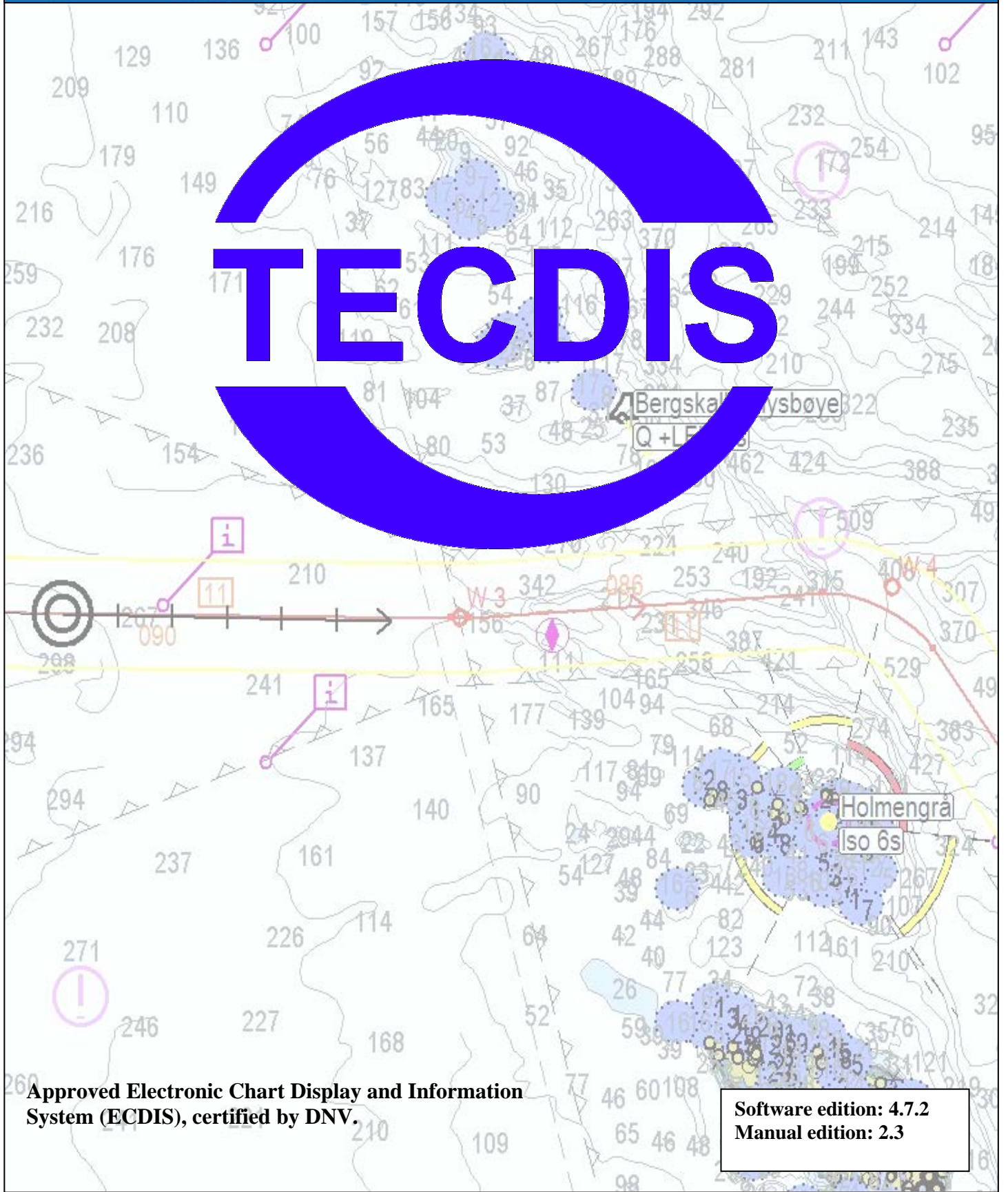




TECDIS



Approved Electronic Chart Display and Information System (ECDIS), certified by DNV.

Software edition: 4.7.2
Manual edition: 2.3

Innhold

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Disclaimer

Notice, Warning and Disclaimer

TECDIS system and its navigation products including Electronic Chart Display and Automatic Navigation and Track Control Systems, assisting to safe marine navigation.

All such navigation aids are subject to certain inaccuracies and deviations, if unconsidered, may result in a maritime accident or incident, and subsequent loss of life, vessel, cargo and environmental damage.

Accordingly, the navigator should not rely on a sole navigation aid (including TECTIS system), for a safe navigation of the vessel.

The responsible navigators, gather navigational information from multiple sources to cross-check all information for any errors or discrepancies, when the vessel's position, course, speed, and planned route shall be decided.

Compliance with Current Standards

TECDIS comply with the following standards or other normative documents:

Version 4.7.1 and higher:

- Marine Equipment Directive, Module B (MED-B)
- IMO Resolution MSC.232(82)
- IMO Resolution MSC.191(79)
- IMO Resolution MSC.74(69) Annex 2
- IMO Resolution A.694(17).

Version 4.6.0 to 4.7.0:

- Marine Equipment Directive, Module B (MED-B)
- IMO Resolution MSC.74 (69) Annex 2
- IMO Resolution A.817 (19) as amended by MSC.64 (67) Annex 5 and by MSC.86/70) Annex 4
- IMO Resolution A.694 (17).

For a current list of software versions, compliance with standards and instructions for updating TECDIS software, to comply with new standards and regulations, refer to the following web page:

<http://www.telko.no/site/support/tecdis/compliance>

Chapter 1 General information

1.1 Understanding the system

TECDIS is an online map and navigation system ECDIS (Electronic Chart Display and Information System) for navigation, voyage planning and voyage monitoring.

TECDIS is designed and developed in accordance with IMO specifications and emphasizes on simple and user-friendly operations without compromising the functional requirements. Information is obtained from instruments and sensors for: position, course, speed, depth, wind, AIS radar etc. (ARPA, EBL, ROT). Position and information both for the own vessel and other vessels appear on officially approved charts [Electronic Navigation Chart (ENC)]. Scheduled Voyage Route is displayed and checked for depth and other hazards.

The voyage is monitored by controlling position in relation to the Route Plan, which controls safe passage and monitoring of the risk of collision.

1.2 Charts

TECDIS is using simultaneously and seamlessly, chart data from multiple vector map databases. Typically it is using CM93/3-format, provided by Jeppesen (C-MAP) of a Professional + (World) chart as basis, as it provides global coverage of all relevant scales. Officially approved charts (ENC) is a requirement for ECDIS when paper charts are not used. These charts can either be loaded directly in the pre-compiled Jeppesen (C-MAP) in its own SENC format or scanned and compiled from the S57 standard format.

Using ECDIS as legal substitute for paper charts, two conditions are met:

1. *The system must show the official ENC (Electronic Navigation Chart), issued by a national hydrographic authority. (for Norway: Primar)*
2. *These charts should be regularly updated.*

TECDIS automatically displays the best available chart. Jeppesen C-MAP ENC (SENC) is preferred and it is shown where it is available, otherwise charts from Jeppesen C-MAP Professional + (CM-93/3) are used.

1.2.1 About Chart Databases and Simplified ENC Distribution

It should be noted that when ENC data (S-57 format) is distributed, it is not used directly in ECDIS system. ENC files are compiled into a seamless database [System ENC (SENC)] that contains all the required ENCs and are optimized for operational use on board.

All charts displayed in TECDIS are saved in C-MAP SENC (System Electronic Navigational Chart) format. The charts can either be received in this format from the supplier, or it can be generated from other formats such as S-63.

The specifications of the S-57 data format can be interpreted in multiple ways, which may lead to ENC data that can be "non-compliant". Such data should not be imported into the ECDIS system, as it can lead to inaccurate information and errors. For this reason, it is best if all ENCs are compiled to SENC format in controlled environments on land (not during voyage).

Another benefit of receiving the charts in SENC format is that the navigator on-board does not need to spend time and patience to import (convert) ENCs to the chart database, a process that requires that ENCs is 100% "compliant".

Distribution of ENC in SENC -format has been approved under CHRIS meeting in Athens in April 2002. A number of hydrographic organizations (HO) admits that it facilitates access to official digital cartography, and that it has no negative effect on compliance (accordance) with IMO.

C-MAP provides official data in **SENC** format in accordance with the "*IHO amendment two paragraph 3.3 of S-52*" and a new "*Technical Resolution A3.11*", adopted by the IHO's 16th International Hydrographic Conference. **C-MAP CM-93/3 SENC** distribution system was also type approved by the Norwegian VERITAS (DNV) in March 2003, as required by the IHO. The distribution system includes Real Time Updating infrastructure that allows users of this system to download chart corrections directly online.

ENC data, from states / countries that still have not approved the distribution of data in the SENC format, are distributed in the S-63 format and converted on board.

1.3 Positions / Chart Datum

The Chart Datum is a mathematical model used by the chart producer to adapt the earth's surface curvature. In TECDIS system, position reference, always use the datum with references to the "World Geodetic System 1984" (WGS84). This format is considered the most accurate chart datum available. All charts and chart objects in TECDIS are shown in the "World Geodetic System 1984" (WGS-84) and all the inputs for position data to TECDIS (GPS) must use this datum. Any translation (recalculation) can easily be made with tools for "Maritime calculations" (Chapter 5.8).

All sensor inputs, with position references, must use the WGS-84 format.

Chapter 2 Overview

2.1 Tooltip (Help Text)

If the user is not familiar with TECDIS, "*Help Text*" can be a useful tool. By hovering the cursor over a toolbar button or over the values presented in one of the menus, it will be displayed an explanatory text on yellow background.



2.1.1 Activate or deactivate the Help Text



Select *Tool Menu Folder* from the Top Menu. A vertical menu will be available on the right side of the display (chart). Select "*Setup*" folder and check on / off for "*Show Help*".

2.2 Language

The language can be selected in the "*Setup*" folder and the available languages are displayed and can be selected from a dropdown menu.

2.3 Operations

All the operations and all functions can be controlled by moving the cursor (screen marker) of a trackball or mouse and using respectively the left or right mouse button. Several functions / features can be enabled or disabled. The chart can be zoomed in or out and the vessel position on the map can be adjusted.

A selection of TECDIS functions can be operated either with trackball / mouse or keyboard, to user's own preferences.

2.3.1. Keyboard operations

The keyboard can be used to operate the system. To enter a text, the operator can choose between on-screen keyboard, which is operated by the cursor, and regular keyboard. For direct access to frequently used functions, the following key / function combination can be used:

Keyboard commands:

```

F1 Info on keyboard functions
F2 Chart query by cursor
F3 Name search (option)
F4 Chart legend

F5 Operations menu
F6 Route menu
F7 Mariner symbol object menu
F8 Mariner line/area object menu

F9 Timestamp past track
F10 Man Over Board
F11 Position fix
F12 Event mark

```

```

1 Screen day/night colors
2 Screen orientation
3 STD S52 official chart presentation
4 USER selected chart presentation
5 Docking conning display
6 Wheather data display (option)
7 Radar overlay (option)
8 EBL / VRM functions
9 Arpa targets
0 Ais targets

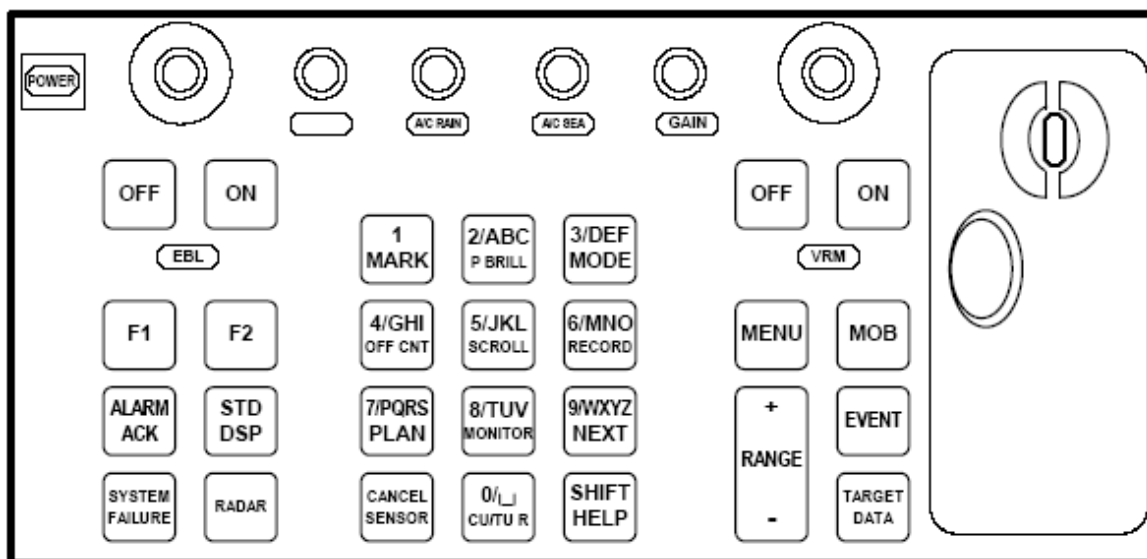
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W-A-B-B-C-D-E-F chart level
S Simulated positon and DR
Arrow keys Move chart
Page Up Zoom out at selected level
Page Dn Zoom in "
- Zoom out auto level
+ Zoom in "
Home Auto chart to boat position
Ins Move cursor/chart to a pos.
Del S52 chart pres. + auto pos.
Enter Left mousekey at cursor pos.
/ or < Darker screen colors
* or > Brighter screen colors
Esc/space Alarm off (list/segencial)
Ctrl+PrtScr Save present screenshot
Ctrl+Alt+Shift+T Screen calib. test

```

2.3.2 RCU-018 Control Unit (Furuno Operative Keyboard)











If a Furuno RCU-018 Control Unit is connected, this unit can be used to operate that chart system.




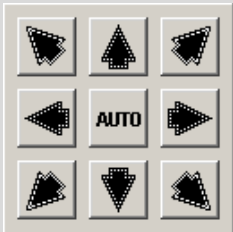




The **Trackball** may be used for cursor control and general operations.

! NB! Double-click and «drag and drop» are not implemented.

The **Scroll Wheel** (up / down scroll) can be used to modify the numeric values of fields, such as speed, corridor, radius and downtime in route planner.

RCU-018 keys have the following functions:

Key	Description	Function
Power	Turns the chart system On / Off . This button does not affect the display (monitor).	
VRM rotary encoder	Adjusts active VRM .	
VRM ON	Activates and displays VRM1 if none is shown, or if VRM2 is active. Enables and shows VRM2 if VRM1 is active.	
VRM OFF	Disables and removes VRM1 if both VRMs are displayed. Disables and removes VRM2 if VRM1 is active.	
EBL rotary encoder	Adjusts active EBL	
EBL ON	Activates and displays EBL1 if none is shown, or if EBL2 is active. Enables and shows EBL2 if EBL1 is active.	
EBL OFF	Disables and removes EBL1 if both EBLs are displayed. Disables and removes EBL2 if EBL1 is active.	
F1	Displays Information Box (keyboard use)	
F2	Chart query by cursor	
ALARM ACK	Alarm acknowledgment of the alerts generated by TECDIS.	
SYSTEM FAILURE	Red backlight button and alarm sounds are triggered when system failure occurs. Click ALARM ACK key to silence the audible alarm. The button lights up red until the problem is found and fixed.	
RADAR	Displays Radar Overlay and Setting Window , which are used for adjustment of radar image, color and transparency.	
STD DSP	Standard Screen Presentation (S52) for TECDIS.	

Key	Description	Function
1/MARK	Opens the Menu for symbols, lines, and areas (maritime objects) and provide maintenance for of various markers.	
2/ABC/ P BRILL	Switches between Day, Dusk and Night –display modes.	Day 
3/DEF/ MODE	Select presentation mode: North, Course, Heading, Radar1 and Radar 2	North 
4/GHI/ OFF CNT	Center Align (off center) last selected VRM / EBL. If no such center, then align the chart.	
5/JKL/ SCROLL	<p>Chart Scroll Box it is activated from the RCU_018 Control Unit (5/JKL/SCROLL key).</p> <p>On -screen: the direction can be selected with the displayed arrow.</p> <p>From the Control Unit: the direction can be selected with the keys situated in the immediate vicinity of 5/JKL/SCROLL key.</p> <p>AUTO key: activates Auto Mode</p>	
6/MNO/ RECORD	Save the Time Marker on the track	F9
7/PQRS/ PLAN	Opens the Route Planning Menu	
8/TUV/ MONITOR	Show / docking "Conning" screen	
9/WXYZ/ NEXT	Same function as the "Enter" key on the keyboard. Also emulates the left mouse button in the cursor position	
CANCEL/ SENSOR	Opens NMEA- Inputs Status Window. Closes any open dialog box or window	
0/space CU/TU R	Repositions the Chart Display to your vessel position and enable Auto Mode	
SHIFT/ HELP	<p>SHIFT: Switches between uppercase and lowercase letters in edit mode</p> <p>HELP: Displays information about the object in the cursor position</p>	
MENU	Displays the main menu.	
+ RANGE -	Adjusts the chart scale.	±
MOB	Insert MOB marker on the screen, in the own vessel position	 F10
EVENT	Insert the Event Marker in the own vessel position	F12
TARGET DATA	Display information for the selected ARPA or AIS target	
GAIN	Adjusts Radar Overlay transparency	
A/C RAIN		
A/C SEA		

2.3.3. Set the Chart Center ; zoom in /out

Place the cursor at the position in the chart where the new chart center is desired and press the middle mouse button. New chart center is now located in this position. Use left mouse button to zoom in and right mouse button to zoom out.



When the cursor is placed on the chart edge, it changes to an arrow and with a click on the left mouse button, you can pan the chart in the selected direction.

2.3.4. Menus and Commands

TECDIS operation and menu presentation complies with standard Windows applications.

Enabling Functions and Commands:

Using the left mouse button or the keyboard, activates the selected function directly (change scale or zooming), while the other buttons on the menu bar will open the submenus or a special function window. Functions can be deactivated and / or closed by clicking the same button that opened them.

Grey colored function or button: Feature is not available or active.

Check Box: Some menu functions can be enabled / disabled by setting / removing a tick in the check boxes.

The vertical toolbars for Route Toolbar or Symbols /Lines/Area Dialog appear on the left side of the chart display and can be closed by clicking the "OK" button. If a route is in edit mode, click "OK" button to exit. Exit the submenu by clicking the button on the main toolbar which opened that submenu. If the vertical toolbar from Route Toolbar, on the left side of the chart display, is not closed it will close automatically after one minute.

2.3.5. Dropdown Menu

The Dropdown Menu is accessed by clicking on the dropdown arrow situated on the right side of the function / edit field to be modified. Select from the available values by clicking the left mouse button on the desired value. "Arrow" keys and the "Enter" key can be used also.

In the Dropdown Menu for *Date Selection*, a calendar will appear as shown in the illustration at right.

The year can be changed by clicking on the *Year* and change it with up/down arrows. The months can be selected by clicking the left and right arrows, or by clicking on the *Month* and select it from the dropdown menu.

Selecting the day will automatically close the dropdown menu for *Date Selection* and save the modified date.

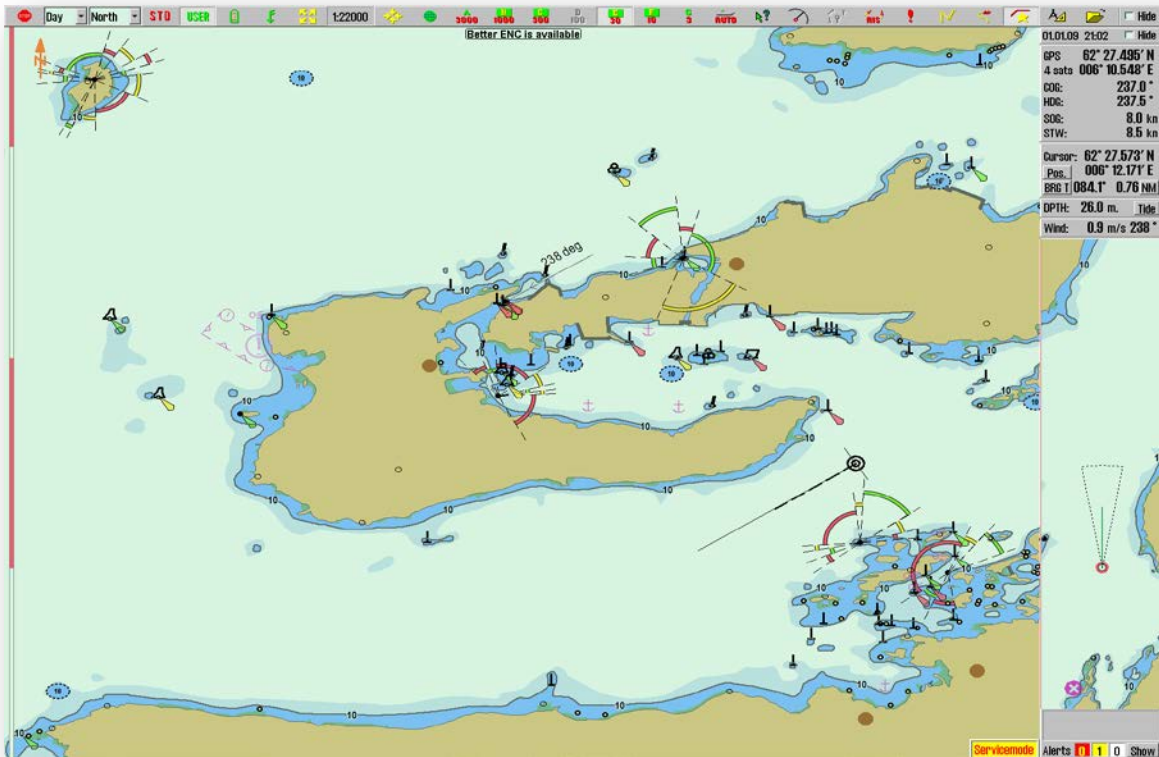
2.3.6. Pop-up windows

All pop-up windows that open into the chart system are movable. Place the cursor on the header section and drag the window to the desired position with the left mouse button pressed.

In the windows with **TECDIS** icon, in the header section, you can also change the size by dragging the frames with the left mouse button pressed.



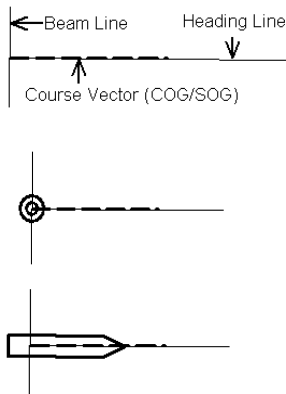
2.4 The Display



TECDIS screen has three main functional areas:

1. The **Vertical Menu** (right side) - Information field
2. The **Horizontal Menu** (top side) - Main Toolbar
3. The **Chart image** covers most of the screen. Charts, symbols, routes, past track (also historical), etc. are displayed here.

The **Vessels Position** is shown graphically on the chart, according to the settings specified in the "Ship menu" (see chapter 3.4 "Ship Menu").



- The "Heading line" indicates the current vessel course.
- The "Beam" line is perpendicular to the Heading Line.
- The Course Vector indicates the current vessel course over ground (COG). The end point of this line shows where the vessel will be if the appointed course it is followed - after a certain time (minutes), specified in the "Ship" menu.
- If "Show double circle" is selected in "Ship" menu, the current vessel's position is marked with a double circle.
- If "Show ship profile" is selected in "Ship" menu, the vessel's relative size in comparison to the chart, will be displayed.
- If both options are selected, the system will choose the best view in relation to chart scale.

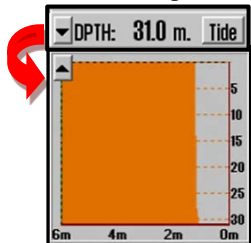
2.4.1. Vertical Menu (Information Field)

The **Vertical Menu** on the right side of the chart display include different fields:

1. Date and time received from GPS adjusted to local time zone.
2. *Sensor Data* for Navigation (GPS, gyro, log).
 - Received GPS Position
 - indicate GPS sensor in use
 - Course Over Ground
 - Heading From Gyro
 - Speed Over Ground
 - Speed Through Water

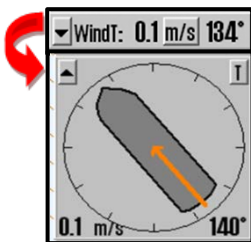
3. *Sensor Data* for marker (cursor)
 - Cursor position-info:bearing and distance from own ship to the cursor.
 - "Pos."*: center chart and cursor in the typed /specified position. Used for both chart and object positioning.
 - *"BRG T"*: select TRUE (*"BRG T"*) or RELATIVE (*"BRG R"*) bearing.
 - By clicking elsewhere in this field, text size for bearing and distance values, can be increased.
 - Measurement. Unit for distance can be selected between *<NM>* and *<Meter>* by clicking the *"NM"*.

4. Depth below surface *"DPTH"* and tidal *"Tide"* information. (see chapter 6.3)



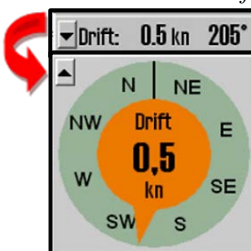
"Expand" button to the left of *DPTH* field opens a graph with depth contour display. The X-axis for depth and Y-axis for time in minutes.

5. True Wind Speed (MU) display, can be changed between *<m/s>* and *<knots>*.




"Expand" button to the left of *WindT* field, allows for graphical display of wind direction relative to own ship. The button in the upper right corner switches between true (*"T"*) or relative (*"R"*) view.

6. Calculated *Drift* based on COG, SOG, HDG and STW.



"Expand" button to the left of *Operation* field allows for graphical display of the vessel drift based on COG, SOG, HDG and STW.

7. Anti-grounding Chart Display (see chapter 5.6).
8. When *Tool Menu Folders*  is activated, *Vertical Menu* displays additional fields (see chapter 3.1).
9. When a Route is active, it is shown in a separate display group.
10. Alarm field (see chapter 5.5).

The screenshot displays the TECDIS interface with several panels and their connections to the numbered instructions:

- Top Panel:** Shows date/time (20.09.12 08:49), GPS coordinates (59° 02.454' N, 010° 30.963' E), COG (149.1°), HDG (149.7°), SOG (10.0 kn), and STW (--- kn). It also shows cursor coordinates (59° 02.686' N, 010° 44.176' E), BRG T (088.0° 6.83 NM), DPTH (31.0 m), and WindT (0.1 m/s 329°).
- Map Panel:** Displays a map with a route and various markers. A dashed line indicates a specific area of interest.
- Vertical Menu:** Contains buttons for Log, Safe, Ais, Setup, Chart, Ship, and Data. Below these are Layer checkboxes: Text (generic), Text (other), Safe hazards, Shallow soundings, Deep soundings, All depth contours, Danger symbol, Cables and pipes, Bottom type, Grid lines, Lights character, Lights cursor info, Active lights, Active lead sectors, and Small craft info. At the bottom, it shows AP mode (Offline), Track, and Heading buttons.
- Route Panel (id: 15):** Shows route details including wp end, planned spd., DTG (55.7 NM), ETA (20. 18:14), Turn WP 5, CTS (204.6 ° 208.6 °), DTG (0.27 NM), TTG (1 min 36 s), XTE (0.194), and Dev. (119 °).
- Alarm list Panel:** A table listing active alarms:

Time	Alarm type	Status
14:04:17	Missing netw. connection (TECDIS Setup Export	Active
14:04:10	Refer to paper charts	Active
14:04:09	Caution area	Active
14:04:09	Antigrinding Alarm	Active
14:04:07	No alarm raised for lost close targets	Active
- Bottom Panel:** Shows a large red "DANGER" warning and an Alerts summary: Alerts 1 3 2 Show.

























Arrows from the numbered instructions point to these specific elements:

- Instruction 7 points to the map area.
- Instruction 8 points to the Vertical Menu.
- Instruction 9 points to the Route Panel.
- Instruction 10 points to the Alarm list Panel.

2.4.2 Horizontal Menu (Main Toolbar)

At the top of the screen, the *Main Toolbar* provide quick access to system features, that must be available for rapid operation of the charting system.

This section provides a brief description of the various functions. The numbers in brackets refers to the sections (chapters) where detailed description can be found.

	Exit TECDIS		Auto Chart Repositioning (4.6)
	Palette (4.3 and 3.9.1) Day/Dusk/Night		Object Inspector (6.1)
	Chart orientation (4.4) North/Course/Head/Radar		Bearing EBL/VRM (5.1)
	S52 Standard Chart Presentation (4.7.1)		Show ARPA targets (6.4)
	User Configured Chart presentation (4.7.2)		Show AIS targets (6.5)
	Conning and Anchor-Guard display (6.2)		Event symbol in vessels position (MOB) (4.8.4)
	Weather Overlay (4.10)		Route planning- toolbar (5.2)
	Radar Overlay (4.9)		Past track menu /history (5.7)
	Zoom inn (4.2)		Symbols, marine objects (4.8)
	Chart Scale (4.2) 2000000		Maritime calculations /L.O.P. (5.8)
	Zoom ut (4.2)		Open NAVTEX dialog box (6.6)
	Show overview chart (4.2)		Open Tool Menu folders (3.1.1)

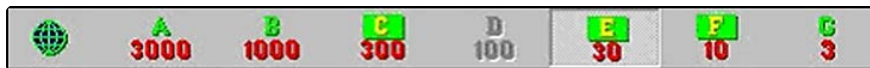


Chart level / types (4.2)

2.5 Hide Main Toolbar and /or Information Field

At the screens upper right corner there are two "Hide" boxes. By activating these boxes, the Horizontal Menu (*Main Toolbar*) and Vertical Menu (*Information Field*) can be hidden.

To reactivate these menus place the cursor at top or right edge of the chart window.



Chapter 3 Settings

3.1 Tool Menu Folders / Settings

3.1.1 Show Tool Menu Folders



By clicking on the "Tool Menu Folders" button on the Main Toolbar, a collection of menu folders are displayed in the lower part of the Vertical Menu (Information Field). There are seven different Menu Folders: "Data", "Log", "Safe", "Setup", "Chart", "Ship" and "AIS", where a folder is displayed one at the time. A Menu Folder can be selected by clicking on the sheet tab.

3.1.2 Hide Tool Menu Folders



Clicking the "Tool Menu Folders" button on the Main Toolbar again, the menu field will be removed from the Vertical Menu.

3.2 « Setup »

Sub menus summary:

1. **Ship Draught** -enter current maximum draught for correct depth and anti grounding handling.
2. **Language** -select language
3. **Time Zone Adjustment** -change the system time zone to the ship local time zone.(10 min resolution)
4. **NMEA Input Status** -sensors status and sensor- port connection. Use TECDIS Setup to change settings.
5. **Setting Position Deviation** -Nav. position offset. Allows manual position correction.
6. **Dead Reckoning Mode**
7. **Chart Utilities** - Chart library - view installed charts and coverage
 - Manual chart update of chart databases
 - C-map chart update
 - Chart license (current chart licenses and expire dates)
 - INT-1 dictionary.A list of chart dictionary items
8. **Chart database** - types and version numbers. (ENC is dominant)
9. **Alarm volume ajustement.** (speaker only)
10. **Auxiliary** - additional functions for screen, conning and database status.
11. **Scroll weel zoom**
12. **Hide /Show "Help Text" (Tooltip).** (see chapter. 2.1)

The screenshot shows the 'Setup' menu with the following items and callouts:

- Log, Safe, Ais, Setup, Chart, Ship, Data (top tabs)
- Ship draught: 12 m. (1)
- Language: english (2)
- Time zone: -01:00 (3)
- Nmea input status (4)
- Nav. position offset (5)
- Chart utilities: (7)
- Chart database:
 - ENC [486]
 - JepsesenPRIMAR [484]
 - Professional+ [560] (8)
- Alarm volume: (9)
- Auxiliary: (10)
- Auxiliary options:
 - Scroll wheel zoom (11)
 - Show help hints (12)

Inset boxes show expanded views of:

- Chart utilities:** Chart library, Manual chart update, C-Map chart update, Chart licenses, INT-1 dictionary, Radar overlay setup
- Auxiliary:** Recalibrate screen, Conning harbour mode, Conning back ward mode, Export DB Status

3.2.1 Ship Draught (1)

Here, the navigator can edit a value (in meters) between minimum draught "*Draught min.*" and maximum draught "*Draught Max.*" that are defined in the "**TECDIS /TELchart ECS Setup**"- "*Specification*" tab. When TECDIS starts, the maximum draught is used as default value (*set the maximum draught for correct depth reading*), but this can be changed in "*Setup*" menu folder, to match the changes in vessel loading conditions. There is no need to make changes in "**TECDIS /TELchart ECS Setup**" after loading or unloading of the vessel. The value for the draft is used by TECDIS to interpret sonar data, automatic routing and eventual display in Conning image.

3.2.2 Language (2)

Standard language for a TECDIS unit is English, which is also consistent with the language of the Windows Operating System. But for normal operation of TECDIS it is also possible to switch languages in the *Operator Controls, Tools* and menus to Norwegian (French and German may be available depending on the SW version). Language can be changed during navigation and will not affect the Chart Data.

3.2.3 Time Zone A (3)

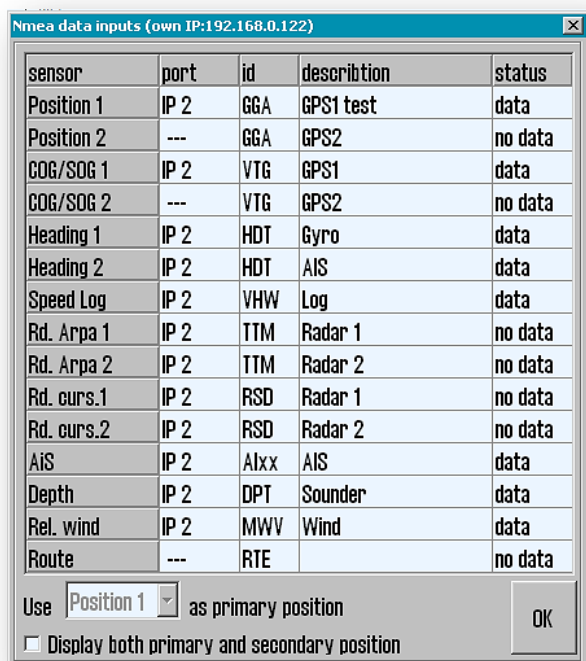
Standard time in TECDIS corresponds to the time received from the GPS satellites, which corresponds to UTC time. If a vessel sailing across one or more time zones, the time zone adjustment is used to adjust the clock shown on TECDIS with + / - ten minute intervals relative to UTC.

3.2.4 NMEA Input Status (4)

"*NMEA Input Status*" button opens a list of which ports the various sensor data are retrieved from, what kind of NMEA sentences are used, and eventually a description.

Status column indicates whether the data is received or not. This is only a info summary; any changes to these settings are made in the *Setup Program* (see Chapter 7).

Primary positioning method: In the NMEA Data Input window both sources for positioning appears, and can be selected which one shall be primary, and whether the secondary position is shown or not on chart display. In case of failure of the primary source, the secondary source is automatically used. If the secondary source also fails, the system automatically change to Dead Reckoning Modus (Log+Gyro).



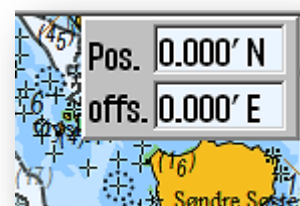
sensor	port	id	description	status
Position 1	IP 2	GGA	GPS1 test	data
Position 2	---	GGA	GPS2	no data
COG/SOG 1	IP 2	VTG	GPS1	data
COG/SOG 2	---	VTG	GPS2	no data
Heading 1	IP 2	HDT	Gyro	data
Heading 2	IP 2	HDT	AIS	data
Speed Log	IP 2	VHW	Log	data
Rd. Arpa 1	IP 2	TTM	Radar 1	no data
Rd. Arpa 2	IP 2	TTM	Radar 2	no data
Rd. curs.1	IP 2	RSD	Radar 1	no data
Rd. curs.2	IP 2	RSD	Radar 2	no data
AiS	IP 2	Alxx	AIS	data
Depth	IP 2	DPT	Sounder	data
Rel. wind	IP 2	MWV	Wind	data
Route	---	RTE		no data

Use as primary position
 Display both primary and secondary position

3.2.5 Nav. Position Offset (setting position deviation) (5)

"*Setting Position Deviation*" button opens a small window at the upper right corner of the chart display, where a fixed value for position deviation can be entered. In some areas old chart positions are somewhat offset to WGS84 datum. It is possible to compensate for this type of error at the TECDIS system entering a position offset. To close the window and disable the position error, click again on "*Setting position deviation*"

("*Nav. position offset* ") button in the settings menu. The system will follow the primary position sensor again.



3.2.6. Dead Reckoning Mode (6)

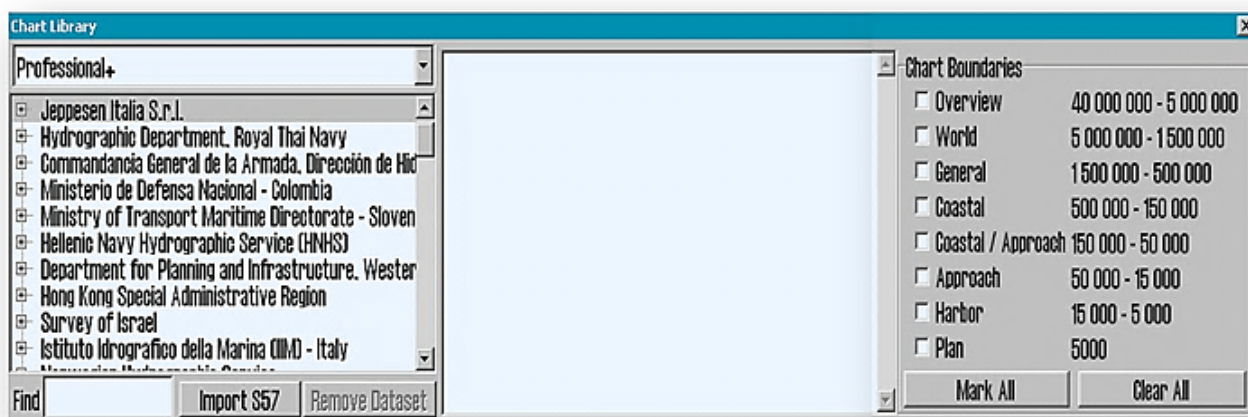
The loss of both primary and secondary position activates automatically Dead Reckoning Mode. Dead Reckoning Mode can also be activated manually by inserting "Lines of Position" (LOP, see Section 5.8.2). Data from log and gyro are used when available, or values must be entered manually. Position is inserted or updated to the position shown in the center of the map by pressing the "S" key on keyboard.



3.2.7. Chart Utilities –Chart Procedures (7)

3.2.7.1 Chart Library

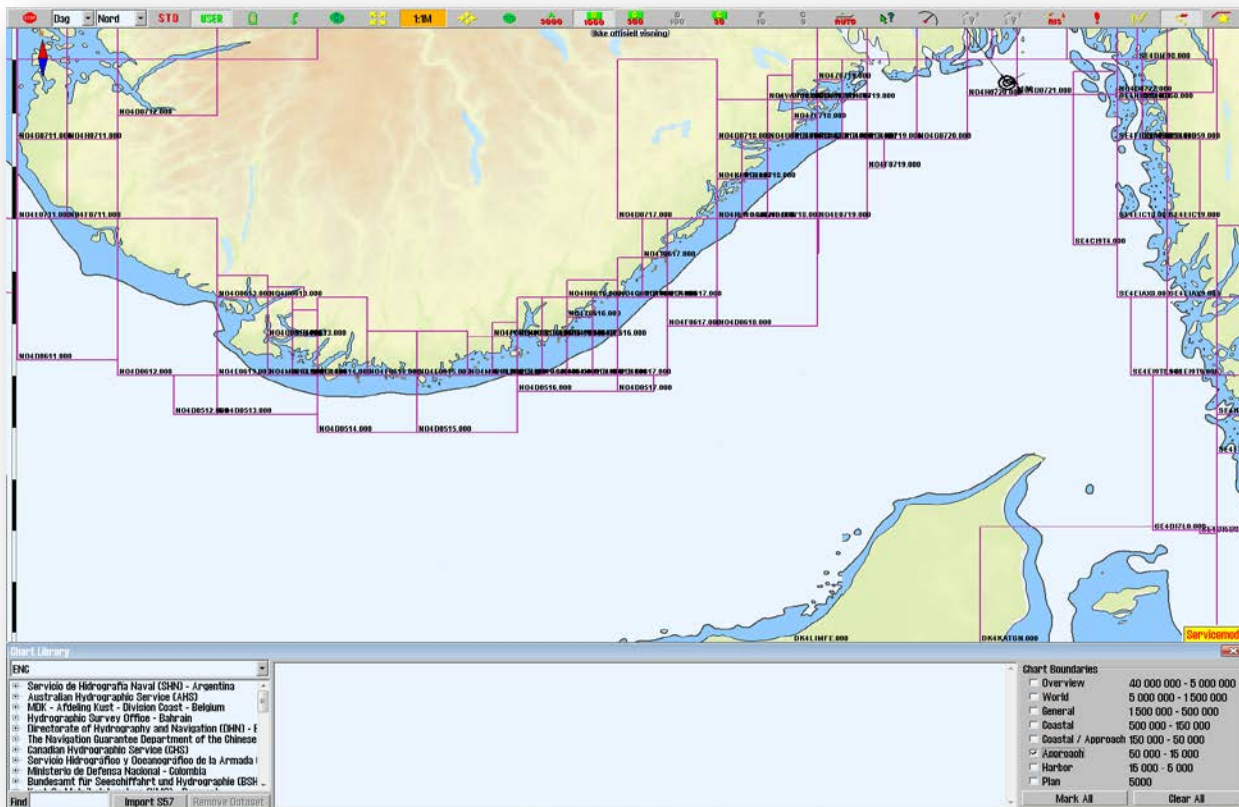
"Chart Library" - option in "Chart Utilities" menu -opens a chart library window that shows a list of installed chart databases in TECDIS program. By selecting one of them, from the drop down menu (top left corner), a list of all the licensed charts (opened) appears, sorted under their respective publishers (Hydrographic organizations). Mark a chart in the list to get access to more information that will be displayed in the middle field. By double clicking on a chart, this will appear on display, if is licensed. If own vessel is under voyage, the chart display will automatically return the own vessel in centered position (unless auto function is disabled).



Note: "Chart Library" only displays the databases that are selected in "Setup" folder. (see chapter 3.2)

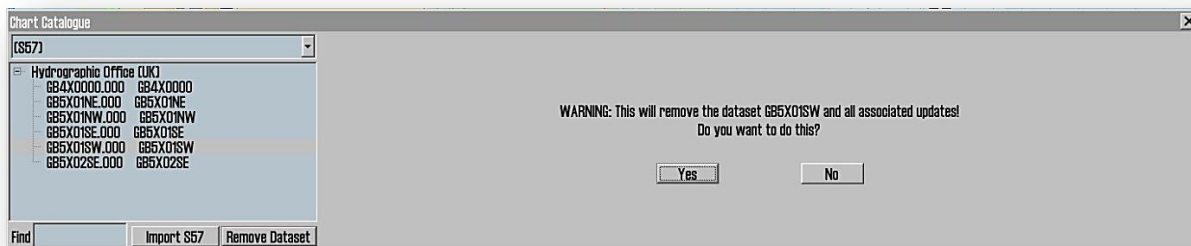
"Chart boundaries"

"Chart boundaries" (windows right side) is graphically displaying coverage for all the maps contained in the database, for the selected level. (the levels correspond to "Overview" and "A" to "G" scales on the Main Toolbar). The graphic coverage on licensed charts is done with magenta borders, while on the unlicensed charts the lines are drawn in black. The name of the chart is displayed in the lower left corner of the respective rectangles.



"Remove Dataset"

If a database containing imported S57 data is selected in the drop-down menu, the "Remove Dataset" button can be used to delete the selected chart.



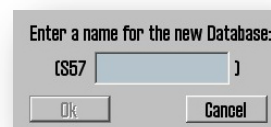
"Import S57"



Note: When two ECDIS chart machines are connected, make similar updates of both ECDIS chart machines.

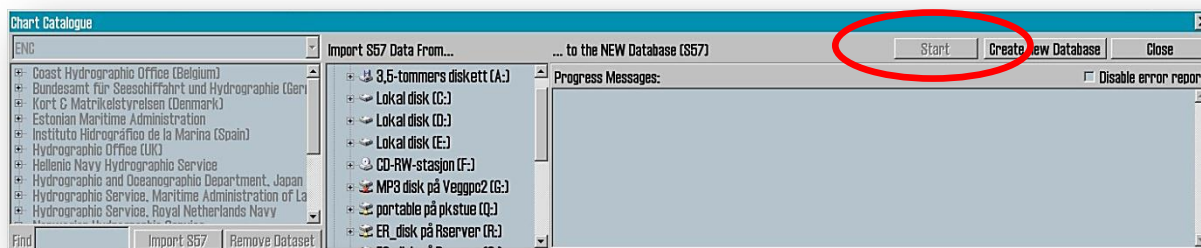
Import of S57 data is done via "Chart Library". Select database from the drop-down menu and click "Import S57" button.

The S57 database consists of data sets (chart sheets). ENC data is being sold as ENC cells in S57 format, and when these are imported into a database, every ENC cell is converted to a data set. This process involves two steps:

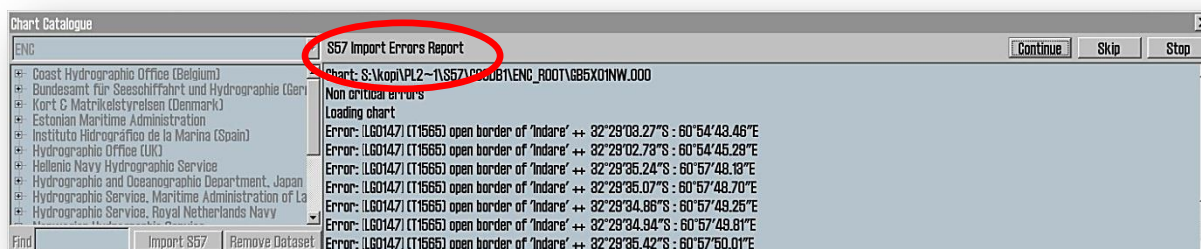


- Verification (checking data validity)
- Compilation (conversion of ENC cell to a data set).

To import data, select drive in the field "Import S57 data from...". Data is imported into a database that begin with "S57...". If no S57 databases exists, a new one automatically will be created. Alternatively, a customized separate S57 database can be created by clicking "Create new database" button. S57 database will automatically be added and selected for display in the "Setup" folder. (see: "7" in 3.2.)



When the source drive for the data to be retrieved is selected, the "Start" button is enabled. Click on "Start" button to begin the import. Data is automatically verified.

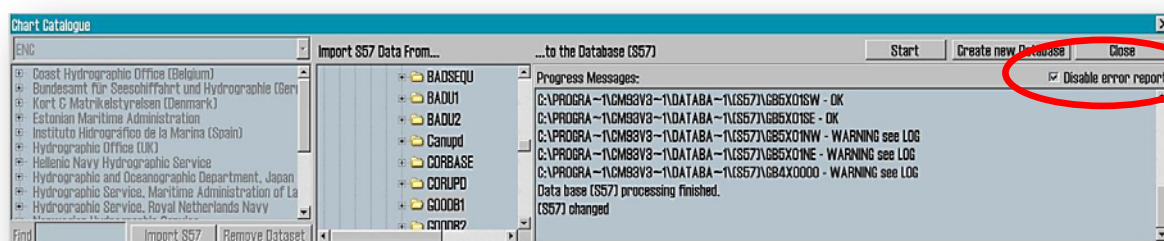


If an error occurs, an "S57 Import Error Report" appears. Here is shown when import file error applies and if there is a critical or mild error. The files with serious errors it will not be imported ;those with non-critical errors (potential irregularities of data) can be manually imported or rejected, by clicking "Continue" respectively "Skip". The import process can be cancelled by clicking "Stop" button.

If "Disable error report" option is selected before data import is starting, the entire import process goes automatically. S57 import files with critical errors will be omitted, while files with non-critical errors are imported.



NB: When using the "Disable error report", there is no possibility to see detailed information about the causes and error of ENC cells that cannot be imported.



An import log will be created. This log can also be viewed by selecting the appropriate dataset in the "Chart Library" by scrolling down to the "S57 import log" in the information field. If there are imported chart updates in S57 format, these can be viewed in "C-MAP chart update" (see section 3.2.6.3).

By right-clicking on "Progress messages ", the operator gets access to the log files with summary / history of all data sets (Charts Cells) that have been tested (Verifier Log) and all files that have been compiled (Compiled Log). This is just an overview and not a detailed rapport (any data set that has been deleted is not listed).

Import S63

For import of Chart Data in S63 format (see chapter 6.9, "Installation of Chart Databases ").

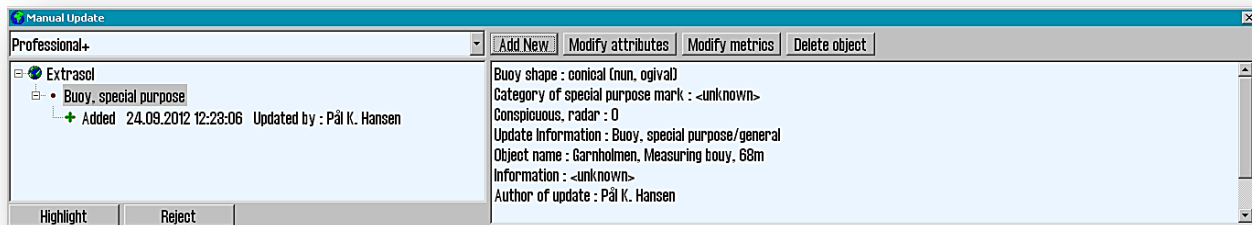
3.2.7.2 Manual Chart Update



NB: When two TECDIS computers are connected, be sure to do the same chart corrections on both machines.

One of the major benefits of CM-93/3 Map Database technology is the ability for automatic updating of electronic charts. TECDIS has full support for this feature (3.2.7.3), but the functions of Manual Chart Corrections are still important, as local reports on changes in aids to navigation can be omitted from the official "Notice to Mariners", which is used as a basis for the Automatic Chart Update. For example, SOLAS Convention requires that all charts must be updated for the intended voyage; before planning a voyage or prior to modify an existing route, is strongly recommended that both, the automatic and manual Chart Update functions, are used to keep the chart material updated.

"Manual Chart Update " window opens from "Chart Utilities" menu. In this window all manual chart updates/ corrections are performed, and it provides access to a list of all past changes. To the left in the menu window, there is a field with a history of chart updates/ corrections. By selecting an item from the list and click "Select", the object in the chart will be marked in orange. The right pane displays information about the selected object. Each change of the object is listed as a separate item in the list that appear below the object, and by clicking on an entry (point), the object is displayed as it appeared at the selection time.

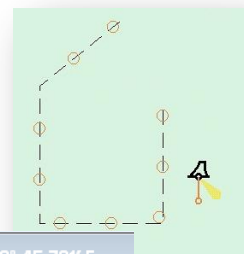


Remove chart corrections

"Reject " button erases all the update history for a selected object or objects that were changed on a selected chart sheet. This feature is only available in service mode.

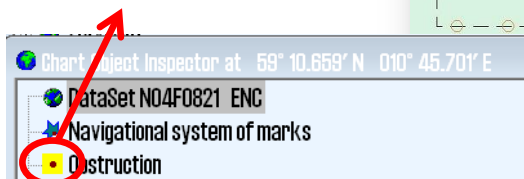
Modify/edit chart corrections

Mark current map corrections from the list in the left pane and click directly on the "Modify Metrics" button to change the position data or "Modify Attributes" button to change the properties. See the next chapter for a description of changing button function.



Own objects

All manual chart corrections are marked in the chart by orange markings. When using Chart Query Info function in the cursor position and a "Chart Object Inspector" window opens, Manual Chart Corrections are marked yellow.



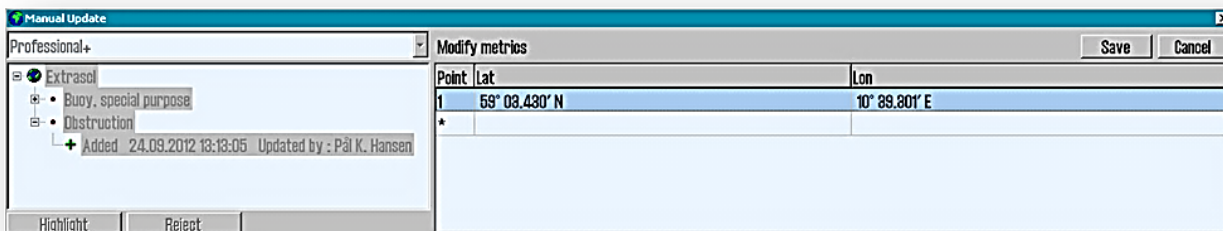
New chart correction / New object

Click "Add New" button, select the type from the list of objects or use the search feature ("Find" at the bottom right). If the search returns more matches, those can be browsed by clicking "Find" several times. Select the object to be added by placing the cursor over it and clicking once with the right mouse button.



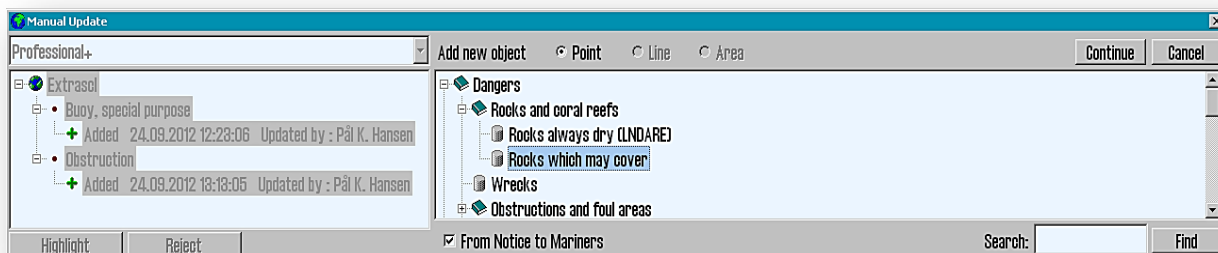
Some objects are characterized only as "Point", "Line" or "Area", while others have optional between two or all three representations. Choose how the object will be represented on chart: as point, line or area.

If you put a checkmark in the checkbox "From the Notices to Mariners", then the new object opens (appears) on a particular chart cell. All chart corrections are saved under "Extrasol" in the "Previous chart corrections", unless the chart correction is locked to a specific chart by selecting "From Notices to Mariners" checkbox. All updates that are not related to a specific chart will be displayed as long as the database is selected for display in the "Setup" folder (see: "7" in 3.2). This applies even when no chart from the current database is displayed. By clicking on "Continue" a new field is opened in the right half of the "Manual update" window. Here the longitude and the latitude can be entered either by typing in or left click on the chart display, in the position the object will be placed. Click the "Continue" button to get to the last field, where any attributes of this object, like values representing depth, text information or min/max scale, can be registered. Finish by clicking the "Save" button and register the name of the person who made the change.

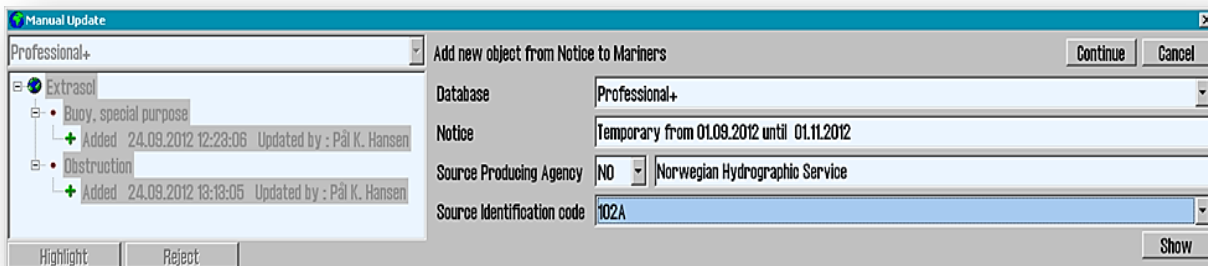


New object from "Notices to Mariners"

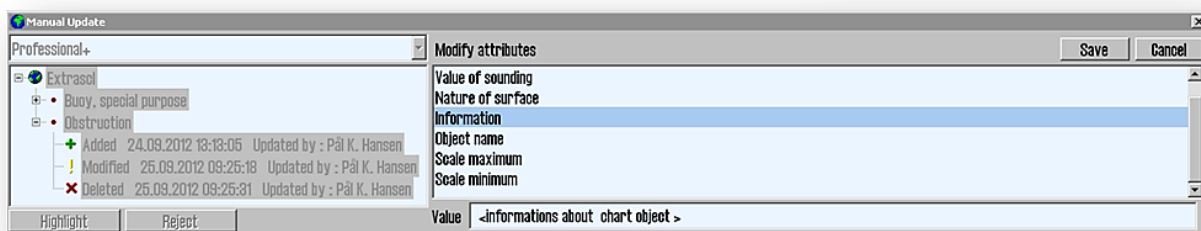
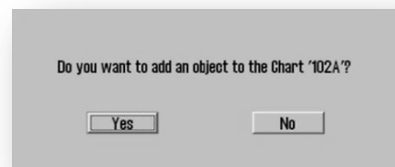
"Notices to Mariners" includes chart updates of the category "Temporary" and "Preliminary" that will be performed in the charts with an automatic or semi-automatic updating. If such updates are relevant to the actual voyage, these must be entered manually. Click "Add New" button, select the type from the list of objects or use the Search feature ("Find") at the bottom right. Some objects are characterized only as "Point", "Line" or "Area", while others are optional between either two or all three representations. Select the object to be drawn as point, line or area. Put a checkmark in the checkbox "From the Notices to Mariners", so that the new object is locked to a specific chart cell. All chart corrections are now saved under Chart Cell Reference in the field of previous chart corrections.



Select chart database ("Database"), original publisher ("Source Producing Agency") and the name of the chart cell ("Source Identification Code") the new update will be linked to. Please include information about the source of the update in the "Notice". A drop-down menu opens by clicking on the arrow in one of the fields where the data should be recorded. Browsing in an open drop-down menu is done by entering a number or a letter.

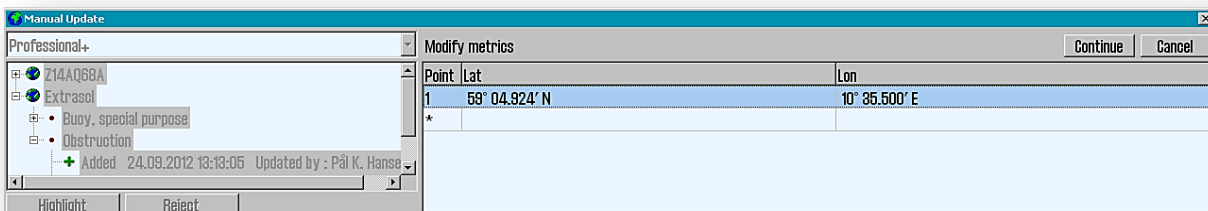


"Show" button, centers the current chart cell, while the "Continue" button saves the information and forwards to the next menu. Confirm that a new object is added to the chart sheet ("Do you want to add an object to the Chart '102A' ?") by clicking "Yes" button. Then add the attribute and any value (depth, text, name, etc.) and click "Save" button.



Modify Metrics

All objects added to the chart database are either one point, a line (minimum two points) or an area (three or more points tied together). The points position in latitude and longitude can be changed by entering values or by selecting a point in the list (in the "Modify Metrics" field) and place it in the chart by clicking the left mouse button.

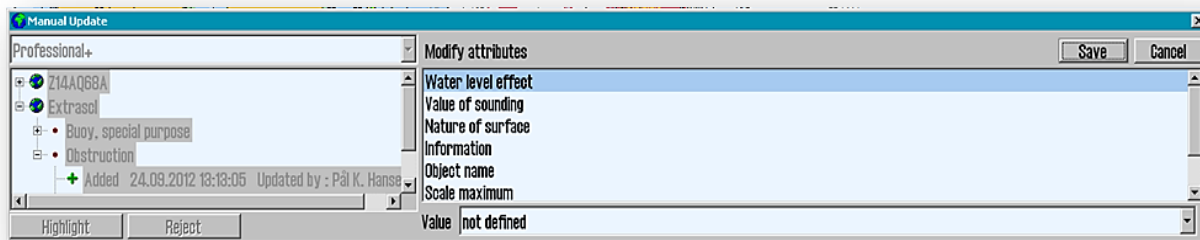


- "Tab" key and "Shift" + "Tab" keys moves the cursor between "Lat" and "Lon" for a point.
- "Up arrow" and "Down arrow" keys moves the cursor to select positions.
- "Enter" key inserts a new position after the marked position
- "Insert" key inserts a new position in front of the marked position.
- "Delete" key deletes the selected position.

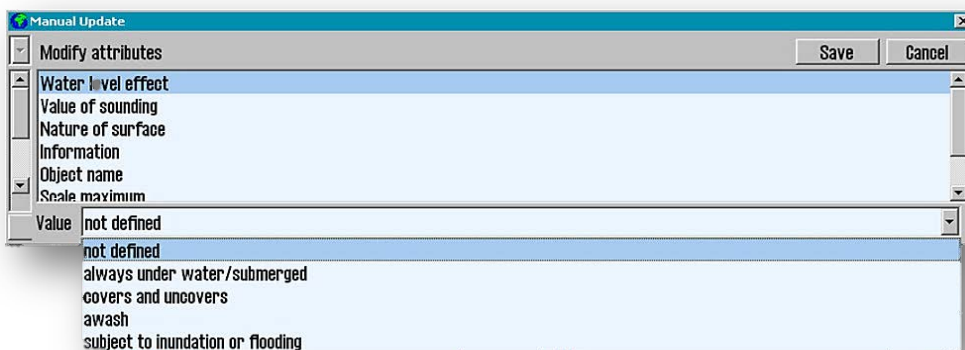
When changes are complete, click "Save" to save the changes and update the chart database.

Modify attributes

All objects added to the chart database have one or more attributes that is providing information about the object. Select an attribute type in "Modify attributes" field, and enter values for the selected attribute in the "Value" field. Use the dot as decimal separator in numeric values. "Scale maximum" and "Scale minimum" indicates respectively the largest scale (the lower number) and the smallest scale (the higher number) where the selected object / change is shown.



For some objects, the particular attributes can be selected from a drop down menu. For other objects, a selected attribute can be locked to a value from a limited selection. Click "Edit" to select among these values. When changes are made, click "OK" and "Save" button to save the changes and update the chart database.



Modified by

All chart database changes are stored with reference to who executed the modification ("Modified by"). Enter the name of the person in the field or pick one from the drop-down menu and click "OK" button to complete the admission of new manual chart correction /update.

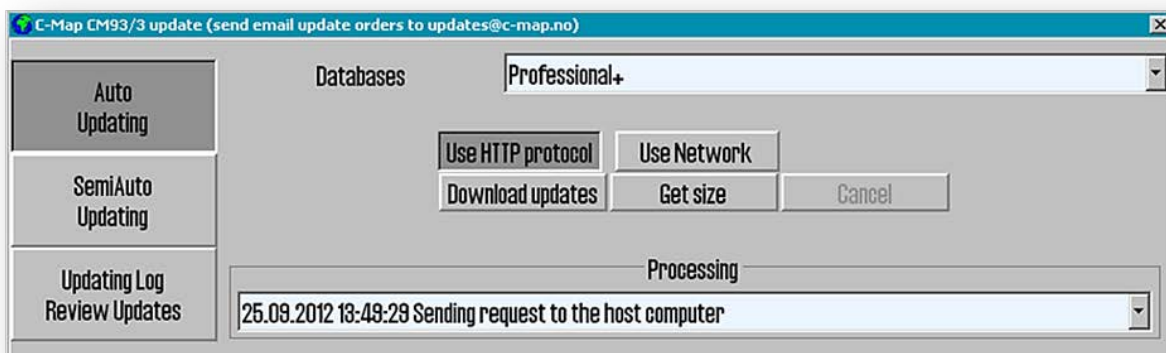


3.2.7.3 C-MAP CM93/3 update



NB: When two TECDIS machines are connected, be sure to do the same chart corrections on both machines.

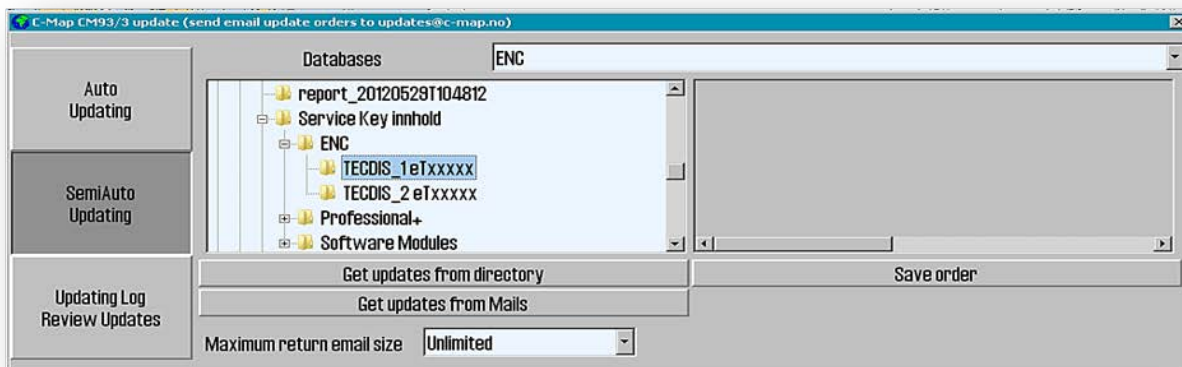
"Auto Updating" allows the subscribers to retrieve updates for the installed chart databases, from **C-MAP's** internet server. All updates are recorded in a log. The user can also check the size of the updates, before downloading (*"Get size"*).



"Semi Auto Updating" is an alternative to *"Auto Updating"*, where the request for downloading updates it is done via email. Select which chart database to be updated (for example, ENC), which order files (the ...*Telko eT* xxxx.ord ... where "xxxx" represents the *"System ID / TELKO eT"* number) to be saved and set the maximum size of the updates. Then click the *"Save order"* action button to generate a file order. The file order must then be sent as an attachment to an email addressed to: updates@c-map.no.

Order will be saved in
F:\Licenses TECDIS_1eTxxxxx\ENC\Telko eT 52020.ord

Updates is an automated service, and **C-MAP** should respond within 5 minutes. The answer file must be copied to the chart system. Mark where the files are saved and click *"Get updates from directory"*.



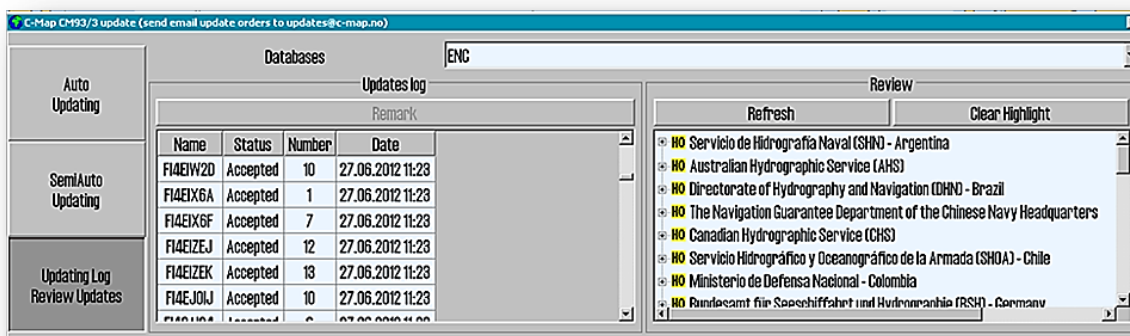
“**Updating Blog Review Updates**” option, opens a list of all changes made in the selected chart database.

“**Updates log**” field shows a list of all updates that have been added. “**Name**”, “**Status**”, “**Number**” and “**Date**” are describing each update ; “**Status**” column will contain either “**Accepted**” or “**Rejected**”; the updates that are “**Rejected**” were dismissed or removed. By clicking “**Remark**” button when is active, it will displayed a note about the update.

“**Review**” field contains a tree-like structure presentation of all updates. It is sorted after the publisher of the update, chart sheet and book number and where the correction (update) it is published. Under each book number you can find information written in key words (shorthand form), for all objects that have been changed. By double-clicking an item in the list, the chart section it will move to the respectively object, and it will be highlighted in red: point- objects marked with a red circle around it, lines drawn in red, and areas shaded red.

When a new CD-ROM from **C-MAP** is installed, all previous updates are removed.

Manual rejection of updates: left-click on that update (to the right of “**Review**” section), and then right-click in the same place(on update) to open a pop-up menu ; select “**Reject Update**” and close the updates window.



Note: Updating window must be closed for the changes to take effect.

3.2.7.4 Chart Licenses

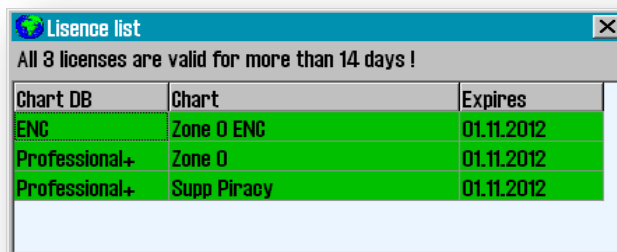
A list of all chart licenses contained in the system opens a “**License list**” window.

Licenses valid for more than 14 days ahead, are marked with green background.

Licenses which will expire within 14 days, are highlighted with a yellow background.

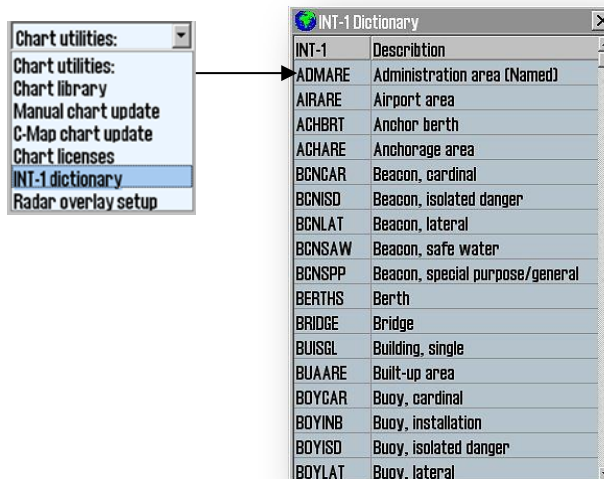
Expired licenses are marked with a red background.

background.



3.2.7.5 INT-1 Dictionary

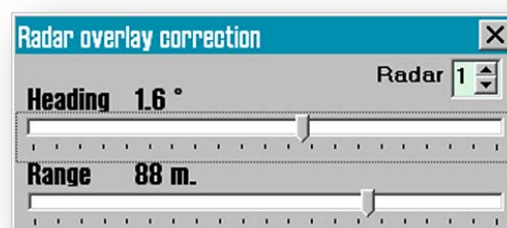
List of INT-1 abbreviations for chart objects opens in a “**INT-1 Dictionary**” window. Select INT-1 abbreviations from the dropdown.



3.2.7.6. Radar Overlay Setup

This option will enable the *Radar Overlay* and view *Radar Overlay Setup* dialog.

! **Note:** TECDIS Radar Overlay is made to play against Furuno Radar FAR-2107/2807 series. Primary TECDIS computer chart, secondary TECDIS computer chart and connected IP-based collection devices must be configured with IP addresses in 172.31.xxx IP address space, to receive data from the radar.



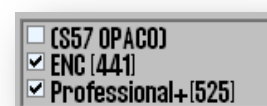
Radar: This value determines the radar system to be connected. This number must match "RADAR NO" value in the Setup menu for Furuno radar.

Heading (bearing): This sliding-controller is used to adjust the radar orientation relative to the chart display.

Range (distance): This sliding-controller is used to adjust the radar range so that it matches the chart display.

3.2.8 Installed Charts on the computer (8)

Under "Chart Utilities" field in the "Setup" menu folder a list with chart databases that are installed on the computer is displayed. Mark with a tick in the box next to the databases will be used.



! **NB!** This field does not appear if you have only one char database installed.

- **ENC** : official ENC in C-MAP SENC format
- **World** : non-official C-MAP charts.(CD)
- **Professional +** : non-official C-MAP chart. (DVD)
- **S57** : official charts in S57 format
- **S63** : official charts in S63 format

3.2.9 Alarm Volume (9)

Alarm volume is adjustable by sliding controller in the range between 65 to 90 dBA (only displayed when alarm sound is set to PC speaker or keyboard "TECDIS setup"). It is not possible to reduce alarm volume completely, which would also be against the certification of the equipment and IMO requirements.

3.2.10 Auxiliary (10)

3.2.10.1 Recalibrate the screen

Sets the screen back to the correct calibrated values.

3.2.10.2 Conning Port Mode and Conning back / forward

Control commands to any connected Conning Control Display.

3.2.10.3 Export DB Status

This option is only used in some chart database configurations.

3.2.10.4 F1 and F2 -Key Settings

This option displays F1, F2 key setting dialog box. If a Furuno RCU-018 Control Unit is connected to the chart system, the operator will be able to specify the function that should be connected to the F1 and F2 keys.



F1 and F2 keys can be configured for the following functions:

Function	Description
Scale W 1:100M	Set the chart scale to 1:100M
Scale W 1:20M	Set the chart scale to 1:20M
Scale A: 1:3M	Set the chart scale to 1:3M
Scale B: 1:1M	Set the chart scale to 1:1M
Scale C: 1:300.000	Set the chart scale to 1:300.000
Scale D: 1:100.000	Set the chart scale to 1:100.000
Scale E: 1:30.000	Set the chart scale to 1:30.000
Scale F: 1:10.000	Set the chart scale to 1:10.000
Scale G: 1:3.000	Set the chart scale to 1:3.000
Chart Content	Show chart content for the current chart view (see 3.3.2.)
Chart Basic	Sets the chart view to "basic" mode (see 3.3.)
Chart Selection 1	Sets the chart view to "1" mode. (see 3.3.)
Chart Selection 2	Sets the chart view to "2" mode. (see 3.3.)
Chart Selection 3	Sets the chart view to "3" mode». (see 3.3.)
ESCAPE function	Emulates the "ESCAPE" key on the keyboard.
Insert the manual position	Allows the operator to move the chartdisplay to a specified position (see 4.1.1.)
Next menu page	Switches to the next menu or folder.

3.2.11 Scroll Wheel Zoom (11)

When the "Scroll Wheel Zoom" check box is enabled, the scroll wheel is used to change the operating scale of RCU-018 Furuno keyboard. Panning, using the middle mouse button, is still carried by both M-BPIND-XROHS and RCU-018.

3.3 « Chart »

This menu folder is described in chapter 4.5 and 4.7. Here you set the screen presentation (display).

Some chart databases contains additionally selectable layers. Once such a database is selected for display, it will show a "Layers" button in the menu. Activating this button will open a new window with selectable layers.

In the second lower field, the operator can choose between four different *User Settings* for chart display. "Base" option provides a chart image with a minimum of visible chart objects and possibilities for customization. The options "1", "2" or "3" allows the user to choose which chart objects are visible. Mark (check) the feature for display on the chart.

"?" –chart legend

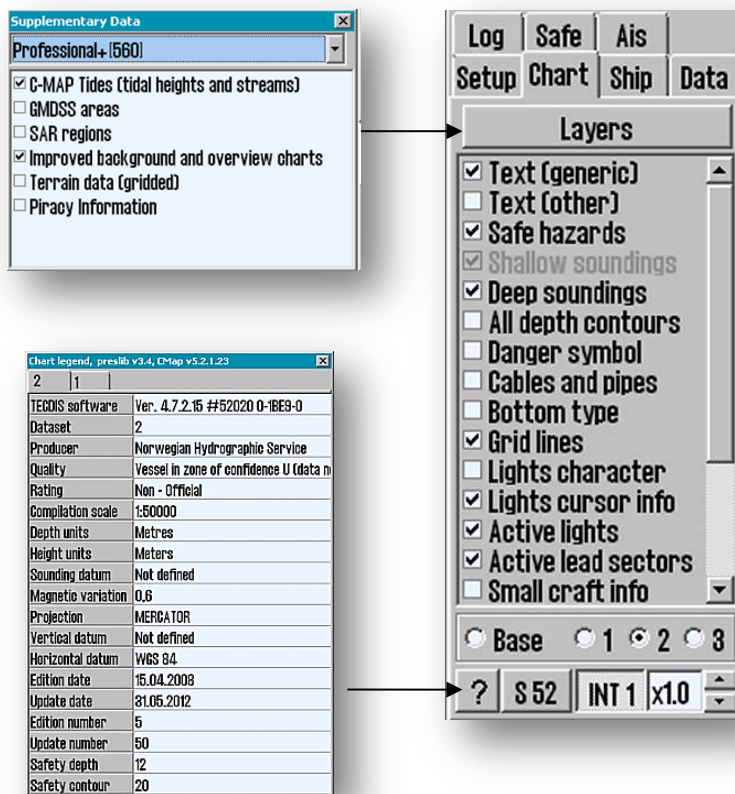


Chart legend, preslib v3.4, CMap v5.2.1.23		
2	1	
TECDIS software	Ver. 4.7.2.16	#52020 0-1BEG-0
Dataset	2	
Producer	Norwegian Hydrographic Service	
Quality	Vessel in zone of confidence U (data n	
Rating	Non - Official	
Compilation scale	1:50000	
Depth units	Metres	
Height units	Metres	
Sounding datum	Not defined	
Magnetic variation	0.6	
Projection	MERIDATOR	
Vertical datum	Not defined	
Horizontal datum	WGS 84	
Edition date	15.04.2008	
Update date	31.05.2012	
Edition number	5	
Update number	50	
Safety depth	12	
Safety contour	20	

"S52" -when activated, is displaying the official chart presentation (standard colors and symbols).



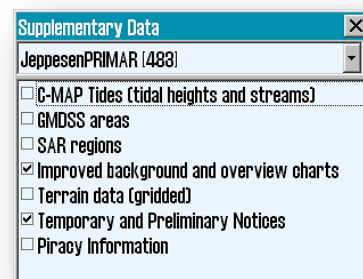
"INT 1" –when activated, is displaying a customized (informal) chart presentation. "Not official view" warning is displayed on the screen.



Arrow keys – user customized size of chart text and objects

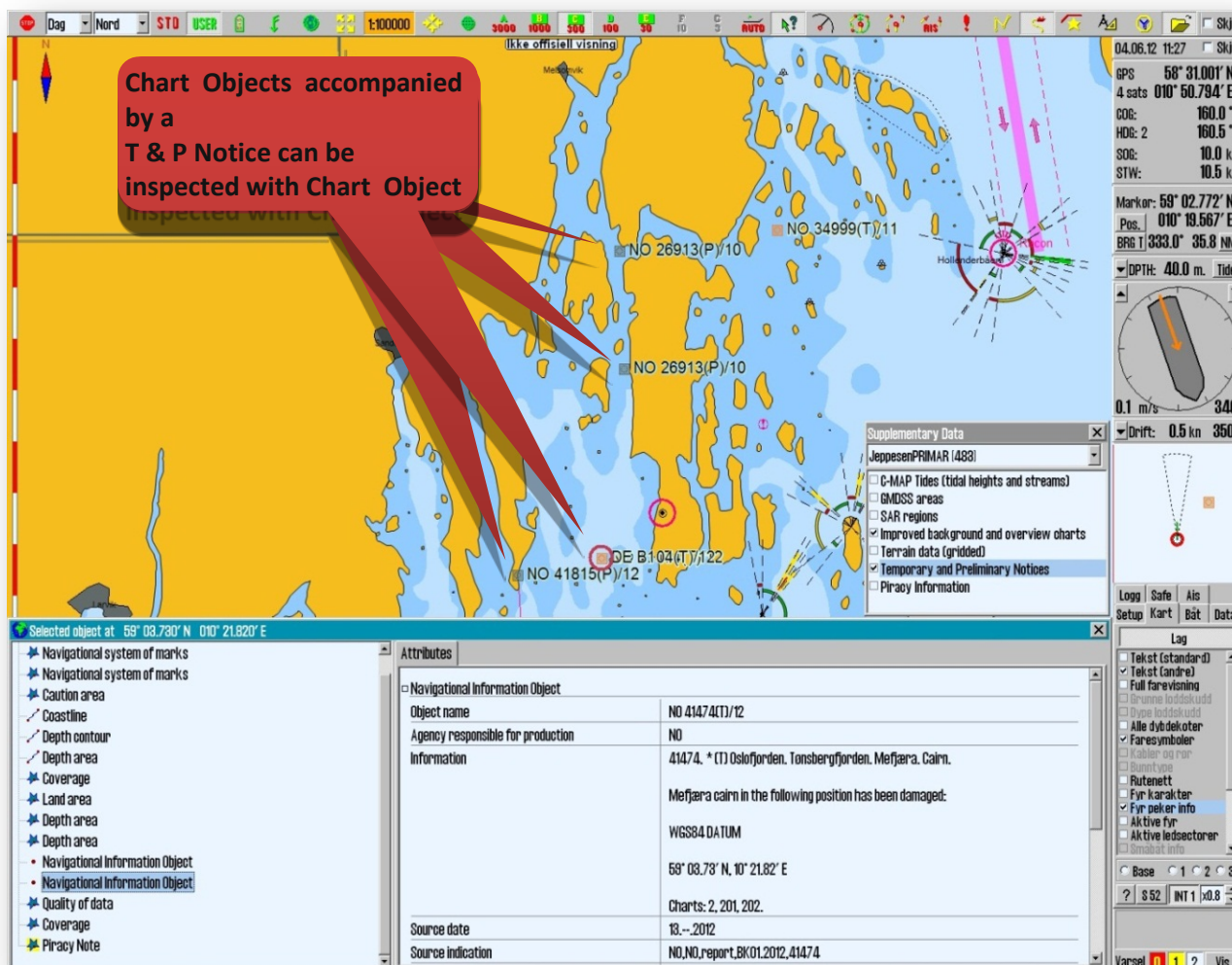
3.3.1 Supplementary Data



"Layers" button opens a new "Supplementary Data" window which enables selection of a new data layer for presentation in the chart. "Layers" button is only visible when the display of chart databases is selected from the Chart Library, and if these chart databases have layers with supplementary data (see section 3.2.7)



3.3.1.1 Temporary and Preliminary Notices


In the database **JeppesenPRIMAR** is a layer that makes it possible to present the "Temporary and Preliminary Notices" on the chart. These data are not part of the normal **ENC Chart Data Layers**, but is still something that navigators have to deal with. Therefore it's a great advantage to have access to this information in electronic format, via update the **JeppesenPRIMAR** Chart Database. This feature is only available from **TECDIS SW ver. 4.7.2.15** and later.



Opens the "Chart Object Inspector" -click on the chart object ( or ) to be examined. The chart object that is selected is displayed on the chart with a red circle around it, and it opens a new "Selected Object" window, as shown in the image above. By enabling "Navigational Information Object", information about chart object is shown in the "Attribute" tab.

"Temporary and Preliminary Notices" appears when "Text (second)" is selected in the "Charts" tab.

3.3.2 Settings Chart View

Function Name	Description
Text (default)	When enabled, displays all the standard text in the chart as countries, cities, islands, and other place names.
Text (other)	Shows chart view informations other than that referred to above.
Full hazards display	Shows the hazards placed (displayed) within safety contour and the isolated dangers placed outside the safety contour, which are deeper than "Safe" depth.
Shallow soundings	Shows soundings shallower than "Safe" depth.
Deep soundings	Shows soundings deeper than "Safe" depth.
All depth contours	Shows all depth contours, even within the safety contour.
Hazard symbols	Sets the rule that all obstacles shallower than safety contour will appear with a special UNDERWATER HAZARD symbol.
Cables and pipes	Shows registered cables and pipelines.
Bottom type	Shows information about bottom types.
Grid	Shows information about chart grid.
Lights character	Shows light character information in the chart.  NB: some lights, for example those with periods longer than 15 seconds, are accompanied with text instead of active blinking.
Light cursor info	Shows lights character information in a textbox when the cursor is placed over a light.
Active lights	Shows lights blinking with right sequence and color, as seen from own vessel.
Active lead sectors	Extension of lead sectors (covering the vessels current position) out from the light ...eng-(<i>When this feature is selected, light lead sectors (white) covering the vessels current position will be extended out from the light.</i>)
Small vessels/boats info	Shows useful information for light and small vessel port info etc.
Simplified symbols	Shows simplified S52 standard chart symbols. (not INT 1)
Chart Quality Labels	Shows labels for quality on chart.
Simple border drawing	In the chart, shows all lines and boundaries as simple lines.
National name	Show the location names in the language the chart was produced in.
Additional info «!»	Marks objects in the chart, with "!", where additional information is available.
All time-limited	Showing all temporary, periodic or otherwise time-limited chart objects, with no link to the current date / time.

3.3.3 Chart Data Information

By clicking on “?” -down left corner in “Chart” menu folder, a new information window is open. There is a tab (folder) for each available chart on display. Area corresponding to each chart is shaded in red on the display.

IHO presentation library version number is displayed as standard text on window’s title bar. (here: "Chart legend, preslib v3.4")

Chart legend, preslib, ver. 3.4		
NO4H0720	NO4N0820	NO4M0820
TECDIS software	ver. 4.7.1.5 #3 0-80-0	
Dataset	NO4N0820.000	
Producer	Norwegian Hydrographic Service	
Quality	Vessel in zone of confidence B	
Rating	Official	
Compilation scale	1:22000	
Depth units	Metres	
Height units	Meters	
Sounding datum	Approximate lowest astronomical tide	
Magnetic variation	0	
Projection	MERCATOR	
Vertical datum	Mean sea level	
Horizontal datum	WGS 84	
Edition date	05.07.2005	
Update date	31.07.2009	
Edition number	4	
Update number	11	
Safety depth	10	
Safety contour	10	

3.4 «Ship»

3.4.1. Ship symbol offcenter

It defines how much of the chart to appear before the own ship symbol. Low value: vessel placed closer to screen center. This function is only active when the *Auto* on the top menu is activated.

3.4.2 Auto Sensitivity

Adjusts the frequency of the automatic chart update.

3.4.3 Viewing the double circle

When selected, the vessel's position is represented by a double circle.

3.4.4 View vessels contour

When selected, the vessel's relative size in comparison to the chart is displayed.

3.4.5 Course Vector

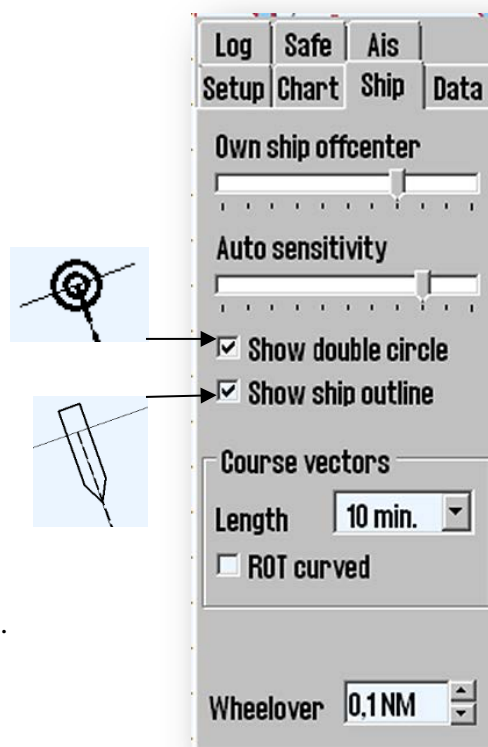
Indicates the vessel's course and speed on the screen (a dotted line in front of the vessel).

3.4.6 ROT curved

When this is selected, the course vector is drawn as an arc when the vessel is turning.

3.4.7 Wheelover

Indicates when (at what distance from the next route leg) should be given a new rudder angle. Important setting for correct Track Control turn behaviour. Select "---" to disable the “Wheelover” view



3.5 «AIS»

3.5.1 Display Filters

3.5.1.1 Range

AIS targets outside the specified range are filtered from the chart display.

3.5.1.2 Track

"Track" specifies the length of AIS target tracks in minutes.

3.5.1.3 All Targets Active

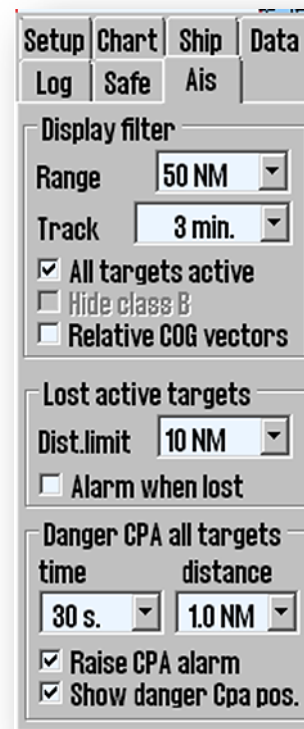
Enables display of all AIS targets with courses COG-vector and tracks. In INT 1 chart presentation can also be seen the vessel's name.

3.5.1.4 Hide class B

"Hide class B" option activated removes the display of all Class B AIS targets in the charts.

3.5.1.5 Relative Course (COG) Vectors

"Relative Course Vector" option makes all AIS targets COG vectors relative to your vessel's movement. AIS target COG vectors have a true course if this option is not selected.



3.5.2 Lost Active Targets

AIS targets within the range specified in the "Area" field is marked with a black cross "+" when the target data ends. If "Alarm when lost" is enabled, this will also provide an alarm.

3.5.3 Danger CPA all Targets

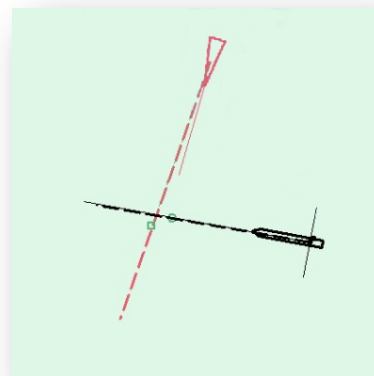
AIS targets which are within the range specified in the "Distance" field, from own vessel's future position and within a time frame specified in the "Time" field, are starting a "Ship CPA" alarm.

"Enabling CPA alarm" is always selected and cannot be changed by the operator. A qualified electrician can set up TECDIS making possible for the operator to clear the "Enable CPA alarm" tick. If "Enable CPA alarm" tick is removed, a warning message is always displayed in the lower right corner of the chart. This mode can be used when navigating in confined waters where additional CPA alarm is triggered very often.

If "Show Dangerous CPA pos." is selected, there are displayed continuously graphic symbols for all dangerous AIS targets. Hazardous targets are shown on the chart, regardless of AIS / ARPA functions settings, and they appear in red until the danger situation is cleared. When "Show Dangerous CPA pos." is selected, the CPA is continuously displayed with a small green circle on its course vector and with a little green square on a crossing vessel's heading vector.

If TECDIS loses the signal from a vessel that have an active CPA alarm, a new alarm will be activated: "Lost CPA" alarm (a "dangerous" vessel has disappeared from the system).

For further description of ARPA and AIS functionality see section 6.4 and 6.5.



CPA alarm disabled

3.6 «Data »

Backing up own data is very important. Individual data important to keep are: routes, tracks, symbols, information and lines / areas. The data backup is done by copying data to hard disk / cd or memory stick for safe keeping. It may also be necessary to copy data from one machine to another, both for backup and daily use.

3.6.1 Function

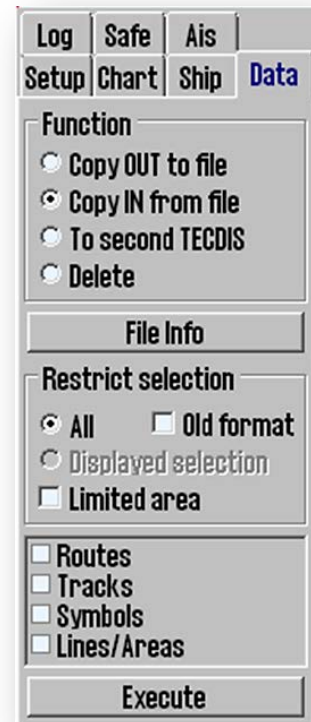
In this field, select the function that is used to copy own data to or from the file on hard disk /CD/ memory stick.

"Copy to other TECDIS" transfers selected objects to a secondary TECDIS device (if connected and configured in *TECDIS Setup*) and will be automatically imported and save therein.



NB: To copy to other TECDIS units, the IP address must be recorded in *TECDIS Setup*.(see chapter 5)

Route and *Secondary Route* is automatically available in the second TECDIS device (when two TECDIS units are connected together). To access the routes, select "Copy IN from file "from the *Function* field, press the "Execute "button and a window will open where the file type and location can be specified.

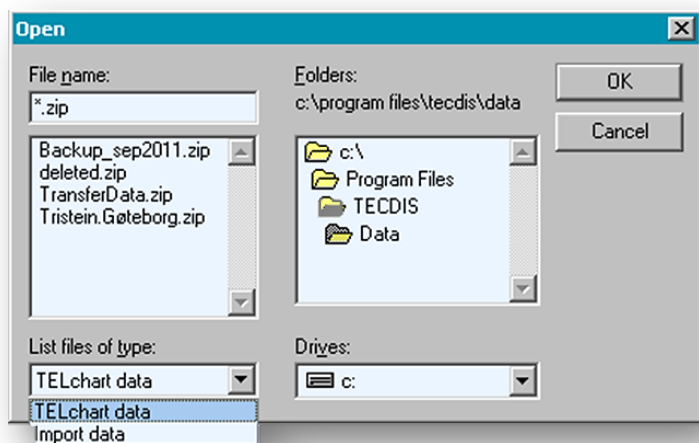


Select *Import data* file type and then select *Received Primary Route* or *Received Secondary Route* from the *File name* field.

The "File Info" button allows inspection of a backup files. The number of routes, lines, areas, symbols, etc. present in the backup file will be reported.

3.6.2 Restrict Selection

Contents of this block varies, depending on selected function.



"All" option includes all relevant data from the file location as specified. A date can be specified with some options, then all data on the specified date will be handled. "Limited Area" option includes all data within a rectangle drawn on the chart when the option is checked. With the "Display Selection" option, only the selected data, displayed in the chart, can be copied.

If it has been stored, copied out / in data from TECDIS vers 4.7.1.10 or earlier, the box for "Old Format " must be unchecked for the data to be read it by the newer version of TECDIS SW. The wrong choice in this box will result in an error, and should be changed before retry.

3.6.3 Execute

To start the function selected in the "Function" field, use "Execute " button at the bottom of the menu.

3.6.4 Route Synchronization

TECDIS can transfer /copy routes, from primary to secondary TECDIS unit and vice versa, in two different ways. Both methods allows the operator to retrieve a planned, active route (for the current voyage) on the secondary TECDIS unit if the primary TECDIS unit fails.

For this to work the following must be ensured:

1. *TECDIS Setup* field "*Data Export IP*" must contain the IP address of the other TECDIS unit. (See section 7.3).
2. TECDIS units must use the LAN adapter, intended for TECDIS network and both devices must be connected to a network switch.



NB! Do not use crossover cable directly between TECDIS units.

3. LAN adapter used for connecting the TECDIS units should not be reconfigured to use an IP address outside **172.31.xxx.xxx / 255.255.0.0** subnet.



NB! The method for Automatic Route Transfer is added to TECDIS unit program manufactured after November 1, 2008.

3.6.4.1 Basic Method

When the *Basic Method* is used for Route Synchronization and a Route is active on one or both TECDIS units, a chart-backup route is imported /copied to the other TECDIS unit. This backup route is not automatically included in the route list on the receiving TECDIS unit, but it can be imported, after needs.

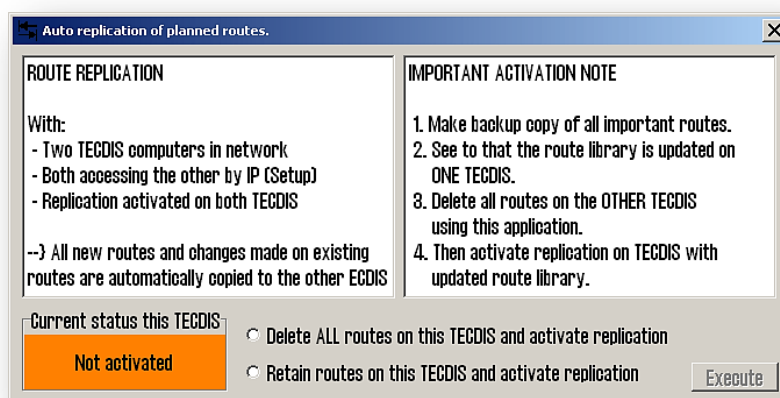
The following routes can be imported from the "*Data*" directory (C: \ Program Files \ TECDIS \ Data):

- Primary Route "*ReceivedPrimaryRoute.lst*"
- Secondary Route "*ReceivedSecondaryRoute.lst*"

To import /copy a route, select "*Copy IN From File*" feature, and select "*Import data*" file type and then select "*ReceivedPrimaryRoute*" or "*ReceivedSecondaryRoute*" from the "*File name*" field.

3.6.4.2 Automatic Method (Replication)

When *Automatic Replication* is enabled, then all the new routes, changing routes and routes deleted automatically, are reflected to the other TECDIS unit. The result is that the routing databases are identical on both TECDIS units.



Enabling Automatic Route Replication

To enable Automatic Route Replication:

1. Verify that the requirements for this feature are met in accordance with the above.
2. If there are routes on both TECDIS units, so choose on which TECDIS unit the routes should be preserved and on which TECDIS unit the routes will be deleted.
3. Insert service key on both TECDIS units and shut down the chart program to return to Windows.
4. Run "*C:\Program Files\TECDIS\Replication.exe*" on both TECDIS units.
5. On the TECDIS unit which routes should be retained, select "*Retain routes on this TECDIS and activate replication*" and press the "*Execute*" button.
6. On the TECDIS device which routes should be removed, select "*Delete ALL routes on this TECDIS and activate replication*" and press the "*Execute*" button.
7. Remove the service key from both TECDIS units and reboot the system..

After both TECDIS units are again operational, all the routes from the unit where the routes were kept will be automatically transferred to the other TECDIS unit. All further route changes will automatically be reflected to the other TECDIS unit.

Disable Automatic Route Replication

To disable *Automatic Route Replication*:

1. Set in the service key in both **TECDIS** units and shut down the chart to return to Windows
2. On both **TECDIS** units delete "*C:\Program Files\TECDIS\SetRtReplicateActive.txt*" file.
3. Remove the service key from both **TECDIS** units and reboot the system.

3.7 « Log »

TECDIS stores data for position, course and speed of a vessel, ARPA and AIS targets, every minute. History from a specified date can be displayed in several ways.

3.7.1. Log text

"*20 min*" button opens a list of position, course and speed for every twenty minutes for the date selected in the upper field.

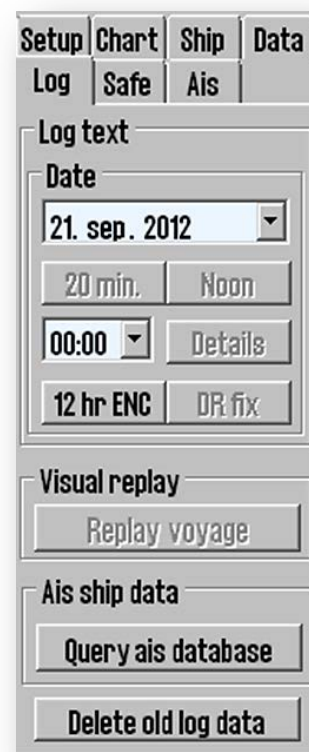
"*Noon*" button opens a list of position, course and speed for each hour, from 12.00 the previous day to 12.00 the day selected in the upper field. For every 4 hours is displayed sailed distance ("*Distance Watch*"), and on the bottom appears total sailed distance ("*Distance total*").

"*Details*" button opens a window with a detailed log of the hours, beginning with the time set in "*00.00*" field.

The log contains detailed information for every minute, of vessel's position, course and speed, on the chart display that is used:

- the chart center and the scale are represented by a cross if Auto Modus is active;
- the type of chart used ("*ENC*", "*S52*");
- if the Primary Position Source was used ("*PRI*");
- if the GPS position encoder was ok ("*X*");
- if the position was corrected manually, it is shown on a separate, third line ("*Offset*"). See illustration.

"*12.t ENC*" button shows what kind of chart data has been displayed on the screen, every minute in the last 12 hours.



"DR fix" button is active and selectable if L.O.P. functionality was used to determine the position on the selected date. Clicking the "DR fix" button, opens a log of completed performed positional decisions, with all associated observational data.

All log files can be saved or printed.

time	Lat.	Lon.	Crs.	Hdg.	Spd.
center	Lat.	Lon.	Scale	Auto ENC	S52 Pri GPS
15:00	59°02.037'N	010°28.948'E	150.0°	150.6°	9.5 kt
chart	59°00.654'N	010°30.990'E	1:30000	X X X	X X
offset	00°00.046'N	000°00.173'W			
15:01	59°01.900'N	010°29.101'E	150.0°	150.6°	9.5 kt
chart	59°00.654'N	010°30.990'E	1:30000	X X X	X X
offset	00°00.046'N	000°00.173'W			
15:02	59°01.763'N	010°29.255'E	150.0°	150.6°	9.5 kt
chart	59°03.058'N	010°22.925'E	1:15000	- X X	X X
offset	00°00.046'N	000°00.173'W			
15:03	59°01.626'N	010°29.409'E	150.0°	150.6°	9.5 kt
chart	58°45.495'N	009°52.371'E	1:300000	- - -	X X
offset	00°00.046'N	000°00.173'W			
15:04	59°01.442'N	010°29.737'E	150.0°	150.6°	9.5 kt
chart	59°00.120'N	010°31.460'E	1:30000	X X -	X X
15:05	59°01.305'N	010°29.891'E	150.0°	150.6°	9.5 kt

3.7.2 Visual Replay

"Replay voyage" button opens a "Replay" window where earlier voyages log data can be simulated on the chart showing own ship, AIS and Arpa Target position for the date and time specified.

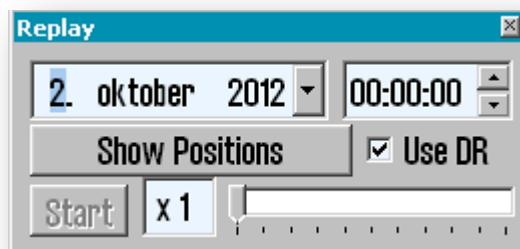
"Show Positions" button, opens the view of the situation on the chart, as it was at the chosen time.

"Start" button starts replaying the situations, as specified in the log, with 1 minute interval.

"Use DR" option allows Dead Reckon Mode for positions between each saved minute and vessels will be shown with new calculated positions every second.

Replay speed is set with the slider at the bottom of the window.

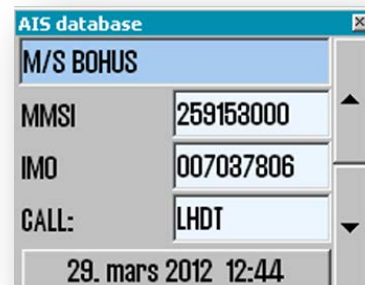
Click on "Replay voyage" button again to stop the playback of a certain earlier plot and return to the present situation.



3.7.3 AIS ship data

"Query AIS database" button opens up the possibility to make queries against a vessel database where all previously received AIS targets are stored under a name and registered with MMSI, IMO, Call Sign, and date of last reception from the vessel. Enter the name of the vessel when the window is opened, then click on the "Enter" button. Last date for stored location is displayed on the Date button. Clicking on this button the situation is displayed on the chart and "Replay" window opens automatically. Replay of the situation can also be started from the "Replay" window as described in section 3.7.2

Click on "Query ais database" button again to close the "AIS database" window and return to the present situation.



3.7.4 Delete Old Log Data

"Delete old data" button deletes log data older than a year if the deletion is confirmed in the subsequent "Delete log files older than one year" window.

3.7.5 Screenshots

Display screenshots from TECDIS can be generated at any time by pressing "Ctrl" + "Alt" and "PrtScrn" buttons simultaneously or "AltGr" and "PrintScrn". A copy of the screen is automatically saved with a file name that is generated from the year-month-date-time-second (YYMMDDHHMMSS), and is available in "C:/ Program Files / TECDIS / Screens" file.

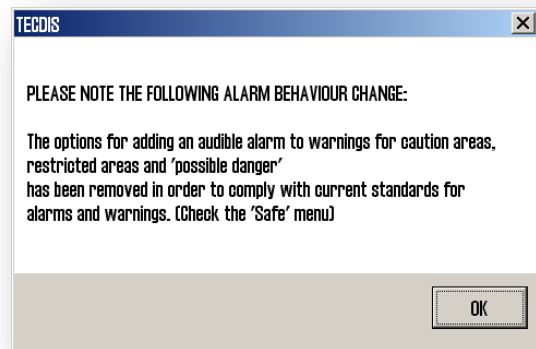


3.8 «Safe » (safety settings)

3.8.1 Safe dpt, Shallow, Deep

Starting with version **TECDIS 4.1.7.15** the settings for alarm sounds are operated in "Safe" – "Alarm" field. Be informed that, in older TECDIS programs which were up gradated to **TECDIS SW 4.7.1.15** or newer, the "Restricted Area", "Caution Area" and/or "Potential Danger" fields, are disabled and a message window, will appear informing that the alarm settings are changed.

The message appears on the first boot and it looks like this: →



older version



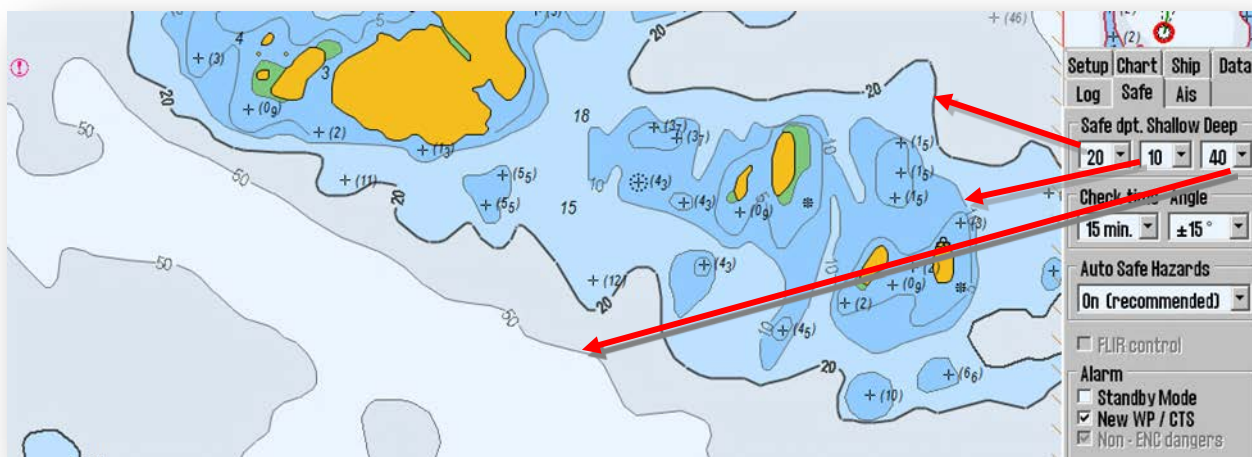
TECDIS 4.1.7.15 version

When TECDIS starts is checking the maximum draught from **TECDIS /TELchart ECS Setup** → "Specification" → "Ship size (m)" → "Draught max"- settings and automatically correlate this value with the **TECDISchart** "Safe" → "Safe dpt" parameters.

The value in **TECDIS chart** "Safe" → "Safe dpt" is always equal or greater than the value registered in **TECDIS /TELchart ECS Setup** → "Draught max". "Safe dpt" field values can be changed manually, but not to a value lower than the one that is set as "Draught max" in **TECDIS /TELchart ECS Setup**.

The "Safe dpt" also specifies the minimum depth for the "Safety Contour". All areas of the chart that are shallower than the specified depth ("Safe dpt." field), are marked with a light blue color and highlighted contours. Similarly, the depth of the "Shallow" and "Deep" areas are defined: "Shallow" areas are colored in dark blue color, while "Deep" areas are colored in a light gray color.(see fig.)





Any chart element shallower than the specified value in "Safe" field, will generate an anti-grounding alarm, when the chart element is within values specified in "Check Time" field and "Angle" field.

⚠ NB! When the Depth Contour of the selected Safe Depth is not found in the chart data, the next and deeper Depth Contour will be selected.

Some charts areas may contain partial data, and although some Depth Contours that are not 'closed', are displayed on the chart, they will not be used as Safety Contours.

3.8.2 Check time and Angle (anti-grounding parameter)

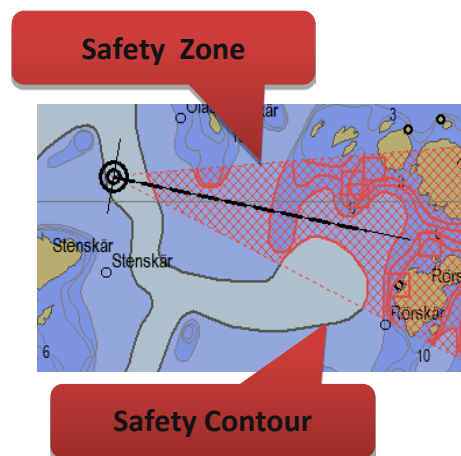
The specified values indicate a safety zone in front of the vessel where dangerous objects (elements) will generate an alarm.(see chapter 5.6)

3.8.3 "Auto Safe Hazards"

"Auto Safe Hazards" settings determine how TECDIS indicates danger objects within the *Safety Contour*, during an anti-grounding alarm situation. When an anti-grounding alarm situation occurs, this setting will determine if "Safe Hazards" and "Shallow Soundings" functions (see chapter 3.3)from "Chart" menu, should be activated or not.

Available settings in "Chart" menu:

- **Disabled** - "Safe Hazards" and "Shallow Soundings" functions: this option gives the possibility to manually display the hazard situation /objects (the functions are not activated automatically).
- **On** (recommended)- "Safe Hazards" and «Shallow Soundings" functions: this option automatically activates the functions when an anti-grounding alarm is triggered; must be disabled manually when danger situation is clarified.
- **On and Off**- "Safe Hazards" and "Shallow Soundings" functions: this option automatically activates the functions when an anti-grounding alarm is triggered and automatically reset when anti-grounding alarm was clarified.



3.8.4 FLIR Control

"FLIR Control" port is set up in **TECDIS /TELchart ECS Setup**. When activated in "Safe" menu, a *FLIR* symbol appears at the end of a vector that starts in Conning position. The operator can control *FLIR* by putting the cursor over "*FLIR*" icon and right-click; "*FLIR*" symbol is highlighted with bold, and now follows the cursor movements on the chart, while *FLIR* unit is controlled to the same position.

FLIR can now be locked into a fixed position on the chart, such as a pillar, a rock/reef or similar, by putting "*FLIR*" symbol above the desired position and right-click. In addition, the "*FLIR*" symbol placed over an ARPA or AIS target will be locked in that position and will follow target.

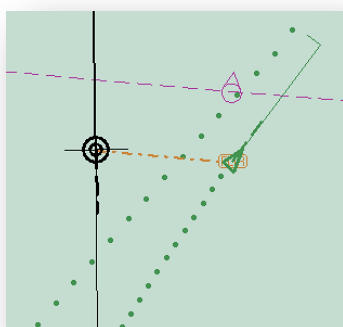
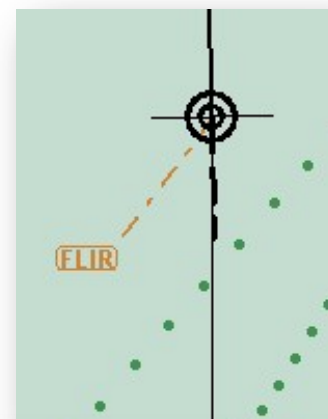



Fig.1. "FLIR" symbol locked to a ARPA or AIS target



Fig.2."FLIR" symbol locked to a fast position

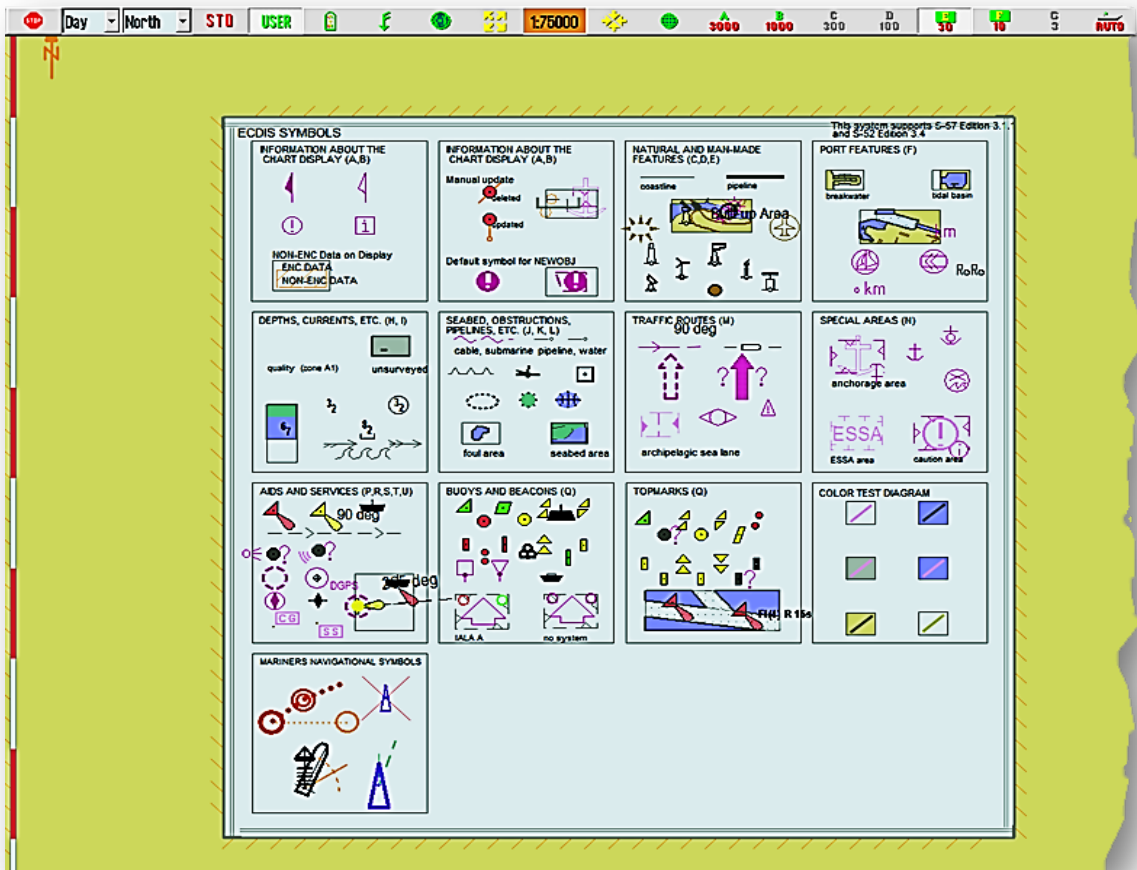
3.8.5 Alarm

The operator can choose some of the alarm functions (see chapters 5.3.5 og 5.5)

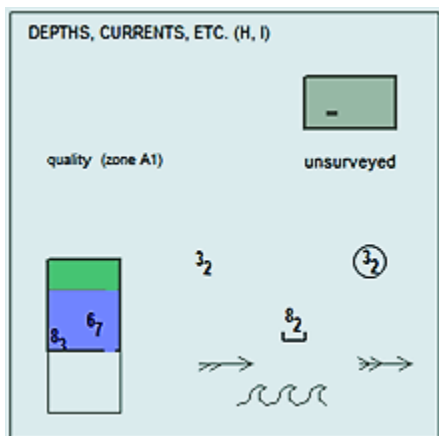
Function Name	Description
Standby mode	<p>This mode is available only if the installer has opened for operator the selection of "Standby mode".</p> <p>When this option is selected, no audible alarms are triggered. It displays just a large warning notice in the lower right portion of the chart.</p> 
New WP/CTS	<p>When the vessel is approaching a new waypoint (WP) on active sailing route, an alarm is triggered when the Wheelover line is crossed.</p>
Non – ENC dangers (informal hazard check)	<p>When ENC charts are available, Anti-grounding System and Route Check will always verify ENC data. By selecting this option it is possible to verified unofficial chart data, there where is no ENC chart coverage in the control area. When this option is enabled, the Route Check will trigger an alarm both from ENC and unofficial chart data.</p>

3.9 IHO Presentation Library Index

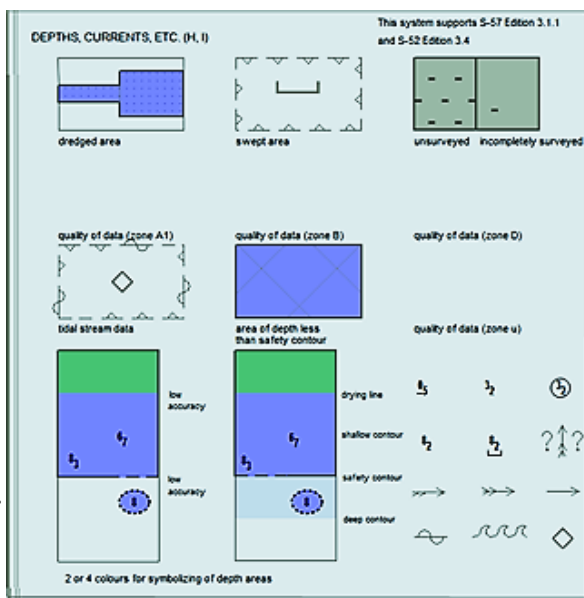
IHO Library Index provides an informational overview over all ECDIS symbols and test images. The Library Index is open with key combination *Ctrl +Alt +Shift +T*. From the keyboard "0" to "9" keys display pages with symbols in Library Index. Also, by zooming in /out with right and left mouse buttons, the display of Library Index widow can be adjusted for summary and detail viewing.




Summary view of Library Index



Ex. Summary view - Zoom OUT (right click)



Ex. Detail view - Zoom IN (left click)

For a description of various symbols use "Chart Object Inspector" button  from the Main Toolbar (the Main toolbar does not appear when the Library Index opens, but is visible when the cursor moves to the top of the screen). Click on "Esc" key to exit Library Index. Version number of the Library Index is obtained by clicking Chart Legend button "?: "Tool menu folders", "Chart", "??" (see chapter 3.3).

3.9.1 Monitor Calibration

All information in electronic chart display must be clearly visible. To ensure this, the monitor must be customized to show the correct colors. This is especially important for night viewing, when the display lighting is reduced.

! Remember to test the colors even at evening and the night view!

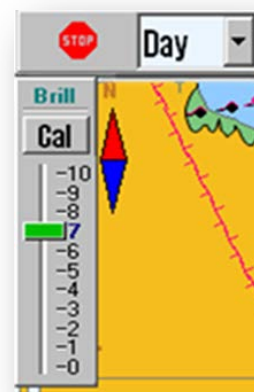
ECDIS test images for monitor calibration is located in the *IHO Library Index*. Open the IHO Library Index with "Control + Alt + Shift + T" key combination and then select the test diagram by pressing "A", "B", "C", "D", "E" or "T" key on the keyboard.

3.9.1.1 Contrast and Brightness

Check the monitor's contrast and brightness by opening the test diagram "E", and verify that the gray box is visible.

Furuno monitors cannot be operated by buttons with the screen in ECDIS mode. All controls of the backlight on the Furuno monitors, is performed from TECDIS via serial cable connected to the monitor. Backlighting is controlled by a new slider which appears next to «Day / Evening / Night" option, when operating the "Day / Evening / Night" function.

This control provides a scale - "Calibrated" - with an indicator for different intensity levels for "day / dusk / night». Inside the correct intensity values, for day, dusk or night, the scale indicator is green, respectively outside the calibrated value the indicator is red. Backlight display can also be adjusted with the "AC Rain" control on the **Furuno RCU-018** keyboard.



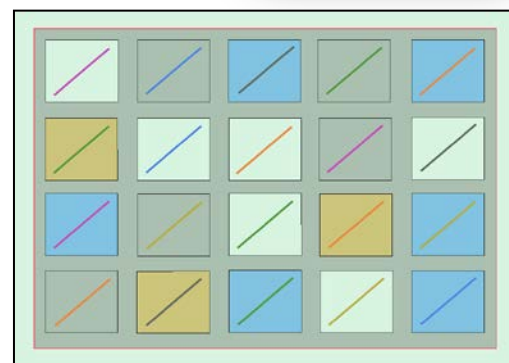
3.9.1.2 Colors

Check the monitor's color by opening the test diagram "T". This is a color test - graph. Check that all the diagonal lines are clearly distinguishable from the background:

- 3 yellow diagonal lines
- 4 orange diagonal lines
- 3 magenta diagonal lines

- 4 green diagonal lines
- 3 blue diagonal lines
- 3 gray diagonal lines

Control the visibility of each color in the test diagrams "A" to "E". If the monitor fails this test, no longer satisfies the color calibration requirements for the use of ECDIS and must be evaluated by qualified personnel to be adjusted, repaired or possibly replaced.



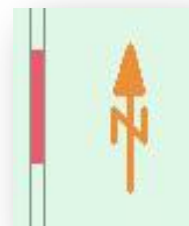
! NB. If the monitor settings have been changed manually in the monitor's Setup Menu, or to make sure that the correct values are used, this can be done from the "Setup" menu folder "Auxiliary" field and select "Recalibrate screen."

Chapter 4 Chart Display Area

The following items are always visible in the chart:

- North arrow indicates the north of the chart when the chart is rotated.
- Scale ruler along the left edge of the chart.

Scale ruler change the color and the distance between color shifts (unit) depending of the scale intervals:



Scale Intervall	Color	Unit
1:1 – 1:7500	Yellow /White	0,1 Nm (0,1')
1:7501 – 1:100 000	Red / White	1 Nm (1')
1:100 001 – 1:2 000 000	Black/ White	10 Nm (10')
1:2 000 001 – 1:100 000 000	Blue/white	60 Nm (1°)

If the generation of a new section of the chart takes 6 seconds or longer, an indicator appears in the upper left corner of the chart showing how long time (seconds) it takes to produce this new chart section. This indicator will only show up on the chart with extreme density information.



4.1 Center the Chart

Move the marker to desired chart center and click the middle mouse button/mouse scrollweel. The chart will then move its center to the point where the marker is. Zoom in with the left mouse button, and zoom out with the right mouse button.

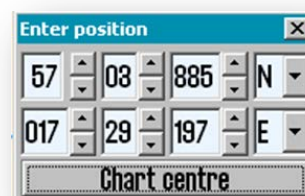


When the marker is moved to the edge of the chart it changes in to an arrow. This feature enables to move the chart horizontally and vertically by clicking any mouse button.

The arrow keys on the keyboard can also be used to move the charts. By pressing the "Home" key the chart will automatically return to own vessel's position.

4.1.1 Set the Chart Center to a Given Position

The chart center can be moved to a specified position by pressing "Pos." button in the *Sensor Data*. In the window that opens, in the upper left corner of the chart, apply the desired position in the fields. "Insert" key on the keyboard will also open this window. Once the desired chart center is entered, click on "Chart Center" button to move the chart and mark the position. This feature is also useful when loading objects (symbols, lines, highlights) in certain positions. When the symbol, line or highlights is chosen and the color is determined, set the desired position and click the "Chart Center" button. Click again on the same button, now called "Save" and click "OK" button to exit the window exit the window.



4.2 Changing the Scale

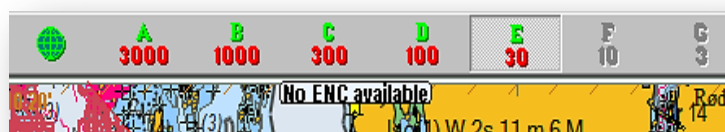
4.2.1 Zooming with Automatic Chart Scale

Zooming is performed easily by pressing the left mouse button to zoom in and right mouse button to zoom out. Does the trackball / mouse have a scroll wheel, this can also be used for quick zooming if enabled in "Setup" menu. The center of the new chart (after zooming) is determined by the cursor position (before zooming).

Alternatively keyboard "+" or "Page Down" keys can be used to zoom in and "-" or "Page Up" keys to zoom out. The program automatically selects the appropriate chart type for new standards. The cursor is now moved to chart center.

4.2.2 Manual Selection of Chart Scale

From the *Main Toolbar*, the *Chart Scale* is directly selected by clicking on one of the scale buttons. The numbers indicate the scale x1000. Alternatively, the *Chart Scale* is selected directly from the keyboard by typing the corresponding letter to the desired scale ("W", "A", "B", "C", "D", "E", "F" or "G" – key)



When the letter on the individual scale buttons are highlighted with yellow text and green background, this indicates that the official charts are available at this level. These official charts will always have priority. If the system is in *Auto*, the scale values of the own vessel position is applied and the manually adjustment is applied for the screen center. When own ship is outside the current chart display, the standard buttons indicate the scale for the chart in the center of the screen. The button that shows the current chart level is highlighted as being selected.

From the *Toolbar* are also displayed text alerts, in the following situations:

- No ENC available
- Better ENC available
- No chart available, consult a paper chart
- Not official presentation
- Over Scale

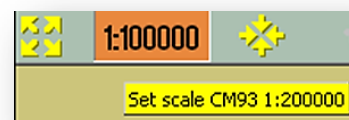
4.2.3 Zooming without changing the chart scale



Zoom buttons on the *Main Toolbar* are used to change the scale of the displayed chart.

"Zoom In" or "Zoom Out" buttons, operated with left mouse button, will automatically change the chart so that the details retrieved from the *Chart Database* are suitable. By using right mouse button the initially chart details, retrieved from the same *Chart Database level*, are retained on the chart. The number in the middle shows the current scale.

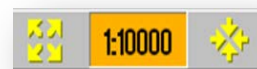
When hovering the cursor over the "Set scale" field, a yellow Tooltip line appears with the chart's original scale info. By clicking on the "Set scale" field, it sets the chart display to this scale.



NB! This function can be overridden by charts from a different database. TECDIS uses several types of charts, but will always give priority to the official ones.

4.2.4 NB! Over Scale

When the smallest scale available in the *Chart Database* is reached, it still can be zoomed into the chart, but this is just a graphical enlargement and no further details will be displayed in the chart. Any errors will be magnified along with the chart. The “*Set scale*” field will turn orange when working on over scale.



4.2.5 Additional marking when working over scale

When only parts of the chart are over scaled, these parts will be marked with vertical lines.

4.2.6 Under scale



When zooming out, the chart can be displayed in under scale. In this case chart data may be too crowded or not visible. The “*Set scale*” field will turn green when working on under scale. Under scale marked by the field that indicates the currently selected scale is green.

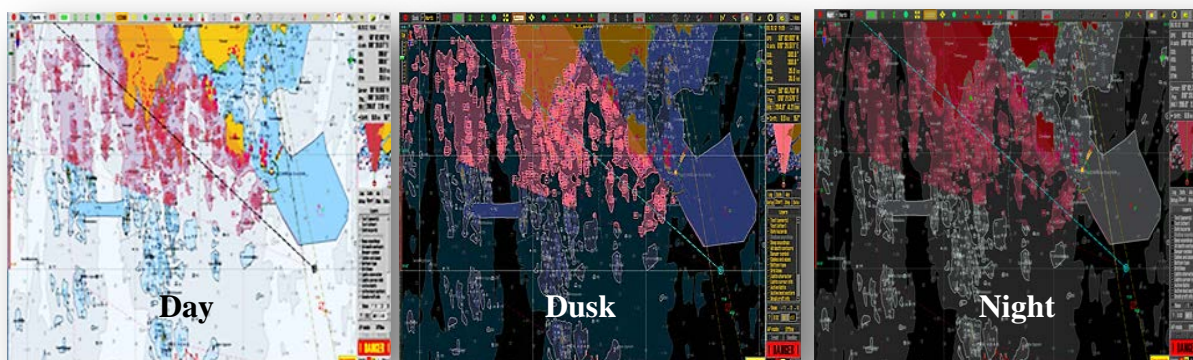
4.3 Light setting – “Chart palettes”



The chart colors can be adjusted for different lighting conditions. The button controlling the light settings can be fined to the right of *Exit* button on the *Main Toolbar*. Pressing the text or the arrow, a drop down menu will be displayed. Select the lighting that fits the conditions, with the left mouse button. The selected setting is visible in the field to quickly to see which mode is selected.

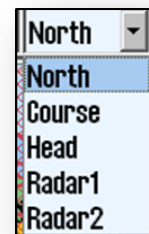
⚠ NB! For optimal lighting, also the monitor must be adjusted for brightness and contrast.

If the screen is too dark, this can limit the visibility, particularly through the use of evening and night settings (see chapter 3.9.1). The brightness control has a marking for a calibrated value.



4.4 “Chart Orientation”

The “Chart Orientation” can be selected from a drop down menu situated on the right side of “Chart Pallets” on Main toolbar.



NORTH stands for "North Up" and it means that the North will always be at the top of the screen, regardless the own vessel's course.

COURSE stands for "Course Up" and it means that the own vessel's course, at the selected time will be orientated towards the top of the screen. It will have the same orientation even if vessel is changing the course.

HEAD stands for "Head Up" and means that the vessels heading always will be towards the top of the screen. The vessel will have a fixed position on the screen, while the chart image is changing (relative motion).

RADAR means that the orientation always will follow the connected radar. If range or orientation on the radar is changed, than the orientation and scale will be changed on the TECDIS system accordingly.

4.5 Own Vessel's symbol - placement on the chart

The vessel's location is indicated on the chart by an icon according to the settings made in "Ship" menu (see ch. 3.4 and ch.2.4 for illustrations). If both, the *double circle* and the *vessel contour* are selected, the system will automatically choose which of the two symbols will be displayed. When the vessel symbol is too small, it will be automatically switch to *double circle* symbol, and the when a better scale is used, the graphic representation is switched to *vessel contour* symbol. In all *Chart Orientation* modes, except "HEAD", the chart will be 'fixed' on the screen while the vessel is moving (**true motion**). In the "HEAD" mode, the vessel will have a 'fixed' position on the screen while the chart image is moving (**relative motion**).

Own ship offcenter: location of own vessel on the screen.

-High value (move slider to the right): the vessel symbol is placed closer to the chart edge.

-Low value (move slider to left): the vessel symbol is placed closer to the screen center. This function is active only when the *Auto* function is enabled.

Auto sensitivity: how often the chart will change.

-High value (move slider to the right): the chart image changes frequently.

-Low value (move slider to left): the chart image switches rarely.

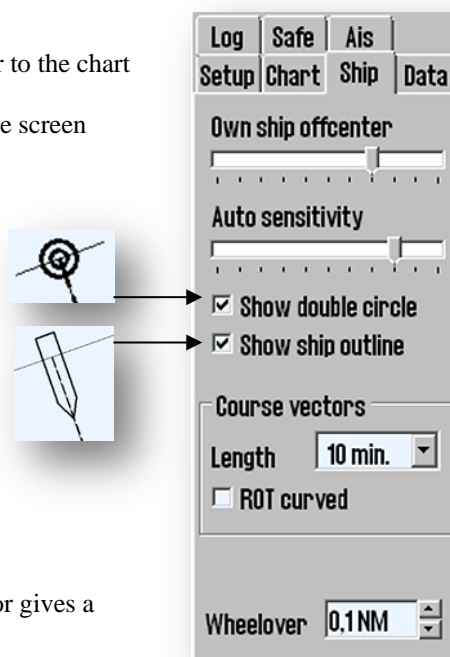
Show double circle: selecting this option, the vessel is displayed as a double circle icon which have the same size regardless of chart scale, unless the vessel contour symbol is displayed.

Show ship outline: selecting this option, the own vessel is displayed in the true size related to chart scale.

Course vector: is setting the length vector for own and other vessels. The length of the vector is relative to the COG.





ROT curved: showing planned course with ROT curve, the course vector gives a correct representation of where the vessel will move in steady turn.

Wheelover: distance from Waypoint. Cange course warning alarm. New leg steering information to autopilot.



4.6 Automatic Chart Centering

TECDIS can automatically ensure that the chart is oriented so that own vessel always is visible (the chart is moving according to the vessel). This function is activated by clicking on the "Auto" button on the *Main Toolbar* or the "Home" key on the keyboard or with the cursor by clicking anywhere in the "Sensor Data for nav." field in the *Vertical Menu* (info field). "Auto Sensitivity" (how often the chart will change) and "Own ship offcenter" (location of own vessel on the screen) can be adjusted in the menu folder "Ship". Select chart scale on the menu bar (this will not abort auto mode).

	Auto chart switch is 'Off'.
	Auto chart switch is 'Off', but Auto function will remain active when zooming with mouse clicks in the chart area.
	Auto chart switch is 'On' until zooming with mouse clicks in the chart area.
	Auto chart switch is 'On', and will not be deactivated when zooming with mouse clicks in the chart area.

Setting the Chart Scale and zoom level by using the "Zoom" buttons on the *Main Toolbar*, will NOT turn off Auto mode. Locking the "Auto" function: click "Auto" with the right mouse button.

4.7 Chart presentation

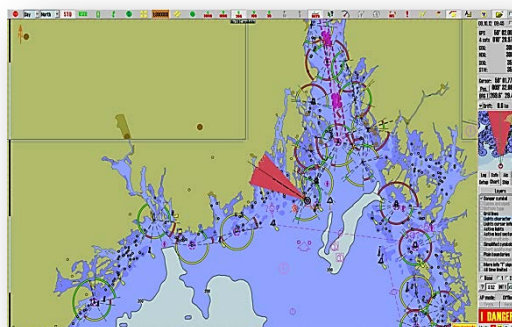


Using the two buttons "STD" and "USER" one can easily choose (or switch between) two types of chart presentations: ECDIS standard or custom.

4.7.1 STD mode

STD is the official standard **ECDIS** presentation, **S52**. This is a standard set by the IMO, with certain colors, symbols and content. *USER* configures the custom *INT1* chart presentation. Clicking on "STD" button sets presentation to IMO defined standard and activates the Auto-function (chart at vessel position is shown).

STD S52



USER INT1



4.7.2 USER mode

“USER” mode configures the custom chart presentation.

Settings are made in menu folder “Chart”.

(Click on the *Tool Menu Folder* icon , situated to the right in the *Main Toolbar*, and open “Chart” folder in the lower right corner of the screen).

The large folder field contains all the options for what can be displayed on the chart; select/deselect the marking box to display/hide the object or feature.

In the second line from the bottom (1), there are four different sets of custom information standards.

“Base” utilizes minimum of chart information to be displayed.

Include information that is shown/hidden in the chart by checking/unchecking the box next desired setting,

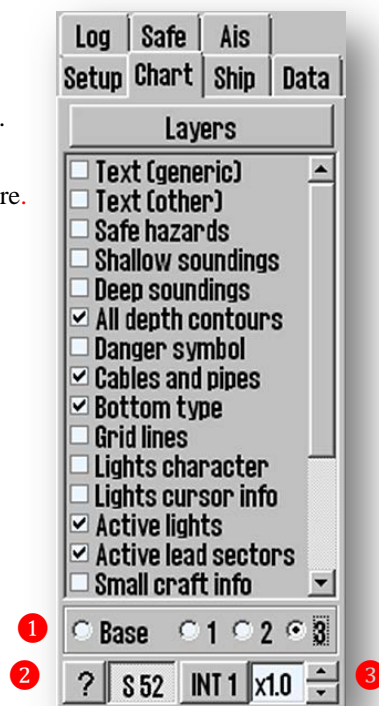
See chapter 3.3.2. for a description of the different settings.

In the bottom line (2), you can choose whether to use the *S52* or *INT 1* presentation. (See illustration description *STD* above).

Using *INT1*, a warning is given: “Not official presentation”.

The buttons on the far right (3) determines the size of the text and symbols.

Reset the size to 1.0 by clicking on *STD* button.

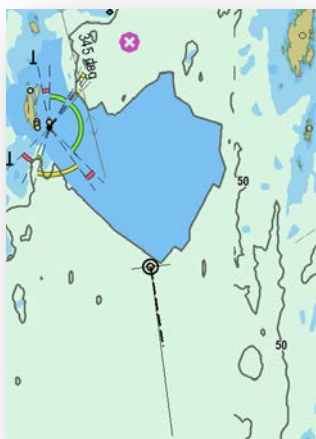


4.7.3 Safe Hazards

Activating the “*Safe Hazards*” the system displays on the chart the hazards/dangers within safety contour and isolated hazards/dangers outside the safety contour, which are deeper than the specified safe depth. In standard mode (*STD*), this feature is turned off by default, but it can be activated from the *Chart* menu folder.

The system can automatically enable the display of *Safe Hazards* and *Shallow Soundings* during anti-grounding alarms. See chapter 3.8.3 for details.

The setting “*Danger Symbol*” marks any hazard on the chart with a danger symbol. This setting is active by default in *STD* mode and when the “*Safe Hazards*” is activated in *STD* mode, all risks (including those within safety contour) are marked with danger symbols.

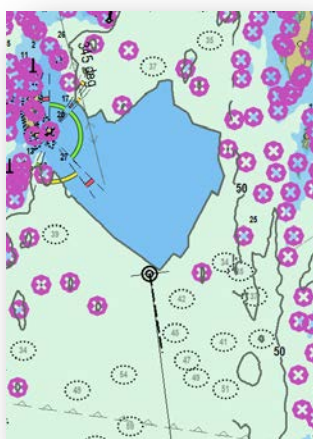


Safe hazards OFF
Danger symbol ON

Dangerous objects outside safety contour are displayed with danger symbol.

Dangerous objects within safety contour are **not** displayed.

Hazards deeper than safety depth are **not** displayed.

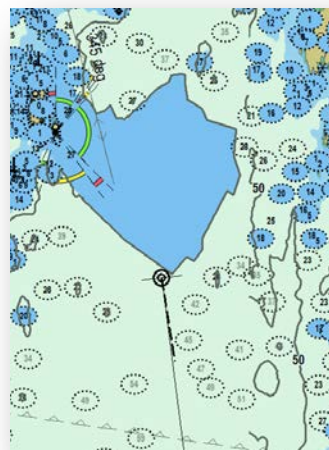


Safe hazards ON
Danger symbol ON

Dangerous objects outside safety contour are displayed with danger symbol.

Dangerous objects inside safety contour are displayed with danger symbol.

Hazards deeper than safety depth are displayed normally.



Safe hazards ON
Danger symbol OFF

Dangerous objects outside safety contour are displayed normally (with black text).

Dangerous objects within safety contour are displayed normally.

Hazards deeper than safety depth are displayed normally (with gray text)

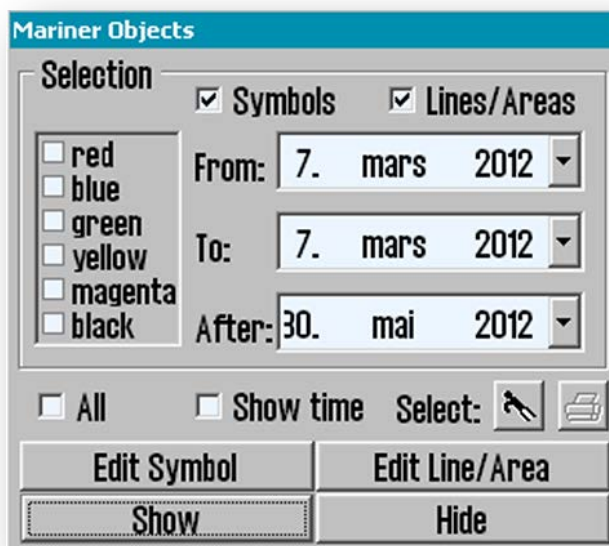


NB: In *STD* mode, hazards deeper than the safety depth are not displayed, regardless of “*Safe hazards*” settings!

4.8 Symbols /"Mariner Objects"



One can easily insert custom symbols and custom drawings in TECDIS chart display; by selecting the "Symbols/Lines/Areas dialog" icon, from the *Main Toolbar* (or the "F7" key on the keyboard) which opens "Mariner Objects" window. From here you can edit, select and add different objects (symbols, lines and areas) that will be displayed on the chart. It is also possible to filter previously entered objects on a time line and by color. These graphic representations are generic called *Mariner Objects*.



4.8.1 Selecting and displaying objects (symbol, line and area)

Mariner objects are displayed in the chart by clicking on the "Show" button and removed from the screen with "Hide" button. When Mariner objects are visible, the icon button from Main Toolbar is activated.

The upper frame of the dialog box provides control over which Mariner objects to be displayed.

- Check "All" to display all Mariner objects (tick the box when add or modify symbols/line/area).
- Uncheck "All" to display only items that:
 - were created after "From" date, but before the "To" date
 - were created after "After" date





Note that only the first two date conditions ("From" and "To"), or only the third condition ("After") must be satisfied, for an object to be displayed. For example, if the operator wants to display only symbols created in a certain previous time period (without viewing recent created symbols), the time period can be introduced in "From" and "To" date fields, whiles "After" is set to a future date.

In addition, "boat hook" button is used to select a single line or area object by selecting the name or directly clicking on it in the chart. Circular areas are selected by clicking on the circle center mark. Selected objects appear highlighted in the chart and the "print" button in the dialog window is activated and can be used to create a position/waypoint list for the selected objects. This list can be saved to external media or printed (if a printer is connected).


4.8.2 Add new, modify or delete symbol (objects)


By pressing "F7" or "Edit Symbol" in the "Mariner Objects" window, a new (vertical) toolbar appears on the left side of the chart display. The top three buttons functions: *Delete object symbol*, *Change/Move object symbol* and *Add new symbol*. The rest of the buttons enables the use of different objects symbols and colors.

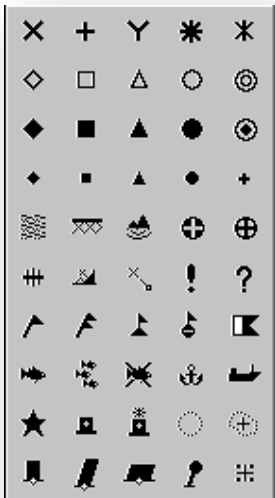


-  **Delete symbols:** enable **Delete function/mode** by clicking on the "Delete" button. The button will now be activated while the deletion mode is active. Delete individual symbols by clicking the left mouse button with the cursor over the icon. To exit the **Delete function/mode** click "OK" or right mouse button.
-  **Change / Move symbols:** enable **Edit / Move mode** by clicking the "Change / Move" button. The button will now be activated while the modification mode is active. By clicking the left mouse button with the cursor over a symbol on the chart, this will be changed, moved and /or colored, to currently selected symbol/color in the vertical toolbar. The new symbol will move with the cursor until is placed in the desired position by clicking the left mouse button again (the previous position and appearance of the symbol will be marked as deleted). To exit the **Edit / Move mode** click "OK" or the right mouse button.
-  **Add New Symbol:** enable **New Symbol mode** by clicking on the "New Symbol" button. The button will now be activated while the mode is active. In this mode, a new icon/symbol will be placed on the chart, with the selected shape and color (from the vertical toolbar), by clicking left mouse button in the desired position. A window will open in the lower part of the chart. Information about the new object, can be introduced here. This is stored as a short visible text displayed in the chart and as a detailed text not visible in the chart (see 6.1.1). Click the left mouse button or the "OK" button when data is entered, to close the window.
-  **OK:** This button will terminate any of the three active modes described above. If none of the modes are activated, this button will exit the symbol menu.

17 Symbol Buttons: There are a total of 17 icons available in the toolbar, where the currently selected symbol is marked as inactive. (Note: The top four symbols are fixed, cannot be changed and will always be presented in orange).

 **Open Symbols Selection:** Symbols, other than those found in the menu, can be accessed from the symbol library. Open symbol selection with the folder icon. First select the symbol that will be replaced in the toolbar. Then select the new symbol from the symbol library, by clicking it. The new symbol will now appear in the toolbar. Close symbol library by clicking the folder icon

 **6 color selection buttons:** These buttons show color choices available symbol colors. The selected color appears as a activated button.



4.8.3 Add new, modify or delete custom lines / areas

By pressing "F8" key or "Edit line/Area " in the "Mariner objects " window, a different (vertical) toolbar appears on the left edge of the chart display. This toolbar provides access to functions that enables the creation, modification and deletion of lines and areas on the chart. Toolbar functionality is the same type as in the previous chapter.




"Delete" (lines and areas): The Delete feature is enabled by clicking on the "Delete" button. The button will now be activated. Delete custom lines / spaces, by clicking on the left mouse button with the cursor over the line symbol or on the center of circular areas. Exit erase mode by clicking "OK" or right mouse button.



"Edit line /change color" (modify / move lines and areas): This feature is only available for multipoint lines and areas. Enable the modify / move mode by pressing the "Edit line/change color" button. The button will now be activated and several operations can be performed.

- to move/modify a corner: left-click on the corner. Move it to the new location and left-click once again to anchor it (click-drag-click procedure).
- add a new corner to a straight line: left-click on a straight line. Move it in the desired location and left-click to anchor it (click-drag-click procedure).
- to delete a corner: right-click the point to delete.
- "OK" button to exit the mode.



Add new line/area: To add mariners line/area objects in the chart display, enable one of the drawing options located in the middle section of the toolbar: "Draw line", "Marked area", «Marked circle area.» or "Marked square area". To activate the drawing mode click on "Draw new"  icon. The selected function will now be activated while the mode is active.

Left -click in the chart to 'anchor' the new element. Simple lines, circular and rectangular areas' extent / size are set in by another click on the left mouse button. For multi-point lines or areas, each click of the left mouse button will place a new 'grip' point. Click the "OK" button or right mouse button to finish the line.

When begin to draw an item, a window will open in the lower part of the chart (see fig.1.). Here you can register a brief or detailed information text about the new object. The short text is visible on the chart whilst the detailed description is hidden (see 6.1.1).

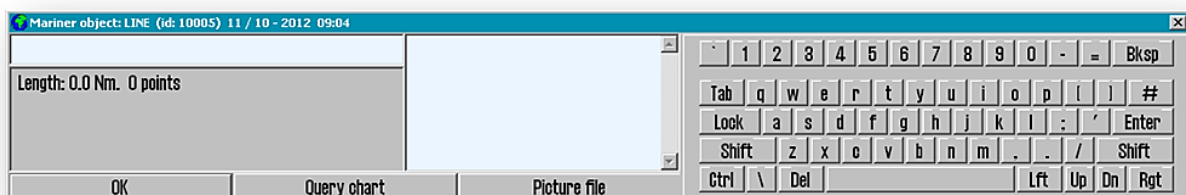


fig.1

Press "Enter" - or "OK" button when data is entered, to close the window.

To ensure all the custom modifications are visible, you can tick "All" in "Mariners objects" window.



“Draw new”: The “Draw new” button activates the drawing mode. Once you have selected an drawing option - “Draw line”, “Marked area”, “Marked circle area”, “Marked square area” or “Position line” - to continue the process, it is necessary to enable “Draw new” feature.



Position Line (bearing line): To mark a bearing position in the chart, select “Position line” drawing ferature and activate the drawing mode by clicking “Draw new” icon.

When the start point of the bearing position is placed on the chart - by clicking the left mouse button a small window opens where a specified angle can be entered and so locking the bearing line (see fig.2). Left-click again to place the end point of the bearing position and a new window will open in the lower part of the chart, where a brief



or detailed information text, about the new formed object, can be entered (see fig.2). The short description can be visibile on the chart whilst the detailed description is hidden (see 6.1.1). Click the left mouse button or the “OK” button when data is entered, to close the window.

fig.2

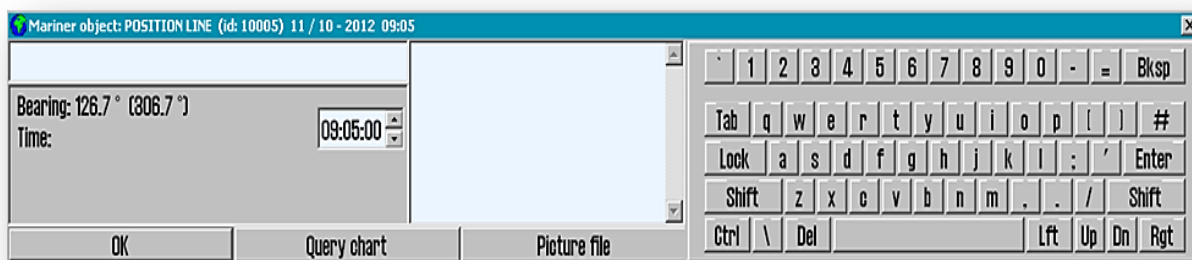


fig.3



“Marked area” (multi-point area): This button is used to enter multi-point/multiple-line areas. After the first point is placed in the chart a window pops up at the bottom of the chart where a brief or detailed information text, about the new object, can be entered (see fig.1). The short description is visibile on the chart whilst the detailed description is hidden (see 6.1.1 and 3.1.1.). Also, in the same pop-up window by checking the feature box “Fill”, the newly created surface can be shaded. Click the left mouse button or the “OK” button when data is added, to close this window.


6 color selection buttons: These buttons show available color choices for lines and areas. Red color indicates danger and the red objects will generate alarms when anti-grunding alarm zone is overlapping with the object (see section 5.6). Red objects are also displayed regardless of symbol visibility, status and filtering.

4.8.4 Event Symbol in boat position/M.O.B. (Man over bord)




This symbol is found on the *Main Toolbar*. With this button or “F12” key, a MOB symbol (*Event Symbol*) is placed at the current vessel position. At the same time a window pops up at the bottom of the chart where a brief or detailed information text, about the new Event Symbol, can be entered. The short description is visibile on the chart whilst the detailed description is hidden. Click the left mouse button or the “OK” button to close this window. Remove MOB symbol by clicking the “F7” key or delete symbol as described in chapter 4.8.

4.9 Radar Overlay (Optional)

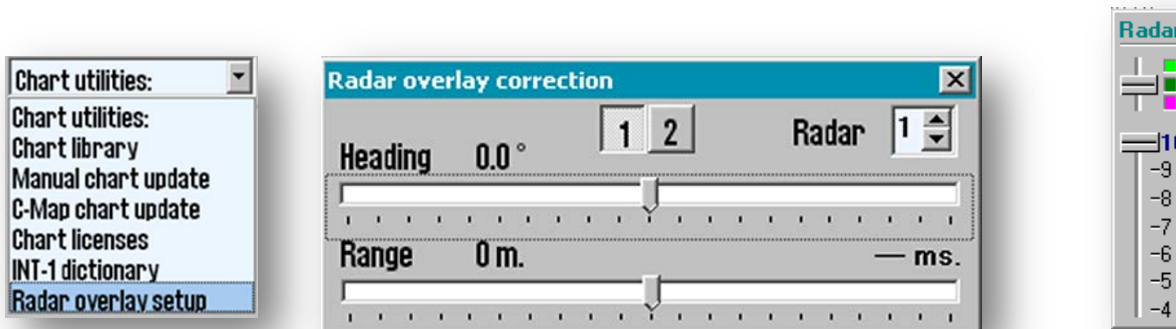
TECDIS can be configured to show the RADAR overlay, elaborated by **Furuno FAR-2107/2807 RADAR** series. When RADAR overlay is enabled, it can be activated from the *Main Toolbar* by clicking on  this icon or the "F7" key.



Access to the configuration and settings of RADAR overlay is provided in "Chart utilities":

Tool Menu Folders  → Setup → Chart utilities → Radar overlay setup → Radar overlay correction window. Here RADAR overlay is configured and set.

The view of RADAR Overlay is adjusted in the control box in the lower left corner of the chart.



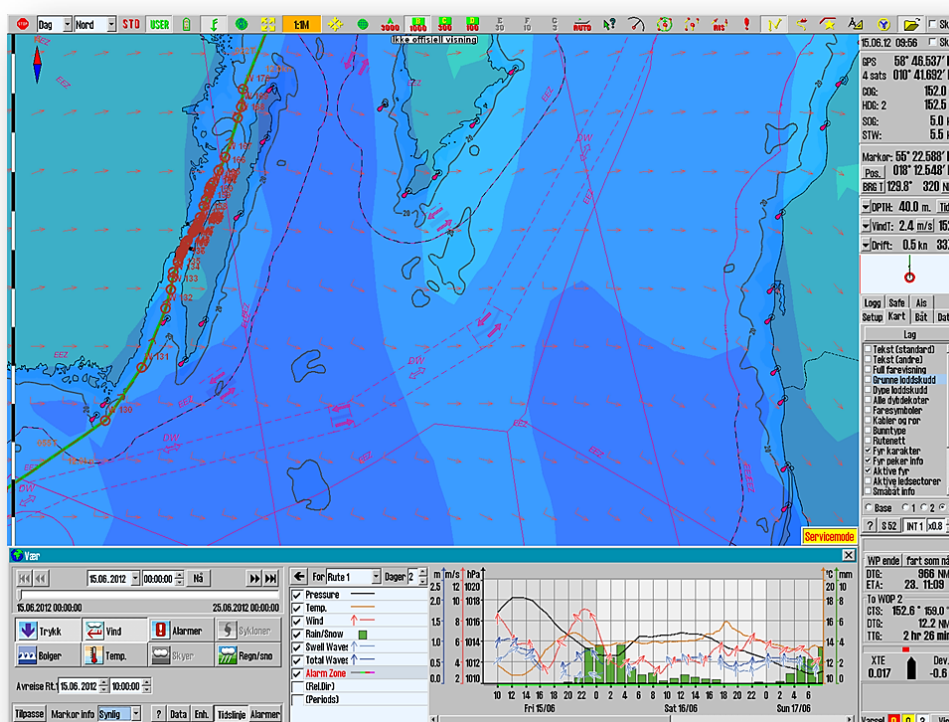
The color of RADAR Overlay can be selected with the top slider. In S52 Chart Display Mode the color choices are light or dark green, while the INT1 Chart Display Mode is an extension module with multiple colors ranging from green (weak echo) to yellow (medium strong echo) to red (strong echo).

The lower slider controls the level of radar echoes transparency on a scale from 10 (relatively opaque) to 4 (relatively transparent).

4.10 Weather Overlays (option)

Weather Overlays feature provide an advanced function that uses highly detailed commercial maritime weather forecast data presentation, which is available as a subscription service from Jeppesen Marine. *Weather Overlays* feature can be configured by the TECDIS operator and includes both atmospheric data and detailed data on waves. *Weather Overlays* feature include a functionality alarm that provides an intuitive and simple visualization of the weather window and hazardous weather conditions. *Weather Overlays* are also integrated with the routing system, which allows manual weather routing and custom voyage meteorograms.

Note that a three-month trial of *Weather Overlay* subscription is available for all systems running TECDIS software version 4.7.1.X or 4.7.2.X. To activate this plan, please contact Jeppesen Marine and enter "**System ID / TELKO eT**" number. A "**eT**" code must also be obtained from TELKO AS or Furuno Norway.



4.10.1 How to activate Weather Overlays

To activate Weather Overlays:

1. the license code for TECDIS option must be inregistered in the "**System ID / TELKO eT**" - license key.
2. a "**Weather Service**" subscription from Jeppesen Marine must be activated. Your TECDIS / TELchart ECS supplier can assist you in all of these steps.

To find out if **eToken** license key has this option enabled, start **TECDIS/TELchart ECS Setup**, go to the "**Licensing**" tab. Click on the "**Show / edit license**" button and wait until the fields are updated. The "**Codeplug: #...**" (in left field) shows the correct **eToken** number and in the field to the right has the options in blue (see section 4.5.1). If the "**Weather display and routing**" are not blue, take a screenshot of this window by pressing "**AltGr**" + "**PrtSc**" keys on the keyboard simultaneously. Open the "**Paint**" from the "**Start**" menu (Windows sys.op.): "**All Programs**" → "**Accessories**" → "**Paint**". Once the program is opened, place the cursor on the blank document and press "**Ctrl**" + "**V**" keys simultaneously to paste in the screenshot. Save this picture with the filename "**eTxxxxx.png**" where **xxxxx** represents the "**System ID / TELKO eT**" number. Send this file as an attachment in an email to an authorized dealer or TECDIS support@telko.no.

Weather Service subscription must be activated by Jeppesen Marine on their own servers and this entails no changes to local TECDIS unit. When a TECDIS unit with "Weather Forecast" subscriptions activated, requests Jeppesen Marine's servers data information, check **eToken** number against registered **eToken** with the correct subscription.

4.10.2 How to download Weather Service Subscription

Weather forecasts can be downloaded using either an Internet connection or via e-mail. Before weather forecasts can be downloaded, the subscription information is retrieved from **Jeppesen Marine**. Both of these actions are performed in "Weather Overlay" window.



Note that if an Internet connection is to be used, the network administrator for the vessel, must be consulted for information about the settings that apply to own vessel network. This information is necessary in step c) below.

4.10.2.1 Subscription download procedure

Open the weather conditions window by clicking the "Weather Overlays" button on the Main Toolbar. A message stating that "No current weather forecasts are available" ("No current weather reports are available") appears. Ignore this message by pressing the "OK" button.

- a) Click "Data" button, indicated by a red frame in the picture below (fig.1), to expand the Weather window with the "Data" area (fig.2), which can be closed again with another click on the "Data" button.

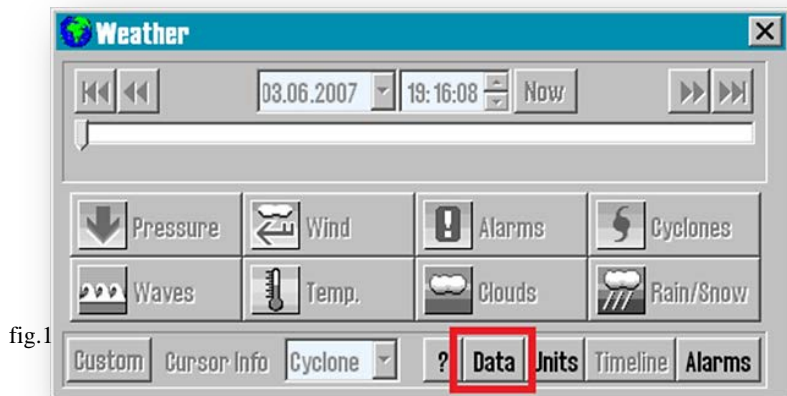


fig.1



fig.2

- b) Click the "Download New" button in the lower right corner of the Weather window (fig.2).

c) Before first use, the connection must be configured:click the "Configure Connection" button (fig.3).

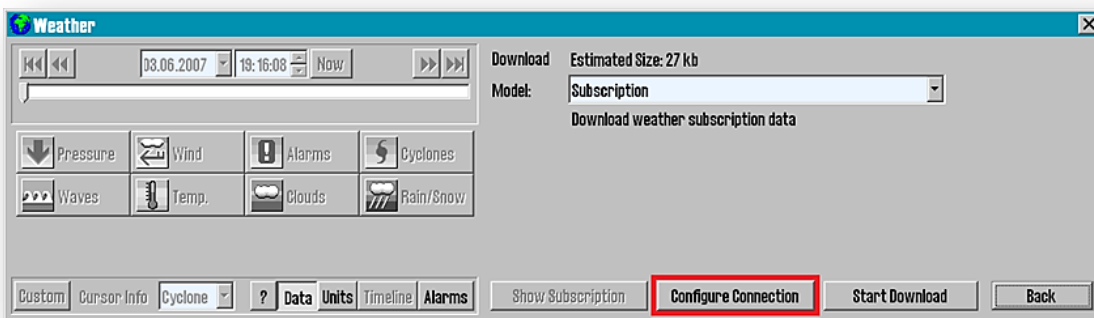


fig.3

Internet update

If TECDIS is set up with an Internet connection through a network cable connected to the internet LAN-port on the back of the computer, select "Internet" in the "Communication Type" field (fig.4).

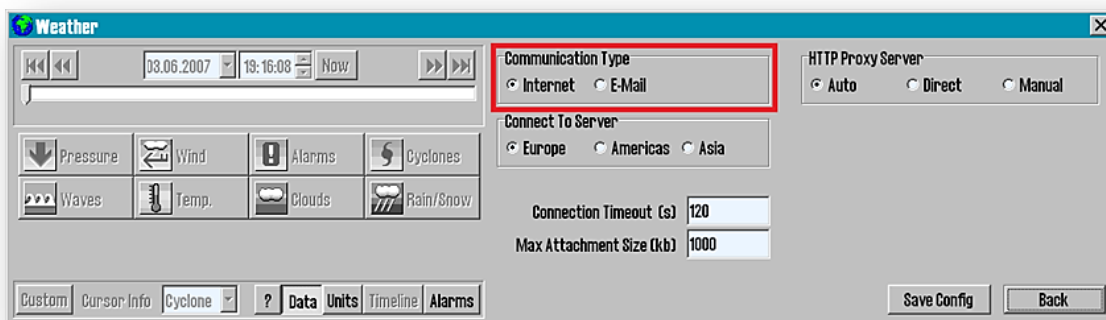


fig.4

1. There are three connection options in the "Connect to Server" field, and basically should be selected the geograsphic zone closest to own location, but if that connection doesn't work, the operator can choose another zone.
2. If an Internet connection is to be used, select "Internet" and make sure that "Connection Timeout (s)" is set to at least 90 seconds (120 seconds is recommended). For slow internet connections, an higher value (180 – 240 seconds) is recommended.
3. Set "HTTP Proxy Server" if required by the local network to access Internet (fig.5)
Consult your network administrator for a correct installation.



fig.5

4.Click "Save Config" button to save the configuration and return to the download window.

E-mail update

If TECDIS is not provided with Internet connection, or the weather feature update can not be performed directly, it can be acquired by generating a file that is sent as an attachment to an e-mail on another computer. Select "E-mail" in the "Communication Type" field (fig.6).

1. Set "Max Attachment Size" to a value that is less than the limit of e-mail attachments that apply to local mail server. Is the limit is 1 MB (Mega Byte), enter as 1000 in "Max Attachment Size" field, where the values are expressed in KB (Kilo Byte).
2. Click "Save Config" button to save the configuration and return to the download window.

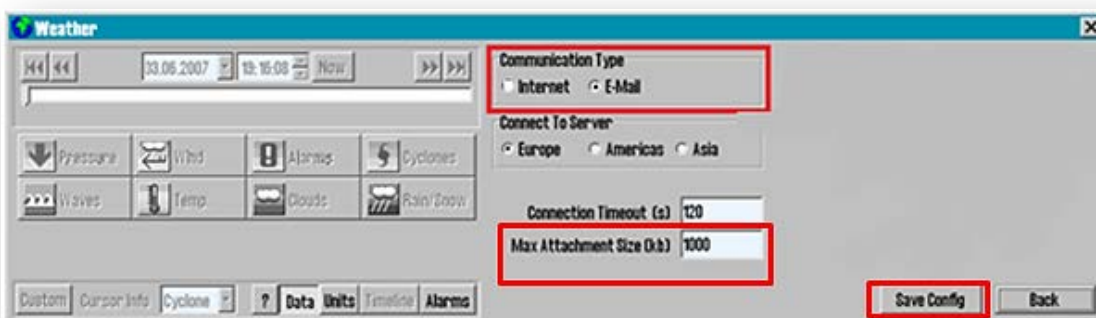


fig.6

3. Insert a USB memory stick that will be used to transport the weather data request and response from **Jeppesen Marine**. Click "Save File Request" button to start saving by ordering file(fig.7).



fig.7

4. Select the USB memory stick from the directory display. If it is not present in the list, collapse the 'My Computer' entry by pressing the '-' box next to it and then expand it again in the same manner. The USB memory stick should now be available. Specify where the order file(request file) will be saved, and press "Select" button. It is a condition that the order file is stored on a removable medium such as a **TECDIS Service Key**. (fig.8)

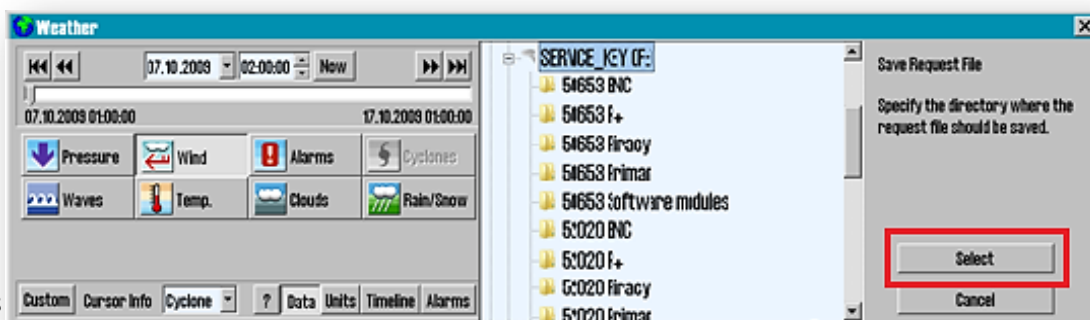


fig.8

5. The request file has been generated and a window is displaying the progress (fig.9). Send this file to datacenterx@c-map.no and wait until all responses are received. Note that the subject line of the response from **Jeppesen Marine (C-Map)** shows how many replies should be in total.

6. Note that the download window can be hidden by clicking on the "Data" button (fig.9), while waiting for the reply files. *Weather Overlays* window can be closed completely, or TECDIS can be stopped, without affecting the downloading process.
7. To return to this screen again, reopen the *Weather Overlay* and click "Data" button.
8. Save all the answer attachments (reply files), that have extension ".dat" or ".jwp" on USB memory stick. Insert the USB memory stick, containing the answers (reply files), into an available USB port in **TECDIS/TELchart ECS** system again and click "Load Reply Files" (fig.9)

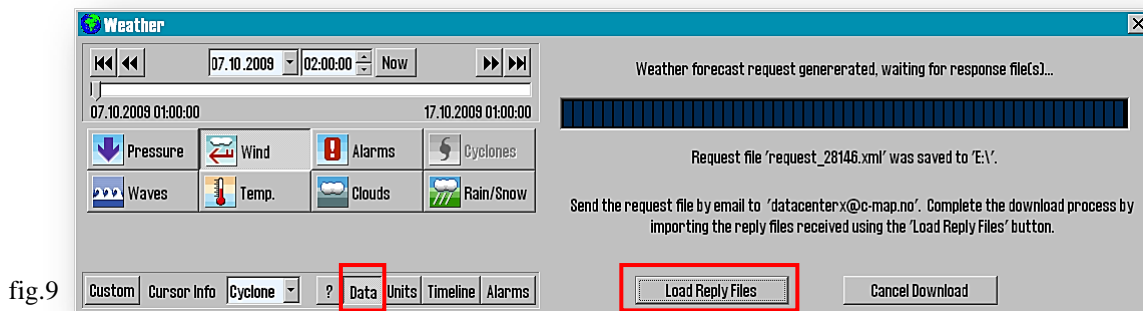


fig.9

9. Locate the reply files (the USB memory stick) in the folder list. If the USB memory stick is not present in the list, collapse the 'My Computer' entry by pressing the '- ' box next to it and then expand it again in the same manner. The USB memory stick should now be available. Select one of the reply file and click "Select" fig.(10).

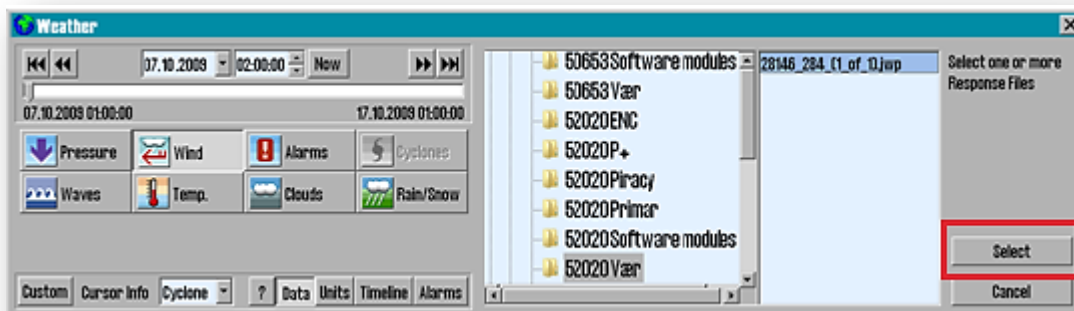


fig.10

The downloading progress window will be shown again (fig.11). If all of the reply files (answer attachments) were located on the USB memory stick, this window will only be shown briefly while the reply files are processed. If this window remains visible without any progress, the memory stick did not contain all of the reply files.

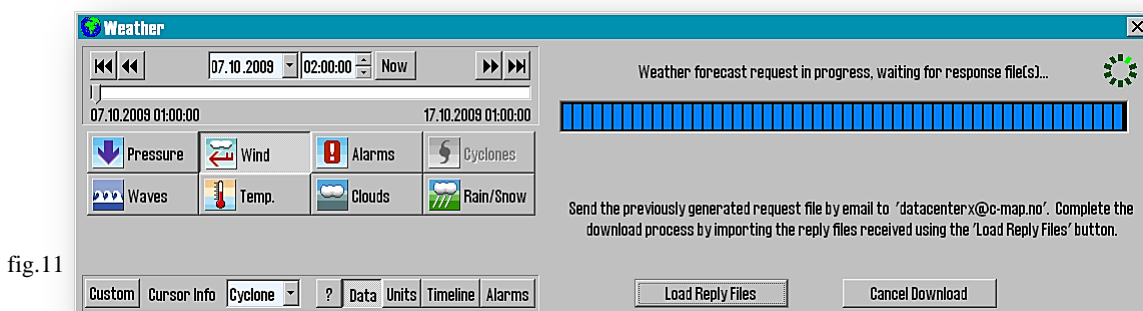


fig.11

Loading of the subscription is now complete and TECDIS is prepared for downloading weather data.

10. Once the reply files have been processed, a download report is displayed (fig.12). Later, when the weather forecasts data are downloaded, an additional “Load and Return” button will be available for instant viewing of weather forecasts (fig.13).



fig.12



fig.13

4.10.3 Control of Weather Subscription Licenses

When the subscription download is complete, it can be inspected by clicking the “Download New” button on the “Data” field (see 4.10.2.1 -2). “Show Subscription” button should now be selectable; this button enables viewing details regarding the weather forecast models that are available in your subscription.(fig.1)

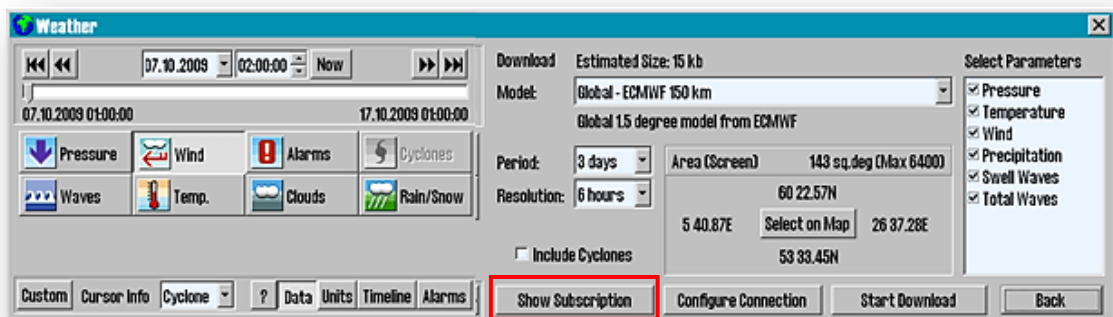


fig.1

Furthermore, it should now be possible to select several different weather forecast models in the ‘Model’ field.

Note that if the subscription download fails, your **TECDIS / TELchart ECS** supplier or **Jeppesen Marine** should be contacted to verify that the subscription is active and valid before troubleshooting the connection.

Subscriptions applicable to the **eToken** in use, now appears on the right side of the window. If the list is long you can browse through it with the scrollbar (fig.2).

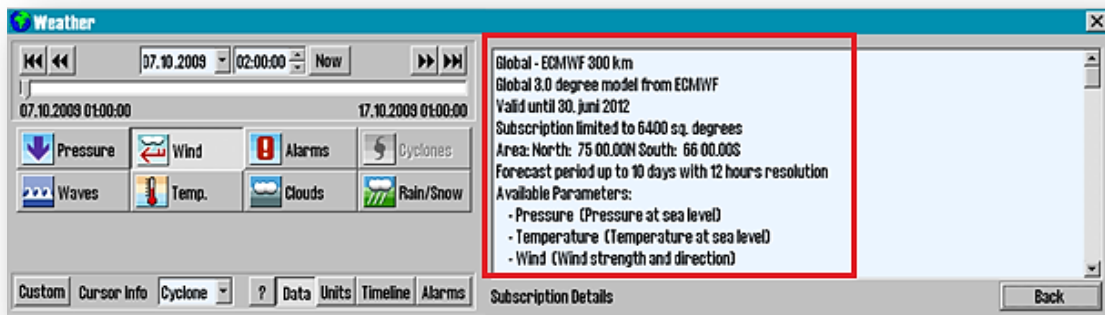


fig.2

For downloading data, you can choose between several different meteorological models in "Model" field (fig.3).

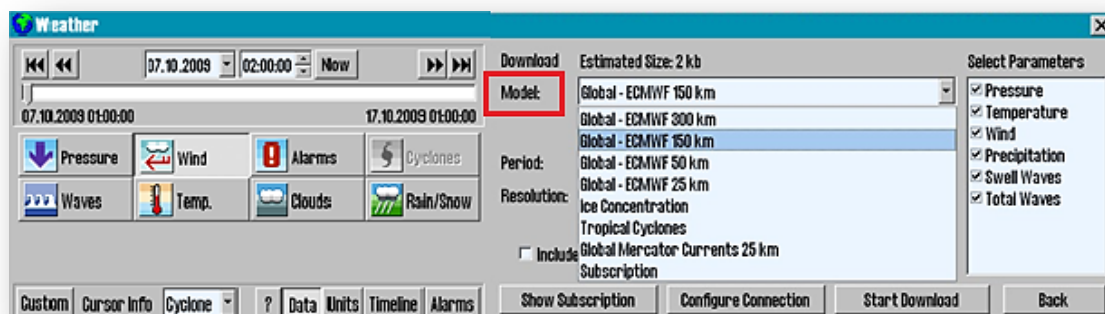


fig.3

4.10.4 Downloading a new Weather Forecast

Once the subscription has been downloaded, the first Weather Forecast can be loaded. First, a short explanation of the words and expressions used.

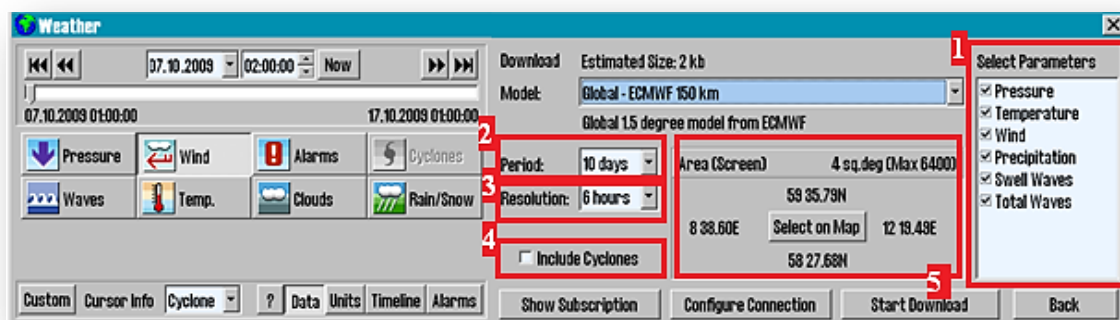
4.10.4.1 Weather Models

Both, the "Model" field in the download window ("Download New") and subscription info window ("Show Subscription"), now shows a number of Weather Models. These refer to the various mathematical weather prediction models that are available and which are computed up to several times daily. When downloading new forecast, a part of the data from the most recent update of the weather model is selected.

Many of the models include a distance in kilometers in the model name (example: "Global - ECMWF 150 Km"). This indicates the distance between each data point that is downloaded. Like zooming into a chart image, the Weather Overlay will compute weather data for each spot situated between these data points. As a general rule, for lower kilometer value will be computed a higher detail level.

The main reason to select a model with a higher distance between data points is to reduce the downloading size. Large downloads will not be stopped, even if the data file exceeds 50-100 MB, but large weather forecast model takes long time to download and can slow down the chart system during operation.

4.10.4.2 Download Window



When a Weather Model is selected, the download window include a number of new options:

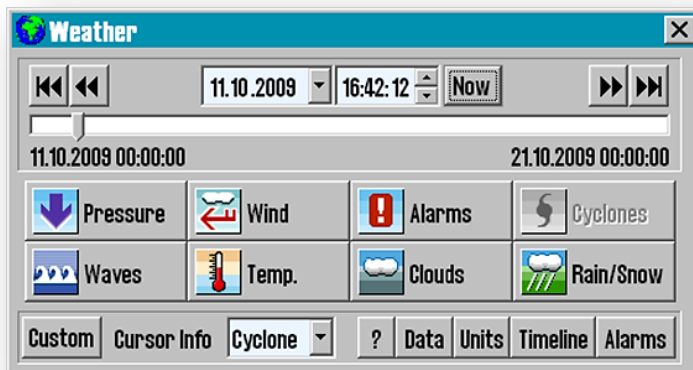
1. The *"Select Parameters"* field provides a list of weather variables that can be selected for viewing: air pressure, temperature, wind, rainfall, swell and waves.
2. The *"Period"* field indicates how many days of forecast data should be downloaded.
3. In the *"Resolution"* field, choose the update frequency for each data point. Again, the Weather Overlay will compute the variables values for each spot in between data points (a smaller value results in more frequent updating of data points and will result in a larger download size).
4. When *"Include Cyclones"* option is activated, the data on cyclones will be downloaded together with other weather data. This eliminates the need for a separate download for cyclone data.
5. *"Area"* field controls and shows both the size and location of the site (area) chosen for the download of weather data. The size in square degrees appears along with maximum size of a downloaded area, as allowed by subscription.
 - By default, the area displayed in the chart window is used to specify the limits for downloading data [*"Area (Screen)"*]. To adjust *"Area (Screen)"*, zoom or pan the chart image to the preferred range. If your subscription does not allow downloading of data for the entire chart window, the central part of the chart is prioritized.
 - With *"Select on Map"* button, the default screen area selection can be overridden. When clicking *"Select on Map"*, the cursor changes and can be established a specified area: with left click, the first corner of the rectangle is fixed in the chart; then set the diametrically opposite corner of the area with another left mouse button click. Select *"Select Screen"* button again to return to the default display area.


The estimated download size, at the top of the window, is constantly updated according to the current selections. Adjust model selection, parameter selection, site(area) selection, time period and resolution to the desired compromise between detail level and download size. Typically, a download size of 5-8 MB provides more than enough detail, but normally requires a broadband connection. For other connection types, carefully consider the costs associated with data download along with the value of the provided information.

When the settings are established, follow same procedure as when downloading the subscription (see ch. 4.10.2 – *"Internet update"*).

4.10.5 Management of Weather Overlays on the chart







The main window of weather overlay control can be divided into three main areas: the upper part contains timing of the weather overlays, the central area for weather parameters display in weather overlays and the lower area for access to the different retail windows for weather overlays.




Note:
 **The weather overlays are displayed in the chart only when the scale is adjusted to the overview level. For the scale levels more detailed than 1:500 000, the chart weather overlay will be hidden, but the weather overlay window, which controls the download and setup operations, will be available.**

4.10.5.1 Time Management field

Time management field includes several ways to verify the date and time weather overlays on the chart:

- Select or enter a specific date..... 
- Select or enter a specific time 
- Go to the current date and time..... 
- Moves 3 hours back or forward in time..... 
- Moves one day back or forward in time..... 
- Sliders, to check the weather data at a given time between the start and end of the forecast.
 While the sliding controller is activated (indicated by a dotted rectangle around it), the arrow keys on the keyboard, are used to move the time one hour forward or back..... 

The dates and time shown in the lower left and right corners of the sliding controller, are the start and end for all of the forecast data sets currently loaded.

Note:  **If the cyclone data is also loaded, this data often starts earlier than the forecast data, meaning there will be a section at the start of the time slider where only cyclone data is shown.**

4.10.5.2 View Controllers

The buttons in the middle field of the weather overlay window, control the weather parameters that will be presented in the chart. The keys of the selected /visible parameters are shown as pressed down (fig.: "Wind"). These buttons, toggles the display between this type of data. If a button is gray (fig.: "Clouds" and "Cyclones"), it means that the selected weather trend does not contain that parameter.

The system optimizes the way in which the selected parameters are displayed, while preventing the weather overlay window to become too cluttered. If only one type of data is selected, it appears in several ways simultaneously. For example, "Waves" is displayed using both area color contours and directional arrows. If several types of data are selected, TECDIS divides the presentation forms among the parameters. For example, when the "Waves", "Pressure" and "Wind" are selected simultaneously, the "Waves" is displayed using the area color, the "Wind" is represented by arrows and the "Pressure" is illustrated using contours.

"Alarms" and "Cyclones" have unique layouts and does not affect the display of other parameters.

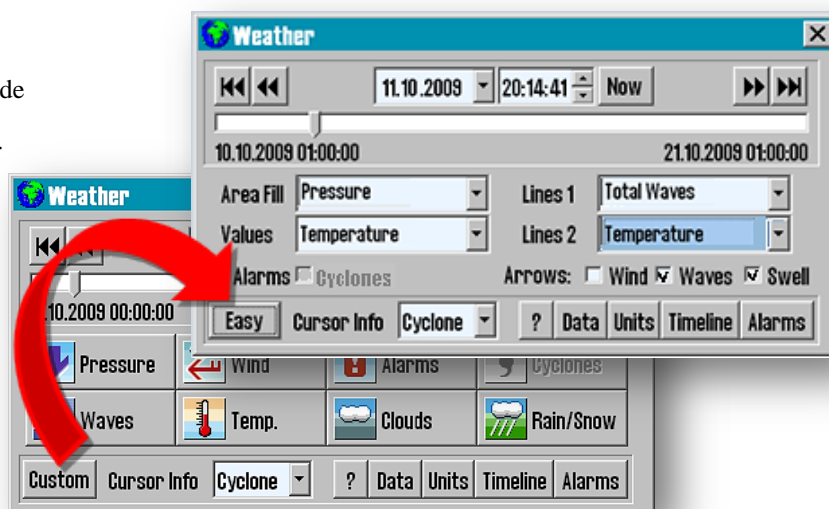
There are some combinations of selected weather parameters that cannot be displayed simultaneously. "Waves", "Temp.", "Clouds" and "Rain / Snow" are best represented using area color, but only one of these can be displayed at once. However, it is possible to show the "Clouds" and "Rain / Snow" in the same time, if no other parameters appears.



4.10.6 Custom Presentation

If a particular view of weather data is required and the standard selection mode (described above), is not sufficient, a custom view mode is available, under the "Custom" button in the lower left corner of the "Weather" window.

Pressing the same button again (now labelled "Easy") switches the weather window back to the default mode.



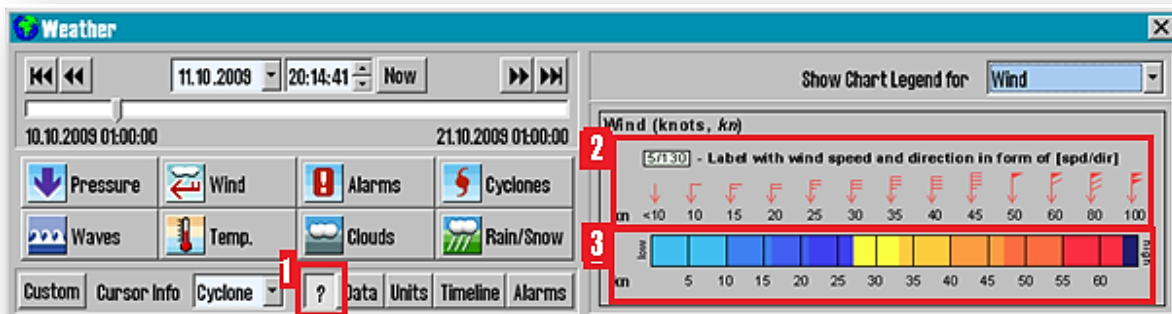
The custom presentation replace the standard presentation window with more flexible options for what to display as "Area" (colour coded area), "Values"(shows parameters values for each data point), "Lines1" and "Lines2"(contours). "Alarms" activation, displaying "Cyclones" and multiple arrow presentation ("Wind", "Waves" and "Swell"), can be selected simultaneously.

4.10.7 Cursor info

In "Cursor Info" field, situated to the right of "Custom" button in the lower part of the "Weather" window, can specify which parameters to be displayed as tooltip-text, when the pointer is hovered over the area with weather data points. The weather forecasts displayed relate to the time that is selected at the top of weather window.

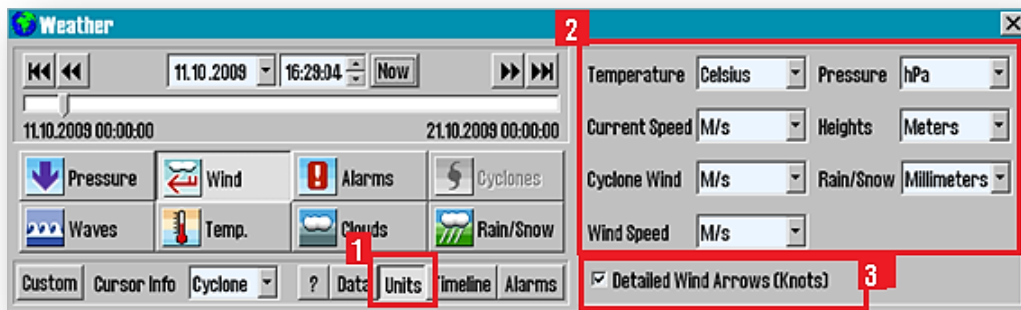
"None" option disables the cursor information. The "Visible" option, shows only the weather parameters that are selected for display on the chart. The "All" option shows all the weather parameters that are available in the data set. By default, the "Cursor Info" is set to "Cyclones", as the "Timeline" option provides a much more responsive method of displaying the weather data in the chart overlay (see. 4.10.12).

4.10.8 Weather Overlay Chart Legend



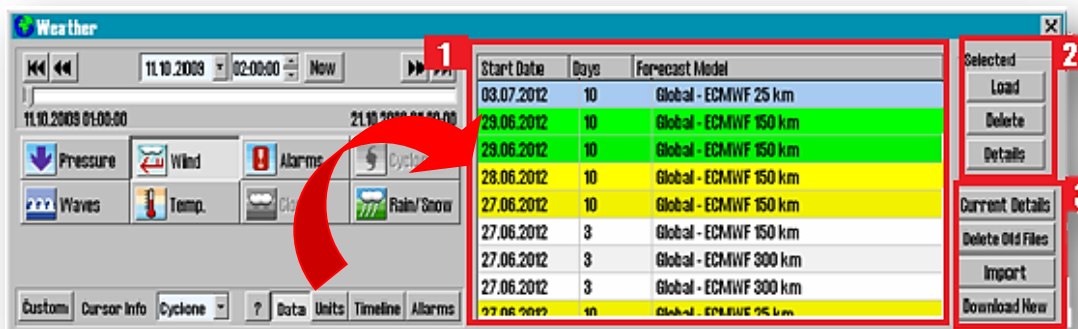
- (1) The "?" button, at the bottom of "Weather" window, opens a chart legend, which explains the graphic symbols representing each weather parameter. Pressing the "?" button again closes the extension window. In "Show Chart Legend for" dropdown menu, the weather parameter is selected whose graphic characteristics are shown in the chart legend.
- (2) The wind graphically represented by arrows fitted with wind strength indicator. The wind speed, is displayed below the arrows.
- (3) The wind's graphic representation as a color coded range, with the associated wind speed.

4.10.9 Selection of units for wind speed, temperature, etc



- To specify the measurement units for "Temperature" (temp.), "Current Speed" (power), "Cyclone Wind" (cyclones wind), "Wind Speed" (wind), "Pressure" (atmospheric pressure.), "Heights" (meteorological tide), "Rain/ snow" (rain and snow)-(2) and "Detailed Wind Arrows (Knots)" (3), click on "Units" (1) button (measurements) in the weather window. Click the same button again to close the units selection window.
- The graphical presentation of wind data varies, depending on the selected measuring unit. Except "Knots", for all other measurement units, the wind arrows become less descriptive (without indicators of wind strength) and the wind speed is indicated only by the length of the arrow. If "Knots" is selected, the wind arrows have the same length, but are equipped with wind strength indicator as well. By activating "Detailed Wind Arrows (Knots)" option, allows the display of detailed wind arrows, even if the measurement unit is different.

4.10.10 Management of downloaded weather forecasts



- (1) A list of downloaded weather forecasts can be accessed by clicking the "Data" button. The list that appears contains information on weather forecast model ("Forecast Model"), the start date for each forecast model ("Start Date") and number of days the forecast represents ("Days"). The list closes again with another click on "Data" button.

The list of downloaded weather reports can be viewed with the following background colors:

Blue	Currently selected weather forecast file.
Green	More than half of the forecast period in the future.
Yellow	Less than half of the forecast period in the future.
Hvit	All information in this weather file is in the past.

- (2) The currently selected weather forecast file can be: loaded by clicking "Load" button, deleted by clicking "Delete" button or inspected by clicking "Details" button in the upper right corner of the window. The chart area, covered by the selected forecast model is marked in red, if a sufficient scale size is chosen for the view of the chart.
- (3) In the lower right corner of the window, the following commands can be found:
 - “Current Details“ Displays detailed information about the selected weather forecast.
 - “Delete Old Files“ Deletes all the weather forecasts, that are more than 14 days old.
 - “Import“ Import a forecast weather file received via other methods than using "New Download" function. "Import" method allows import of **.grb** and **.xml** file format. Note that this function only supports files that are supplied by **Jeppesen Marine** and may not be used to download data from other vendors.
 - “Download New“ Opens the window for downloading weather reports. (see chapter 4.10.2 and 4.10.4).

4.10.11 Weather alarm settings (oversettelse fra TEC.manula rev 2-3-work

The alarm settings, in weather overlays, allows to specify exactly what kind of weather conditions have to be notified. When an alarm criterion is defined, TECDIS issue clear warnings indicating when, where and how these factors may be present. Such indications are given on the chart display along with weather overlay, the timeline and marked as redlining on routes.



In the chart weather overlay, areas where the alarm conditions are met, are shown as an area limited by a red outline, shaded in red.

In the weather timeline, alarm conditions can be indicated as a line along the bottom of the graph that is **red** when alarm conditions are present, **purple** when cyclones are close and **green** otherwise.
When visible, the routes are colored using the same scheme, while the weather overlay is active.

About alarm condition

An alarm condition may be based on a single weather parameter (for example: 'Wind Speed above 20 m/s'), or on a combination of parameters (for example: 'Wind Speed above 20 m/s AND Total Waves Height above 6 m').



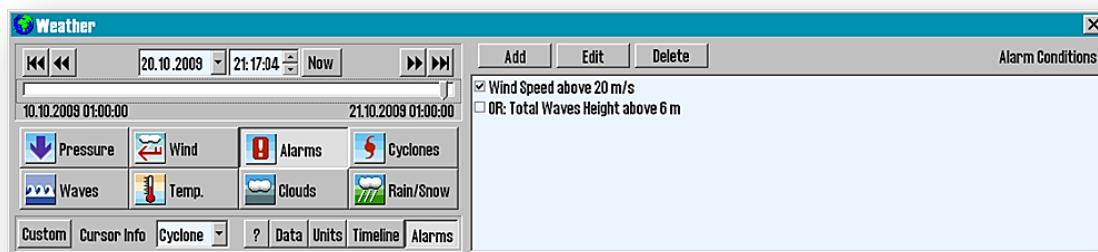
Note that when a single alarm condition includes more than one parameter, it will not be 'triggered' until ALL of the included parameter conditions are met.

Any number of alarm conditions may be entered, and any number of the entered conditions may be selected at one time.
Note that, when more than one alarm condition is selected, alarm indication will be triggered if ANY of the selected conditions are met.

Understanding the distinction between combining parameters into a single alarm condition and selecting separate alarm conditions for each parameter is important. The alarm condition 'Wind Speed above 20 m/s AND Total Waves Height above 6 m' will result in very different alarm results than selecting the separate alarm conditions 'Wind Speed above 20 m/s' and 'Total Waves Height above 6 m'.

The interface assists in making this distinction by marking all other alarm conditions with 'OR:' as soon as an alarm condition is selected.

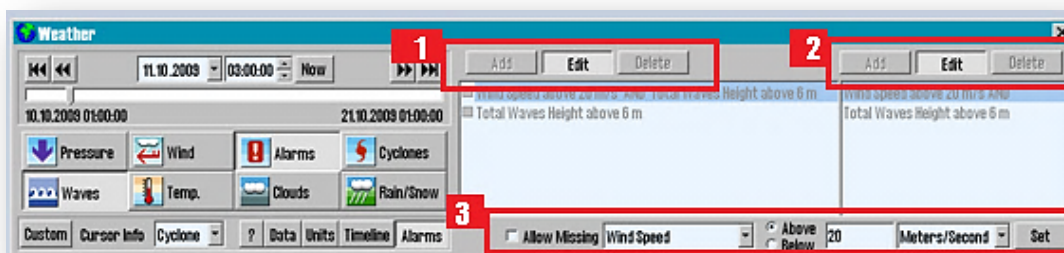
The Alarm Interface



By pressing the "Alarm" button in the bottom part of the main weather overlay window, the interface for selecting, adding and editing alarm conditions is shown. To hide the alarm interface, press the "Alarm" button again.

The list of alarm conditions occupies most of this window. Here, all of the entered alarm conditions are listed and can be selected by marking the checkbox to the left of the alarm condition descriptions.

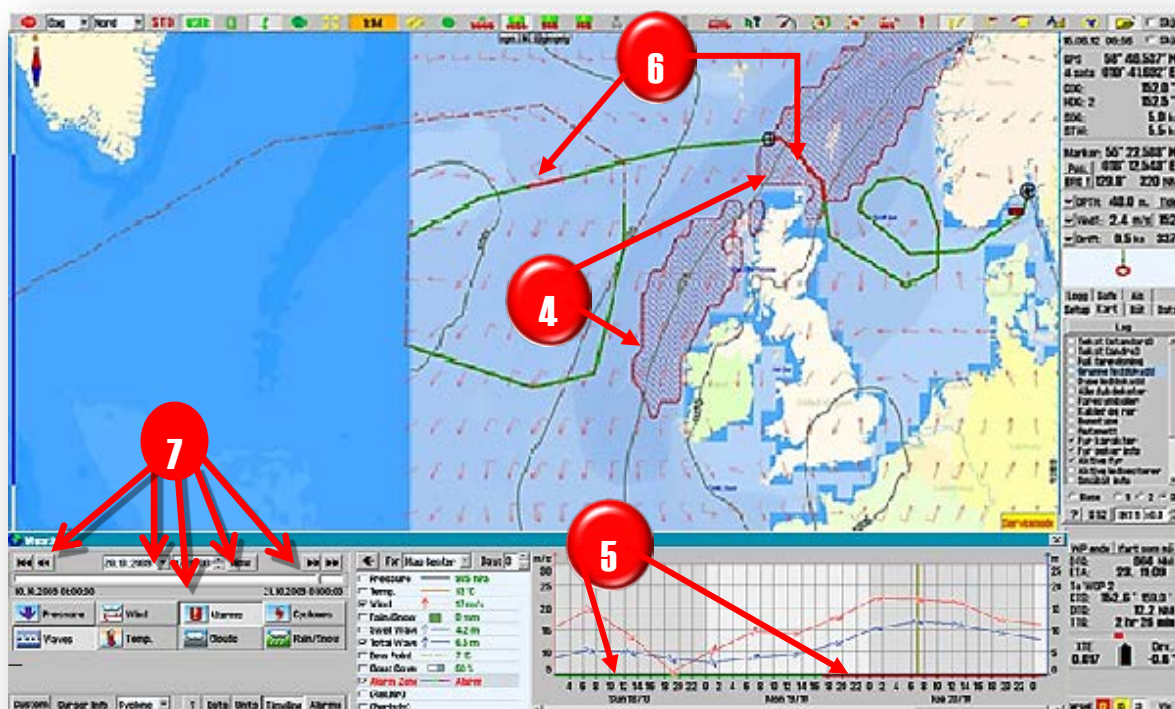
- (1) Buttons for adding, editing and deleting alarm conditions are found at the top edge of the window.
Note that the "Add" and "Edit" buttons in the alarm interface, behave in the same manner as the menu buttons at the bottom of the main window; simply click these buttons again to 'back out' of the function.



- (2) When «Add» or «Edit» are activated, a new parameter condition list is shown in the right part of the window. This area lists all the parameter conditions that are a part of the selected alarm condition in field (1). For new alarm conditions, this list will be empty initially. This list has separate "Add", "Edit" and "Delete" buttons for manipulating the parameter condition list.

- (3) When “Edit” is activated, in the parameter condition list, a new area is shown along the bottom of the window allowing adjustments to the condition. This area includes fields for selecting the weather parameter, specifying the value limit and measurement unit, and fields for selecting whether the condition should trigger the alarm for values above or below the limit value. Click “Set” saves any changes made and returns to the parameter condition list. When pressing “Add” in the main alarm interface, this area is shown directly.

If “Allow missing” is selected, you may select weather parameters that are not present in the currently loaded weather data. Exit alarm setting, click the “Add” button.



- (4) Areas that have data that exceeds the alarm conditions are hatched in red (*Alarm Zone*).
- (5) In the timeline graph the alarm conditions are specified as a red line along the bottom of the graph, purple line when cyclones are close and green line for normal condition.
- (6) Portions of active routes passing through an alert area (hatched in red (4)), in a future scenario- an early estimate of the time when the active route is passing through these areas- are colored red while the weather overlays are active.
- (7) All data shown in the chart, is related to the time set in the “time management” field in the upper left corner of the “Weather” window. (see section 4.10.5.1 for further explanations of the controllers in the time management field). The own vessel’s computed position is indicated by a symbol “⊕” that moves along the active route on the chart, in phase with the settings in the “time management” field and weather overlays

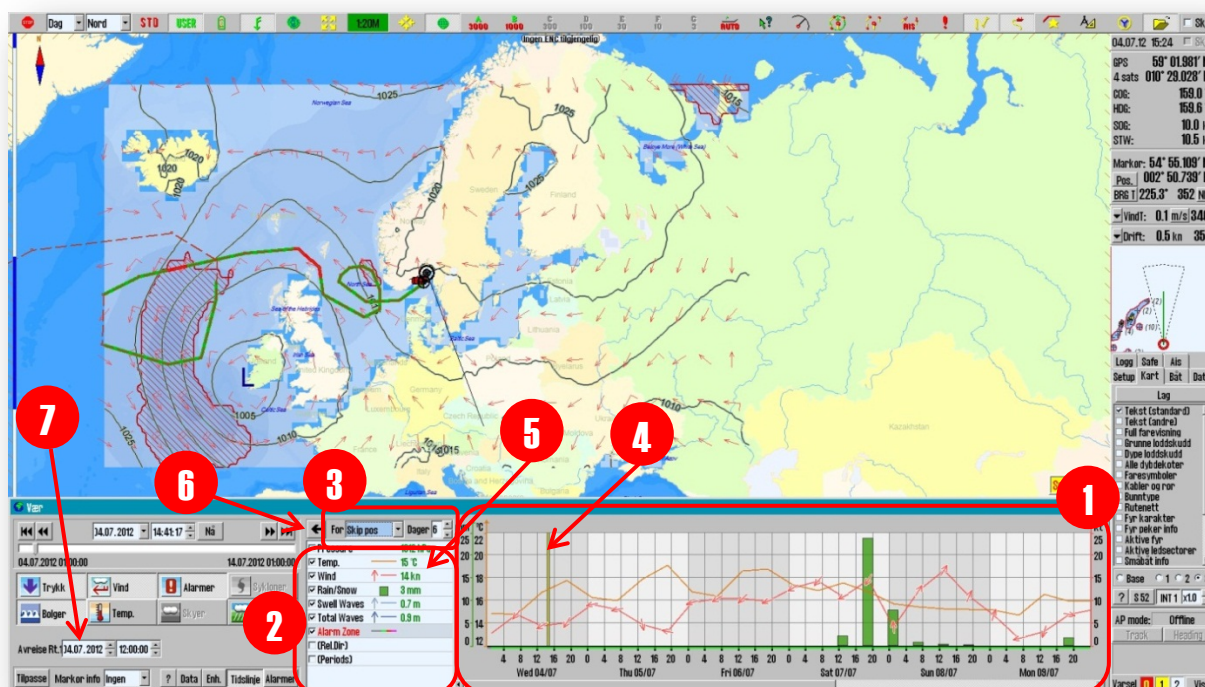
4.10.11.1 About alarm conditions

An alarm condition can be based on simple weather data info, for example: “Wind Speed of 20 m / s”, or a combination of several types of weather data for example: “Wind Speed of 20 m / s and Total Waves Height over 6 m”. When an alarm condition contains more than one type of data, an alarm condition will not be ‘released’ until all the weather information, that have alarm limits, has been exceeded.

An unlimited number of alarm conditions can be entered, and one or more of these alarm conditions may be selected simultaneously. When more than one alarm condition are selected simultaneously, the alarm state is triggered if one of the selected conditions are met.

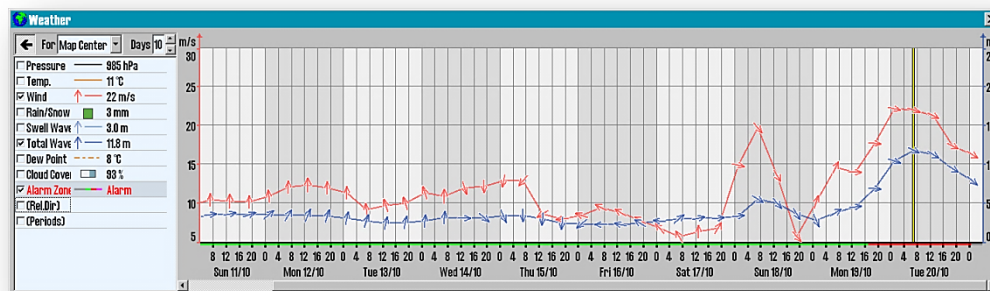
It is important to understand the difference between combining multiple types of data in a single alarm condition and to select separate alarm conditions for certain types of data. Alarm condition “Wind Speed of 20 m / s and Total Waves Height over 6 m” will result in very different alarm condition than to select two separate alarm conditions “Wind Speed of 20 m / s” and “Total Waves Height over 6 m”. As soon as an alarm condition is selected in the “Weather” window, TECDIS assists the operator to indicate the options that are set, by marking all other alarm conditions with “OR:”.

4.10.12 Timeline Feature



- (1) The *Timeline* window provides a graphical representation of weather data variation over time (meteograms).
- (2) To the left of the *Timeline* window, there is a *Parameters Selection Field*, with the following options: the data to be displayed (graph parameter list) and graph legend (shape and color). Also in this selection field there is a column which provides data for the current position of the cursor, in the selected point in the “*time management*” field. Select the weather data to be displayed in the *Timeline* by selecting the respective checkboxes in the selection field. Options:
 - “*Pressure*”, the graph for the selected pressure unit (mmHg or hPa)
 - “*Temp*”, the graph of temperature in selected units (Celsius, Fahrenheit or Kelvin)
 - “*Wind*”, the true wind speed in selected units (Knop, m/s (meters per second), mph (miles per hour) or Beaufort.
 - “*Rain / Snow*”, the graph of precipitation in selected units (millimeters or inches)
 - “*Swell Waves*”, the graph for waves (*Swell*) in selected unit (meters or feet)
 - “*Total Waves*”, the graph for cumulative waves in the selected unit (meters or feet)
 - “*Alarm Zone*”, visualized as a colored ribbon on X-axis of the graph or as the hatched red area on the active route. If the alarm conditions are not met, the ribbon is green and if the ribbon is gray it means that weather data is not relevant (applicable) or available.
 - “*(Rel.Dir)*”, when this option is selected, and the *Timeline* is in “*Route*” mode, then the directional arrows in the *Timeline* graph, changes to show the direction in relation to the planned course of the vessel at the time. In the *Parameter Selection Field* is indicated also the numerical value of the relative wind direction together with the true value of wind speed.

- "(Period)", when selected, the shown wave graph will include also the wave period. Wave period is expressed in seconds (s).
- The number of days shown in the graph at once can be adjusted from one up to ten days.

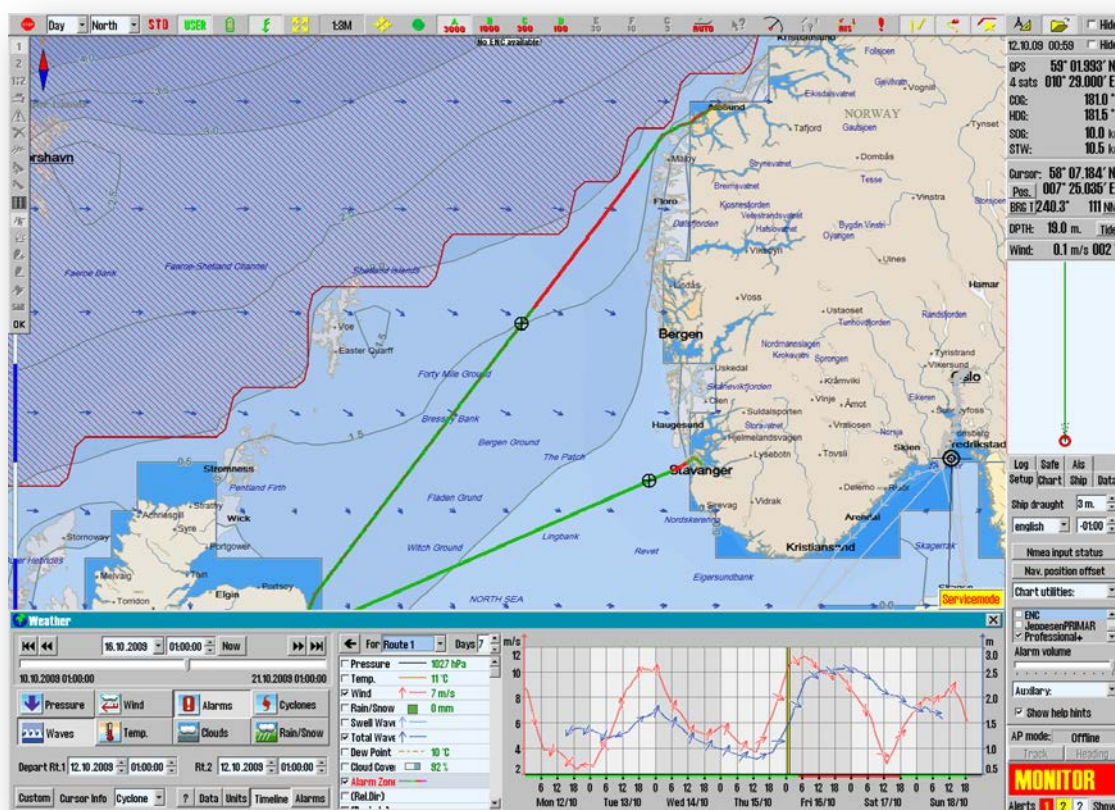


- (3) The controls for manipulating the *Timeline* feature, are located above the parameter list. The settings for *Timeline* presentation:
 - "*Chart Center*" - a red cross with a circle placed in the center to mark the exact point that the *Timeline* shows data from.
 - "*Skip pos*" - the *Timeline* is updated continuously as the own ship changes position.
 - "*Cursor position*" - the *Timeline* is updated continuously as the cursor moves on the chart. If one of the mouse buttons is pressed, the timeline snaps to the cursor position and dropdown selection is changed to "*Chart Center*".
 - "*Route 1*", see next section "*Manual Weather Routing*"
 - "*Route 2*", see "*Manual Weather Routing*" explained in the next section. By clicking "*Ctrl*" + "*S*" keys simultaneously, while the *Timeline* is shown, generates an image of the current graph that can be saved in the desired location.

All scales in the *Timeline* window are dynamic, meaning that the start and maximum levels are set to the most ideal value for displaying the data selected.

- (4) The time and date chosen for displaying weather data in the chart it's marked with a vertical yellow line in the timeline graph window.
- (5) By hovering the cursor over the timeline graph or in chart display, the weather information that applies to the area which is directly under the cursor, it will be displayed to the right in the selection field(parameter list): in black when data is 'sourced' from graphs surface, and green when the cursor is in a certain position in the chart display.
- (6) Clicking the "*Arrow*" button in the upper left corner of the selection box, the graph expands to fill the entire weather window. Click the "*Arrow*" button again to return to normal.
- (7) By default, it is assumed that the vessel starts on a path at the next full hour. Check this time and adjust the departure time with the controllers "*Departure Rt.1*" or "*Departure Rt.2*" to correspond to the most actual departure schedule. It is only when the departure time is set correctly as possible, that weather timeline feature will provide a representative picture of what kind of weather the vessel will experience.

4.10.12.1 How to do manual weather routing



When one or two routes are selected before activating the weather overlay, several features aiding in weather routing come into play.

First of all, the appearance of the routes in the chart is changed. Waypoint indicators are removed to avoid clutter in overview charts, and the route is colored according to the alarm conditions the vessel will encounter. For parts of the planned voyage where weather exceeding the alarm conditions will be encountered, the route is marked with red. If the weather conditions are below alarm condition limits, the route is marked with green.

Furthermore, when the planned position of the vessel for the time shown by the weather chart overlay is shown in the chart as a black cross and circle symbol.

Finally, the *Timeline* graph can be set to show a graph for either 'Route 1' or 'Route 2' (if present). For each point in this graph, the values shown are for the planned position of the vessel at that time. In other words, the graph is a custom meteogram for the planned voyage.

All of these features assume the vessel starts following the route at the next full hour. Controls to adjust this time for each route are available in the *Timeline* window.

All adjustments to the route, either by adding / moving / removing waypoints, making changes in the route planner or adjusting the departure time in the timeline window are reflected immediately in all of the route weather integration features described in this section.

4.11 Troubleshooting

This chapter provides some guidelines for troubleshooting the connection problems, and a list of error messages with descriptions.

4.11.1 Connection Problems

For any problems occurring during the download of weather data, regardless of the connection type used, **TECDIS** service partner and / or **Jeppesen Marine** will be able to provide very useful assistance in tracking down the cause of weather download problems. **Jeppesen Marine**'s servers have logs that show whether the weather download attempts actually achieved contact with **Jeppesen Marine**'s servers or if the weather download procedure was successful. They will also be able to confirm whether the subscription is intact.

In order to provide help and assistance, regarding **TECDIS** system or chart - weather databases, **Jeppesen Marine** or your chart supplier, will need your "System ID / TELKO eT " number.

Make sure your subscription is valid.

The expiration date can be viewed in "Weather" window: "Data" → "New Download" → "Show Subscription".

Before contacting anyone, at least some of the tests here should be attempted:

General Tests

- a) Check your subscription. Make sure that your subscription has not expired. Expiry information can be seen by opening the weather overlay, pressing "Data", "Download New" and then "Show Subscription".
- b) Update your subscription. **Jeppesen Marine** may make changes to the weather service that are not automatically reflected by in your subscription.
- c) Try another connection method. If you use an internet connection, try downloading by e-mail. If you use e-mail already, try using another e-mail account/system. If this is successful, you have verified that the problem is with your connection, not your chart system or a problem with the weather service.
- d) Try a smaller download size. The problem may be connected to downloading large files, especially if the connection is "noisy" and/or error prone.
- e) Try another model. The problem may be connected to downloading a specific forecast method. If a download of similar size using a different model is successful, the list of potential causes for the problem is significantly reduced.
- f) Try updating the chart software. **Telko AS** provides software updates containing both bug fixes and new features free of charges at our website <http://www.telko.no>. Your problem may be due to a bug in the software that we have fixed in an update.

Internet Connection

- g) (TECDIS Only) Make sure that the internet connection is not turned off. In a valid **TECDIS** installation with a direct internet connection, a switch has been installed so that the internet connection can be turned off when not in use.
- h) Try setting a higher Connection Timeout. The download attempt may be timing out before the request can be completed. (Refer to chapter 4.10.2 section c -**Internet update**).
- i) Verify that you can reach the servers. Exit the chart system (For **TECDIS**: insert the **TECDIS Service Key** first), open Internet Explorer and try the following addresses. If the reply does not match what is indicated in this table, you are not reaching the weather service servers.

http://distribution.c-map.no	Should show: Connection OK
http://datacenter.c-map.no	
http://datacenter.jeppesen.com	

- j) If test I failed, see if you can reach the servers using IP addresses. Continue where you left off in the previous test. Try the following addresses and see if the replies match what is specified in the table.

http://80.239.21.75	Should show: Connection OK
http://80.239.21.103	

If these tests succeed, then the problem is with your **DNS** settings.

(TECDIS Only: If you have not performed test f., do so now, then run the following file and see if the problem is fixed:
C:\Program Files\TECDIS\AddCMapHosts.exe)

- k) If test j. failed, have your network administrators check the firewall. Make sure that the firewall in you Internet Setup is not blocking your weather data requests.

E-mail connection

- l) Check your spam folder. Make sure that the replies to your request email from Jeppesen Marine are not being marked as spam.
- m) Try setting a lower Max Attachment Size. Your email service may be having problems with the weather data attachments. Try lowering the Max Attachment Size value in the Configure Connection window. Refer to section 1.2 step 6 for details.
- n) Make sure you are not using old request / reply files. Delete all request and reply files from the USB memory stick so that you are sure you are not using the request or reply files from a previous download (or from the other **TECDIS**).
- o) **(TECDIS Only)** Update only one **TECDIS** at a time. If you send weather requests from both **TECDIS** systems at the same time, it is very easy to get the reply files mixed up.

4.11.2 Error Messages

The list below shows some of the error messages, that can appear on the weather overlay feature, including explanations.

Error Message	Explanation
'Current weather data lacks parameters set in active alarm conditions. Review alarm settings'	This is not an error. It is simply an indication that the currently loaded <i>Weather</i> data file does not contain all of the weather parameters you have specified in your selected alarm conditions
No current weather forecasts are available.	This is not an error. It is simply an indication that you have no current <i>Weather</i> data files on the system.
No cyclones in effect at last download.	This is not an error. It is a message to inform you that the " <i>Cyclone</i> " presentation is not available because there are no cyclones at this time.
Communication Error	There was a problem during the <i>Weather</i> data download. Refer to section 4.11.1
"You must be in 'show checkbox' mode to set this date"	This message is due to a known error. Update TECDIS software to the latest version
ERROR: Weather components are not initialized	There is a problem with C-Map System files in the installation. Contact TECDIS service support for assistance.
Weather Data Error: The internal component processing the weather data, cannot be created.	There is a problem with C-Map System files in the installation. Contact TECDIS service support for assistance.
Cyclone Data Error: The internal component processing the weather data cannot be created.	There is a problem with C-Map System files in the installation. Contact TECDIS service support for assistance.
Cyclone Data Error: License interface cannot be obtained.	There is a problem with C-Map System files in the installation or with the license in the " System ID / TELKO eT "(codeplug). Contact TECDIS support for

Error Message	Explanation
	assistance.
Weather Data Error: File is not found.	The <i>Weather</i> data file is missing from the system.
Weather Data Error: Corrupted or wrong format file.	The <i>Weather</i> data file has become corrupted or is not provided by Jeppesen Marine .
Weather Data Error: The file data cannot be accessed.	The system cannot access the <i>Weather</i> data file.
Weather Data Error: Problems with weather data licensing.	The <i>Weather</i> data file does not appear to be licensed to this system.
Cyclone Data Error: File is not found.	The “ <i>Cyclone</i> ” data file is missing from the system.
Cyclone Data Error: Corrupted or wrong format file.	The “ <i>Cyclone</i> “ data file has become corrupted or is not provided by Jeppesen Marine .
Cyclone Data Error: Wrong format of cyclones data.	The “ <i>Cyclone</i> “ data file has become corrupted or is not provided by Jeppesen Marine .
Cyclone Data Error: Wrong point values in cyclones.	The “ <i>Cyclone</i> “ data file has become corrupted or is not provided by Jeppesen Marine .
Cyclone Data Error: The file data cannot be accessed.	The system can not access the “ <i>Cyclone</i> “ data file.
Cyclone Data Error: Problems with weather data licensing.	The “ <i>Cyclone</i> “data file does not appear to be licensed for this system S
The specified file did not have a ‘.grb’ or ‘.xml’ extension.	The “ <i>Import</i> ” feature can only load files with a ‘ .grb ’ or ‘ .xml ’ file extension. Import of a file with another extension was attempted

4.12 Locating licensing and version information

Determining the TECDIS or TELchart ECS Software version number

The major software version number is displayed in the initial stages of starting the **TECDIS** or **TELchart ECS** software. For **TECDIS**, this will either be '4.6.0' for the previous generation or '4.7.1' for the current generation. For **TELchart ECS**, this will be '3.7.1'.

The following procedure determines the full **TECDIS** or **TELchart ECS** software version number:

1. On the **TECDIS** or **TELchart ECS**, check if the menu folders are visible on the right side of the screen..
2. If they are not, press the "Menu Folder" icon at the upper right corner of the screen, labeled 'Tool menu folders'.
3. Select the menu folder labeled "Chart".
4. Press the button named "?" to the immediate left of the buttons "S52" and "INT1". A chart legend window will be displayed.
5. Note the **TECDIS** or **TELchart ECS** software version number specified in the first entry of the chart legend (**TECDIS Software / TELchart ECS Software**). The version number is the value of this field up to the "#" character.

Determining the TECDIS or TELchart ECS System ID number

The System ID number for each **TECDIS** or **TELchart ECS** unit is required when *Weather Overlay* is to be activated. This number can be determined by:

- a) **Physical Inspection**
 1. Inspect the label connected to the USB license dongle attached on the rear side of the **TECDIS** or **TELchart ECS** processor. The System ID is noted on this label.
 - b) **Using TECDIS / TELchart ECS Setup**
 1. (For **TECDIS**) Insert the **TECDIS** Service Key in the **TECDIS** processor.
 2. In the **TECDIS** or **TELchart ECS** main display, exit the software by pressing the icon in the upper left corner of the display. Press "YES" to confirm.
 3. Start **TECDIS / TELchart ECS** Setup by clicking the **TECDIS** Setup or **TELchart ECS** Setup shortcut on the desktop.
 4. Select the "Licensing" folder.
 5. The System ID is displayed in the lower half of the setup window (**C-Map** License area).
 - c) **Using TECDIS / TELchart ECS**
 1. Follow the procedure for determining the full **TECDIS / TELchart ECS** software version number, and note the five digits immediately following the '#' sign in the '**TECDIS Software**' or '**TELchart ECS Software**' entry in the chart legend. Add this number to text "Telko eT" to get the complete System ID.
-

Chapter 5 Navigation

5.1 Bearing EBL / VRM



Left click the "Bearing EBL / VRM" icon, on the *Main Toolbar*, activates an *Electronic Bearing Line (ELB)* and a *Variable Range Marker (VRM)*, with anchor points (origin points) locked in the own vessel position; as the vessel moves, the origin of the EBL will follow the vessel movements (it is "locked" to the vessel). The anchor point can be moved by left click in any point in the chart (fig.1).

Right click on "Bearing EBL/VRM" icon, opens "Bearing list" window, while all saved bearing position and lines of position (LOP) are shown on the chart.

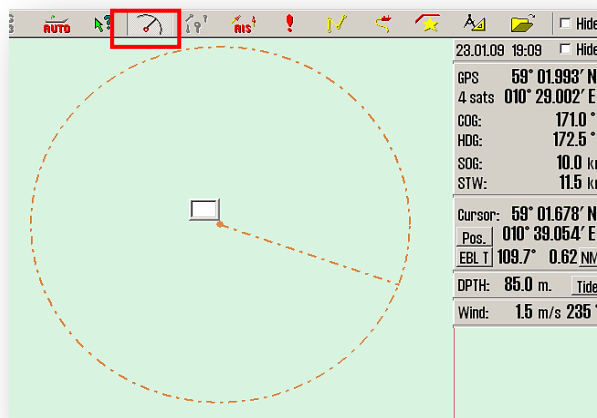


fig.1

5.1.1 General about EBL / VRM operation

Bearing and range information is displayed in the *cursor info field* (marked with a red frame in the fig.2). The measure unit for the distance is indicated in the lower right corner of the info field, and it can be switched between nautical miles (NM) and meters (m); the range value is given in the lower left corner of the field.

When the anchor point of the bearing (EBL/VRM origin) is locked to own vessel position, ETA (Estimated Time Arrival) to the bearing point, with SOG as constant speed, is displayed in a small window at the top right of the chart (marked with green frame in fig.2)

The bearing can be locked to a fixed heading by entering a value between 0-360 degrees in the small input window at the bearing line's anchor point.

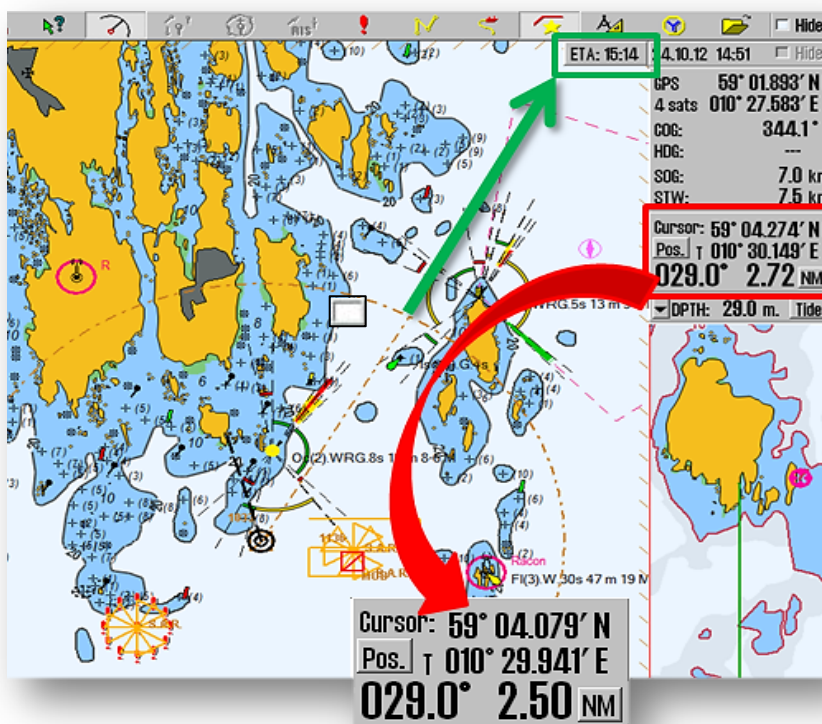


fig.2

The font size of the cursor data (bearing and range numerical values), can be changed by clicking anywhere in the *cursor info field* (fig.3)

The current bearing mode is indicated on the button that precedes the bearing numeric value, and can be changed from true -“*EBL T*” to relative-“*EBL R*” and invers, by left click on the same button.

When the font size of the cursor data is increased, switching between *EBL A* and *EBL R* mode operation is not available.

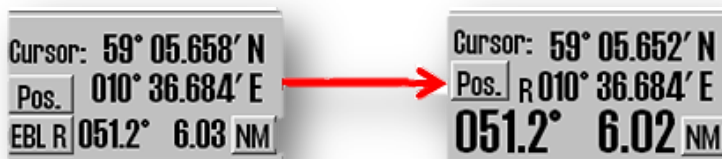


fig.3

“*EBL T*” indicates that a given, true bearing is displayed in the chart, respectively “*EBL R*” indicates that a relative bearing is shown. Bearing mode is set back to ‘true’ mode (*EBL T*) each time the anchor point is moved outside own vessel’s position.

By left click in the chart, the anchor point of the bearing line (*EBL/VRM* origin point), is moved in a new location. The *EBL/VRM* origin point will no longer follow the cursor movements., *EBL/VRM* origin point can be moved back to own vessel’s position, by mouse left click on the boat symbol. By right click in the chart, the target point is locked to cursor position.

Estimated time commitment to go from the anchor point (*EBL/VRM* origin) to bearing point, with the current speed, is displayed in a small window at the top right of the chart (see fig.2 - marked with green frame).

5.1.2 Temporary Route (2 Waypoint)

EBL / VRM function can also be used to generate a temporary route. Own position is origin WP.

Left click (new *EBL / VRM* origin) is the second point WP2. Right click (*EBL / VRM* target) with the cursor over the position that will be WP3. Confirm “*Activate voyage route?*” window to activate the temporary route (fig.4).

This route serves as a normal 3 point route, with the exception that it is not saved.

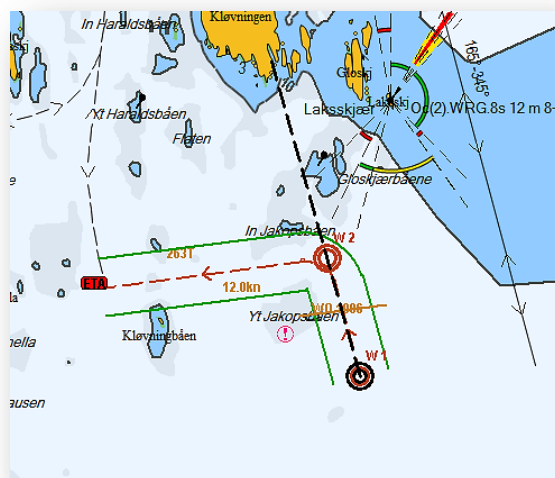


fig.4

5.1.3 Storage and export of Bearing Position and of Line Of Position (LOP)

To save and export bearing lines, right click on "Bearing EBL / VRM" icon, on the Main Toolbar, to open the "Bearing list" window. All saved bearing lines are displayed on the chart. On the far left of the window is the column for line selection. The selected lines are displayed on the chart with a bold line and text (fig.5).

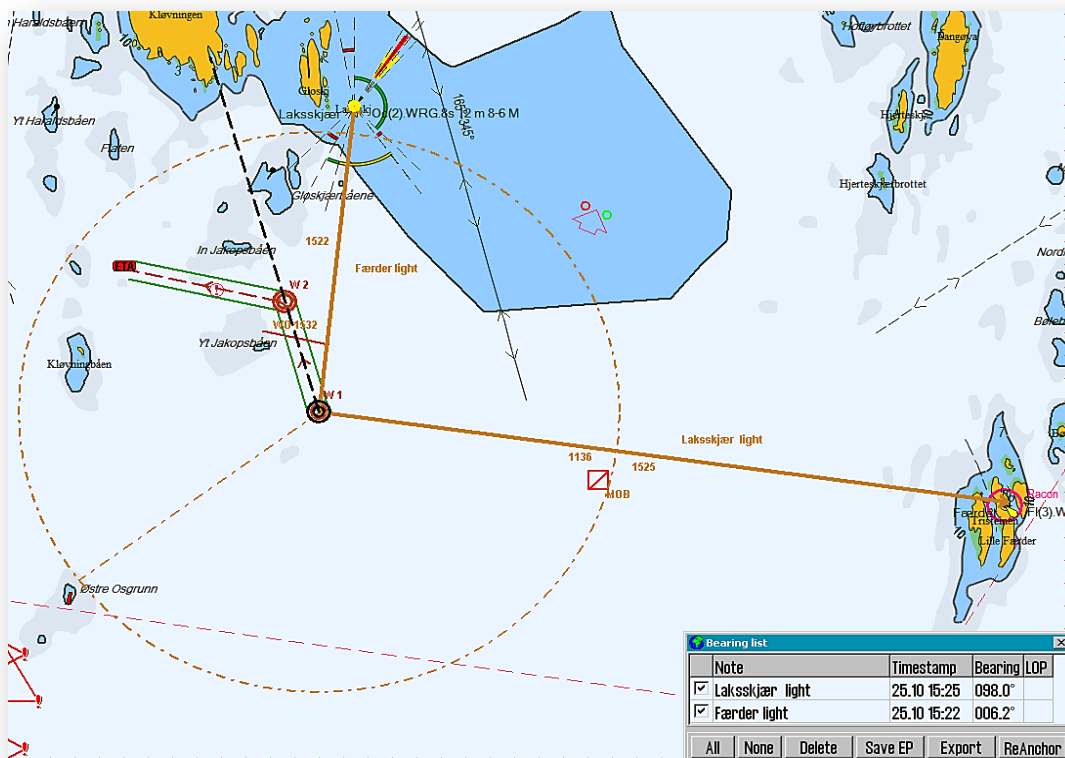


fig.5

At the bottom of the "Bearing list" window, buttons is provided with functions necessary to amend the status of bearing lines:

- "All" - select all bearing line; "None" - deselect all bearing lines; "Delete" - delete all selected lines.
- "Save EP" – calculate and display the estimated position of 2 and 3 position lines. "Export" - export the selected lines or move lines individually.
- "ReAnchor" - when this command is activated, the cursor must be positioned over the anchor point or over the arrowhead of the bearing line, and then left click to retrieve it. The bearing line now follows the cursor movement, without changing the angle (parallel shift), and can be placed by clicking again the left mouse button.

New bearing lines can be added to the "Bearing list" by enabling "Bearing EBL / VRM" (left click) icon from the "Main Toolbar" (if the function is not activated).

To save a bearing line, click on the middle mouse button. Then the bearing line appearance changes from dashed to solid line (fig.5. placed bearing lines in bold solid brown). This modification indicate that the bearing line is saved and is visible as long as "Bearing list" window is activ. Here the bearing line's data and status can be modified. This process can be repeated as many times as desired.

To save data from "Bearing list", for later use or for transport to another computer, use the "Export" function,. The Bearing Positions and / or the Lines of Position data that will be exported, must be selected with a tick in the checkbox. Data is exported to the location and under file name which is specified in the "Save As" window. The file format is not selectable; it is saved under " *csv " format, which is a text file readable in the Excel. In fig. 6 is illustrated such a " *csv " file opened in Excel and some formatting are made for easier readability.

	A	B	C	D	E	F	G	H	I	J	K
1	From lat.	From lon.	To lat.	To lon.	Date	Time	LOP	Type	Brg	Dist mtr.	Note
2	58.903405	010.571202	58.973400	010.641603	18.05.2012	12:12:52	0	1	027.4	8787	Bearing
3	59.022440	010.686358	59.033847	010.764302	18.05.2012	12:13:34	1	2	074.1	4653	LOP without time marking
4	59.000394	010.930751	58.969764	010.835206	18.05.2012	12:14:11	1	2	238.1	6467	LOP without time marking
5	58.918650	010.541676	58.869900	010.760782	18.05.2012	12:19:57	1	1	113.4	13749	ReAnchored Bearing
6	58.962479	010.590870	58.918568	010.692895	18.05.2012	12:21:16	1	2	129.8	7643	ReAnchored LOP

fig.6

The positions are specified in decimal grades and the time is indicated in the *Date* and *Hour* separate columns. *LOP* is indicated either by a "0" or "1", where "0" indicates a Bearing Line while "1" indicates a Line of Position.

In the column "Type": "1" – Bearing, "2" – LOP or a Bearing that has been moved, "3" – NMEA data received from the optical sounding instrument, "4" – NMEA data received from VHF.

In the column labeled "Brq" is indicated the bearing of the line, while in the column marked "Dist mtr." is specified the length of the line in meters. The last column contains the text that was entered in the "Notes" field in the "Bearing list" window.

All bearings and / or Lines of Position are saved and available in the "Bearing list", until are removed by operator. Deletion of data is performed using the "Delete" function and it can be done without further verification.

5.2 Route Planning (Voyage Planning)



Route planning button is located in the *Main Toolbar* and enable the *Route Planning Toolbar* situated on the left edge of the chart. When a route is visible or active, this toolbar is automatically displayed by moving the cursor to the upper left corner of the chart. The *Route Planning Toolbar* will be hidden if it has not been used within the last minute.

On the following pages you will find a description of the Route Planning in general and how each button in the *Route Planning Toolbar* works.

5.2.1 Draw a new route directly on the chart



"Make a new route" button starts the process of creating a new route.

The route Waypoints can be entered graphically in the chart. With the cursor on the desired location on the chart, left click to set the first waypoint (*W1*). When *W1* is placed, a pop-up window is displayed at the bottom of the chart, where the name of the route and eventually a descriptive text can be entered. Click "OK" to register this data.

Continue by moving the cursor to the next position and left click to insert the second waypoint (*W2*). A line joining these two points appears, creating a sail corridor - *Route Leg*. Continue to insert waypoints in the same manner, until the planned route is drawn.



Note that the default width of the passage corridor is set in the *Voyage Planner* as described in section 5.2.13.

Exit this function by right click in the chart or left click on "OK" icon situated on the *Route Planning Toolbar*.

A route can contain up to 500 Waypoints.

If a turn radius in the route is invalid (eg: too large), it will not be drawn, and a warning is given each time the route is selected.

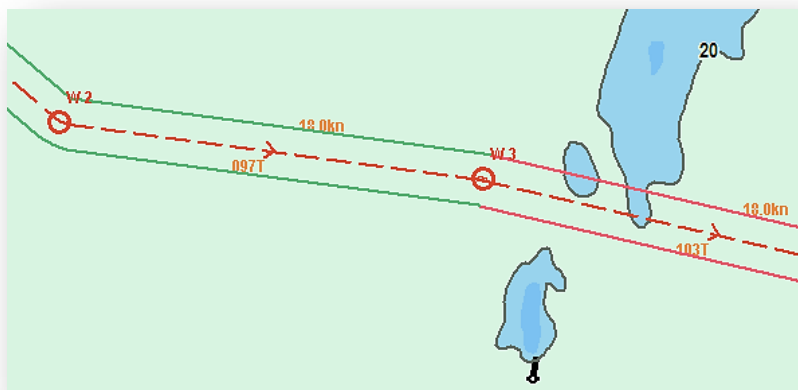
The coordinates of the Waypoints can be entered manually using the keyboard (see section 5.2.13. "Voyage planning") for details.

To move the chart while planning a route, use the middle mouse button, or move the cursor to the edge of the screen so that the cursor changes in a bold, black arrow. The scale can be changed on the *Main Toolbar* or by using the mouse scroll wheel. Keyboard shortcuts can also be used to control the chart changes (reposition or change scale), during route planning (see chapter 2.3.3).

When creating a new route or changing an existing one, all other previously saved routes, are displayed in the background, in gray. If the "Active lead sectors" feature (from "Tool Menu Folders" → "Chart") is selected, then the lead sectors will be displayed at the cursor position (also applies to route editing).

The route is displayed as a red line with direction arrows and each Waypoint is marked as a circle with a point number (W1, W2,...). The planned course and speed can optionally be displayed on the route line between two Waypoints.

When the last Waypoint is inserted, a safety check is performed automatically. The security check for the corridor width or any field settings, are performed in the "Voyage Planning" (see section 5.2.13). The lines on the corridor (Route Leg) have different colors, indicating the security status. If the route is completely safe and there are no warnings in the area, the corridor (Route Leg) is marked with green lines. If there are alerts, the corridor is displayed with yellow lines. Red lines indicate danger. If the lines are gray, that means that the control of chart data for the actual Route Leg, has failed. This can happen if the distance between two Waypoints is too long, and can be solved by splitting the long Route Leg with multiple waypoints.



The route lines are displayed in certain colors according to the safety status of each Route Leg:

Corridor Colour	Description
Green	The route is completely safe and there are no warnings in this Route Leg / Turn.
Yellow	Chart Objects with warnings are contained in this Route Leg/ Turn
Red	Dangerous objects are present in this Route Leg /Turn.
Gray	The Safety Check has failed for this Route Leg/ Turn. Divide the Route Leg in two.

! NB: If the last Waypoint is within a distance of 0.1 Nm from the first Waypoint, the route will form a circle (repeated).

5.2.2 Index Lines

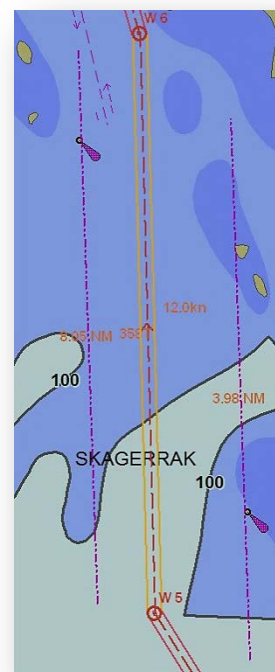


When a route is fully drawn and the route hazards and alerts have been reviewed and accepted, the Index Lines can be added for even safer navigation. An Index Line is launched by first selecting "Indexline" function from the Route Planning Toolbar, then move the cursor in the middle of the Route Leg and left click to 'release' an Index Line. The Index Line is displayed in magenta color and is parallel to the Route Leg from which it was generated. The Index Line now follows the cursor movement, and while still parallel with the Route Leg, it can be placed in the desired position in the chart with a mouse left click.

The end of each Index Line, is marked with a square symbol. If the "Indexline" edit function is activated, a left click on one of these square symbol, enables the **extension /shortening** of Index Line. Lock the Index Line in to position by left clicking again. The distance from route to Index Line is given in NM at the Index Line middle point.

Deleting an Index Line is done by right-clicking with the cursor over one of Index Lines end points.

Undo last deletion and **Restore** the last deleted line is done by double clicking on the Route Leg corresponding to that Index Line.



5.2.3 Extending a Route



If a route was only partly drawn or need extension, it can be extended by using “Continue Drawing” function. Frist select the route and then activate the “Continue Drawing” function from the *Route Planning Toolbar*.

5.2.4 Changing the existing route



To modify an existing route, select the route to be changed, then activate “Edit” function from *Route Planning Toolbar*. With this function activated, the following operations are available:

Requested modification	Procedure
Moving a Waypoint	Left click on the <i>Waypoint</i> and move it to the new location and left click again to release it
Delete a Waypoint	Place the cursor over the <i>Waypoint</i> to be deleted and right click.
Adding a Waypoint	Left click on the line between two <i>Waypoints</i> to add a new <i>Waypoint</i> . Move the new <i>Waypoint</i> to the desired position and left click again to lock it.
Exit <i>Edit</i> mode	Click “OK” button in the <i>Route Planning Toolbar</i> .

An active route can be edited without stopping it, but the Waypoint ahead of own ship and the immediate two points behind own ship, are fixed and can not be changed.

5.2.5 Selecting a Route



The route selection function is used to select a route for use or editing. Clicking on “Select a route “ button, all the existent routes will be displayed in the chart, and on a drop-down list will be available in a dialog box in upper left corner of the chart.. To select a route having the same direction as the arrows, left click that route, or right click to select the same route but to use in reverse.

To select a route by name, use the drop-down list from “Select by name/id” dialog box. Click “OK” for the planned sailing direction (the route have same direction as the arrows), and “Retour” if the route is to be used in reverse.



5.2.6 Merging routes

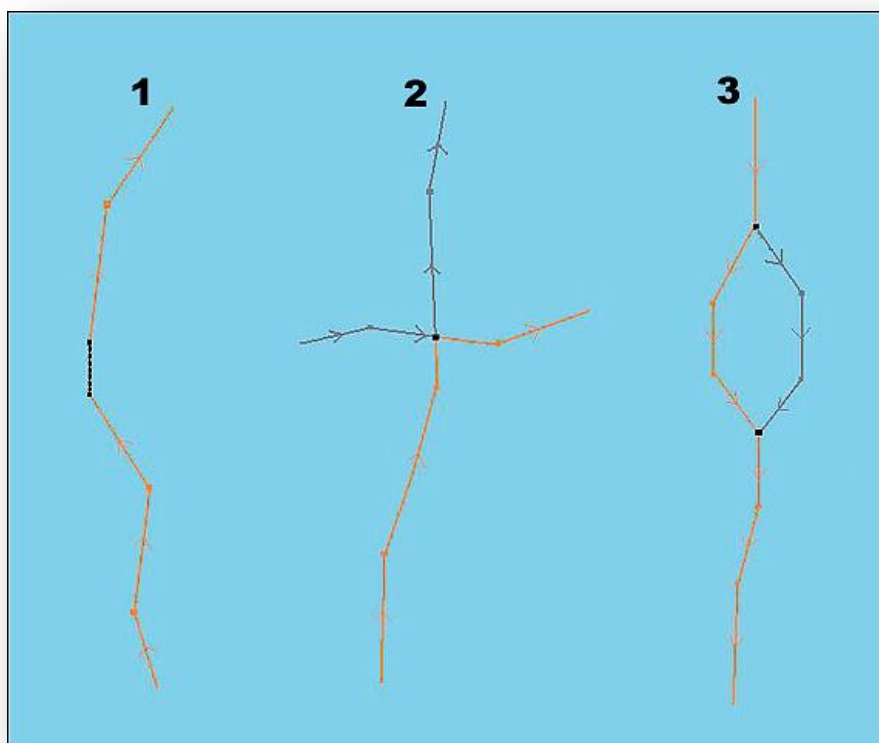
The following procedure explains the combination of two or more routes into a new one.



Tools to select route: select the route to be expanded / extended (original route), as described in section 5.2.5



Tools to extend a route or to select the secondary route in a merging process: activate the “Add a route” function to select the route to be added. (If you want to draw a new route that will later be merged with another, use as usual the “Make a new route ” function –see section 5.2.1. You can see the route you are going to splice it with, in the background, as well as all the other existing routes, shown in gray while drawing or modify routes). Waypoints in the active route and in the secondary route, are checked against each other so that the routes are connected in the coincident Waypoints (see fig. 1).This provides flexible possibilities of connecting main and secondary routes.



5.2.6.1 Example 1: Route extension

The last Waypoint of the original route joins with the first Waypoint on the new route, or a bridge connection is made.

5.2.6.2 Example 2: One Way Point connection (<0,1 Nm)

When the routes are connected only in one Waypoint, a combination of the two routes will be created, where the gray route parts will be deleted.

5.2.6.3 Example 3: Two Way Points connection (< 0,1 Nm)

When both the first and last Waypoint on new route join with Waypoints on the original route, the intermediate parts of the original route will be replaced with new / changed sailing route.

5.2.6.4 Save the new formed route



The merged routes will be presented as a new route, and TECDIS will automatically enumerate again the Waypoints. The merged route can be saved as new route by pressing the “*Copy active route to new route button*”

5.2. Using an existing route as a template for a new route



Use the “*Copy active route to new route*” button to save a selected route as a new route (“*Save As*”)

If you want to create a new route based on an existing one, a copy of the original route can be created using “*Copy active route to new route*” function. First, the existing route should be selected. When activating “*Copy active route to new route*” function, a dialog box opens; click “*OK*” button to confirm copying and saving of the original route. The route that appears on the screen is a copy with an independent status and can be modified in the usual way, and it will be saved as a new route. (The original, template route, is preserved in its original form).

5.2.8 Delete a route



Use the “*Delete*” button to delete a selected or active route. If no route is selected or active, all routes will be displayed in the chart while the cursor changes into the tool for selecting the route (see 5.2.5). Select the route to be deleted and a pop-up window appears for confirming/cancelling the deleting process.

5.2.9 Activating a selected but inactive route



If a route has been selected but not activated Use the “*Check and Activate displayed main route*” function to enable it. Enabling the route starts route navigation (see section 5.3). This function also forces a new safety check of the route.

5.2.10 Save, edit and print route list



When a route is selected, and the “*Make, edit and print waypoint list*” function is active, a pop-up window with a route list (as text file –“.txt”) it will be open, containing the waypoints detail information’s, total distance and total time. The list can be saved, exported or printed. Any comments can be added to, before printing or saving the file.

5.2.11 Automatic Route Generation Drafts - "Sea Routes"



C-Routes are supplied as an integral part of **Jeppesen Professional + Chart Database**, therefore are available only on **TECDIS** computers that have **Jeppesen Professional +** installed and enabled. Also, valid licenses are necessary for the area the routes are generated for.

C-Routes Automatic Route Generation Drafts includes functionality for automatic generation of Route Drafts, to and from both established ports and custom positions. Route Drafts follows traffic separation schemes and takes into account all the other chart features and the vessel’s draft as well. This feature can speed up the route generation and so reducing navigator’s workload significantly.

Route Planning is a key activity that forms the basis of the scheme that the navigators will use to ensure the vessel’s voyage along the planned route. A Route Plan is a comprehensive, port to port guide, developed and used by the navigators to determine the most favorable route, to identify potential problems or hazards along the route, and to adopt the navigator practice to ensure safe vessel navigation. During a Route Planning procedure, the parts of the route that have the potential to pose the greatest risk, should be subject to further review. Such review sets in advance the limits and restrictions that apply to those parts of the route.

C-Routes library is developed by **Jeppesen Marine** and is included in **TECDIS.C-Routes** library provides assistance to navigators in the implementation of routing. The library's main feature is the computation of a shortest path between two ports. Route calculation is based on the matching conditions specified by the vessel parameters with the territorial limits along the planned route.



Automatic Route Generation- "**C-Routes**" function- opens a new "*Create route with C-Routes*" window. Route Planning tool is divided into various fields:

- Route Name
- New Stop
- Restrictions
- More opsjons
- Keyboard
- CREATE ROUTE

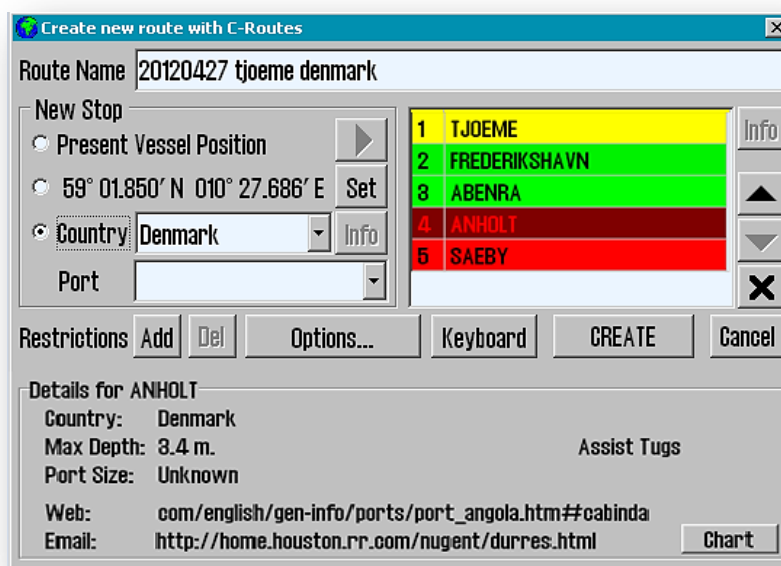
5.2.11.1 "Route Name"

Enter the name of the route.
Use the terminology that makes it easy for others to pick up the route later.

5.2.11.2 "New Stop"

The left part of the window is used to enter the departure port, ports of call (calls locations) and the final destination. Departure point can easily be added to the "*Present Vessel Position*". This adds the current position to the first WP on the route. Other ports of call can be added to that position, by selecting "*Specified Position*" option, followed by "*Set*" button. Left click on the desired position in the chart.

fig.2



Alternatively port of call can be introduced with "*Country*" option, where the country's name is initially selected in the drop-down menu. If the keyboard is used, then click on the country name's first letter, and use the arrow keys to browse. Then move the cursor to the "*Port*" field, where the search is done either with the arrow keys or by typing one or more letters of the name of the desired port. Note that it's not necessary that the name to include Æ, Ø and Å letters, so the international notation must be sought.

The right side of this field contains information about the ports of call that are selected. When all ports of call are added, the formed list can be edited using the *UP/DOWN* arrows and removed with delete - "X" button.

"*Info*" button is used to retrieve information about the port that is selected. In the fig.2 the harbor Anholt is selected, and the corresponding information is found in the lower field of the window. It also indicates the maximum draft of vessels that are entering this port. In the example the max. draft is 3.4 meters, which is too shallow for the own ship. Therefore the name is shown in red, and further processing of this Route Generation will be stopped. This place (this port of call) must either be deleted or an alternative port of call (specified position outside the shallow harbor) must be found. Another option is to activate the "*Ignore ship draft*" option under "*Options...*" field (see section 5.2.11.4).

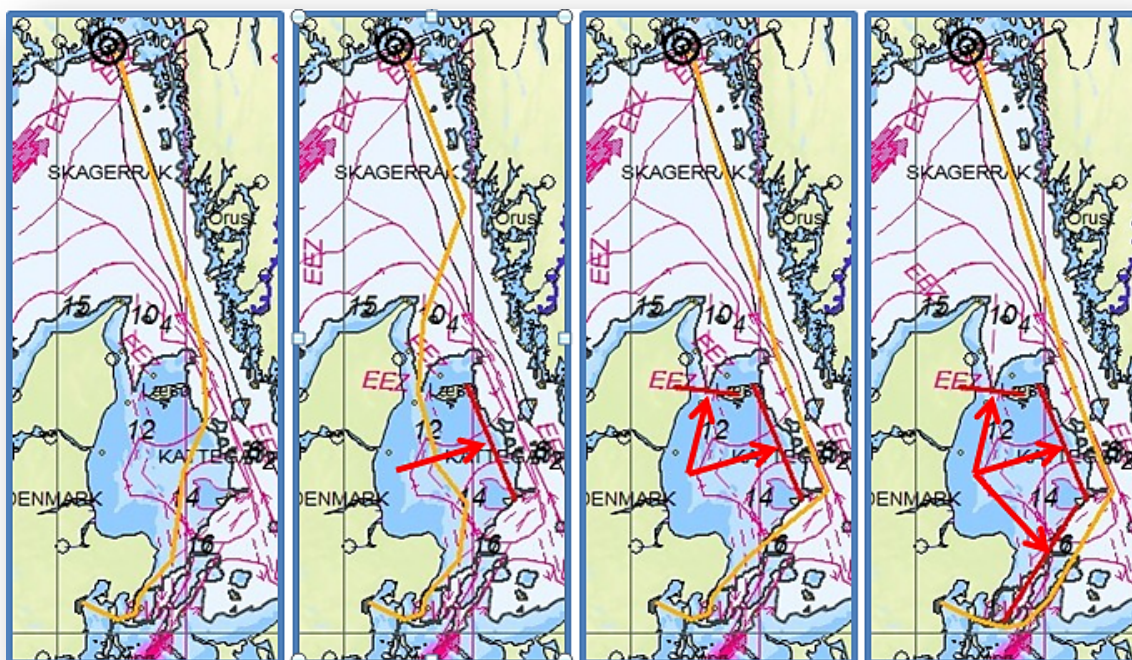
With the "*Chart*" feature the selected port will be centered in the chart display.

In the fig.2 example, the first port is presented with yellow color background, which indicates that there is no depth information in the database for this port. The ports of call, rendered in green, have depth limitations bigger than the own vessel's draught - own vessel draught value is indicated in "*Draught / Ship draft*", "*Setup*" folder in TECDIS "*Tool menu folders*".

5.2.11.3 “Restrictions”

With "Restrictions" functions, C-Routes that doesn't cross each other, are inserted. In an earlier planning stage, the C-Routes should be zoom out in the chart so that it can be visible. When minimum two ports of call are set, the C-Routes are drawn as an orange preliminary routes. When a sea area, bridges, canals, objects or places, are considered obstructions for the own vessel, it can be inserted restrictions in the form of a red slash across those areas which C-Routes will not take into the route calculation. When the "Add" function is activated, the cursor will change and with a left click in the desired position, in the chart, the first point of a red restriction line is set. The other end of the restriction line is set by moving the cursor to the desired location and left click again. There is no limit to the number of restriction lines that can be deployed.

fig.3



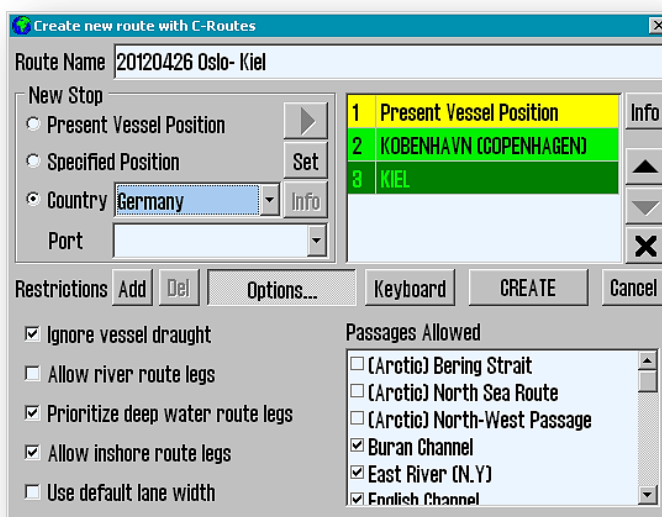
In fig. 3 it is shown a screenshot of a chart images where none, one, two or three restriction lines are present. Note how the C-Route continuously seeking a safe sailing route (passage).

A click on the "Del" button deletes the last plotted restriction line, a second click on "Del" button removes the second-last restriction line, and so on.

5.2.11.4 “Options”

The C-Routes can be adjusted to avoid planning the route through fairways and / or channels. To restrict or prohibit certain passages through the fairways and / or channels, remove the checkmark in front of the fairway or channel's name, in "Passages Allowed" field.

The fairway / channel's name that is checked (highlighted) in the "Passages Allowed" field, will be indicated on the chart with a red marker. This is so that the navigator should use the least amount of time to make correct decisions when planning a route.

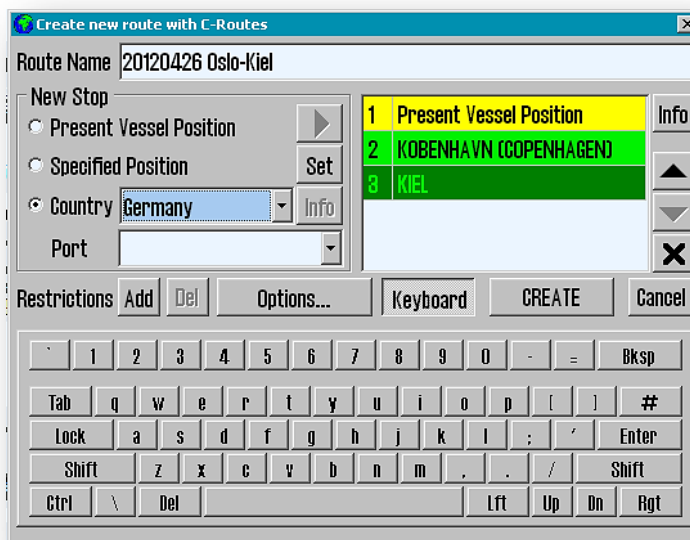


Furthermore, when planning a route, C-Routes can be adjusted to consider the following options:

- “Ignore ship draft”- when checked, C-Routes will generate a route without taking into consideration the own vessel draft. The new generated route draft must be reviewed in detail before the route is used!
- “Allow river route legs “- when checked, the C-Routes it will generate routes, using inland waterways, there where it makes sense.
- “Prioritize deep water route legs”- when checked, C-Routes generates routes preferably in the open ocean.
- “Allow inshore route legs “- when checked, C-Routes can use the fairways within the shoreline for navigation plan. In that case, a route can be plotted outside the traffic separation schemes and be shorter.
- “Use default lane width” - when checked, C-Routes uses TECDIS standard corridor width (default), instead of corridor width from C-Routes that are highly variable per leg.

5.2.11.5 “Keyboard”

The “Keyboard” function is used when the access to a terminal keyboard is limited. Use the cursor to introduce all the necessary data in to the fields.



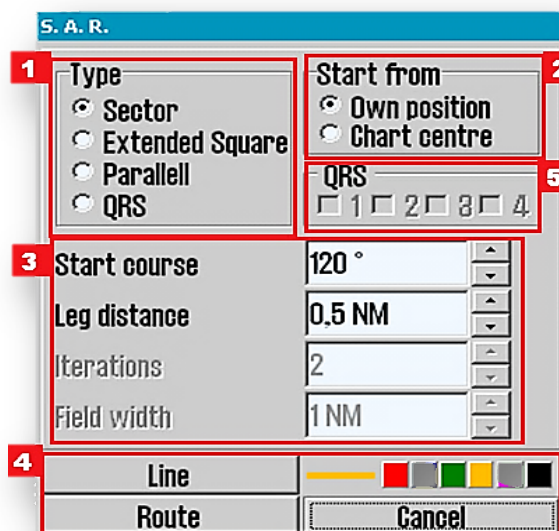
5.2.11.6 “CREATE”

When all Ports of Call are placed in the list and displayed in yellow or green color and all the parameters options are set, left click on “CREATE” button to start the generation of the route draft. What has been an orange line indicating the route, now is converted in to a preliminary route with Waypoints, sailing corridor, speed annotation, direction and is registered in *Route Planning Toolbar* with the reference to the route’s name (see section 5.2.11.1). Further work on the route is done via the *Route Planning Toolbar* before the route is actually used the navigator must check it both, automatically and manually.

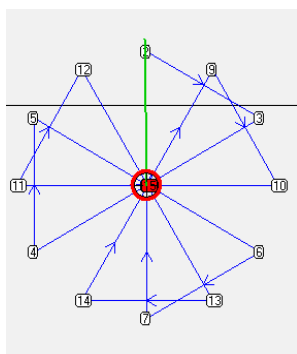
5.2.12 SAR - Search and Rescue Pattern

SAR Use the “S.A.R.” button for quick access to a built-in function providing search and rescue patterns directly on the chart. There are four types of search and rescue patterns to choose from and they can be defined either as a separate chart object or as a route. When “S.A.R.” is activated, a new window opens where search and rescue pattern type, starting position and other settings can be configured.

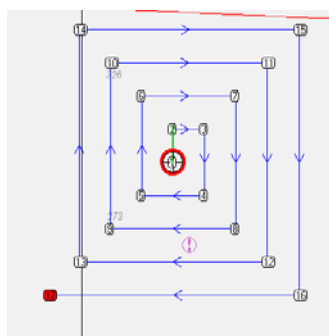
- 1) Select the type of search pattern; the most common are available in the S.A.R. window.
- 2) Select the search pattern’s anchoring point (origin point) in own vessel’s position or in the chart center.



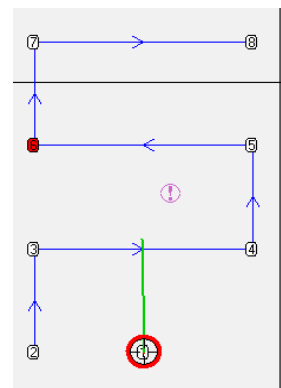
- 3) Set the corresponding parameters for the selected search pattern type. The search direction, length of line, number of lines and the distance between lines are all adjustable. The parameters that are not applicable for the selected search pattern type in (1), are inactive.
- 4) Choose the operating mode of the search pattern. By closing the settings with "Route" function, the search pattern is generated as a route and is automatically enabled for route navigation. By closing the with "Line" function, the search pattern is generated as a *Mariner Objects* line. When the line is set in red, it will indicate hazards - "Indicate danger", ALARM. This line will be visible regardless of the displaying settings made in "Mariner Objects". In any other color the search pattern behave as ordinary line generated under "Mariner Objects". To delete/ change lines, use the "Delete"/ "Change" functions in "Mariner Object" described in section 4.8.3.
- 5) The "QRS" search pattern differs from the other because is not a continuous line and thus cannot be converted to a route. "QRS" is a numbered mesh (grid) where the anchor point, the start and the leg distance can be selected. Everything else is fixed and cannot be edited. Up to four "QRS" search patterns can be visible on the chart simultaneously. To remove the "QRS" search pattern, return to the "S.A.R". window and deselect the checkbox of those patterns that will be removed. To display or hide the grid pattern according to the specified parameters, go to "Mariner Objects" window and use "Show" or "Hide".



Sector



Extend Square



Parallel

5.2.13 Route Planning and calculation



"Route planning and Calculation" function provides access to detailed information and control of the selected route parameters.

When this function is activated, a table with detailed Waypoint information is displayed in the lower part of the screen.

wp	GC	Lat.	Lon.	Dist.	Course	Speed	Lane	Turn	ROT	Time	Delay	Text	Keyboard
1		59° 01.869' N	010° 27.597' E	0.5 NM	120.0°	12.0 kn	0.10 NM	---	---	---	---		
2		59° 01.620' N	010° 28.435' E	0.5 NM	240.0°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:05	---		
3		59° 01.370' N	010° 27.598' E	1.0 NM	000.0°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:07	---		
4		59° 02.368' N	010° 27.598' E	0.5 NM	120.0°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:12	---		
5		59° 02.119' N	010° 28.436' E	1.0 NM	239.9°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:15	---		
6		59° 01.620' N	010° 26.760' E	0.5 NM	000.0°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:20	---		
7		59° 02.118' N	010° 26.760' E	0.5 NM	120.1°	12.0 kn	0.10 NM	0.10 NM	115°/min	01. 19:22	---		

The table below describes the information type available for each waypoint in “*Route planning and Calculation*” window.

Default values for *Speed*, *Corridor Width* and *Turning Radius* are specified in the “*Default*” field (left side). The values specified here are used for all the route waypoints, with the exception of those having override values.


Speed, *Corridor Width*, *Rate Of Turn (ROT)*, *Arrival Time*, *Delay* and *Text* for each waypoint on the selected route can be modified, even during voyage.

If 0 is used as the new value, then the default value is used (the default value is shown in gray in the table). If another value is specified this will override the default and the value will be displayed in bold font in the table.

Values can be entered in cells using the keyboard, or by using the scroll wheel on your mouse.

Separate values for each waypoint can be introduced in the table, by typing the value in the corresponding cell for *Speed*, *Corridor Width*, *Rate Of Turn (ROT)*, *Arrival Time*, *Delay* or *Text*. If a terminal keyboard is not available, use the “*Keyboard*” function (window upper right corner).

For example, the stopover duration can be inserted at a waypoint (eg. port), in the column for *Delay*; this can be useful for vessels operating in a regular route (eg. ferry boats).

Text column, can record comments or info for each waypoint. For more detailed comments or photo / document presentation etc. use “*Chart Object Inspector*”  function from the *Main Toolbar* (object information at waypoint position)

If a route is to be modified, there are two ways to do it; note the route modification either by activating the “*Edit*” function in the *Route Planning Toolbar* (see 5.2.4), or tick the “*Edit wayp.*” checkbox in the upper left corner of the window. When the route editing is complete, the route safety check will be activated automatically.

“*Lane*” (window lower left corner) - selected/deselect the checkbox to display /hide the corridor width.


“*Info*” (window lower left corner) - select/deselect the checkbox to display /hide the planned course and the speed corresponding to each route leg. This option is disabled for **TECDIS** systems equipped with optional Track Control.

“*Zone*” field - enter the time zone for the specified route.



NB! When the Route Planner is in *edit waypoint* mode, the route monitoring function is turned off (the route control signals will not be generated to the autopilot).

Column	Explanation
Wp	Waypoint number
GC	Great circle
Lat.	Waypoint latitude
Lon.	Waypoint longitude
Dist.	Distance to the next Waypoint
Course	Course to next Waypoint
Speed	Planned speed
Lane	Lane/corridor width
Radius	Turn radius
ROT	Rate Of Turn
Arrival	ETA Waypoint
Delay	Stop time at Waypoint (min) / Waypoint delay
Text	Waypoint name and additional information

By clicking one of the data fields in the list, belonging to a Waypoint that is not displayed, the chart will center at the specified Waypoint. This feature is disabled if the “*Auto Chart Reposition*”  is enabled, and in this case the chart follows the vessel.

5.2.14 Use of keyboard and mouse for Route Planning

With "Edit wayp." function selected, the keyboard or the mouse can be used to introduce new waypoints on the route or to modify the coordinates of the existing ones.

Using terminal keyboard: double left click in the *Route Planer* list, on the waypoint coordinates (or double left click on the waypoint directly in the chart) and add /modify its values with the keyboard. Activate the "Enter" key or click on another cell in the route planner list to install the modifications. A new waypoint can be introduced in front of the currently selected waypoint, by pressing the "Insert" key.

The new waypoint is placed midway between the previous and the currently selected waypoint.

The selected waypoint can be deleted using the keyboard "Delete" key.

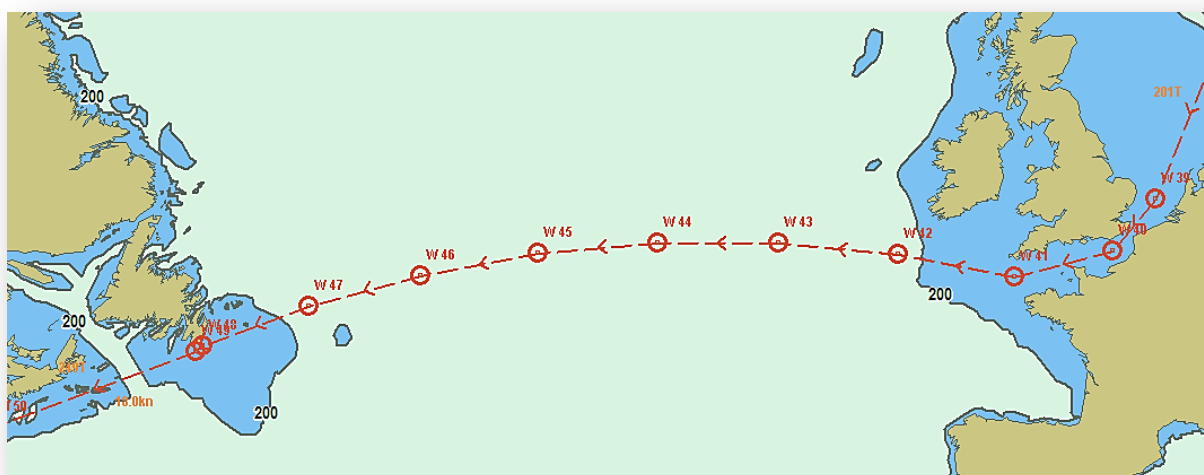
15 wp 9.0 NM 44 min 52 s				
<input checked="" type="checkbox"/> Edit wayp.	wp	GC	Lat.	Lon.
Default	1		59° 01.869' N	010° 2
Spd. 12.0	2		59° 01.620' N	010° 2
Lane 0.10	3		59° 01.370' N	010° 2
Turn 0.10	4		59° 02.368' N	010° 2
<input checked="" type="checkbox"/> Lane <input checked="" type="checkbox"/> Info	5		59° 02.119' N	010° 2
Zone -9	6		59° 01.620' N	010° 2
	7		59° 02.118' N	010° 2

Using the mouse: left click on the waypoint directly in the chart to modify its coordinates (the waypoint is moving with the cursor). Set the new position by another left click in the chart.

Note that, when the "Edit wayp." is selected, the zoom in/out mouse function is disabled.

5.2.15 Great Circle Route

In the *GC* (Great Circle) column, the route leg presentation can be toggled between *Great Circle* or *Loxodrome* route type (assuming that "Edit wayp." mode is not active). A route leg can be toggled between *Great Circle* and a *Loxodrome* line, by clicking in *GC* field for the respective route leg, assuming that the difference is longer than 300 NM. If the Great Circle mode is selected, the symbol for this field will be a curved line in edit mode and dotted line in finished/active mode. The color of the symbol will also set the security status, having the same color code as the route corridor (see the table in section 5.2.1 for an explanation of the color codes).



The *Great Circle* route generate additional waypoints on the table, which are the intermediate waypoints on the *Great Circle*. This means that the *Great Circle* is recorded as a series of *Loxodrom* routes. Such additional waypoints can not be modified in the table and are automatically removed if the route leg presentation is switched back to *Loxodrome* route type.

5.3 Route Navigation

See Section 5.2.5 and 5.2.9 for information about selecting and activating a route.

When activating a selected route, and the distance between the own ship and the route is least two times bigger than the width of the corridor route, the first route waypoint to steer towards must be indicated (start of navigation route). After confirming this message, select the first waypoint to steer toward, by clicking on it. When the last waypoint has been passed, the route will be disabled automatically.

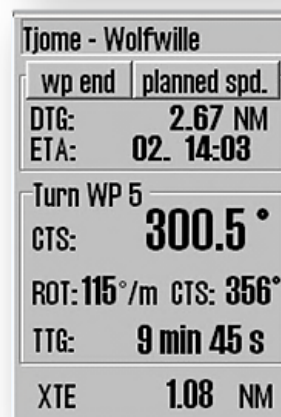
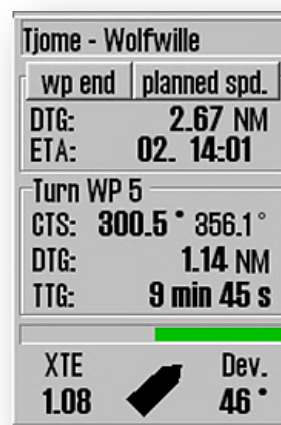
When the route is active, an information window is displayed in the lower part of the *Vertical Menu (Information Field)*. This window contains all relevant information about the current Route Navigation (see fig 1).

Route Navigation window:

- route name
- “WP end” : DGT and ETA for entire route
- WP + nr. : DGT and ETA for the selected waypoint.
(Toggle between “WP end “and” WP + “ by mouse click.)
- DGT : Distance To Go (Remaining distance)
- ETA : Estimated Time of Arrival
- “Turn WP1,2,3....” : Wheel Over for Waypoint 1,2,3....”
- CTS : Courses to be controlled now (Course To Steer to the next Wheel Over point) and heading for the next route leg.
(the first heading displayed is the current CTS and the second heading is the next CTS)
- DTG : Distance to the next waypoint (Distance To Go)
- TTG : Time to the next Wheel Over point (Time To Go)
- “XTE” /”Dev” : Position in relation to the planned route.
XTE indicates Cross-track error for the current course, measured in the same unit as the cursor range (see5.1.1)
Dev. indicates course deviation.

The horizontal bar corresponds corridor width, and displays XTE to port as a red bar and XTE to starboard as a green bar.

A full bar indicates that the vessel is located at the limit or outside of the current leg lane. The vessel graphic below the horizontal bar illustrates the current heading deviation graphically.

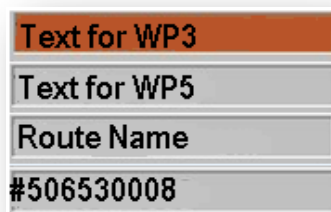


If a larger font size for CTS data is required, just click directly in the field. In addition the *Rate Of Turn (ROT)* is displayed, while the graphic representation of the current heading, is removed (only the XTE (X-cross Track Error) value is presented).

5.3.1 Route Name text field

Route Name text field displays WP info text or route name info text, with the following priority:

1. Text for next WP
2. Text for ETA WP
3. Route name
4. Route ID number



5.3.2 Calculation of the duration of the voyage

Route Navigation window displays ETA / DTG of the last WP in the selected route or for a specific WP, based on the current speed or planned speed as specified in the *Route Planner*.

The text on the "WP end" button, as shown in the illustration above, shows to which waypoint (WP), DTG and ETA values is referring to. By clicking on the "WP end" button, alternates between DTG and ETA values for the selected WP (WP xx) and last WP (WP end).

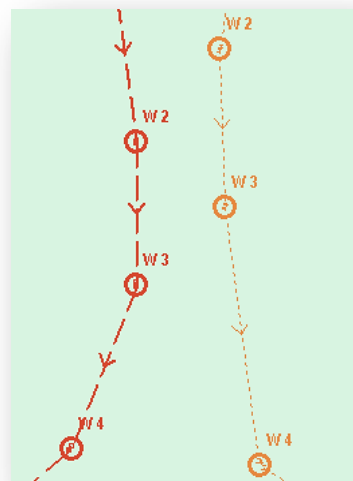
ETA-value can be calculated based on the current speed or based on the planned speed. To switch between these two modes, press the "Planned Speed" button which then changes to "Present Speed" button. The text on the button shows the current calculation mode.

5.3.3 Primary and Alternative routes

The top three buttons in the *Route Planning Toolbar* enables the simultaneous use of two routes ("1" and "2").

Select or draw a new route with the "1" button activated, and so the Primary Route is selected and displayed in red color.

Select or draw a new route with the "2" button enabled and so an Alternative Route is available and displayed as orange dotted lines.



The "1:2" function, allows to switch between routes.

Only the Primary Route can be activated, and to replace the primary position "1" with a secondary position "2", must be confirm that the active route is cancelled. After replacing the routes, the operator must verify "Check and Activate displayed main route" function because the *Route Navigation* should be enabled again for the Primary Route.

All operations made in *Route Planning Toolbar*, affect the currently selected route position.

Transfer of Primary Route and Secondary Route to another TECDIS:

when two TECDIS devices are connected, and the IP address of the second device has been configured in the *Setup* program, the last selected sailing route (primary and secondary) will be automatically transferred to the second TECDIS device and will be available as *Import Data* on the other computer. See Section 3.6.4 for a more detailed description of this function.

5.3.4 Notify Waypoint / Critical Point on the voyage

If a critical WP on the route is of particular interest, TECDIS can provide an warning at a pre-determined distance. To use this feature, enable "Chart object inspector" function (from the *Main Toolbar*) and click on the WP where the warning is to be placed. An information window, that provides details on the selected waypoint, opens in the lower part of the chart. In the lower left corner of this window, check (activate) "Warning before point" feature and specify the time or the distance before the particular waypoint, when the warning should be given. Put a checkmark in the box to the left, and then when point shall be notified in time or distance.



A critical waypoint is marked with four red exclamation marks.

When the predetermined limit for a critical point is reached, an “Point Info” alarm is activated and the info window for this critical waypoint, appears at the bottom of the chart. Any info text entered previously to describe this critical waypoint, will also be visible in the information window.



NB: Critical waypoint warning is triggered when the vessel moves within the specified range from any heading, not just along the route. When the warning has been raised, the marking of the critical waypoint in the chart will change in to four green exclamation marks.

To delete a critical waypoint, click it with the “Chart object inspector” and deselect the «Warning before point” checkbox.

5.3.5 Hazards and alerts on a route

When a new route is created, or when an existing route is selected, the system will conduct a safety check of the route and generate a list of all hazards and warnings for the entire route.



Access to the list of hazards and alerts by clicking on the “List route dangers and cautions” button on the Route Planning Toolbar. This button can either be displayed as an exclamation mark or as a question mark.

An exclamation mark indicates that the safety check of the route must be done again. Click this button to start the security check of the route, which will start and run in the background. While security is running, a reminder of this is shown in the upper part of the anti-grounding chart.

A question mark indicates that the route safety check has been completed and the dangers and cautions list can be displayed.

The list of hazards and alerts (Route Alerts) it is actually a table where:

- the first column contains the identification number of each waypoint the warning/danger relates to, accompanied by the “=“or “+” sign; the “=” sign indicates that the warning applies to the route leg between two waypoints, while the “+” sign shows that the warning is concerning a turn (wheel over) with a single waypoint.

Alert object type	Depth	Chart
6 + Caution area		Professional+
8 = Caution area		Professional+
7 + Caution area		Professional+
2 = Depth area	5 to 10	Professional+
2 = Depth contour	10	Professional+
2 = Underwater/awash rock	9	Professional+
4 = Depth contour	10	Professional+
4 = Depth area	5 to 10	Professional+

- the second column gives a short description of the item, followed by the object's depth (if available).
- the last column gives information about the chart database where the object originated.

The screenshot shows a nautical chart with a route highlighted in red. A 'Route alerts' window is open, displaying a table of hazards and cautions. Below the chart, an information window is open for a selected 'Caution area' object, showing details about submarine and overhead cables.

The warnings, highlighted in yellow, are listed first. Then follows a list of all the dangers on the route, which are highlighted in red. Clicking on one of the yellow warnings, opens an information window with more info details and a description of that warning /area. All the warnings are also marked on the chart display (with red markings) when the clicking on the notification in the list. This is the modality to get a quick visual overview of where the dangers are. If the current way point is outside the displayed section the chart will move automatically, if the auto function is not activated.

5.4 Autopilot (Track Control)



NB. Refers to the autopilot User Manual to operate the autopilot.

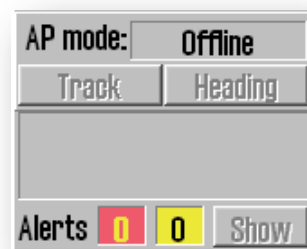
Autopilot Functionality, associated with the source of position, course and speed information, is designed to automatically keep the vessel on a pre-planned course over ground (COG) under various conditions and within the limits related to the ship's maneuverability.

5.4.1 Autopilot mode information

When TECDIS system (configured for "Track Control" function) is connected to a **Raytheon Anschütz AP 2025 Plus autopilot**, a window containing information about the autopilot status, is visible directly above the alarm box.

The possible values for the Track Control ("AP mode") are:

"Offline"	No data is received from the autopilot.
"Manual"	The autopilot is now the manual steering mode.
"Heading ctrl"	The autopilot is now at a Heading control mode.
"ROT control"	The autopilot is now the Rate of Turn control mode.
"Track Control"	The autopilot is now the Track Control mode.
"External"	The autopilot is now in External (Remote) control mode and Autopilot Remote Control appears on TECDIS screen.
"Override"	Check with Autopilot users manual.



5.4.2 Sensor Monitoring and fault-tolerance

A *TECDIS TCS (Track Control System)* must be connected: to two independent position sensors, two independent heading sensors and one speed sensor. The data from these sensors are continuously monitored by the system and alarms are triggered if data is lost or deemed invalid. Positions and Heading data from the independent sensors are also compared and alarms are triggered if the position or the heading difference exceeds the limits specified in **TECDIS/TELchart ECS Setup** (see section 5.5 and 7.6).

If the monitor sensor detects a failure or error, *TECDIS TCS* attempt to switch from the Autopilot system to Heading Control mode ("Heading ctrl"), having the parameters set to keep the vessel on the planned course (COG). "Set Course" and "Rate of Turn" function, for the next WP, are set to the same values that were active when the track control (*TECDIS TCS*) was terminated.



NB: In case that both heading sensors have failed or in case of loss of power on autopilot, the rudder angle will not be changed relative to the rudder angle at the moment when the error occurred.

The following events and alerts appear when *TECDIS TCS* is stopped by the autopilot:

Autopilot	TECDIS
"Track Control Mode"- indicator light goes out.	Alarm starts, to indicate "Track Control Mode" shutdown.
"Heading Control mode"- indicator light is lit (if possible).	"AP mode" information field switches to "Heading ctrl" or "Offline" if communication to the autopilot is lost for more than 20 seconds.
"Track Control Stopped"- the alarm is triggered	Alarm "Autopilot" starts and the "AP mode" info field switches to "Offline".

5.4.3 TECDIS TCS Operation

To enable AP ("Track control") mode, a planned route must to be selected and activated. In addition, the vessel's position, course and speed, relative to the active route, must fall within the limits specified in **TECDIS/TELchart ECS Setup** (see 5.4.5 and 7.6).

When *TECDIS TCS* is in AP ("Track Control") mode, will work together with **Raytheon Anschutz AP2025 PLUS** to keep the vessel sailing on the planned route (relating to *COG*). Before each WP the following sequence is performed:

	Warning	Description	When
1.	Change Course early warning	This warning is enabled in TECDIS, 1 - 5 minutes before the course change (<i>WOP</i>), as configured in TECDIS/TELchart ECS Setup (see 7.6).	1-5 min before <i>WOL</i>
2a.	Change Course LAST warning	If "Change Course early warning" (1) <u>was confirmed</u> by the operator, this warning is enabled in TECDIS, 30 -60 seconds before the course change (<i>WOP</i>), as configured in TECDIS/TELchart ECS Setup (see 7.6).	30-60 sec. before <i>WOL</i>
2b.	New WP	If "Change Course early warning" (1) <u>was not confirmed</u> by the operator, this alarm is activated in TECDIS, 30 - 60 seconds before the course change (<i>WOP</i>), as configured in TECDIS/TELchart ECS Setup (see 7.6).	30-60 sec. before <i>WOL</i>
3.	New WP	If "Change Course LAST warning" (2a) <u>was not confirmed</u> by the operator, this alarm is activated in the TECDIS weel-over point(<i>WOP</i>)- start of the course change.	At <i>WOL</i>
4.	The Turn (course changing) is performed		At <i>WOL</i>
5.	Back-up Navigator Alarm from the separate alarm system	If "Change Course LAST warning" (2a) or "New WP" (3) <u>was not confirmed</u> by the operator, a back-up Navigator Alarm will be activated on the separate alarm system.	30 sec., after <i>WOL</i>

As long as the *Track Control* is active, the system will, at all times, continue to keep the vessel on the planned course over ground (*COG*), regardless of the alarms and warnings that have been acknowledge by operator.

5.4.4 Activating Heading Control mode (AP mode: "Heading Control")

"Heading" button will set the autopilot in Heading Control mode.

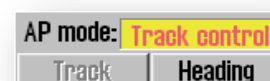


5.4.5 Activating Route Control mode (AP mode: "Track Control")

"Track" button will initiate the Track Control mode, if the following conditions are met:

- A route must be selected and activated. "Track" button is inactive if no route is selected and activated.
- The distance from the vessel's position to the activated route leg must be within the distance limitations, specified by the 'Max lane deviation' parameter in **TECDIS/TELchart ECS Setup –Track Control** (see 7.6.2).

If the distance from the position of the vessel to the route leg is greater than this limit, when the route is activated, *TECDIS TCS* will ask the operator to specify the first WP for route monitoring. When a WP is selected, *TECDIS TCS* will set up a temporary route leg from the vessel position to the starting point. This can be edited if needed.



- The difference between the vessel's course over ground and planned course must be less than the limit specified in **TECDIS/TELchart ECS Setup -Track Control - "Max course deviation"** (see 7.6.2).
- The vessel's speed must be greater than the one set in **TECDIS/TELchart ECS Setup -Track Control - "My speed"** TECDIS Setup Track Control "My speed" (see 3.6.2).
- Fartøyets hastighet må være større enn den som er satt i TECDIS Setup- Track Control "Min speed" (see 7.6.2).

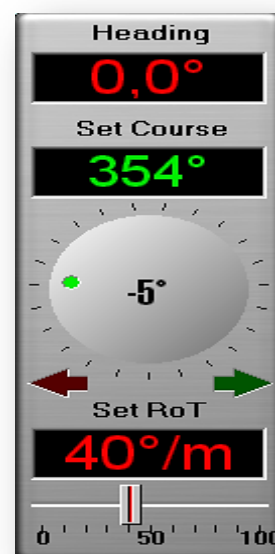
If any of these conditions are not met, the cause will be communicated to the operator.

5.4.6 External (Remote) mode

When the autopilot is set to *External* (remote) mode, a dialog box is displayed in TECDIS, showing the current "Heading", "Set Course" and "Set RoT".

The current "Set Course" can be adjusted by either turning, with the left mouse button, the wheel situated under "Set Course" displayed value or clicking the red or green arrow under the wheel or by using the mouse scroll wheel.

"Set RoT" can be adjusted by sliding the controller just below the display for "Set RoT", with the left mouse button pressed.



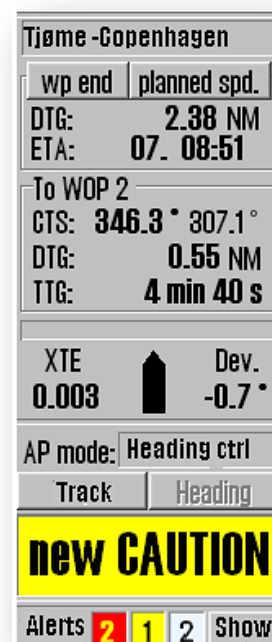
5.5 Alerts: alarms, alerts and warnings

In some hazardous situations TECDIS TCS will generate alarms, alerts and warning messages. These alerts are displayed in the lower right corner of the screen. This area contains a notification field (alert box) displaying large font warnings and a system status field with counters for alarms, warnings and alert messages. In the lower right corner of the notification field, the "Show" button enables the access to the full list of active alerts.

The list of active alerts shows the next event that requires confirmation from the operator (if any). If there is no active alerts that need confirmation, but an alarm is still active, then the alarm will be visible. If more confirmed alerts are active, the alert box is displaying the "ALARMS" text. When no alarm is active and no alerts requires operator's approval, the notification field is blank.

When there are several alert notifications that require confirmation, they are submitted in the following order:

1. Alarms (in chronological order)
2. Audible alarms (in chronological order)
3. Warnings without sound (in chronological order)



Alarms, alerts and warning messages are indicated as follows:

	Notification Fields	Alarm list	Beep
Unconfirmed Alarm	Red background Blinking yellow / black text	Red background Yellow text	Yes
Confirmed Alarm	Red background Yellow text	Red text	No
Unconfirmed Warning	Yellow background Black Text	Yellow background Black Text	No
Confirmed Warning	Not displayed	Yellow Text	No
Alert message	Not displayed	Black text	No

For unconfirmed alarms, an audible signal will be generated via the audio source specified in **TECDIS/TELchart ECS Setup** —“Specifications” —“Alarm” (see chapter 7.3)

Note that it is possible to activate the "Standby mode", if this has been marked as *permitted* in **TECDIS/TELchart ECS Setup** —“Specification” —“Alarm “ —“Allow Standby Mode”. In this mode, **no audible notifications will be generated**. A prominent and flashing standby mode window appears on the chart when this mode is active (see section 3.8.5).

5.5.1 Confirming alarms and warnings

Alarms and warnings are pending until they are confirmed by the operator, and they'll be visible as long as the alarm /warning conditions are present. Alert Messages does not require operator's confirmation.

Events can be individually confirmed by clicking the icon in the notification area or with the keyboard spacebar or by pressing the "ALARM ACK" key on **Furuno RCU-018** control unit.

Several unconfirmed pending warnings can be verified at once by clicking on the chart or by clicking the keyboard "ESC" key three times ; the first click will bring up the complete alarm list, the next click confirm all notifications, and the last click is hiding the alarm list again.

Alerts can also be verified/confirmed from an external alarm central, if one is connected. During the installation the technician can configure **TECDIS/TELchart ECS Setup** so that the confirmations from the external alarm central, closes only for alarm sound or closes when the alarm is actually confirmed.

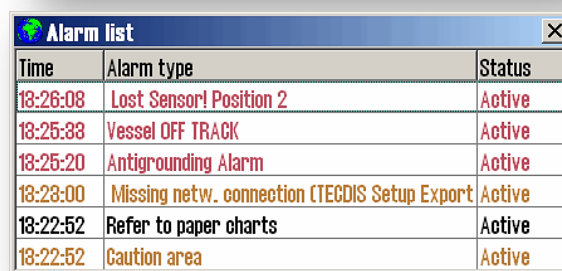
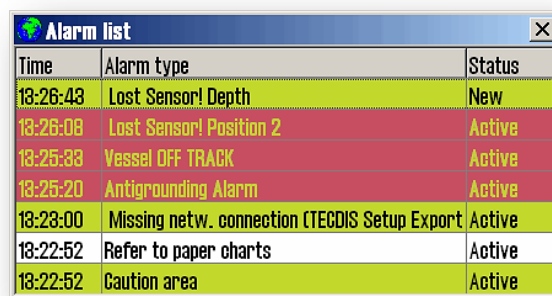
5.5.2 Alarm list

The number of active alarms, warnings and alert messages are specified in the notification field. By clicking the "Show " button a window opens with a list of all alerts, including information about triggered time, alert type and status.

When the warnings and the alerts are confirmed, they will still be shown in the list as long as they are active.

Some notifications contain detailed information that is visible when you click the notification list. For detail information "Anti-grounding " alert and "Possible danger" alert show its own list of dangerous objects. When you click on each of the dangerous objects in the list, its graphic representation is highlighted on the chart.

When it is confirmed the alarm "Ship CPA" will display the AIS-/ARPA target window with details.



5.5.3 Alarm texts

Alarm text	Description
<i>! DANGER !</i>	Anti-grounding. Click to open a separate list.
<i>Ship CPA</i>	Danger of collision (see 3.5.3). By clicking on the “ <i>Ship CPA</i> “ in alarm list, <i>AIS / ARPA target window</i> for the relevant vessel.
<i>Lost CPA</i>	Lost signal for a target that has an active <i>CPA</i> alarm opens.
<i>Lost AIS</i>	Lost signals from an <i>AIS</i> targets within range specified in <i>AIS</i> menu folder (see 3.5.2.).
<i>Point Info</i>	The vessel has reached a WP with a <i>notice before waypoint /Critical WP</i> (see 5.3.4).
<i>OFF TRACK</i>	For this route voyage, the vessel has moved outside the route corridor.
<i>New WP</i>	New waypoint, if this alarm is activated. (see chapter 3.8.5) <i>Track Control</i> : Alarm for changing course, triggered when the warnings “ <i>Change Course early warning</i> ” or “ <i>Change Course LAST warning</i> ” are not confirmed (see 5.4.3).
<i>Last WP</i>	The vessel has reached the last WP in the active route.
<i>Low Speed</i>	The vessel's speed is below the limits set in TECDIS/TELchart ECS Setup (see 5.4.5 and 7.6). (Only for <i>Track Control</i>)
<i>Lost Sensor! Position 1</i>	TECDIS is no longer receiving data from sensor to Position 1.
<i>Lost Sensor! Position 2</i>	TECDIS is no longer receiving data from sensor in Position 2.
<i>Lost Sensor! Heading 1</i>	TECDIS is no longer receiving data from sensor for Heading 1 (Only for <i>Track Control</i>)
<i>Lost Sensor! Heading 2</i>	TECDIS is no longer receiving data from sensor for Heading 2 (Only for <i>Track Control</i>)
<i>Lost Sensor! Water Speed</i>	TECDIS is no longer receiving data from sensor for speed through the water (Water Speed). (Only for <i>Track Control</i>).
<i>Sensor Error! Pos.1 Wrong Datum</i>	Sensor for Position 1 sends a different datum than WGS84 .
<i>Sensor Error! Pos.2 Wrong Datum</i>	Sensor for Position 2 sends a different datum than WGS84 .
<i>Gyros difference limit exceeded</i>	The course deviation between the sensors <i>Heading 1</i> and <i>Heading 2</i> is greater than the limit set in TECDIS/TELchart ECS Setup (see 5.4.5 and 7.6). (Only for <i>Track Control</i>).
<i>Pos sensors difference limit exceeded</i>	The position deviation between the sensors <i>Position 1</i> and <i>Position 2</i> is greater than the limit set in TECDIS/TELchart ECS Setup (see 5.4.5 and 7.6). (Only for <i>Track Control</i>).
<i>MONITOR</i>	TECDIS has lost serial communication with the monitor.
<i>AUTOPILOT</i>	TECDIS has lost communication with the autopilot. (Only for <i>Track Control</i>).
<i>Danger OBJ</i>	Own /designated object with danger mark in the security zone.
<i>Chart license expired Check license status</i>	Alarm for expired licenses is triggered if more than half of the licenses have expired for less than 30 days ago. Check the license status (see 3.2.6.4) and contact chart provider.
<i>Dynamic licensing update deadline</i>	Only for dynamic licensing. If it's been a long time since last update, perform an online chart update, and restart TECDIS (see 6.12)
<i>Dynamic licensing out of credits</i>	Only for dynamic licensing. If the credit limit is exceeded, contact Jeppesen Marine to update your subscription. Perform an online chart update, and then restart TECDIS (see 6.12)
<i>ALARM</i>	Other alarm conditions, check the alarm list.
<i>ALARMS</i>	Appears when there are two or more active alarms and all alarms and warnings have been confirmed.

5.5.4 Warning texts

Warning text	Description
<i>new CAUTION</i>	The vessel is entering a new area where special conditions applies. Clicking on a "new Caution" in the alarm list, the danger object is highlighted with red in the chart.
<i>Lost Sensor! COG/SOG 1</i>	TECDIS is no longer receiving data from sensor for <i>COG / SOG 1</i>
<i>Lost Sensor! COG/SOG 2</i>	TECDIS is no longer receiving data from sensor for <i>COG/SOG 2</i>
<i>Lost Sensor! Heading 1</i>	TECDIS is no longer receiving data from sensor for <i>Heading 1</i>
<i>Lost Sensor! Heading 2</i>	TECDIS is no longer receiving data from sensor for <i>Heading 2</i>
<i>Lost Sensor! Water Speed</i>	TECDIS is no longer receiving data from sensor for <i>Water Speed</i>
<i>Lost Sensor! Radar Arpa 1</i>	TECDIS is no longer receiving data from sensor for <i>Radar ARPA 1</i>
<i>Lost Sensor! Radar Arpa 2</i>	TECDIS is no longer receiving data from sensor for <i>Radar ARPA 2</i>
<i>Lost Sensor! Radar Cursor 1</i>	TECDIS is no longer receiving data from sensor for <i>Radar Cursor 1</i>
<i>Lost Sensor! Radar Cursor 2</i>	TECDIS is no longer receiving data from sensor for <i>Radar Cursor 2</i>
<i>Lost Sensor! AIS</i>	TECDIS is no longer receiving data from sensor for <i>AIS</i>
<i>Lost Sensor! Depth</i>	TECDIS is no longer receiving data from sensor for <i>Depth</i>
<i>Lost Sensor! Relative Wind</i>	TECDIS is no longer receiving data from sensor for <i>Relative Wind</i>
<i>Lost Sensor! Route</i>	TECDIS is no longer receiving data from sensor for <i>Route</i>
<i>Possible Danger</i>	Anti grounding. Possible dangerous objects in the safety zone
<i>Lost backup link to other TECDIS</i>	Error in transferring active route between primary and secondary TECDIS.
<i>Change Course early warning</i>	First warning for upcoming course change. (Only for <i>Track Control</i>).
<i>Change Course LAST warning</i>	Final warning for upcoming course change. (Only for <i>Track Control</i>).
<i>Chart license expiring check license status</i>	One or more chart licenses will expire in less than 14 days. Check the license status and contact the chart supplier (see 3.2.6.4)
<i>Dynamic licensing update deadline</i>	Only for dynamic licensing. If it's been a long time since last update, perform an online chart update, and then restart TECDIS. (see 6.12)
<i>Dynamic licensing credits low</i>	Only for dynamic licensing. If the credit limit is about to be exceeded, contact Jeppesen Marine to update your subscription. Take as an online chart update, and then restart TECDIS (see 6.12)
<i>Missing netw. connection (TECDIS Setup Export IP)</i>	The physical network connection to another TECDIS device does not work. Check the connection.
<i>Target buffer use > 95% Reduce AIS range</i>	TECDIS receive too many AIS targets, reduce the AIS area in AIS menu folder (see 3.5.2).
<i>Target buffer full! Reduce Ais range</i>	TECDIS receive too many AIS targets, reduce the AIS area in AIS menu folder (see 3.5.2).
<i>Ship CPA</i>	Risk of collision. (see 3.5.3). If <i>CPS</i> Alarms are disabled, warnings are provided instead.
WARNING	Other warning, check the alarm list.

5.5.5 Text messages

Text message	Description
<i>Refer to paper charts</i>	Unofficial chart is displayed.
<i>Refer to paper charts or S52 presentation</i>	The chart is not shown in S52 presentation.
<i>AIS range is limited</i>	AIS targets outside the specified range are not displayed (see 3.5.2).
<i>Sleeping AIS class B vessels are hidden</i>	Sleeping AIS class B targets are not displayed (see 3.5.2).
<i>No alarm raised for lost close targets</i>	Alarm for lost AIS target has been disabled (see 3.5.2).
<i>All time limited chart objects shown</i>	All time-limited chart objects are displayed (see 3.3.1).

5.6 Anti-grounding

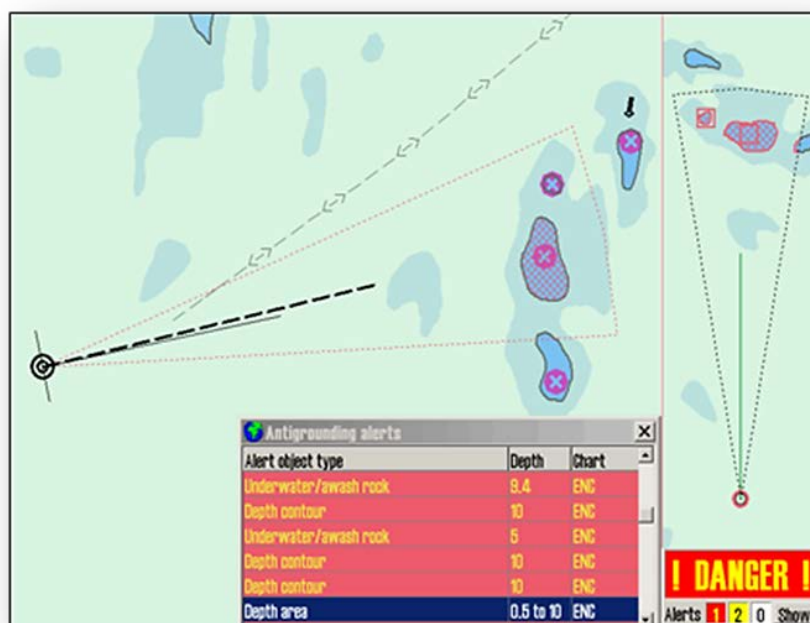
When the vessel's speed over ground (SOG) is over 1.0 knots, the system will oversee a safety zone in front of the vessel and notify all the hazards objects and areas with special conditions. The angle and extent of this security zone is set up in "Safe" menu folder (see 3.8)

The vertical menu includes an anti-grounding chart display, showing the safety zone at all times is fixed to course-up mode.

If any hazards are detected, the following actions are triggered:

- starts an anti grounding alarm.
- anti-grounding chart will highlight the dangerous chart objects within the safety zone.
- the safety zone will be in the main chart display.
- if the main chart display has been repositioned away from the own vessel position, the chart centrum will be moved back to the own vessel position.
- If "Auto Safe Hazards" is set to "Auto On" or "Auto On+Off", then the "Safe Hazards" and "Shallow Soundings" options, in the "Chart" menu folder, are turned On at the first warning, if they were not selected already.
- Until the anti-grounding alarm is examined, the dangerous chart objects inside the safety zone will be highlighted in the main chart display.

By clicking one of the alerts in the alarm list, it opens a separate list of anti-grounding alerts or dangerous objects. Clicking an item in the list, the selected risk is highlighted in the chart, with red markings, and centered in the chart display.



5.7 Past Track (Towbar)- history



The icon for “*Track dialog*” is found in the *Main Toolbar* on the top edge of the chart. This function provides access to previous routes. The menu window is divided into four frames:

- “*Primary pos. source*” control of the past tracks generated by the primary position sensor.
- “*Secondary pos.source*” control of the past tracks generated by the secondary position sensor.
- “*Convert past track to route*” create route from previously sailed track.
- “*Show*” or “*Hide*” the selected track.

5.7.1 “Primary position source” (primary sensor)

“*Primary pos. source*” frame enables visualization of the previous routes (*Past Tracks*), from primary position sensor. The selected *Past Tracks* can be displayed with name (if previously entered, using the “*Chart Object Inspector*”, see 6.1.1) and the performing date. If the “*Timemark*” feature is selected the *Past Tracks* are displayed with time indicators and the interval at which these are displayed.

The *Past Tracks* are selected for visualization by entering the time period they performed in. It is possible to select two independent intervals: one interval is displaying all the *Past Tracks* made between certain dates entered in the “*From*” field and “*To*” field and the other is displaying all the tracks made after the date introduced in “*After*” field until the current date. Alternatively, the bottom field in this frame is used to select a number of days, weeks or months of track history(going back from the current date).

The information field “*Total*” displays the number of *Past Tracks* that appear for the selected time interval.

The *Past Track* “*Select*” function is used to select and edit (color change) a previous track. It can also be used to select a specific track for display even from a not specified age. When the “*Select Past Track*” is activated, all tracks are displayed temporarily, and a track can be selected either graphically in the chart, by clicking it with the ‘*boat hook cursor*’, or from the Track List displayed on the top of the screen. Activating the *color* function is indicated by the cursor changes to an arrow with a small sheet icon to the edge. Left click with this arrow positioned over a track, will change its color (assuming that INT 1 chart presentation is activated). Right click to exit this mode.

The *Past Track* “*Delete*” function is activated when the cursor changes to a ‘*cross*’ (same functional behavior as the “*Delete*” function in the vertical toolbar). Left click with this ‘*cross*’ positioned over a track to deleted it. Note that only the tracks older than 90 days can be deleted. Right click to exit this mode.

5.7.2 “Secondary position source” (secondary sensor)

“Secondary Position Sensor” enables visualization of the previous tracks (*Past Tracks*), from secondary position sensor. In this frame the operator can choose whether the *Past Tracks* are visible on the chart and for how long time they will be displayed (1 or 12 hours). If the “Timemark” feature is selected the *Past Tracks* are displayed with time indicators and with the interval at which these are displayed. The *Past Tracks* from the secondary sensor position are displayed always in gray.



5.7.3 “Convert Past Track to Route”

Tecdis has capability to convert a previous track to a sailing route. If “Allowed” is ticked, a user can hook-select a previous track instead of a route. A new route will be generated following this track. Route accuracy (WP-density) is governed by allowed max deviation.

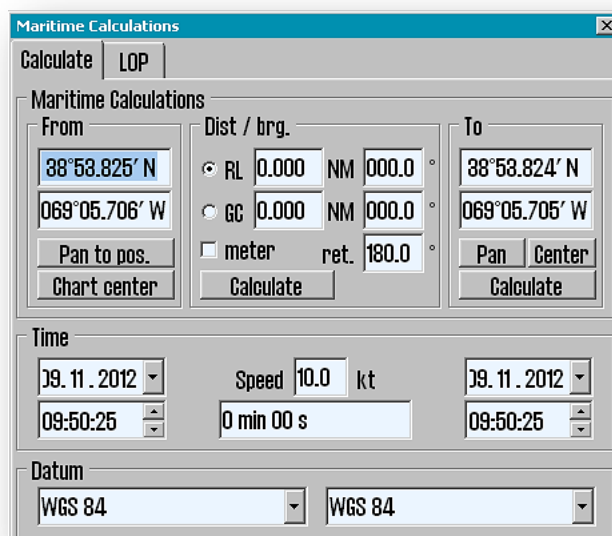
5.7.4 “Show ” and “Hide”

When the “Show” function is selected the *Past Track* lines, that match the criteria in the date fields, are displayed on the chart. The “Show” button will appear in the active mode, until the “Hide” button is selected in the “Past Tracks” menu.

5.8 Maritime calculations “Calculate” and “Lines of Position”



By clicking “Maritime calculations” icon on the Main Toolbar a window opens for “Maritime calculations” in the lower left corner of the screen. This window provides two functions under two menu folders: a “Calculate” tab is a maritime calculator, and a “LOP” tab (Line of Position) which is an interface for entering manual positions using the bearing and / or distance observations.



5.8.1 “Calculate”

The “Calculate” tab opens for maritime calculations based on a start position (“From”), with the distance and bearing data (“Dist./brg.”), or based on an end position (“To”). If the “To” position is known, all the fields in the “Dist./brg.” will be filled automatically with the correct data when clicking the “Calculate” button in the respective field.

In the «From” and “To” frames the positions recorded in the fields can be set automatically to the center of the currently chart display by clicking “Chart center”, respectively “Center” button. The chart can be repositioned to the marked center (currently vessel’s position) in the chart display by pressing either the “Pan to pos.” or “Pan” button, respectively.

In the distance and bearing frame (“*Dist/brg.*”) is an alternative field for the *Great Circle* route (*GC*) and one for *Loxdrome* route (*RL*). The values of distance can be specified either in NM or meters. When calculated, the return bearing (“*ret.*”) is provided to the right of the “*meter*” selection.

The “*Time*” frame contains information about the time and speed connected to the “*From*” and “*To*” positions values, where one can be set manually and the other can be updated automatically. Time and date values are initialized with the current time and date, when the “*Maritime calculations*” window opens. By entering a value in “*Speed*” field, the sailing time is calculated in the under box. Time and date fields can be adjusted, and so the other values for departure or arrival, will be adjusted accordingly to show the correct voyage duration.

“*Datum*” frame at the bottom of the folder makes it possible to ‘translate’ both the “*From*” and “*To*” positions between different datum. Positioning in the “*From*” and “*To*” fields will always be specified for the datum that is selected in the “*Datum*” field right below. If it is selected another datum using the drop-down menu, numerical values change in the “*From*” or “*To*” field immediately, to reflect a different datum choice.

Some examples on how the “*Maritime calculation*” can be used:

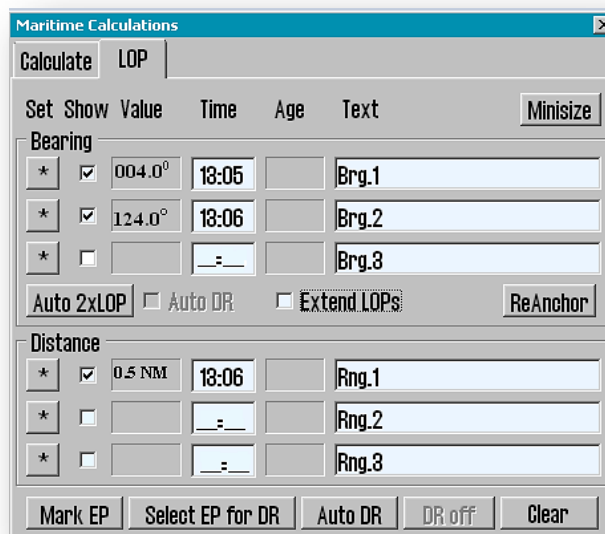
- Calculation of a new and unknown position based on the distance and bearing from a given position.**
 Set the chart center in “*From*” position by clicking, with the middle mouse button on the desired start point in the chart (or load it by entering the values directly in the latitude “*Lat*” and longitude “*Lon*” fields) and then click on the “*Chart center*” in “*From*” frame. Select “*RL*” or “*GC*” in “*Dist / brg.*” field and enter the appropriate values for distance and bearing. Click on the “*Calculate*” button in the “*To*” field to calculate the finish position (“*To*”).
- Calculation of the bearing and the distance between two points.**
 Set the chart center in the start position (“*From*”) by clicking with the middle mouse button on the first point and then again middle mouse button click on the second point, or enter manually the coordinates in the “*Lat*” and “*Lon*” fields. Click on the “*Calculate*” button in the “*Dist / brg.*” field to calculate both the Loxodrome and the Great Circle bearing and distance.
- Calculate the time required to sail between two points at an given speed**
 Set the chart center in the start position by clicking with the middle mouse button on the first point and then again middle mouse button click on the second point, or enter manually the coordinates in the “*Lat*” and “*Lon*” fields. Add the “*Speed*” value in the “*Time*” field and the time required to sail between two points is shown in the box below the “*Speed*” field.
- Convert a position to WGS 84, from another datum**
 Select the datum as the known position stated in the “*Datum*” field, and enter position values in the ‘equivalent’ fields of “*From*” or “*To*” above. Then change the datum to **WGS84** in the same “*Datum*” field below and the position is now converted to the **WGS84** datum.

5.8.2 Lines of Position (LOP)

If it is determined that both the primary and the secondary position sensor fails or provide the wrong position, it may be preferable to use a position based on manual observation and Dead Reckoning parameters. In “*LOP*” folder it is possible to determine the ship's position from bearing and / or distance observations.

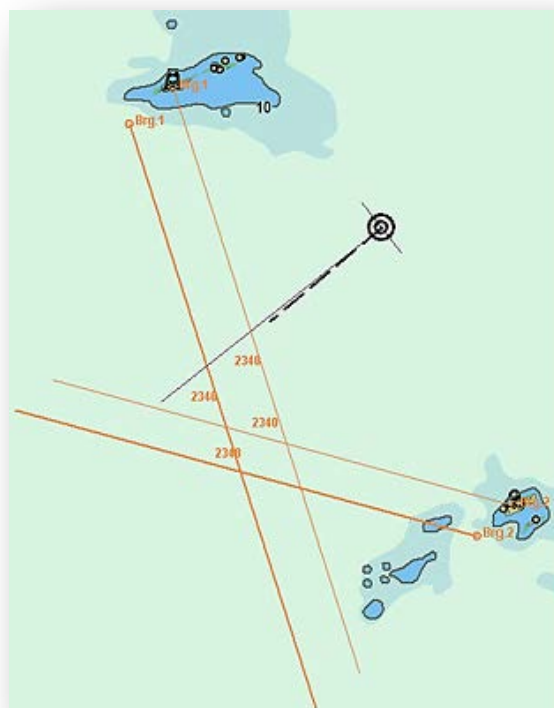
Most of this window is occupied by bearing and distance registration fields. Up to three observations of each (bearing and distance) can be recorded. Each entry contains the following line control and information (from left to right):

- A “*” button to set an observation
- A checkbox to select whether the registered observation is displayed or not on the chart.
- Registered bearing / distance values.
- The time of registration.
- Text describing the registration (eg. observation method).



5.8.2.1 Register Observations

1. Click the "*" button on the desired entry line.
2. Left-click in the chart display on the target (the chart object that a bearing or distance it was measured to).
3. An *EBL / VRM* function (Electronic Bearing Line and Variable Distance Marker) is now enabled with the anchor point in the target.
4. The observed value can now be entered in the small field near the anchor point (optionally). The distances are registered in nautical miles.
5. If a numeric value is entered, adjust the *EBL / VRM* so that the correct observation value is shown on the registration line. For bearings, the line should extend throughout the area where the vessel may be situated.
6. Left-click to finish observation object in the chart.
7. If the observation was made more than 1 minute ago, set the time of observation in the registration line.
8. Write a short description of the observation in the text box on the registration line (optional).



When an observation has been registered, it will appear on the chart display and is marked with the name (short description) and time of the observation.

Two versions of each observation will be visible on the chart. The first version remains where the observations were recorded. The second (bold) version is tweaked in real time according to current Dead Reckoning (*DR*) parameters (course, speed). This ensures that observations made at different times can be used together to provide a position.

5.8.2.2 Features of the *LOP* tab

The functions in the *LOP* folder works as follows:

- "*Minimize*" - minimizes the "*Maritime calculations*" window, but keeps visible all keys for function selection and registered values and any *DR*.
- "*Auto 2xLOP*" - allows to put out two bearings one after each other, without moving the cursor back to the "*" button in the "*LOP*" tab, between bearings.
- "*Auto DR*" - is selectable when "*Auto 2xLOP*" button is activated and is available only after two or more observations have been made and are selected for display. The system will use the first two (from top to bottom) of the selected observations, to automatically calculate and place an estimated position mark; a window is displayed allowing the operator to enter supplementary information for this *EP* mark. *DR* starts immediately when the two intersecting bearings are set out in the chart display, using the calculated position as the origin point.
- "*Extended LOPs*" - extends the bearing lines outside of the visible chart image, regardless of scale.

- "*ReAnchor*" - translate (parallel move) a bearing line. With the "*ReAnchor*" button active, left -click the over the anchor point (the end marked with a small circle) of any original bearing lines (the one that is standing still and is displayed as a thin line), drag it and another left-click to place it in the desired position.
- "*Mark EP*" - placing manually an *estimated position mark* on the chart. With the "*Mark EP*" activated, the cursor is placed on the chart on the vessel's estimated position and left -click to place an *EP-symbol* in that position. *EP symbol* is marked with the date of entry. A window will pop up at the bottom of the screen so that the operator can print both the text, that is visible on the chart and supplementary information that will only appear to next object inspection. *EP symbol* is stored in the system and can be deleted later using the symbol editor (see section 4.8.2).
- "*Select EP DR*" - used to select one of the previously registered *EP symbols* as base for Dead Reckoning. After activateing this function, place the cursor on one of the previously specified *EP* in the chart and left -click ; *Dead Reckoning* will be initiated and the vessel symbol moves to the selected position.
- "*Auto DR*" - available only when two or more observations are made and selected for display. When this button is pressed, the system will use the top two registration lines to automatically calculate and place an estimated position symbol. Dead Reckoning is immediately initiated with the calculated position as a starting point.
- "*DR off*" - used to disable Dead Reckoning mode and return to use the position sensor data in order to place the vessel. But that assumes that Dead Reckoning was initiated from this menu (*LOP* tab), either by using the "*Select EP for DR*" or "*Auto DR*" functions. Note that this function (button) will be unavailable if both position sensors are lost.
- "*Clear* " - removes all observations from the *LOP* folder and delete any selected observation made on the chart display.



Note that when Dead Reckoning has been initiated using *LOP*-tab, all input from the primary and secondary position sensors are ignored until Dead Reckoning is deactivated again in the same sheet tab!

Details for use of *LOP*-tab to generate estimated positions and position observations, are logged. For access to these logs, use "*DR fix*" button in the "*Log*" menu folder (see 3.7).

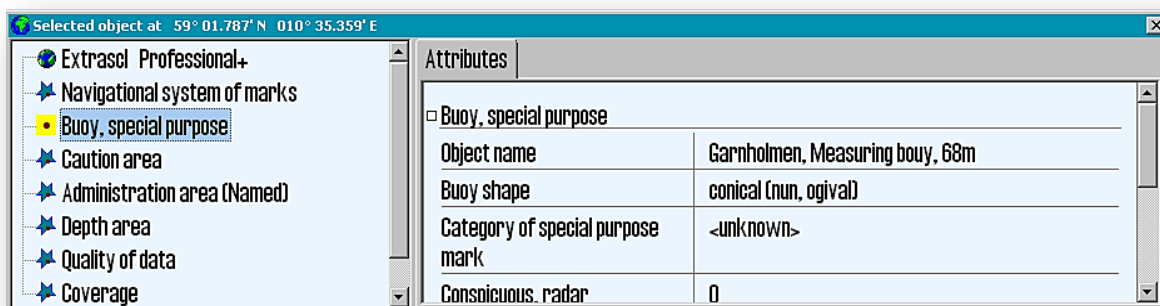
Chapter 6 Other features

6.1 Chart Object Inspector



Detailed information about an object on the chart can be accessed using the “*Chart Object Inspector*” (*query tool*), situated on the *Main Toolbar* at the top of the screen. Clicking on this function, activates the *query cursor*. To disable this cursor, click the “*Chart Object Inspector*” icon again or right click.

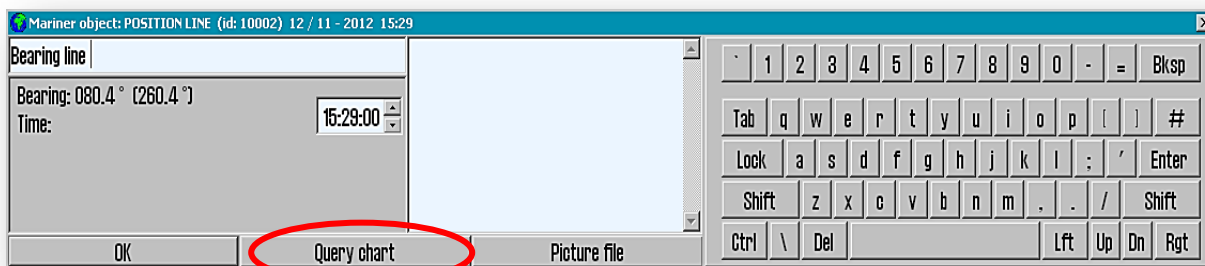
While the “*Chart Object Inspector*” is active, clicking any location on the chart it brings up a window at the bottom of the screen. In this window the *query cursor*’s position is displayed in the window’s title bar. The left side of this window will provide a list of all chart objects near the *query cursor* position. The first entry in this list provides details about the chart cell containing the chart objects. Each entry is marked with a symbol that indicates whether the object is a point, line or geometric area. The symbol for entries that have been added or modified through chart updates is marked with a yellow background.



By clicking each entry in the chart objects list, in the right part of the window, more detailed information appears regarding the selected object and it is highlighted in red on the chart.

6.1.1 Inspection Past Tracks, Routes, Mariner Objects etc

The “*Chart Object Inspector*” can be used to inspect additional objects (data) that the system adds to the chart, for example, *Past Tracks*, *Routes*, *Mariner Objects*, etc. When such objects are selected, another window (“*Mariner object...*”) appears at the bottom of the screen. In contrast to the “*Chart Object Inspector*” information window (“*Select object at...*”), the contents of this window (such as chart text or additional info text), can be modified. The text that appears on the chart can contain up to 30 characters; additional information can contain up to 4800 characters. *Mariner objects* containing additional information are marked with an exclamation mark on the chart.



If an object query is performed and instead of “*Chart Object Inspector*” window, the “*Mariner objects...*” info window appears, it can be changed by clicking the “*Query chart*” button (see illustration above).

JPEG picture files, which are physically located on the system's hard disk, can be attached to some objects. To attach an image to a *Mariner object*, click "Picture File" button and then select the picture. The text in the additional information field will now include the image file name in parentheses. The image is displayed in a separate window when the "Picture File" button is activated.

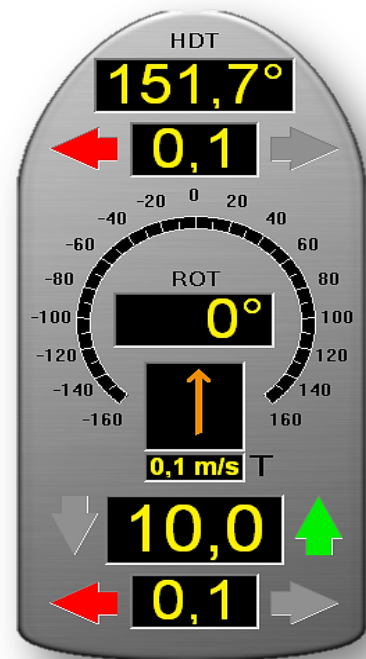
6.2 Conning display



"Conning Display" button in the *Main Toolbar* is used to display a mini conning image in the lower left corner of the screen. This feature provides information about movement, heading and wind info, when maneuvering.

6.2.1 Conning display for mooring

Left click on the "Conning display" icon to open the *Docking* display. This feature provides excellent visual information about movement, heading and wind info, that is essential for maneuvering at mooring. The "Conning display" can be moved in other parts on the screen, by click and drag action (click anywhere on the display except the value frames). The wind direction can be toggled between the 'true' and 'relative' mode, by clicking on the wind vane. When the true wind direction is shown this is indicated with a "T" next to wind speed frame and so for the relative direction with a "R". The wind speed can be changed from meters per second (m / s), knots (kn) and Beaufort (B), by clicking on the wind speed frame.




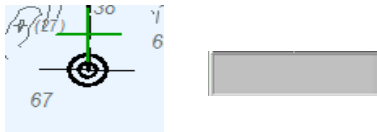
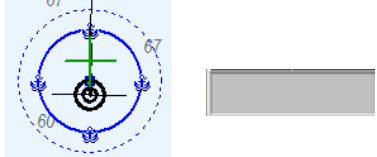
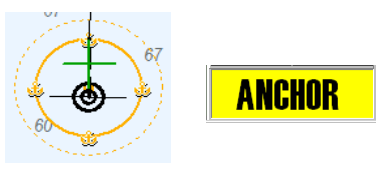
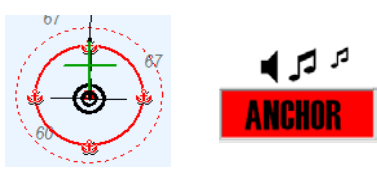
6.2.2 Conning Anchorguard

In the *Main Toolbar*, right click the "Conning display" icon, to open the *Anchorguard* display in the lower left corner of the chart. *Anchorguard* display is showing, drifting and heading in relation to the anchor point and wind parameters (*anchor drag*).

The *Anchorguard* feature has the same functionality as *Docking* display in relation to the wind. Click the "Reset" button to set the anchor point ;the current position is placed in the center of the *Circle "Safe radius"* whose size is adjusted with the slider. Circle radius is read from the display for maximum drift (max drift: 1000 meters).

Select the alarm mode with the slider situated in lower left corner. In the following table the alarm display modes are presented. There's also a 'built-in logic' for this function which cancels *Anchorguard* functionality when the vessel clearly has high speed and can not be possibly anchored.

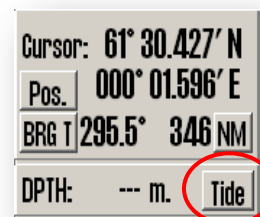


	Chart view and the warning field	Description
Off		"Off" option turns off all <i>Anchorguard</i> functionality and remove any <i>Anchorguard</i> circle the chart.
View		"View" option selects a blue <i>Anchorguard</i> circle in the chart, with a radius having the dimension displayed in the "Circle" frame and so the plotting begins with yellow plot (past positions) in "Safe radius" circle.
Warn		"Warn" option has the same functionality as the "View" option but is marking with a yellow <i>Anchorguard</i> circle in the chart display and will also trigger an yellow visual warning.
Alarm		"Alarm" option has the same functionality as the "Warn" option, but a red <i>Anchorguard</i> circle will appear in the chart, in addition to a visual (red signal) as well as auditive alarm notification.

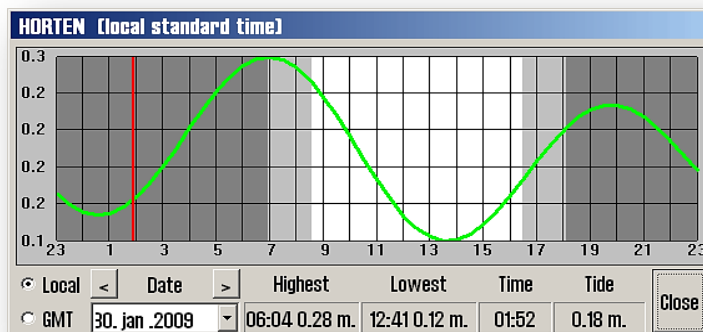
6.3 Tidal information


The "Tide" button, situated next to the "Depth" sensor button in the *Information Field (Vertical Menu)*, opens a notification window that shows tide prediction from the *forecast point* (station), that is closest to the vessel's position (or nearest to the chart center if the vessel is outside the visible chart area).


This window provides a graphical representation of the tides for the next 24 hours. The name of the window corresponds with the *forecast point's* name. Time and tide parameters, for the highest and lowest level, as well as the current tidal levels, are presented in the lower part of the notification window.

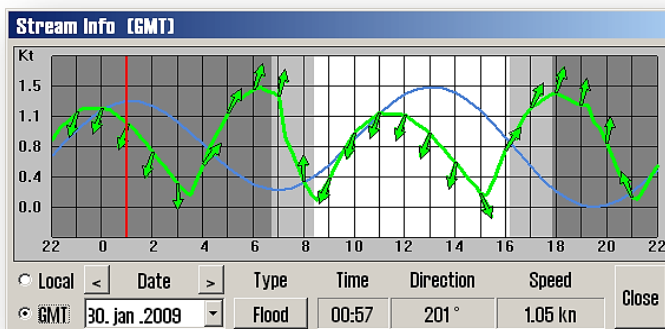


The time can either be shown in GMT or in local standard time for the *forecast point*. Tides for other dates may also be selected for display. By placing the cursor on the curve in graphic presentation, the corresponding time and tide levels are displayed with green numeric values in the lower right part of the notification window.




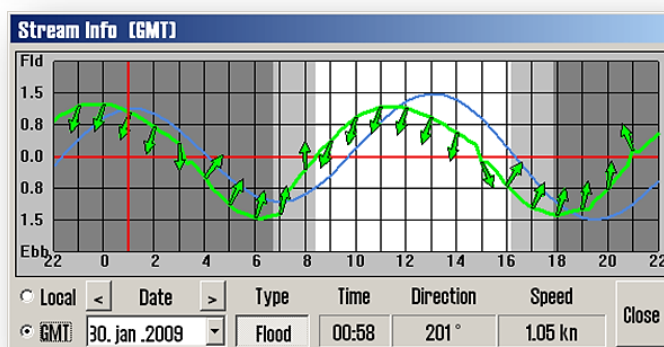
As long as a tide notification window is opened in the chart, the other near *forecast points* are marked in the chart with a yellow symbol:  Left click on the symbol to expose the tide data from that particular *forecast point*.

Also, while a tide notification window is opened, on the chart display will appear *tidal power indicators* (yellow arrows) reflecting the current tidal direction and speed: . By placing the cursor over one of these arrows a *tidal power indicator* window opens, that works in the same way as tidal notification window.



Some tidal *forecast points* can be displayed by a graphical ebb and flow representation. In order to bring this view, press the "Flood / Ebb" button (if available).

 **Note that display of tidal information requires the "Professional+" chart database to be selected for display.**



6.4 View ARPA / Radar Targets



In the *Main Toolbar*, there are two "ARPA/Radar Targets" buttons, one for each of the radars that can connect to TECDIS. These buttons are only eligible if radar targets are being received from the radars. The help text that appears on these buttons is actually the name that is registered for each of the sensors, making it easy to differentiate between them. Clicking on one of this icons will show the *ARPA/Radar Targets* for the specified radar (s), on the chart display.

With a right click on one of the "ARPA/Radar Targets" button, the *Radar Echo* and cursor for that particular radar will be displayed. Activation of this view is indicated by the icon's changed appearance, as shown in the illustration above.

All traced (tracked) radar targets are shown as green rings with course vector. Deactivated (sleeping) targets are displayed without track and course vector. The ID of the target or names (if available in the radar transmission) are shown on the chart when the cursor is placed over the target. Shown ID number is the ID number from the radar plus 1000 or 3000 for targets from Radar 1, or plus 2000 or 4000 for targets from Radar 2



By clicking on a radar tracked target, a detailed "ARPA target" information window will be displayed together with CPA information. The tracked target (past positions) can be saved (click "Save" button) or deleted (click "Delete" button). The target can be enabled / disabled by check / uncheck the "Enable" box. The CPA marking is shown in the chart by checking the "CPA" box. Click "OK" button to close the window.

The behavior of the ARPA / radar targets is affected by the settings in the "AIS" menu folder (see chapter 3.5).

Target	
Id: 1	INA
BRG: 037.0 °	Pos.: 59° 02.329' N
DST: 1.1Nm	010° 30.070' E
COG: 000.0 °	CPA: 1.20 Nm
SOG: 21.0 Kt	TCPA: 3.4 min
<input checked="" type="checkbox"/> Activate	Track Save Clear
<input type="checkbox"/> CPA	Close

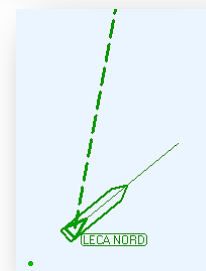
6.5 AIS operations



"AIS" button in the Main Toolbar displays AIS targets on the chart according to the settings made in the "AIS" menu folder (see chapter 3.5). With right click "AIS" button also opens the "AIS Target List" window listing all AIS targets within range. When "AIS" button is active, provides access to other AIS features.

AIS targets are presented in the chart as green triangles. Deactivated ('resting' mode) target, is represented as a smaller triangle, without vectors, past track line or name /MMSI number, which points up in the chart and heading information is missing. For activated target the triangle points in the course direction and has past track line, heading and course vector. The track points that indicate the past position (past track line) are placed at one minute intervals. If "Show ship outline" option is checked in the "Ship" menu folder, the true target vessel outline will be displayed on the chart (see section 3.4).


A resting AIS targets can be activated temporarily by placing the cursor over it. This will also display the name of the vessel (or MMSI number if the name has not yet been received) on the chart. When the cursor is moved away from the vessel (target), the AIS target again become disabled ('resting' mode). All measurements can be activated by selecting "All targets active" option in "AIS" folder (see chapter 3.5).

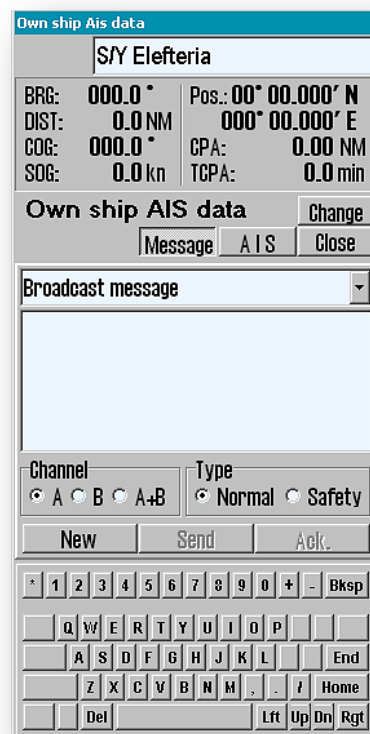


AIS target	
LLTF: COLOR VIKING	
BRG: 268.0 °	Pos.: 59° 01.771' N
DIST: 6.7 NM	010° 16.062' E
COG: 140.6 °	CPA: 5.34 NM
SOG: 17.1 kn	TCPA: 14.1 min
<input checked="" type="checkbox"/> Activate	Save Clear
<input type="checkbox"/> CPA	Message AIS Close

6.5.2 AIS broadcast messages

To send an *AIS broadcast message* (message to all vessels within VHF range) or to access the received broadcast messages, open the "Own ship AIS data" (see above) and click on the "Message" button. This will display the broadcast message window, where the received messages can be selected for display in the drop-down list at the top of the window. New messages are entered by clicking the "New" button. After the message is inserted (optionally using the on screen keyboard provided), click the "Send" button to transmit the message. To verify a received message, click the "Ack" button.


 **Note: Messages older than three months will be automatically deleted.**

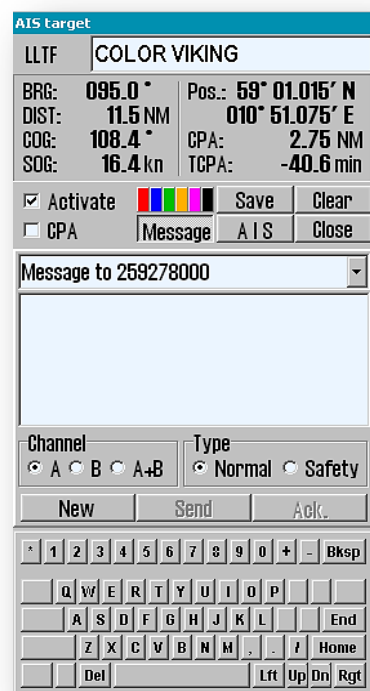


6.5.3 Writing a message to another vessel

The AIS targets are selected by clicking on it (the target is marked on the chart with a black rectangle) and the "AIS targets" window appears in the upper left corner of the screen.

To post a message to the selected vessel, pressed the "Message" button to open a message window. Previous messages are available for review via the drop-down list in the upper part of the window. New messages are introduced by clicking the "New" button. When the text is entered, press the "Send" button to transmit it. The on-screen keyboard at the bottom of the window can be used as an alternative to regular physical keyboard to type text in the message

 **Note: Messages older than three months will be automatically deleted.**



6.5.4 AIS Target List

By right clicking on the "AIS" icon the "AIS Target List" window will open, listing all AIS targets within range. By clicking on the headline of a column, sorting can change focusing on that particular column (blue font).

"AIS target" information window of a vessel is opened by right-clicking on the name of the vessel in the "AIS Target List" window. In addition the chart will pan to the selected AIS target by left click on the vessel's name.

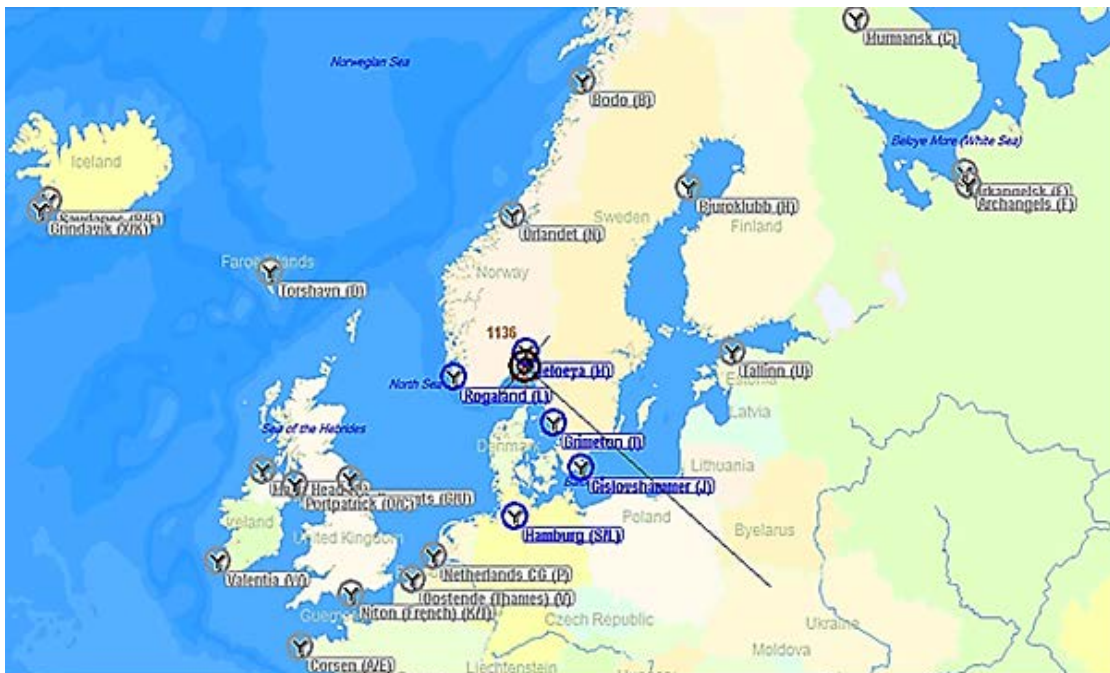
Name	Dist	CPA Dist	CPA Time
COLOR VIKING	4.72 Nm	4.20 Nm	8.2 min
HVALERBUEN	6.50 Nm	1.05 Nm	37.3 min
BALTIC SUN 2	8.04 Nm	0.09 Nm	49.1 min
ICEBEAM	2.20 Nm	1.29 Nm	-8.4 min
ROEDFJORD	10.41 Nm	7.65 Nm	-25.7 min
CHILEAN REEFER	15.58 Nm	15.14 Nm	-27.9 min
LOS 111	13.46 Nm	0.94 Nm	-36.6 min
LOS 112	7.67 Nm	2.62 Nm	-43.8 min
REGINA III	8.85 Nm	3.73 Nm	-49.9 min
TORMO	13.40 Nm	9.67 Nm	-55.7 min
SOUTHERN ACTOR	13.58 Nm	9.56 Nm	-58.8 min
RODOY	11.88 Nm	10.06 Nm	-64.4 min
BASTOE I	27.09 Nm	13.13 Nm	-70.9 min
SKJARGARDSTJENESTEN	7.52 Nm	5.56 Nm	-2.8 hr

6.6 NAVTEX



If a NAVTEX receiver is connected to TECDIS unit, the "Navtex dialog" function will be available on the Main Toolbar. If the "Navtex dialog" function does not appear then TECDIS Setup is not configured for this function.

Before using the "Navtex dialog" window, the NAVTEX stations to use must be selected. Stations are shown on "World" overview. Stations are select/deselect using the left mouse-button. Selected stations are displayed in blue color.



In "Navtex dialog" window it is possible to choose which data to display. In the upper left frame selected message types to be displayed.

	Id	Code	Country	Station	Time	Freq.	Message
<input checked="" type="checkbox"/> Nav.	67	MA03	Norway	Jeloeya	11/04 13:00	518	290958 UTC MAR 12DANISH NAV WARN 121/12LIMFIORD.AALBORG HARBOURTHE RAILWAY B
<input checked="" type="checkbox"/> Met.	68	MA02	Norway	Jeloeya	11/04 13:02	518	191100 UTC MAR 12DANISH NAV WARN 115/12 LIMFIORD.SAELHUNDEHOLM CHANNEL SERED
<input checked="" type="checkbox"/> Ice	68	MA02	Norway	Jeloeya	11/04 13:02	518	191100 UTC MAR 12DANISH NAV WARN 115/12 LIMFIORD.SAELHUNDEHOLM CHANNEL SERED
<input checked="" type="checkbox"/> SAR	67	MA03	Norway	Jeloeya	11/04 13:00	518	290958 UTC MAR 12DANISH NAV WARN 121/12LIMFIORD.AALBORG HARBOURTHE RAILWAY B
<input checked="" type="checkbox"/> Other	64	LB27	Norway	Rogaland	24/02 16:20	518	240906 UTC FEB 12LGTNORWEGIAN GALE WARNING NO. 134 FISHER AND FORTIES TODAY FI
<input checked="" type="checkbox"/> 490	63	LB28	Norway	Rogaland	24/02 16:00	518	211156 UTC FEB 12LGTNORWEGIAN GALE WARNING NO. 135 TORUNGEN - AANA SIRRA TODAY FI
<input checked="" type="checkbox"/> 518	62	LB28	Norway	Rogaland	24/02 14:18	518	211156 UTC FEB 12LGTNORWEGIAN GALE WARNING NO. 135 TORUNGEN - AANA SIRRA TODAY FI
<input checked="" type="checkbox"/> 4209							



Message Types

- ← navigational warnings
- ← meteorological forecasts and meteorological warnings
- ← ice reports
- ← search and rescue- pirate and information on armed robbery
- ← other messages (other navigational aid system messages)

Radio Channels



In this frame the data radio frequencies are specified. All frequencies relate to the NAVTEX default frequencies is specified in KHz. The international frequency is 518KHz where messages are sent in English, while the 490KHz frequency is the local language and 4209.5 kHz frequencies are intended to be used in tropical areas, but they are not excessively use.

Messages History



- In the lower frame it is possible to set the message display cronologiclay:
- ← "NEW" only unread messages are displayed.
 - ← "66 hr." only messages from the last 66 hours are displayed.
 - ← "All" all the messages are shown.

The screenshot shows the TECDIS software interface. At the top, there is a menu bar with options like 'Day', 'North', 'STD', 'USER', 'L200M', and 'Hide'. Below the menu bar is a map of the North Atlantic region, including Greenland, Iceland, Norway, Finland, and Russia. The map is overlaid with a grid. To the right of the map, there is a panel displaying GPS coordinates and other data: 'GPS: 58° 57.719' N, 4 sats, 010° 31.907' E, COG: 037.5°, HDG: 2, 038.0°, SOG: 10.0 kn, STW: 10.5 kn. Below the map is a table with columns for 'Id', 'Code', 'Country', 'Station', 'Time', and 'Message'. The table contains several rows of data, with the first row highlighted in blue. Below the table, there is a panel displaying the selected message text. Four numbered callouts are overlaid on the interface:

- 1 click on a station data row ...
- 2 ..to open the message
- 3 click again ...
- 4 ..to close the message window

Id	Code	Country	Station	Time	Message
64	B27	Norway	Rogland	24/02 14:00	12040006 UTC FEB 12 CLET CNDR
65	B28	Norway	Rogland	24/02 15:00	12041106 UTC FEB 12 CLET CNDR
66	B29	Norway	Rogland	24/02 16:00	12041606 UTC FEB 12 CLET CNDR
67	A30	Norway	Rogland	24/02 10:57	12041000 UTC FEB 12 ALAND RADG

Message text (from row 67):

```

21156 UTC FEB 12
LGT
NORWEGIAN GALE WARNING NO. 135 2
LGT
NORWEGIAN GALE WARNING NO. 135
TODAY FRIDAY AND T
TODAY FRIDAY AND THE NIGHT BETWEEN FRIDAY AND SATURDAY WESTERLY
HEARBE HIGHT BETWEEN FRIDAY AND SATURDAY WIND GALE FORCE 7.
OCCASIONALLY GALE FORCE 8, WIND GALE FORCE 7 - OCCASIONALLY GALE
FORCE 8, WEST
OUTER SEAGER
TODAY FT OF OR
OUTER SEAGER
TODAY FRIDAY AND THE NIGHT BETWEEN FRIDAY AND SATURDAY W
IN FRIDAY AND SATURDAY WESTERLY STRONG GA

```


6.7 AIS vessel monitoring

For any TECDIS unit, the service technician can install a function that allows the "Danger" line /area to emit warnings or alarms when an AIS target course vector intersects it.

This function has no user controls and it will remain in same mode until the TECDIS technician makes a change again. This function is disabled in default setting.

When the "Ais vessel watch" is set to "1", a warning is displayed if a vessel's course vector crosses a line or edge of a hazardous area. The warning is not audible.

When the "Ais vessel watch" is set to "2", an alarm is issued when a vessel's course vector crosses a line or edge of an hazardous area. The alarm will also be audible.



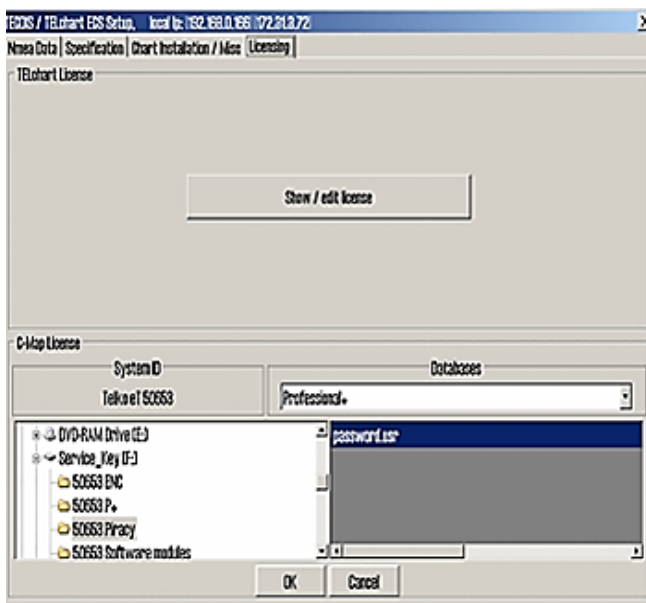
6.8 Pirate Info (only for TECDIS ver. 4.7.2.15 or later)

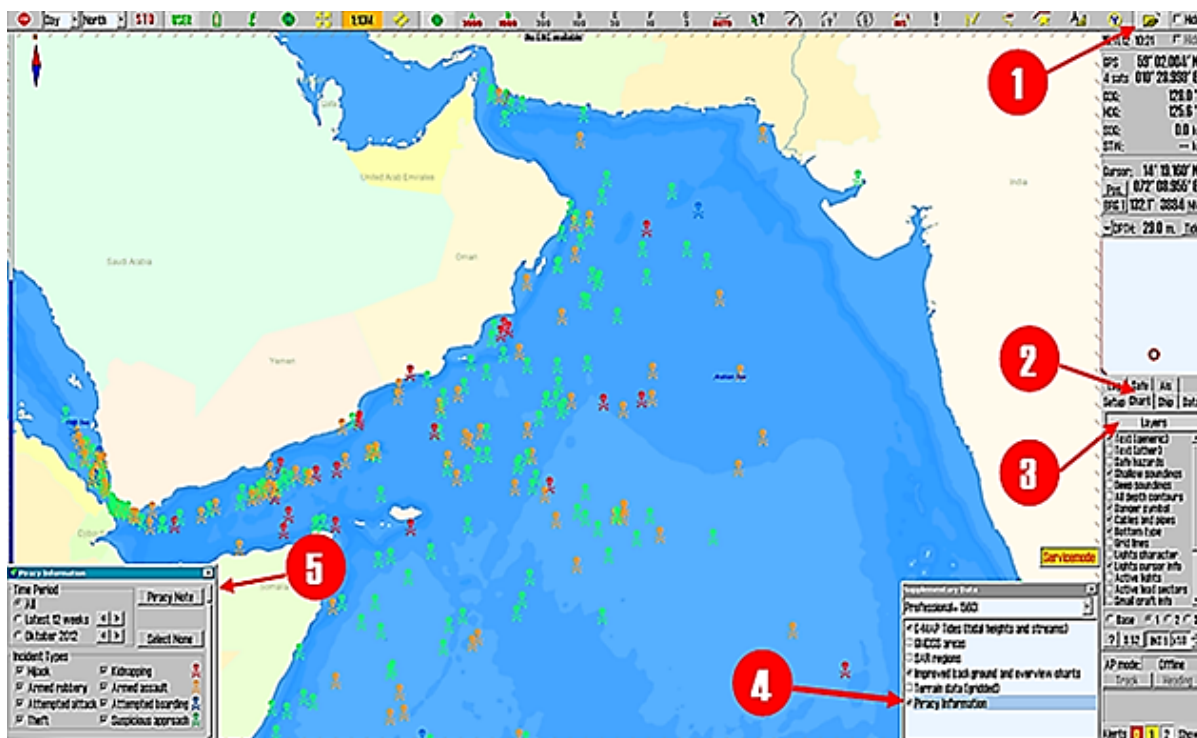
TECDIS have the ability to download data for pirate activities directly to the chart for planning and navigation. *Pirate Data* is an additional service from **Jeppesen** for **Professional +** or **Primar** chart. Once the subscription is established, the *Pirate Data* will be included when the chart program is updated.

The subscription shall be determined by contacting **Jeppesen** and receive an email with an attachment named "**password.usr**". This appendix must be recorded on the **TECDIS Service Key** so that it can be imported into **TECDIS Setup**. It may be advantageous to establish a separate folder on the "*TECDIS Service Key*" which distinguishes this file passwords from other password files which can be stored on the "*TECDIS Service Key*".

Select "**Professional +**" in the "Databases" and search for the folder where the file "**password.usr**" for *Pirate Data* option is located. Click the "OK" button to enter the license code. Exit **TECDIS Setup** and take out the **TECDIS Service Key** and start the

TECDIS chart. Make a chart update least for the **Jeppesen "Professional +"** database or "**Primary**" database. Now all available *Pirated Data* are available in **TECDIS** and ready for use.





To activate display of *Pirate Data*:

1. open "Tool menu folders "
2. select "Chart " folder
3. click on "Layers" function
4. in "Supplementary Data" window check the "Piracy Information" box
5. make the appropriate choices in "Piracy Information" window for proper display of current pirate data

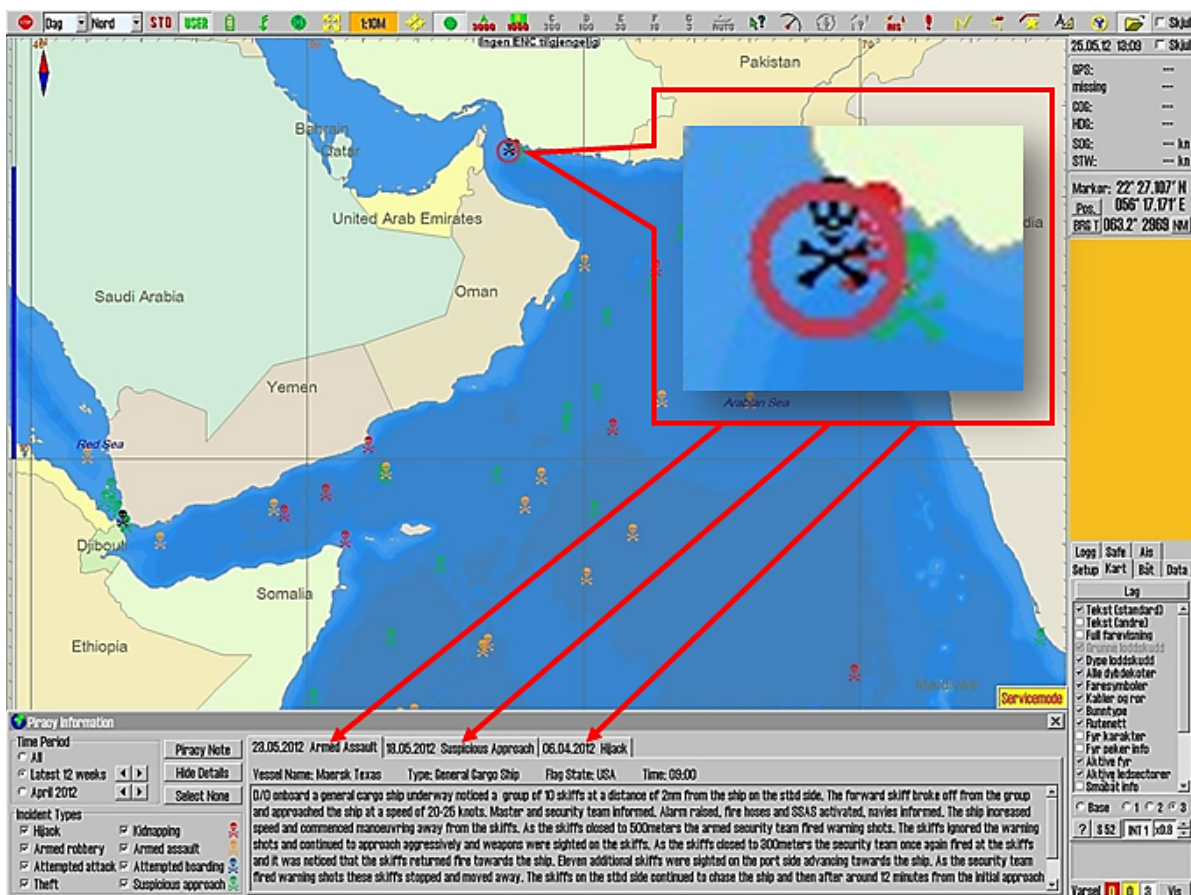
In "Piracy Information" window, it is possible to set up criteria for displaying the type of *Pirate Data*. "Time Period" frame contains three time period options for viewing of *Pirated Data*. The "All" is selected to display all the *Pirate Data*, regardless of when the incident occurred. The "Latest 12 weeks" shows all cases in the last 12 weeks, or the number of weeks set by "up / down" buttons on the right. With the last limit time option, all the *Pirate Data* within a month can be displayed; selected the month with "up / down" buttons on the right.



"Incident Types" frame and the corresponding "Select None" button, has options for viewing these *Pirate Data* categories.

- "Hijack" and "Kidnapping" is indicated with the red symbol
- "Armed robbery" and "Armed assault" is indicated by the orange symbol
- "Attempted attack" and "Attempted boarding" indicated by the blue icon
- "Theft" og "Suspicious approach" indicated by the green symbol
- All cases from last week are marked with black color, no matter which *Pirate Data* category is displayed.

By clicking on a pirate symbol, a red ring appears around the pirate symbol and "Piracy Information" window expands with more information about the selected symbol. If more symbols are overlapping, the information window will contain a tab per pirate symbol. You can click the tab in the information window and in the chart, the focus will be switch between pirate symbols by the red ring.



6.9 Installation of chart Databases

In this chapter it is explained how the chart is installed on the TECDIS units. Deviations can occur, based on who is the chart supplier and how the chart suppliers designate media, menu, options, error messages etc.

6.9.1 Starting Chart S63 Loader software

For uploading the chart data bases, a program called **S63 Chart Loader** is used and this is pre-installed on all TECDIS devices. **S63 Chart Databases** can be loaded only with this program, while **Jeppesen PRIMAR, C-MAP ENC or C-MAP Professional + (SENC format)** also can be installed using the corresponding functionality in **TECDIS Setup**. The explanations in this manual refers to **2.01** version of **S63 Chart Loader**, supplied with new TECDIS devices: **TECDIS version 4.7.2.15** or later.

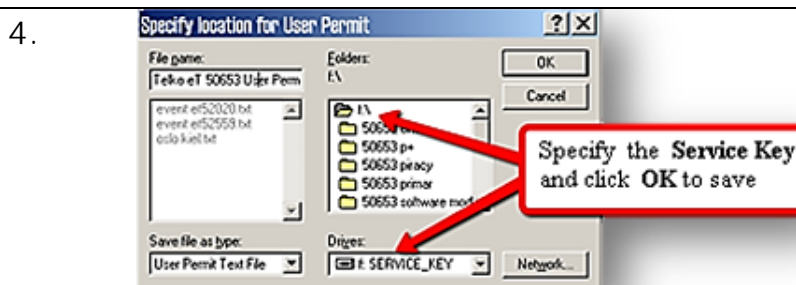
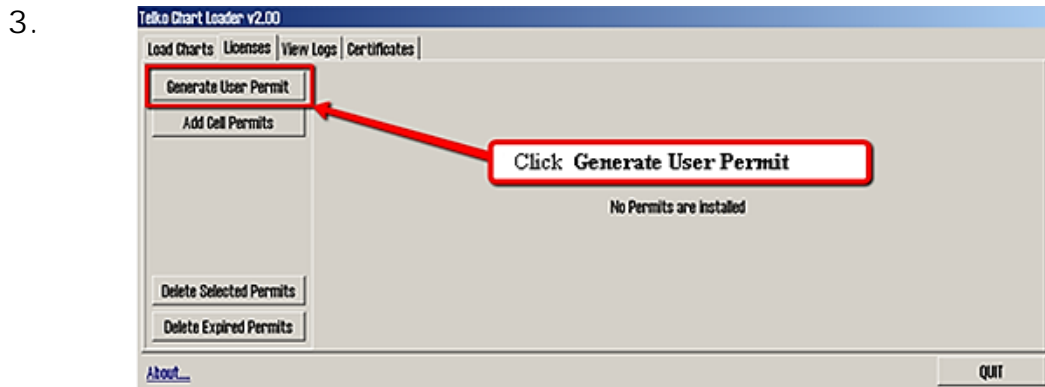
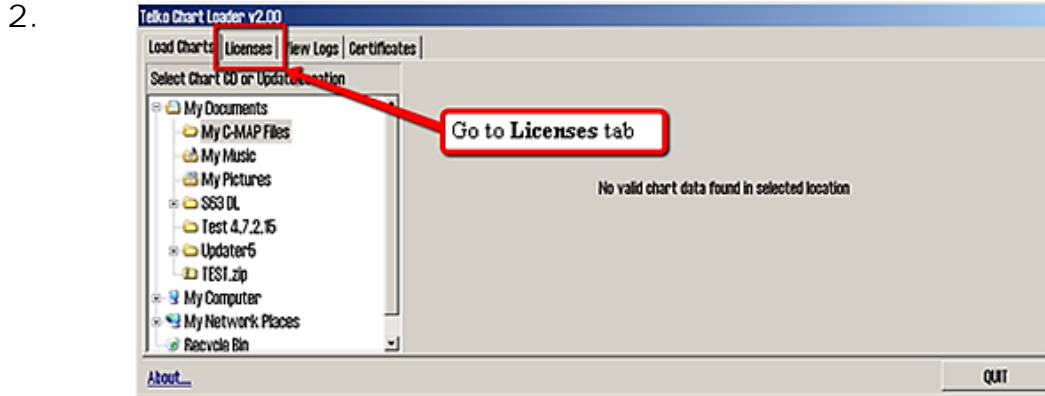
To start the "Chart S63 Loader":

1. Set "TECDIS Service Key" into a free USB ports
2. End TECDIS program and wait until the Windows desktop is available.
3. Double-click on "Chart S63 Loader" icon.
4. Wait for the "Chart S63 Loader" program to complete the start procedure.

6.9.2 Generation of "User Permit" file

Before the "Cell Permits" files for S63 Chart Databases (with access to chart cells) are issued, a "User Permit" file must be generated. This "User Permit" file is unique to each TECDIS licence and is generated by "Chart S63 Loader" based on encrypted data that is stored in TECDIS license key. The chart suppliers must receive this "User Permit" file to be able to issue the chart licenses that were ordered.

1. Insert "TECDIS Service Key" in a free USB port



5. Close the **Chart S63 Loader**, remove the "TECDIS Service Key" and repeat the procedure for the other TECDIS devices.

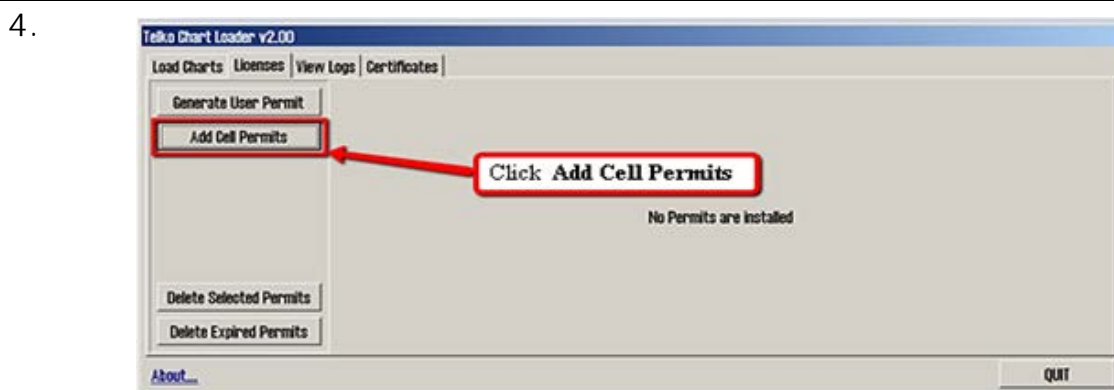
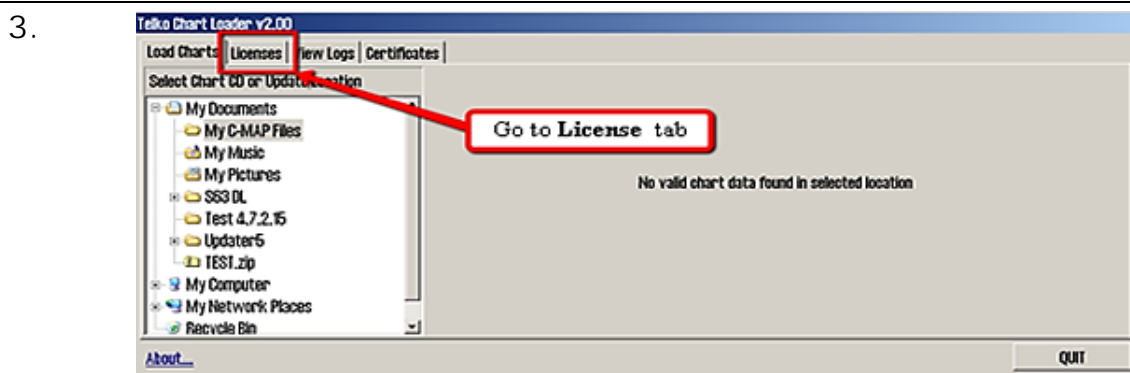
6. To order the chart licenses send all "User Permit" 's to a chart supplier, eventual with a confirmation regarding the chart areas ("Cell Permits").

6.9.3 Input "Cell Permits" from CD-ROM

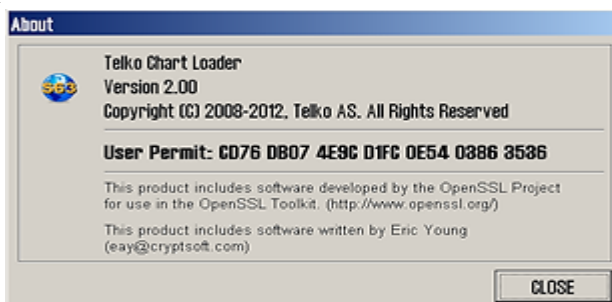
After the "User Permitt" is sendt to the selected chart supplires, the 'order' is processed and the "Cell Permits" are issued as CD-ROM, DVD-ROM, USB memory stick or as othe suitable medium.

In this example, it is demonstrated how the "User Permits", received as a CD-ROM, is uploaded. Only the chart supplier directory and the file types applies, so the adjustments must be made after the chart supplier specification.

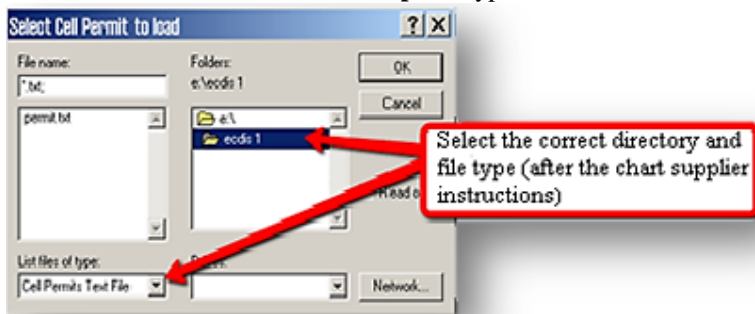
1. Insert "TECDIS Service Key" in a free USB port
2. Insert the CD-ROM with "Cell Permits" in the CD-ROM drive and restart the S63 C hart Loader



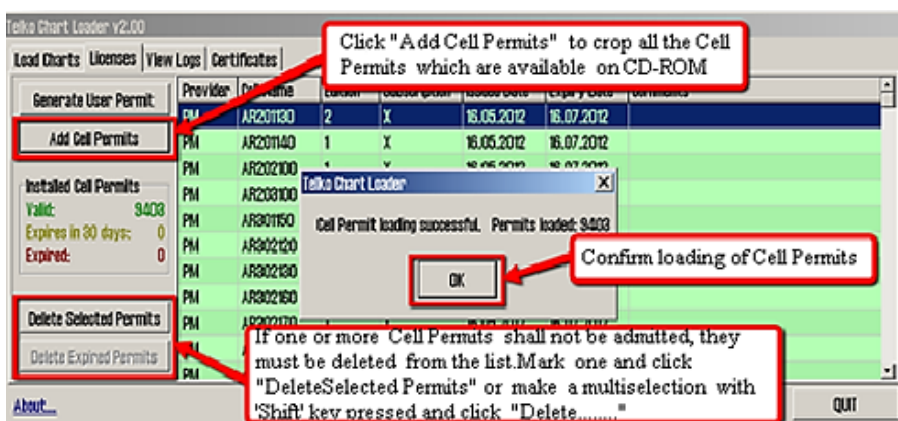
5. "About..." text in the lower left corner of the "Licenses" tab, opens a window where the "User Permit" code is rendered as plain text.



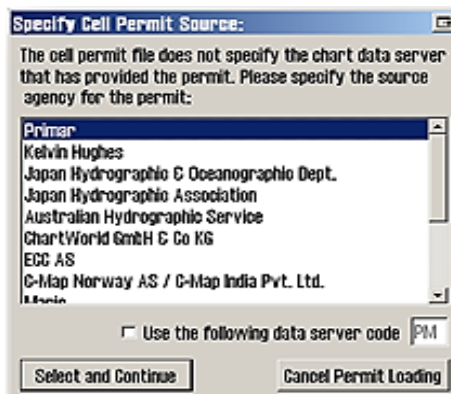
6. If the "Cell Permit" are "enc" or "pmt" type, choose the "ENC.PMT File" type.



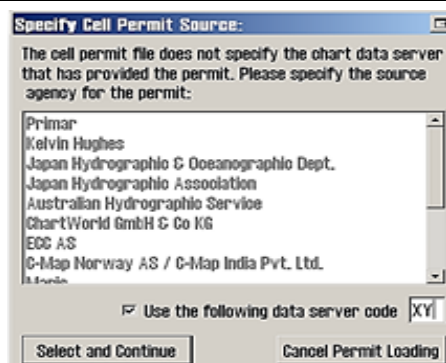
7.



8. This dialog window appears if the "Cell Permits" file does not contain the identity of the chart supplier. Choose the chart supplier from the list and click "Select and Continue". (Note: You can also double-click the chart supplier name in the list.)



9. If the chart supplier is not listed, "Use the Following data server code" field can be used. Tick the check box and enter the chart supplier's digit in "Data Server Code" field and confirm by clicking "Select and Continue".



- After the loading is finished, a message of successful "**Cell Permit**" loading appears. Here is specified the number of loaded "**Cell Permits**". Press "**OK**" to close this message and confirm the loading of "**Cell Permits**".
Left field in the "**License**" tab will show details about the loaded "**Cell Permit**", which is color coded by expiration status..

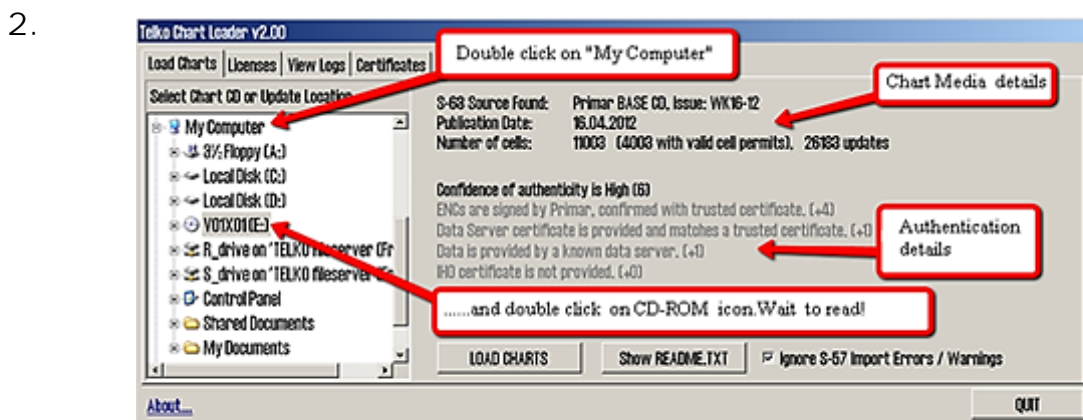
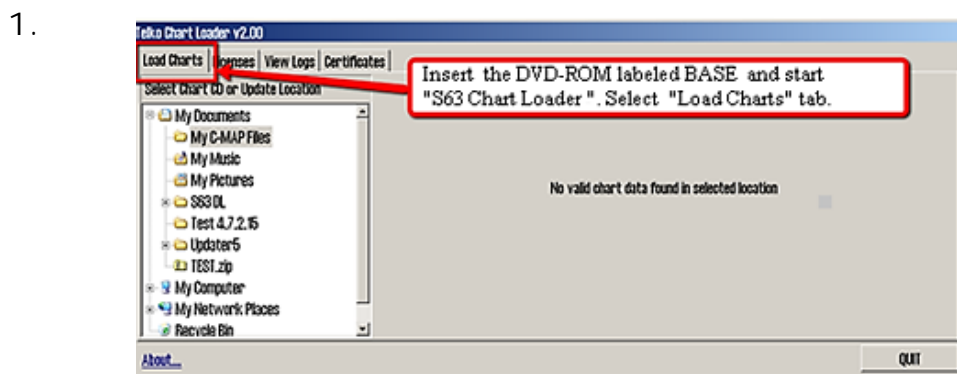
6.9.4 Input of S63 chart from CD-ROM

Encrypted charts are delivered by chart supplier on one or more CD-ROMs and / or DVD-ROMs. The chart loading process is using the "**Cell Permits**", previously installed (see chapter 6.9.3), to decrypt the chart cells, to confirm the cells against **S57 standard**, and to compile them into **SENC** format (**CM93 / 3**), that **TECDIS** is using for chart display. Chart suppliers deliver two types of chart media: **BASE** and **UPDATE**. If both media are provided by the same chart supplier and the chart loading is performed for the first time, the **BASE** format is installed first and then **UPDATE**, or follow the chart supplier specification. Moreover, only the chart supplier instructions are valid regarding the chart media loading sequence.

Under the chart loading process the chart media authenticity will be verified (using the installed certificates). If the Chart Loader has found that authenticity is uncertain, the system will provide a number of warnings that must be overridden by the user before proceeding with the loading of the chart. This can be avoided by installing *Certificate Files* from the chart supplier (see section 6.9.7, *Certificate Installation*). *Certificate Files for Primary (ECC)* is pre-installed on all **TECDIS** units.

Note that the first chart loading process, from another chart supplier can be time consuming. Loading **UPDATE**-media takes less time. For example, loading all Norwegian **ENC** cells takes about 1/2 - 1 hour for **TECDIS** system (depending on the hardware type). Loading a **UPDATE** CD for the same sample, usually takes between 20-40 minutes for **TECDIS** system.

Here is the procedure for downloading a chart from CD-ROM or DVD-ROM, (assuming that all "**Chart Licenses**" are installed):

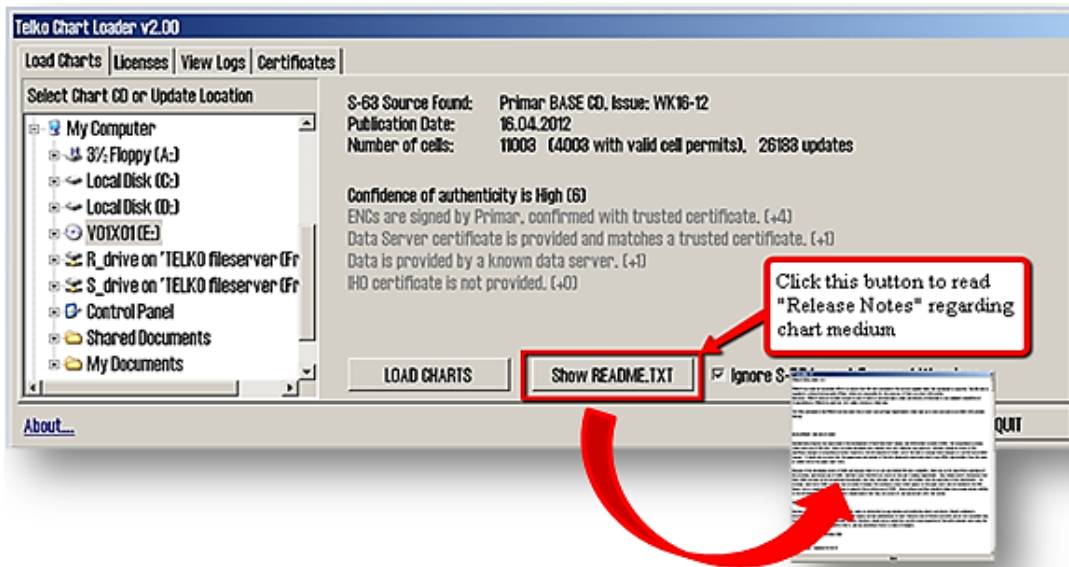


In the Authentication field, the title (in bold font), specify a certain confidence factor. A confidence factor of 0-3 are categorized as low, a confidence factor of 4-5 is categorized as medium and confidence factor of 6-10 are categorized as high and requires no manual reviews. If the confidence factor "**Confidence of Authenticity**" is 0, it is not possible to download charts from the CD. The calculation of the confidence factor is reproduced in gray, under the title. Confidence factor shall be used by the operator to determine if the chart CD is authentic and if the chart comes from an appropriate chart supplier.

A detailed overview, on how the "**Confidence of Authenticity**" factor is calculated and the criteria on which the individual ratings are based, is given in the table below:

Value	Text in the "Load Charts" tab	Explanation
Line 1	The CD chart includes a signature for each chart and these signatures were verified by Chart Loader?	
+0	ENCs are not properly signed, authenticity data can not be confirmed!	If ENC's not properly signed, the CD chart is not valid according to the specification in the S63 Standard .
+2	ENCs are signed with included data server certificate.	If ENC is signed and this is confirmed with a certificate, including on the media. This just confirms that the signatures are technically correct. Since the certificate is included in the data, then the origin of the data is not verified independently.
+4	ENCs are signed by XXX, confirmed with trusted certificate.	If ENC is signed by the supplier (XXX) and this is confirmed with pre-installed certificates, the authenticity of the data has been independently verified and can be trusted.
+7	ENCs are signed by IHO, confirmed with trusted certificate.	If ENC is signed by IHO and this is confirmed with pre-installed certificates, the authenticity of the data has been independently verified and can be trusted..
Line 2	The CD chart includes a certificate from the chart supplier (<i>Data Server</i>)?	
+0	Data Server certificate is not provided.	"Data Server" certificate is not included on the CD chart- authenticity must be evaluated manually.
+0	Data Server certificate is provided, but does not match any trusted certificates.	"Data Server" certificate is included in the CD chart, but it is not identical to any of the pre-installed and approved certificates. Ask the chart supplier for a valid certificate, and install it as described in chapter 6.9.7.
+1	Data Server certificate is provided and matches a trusted certificate.	"Data Server" certificate is included on the CD chart and is identical to one of the pre-installed and trusted certificates. This provides further confirmation of the CD chart's authenticity.
Line 3	Is the chart provider (<i>Data Server</i>) pre-registered in TECDIS ?	
+0	Data is not provided by a known data server.	The chart supplier (<i>Data Server</i>) is not registered in TECDIS . The chart supplier must be evaluated manually.
+1	Data is provided by a known data server.	TECDIS have a list of known S63 chart suppliers (<i>Data Server</i>). The CD chart is issued by a supplier from this list, which is a positive indicator of authenticity.
Line 4	A valid license included on IHO CD chart ?	
+0	IHO certificate is not provided.	TECDIS do not find the IHO certificate on the CD chart- authenticity must be evaluated manually..
+0	IHO certificate is provided, but does not match trusted IHO certificate.	TECDIS find an IHO certificate on CD chart, but it does not match the pre-installed and trusted certificate. The certificate authenticity must be evaluated manually.
+1	IHO certificate is provided and matches trusted IHO certificate.	TECDIS find an IHO certificate on CD chart that matches the pre-installed and trusted certificate, which is a positive indicator of authenticity.
Line 5	Additional authentication information will only appear if applicable.	
-1	ENC signature files are not present.	The CD chart does not include the signature for the chart and the authenticity of the chart data can not be verified. Certificate must be evaluated manually.
-1	ENC signature file checksums are invalid.	The chart signature checksum is invalid. Signature files can be manipulated and unreliable. Certificate must be evaluated manually.

3.



4.

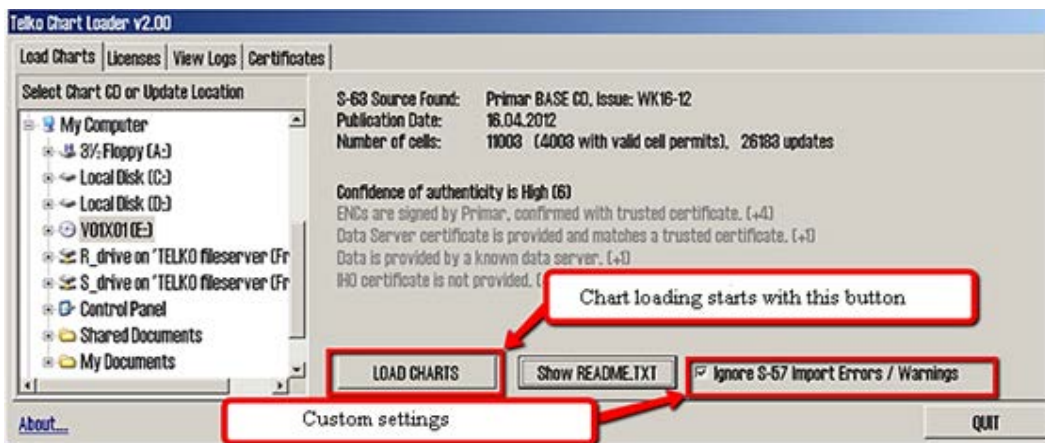


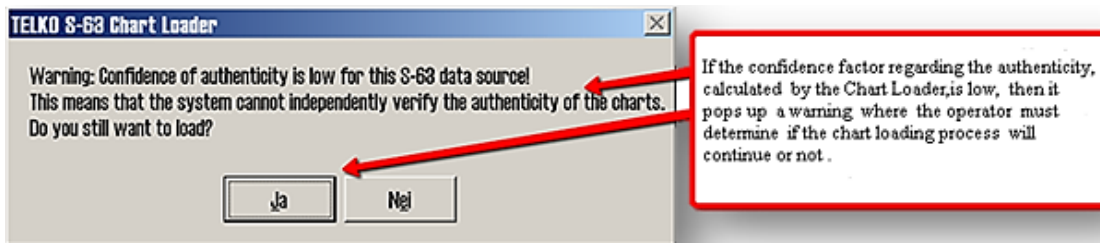
Chart loading process stops when **S57 chart verification** emits warnings or errors alerts and the operator is the one can determine whether the chart loading continues, ignore the warnings or stop the process. This requires that the operator must be present throughout the whole chartloading process.

If "*Ignore S-57 Import Errors / Warnings*" option is checked, the chart loading automatically continue regardless of whether **S57 chart verification** emits an error message or warning. If a critical chart error occurs during the loading process, the chart will be rejected. *Chart Loader* window display that an error or warning messages are logged.

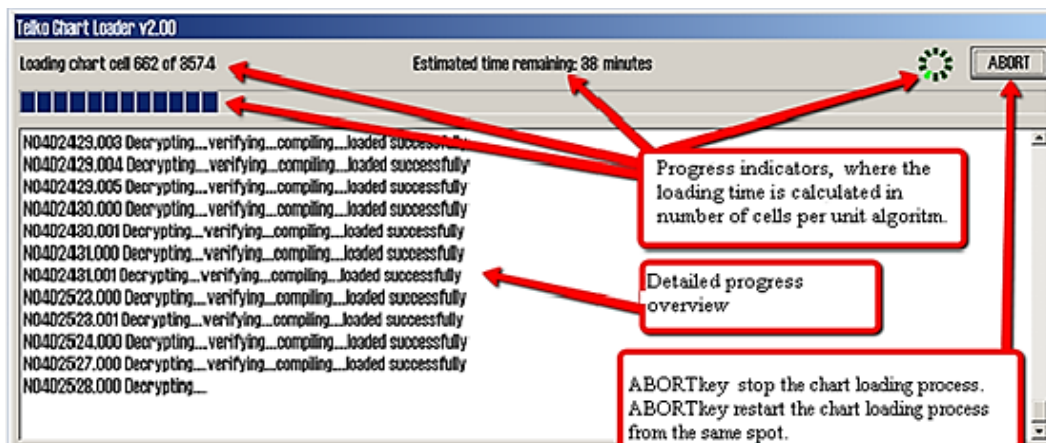


Note: The log for chart loading should be inspected when loading process is finished. The log contains details of all errors and warnings.

5.



6.



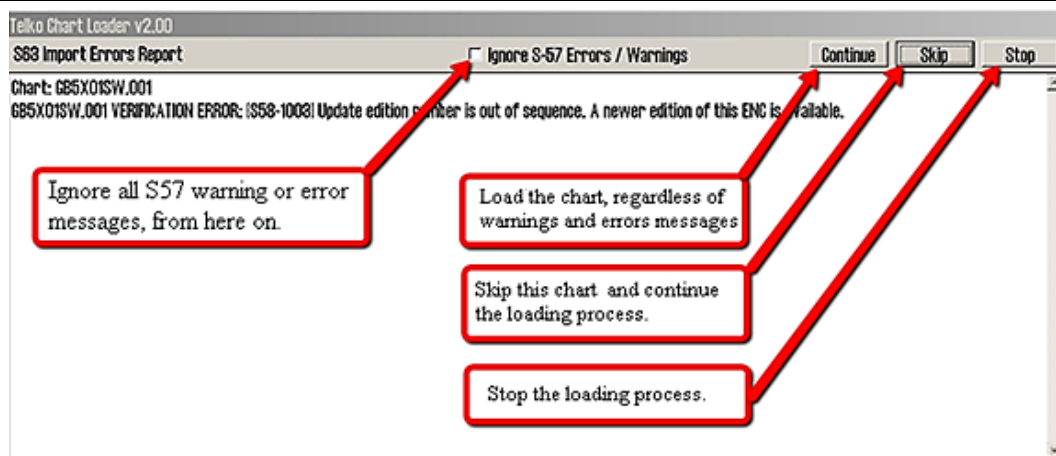
7.

The **Chart Loader** starts to analyze charts that are already on your computer. The progress indicators will display "Initiating..." during this process. This may take several minutes if a larger number **ENC**'s from chart provider are installed from before.

If any of the chart cells of the CD were installed earlier, these will be skipped and the "Progress overview with details" field will contain information regarding this.

"ABORT" key can be used any time when the operator wants to stop the loading process. Already loaded charts will be available in **TECDIS** system and loading of the same CD can be resumed later by following this procedure from the beginning.

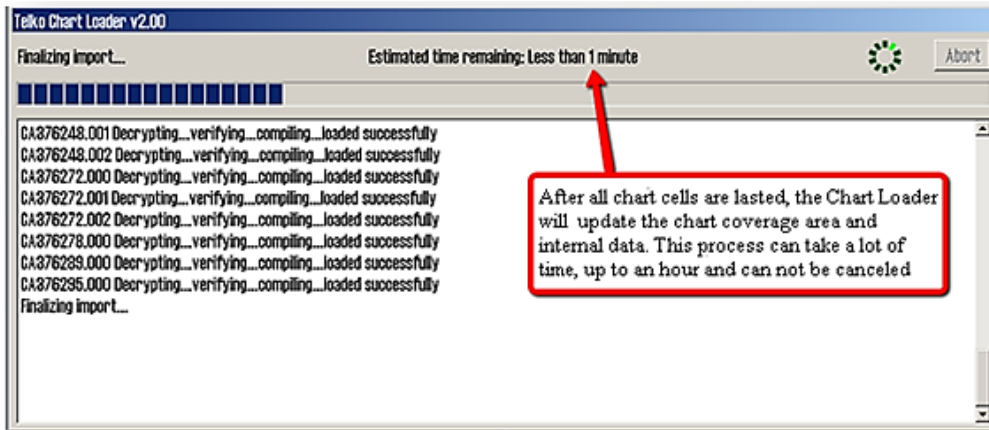
8.



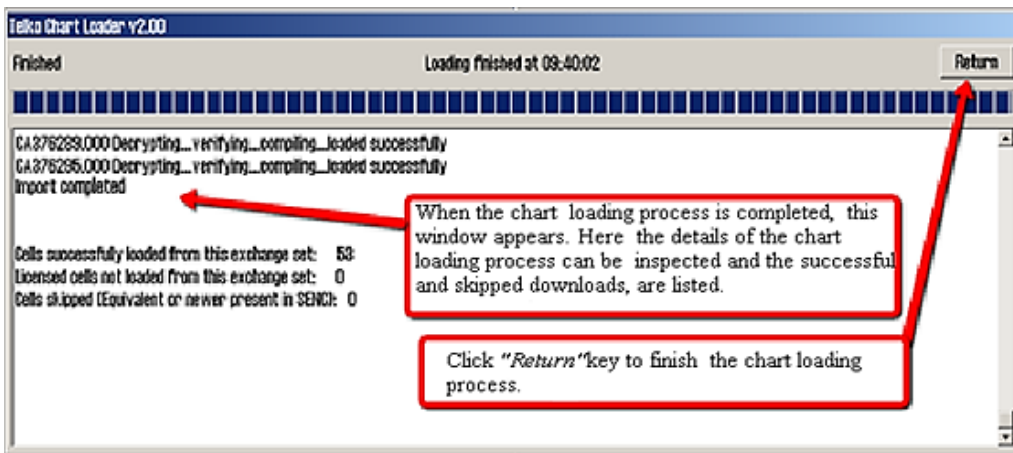
Any errors in the chart loading process is handled via "S63 Import Errors Report" window.

If the operator is uncertain about the S57 error or warnings messages, the authenticity of the chart cannot be verified and in this case the chart supplier should be consulted.

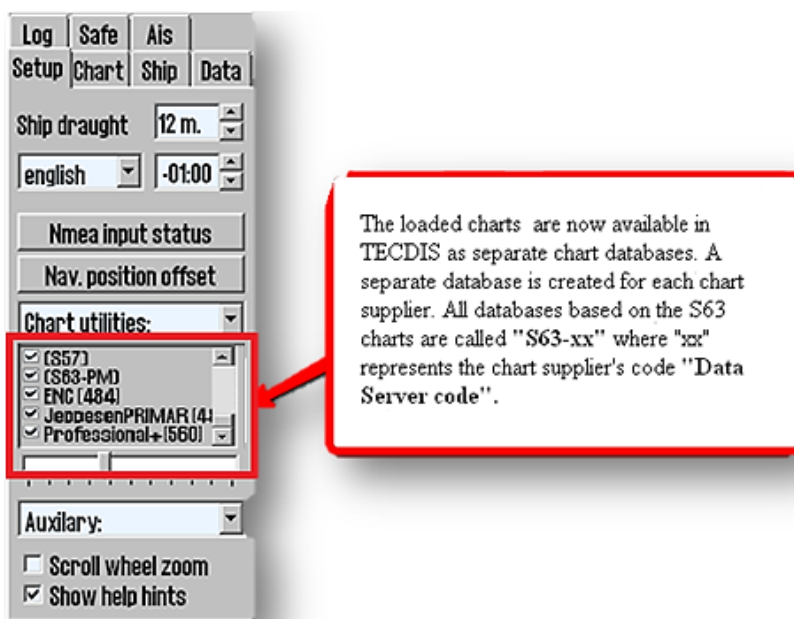
9.



10.

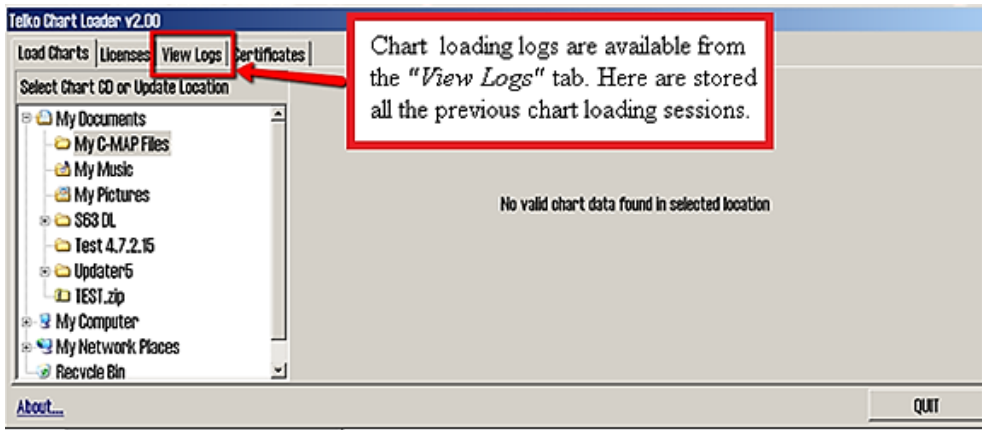


11.

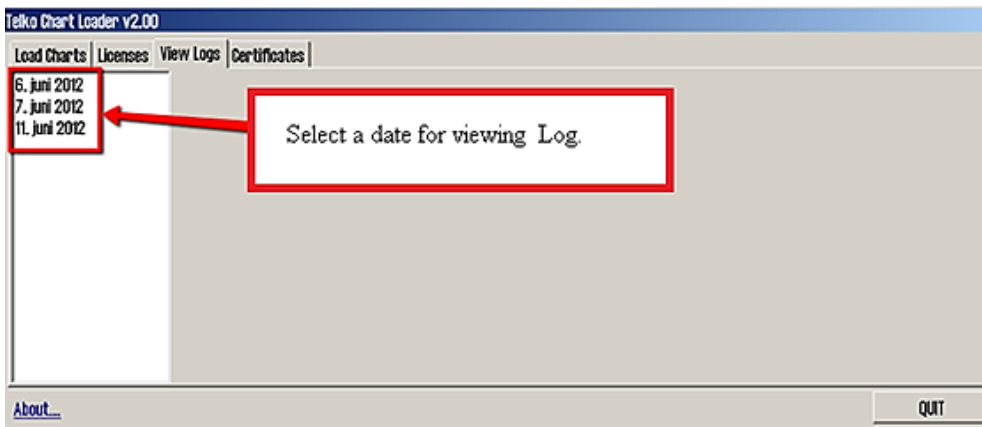


6.9.5 Log Review

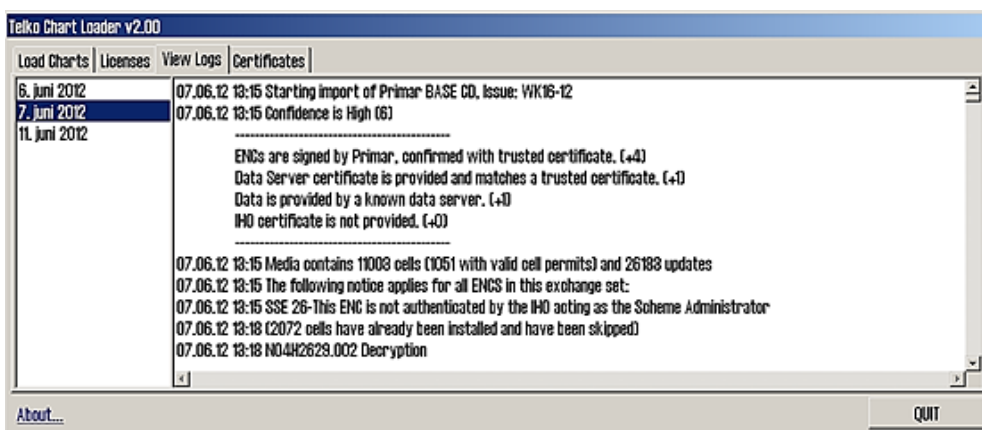
1.



2.



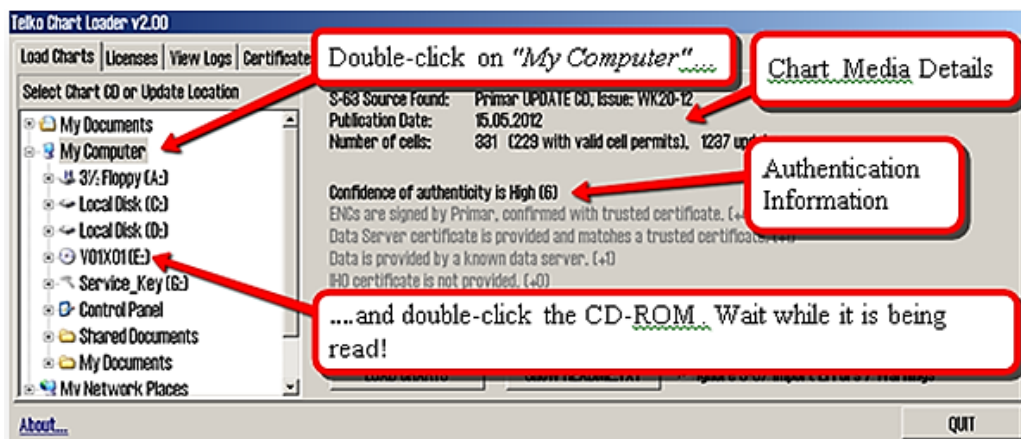
3.



S63 chart loading history is now displayed in the window (zooming available).

6.9.6 Chart Update (ENC Update CD)

1.



For a detailed description of "Authentication Information", see chapter 6.9.4.

2.

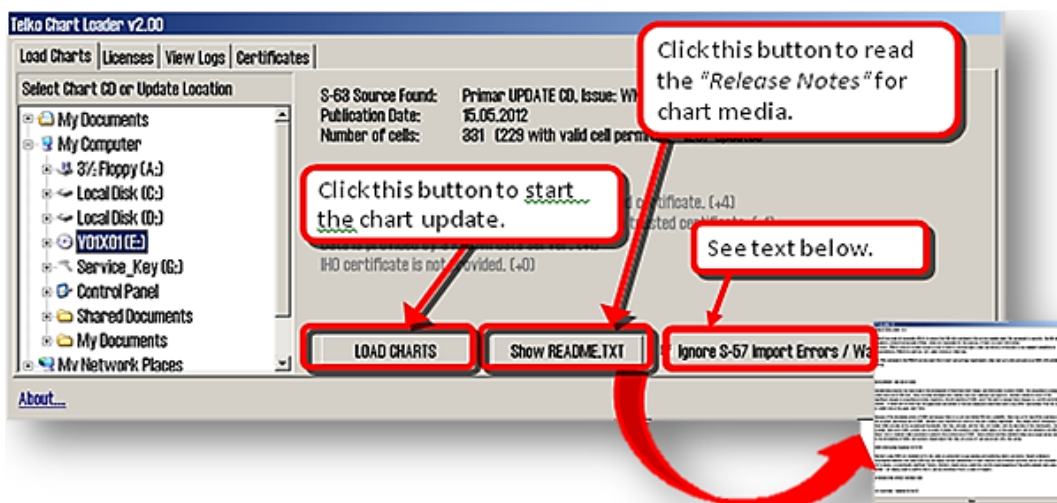


Chart update process stops when S57 chart verification emits warnings. The reason of disturbance is displayed and the operator can determine whether the chart should be loaded, ignored or the loading process should be stopped. This requires that the operator must be present throughout the chart update process.

If "Ignore S-57 Import Errors / Warnings" option is checked, the chart update process will automatically continue, regardless of the S57 chart verification warnings. If a critical error occurs with a chart during the update, the chart will be rejected. Chart Loader window display that the error or warning messages are logged in.

! Note: The chart update log should be inspected when the update is complete. The log contains details of all error messages and warnings.

3.

The further progress is the same as for "S63 chart" (see chapter 6.9.4).

6.9.7 Certificate Installation

1. Certificates are used by **S63 C** hart Loader to verify signatures and authenticity of chart cells and CD charts. Two certificates from the **IHO** and **Primar** are pre-installed in **TECDIS**.

If the charts from other suppliers are loaded, it is highly recommendable that a certificate from that chart supplier is installed before chart loading starts.

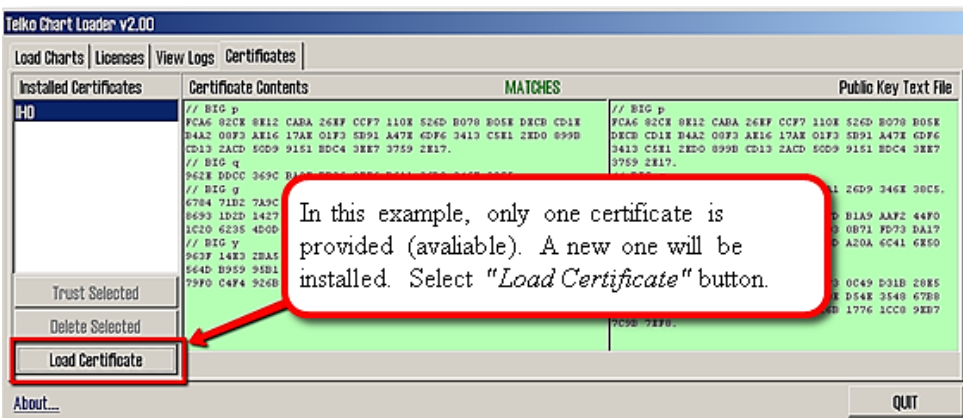
S63 C hart Loader requires two files to install a certificate: a **"*.CRT"** certificate and a **"*.txt"** official key file. These files must be obtained from the chart supplier. It should both be named with chart supplier's title in large letters. Use the following procedure to load a certificate:

2. Place the certificate file from the chart supplier on a **"TECDIS Service Key"** and plug it into an available USB port. Start **TECDIS** to Windows desktop (service mode).

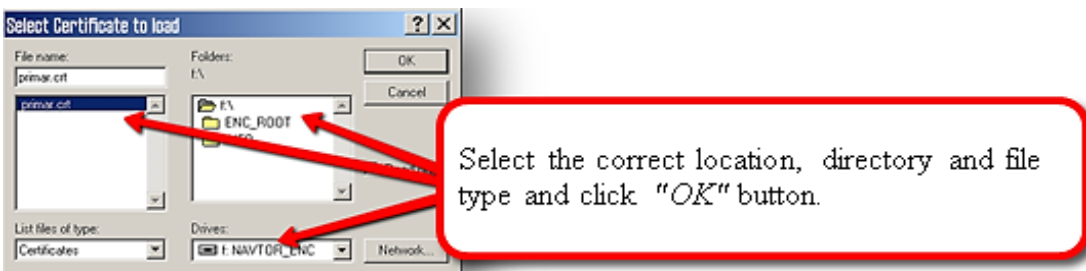
- 3.



- 4.

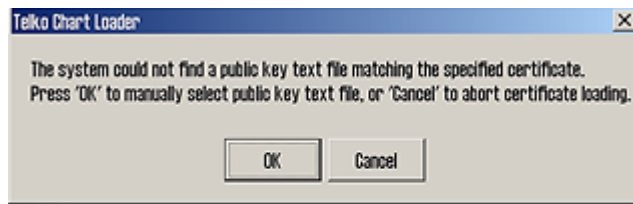


- 5.

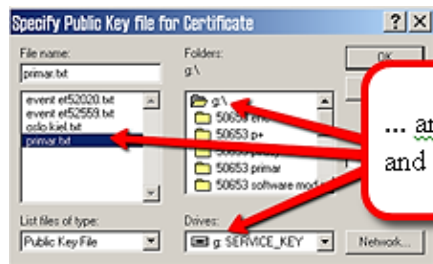


6.

If the Chart Loader finds a file in the same folder as specified for **"*. Cert"** file, the certificate will be installed. If not this notification appears. Press the **"OK"** button...



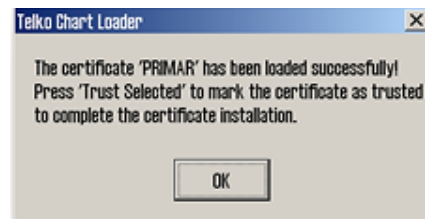
7.



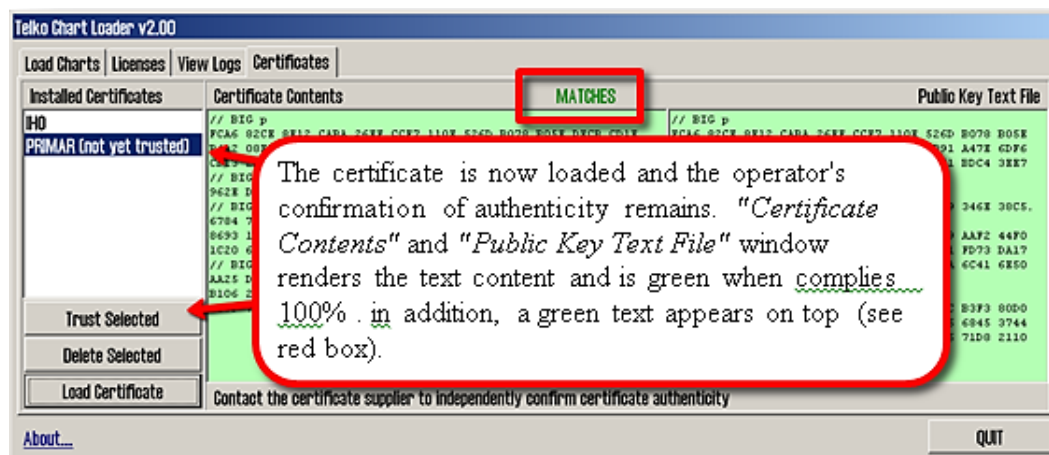
... and select the correct location, directory and file type and click **"OK"** button.

8.

This message appears if the certificate is valid and the **"Public Key"** file matches. Click **"OK"** button.



9.



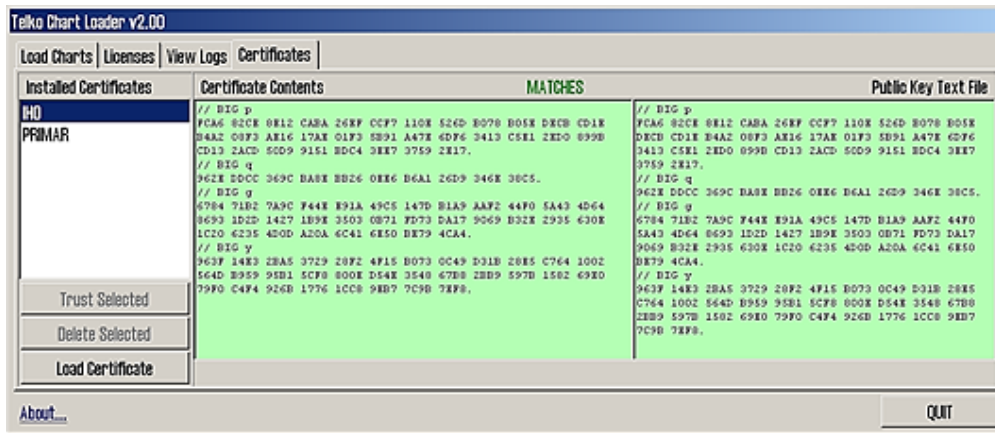
The certificate is now loaded and the operator's confirmation of authenticity remains. **"Certificate Contents"** and **"Public Key Text File"** window renders the text content and is green when complies 100% . in addition, a green text appears on top (see red box).

10.

If the operator is positive regarding the authenticity certificate or had received assistance from the certificate authority (chart supplier) to verify this, this is confirmed by clicking the **"Trust Selected"** button. The Chart Loader is showing a confirmation text.



11.



The Certificate Upload is now complete. (there are two certificates visible in left field)

6.10 Chart loading from NAVTOR NavSync USB stick

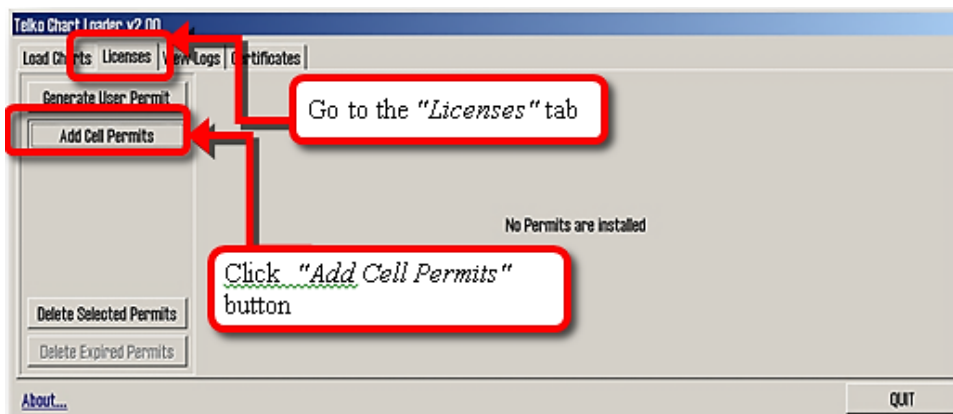
6.10.1 Loading the "Cell Permits" from NAVTOR NavSync USB stick

The chart supplier (which in this chapter is NAVTOR) received the "User Permit", processed the 'order' and issued the "Cell Permits" in the form of files that are prepared for transfer to the administrative NavSync computer on board of the vessel. Prepare NAVTOR NavSync USB stick according to NAVTOR's description. The NAVTOR's folder structure and file types applies and modifications to this description may be necessary.



1. Insert "TECDIS Service Key" in a free USB port.
2. Insert NAVTOR NavSync USB stick with "Cell Permits" in a free USB port and start S63 C hart Loader

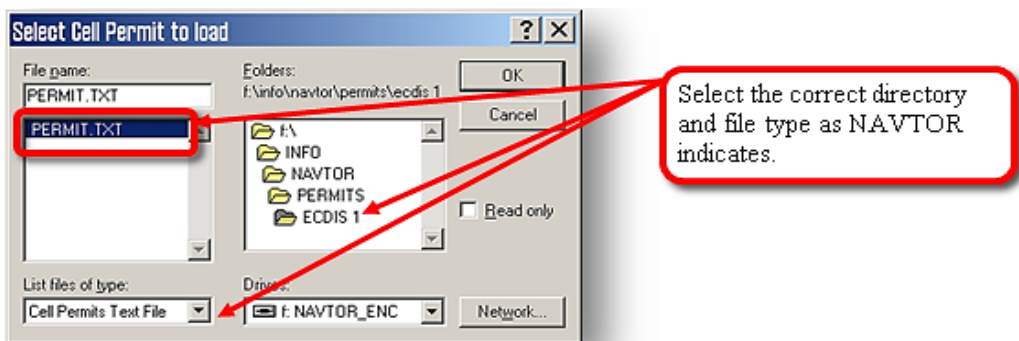
3.



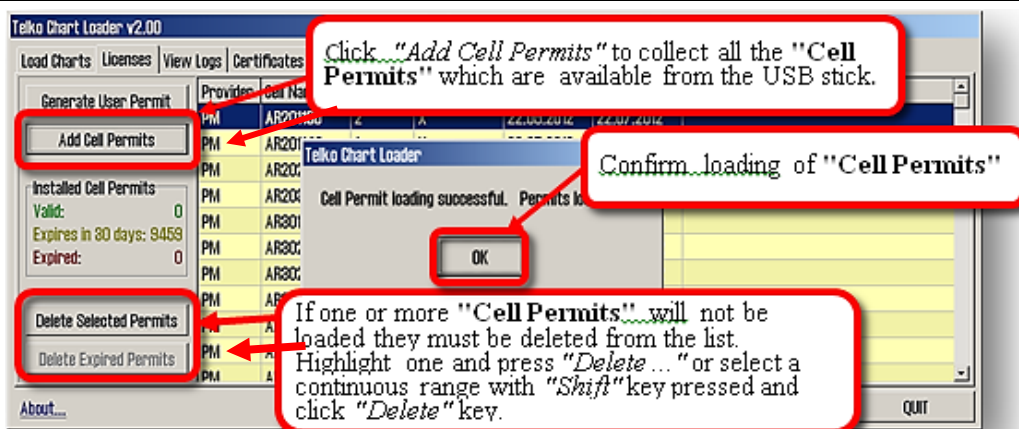
- 4. Click the "About..." text in the lower left corner of the "Licenses" tab, to open a window where "User Permit" code is rendered as plain text.



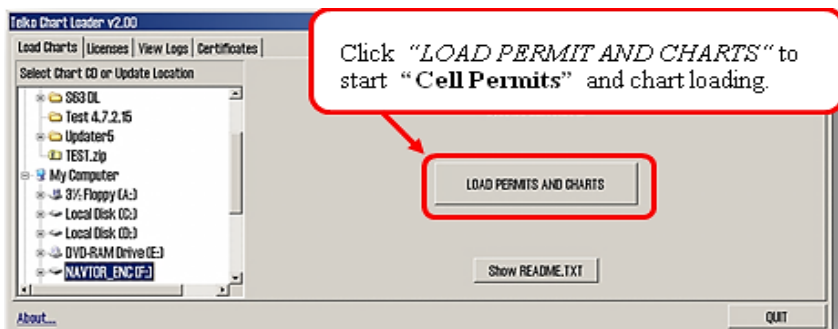
- 5.




- 6.

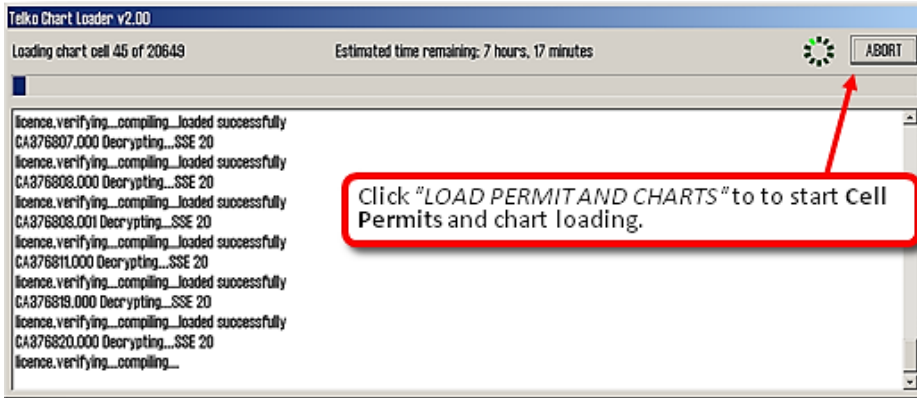


- 7.

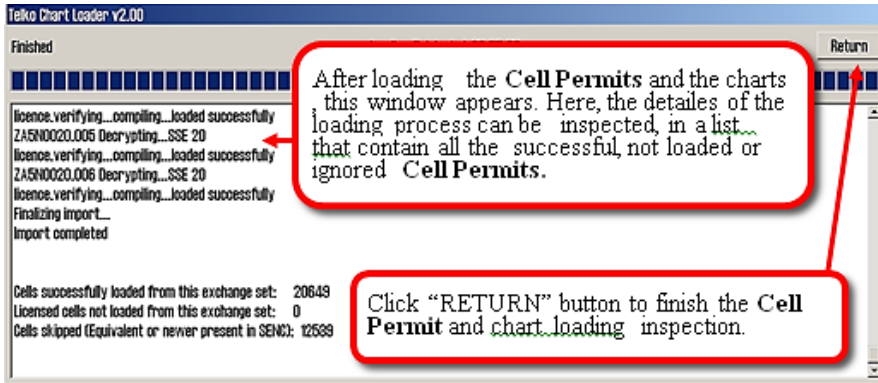


 **Note:** The Chart Loading log must be inspected when the Chart Loading is finished. The log contains details of all error messages and warnings.

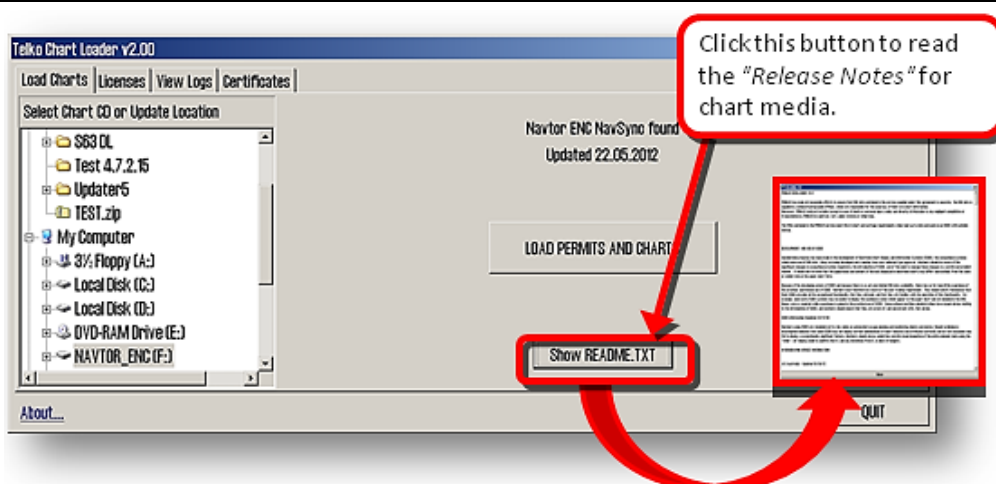
8.



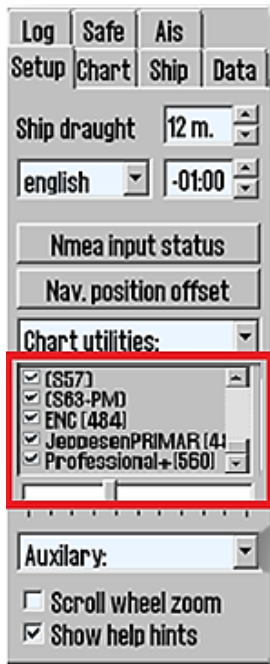
9.



10.



11.



The loaded charts are now available in TECDIS as separate chart databases. A separate database is created for each chart supplier. All databases based on the S63 charts are called "S63-xx" where "xx" represents the chart supplier's code "Data Server code".

6.11 Error Handling in S63 chart loading

In all cases when S63 Loader fails to perform an action, the reason for the failure is indicated with an error message. Consult the following table for details and remedial action.

Table 1.1: Error description

Error message	Cause	Treatment
Format error loading installed Cell Permits	The saved "Cell Permit" has become unreadable.	Stop Chart S63 Loader , delete the file "C: \ Program Files \ TECIDS \ S63SYS \ PMT.DAT" and load all the "Cell Permit" again.
Failure to access cell permit storage	The saved "Cell Permit" has become unreadable.	
No eToken detected	No TELKO eT ("code plug") is connected to TECDIS or is defective.	Check that TELKO eT ("code plug") is connected and that a LED inside the blue plastic, next keychain hole is on. Take it out and in of the USB port. If this didn't help, take it out and put it into a different USB port. If it still does not work, contact a TECDIS service partner.

Error message	Cause	Treatment
SSE 11 - Cell Permit file not found. Load the permit file provided by the data supplier.	<p><u>During loading:</u> The required "Cell Permit" file was not found or could not be loaded.</p> <p><u>When delete:</u> The required "Cell Permit" file was not found or is already deleted.</p>	<p><u>During loading:</u> Check that the file exists and is readable by copying it to a temporary location.</p> <p><u>Under erasure:</u> Stop and restart Chart S63 Loader and check the "Cell Permit" list under the "<i>Licenses</i>" tab. If the "Cell Permit" which was deleted, is still visible in the "Cell Permit" list, delete this file: "<i>C: \ Program Files \ TECIDS \ S63SYS \ PMT.DAT</i>" and download all the "Cell Permit" again.</p>
SSE 11 - Cell Permit file contains no permits. Contact your data supplier and obtain a new permit file.	The specified " Cell Permit " file contains no " Cell Permit "	Contact the " Cell Permit " supplier and ask for a new " Cell Permit " file. Load the new " Cell Permit " when the file is received.
SSE 12 - Cell Permit format is incorrect. Contact your data supplier and obtain a new permit file.	<p><u>Under S63 startup:</u> The saved "Cell Permit" has become unreadable.</p> <p><u>During loading:</u> The "Cell Permit" have errors or is incorrectly formatted.</p>	<p><u>Under S63 startup:</u> Stop S63 Chart loader and delete the file "<i>C: \ Program Files \ TECIDS \ S63SYS \ PMT.DAT</i>" and enter all the "Cell Permit" again.</p> <p><u>During loading:</u> Check that the file, is actually a "Cell Permit" file. If this is confirmed, contact the "Cell Permit" supplier and ask for a new "Cell Permit" file.</p>
SSE 13 - Cell Permit is invalid (checksum is incorrect). Contact your data supplier and obtain a new permit file.	<p><u>Under S63 startup:</u> The saved "Cell Permit" has become unreadable.</p> <p><u>During loading:</u> The "Cell Permit" have errors or is incorrectly formatted.</p>	<p><u>Under S63 startup:</u> Stop S63 Chart Loader, delete the file "<i>C: \ Program Files \ TECIDS \ S63SYS \ PMT.DAT</i>" and enter all the "<i>Cell Permit</i>" again.</p> <p><u>During loading:</u> Check that the file is actually a "Cell Permit" file. If this is confirmed, contact the "Cell Permit" supplier and ask for a new "Cell Permit" file.</p>
SSE 14 - Incorrect system date, check that the computer clock (if accessible) is set correctly or contact your system supplier.	The date has been reset.	Set the correct system date. If the problem persists, contact an authorized TECDIS service partner.
SSE 21 - Decryption failed no valid cell permit found. Permits may be for another system or new permits may be required, please contact your supplier to obtain a new licence.	A S63 encrypted chart cell file is corrupted or incorrect and / or an outdated " Cell Permit " is in use.	Obtain a valid " Cell Permit " from the chart supplier and enter them in the S63 Chart Loader . Try chart loading process. If the problem persist, contact you chart supplier.
SSE 19 - Permits are not valid for this system. Contact your data supplier to obtain the correct permits.	" Cell Permit " for one or more S63 chart cells do not contain the correct decryption keys.	

Error message	Cause	Treatment
SSE 15 - One or more ENC subscriptions in this cell permit file have expired. Please contact your data supplier to renew the subscription licence.	One or more of the " Cell Permit " have been expired.	
SSE 15 - All ENC subscriptions for this ENC media have expired. Please contact your data supplier to renew the subscription licence.	All " Cell Permit " one for ENC cells, which are available on chart media (CD-ROM, USB memory stick, etc.) are expired.	Obtain a valid " Cell Permit " from the chart supplier and enter them in the S63 Chart Loader.
SSE 15 - Subscription for this ENC has expired. Please contact your data supplier to renew the subscription licence.	" Cell Permit " for the specified chart cell is expired and ENC cell has not been loaded.	
WARNING: SSE 15 - One or more ENC subscriptions have expired. Contact your data supplier for a subscription renewal.	<u>Under S63 startup:</u> One or more of the installed " Cell Permit " are expired. <u>During loading:</u> One or more of the installed " Cell Permit " are expired.	
WARNING: SSE 20 - One or more ENC subscriptions will expire in less than 30 days. Contact your data supplier for a subscription renewal.	<u>Under S63 startup:</u> One or more of the installed " Cell Permit " s will expire in less than 30 days. <u>During loading:</u> One or more of the " Cell Permit " for ENC cells, that are available on chart media (CD-ROM, USB memory stick, etc) expires in less than 30 dager.	Obtain valid " Cell Permit " from the chart supplier and enter them in the S63 Chart Loader.
SSE 20 - Subscription for this ENC will expire in less than 30 days. Please contact your data supplier to renew the subscription licence.	" Cell Permit " for the specified chart cell expires in less than 30 days	
SSE 26-This ENC is not authenticated by the IHO acting as the Scheme Administrator.	The chart cell is signed by the chart supplier, but not by the IHO, as S-63 standard requires.	Although the S-63 standard specifies that the chart cells should be signed by the IHO, in the current practice, this signature is done by the chart suppliers themselves. This message informs the user about this and should not be considered a failure.
Specified path does not contain valid S63 data	The specified location does not contain valid S-63 data.	Verify that the specified location contains an S-63 data source.
This system does not support the S63 version of specified data	The S63Chart Loader supports S63 data format version 1.0 and 2.0 of the S63 standard . The specified S63 data source uses a different version.	Contact the chart supplier for S-63 chart media according to version 1.0 or 2.0 of S-63 standard.
This system does not support this cell permit version	The S63Chart Loader supports S63 data format version 1.0 and 2.0 of the S63 standard. The specified S63 " Cell Permit " file is using a different version.	Contact The chart supplier for S-63 " Cell Permit " file under version 1.0 or 2.0 of S-63 standard.
SA digital certificate has not yet been trusted	The IHO certificate is loaded, but is not verified for authenticity.	Inspect the certificate in the S63 Chart Loader under " <i>Certificates</i> " tab and check it and confirm the authenticity (" <i>SELECT Trust</i> "), according to paragraph 9 of section 6.9.6, " <i>Map Update (ENC Update</i>

Error message	Cause	Treatment
Certificate has not yet been trusted	The specified certificate has been loaded, but has not yet been marked as trusted.	CD)”).

6.12 Chart Dynamic Licensing

Dynamic licensing function in **TECDIS** includes full support for "**Jeppesen Marine Dynamic Licensing**" for ENC and **JeppesenPRIMAR** charts in **C-MAP SENC** format. Dynamic licensing provides a cost effective method to ensure a continuous ENC chart coverage with minimal administrative costs.

6.12.1 Traditional Chart Licensing

Previously, the only method of obtaining charts for ‘paperless voyage’, was to purchase in advance a subscription for planned voyage route chart cells. Activation of chart licenses require license codes which were entered in **TECDIS** system, both when a new chart was added and every time when the chart licenses expired. Generally chart are licensed for a 12 month period, regardless of whether the vessel is actually making use of the charts or not..

6.12.2 General about Dynamic Licensing

Dynamic licensing is a subscription agreement between the vessel operator and **Jeppesen Marine**, which provides instant access to charts within the subscription limits. Vessel operator doesn’t supports any cost at the time of subscription to dynamic licensing. However, the vessel gets immediate access to all charts within the subscription restrictions, for use of route planning or actual voyage, without specifying any license codes..

6.12.2.1 Credit Limit

To prevent uncontrolled license costs, the subscription include an annual credit limit based on estimated annual costs for the vessel. When a chart is used by **TECDIS** system, the chart licensing cost is charged within the subscription and the remaining credit is reduced accordingly. The credit limit can be extended if necessary.

6.12.2.2 Automatic Licensing

When a new chart is needed (accordingly with the vessel's voyage), **TECDIS** enables immediately a three-month license for that chart. If the vessel needs again the same chart after this period, a new 3 month license active. This means that a chart subscriptions is charged from the time the vessel actually need the chart, with a 3 month license period.

6.12.2.3 Reporting user

The active chart licenses are automatically reported back to **Jeppesen Marine**, when "*Auto Updating*" or "*Semi Auto Updating*" functions, in "*C-MAP chart update*" option in the "*Setup*" menu, is used to download chart updates for **ENC** or **JeppesenPRIMAR**-charts. So, to update a chart is a necessary for the ‘paperless navigation’ and involves no extra work for the navigators..

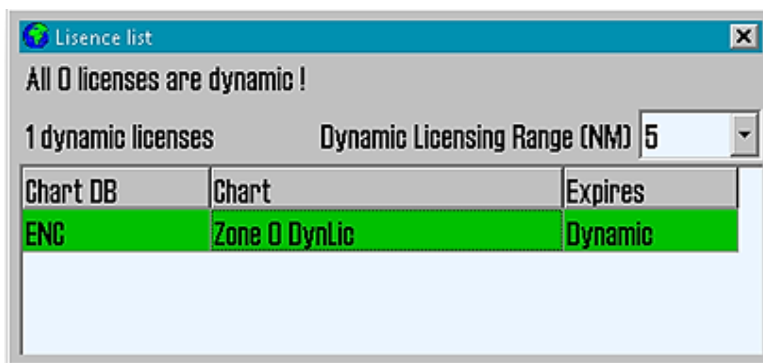
6.12.2.4 Billing

Based on the actual chart use, **Jeppesen Marine** will charge the vessel operator for accrued chart license. This can either be done at regular intervals, or when the total outstanding amount exceeds the credit limit defined in the Subscription Agreement. All matters relating charts, licensing of charts and chart subscriptions is between **Jeppesen Marine** and vessel operator.

6.12.3 Use of Dynamic Licensing in TECDIS

After Dynamic Licensing agreement draft between **Jeppesen Marine** and ship operator, the function is automatically enabled in **TECDIS** when then next chart update is completed. The chart is automatically licensed within a specified distance from your vessel. This ensures chart coverage in the vessel's current position and that the route planning or fake chart requests do not result in Chart License costs.

The status of the Dynamic License (credit limit, last usage report and the next reporting date) can be monitored by opening the "License list" in "Check chart licenses" option in the "Setup" menu and click on the dynamic license entry in the list.



Once the credit limit is lower than 200 "credits" or the deadline for the next reporting is less than 3 days, TECDIS will issue a warning about this. Lists of chart dynamic license (both reported and unreported)

opens the "C-Map Chart Manager" started from "Chart Installation / Misc" folder in TECDIS Setup.

6.12.3.1 Adjustment for automatic ENC licensing

Adjustment for automatic ENC Licensing is performed in "License list." With "TECDIS Service Key" connected, by opening this window is it possible to adjust the threshold value "Dynamic Licensing Range (NM)" (see illustration above).

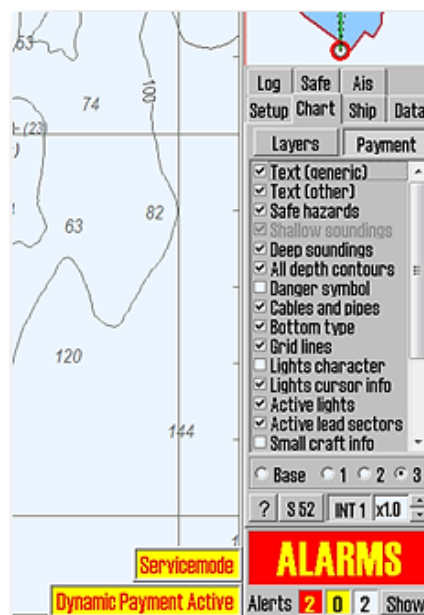
6.12.3.2 Route Planning using ENC diagrams

Since only chart within a given distance is licensed automatically in the default mode, it is possible to plan a voyage, in advance, without being charged for extra chart license costs. When it is determined that the voyage will take place, the route should be checked against the charts to meet the government requirements for 'paperless navigation'.

"TECDIS Service Key" is required to license a chart outside the parameters which are set in the "Dynamic Licensing Range (NM)." When "TECDIS Service Key" is plugged in a USB port, a "Payment" button will be available in the "Chart" folder in the "Menu" folder. By clicking this button activates the payment mode.

In the payment mode, all requested chart cells are licensed, including outside "Dynamic Licensing Range (NM)." A clear warning is displayed on the screen to show that the payment mode for the chart opening, is active. A route check can now be performed and all hazards / precautions from the charts will be displayed. The route can also be adjusted manually using the charts.

When route check is performed, the payment mode is disabled either by clicking the "Checkout" button again, or by removing the "TECDIS Service Key".



Chapter 7 Parameter Setup

When you first starts the TECDIS computer it will automatically start up and enter the TECDIS program. Windows XP and TECDIS software are pre-installed. To exit TECDIS program for commissioning and installation setup procedures see chapter 3.1 for details.



7.1 Service mode (Windows)



When you exit TECDIS (using the button at the upper left corner), the chart plotter will automatically be turned off after you confirm that you want to exit. In order to exit TECDIS without turning the chart plotter off, you must insert the USB service key (memory dongle) *before* you exit TECDIS. When this service key is connected to the chart plotter, the chart plotter will not be turned off when you exit TECDIS and you will be able to work in Windows (service mode) and open the Setup program by double clicking on the Setup icon on the desktop. When service mode is available, a text indication is shown in the lower right corner of the chart.

7.2 NMEA data setup

The “NMEA Data”-folder in the TECDIS Setup, constitutes all controls and settings for inputs and outputs, to and from TECDIS, are set. The table to the left (information field), shows the current settings and is instantly updated if changes are made by using the “Input”- and “Output”-folders at the upper right part of the window. The pull-down menu for “Input”-selection will open/close for other options to be selected as required, to assist in making correct settings.

The screenshot shows the 'TECDIS / TELchart EGS Setup' window with the 'NMEA Data' tab selected. The window title bar indicates the local IP address as (172.31.3.71) (192.168.0.103). The 'NMEA Data' table is as follows:

Data	Nmea	Input	baud/TPA	port	Info
Position 1	GGA	Com4	4800		GPS1
Position 2	GGA	Com5	4800		GPS2
COG/SOG 1	VTG	Com4	4800		GPS1
COG/SOG 2	VTG	Com5	4800		GPS2
Heading 1	HDT	Com6	4800		Gyro
Heading 2	HDT	---	---		AIS
Water speed	VBW	Com	4800		Log
Radar arpa 1	TTM	IP1	0.0.0.0	10028	Radar 1
Radar arpa 2	TTM	IP1	0.0.0.0	10028	Radar 2
Radar cursor 1	RSD	IP1	0.0.0.0	10028	Radar 1
Radar cursor 2	RSD	IP1	0.0.0.0	10028	Radar 2
AIS	Aixxx	Com9	38400		AIS
Depth	DPT	IP3	172.31.3.71	2001	Sounder
Rel. wind	MWV	Com11	4800		Wind
Route	RTE	WPL	----		
Monitor ctrl.	Hatte	Com3	4800		Main display
Alarm ctrl.	Digi	Com1	4800		Alarm central
Control unit	Rcu18	Com2	19200		Furuno keyboard
Trackcontrol	Ansch	---	----		
Navtex	NRX	---	----		
Search	Flir	---	----		
Options 1	---	---	----		
Options 2	---	---	----		
Options 3	---	---	----		
Options 4	---	---	----		

On the right side of the window, there are configuration options for 'Input' and 'Output'. The 'Input' section includes a 'Sentence and port select' area with a dropdown menu for 'Position 1' (set to 'Position 1') and a text field for 'GPS1'. Below this, there are three dropdown menus: 'GGA', 'COM 4', and 'baud 4800'. The 'Output' section includes a 'Serial port activity' area with a grid of 12 numbered buttons (1-12) and a 'Clear' button. At the bottom right, there is a 'Save to file' checkbox.

7.2.1 The “Input”-folder



Note: All position inputs to TECDIS from all external sensors must be in WGS-84 format.

Use this tab of the setup program to configure input signals, by selecting the “Data”-type either by activating the desired line in the table to the left, or by selecting the “Data”-type from the pull-down menu in the “Input”-folder to the right. When “Data”-type is selected, the corresponding line in the information field to the left is shown as active in blue background color.

7.2.2 Info text

Then, type in a text description in the “Info”-field to identify the source instrument for the selected “Data”-type. This could be brand name for the sensor connected, as this field text will be visible in warnings and alerts in the TECDIS program.

7.2.3 NMEA sentence

In the pull-down menu for “NMEA”-sentence; select the type of “NMEA”-sentence for this input. For more information about the different NMEA sentences, see the table in paragraph below. Available “NMEA”-sentences in the pull-down menu will change according to which “Data”-type is selected. When a given sensor provides more than one of the supported “NMEA”-sentences, the highest ranking option from the following lists (as applicable) should be used:

Position 1 and Position 2

1. \$??GNS GNSS fix data
2. \$??GGA GPS fix data
3. \$??GLL Geographic position lat/long
4. \$??RMC Recommended minimum specific GNSS data
5. !AIVDO¹ AIS own ship position. UAIS VHF Data link own-vessel report

COG/SOG 1 and COG/SOG 2

1. \$??VTG Course and speed over ground
2. \$??RMC Recommended minimum specific GNSS data
3. \$??OSD Own ship data
4. !AIVDO AIS own ship position. UAIS VHF Data link own-vessel report

Heading 1 and Heading 2

1. \$??THS True heading and status
2. \$??HDT Heading true
3. \$??OSD Own ship data
4. \$??VHW Water Speed and Heading
5. !AIVDO AIS own ship position. UAIS VHF Data link own-vessel report

Radar ARPA 1 and Radar ARPA 2

\$??TTM Tracked Target Message

Radar Cursor 1 and Radar Curson 2

\$??RSD Radar System Data

AIS

!AI?? AIS UAIS VHF Data Link

Depth

1. \$??DPT Depth
2. \$??DBT Depth below transducer

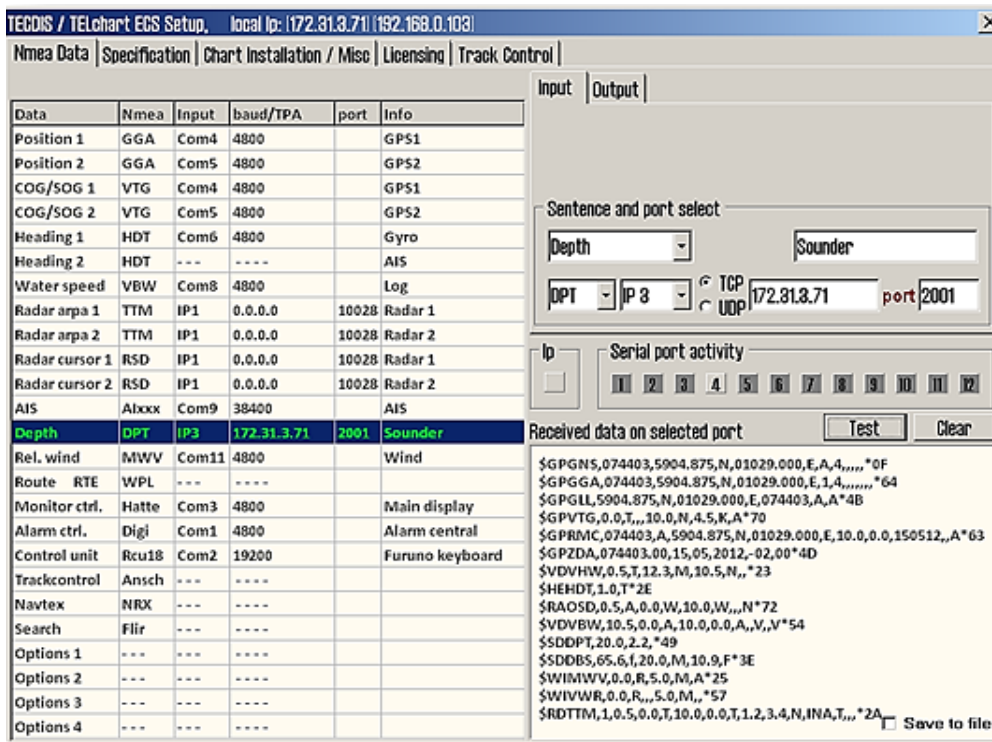
¹ Position: !AIVDO may be used as a secondary position source whenever primary source is missing.

7.2.4 Input port

In the pull-down menu “Input”-port, select the physical serial port the selected sensor “Data”-type should be read from. If the “Input”-port field is set to same value as already set for; “Monitor ctrl.”, “Alarm ctrl.” or “Control unit”, the text of the corresponding lines in the information field will turn red. This indicates that the port selection is invalid, and that another COM port must be selected either for the sensor or the conflicting equipment.

The text of the corresponding line in the information field will turn green when valid “NMEA”-sentences is received on the specified “Input”-port.

7.2.5 IP-port



IP ports: TECDIS has 12 COM ports and 4 IP ports. For each IP port, the IP address and “IP”-port number must be entered. The “Test”-button establishes a connection to the IP server with the selected address/port number and the “Received data on selected port”-area will show any data that is received.

Example: In order to receive position data from a GPS, you need to:

1. Select “Position 1” or “Position 2” from the “Data”-type pull-down menu.
2. Optionally (but recommended) enter a description identifying the sensor as a GPS in the “Info” field. If the sensor signal is lost while the TECDIS is in operation, an alarm will be sounded. The alarm message will indicate the type of sensor lost as well as what port it is connected to and the sensor description from the “Info”-field. The failing instrument (instead of having to refer to the configuration in the Setup program) is easily identified. NMEA Sensor inputs and status can also be displayed in TECDIS.
3. Select the “NMEA”-sentence from the “NMEA”-sentence pull-down menu.
4. Select the “Input”-port for the GPS from the “Input”-port pull-down menu.

7.2.5.1 The “Baud/TPA”-field

In the “Baud/TPA”-field the data speed to be used for the COM are set. The NMEA standard is 4800 (low speed). Be aware though that some instruments require a different data speed selection. There is also a NMEA high speed standard (38400). AIS units typically use high speed in order to transmit as much data as possible. (Select AIS in the “Data”-type field and check that the “Baud/TPA”-field indicates the high-speed setting). The speed is set by selection from this field’s drop-down menu.

7.2.6 Serial port activity

In the “Serial port activity”-field the ports that are receiving data are shown. Whenever data is received on a COM port, the corresponding indicator in this area will flash green. The indicators are for COM ports 1-12 in increasing order from left to right.

7.2.7 Received data on selected port

In the “Received data on selected port”-field the data that are being received from the COM port that is marked with green in the “Information”-field and selected in the “Data”-type field. By changing the selected port in “Data”-type field by selecting one of the other “Data”-types, the data shown in the “Received data on selected port”-field will change correspondingly.

7.2.8 Other COM port connections

All “Input”-ports settings that is not used should be set to “---”. Additionally there are some predefined in-/outputs that may have non-NMEA protocol. On the “HT C01 TEL-A-596” and “HT C01 TEL-A-596” computers used for “TECDIS 2138AA” and “TECDIS 2138AD” the serial ports COM 1 and 3 are set as RS232, COM 2 is proprietary and remaining COM-ports are RS 422 serial ports.

Monitor Ctrl: Select the COM port (RS232) that the monitor is connected to. This connection will control the monitor background light and calibration settings, as well as the alarm sounder in the screen unit (if used). Ensure that the power supplied to the monitor is from the same source (UPS, mains socket etc.) as for the TECDIS.

Alarm ctrl: Select the COM port that should be used for the alarm central interface (if used). In the “NMEA”-sentence pull-down menu there are two choices; “Digi” and “ALR”. “Digi” will set the port up to serial NMEA communication with the alarm central. “ALR” option should be used when connected to a proprietary alarm interface TEA-01, which is an open/close relay contact.

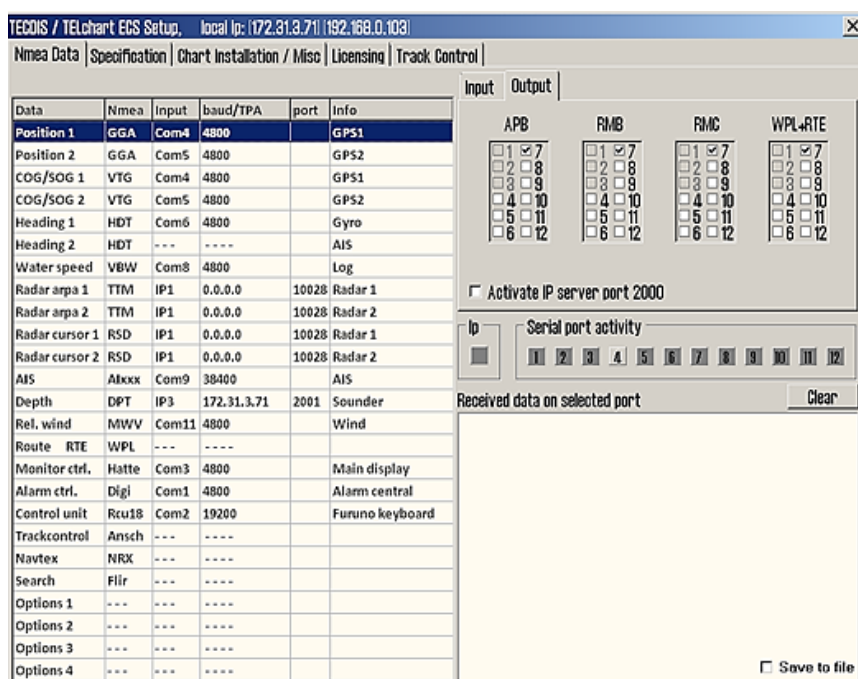
Control unit (RCU-018): Set “Input”-port to “COM 2” if the Furuno RCU-018 is connected to the TECDIS. Physically, the “COM 2”-port provides live 12VDC power to the Control unit and thus this port cannot be used to any other equipment.

Search FLIR: Select the COM port where gyro-stabilized FLIR camera (if used) is connected.

7.2.9 The “Output”-folder

The “Output”-folder in the upper right corner of the “NMEA Data”-folder have settings for the following outputs: APB, RMB, RMC and WPL+RTE. For each of the outputs, there are choices of which of the physical COM-ports the output should be directed trough.

There is also a tick-box for activating IP-server on port 2000 on this folder.



7.2.10 Enabling IP server

By selecting "Activate conning IP server port 2000" opens a TCP / IP server in TECDIS for data transfer to TECDIS Conning program. This option should only be activated when TECDIS Conning displays the data from TECDIS.

7.2.11 Supported NMEA Sentences

TECDIS supports communication with external equipment using the following NMEA sentences, as specified by the NMEA standard and IEC 61162-1 (Ed. 3.0):

NMEA sentence	Description	Send / Receive
ABK	(AIS) AIS addressed and binary broadcast acknowledgment	Receive
ABM	(AIS) AIS Addressed Binary and Safety Related Message	Send
ACK	Acknowledge Alarm	Send / Receive
ALR	Set Alarm State	Send / Receive
APB	Heading/Track Controller (Autopilot) Sentence "B"	Send
BBM	(AIS) AIS Broadcast binary message	Send
DBT	Depth Below Transducer	Receive
DPT	Depth	Receive
DTM	Datum reference	Receive
GGA	Global Positioning System (GPS) Fix Data	Receive
GLL	Geographic Position – Latitude / Longitude	Receive
GNS	GNSS Fix Data	Receive
HDT	Heading, True	Receive
MTW	Water temperature	Receive
MWV	Wind Speed and Angle	Receive
OSD	Own Ship Data	Receive
RMB	Recommended Minimum Navigation Information	Send
RMC	Recommended Minimum Specific GNSS Data	Send / Receive
ROT	Rate of Turn	Receive
RSA	Rudder Sensor Angle	Receive
RSD	Radar System Data	Receive
RTE	Routes	Send / Receive
THS	True Heading and Status	Receive
TTM	Tracked Target Message	Receive
VDM	(AIS) AIS VHF Data-link Message	Receive
VDO	(AIS) AIS VHF Data-link Own-vessel Report	Receive
VBW	Dual Ground/Water Speed	Receive
VHW	Water Speed and Heading	Receive
VSD	(AIS) AIS voyage static data	Send
VTG	Course Over Ground and Ground Speed	Receive
VWR	Relative (Apparent) Wind Speed and Angle	Receive
WPL	Waypoint Location	Send / Receive
ZDA	Time and date	Receive

NOTE: TECDIS also supports a number of proprietary protocols for specific application areas. Contact your TECDIS supplier for details.

7.3 Specification



Note: The descriptions in this chapter are presented in this manual as pure information. Only qualified electrician to make changes to the settings listed in this chapter

On this tab, the dimensions of the vessel and the placement of sensors on the vessel are specified. Specifying the position of the sensors is important in order to get the highest possible accuracy in position (GPS antenna) and other data as possible.

TECDIS / TELchart ECS Setup, local Ip: (172.31.3.71) (192.168.0.103) ver. 1.7.15

Nmea Data | **Specification** | Chart Installation / Misc | Licensing | Track Control

Ship size (m.)

- Length: 100
- Beam: 25
- Draught min.: 7
- Draught max.: 12
- Height: 21

Position sensor 1

- 78 m. from bow
- 6 m. center -> starbrd.

Position sensor 2

- 78 m. from bow
- 6 m. center -> starbrd.

Conning position

- 208 m. from bow
- 0 m. center -> starbrd.
- 34 m. height

Depth transducer

- 41 m. from bow
- 1 m. above keel

Radar antenna 1

- 70 m. from bow
- 1 m. center -> starbrd.

Radar antenna 2

- 22 m. from bow
- 0 m. center -> starbrd.

Data export Ip: 172.31.3.62
(Ip address to second Eodis unit)

Radar use true EBL reference
 Arpa is conning referenced

Monitor

- 23 inch diagonal
- backward (gyro - 180°)

Alarm

- Allow Standby Mode
- Alarm if HDT1-HDT2>2.5°
- Remote silence only

Name: OWN SHIP NAME **MMSI:** 257000000

Erase Secondary past track
Restore saved default values

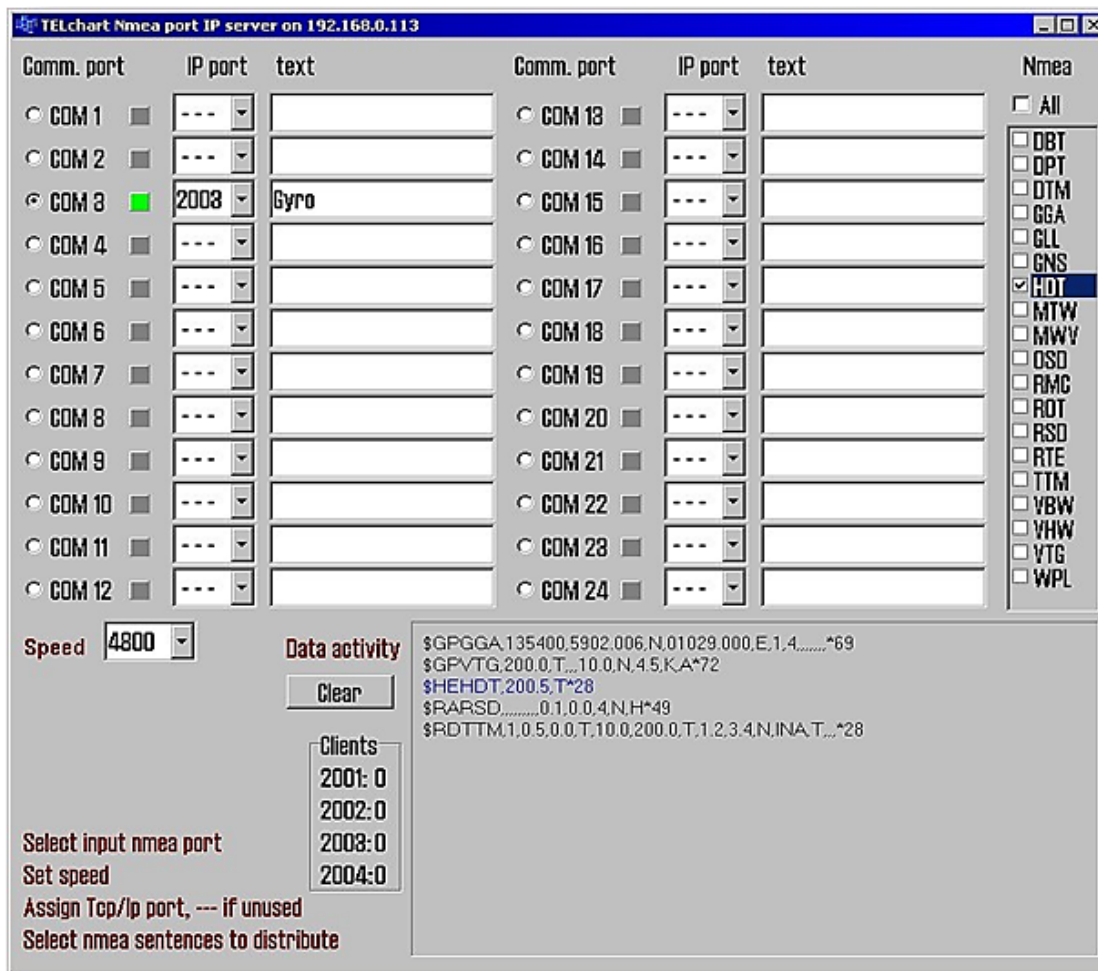
- In the “*Ship Size*”-field, enter the length, beam, draught and height of the vessel in meters.
 - For “*Length*”- and “*Beam*”-fields the ship’s largest dimension value for length and beam should be used.
 - For “*Draught*” and “*Height*” the largest possible height and draught taking load conditions into consideration should be entered.
- When a second TECDIS unit is present in the installation (for example, backup unit). The IP address of the second TECDIS unit should be entered in the “Data export IP” field. This will activate automatic transfer of active routes to the second TECDIS, and it will be possible to transfer data (objects, tracks, routes) to the second unit. (See chapter 3.8 Route Synchronization for details).



NOTE: If the TECDIS unit is not to be connected to a second TECDIS unit, this value should be set to “0.0.0.0”. For any other value in this field, TECDIS will generate an alarm if unable to connect to the other TECDIS unit.

- “*Radar use true EBL reference*”: When this checkbox is marked, it is assumed that bearings lines received from the radar(s) are true referenced. If this option is not marked, TECDIS will perform the necessary adjustments.
- “*Arpa is conning referenced*”: When this checkbox is marked, it is assumed that target information from Arpa radar is already adjusted to the navigator position. If it is not marked, TECDIS will perform the necessary adjustments.
- In the “*Monitor*”-field the following should be set:
 - “*Monitor inch diagonal*”: Specify the diagonal size of the monitor here.
 - “*Backward (gyro-180°)*”: Checking this box turns the heading value from gyro 180 degrees.
- In the “*Alarm*”-field, you can select:
 - “*Allow Standby Mode*”: When this option is activated, it will be possible to set TECDIS in “Standby Mode”. In this mode, no audible alarms will be generated. Activating this option also allows CPA alarms to be disabled in TECDIS.
NOTE: A prominent warning is displayed whenever the “Standby Mode” is active.
 - “*Alarm if HDT1-HDT2 > 2.5°*”: When this box is checked, an alarm will be given if the heading from the two sensors “Heading 1” and “Heading 2” deviates with more than 2.5 degrees.
Note: If the TECDIS system has the option “*Track Control*” enabled, this box is inactivated as control for this alarm is set up in the “*Track Control*”-folder.
 - When selecting the “*Remote silence only*”-checkbox an acknowledgement made on a TECDIS alarm in an Alarm Central (not part of TECDIS system), only turns off the audible alarm signal. The TECDIS alarm situation must be solved in TECDIS.
- If two positioning methods are in use, the button “*Erase Secondary past track*” allows you to remove the past track line from the secondary position sensor.
- “*NAME*”: The vessel name should be specified in this field.
- “*MMSI*”: The MMSI number should be specified in this field
- “*Restore saved default values*”-button allows you to retrieve all settings made in the NMEA Server, Conning and TECDIS setup from the backup file that was saved in the “*Service key*” last time TECDIS Setup was closed. When “*Restore saved default values*”-button is clicked, a dialog window called “*Restore to xxxxx (eToken #): Locate the setup file to restore from, and click OPEN*” appears. Locate the file that contains all the settings, called “*T-setup xxxxx.tsz*” where xxxxx represents eToken serial number.
 - A “*T-setup xxxx.tsz*”-file is generated by TECDIS Setup every timer TECDIS Setup is started and stopped again. The file is created by setting the “*Service Key*” into the computer, stop TECDIS and start TECDIS Setup, stop TECDIS Setup, remove the “*Service Key*”. “*T-setup xxxx.tsz*”-file is saved to the “*Service Key*” automatically, where “*xxxxx*” represents the unit’s eToken serial number. Repeat for TECDIS No. 2.
“*T-setup xxxx.tsz*”-file can be used by TELKO for an analysis of the setup, installation and other settings.

7.4 TECDIS NMEA and TCP/IP server



TECDIS NMEA and TRP/IP server allows distribution of selected comport data out through a TCP/IP network. This way one sensor can be shared by multiple users in a TCP/IP network.

As shown above, “HDT sentence”, is received on comport 3 and is retransmitted on port 2003 through TCP/IP address 192.168.0.113. This means that backup ECDIS (or other connected computers to the LAN network) can receive “HDT” data through TCP/IP by selecting correct IP address (192.168.0.113 port 2003).

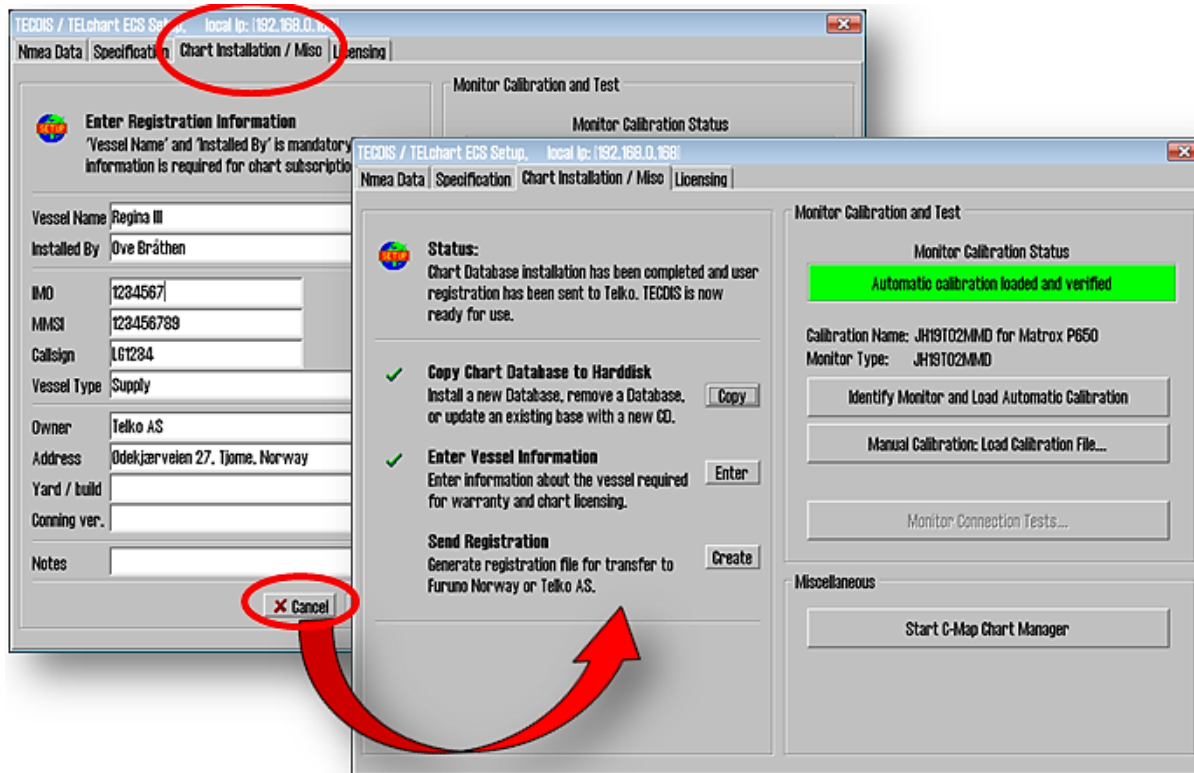
Setup procedure:

1. Select appropriate comport with desired data
2. Select appropriate baud rate on receiving comport, by using “Speed” dialog box
3. Select to which TCP/IP ”port” it shall retransmit data (from the selected comport), for example 2003
4. Describe with text connected device to TCP/IP port (backup station, conning PC etc.)
5. Select which NMEA sentences you which to send (you may select one, multiple or all on one TDP/IP port)
- 6.

”Data activity” shows activity on selected (monitored) comport. HDT is marked in blue due to it is selected for output to TCP/IP.

”Clients” shows how many listeners (connections) there are on each connected TCP/IP port.

7.5 Chart Installation/Misc.



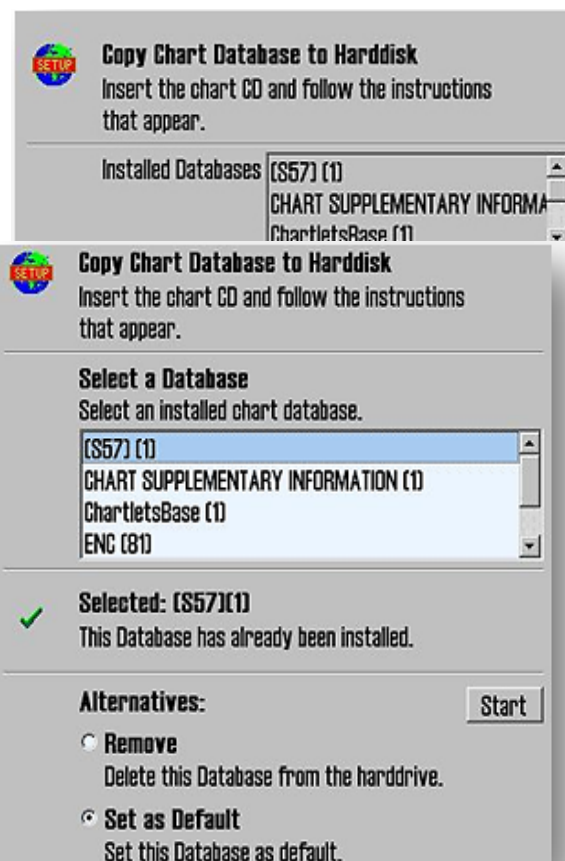
If “Enter Registration Information”-field is visible when opening the “Chart Installation/ Misc”-folder, click the “Cancel”-button to access the front page containing the “Status”-field.

7.5.1 Install, update or remove chart databases

By clicking “Copy”, a new area with an overview of installed chart databases is opened. Insert the CD for the chart database that is to be operated on and select the CD-ROM drive from the drop down menu below the database list. The Setup program will read the CD and display the available actions for the chart database. (Install, Update, Remove and ‘Set as Default’).



Important: “Purchase” chart licenses are locked to a specific edition of the chart database. If a different edition of the database is installed, new licenses must be acquired. ‘Subscription’ licenses remain valid when newer chart database editions are installed.



If a CD is not available for the chart database (as would be the case for databases containing imported S57 data),

these databases can be selected for modification by choosing a drive *other than the CD-ROM drive* from the drive drop down menu. (For example D:). When Setup is unable to find a chart database on the selected drive, you get the option to manually select an installed database by pressing the button “Select an Installed DB”.

You will get two options for the database you select from the list of installed databases: “Remove” and “Set as Default”. We recommend that the “World” database should be set as default, if installed.

Important: Some chart databases are protected and cannot be removed unless you have a CD for the database available.

The option ‘*Remove Licenses*’ will also be displayed in some instances. Selecting this option and pressing ‘Start’ will allow you to remove all chart licenses for the specified database. Make sure you have new valid chart licenses available before starting this option!

7.5.2 Enter vessel information:

In this area, information about the vessel and owner should be entered. This information is needed for chart licensing and warranty purposes.

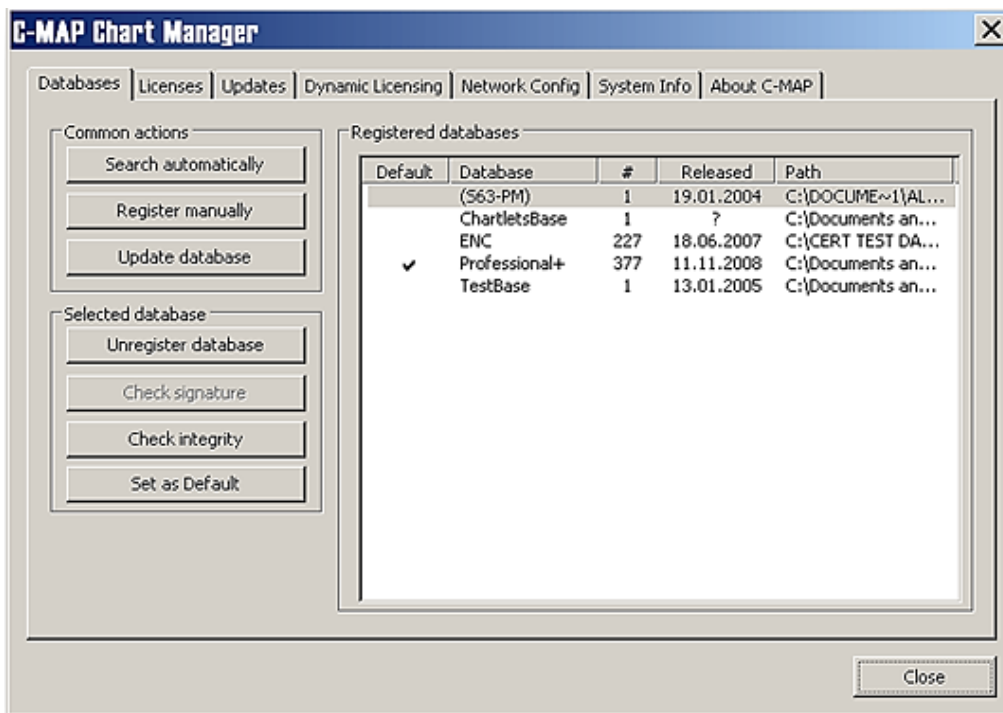
7.5.3 Send registration

When the vessel information has been entered and stored, the option to send registration will be enabled on the main area of this part of the Setup program. If “*Send on Diskette*” is selected, the registration file will be saved to an inserted diskette.

If “*Send Manually*” is selected, the registration file will be saved on the hard drive and a message informing you about the file name and location of the file. Send this file to the specified email address whenever the “*Vessel information*” data is changed.

7.5.4 Start C-Map Chart Manager

The “*Start C-Map Chart Manager*” button provides access to the C-Map chart database, licensing and diagnostics interface.



This can be useful when **Jeppesen Marine** support needs to make adjustments to the system.

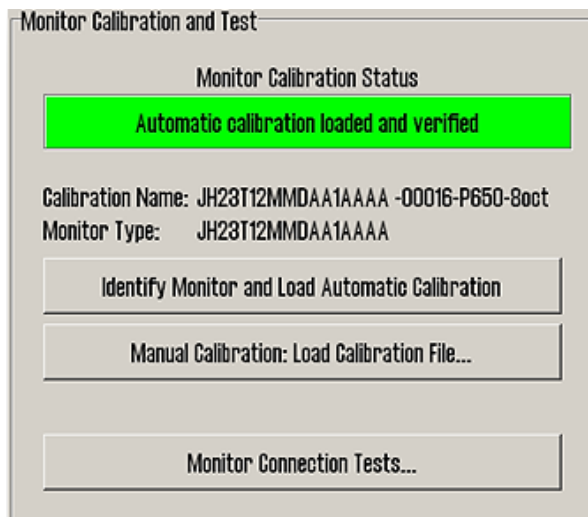
By selecting a chart database and clicking “*Check Signature*”, it is possible to verify that the database has not been corrupted and is in the same state as when provided by C-Map.

7.5.5 Monitor Calibration and Test

This area provides information on the current monitor calibration status, means to update the monitor calibration and diagnostics for testing the serial connection to the monitor.

Proper monitor calibration is needed to ensure correct chart colors and symbols.

To calibrate the monitor first attempt automatic calibration by pressing the “Identify Monitor and Load Automatic Calibration” button. If this is not successful, calibrate manually by pressing the “Manual Calibration: Load Calibration File...” button and selecting the correct calibration file matching the monitor. If such a file cannot be located, this can be obtained from your TECDIS support provider.



Monitor Calibration Status:

Indicates the current status of monitor calibration. The possible values seen here and steps to rectify any problems are as follows:

Status	Tiltak
No serial line to monitor!	Connect the monitor to a serial port as described in 3.2.9.1.
Calibration not performed!	Perform automatic or manual calibration as outlined below.
Wrong manual calibration file loaded!	The manual calibration file loaded does not match the connected monitor. Obtain the correct calibration file from your TECDIS support provider and repeat manual calibration.
Monitor contains wrong automatic calibration!	The monitor does not contain the correct monitor calibration files. Contact your TECDIS support provider.
Automatic calibration loaded but not verified	Calibration has been successfully performed. Verify correct calibration by comparing the monitor model specified in “ <i>Calibration Name</i> ” to the monitor model label.
Manual calibration loaded but not verified	
Automatic calibration loaded and verified	Calibration has been successfully performed and verified.
Manual calibration loaded and verified	

Calibration Name: Indicates the name of the currently loaded manual or automatic calibration.

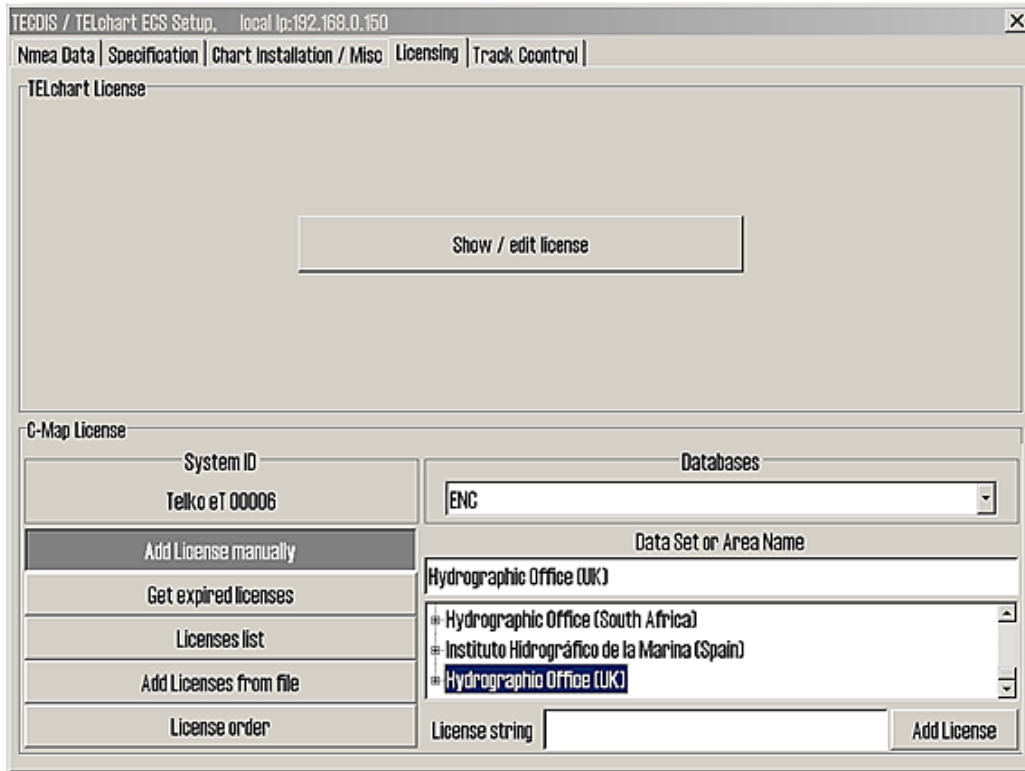
Monitor Type: Indicates the monitor model name as reported by the monitor during the last automatic calibration process.

Identify Monitor and Load Automatic Calibration: Initiates automatic identification of monitor type and attempts to load automatic calibration data from the monitor.

Manual Calibration: Load Calibration File...: Allows the operator to manually load a monitor calibration file.

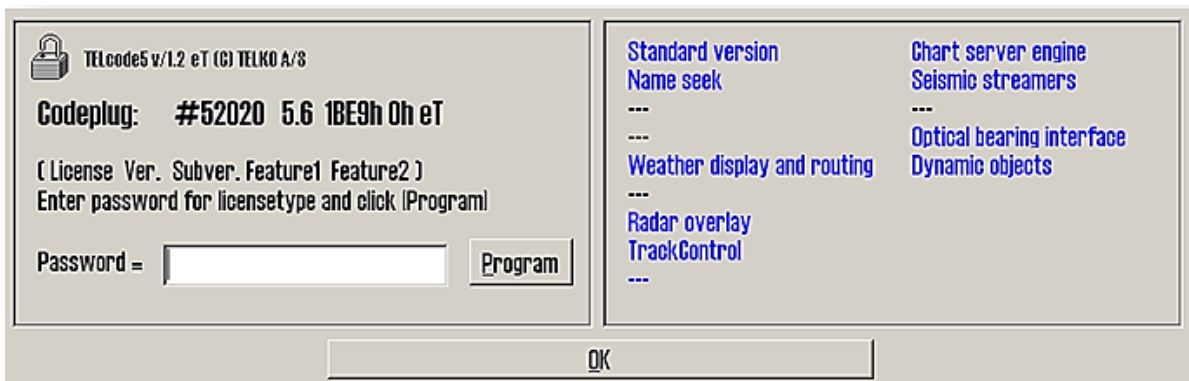
Monitor Connection Tests...: Provides access to tests to verify correct monitor serial connection (buzzer test, backlighting adjustment tests and monitor identification test).

7.6 Licensing



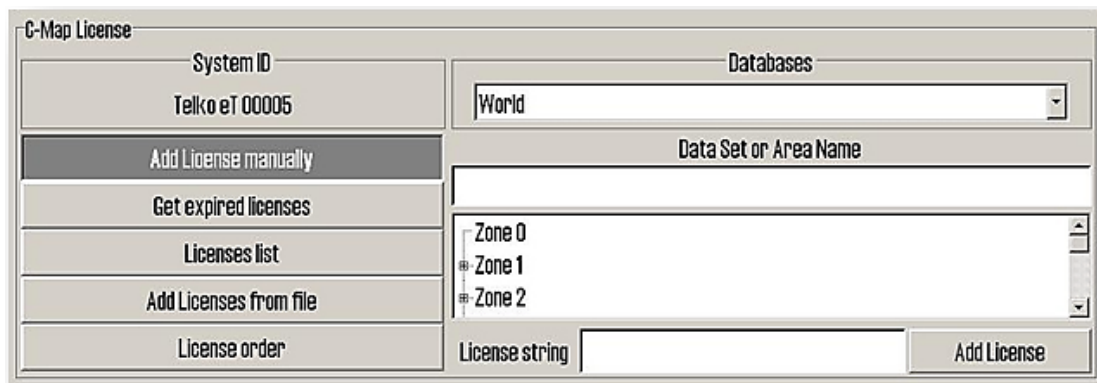
7.6.1 TECDIS license

By clicking “*Show / edit license*” information about the current system license is shown as illustrated below. This information includes the license number and version information, and a list of installed optional components in blue in the right part of the area. In order to activate additional optional components, a password for this should be entered in the “*Password*” field and the “*Program*” button should be clicked.

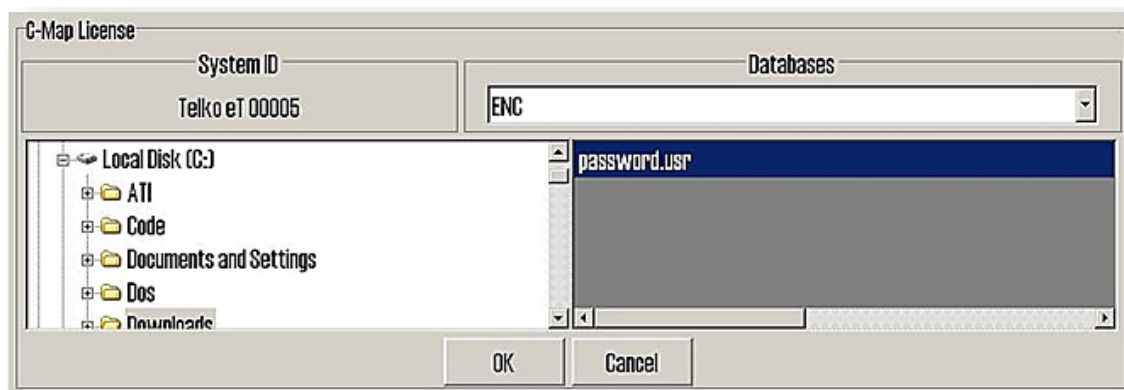


7.6.2 C-MAP License

Add licenses manually: Select the zone or area you have received a license for in the window to the right (under “Data set” or “Area name”). The 16-character license code is entered in the “License string” field. Finally, click on “Add License” to activate the license.



Add license from file: Use this option if you want to use a supplied password.usr file to activate chart licenses, browse to the location of this file and select it and press “OK”. The licenses contained in the file will be automatically activated.



In this area, it is also possible to get a list of licenses that are expired and no longer valid (“Get expired licenses”), to see a list of all valid licenses (“Licenses list”) and to generate an order file for new licenses (“License order”).

7.6.3 Dynamic Licensing

TECDIS includes full support of **Jeppesen Marine’s Dynamic Licensing** solution for ENC charts in **C-MAP SENC** format. **Dynamic Licensing** provides a cost-effective method for ensuring continual vessel ENC coverage with minimal overhead and administrative costs.

7.6.3.1 Traditional ENC Licensing

Previously, the only way to acquire ENC charts for paperless navigation has been to purchase subscriptions for all ENC charts required by the vessel in advance. Activating the ENC charts on the vessel requires license codes to be entered on the onboard **ECDIS** systems, both initially and each time the chart licenses expire. Typically, each required ENC chart is licensed for a 12 month period, regardless of whether the vessel actually makes use of the ENC chart or not.

7.6.3.2 What is Dynamic Licensing?

Dynamic Licensing is a subscription agreement between the vessel operator and **Jeppesen Marine** that gives the vessel immediate access to ENC charts within the subscription area. The subscription incurs no immediate costs to the

operator. Once the subscription agreement is active, the vessel ECDIS systems will provide immediate access to any ENC charts required within the subscription area, either for planning or monitoring. There is no need to enter any license codes.

7.6.3.3 Credit Limit

To prevent uncontrolled licensing costs, the subscription agreement includes a yearly credit limit based on estimated yearly costs for the vessel. When an ENC chart is licensed by the **ECDIS** system, the licensing cost for the chart is subtracted and the credit limit is reduced accordingly. This credit limit can be extended whenever needed.

7.6.3.4 Automatic licensing

When the vessel requires access to a new ENC chart, the system immediately activates a 3 month license for the chart². If the vessel again requires access to the same ENC chart after this period, a new 3 month license is activated. This means that an ENC chart subscription is only purchased at the time the vessel actually requires the chart, and the 3 month licensing period ensures that no subscription costs are incurred when the vessel has no need for the chart.

7.6.3.5 Reporting usage

The activated ENC chart licenses are automatically reported back to **Jeppesen Marine** whenever the vessel uses the **C-MAP Update Service Online** to download corrections to the ENC charts. Since the chart update process is required for paperless navigation, this does not require any additional work for the bridge personnel.

7.6.3.6 Invoicing

Based on the reported actual ENC chart usage, **Jeppesen Marine** invoices the vessel operator for the licensing costs. This can either be done periodically, or whenever the total outstanding amount exceeds the maximum invoicing amount defined in the subscription agreement.

7.6.3.7 Benefits over traditional ENC chart licensing

Dynamic Licensing provides a clear cost advantage over traditional ENC licensing:

- Traditional ENC licensing requires predicting which ENC charts will be required by the vessel. Since ENC charts are only licensed when the vessel actually requires the chart with Dynamic Licensing, no charts not needed by the vessel are licensed.
- Traditional ENC licensing typically provides 12 month licenses for ENC charts. Since Dynamic Licensing generates 3 month licenses for ENC charts, licensing costs for charts that are only required periodically or for shorter periods are lowered significantly.

Dynamic Licensing provides a clear operational advantage over traditional ENC licensing:

- There is no need to predict future ENC chart requirements for the vessel, or to purchase chart licenses in advance.
- Activating new ENC licenses requires no chart licensing codes that need to be entered on the ECDIS systems.
- Usage reports are returned to Jeppesen Marine automatically during chart updating, an operation that is performed routinely regardless of licensing method.

To summarize, use of Dynamic Licensing ensures that ENC chart licensing costs are minimized, and administration of chart licenses is handled automatically by the system, reducing the workload both for bridge personnel and for vessel operators.

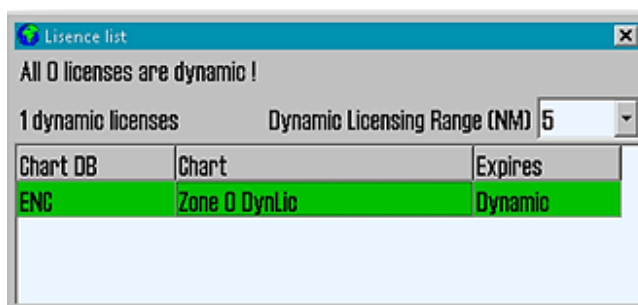
² Some Hydrographic Offices requires 12 month subscription periods for all of their ENC charts. For these charts, 12 month licenses are generated.

7.6.4 Using Dynamic Licensing in TECDIS

After a dynamic licensing agreement is made between Jeppesen Marine and the vessel operators, this feature is automatically activated in **TECDIS** the next time the **C-MAP Update Service Online** is used.

After activation, ENC charts will automatically be licensed for all required charts within a specified distance of the vessel³. This ensures that ENC coverage is always available for the vessel location, and that early route planning or spurious chart requests does not result in ENC licensing costs.

The current state of the dynamic licensing agreement (credit limit, last usage report and next reporting deadline) can be monitored by accessing the chart licenses interface in **TECDIS** and clicking on the dynamic license entry in the list (**TECDIS Operators Guide** chapter 3.2).



When the credit limit is lower than 200 credits or the next reporting deadline is within 3 days, this is reported to the operator as warnings in the alarm system. When the credit limit is exhausted or the reporting deadline has been exceeded, this is reported to the operator as alarms in the alarm system (**TECDIS Operators Guide** chapter 5.5).

Lists of dynamically licensed ENC charts (both reported and unreported) can be viewed in the C-Map Chart Manager, available in the “*Chart Installation / Misc*” folder in the **TECDIS Setup** program (**TECDIS Operators Guide** chapter 7.4).

7.6.4.1 Adjusting the distance limit for automatic ENC licensing

To adjust the distance limit for automatic ENC licensing, the **TECDIS Service key** is needed. When the **TECDIS Service key** is inserted, it is possible to adjust the distance limit in the chart licenses interface in **TECDIS** (See illustration above).

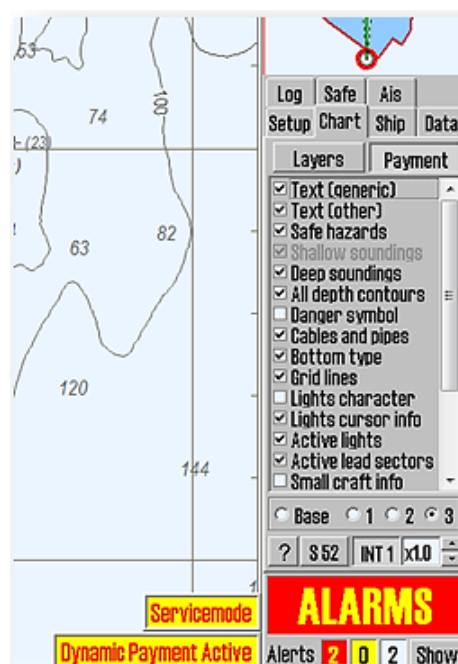
7.6.4.2 Route Planning using ENC charts

Since only charts within a specified distance are licensed automatically in standard mode, it is possible to plan a potential voyage in advance without incurring additional ENC chart licensing costs. Once it is decided that the voyage will take place, the voyage plan should be checked using ENC charts in order to comply with official requirements for paperless navigation.

The **TECDIS Service Key** is needed to license charts outside the specified distance limit. When the **TECDIS Service Key** is inserted, a “*Payment*” button will be available in the “*Chart*” folder of the **TECDIS** menus. Pressing this button activates *Payment Mode*.

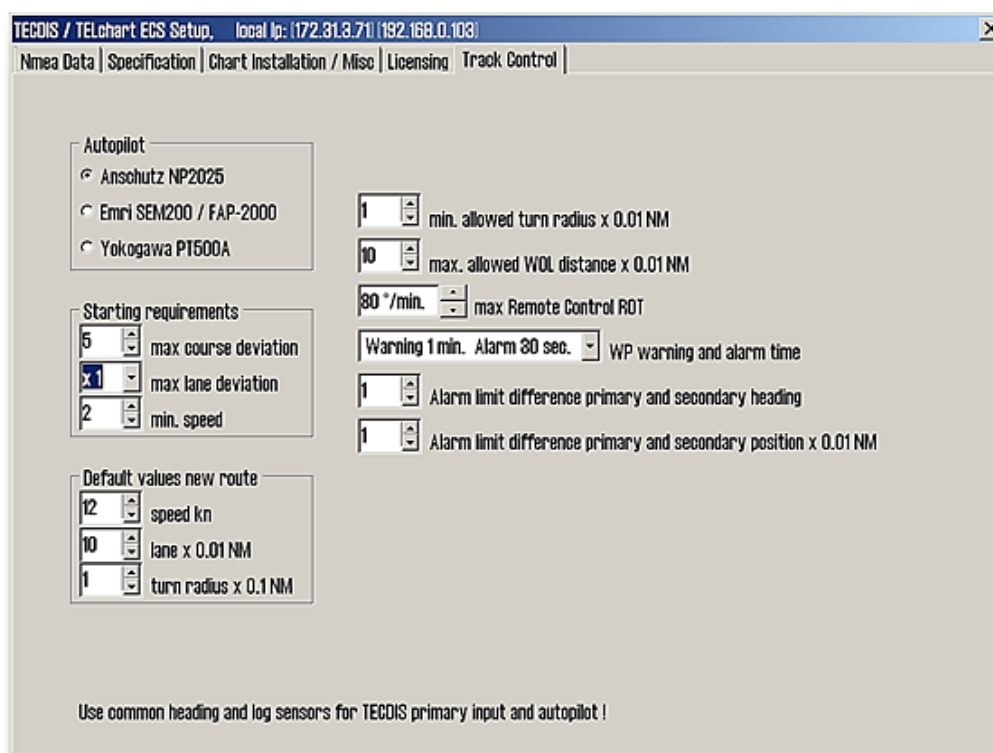
In *Payment Mode*, all requested ENC charts are licensed, disregarding the distance limit. A clear warning is displayed on screen, indicating that payment mode is active. A route check can now be performed and all dangers / cautions from the ENC charts will be displayed. The route can also be adjusted manually using ENC charts.

Once the voyage plan check is complete, *Payment Mode* is deactivated either by pressing the “*Payment*” button again, or by removing the **TECDIS Service Key**.



³ By default, all ENC charts requested within 5 nautical miles of the vessel are automatically licensed.

7.7 Track Control



On this tab, settings for connection to autopilots and *Track Control* can be set.



Refer to OEM Installation Manual for installation and configuration of the autopilot. NB: The autopilot and TECDIS must be supplied with the same heading and log sensor inputs!

7.7.1 Starting Requirements

The values in this area specify the conditions needed before Track Control mode can be activated.

- Max course deviation** The maximum number of degrees the course over ground (COG) of the vessel can differ from the planned course.
- Max lane deviation** The maximum distance of the vessel position from the planned route leg, expressed as a multiplier of the planned route leg lane width. (For example, if the lane setting for the initial planned route leg is 100m, and 'max lane deviation' is set to x2, the vessel position can be up to 200m from the planned route leg when Track Control is activated.)
- Min. speed** The minimum speed of the vessel in knots.

7.7.2 Default values new route

The values in this area will be used as the default values for the parameters specified when planning a new route.

- Speed kn** The default planned speed in knots for new route legs.
- Lane x 0.01 NM** The default planned lane width for new route legs, expressed as hundredths of a nautical mile. (For example, if the value specified here is 10, the default lane width would be 0.1 NM.)
- Turn radius x 0.1 NM** The default planned turn radius for new route legs, expressed as tenths of a nautical mile. (For example, if the value specified here is 5, the default turn radius would be 0.5 NM.)

7.7.3 Other settings

Autopilot: In this field the type of autopilot should be selected. Only the type approved autopilots according to the certificate, should be installed and configured to work with the TECDIS. The selection made in this field is transferred to the “NMEA”-folder, where further configurations should be made.

Min. allowed turn radius x 0.01 NM

This setting specifies the minimum turn radius allowed, expressed as hundredths of a nautical mile. This value should be determined during vessel sea trials.

Max. allowed WOL distance x 0.01 NM

This setting specifies the maximum value allowed for operator selected Wheelover Line (WOL) distance, expressed as hundredths of a nautical mile.

Max Remote Control ROT

This setting specifies the maximum rate of turn (ROT) value allowed in the autopilot remote control panel in TECDIS, expressed as degrees per minute.

WP warning and alarm time

This setting controls how long before a waypoint warnings and alarms are generated.

Alarm limit difference primary and secondary heading

This setting controls the number of degrees the primary and secondary heading sensor values can differ before an alarm is generated. If the two heading sensors differ by more than this value, an alarm is generated in TECDIS.

Alarm limit difference primary and secondary position x 0.01 NM

This setting controls the distance allowed between the two position sensors before an alarm is generated, expressed in hundredths of a nautical mile. If the distance between the positions reported by the two position sensors is larger than this value, an alarm is generated in TECDIS.

7.8 Route Synchronization

TECDIS provides two alternative ways of transferring routes between the primary and secondary **TECDIS** units. Both solutions allow the operator to retrieve the planned route for the current voyage on the secondary **TECDIS** unit if the primary unit fails.

For this function to work correctly, the following must be observed:

1. The Setup field “Data export IP” must contain the correct address to the other **TECDIS** unit. (See section 3.3 Specification).
2. The **TECDIS** units must be connected using the specified LAN adapter ports.
3. The LAN adapter port used for connection between the **TECDIS** units should not be reconfigured to use an IP address outside the subnet (172.31.3).
4. (Replication) The **TECDIS** units must use unique license dongles (**Telko eToken ID numbers** must be different).

NOTE: The automatic method is activated by default in all **TECDIS** units produced after 1.November 2008

7.8.1 Basic Method

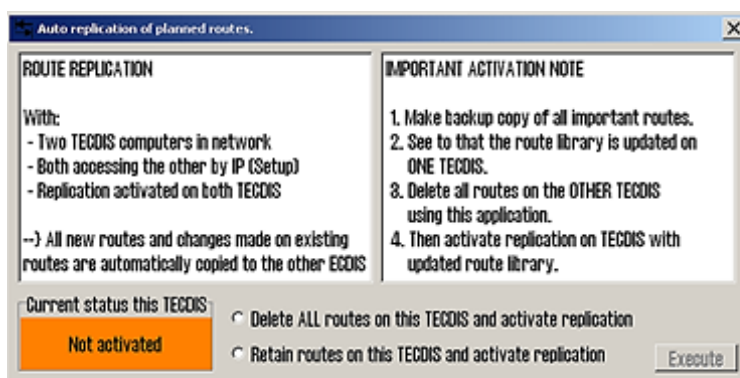
When the basic route synchronization method is in use and a route is activated on either of the **TECDIS** units, a backup copy of the route is transferred to the other **TECDIS**. This backup is not automatically included in the route list on the receiving **TECDIS** unit, but it can be imported when needed.

The route is available for import from the following files in the *Data* subdirectory of the *TECIDS* directory (*C:\Program Files\TECDIS\Data*):

Primary Route	ReceivedPrimaryRoute.lst
Secondary Route	ReceivedSecondaryRoute.lst

7.8.2 Automatic Method (Replication)

When *Replication* is activated, all new routes entered, changes to existing routes and removal of routes is automatically reflected at the other **TECDIS** unit. In effect, the two **TECDIS** units will contain identical route databases.



Activating Replication

Follow these steps to activate Replication:

1. Verify that the requirements for this feature listed above are met.
2. If routes are present on the **TECDIS** units, select one unit where all routes will be kept and one **TECDIS** unit where all routes will be removed.
3. On both **TECDIS** units, insert the Service Key and exit to Windows.
4. On both **TECDIS** units, run *C:\Program Files\TECDIS\Replication.exe*.
5. On the **TECDIS** unit where all routes should be kept, select “**Retain routes on this TECDIS and activate replication**” and press *Execute*.
6. On the **TECDIS** unit where all routes should be removed, select “**Delete ALL routes on this TECDIS and activate replication**” and press *Execute*.
7. On both **TECDIS** units, remove the service dongle and reboot the system.

After both **TECDIS** units are again operational, all routes from the unit where routes were kept will be automatically transmitted to the other **TECDIS**. All further route changes are automatically reflected on the other **TECDIS**.

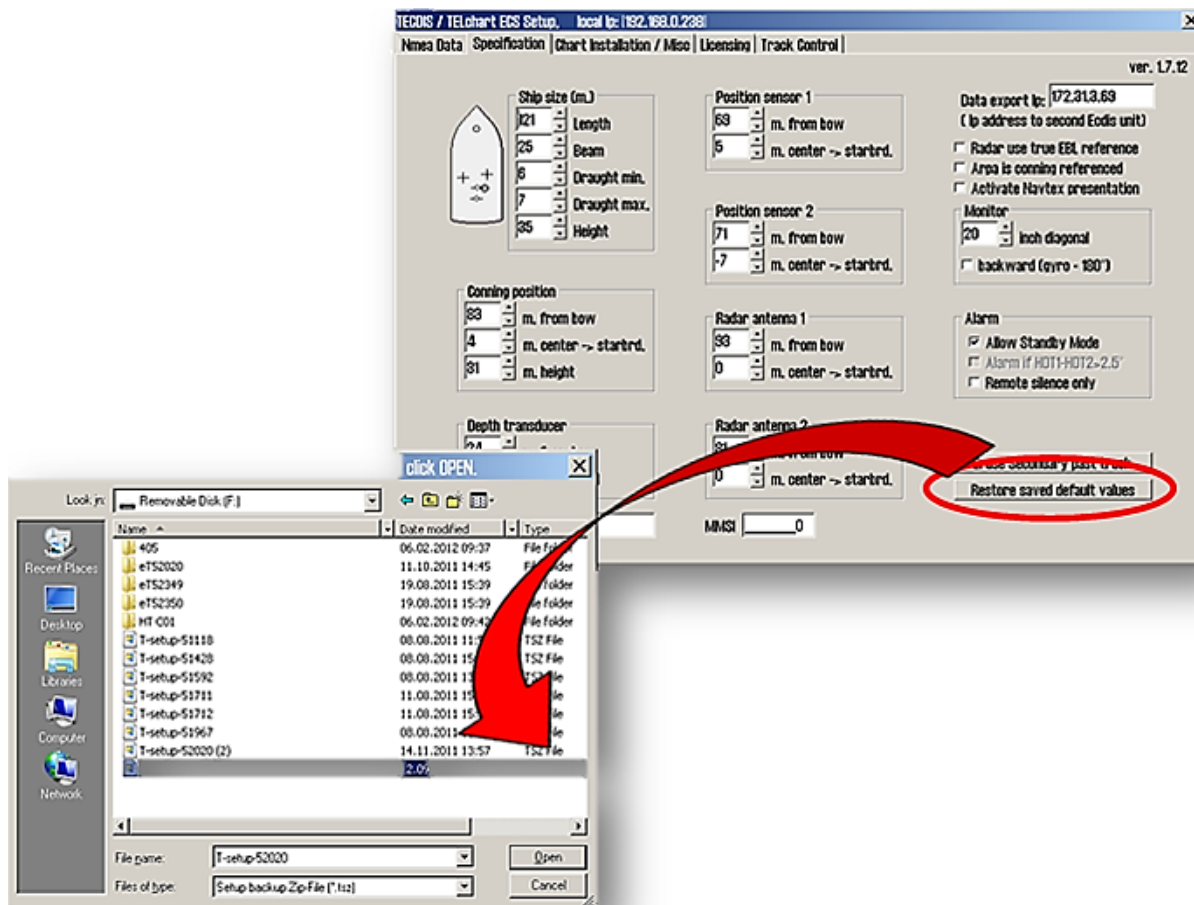
Deactivating Replication

If the replication feature needs to be deactivated, follow these steps:

1. On both **TECDIS** units, insert the Service Key and exit to Windows.
2. On both **TECDIS** units, *delete* the file *C:\Program Files\TECDIS\SetRtReplicateActive.txt*.
3. On both **TECDIS** units, remove the service dongle and reboot the system.

7.9 Substitution of computer

Before you start removing the old computer, insert the "Service Key" into an available USB port and **TECDIS Setup** must be started and stopped again. This is to load "T-setup-xxxxx.tsz" file in to the **Service Key**, with the settings that currently applies. This layout can then be imported to the new machine using **TECDIS Setup** and "Restore saved default values" feature. This minimizes the risk of error when changing computer.



Chapter 8 Other

8.1 Error Messages

TECDIS have automatic error checking in most routines. Where possible the correction is made by **TECDIS** program without operator intervention. For critical errors the operator is notified. In addition to possible error situations listed here, both Windows and the Procedures have an unknown number of possible error messages. Common to all of these error conditions is that, if possible, the error is corrected with a system reboot. In case of system failure error messages should be noted. If the program stops or behave wrong, try to restarting the machine. If the default is still present, contact your system administrator or the support manager.

Error	Cause
10=Init required too much space	The unit memory is full or errors, restart the unit.
11=Bad init parameters	System error, should not normally occur.
12=Data files not found	The old file is deleted or corrupted. New (empty) data file is created automatically.
13=Open db cannot determine type of file	Installation errors, use of invalid data.
14=Data files appear to be corrupted	Try to restart the unit.
16=Could not create index file	Hard drive error or full, or delete old data.
17=Could not create data file	Hard drive error or full, or delete old data.
18=Tried to create existing index file	System error, should not normally occur.
19=Tried to create existing data file	System error, should not normally occur.
24=Could not close file	System error, probably memory errors.
46=File number already in use	System error, should not normally occur.
47=c-tree has not been initialized	System error, should not normally occur.
101=C-MAP system files not installed	Incorrect or missing installation
102=No C-MAP charts installed!	Incorrect or missing installation
103=No chart database set as default!	Incorrect or missing installation
104=g_manager->Init() failed	System error, should normally not occur
105=g_map->Init() failed	System error, should normally not occur
106=g_mini->Init() failed	System error, should normally not occur
107=Update successfully completed	Confirmed update
108=g_map->SetZoom() failed	System error, should normally not occur
109=g_map->SetScale() failed	System error, should normally not occur
110=g_mini->SetScale() failed	System error, should normally not occur
111=g_map->SetRotation() failed	System error, should normally not occur
112=g_mini->SetRotation() failed	System error, should normally not occur
113=g_map->AddBase() failed	System error, should normally not occur
177=Not TECDIS dongle	Code key found but not approved
188=Error in periodic ID check	Code Key not found or recognized
189=File read failed	Error code key
190=Read of file length failed	Error code key
191=File number out of bounds	Error code key
192=CMap init error	Code Key is not C-MAP approved
193=Init has not been called	Error in communication with key code
194=Error parsing system ID	Error in communication with key code
195=CMap registry error	Error in communication with key code
196=Dongle is not Telko dongle	Code Key not accepted
197=No eToken dongle present	Can not find TELKO eT ("code plug")
198=CMap init error	Error code key
199=Init has not been called	Error in communication with key code
200=Unknown error	NB! The errors related to code key, try to take the key out and in or transfer it to another USB port and try restart the program.

8.2 Past Revisions

Revision 2.2 (06/07/2012)

- First **TECDIS Edition** ver. 4.7.2.15

Revision 2.3 (11/27/2012)

- Several minor errors and omissions, corrected through the whole manual.
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