TECDIS

Operators Manual

A fully type approved Electronic Chart and Display Information System (ECDIS), certified by DnV.

Software edition: 4.7.1
Manual edition: 2.0

Disclaimer

Notice, warning and disclaimer

NOTICE, WARNING AND DISCLAIMER

THE TECDIS SYSTEM AND ASSOCIATED NAVIGATION PRODUCTS INCLUDING THE ELECTRONIC CHARTDISPLAY AND AUTOMATIC NAVIGATION AND TRACK KEEPING SYSTEM ARE AIDS TO SAFE MARINE NAVIGATION.

ALL SUCH NAVIGATION AIDS ARE SUBJECT TO CERTAIN INACCURACIES AND DISCREPANCIES THAT, IF UNCONSIDERED, MAY RESULT IN A MARINE ACCIDENT OR INCIDENT, AND CONSEQUENT LOSS OF LIFE, VESSEL, CARGO AND ENVIRONMENTAL DAMAGE.

ACCORDINGLY, THE MARINER WILL NOT RELY ON A SOLE NAVIGATION AID (INCLUDING THE TECDIS SYSTEM) FOR THE SAFE NAVIGATION OF THE VESSEL.

THE PRUDENT MARINER WILL OBTAIN NAVIGATION INFORMATION FROM ADDITIONAL SOURCES, CROSS-CHECKING ALL INFORMATION FOR ANY INACCURACIES OR DISCREPANCIES WHILE DETERMINING THE VESSEL'S POSITION, COURSE, SPEED AND INTENDED TRACK.

Standards Compliance

TECDIS conforms to the following standard(s) 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 overview of software versions, standards compliance and instructions for updating TECDIS software to comply with new standards and regulations, refer to the following web site:

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

Chapter 1: General Information

1.1. Introduction

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

TECDIS is designed and developed according to IMO specifications, weighting easy and user-friendly operation. High performance and a wide range of features are maintained at the same time. The system is connected to the ships navigation sensors, which provide information as: Position, course, heading, speed, wind, depth, AIS, radar. (ARPA, EBL, ROT) Own ship and other ships position are shown in real-time on the chart display, which is officially approved. (ENC) Danger query and Validation check provides that the displayed voyage plans are safe.
The voyage is monitored, by controlling position according to plan, antigrounding and anti collision.

1.2. Charts

TECDIS uses simultaneously seamless chart material from various vector chart databases. C-Map CM93/3 Professional (World) charts are usually used as base, as it provides global coverage in all scales. Officially approved charts (ENC) are compulsory for ECDIS when not using paper charts. ENC charts are loaded into the system directly as decrypted C-Map SENC or as S57 standard format and must be generated onboard.

Using ECDIS as a substitute for paper charts following conditions must be fulfilled.

1. *The system must display official ENC (Electronic Nautical Chart), published by an approved national hydrographic office. (Norway: Primar)*
2. *Charts must be updated according to SOLAS.*

TECDIS displays automatically best available chart. ENC (SENC) is priority and is displayed where available; otherwise charts from C-Map CM93/3 Professional (World) are used.

1.2.1. Chart databases and Simplified ENC distribution

It must be noted that when ENCs are distributed they are not used directly in the ECDIS system. ENC files are compiled into a seamless database known as the SENC, System Electronic Navigational Chart, which incorporates all the required ENC's and is 'ready for use' on-board.

All charts used by TECDIS are saved in C-Map SENC (System Electronic Navigational Chart) format. Charts can either be received in this format from the chart supplier or it will be generated onboard.

The SENC can be generated onshore in a controlled environment, or offshore in the ECDIS. It is preferable that this process takes place onshore as the S-57 data format specifications can be interpreted differently and therefore there is a risk of using non-compliant data. This data should not be accepted into the ECDIS, as it could cause malfunctions, incorrect information or, in the extreme case, cause the ECDIS to crash. Therefore it is better if all ENCs are compiled into the SENC in a controlled office environment.

A further advantage of SENC distribution is that the navigator on-board does not have to spend considerable time and patience required to convert the ENC's to the SENC, a process that requires the ENC to be 100% compliant.

The distribution of ENC in SENC format has been approved during the Athens CHRIS meeting in April 2002. Many HO's admit that it simplifies access to official digital cartography, and this does not have any effect on IMO performance

C-MAP deliver official ENC data in SENC format in accordance with the IHO amendment to paragraph 3.3 of S-52 and a new Technical Resolution A3.11 adopted at IHO's 16th International Hydrographic Conference. The C-MAP CM-93/3 SENC distribution system was also successfully type approved by Det Norske Veritas (DNV) in March 2003, as required by the IHO. The distribution system is supported with a Real Time Updating infrastructure, which allows users to access chart corrections directly online.

The ENC data from countries that have not yet approved SENC distribution is available in S-63 format.

1.3. Position/Chart datum

The chart datum is the mathematical model used by a chart maker to map the earth’s surface. In the TECDIS system, the Mercator grid is always displayed using the datum known as World Geodetic System 1984 (WGS-84). This is considered to be the latest and most accurate datum available. The electronic charts and all chart objects are also displayed using the WGS-84 datum. Datum conversion can be done by using ”Maritime calculations” (Chapter 5.6)

All position inputs to TECDIS must be in WGS-84 format.

Chapter 2: Overview

2.1. Tooltip

If you are not familiar with TECDIS, the tooltip function can be useful. Moving the mouse marker over the buttons on the menu bars, will make a brief description in a yellow frame to appear.

2.1.1. Activate or deactivate tooltip.

Press button for menu folders on the top menu bar.
Menu folders will appear on your right hand side on the display.
Press ”Setup”. Tick on or off “Show Tooltip” (at the bottom)

2.2. Language

Language can be set in setup menu folder. Available languages can be selected from the drop down folder.

2.3. Operation

All features/functions expect text input can be done with a trackball/mouse which controls a screen marker. Functions/features can be activated/deactivated, charts zoomed in/out and off centered. Various functions can be operated by mouse or keyboard as it suits user.

2.3.1. Keyboard operation

Keyboard can be used for system operation. For text input and own object info, keyboard is needed.

F1: Info about keyboard functions.
F2: Chart query at cursor
F3: Geographical name database. (Option)
F4: Chart Legend

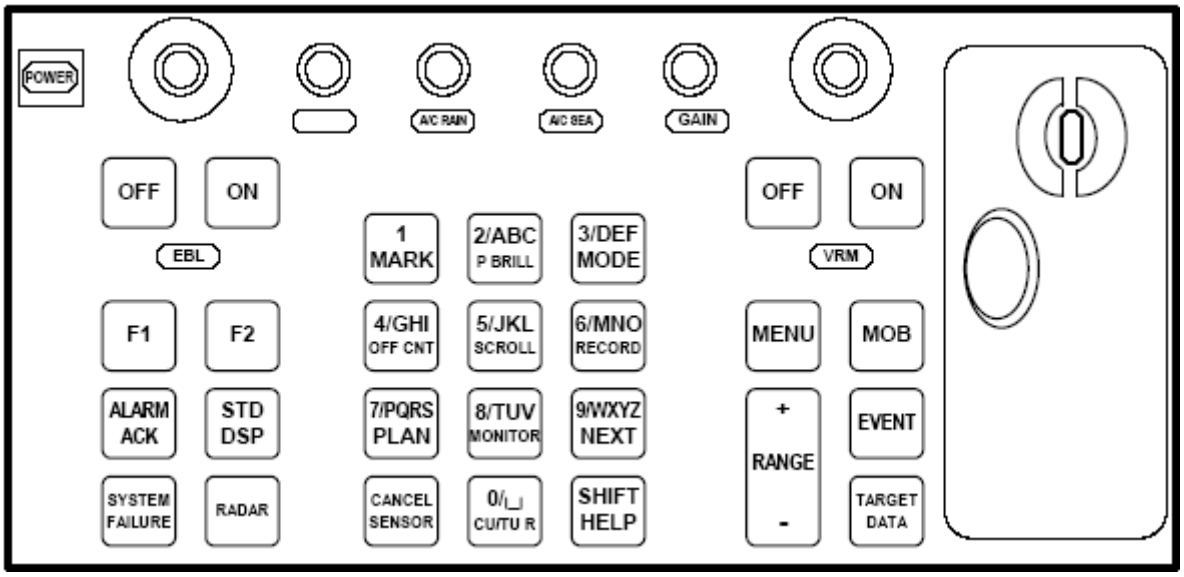
F5: Menu folders
F6: Route planning
F7: Symbol bar, ready to insert new symbol.
F8: Symbol bar, ready to insert new line/area.

F9: Timestamp on track
F10: Man over board (MOB)
F11: Mark own ship position (last color selected)
F12: Mark event (last color selected)

1. Brightness settings
2. Display orientation.
3. STD S52 AUTO presentation
4. USER presentation
5. Conning display
6. Weather display (option)
7. Radar overlay (option)
8. Bearing
9. Arpa
0. AIS

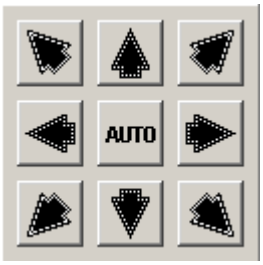
W-A-B-C-D-E-F-G: Chart levels
S: simulated position and dead reckoning when nav. data is missing.
Arrow keys: Set chart center (move chart)
Page Up: Zoom out in fixed chart level
Page Down: Zoom in fixed chart level
- : Zoom out auto level
+ : Zoom in auto level
Home: Auto activated, vessel displayed on chart in best scale.
Ins: Cursor and chart to inserted position.
Del: S52 chart pres. + auto pos.
Enter: work as left mouse button in cursor pos.
/ or <: Darker screen colors
*** or >:** Brighter screen colors
Esc / spacebar: Reset Alarm
Ctrl+PrtScr: Save present display on disk.
Shift + control + alt + T: Screen calibration test

2.3.2. RCU-018 Control unit operation



If a Furuno RCU-018 control unit is connected, this can be used for operation of the system. The trackball may be used for cursor control and general operations (Note: double clicking and dragging is not implemented). Additionally, the trackball scroll wheel may be used to modify value fields with up/down buttons, as well as speed, lane, radius and stop time in the route planner. RCU-018 buttons perform the following functions:

Key	Description
Power	Turns the system on/off. (This control does not switch the display on/off.)
VRM rotary encoder	Adjusts active VRM.
VRM ON	Activates and displays VRM1 if none is displayed or VRM2 is active. Activates and displays VRM2 if VRM1 is active.
VRM OFF	Inactivates and erases VRM1 if both VRMs are displayed. Inactivates and erases VRM2 if VRM1 is active.
EBL rotary encoder	Adjusts active EBL.
EBL ON	Activates and displays EBL1 if none is displayed or EBL2 is active. Activates and displays EBL2 if EBL1 is active.
EBL OFF	Inactivates and erases EBL1 if both EBLs are displayed. Inactivates and erases EBL2 if EBL1 is active.
F1	Activates user-defined function or menu. (See 3.2.16)
F2	Activates user-defined function or menu. (See 3.2.16)
ALARM ACK	Alarm acknowledgment for alarms generated by TECDIS.
SYSTEM FAILURE	The red lamp behind the key lights and the buzzer sounds when system failure is found. Hit the ALARM ACK key to silence the buzzer. The key remains lit until the reason for the problem is removed.
RADAR	Displays Radar Overlay and Radar Overlay dialog box, which provides functions for adjustment of the radar picture color and

	transparency.
STD DSP	Activates standard display presentation on TECDIS.
1/MARK	Displays the Nav. Marks menu buttons, which provides maintenance of various markers.
2/ABC/P BRILL	Toggles day-dusk-night display mode.
3/DEF/MODE	Choose presentation mode: NU, HU, CU, Radar
4/GHI/OFF CNT	Off center last selected VRM/EBL. If none off centers chart.
5/JKL/SCROLL	 Show Scroll Chart box, select direction with one of the neighboring number keys or by selecting with mouse. If pressed while scroll chart box is visible, activates auto mode.
6/MNO/ RECORD	Saves time stamp record on track.
7/PQRS/PLAN	Opens Route planning menu buttons.
8/TUV/ MONITOR	Show/hide docking conning display.
9/WXYZ/NEXT	“Enter” keyboard button, emulate left mouse button at cursor position.
CANCEL/ SENSOR	Open sensors dialog box; Closes open dialog box or window.
0/space CU/TU R	Return chart display to own ship position and activate auto mode.
SHIFT / HELP	SHIFT: Shifts between lower case and upper case alphabets. HELP: Displays information for object of interest at cursor position.
MENU	Displays the main menu.
+ RANGE -	Adjusts chart scale.
MOB	Inscribes MOB mark on the screen at own ship position.
EVENT	Records event mark at own ship position
TARGET DATA	Shows target data for selected ARPA or AIS target.
GAIN	Adjusts radar overlay transparency
A/C RAIN	
A/C SEA	

2.3.3. Set chart center, zoom in/out

Place the mouse marker at desired chart center and press middle mouse button. New center will be the position where middle button was pressed. Use left button to zoom in and right

button to zoom out. When the cursor is moved to the edges of the map, it changes to an arrow. Every click will then move the charts.

2.3.4. Menus and commands

TECDIS operation and menu presentation complies with standard windows applications.

Activate functions and commands: use left mouse button or use keyboard. This will activate the function directly (change scale or zooming); whilst other buttons on the menus will open a under menu or a pop up window. Functions can be deactivated by pressing the same button as used for activation.

Grey colored function / button: Function not available or active.

Check boxes: in some of the menus functions are activated/deactivated by adding or removing the tick in the check boxes.

When opening a under menu bar on the left hand side on the chart display area press OK to end last used function/command. For instance if a route has been edited, OK has to be pressed to end the edit function. To close the under menu bar press OK or press the main function button on the top menu bar. The route menu bar will automatically hide after one minute, if not used.

2.3.5. Drop down menus

Drop down menus are opened by pressing the arrow on the right side of the window, where values desired changed.

In drop down menus where a date is to be changed, automatically a calendar appears, as illustrated over.

Press year and adjust with appearing arrows.

Change of month is done by pressing the two arrows in the blue top header, or by pressing on the text. A list will then appear and changes can be done directly.

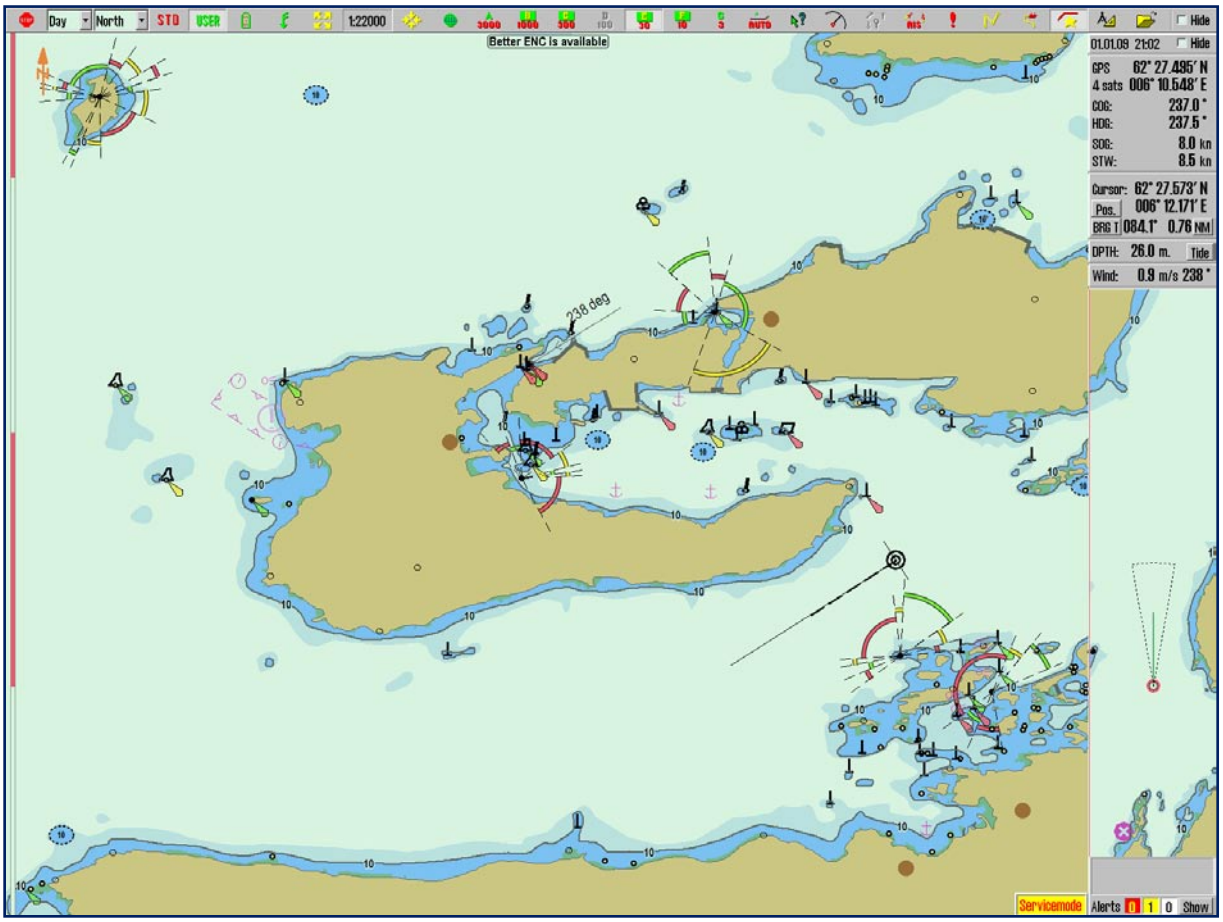
By pressing the bottom line, today's date is selected.

2.3.6. Pop up windows

All windows which is opened in the chart display area are moveable.. Place the marker in the header field, keep the left mouse button down, dragging the window to desired location.

Windows with TECDIS icon ahead of header are also resizable, pulling the edges using marker placed on.

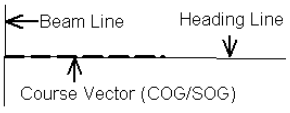
2.4. Display



TECDIS display has three main areas:

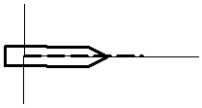
1. The **Vertical Menu** (right side).
2. The **Horizontal Menu Bar** (top).
3. The **Chart display area** covers most of the display. Charts, symbols, routes, past track, etc is displayed here.

The **Vessel Position** is indicated graphically in the chart according to the settings made in the *"Ship"* menu (See chapter 3.4).

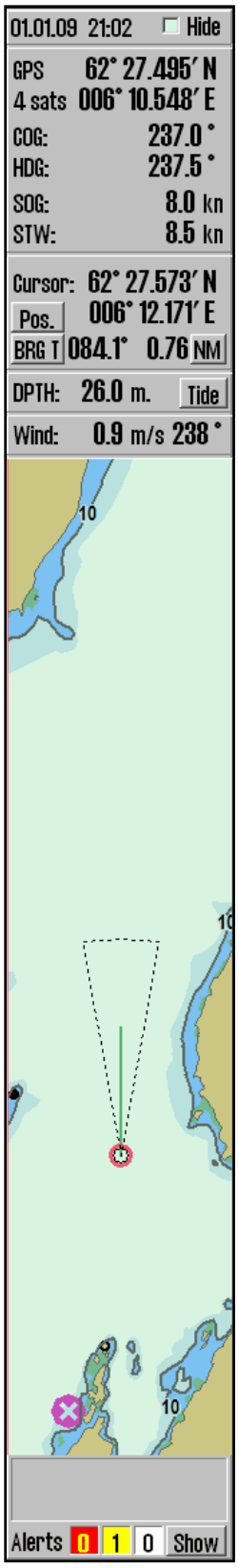


- The heading line indicates the current vessel heading.
- The beam line is perpendicular to the heading line.
- The course vector indicates the current vessel course over ground (COG). The endpoint is where the vessel would be if the present course was followed for a number of minutes as set in the *"Ship"* menu.

- If *"Show double circle"* is selected in the *"Ship"* menu, a double circle centered at the conning position will be shown.
- If *"Show ship outline"* is selected in the *"Ship"* menu, the vessel outline in true scale will be shown.



- If both are selected, the system will automatically switch between the two modes in accordance with chart scale.



2.4.1. Vertical Menu

The vertical menu on the right side of the display includes various fields:

1. Date and time (top line)

2. Navigational sensor data (GPS, gyro, log)

3. Cursor info (position of cursor, bearing and range values from own ship to marker).
   By pressing *"Pos."*, charts can be centered in a specified position.

   By pressing *"BRG T"*, the bearing values can be switched between TRUE ("BRG T") and RELATIVE ("BRG R").

   By pressing anywhere else in this area, the size of the cursor bearing and range values can be increased.

   Units can be changed by between Nm/meters by pressing *"NM"*.

4. Depth, tidal info button (Tide)
   (see chapter 6.3)

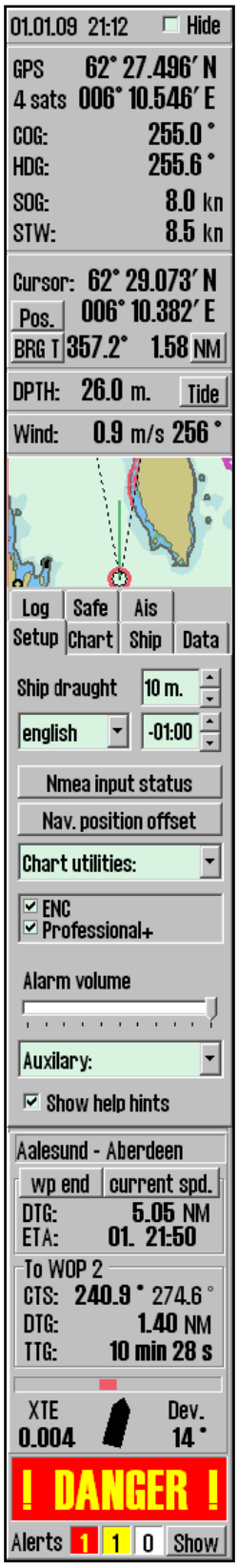
5. True wind.

6. Anti grounding chart display.
   (see chapter 5.5)

7. When pressing tool menu folder button in the top menu bar, menu folders will open up in the lower part of the side menu.
   (see chapter 3.1)

8. When a route is active, information is shown in a separate field.

9. Alarm field (see chapter 5.4)



2.4.2. Top menu bar

At the top of the screen, the top menu bar provides quick access to system functions, which must be available for immediate action.

This section contains a brief description of the various functions. Numbers in parenthesis are chapters where detailed information can be found.

Exit TECDIS

Palette (4.3 and 3.9.1)

Chart orientation (4.4)

S52 standard chart presentation (4.7.1)

User selected chart presentation (4.7.2)

Docking conning display (6.2)

Radar Overlay (4.9)

Weather Overlay (4.10)

Zoom in (4.2)

Chart scale (4.2)

Zoom out (4.2)

Auto chart reposition (4.6)

Chart query/info (6.1)

Bearing EBL / VRM (5.1)

Show ARPA targets (6.4)

Show AIS targets (6.5)

M.O.B symbol in vessels pos(4.8.4)

Route planning/toolbar (5.2)

Track dialog/Past track (5.5)

Symbols, mariners objects (4.8)

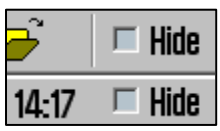
Maritime calculations / L.O.P. (5.6)

Open menu folders (3)

Chart level/type(4.2)

2.5. Hide top menu bar and/or side menu

On the right side upper corner *"Hide"* can selected on the menu bar and the side menu. The menus will only be visible when mouse marker is moved over respective fields. (To the top or to the right)



Chapter 3: System settings

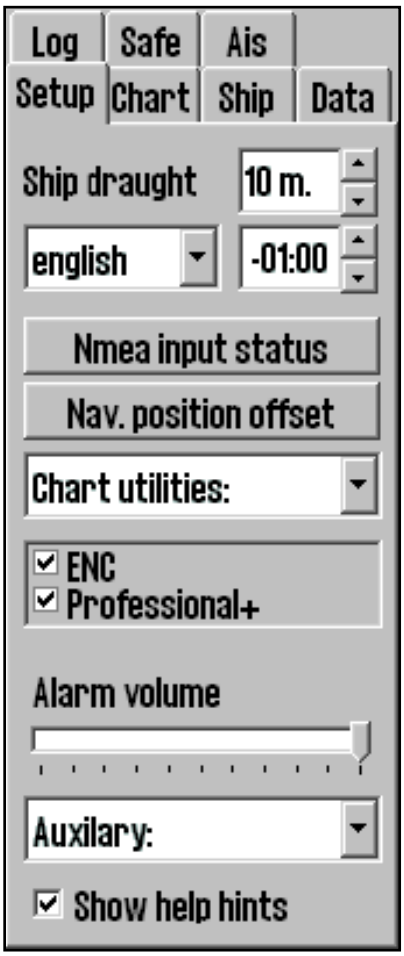
3.1. Menu folders/System settings

3.1.1. Show menu folders

When pressing the menu folder button in the top menu bar, menu folders will open in the lower part of the vertical side menu. There are 7 different menu folders: *"Data"*, *"Log"*, *"Safe"*, *"Setup"*, *"Chart"*, *"Ship"* and *"AIS"*. The menus are separated in a folder system where of the folders is displayed at a time. Select the desired folder by pressing a folder title.

2. Hide menu folders

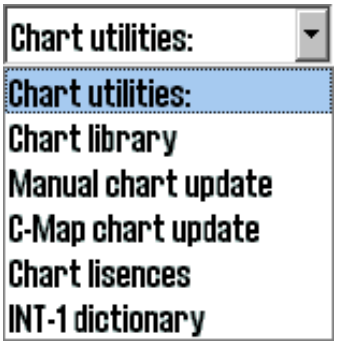
Press the menu folder button again in the top menu bar and the menu folders disappear from the vertical side menu.

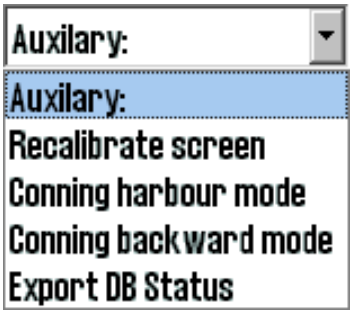


3.2. Setup

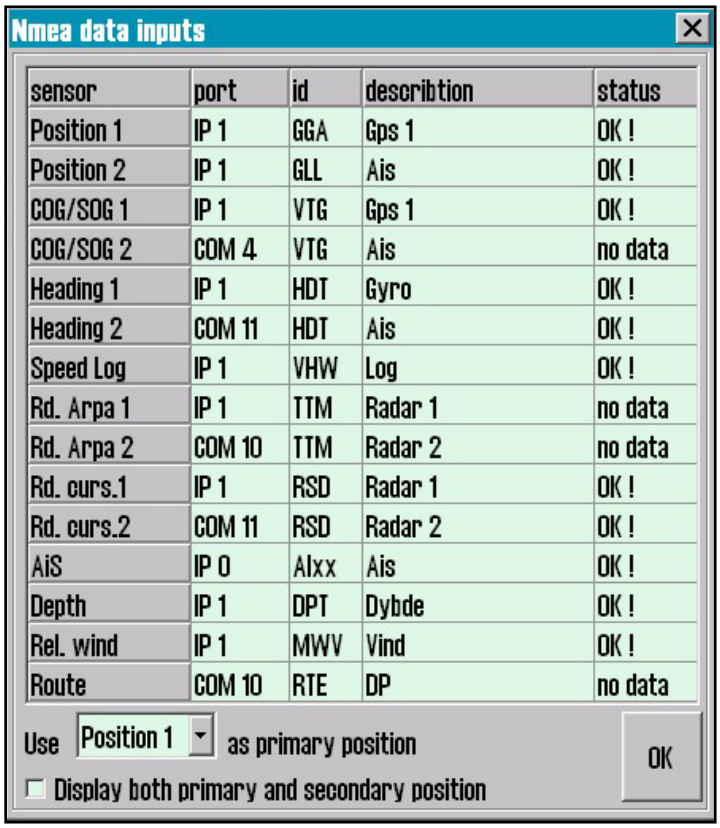
This folders contains.

1. Ship draught
2. Language selection
3. Time zone selection
4. Nmea input status
5. Nav. Position offset
6. Chart utilities
7. Chart library (installed chart databases)
8. Alarm volume (only shown when alarm sound is set to PC speaker or Keyboard in the Setup program)
9. Auxiliary
10. Hide/unhide tool tip.(see chapter 2.1)





Ship draught: minimum and maximum ship draught is defined in the setup program (see chapter 7). When TECDIS starts, the maximum draught is used as default, but this can then be changed in the setup menu folder.

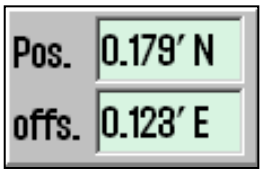


3.2.1. Nmea data inputs:

Displaying a list describing which ports the various sensor information is received from. Also displaying which Nmea sentences used and the data communication status. This is only a information window. Changes have to be made in the separate setup program. (see chapter 7).

Position fixing: Displays 2 sources for positioning. Primary and secondary can be selected. Primary and secondary can be displayed simultaneously on the chart display. If primary position fixing system falls out, the system automatically uses secondary. If both positioning systems drops out, change over to dead reckoning is executed. (Log+Gyro)

3.2.2. Nav. position offset:



This button opens a pop up window in the upper right corner on the chart display area. Certain position sensor devices may have good repeatable accuracy, but can have a fixed error for a given geographic area. It is possible to compensate for this type of error at the TECDIS system entering a position offset. To turn this off, press “Nav. position offset” again.

3.2.3. Dead reckoning mode

If both the secondary and primary positioning systems drops out, dead reckoning mode is activated automatically. Dead reckoning can also be activated by manually entering Lines of Position (LOP, See Chapter 5.6). Input data from log and gyro are used when available, if not data must be entered manually. Use keyboard “S” to set position to chart center.

3.2.4. Chart library

Chart library provides an overview of all chart in a database. Selecting a database from the drop down menu a list with all charts in the database appears, sorted by publisher. Highlight a chart in the list to display further information (middle field). When double clicking on a chart in the list, it will appear if license is present. When vessel is sailing, vessel is automatically centered. (if not auto function is disabled).

NB: Chart library only displays databases selected in setup menu folder.

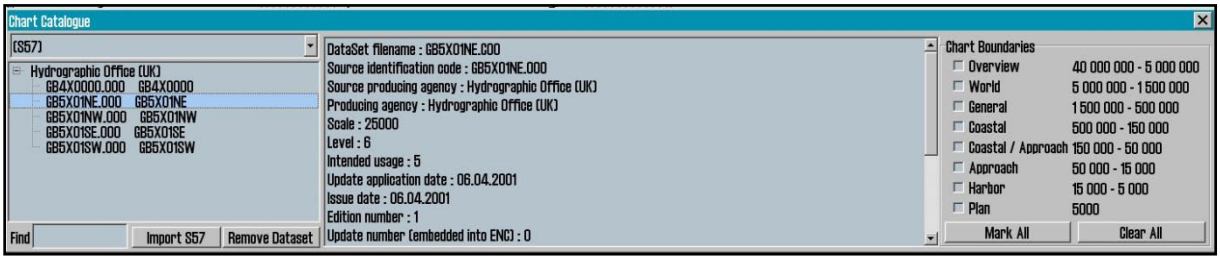
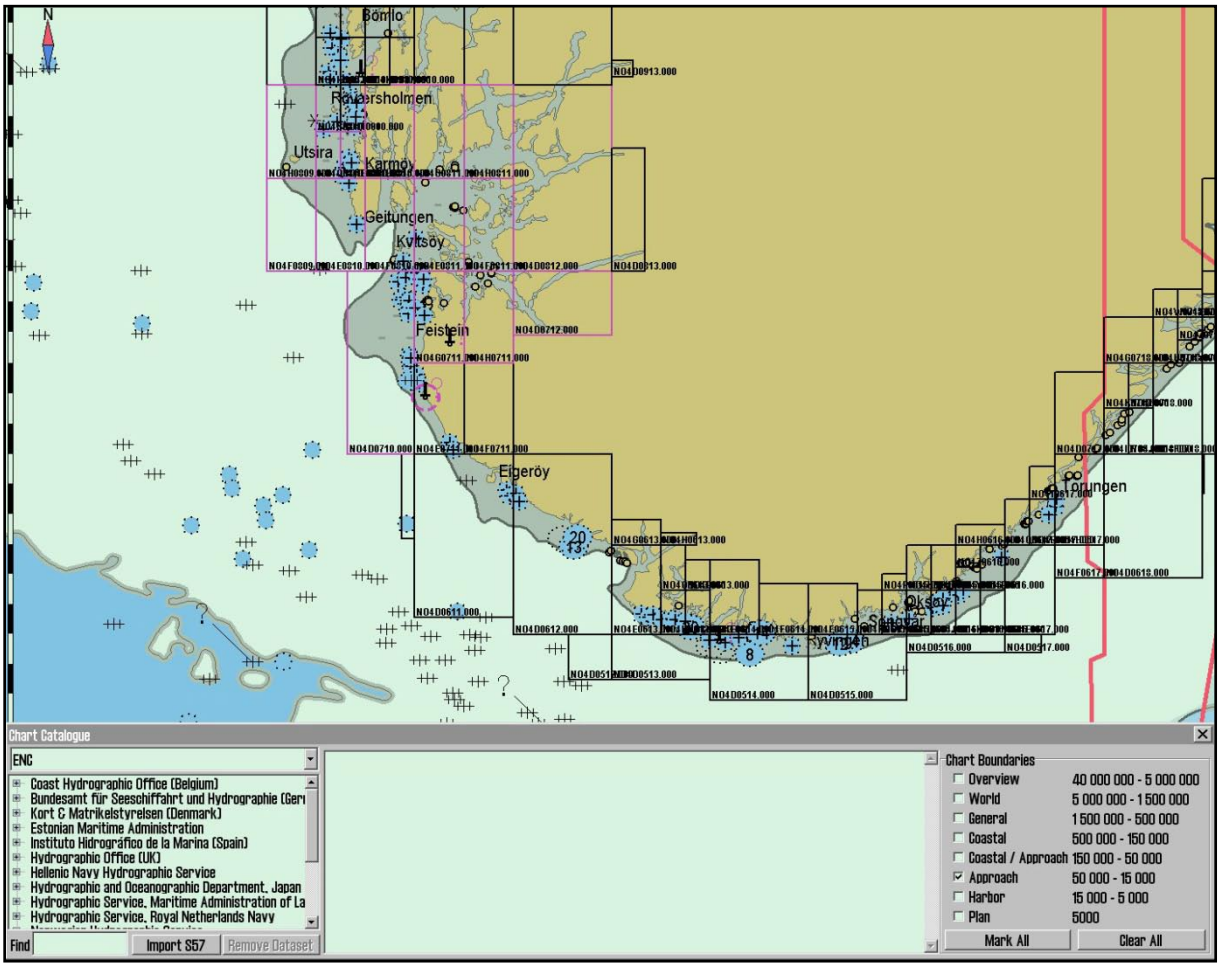


Chart boundaries: graphically presents coverage of all charts in the database at present level. (Levels comply with scale selected on the top menu bar) Licensed charts are displayed with magenta, non licensed charts are marked with black boundary. Chart names are presented in the bottom left hand corner of the square.



Remove dataset: If a database contains imported S57 data is selected in the drop down menu, the button" Remove Dataset" will delete selected chart.

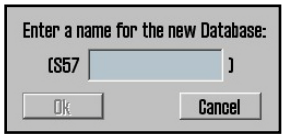
3.2.5. Import of S57 data

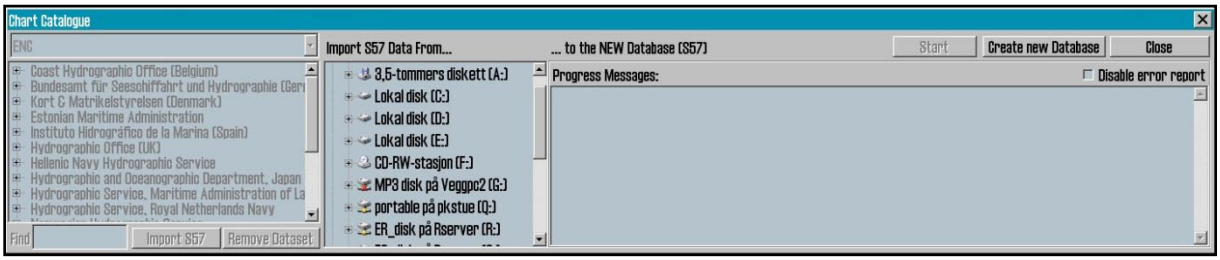
NB: When two ECDIS machines are connected, make sure to make the same updates in the second ECDIS.

Import of S57 data is done trough the chart library. Select database in the drop down menu and press "Import S57".

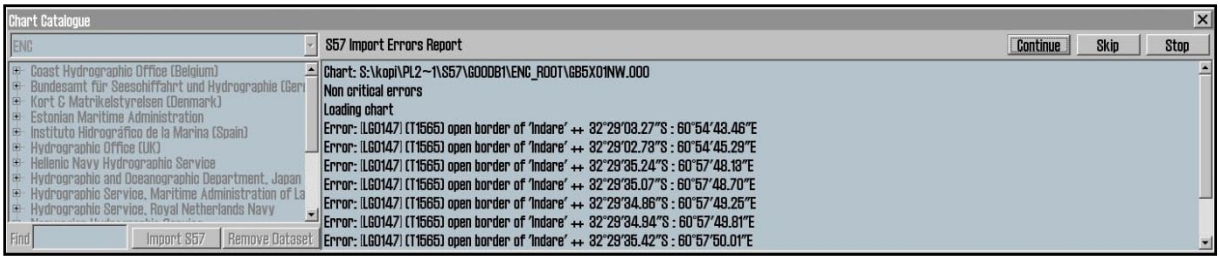
A database contains of datasets (charts). ENC data is sold as ENC cells in S57 format. Trough import to a database every ENC cell is converted to a dataset. This is a two step process: verification of data and conversion/compilation to a dataset.

To import data, select drive in the field "*Import S57 data from…*". Data is imported to a database which name begins with S57. However there are none S57 databases present, a new one (S57) is created. Optional an own database can be created by pressing "create new database". S57 database is added automatically and can be highlighted for viewing in setup menu folder.





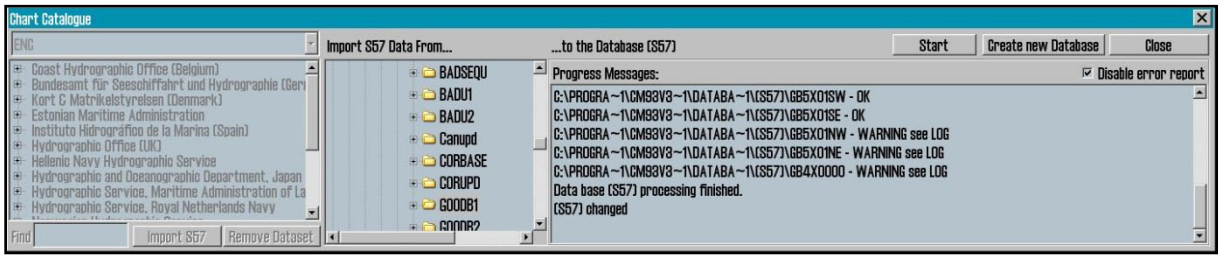
When drive is selected, the "start" button is activated. Press the button to commence import. Data is automatically verified.



If errors are discovered a "**S57 Import ERROR report**" is shown. The error report contains name of import file and whether the error are critical or non-critical. Files including critical errors are not imported. If non-critical errors occurs, files can be imported or excluded by pressing "continue" or skip. If "stop" is pressed the import process is terminated.

Disable error report: If this option is selected prior to data import, the process will run automatically. S57 import files including critical errors will be excluded and files with non-critical errors are imported.

NB: When using "disable error report", it is impossible to view detailed information about the data import. Also errors reasoning ENC cells not to be imported due to critical errors, are not displayed.



A import log will be created. This log can be viewed selecting actual dataset in the chart library, by scrolling down to S57 import log in the information field. If import of chart corrections are done in S57 format, those can be viewed in C-Map chart update (see chapter 3.2.8)

By pressing the right mouse button in the message field, log files with information/history about file verifying and compilation are displayed. This is a overview, not a detailed report/log (not displaying any deleted datasets).

3.2.6. Import of S-63 chart data

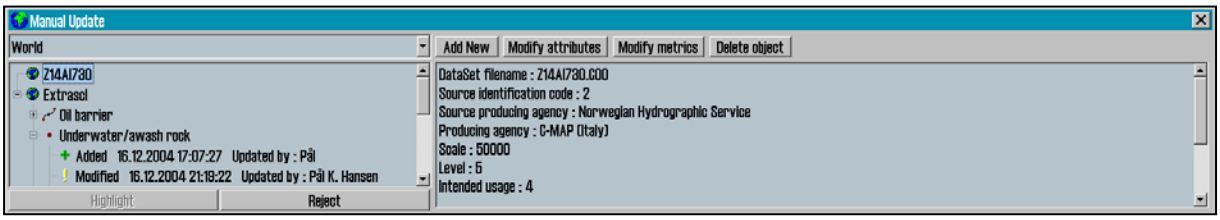
For import of chart data in the S-63 format, refer to "S63 Loader User Guide", available for download from http://www.telko.no.

3.2.7. Manual chart updates

NB: When two ECDIS machines are connected, make sure to make the same manual chart updates in the second ECDIS.

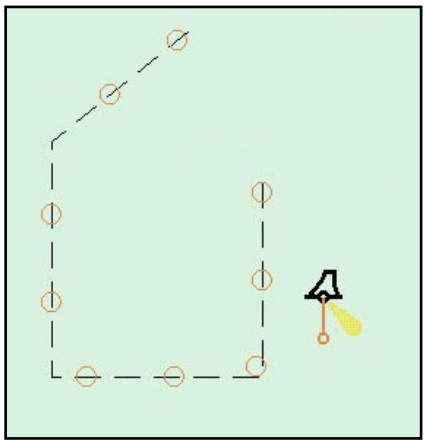
One of the main features of the CM-93/3 Chart Database technology is the automatic updating of electronic charts. TECDIS fully supports this feature but manual updating is still important, as local reports about navigational aid changes may not be included in the Notice to Mariners that are used in updating the Chart database. For example, the SOLAS convention requires that all charts must be updated for the intended voyage. Before planning a new route or prior to updating an existing voyage it is strongly recommended that TECDIS be automatically updated and subsequently that any required manual updates have been added.
.

There are a wide variety of navigational objects listed within the Add New Object function under the menu. Features are sorted in an orderly manner and within each feature, object properties may be chosen. Once the desired object and type is selected, press OK. The object may now be placed onto the screen by clicking the left mouse button. At this time, it may be moved, modified, deleted, cancelled or saved from the Manual Update menu. Once the object has been saved, a graphical presentation of the object will be visible on the screen.



Remove chart corrections: If ”Reject” is pressed the entire update history for a selected object or all objects on the dataset is deleted. This function is only available in service mode.

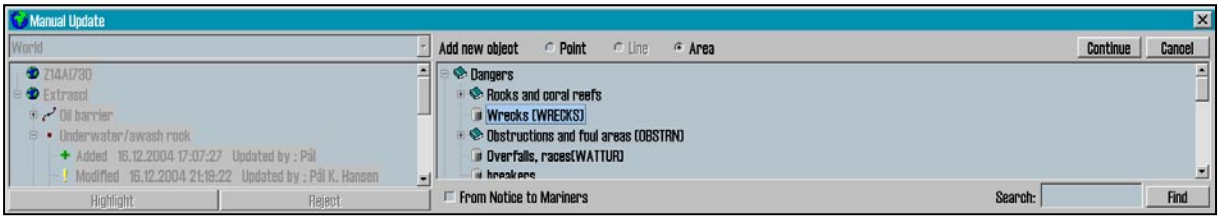
Edit/modify chart corrections: marker the actual object in the left hand list, and press “Modify metrics” (change position) or ”Modify attributes” (edit properties). See under for detailed information on adding new corrections/objects.



Own objects: All manual corrections are displayed in the chart with orange marking (see illustration). When using chart query/info function, manual updates are marked yellow.

New correction / new object:

1. Press ”Add new”. Select type from the list or use search function in the right bottom corner. If the search have multiple hits, those can be scrolled trough, by pressing “find” several times.

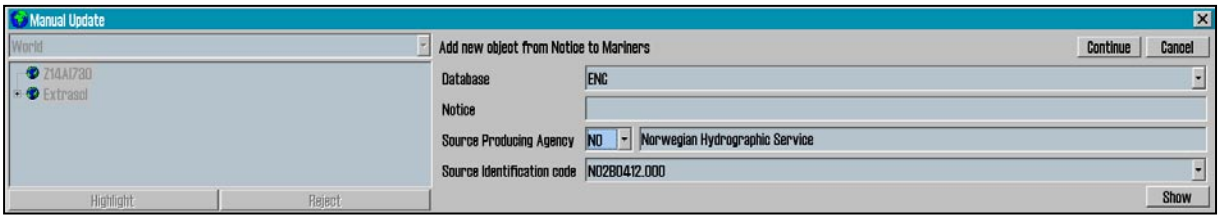


Select if the object is to be drawn as a point, line or area.

From notice to mariners: This means that this new object will only be displayed when this particular chart is on the screen. All corrections are saved under ”extrascl”, if not the correction is locked to a specific chart selecting “from notice to mariners”.

All updates which is not locked to specific chart are displayed, as long as the database is highlighted for viewing in setup menu folder. This despite no charts from the actual database is on the present screen.

Press ”Continue”.

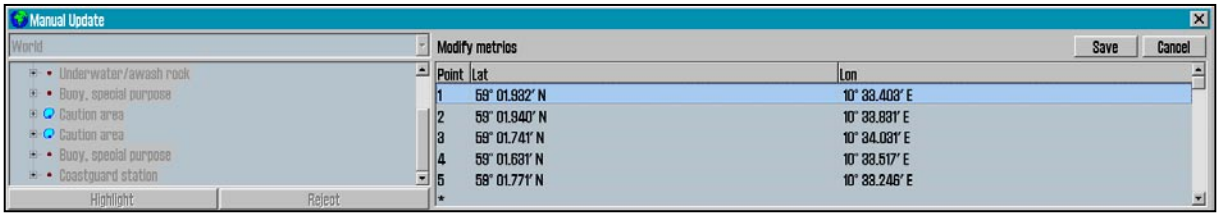


2. New object from Notice to Mariners: Select database, producing agency, and note the new update is to be linked to. Source identification is also to be entered. By pressing the arrow a list will appear. Press a number or a letter on the keyboard to move to desired chart.

Show: Centers selected chart.

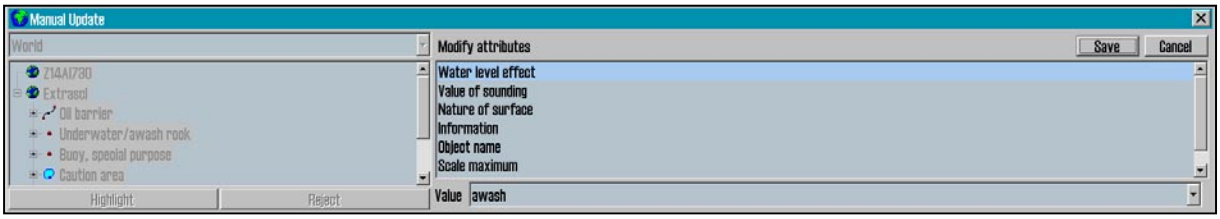
Press ”Continue”.

3. Modify metrics: enter lat/lon for the object, or highlight a row in the list and place it in the chart by pressing left button. Point is entered by one position, lines two and areas 3 or more inputs.

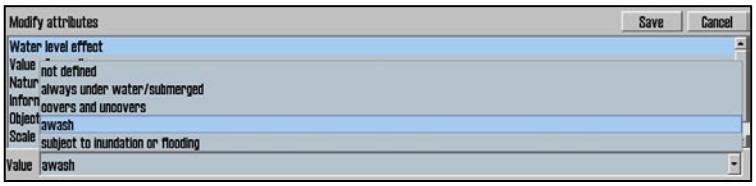


Tab and shift+tab: Move marker between 'Lat' and 'Lon' to insert pos.
Arrow up and down: Move marker up or down, to select positions.
Enter: new pos after the marked pos.
Insert: new pos. before marked pos.
Delete: delete marked pos.

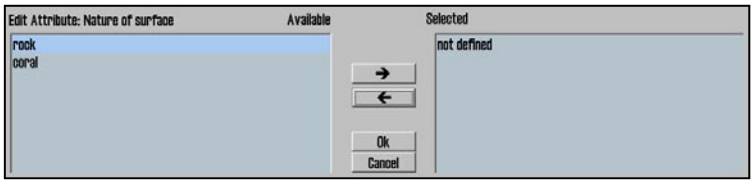
Press "Continue".



4. Modify attribute enter/add info regarding chosen object. Select a item in the list, and enter settings in the value field. Use period as decimal symbol for numeric inputs. Scale maximum and minimum is used to select highest scale (lowest number) and the lowest scale (highest number) for the correction/object to be displayed.



For some objects the chosen attributes is selected from a drop down window.



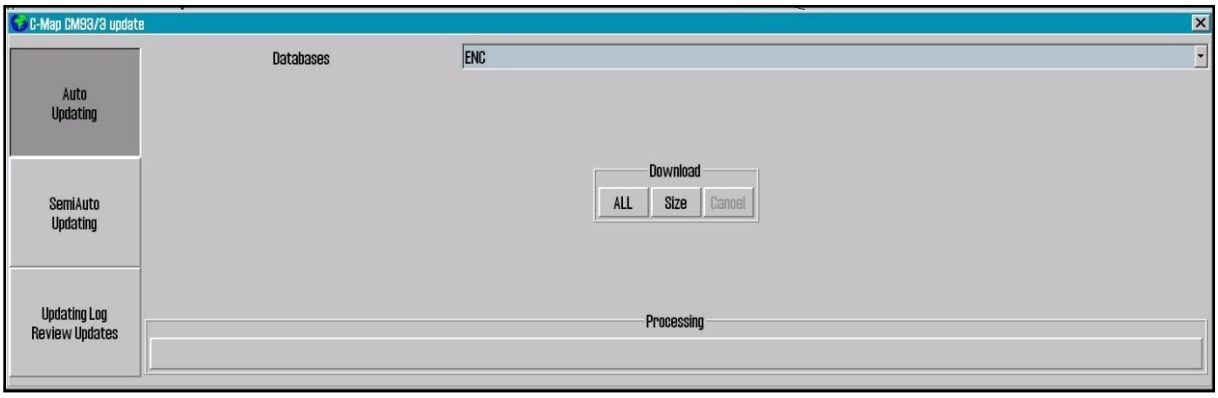
For some objects the value can be one or more, selected from a list.. Press 'Edit' to select among these values.

Press "save".

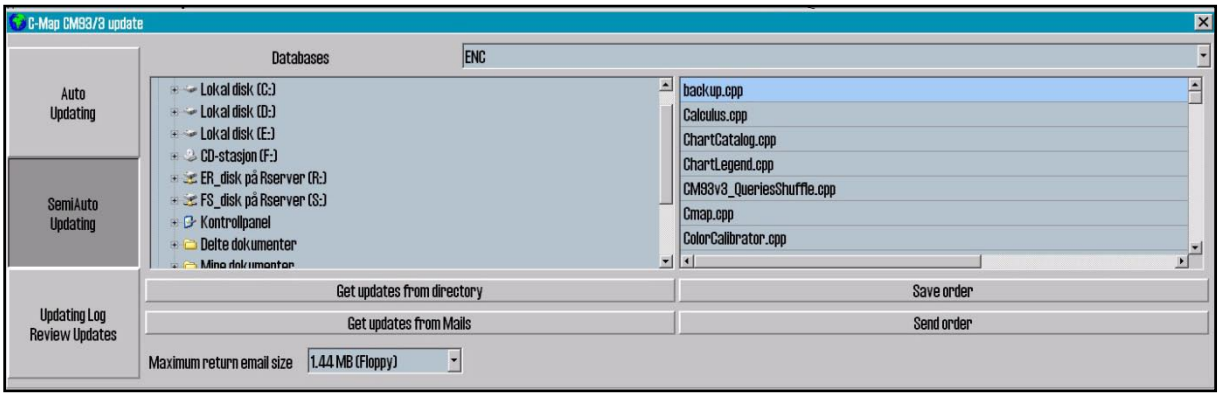
5. Modified by: enter name of person who executed the correction. Select name from the drop down menu or enter new, and press OK to complete the manual chart update.

3.2.8. C-Map chart update

NB: When two ECDIS machines are connected, make sure to make the same chart updates in the second ECDIS.

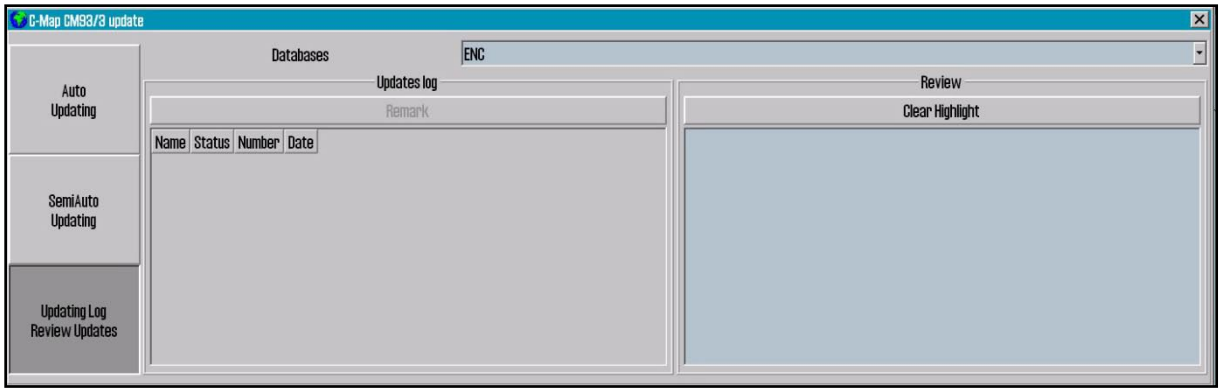


Auto updating makes it possible for all subscribers to download updates from databases from the C-MAP internet server. All updates are registered in a log. File size can be checked prior to download by pressing ”size”.



SemiAuto updating is an alternative to auto updating, where download requests and download are done by e-mail. Select chart database to be updated (e.g. World), where the files are to be saved, and enter maximum file size. The update order must then be sent by email to updates@c-map.no.

This is an automatic service, and C-MAP will answer within 5 minutes. Answering files must be transferred to the chart system. Select where the files are stored and press “get updates from directory”.



Updating log / Review updates: the list on the left side, ”updates log”, displaying a complete list of updates which has been received. Status, number and date for update are displayed. The ’Status’ column will either show ’Accepted’ or ’Rejected’. Rejected updates have been rejected or deleted. If the ’Remark’ button is activated, a note about the updates can be displayed by pressing this.

The right part of the windows displays a branch-presentation of all the updates, sorted by publisher of the update, chart number and NTM number where the correction is issued. Information about the modified objects can be found under each book number. By double clicking an object in the list, the chart will center on the object, and object is marked with a red circle. (Point-objects are marked with a red circle , lines are displayed red, and areas are filled-in red.)

When installing a new CD-ROM / DVD from C-MAP, all previous updates will be deleted.

Manual rejection of updates: choose the update you want to reject by left clicking the update in the “review” section. By right clicking the same update, a small popup menu opens. Choose “reject update”, and close the updates window in order for the changes to take effect.

3.2.9. Chart licenses

A list of all the chart licenses is opened in a pop up window.
Licenses that are valid for more than 14 days are marked with a green background.
Licenses that will expire within 14 days are marked with a yellow background.
Expired licenses are marked with a red background.

3.2.10. INT-1 dictionary

Opens a list of all INT-1 chart object abbreviations.

3.2.11. Charts installed on the system

At the bottom of the Setup menu folder there is a view showing which charts are installed on the system. Mark the charts to be used. NB! This field is not displayed if only one chart database is installed.

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

3.2.12. Recalibrate screen

Restores display to correct calibrated settings.

3.2.13. Conning harbor mode and conning aft / for

Controls conning maneuvering display.

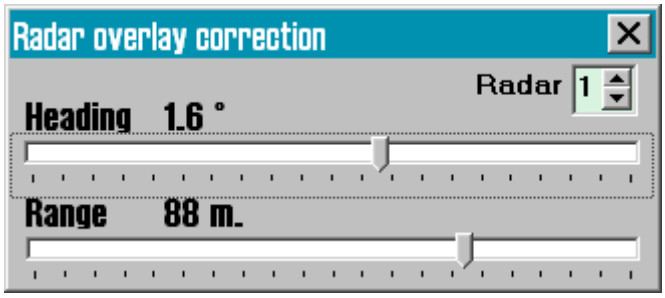
3.2.14 Export DB Status

This option is only used in some custom chart database configurations.

3.2.15. Radar overlay setup

This selection will activate the radar overlay and bring up the radar overlay setup dialog.

Note: The TECDIS Radar Overlay is designed to work with the Furuno FAR-2107/2807 radar series. The primary TECDIS system, the backup TECDIS system (if connected) and analog adapter (if connected) should be configured to the 172.31.3.xxx IP address range in order to receive data from the radar.



Radar: This value specifies the radar number the system should connect to. This should correspond with the RADAR NO value in the INSTALLATION menu of the Furuno radar.

Heading: This control should be used to adjust the orientation of the radar overlay so that it corresponds with the chart display.

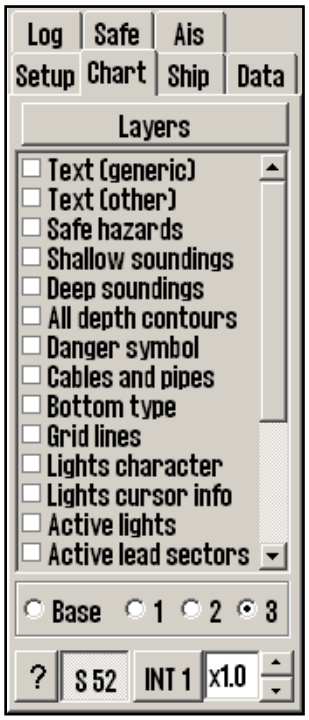
Range: This control should be used to adjust the radar echo range so that the radar overlay corresponds with the chart display.

3.2.16. F1 F2 button setup

This option will display the F1 F2 button setup dialog. If a Furuno RCU-018 control unit is connected to the system, this option allows the operator to specify the functions the F1 and F2 keys on the control unit should activate.

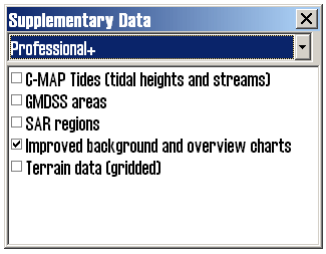
The F1 and F2 buttons can be used for the following functions:

Function	Description
Scale W 1:100M	Sets the chart scale to 1:100M
Scale W 1:20M	Sets the chart scale to 1:20M
Scale A: 1:3M	Sets the chart scale to 1:3M
Scale B: 1:1M	Sets the chart scale to 1:1M
Scale C: 1:300.000	Sets the chart scale to 1:300.000
Scale D: 1:100.000	Sets the chart scale to 1:100.000
Scale E: 1:30.000	Sets the chart scale to 1:30.000
Scale F: 1:10.000	Sets the chart scale to 1:10.000
Scale G: 1:3.000	Sets the chart scale to 1:3.000
Chart Legend	Displays the chart legend for the current chart display (See 3.3.2.)
Chart Base	Configures the chart display to ‘base’ mode (See 3.3.)
Chart selection 1	Configures the chart display to mode ‘1’. (See 3.3.)
Chart selection 2	Configures the chart display to mode ‘2’. (See 3.3.)
Chart selection 3	Configures the chart display to mode ‘3’. (See 3.3.)
ESCAPE function	Emulates the ‘ESCAPE’ keyboard key.
Enter Manual Position	Allows the operator to move the chart display to a specified position. (See 4.1.1.)
Next menu page	Switches to the next menu or folder.



3.3. Chart Menu

This folder is described in detail in chapter 4.5 and 4.7. Settings for chart features is performed in this window.



Some chart databases contain additional selectable chart layers. When such a database is present and selected for view, the *"Layers"* button appears in this menu. Pressing this button brings up a window where such chart layers can be displayed.

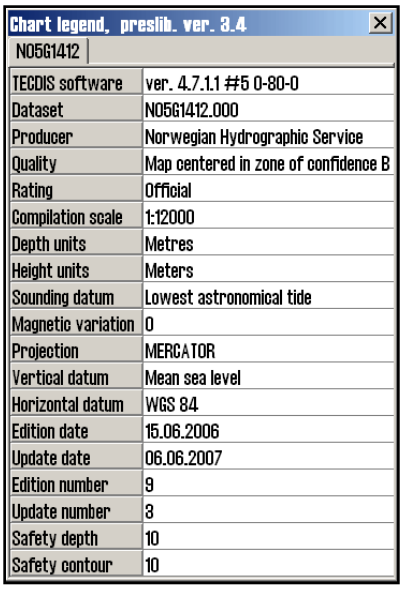
In the area immediately above the bottom row of controls, 3 user settings can be stored. Select wanted feature by placing a tick in the box, or remove to disable/hide feature.

On the bottom row of controls, settings for S52 presentation (standard colors and symbols) , INT 1 presentation and text/symbol size can be performed. See chapter 4.7 for detailed information.

3.3.1. Chart Features/Settings

Feature Name	Description
Text (generic)	When activated it allows the display of text that has the category "generic". It can be names of countries, cities, islands etc.
Text (other)	Other available information not mentioned above will be displayed.
Safe hazards	Displays hazards inside the safety contour and isolated dangers outside the safety contour, that are deeper than the safety depth.
Shallow soundings	Displays soundings shallower than safety depth.
Deep soundings	Displays soundings deeper than safety depth.
All depth contours	Displays all depth contours, also inside the safety contour.
Danger symbol	When activated it applies the rule that all obstructions that are shallower than the safety contour should be displayed by a special UNDER WATER HAZARD symbol.
Cables and pipes	Displays cables and pipes.
Bottom type	Displays bottom type texts.
Grid lines	Displays chart grid.
Lights character	Displays light character information in the chart. NB: for some lights, for example lights with periods that are longer than 15 seconds, text is shown instead of active blinking.
Light cursor info	Displays light character information in a textbox when the cursor is moved over a light.
Active lights	Displays lights blinking with right sequence and color, as seen from own ship.
Active lead sectors	When this feature is selected, light lead sectors (white) covering the vessels current position will be extended out from the light.
Small craft info	Displays leisure/small craft info, such as information about small craft harbor, hotels, bunker stations etc.

Simplified symbols	Displays simplified S52 standard chart symbols. (S52 presentation only)
Chart quality marks	Displays official chart quality marks.
Plain boundaries	Displays all lines and boundaries as simple lines in the chart.
National language	Displays location names in the language the chart was produced in.
More info "!" sign	Marks chart objects with a "!" when extra information is available.
All time limited	Displays all temporary, periodical, or otherwise time limited chart objects regardless of current time/date.



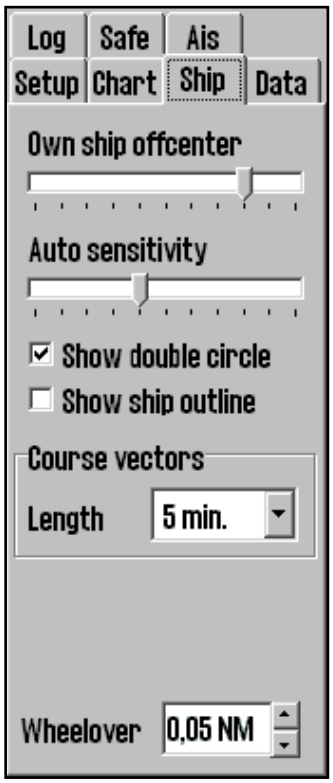
3.3.2. Chart legend

Pressing the question mark at the bottom left corner in the chart menu folder, opens a chart information window. For each chart that is currently presented on screen, a "folder" for each chart is available.

The area of the current chart display where the currently selected chart is visible is marked with a red pattern in the cart.

The IHO presentation library version number is shown in the title bar of the window.

3.4. Ship Menu



3.4.1. Own ship offcenter

Location of own ship on the screen. High value: Vessel is placed more offcenter. Low value: vessel is placed closer to screen centre. This function is only active when auto function is enabled.

3.4.2. Auto sensitivity

How often chart to be centered/shifted in Auto mode.

3.4.3. Show double circle

The boat symbol can be displayed with or without circles.

3.4.4 Show ship outline

This option allows the true vessel outline to be displayed in the chart.

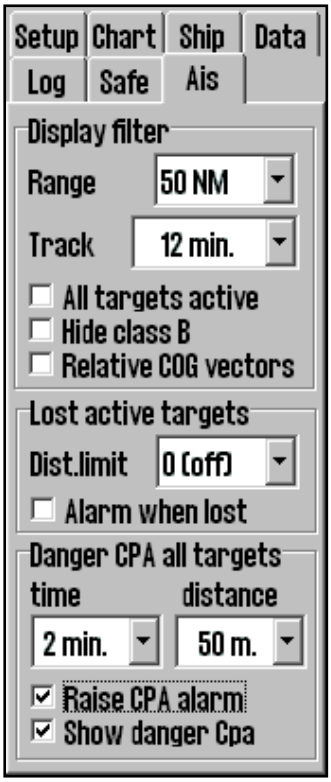
3.4.5. Course vectors

Sets vector length on own ship and targets. (One cross line on vector is one minute).

3.4.6. Wheelover

Wheel over line forward distance from Waypoint. Used for autopilot track control and route monitoring.

3.5 AIS Menu



3.5.1. Display filter: Range and Track

AIS targets outside specified range are filtered from display. Track specifies length of AIS target tracks in minutes.

3.5.2. Display filter: All targets active

Allows all AIS targets to be shown with heading / COG vectors and tracks. In INT1 chart display mode, target names are displayed.

3.5.3 Display filter: Hide class B

Allows filtering display of class B AIS targets.

3.5.4 Display filter: Relative COG vectors

Allows display of COG vectors relative to own ship movement. Vectors are true if this option is not selected.

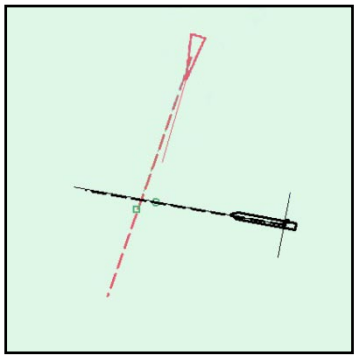
3.5.5 Lost active targets

AIS targets inside the specified range will be indicated with a black X over the target when it is lost. If *"Alarm when lost"* is activated, an alarm will be raised.

3.5.6 Danger CPA all targets

Specify time and distance limits for CPA alarms from all targets. "Show danger CPA" allows display of the CPA graphically in the chart.

When a CPA situation arises, an alarm will be raised, the target is colored in red and flashes until the alarm has been turned acknowledged.

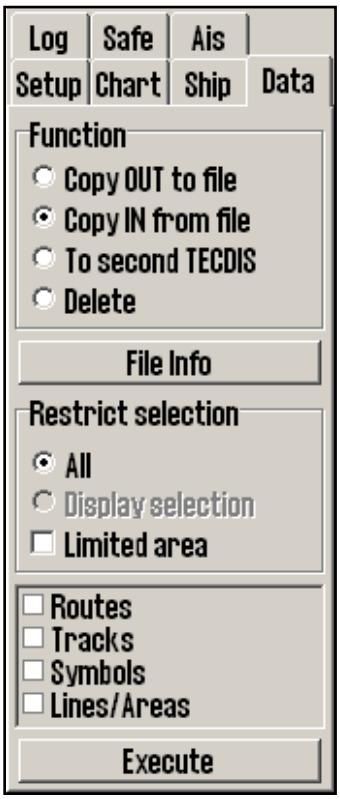


Dangerous targets are displayed regardless of whether the AIS/ARPA functions are enabled, and they are shown in red until the danger situation is over. By ticking the box *"Show danger Cpa"*, the cpa is marked in the charts with a green circle on own course vector, and a green square on the target's course vector.

If TECDIS loses the signal from a ship that has an active CPA alarm, a NEW alarm is given: "Lost CPA alarm" (a "dangerous" vessel has disappeared from the system).

If "Allow Standby Mode" is selected in TECDIS Setup (See chapter 7.3), it is possible to disable CPA alarms by unselecting *"Raise CPA alarm"*. A prominent warning is displayed when CPA alarms are disabled.

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

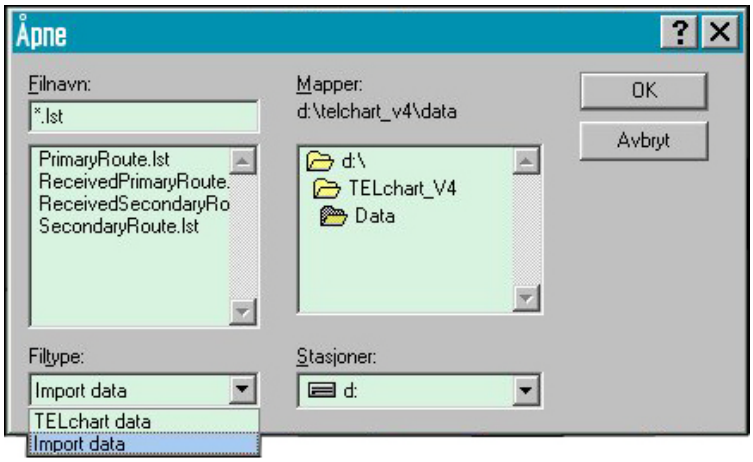


3.6. Data Menu

3.6.1. Backup

Settings for backup/restore of additional data to/from floppy/hard drive or CD/DVD is done here.

”To second TECDIS” transfers selected objects to the second TECDIS unit (if connected and configured in Setup). The objects are automatically imported on the second TECDIS. (NB: In order to copy to second TECDIS, IP address must be specified in the TECDIS Setup program, see chapter 7).



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

Use ”selection” to select what to be copied from/to TECDIS. If ”all” is selected everything is copied. If ”limited area” is ticked, selection of data must be done.

Press ”Execute” at the bottom to start copying.

NB! Backup of own data as tracks, symbols, routes, info, etc. is very important. Make sure important data is backed up to a floppy disk or other media for safe storage.

3.6.2 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 chapter 7.3).
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.

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.

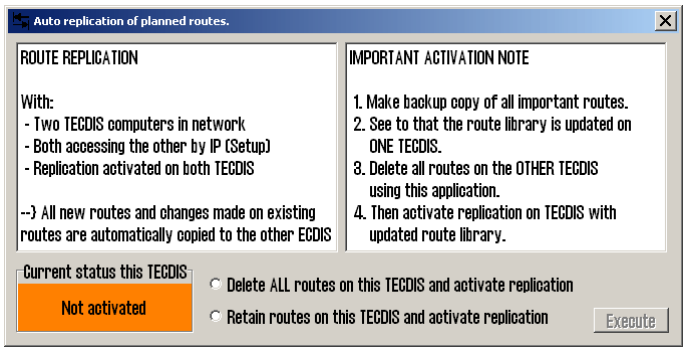
The route is available for import from the following files in the ***Data*** subdirectory of the ***TECIDS*** directory (C:\Program Files\TECDIS\Data):

Primary Route	ReceivedPrimaryRoute.lst
Secondary Route	ReceivedSecondaryRoute.lst

In order to import the route, select “Copy IN from file”, select “import data” in the file type menu, and then select ”ReceivedPrimaryRoute” or ”ReceivedSecondaryRoute” from the list of files.

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:

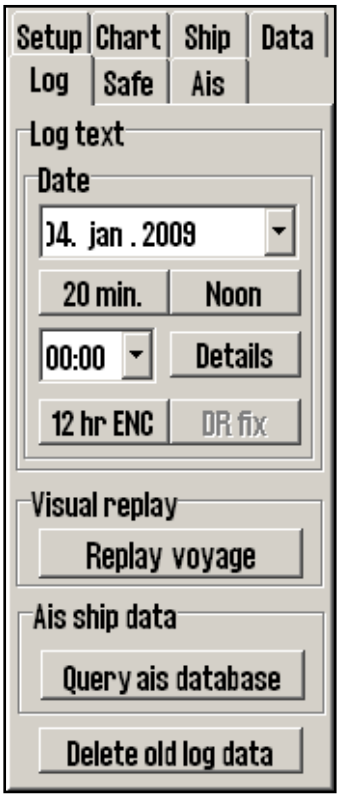
1. Verify that the requirements for this feature listed above are met.
2. If routes are present on the TECDIS units, select one unit where all routes will be kept and one TECDIS unit where all routes will be removed.
3. On both TECDIS units, insert the Service Key and exit to Windows.
4. On both TECDIS 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.



3.7. Log Menu

TECDIS saves important data (position, course, speed) for own ship, ARPA and AIS targets every minute. Logs from a certain date can be displayed in different ways .

20 min.: shows a list with position, course and speed every 20 minute for a selected 24 hour period.

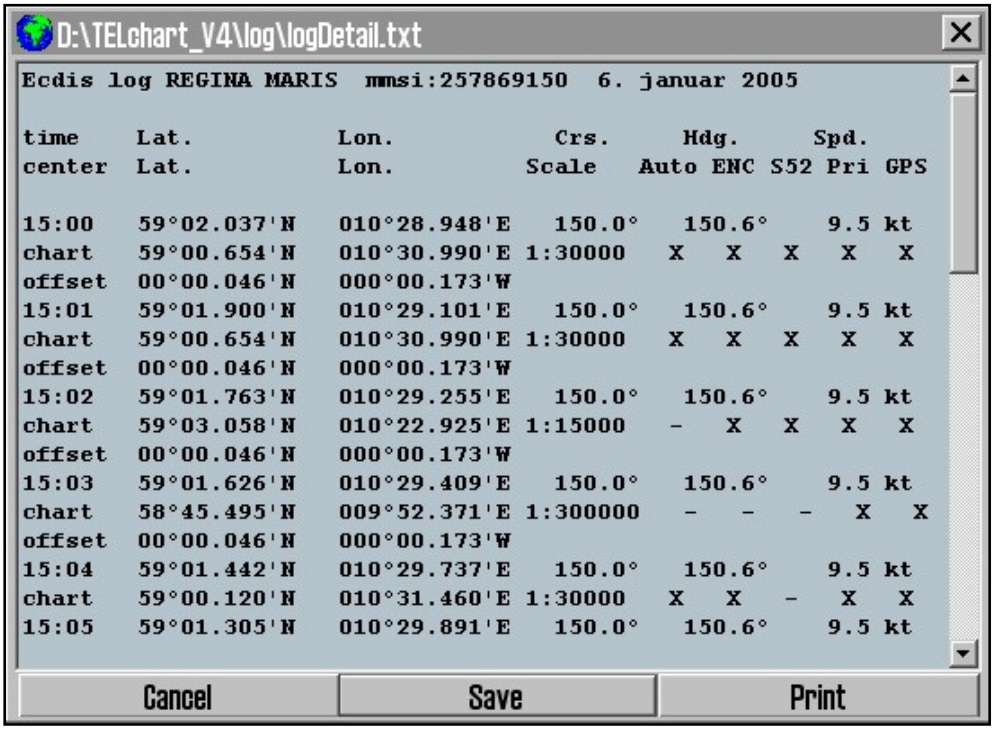
Noon: shows a list with position, course and speed for every hour from 12:00 the previous day until 12:00 current day. Sailed distance is shown after every 4 hours, and the total sailed distance is shown at the bottom.

By entering a time directly and press **Details**, a detailed log from the selected hour will appear. The log list will contain details updated every minute. Additional to information regarding vessels position, course and speed, info about used charts at the present time is displayed. Scale and chart center is listed and if auto mode was activated it is marked with a cross. Other info is ENC / S52, primary position sensor and GPS status. Manual position offset activated will also show. See picture.

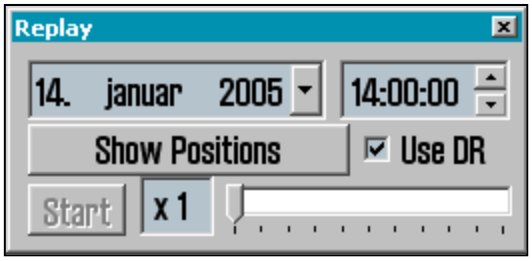
12 hr ENC: shows a log of the chart data that was shown on the screen for every minute during the last 12 hours.

DR fix: If the L.O.P. functionality has been used to provide a position fix for the selected day, this option shows the log of performed fixes with all corresponding observation data.

Log files can be saved or printed out..

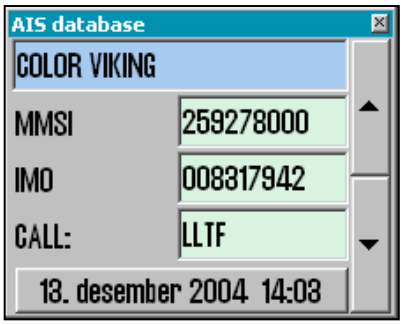


Visual playback:



Previous voyage: Log data can be played back visually by pressing ”voyage replay”. Enter time and date in the window which opens. At the bottom line replay speed can be entered. By selecting *“Use DR”*, Dead reckoning may be used between each minute logged. Vessels will be displayed with a estimated position every second.

Press “STD” to stop the playback and return to current situation.



Query AIS database opens a ship database, where all received AIS targets are saved with name, MMSI, IMO, call sign and date for last reception from the vessel. By pressing the date button, the situation will be played back in last tracked position.

Delete old log data: Deletes log data older than one year. The system will ask for confirmation before deleting.

3.7.1. Screenshots

Anytime screenshots/pictures from TECDIS can be saved by pressing Control (Ctrl) + Print Screen (Prt Scr). The picture is automatically saved with filename: year-month-date time-second. They will be saved and accessible in the folder **C:/Program Files/TECDIS/Screen**.

3.8. Safety Menu: Safety settings

3.8.1. Safety Depth, Chart depth levels.

The *"Safe dpt."* specifies the **Safety Depth**, and the minimum depth for the **Safety Contour**, which is emphasized in the chart. (Where the chart does not contain a depth contour for the specified value, the next deeper one is selected.) Any chart elements shallower than the specified value will generate an anti grounding alarm when present in the area ahead of the vessel specified by *"Check time"* and *"Angle"*.

The values *"Shallow"* and *"Deep"* control the coloring of shallow waters. Areas shallower than the specified values are colored blue (dark blue for "shallow", lighter blue for "deep").

3.8.2. Anti grounding parameters : Check time / Angle.

These values specifies the safety sector (guard zone) ahead of the vessel where dangerous chart objects will generate alarms. See chapter 5.6 for details.

3.8.3 Auto Safe Hazards

This setting controls whether the system should automatically display hazards inside the safety contour during anti grounding alarms. When activated, this feature turns the "Safe Hazards" and "Shallow Soundings" chart features on (see chapter 3.3.1) when an anti grounding alarm is triggered. Available settings are:

- **No Safe Haz. Auto:** "Safe Hazards" and "Shallow Soundings" chart features are not modified automatically.
- **Safe Haz. Auto on:** "Safe Hazards" and "Shallow Soundings" chart features are automatically enabled when an anti grounding alarm is triggered.
- **Safe Haz. Auto on+off:** "Safe Hazards" and "Shallow Soundings" chart features are automatically enabled when an anti grounding alarm is triggered, and are in addition automatically disabled when the anti grounding alarm is removed.

3.8.4. User selectable alarms

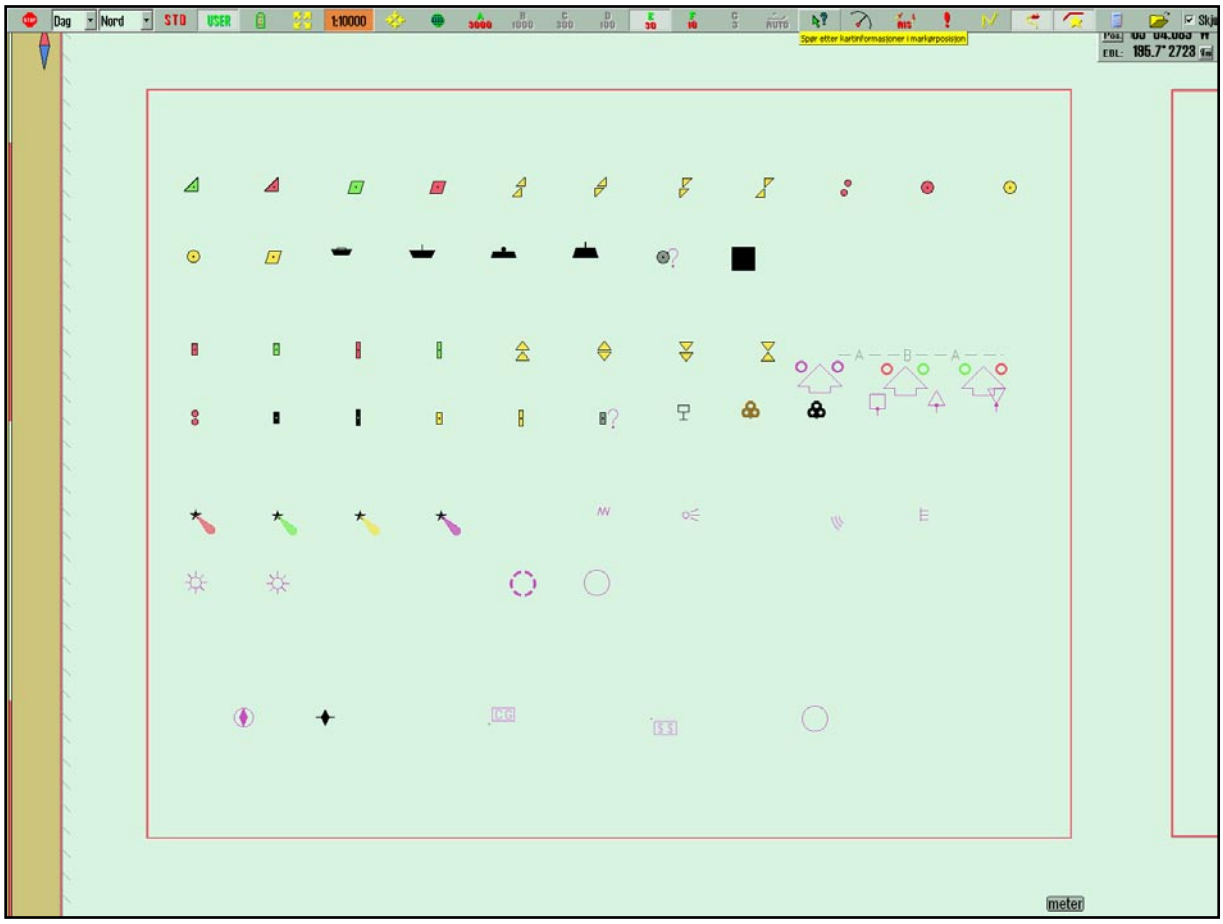
Some alarms and controls can be set by user. See chapter 5.3.4 and 5.5 for more details regarding the alarm system.

Option Name	Description
Standby mode	This mode is only available if *"Allow standby mode"* has been selected in TECDIS Setup (See chapter 7.3). **When this option is activated, no alarms will be audible.** A strong warning to this effect is displayed in the chart area.

New WP / CTS	When approaching a new waypoint (WP) in the present navigation route an alarm can be triggered. (on wheelover line)
Non – ENC dangers	The antigrounding system and route checking always checks ENC data where ENC charts are available. Enabling this check box will activate checking of unofficial chart data where ENC charts are not available in an area that is checked. Route checking will report alarms from both ENC and non official chart data when this option is activated.
Restricted areas	Generates an alarm if the vessel enters a restricted area.
Caution area	Select whether approaching and entering caution areas, e.g. Traffic Separation Systems, should result in an audible alarm.
Possible danger	Generates an alarm for other possible dangers, such as Ferry routes.

3.9. IHO Presentation library index

IHO presentation library provides comprehensive information about vector chart symbols (ECDIS), test images. Press Control + alt + shift + T to open library. By pressing numbers 0-9 on the keyboard the pages with symbols appears. For info about the symbols use chart query/info function on the menu bar. (Menu bar is hidden during library presentation, but it will appear moving the marker to the top). Press “Esc” on the keyboard to close the library. The IHO Presentation library version number is found under the menu folder ”chart” (see chapter 3.3).



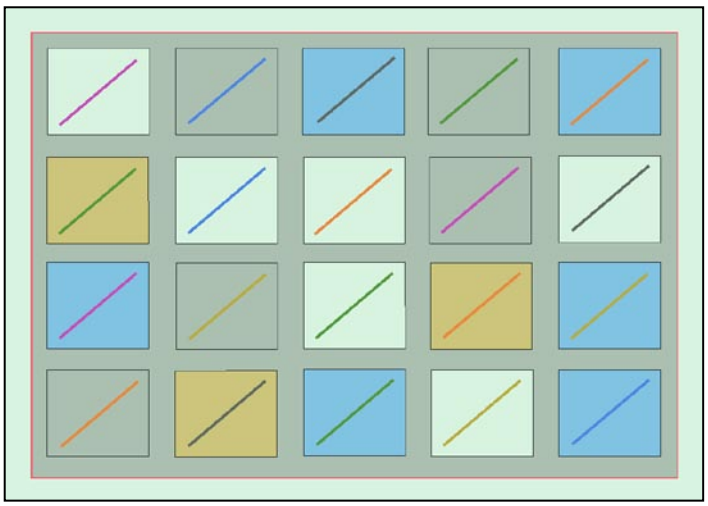
3.9.1. Monitor Calibration

All information in electronic chart displays must be highly visible. To ensure this monitor must be calibrated to display correct colors. This is very important, specially for night palettes, when monitor is dimmed.

NB: Make sure to test the colors at evening and night colors as well (as for day colors).

ECDIS color test for monitor calibration is also placed in IHO presentation library. Open library by pressing Control + alt + shift + T, and select test diagram by pressing A – B – C- D- E or T on the keyboard.

Brightness check: Open test diagram E and verify that the grey box is clearly visible.



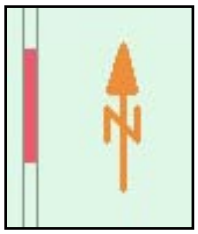
Check colors: Open test diagram T. All diagonal lines to clearly separate from background:

- 3 Yellow diagonal lines
- 4 orange diagonal lines
- 3 magenta diagonal lines
- 4 green diagonal lines
- 3 blue diagonal lines
- 3 grey diagonal lines

Check visibility of each color in the diagrams (A-E). If the monitor fails the test, it no longer meets the minimum requirements for display performance. It should be evaluated by a qualified engineer and be repaired or replaced it as necessary.

NB. If monitor settings has been changed manually in the monitor menu, or to make sure correct settings are used, go to *"Setup"* menu folder, press *"Auxiliary"* and select *"recalibrate screen"*.

Chapter 4: Chart display area



The following elements are always visible in the chart area:

- North arrow, indicating direction of north when the chart is rotated.
- The vertical scale bar along the left edge of the chart area

The scale bar changes color according to the distance between each line (unit):

Scale Interval	Colors	Unit
1:1 – 1:5000	Yellow / White	0.1 Nm (0.1 ’)
1:5001 – 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 generation of a new chart display takes 6 seconds or more, an indicator appears in the upper left corner of the chart area showing how long in seconds the system has been working on the new chart display. This indicator will only appear when using charts with extremely high information density.

4.1. Chart centering

Move marker to desired chart centre and press **middle mouse button** (press scroll wheel down if no middle button). Use left mouse button to zoom in and right to zoom out.

When the cursor is moved to the edges of the map, it changes to an arrow. Every click will then move the charts.

Keyboard arrows can also be used to move charts/set chart center. Use **”home”** key to center own ship.

4.1.1. Setting chart center to a specific position.

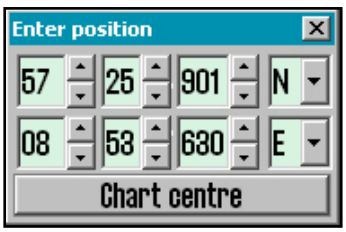


Chart centre can be moved to a specific dialed in position. In the marker data field in the side menu there is located a button ”Pos.” It opens a pop up box where position can be entered manually. Keyboard “Ins” also opens this box. Enter selected position and press ”chart centre” to centre chart and mark position. This is very handy when adding new objects as symbols, lines and waypoints. When adding new symbol a second click on “Chart center” will add the symbol/WP in entered position.

4.2. Changing chart display scale

4.2.1. Zooming with automatic chart level selection

Use left mouse button to zoom in and right to zoom out. Optional use keyboard + and – . Marker position will be new chart centre. The system automatically selects suitable chart depending of selected scale.

4.2.2. Manual chart level selection

From the menu bar chart levels can be selected directly. The numbers present scale x1000. Select chart and scale by pressing one of the buttons. Optional keyboard can be used to give direct commands, by pressing the wanted scale level letter (W-A-B-C-D-E-F-G).

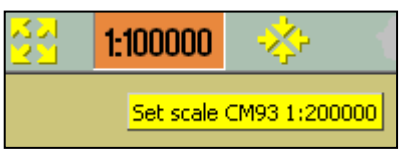
When letters on the scale buttons are emphasized with yellow text and green background, official charts are available in this scale. Official charts always have priority. If the vessel is present on the current chart display, the scale buttons indicates the scale values of the own vessel position. When own vessel is located outside the current chart display, they indicate scale for chart center. The button representing the currently displayed chart scale level is marked as selected.

Text warnings are also displayed in the following situations:

- No ENC available, refer to paper chart
- Not official presentation, refer to paper charts or S52 presentation
- Better ENC is available
- No chart available, refer to paper charts

4.2.3. Zooming without changing chart

Using these buttons, zooming in and out in the same chart is possible. The left button decreases the scale (more details), the right button increases the scale. The number in the middle displays present scale. For keyboard operation use Page up to zoom out in the same chart, and Page Down to zoom in the same chart.



When moving the marker over the middle field, a yellow tool tip line where the charts original scale is shown. By pressing the middle field, the chart is automatically scaled to this. *NB! This function can be overruled by charts from another database. TECDIS uses several chart types, but gives priority to official charts.*

4.2.4. NB! Over scale

When lowest scale available in the chart is reached, it is still possible to zoom in. However, be aware that this is only a graphic enlargement and no further details in chart will be available. Possible errors in the charts will be enhanced along with the chart. The middle field will turn orange when working on overscale.

4.2.5. Extra marking of over scale

Over scale warning can additionally be marked with vertical lines in the chart. This is an automatic function. When parts of the chart is over scaled, these parts will be marked.

4.2.6. Under scale

When zooming the chart out, the chart can be displayed in under scale. Details can merge / not be visible. The middle field is marked green when chart is under scaled.

4.3. Lighting /set palettes

The colors on the chart can be adjusted to different light conditions. The button controlling the palettes is on the left side of the top menu bar. By pressing the text, or the arrow, a drop down menu will appear. Select wanted palette. Selected setting will be visible in the field, and it is easy to recognize which mode is chosen.

NB! To optimize light settings, brightness and contrast adjustment must be done on the ECDIS monitor. If the screen is too dark, this can limit the visibility of important information, particularly when using dusk and night palettes. (See chapter 3.9.1) Brightness control on the screen has a marking for calibrated value.

Day *Dusk* *Night*

4.4. Chart orientation

Click on the chart orientation button on the top menu bar. A drop down menu on the top menu bar appears, where the desired orientation can be selected.

NORTH means ”north up”, and means north is always to the top of the screen, independent of your own course.

COURSE means ”course up”, and means that your own course at the selection time, will be towards the top of the screen. It will not be changed, even if the vessel later changes course.

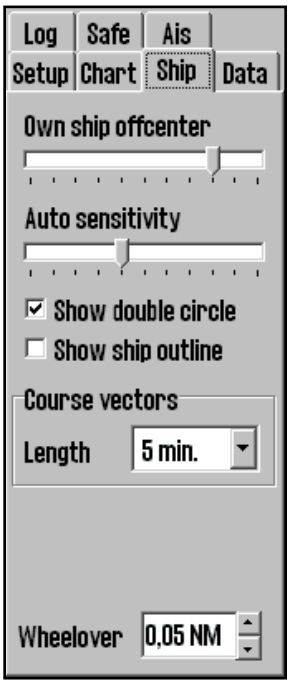
HEAD means ”head up”, and means that the vessels heading always will be towards the top of the screen. The vessel will have a fixed position on the screen, while the chart is changing (relative motion).

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

4.5. Own ship symbol

The **Vessel Position** is indicated graphically in the chart according to the settings made in the *"Ship"* menu (See chapter 3.4). See chapter 2.4 for illustrations.

In all chart orientations, except" head", the chart is fixed to the screen, while the vessel is moving (true motion). By "head" orientation, the vessel will have a fixed position on the screen, while the chart is changing (relative motion).



Own ship offcenter: Location of own ship on the screen. High value: Vessel is placed more offcenter. Low value: vessel is placed closer to screen centre. This function is only active when auto function is enabled.

Show double circle: draws the boat symbol with two circles. See illustrations to the right.

Show ship outline: This option allows the true vessel outline to be displayed in the chart.

Course vectors: Sets vector length on own ship and targets. (One cross line on vector is one minute).

Wheelover: line distance from Waypoint. New command to track pilot and route monitoring.

4.6. Automatic chart centering

Press *"auto"* on the top menu bar to activate, or *"home"* on the keyboard, or by pressing anywhere in the nav. data field in the side menu. The system will then automatically ensure that the charts are moved according to the vessel. How often chart to be centered/shifted in Auto mode can be selected in the "ship" menu folder.
Select chart scale on the menu bar (this will not abort auto mode).

4.7. Chart presentation

By using ”STD” and ”USER” it is easy to select chart presentation (or switch between) ECDIS standard or user defined.

4.7.1. STD mode

STD is the official standard ECDIS presentation, S52. This standard is set by IMO, with certain colors, symbols and content (see illustration to the left. The right hand picture shows user selected INT 1 chart presentation). By pressing STD the auto mode is also activated.

4.7.2. User mode

“User” mode displays a user defined chart presentation. Settings are performed in the menu folder *“Chart”*. (Press the menu folder button on the top menu bar and select “Chart” folder.)

In this line (second from the bottom), 3 user defined information standards can be stored and selected. Base uses minimum chart information/features.

Place checkmarks in the boxes to add info, or remove checkmarks to reduce info. (not to be displayed). See chapter 3.3.1 for details.

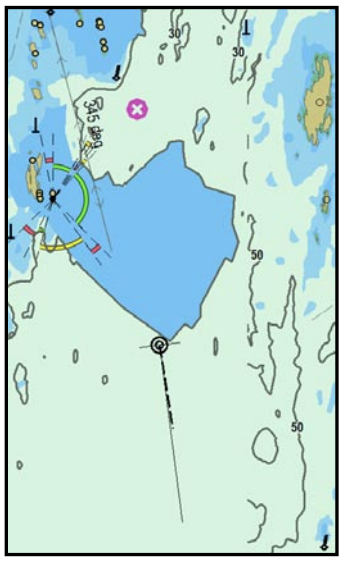
On the bottom line S52 or INT 1 presentation is selectable. (See pictures above) Selecting INT 1 a warning saying “not official presentation, select S52” will appear. The up and down buttons to the right controls text and symbol size. By pressing STD text is set to 1.0.

4.7.3. Safe hazards

Safe hazards displays hazards inside the safety contour and isolated dangers outside the safety contour that are deeper than the safety depth. In STD (standard) presentation, this function is deactivated, but it can also be switched on manually from the chart menu.

The system can optionally automatically enable display of safe hazards and shallow soundings during anti grounding alarms. See chapter 3.8.3 for details.

The setting "*Danger symbols"* marks dangers with a danger symbol. This setting is active by default in STD mode. When "*Safe hazards"* is switched on in combination with *"Danger symbols"*, all dangers (also inside the safety contours) are marked with danger symbols. When the "*Danger symbols"* setting is deactivated, no chart objects will be marked with danger symbols.

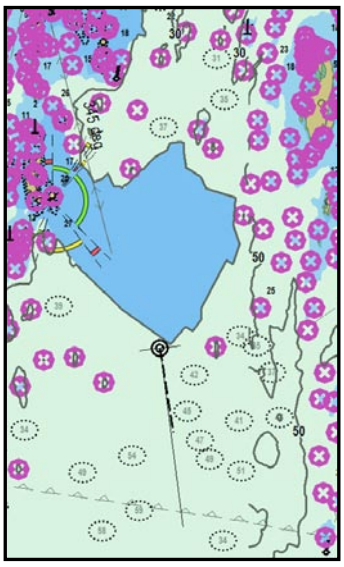


Safe hazards OFF
Danger Symbol ON

Dangerous objects outside the safety contour are displayed with danger symbol.

Dangerous objects inside the safety contour are **not** displayed.

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

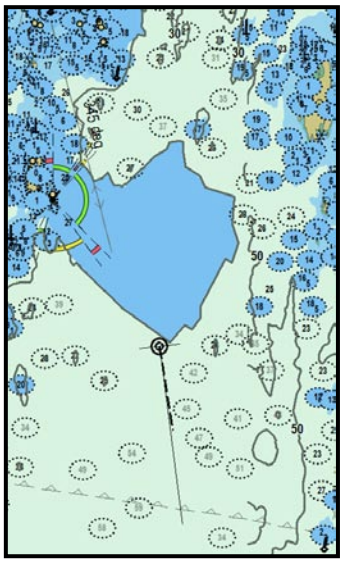


Safe hazards ON
Danger symbol ON

Dangerous objects outside the safety contour are displayed with danger symbol.

Dangerous objects inside the safety contour are displayed with danger symbol.

Hazards deeper than the safety depth are displayed normally.



Safe hazards ON
Danger symbol OFF

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

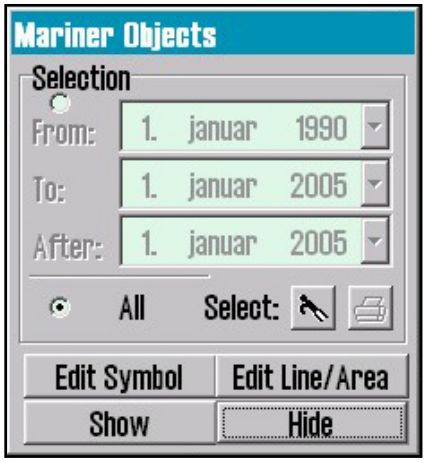
Dangerous objects inside the safety contour are displayed normally.

Hazards deeper than the safety depth are displayed normally (with grey text).

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

4.8. Symbols/Mariners objects

Pressing the symbol button on the top toolbar (keyboard shortcut: F7), the *"Mariner Objects"* interface is displayed. Here, new symbols, lines and areas can be added to the chart display, and previously entered objects can be filtered for view.



4.8.1. Selecting and displaying objects

Mariner objects are made visible in the chart display by pressing the *"Show"* button. Accordingly, all mariner objects are hidden from display by pressing the *"Hide"* button. When mariner objects are visible, the toolbar symbol button appears pressed down.

The upper area of this dialog provides control of which mariner objects should be shown:

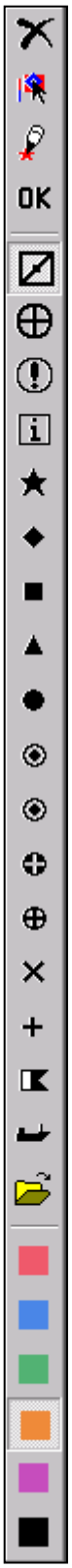
- Pressing *"All"* displays all objects.
- Pressing *"Selection"* only displays objects
  - created after the *"From"* date, but before the *"To"* date
  - created after the *"After"* date.

Note that **both of the two first** date conditions ("From", "To"), **or** the third condition ("After") must be satisfied for an object to be displayed. For example, if the operator wishes to only display symbols created in a previous time period and no recent symbols, the period can be selected using "From" and "To" dates, while "After" is set to a future date.

In addition, the *boat hook selection button* can be used to select a single line or area object by name or by clicking on it in the chart. The object is emphasized in the chart display, and the *printer button* in this dialog can now be used to produce a position / waypoint list for the selected object. This report can be saved to external media or printed (if a printer is connected).

4.8.2. Adding new, modifying or deleting objects

By pressing *"Edit Symbol"*, a new vertical menu bar will be displayed on the left edge of the chart display. The 3 top buttons of this menu bar controls following (from top to bottom): *Delete symbols*, *Change/Move symbols* and *Add new symbol*. The rest of the buttons in the menu bar allow the selection of symbol/line/area type and color.



Delete symbols: Press this button to enter symbol deletion mode. The button will appear pressed down while the mode is active. Using the cursor, click on symbols in the chart display with the left mouse button to delete them. Press the right mouse button, or the *"OK"* button when finished to exit the mode.

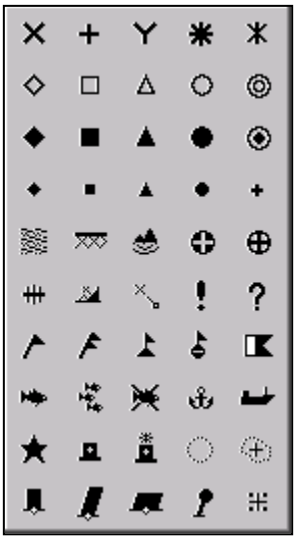
Change/Move symbols: Press this button to enter symbol modification mode. The button will appear pressed down while the mode is active. In this mode, symbols in the chart display clicked with the left mouse button will be changed to the currently selected symbol appearance and color, and the symbol will move with the cursor until placed in a new position by clicking the left mouse button again (The previous position and appearance of the symbol will be marked with a deleted mark). Press the right mouse button, or the *"OK"* button when finished to exit the mode.

Add new symbol: Press this button to enter symbol addition mode. The button will appear pressed down while the mode is active. In this mode, clicking the left mouse button in the chart display will place a new symbol with the currently selected appearance and color in the specified position. A window will appear in the lower part of the display that allows the operator to enter both a short text visible in the chart, and more detailed information not visible in the chart (See 6.1.1). Press the right mouse button, or the *"OK"* button when finished to exit the mode.

OK: In any of the three modes detailed above, this button will exit the active mode. If none of these modes are active, this button will close the symbol menu.

17 symbol appearance buttons: These buttons indicate the available symbol appearances. The currently selected appearance is marked as pressed down. (Note: The top four symbols appearances are fixed, and can only be displayed in orange color.)

Select symbol appearance: This button allows the operator to change any of the 13 lowermost available symbol appearances. The full list of available symbol appearances is displayed. When any of these are selected, the currently selected symbol appearance in the symbol menu bar will be replaced with the new selected symbol appearance. Press the *select symbol appearance* button again to close the symbol list.



6 color selection buttons: These buttons indicate the available symbol colors. The currently selected color is marked as pressed down.

4.8.3. Add new, modify or delete lines/areas

By pressing *"Edit line/Area"* in the *"Mariner Objects"* dialog, the following vertical menu bar will be displayed on the left edge of the chart display. This menu bar allows addition, modification and deletion of lines and areas in the chart, and is similar in functionality to the symbol menu bar described in the previous section.

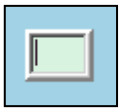
Delete line/area: This button works in the same way as the corresponding function for symbols. Note that the first point of the line/area must be clicked to delete it (where the text, if any, is displayed).

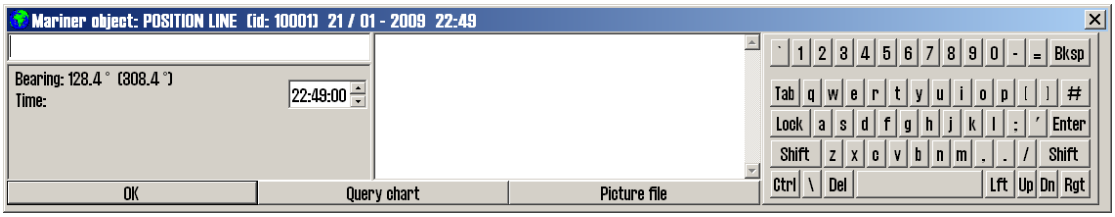
Change line/area: This button is only available for multi point lines and areas. First select the multi point line or area that is to be modified. In this mode, the following operations can be performed:

- Click with left mouse button on a corner to start moving it. Move the cursor to its new location and press again to fix it there.
- Click with left mouse button on a straight leg to add a corner. Move the cursor to the location of the new corner and press again to fix it there.
- Click with right mouse button on a corner to delete it.
- Press *"OK"* to exit the mode.

Add new line/area: button allows the operator to add the currently selected line / area type in the currently selected color to the chart by clicking the left mouse button in the chart display. For simple lines, circular areas and rectangular areas, a second left mouse click in the chart display specifies the extent of the line/area. For multi point lines / areas, points will be added until the right mouse button is pressed and the mode is deactivated.

Position line: When the first point of this type of line is placed in the chart, a small window will be displayed next to this point. A specified heading can be entered here, locking the heading of the line being entered to this heading. A window will appear in the lower part of the display that allows the operator to enter additional information about the object.





Multi point lines, Areas: The next buttons below position line allows for adding multipoint lines, and multipoint, rectangular and circular areas. Additional information can in the same manner as for position line. In addition, fill of areas can be toggled by the *"Fill"* checkbox in this window.

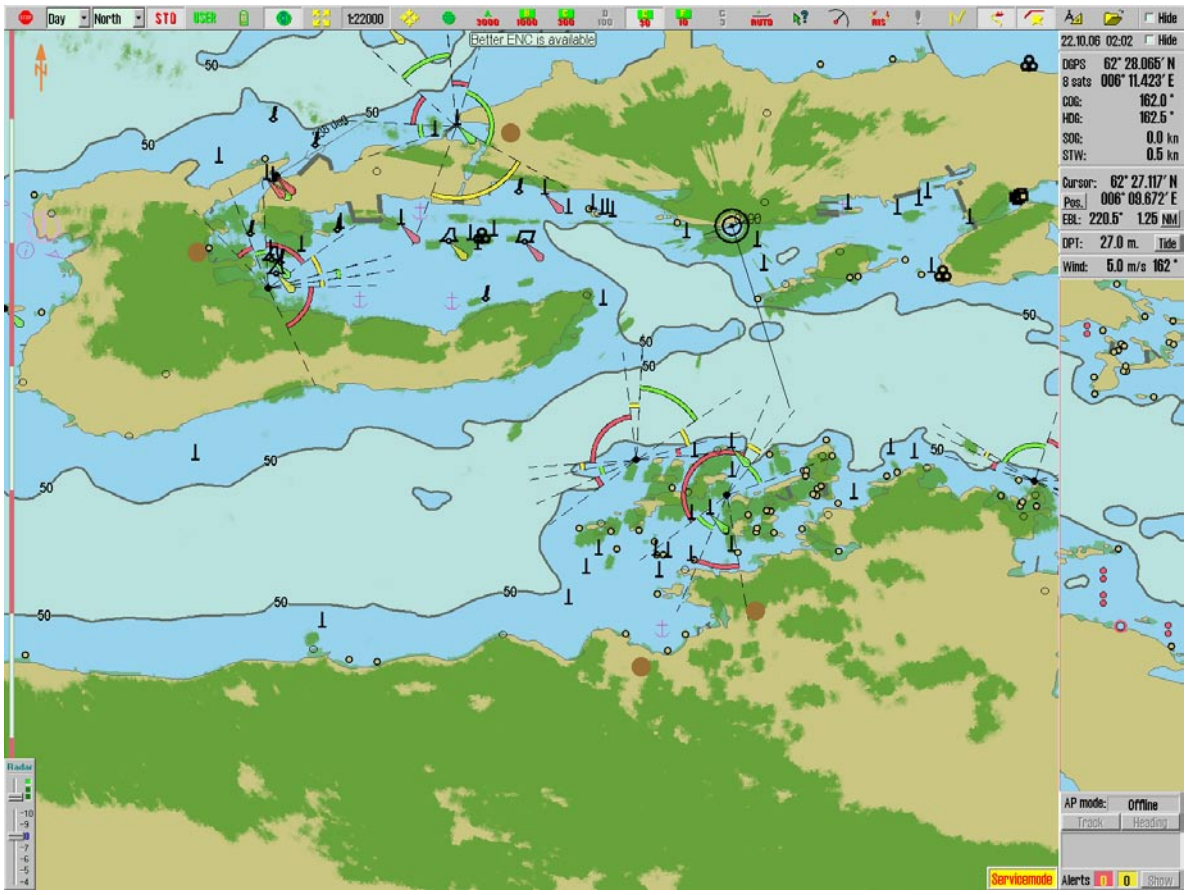
6 color selection buttons: The red color option allows the operator to add chart objects that will trigger alarms when the anti grounding check zone intersects the object (see chapter 5.4). Red objects are also displayed regardless of symbol visibility status and filtering.

4.8.4. M.O.B.: Event mark / Man over board

This top menu button (keyboard shortcut: F12) will add an orange event mark at the current vessel position, including the time of the event.

4.9. Radar Overlay

TECDIS can be configured to display a radar overlay supplied by the Furuno FAR-2107/2807 radar series. If configured and enabled, the radar overlay can be activated from the toolbar (See 2.4.2.). When activated, the chart display will include a radar image overlay.



Configuration and adjustment of the radar overlay is accessed though the Chart Utilities dropdown in the Setup menu (See 3.2.15.).

The radar overlay display is controlled with the radar overlay control dialog in the lower left corner of the chart display.

The first slider on this control (counting from top to bottom) allows the operator to select the color that should be used to draw the radar overlay. In S52 chart display mode, two colors are available; Light or dark green. In INT1 display mode, a additional multicolor mode is available with overlay color varying from green (faint echo) through yellow (intermediate echo) to red (strong echo).

The radar overlay transparency can be adjusted with the second slider, with transparency levels ranging from 10 (relatively opaque) to 4 (relatively transparent).

4.10. Weather Overlay

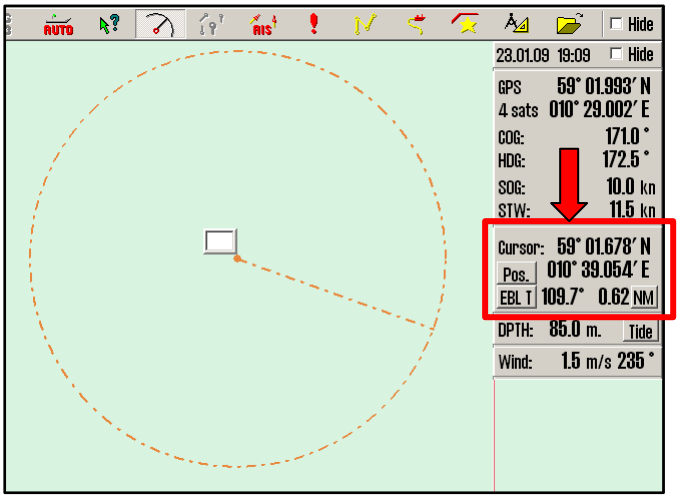
For instructions on use of the Weather Overlay functionality, refer to “TECDIS 4.7.1: New Features Guide”.

Chapter 5: Navigation

5.1. Bearing EBL / VRM

The EBL/VRM button on the top menu bar activates an EBL/VRM centered at the current vessel position. As the vessel moves, the origin of the EBL/will follow the vessel movements (it is “locked” to the vessel).

5.1.1. General EBL / VRM operation



Bearing and range information is displayed in the cursor information area in the right part of the screen. The current unit of the range value is indicated on a button immediately to the right of the range value. This button can be clicked to switch between meters (“m”) and nautical miles (“NM”).

The bearing can be locked to a specific heading by entering the desired heading in the small box next to the EBL/VRM origin.

The current bearing mode (true / relative) is indicated by the text of the button preceding the bearing value. “*EBL T*” indicates that the true bearing is displayed, and “*EBL R*” indicates that the relative bearing is displayed. The operator can switch between these modes by pressing the button.

By clicking on any text (excluding the buttons) in the cursor / EBL/VRM information area, the size of the bearing and range values can be increased. Note that in this mode, switching between true and relative bearing is not available.

By pressing the left mouse button at a point in the chart, the origin of the EBL/VRM can be moved to a different location. It can be moved back to the vessel by clicking the vessel with the left mouse button.

By pressing the right mouse button at a point in the chart, the target of the EBL/VRM can be locked in place. The EBL/VRM will no longer follow the cursor movements. To return to normal EBL/VRM operation, turn the EBL/VRM off by clicking the top menu bar button, then turn it back on.

5.1.2. Temporary route (2 Waypoints)

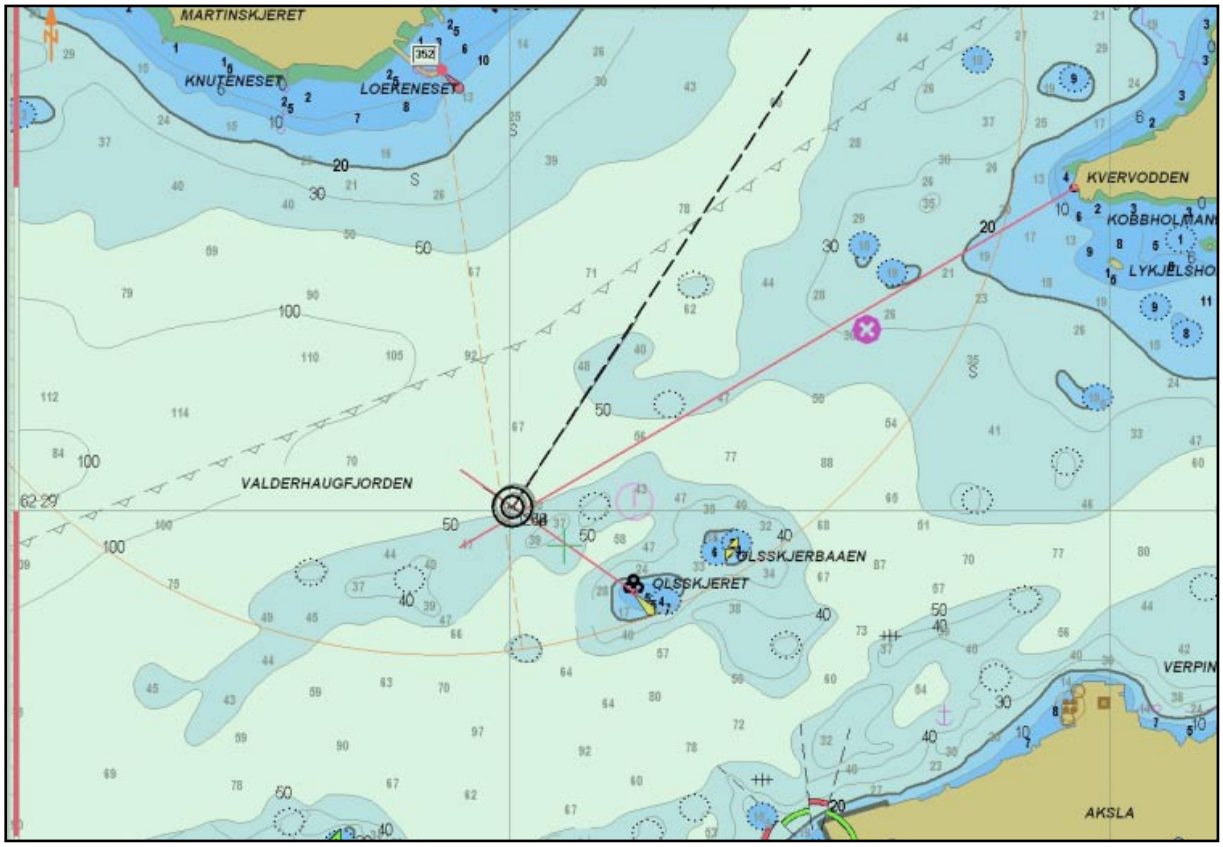
The EBL/VRM function can also be used to quickly generate a temporary route. First place the origin of the EBL/VRM at a point in the chart. This will become the first waypoint. Now, press the right mouse button in the desired second waypoint position. If the operator confirms that the temporary route should be activated, the temporary route will be generated. This route now functions as a normal route, but cannot be saved.

5.1.3. Temporary bearing lines

When the origin of the EBL/VRM is anchored to the chart, up to 3 additional temporary bearing lines can be placed in the chart display. When the EBL/VRM shows desired bearing line, press the middle mouse button to place the temporary bearing line. The EBL/VRM can now be moved or even switched off and the temporary bearing line will remain.

This can be repeated as many times are required, but only the last 3 temporary bearing lines entered will be displayed.

These bearing lines are not stored, and are removed from the chart display the next time the chart origin is moved, or the scale is changed.



5.2. Route / Voyage Planning

The route / voyage planning top menu button activates the route toolbar, which is located on the left side of the screen. While a route is displayed or activated, this toolbar is automatically displayed by moving the cursor to the upper left edge of the screen. The toolbar is hidden if it is not used for 1 minute.

The following pages will detail how the various buttons on the toolbar (and route planning in general) function.

5.2.1. Creating a new route

The *new route button* starts the process of creating a new route. The route waypoints can be entered graphically in the chart display. Place the cursor in the first waypoint position and press the left mouse button to place the first waypoint (marked W1 in the chart).

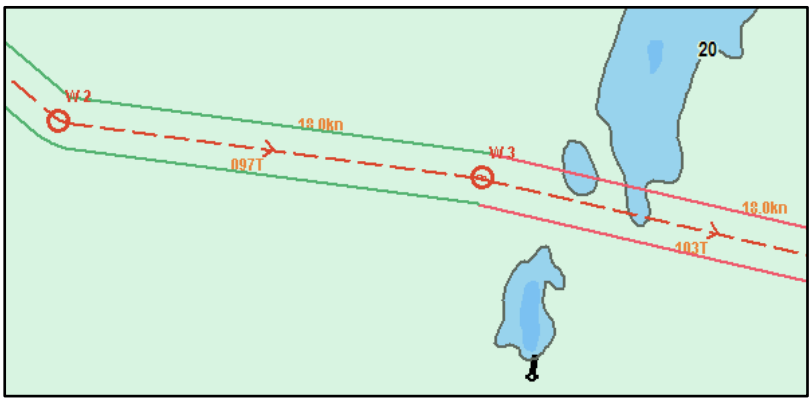
When the first waypoint is placed, a window is displayed in the lower part of the screen. In this window, the route name (and additional information, if needed) can be entered. Press *"OK"* in this window when finished.

Now, place the cursor in where the second waypoint is to be located and press the left mouse button again. The first route leg is now displayed. Continue placing waypoints using the left mouse button until the route is complete. (Note: The default lane width specified in the voyage planner described in chapter 5.2.11 is used for the displayed lane.) When finished, press the right mouse button, or *"OK"* on the route toolbar to exit the route drawing mode and complete the route. The maximum number of waypoints in the route is 500.

If a turn radius on the route is invalid (for example too big), the turn will not be drawn, and a warning will be given every time the route is selected.

Waypoints coordinates can also be entered using the keyboard. See chapter 5.2.11 (Voyage planning) for details.

To reposition the chart during route planning, use middle mouse button to set chart centre or move the marker towards the limit/edges of the chart display and press the left mouse button when an arrow cursor is shown. Use the top menu bar to change scale. Keyboard shortcuts can also be used to move/centre/change scale during voyage planning (see chapter 2.3.1).



The route is displayed as a dashed red line with direction arrows and the waypoints are displayed as circles labeled with the waypoint number. The route leg is optionally marked with planned course and speed.

When last waypoint is inserted, a safety check is performed automatically. The lane borders are colored according to safety status of the given leg/turn:

Lane Color	Explanation
Green	No warnings or dangerous chart objects are present in the leg/turn lane.
Yellow	Chart objects with warnings are present in the leg/turn lane.
Red	Dangerous objects are present in the leg/turn lane.
Grey	The safety check has failed for the leg/turn. Split the leg into two legs.

When a route is drawn or edited, all other existing routes are shown in gray color in the background. When “active lead sectors” is checked in the chart folder, lead sectors will be shown by the cursor position.

NB: when the last way point is within a distance of 0.1 Nm from the first way point, the route will be sailed in a loop (repeated).

Continue drawing a route
If a route has only been partially finished previously, the route can be extended by first selecting it, then pressing this route toolbar button to continue drawing the route.

5.2.2. Modifying an existing route

To modify an existing route, first select the route that is to be modified, then press this button on the route toolbar. While route edit mode is active, the following actions are available:

Action:	Procedure:
Move waypoint	Click on the waypoint with the left mouse button, place the cursor in the new waypoint position and press the left mouse button again.
Delete waypoint	Place cursor over the waypoint and press the right mouse button.
Insert waypoint	Click on the leg between two waypoints with the left mouse button. A new waypoint is inserted. Move the waypoint to the desired position and press the left mouse button to place it.
Exit edit mode	Press *“OK”* on the route toolbar.

Note: An active route can also be edited (while it is being used). When an active route is edited, it is not possible to edit the waypoints that are immediately before and after the ship.

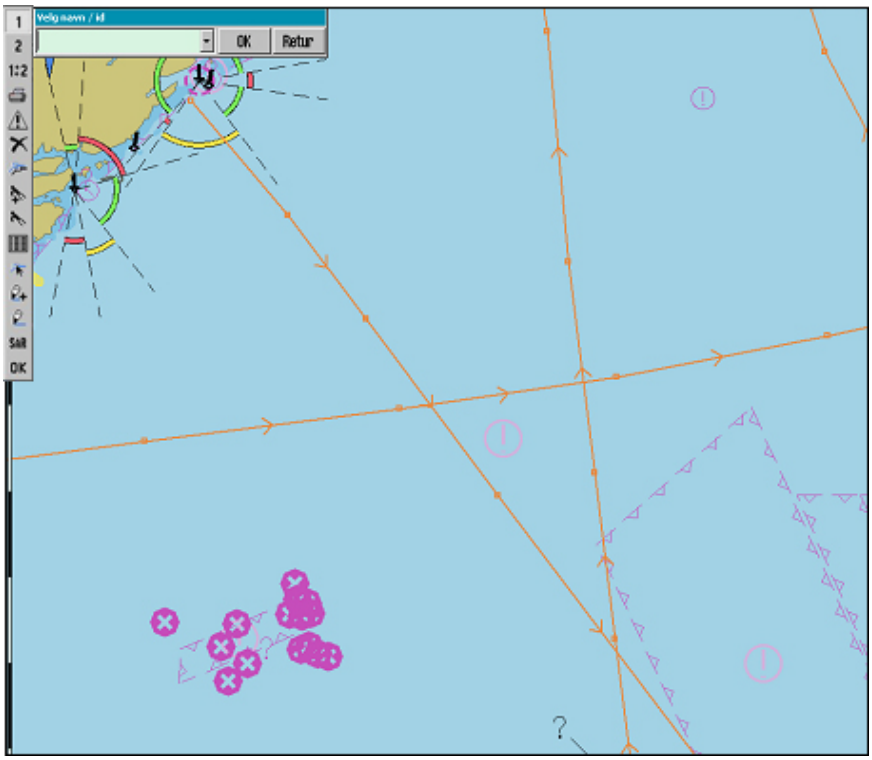
5.2.3. Selecting a route

The *route selection button* is used to select a route for use or modification. When pressed, all saved routes are displayed in the chart display, and a list of routes is available in the upper left corner of the chart display.

To select a route in the chart display, place the cursor over it and press the left mouse button.

To select a route for use in the direction opposite of the arrows shown on the route, place the cursor over it and press the right mouse button.

Routes can be selected by name/id using the drop down route list. Select a route from the list, then press *"OK"* to select the route. (The route can be selected for use in the opposite direction by pressing *"Retour"* instead of "OK".)



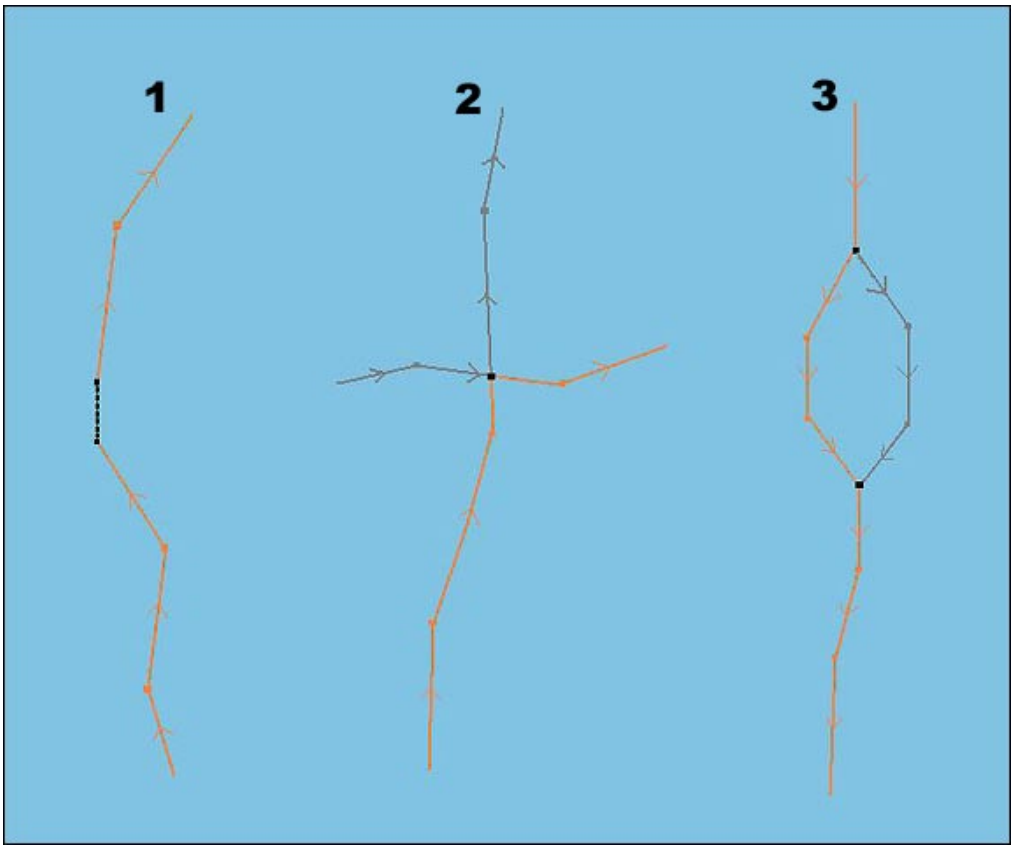
5.2.4. Merging routes

Different stored routes can be combined into a new route, by following this procedure:

1. Select route that is to be extended with the *route selection button*, as described above. (see chapter 5.2.3).

3. Next, press the *add route button*. This button functions in the same way as the route selection button. When the second route is selected, the two routes will be combined as shown in the three examples below.

To plan for merging routes, the operator should be mindful of the existing routes that are displayed in grey in the chart display while the new route is being drawn (All existing routes are shown in gray while drawing new routes). Waypoints in the new route can be placed at locations where they will merge with waypoints from existing routes.



Example 1: Route extension.
The last waypoint joins with first on the new route, or a connection is made.

Example 2: One joining waypoint (< 0.1 Nm.)
In the case where there is one joining waypoint, a combination of the routes will be created. The grey route parts will be discarded.

Example 3: Two joining waypoints (< 0.1 Nm)
When the first and the last waypoint on part of a route join with waypoints on the first route selected, intermediate parts of the first route will be replaced by waypoints from the extension (new)route.

The merged/joined route will be presented as a new route, and TECDIS will automatically renumber the waypoints. The joined/merged route can be saved as new route by pressing the *copy active route to new route button*.

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

Use the *copy active route to new route button* to save the currently selected route as a new route. (Save as)

To create a new route based on an existing route, a copy of the existing route can be created. First, the existing route should be selected (see chapter 5.2.3). Now, by pressing the *copy active route to new route button* and confirming the operation by pressing *"OK"* in the query window that is shown, the existing route is copied. The operator can now give the new route a name in the window that is shown in the lower part of the screen. The new route can now be modified as desired, and the template remains unchanged in the route storage.

5.2.6. Deleting a route

Press the *delete route button* to delete a route. If a route is currently selected, it is deleted immediately, after the operator confirms the operation. If no route is selected, all routes are displayed and a route can be picked for deletion in the same manner as selecting a route (see chapter 5.2.3). The operator is asked to confirm the deletion before it is performed.

5.2.7 Activating a selected route

If a route has been selected but not activated previously, it can be activated by pressing the *activate route button*. Activating the route starts route navigation. For details on this, see chapter 5.3.

5.2.8. Generating a waypoint list / route report

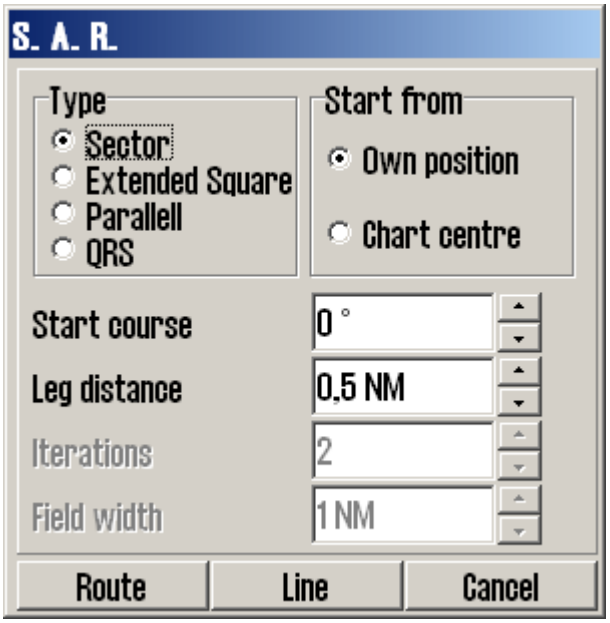
When a route is selected, and the *make, edit and print waypoint list button* is pressed, a window containing a text report of all waypoints details and total distance / time is displayed. The report may be saved or printed to a connected printer. Comments can be added, if needed.

5.2.9 C-Routes automatic route drafts

For details on C-Routes automatic route draft generation, refer to "TECDIS 4.7.1: New Features Guide".

5.2.10. SAR: Search and rescue

The *search and rescue button* provides access to the systems Search and Rescue functionality. Here, different SAR patterns can be generated, either as mariner object lines (*"Line" button*) or as routes that can be used for route navigation (*"Route" button*).



Pressing the search and rescue button opens a new window. Here, search pattern (type), start position and further settings be done.

First, select the search pattern. The most common SAR patterns are available (Sector, Extended Square and Parallel).

Next, select the search pattern origin (Own vessel position or chart center).

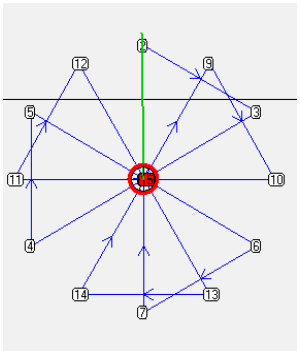
Now, adjust the search pattern parameters to match the actual scenario. Search direction, length of lines, number of lines and distance between lines are adjustable using the window settings. The parameters that are not applicable to the selected search pattern are disabled.

By pressing the *"Route"* button, the specified SAR pattern is generated as a route and is automatically activated for route navigation.

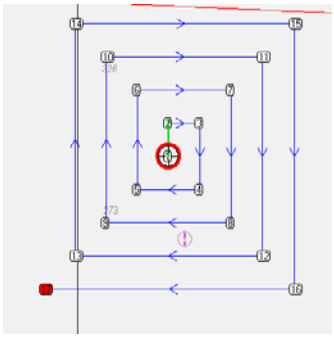
By pressing the *"Line"* button, the specified SAR pattern is generated as a red mariner objects line. This line is displayed regardless of mariner object visibility settings. To delete it, use the mariner object lines/areas delete function (see chapter 4.8.3).

The SAR pattern type "QRS" is different from the other selections. This option displays a numbered grid in the chart. To display this grid according to the specified parameters, press *"Show"*. To hide it again, return to this window and press *"Hide"* or select another SAR type.

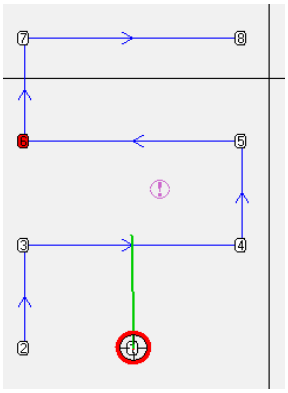
Sector



Extended Square



Parallel



5.2.11. Voyage planning

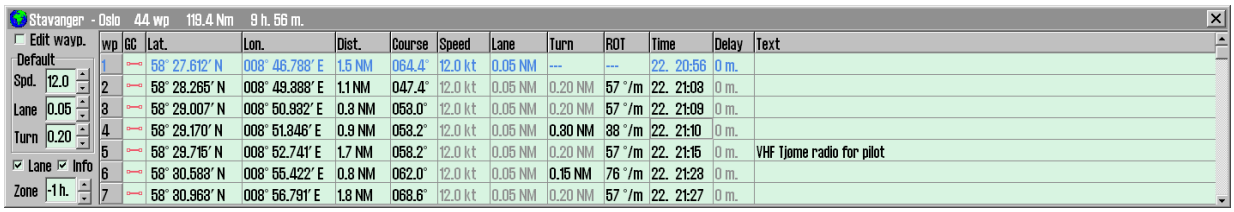
The *voyage planning and calculation button* provides access to detailed information and control of the selected route parameters.

When pressed, a table with detailed waypoint information is displayed in the lower part of the screen.

Description of the different columns can be found in the table to the right.

Default values for Speed, Lane and Turn are specified in the left part of this window. These are used for the entire route, except for waypoints containing override values.

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
Spd.	Planned speed
Lane	Lane/corridor width
Turn	Turn radius
ROT	Rate Of Turn
Time	ETA waypoint
Delay	Waypoint delay
Text	Waypoint name and additional information



Speed, lane, turn, rate of turn (ROT), time, delay and text for each waypoint can be modified, also during a voyage. If 0 is used as the new value, the default value is used. The value will then be shown in grey. If a new value is specified for a given waypoint, this will override the default value and the value text will be shown in black.

As an example, a waypoint delay at a port can be entered. This can be very useful for vessels operating in a regular route. In the column for text, comments or names for each waypoint can be filled in. For insertion of further comments and/or pictures/ documents/presentations etc, use waypoint object information.

To modify the route itself, the *"edit waypoint"* checkbox must be ticked or the route edit button on the route toolbar must be active (see chapter 5.2.2). When waypoint editing is complete, the route safety check will be activated automatically.

The *"Lane"* checkbox toggles display of route lanes in the chart display.

The *"Info"* checkbox toggles display of planned course and speed on route legs.

The *"Zone"* field specifies the time zone used for the route.

NB! When voyage planning is in *"edit waypoint"* mode, the route monitoring function is OFF. (No track commands to auto pilot are sent.)

By clicking a waypoint in the list which is not displayed on the present chart display, the chart will be centered at chosen waypoint. Note: This function is disabled if auto mode is activated; the chart display is then following the vessel.

5.2.12. Using the keyboard in the voyage planner

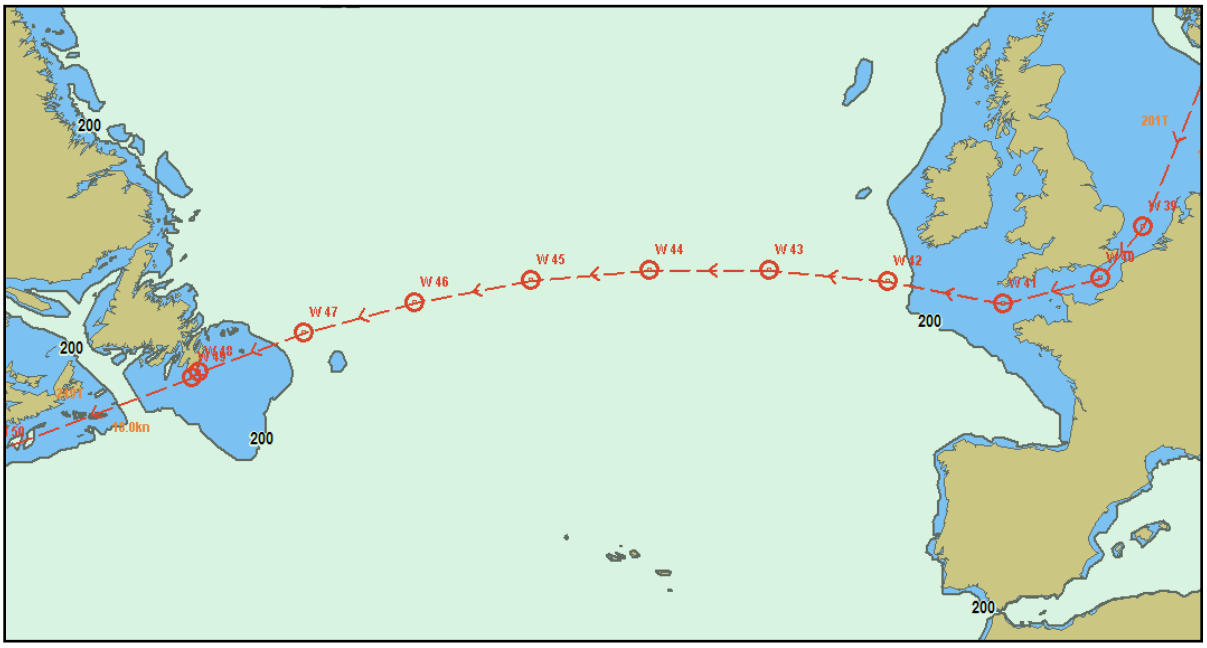
In *"edit waypoint"* mode, waypoint positions can be modified/entered using the keyboard. Click on a waypoint coordinate with the left mouse button two times and modify the coordinate value using the keyboard. When done, press enter, or click another part of the waypoint list with the left mouse button.

Waypoints can be inserted before the currently selected waypoint using the keyboard by pressing the *"Ins"* key. The new waypoint is placed at the midpoint between the previous and the currently selected waypoint.

The selected waypoint can be deleted using the keyboard by pressing the *"Del"* key.

5.2.13. Great circle routes

Great circle or rhumb can be selected for each leg in the voyage plan. A route leg can be toggled between great circle and rhumb line by clicking in GC field for the actual leg. If great circle is selected the line displayed in this field will as well indicate safety status using the same colors as lane corridors in the chart display (see chapter 5.2.1).

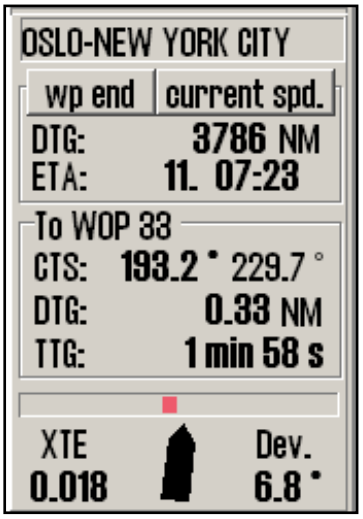


When great circle is selected, extra waypoints are added in the list. They are the intermediate waypoint on the great circle. The great circle voyage consist of numerous rhumb line legs. These intermediate waypoints cannot be modified, and are automatically removed if the leg is switched back to rhumb line.

5.3. Route navigation

See chapter 5.2.3 and 5.2.7 for information on how to select and activate a route.
When you activate a selected route and the vessel is located more than twice the lane width away from the route, a message will appear upon activation, requesting that you choose which waypoint to use as the starting point for the route navigation. After confirming this message, select the desired waypoint by clicking on it.

When the last waypoint has been passed, the route will automatically be deactivated.



The route navigation information area is displayed towards the bottom of the right side vertical menu. This area contains all relevant information about the current route navigation state.

At the top of this area, the name of the current route is shown (if entered).

Below this, Distance to go (DTG) and estimated time of arrival is shown. See chapter 5.3.4 for more details regarding this area.

The next information area displays Course to steer (CTS) to the next wheel over point (WOP) (the first heading displayed here is the current CTS, the second heading is the next CTS), Distance to go (DTG) and Time to go (TTG) to the next wheel over point.

The bottom information area displays Cross-track error (XTE) and deviation of current course to the current CTS (Dev.). The unit for XTE is the same as specified for the cursor range (see chapter 5.1.1.) This information is also displayed graphically; The horizontal bar 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.

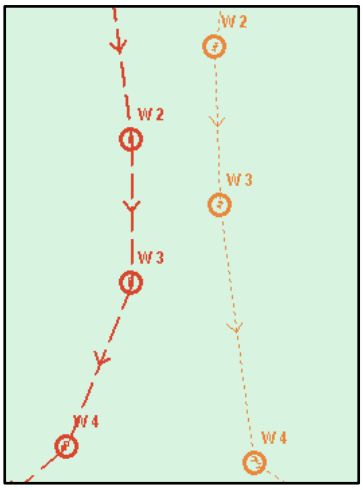
5.3.1. Calculate voyage time

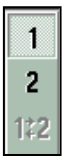
The information area for ETA and DTG can display this ETA/DTG to the end of the current route, or to any waypoint using either the current speed or the planned speed as specified in the voyage planner.

The text on the *"wp end"* button shown in the illustration above indicates which waypoint the currently displayed ETA/DTG information refers to. Click on any waypoint in the chart display to switch ETA waypoint. The selected ETA waypoint is marked graphically in the chart display, and its number is reflected in the text of this button. To switch back to showing ETA to the route endpoint, click this button.

The ETA information can be calculated based on the current vessel speed, or the planned speed. To switch between these modes, press the button shown in the illustration above with the text *"current spd."*. The text on this button reflects the current ETA calculation mode.

5.3.2. Primary and secondary/alternative route.





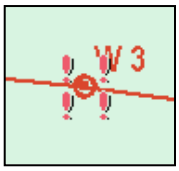
The top three buttons in the route menu allows the operator to select and display two routes simultaneously. The *"1"* and *"2"* buttons indicates the currently selected route "position" and allows for switching between the positions. All route menu operations affect the currently selected route position. Note that only the route in the first position can be activated.

The *"1↔2"* exchanges the routes in the two positions. If route navigation is active, the operator is asked to confirm termination of active route, and is asked if the new primary route should be activated.

The primary route is displayed in red, and the secondary in orange, as shown in the illustration to the left.

Transfer of primary and secondary route to second TECDIS: When two TECDIS units are present in the installation and an IP address for the second unit has been configured in the Setup program, routes will automatically be transferred to the second TECDIS unit. See chapter 3.6 for details.

5.3.3. Critical point – route warnings.



It is possible to enter custom warnings or alerts for any given point of the route. This is done via the *chart object inspector button* on the top menu (see chapter 6.1).

To enter a critical point in the route, select the chart object inspector tool and click on the waypoint where the warning/alert is to be placed. This will bring up a window in the bottom of the chart display area that provides details on the selected object. Activate *"Warning before point"* in this window and specify either the time or distance before the point when the alert should be shown. The waypoint marked as a critical point will be marked with 4 red exclamation marks.

When the critical point is reached, a *"Point Info"* alarm will be raised and the information window for the waypoint will be shown. Any text entered previously for the point will be shown. Note that the critical point will be triggered when the vessel moves within the specified range from any heading, not just along the route. When the alert has been raised, the marking of the critical point in the chart will switch to 4 green exclamation marks.

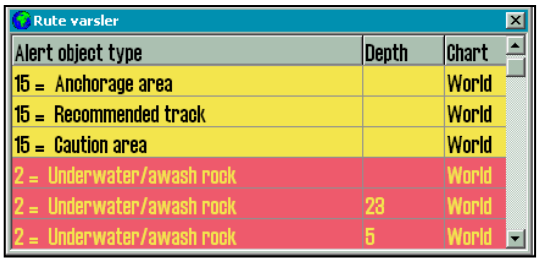
To deactivate the critical point, unselect *"Warning before point"* for the relevant waypoint following the same procedure as outlined for activating it.

5.3.4. Route dangers and warnings

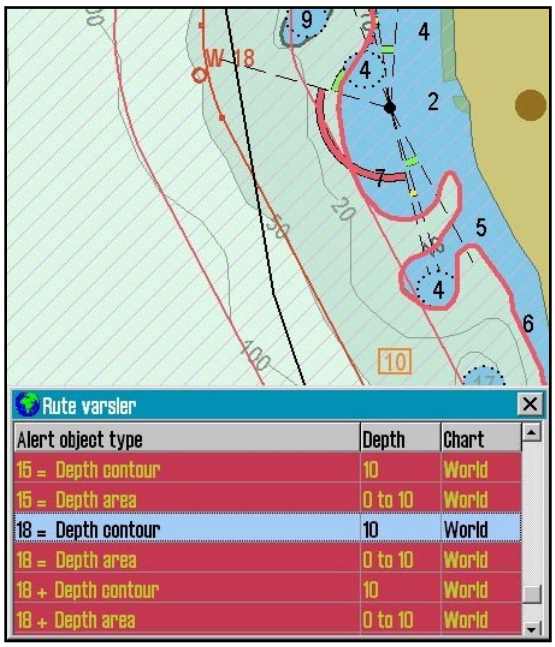
Whenever a new route is created, or an existing route is selected, the system will perform a route safety check and generate a list of dangers and warnings for the route.


Means to access this list is provided through the *list route dangers and cautions button* on the route menu bar. This button may be shown either a question mark or an exclamation mark. An exclamation mark indicates that the route safety check needs to be performed again. Press the button to start this, and the check will be performed in the background. While the check is in progress, a notification about this will be displayed at the top of the anti grounding chart display.

When this button is shown with a question mark, the route safety check has been completed and the dangers and cautions list can be displayed by clicking the button.



The route dangers and cautions list is composed of several columns. The first number indicates the waypoint number the warning/danger relates to. The next symbol can either be a “=” mark, which indicates that the warning/danger relates to a leg between waypoints, or a “+” mark, which indicates that the warning/danger relates to the turn radius at a waypoint. The next column provide a short description of the object, followed by the depth of the object (if available). The final column names the chart database where the object is located.



Warnings are shown with yellow background and are listed first. Immediately following the warnings are the dangers, which are shown with red background and yellow text.

All warnings and dangers can be inspected by clicking them in the list. For warnings, an additional window will appear with the warning text.

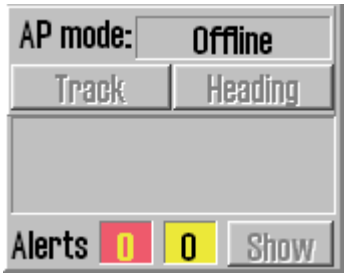
When an item in the list is clicked (and auto mode is not enabled), the chart will be repositioned to show the danger object, which will be marked with red in the chart display.

5.4. Track Control

Refer to Raytheon Anschütz AP2025 PLUS User Manual for operation of this autopilot.

The Track Control feature in conjunction with the sources of position, heading and speed information is intended to keep a ship automatically on a pre-planned track over ground under various conditions and within the limits related to the ship's maneuverability.

5.4.1. Autopilot mode information



When the system is connected to a Raytheon Anschütz AP 2025 Plus autopilot and configured for Track Control, an additional field is displayed above the alarm display area in the lower right corner of the display. In this field, the current operation mode of the autopilot is displayed.

The possible values for AP mode are:

Offline	No data is being received from the autopilot.
Manual	The autopilot is currently in manual steering mode.
Heading ctrl	The autopilot is currently in Heading control mode.
ROT control	The autopilot is currently in Rate of Turn control mode.
Track Control	The autopilot is currently in Track Control mode.
External	The autopilot is in External (Remote) mode and the autopilot remote Control dialog is shown in TECDIS (See below).
Override	Refer to autopilot manual

5.4.2. Sensor monitoring and fall-back arrangements

The Track Control system must be connected to two independent position sensors, two independent heading sensors and a speed sensor. The data from these sensors is continually monitored by the system and alarms are raised if the data is lost or deemed invalid. Positions and headings from the independent sensor are also compared, raising alarms if the position / heading difference exceeds the limits specified in TECDIS Setup (See 7.6 and 5.5).

When a sensor data or other failure is detected, the system will if possible switch to Heading Control with parameters set for the best possible keeping with the pre-planned track over ground. Values for 'Set course' and 'Rate of Turn' for next waypoint is set to the values active when track control was terminated. **On failure of both heading sensors or on loss of power to the autopilot, the rudder angle will not be changed by the system from the rudder angle at the time of failure.**

The following events and indications will take place when Track Control is stopped by the system:

Autopilot

- Track Control mode indication light goes dark.
- Heading control mode indication light is lit (if possible).
- Track Control stopped alarm is triggered.

TECDIS

- Alarm is raised, indicating reason for termination of Track Control Mode.
- AP mode display changes to Heading Control mode (or 'Offline' if communication with Autopilot is lost).

5.4.3. Track Control operation

In order for Track Control mode to be activated, a pre-planned route must be selected and activated. In addition, the current position, heading and speed of the vessel in relation to the route must fall within the limits specified in TECDIS Setup (See 5.4.5 and 7.6).

While in Track Control mode, TECDIS and the Raytheon Anschütz AP2025 PLUS will work together to keep the ship travelling over the pre-planned track over ground. Before each waypoint, the following sequence of events will occur:

	Event		Description	When
1.	Indication:	Change Course early warning	This indication is activated in TECDIS between 1 and 5 minutes before Course change (WOL), as configured in TECDIS Setup (See 7.6).	1-5 min before WOL
2a.	Indication:	Change Course LAST warning	If Change Course early indication (1) was acknowledged, this indication is activated in TECDIS between 30 and 60 seconds before Course change (WOL), as configured in TECDIS Setup (See 7.6).	30-60 sec before WOL
2b.	Alarm:	New WP	If Change Course early indication (1) was **not** acknowledged, this alarm is activated in TECDIS between 30 and 60 seconds before Course change (WOL), as configured in TECDIS Setup (See 7.6).	30-60 sec before WOL
3.	Alarm:	New WP	If Change Course LAST indication (2a.) was **not** acknowledged, this alarm is activated in TECDIS at the start of the course change.	At WOL
4.	**Turn is performed**			**At WOL**
5.	Back-up navigator alarm from the separate alarm system		If Change Course LAST indication (2a.) or New WP alarm (3.) was **not** acknowledged, a back-up navigator alarm is activated on the separate alarm system.	30 sec after WOL

As long as Track Control remains active, the system will at all times continue to keep the ship following the pre-planned track over ground regardless of which alarms and indications that are acknowledged.

5.4.4. Activating Heading control mode

The ‘Heading’ button will set the autopilot to heading control mode.

5.4.5. Activating Track Control mode

The ‘Track’ button will initiate Track Control mode. In order for this mode to be available to the operator, a number of preconditions must be satisfied:

- A route must be selected and activated for route monitoring. The ‘Track’ button is disabled if no route is selected and activated.
- The distance from the vessel position to the activated route leg must be within the distance limit specified by the ‘max lane deviation’ parameter in Setup (See 7.6.1.). (If the distance from the vessel position to the route is larger than this limit when the route is activated, the system will request the operator to specify the starting waypoint for route monitoring. When a waypoint is selected, the system will set up a temporary route leg from the vessel position to the starting point. This can be edited if needed.)
- The difference between vessel course over ground and planned heading must be less than the limit specified by the ‘max course deviation’ parameter in Setup. (See 7.6.1.)
- The vessel speed must be larger than the limit specified by the ‘Min speed’ parameter in Setup. (See 7.6.1.)

If any of these preconditions are not met, the problem will be communicated to the operator.

5.4.6. External (Remote) mode

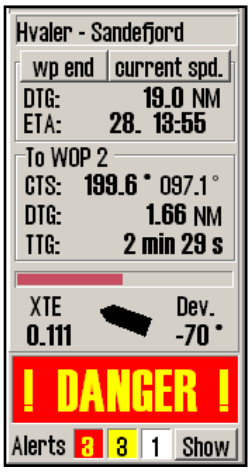
When the autopilot is set to External (remote) mode, a dialog is displayed in TECDIS, showing the current heading, the current Set Course and the current Set RoT (Rate of Turn).

The current Set Course can be adjusted by either dragging on the rotational control immediately below the Set Course value display with the left mouse button depressed.

The current Set Course can also be adjusted by clicking on the red and green arrows below the rotational control.

The Set RoT can be adjusted by dragging the slider immediately below the Set RoT value display with the left mouse button depressed.

5.5. Alarms, Warnings and Caution messages



A number of situations will cause the system to raise *alarms*, *warnings* or *caution* messages. These notifications are displayed in the lower right corner of the display. This area contains a large text notification area with counters for alarms, warnings and caution messages. In the lower right corner of the area, the *"Show"* button provides access to the full list of active events.

The text notification area will display the next event (if any) that requires acknowledgement. If no events require acknowledgement, but an alarm is active, the alarm will be displayed. If multiple acknowledged alarms are active, the text *"ALARMS"* is displayed. When no alarms are active and no events require acknowledgment, this area is blank.

When several unacknowledged events are present, they are presented for acknowledgment in the following order:

1. Alarms (in chronological order)
2. Warnings with audible alarm selected (in chronological order)
3. Warnings without audible alarm selected (in chronological order)

Alarms, warnings and caution messages are signaled as follows:

	Text notification area	Alarm list	Audible alarm
Unacknowledged Alarm	**Red background Text flashing yellow/black.**	**Red background Yellow text**	**Yes**
Acknowledged Alarm	Red background Yellow text	Red text	No
Unacknowledged Warning	**Yellow background Black text**	**Yellow background Black text**	**No / Optional (See 3.8.4.)**
Acknowledged Warning	Not shown	Yellow text	No
Caution Message	Not shown	Black text	No

For unacknowledged alarms (and optionally for selected unacknowledged warnings, see chapter 3.8.4.), an audible alarm is generated through the sound source specified in the Setup program (see chapter 7.3).

Note that it is possible to activate *"Standby mode"*, if this has been marked as allowed in the Setup program. In this mode, **no audible alarms will be generated**. A prominent and flashing standby mode warning is shown in the chart display area whenever this mode is active. See chapter 3.8.4 and 7.3 for details.

5.5.1 Acknowledging alarms and warnings

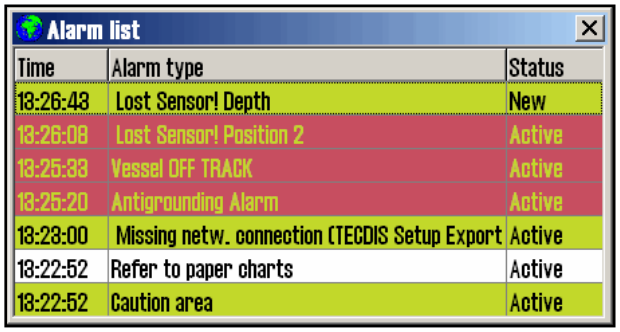
Alarms and warnings will remain unacknowledged until they are acknowledged by the operator, and will remain visible as long as the alarm/warning condition is present. Caution messages require no acknowledgement.

Events can be individually acknowledged by clicking the text notification area, by pressing *spacebar* on the keyboard or by pressing *ALARM ACK* on the Furuno RCU-018 control unit.

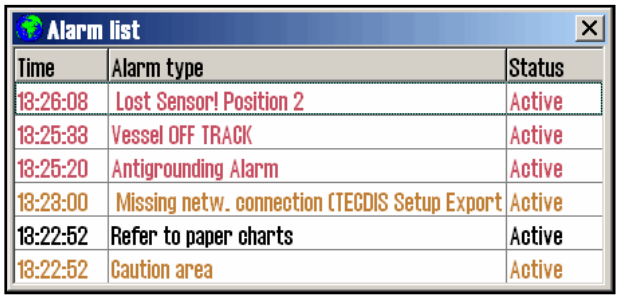
When more than one unacknowledged event is present, all unacknowledged events can be acknowledged at once by clicking in the chart display area or by pressing *ESC* on the keyboard three times. The first click will bring up the full alarm list, the next click will acknowledge all events, and the final event will hide the alarm list again.

Events can also be acknowledged from an external alarm central, if connected.

5.5.2. Alarm list



The number of active alarms, warnings and caution messages are indicated below the alarm field, and by pressing the *"Show"* button, a complete alarm list is displayed. This list includes information about alarm type, time triggered and status.



When alarms and warnings have been acknowledged, they are still displayed in the alarm list as long as they are active.

Some events provide more detailed information when clicked in the alarm list.

The events *"Antigrounding"* and *"Possible danger"* will display a separate list of dangerous objects when clicked. Entries in the new list can then be clicked to highlight the dangerous object in the chart display.

The alarm *"Ship CPA"* will display the target AIS / Tracked Target details window when clicked.

5.5.3. Alarm message texts

Alarm	Description
! DANGER !	Anti grounding. Click to open a separate list.
Ship CPA	Danger of collision. (see chapter 3.5.6). By clicking on Ship CPA in the alarm list, AIS/ARPA target information is shown.
Lost CPA	Lost signals for a target that has an active CPA alarm.
Lost AIS	Lost signals for an AIS target within the range specified in the AIS menu folder (see 3.5.5)
Point Info	The vessel has reached a route critical point
OFF TRACK	The vessel has moved outside the active route lanes.
New WP	The vessel has reached a new waypoint, when this has been defined to be alerted with an alarm. (see chapter 3.8.4) (Track Control: Course Change alarm given when course change indications are not acknowledged. See 5.4)
Last WP	The vessel has reached the last waypoint in the active route.
Low Speed	The vessel speed is below minimum allowed threshold. (Track Control only)
Lost Sensor! Position 1	TECDIS is no longer receiving data from sensor for position 1.
Lost Sensor! Position 2	TECDIS is no longer receiving data from sensor for position 2.
Lost Sensor! Heading 1	TECDIS is no longer receiving data from sensor for heading 1. (Track Control only)
Lost Sensor! Heading 2	TECDIS is no longer receiving data from sensor for heading 2. (Track Control only)
Lost Sensor! Water Speed	TECDIS is no longer receiving data from sensor for water speed. (Track Control only)
Sensor Error! Pos.1 Wrong Datum	Sensor for position 1 is sending in a different datum than WGS84.
Sensor Error! Pos.2 Wrong Datum	Sensor for position 2 is sending in a different datum than WGS84.
Gyros difference limit exceeded	Heading difference between sensors Heading 1 and Heading 2 is larger than allowed threshold. (Track Control only)
Pos sensors difference limit exceeded	Position difference between sensors Position 1 and Position 2 is larger than allowed threshold. (Track Control only)
MONITOR	TECDIS has lost serial communication with the monitor.
AUTOPILOT	TECDIS has lost communication with the autopilot. (Track Control only)
Danger OBJ	Own object with danger marks within the safety zone.
Chart license expired Check license status	One or more chart licenses have expired. Check license status (See 3.2) and contact chart supplier.
Dynamic licensing update deadline	Refer to “TECDIS 4.7.1: New Features Guide” (Dynamic licensing only)
Dynamic licensing out of credits	Refer to “TECDIS 4.7.1: New Features Guide” (Dynamic licensing only)
ALARM	Other alarm situation, check alarm list.
ALARMS	Shown when there are 2 or more active alarms, and all alarms and warnings have been acknowledged.

5.5.4 Warning message texts

Warning	Description
new CAUTION	The vessel is entering a new area with special conditions. By clicking on the text “new Caution” in the alarm list, it is marked with red color in the chart.
Lost Sensor! COG/SOG 1	TECDIS is no longer receiving data from sensor for COG/SOG 1
Lost Sensor! COG/SOG 2	TECDIS is no longer receiving data from sensor for COG/SOG 2
Lost Sensor! Heading 1	TECDIS is no longer receiving data from sensor for Heading 1
Lost Sensor! Heading 2	TECDIS is no longer receiving data from sensor for Heading 2
Lost Sensor! Water Speed	TECDIS is no longer receiving data from sensor Water Speed
Lost Sensor! Radar Arpa 1	TECDIS is no longer receiving data from sensor Radar Arpa 1
LOST SENSOR! Radar Arpa 2	TECDIS is no longer receiving data from sensor for Radar Arpa 2
Lost Sensor! Radar Cursor 1	TECDIS is no longer receiving data from sensor for Radar Cursor 1
Lost Sensor! Radar Cursor 2	TECDIS is no longer receiving data from sensor for Radar Cursor 2
Lost Sensor! AIS	TECDIS is no longer receiving data from sensor for AIS
Lost Sensor! Depth	TECDIS is no longer receiving data from sensor for Depth
Lost Sensor! Relative Wind	TECDIS is no longer receiving data from sensor for Relative Wind
Lost Sensor! Route	TECDIS is no longer receiving data from sensor for Route
Possible Danger	Antigrounding; possibly dangerous object within the safety zone.
Lost backup link to other TECDIS	Lost communication with other TECDIS (Error when transferring routes).
Change Course early warning	First warning of upcoming course change (Track Control only)
Change Course LAST warning	Last warning of upcoming course change (Track Control only)
Chart license expiring check license status	One or more chart licenses will expire in less than 14 days. Check license status (See 3.2) and contact chart supplier.
Dynamic licensing update deadline	Refer to “TECDIS 4.7.1: New Features Guide” (Dynamic licensing only)
Dynamic licensing credits low	Refer to “TECDIS 4.7.1: New Features Guide” (Dynamic licensing only)
Missing netw. connection (TECDIS Setup Export IP)	The physical network connection to the other TECDIS unit is not operational. Check the connection.

Warning (cont.)	Description
Target buffer use > 95% Reduce Ais range	TECDIS is receiving too many AIS targets, reduce the AIS range in AIS menu folder (See 3.5).
Target buffer full! Reduce Ais range	TECDIS is receiving too many AIS targets, reduce the AIS range in AIS menu folder (See 3.5).
Ship CPA	Danger of collision. (see chapter 3.5.6). When CPA alarms are disabled, warnings are provided instead.
WARNING	Other warning, check alarm list

5.5.5 Caution message texts

Caution message	Description
Refer to paper charts	Unofficial charts are present on the chart display.
Refer to paper charts or S52 presentation	The chart is not displayed in S52 presentation.
Ais range is limited	Ais targets outside a specified range are not displayed (See 3.5).
Sleeping Ais class B vessels are hidden	Sleeping Ais class B targets are not displayed (See 3.5)
No alarm raised for lost close targets	Alarm for lost Ais targets has been disabled (See 3.5).
All time limited chart objects shown	All time limited chart objects are displayed (See 3.3.1).

5.6. Anti grounding

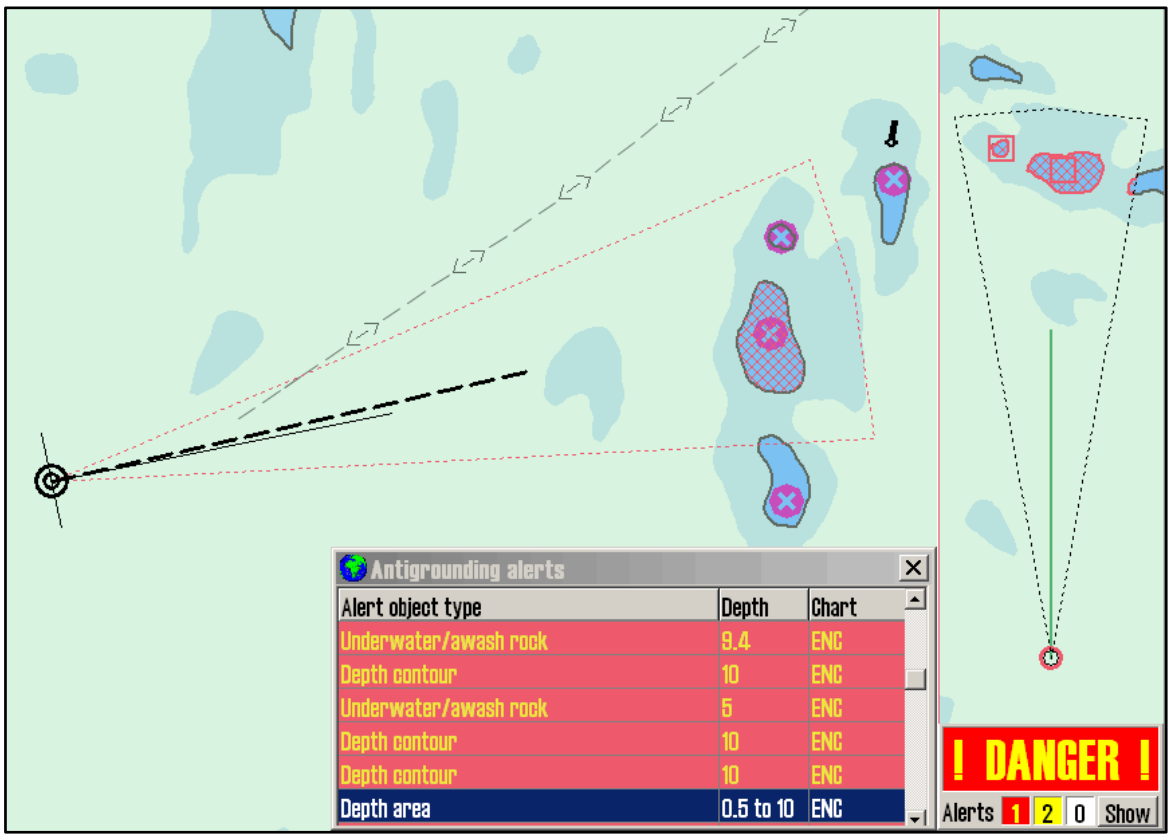
Whenever the vessel speed over ground (SOG) is above 1.0 kn, the system will constantly monitor a safety zone ahead of the vessel for dangerous chart objects. The angle and extent of the safety zone is specified in the *"Safe"* menu folder (See chapter 3.8).

The vertical menu area includes an anti ground chart display that displays this safety zone at all times. This chart display area is fixed to course up mode.

If any dangers are detected, the following actions will occur:

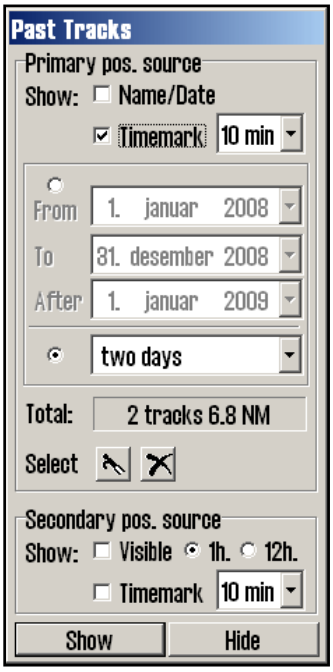
- An anti grounding alarm will be raised.
- The anti grounding chart will highlight dangerous chart objects within the safety zone.
- The safety zone will be displayed on the main chart display.
- If the main chart display has been repositioned away from the vessel, the chart display is moved back to the vessel.
- If *"Auto Safe Hazards"* is set to "Auto On" or "Auto On + Off", the "Safe Hazards" and "Shallow Depths" chart menu folder settings will be turned on. (See 3.3.1, 3.8.3 and 4.7.3).
- Until the anti grounding alarm is inspected, the dangerous chart objects inside the safety zone will be highlighted in the main chart display as well.

By showing the alarm list and clicking on the antigrounding alarm (or possible danger alarm), a new window listing the dangerous objects will be displayed. The individual dangerous objects can be clicked to highlight these objects in the main chart display.



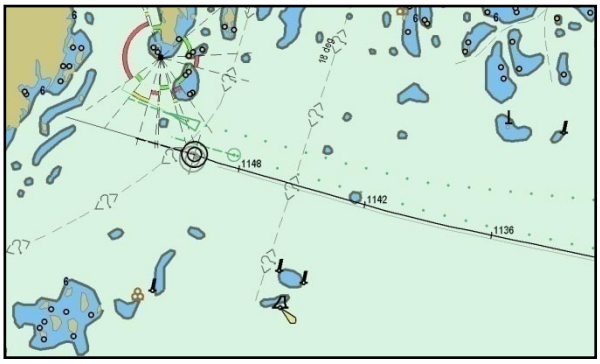
5.7. Past Track (History)

The *track dialog button* on the top menu bar displays the "Past Tracks" dialog, providing access to the tracks of previous vessel voyages. The dialog is divided into three main parts; Control of track selection from the primary position sensor, control of track display from the secondary position source, and the *"Show"* and *"Hide"* buttons that show and hide the selected tracks, respectively.



The first area allows the operator to select a subset of the stored tracks through one of two means. The first option is showing all tracks between a *"From"* and a *"To"* date, as well as all tracks *"After"* a given date. The second is selecting a number of days, weeks or months of track history, going back from the current date. Track names (if previously entered with the help of the object inspector cursor, see 6.1.1), dates and timemarks at a selected time interval can be selected for display as well.

The second area allows the operator to toggle visibility of the secondary position sensor track, and select either the last hour or for the past 12 hours of secondary track. These tracks may be shown with timemarks at a selected time interval as well.



Once the *"Show"* button is pressed, the selected tracks are displayed in the chart display. Tracks from the primary position sensor are shown in black, and tracks from the secondary position sensor are shown in grey. The track dialog button will appear pressed down until the track dialog is displayed again and *"Hide"* is pressed to hide all displayed tracks.

After a track selection is performed and shown, the track dialog can be displayed again to observe the number of displayed tracks and the total distance in the *"Total"* area.

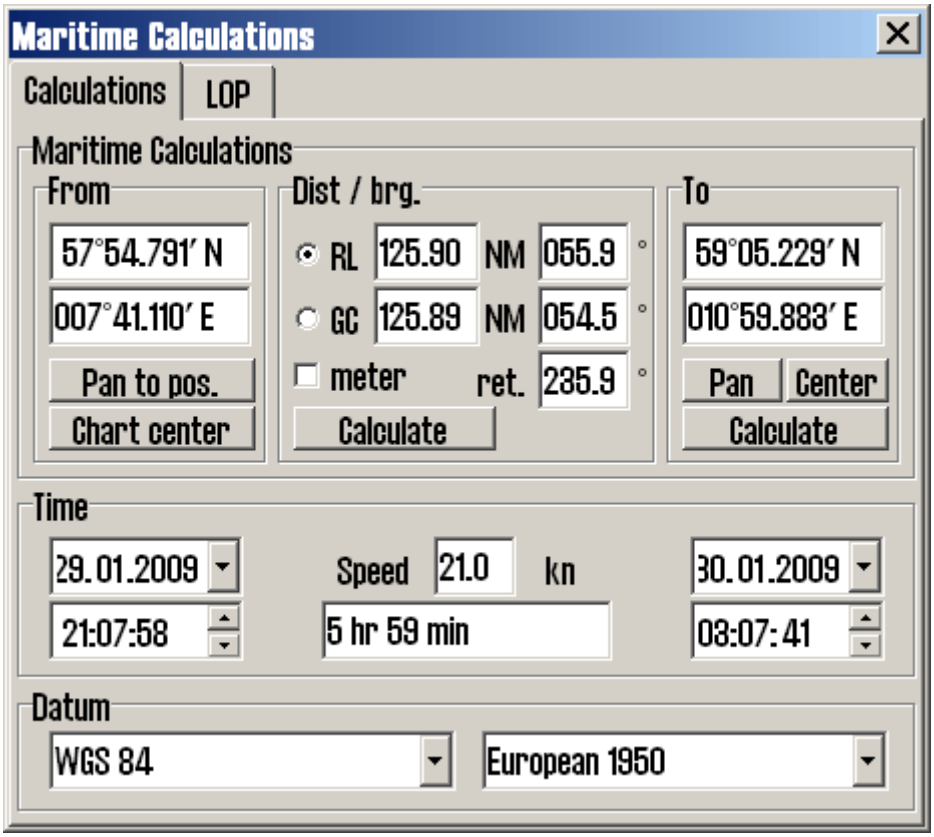
5.7.1. Selecting or deleting individual tracks:

Individual tracks can be selected for display using the *boat hook button*. When this button is pressed, all tracks are displayed temporarily, and a track can be selected either graphically in the chart display by clicking it with the boat hook cursor, or from the track list displayed towards the top of the screen.

Individual tracks can also be deleted using the *delete track button*. After pressing this button, select one of the previously displayed tracks to delete by clicking it using the "cross" cursor. Note that only tracks older than 3 months may be deleted.

5.8. Maritime calculations and Lines of Position

Pressing the *maritime calculations button* on the top menu bar displays a window in the lower left corner of the display. This window provides two functions; A maritime "calculator", and an interface for entering manual position fixes using bearing and/or range observations (Lines of Position, or L.O.P.). These features are provided on separate folders in the window (*"Calculations"* and *"LOP"*).



5.8.1. Calculations

The maritime calculations window allows for a number of position, distance/bearing, time/speed and datum operations. The window includes a several value fields that may be specified manually.

The position areas in the top left and right corners may also be set to the center position of the current chart display (*"Chart Center"* and *"Center"* buttons). The chart display may be repositioned to the positions and the position marked in the chart display by pressing either the *"Pan to pos."* or *"Pan"* buttons, respectively.

The upper middle bearing/range area allows for both rhumb line and great circle based calculations (*"RL"* and *"GC"* selections), and the ranges may be specified in meters by selecting *"meter"*. When calculated, the return bearing is provided to the right of the "meter" selection.

The *"Calculate"* buttons in the distance/bearing and "To" position areas may be used to calculate the respective values based on the other information specified. For example, if

"From" position and distance/bearing is entered, the resulting position is calculated by pressing the *"Calculate"* button in the "To" field.

The middle area focuses on time and speed. The time and date values are initialized with the current time and date when the calculator is opened. By entering a speed value, the duration of moving between the positions in the upper area at the specified speed is provided below the speed field and the rightmost time and date reflects the arrival time given departure at the leftmost time and date. These time/date fields may be adjusted, and the other will be adjusted correspondingly to correctly reflect the voyage duration.

The *"Datum"* area at the bottom of the calculator allows the operator to translate the "From" and "To" positions between position datums, or enter positions in other datums. The calculator assumes that all positions entered are in the datums specified here. When datum is changed for either, the corresponding position will be translated to the new datum selection.

Some examples of how the calculator may be used:

- **Calculate a new, unknown position using bearing and distance from a given position.**
  Reposition the chart to the desired origin position and click the *"Chart center"* button in the "From" area (or enter it manually). Select "RL" or "GC" in the distance/bearing area and enter the corresponding distance and bearing values. Now click the "Calculate" button in the "To" position area to compute the new position.

- **Calculate the bearing and distance between two positions**
  Enter the two positions, either manually or by repositioning the chart and clicking the "Center" buttons. Now press the *"Calculate"* button in the distance/bearing area to calculate both rhumb line and great circle bearings and ranges.

- **Calculate time required to move between two positions at a given speed**
  Enter the two positions and enter a speed value in the middle "Time" area. The time required to move between the positions is specified below the speed field.

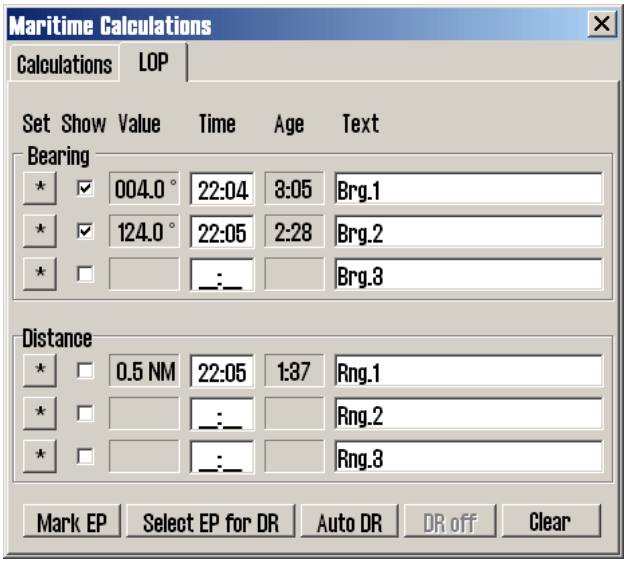
- **Convert a position to WGS 84 from another datum**
  Select the datum of the position to be entered in the datum selection field for either the "From" or "To" position fields. Next, enter the position in the corresponding position field. Finally, select WGS 84 in the same datum selection field as the first step. The position is now converted to WGS 84.

5.8.2 Lines of Position (LOP)

If it is determined that both the primary and secondary position sensors fail or provide incorrect positions, it may be preferable to use a position based on manual observations and dead reckoning. The *"LOP"* folder of the maritime calculations window allows the operator to enter bearing and/or range observations and to use these observations to enter a position fix.

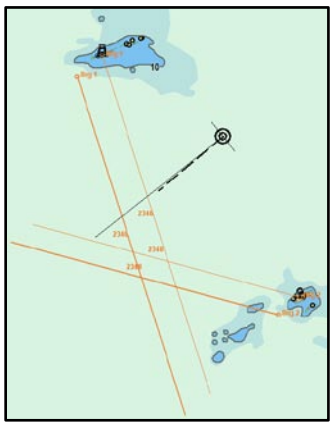
The majority of this window is dedicated to the entering of bearing and range observations. Up to three of each may be entered. Each observation line includes the following controls and information (from left to right):

- *A "*" button for setting the observation.
- Checkbox for selecting the observation for display and use for position fixes.
- The observed bearing/range value.
- The time of the observation
- The age of the observation
- A description of the observation (for example, observation method).



Entering observations

1. Press the "*" button on the desired observation line.
2. Click the target of the observation (the chart feature to which a bearing/range has been measured) in the chart display.
3. A EBL/VRM is now active, anchored at the observation target position.
4. The observed value may now optionally be entered in the small entry field near the anchor point (ranges should be entered in nautical miles).
5. If not, adjust the EBL/VRM so that the correct observation value is shown on the observation line. For bearings, the line should extend through the entire area where the vessel may be situated.
6. Press the left mouse button to finish placing the observation in the chart.
7. If the observation was made more than 1 minute ago, enter the time of the observation on the observation line.
8. Optionally, enter a short description of the observation.



Once an observation has been entered, it will be displayed in the chart display and marked with the name and time of the observation.

Two versions of the observation will be visible in the chart display. The first version remains as the observation was entered. The second (emphasized) version is shifted in real time according to the current dead reckoning parameters (course, speed).

This ensures that observations made at different points in time may be used together to provide a position fix.

The buttons along the bottom of the LOP window works as follows:

Mark EP: Press this button to place an *estimated position mark* in the chart display manually. After pressing the button, place the cursor in the chart display where the operator estimates the vessel is located and click the left mouse button. This will place an EP mark at the specified position, labeled with the time of entry. A window will appear at the bottom of the screen, allowing the operator to enter both text visible in the chart display and supplementary information only shown on object inspection. The EP mark is stored in the system as a symbol and may be deleted later using the symbol editing interface (See 4.8.2).

Select EP for DR: After one or more EP marks have been placed, press this button to use one of the estimated positions as the origin for dead reckoning. After pressing the button, place the cursor on one of the previously entered EP marks in the chart display and press the left mouse button. Dead Reckoning will now be initiated and the vessel symbol will move to the selected position.

Auto DR: This button is only available after two or more observations have been made and are selected for display. When this button is pressed, the system will use the first two (from top to bottom) of the selected observations to automatically calculate and place an estimated position mark. As for the "Mark EP" button, a window is displayed allowing the operator to enter supplementary information for this EP mark. Dead reckoning is immediately initiated, using the calculated position as the origin point.

DR off: After dead reckoning has been initiated in this window, using either the "Select EP for DR" or "Auto DR" buttons, this button may be used to deactivate dead reckoning mode and return to using the position sensor data to position the vessel. Note that this button will be unavailable if both position sensors are lost.

Clear: This button clears all observations from the LOP window, removing any selected observations from the chart display.

Note that when dead reckoning has been initiated in the LOP window, all input from the primary and secondary position sensors is ignored until dead reckoning is deactivated again in this window!

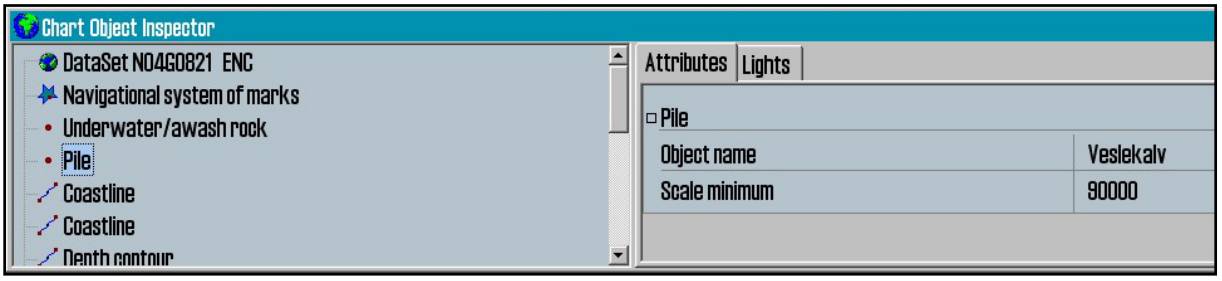
Use of the LOP window to generate estimated positions and position fixes is logged in detail. To access these logs, use the *"DR fix"* button in the *"Log"* menu folder (See 3.7).

Chapter 6: Other features

6.1. Chart object inspector

Detailed information about object in the chart display may be accessed using the *query chart data button* on the top menu bar. Pressing this button activates the object inspector cursor. To deactivate this cursor, press this button again or click the *right mouse button*.

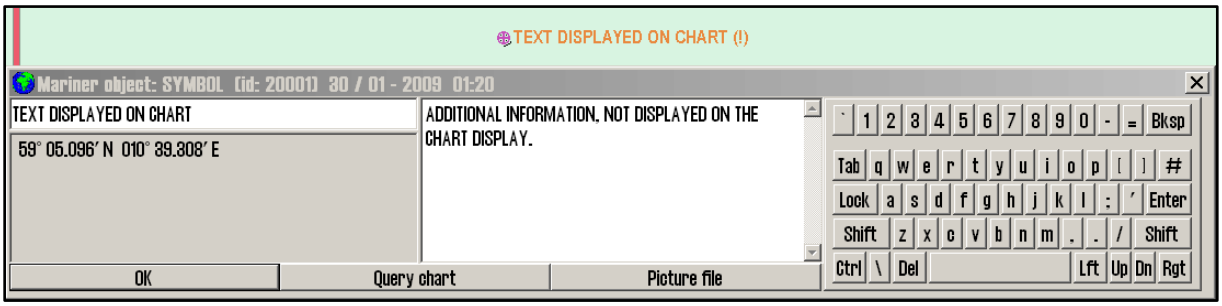
While the object inspector cursor is active, clicking a location in the chart display area will bring up a window at the bottom of the screen. The position that was selected for inspection is shown in the window title bar. The left part of this window will provide a list of all chart objects that are present at or close to the clicked position. The first entry in this list provides details about the chart cell containing the chart objects. Each entry is marked with a symbol indicating if the chart object is of point, line or area geometry. The symbol for entries that have been added or modified through chart updates is marked with a yellow background.



Clicking on the various entries in the list will bring up detailed information about the selected chart object in the right part of the window, and the chart object is highlighted in red in the chart display.

6.1.1. Inspecting tracks, routes, mariner objects, etc.

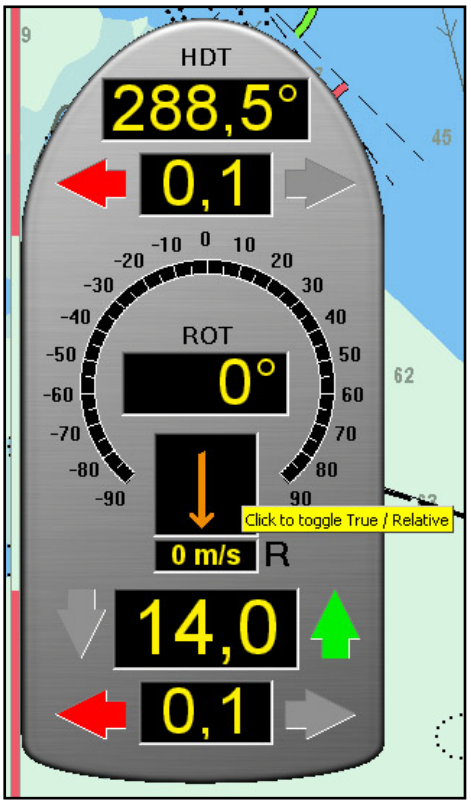
The object inspector may also be used to inspect other data the system adds to the chart display, such as tracks, routes, mariner objects, et cetera. When such objects are clicked, a different window will be shown at the bottom of the screen. Unlike the chart object information, values in this window (such as text displayed in the chart and additional text information) may be modified if desired. The text displayed in the chart may contain up to 30 characters. The additional information text may contain up to 4800 characters. Objects containing additional information are marked with an exclamation mark.



If a chart query was intended, but the system object window is displayed instead, clicking the *"Query chart"* button switches to the chart object query window (see above).

JPEG picture files may be optionally be attached to some objects (Note that the picture must be physically located on the system storage). To do this, press the "Picture file" button and select the picture. The additional information text will now include the picture file name in brackets, and pressing the *"Picture file"* button again will display the image.

6.2. Docking Conning display



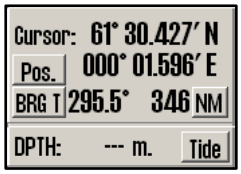
The *docking conning display button* on the top menu bar displays a small conning display in the lower left corner of the screen. This conning display provides prominent display of movement, heading and wind information central when maneuvering.

By placing the cursor on any part of the conning display outside of the value displays, clicking the left mouse button and holding it down, the conning display may be moved to other parts of the screen.

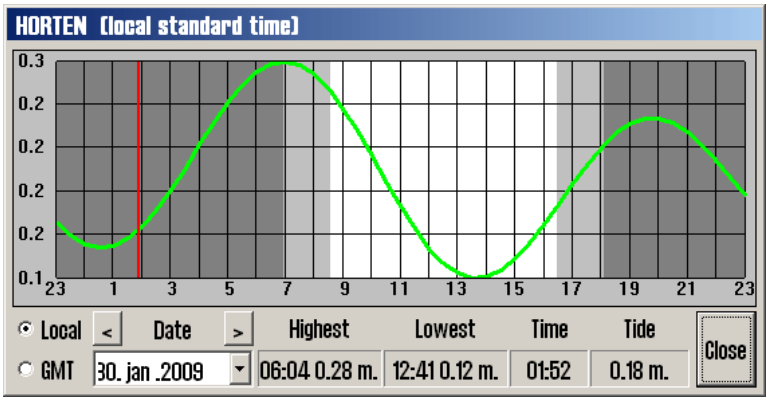
The wind direction may be toggled between *true* and *relative* mode by clicking the wind arrow. When true wind direction is shown, this is marked with a "T" next to the wind speed display. Relative wind direction display is marked with an "R".

The wind speed may be toggled between meters per second (m/s), knots (kn) and beaufort (B) by clicking the wind speed display.

6.3. Tidal information



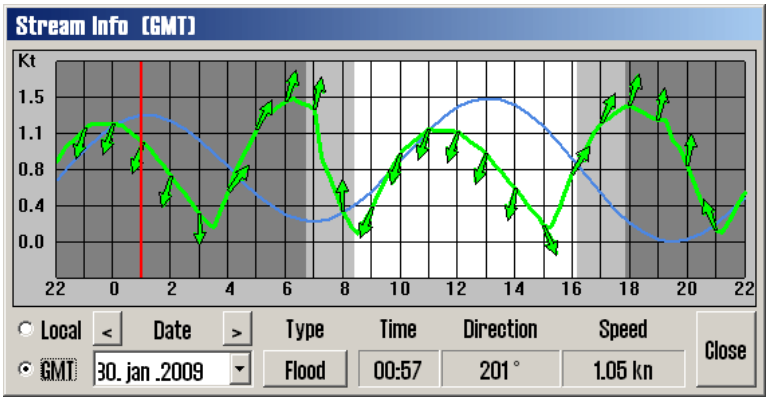
The "Tide" button next to the depth sensor display on the vertical side menu displays a window showing tide predictions from the prediction point closest to the vessel (or closest to the chart center if the vessel is positioned outside the currently displayed chart area).



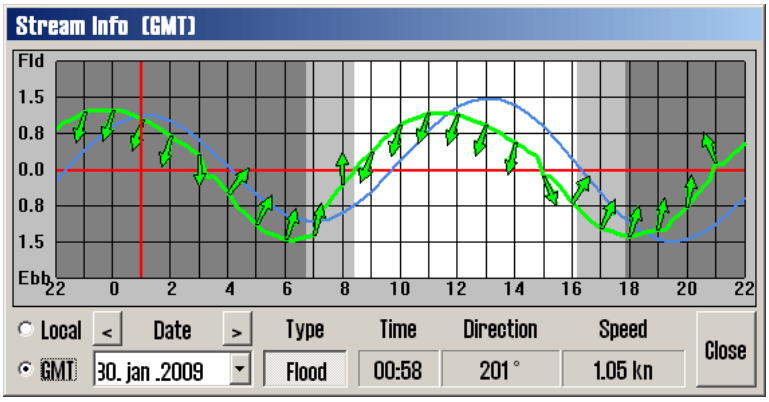
This window provides a graph of the tide for the next 24 hours. The name of the tide prediction point is indicated in the window title. Time and tidal level for highest and lowest tide during the period, as well as current tidal level is shown along the bottom of the window.

Times may be shown either in GMT or in the local standard time for the prediction station. Tide of other dates may also be selected for display. By placing the cursor on the graph, the corresponding time and tidal level is shown in green text on the bottom of the window.

While this window is shown, other tidal prediction points available are shown in the chart display with a yellow symbol. By clicking these symbols, the tide window will show prediction data for the selected point.



Additionally, while the tide prediction window is displayed, the chart display will include yellow tidal stream arrows that reflect the present tidal stream directions and speed (Example:). These may also be clicked, bringing up a tidal stream prediction window that works in a similar manner as the tidal window.

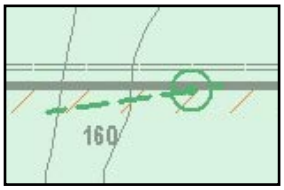


Some tidal stream prediction points may be shown using an ebb/flood type graph. To switch to this graph type, press the *"Flood"* button (if available).

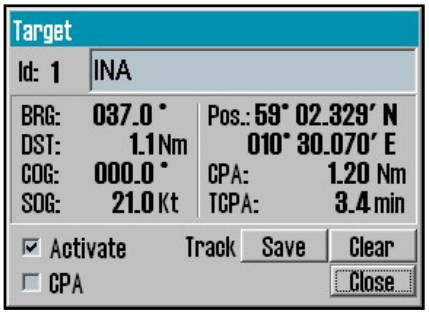
Note that display of tidal information requires the "Professional+" chart database to be selected for display.

6.4. Radar tracked targets

The top menu bar may include up to two *radar tracked target* buttons, one for each of the radars connected. These buttons are only shown if targets are being received from the radar(s). The hint text for these buttons will show the name of the two radar sensors, allowing them to be differentiated. Pressing one of these buttons will show the tracked targets from the specified radar on the chart display.



The radar tracked targets are shown as green rings with course vectors. Deactivated (sleeping) targets are shown without track and course vectors. The ID of the target (or name, if provided from the radar) is shown in the chart display by placing the cursor on the target. Shown ID numbers are ID numbers from the radar plus 1000 or 3000 for targets from radar 1, or plus 2000 or 4000 for targets from radar 2.



By clicking a radar tracked target, a detailed target information window is displayed. This window includes all received information about the target as well as CPA information. The target track may be saved (*"Save"* button) or cleared (*"Clear"* button). The target may also be individually activated/deactivated (*"Activate"* checkbox). Finally, CPA points for the target may be shown in the chart display (*"CPA"* checkbox). Press the *"Close"* button to close the window.

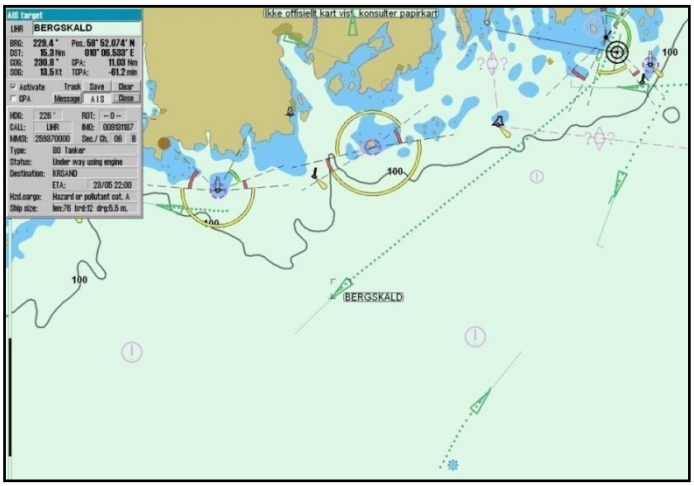
The behavior of radar tracked targets are influenced by the settings in the *"Ais"* menu folder, see chapter 3.5 for details.

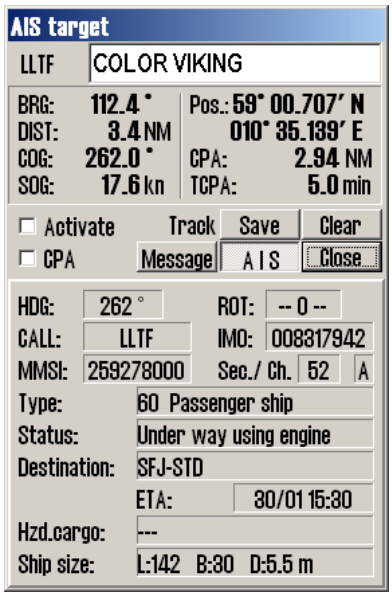
6.5. Working with AIS

The *AIS button* on the top menu bar displays AIS targets in the chart display according to the settings in the "Ais" menu folder (see 3.5) and provides access to other AIS features.

AIS targets are presented in the chart display as green triangles. For deactivated (sleeping) targets, the triangle is smaller and is pointed up. For activated targets, the triangle is pointed in the current target heading with track and heading and course vectors. Track points are placed at one minute intervals. If "Show ship outline" is selected in the "Ship" menu folder (See 3.4), the true target vessel outline will also be shown in the chart display.

A sleeping AIS target may be temporarily activated by placing the cursor on it. This will also display the vessel name (or MMSI number if the name has not yet been received) in the chart display. When the cursor is moved away from the target, it will return to the sleeping state. All targets may be activated by selecting "All targets active" in the "Ais" menu folder (see 3.5).



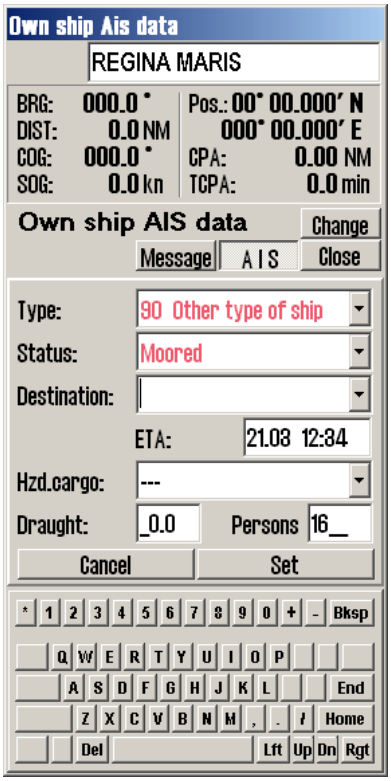


Clicking an AIS target will select it (the target is marked in the chart display with a black rectangle) and display a window showing detailed information about the target.

The selected target may be activated by selecting *"Activate"*. Additionally, CPA information for the target may be shown in the chart display by selecting *"CPA"*. The target track may be saved by pressing *"Save"*, or cleared by pressing *"Clear"*. The *"Message"* button provides access to the AIS message history for the selected vessel and allows for sending new messages (see below).

The *"AIS"* button extends the target information window to include target details such as destination, status, vessel type, etc. The target information window may be removed from the display by clicking *"Close"*.

6.5.1. Own ship AIS information



Own vessel AIS information may be accessed by clicking the vessel in the chart display. This will bring up the target information window for the vessel, with some differences from the normal target window. Instead of activation, CPA and track options, the text "Own ship AIS data" is shown.

Additionally, information such as status and destination may be changed by pressing the *"Change"* button. To modify information, make the desired changes and press *"Set"*. Values that will be modified from their current values are marked in red.

Note that previously entered "Destination" values are available for quick selection. Draught values deeper than 25.5 meters will be reset to 25.5 meters.

The on screen keyboard provided may optionally be used to enter values.

To exit without making changes, press *"Cancel"*.

6.5.2. AIS broadcast messages

To send an AIS broadcast message or to review received broadcast messages, open the "Own ship AIS data" window (see above) and press the *"Message"* button. This will display the broadcast message interface, where received messages may be selected for display in the drop down list at the top of the interface. To write a new message, press the *"New"* button. Once the message text has been entered, press *"Send"* to transmit the message. To acknowledge a received message, press the *"Ack."* button.

6.5.3. Write a message to a vessel

To write a message to a specific vessel, first select the target to bring up the target information window. Press the *"Message"* button to display the message interface. Previous messages are available for review through the drop down list at the top of the interface. To write a new message, press the *"New"* button. Enter the message text (optionally using the on screen keyboard provided) and press *"Send"* to transmit the message.

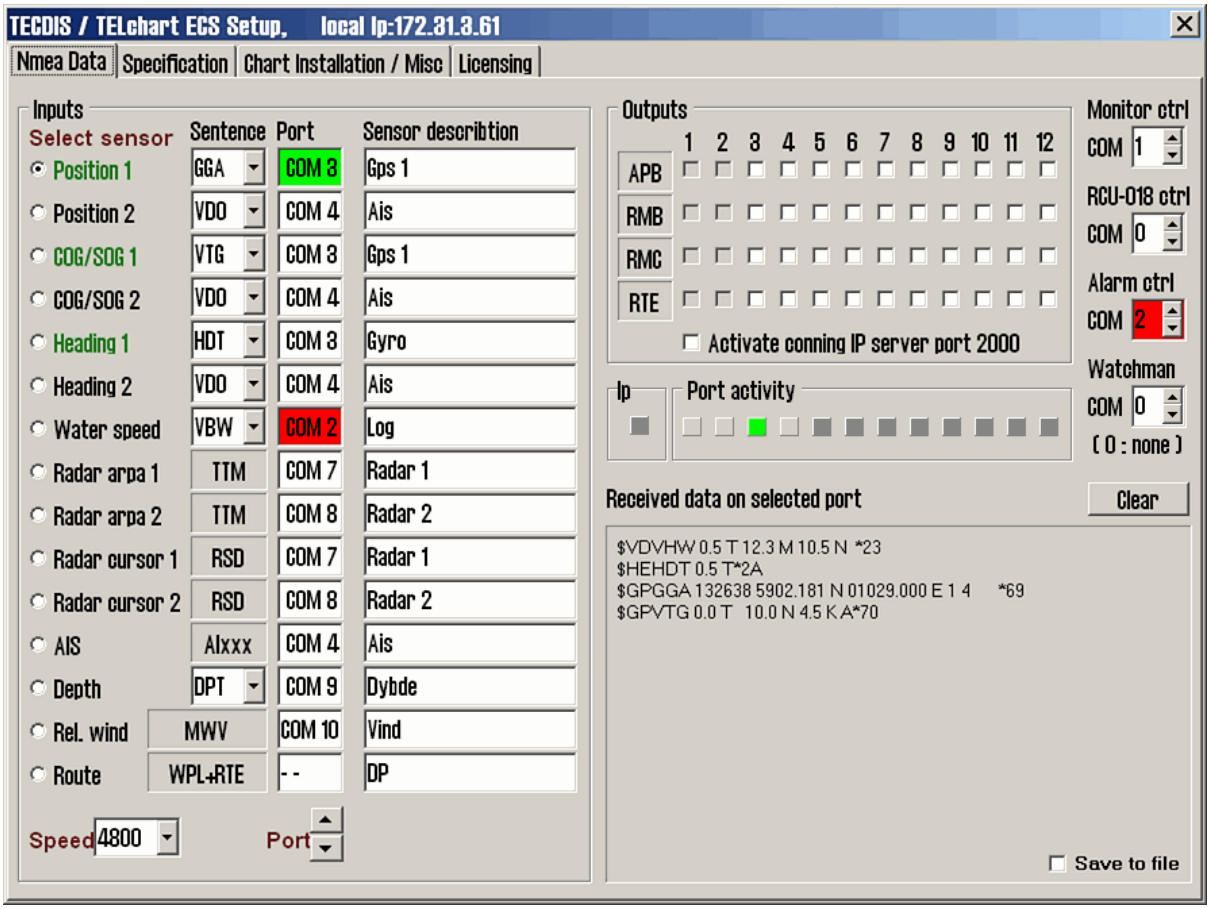
Note that messages older than 3 months are automatically deleted.

Chapter 7: The Setup Program (NMEA selection)

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



Use this tab of the setup program to configure input and output signals. This is done by selecting the type of NMEA messages for each sensor type and the COM port where the signal is connected.

There are four main areas of this tab: “Inputs”, “Outputs”, “Port Activity” and “Received data on selected port”.

7.2.1 Inputs

Note: All position inputs to TECDIS from all external sensors must be in WGS-84 format.

In the first area ("Inputs"), you can configure the message type and source of the different possible sensor inputs.
In the first column, "Select sensor" you can select which sensor you want to configure. **The sensor name will turn green when valid NMEA sentences of the type specified is received on the specified port.**
In the box next to "Sentence" you can select the type of NMEA sentence this input should be read from on a drop down menu. For more information about the different NMEA sentences, see the table below.
In the third box, ("Port") you can select the COM port the selected sensor data type should be read from by using the two arrow buttons at the bottom of the column (to the right of the drop down menu for speed/port). **The COM port field will turn red if the specified COM port is already in use by monitor, alarm control or RCU-018. This means that the port selection is invalid, and that another COM port must be selected either for the sensor or the conflicting equipment.**
In the fourth column, "Sensor Description", you can manually enter a text description that identifies the source instrument of the sensor data.

NB: When there is a port collision (when there is an attempt to use the same port for multiple conflicting functions), the affected ports are marked with red color.

IP ports: TECDIS has 12 COM ports and 4 IP ports. For each IP port, the IP address and 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" 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 "Select sensor" column.
2. Select the COM port the GPS is connected to in the "Port" field.
3. Select the NMEA sentence type to be used.
4. Optionally (but recommended) enter a description identifying the sensor as a GPS in the "Sensor Description" 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 you enter in this field. This way, you can quickly identify the failing instrument (instead of having to refer to the configuration in the Setup program). NMEA Sensor inputs and their status can also be displayed in TECDIS. (See chapter 3.2.1).

7.2.2 Speed

In this field you select the data speed to be used for the COM port of the currently selected sensor. 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 “Selected sensor” column and check that the “Speed” field indicates the high-speed setting). The speed is changed by selecting the speed from the drop down menu.

7.2.3 Outputs

In this area you can select which NMEA sentences you want TECDIS to output. In order to send a NMEA sentence type on a COM port, put a check mark in the box at the intersection of the desired sentence type row and COM port column. You can find descriptions of the different NMEA sentence types in the table above. Regarding the RTE route sentence; note that TECDIS will send up to 10 of the next waypoints of the currently active route.

By selecting ”Activate conning IP server port 2001” you activate a TCP/IP server in TECDIS for data transfer to the TECDIS Conning program. This option should only be selected when a connected TECDIS Conning unit should use data from TECDIS.

7.2.4 Port Activity

In this area you can see which ports that are receiving data. 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.

7.2.5 Received data

In this area you can see the data that are being received from the COM port that is marked with green in the “Input” area. By clicking on one of the other COM ports in the “Input” area, the data shown in the “Received Data” area will change correspondingly.

7.2.6 Other COM port connections

The units available in this area all require dedicated COM ports (if used). If not used, these settings should be set to ‘**0’**. **If the specified COM port is in use by a sensor, the selection field will turn red to indicate the conflict situation. This means that the port selection is invalid, and that another COM port must be selected either for the sensor or the conflicting equipment.**

Monitor Ctrl: Select the COM port that the monitor is connected to in this field. This connection will control the monitor background light and calibration settings, as well as the alarm sounder in the screen unit (if used).

RCU-018 ctrl: Select the COM port that the Furuno RCU-018 keyboard and trackball control unit is connected to (if used).

Alarm ctrl: Select the COM port that should be used for the alarm central interface (if used).

Watchman: Not yet in use. This feature will be released in a future update.

7.2.7 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	(AIS) Acknowledge Alarm	Send
ALR	(AIS) Set Alarm State	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.

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. $??GNS GNSS fix data
2. $??GGA GPS fix data
3. $??GLL Geographic position lat/long
4. $??RMC Recommended minimum specific GNSS data
5. !AIVDO * AIS own ship position. UAIS VHF Data link own-vessel report

Course & Speed
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. $??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
$??TTM Tracked Target Message

Radar Cursor
$??RSD Radar System Data

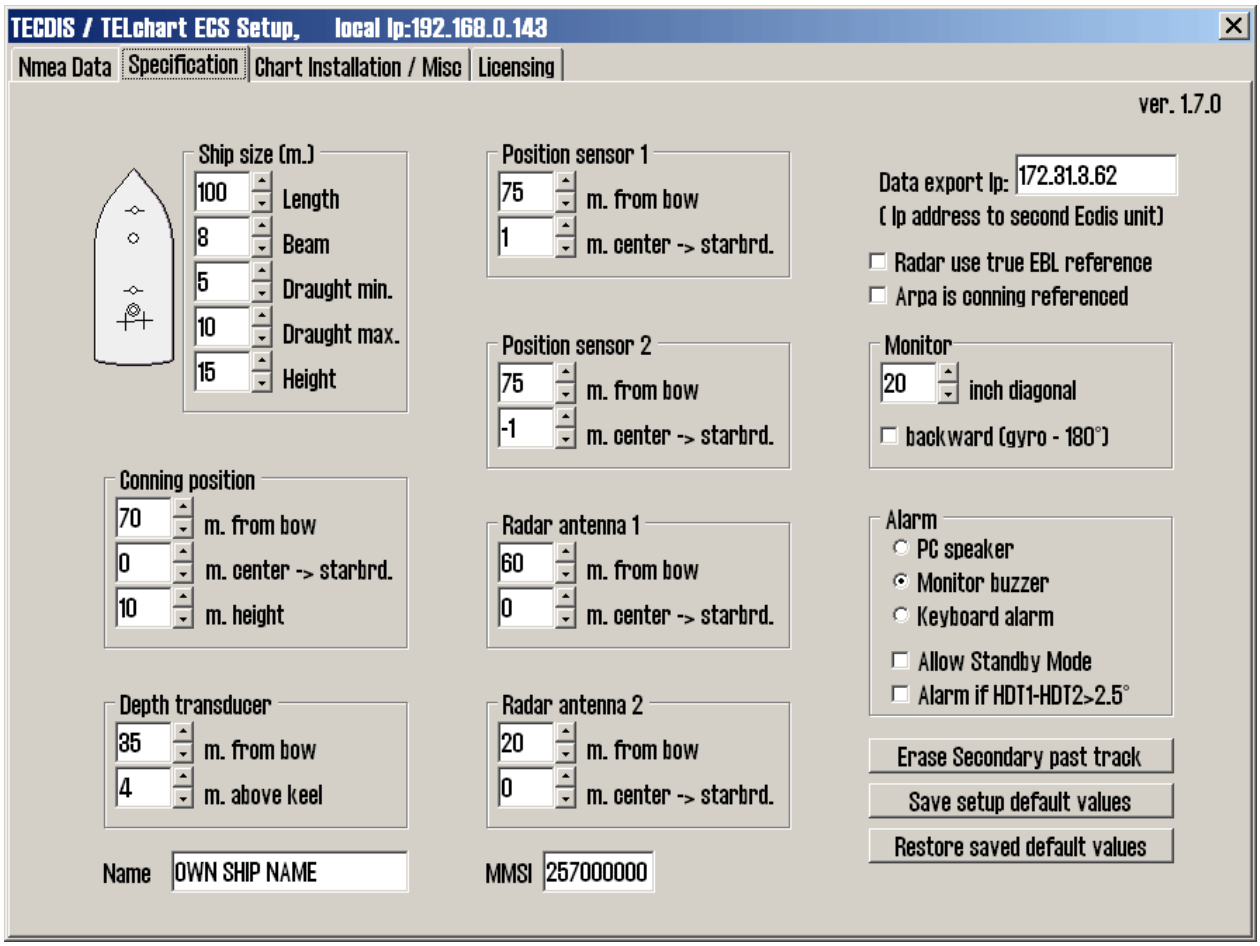
AIS
!AI??? AIS UAIS VHF Data Link

Depth
1. $??DPT Depth
2. $??DBT Depth below transducer

* Position: !AIVDO may be used as a secondary position source whenever primary source is missing.

7.3 Specification

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.



- In the *"Ship Size"* area, enter the length, beam, draught and height of the vessel in meters. For length and beam, the largest extent of vessel length and beam should be used.

- For draught and height you enter the largest possible height and draught taking load conditions into consideration.

- 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.

- *"Monitor inch diagonal"*: Specify the diagonal size of the monitor here.

- *"Backward (gyro-180º)"*: Checking this box turns the heading value from gyro 180 degrees.

- In the *"Alarm"* area, you can select whether sound alarms should sound through the PC speaker in the chart plotter, through the monitor buzzer or through the RCU-018 Control Unit.

- *"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. (See 3.8.4, 3.5.6 and 5.5).

- *"Alarm if HDT1-HDT2 > 2.5º"*: 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.

- 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" and "MMSI"*: The name of the vessel and the MMSI number should be specified in these fields.

7.3.1 Save and restore setup default values

By clicking the button "Save setup default values", all settings in the "Nmea data" and "Size and sensors" tabs are saved as default settings. If temporary changes to the settings are made later, the default values can be restored by clicking the button "Restore saved default values".

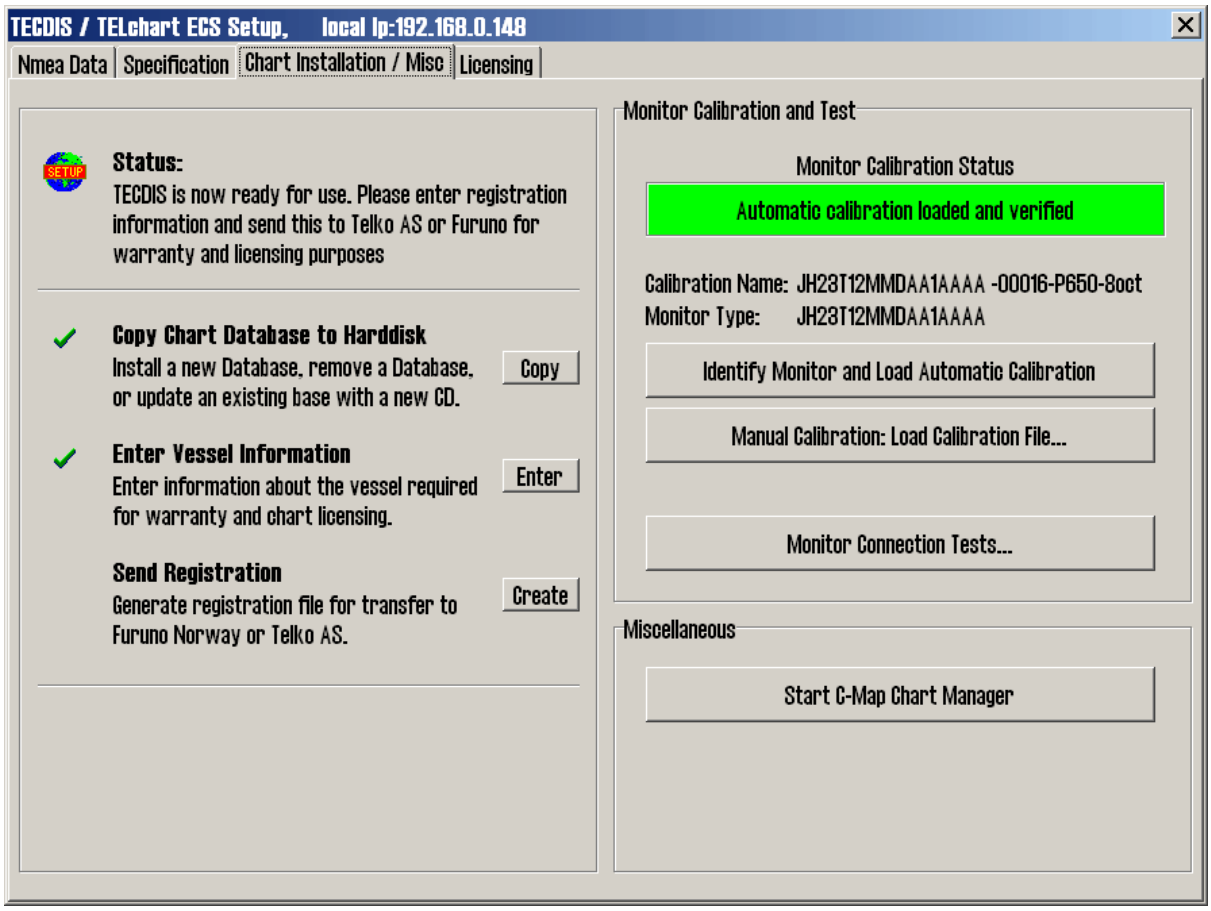
For future use and to be certain that no misunderstandings may occur regarding the installation we recommend that the service engineer saves the default setup file to floppy disk or other media. He can then keep this file in his personal register of TECDIS installations.

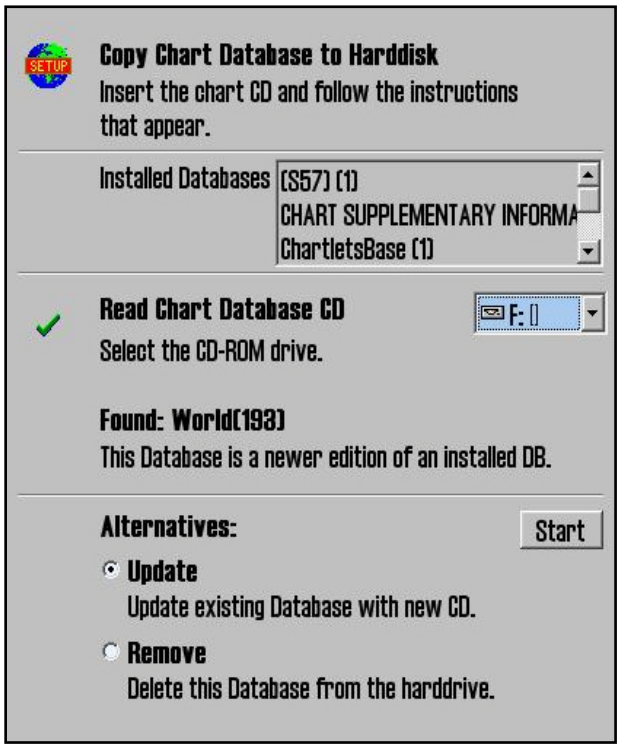
The following files should be copied:

- **C:\Program files\TECDIS\dta4.setup**
- **C:\Program files\TECDIS\Telchart.ini**

NOTE: When a Service Key is present when TECDIS Setup is closed, a backup copy of the files specified above are automatically copied to the Service Key.

7.4 Chart Installation / Misc

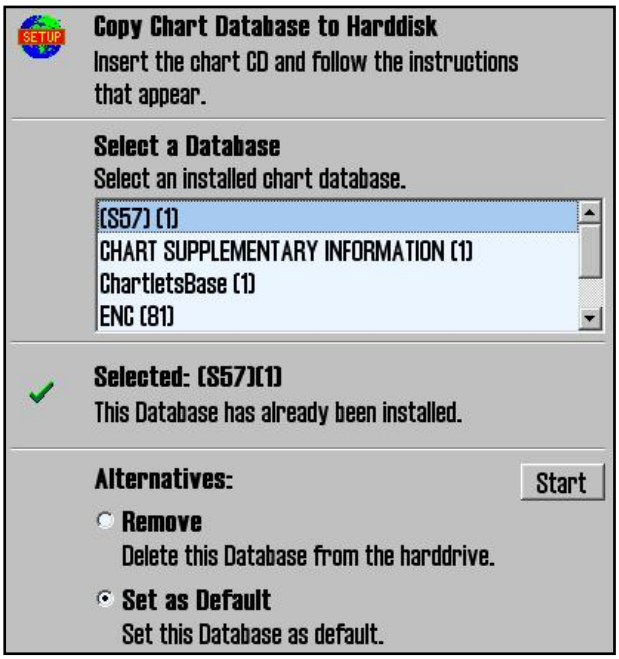




7.4.1 Install, update or remove chart databases

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.

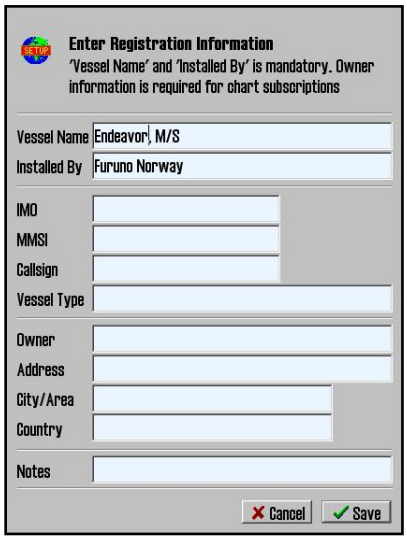


If a CD is not available for the chart database (As would be the case for databases containing imported S57 data), these databases can be selected for modification by choosing a drive *other than the CD-ROM drive* from the drive drop down menu. (For example D:\). When Setup is unable to find a chart 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.

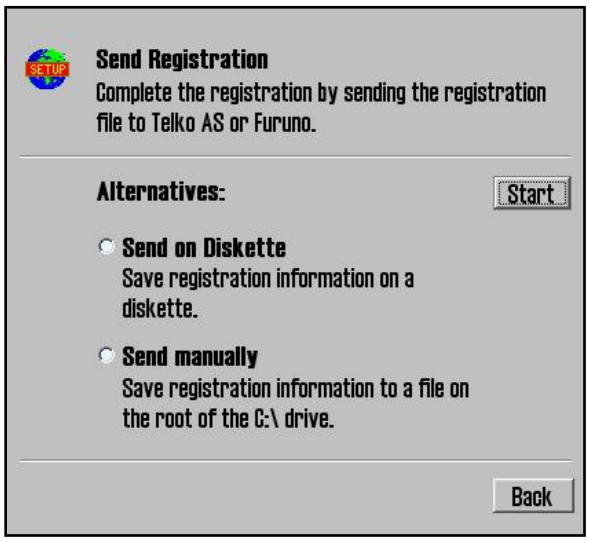
Important: Some chart databases are protected and cannot be removed unless you have a CD for the database available.

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!



7.4.2 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.

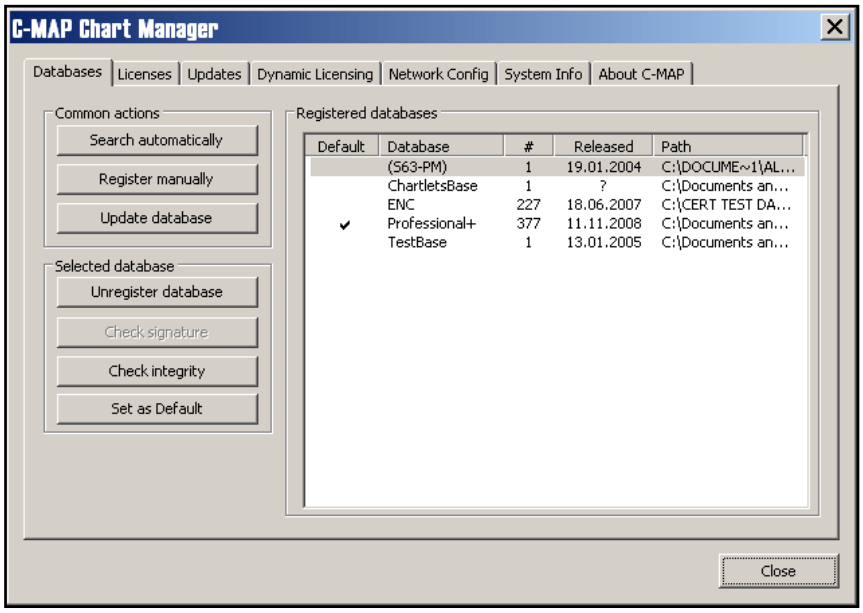


7.4.3 Send registration

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.

7.4.4 Start C-Map Chart Manager

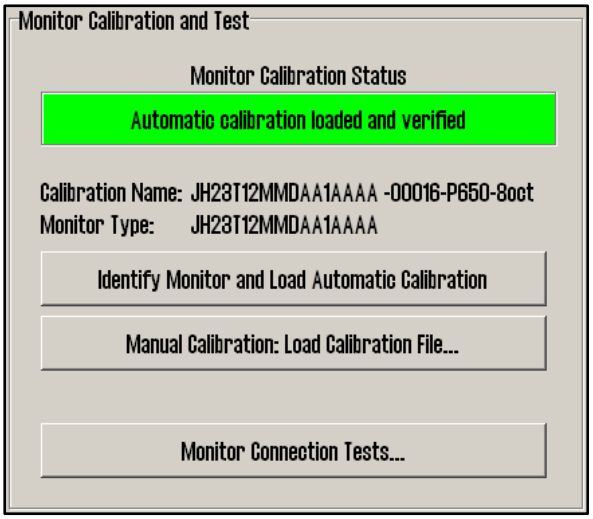
The “Start C-Map Chart Manager” button provides access to the C-Map chart database, licensing and diagnostics interface.



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.

7.4.5 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 Message	**Action**
No serial line to monitor!	Connect the monitor to a serial port in accordance with chapter 2 and 3.2.
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 "Calibration Name" 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.

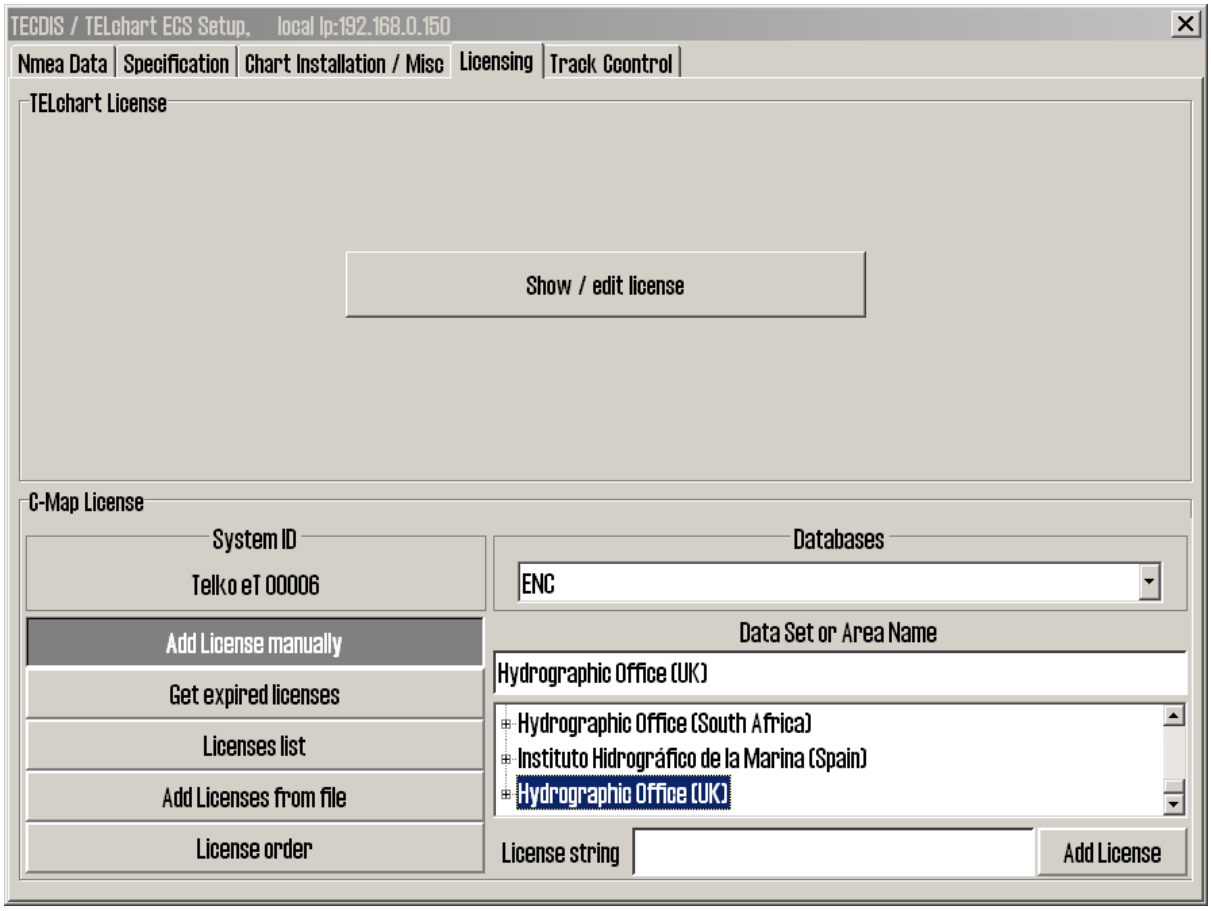
Monitor Type: Indicates the monitor model name as reported by the monitor during the last automatic calibration process.

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.

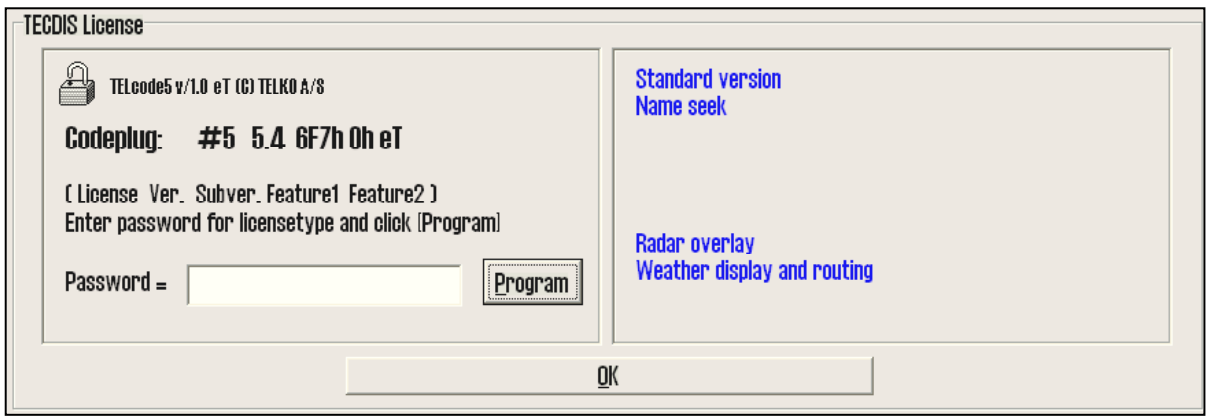
Monitor Connection Tests…: Provides access to tests to verify correct monitor serial connection (buzzer test, backlighting adjustment tests and monitor identification test).

7.5 Licensing



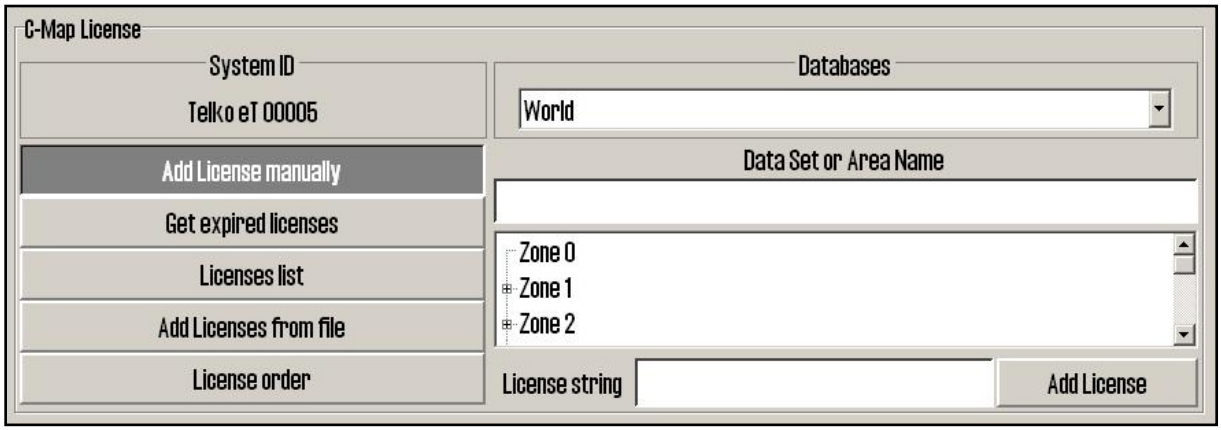
7.5.1 TECDIS license

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.

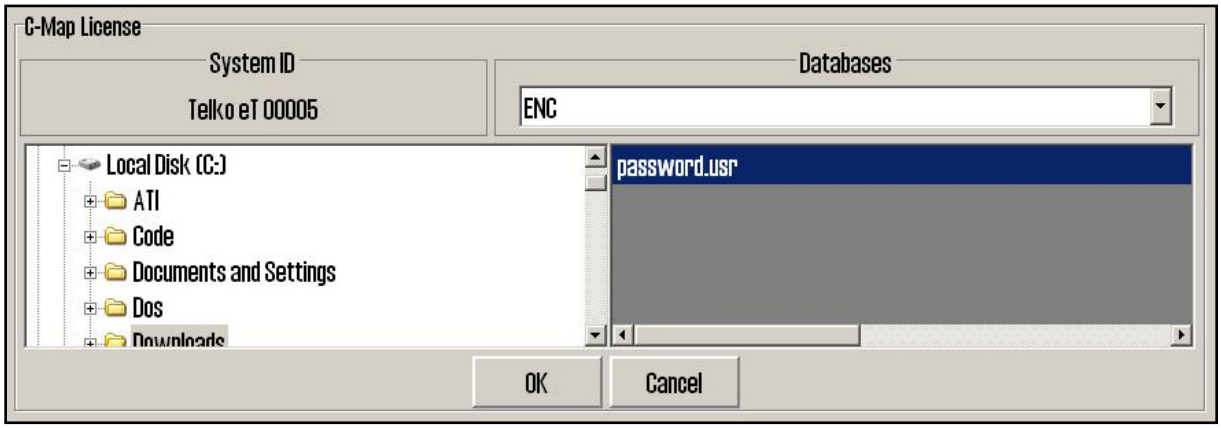


7.5.2 C-MAP License

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.

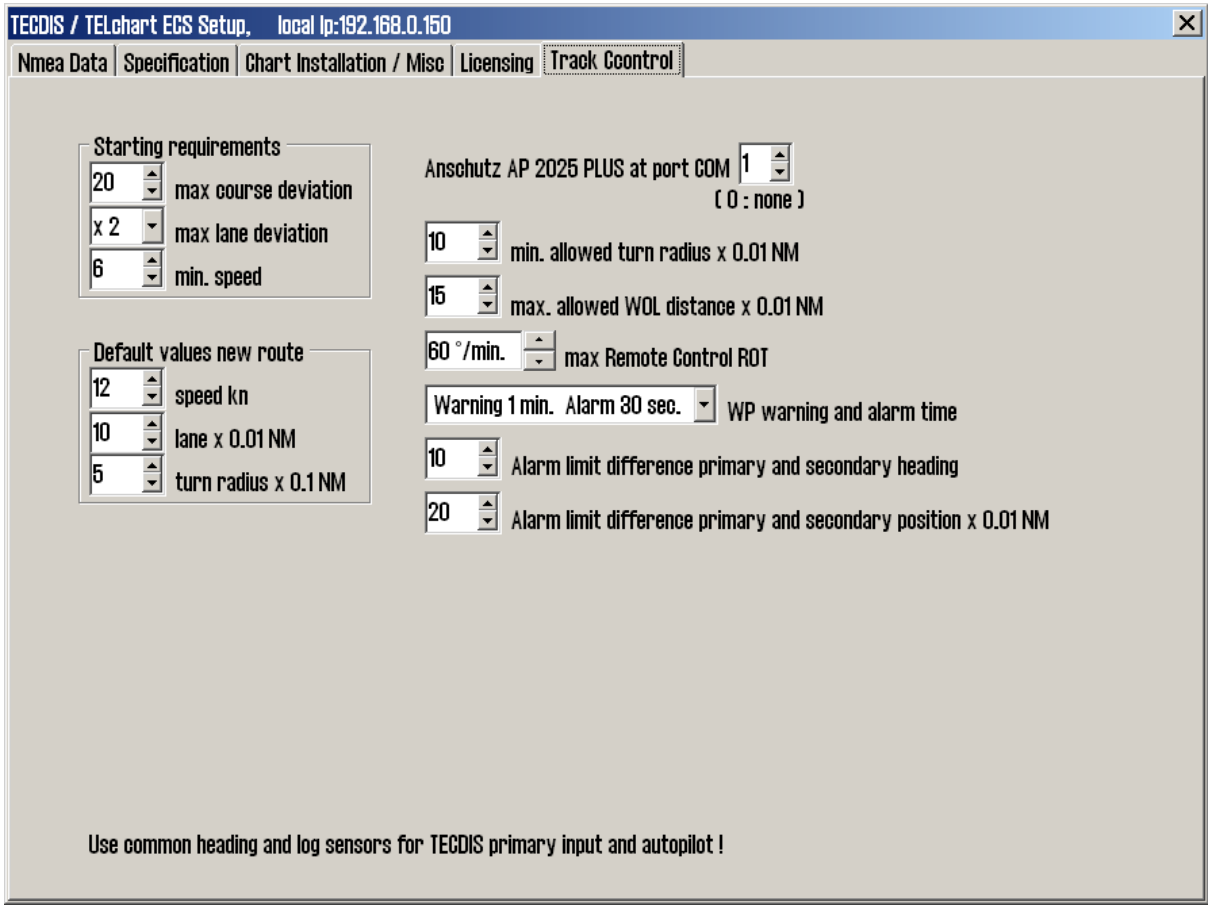


In this area, it is also possible to get a list of licenses that are expired and no longer valid (“Get expired licenses”), to see a list of all valid licenses (“Licenses list”) and to generate an order file for new licenses (“License order”).

7.5.3 Dynamic Licensing

For information regarding dynamic chart licensing, refer to “TECDIS 4.7.1: New Features Guide”.

7.6 Track Control



On this tab, settings for connection to Raytheon Anschütz AP2025 PLUS autopilot and Track Control can be set.

Refer to Raytheon Anschütz AP2025 PLUS 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!

7.6.1. 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.

7.6.2 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.)

7.6.3 Other settings

Anschütz AP 20205 PLUS at COM
Specify the COM port that the Raytheon Anschütz AP 2025 PLUS autopilot is connected to.

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.

Chapter 8: Other

8.1. Error Messages

TECDIS includes automatic error detection in most functions. If it is possible, corrective measures will be taken without requiring operator intervention. In case of critical errors, the operator is notified. In addition to the possible error situations listed here, both the Windows operating system and support routines may in some instances display error messages not listed. Common to these error messages is that corrective measures (if possible) are initiated by restarting the ECDIS. In the case of a system failure any error messages should therefore be noted. If the ECDIS is not responding or appear to be malfunctioning, try restarting the ECDIS. If this does not correct the error situation, notify your support contact.

10=Init required too much space	Memory full or error. Try restarting ECDIS.
11=Bad init parameters	System error, should not normally occur.
12=Data files not found	Old data file has been erased or destroyed. New (empty) data file is automatically generated.
13=Open db can not determine type of file	Installation error, use of invalid data.
14=Data files appear to be corrupted	Try restarting ECDIS to generate new data file.
16=Could not create index file	Hard drive error or full, try erasing old data.
17=Could not create data file	Hard drive error or full, try erasing 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 error.
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 incomplete installation.
102=No C-Map charts installed!	Incorrect or incomplete installation.
103=No chart database set as default!	Incorrect or incomplete installation.
104=g_manager->Init() failed	System error, should not normally occur.
105=g_map->Init() failed	System error, should not normally occur.
106=g_mini->Init() failed	System error, should not normally occur.
107=Update successfully completed	Update confirmation.
108=g_map->SetZoom() failed	System error, should not normally occur.
109=g_map->SetScale() failed	System error, should not normally occur.
110=g_mini->SetScale() failed	System error, should not normally occur.
111=g_map->SetRotation() failed	System error, should not normally occur.
112=g_mini->SetRotation() failed	System error, should not normally occur.
113=g_map->AddBase() failed	System error, should not normally occur.
177=Not TECDIS dongle	License dongle found but not approved.
188=Error in periodic ID check	No license dongle found or approved.
189=File read failed	Error in license dongle.

190=Read of file length failed	Error in license dongle.
191=File number out of bounds	Error in license dongle.
192=CMap init error	License dongle not C-Map approved.
193=Init has not been called	Error in communication with license dongle.
194=Error parsing system ID	Error in communication with license dongle.
195=CMap registry error	Error in communication with license dongle.
196=Dongle is not Telko dongle	License dongle not approved.
197=No eToken dongle present	No license dongle found.
198=CMap init error	Error in license dongle.
199=Init has not been called	Error in communication with license dongle.
200=Unknown error	Important! With errors relating to license dongle, try removing then reinserting the license dongle, or try moving it to another USB port. Then try restarting the ECDIS.

8.2. Revision history

Revision 1.0 (18.02.2005)

- First edition

Revision 1.1 (23.02.2005)

- Most illustrations updated
- Chapter 3.5: New function – Ship menu (“To Second TECDIS”)
- Chapter 3.7.4: Revised text for ”Include World check”.
- Chapter 4.0: Revised text
- Chapter 5.2: New function – ”Extend route”
- Chapter 5.3.1: New function – Transfer of primary and secondary route to second TECDIS.
- Chapter 7.3: Revised text, new function - ”Data export IP”
- Chapter 7.3.1: Revised text
- Chapter 7.5.2: Revised text

Revision 1.2 (24.02.2005)

- Front and Back Cover Page added

Revision 1.3 (09.04.2005)

- Updated illustrations
- Chapter 3.2.7: Text addition to “C-map chart updates”: manual rejection
- Chapter 3.3.2: Description of new setting: safe hazards
- Chapter 3.4: New checkbox: show the boat symbol with double circles. Define AIS track settings.
- Chapter 3.7.4: New alarm: 'restricted' area.
- Chapter 4.5: Text and illustration of boat symbol with and without circles.
- Chapter 4.7.3: New paragraph: safe hazards (illustrated).
- Chapter 4.8.3: New function for areas: filling is now optional.

- Chapter 5.2.1: Added text: when the last wp is within a distance of 0.1 Nm from the first wp, the route will be sailed in a loop (repeated).
- Chapter 5.5: In the track dialogue, the checkbox for track ”width” has been removed.
- Chapter 6.5: Updated AIS symbols.

Revision 1.4 (24.05.2005)

- Updated illustrations
- Chapter 3.2.1: Changed keyboard commands
- Chapter 3.2: New setting for ship draught and for alarm volume. TECDIS version nr. has been moved to the chart menu folder (”?” chart information)
- Chapter 3.3: New chart settings
- Chapter 3.5: Revised text about backup and copy to second TECDIS
- Chapter 3.6: View screenshots has been removed; new logs: noon and 12h. ENC use
- Chapter 3.7.3: Revised text about CPA
- Chapter 3.7.4: New optional alarm: possible danger
- Chapter 3.8.1: NB added: remember to test colors for evening and night presentation
- Chapter 4.2: New text warnings regarding chart type
- Chapter 4.7: Text about safe hazards has been revised
- Chapter 5.2: When a route is drawn or edited, all other existing routes are shown in gray color in the background.
- Chapter 5.3: Critical point can now also be entered on a route leg. (revised text)
- Chapter 5.4: New chapter "Warnings and Alarms"
- Chapter 5.5: Minimum alarm speed has been removed
- Chapter 6.1: Infofile for own objects has been removed
- Chapter 7.2: Nmea sentence DBS has been removed
- Chapter 7.3: Size and sensors, new function: arpa is conning referenced
- NB: The previous chapters 5.4 – 5.6 has changed numbers to 5.5 – 5.7.

Revision 1.5 (05.01.2006)

- Chapter 3.2: New function in setup menu chart utilities, updated illustration
- Chapter 3.2.8: New function: Chart licenses
- Chapter 3.6: Updated text. STD stops replay.
- Chapter 3.7: New choice in safety menu: No LostCPA alarm
- Chapter 4.6: Updated text. When AUTO is pressed, the scale is not changed.
- Chapter 5.2.1: Updated text. Improved route drawing when turn radius is invalid.
- Chapter 5.2.2: Updated text. Editing an active route.
- Chapter 5.3: Updated text. Choose with waypoint to aim for, when ship position is more than 2x corridor width from the chosen route.
- Chapter 5.5: Updated text. Chart centers on specified antigrounding alerts.
- Chapter 6.2: Updated text and illustration. Conning display now with both true and relative wind, and different types of wind speed.
- Chapter 7.3: Updated text and illustration. New choices: "backward (gyro-180º)" and "Raise alarm if HDT1-HDT2 > 2.5º".
- NB: The previous chapters 3.2.8 – 3.2.11 has changed numbers to 3.2.9 – 3.2.12.

Revision 1.6 (04.08.2006)

- Chapter 2.3.2: New function: cursor changes to an arrow in the edges (case 67, 19.94.06)

- Chapter 3.2: New function: time zone selection (case 98, 22.05.06)
- Chapter 3.7: Updated text and illustrations: new function – suppress CPA alarm (case 53, 30.03.06)
- Chapter 4.1: New function: cursor changes to an arrow in the edges (case 67, 19.94.06)
- Chapter 5.2.1: Updated text: Lead sectors are displayed by cursor position
- Chapter 5.2.8: Updated text and illustrations. New: ROT
- Chapter 6.1.1: Updated text and illustrations. New function: screen keyboard (case 22, 07.03.06)
- Chapter 7.2.1: Updated text. Port collision warning (case 69, 19.04.06)
- Chapter 7.3: Updated text and illustrations. New function: shiphandle mode (case 53, 30.03.06)

Revision 1.7 (22.10.2006)

- Added Chapter 2.3.2, RCU-018 Control unit operation
- Chapter 5.2.8: Updated illustration and added ROT column description
- Chapter 7: Updated to correspond with installation manual rev. 1.5.
- Added new chapter 5.4: Track Control.
- Chapters following Chapter 5.4 renumbered.
- Chapter 2.4: Updated illustration
- Chapter 2.4.2: Added radar overlay button description
- Added Chapter 4.9. Radar Overlay
- Chapter 3.1.2: Updated illustrations
- Added Chapters 3.2.13 Radar overlay setup and 3.2.14 F1 F2 button setup

Revision 1.8 (10.05.2007)

- Chapter 5.5.2: Updated alarm and warning lists

Revision 1.9 (15.11.2007)

- Chapter 5.5.2: Description of ‘New WP’ alarm expanded to describe Track Control function.
- Chapter 5.4: Expanded with functionality description, overview of monitoring functions and fall-back arrangements and WP alarm/indication sequence for Track Control.

Revision 2.0 (23.01.2009)

- Guide updated to reflect changes and new features in TECDIS version 4.7.1.

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