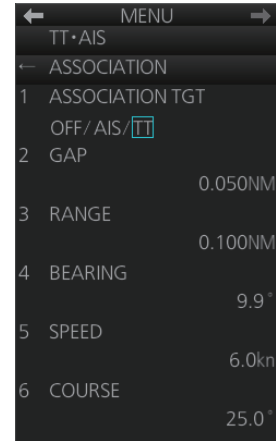


4.14.2 How to set the conditions for association

1. Open the menu then select [TT•AIS] and [6 ASSOCIATION].
2. Enter the association conditions, referring to the following:
 [1 ASSOCIATION TGT]: Disable Association with [OFF], or select [AIS] or [TT]. [AIS] selects the AIS symbol for association target; [TT] selects the TT symbol for the association target.
 [2 GAP]: Range between AIS target and TT.
 Setting range: 0.000 to 0.050(NM)
 [3 RANGE]: Enter the range difference from own ship to AIS target and TT.
 setting range: 0.000 to 0.100(NM)
 [4 BEARING]: Enter the bearing difference from own ship to AIS target and TT.
 Setting range: 0.0 to 9.9(°)
 [5 SPEED]: Enter the speed difference between AIS target and TT.
 Setting range: 0.0 to 6.0(kn)
 [6 COURSE]: Enter the course difference between AIS target and TT.
 Setting range: 0.0 to 25.0(°)



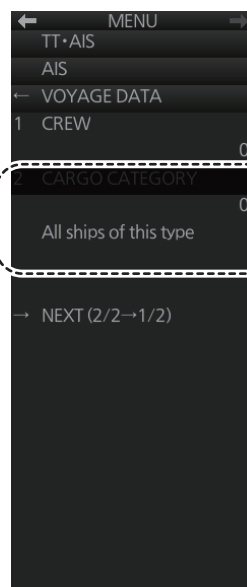
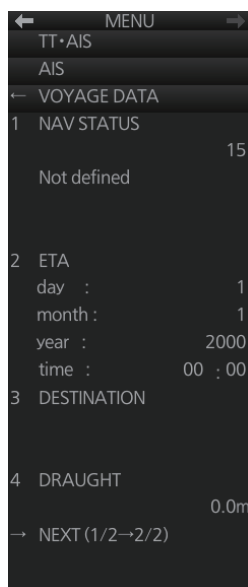
When the association criteria are met

- either the AIS or TT symbol is erased according to association made in section 4.14.1.
- the Alert 560 (ALF format: 10560) "Association" appears in the [Alert] box.

4.15 Voyage Data

Before you embark on a voyage, set your navigation status, ETA, destination, draught and the number of crew, on the [VOYAGE DATA] menu.

1. Click the [OWN AIS] button on the InstantAccess bar™ to show the [VOYAGE DATA] menu.



Display of [2 CARGO CATEGORY] and [All ships of this type] is dependant on the settings for the connected AIS transponder.

4. AIS OPERATION

2. Select [1 NAV STATUS] then use the scrollwheel to set the applicable two-digit nav status code, referring to the table below.

No.	Nav status	No.	Status
00	Underway using engine	08	Under way Sailing
01	At anchor	09	Reserved for high speed craft
02	Not under command	10	Reserved for wing in ground
03	Restricted Maneuverability	11	power-driven vessel pushing ahead or towing alongside (regional use)
04	Constrained by her draught	12	power-driven vessel towing astern (regional use)
05	Moored	13	Reserved for future use
06	Aground	14	AIS SART (Active)
07	Engaged in fishing	15	Not Defined

3. Select [2 ETA] then use the scrollwheel to enter ETA: day (two digits), month (two digits), year (four digits) and time (four digits).
4. Select [3 DESTINATION] then use the software keyboard to enter the name of your destination, using a maximum of 20 characters.
5. Select [4 DRAUGHT] then use the scrollwheel to enter ship's draft (0.0 - 25.5 (m)).
6. On page 2, select [1 CREW] then use the scrollwheel to enter the number of crew (0-8191).
7. Where required, spin the wheel to enter the appropriate [CARGO CATEGORY], referring to the table below.

No.	Cargo Type	No.	Cargo Type
0	All ships of this type	5	Reserved for future use
1	Carrying DG, HS, or MP, IMO hazard or pollutant category X	6	Reserved for future use
2	Carrying DG, HS, or MP, IMO hazard or pollutant category Y	7	Reserved for future use
3	Carrying DG, HS, or MP, IMO hazard or pollutant category Z	8	Reserved for future use
4	Carrying DG, HS, or MP, IMO hazard or pollutant category OS	9	No Additional Information

8. Close the menu.

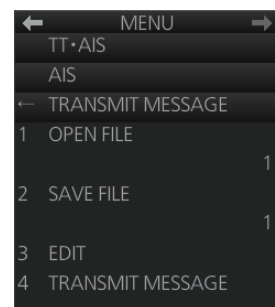
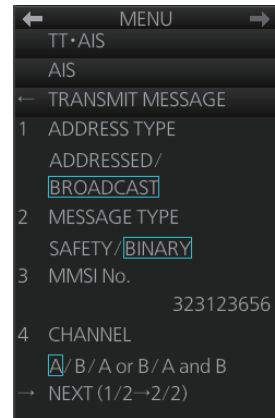
4.16 AIS Messages

You can send and receive messages via the VHF link, to a specified destination (MMSI) or all AIS-equipped ships within communication range of your ship. Messages can be sent to warn of safety of navigation, for example, an iceberg sighted. Routine messages are also permitted. Short safety-related messages are only an additional means to broadcast safety information. They do not remove the requirements of the GMDSS.

4.16.1 How to create and transmit a new AIS message

You can create and send an AIS message as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [8 TRANSMIT MESSAGE] menu.
3. At [1 ADDRESS TYPE], select [ADDRESSED] to send the message to a specific AIS-equipped ship, or [BROADCAST] to send the message to all AIS-equipped ships within VHF communication range. For [ADDRESSED], enter MMSI of ship at [3 MMSI No.].
4. At [2 MESSAGE TYPE], select [SAFETY] for safety message, or [BINARY] for routine message.
5. At [4 CHANNEL], select the channel over which to broadcast your message. The choices are [A], [B], [A or B] or [A and B].
6. Click [NEXT] to go to the next page.
7. Select [3 EDIT]. A text input box appears together with the software keyboard. Use the software keyboard to enter your message. The number of characters that may be entered depends on message type, and the number of characters available appears below the text box.
 Safety message broadcast: 90 characters
 Binary message broadcast: 86 characters
 Safety message addressed to MMSI: 85 characters
 Binary message addressed to MMSI: 80 characters
8. To save the file, select [2 SAVE FILE].
9. To transmit the message, click [4 TRANSMIT MESSAGE]. The confirmation message "Attention: Do you wish to transmit AIS message?" appears. Click the [OK] button to transmit the message.



The Alert (ALF format: 10540,3) "542 AIS Transmitting" appears in the [Alert] box while the message is being transmitted. If the message could not be transmitted, the Alert 541 (ALF format: 10540,2) "AIS Message Transmit Error" appears.

4.16.2 How to transmit a saved AIS message

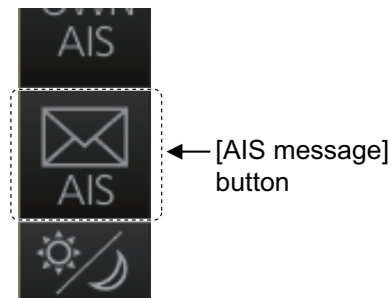
If you have saved some previously transmitted AIS messages, you can edit one and send it as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Open the [8 TRANSMIT MESSAGE] menu.
3. Go to page 2 of the menu, select [1 OPEN FILE] then select the number of the message to transmit.
4. Select [3 EDIT] to edit the message.
5. To save the message, select [2 SAVE FILE].
6. To transmit the message, select [4 TRANSMIT MESSAGE]. The confirmation message "Attention: Do you wish to transmit AIS message?" appears. Click the [OK] button to transmit the message.

4.16.3 How to display received AIS messages

When you receive an AIS message, the Alert 539 (ALF format: 10540,1) "AIS Message Received" appears.

To display the message, click the [AIS message] button on the InstantAccess bar™.



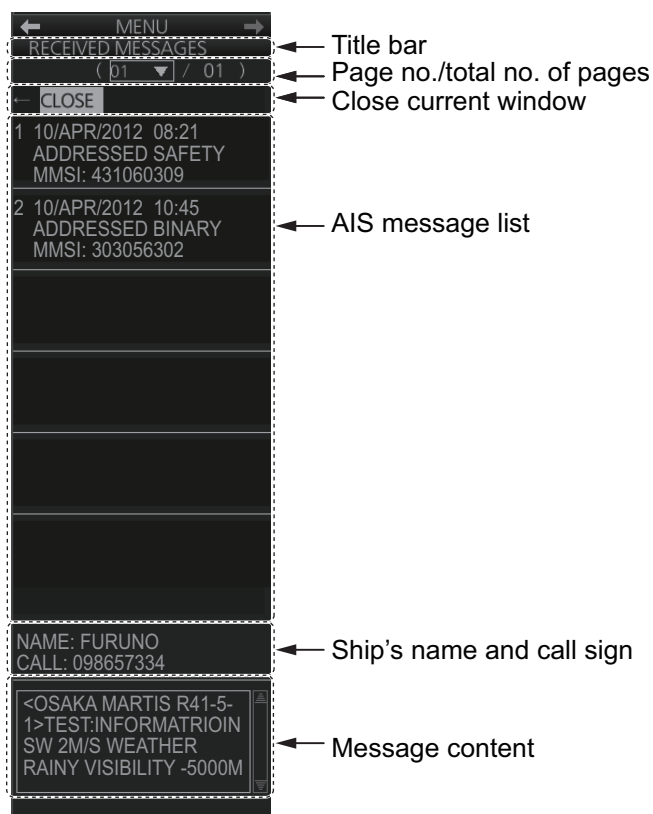
How to get notification of AIS message reception with the [AIS message] button

Right-click the AIS mode indication then click [AIS Menu] to show that menu. Go to page 2 and set [1 AUTO DISP MESSAGE] to [ON]. When you receive an AIS message, the [AIS message] button is displayed in orange.

AIS Received Messages list

Received AIS messages are stored in the AIS received message list. A maximum of 200 messages are saved over 50 pages for FURUNO 19-inch monitor unit, 34 pages for FURUNO 23-inch monitor unit.

1. Right-click the AIS mode indication then click [AIS Menu] to show that menu.
2. Select [7 RECEIVED MESSAGES].

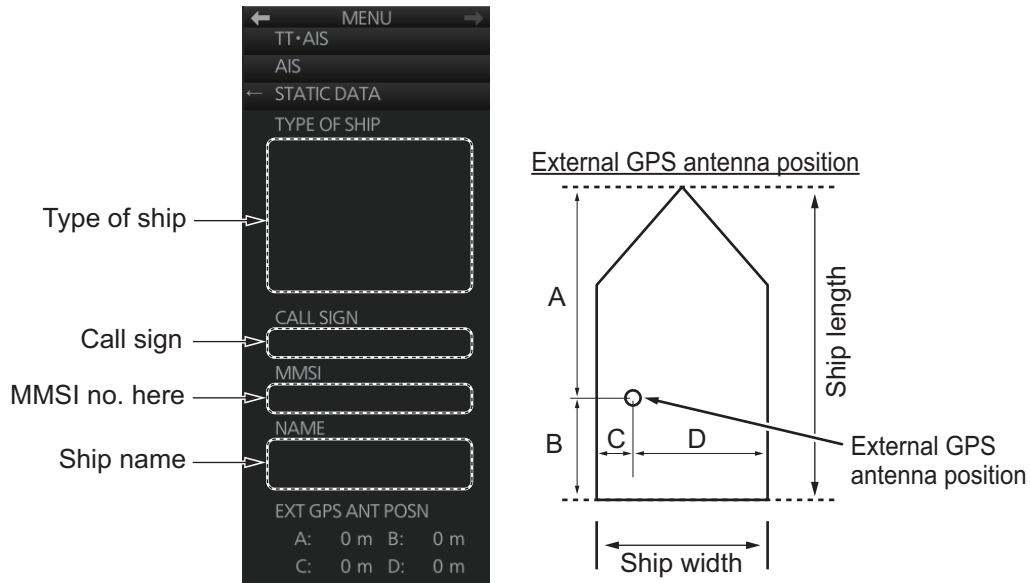


3. Click an AIS message in the list to show its contents.
4. Click the [CLOSE] window button to close the window.

4.17 How to View Own Ship Data

Own ship's static data (type of ship, call sign, MMSI, name and position of external GPS antenna) can be viewed as follows:

1. Right-click the AIS mode indication then click [AIS Menu] to show the AIS menu.
2. Select [STATIC DATA].

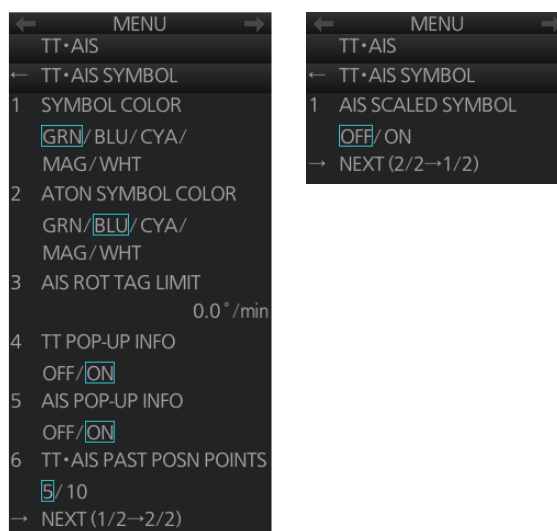


3. Close the menu.

4.18 Other AIS Features

The [TT•AIS SYMBOL] menu additionally provides the features described below.

To show the [TT•AIS SYMBOL] menu, right-click the AIS mode indication on the bottom-right of the screen then select [Symbol Menu].



Page 1

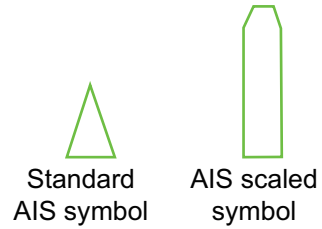
Page 2

[2 ATON SYMBOL COLOR]: Select the ATON symbol color.

4. AIS OPERATION

[3 AIS ROT TAG LIMIT]: The ROT marker appears on the heading line of an AIS target and points in the direction of the turn when the ship's rate of turn is greater than that set here.

[1 AIS SCALED SYMBOL]: The AIS target symbol can be shown as a simple triangle or a symbol scaled according to a vessel's dimensions. Select [ON] to show the scaled symbol.



5. RADAR MAP AND TRACK

5.1 What is a Radar Map?

A radar map consists of a layer of marks and lines overlaid on the radar display. A map is intended for indicating safety-related areas and objects. Ten radar maps can be made and each map can have a total of 4,000 lines and marks. The map data can be saved to facilitate repeated use on a routine navigation area. The user can create a radar map in real time while using the radar for navigation or at leisure time at anchor or while the radar is not being used. Waypoints, events and user charts from the chart can be shown or hidden on the radar map display.

The radar map does not affect any radar function.

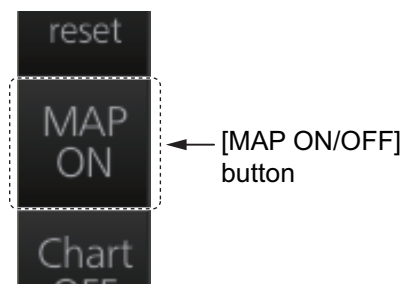
5.2 Presentation Modes

Six presentation modes are available: North-up, Course-up, Head-up, STAB Head-up, Stern-up and North-up TM. To select a mode, use the **MODE** key on the Control Unit or click the [Range/Presentation mode] box.

Note: Chart data is not displayed in the Head-up and STAB Head-up modes.

5.3 How to Show, Hide the Radar Map Display

Click the [MAP ON/OFF] button to display [MAP ON] or [MAP OFF] as appropriate.



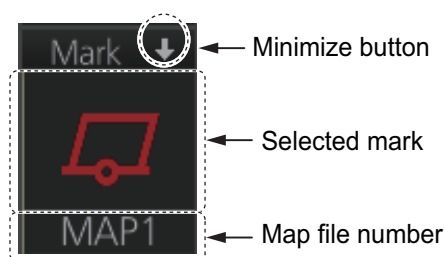
5.4 How to Enter Radar Map Marks and Lines

Marks and lines can be entered in the radar mode. (Marks cannot be entered in the chart radar mode.) These marks and lines can be displayed in red, green, blue, cyan, magenta, yellow or white. (Some marks, lines and colors may not be available depending on the specifications of your radar.)

The capacity for map storage is 10 maps/4,000 points per map. When 4,000 marks and lines have been entered into a map, the message "MARK FULL" replaces the mark icon in the [Mark] box and no more marks and lines can be entered into that map. In this case save the marks/lines to another map file or erase some marks from the full map file in order to save the mark.

The procedure below shows how to enter a mark, including mark selection, mark entry method, and save location. You can skip steps in the procedure where it is not necessary to complete the corresponding action.

1. Put the cursor on the mark shown in the [Mark] box at the bottom-left position on the display.



2. Spin the scrollwheel to select a mark. The name of the mark appears to the right of the mark.



3. Select mark color (B-type only), mark position, and where to save the mark as follows:

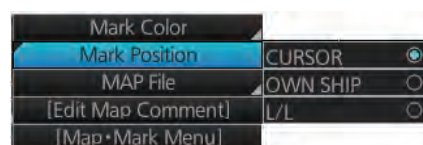
- 1) Right-click the [Mark] box to show the context-sensitive menu then click [Mark Color].



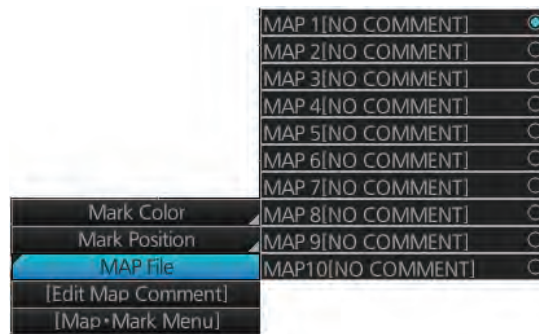
- 2) Click the mark color desired.

- 3) At the context-sensitive menu, click [Mark Position] to select the mark input method. The choices are [CURSOR], [OWN SHIP] and [L/L].

For L/L, the mark is entered at the L/L position entered at [MAP MARK L/L] on the [MAP•MARK] menu.



- 4) At the context-sensitive menu, click [MAP File] then click the map file number where to save the mark.



4. **For entry with the cursor**, use the trackball to put the cursor on the location desired. (You can see the range and bearing from own ship to the cursor location by monitoring the Cursor position box.) Push the left button or the **MARK** key on the Control Unit to inscribe the mark or line point.

Note: To continue entering the same mark or line under the same conditions, do the following at the next time of entry.

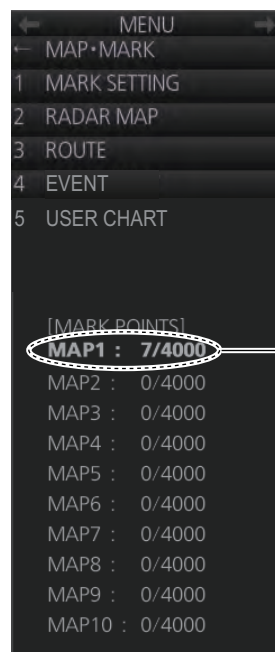
Entry by cursor: Click the location where to put a mark.

Entry by ship's position, or manual input of latitude and longitude: Click the mark icon.

5.5 How to Find Number of Map Points Used

You can show the number of points used in each radar map file.

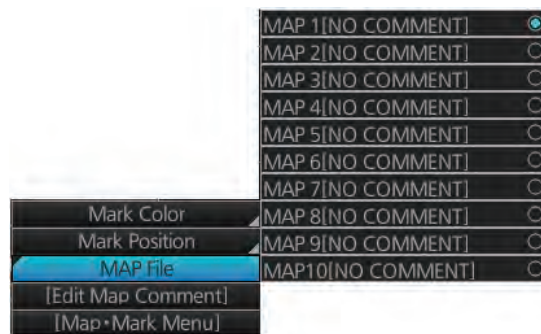
Right-click the [Mark] box then select [Map•Mark Menu]. See [MARK POINTS] at the bottom of the menu to see how many mark points have been used per map file. In the example below 7 points out of 4,000 points have been used in Map 1.



Map no., no. of points used/total no. of points

5.6 How to Select the Radar Map to Display

1. Right-click the [Mark] box to show the context-sensitive menu.
2. Click [MAP File] and then click the map no. you want to display.

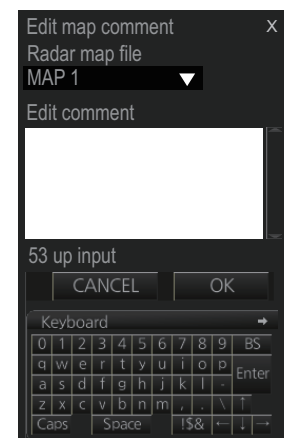


5.7 How to Attach a Comment to a Radar Map, Find Comment for a Map

5.7.1 How to attach a comment to a radar map

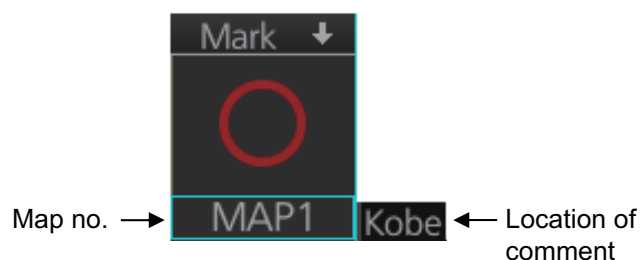
You can attach a comment to radar maps you have created, to help you distinguish your maps.

1. Right-click the [Mark] box to show the context-sensitive menu.
2. Click [Edit Map Comment]. A text input box appears together with the software keyboard, as shown in the right figure.
3. Select the map no. with the [Radar map file] drop-down list.
4. Enter your comment in the text input box. The number of characters available appears below the box.
5. Click the [OK] button to finish.



5.7.2 How to find the comment for a map

Put the cursor on the map no. indication. The comment is displayed to the right of the map no. In the example below the comment is "Kobe".

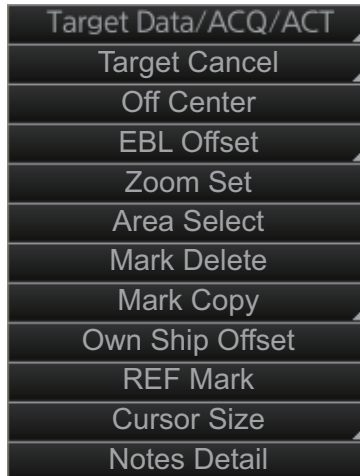


5.8 How to Erase Radar Map Marks and Lines

A total of 4,000 marks and lines is allotted per map. When this amount is exceeded in a map, no more map marks or lines may be entered into the map unless you erase some unnecessary marks or lines.

5.8.1 How to erase individual radar map marks and lines

1. Right-click the display area to show the context-sensitive menu.

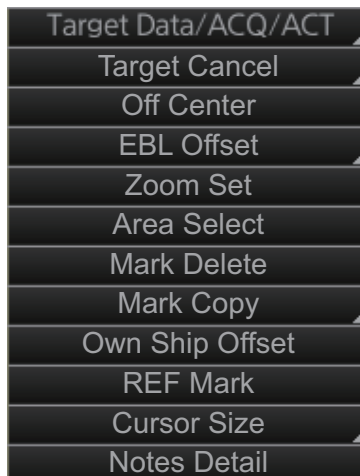


2. Click [Mark Delete].
3. Click the mark or line to erase.

5.8.2 How to erase map marks and lines in an area

You can erase all marks and lines within an area as follows:

1. Right-click the display area to show the context-sensitive menu.

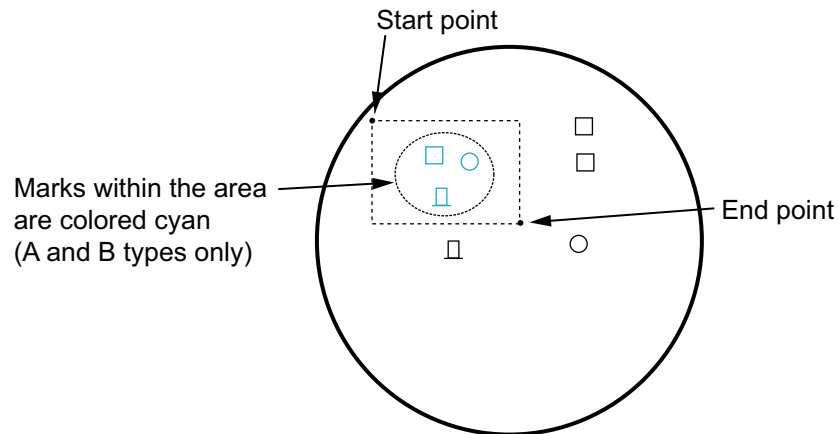


2. Click [Area Select].

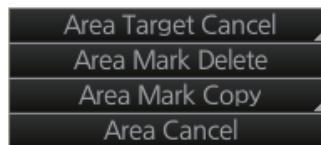
5. RADAR MAP AND TRACK

3. Specify the area as follows:

- 1) Put the cursor on the start point and push the left button.
- 2) Drag the cursor diagonally to the end point and push the left button.



4. Right-click the display area to show the context-sensitive menu.



5. Click [Area Mark Delete] to delete the marks and lines in the area selected.

5.8.3 How to erase all radar map marks and lines in a map file

You can erase all radar map marks and lines in the map file currently displayed. Be absolutely sure you want to erase the marks and lines - erased marks and lines cannot be restored.

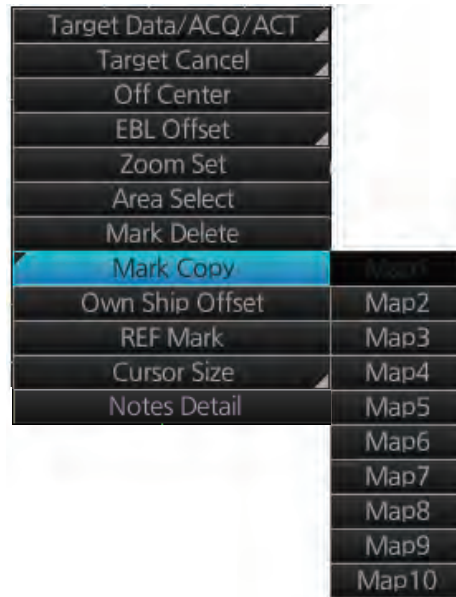
1. Right-click the [Mark] box, select [Map•Mark Menu] and [1 MARK SETTING].
2. Select [8 MAP MARK ALL DELETE]. The confirmation message "Attention: Do you wish to delete all map mark?" appears. Click the [OK] button to erase all marks and lines.
3. Close the menu.

5.9 How to Copy Radar Map Marks and Lines

5.9.1 How to copy individual radar map mark and line to another map file

You can copy individual mark and line from the currently displayed radar map to the radar map file of your choice.

1. Right-click the display area to show the context-sensitive menu.
2. Click [Mark Copy] then click the map file no. where to copy the mark.



3. Put the (light-blue) cursor on the mark or line then click.

5.9.2 How to copy radar map marks and lines within an area to another map file

You can copy radar map marks and lines within an area of the currently displayed radar map to the radar map file of your choice.

1. Right-click the display area to show the context-sensitive menu.
2. Click [Area Select].
3. Specify the area as follows.
 - 1) Put the cursor on the start point and push the left button.
 - 2) Drag the cursor diagonally to the end point and push the left button.

All marks and lines within the area selected are highlighted in blue (A and B types only).
4. Right-click to show the context-sensitive menu.

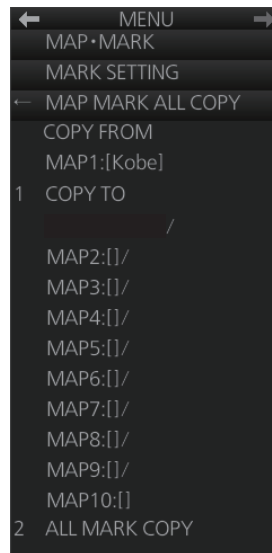


5. Click [Area Mark Copy] then click the map file number where to copy the marks and lines.

5.9.3 How to copy all radar map marks and lines in a map file to another map file

You can copy all radar map marks and lines in the currently displayed radar map to the radar map file of your choice.

1. Display the map file of which to copy all its marks and lines. See section 5.6.
2. Right-click the [Mark] box then click [Map•Mark Menu].
3. Select [1 MARK SETTING].
4. Select [9 MAP MARK ALL COPY].



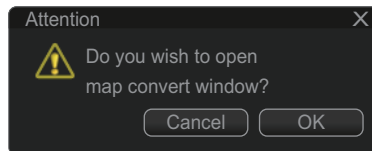
5. Select [1 COPY TO] then select where to copy the map marks and lines.
6. Select [2 ALL MARK COPY]. The confirmation message "Attention: Do you wish to copy all map mark?" appears. Click the [OK] button to copy.
7. Close the menu.

5.10 How to Export Radar Map

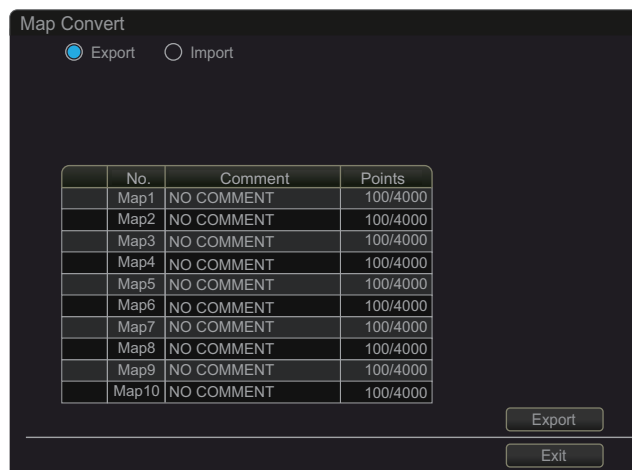
You can export a radar map to a USB flash memory. For safety, only export radar maps while the radar is in standby.

1. Set the USB flash memory in the USB port on the Control Unit.
2. Open the menu then select the [5 MAP•MARK] and [1 MARK SETTING] menus.
3. Go to page 2 of the menu, select [1 MAP MARK MANAGE]. The confirmation message appears.

Note: The [1 MAP MARK MANAGE] menu appears only when the radar is in standby.



4. Click the [OK] button to show the [Map Convert] dialog box.

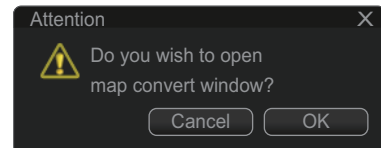


5. Check [Export] at the top-left position of the dialog box.
6. Check the radar map(s) (Map1 to Map10) to export.
7. Click the [Export] button to show the [Save file] dialog box.
8. Select the USB flash memory as the destination to save then click the [Save] button. After the data export is completed, the message "x file(s) have exported success." appears (x is the number of the radar map(s)).
9. Click the [OK] button.

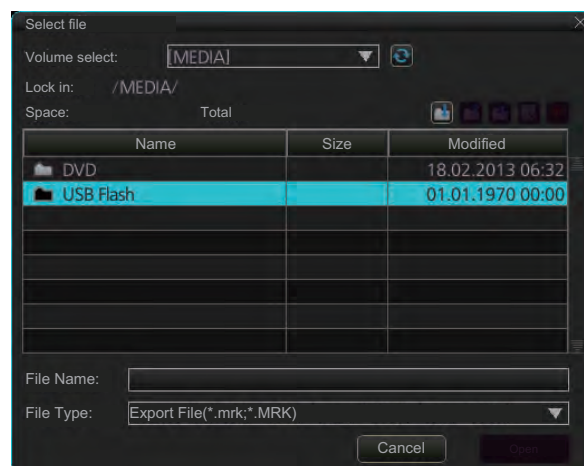
5.11 How to Import Radar Map

You can import a radar map created on another equipment (FCR-2xx9, FAR-3xx0 or FAR-2xx7). For safety, only import radar maps while the radar is in standby. Copy the radar maps to a USB flash memory.

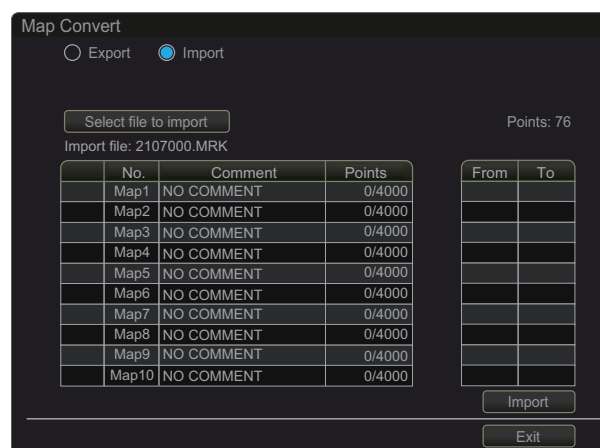
1. Set the USB flash memory that contains the radar map(s) to import in the USB port on the Control Unit.
2. Open the menu then select the [5 MAP•MARK] and [1 MARK SETTING] menus.
3. Go to page 2 of the menu, select [1 MAP MARK MANAGE]. The confirmation message appears.
Note: [1 MAP MARK MANAGE] is only available when the radar is in standby.



4. Click the [OK] button to show the [Map Convert] dialog box.
5. Check [Import] at the top-left position of the dialog box then click the [Select file to import] button to show the [Select file] dialog box.



6. Select the folder that contains the file to import then click the [Open] button to show the [Map Convert] dialog box.



7. Check the radar map(s) (Map1 to Map10) to which the data created on another unit are imported.
8. Click the [Import] button to import the data to the radar map(s) selected at step 7.

Note: When importing a radar map created on another FAR-2xx7, the radar maps marks and lines are converted. See the tables on pages 5-11 and 5-12.

5. RADAR MAP AND TRACK

Lines

FAR-2xx7			FAR-3xx0					
Symbol	Color	Name	IMO or A type			B type		
			Symbol	Color	Name	Symbol	Color	Name
	*	Mark		Yellow-orange	Buoy		*	Mark
	*	Mark		Yellow-orange	Buoy		*	Mark
	*	Nav Line		Purple	Buoy		*	Nav Line
	*	Coast Line		White	Buoy		*	Coast Line
	*	Contour Line		Gray	Buoy		*	Contour Line
	*	Prohibited Area		Purple	Prohibited Area		*	Prohibited Area
	*	Danger		Purple	Danger		*	Danger
	*	Line Buoy		Yellow-orange	Line Mark		*	Line Buoy
	*	Line Buoy		Yellow-orange	Line Mark		*	Line Buoy
	*	Line Mark		Yellow-orange	Line Mark		*	Line Mark
	*	Line Mark		Yellow-orange	Line Mark		*	Line Mark
Other	-	-		Yellow-orange	Line Mark		*	Mark

*: The display color is selectable. See "Contrast table for the display colors" on this page.

Contrast table for the display colors

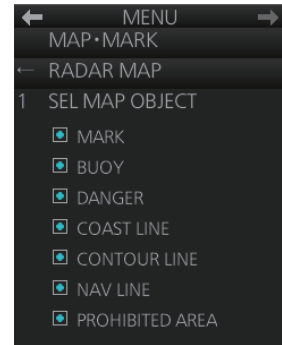
Below is the contrast table for the display colors of the radar map marks and lines.

FAR-2xx7	FAR-3xx0
Red	Red
Yellow	Yellow
Green	Green
Cyan	Cyan
Magenta	Magenta
Blue	Blue
White	White
Other	Green

5.12 How to Show, Hide Radar Map Features

You can show or hide radar map objects as follows:

1. Right-click the [Mark] box then select [Map•Mark Menu] and [2 RADAR MAP].
2. Turn objects on or off as appropriate.
3. Close the menu.



5.13 Track

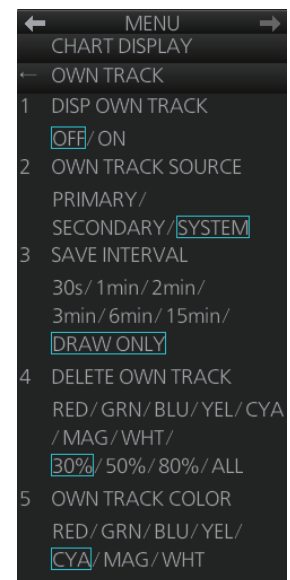
5.13.1 How to set up ship's track

The track traces your ship's movement. This radar records track at the interval you set on the [OWN TRACK] menu, and the recording interval determines the maximum recording time. The longer the interval the longer the recording time, as shown in the table below.

When the memory for track becomes full, the oldest track is deleted to make room for the latest. For that reason you may want to adjust the recording interval so as to keep the track on the display for a longer time.

Save Interval	Max. Recording Time	Save Interval	Max. Recording Time
30 s	6 days 22 hr 40 min	3 min	41 days 16 hr
1 min	13 days 21 hr 20 min	6 min	83 days 8 hr
2 min	27 days 18 hr 40 min	15 min	208 days 5 hr

1. Open the menu then select the [6 CHART DISPLAY] and [1 OWN TRACK] menus.
2. Select [1 DISP OWN TRACK].
3. Select [ON] to show your ship's track or [OFF] to hide the track.
4. Select [2 OWN TRACK SOURCE].
5. Select the navigation sensor that is to feed the position data to use to plot your ship's track, among [PRIMARY], [SECONDARY] and [SYSTEM].
[PRIMARY]: Navigation sensor having first priority.
[SECONDARY]: Navigation sensor having second priority.
[SYSTEM]: Plot own ship's track using system-fed position.
6. Select [3 SAVE INTERVAL].
7. Select how often to save your ship's track, among [30s], [1min], [2min], [3min], [6min] and [15min]. [DRAW ONLY] draws the track but does not save it.
8. **For the B-type radar**, you can select the color for the track with [5 OWN TRACK COLOR].
9. Close the menu.



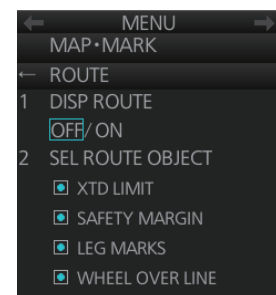
5.13.2 How to erase track

When the display becomes filled with track, for example, your ship traces the same route several times, you may want to delete some or all of your track from the display.

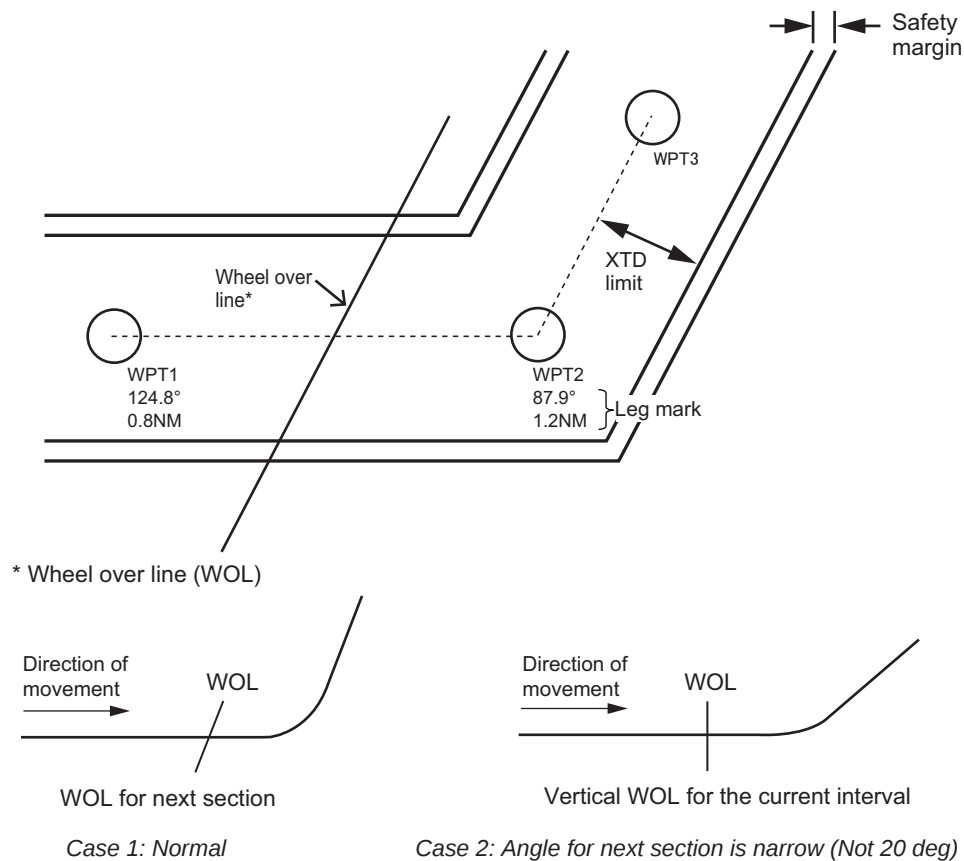
1. Open the menu then select the [6 CHART DISPLAY] and [1 OWN TRACK] menus.
2. Select [5 DELETE OWN TRACK].
3. Select the color to delete (A and B types), or the percentage of track to delete among [30%], [50%], [80%] and [ALL].
4. Close the menu.

5.14 Route Display

The route selected for navigation (in the chart mode) (see chapter 12) can be shown on the radar display. You can show or hide the entire route, and show or hide elements of the route (channel limits, safety margin, leg marks and wheel over line).



1. Right-click the [Mark] box then select [Map•Mark Menu] and [3 ROUTE].
2. Turn the route display on or off at [1 DISP ROUTE].
3. Turn the XTD limit, safety margin, leg marks and wheel over line displays on or off at [2 SEL ROUTE OBJECT].

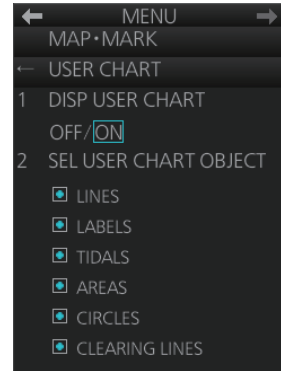


4. Close the menu.

5.15 User Chart Display

The active user chart can be shown in the chart radar mode. See chapter 13 for a description of the user chart.

1. Right-click the [Mark] box then select [Map•Mark Menu] and [5 USER CHART].
2. Show or hide the user chart on the radar display with [1 DISP USER CHART].
3. Show or hide the user chart objects on the radar display with [2 SEL USER CHART OBJECT].
4. Close the menu.



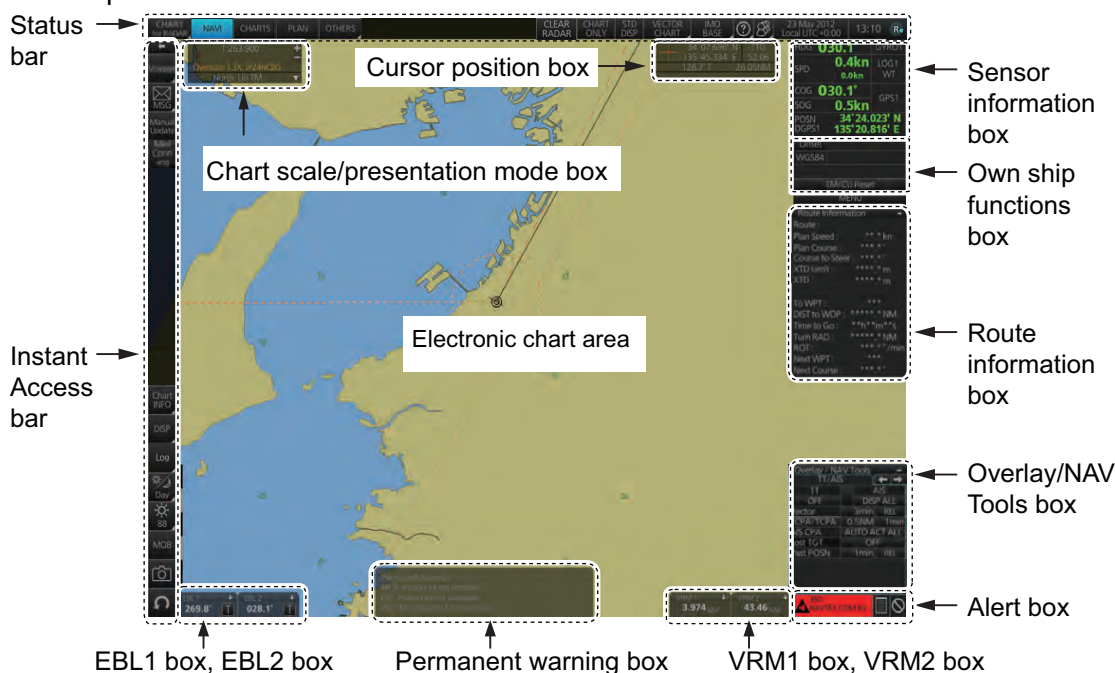
5. RADAR MAP AND TRACK

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6. CHART OVERVIEW

6.1 Chart Screen Overview

The chart screen is divided into several areas, as illustrated below (The layout on your screen may differ slightly depending on your monitor's resolution). The chart screen operational area has no limitations. That is, high latitudes (85° and higher) are correctly displayed always*. The chart screen uses "cylindrical equidistant" projection for areas of high latitude and small chart scales. All other conditions use the "orthographic" presentation.



*: High altitudes are not supported in RADAR mode.

- The **Status bar** provides for selection of display mode, chart format, IMO chart display; one-click restoration of IMO standard display, etc.
- The **Sensor information box** displays ship's speed, course and position and selects sensors.
- The **Own ship functions box** applies offset to the chart.
- The **Route information box** shows route and waypoint data, when a route is selected for navigation.
- The **Overlay/NAV Tools box** provides for setup of navigation-related functions.
- The **Alert box** shows operational and system alert messages.
- The **VRM boxes** measure the range to an object.
- The **Permanent warning box** displays chart-related warning messages.
- The **EBL boxes** measure the bearing to an object.
- The **InstantAccess bar™** provides quick access to functions such as brilliance adjustment, display palette and the chart-related menu. The contents change according to the display mode selected.
- The **Chart scale/presentation mode box** selects the chart scale and presentation mode.
- The **Cursor position box** shows the latitude and longitude position of the cursor and the TTG to the cursor.
- The **Electronic chart area** shows the chart.

Note: If the display indications freeze, the buzzer sounds continuously. Restart the unit to restore normal operation.

6.1.1 Electronic chart area

This radar can use the following types of charts:

- S-57 (IHO)
- S-63 (IHO) (S-63 encrypted)
- C-MAP

The following information can also be displayed:

- Cursor (moved by trackball)
- Planned route
- EBL (Electronic Bearing Line) and VRM
- Own ship symbol with speed vector
- TT-acquired target from radar
- AIS target

Electronic charts

The electronic navigational charts are displayed in the electronic chart area. There are two kinds of electronic navigational charts available for use in this radar:

- Vector format (C-MAP or ENC)
- Raster format (ARCS)

The radar combines chart and navigational information. It should be noted that modern navigation systems (e.g., differential GPS) may offer more accurate positioning than what was used to position some of the surveys from which the electronic navigational chart was derived.

This radar is compatible with S57 release 3 ENC format charts. ENC charts are converted to SENC for use with the radar.

When you open a chart, it is displayed with the default scale, called the compilation scale. The details for the chart are displayed in the electronic chart area and these can be modified. You can change the chart scale with the ZOOM IN and ZOOM OUT functions, and the scale range is 1:1,000 - 1:70,000,000.

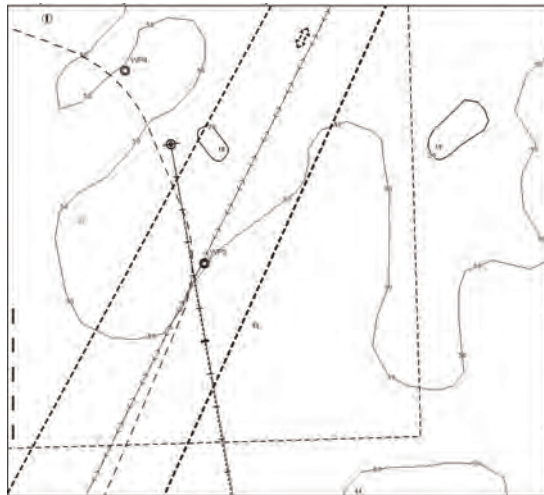
C-MAP vector format

The C-MAP charts require a contract with applicable provider. There are two types of C-MAP charts; C-MAP ENC SERVICE, which are officially recognized charts, and C-MAP PROFESSIONAL, which are charts from a private source and cannot be used as a substitute for paper charts under any condition. To emphasize this point C-MAP PROFESSIONAL charts are called "Non-ENC" charts in this manual.

Note: Some eToken dongles from the FEA-2xx7 can be used with this system. These are labeled "JeT FURUNO XXXXX". Contact your dealer for details.

This radar accepts the following C-MAP chart types: C-MAP ENC SERVICE, C-MAP PROFESSIONAL, C-MAP ENC+ SERVICE.

C-MAP ENC SERVICE charts comply with the IHO's (International Hydrographic Organization's) S-57 Edition 3 product specification. When used in this radar, the ENC data improves the safety of navigation at sea.



What is ENC delivery?

ENCs can be distributed as ENC delivery or SENC delivery. Both deliveries can be used in this system.

In ENC delivery, charts are distributed directly from source like PRIMAR, IC-ENC, JHA, etc. They are delivered onboard in ENC format (using S-57 and S-63) then the charts are installed into the system.

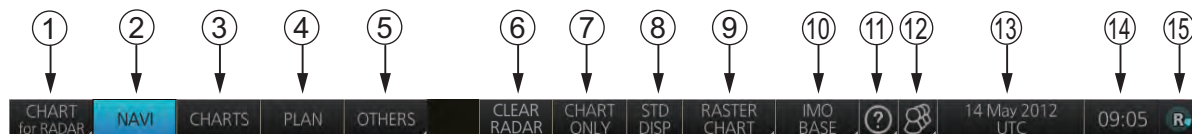
In SENC delivery, charts are converted from ENC to SENC before delivery to onboard and then installed into the system. A C-MAP ENC delivery is SENC delivery.

Important notices

- If you are using both services (ENC and SENC deliveries) having the same chart name installed into the system through both deliveries, priority of displaying the chart is in ENC delivery.
- Chart updates for ENC delivery are only for charts of ENC delivery and chart updates for SENC delivery is only for charts of SENC delivery. You have to keep charts up-to-date separately.
- If you change from ENC delivery to SENC delivery, remove old charts from the system before installing charts from new delivery.

6.1.2 Status bar

The Status bar mainly provides for selection of display mode, chart type and IMO chart display setting.

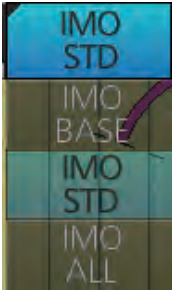


No.	Button name	Description
1	Display mode	Selects the display mode: [RADAR], [CHART for RADAR], [AMS for RADAR] or [CONNING for RADAR].
2	NAVI	Selects the Voyage navigation mode.
3	CHARTS	Goes to the Chart maintenance mode.
4	PLAN	Selects the Voyage planning mode.
5	OTHERS	Sets system in silent mode.
6	CLEAR RADAR	Hides radar echoes and TT/AIS symbols. Available only when radar overlay is active, or when there is at least one TT/AIS symbol displayed.
7	CHART ONLY	Shows only the chart, when left button is pressed and held down.
8	STD DISP	Restores the IMO standard display instantly.
9	Chart priority	No use.
10	Chart database	Selects the pre-defined presentations of ENC content: IMO BASE, IMO STD or IMO ALL. CUSTOM appears when the symbols selected or deselected on the [Chart Display] menu do not match the preset conditions for IMO BASE, IMO STD or IMO ALL.
11		Displays the operator's manual, chart program no. and system information.
12	Settings	Manages user profiles; opens the Settings menu.
13	Date	- Displays the date. - Selects the time to use, local or UTC. - Sets the time difference between local and UTC (to use local time).
14	Time	Displays the time, local or UTC.
15	Working Indicator 	- Rotates clockwise if the system is working properly. If it is not spinning the system is not working. Shortly after it stops spinning the buzzer sounds. Reset the power to restore normal operation. - If the primary display mode is specified during the installation, the first letter of the mode name appears at the center of the working indicator as follows: C: Conning, E: ECDIS, R: Radar. The letter can be clicked to return to the primary display mode.

How to operate the buttons on the Status bar

The Status bar has two types of controls: toggle button and drop-down list button. You operate the buttons with the trackball module.

Button type	Operating procedure
Mode button	
A mode button selects the chart operating mode (see section 6.3). The background color of a mode button is light-blue when its chart operating mode is enabled; gray when disabled. The [NAVI] button is an example of a mode button.	OFF (gray) Click button. ON (light-blue)

Button type	Operating procedure
Drop-down list button	
A drop-down list button provides a list from which to select an option related to the label on the button. The [Chart Database] button is an example of a drop-down list button. See the right figure. A drop-down list button has a list status indicator (a triangle) whose position changes according to list status.  List closedList opened	 Click button.

6.1.3 InstantAccess bar™

The InstantAccess bar™ runs vertically along the left edge of the screen. The bar contains all the operating functions related to the selected chart operating mode (Voyage planning, Voyage navigation and Chart maintenance). The bar is divided into two sections, upper and lower. The buttons in the lower section are common to all modes. A button with a triangle mark at its bottom right corner indicates a button with multiple functions.



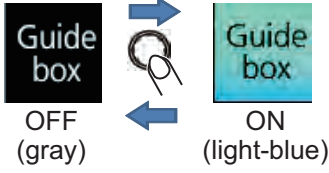
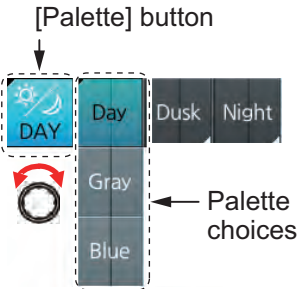
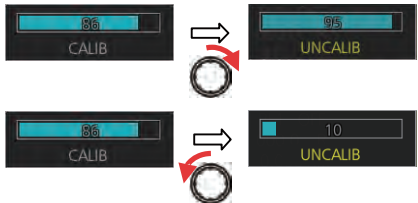
Button name	Description
Voyage navigation mode bar	
←	Minimize the InstantAccess bar™. To restore the maximized bar, click anywhere on the bar. 
Voyage	[Route]: Selects/deselects routes, and moves route to Voyage planning mode (for editing). [User Chart]: Selects/deselects user chart for monitoring. [Monitor INFO]: Shows the [Monitor Information] dialog box. [Stop Monitor]: Stops monitoring of route, user chart. [Instant Track]: Creates a temporary track to return to or make a temporary detour from the monitored course.
	Processes AIS Safety and Navtex messages. If you have unread Navtex or Safety messages, the icon changes as shown right; "N" for unread Navtex, "S" for unread Safety, "S/N" for unread Safety and Navtex. 
Manual Update	Shows the menu for manual update of chart objects.
Mini Conning	Shows or hides the mini conning display.
Chart maintenance mode bar	
←	Minimizes the InstantAccess bar™.
AUTO Import	Loads charts automatically.
Manage Charts	Deletes charts; installs (loads) charts manually.
Cell Status	Finds cell status.
License	Enters license information.
Public Key	Shows the current public key. The public key changes each time a new one is installed.
System	Functions for chart synchronization. [Sync Config]: Selects the ECDIS units to synchronize. [Sync Status]: Checks synchronization status. [Reconvert]: Reconverts outdated SENC charts.
Voyage planning mode bar	
←	Minimizes the InstantAccess bar™.
Planning	Creates and edits routes and user charts.
Report	Displays route and user chart reports.
Guide Box	Shows or hides the guide box, which provides range and bearing measurement between waypoints when creating a route. Note: Range and bearing between waypoints can be calculated using either [Rhumbline] or [Great Circle]. Select the appropriate method from the [Guide Box] drop-down list in the [Geometry] section of the [NAV TOOLS] menu.

6. CHART OVERVIEW

Button name	Description
Manage Data	Manages routes and user charts. [Route]: Imports, exports, deletes routes. [User Chart]: Deletes user charts. [Data Import]: Imports route, user chart created with FEA-2x07 ECDIS.
Common bar	
Chart INFO	Provides chart information. [Chart Legend]: Shows chart legend, with your vessel at the center, in the Voyage navigation mode. [Viewing Dates]: Sets Display date and Update Review dates. [Chart 1]: Displays an overview of ECDIS chart symbols.
DISP	[SET]: Shows the [Basic Setting] menu, [Chart Display] menu, [Symbol Display] menu, [Chart Alert] dialog box. [TWO DISP]: Splits the screen in two, vertically or horizontally, in the Voyage navigation mode. [NtoM]: Shows or hides the Notices to Mariners (NtoM).  : Shows or hides the software keyboard.
Log	Displays Update log (ENC, C-MAP), Event log* (user event, POSN event), NAV log (Voyage, Details, Chart Usage), Target log (Danger Target), and Route Transfer log. *: Voyage navigation and Voyage planning modes.
 Palette	Selects a color palette, day, dusk or night.
 BRILL	Adjusts the backlighting for the control unit. (chart mode)
MOB	Inscribes the MOB (ManOverBoard) mark.
 Capture	Takes a screenshot.
 UNDO	Restores previous condition in route and user chart creation.

How to operate the buttons on the InstantAccess bar™

The InstantAccess bar™ has four types of buttons: toggle button, drop-down list button, slider bar button, and specialty button. (The [MOB], [Capture] and [UNDO] buttons are specialty buttons that provide a single-action function.) The buttons can be operated with the trackball module or the **InstantAccess** knob. This section shows you how to operate the buttons with the **InstantAccess** knob.

Toggle button	Drop-down list button	Slider bar button
		

1. Push the **InstantAccess** knob to enable its use with the InstantAccess bar™.
2. Rotate the **InstantAccess** knob to select a button. The background color of the button selected is light blue.
3. Do one of the following depending on button type.
 - **Toggle button:** Push the knob to select setting.
 - **Drop-down list button** or **slider bar:** Rotate the knob to select an item or adjust the slider bar. Push the knob to confirm your selection or setting.

Note 1: You can use the **ESC** key to go back one step in the current operating sequence.

Note 2: The **InstantAccess** knob can only adjust the slider bar on the InstantAccess bar™.

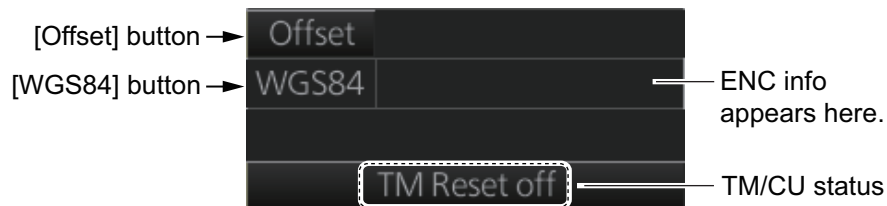
6.1.4 Sensor information box

Sensor information box displays the sensor data. When the user-selected sensor fails, the system automatically selects another sensor. When this occurs, the color of the sensor name changes according to the sensor status. For details, see section 1.11.

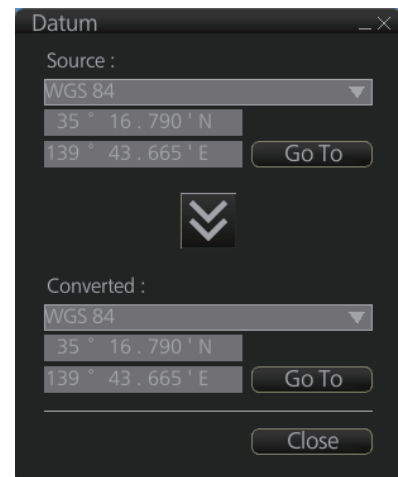
HDG	141.0° T	GPS1
SPD	-3.0kn	GPS1
	➔ 4.6kn	BT
COG	262.7° T	GPS1
SOG	5.5kn	
POSN	35° 37.9964'N	
GPS1	139° 45.8268'E	

6.1.5 Own ship functions box

The own ship functions box shows information about own ship, enables offset and TM reset.



- **[Offset]** button: See section 16.8.1.
- **[WGS 84]** button: Convert position data between datum; go to selected position on the current chart. Click the button to display the dialog box shown in the right figure. To convert a position from one datum to another, select the datum source at the [Source] pull-down list and enter position. Select the datum to convert to at the [Converted] pull-down list then click the  button. The position on the chart selected is shown below the [Converted] pull-down list. To go to a position, click a [Go To] button.



- **ENC info:** ENC chart info appears here.
No indication: ENC chart is currently displayed.
"Non-ENC data": Non-official ENC material, in yellow characters. See section 7.19.
- **TM/CU status:**
"TM/CU Reset": True motion reset is active. (Chart is stationary and own ship moves on the chart.)
"TM Reset off": When dragging the chart; true motion is OFF. To restart true motion, click the indication.
"Ship off screen": Ship is out of the display area.

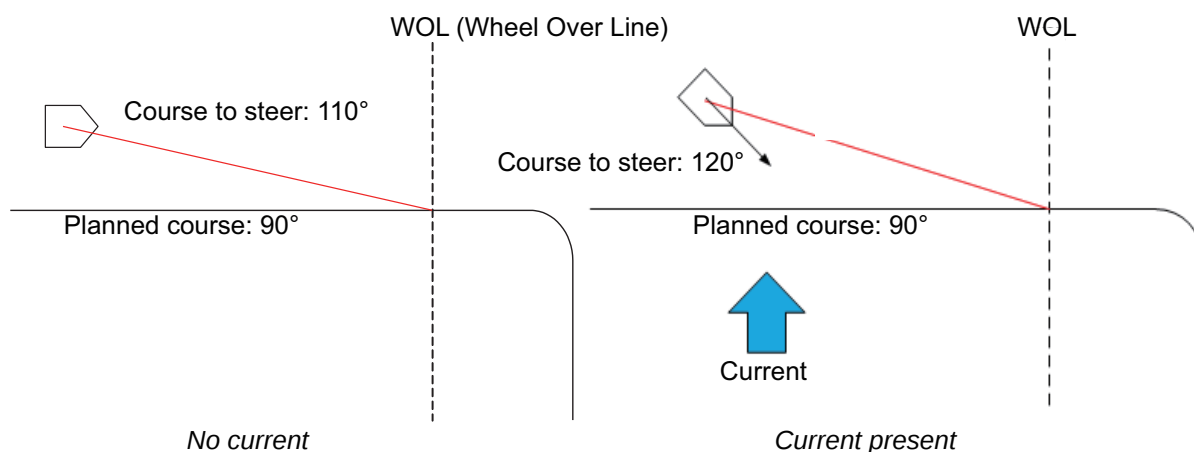
6.1.6 Route information box

Asterisks appear in data locations when no route is selected for navigation.

- [Route]: Name of monitored route.
- [Plan Speed]: Planned speed to approach "To WPT".
- [Plan Course]: Planned course between previous WPT and "To WPT".
- [Course to Steer]: Calculated set course to follow the monitored route, including XTD, drift and gyro error compensation.
- [XTD Limit]: Planned width of channel to approach "To WPT".
- [XTD]: Perpendicular distance the ship is from the intended track. The XTD figure can be shown in meters or nautical miles. Click this box, then select [XTD] and unit desired, or open the menu and select desired unit with [unit of "XTD"] in the [Route Information] menu.
- [To WPT]: The waypoint that the ship is approaching.
- [DIST to WOP] (Wheel Over Point): Distance to the point where rudder order for course change at "To WPT" is given.
- [Time to Go]: Time to go to WOP (hh:mm:ss).
- [Turn RAD]: Planned turning radius at "To WPT".
- [ROT]: Calculated rate of turn that is based on current speed and planned turning radius.
- [Next WPT]: The WPT following the "To WPT".
- [Next Course]: Next course (in degrees).

Route Information →	
Route :	cc_import_03
Plan Speed :	20.0 kn
Plan Course :	337.5 °
Course to Steer :	332.9 °
XTD Limit :	185.0 m
XTD :	0.9 m
To WPT :	36
DIST to WOP:	0.50 NM
Time to Go :	00:05:38
Turn RAD :	0.50 NM
ROT :	000.0 °/min
Next WPT :	37
Next Course :	112.1 °

Course to steer

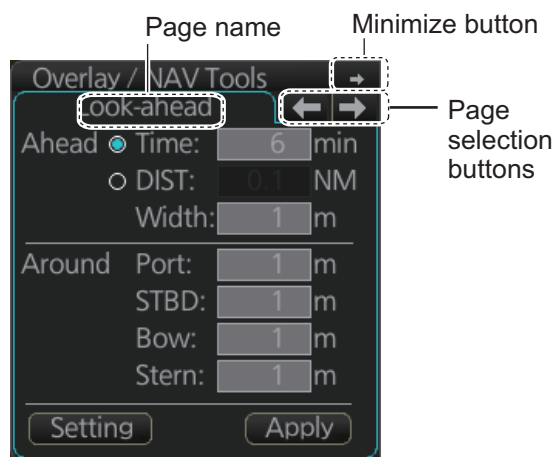


6.1.7 Overlay/NAV Tools box

The [Overlay/NAV Tools] box sets up the following objects and consists of the following pages.

- TT•AIS
- Echo*¹
- Parallel index lines
- Range rings
- Predictor (predicts ship's future movements)
- Under the keel clearance graphic
- Anchor watch
- Look-ahead
- Curved EBL*²

See chapter 15 for information about objects other than TT•AIS.



*¹: Available only when the Echo page is enabled at installation. Not available for B types.

*²: Available only when a EC-3000 with TCS functionality is connected to the same network.

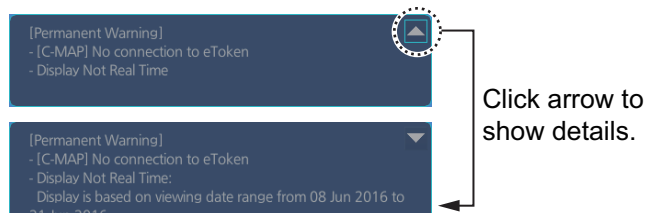
6.1.8 Alert box

The [Alert] box shows operational and system alert messages, with alert ID no. and alert message. See chapter 20.



6.1.9 Permanent warning box

The permanent warning box displays chart-related warning messages. Click the arrow to show details. Click the arrow again to minimize the box.



6.1.10 EBL, VRM boxes

The EBL measures the bearing to an object, and the VRM measures the range to an object. See section 6.10.

6.1.11 North mark

The north mark appears at the top left of the chart display, is always visible, and points in the northerly direction. At high latitudes where north is not in a set direction, the north mark appears with the text "at own ship" or "at center" below the mark to show the reference point.

North

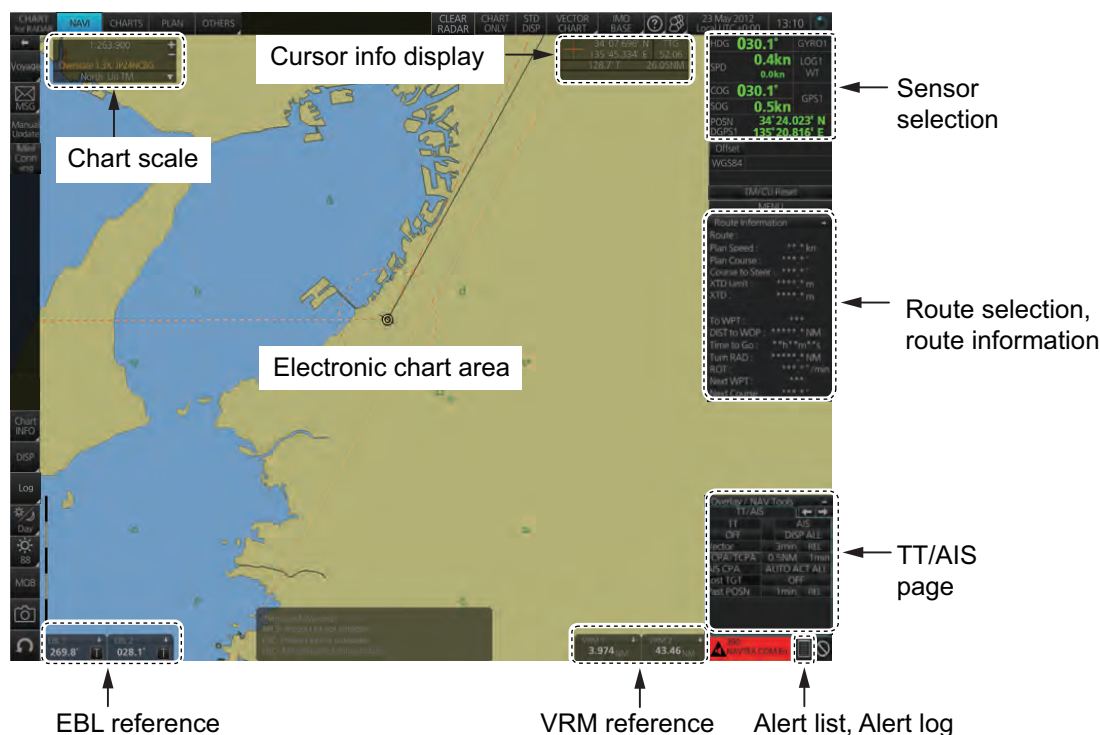


North mark

- "at own ship": Shown when your vessel is displayed on-screen. North is shown with your vessel as the reference point.
- "at center": Shown when your vessel is not displayed on-screen. North is shown with the center of the screen as the reference point.

6.1.12 Context-sensitive menus

Context-sensitive menus are available at the locations shown below. Right-click the applicable area then select the appropriate item from the menu. The availability of the context-sensitive menu depends on the mode in use, as shown in the table below.



Item	Functions	Mode and availability		
		NAVI	CHARTS	PLAN
Chart scale	Drop-down list of chart scales.	Yes	Yes	Yes
Cursor info display	Switch cursor displays.	Yes	Yes	Yes
Sensor selection	Select sensors.	Yes	Yes	Yes
Route selection, route information	Select /unselect route for monitoring*; Move to plan*; Select user chart for monitoring*; Monitor INFO box*; Stop route monitoring*; XTD	Yes	Yes (XTD only)	Yes (XTD only)
TT, AIS page	Access TT, AIS functions.	Yes	Yes	Yes
Alert list, Alert log	Open alert list, alert log.	Yes	Yes	Yes
VRM reference	Select VRM reference; offset (heading or north).	Yes	Yes	Yes

Item	Functions	Mode and availability		
		NAVI	CHARTS	PLAN
EBL reference	Select EBL reference; offset (heading or north).	Yes	Yes	Yes
Electronic chart area	Own ship mark (or cursor position*) to screen center; object info; chart legend; manual update*; divider, hide MOB, [Message] dialog box.	Yes	No	Yes*

* NAVI mode only

6.1.13 How to enter alphanumeric data

On some screens it is necessary to enter alphanumeric data. The data can be input two ways: software keyboard or trackball.

Alphanumeric data entry from the software keyboard

A software keyboard is also available for entry of alphanumeric data. Do as follows to use the software keyboard. Display the keyboard before opening menus.

1. On the InstantAccess bar™, press the [DISP], [] and [ON] buttons to show the software keyboard. The [BS], [Enter], [↑], [↓], [←], [→] and [Space] on the keyboard function the same as those keys on the keyboard of the Control Unit.



2. To switch between the alphabet keyboard and symbols keyboard, click the [!\$&] key.



Alphabet keyboard



Symbols keyboard

3. Click the input box.
4. Click appropriate keys and finally click the [Enter] key.

To erase the software keyboard, click the X button at the top right corner of the keyboard.

Alphanumeric data entry with the trackball module

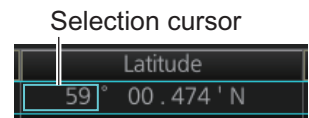
The trackball module can also be used to enter alphanumeric data.

1. Put the cursor in the input box. Up and down arrows appear at the right side of the box.
2. Enter data by one of the methods shown below.
 - Spin the scrollwheel to set data. Upward to decrease the value; downward to increase the value.
 - Click ▲ to increase the value; ▼ to decrease the value.

**How to enter latitude and longitude data with the trackball module**

The trackball module can also be used to enter latitude and longitude data.

1. Put the cursor in the input box. A selection cursor (light-blue) appears.
2. Enter data by spinning the scrollwheel. Upward to decrease the value; downward to increase the value.
3. To switch coordinate between N and S and vice versa, put the cursor at the right edge of the input box. Dual arrows appear
4. Click to switch the coordinates. The method to switch E to W and vice versa is the same.



6.2 How to Select a Display Mode

Click the display mode button at the far left side of the Status bar then click [RADAR], [CHART for RADAR] or [CONNING for RADAR] to select a display mode.

