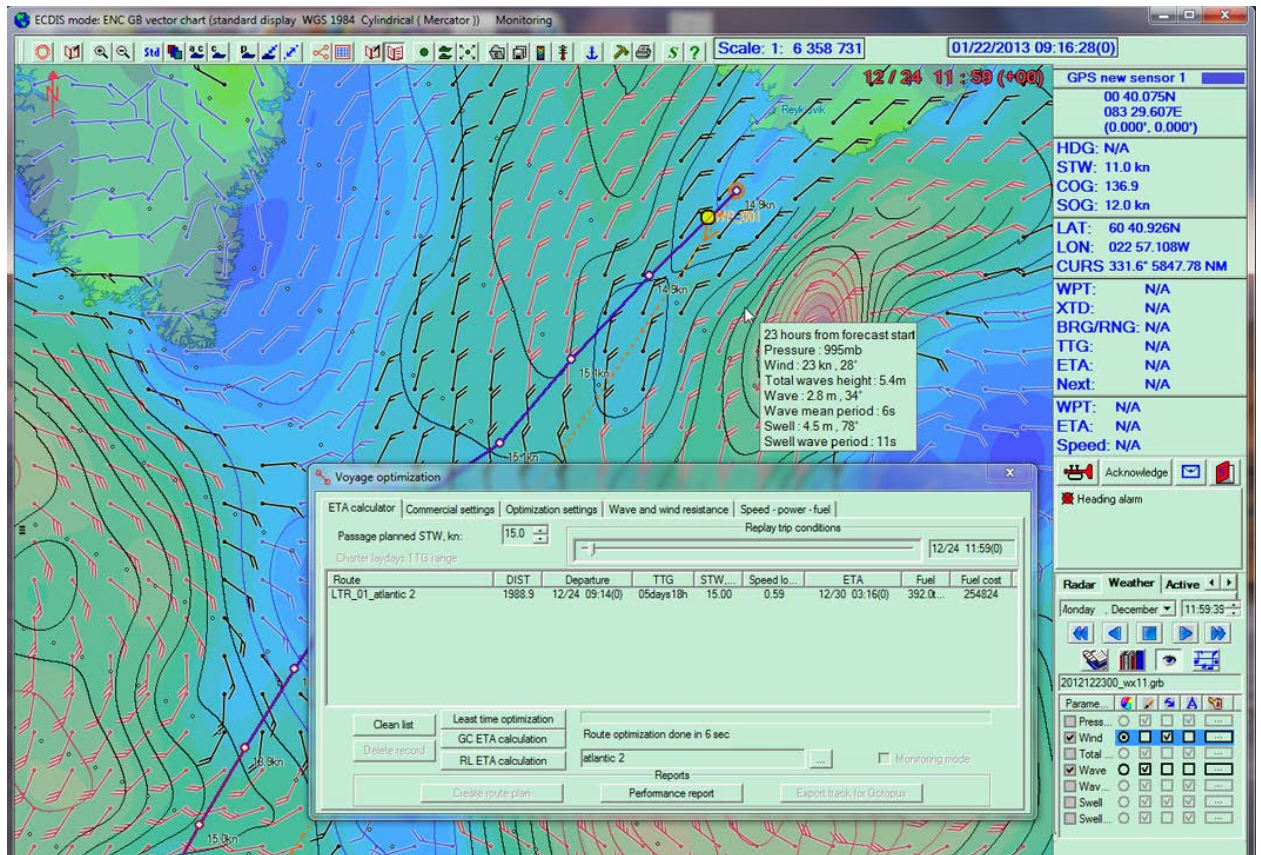
VDS4000 is installed on a PC on board the ship with the proper ship model.

Weather and current forecasts are received every day.

The navigator plots the route to be optimized in VDS4000. Alternatively the navigator may import in VDS4000 the route from existing ECDIS.

VDS4000 calculates the optimal route from the ship model, the forecasts and the ENC charts used on board.

After the navigator has confirmed the calculation, the route is exported to ECDIS and used as active route.



CHART

The management of electronic charts is an essential part of the ECDIS and is described in details in ECDIS900 user manual.

ECDIS900 is compatible all types of official electronic charts, ENC or AVCS which can be ordered and updated in real time thanks to MBA (MDS), the online MARIS chart service.

ROUTE

ECDIS900 provides efficient tools to plan the route and to monitor the active route. See the **Routeplan** section for a complete description.

WEATHER PANEL

The weather panel is accessible in the ECDIS900 Console area and allows loading / unloading weather data file and customize the display on the chart.

IMPORTANT: please note that the calculation of optimal route by the module does not depend on the weather and current display on the screen, meaning that the optimization is run even the weather data is not loaded and displayed on the map.

Weather routing procedure searches on the hard disk for the latest data available.

When weather – current forecasts are available the module calculates the optimal route.

When data is not available, meaning that there are no forecasts available for either the selected departure date or for the route area, the system cannot calculate any optimized route and provides the great circle

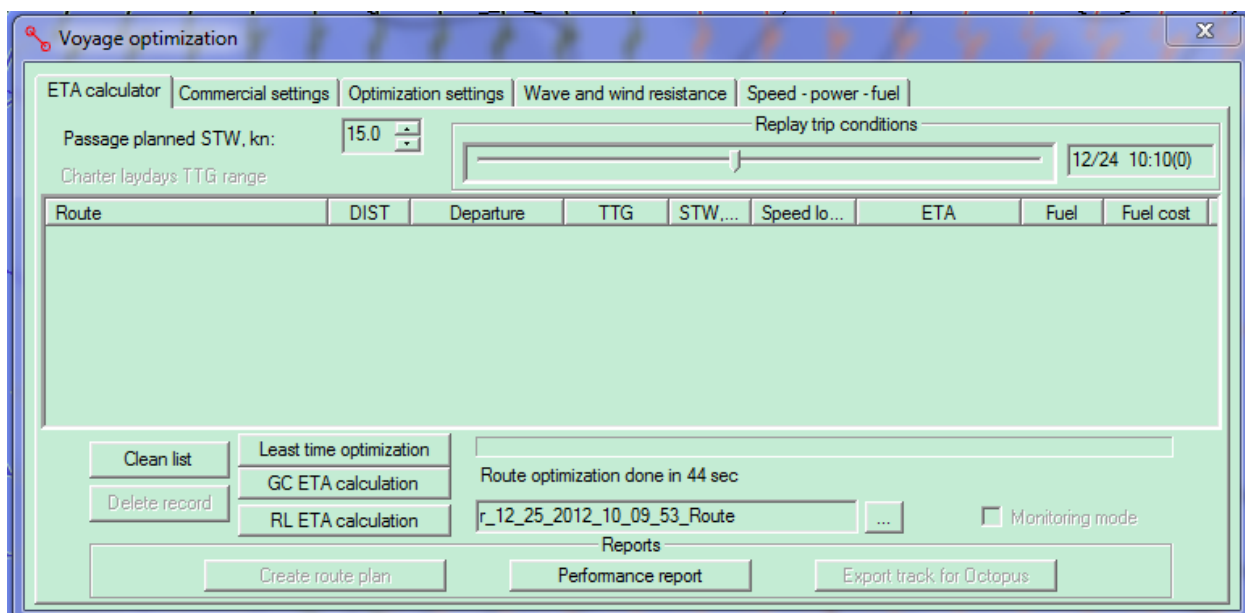
route as result. The solution is to send a request for weather and current for the route area using MBA (MDS).

VOYAGE OPTIMIZATION DIALOGUE

Right click on the route and activate the menu "Voyage Optimization" to display the optimization dialogue.

The optimization dialogue has several panels:

1. ETA calculator: main panel where the optimization is done
2. Commercial settings: set up of departure time and commercial issues linked with the type of voyage
3. Optimization settings: parameters to control the optimization
4. Wave and Wind resistance: describe the ship model
5. Speed Power fuel: describe the ship model



NEW VOYAGE

PREPARING NEXT VOYAGE

PLOTTING THE ROUTE

Plot the route on ENC charts as described in ECDIS900 manual. It is recommended not to use too many waypoints for ocean crossing. The VDS calculates the optimized route passing the waypoints defined by the master.

ORDERING CHARTS ALONG THE ROUTE

There are several ways of ordering charts but the most efficient way is to use MBA (MDS) function and server. See MBA user manual.

ORDERING NEW WEATHER FORECAST

MBA (MDS) is used to order the weather forecasts. The weather forecasts will automatically be sent on board on a daily basis. For complete description of the service see MBA User manual.

ROUTE OPTIMIZATION

VOYAGE PARAMETERS

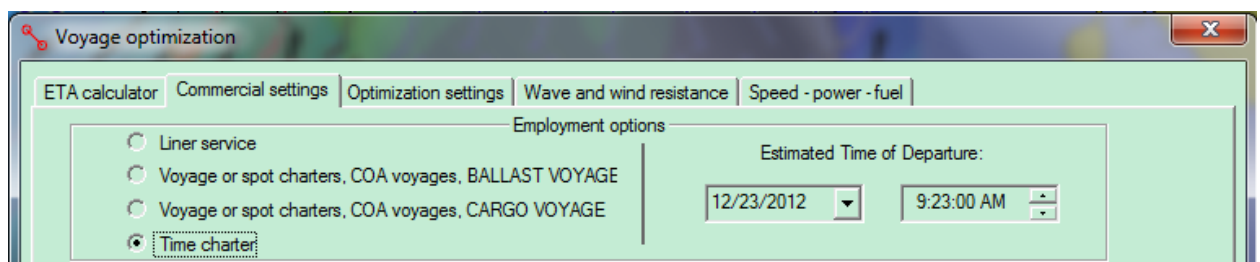
ENTERING CORRECT SHIP DRAUGHT

Right click on the ship icon or press the button "Ship Properties" to enter the correct draught in the dialogue called "Ship":

When the draught is entered, the VDS adjusts the ship model to the selected loading conditions in order to have accurate dynamic and static ship characteristics for the calculation of optimal route.

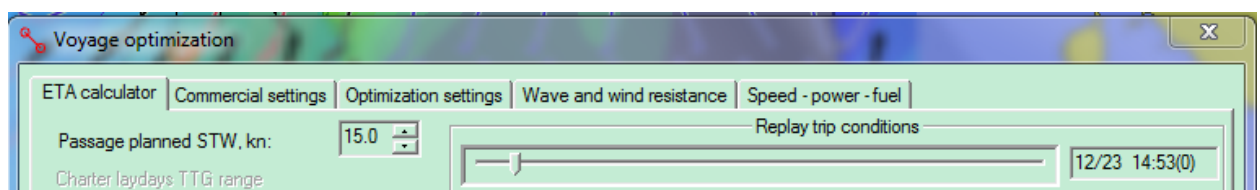
DEPARTURE TIME

In the panel "Commercial settings" select the estimated departure time and press the button "Apply changes":



PLANNED SPEED

In the panel "ETA Calculator" select the planned speed before optimization:



OPTIMIZATION

When the parameters are properly entered (Draught, Departure time and Planned Speed) three different types of optimization are possible:

Least time

Least time track (LTT) is the predicted track that the ship should follow to reach destination in the shortest possible time and with the lowest fuel consumption. LTT is the result of complex mathematical processing which optimizes route using precise weather and ocean surface current data and expected ship performance under predicted conditions.

Rhumblin

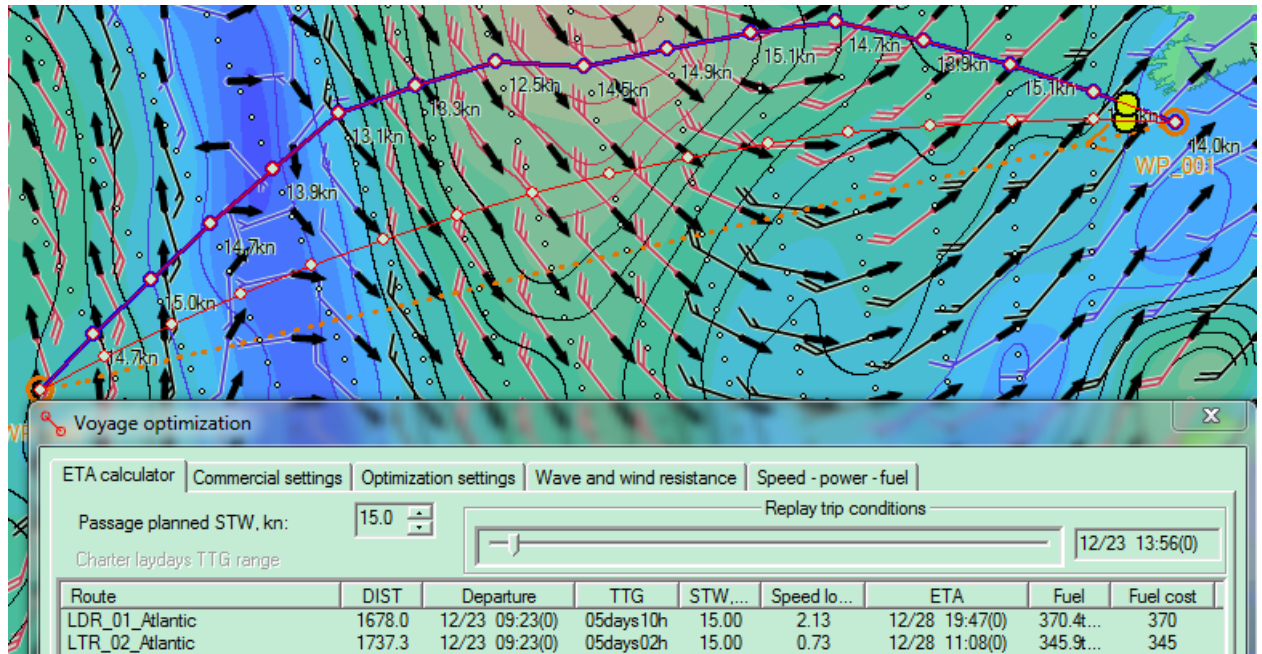
VDS calculates the fuel consumption and sailing time along the track defined by rhumblin

Great circle

VDS calculates the fuel consumption and sailing time along the shortest track i.e. the track defined by great circle legs.

EVALUATING CALCULATED ROUTES

ROUTES DATA



Two routes have been calculated for the next voyage called "Atlantic":

- LDR_01_Atlantic is the shortest route using great circle le, calculated using the Great circle option
- LTR_02_Atlantic is the fastest and best economical route, calculated using the least time route option.

The results of the calculation are given in table:

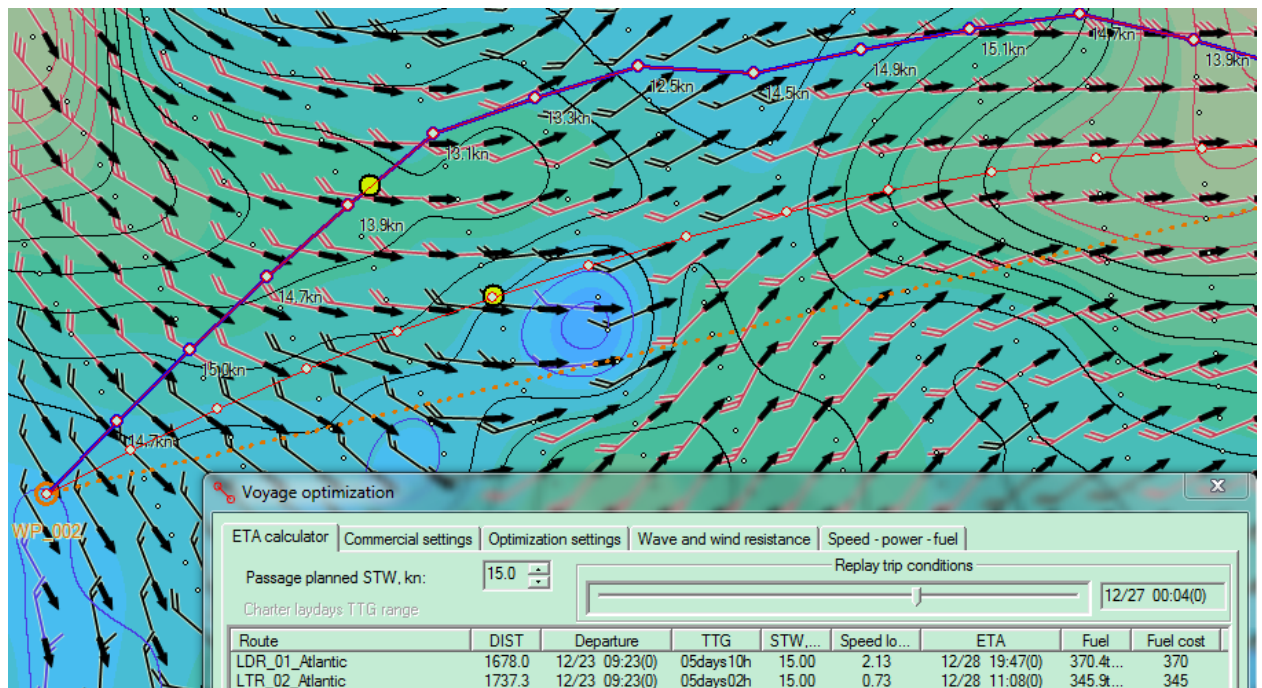
- Dist: the distance of the each calculated route
- Departure time. Same departure time for this calculation
- TTG is the total sailing time for each route, 8h difference between the two options.
- STW is the planned speed
- Speed loss is difference between the planned speed and the calculated SOG for each option due to the effect of the waves, wind and current. In the example the Speed loss for the shortest route LDR_01_Atlantic is 2.13 kn meaning that the SOG along this route should be 12.87 Knots for a 15 Knots planned speed.
- ETA is the estimated time arrival for each route
- Fuel is the consumption for each route. In the example the LTR_02_Atlantic is the most economical route of the calculation as the ship may spend 35 Tons less fuel than with the great circle route
- Fuel cost gives indication of the cost of each option.

REPLAY

VDS offers an efficient tool to evaluate the different calculated routes and to check the forecasted weather conditions the ship will face according to the planned speed and the selected route.

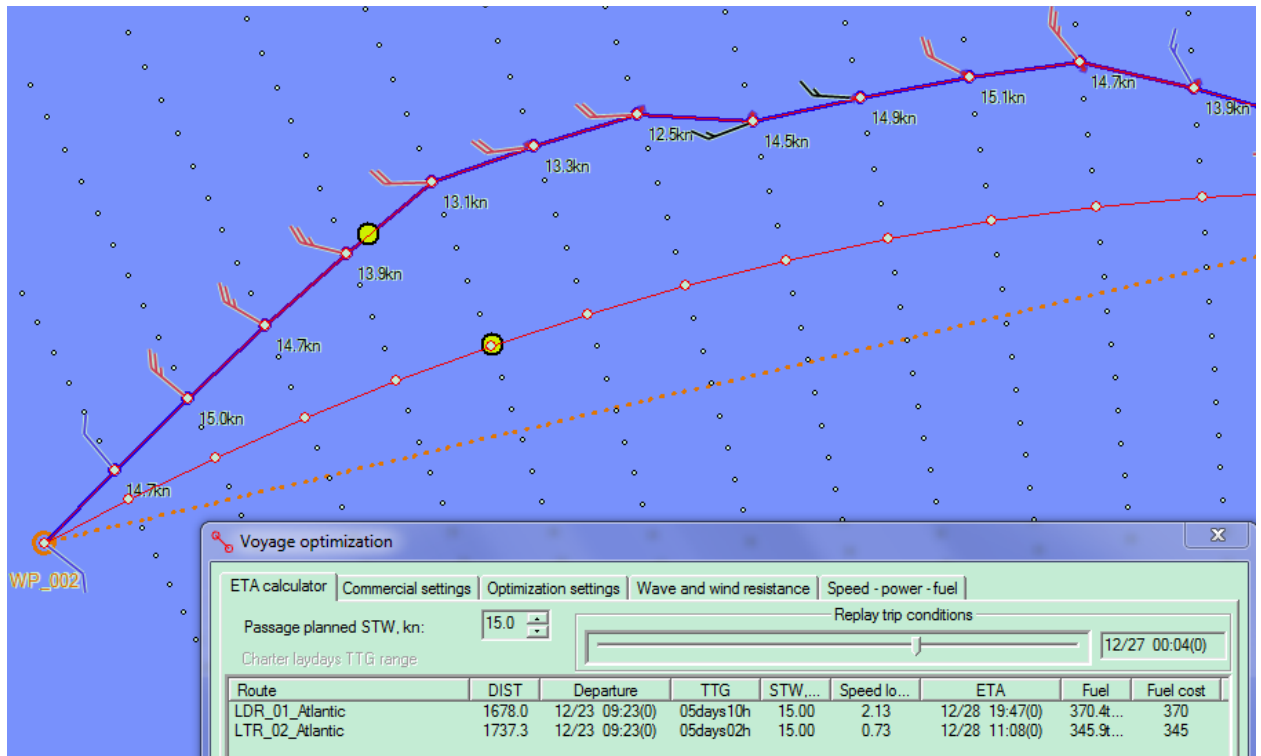
Use the slider in the panel “Replay trip conditions” to display the ship positions according to the selected time displayed on the right of the slider. Please note that the weather and current situation is changing according to the selected time.

When several routes are calculated the VDS displays the calculated ship positions on all the routes.



It is possible to have an immediate view on the forecasted weather and current conditions on the latest calculated route. When the weather display is hidden (Option accessible from the weather panel) the VDS will show the latest route with the weather and current condition on each intermediate waypoints together with the calculated SOG for each leg:

- Wind information is displayed with a bar.
- Wave information is displayed by colour: blue leg indicates low waves, high is waves higher than 6 meters.
- Current is displayed as an arrow.



CONTROLLING OPTIMIZATION

COMMERCIAL SETTINGS

The screenshot shows the 'Commercial settings' window. It has tabs for 'ETA calculator', 'Commercial settings', 'Optimization settings', 'Wave and wind resistance', and 'Speed - power - fuel'. The 'Commercial settings' tab is active, showing 'Employment options' and 'Parameters for voyage'.

Employment options:

- ☐ Liner service
- ☐ Voyage or spot charters, COA voyages, BALLAST VOYAGE
- ☐ Voyage or spot charters, COA voyages, CARGO VOYAGE
- ☒ Time charter

Estimated Time of Departure: 12/23/2012 9:23:00 AM

Parameters for voyage:

Start laydays given: 1/24/2013 9:07:00 PM
 End laydays given: 1/25/2013 1:52:00 PM
 STW required, kn: 15.0
 Bunker cost, \$/ton: 650.00
 Dayrate to hire the ship without bunker cost, \$/day: 10000.0

Cargo heating consumption:

☒ Include heating consumption

Air temperature, C	Consumption, kg/hour
-20 C	150.0
0 C	110.0
10 C	40.0
20 C	5.0

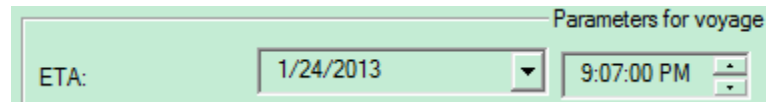
Apply changes

EMPLOYMENT OPTIONS

Different ships have different voyage requirements. There are 4 different types of voyages available in VDS:

Liner service

This type of voyage requires a fixed ETA. The user enters the Estimated Time of Departure and the ETA.

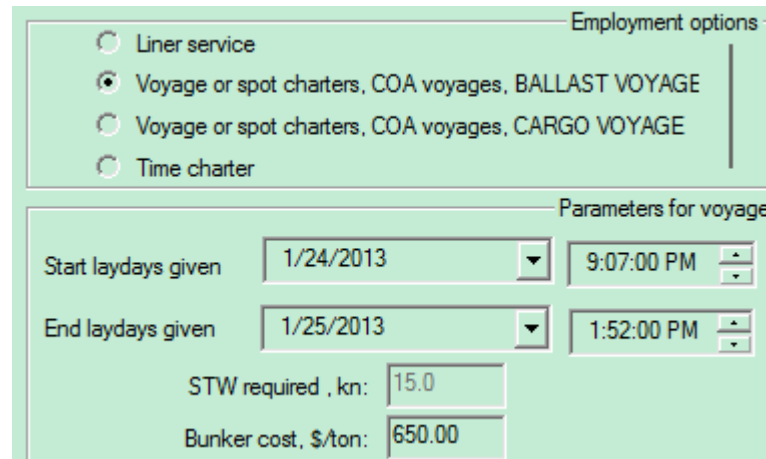


Parameters for voyage

ETA: 1/24/2013 9:07:00 PM

VDS calculates the required speed to achieve this voyage with fixed ETA and lowest consumption.

Voyage or spot charters, COA voyage, BALLAST VOYAGE



Employment options

☐ Liner service
☒ Voyage or spot charters, COA voyages, BALLAST VOYAGE
☐ Voyage or spot charters, COA voyages, CARGO VOYAGE
☐ Time charter

Parameters for voyage

Start laydays given 1/24/2013 9:07:00 PM

End laydays given 1/25/2013 1:52:00 PM

STW required , kn: 15.0

Bunker cost, \$/ton: 650.00

The user enters the Estimated Time of Departure and lay days for loading. VDS calculates the required speed to achieve this voyage within these limits and lowest consumption.

Voyage or spot charters, COA voyage, CARGO VOYAGE

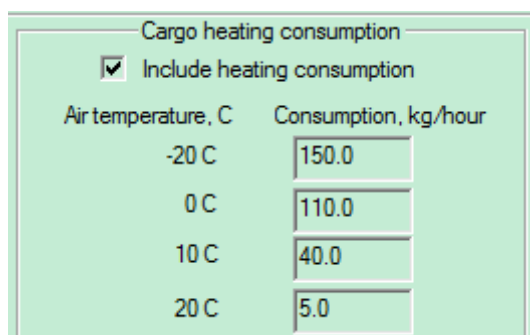
The planned speed is fixed, the user enters the Estimated Time of Departure and VDS calculates the best ETA and lowest consumptions.

Time charter

The planned speed is fixed, the user defines the Estimated Time of Departure and VDS calculates the best ETA and lowest consumptions.

Cargo heating

This option is applicable only for some tankers when the cargo requires to be heated. In this case the total consumption is calculated as sum of propulsion and cargo heating consumptions.



Cargo heating consumption

☒ Include heating consumption

Air temperature, C	Consumption, kg/hour
-20 C	150.0
0 C	110.0
10 C	40.0
20 C	5.0

OPTIMIZATION SETTINGS

WAVES CONSTRAINTS

The optimized route can be controlled to avoid areas where the wave heights exceed certain limits set by the captain in the "Constraints" table.

Constrains	
Wave direction	Wave height, m
0 deg, HEAD	6.0
30 deg	6.0
60 deg	6.0
90 deg, BEAM	6.0
120 deg	6.0
150 deg	6.0
180 deg, STERN	6.0

In the example the calculated route will never cross areas with waves higher than 6 meters.

Be aware that, in some weather situations, the VDS is not able to calculate a route within the waves constrains. In this case the VDS will advise the user to change the constrains values or to change ETA or the speed settings to avoid bad weather.

SAFETY CONTOUR AND USER DEFINED NO GO AREAS

When this option is activated the calculated route will never cross the safety contour defined on ENC charts and will never cross NO GO areas the user has plotted manually on the chart.

For a safe calculation it is essential to enter the correct safety contour value in the "Chart Depths" panel of the "S57 settings" dialogue.

The screenshot shows the 'S57 settings' dialog box with the 'Chart Depths' tab selected. The 'Projection' is set to 'Cylindrical (Mercator)'. The 'Safety contour (m) used for grounding alarm' is set to 30. The 'Safety depth (m) used to portray soundings' is set to 30. The 'Safety height, m:' is set to 20. The 'Deep contour, m:' is set to 30. The 'Shallow contour, m:' is set to 2. There is an unchecked checkbox for 'Use two colours for waters'. The 'OK', 'Cancel', and 'Apply' buttons are at the bottom.

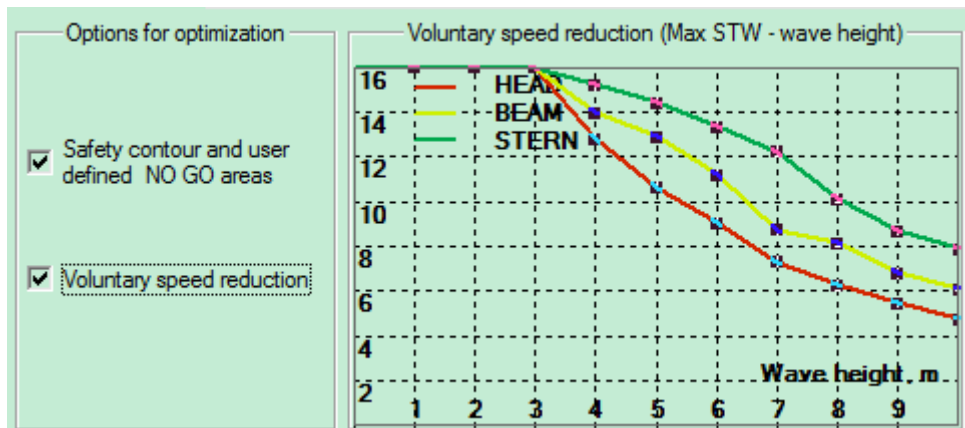
S57 settings	
Chart Depths	
Projection:	Cylindrical (Mercator)
Safety contour (m) used for grounding alarm	30
Safety depth (m) used to portray soundings	30
Safety height, m:	20
Deep contour, m:	30
Shallow contour, m:	2
<input type="checkbox"/> Use two colours for waters	
OK Cancel Apply	

IMPORTANT: in order to take the benefit of the safety contour function it is required to install the ENC or AVCS charts along the route

User defined NO GO Areas are plotted on the chart using ECDIS Object editor function. For more details on how to plot areas and activate them as alarm object, see [User defined alarm](#)

VOLUNTARY SPEED REDUCTION

This extremely important function is used to control the stress of the engine and on the hull in heavy weather conditions.



Depending on the wave's height and direction the Captain may want to reduce the speed or engine power according to the curves pre-defined during installation of the VDS.

When the Voluntary Speed reduction is activated, VDS will limit STW according speed curves depending from wave conditions. It means that planned speed as major input parameter of optimization is modified according voluntary speed reduction curves

OPTIMIZATION METHOD

When the legs are longer than the "Minimum leg length to optimize" value, the VDS optimization algorithm creates for each leg intermediate points which are used to investigate the route possibilities.

The number of points for each leg depends on the selected accuracy:

- Low accuracy: 25 intermediate points are created.
- Medium: 30 points
- High: 35 points

Optimization method settings

Be aware that choosing high accuracy increases the calculation time.

☒ Low accuracy ☐ Medium accuracy ☐ High accuracy

Minimum leg length to optimize, NM:

The highest accuracy gives the better optimization but requires high processing capacity and the calculation may take some time depending on the power of the PC.

It is recommended to use Low or Medium accuracy for trans ocean routes and high accuracy for narrow water.

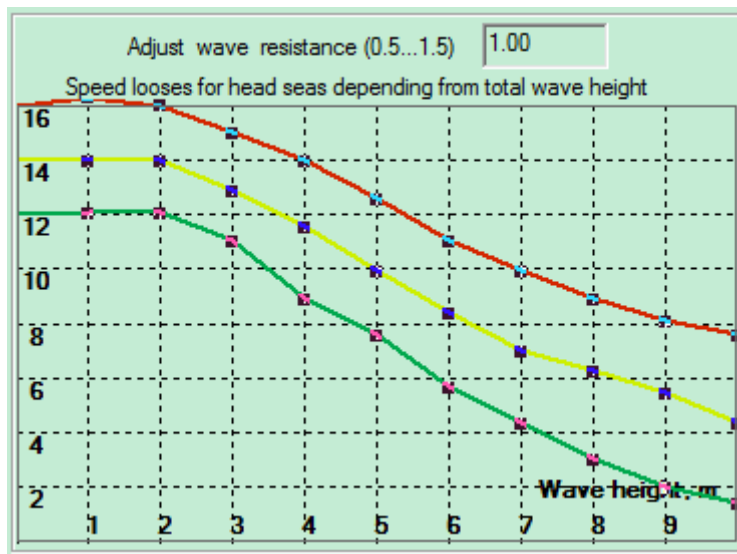
IMPORTANT: when planning a voyage in areas with narrow water, channels, islands, shallow water high accuracy must be used.

WAVE AND WIND RESISTANCE

ADJUST WAVE RESISTANCE

During sea trial the wave resistance has been measured and during installation of VDS the proper ship model has been installed.

Three curves for 3 different speeds describe the speed loss of the ship according to wave height.



At 16 Kn the ship loses 10 knots with 7 meters waves.

Adjust wave resistance (0.5..1.5): the wave resistance made from sea trial may not be completely correct and the navigator can adjust the curves according to his experience by changing the calibration coefficient called Wave resistance.

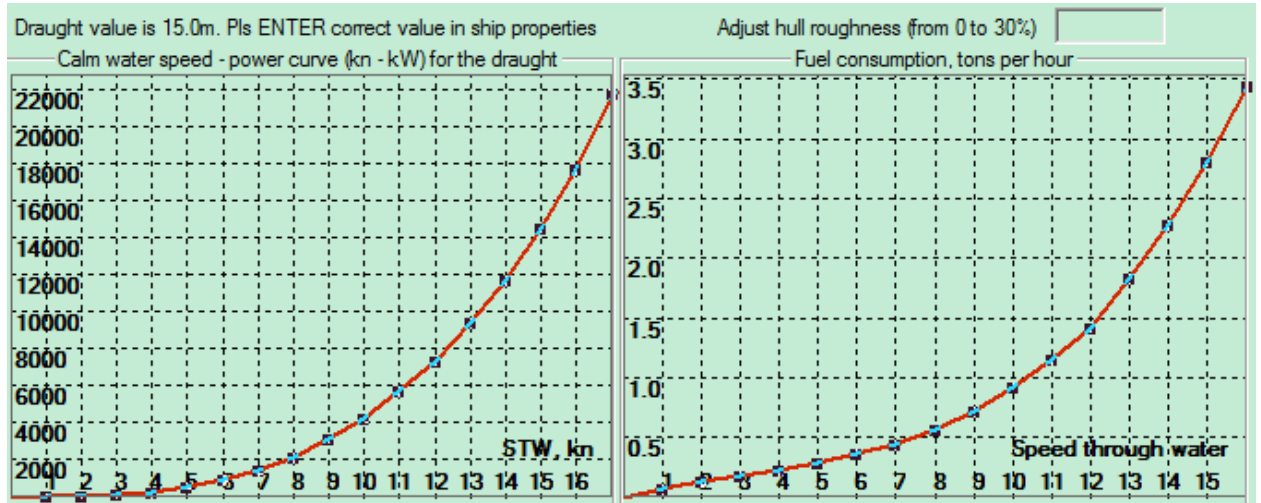
It is recommended to start with a value of 1.0 for this coefficient and adjust it as required by experience.

REMARK: the wind impact curve cannot be adjusted.

SPEED-POWER-FUEL

ADJUST HULL ROUGHNESS

During sea trial the speed – power and the fuel consumption have been measured and during installation of VDS the proper ship model has been installed.



When the hull is clean and newly painted the hull roughness parameter should be 0 and the ship performing according to the curves.

With increase of roughness the performances of the ship decline and the consumption increases. The navigator controls the effect of the roughness by entering a coefficient in hull roughness (Around 5% per year for example).

OPTIMIZING ACTIVE VOYAGE

NEW WEATHER FORECASTS

The weather data updates are received automatically on board thanks to MBA (MDS) on a daily basis.

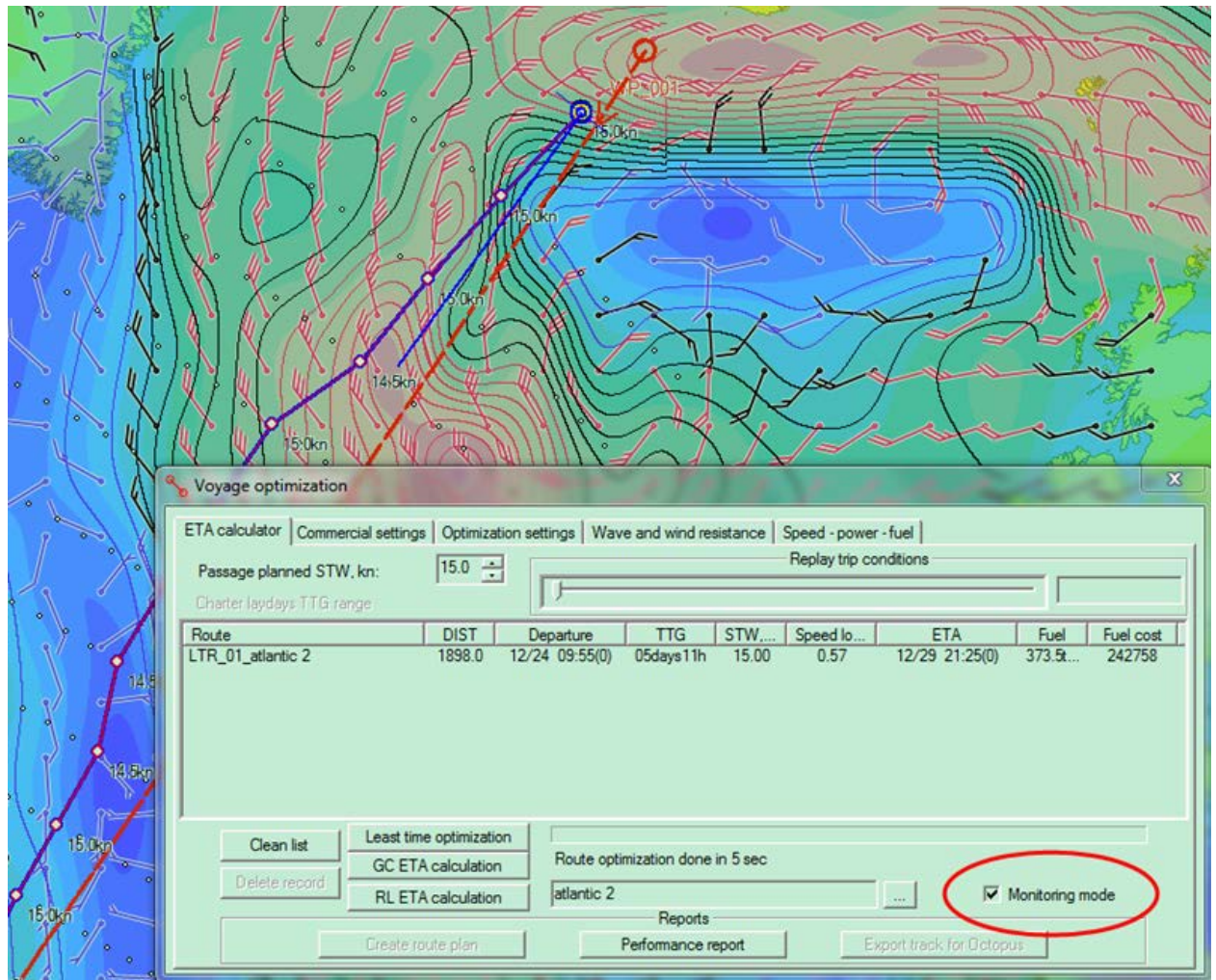
The data includes the wind, wave, sea, swell, pressure for 10 to 14 days. The current forecasts are either sent daily for medium resolution data or must be manually ordered for high resolution current forecasts

ACTIVE ROUTE

When the ship is on active route, the navigator should optimize the route each time when new weather or current forecasts have been received.

Proceed as follow:

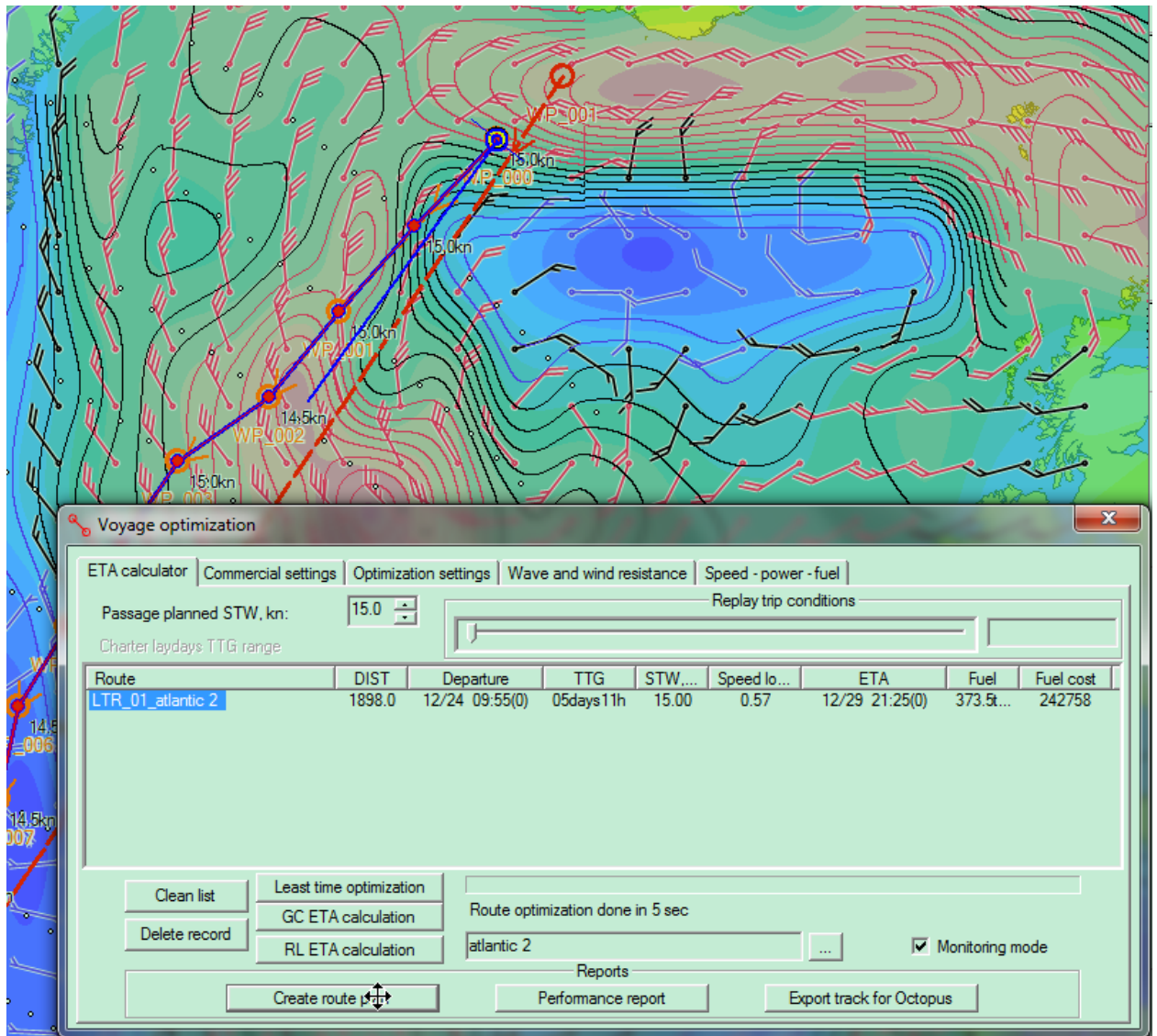
- Make sure that the flag "Monitoring mode" is checked on.
- Press Least time Optimization button
- Check the new optimized route to make sure that the route is correct
- Press the button "Create route plan" to create new waypoints
- Activate the new route



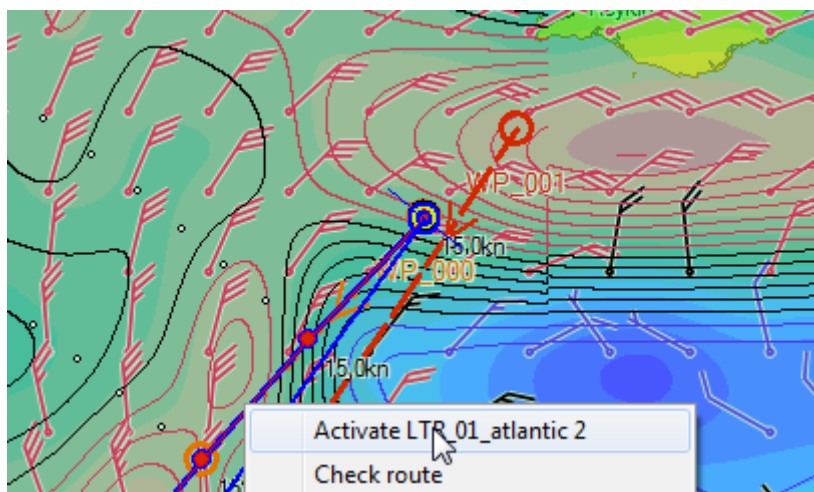
Monitoring mode flag is checked ON.

Least time optimization has been run and a new optimized route calculated by VDS. Intermediate calculation points are displayed in white dots.

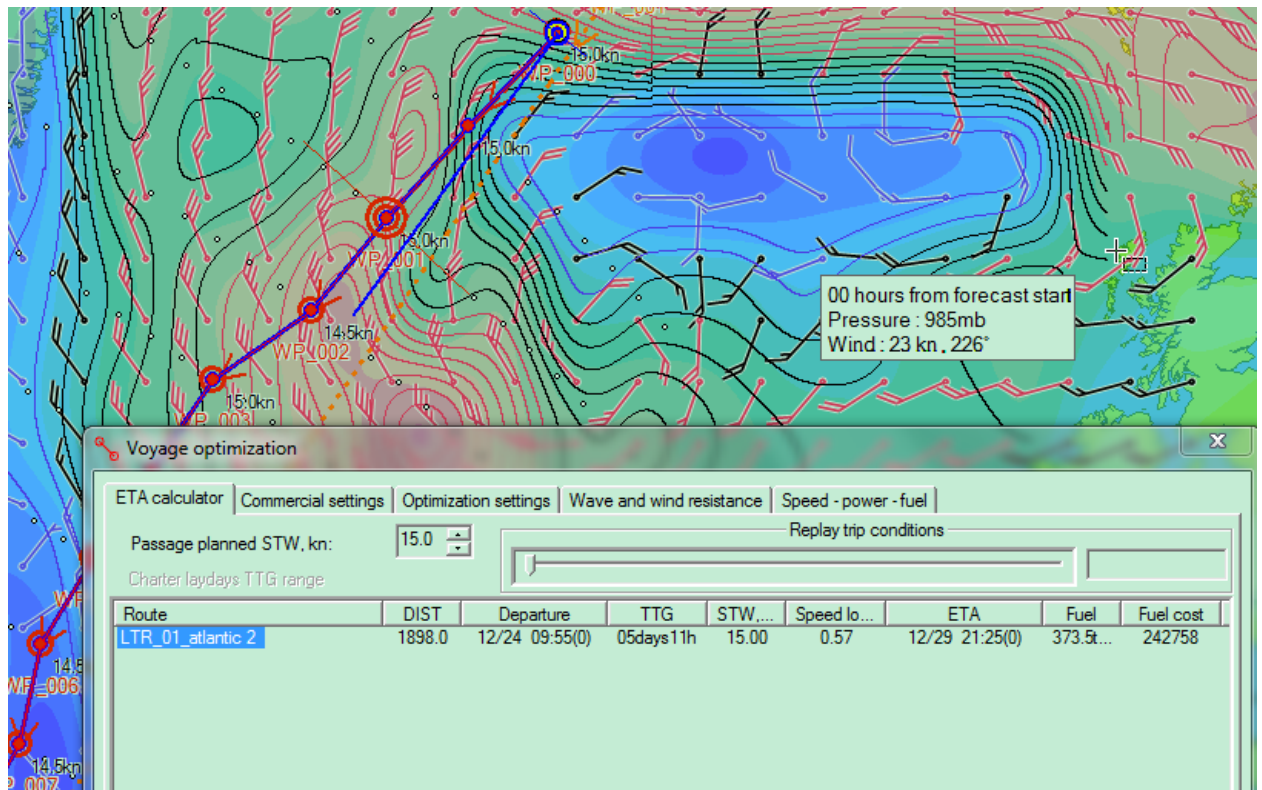
The calculation is made from the current position of the ship, the current ECDIS time and with the planned speed decided by the Captain and displayed in the "ETA calculator" panel.



When the route has been validated, press the button "Create Route Plan" to create waypoints, displayed with wider red circle from intermediate calculation points.



Right click on the optimized route, select the menu item "Activate xxx" to activate the new route



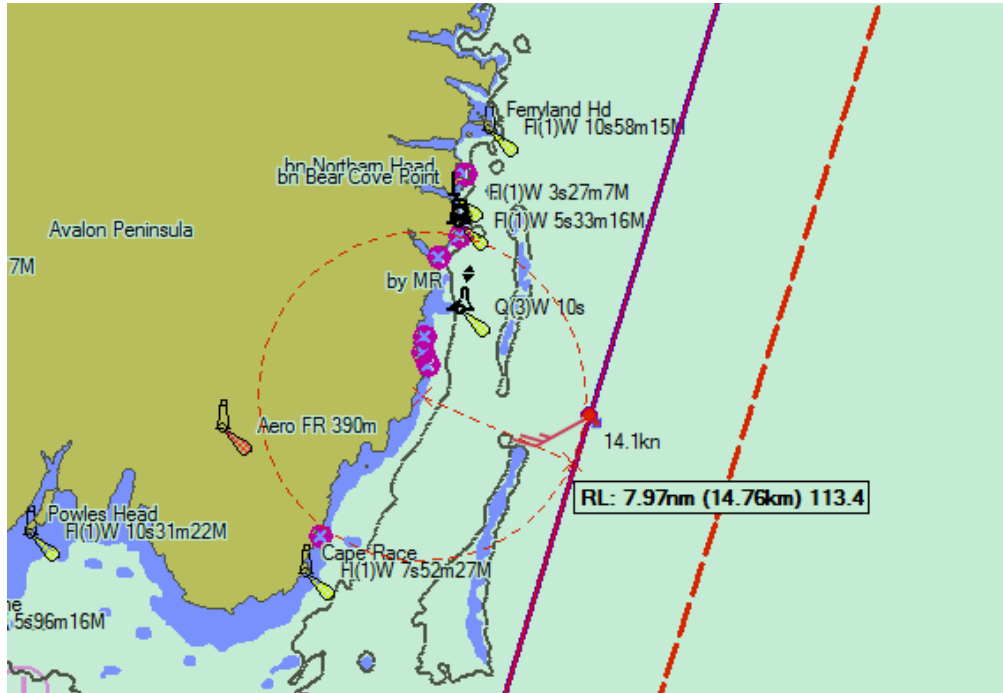
The optimized route is now the new active route.

CHECKING THE OPTIMIZED ROUTE

The optimized route calculated by VDS is designed to keep the vessel away from heavy weather (waves constrains) and shallow water (Safety contour) as well as any no go areas defined by the master.

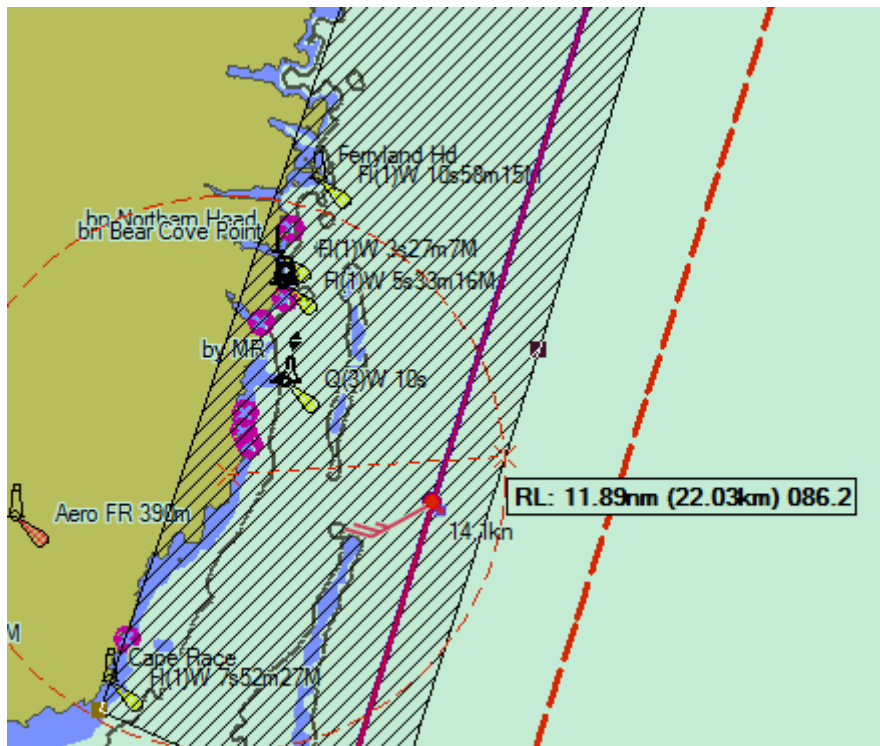
However it is strongly recommended:

- To check the optimized route against the weather forecasts to make sure that the sea conditions are acceptable and to evaluate any risks which might be present, as for example ice conditions and tropical storms.
- To check the route against the electronic charts by using the function "Check route".
- To check visually the route in order to verify the safe water depth, the distance to shore, safety fairway crossing and any other potential dangers for navigation.



Example: optimized route outside of New Foundland.

- Active route is displayed in RED, the calculated optimized route, displayed in violet, is passing outside of safety contour (Grey bold line) but inside the 12 NM Canadian coast guard reporting area which forces the Captain to send report. This situation can be avoided by adding a user defined no go area out of 12 NM from shore.



No Go area defining the 12 NM limits

