HDS Carbon

LOWRANCE

Manual

Preface

Disclaimer

As Navico is continuously improving this product, we retain the right to make changes to the product at any time which may not be reflected in this version of the manual. Please contact your nearest distributor if you require any further assistance.

It is the owner's sole responsibility to install and use the equipment in a manner that will not cause accidents, personal injury or property damage. The user of this product is solely responsible for observing safe boating practices.

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Navico product references

This manual can refer to the following Navico products:

- Broadband Radar™ (Broadband Radar)
- Broadband 3G™ Radar (Broadband 3G Radar)
- Broadband 4G™ Radar (Broadband 4G Radar)
- Broadband Sounder™ (Broadband Sounder)
- DownScan Imaging™ (DownScan)
- DownScan Overlay™ (Overlay)
- GoFree™ (GoFree)
- INSIGHT GENESIS® (Insight Genesis)
- SmartSteer™ (SmartSteer)
- SonicHub® (SonicHub)
- StructureMap™ (StructureMap)
- StructureScan® (StructureScan)
- StructureScan® HD (StructureScan HD)

Compliance statements

This equipment complies with:

- CE under 2014/53/EU Directive
- The requirements of level 2 devices of the Radio communications (Electromagnetic Compatibility) standard 2008
- Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Internet usage

Some features in this product use an internet connection to perform data downloads and uploads. Internet usage via a connected mobile/cell phone internet connection or a pay-per-MB type internet connection may require large data usage. Your service provider may charge you based on the amount of data you transfer. If you are unsure, contact your service provider to confirm rates and restrictions.

About this manual

This manual is a reference guide for operating the HDS Carbon. It assumes that all equipment is installed and configured, and that the system is ready to use.

The manual assumes that the user has basic knowledge of navigation, nautical terminology and practices.

Important text that requires special attention from the reader is emphasized as follows:

→ **Note:** Used to draw the reader's attention to a comment or some important information.

> **⚠ Warning:** Used when it is necessary to warn personnel that they should proceed carefully to prevent risk of injury and/or damage to equipment/ personnel.

Manual version

This manual is written for software version 1.0. The manual is continually updated to match new software releases.

Viewing the manual on the screen

The PDF viewer included in the unit makes it possible to read the manuals and other PDF files on the screen.

The manuals can be read from a card inserted in the card reader or copied to the unit's internal memory.
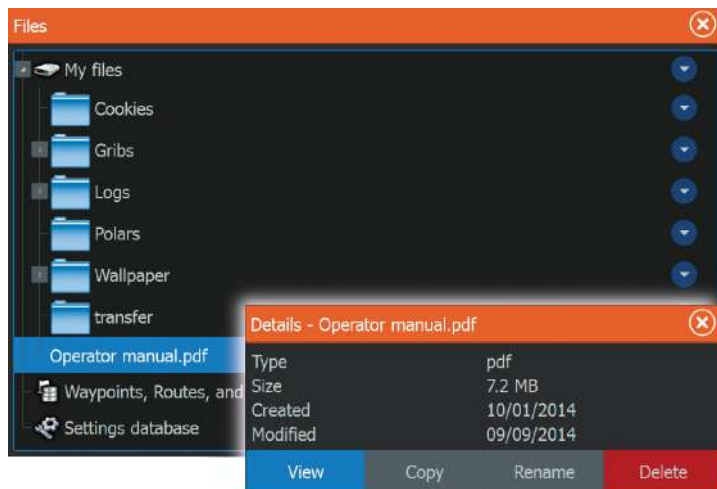
Use the menu options or the keys and on-screen buttons to maneuver in the PDF file as described below:

• Search, Goto page, Page Up and Down

Select the relevant panel button.
- Scroll pages
  Touch operation: Drag finger on the screen in any direction.
  Key operation: Use the **Cursor** keys.
- Panning on the page
  Touch operation: Drag finger on the screen in any direction.
  Key operation: Use the arrow keys.
- Zoom In/Out
  Select the relevant panel button.
  Touch operation: Use pinch or spread gestures.
  Key operation: Use the **+** and **-** keys.
- Exit the PDF viewer
  Touch operation: Select the **X** in the upper right corner of the panel.
  Key operation: Press the **X** key.

The Software version

The software version currently on this unit can be found in the About dialog. The About dialog is available in the System Settings. For more information, refer to *"About"* on page 171. For upgrading your software, refer to *"Software upgrades"* on page 179.

Contents

Introduction

1

Operating the system

You can use both the keys and the touchscreen to operate the HDS Carbon.

This manual uses the following general terminology to describe operating the unit:

Select

- Touch: Tap the panel

- Key: Use the cursor keys to select, then confirm by pressing the **Enter** key

Press and hold

- Touch: Press and hold on the screen
- Key: Use the cursor keys to select, then press and hold the **Enter** key

Drag

- Touch: Drag an item to a new position
- Key: Use the cursor keys to select an item, confirm by pressing the **Enter** key. Use the cursor keys to select a new position, and then press the **Enter** key again to confirm the new position.

The front panel and keys
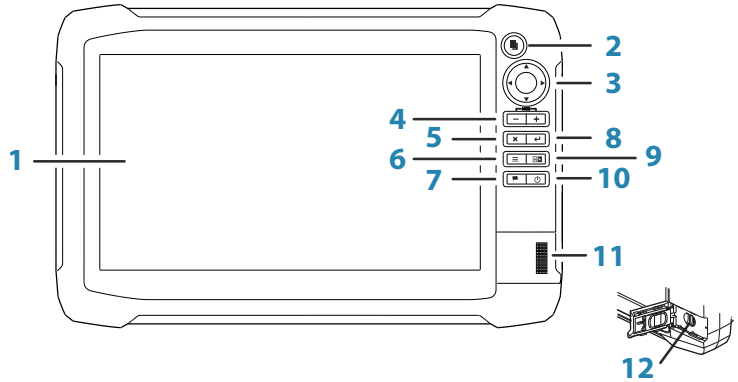
1 Touchscreen

2 Pages key
Press once to activate the **Home** page. Repeat short presses to cycle the favorite buttons. Press and hold from an active page to go to the last used page.

3 Cursor keys
Press arrows to move through menu items, to adjust a value, and to move the cursor on a panel.

4 Zoom Out / Zoom In keys and MOB key
Zoom keys for panels and images. Simultaneous pressing both keys saves a Man Overboard (MOB) waypoint at the current vessel position.

5 Exit (X) key
Press to exit a dialog, to return to previous menu level, and to remove the cursor from the panel.

6 Menu key
A single press displays the menu for the active panel/overlay. Press and hold to hide or show the menu. A quick double-press displays the settings menu.

7   Waypoint key
Press to display the dialog for saving new waypoints. Press twice to quick save a waypoint. Press and hold to access the Find menu.

8   Enter key
Press to select or save your settings.

9   Panel key
Used on multiple-panel pages. A short press switches between the panels, a long press expands active panel to a full page panel and back again.

10   Power key
Press once to display the **System Controls** dialog. Repeat short presses to cycle the backlight brightness. Press and hold to turn the unit ON/OFF.

11   Card reader door

12   microSD Card readers

The Home page

The **Home** page is accessed from any operation by a short press on the **Pages** key.

1   2   3   4   5

1   Tools

Select a button to access dialogs used for carrying out a task, or for browsing stored information.

2   Local time and **Water depth**

3   Applications

Select a button to display the application as a full page panel.

Press and hold a button to display pre-configured split page options for the application.

4   Close button

Select to exit the **Home** page and return to the previous active page.

5   Favorites

Select a button to display the panel combination.

Press and hold a favorite button to enter edit mode for the Favorites panel.

Application pages

Each application connected to the system is presented on panels. The application can be presented as a full page, or in combination with other panels in a multiple panel page.

All application pages are accessed from the **Home** page.

1   Application panel

2   Menu
Panel specific menu.

3   System Controls dialog
Quick access to basic system settings. Display the dialog by a short press on the **Power** key.

4   Dialog
Information to or input from the user.

5   Alarm message
Displayed if dangerous situations or system faults occur.

Split pages
You can have up to 4 panels on each page.
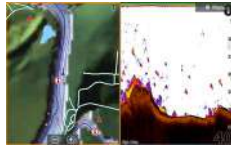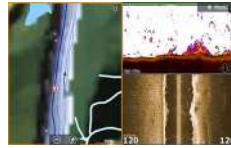
| *2 panels page* | *3 panels page* | *4 panels page* |
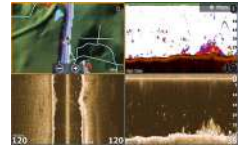
Panel sizes in a split page can be adjusted from the **System Controls** dialog.

Quick split pages

Each full screen application has several pre-configured **quick split** pages, featuring the selected application combined with each of the other panels.

➔ *Note:* The number of quick split pages cannot be changed, and the pages cannot be customized or deleted.

Access a **quick split** page by pressing and holding the **application** button on the **Home** page.

Favorite pages

All preconfigured favorite pages can be modified and deleted, and you can create your own. You can have a total of 12 favorite pages.

For more information, refer to *"Adding new favorite pages"* on page 32.

Integration of 3rd party devices

Several 3rd party devices can be connected to the HDS Carbon. The applications are displayed on separate panels or integrated with other panels.

A device connected to the NMEA 2000 network should automatically be identified by the system. If not, enable the feature from the advanced option in the System settings dialog.

The 3rd party device is operated by using menus and dialogs as on other panels.

This manual does not include specific operation instructions for any 3rd party device. For features and functionality, refer to the documentation included with the 3rd party device.

SmartCraft VesselView integration

SmartCraft data can be displayed and interaction are enabled through the unit when a Mercury VesselView® 4, 7, 403, 502, 702, 703, or Link is present on the network.

When the features are enabled, the display may prompt the user for some basic configuration information. Refer to the VesselView® manual or engine supplier for further information.

The engine supplier icon appears on the **Home** page when a device is available.

Suzuki Engine panel

If a Suzuki C10 gauge is available on the network, a Suzuki engine icon is added to the **Home** page. An icon is also added to the Page editor. You can select to display the Suzuki engine panel as a full page panel or as part of a multi-panel page.

The layout and content of the engine panel depends on selected panel size. The digital gauges can be customized, refer to *"Customizing the panel"* on page 99.

FUSION-Link integration

FUSION-Link devices connected to the NMEA 2000 network can be controlled from the HDS Carbon system.

The FUSION-Link devices appear as additional sources when using the audio function. No additional icons are available.

Refer to *"Audio"* on page 152 for more information.

BEP CZone integration

The HDS Carbon integrates with BEP's CZone system used for controlling and monitoring a distributed power system on your vessel.

The CZone icon is available in the Tools panel on the **Home** page when a CZone system is available on the network.

A separate manual is provided with your CZone system. Refer to this documentation and to the HDS Carbon Installation manual for how to install and configure the CZone system.

CZone dashboard

When the CZone is installed and configured, an additional CZone dashboard is added to the Info panels.

You switch between a panel's dashboards by selecting the left and right arrow symbols or by selecting the dashboard from the menu.

Editing a CZone dashboard

You can customize a CZone dashboard by changing the data for each of the gauges. Available editing options depend on the type of gauge and which data sources that are connected to your system.

For more information, refer to *"Info panels"* on page 99.

Power-Pole anchors

Power-Pole anchors, which can be controlled by the C-Monster Control System installed on your boat, can be controlled from the HDS Carbon. To control the Power-Poles, you *pair* the Power-Poles with the HDS Carbon using Bluetooth wireless technology available in both products.

Power-Pole controls

When Power-Poles are paired with the HDS Carbon, the Power-Pole button becomes available in the System Controls dialog. Select it to display the Power-Pole controller.

For pairing Bluetooth devices, refer to *"Pairing Bluetooth devices"* on page 126. If you are pairing dual Power-Poles, also review *"Pairing with dual Power-Poles"* on page 127.

When the Power-Pole controller is opened, the system connects to paired Power-Poles. When the connection is confirmed the control buttons are enabled.

→ **Note:** The controls are grayed out until the system connects with the Power-Poles. Once connected and functional the arrows in the dialog turn white.

The Power-Pole controller displays control buttons for each Power-Pole that is paired to the HDS Carbon.

Single press the Auto buttons to raise and lower the Power-Poles automatically all the way up and down. The manual up and down buttons raise and lower them as quickly, and as high or low as you want.
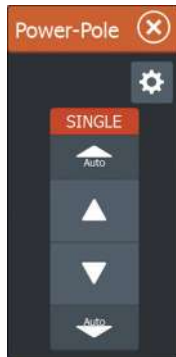
Single Power-Pole controller

Dual Power-Poles controller

On a dual controller you can raise and lower the Power-Poles separately, or press the sync (links) button to allow for control of both with a single press of the auto buttons or the manual up and down buttons.

Stay connected

Select the Stay connected (cog) button on the Power-Pole controller to open the Power-Pole settings dialog where you can select to stay connected to all paired Power-Pole anchors.

→ **Note:** Selecting to **Stay connected** speeds up access to the controls, but the anchors cannot be controlled from another display when it is selected. Turn off this option to allow connection from other displays.

2

Basic operation

System Controls dialog

The System Controls dialog provides quick access to basic system settings. You display the dialog by making a short press on the **Power** key.

The icons displayed on the dialog can vary. For example, the adjust splits option is only available if you are viewing a split page when you open the **System Controls** dialog.

System Controls	⊗
⚙ Settings	⏻ Standby	⏻ Power off	☀ Brightness	☾ Night mode
🔒 Touch lock	▣ Data overlay	▣ Edit overlay	ᳵ Audio	📞 Simulator transmit

Activating functions

Select the icon of the function you want to set or toggle on or off. For those functions that toggle on and off, an orange bar across the top of the icon indicates the function is activated, as shown in the Data Overlay icon above.

Turning the system on and off

You turn the system on and off by pressing and holding the **Power** key. You can also turn the unit off from the **System Controls** dialog.

If the **Power** key is released before the shut-down is completed, the power off process is cancelled.

Standby mode

In Standby mode, the Sonar and the backlight for screen and keys are turned off to save power. The system continues to run in the background.

You select Standby mode from the **System Controls** dialog.

Switch from Standby mode to normal operation by a short press on the **Power** key.

Display illumination

Brightness
The display backlighting can be adjusted at any time from the **System Controls** dialog.

You can also cycle the preset backlight levels by short presses on the **Power** key.

Night mode
The night mode option optimizes the color palette and backlight for low light conditions.

→ **Note:** Details on the chart may be less visible when the Night mode is selected!

Locking the touchscreen

You can temporarily lock a touchscreen to prevent accidental operation of the system. Lock the touchscreen when large amounts of water are on the screen, for example, in heavy seas and weather. This feature is also useful when cleaning the screen while the unit is turned on.

When the touch lock is active you can only operate the unit from the keys.

→ **Note:** To prevent false touchscreen activation, the touchscreen will automatically lock when it detects a significant amount of water on the screen.

You lock the touchscreen from the **System Controls** dialog.

You remove the lock function by a short press on the **Power** key.

Using menus and dialogs

Menus
The menu is used to operate the system and to adjust settings.

- Activate a menu item and toggle on/off an option by selecting it
- Adjust a slide bar value by either:

- dragging the slide bar
- selecting the **+** or **-** icons

Select the **Back** menu option or the **X** key to return to the previous menu level, and then exit.

Page menus can be hidden to allow pages to be a full screen view. To hide the menu, drag the menu to the right, or press and hold the **Menu** key.

When you hide a menu on one page, the menu on other pages is also hidden. To display the menu again, select the menu option, or press the **Menu** key.
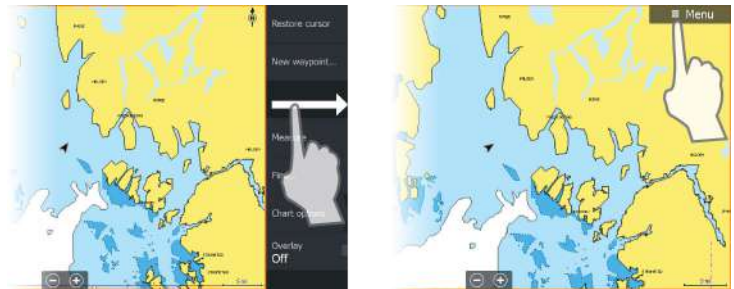
The status of the cursor (active vs. inactive) changes the menu options.

Dialog boxes
Numeric and alphanumeric keyboards are automatically displayed when required for entering user information in dialogs.

A dialog is closed by saving or cancelling the entry.

A dialog can also be closed by selecting the **X** in the dialog's upper right corner or by pressing the **X** key.

Selecting pages and panels

Selecting a page
- Select a full page panel by selecting the relevant application button on the **Home** page
- Select a favorite page by selecting the relevant favorite button
- Select a predefined split panel by pressing and holding the relevant application icon

Select active panel

In a multiple panel page, only one panel can be active at a time. The active panel is outlined with a border.

You can only access the page menu of an active panel.

You activate a panel by:

- Touch operation: tapping the panel
- Key operation: pressing the **Panel** key

Using the cursor on the panel

The cursor can be used to measure a distance, to mark a position, and to select items.

By default, the cursor is not shown on the panel.

Position the cursor by tapping the desired location on the screen or by using the **Cursor** keys to move the cursor.

When the cursor is active, the cursor position window is displayed.

N 59°01.280'
E 13°37.148'
110.5 mi, 104 °M

To remove the cursor and cursor elements from the panel, press the **X** key or select the **Clear cursor** option.

GoTo cursor

You can navigate to a selected position on the image by positioning the cursor on the panel, then using the **Goto Cursor** option in the menu.

The cursor assist function

The cursor assist function allows for fine tuning and precision placement of the cursor without covering details with your finger.

Activate the cursor on the panel, then press and hold your finger on the screen to switch the cursor symbol to a selection circle, appearing above your finger.

Without removing your finger from the screen, drag the selection circle to the desired position.

When you remove your finger from the screen the cursor reverts to normal cursor operation.
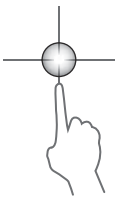
Measuring distance

The cursor can be used to measure the distance between your vessel and a selected position, or between 2 points on the chart panel.

1. Position the cursor on the point from where you want to measure the distance. Start the measure function from the menu
   - The measuring icons appear with a line drawn from the vessel center to the cursor position, and the distance is listed in the cursor information window.
2. You can reposition the measuring points by dragging either icon as long as the measuring function is active

→ *Note:* The bearing is always measured <u>from</u> the grey icon <u>to</u> the blue icon.

You can also start the measuring function without an active cursor. Both measuring icons are then initially located at t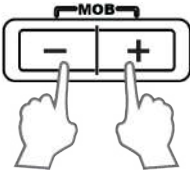he vessel position. The grey icon follows the vessel as the vessel moves, while the blue icon remains at the position given when you activated the function.

You terminate the measuring function by selecting the **Finish measuring** menu option.

Creating a Man Overboard waypoint

If an emergency situation should occur, you can save a Man Overboard (MOB) waypoint at the vessel's current position by pressing the **Zoom In** (**+**) and **Zoom out** (**-**) keys simultaneously.

When you activate the MOB function the following actions are automatically performed:

- a MOB waypoint is created at the vessel's position
- the display switches to a zoomed chart panel, centered on the vessel's position
- the system displays navigation information back to the MOB waypoint

Multiple MOB waypoints are saved by repeatedly pressing the **MOB** buttons. The vessel continues to show navigation information to the initial MOB waypoint. Navigation to subsequent MOB waypoints needs to be done manually.

Cancel navigation to MOB

The system continues to display navigational information towards the MOB waypoint until you cancel the navigation from the menu.

Display MOB waypoint information

You can display MOB information by selecting the MOB waypoint and then the MOB waypoint pop-up.

The MOB waypoint menu option

When an MOB waypoint is activated, you can use the **Waypoint MOB** menu option to:

- **Move** it on the panel
- **Edit** its attributes
- **Delete** it
- **Goto** it

When you select the Edit menu option the Edit Waypoint dialog opens.

Edit Waypoint	
MOB-1	
39.0 m 187 °M	
N 25°45.037' W 080°07.821'	Display icon and name
Notes	Depth (ft)
	00038.32
	Alarm radius (mi)
	00.00
Created: 9:57 am 10/24/2014	
Delete	Goto
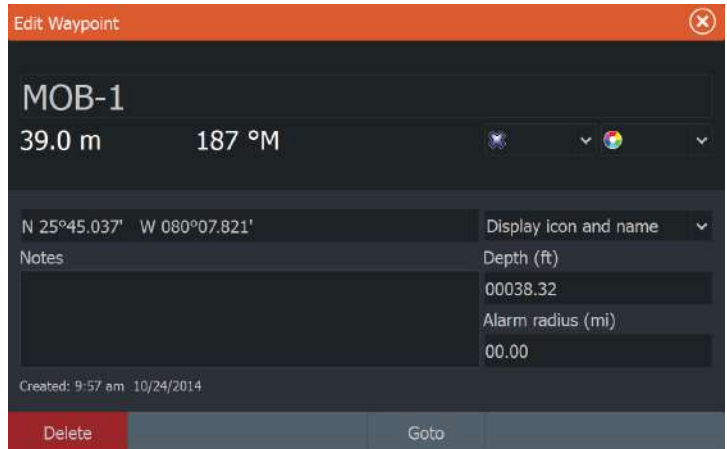
Screen capture

Simultaneously press the **Pages** and **Power** keys to take a screen capture. Screen captures are saved to internal memory.

To view files, refer to *"Files"* on page 173.

Customizing your system

3

Customizing the Home page wallpaper

The Home page's wallpaper can be customized. You can select one of the pictures included with the system, or you can use your own picture in .jpg or .png format.

The images can be available on any location that can be seen in the files browser. When a picture is chosen as the wallpaper, it is automatically copied to the Wallpaper folder.
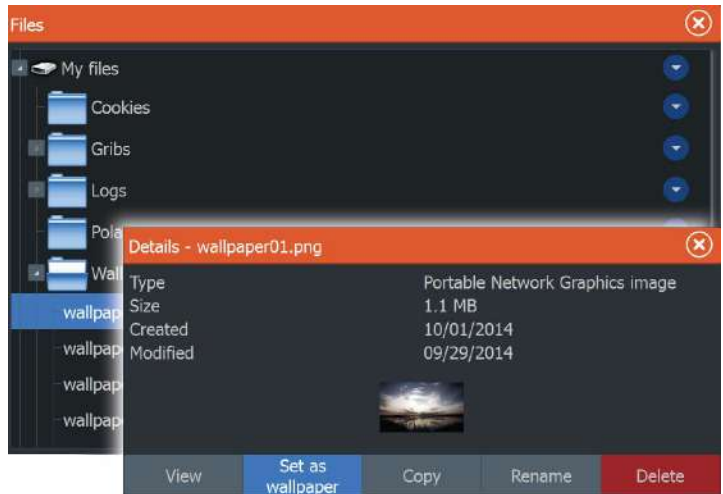
Settings

Vessels

Sun, Moon

Trip calculator

Files

Find

Files

- ⛵ My files
  - 📁 Cookies
  - 📁 Gribs
  - 📁 Logs
  - 📁 Pol...
  - 📁 Wal...
    - wallpap...
    - wallpap...
    - wallpap...
    - wallpap...

Details - wallpaper01.png

Type	Portable Network Graphics image
Size	1.1 MB
Created	10/01/2014
Modified	09/29/2014

| View | Set as wallpaper | Copy | Rename | Delete |

Adjusting panel size

You can change the panel size for an active split page. The panel size can be adjusted for both favorite pages and for predefined split pages.

1. Activate the **System Controls** dialog
2. Select the adjust splits option in the dialog
3. Adjust the panel size by:
   - Touch operation: dragging the adjustment icon
   - Key operation: using the **Cursor** keys to move the adjustment icon

4. Confirm your changes by tapping one of the panels, selecting the save option in the menu, or by pressing the **Enter** key.
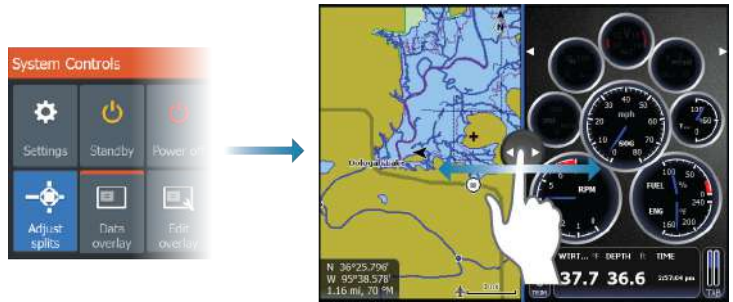
The changes are saved to the active favorite or split page.

Data Overlay

You can have data information as overlay on a page. The information can be any data available on the network.

Turning Data overlay on and off

You can turn overlay data on or off for any active page by selecting the **Data overlay** icon on the **System Controls** dialog. When Data overlay is on, an orange bar appears above the icon.

Edit overlay data

Use the **Edit overlay** option on the **System Controls** dialog to access edit menu options to:

- Add a new data overlay to the active panel.
- Delete a selected data overlay.
- Change a selected data overlay to display different data.
- Configure a selected data overlay appearance (digital or analog, size, etc).
- Re-locate an item by selecting and moving it.

Adding new favorite pages

1. Select the **New** icon in the favorite panel on the **Home** page to open the page editor dialog

2. Drag and drop page icons to set up a new page

3. Change the panel arrangement (only possible for 2 or 3 panels), if required

4. Save the page layout.

The system displays the new favorite page, and the new page is included in the list of favorite pages on the **Home** page.
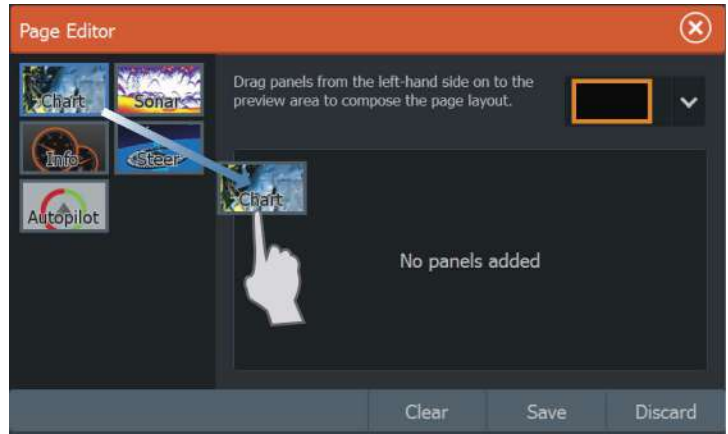
Edit favorite pages

1. Select the edit icon in the Favorite panel:
  - Select the X icon on a favorite icon to remove the page
  - Select the tool icon on a favorite icon to display the page editor dialog

2. Add or remove panels in the page editor dialog

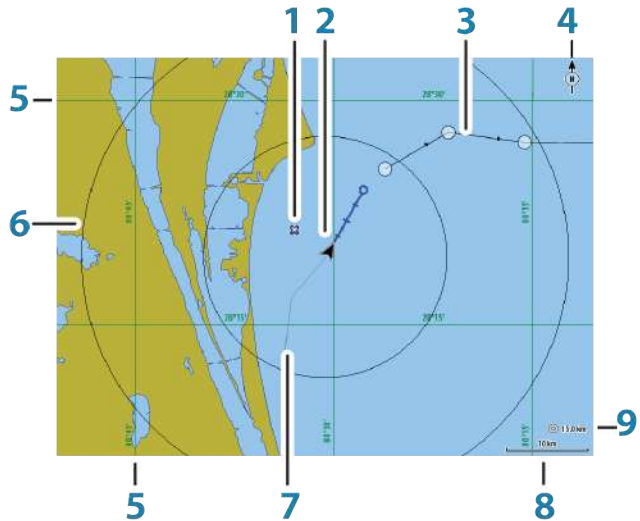**3.** Save or discard your changes to leave the favorite edit mode.

Charts

4

The chart function displays your vessel's position relative to land and other chart objects. On the chart panel you can plan and navigate routes, place waypoints, and display AIS targets.

You can overlay a radar image, a StructureScan image or weather information.

The Chart panel

1	Waypoint*
2	Vessel with extension line (extension line is optional)
3	Route*
4	North indicator
5	Grid lines*
6	Range rings*
7	Trail*
8	Chart range scale
9	Range rings interval (only displayed when Range rings are turned on)

* Optional chart items. You turn the optional chart items on/off individually from the Chart settings dialog.

Chart data

The system is delivered with different embedded cartography depending on region.

All units support Insight charts from Navico including Insight Genesis. The system also supports charts from Navionics and C-MAP as well as content created by a variety of third party mapping providers in the AT5 format.

→ **Note:** In this manual, all possible chart menu options are described. These options vary depending on the chart you are using.

→ **Note:** Insight charts are referred to as Lowrance in the menu.

Charts on chart cards are shared over the Ethernet network, so only one chart card per vessel is required.

→ **Note:** The system does not automatically switch to embedded cartography if the chart card is removed. A low-resolution chart will be displayed until you re-insert the card or manually switch back to the embedded cartography.

Showing dual chart types

If you have different chart types available - embedded, in the card slot, or on the Ethernet network - you can show two different chart types simultaneously on a page with two chart panels.

You can select a dual chart panel by pressing and holding the Chart application button on the **Home** page, or by creating a favorite page with two chart panels.
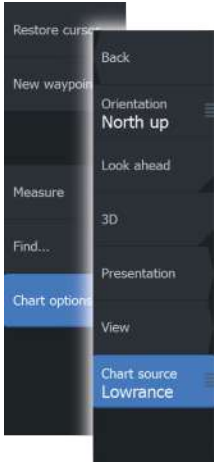
Selecting chart type

You specify the chart type in the Chart panel by selecting one of the available chart types in the chart source menu option.

If you have a multiple Chart panel, the chart type is set individually for each chart panel. Activate one of the chart panels, and then select one of the available chart types in the chart source menu option. Repeat the process for the second chart panel, and select an alternative chart type for this panel.

Panning the chart

You can move the chart in any direction by:

- Touch operation: dragging your finger on the screen
- Key operation: using the **Cursor** keys to move the cursor to the edge of the chart panel in the desired direction

Select the **Clear cursor** menu option or press the **X** key to remove the cursor and cursor window from the panel. This also centers the chart to the vessel position.
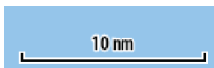
Vessel symbol

When the system has a valid GPS position lock, the vessel symbol indicates vessel position. If no GPS position is available, the vessel symbol includes a question mark.

➔ *Note:* Without a heading sensor on the network, the vessel icon orientates itself using COG (Course over Ground).

Chart scale

You zoom in and out on the chart by using the zoom (+ or -) buttons, the **+** or **-** keys, or two fingers to pinch (zoom out) and spread (zoom in).

Chart range scale and range rings interval (when turned on) are shown in the lower right corner of the chart panel.

Positioning the vessel on the chart panel

Chart orientation

Several options are available for how the chart is rotated in the panel. The chart orientation symbol in the panel's upper right corner indicates the north direction.

| North up | Heading up | Course up |
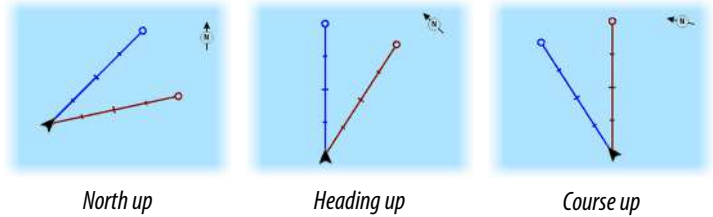
North up
Displays the chart with north upward.

Heading up
Displays the chart with the vessel's heading directed upward. Heading information is received from a compass. If heading is not available, then the COG from the GPS is used.

Course up
Displays the chart with the direction the vessel is ACTUALLY traveling directed upward, which in some cases is not the direction the vessel is headed.

Look ahead

Moves the vessel icon closer to the bottom of the screen so that you can maximize your view ahead.

Displaying information about chart items

When you select a chart item, a waypoint, a route, or a target, basic information for the selected item is displayed. Select the chart item's pop-up to display all available information for that item. You can also activate the detailed information dialog from the menu.

→ *Note:* If you are viewing applicable C-MAP charts on your system, you can select marine objects to display information

about services and available multimedia (photos) associated with the location or object.

→ *Note:* Pop-up information has to be enabled in chart settings to see basic item information.
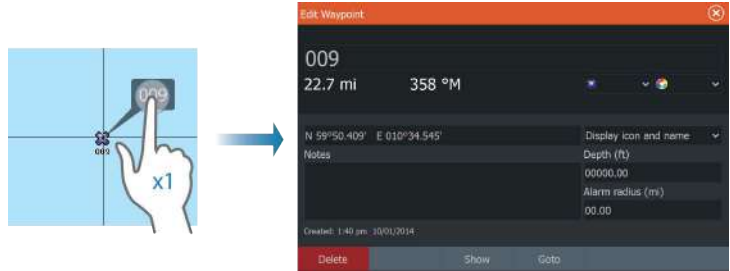
Using the cursor on the chart panel

By default, the cursor is not shown on the chart panel.

When you activate the cursor, the cursor position window is displayed. When the cursor is active, the chart does not pan or rotate to follow the vessel.

Press the **X** key or select the **Clear cursor** menu option to remove the cursor and the cursor window from the panel. This also centers the chart to the vessel position.

Select the **Restore cursor** menu option to display the cursor in its previous location. The **Clear cursor** and **Restore cursor** options are useful features for toggling between the vessel's current location and the cursor position.

Creating routes

You can create routes as follows on the chart panel.

1. Position the cursor on the chart panel
2. Select **New** followed by **New route** in the menu
3. Continue positioning the remaining routepoints
4. Save the route by selecting the save option in the menu.

→ *Note:* For more information, refer to *"Waypoints, Routes, and Trails"* on page 54.

Find objects on chart panels

You can search for other vessels or various chart items from a chart panel.

Activate the cursor on the panel to search from the cursor position. If the cursor is not active, the system searches for items from the vessel's position.
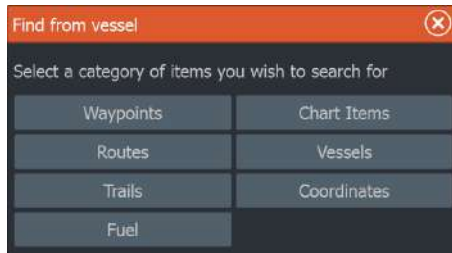
→ **Note:** You must have a SIRIUS data package subscription to search for fueling stations and an AIS receiver connected to search for vessels.

3D charts

The 3D option provides a three dimensional graphical view of land and sea contours.

→ **Note:** All chart types work in 3D mode, but without 3D cartography for the appropriate area the chart appears flat.

When the 3D chart option is selected, the Pan and the Rotate icons appear on the chart panel.

Panning the 3D chart

You can move the chart in any direction by selecting the Pan icon and then panning in the desired direction.

Select the **Return to vessel** menu option to stop panning, and to center the chart to vessel position.

Controlling the view angle

You can control the view angle by selecting the Rotate icon and then panning the chart panel.

- To change the direction you are viewing, pan horizontally
- To change the tilt angle of the view, pan vertically

→ **Note:** When centered on the vessel position, only the tilt angle can be adjusted. The view direction is controlled by the chart orientation setting. See *"Positioning the vessel on the chart panel"* on page 37.

Zooming a 3D chart

You zoom in and out on a 3D chart by using the zoom (+ or -) buttons, by using the **+** and **-** keys, or the touch method of pinching and spreading your fingers.

Chart overlay

Radar, structure, SonarChart Live (Navionics charts only) and weather data can be displayed as overlay on your chart panel.

→ **Note:** Weather overlay is currently only available in the United States.

When an overlay is selected, the chart menu expands to include basic menu functions for the selected overlay.

Radar, structure and weather functions are described in separate sections in this manual. For more information about SonarChart Live, see section *"SonarChart Live"* on page 46.

Insight and C-MAP charts

All possible menu options for Insight and C-MAP charts are described below. The features and menu options available can vary depending on the charts you use. This section shows menus from an Insight chart.

→ **Note:** A menu option is greyed out if it is not available on the chart displayed. For example, raster charts are not available with Insight, so the Raster charts menu option is greyed out when Insight charts are displayed.

Insight and C-MAP tides and currents

The system can display Insight and C-MAP tides and currents. With this information it is possible to predict the time, level, direction and

strength of currents and tides. This is an important tool when considering planning and navigation of a trip.
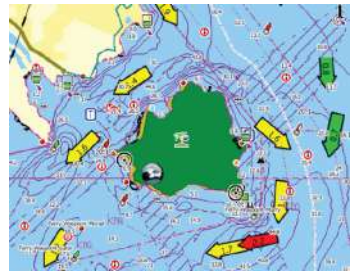
In large zoom ranges the tides and currents are displayed as a square icon including the letter **T** (Tides) or **C** (Current). When you select one of the icons, tidal or current information for that location are displayed.

Dynamic current data can be viewed by zooming inside a 1-nautical mile zoom range. At that range, the Current icon changes to an animated dynamic icon that shows the speed and direction of the current. Dynamic icons are colored in black (greater than 6 knots), red (greater than 2 knots and less than or equal to 6 knots), yellow (greater than 1 knot and less than or equal to 2 knots) or green (equal to or less than 1 knot), depending on the current in that location.

If there is no current (0 knots) this will be shown as a white, square icon.

Static Current and Tide icons   *Dynamic Current icons*
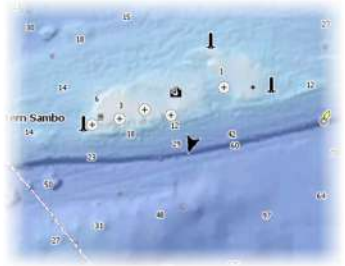
Insight and C-MAP specific chart options

Orientation, Look ahead, 3D, and change Chart source (previously described in this section) are common for all chart types.
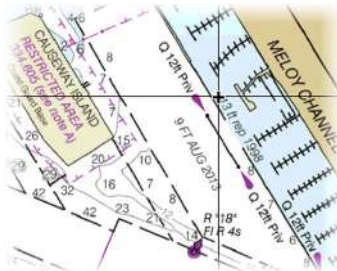
Presentation

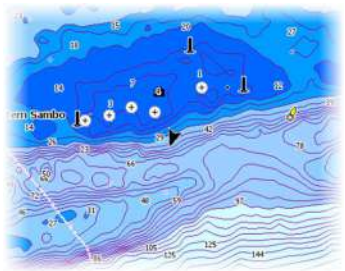The charts can be displayed in different imagery styles.

Shaded relief

No contours

Raster imagery

High resolution bathymetry

Shaded relief
Shades seabed terrain.

No contours
Removes contour lines from the chart.

Raster charts
Changes the view to that of a traditional paper chart.

Raster transparency
Controls the transparency of raster imagery.

High resolution bathymetry
Enables and disables higher concentration of contour lines.

Insight and C-MAP view options

Chart detail
- **Full**
  All available information for the chart in use.
- **Medium**
  Minimum information sufficient for navigation.
- **Low**
  Basic level of information that cannot be removed, and includes information that is required in all geographic areas. It is not intended to be sufficient for safe navigation.

Insight and C-MAP chart categories
Insight and C-MAP charts include several categories and sub-categories that you can turn on/off individually depending on which information you want to see.

Photo overlay
Photo overlay enables you to view satellite photo images of an area as an overlay on the chart. The availability of such photos is limited to certain regions, and cartography versions.

You can view photo overlays in either 2D or 3D modes.

No Photo overlay   *Photo overlay, land only*   *Full Photo overlay*

Photo transparency

The Photo transparency sets the opaqueness of the photo overlay. With minimum transparency settings the chart details are almost hidden by the photo.

Minimum transparency   *Transparency at 80*

Depth palette

Controls the Depth palette used on the map.

Paper chart

Changes the appearance of the map to a paper chart style.

Safety depth

Insight and C-MAP charts use different shades of blue to distinguish between shallow (lighter shades) and deep (darker shades) water. After enabling Safety depth, specify the desired safety depth limit. The Safety depth sets the limit at which depths will be drawn without blue shading.
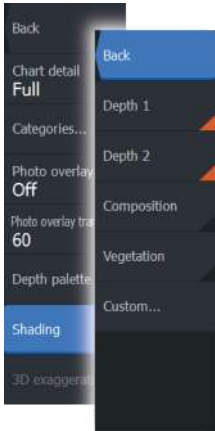
Depth filter

Filters out depth values shallower than the selected depth filter limit.
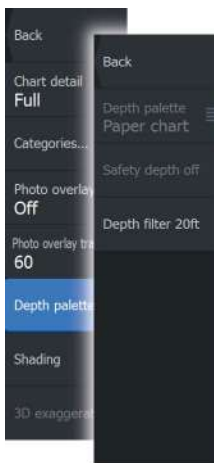
Shading

Shades different areas of the seabed, depending on the selected Shading category.

→ **Note:** Composition and Vegetation shading are not applicable to C-MAP charts.

Depth 1 and Depth 2

Depth presets that shade different depths in different colors.

Custom

You can adjust the depth threshold, color and opacity (transparency) of color shading for Depth 1 and Depth 2.

3D exaggeration

Graphical settings that are available in 3D mode only. Exaggeration is a multiplier applied to the drawn height of hills on land, and troughs in water to make them look taller or deeper.

→ **Note:** This option is grayed out if the data is not available in the map card inserted.
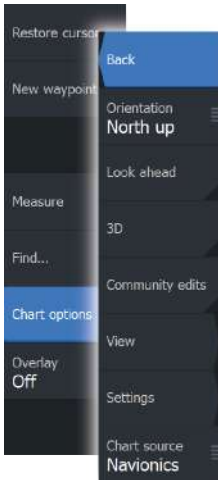
Navionics charts

Some Navionics features require the most current data from Navionics. For those features, a message is displayed stating that the

feature is unavailable if you do not have the appropriate Navionics charts or chart card inserted.

Navionics specific chart options

Orientation, Look ahead, 3D and change Chart source (previously described in this section) are common for all chart types.

Community edits
Toggles on the chart layer including Navionics edits. These are user information or edits uploaded to Navionics Community by users, and made available in Navionics charts.

SonarChart Live
SonarChart Live is a real-time feature where the device creates an overlay of depth contours based on your own live sonar soundings.

In the Navionics chart menu, select **Overlay** and then **SonarChart Live** to display it as an overlay on the chart.

When you select SonarChart Live overlay the menu expands to display SonarChart Live Options. Use the options to set the transparency and minimum depth.

Transparency
The SonarChart Live overlay is drawn on top of other chart data. The chart data is completely covered at minimum transparency. Adjust the transparency to allow the chart details to be seen.

Minimum depth
Adjusts what SonarChart Live rendering treats as the safety depth. This affects the coloring of the SonarChart Live area. As the vessel approaches the safety depth, the SonarChart Live area will gradually change from a simple grey/white to red.
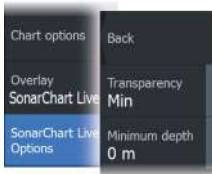
Navionics chart settings

Colored seabed areas
Used for displaying different depth areas in different shades of blue.
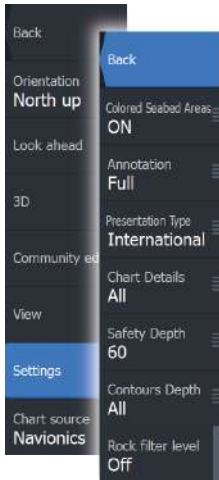
Presentation type

Provides marine charting information such as symbols, colors of the navigation chart and wording for either International or U.S. presentation types.

Annotation

Determines what area information, such as names of locations and notes of areas, is available to display.

Chart details

Provides you with different levels of geographical layer information.

Safety depth

The Navionics charts use different shades of blue to distinguish between shallow and deep water.

Safety depth, based on a selected limit, is drawn without blue shading.

→ **Note:** The built in Navionics database features data down to 20 m, after which it is all white.

Contours depth

Determines which contours you see on the chart down to the selected safety depth value.

Rock filter level

Hides rock identification on the chart beneath a given depth.

This helps you to declutter charts in areas where there are many rocks located at depths well below your vessel's draught.

Navionics view options

Back

Orientation
North up

Look ahead

3D

Community edits

View

Settings

Chart source
Navionics

Back

Shading

Dynamic icons

Easy View

Photo overlay
Off

Transparency
Min

SonarChart

SC Density
Very High

Fishing range

Shallow water
0 m

Chart shading
Shading adds terrain information to the chart.

Navionics dynamic tide and current icons
Shows tides and currents with a gauge and an arrow instead of the diamond icons used for static tides and current information.

The tide and current data available in Navionics charts are related to a specific date and time. The system animates the arrows and/or gauges to show the tides and currents evolution over time.
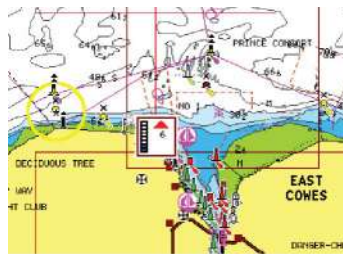
Dynamic tide information   *Dynamic current information*

The following icons and symbology are used:

Current speed
The arrow length depends on the rate, and the symbol is rotated according to flow direction. Flow rate is shown inside the arrow symbol. The red symbol is used when current speed is increasing, and the blue symbol is used when current speed is decreasing.

Tide height
The gauge has 8 labels and is set according to absolute max/min value of the evaluated day. The red arrow is used when tide is rising, and the blue arrow is used when tide is falling.

➔ **Note:** All numeric values are shown in the relevant system units (unit of measurement) set by user.

Easy View

Magnifying feature that increases the size of chart items and text.

→ **Note:** There is no indication on the chart showing that this feature is active.

Photo overlay

Photo overlay enables you to view satellite photo images of an area as an overlay on the chart. The availability of such photos is limited to certain regions, and cartography versions.

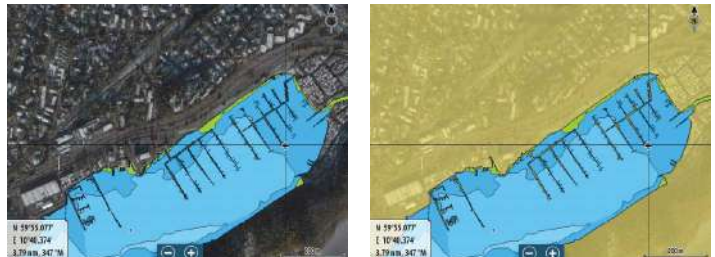You can view photo overlays in either 2D or 3D modes.

No Photo overlay   *Photo overlay, land only*   *Full Photo overlay*

Photo transparency

The Photo transparency sets the opaqueness of the photo overlay. With minimum transparency settings the chart details are almost hidden by the photo.

Minimum transparency   *Maximum transparency*

SonarChart

The system supports the Navionics SonarChart feature.

SonarChart displays a bathymetry map showing high resolution contour detail and standard navigational data.

SC Density
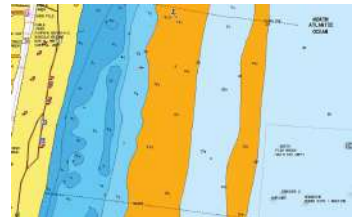Controls the density of the SonarChart and SonarChart Live contours.

Fishing range
Select a range of depths between which Navionics fills with a different color.

This allows you to highlight a specific range of depths for fishing purposes. The range is only as accurate as the underlying chart data, meaning that if the chart only contains 5 meter intervals for contour lines, the shading is rounded to the nearest available contour line.
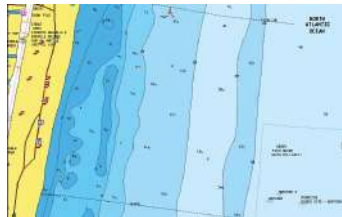
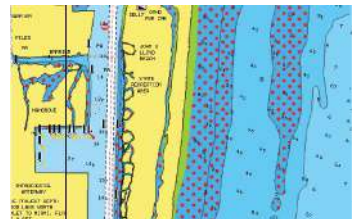*No Depth highlight range*　　　　*Depth highlight range: 6 m - 12 m*

Shallow water highlight
Highlights areas of shallow water.

This allows you to highlight areas of water between 0 and the selected depth (up to 10 meters/30 feet).
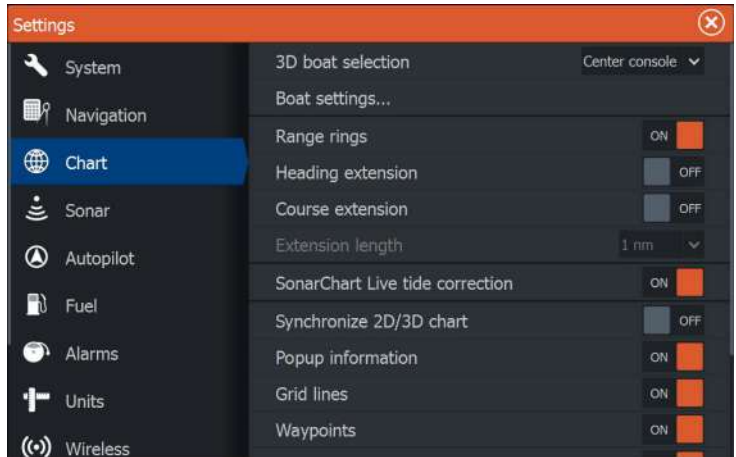

No shallow water highlighted　　　　*Shallow water highlight: 0 m - 3 m*

Chart settings

Settings and display options made in the Chart settings page are common for all chart panels.

3D boat selection

Determines which icon to use on 3D charts.

Boat settings

The boat settings are used when calculating an automatic route. The boat's draught, width and height must be input to use Navionics Dock-to-dock autorouting and easy routing features.
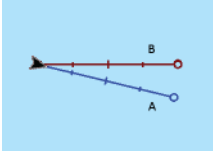
→ **Note:** Dock-to-dock Autorouting is not available in Insight units, or in any unit used in U.S. territorial waters.

Range Rings

The range rings can be used to present the distance from your vessel to other chart objects.

The range scale is set automatically by the system to suit the chart scale.

Extension lines

Sets the lengths of the heading and course extension lines for your vessel. For setting extension line lengths on other vessels shown as AIS targets, refer to AIS *"Course extension lines"* on page 150 lines.

A: Heading

B: Course Over Ground (COG)

The lengths of the extension lines are either set as a fixed distance, or to indicate the distance the vessel moves in the selected time period. If no options are turned on for the vessel then no extension lines are shown for your vessel.

Your vessel heading is based on information from the active heading sensor and the COG is based on information from the active GPS sensor.

SonarChart Live tide correction

When selected, the tide correction feature uses information from nearby tide stations (if available) to adjust the depth values used by SonarChart Live as the sonar is recorded.

Synchronize 2D/3D chart

Links the position shown on one chart with the position shown on the other chart when a 2D and a 3D chart are shown side by side.

Pop-up information

Selects whether basic information for chart items is displayed when you select the item.

Grid lines

Turns on/off viewing of longitude and latitude grid lines on the chart.

Hide chart

If the option is set to ON when viewing a Lowrance chart, the chart (background) is not displayed and only the vessel, extensions, waypoints, and routes are displayed on a white background.

Waypoints, Routes, Trails

Turns on/off displaying of these items on chart panels. Also opens the Waypoints, Routes and Trails dialogs you can use to manage them.
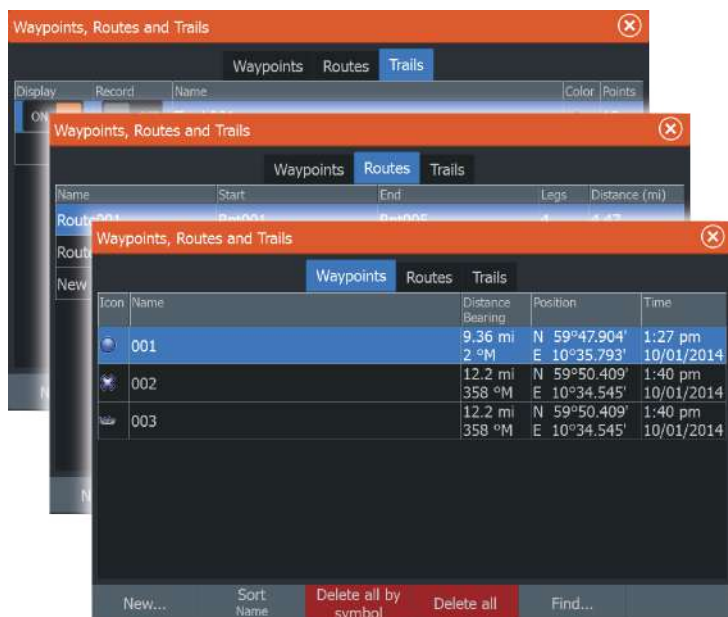
5

Waypoints, Routes, and Trails

Waypoints, Routes, and Trails dialogs

The Waypoints, Routes, and Trails dialogs give access to advanced edit functions and settings for these items.

The dialogs are accessed from the **Tools panel** on the **Home** page.

Waypoints

A waypoint is a user generated mark positioned on a chart, on a radar image or on the Sonar image. Each waypoint has an exact position with latitude and longitude coordinates. A waypoint positioned on the Sonar image has a depth value, in addition to position information. A waypoint is used to mark a position you later may want to return to. Two or more waypoints can also be combined to create a route.

Saving waypoints

You can save a waypoint at a selected location by positioning the cursor on the panel, and then selecting the new waypoint option in the menu.
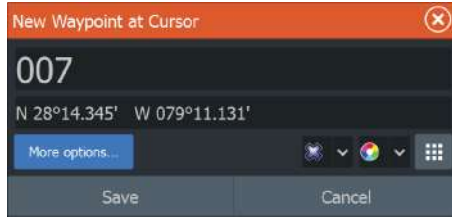
You can also save a waypoint by pressing the Waypoint key:

- Press once to display the New Waypoint dialog
- Press twice to quickly save a waypoint. If the cursor is active, the waypoint is saved at the cursor position. If the cursor is not active, the waypoint is saved at your vessel's position.

New Waypoint dialog

- **More options** button - Displays more details dialog where you can change the waypoint name and add notes, specify to display or hide the waypoint icon and name, select the waypoint symbol and waypoint symbol color, note the depth, and specify alarm radius.
- **Waypoint symbols** button - Displays waypoint symbol alternatives for selection.
- **Waypoint symbol colors** button - Displays waypoint symbol coloring alternatives for selection.
- **New waypoint** button - When selected, the dialog with waypoint symbol alternatives is displayed. Selecting a waypoint symbol creates the waypoint at cursor or vessel position with the selected symbol. This mode is persistent, the next time you create a new waypoint the same dialog opens and if you select a symbol a waypoint is created with the symbol.
  Instead of selecting a symbol, select the menu button in the bottom-right corner to return to the previous New Waypoint dialog. This selection becomes the persistent mode, the next

time you create a new waypoint the New Waypoint dialog is displayed.

- **Save** button - (Only available from the New Waypoint and more options dialogs.) Saves the waypoint and closes the New Waypoint dialog.
- **Cancel** button - (Only available from the New Waypoint dialog.) Cancels the waypoint creation and closes the New Waypoint dialog.

Moving a waypoint

1. Select the waypoint you want to move. The waypoint icon expands to indicate that it is active.
2. Activate the menu and select the waypoint in the menu
3. Select the move option
4. Select the new waypoint position
5. Press the **Enter** key to confirm the new position.

The waypoint is now automatically saved at the new position.

Edit a waypoint

You can edit all information about a waypoint from the **Edit Waypoint** dialog.

This dialog is activated by selecting the waypoint's pop-up, or from the menu when the waypoint is activated.

The dialog can also be accessed from the Waypoints tool on the **Home** page.
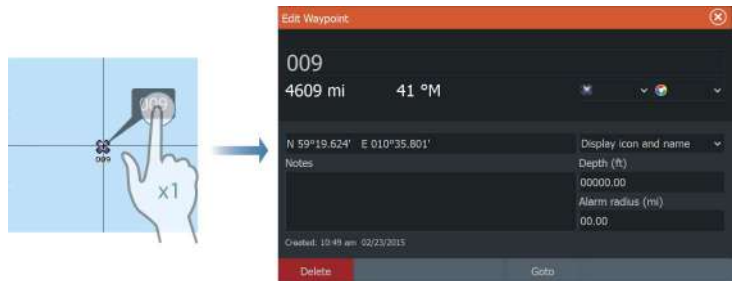
Delete a waypoint

You can delete a waypoint from the **Edit Waypoint** dialog or by selecting the **Delete** menu option when the waypoint is activated.

You can also delete waypoints from the Waypoints tool on the **Home** page.

You can delete MOB waypoints the same way.

Waypoint alarm settings

You can set an alarm radius for each individual waypoint you create. The alarm is set in the **Edit Waypoint** dialog.

→ *Note:* The waypoint radius alarm must be toggled ON in the alarm dialog to activate an alarm when your vessel comes within the defined radius. For more information, refer to *"Alarms dialog"* on page 176.
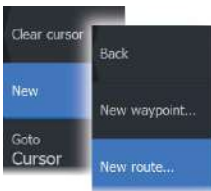
Routes
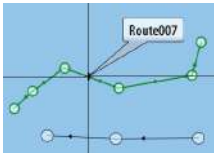
A route consists of a series of routepoints entered in the order that you want to navigate them.

When you select a route on the chart panel it turns green, and the route name is displayed.

The system includes support for Navionics Autorouting and C-MAP Easy Routing. This feature automatically suggests routepoints between the first and last routepoint of a route, or between selected routepoints in a complex route. You can use the feature when you create a new route, or you can use it to edit already saved routes.

Creating a new route on the chart panel

1. Activate the cursor on the chart panel
2. Select the new route option from the menu
3. Position the first waypoint on the chart panel
4. Continue positioning new routepoints on the chart panel until the route is completed
5. Save the route by selecting the save option in the menu.

Edit a route from the chart panel

1. Select the route to make it active
2. Select the route edit option in the menu
3. Position the new routepoint on the chart panel:
   - If you set the new routepoint on a leg, a new point is added between existing routepoints

- If you set the new routepoint outside the route, the new routepoint is added after the last point in the route
4. Drag a routepoint to move it to a new position
5. Save the route by selecting the save option in the menu.

→ *Note:* The menu changes depending on the selected edit option. All edits are confirmed or cancelled from the menu.

Delete a route

You can delete a route by selecting the **Delete** menu option when the route is activated. You can also delete routes from the Routes tool on the **Home** page.

### Creating routes using existing waypoints

You can create a new route by combining existing waypoints from the **Routes** dialog. The dialog is activated by using the **Routes** tool on the **Home** page.
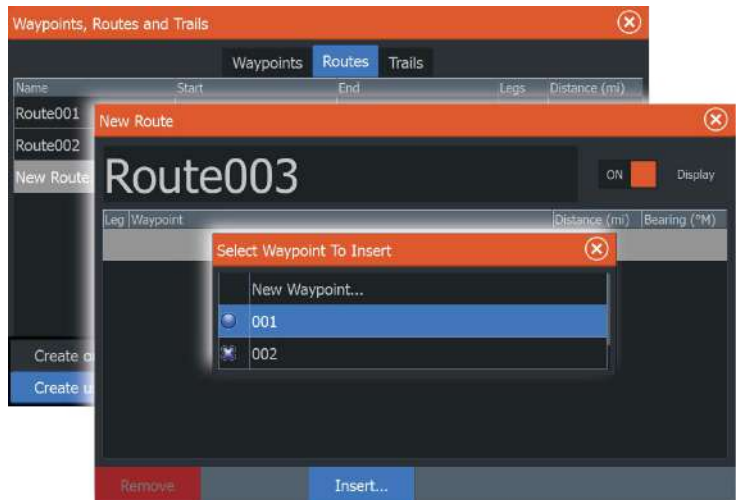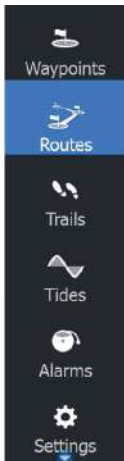
Converting Trails to Routes

You can convert a trail to a route from the Edit Trail dialog. The dialog is activated by activating the trail, then selecting the trail's pop-up, or the **Trail** menu option.

The Edit Trails dialog can also be accessed by selecting the Trails tool on the **Home** page.
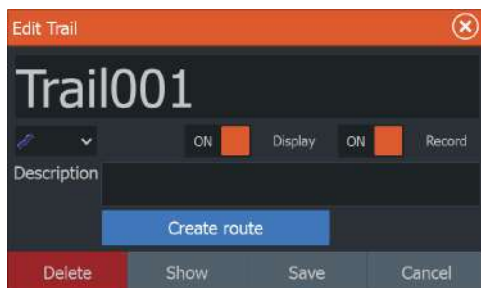
Dock-to-dock Autorouting and Easy Routing

The Dock-to-dock Autorouting and Easy Routing suggest new routepoint positions based on information in the map and on your boat's size. Before you can start using this feature the boat draught, width and height must be entered into the system. The boat settings dialog is automatically displayed if the information is missing when you start the feature.

➔ *Note:* Units designed for sale in the U.S. region do not have Autorouting capabilities. Autorouting features are disabled on all non-U.S. units when they are used in U.S. territorial waters.

➔ *Note:* It is not possible to start the Dock-to-dock Autorouting or Easy Routing if one of the selected routepoints is located in an unsafe area. A warning dialog is displayed, and you have to move the relevant routepoint(s) to a safe area to proceed.

➔ *Note:* If no compatible cartography is available, the Dock-to-dock Autorouting or Easy Routing menu option is not available. Compatible cartography includes C-MAP MAX-N+, Navionics+ and Navionics Platinum.

1. Position at least two routepoints on a new route, or open an existing route for editing.
2. Select **Dock-to-dock Autorouting**, followed by:
   - **Entire Route** if you want the system to add new routepoints between the first and the last routepoint of the open route.

- **Selection** if you want to manually select the routepoints that define the limits for the autorouting, then select the relevant routepoints. Selected routepoints are colored red. Only two routepoints can be selected, and the system discards any routepoints between your selected start and end points.

3. Select **Accept** to start the automatic routing.
   - When the automatic routing is completed the route appears in preview mode, and the legs are color coded to indicate safe or unsafe areas. Navionics uses red (unsafe) and green (safe), while C-MAP uses red (unsafe), yellow (dangerous) and green (safe).

4. Move any routepoints if required when the route is in preview mode.

5. Select **Keep** to accept the routepoints positions.

6. Eventually repeat step 2 (**Selection**) and step 3 if you want the system to automatically position routepoints for other parts of the route.

7. Select **Save** to complete the automatic routing and save the route.

Dock-to-dock Autorouting and Easy Routing examples

- **Entire route** option used when first and last route points are selected.
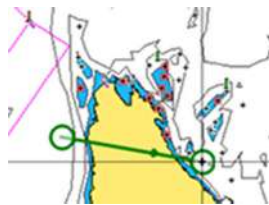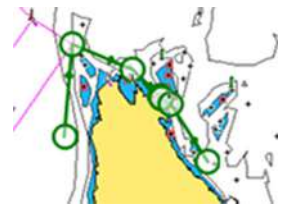
First and last routepoint   *Result after automatic routing*

- **Selection** option used for autorouting part of a route.

| Two routepoints selected | Result after automatic routing |

The Edit Route dialog

You can add and remove routepoints from the **Edit Route** dialog. This dialog is activated by selecting an active route's pop-up or from the menu.

The dialog can also be accessed by using the **Routes** tool on the **Home** page.

Leg	Waypoint	Distance (mi)	Bearing (°M)
0	Rpt006		
1	Rpt007	0.68	44
2	Rpt008	1.32	126
3	Rpt009	1.25	158

Edit Route   Route002   ON   Display

Remove   Insert...

Trails

Trails are a graphical presentation of the historical path of the vessel, allowing you to retrace where you have travelled. Trails can be converted to routes from the **Edit** dialog.

From the factory, the system is set to automatically track and draw the vessel's movement on the chart panel. The system continues to record the Trails until the length reaches the maximum points, and then automatically begins overwriting the oldest points.

The automatic tracking function can be turned off from the Trails dialog.

Creating new Trails

You can start a new trail from the **Trails** dialog, activated by using the **Trails** tool on the **Home** page.

Trails settings

Trails are made up of a series of points connected by line segments whose length depends on the frequency of the recording.

You can select to position trail points based on time settings, distance, or by letting the system position a waypoint automatically when a course change is registered.

→ *Note:* The Trails option must also be turned ON in the chart settings to be visible.
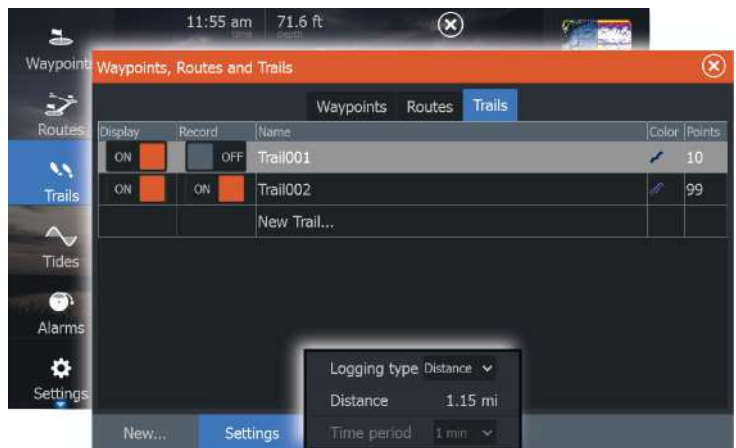
6

Navigating

The navigation function included in the system allows you to navigate to the cursor position, to a waypoint, or along a predefined route.

If autopilot functionality is included in your system, the autopilot can be set to automatically navigate the vessel.

For information about positioning waypoints and creating routes, refer to *"Waypoints, Routes, and Trails"* on page 54.

Steer panel

The Steer panel can be used to display information when you are navigating. It is activated from the **Home** page, either as a full page panel or as part of a multiple panel page.

1   Data fields
2   Vessel heading
3   Bearing to waypoint
4   Destination point

5   Bearing line with allowed off course limit
When travelling on a route the bearing line shows the
intended course from one waypoint towards the next.
When navigating towards a waypoint (cursor position, MOB,
or an entered latitude and longitude position), the bearing
line shows the intended course from the point at which
navigation was started towards the waypoint.

6   Vessel symbol
Indicates distance and bearing relative to the intended
course. If the XTE (Cross Track Error) exceeds the defined XTE
limit, this is indicated with a red arrow including the
distance from the track line.
Refer to *"XTE limit"* on page 66.

Data Fields

The Steer panel provides the following information:

XTE	Cross track error
SOG	Speed over ground
COG	Course over ground
POS	Position
DTD	Distance to destination
TTD	Time to destination

Navigate to cursor position

You can start navigating to a cursor position on any chart, radar, or
Sonar panel.

Position the cursor at the selected destination on the panel, and
then select the **Goto Cursor** option in the menu.

→ **Note:** The **Goto Cursor** menu option is not available if you are
already navigating.

Navigate a route

You can start navigating a route from the chart panel, steer panel, or
from the Route dialog.

When route navigation is started, the menu expands and shows options for canceling the navigation, for skipping a waypoint, and for restarting the route from current vessel position.

Starting a route from the chart panel

Activate a route on the panel, and then select the route navigation option from the menu.

You can select a routepoint to start navigating from a selected position.

Starting a route from the steer panel

Select the start route option on the menu, and then details from the dialogs.

Start navigating a route from the Route dialog

You can start navigating from the **Route** dialog, activated by:

- Selecting the **Route** tool from the **Home** page
- Selecting the route details from the menu

Navigating with the autopilot

When you start navigation on a system with autopilot functionality, you are prompted to set the autopilot to navigation mode.

If you choose not to engage the autopilot, the autopilot can be set to navigation mode from the Autopilot Controller later on.

For more information about autopilot functionality, refer to *"Autopilot"* on page 104.

Navigation settings
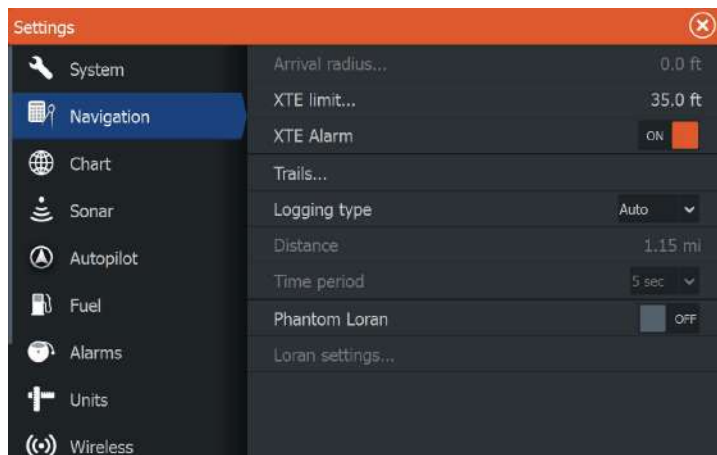
Arrival radius
Sets an invisible circle around the destination waypoint.

The vessel is considered arrived at the waypoint when it is within this radius.

XTE limit
This setting defines how far the vessel can deviate from the selected route, if the vessel goes beyond this limit, an alarm is activated.

XTE alarm (Cross track error)
Turns on/off the XTE alarm.

Trails
Opens the **Trails** dialog where trails settings can be adjusted and trails can be converted into routes for navigation. Refer to *"Converting Trails to Routes"* on page 58.

Logging type

You can select to record trail points based on time, distance, or by letting the unit position a point automatically when a course change is registered.

Specify one of the following logging types in the Navigating Settings dialog:

• **Auto** - the unit positions a point automatically when a course change is registered.
• **Distance** - select the Distance field and enter the distance you want to record.
• **Time** - select the Time field and enter the time you want to record.

Phantom Loran

Enables use of Phantom Loran positioning system.

Loran settings

N 25°44.044'
W 80°08.285'
43132.70 7980
62156.66
0.30 nm, 254 °M

Defines Loran chains (GRI) and preferred station for waypoint entry, cursor position and position panel.

The graphic example shows a cursor position window with Loran position information.

For more information refer to your Loran system documentation.
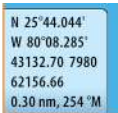
7

Sonar

The Sonar function provides a view of the water and bottom beneath your vessel, allowing you to detect fish and examine the structure of the bottom.

The Sonar image
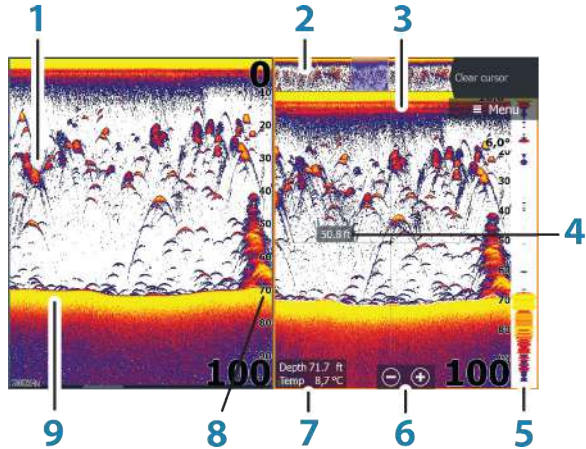
1   Fish arches

2   History preview*

3   Temperature graph*

4   Depth at cursor

5   Amplitude scope*

6   Zoom (range) buttons

7   Water depth and Water temperature at cursor location

8   Range scale

9   Bottom

* Optional Sonar items.

➔ **Note:** You turn the optional Sonar items on/off individually. Refer to *"view options"* on page 76.

Multiple Sonar

You can specify the Sonar source for the image in the Sonar panel. You can display two different sources simultaneously, using a split panel configuration. For more information how to select the source for a panel, refer to *"Source"* on page 71.

Zooming the image

You can zoom the image by:

- using the zoom (+ or -) buttons
- pinching or spreading on the screen
- using the **+/-** keys

Zoom level is shown on the bottom left side of the image.

When zooming in, the sea floor is kept near the bottom of the screen, irrespective of whether it is in auto-range or manual range.

If the range is set considerably less than the actual depth, the unit is not able to find the bottom when zooming.

If the cursor is active, the unit zooms in where the cursor is pointed.

Zoom bar

The zoom bar is displayed when you zoom the image.

Drag the zoom bar vertically to view different parts of the water column.

Using the cursor on the image

The cursor can be used to measure a distance to a target, to mark a position, and to select targets.

By default, the cursor is not shown on the image.

When you position the cursor on the image; the screen pauses, the depth at the cursor position is shown, and the information window and the history bar are activated.

To remove the cursor and cursor elements from the panel, select **Clear cursor** or press the **X** key.

Viewing history

Whenever the cursor is shown on the Sonar panel, the scroll bar is shown at the top of the panel. The scroll bar shows the image you

are currently viewing in relation to the total Sonar image history stored.

If the scroll bar is on the far right side, it indicates that you are viewing the latest soundings. If you position the cursor to the left side of the screen, the history bar starts scrolling towards the left, and the automatic scrolling as new soundings are received is turned off.

You can view sonar history by panning the image. You can also use the preview feature to pan history, refer to *"Preview"* on page 77.

To resume normal scrolling, select **Clear cursor** or press the **X** key.
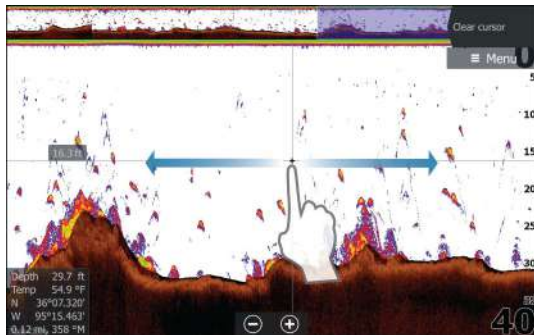
Setting up the image

Use the Sonar menu options to set up the image. When the cursor is active, some options on the Sonar menu are replaced with cursor mode features. Select **Clear cursor** to return to the normal Sonar menu.

The range

The range setting determines the water depth that is visible on the screen.

Frequency

The unit supports several transducer frequencies. Available frequencies depend on the transducer model that is connected.

You can view two frequencies at the same time by selecting dual Sonar panels from the **Home** page.

Sensitivity

Increasing Sensitivity shows more detail on the screen. Decreasing Sensitivity displays less. Too much detail clutters the screen. Conversely, desired echoes may not be displayed if Sensitivity is set too low.
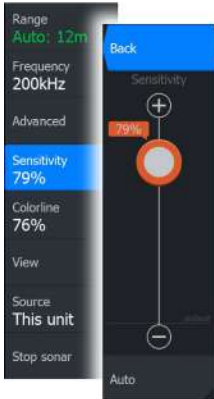
→ **Note:** Auto Sensitivity is the preferred mode for most conditions.

Auto sensitivity

Auto sensitivity automatically adjusts the sonar return to the optimal levels. Auto sensitivity can be adjusted (+/-) to your preference while still maintaining the auto sensitivity functionality.

Colorline

Allows the user to adjust the colors of the display to help differentiate softer targets from harder ones. Adjusting the Colorline can help separate fish and important structures on or near the bottom from the actual bottom.

Adjusting Sensitivity and Colorline

Select the Sensitivity or Colorline menu options in the Sonar menu and adjust them by dragging the bar vertically or by using the **Cursor** keys.

→ **Note:** Minor adjustments can be made by tapping above or below the slider bar or pressing the **Cursor** keys.

→ **Note:** When the Sensitivity or Colorline slider bar is displayed, it is automatically selected and adjustments can be made up/down with the **Cursor** keys.

Source

Select to specify the source for the image in the selected panel.

You can display two different sources simultaneously, using a split panel configuration. Menu controls for each panel are independent.

The source can be the internal Sonar, another MFD on the Ethernet network, or a Sonar module. To define sources, refer to the separate HDS Carbon Installation manual.

→ **Note:** Using two transducers at the same frequency ranges can cause interference between the two, and they can show up on

the image as vertical lines. To avoid this, set one transducer at one frequency range (such as Medium CHIRP) and the other transducer at a different frequency range (such as High CHIRP) using the Frequency menu option.

Stop sonar

Select the **Stop sonar** menu option to stop the sonar from pinging. Use the stop sonar option anytime you want to disable the sonar but not power off the unit.

Advanced options

The Advanced option is only available when the cursor is not active.

Noise rejection

Signal interference from bilge pumps, engine vibration and air bubbles can clutter the image.

The noise rejection option filters the signal interference and reduces the on-screen clutter.

Surface clarity

Wave action, boat wakes, and temperature inversion can cause onscreen clutter near the surface. The surface clarity option reduces surface clutter by decreasing the sensitivity of the receiver near the surface.

Scroll speed

You can select the scrolling speed of the image on the screen. A high scroll speed updates the image fast, while a low scroll speed presents a longer history.

→ *Note:* In certain conditions it may be necessary to adjust the scroll speed to get a more useful image. Such as adjusting the image to a faster speed when vertically fishing without moving.

Ping speed

Ping speed controls the rate the transducer transmits the signal into the water. By default, the ping speed is set to max. It may be necessary to adjust the ping speed to limit interference or to adjust for specific fishing conditions.

Manual mode

Manual mode is an advanced user mode that restricts digital depth capability, so the unit only processes sonar signals in the selected range. This allows the display to continue smooth scrolling if the bottom depth is out of transducer range. When the unit is in manual mode, you might not receive any depth readings, or you might receive incorrect depth information.

Start recording log data

You can start recording log data and save the file internally in the unit, or save it onto a card inserted into the unit's card reader.

The **Log sonar** dialog is activated from the **Advanced** menu option, or from the **Sonar Settings** dialog.

When the data is being recorded, there is a flashing red symbol in the top left corner and a message appears periodically at the bottom of the screen.
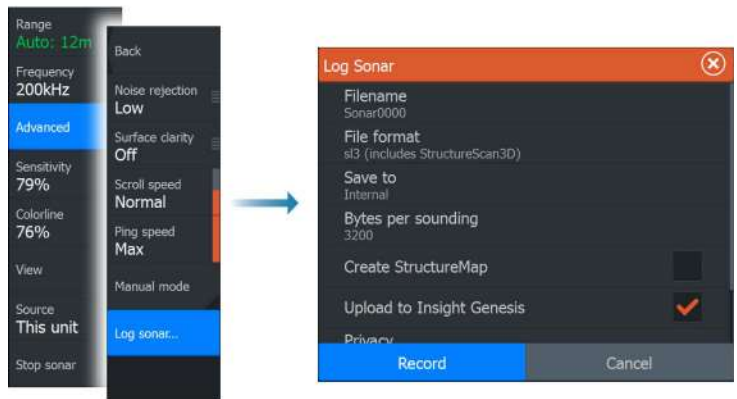
Filename

Specify the name of the recording (log).

File format

Select a file format from the drop-down, slg (Sonar only), xtf (Structure only*), sl2 (Sonar and Structure) or sl3 (includes StructureScan 3D).

→ **Note:** XTF format is for use only with select 3rd party Sonar viewing tools.

Save to
Select whether the recording is to be saved internally or to a memory card in the card reader.

Bytes per sounding
Select how many bytes per seconds that are to be used when saving the log file. More bytes yield better resolution, but cause the record file to increase in size compared to using lower byte settings.

Create StructureMap
If StructureScan is available on the network, you can convert the .sl2 or .sl3 logs to StructureMap format (.smf) when recording completes. The log file can also be converted to StructureMap format from the Files option.

Upload to Insight Genesis
Files are transmitted to Insight Genesis when recording completes, if you are connected to a wireless hotspot. For information about wireless hotspots, refer to *"Wireless connection"* on page 123.

Privacy
If allowed by your selected Insight Genesis account, you can choose between setting the recorded log files as Private or Public at Insight Genesis.

Time remaining
Shows the remaining allocated space available for recordings.

Stop recording log data
Select **Stop** in the Logging Sonar dialog to fully stop the recording of all sonar log data.

→ **Note:** If you have selected the **Upload to Insight Genesis** option and are connected to a wireless hotspot, your recorded files are transmitted to Insight Genesis when you select **Stop**.
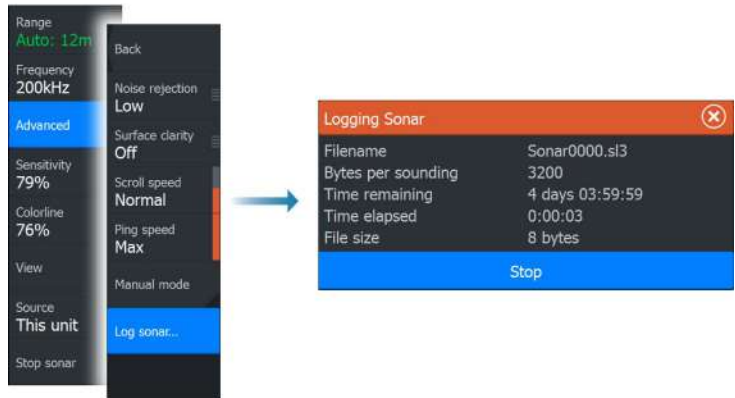
Viewing the recorded sounder data

Both internally and externally stored sounder records may be reviewed when the view sonar log option is selected in the Sonar settings dialog. Refer to *"Sonar settings"* on page 78.

The log file is displayed as a paused image, and you control the scrolling and display from the replay menu option.

You can use the cursor on the replay image, and pan the image as on a normal echo image.

If more than one channel was recorded in the selected echo file, you can select which channel to display.

You exit the replay mode by pressing the **X** key or by selecting the **X** symbol in the upper right corner of the replay image.

Sonar view options

Select the View option in the Sonar menu to see View options.

Split screen options

Zoom

1 Zoom level

2 Zoom bars

The Zoom mode presents a magnified view of the sounder image on the left side of the panel. By default, the zoom level is set to 2x. You can select up to 8x zoom from the drop-down menu, using the **+/-** keys, or the zoom (+ or -) buttons. The range zoom bars on the right side of the display shows the range that is magnified. If you increase the zooming factor the range is reduced. You see this as reduced distance between the zoom bars.

Bottom lock
The bottom lock mode is useful when you want to view echoes close to the bottom. In this mode, the left side of the panel shows an image where the bottom is flattened. The range scale is changed to measure from the seabed (0) and upwards. The bottom and the zero line are always shown on the left image, independent of the range scale. The scaling factor for the image on the left side of the panel is adjusted as described for the Zoom option.

Flasher

The Flasher mode shows a flasher-style sonar view in the left panel and a normal sonar view in the right panel.
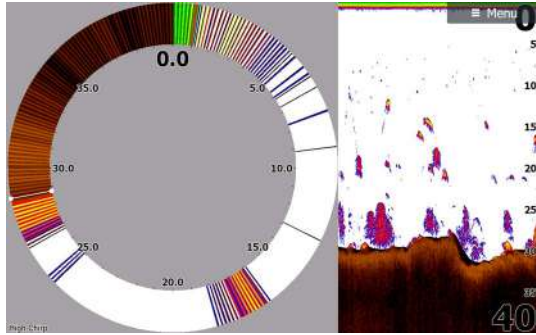
Palettes

You can select between several display palettes optimized for a variety of fishing conditions.

Temperature graph

The temperature graph is used to illustrate changes in water temperature.

When toggled on, a colored line and temperature digits are shown on the Sonar image.

Depth line

A depth line can be added to the bottom surface to make it easier to distinguish the bottom from fish and structures.

Amplitude scope

The Amplitude scope is a display of real-time echoes as they appear on the panel. The strength of the actual echo is indicated by both width and color intensity.

Preview

You can have all available sonar history shown at the top of the sonar screen. The Preview bar is a snapshot of available sonar history. You can scroll through sonar history by dragging the

preview slider horizontally. By default, Preview is turned on when the cursor is active.

Fish ID

You can select how you want the echoes to appear on the screen. You can also select if you want to be notified by a beep when a fish ID appears on the panel.
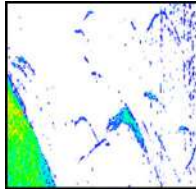
Traditional fish echoes

Fish symbols

Fish symbols and depth indication

→ **Note:** Not all fish symbols are actual fish.
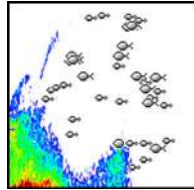
Sonar settings
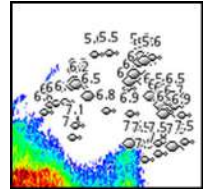
Internal Sonar

Select to make the internal Sonar available for selection in the Sonar menu. For more information about panel source selection, refer to *"Source"* on page 71.

When set to off, this option disables the internal Sonar in the unit. It will not be listed as a Sonar source for any unit on the network. Select this option on a unit in your network which does not have a transducer connected.

Network Sonar

You can share the Sonar images from this unit with other units connected on the Ethernet network.

For more information about how to setup Sonar, refer to the separate HDS Carbon Installation manual.

Overlay downscan

When a DownScan source is connected to your system, you can overlay DownScan images on the regular Sonar image.

When activated, the Sonar menu expands to include basic DownScan options.

Select Overlay on the Structure options menu to adjust the level of structure overlay shown on the screen. You can make adjustments using the Overlay slider bar.

Fishing mode

This feature consists of preset packages of sonar settings designed for specific fishing conditions.

→ **Note:** Selecting the proper fishing mode is critical to optimal sonar performance. If you completed configuration setup at initial startup, the proper fishing mode has already been selected.

Fishing mode	Depth	Palette
General Use	≤ 1,000 ft	White background
Shallow Water	≤ 60 ft	White background
Fresh Water	≤ 400 ft	White background

Fishing mode	Depth	Palette
Deep Water	≤ 5,000 ft	Deep Blue
Slow Trolling	≤ 400 ft	White background
Fast Trolling	≤ 400 ft	White background
Clear Water	≤ 400 ft	White background
Ice Fishing	≤ 400 ft	White background

Reset fishing mode

Resets selected fishing mode to default settings, allowing you to clear settings adjustments made while using a fishing mode.

Log sonar

Select to start and stop recording of Sonar data. For more information, refer to *"Start recording log data"* on page 73.

This option is also available from the Advanced option in the Sonar menu.

View Sonar log

Used to view Sonar recordings. The log file is displayed as a paused image, and you control the scrolling and display from the menu.

You can use the cursor on the image, measure distance, and set view options as on a live Sonar image. If more than one channel was recorded in the selected Sonar file, you can select which channel to display.

You exit the view function by selecting the **X** in the upper right corner or by pressing the **X** key.

Structure depth offset

Setting for Structure transducers.

All transducers measure water depth from the transducer to the bottom. As a result, water depth readings do not account for the distance from the transducer to the lowest point of the boat in the water or from the transducer to the water surface.

To show the depth from the lowest point of the boat to the bottom, do the following. Before setting the Structure offset, measure the distance from the structure transducer to the lowest point of the

boat in the water. If, for example, the distance is 0.3 m (1 ft), it will be input as (minus) - 0.3 m (-1 ft).

To show the depth from the water surface to the bottom, do the following. Before setting the Structure offset, measure the distance from the structure transducer to the water surface. If, for example, the distance is 0.3 m (1 ft), it will be input as (plus) 0.3 m (1 ft).

A setting of 0 (zero) causes the depth displayed to be the distance from the transducer to the bottom.

Installation

Used for defining Sonar sources available for selection in the Source menu option. For information about defining sources, refer to the separate HDS Carbon Installation manual. For information about Source selection, refer to *"Source"* on page 71.

8

StructureScan

StructureScan uses high frequencies to provide a high resolution, picture-like image of the seabed.

→ **Note:** You must have a StructureScan HD, TotalScan or StructureScan 3D transducer installed to use StructureScan features.

StructureScan provides a wide coverage in high detail with SideScan, while DownScan provides detailed images of structure and fish directly below your boat. The StructureScan page is accessed from the **Home** page when the transducer is connected.

→ **Note:** StructureScan 3D is also supported. StructureScan 3D is a multi-beam sonar technology that allows anglers to see underwater structure and bottom contours in customizable, three-dimensional views. For more information about StructureScan 3D, refer to the separate StructureScan 3D documentation.
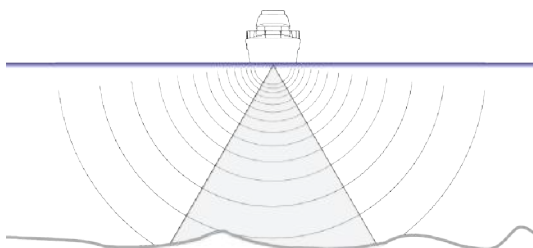
The StructureScan image

The view

The StructureScan panel can be set up as a DownScan image, or showing left/right side scanning.

The DownScan image can also be added as an overlay to the traditional Sonar image.
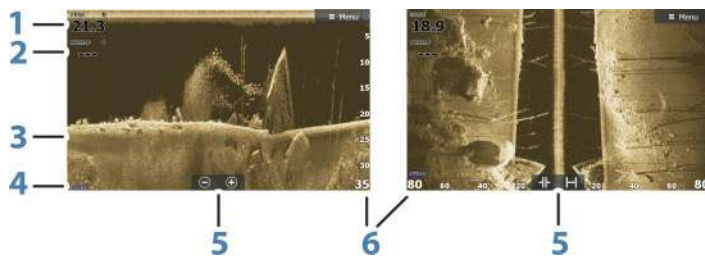
1   Depth

    → *Note:* The depth reading depends on the **Structure depth offset** setting, refer to *"Structure depth offset"* on page 80

2   Temperature

3   Bottom

4   Frequency

5   Zoom (downscan) / Range (sidescan) icons

6   Range scale

Zooming the StructureScan image

You can zoom a StructureScan image by:

- using the zoom (+ or -) buttons
- pinching or spreading on the screen
- using the **+/-** keys

Zoom level is shown on the bottom left side of the panel.

Using the cursor on the StructureScan panel

By default, the cursor is not shown on the StructureScan image.

When you position the cursor on a DownScan image, the screen pauses, the cursor information window and the history bar are activated. On a DownScan image, the depth is shown at cursor position.

When you position the cursor on a SideScan image, the screen pauses, and the cursor information window is activated. On a

SideScan image, the left/right distance from the vessel to the cursor are shown at the cursor position.

To remove the cursor and the cursor elements from the panel, press the **X** key or select the **Clear cursor** option.
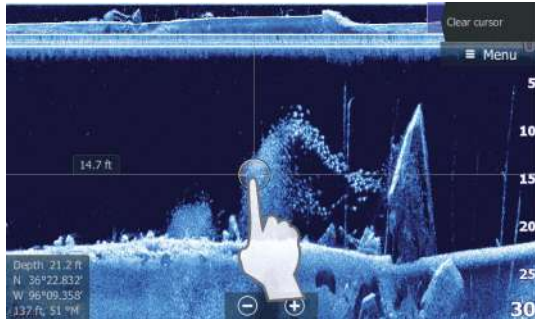
Viewing StructureScan history

When the cursor is active in a DownScan view, the history bar is shown at the top of the panel.

The highlighted part of the history bar shows the image you are currently viewing in relation to the total StructureScan image history stored. You can pan the history by dragging the image or the highlighted part of the history bar, to the left or right.

In a SideScan view, you can pan the image to see sides and history by dragging the image left, right, and up.

To resume normal StructureScan scrolling, select **Clear cursor** or press the **X** key.
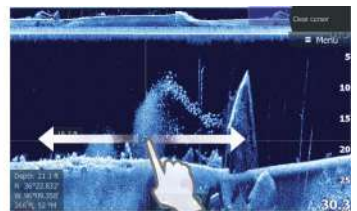
Setting up the StructureScan image

Use the StructureScan menu to set up the image. When the cursor is active, some options in the menu are replaced with cursor mode features. Select **Clear cursor** to return to the normal menu.

Range

The range setting determines the water depth and SideScan range that is visible on the screen.

Auto range

When the range is set to Auto the system automatically sets the range depending on the water depth.

Preset range levels

You can select between several preset range levels.

StructureScan frequencies

StructureScan supports two frequencies. 455 kHz provides ideal range and image quality in most situations, while 800kHz is used to provide higher detail in shallow water.

Contrast

Determines the brightness ratio between light and dark areas of the screen.

To adjust the contrast setting:

1. Select the contrast icon or activate the contrast option in the menu to display the color adjustment bar
2. Drag the bar up or down to get the desired contrast setting or select **Auto contrast**.

→ *Note:* We recommend that you use **Auto contrast**.

Palettes

You can select between several display palettes optimized for a variety of fishing conditions.

View

You can set up the StructureScan page as a DownScan image, left only, right only, or left/right side scanning.

Stop sonar

Use the **Stop sonar** menu option when you want to turn off the StructureScan transducer, but not turn off the unit.

Advanced StructureScan settings

Surface clarity

Wave action, boat wakes and temperature inversions can cause on-screen clutter near the surface.

The surface clarity option reduces surface clutter by decreasing the sensitivity of the receiver near the surface.

→ *Note:* By default, surface clarity is set to Low, for optimal image return and clarity.

Noise rejection

Signal interference from bilge pumps, engine vibration and air bubbles can clutter the sonar screen. The noise rejection option filters the signal interference and reduces on-screen clutter.

→ *Note:* By default, Noise rejection is set to **on**, for optimal signal returns and clarity.

Flipping the Structure image left/right

If required, the left/right SideScanning images can be flipped to match the direction of the transducer installation.

Range Lines

Range lines can be added to the image to make it easier to estimate depth (Downscan) and distance (SideScan).

Preview

You can turn off sonar history preview, have it always shown at the top of the screen, or have it appear only when the cursor is active. By default, the sonar history preview appears when the cursor is active.

Recording StructureScan data

You can record StructureScan data and save the file internally in the unit, or onto a memory card as described in *"Start recording sonar data"* on page 73.

9

SpotlightScan

To use the SpotlightScan feature, the SpotlightScan transducer must be mounted on your trolling motor and its trolling motor position sensor mounted on the trolling motor foot pedal. The SpotlightScan feature can show structure and fish targets ahead and around the boat without disturbing these areas before you have a chance to fish them. Its trolling motor position sensor ensures that the SpotlightScan returns match up correctly with the orientation of your trolling motor. For installation instructions, refer to the SpotlightScan Installation Manual.

The SpotlightScan transducer can be used for SpotlightScan imaging, Downscan imaging, or as a conventional broadband/CHIRP transducer.

The SpotlightScan transducer works with most MotorGuide and Minn Kota cable steer trolling motors. Its scanning speed is controlled by how fast the trolling motor is rotated with the foot pedal.

The SpotlightScan image
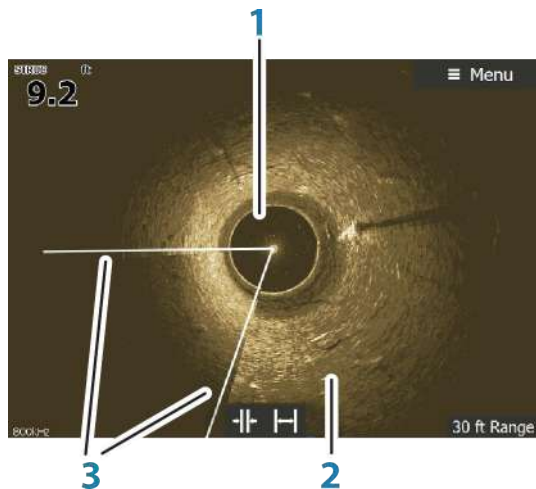
1   Water column

2	Bottom
3	Twin scanning beams

SpotlightScan setup

Configuring the heading sensor to the trolling motor

You must configure the heading sensor with the trolling motor foot pedal.

1. Select **Network** from the **Settings** dialog
2. Select **Device list**
3. Select the position sensor (**SLS-100**)
4. Select **Calibrate** on the device information dialog
5. Select your trolling motor foot pedal
6. Select **Calibrate**
7. Select **OK** on the confirmation dialog.

Displaying SpotlightScan images

To display SpotlightScan images, the SpotlightScan feature must first be turned on in the **Advanced Settings** dialog. For more information, refer to *"Tools"* on page 169.

1. Select the Structure application in the **Home** page.
2. Select the View menu option.
3. Select the Spotlight menu option.

You can set up multiple panel pages to view SpotlightScan, broadband sonar, and Downscan images at the same time. You cannot view SpotlightScan and SideScan images at the same time.

Aligning the SpotlightScan image

You must align the SpotlightScan image with the direction the trolling motor is pointing. If the image is not correctly aligned with the trolling motor, the orientation of the image does not match the underwater environment around your boat.

1. Position your trolling motor so it is pointing straight ahead
2. Access the **Advanced** option in the Structure menu
3. Select **Position adjustment**
4. Move the Position adjustment scroll bar so the top of the **V** is centered at the top of the display.

→ *Note:* The **V** on the Structure display represents the beams of the SpotlightScan transducer. The wide end of the **V** should be aligned in the direction the trolling motor is pointing.

→ *Note:* Do not use the arrow indicator on the trolling motor head as a heading reference as it might not be aligned correctly with the trolling motor.

SpotlightScan options

SpotlightScan menu options are available in the Structure menu.

Range

You can control how much of the area around your boat appears on the display by increasing or decreasing the range.

Frequency

SpotlightScan can be used at 800 kHz or 455 kHz. 800 kHz provides the highest resolution with less range. 455 kHz has the best range, but with lower resolution.

Advanced SpotlightScan settings

Surface clarity

Wave action, boat wakes and temperature inversions can cause onscreen clutter near the surface. The surface clarity option reduces surface clutter by decreasing the sensitivity of the receiver near the surface.

Noise rejection

Signal interference from bilge pumps, engine vibration and air bubbles can clutter the sonar screen. The noise rejection option filters the signal interference and reduces on-screen clutter.

Log sonar

You can Log sonar data and save the file internally in the HDS Carbon unit, or onto a microSD card as described in *"Recording Sonar data"* on page 73.

Position adjustment

You must align the SpotlightScan image with the direction the motor is pointing. Refer to *"Aligning the SpotlightScan image"* on page 90.

Look Ahead

You can make the top half of the image predominant on the display, for a better view of what is in front of you. Select Advanced and then Look Ahead menu options in the Structure menu to toggle it on and off.

Contrast

The contrast determines the brightness ratio between light and dark areas of the screen. This makes it easier to distinguish object from the background.

Palettes

You can select between several display palettes optimized for a variety of fishing conditions.

View

You can select between SpotlightScan and DownScan.

Stop sonar

Pauses the sonar. Re-select to restart the sonar.

SpotlightScan operation tips

• Remove slack in the trolling motor cable to prevent image distortion.

- Rotate the trolling motor at a slow, constant speed to achieve the best results.

- Reducing the range increases the size of the water column, providing the best view of fish activity beneath the boat.

10

StructureMap

The StructureMap feature overlays SideScan images from a StructureScan source on the map. This makes it easier to visualize the underwater environment in relation to your position, and aids in interpreting SideScan images.

The StructureMap image

The example below shows a chart panel with Structure overlay, combined with a traditional SideScan panel.
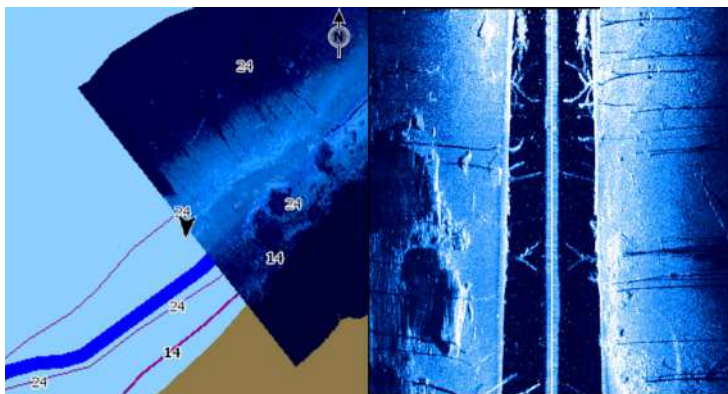
You move around in the chart as usual when you have a Structure overlay:

- Touch operation: zoom the chart and the scanned image by using the zoom (+ or -) buttons, or by pinching or spreading on the screen. Drag on the panel to view the scanned image.
- Key operation: zoom the chart and the scanned image by using the **+/-** keys.

Selecting the **Clear cursor** option removes the cursor from the panel, and the chart center is positioned at the vessel.

Activating Structure overlay

1. Turn on Structure overlay from the chart menu
   - The chart menu is increased to show Structure options
   - Structure data starts to appear on the chart screen as soon as Structure overlay is enabled

2. Select Structure source
- Live data is default

→ *Note:* Structure overlay can also be activated by selecting a saved StructureMap file in the files browser.

StructureMap sources

Two sources can be used to overlay Structure logs on the charts, but only one can be viewed at a time:

- Live data - Used when StructureScan data is available on the system.
- Saved files - These are recorded StructureScan (*.sl2 or *.sl3) data that are converted to StructureMap (*.smf) format. Saved *.smf files can be used even if no StructureScan sources are connected.

Live source

When live data is selected, the SideScan imaging history is displayed as a trail behind the vessel icon. The length of this trail varies depending on available memory in the unit and range settings. As the memory fills up, the oldest data is automatically deleted as new data is added. When increasing the search range, the ping speed of the StructureScan transducer is reduced, but the width and the length of the image history is increased.

→ *Note:* Live mode does not save any data. If the unit is turned off, all recent data is lost.

Saved files

When Saved files are selected, the StructureMap file is overlaid on the map based on position information in the file.

If the chart scale is large, the StructureMap area is indicated with a boundary box until the scale is large enough to show Structure details.

Saved mode is used to review and examine StructureMap files, and to position the vessel on specific points of interest on a previous scanned area.

→ *Note:* When saved files are used as the source, all StructureMap files found on the memory card and in the system's internal memory are displayed. If there is more than one StructureMap of the same area, the images overlap and clutter the chart. If several logs of the same area are required, the maps should be put on separate memory cards.

StructureMap tips

- To get a picture of taller structures (a wreck, etc.) — do not drive over it, instead, steer the boat so the structure is on the left or right side of your vessel.
- Do not use Autorange when using StructureScan. Set your structure range to a significantly greater level (two-to-three times) than the water depth to ensure a complete scan and to maximize conversion accuracy.
- Do not overlap history trails when conducting a side-by-side scan of an area.

Recording StructureScan data

StructureScan data can be recorded from a chart panel with Structure overlay enabled.

StructureScan recordings can also be started from a StructureScan panel.

When StructureScan data is being recorded, there is a flashing red symbol and a message appears periodically at the bottom of the screen.

→ **Note:** The message includes information about file size. Keep the size of your logs to 100MB or less to allow for faster file conversion.

The recording is stopped by re-selecting the record function.

Converting StructureScan data to StructureMap format

A StructureScan log file (.sl2) is converted to StructureMap format (.smf) after recording from the recording dialog, or from the files browser.
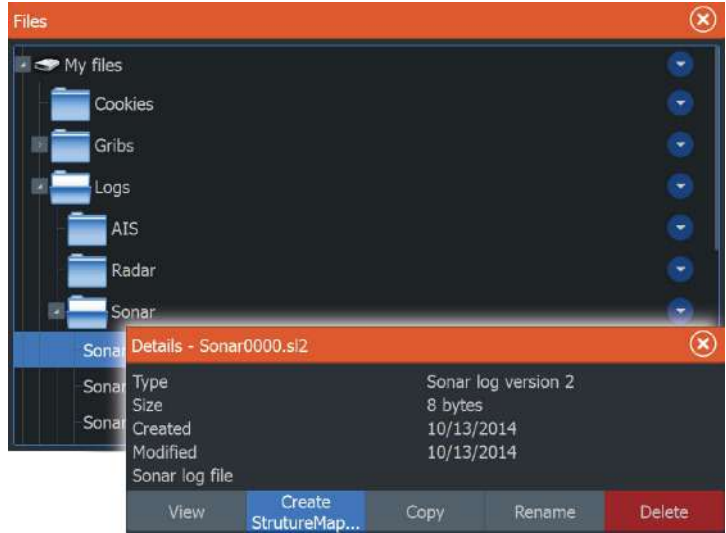
You can create standard or high resolution files. High resolution .smf files capture more detail, but take longer to convert and are larger than standard resolution files.

To save disc space it is recommended to remove the StructureScan (.sl2) files after conversion.

Using StructureMap with mapping cards

StructureMap allows you to maintain full chart capability and can be used with embedded cartography as well as Navionics, Insight and other third-party charting cards compatible with the system.

When using StructureMap with mapping cards, copy the StructureMap (.smf) files to the unit's internal memory. We recommend keeping copies of StructureMap files on external mapping cards.

Structure options

You adjust the StructureMap settings from the Structure options menu. The menu is available when Structure overlay is enabled.

Not all options are available when saved StructureMap files are used as the source. Unavailable options are greyed.

Range
Sets the search range.

Transparency
Sets the opaqueness of the Structure overlay. With minimum transparency settings, the chart details are almost hidden by the StructureMap overlay.

Palette
Selects Structure palette.

Contrast
Determines the brightness ratio between light and dark areas of the screen.

Water column
Shows/hides the water column in Live mode.

If turned OFF schools of bait fish might not be seen on the SideScan image.

If turned ON the accuracy of the SideScan image on the map might be affected by the water depth.

Frequency
Sets the transducer frequency used by the unit. 800 kHz offers the best resolution, while 455 kHz has greater depth and range coverage.

Clear live history
Clears existing live history data from the screen and begins showing only the most current data.

Log Sonar data

Records StructureScan data.

Source

Selects StructureMap source.

11

Info panels

The **Info** panels consist of multiple gauges - analog, digital, and bar - that can be customized to display selected data. The panel displays data on dashboards, and you can define up to ten dashboards within the panel.

Dashboards

A set of dashboard styles are predefined to display vessel, navigation, and angler information.

You switch between the panel's dashboards by selecting the left and right arrow buttons on the panel. You can also select the dashboard from the menu.

Vessel dashboard   *Navigation dashboard*   *Angler dashboard*

→ **Note:** Additional dashboards can be activated from the menu if other systems (e.g. CZone) are present on the network.

Customizing the Info panel

You can customize the Info panel by changing the data for each of the gauges in the dashboard, by changing the dashboard layout, and by adding new dashboards. You can also set limits for analog gauges.

All edit options are available from the Info panel menu.

Available editing options depend on which data sources are connected to your system.

Edit a dashboard

Activate the dashboard you want to edit, then:

1. Activate the menu
2. Select the edit option
3. Select the gauge you want to change. Selected gauge is indicated with a colored background
4. Select information to be displayed, configure limits, and eventually change the source for the information
5. Save your changes by selecting the save option in the menu
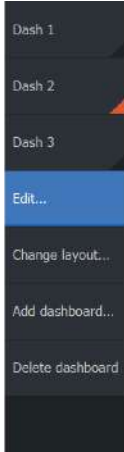
12

Video

The video function allows you to view videos or camera sources on your system.

→ *Note:* The video images are not shared from the Ethernet network. You can only view the video on the unit connected to the video source.

The Video panel

A video panel can be set up as a single panel, or as one of the panels on a multiple panel page.

The video image is proportionally scaled to fit into the video panel. Areas not covered by the image are colored black.
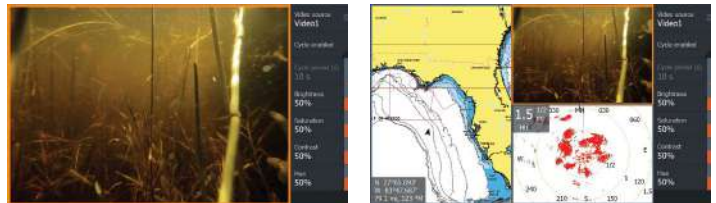
Setting up the video panel

Video source
HDS Carbon supports one video input channel.

Video standard
HDS Carbon supports NTSC and PAL video. Check the local video standard or the standard of your cameras.

Adjusting the video image
You can optimize the video display by adjusting the video image settings. Default for all settings: 50%.

13 Simulator

The simulation feature lets you see how the unit works in a stationary position and without being connected to sensors or other devices.
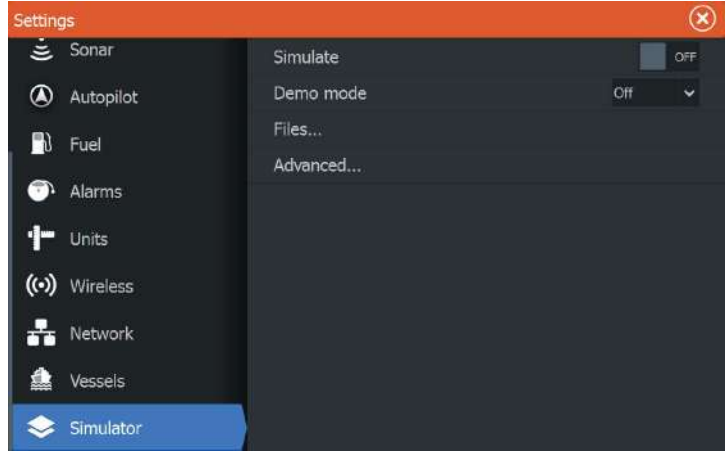
Demo mode

In this mode the unit automatically runs through the main features of the product; it changes pages automatically, adjusts settings, opens menus, etc.

If you tap on a touchscreen or press a key when demo mode is running, the demonstration pauses. After a time-out period, demo mode resumes and any changed settings are restored to default.

→ *Note:* Demo mode is designed for retail/showroom demonstrations.

Simulator source files

You can select which data files are used by the simulator. A set of source files is included in your system, and you can import files by using a card inserted into the card reader. You can also use your own recorded log data files in the simulator.
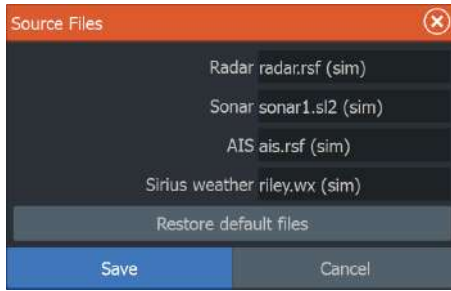
Advanced simulator settings

The Advanced simulator settings allows for manually controlling the simulator.
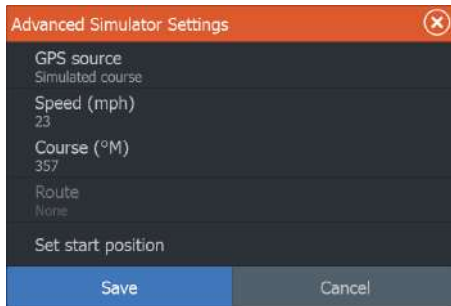
GPS source

Selects where the GPS data is generated from.

Speed, Course and Route

Used for manually entering values when GPS source is set to Simulated course or Simulated route. Otherwise, GPS data including speed and course come from the selected source file.

Set start position

Moves your vessel to the current cursor position.

→ *Note:* This option is only available when the GPS source is set to Simulated course.

14

Trolling motor autopilot

If a MotorGuide Xi5 trolling motor with Pinpoint GPS is connected to the network, then the SmartSteer (autopilot) functionality is available on your HDS Carbon.

To use trolling motor autopilot functionality, you need the following:

- MotorGuide Xi5 trolling motor with Pinpoint GPS (available from MotorGuide)
- MotorGuide Pinpoint GPS Gateway (available from MotorGuide)
- NMEA 2000 network

For details about installing this equipment, refer to the separate installation manuals that come with the equipment.

The Autopilot can automatically control the trolling motor to:

- Maintain a set heading
- Maintain the vessel's position
- Navigate to the cursor position, to a waypoint, or along a route
- Follow pre-defined turn patterns
- Control the speed of the trolling motor

Xi5 trolling motor software

If at any time there is an update required for your Xi5 trolling motor, instructions will be made available by MotorGuide.

Follow the onscreen instructions to update Xi5 software.

Safe operation with the autopilot

> ⚠ Warning: An autopilot is a useful navigational aid, but DOES NOT replace a human navigator.

Switching from automatic navigation to standby mode

To switch from autopilot to handheld remote or foot pedal steering, set the autopilot to standby mode. You can select standby mode from the **Autopilot Controller** or the **System Controls** dialog.

Autopilot interface
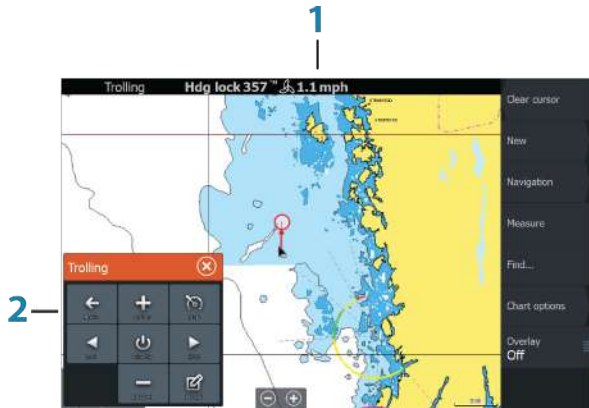
1 Autopilot information bar

2 Autopilot Controller

The Autopilot Controller

The autopilot is controlled from the **Autopilot Controller**, activated from the **System Controls** dialog displayed by pressing the **Power** key.

You can select the position of the Autopilot Controller on the page. Refer to *"Autopilot settings"* on page 109.

→ *Note:* As long as the **Autopilot Controller** is active, you cannot operate the background panel or its menu.

The **Autopilot Controller** can also be set up as a panel in a split panel page by using the Page Editor to make a Favorite page. For information about Favorite pages, refer to *"Adding new favorite pages"* on page 32.

The Autopilot information bar

The **Autopilot information bar** is displayed when an autopilot mode is selected. The bar includes information about the autopilot mode and navigational information. The bar is present on all pages if the autopilot is in an active mode. In the Autopilot settings dialog,

you can select that the bar is off when the autopilot is in standby mode. Refer to *"Autopilot settings"* on page 109.

Autopilot control of the trolling motor

Selecting an Arrival mode
The autopilot switches from navigation mode to the selected arrival mode when your vessel reaches the destination. Arrival mode is set to Standby by default. Before starting a navigation mode or a turn pattern, it is important to select an arrival mode that fits your navigation needs. Refer to *"Arrival mode"* on page 110.

Anchor mode
Maintains your vessel position at a selected location.

→ *Note:* When in anchor mode, your vessel orientation can be affected by wind or currents.

The following occurs when you select to anchor at:

- **Waypoint**
  Enables anchor mode when your vessel arrives at a selected waypoint.
- **Cursor**
  Enables anchor mode when your vessel arrives at the cursor position.
- **Here**
  Enables anchor mode at your current location.

Heading Lock mode
Locks and maintains the current vessel heading. Use the left and right arrow buttons in the **Autopilot Controller** to make heading adjustments. To make small heading adjustments, single-select the left or right buttons. For larger adjustments, select and hold the left or right buttons.

Standby mode
Cancels autopilot activity and returns the vessel to handheld remote or foot pedal steering control.
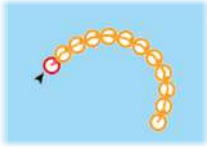
Turn pattern steering

Steers the vessel in predefined turn patterns. When you select a turn pattern, the system creates temporary waypoints on the turn. The last waypoint on the turn is the final waypoint. When the vessel reaches the final waypoint, the vessel goes into arrival mode. Refer to *"Arrival mode"* on page 110.

Setting up a turn pattern
1. Select a turn pattern.
2. Enter the desired value(s) in the turn pattern dialog or use default settings.
3. Select the direction of the turn.

→ *Note:* Selecting a turn radius smaller than the GPS accuracy may result in incomplete navigation of the turn pattern.

U-turn
Changes the current set heading to be 180° in the opposite direction.

C-turn
Steers the vessel in a C-shaped pattern.

Spiral turn
Steers the vessel in a spiral with a decreasing or increasing radius. Negative values indicate decreasing radius while positive values indicate increasing radius.

Zigzag turns
Steers the vessel in a zigzag pattern.

Square turn
Makes the vessel automatically turn 90° after having travelled a defined leg distance.

Lazy S-turn
Makes the vessel yaw around the main heading.

Navigation mode

In Nav. mode you can use the autopilot to steer the boat to cursor position, to a waypoint position, or along a pre-defined route. The position information from the GPS is used to keep the boat on the track line towards the destination point.

When you start navigating from an application (from chart, steering, radar, etc) you are prompted to engage the autopilot in Nav. mode.
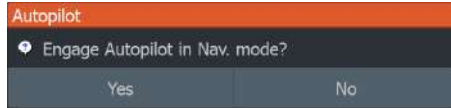
You can also initiate Nav. mode from the **Autopilot Controller** after navigation is started.

When you reach the destination, the autopilot switches to your **Arrival mode** setting. Refer to *"Autopilot settings"* on page 109.

Trolling motor speed control

In navigation modes (Heading lock mode, Nav. mode, and Turn pattern steering) there are two ways to control speed:

• Prop - selects a target propeller rate (percentage of power) shown as **%** in the Autopilot information bar.

• Cruise - selects a target cruise control speed shown as **mph**, **kn**, or **kph** in the Autopilot information bar.

→ *Note:* Cruise set speed sets the target speed for your vessel. Your vessel may not be able to achieve the set target. The Cruise set speed (not your current speed) is displayed in the Autopilot information bar.

Speed adjustments

You can make speed adjustments on the Heading lock and Navigation control dialogs by selecting the Spd up (+) and Spd down (-) buttons, or by selecting the **Set Spd** or **Set prop** option and entering your desired speed or propeller rate.

Recording and converting a trail to a route

The **Record trail** button is used to record and convert a trail or part of a trail to a route.

1. Select **Record trail** at the desired location to start recording a new trail.
2. Select **Save route** to select the end location of the route. The Edit trail dialog appears.
3. Select **Create route**. The Edit route dialog appears.
4. Enter the route details and save it.

Autopilot settings
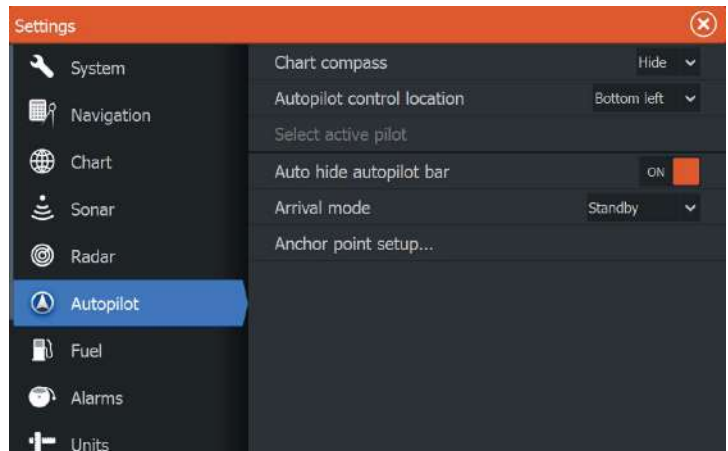
→ *Note:* Options shown on the Autopilot setting dialog varies depending on if the trolling motor or outboard motor autopilot is active.

Chart compass

You can select to show a compass symbol around your boat on the chart panel. The compass symbol is off when the cursor is active on the panel.

Autopilot control location

Controls the location of the **Autopilot controller** on the panel.

Select active autopilot

Selects if the autopilot controls the trolling motor or the outboard motor(s).

Auto hide autopilot bar

Controls whether the Autopilot information bar is shown when the autopilot is in Standby mode.

Arrival mode

The trolling motor autopilot switches from navigation mode to the selected arrival mode when your vessel reaches the destination.

➜ *Note:* Before starting a navigation mode or a turn pattern, it is important to select an arrival mode that fits your navigation needs.

Arrival modes are:

- **Standby**
  Cancels autopilot activity and returns the vessel to handheld remote or foot pedal control.
- **Heading lock**
  Locks and maintains the last vessel heading.
- **Anchor**
  Anchors the vessel at the current destination.

➜ *Note:* We recommend only using heading lock in open water.

Anchor point setup

Anchor points can be saved as a new waypoint, replaced with an existing waypoint, or set as your current coordinates.
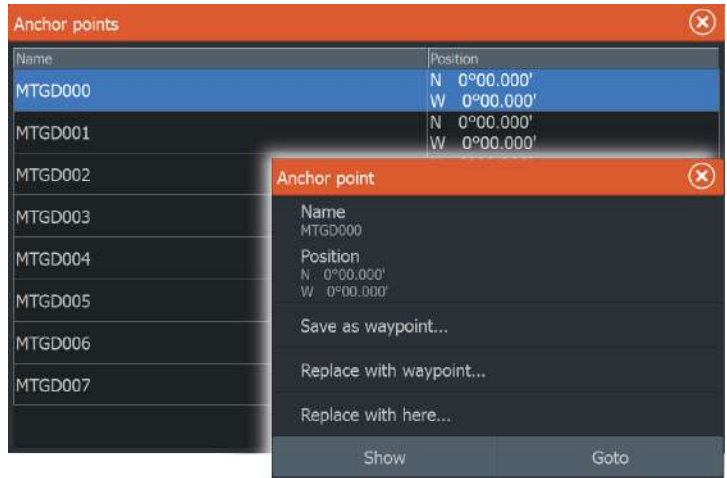
Anchor points are synced with the Xi5 trolling motor. If any anchor points are stored in the motor, they appear in the anchor points list.

15

Outboard motor autopilot

The Lowrance SmartSteer interface (Autopilot Controller) provides outboard motor control. The outboard autopilot can steer on a set heading, to a waypoint, or along a route.

To use outboard autopilot functionality the following are required:

- NAC-1 Autopilot computer
- Point-1AP GPS/Heading sensor or RC42N Heading sensor and a separate GPS antenna
- Pump or drive unit connected to the steering system

For details about installing this equipment, refer to the separate installation manuals that come with the equipment. After installation is complete you must set up the outboard autopilot, for instructions refer to the HDS Carbon Installation Manual.

Safe operation with the autopilot

⚠ Warning: An autopilot is a useful navigational aid, but DOES NOT replace a human navigator.

Autopilot control of the outboard motor(s)

The autopilot is controlled from the **Autopilot Controller**, activated from the **System Controls** dialog displayed by pressing the **Power** key.

The **Autopilot Controller** can also be set up as a panel in a split panel page by using the Page Editor to make a Favorite page.

The options in the **Autopilot Controller** vary with active mode.

Selecting the trolling or outboard motor autopilot

If autopilot control of the trolling motor and outboard motor are installed on the same vessel, only one of the auto steering options can be active at a time. When both options are installed, a button to switch between them is included in the **Autopilot Controller**.

Mode overview

Standby mode

Standby mode is used when you want to disable the autopilot and manually steer the boat.

The autopilot information bar is hidden when the autopilot is in Standby mode. To view the autopilot bar, disable **Autohide** from the Autopilot settings dialog.

Power steer mode

In this mode you use the port and starboard arrow buttons in the **Autopilot Controller** to turn the outboard motor(s). The motor turns as long as the button is pressed and remains at the set angle.

Auto mode

In AUTO mode, the autopilot steers the boat automatically on a set heading.

When the mode is activated, the autopilot selects the current compass heading as the set heading.

→ *Note:* Strong wind and current might affect the steering of the vessel in AUTO mode. While the autopilot compensates for any heading change, the wind and current could cause the course of the boat to differ significantly from the heading.
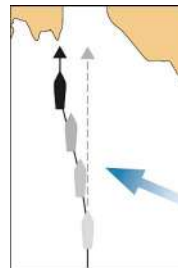
Changing set heading in AUTO mode

You adjust the set heading by using the port and starboard (1 or 10 degrees) arrow buttons in the **Autopilot Controller**.

When you select the button, an immediate heading change takes place. The new heading is maintained until a new heading is set or until you select another mode for the autopilot.

Turn pattern steering

The autopilot includes a number of automatic turn steering features when the autopilot is in AUTO mode.

→ *Note:* Turn pattern steering for outboard motors uses heading information only, while turn pattern steering for the trolling motor uses both GPS and heading information. Therefore, with outboard turn pattern steering, waypoints in the turns are not created and displayed as they are with trolling motor turn patterns.

Initiating a turn

You start the turn by selecting the relevant turn icon, followed by selecting the port or starboard options in the turn dialog to select the turn direction.

Stopping the turn

You can stop the turn from within the turn dialog.

At any time during a turn you can select **Autopilot standby** in the System Controls dialog to return to STBY mode and manual steering.

Turn variables

The turn steering options have settings that you can adjust before you start a turn and at any time when the boat is in a turn.

U-turn

U-Turn changes the current set heading to be 180° in the opposite direction.

The turn rate is identical to Rate limit settings. This cannot be changed during the turn.

C-turn

Steers the vessel in a circle.

You can adjust the Rate of turn from the turn dialog before the turn is initiated and during the turn. Increasing the turn rate makes the vessel turn a smaller circle.

Spiral turn

Spiral-turn makes the vessel turn in a spiral with a decreasing or increasing radius. You set the initial radius before the turn is initiated, and the change per turn during the turn. If the change per turn is set to zero, the vessel turns in a circle. Negative values indicate decreasing radius while positive values indicate increasing radius.

Zigzag turns

Steers the vessel in a zigzag pattern.

For navigating in a zigzag pattern, you set the initial heading change before the turn is started.

During the turn you can alter the main heading, the heading change, and the leg distance.

Square turn

Makes the vessel automatically turn 90° after having travelled a defined leg distance.

At any time during the turn you can change the main heading and the distance of the leg until the vessel makes a new 90° turn.

Lazy S-turn

Makes the vessel yaw around the main heading.

You set the selected heading change before the turn is started.

During the turn you can alter the main heading, the heading change and the turn radius from within the turn dialog.

Depth contour tracking, DCT^{TM}

If the system has Sonar input, the autopilot can be set to follow a depth contour.

> ⚠ Warning: Do not use this feature unless the seabed is suitable. Do not use it in rocky waters where the depth is varying significantly over a small area.
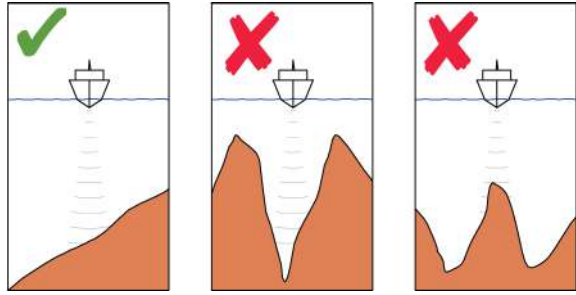
Use the following process to initiate DCT steering:

1. Ensure that you have depth reading on the panel or on a separate depth instrument.
2. Steer the boat to the depth you want to track, and in the direction of the depth contour.
3. Activate **AUTO** mode, select depth contour steering and monitor the depth reading.
4. Select the port or starboard option in the turn dialog to initiate the depth contour steering to follow the bottom sloping to starboard or to port:
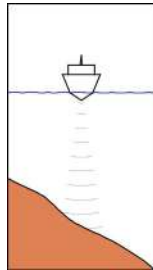
Port option
(depth decreases to port)
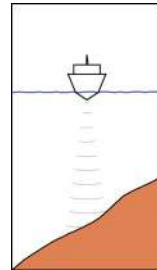
Starboard option
(depth decreases to starboard)

The following parameters are available for depth contour tracking:

Depth gain

This parameter determines the ratio between commanded rudder and the deviation from the selected depth contour. The higher depth gain value the more rudder is applied.

If the value is too small, it takes a long time to compensate for drifting off the set depth contour, and the autopilot fails to keep the boat on the selected depth.

If the value is set too high, the overshoot increases and the steering is unstable.

Contour Cross Angle (CCA)

The CCA is an angle that is added to or subtracted from the set course.

With this parameter you can make the boat yaw around the reference depth with lazy-s movements.

The larger the CCA, the bigger yawing is allowed. If you the CCA set to zero there are no lazy-s movements.

Ref. depth

Use this parameter to change the reference depth which the boat will yar around when making Lazy-s movements.

Course mode

The Course mode combines the heading information from the steering compass and the positioning information from the GPS. In this mode, the vessel is steered along a calculated track line in a direction set by the user. If the vessel's heading is drifting away from the original heading due to current and/or wind, the vessel follows the line with a crab angle.

1. Turn the vessel to the desired heading.
2. Activate Course mode. The autopilot draws an invisible bearing line based on the current heading from the boat's position.

In Course mode, the autopilot uses position information to calculate the cross track error, and to automatically keep your track straight.
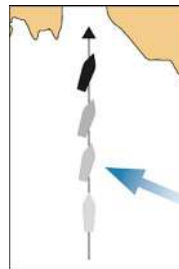
Use the port and starboard (1 or 10 degrees) arrow buttons in the **Autopilot Controller** to change the bearing line while in Course mode.

NAV mode

You can use the autopilot to automatically steer the boat to the cursor position, to a waypoint position, or along a pre-defined route. The position information from the GPS is used to change the course to steer to keep the boat on the track line towards the destination point.

> ⚠ Warning: NAV mode should only be used in open waters.

→ *Note:* To use navigation mode, the system must have valid position input.

When the vessel reaches the arrival circle for a waypoint, the autopilot gives an audible warning and displays a dialog with the new course information. If the required course change to the next waypoint is less than 30°, the autopilot automatically changes the course. If the required course change to next waypoint in a route is more than 30°, you are prompted to verify that the upcoming course change is acceptable.

Waypoint arrival circle
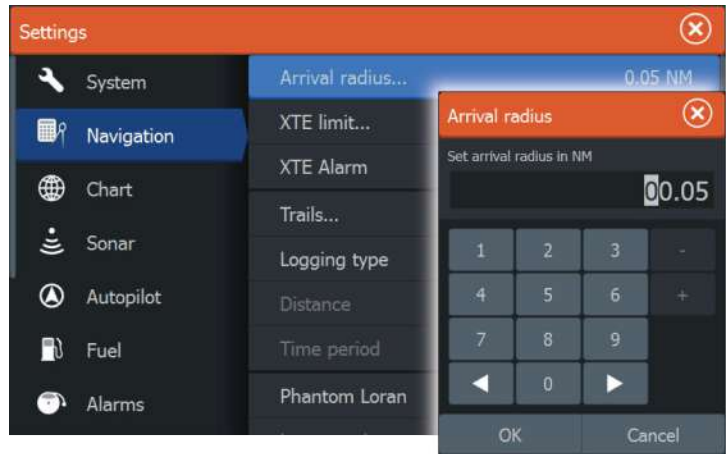
The Arrival radius defines the point at which a turn is initiated when you are navigating a route.
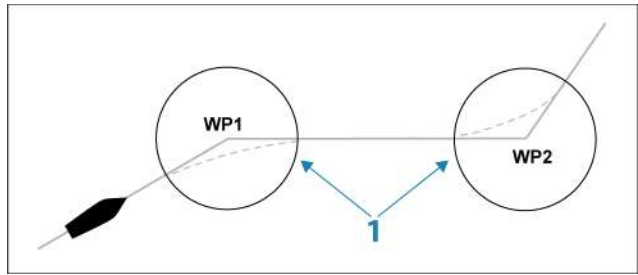
The arrival circle (**1**) should be adjusted according to boat speed. The higher the speed, the wider the circle. The intention is to make the autopilot start the heading change in due time to make a smooth turn onto the next leg.

The figure below may be used to select the appropriate waypoint circle when creating the route.
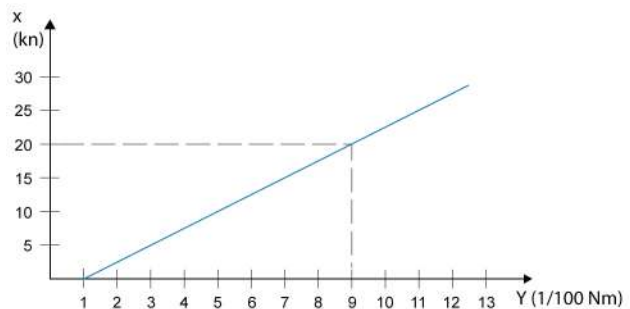
X axis = Boat speed in knots
Y axis = Arrival circle, radius in 1/100 Nm

Example: With the speed of 20 knots you should use a waypoint circle with radius 0.09 Nm.

→ *Note:* The distance between any waypoints in a route must not be smaller than the radius of the waypoint arrival circle.

Start automatic navigating

1. Start navigating a route, or start navigation to a waypoint or to the cursor position from the Chart panel or from the Steer panel.
2. Engage the autopilot in NAV mode when prompted.
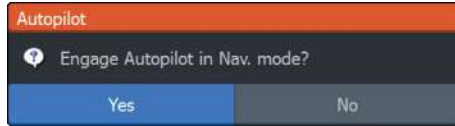
- If you reject this request, you can later start NAV mode from the **Autopilot Controller**.
3. Accept the required course change to activate NAV mode.
   - If the course change is not accepted within 8 seconds, the dialog is removed and the autopilot remains in the current active mode.

After the autopilot is engaged in NAV mode, the **Autopilot Controller** shows NAV steering options.

Restart
Restarts the navigation from the vessel's current position.

Cancel
Cancels active navigation and deselects the current route or waypoint navigation. The autopilot is switched to AUTO mode, steering the vessel on the heading that was active when the Cancel button was selected.

→ *Note:* This is different from selecting Standby mode which does not stop current navigation. From Standby mode you can later restart the active route.

Skip
Skips the active waypoint and steers towards the next waypoint when you are navigating a route.

Autopilot settings
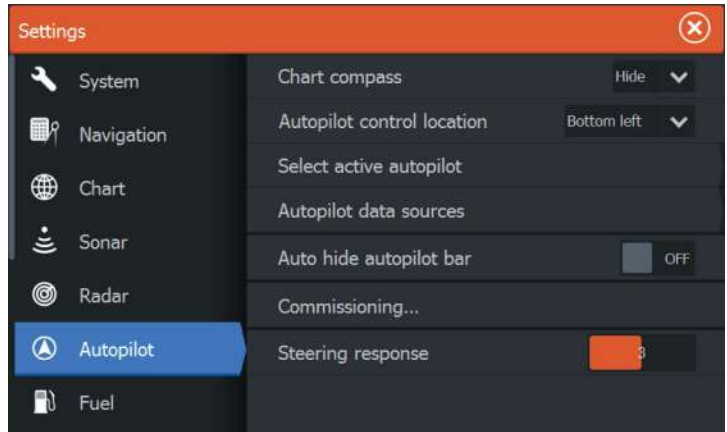
→ **Note:** Options shown on the Autopilot setting dialog varies depending on if the trolling motor or outboard motor autopilot is active.

Chart compass

You can select to show a compass symbol around your boat on the chart panel. The compass symbol is off when the cursor is active on the panel.

Autopilot control location

Controls the location of the **Autopilot controller** on the panel.

Select active autopilot

Selects if the autopilot controls the trolling motor or the outboard motor(s).

Autopilot data sources

Provides automatic and manual data source selection for your outboard autopilot.

Auto hide autopilot bar

Controls whether the Autopilot information bar is shown when the autopilot is in Standby mode.

Commissioning

Used to calibrate your outboard motor's steering (Cablesteer or Hydraulic steering) with the NAC-1.

Steering response

Used to increase or decrease the steering sensitivity. A low response level reduces the rudder activity and provides a more *loose* steering. A high response level increases the rudder activity and provides more *tight* steering. Too high a response level will cause the boat to make "S" movements.

16

Wireless connection

GoFree wireless connectivity gives you the ability to:

*   Use a wireless device to remotely view (smartphone and tablet) and control the system (tablet only).
*   Access the GoFree Shop.
*   Upload your Sonar logs to create custom maps at Insight Genesis.
*   Download software updates
*   Connect to third party applications

→ **Note:** Maps, charts, software updates, and other data files can be large. Your data provider may charge you based on the amount of data you transfer. If you are unsure contact the service provider for information.

The unit includes:

*   Built-in wireless functionality for connecting to the internet and wireless devices such as smartphones and tablets.
*   Built-in Bluetooth wireless technology.
    The built-in Bluetooth wireless technology gives you the ability to connect the unit to Bluetooth enabled devices. For more information, refer to *"Bluetooth wireless technology"* on page 126.

Initial configuration and setup of the built-in wireless functionality is described in your system's Installation Manual.

Connect and disconnect from a wireless hotspot

To connect to a wireless hotspot, select the Wireless option in the System Controls dialog and then select Not Connected. This opens the Wireless Devices dialog. Use this dialog to select the desired hotspot, enter the login information and then select Connect. Connecting to a wireless hotspot changes the wireless mode to **Client mode**. In this mode, you can access the GoFree Shop.

To disconnect from a wireless hotspot, select the Wireless option in the System Controls dialog, then select Connected *hotspot_name*, and then Disconnect. This changes the wireless mode to **Access point**

mode. In this mode, you can connect a wireless device so that Apps such as GoFree Link can access the vessel's navigation information.

GoFree Shop
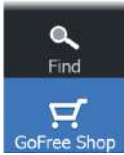
The wireless must be connected to an external wireless hotspot in order to access the GoFree Shop.

At the GoFree Shop you can browse, purchase and download compatible content for your system including navigation charts and Insight Genesis Maps. When you log on, the system automatically gives you a notification if a new software version is available for your system. If an update is available, you can download it to a card slot or defer the download until later. If you defer the download until later, the notification is available in the About dialog accessible from the System Settings.

GoFree Link

The wireless functionality lets you use a wireless device to remotely view (smartphone and tablet) and control the system (tablet only). The system is viewed and controlled from the wireless device by the GoFree Link Apps downloaded from their relevant Application store. When remote control is accepted, the active page is mirrored to the wireless device.

→ *Note:* To use smartphones and tablets to view and control the system, wireless functionality must be disconnected from the wireless hotspot (in **Access point mode**).

→ *Note:* For safety reasons, Autopilot and CZone functions cannot be controlled from a wireless device.

Connecting a tablet

Install the GoFree App on the tablet before following this procedure.

1. Set the internal wireless to **Access Point** mode. To do this, select the **Wireless devices** page in the Wireless settings dialog and then select the Internal wireless. Next, select the **Mode** option and then select **Internal Access Point**.
2. Select a device on the **Wireless devices** page to view its network key.
3. Navigate to the wireless network connection page on the tablet, and find the unit or GoFree wireless *xxxx* network. If more than

one is in range, review the **Wireless devices** page on the unit to confirm which wireless device is connected to the unit.

4. Enter the Network Key in the tablet to connect to the network.
5. Open the GoFree application - the unit should be automatically detected. The name displayed will be either the default, or that assigned in the Device Name setting. If the unit does not appear, follow the on screen instructions to manually find the device.
6. Select the graphic icon of the unit. The unit displays a prompt similar to the following:

❓ Allow "	iPad" remote MFD control?	
Yes	No	Always
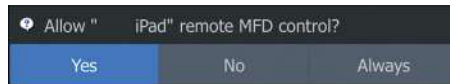
7. Select **Yes** for one-time connection, or **Always** if device is to be remembered for regular connection. This setting can be changed later if required.

➔ *Note:* The internal wireless module only supports GoFree connection to itself. Other units connected on the network are not visible.

Connecting a smartphone

Install the GoFree App on the smartphone before following this procedure.

1. Set the internal wireless to **Access Point** mode. To do this, select the **Wireless devices** page in the Wireless settings dialog and then select the unit's Internal Wireless. Next, select the **Mode** option and then select **Internal Access Point**.
2. Select a device on the **Wireless devices** page to view its Network Key.
3. Navigate to the wireless network connection page on the smartphone, and find the unit or GoFree wireless *xxxx* network. If more than one is in range, review the **Wireless devices** page from the unit's Wireless settings dialog to confirm which wireless device is connected to the unit.
4. Enter the Network Key in the smartphone to connect to the network.
5. Open the GoFree application on the smartphone, the unit should be automatically detected. The name displayed will be either the default, or that assigned in the Device Name setting. If

the unit does not appear, follow the on screen instructions to manually find the device.

The MFD's display is shown on the smartphone. To change the MFD's display on the smartphone, use the MFD to change the display on the MFD. The display change on the MFD is reflected on the smartphone.

Uploading log files to Insight Genesis

To upload a recorded Sonar log file to Insight Genesis, select the file you want to upload from the Files panel and select the upload to Insight Genesis option.

→ **Note:** You must be connected to a wireless hotspot to upload recorded log files to Insight Genesis.

→ **Note:** Recorded log files can also be uploaded to Insight Genesis if you have specified **Upload to Insight Genesis** in the Log Sonar dialog. For more information, refer to *"Start Recording log data"* on page 73.

Bluetooth wireless technology

The HDS Carbon includes built-in Bluetooth wireless technology. To connect the HDS Carbon to Bluetooth enabled devices you must *pair* them.

Pairing Bluetooth devices

To *pair* the unit with a Bluetooth enabled device, do the following:

1. Turn on the Bluetooth enabled device so that it is able to send and receive Bluetooth signals.
2. Open the Wireless settings dialog in the HDS Carbon and turn on Bluetooth, if it is not already enabled.
3. Select **Bluetooth devices**. The system searches for Bluetooth enabled devices, and lists them in the Bluetooth Devices dialog.

Devices that are already paired are listed under **Paired Devices**.
Devices that are not paired are listed under **Other Devices**.

4. Select the Bluetooth enabled device you want to *pair* with in the
   list under **Other Devices**. The **Bluetooth Device Details**
   dialog opens.
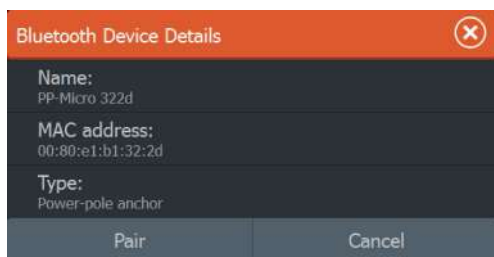
5. Select **Pair** to *pair* the HDS Carbon to the device.
6. Repeat these steps for each device you want to *pair* with the
   HDS Carbon.

Pairing with dual Power-Poles

If dual Power-Poles are installed on your boat, the one that is paired
first automatically becomes **Port** and the second is set to
Starboard in the Power-Pole controls.

To swap them around, unpair the connected Power-Poles. And
then, toggle off and on **Bluetooth** in the Wireless settings dialog to
reset the Bluetooth memory. Once Bluetooth has been toggled
back on, proceed in pairing the Power-Poles in the correct order.

Wireless settings

Provides configuration and setup options for the wireless
functionality.
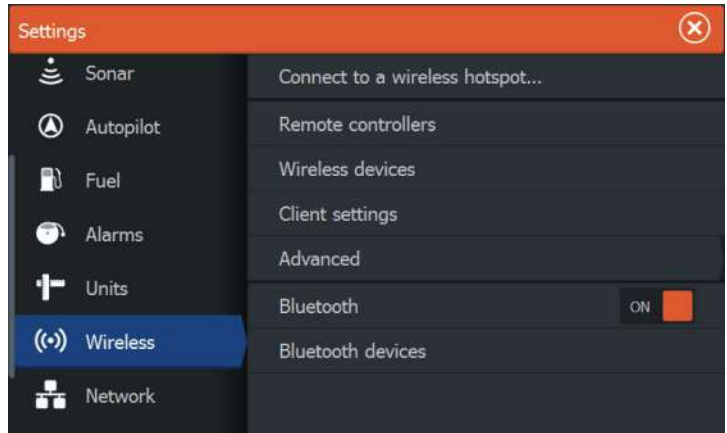
Connect to a wireless hotspot

Displays the Wireless device dialog that you can use to connect the wireless functionality to a wireless hotspot.

Remote controllers

When a wireless device (smart phone or tablet) is connected, it should appear in the Remote controllers list. Selecting **Always allow** means the device can automatically connect without needing a password each time. This menu also allows you to disconnect devices that no longer require access.

Wireless devices

This dialog shows the internal wireless and any connected WIFI-1 devices, as well as their IP and channel number. Selecting the internal wireless or a WIFI-1 device provides additional detail.

To view and change internal wireless detail values (Network Name (SSID), Network Key, or Channel) the internal wireless must be in **Access Point** (Internal Wifi) mode. To select a network (hotspot) to connect to, the internal wireless must be in **Client Mode**. Use the Mode option to change modes.

Client settings

Displays information about the wireless hotspot your unit is connected to or the last one your unit was connected to. You can

select the hotspot in the dialog to set it as a hotspot you want to always connect to when in range or you can select to delete it.

Advanced

Initiates the Iperf and DHCP Probe tools that help in fault-finding and setting up the wireless network.

→ **Note:** Iperf and DHCP Probe are tools provided for diagnostic purposes by users familiar with network terminology and configuration. Navico is not the original developer of these tools, and does not provide support related to their use.

Bluetooth

Enables the built-in Bluetooth wireless technology functionality.

Bluetooth devices

Displays the Bluetooth Device list dialog. Use the Bluetooth Device List dialog to pair or remove pairing to Bluetooth enabled devices.

17 Radar

The radar panel can be set up as a full screen view or combined with other panels.

The radar image can also be displayed as an overlay on a chart panel. For more information, see *"Chart overlay"* on page 40.

→ **Note:** Radar overlay requires data from a heading sensor or compass to ensure proper orientation with the chart.

The Radar panel
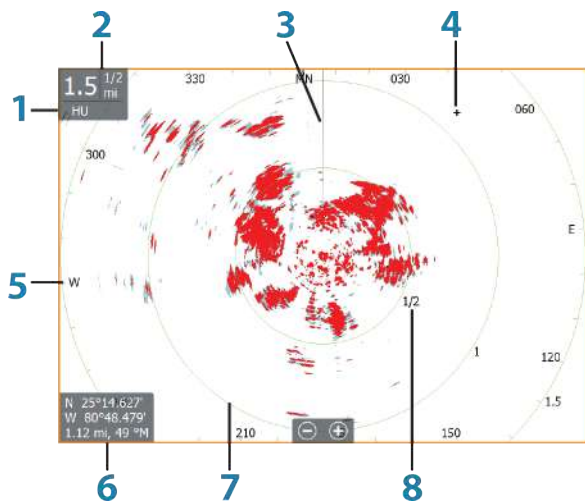
1	Orientation
2	Range
3	Heading line*
4	Cursor
5	Compass*
6	Cursor position window
7	Range rings*
8	Range markers*

* Optional radar symbology.

Radar symbology can be turned ON/OFF collectively from the Radar menu, or individually as described in Radar settings panel.

Radar overlay

You can overlay the Radar image on the Chart. This can help you to easily interpret the radar image by correlating the radar targets with charted objects.

When the radar overlay is selected, basic radar operational functions are available from the Chart panel's menu.

Selecting radar overlay source on chart panels

To select the radar source of the radar overlay displayed on the chart panel, use the **Radar options** and then **Source** chart panel menu options to select the radar source.

For chart pages with more than one chart with radar overlay, it is possible to set up different radars sources for each chart panel. Activate one of the chart panels and then select one of the available radars in the radar source menu option. Repeat the process for the second chart panel with radar overlay, and select an alternative radar for this panel.

Radar operational modes

The radar's operational modes are controlled from the HDS Carbon unit. The following modes are available:

Off

The power to the radar scanner is turned off.

Standby

The power to the radar scanner is on, but the radar is not transmitting.

Transmit

The scanner is on and transmitting. Detected targets are drawn on the radar PPI (Plan Position Indicator).

Radar Range

You adjust radar range by selecting the zoom (+ or -) buttons on the radar panel or using the zoom (**+** or **-**) keys.

Using the cursor on a radar panel

By default, the cursor is not shown on a radar panel.

When you position the cursor on the radar panel, the cursor position window is activated and the cursor menu options are displayed.

To remove the cursor and cursor elements from the panel, select **Clear cursor** or press the **X** key.

Adjusting the radar image

You may be able to improve the radar image by adjusting the radar sensitivity, and by filtering out the random echoes from sea and weather conditions.

You can adjust the image settings from the radar menu.
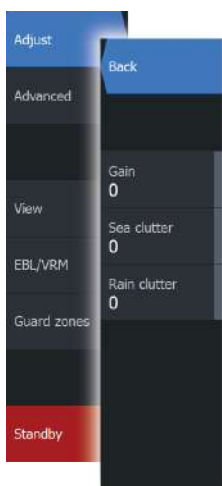
Directional clutter rejection

(Broadband 4G Radar only)

This mode automatically works when GAIN = AUTO and SEA = HARBOR or OFFSHORE. The purpose is to allow smaller vessels to be seen in the leeward direction of the sea clutter. The GAIN of the radar receiver is increased dynamically during the sweep, in the leeward direction, for increased target sensitivity in heavier sea states.

When GAIN or SEA = MANUAL, the Directional Clutter Rejection mode will be OFF (non-directional).

In addition, CALM, MODERATE or ROUGH STC Curve settings are available in the Radar options menu to better optimize the radar image to your liking.

Gain

The gain controls the sensitivity of the radar receiver.

A higher gain makes the radar more sensitive to radar returns, allowing it to display weaker targets. If the gain is set too high, the image might be cluttered with background noise.

Gain has a manual and an automatic mode. You toggle between automatic and manual mode in the slide bar.

Sea clutter

Sea clutter is used to filter the effect of random echo returns from waves or rough water near the vessel.

When you increase Sea clutter, filtering the on-screen clutter caused by the echoes of waves is reduced.

The system includes predefined Sea clutter settings for harbor and offshore conditions, in addition to the manual mode where you can adjust the settings. You select Sea clutter modes from the menu. You can only adjust the Sea clutter value in manual mode.

Rain clutter

Rain clutter is used to reduce the effect of rain, snow or other weather conditions on the radar image.

The value should not be increased too much as this may filter out real targets.

Advanced radar options
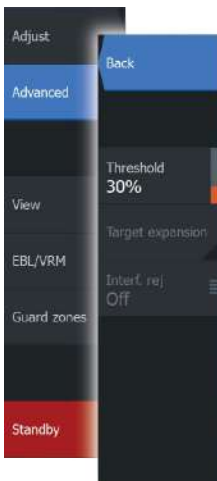
Noise Rejection

(Broadband 4G radar only)

The Noise Rejection control sets the amount of noise filtering applied by the radar. Target sensitivity is increased at longer ranges when this control is set to Low or High, but does cause some loss of target discrimination.

Tip: To get maximum range performance from Broadband 4G Radar, transmit on one range only, set the Noise Reject control to High and the threshold as low as possible. The default is 30% for less clutter on the screen. If OFF is selected for the HDS Carbon, the range performance is about equal to 3G radar. In some areas where extreme high interference may exist, try OFF for best radar image.

Radar threshold

The threshold sets required signal strength for the lowest radar signals. Radar returns below this limit are filtered and are not displayed.

Default value: 30%.

Target expansion

Target expansion increases the length of targets in range, making them easier to see.

Rejecting radar interference

Interference could be caused by radar signals from other radar units operating in the same frequency band.

A high setting reduces the interference from other radars.

In order not to miss weak targets, the interference rejection should be set to low when no interference exists.

Target separation

(Broadband 4G Radar only)

The **Target separation** control allows you to control the target discrimination of the radar (separation between objects is more prominent).

Fast scan

(Broadband Radar only).

Sets the speed of the radar antenna rotation. This option gives faster target updates.

→ *Note:* Maximum speed may not be achieved depending on the radar Settings, Mode, and Range selected. The radar will only rotate as fast as the current control settings allow.

Sea State

Set the Sea State control according to current sea conditions for best sea clutter rejection.

Target boost

(3G and 4G Broadband, and Pulse Radar only)

The target boost control increases pulse length or reduces radar bandwidth to make targets appear larger in range and increase radar sensitivity.

Radar view options
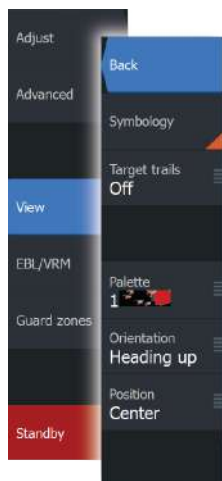
Radar symbology

Radar symbology defined in the Radar Settings panel can be turned on/off collectively. See the radar panel illustration showing optional radar items.

Target trails

You can set how long the trails generated from each target on your radar panel remain. You can also turn OFF target trails.

→ **Note:** True motion is recommended when using Target trails

Clearing target trails from the panel

When target trails are displayed on the panel, the radar menu expands to include an option where you can clear target trails from your radar panel temporarily. The target trails start to appear again unless you switch them off as described above.

The radar palette

Different colors (palettes) can be used to represent detail on your radar panel.

Radar orientation

Radar orientation is indicated on the upper left corner of the radar panel as either HU (Heading UP), NU (North Up) or CU (Course up).

Heading up

Rotates the radar image to display the current heading directly up on the radar image.

North up

Rotates the radar image with the north direction upwards.

Course up

Rotates the radar image to display the current navigation course directly up.

This option works only when the system is navigating an active route. If you are not navigating an active route, the heading up orientation is used until the navigation function is started.

Positioning the radar center

You can move the radar PPI (Plan Position Indicator) center to different positions within the radar panel, and select how your vessel symbol moves on the radar image.

Radar motion is indicated on the upper left corner of the radar panel as either TM (True motion) or RM (Relative motion).

The radar position can only be changed when the radar is transmitting.
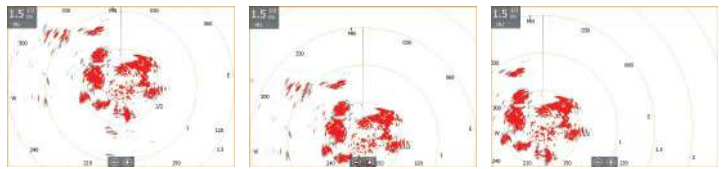
Center	*Look ahead*	*Custom offset*

Center
Default setting. The radar PPI center is centered on the radar panel.

Look Ahead
Moves the radar PPI center to the bottom of the panel to maximize the view ahead.

Offset
Allows you to move the PPI center to any location on the radar panel.

1. Select the offset option from the menu
2. Move the cursor to where you want to position the radar center
3. Confirm the setting by selecting the save offset option in the menu.

EBL/VRM markers

The electronic bearing line (EBL) and variable range marker (VRM) allows quick measurements of range and bearing to vessels and landmasses within radar range. Two different EBL/VRMs can be placed on the radar image.
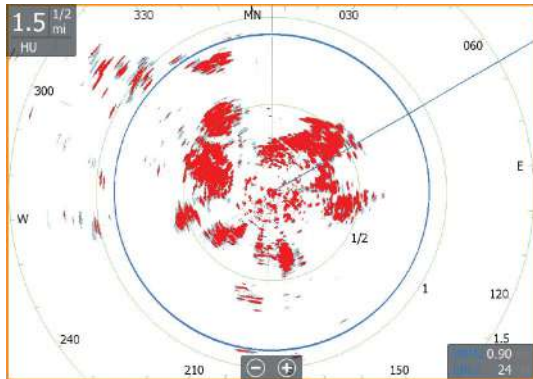
The EBL/VRMs are by default positioned from the center of the vessel. It is, however, possible to offset the reference point to any selected position on the radar image.

When positioned, you can turn the EBL/VRM on/off by selecting the relevant markers on the data bar, or by deselecting the marker from the menu.

Defining an EBL/VRM marker

1. Ensure that the cursor is not active
2. Activate the menu, select **EBL/VRM**, then select **EBL/VRM 1** or **EBL/VRM 2**
   - The EBL/VRM is now positioned on the radar image
3. Select the adjustment option from the menu if you need to reposition the marker, then adjust the marker by dragging it into position on the radar image
4. Select the save option in the menu to save your settings

Placing EBL/VRM markers by using the cursor

1. Position the cursor on the radar image
2. Activate the menu
3. Select one of the EBL/VRM markers

- The EBL line and the VRM circle are positioned according to the cursor position.

Offsetting an EBL/VRM marker

1. Ensure that the cursor is not active
2. Activate the menu, select **EBL/VRM**, then select the marker you wish to offset
3. Select the set offset option
4. Position the cursor on the radar panel to set the offset position
5. Select the save option in the menu to save your settings.

You can reset the EBL/VRM center to vessel position from the menu.

Setting a guard zone around your vessel
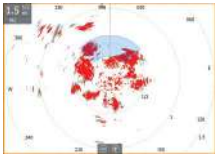
A guard zone is an area (either circular or a sector) that you can define on the radar image. When activated, an alarm alerts you when a radar target enters or exits the zone.

Defining a guard zone

1. Ensure that the cursor is not active
2. Activate the menu, select **Guard zones**, then select one of the guard zones
3. Select the shape for the zone
   - The adjustment options depend on the guard zone shape
4. Select **Adjust** to define the settings for the guard zone. The values can be set from the menu or by dragging on the radar panel.
   - **A**: Bearing, relative to the vessel heading
   - **B**: Depth
   - **C**: Range, relative to vessel center
   - **D**: Width
5. Select the save option in the menu to save your settings.

When positioned, you can turn the guard zones on/off by selecting the relevant section on the data bar.
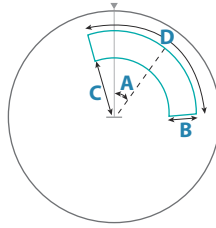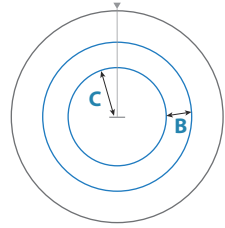
Shape: Sector   *Shape: Circle*

Alarm settings

An alarm is activated when a radar target breaches the guard zone limits. You can select if the alarm is activated when the target enters or exits the zone.

Sensitivity

The guard zone sensitivity can be adjusted to eliminate alarms for small targets.

MARPA targets

If the system includes a heading sensor, the MARPA function (Mini Automatic Radar Plotting Aid) can be used to track up to ten radar targets.

You can set alarms to notify you if a target gets too close. Refer to *"Radar settings"* on page 142.

MARPA tracking is an important tool for collision avoidance.

➔   *Note:* MARPA requires heading data for both the radar and the HDS Carbon.

MARPA target symbols

The system uses the target symbols shown below.

⌐ ¬ ∟ ⌐	Acquiring MARPA target. Typically it takes up to 10 full rotations of the scanner.
◯	Tracking MARPA target, not moving or at anchor.

⚲	Tracking and safe MARPA target with extension lines.
△	Dangerous MARPA target. A target is defined as dangerous when it enters the guard zone defined on the radar panel.
◇	When no signals have been received within a time limit a target will be defined as lost. The target symbol represents the last valid position of the target before the reception of data was lost.
⟦O⟧	Selected MARPA target, activated by positioning the cursor on the target icon. The target returns to the default target symbol when the cursor is removed.

Tracking MARPA targets

1. Position the cursor on the target on the radar image
2. Select **Acquire targets** from the menu
3. Repeat the process if you want to track more targets

After your targets are identified, it may take up to 10 radar sweeps to acquire and then track the target.

Cancelling MARPA target tracking
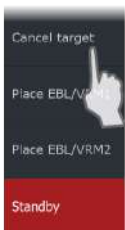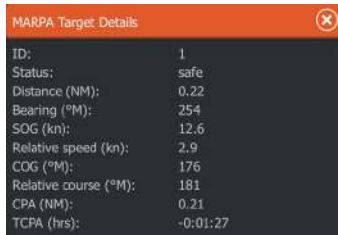
When targets are being tracked, the radar menu expands to include options for cancelling individual targets or to stop the tracking function.

Cancel tracking individual targets by selecting the target icon and then selecting **Cancel target** on the menu.

Viewing MARPA target information

Detailed information for MARPA targets can be displayed. Select the desired target and then either select the target pop-up, or select **Target details** in the menu.

MARPA alarm settings

You can define the following MARPA alarms:

- **MARPA target lost**
  Controls whether an alarm is activated when a MARPA target is lost.
- **MARPA unavailable**
  Controls whether an alarm is activated if you do not have the required inputs for MARPA to work (valid GPS position and heading sensor connected to the radar server).

You can also set up a guard zone around your vessel and when a target comes with in this zone, an alarm can be triggered. For more information, refer to Marpa settings under *"Radar settings"* on page 142.

Recording radar data

You can record radar data and save the file internally in the HDS Carbon unit, or save it onto a memory card inserted into the unit's card reader.

A recorded radar file can be used for documenting an event or an operational error. A logged radar file can also be used by the simulator.

Radar settings
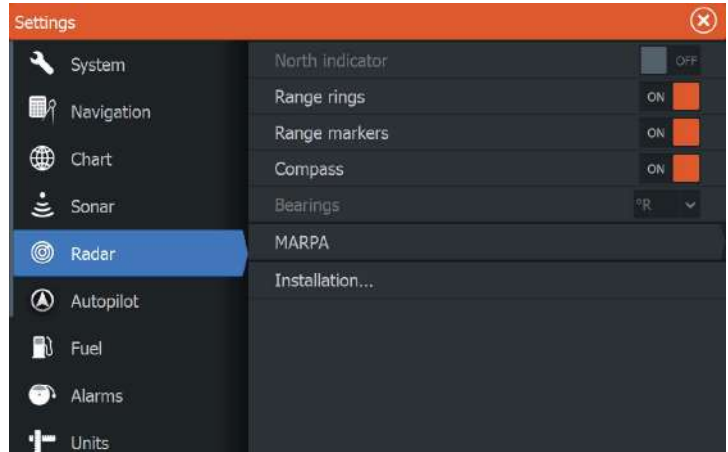
Radar symbology

You can select which optional radar items that should be turned on/off collectively from the menu. Refer to the Radar panel illustration.

Bearings

Used for selecting whether the radar bearing should be measured in relation to True/Magnetic North (°T/°M) or to your relative heading (°R).

Data bar

Turns on/off the radar data bar. Refer to the radar panel illustration.

The data bar can show up to 3 targets, arranged with the most dangerous targets on top. You can select to show MARPA targets on top and before any AIS targets, even if the AIS targets are closer to your vessel.

MARPA settings

You can define the length of the MARPA trail making it easier to follow target movement.

A circle can be added around your vessel to present the danger zone. The radius of the ring is the same as the closest point of approach as set in the Dangerous Vessels dialog. Refer to *"Defining dangerous vessels"* on page 150. An alarm triggers if a vessel is tracking into your safe zone.

Installation
The Installation option is used for radar installation, described in the separate Radar or HDS Carbon Installation manuals.

18

AIS

If an NAIS400, an AI50 or an NMEA 2000 VHF that can do AIS (Automatic Identification System) is connected to the network, then any targets detected by these devices can be displayed and tracked. You can also see messages and position for DSC transmitting devices within range.

AIS targets can be displayed as overlay on chart images, making this feature an important tool for safe travelling and collision avoidance. You can set alarms to notify you if an AIS target gets too close or if the target is lost.
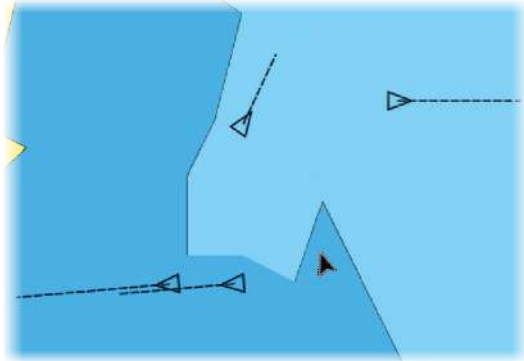
AIS target symbols

The system uses the AIS target symbols shown below:

	Sleeping AIS target (not moving or at anchor).
	Moving and safe AIS target with course extension line.
	Dangerous AIS target, illustrated with bold line. A target is defined as dangerous based on the CPA and TCPA settings. Refer to *"Defining dangerous vessels"* on page 150.

	Lost AIS target. When no signals have been received within a time limit, a target is defined as lost. The target symbol represents the last valid position of the target before the reception of data was lost.
	Selected AIS target, activated by selecting a target symbol. The target returns to the default target symbol when the cursor is removed from the symbol.

Searching for AIS items

You can search for AIS targets by using the **Find** option in the Tools panel.

From a chart panel you can search for AIS targets by using the **Find** option in the menu. If the cursor is active, the system searches for vessels around the cursor position. Without an active cursor, the system searches for vessels around your vessel's position.
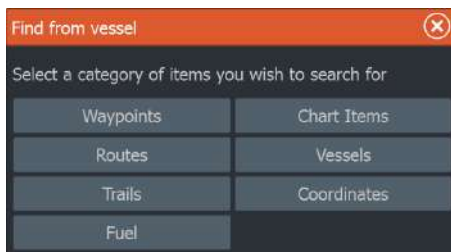
→ **Note:** You must have a SIRIUS data package subscription to search for fueling stations.

Viewing information about single AIS targets
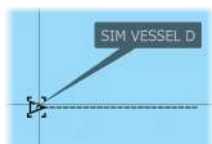
When you select an AIS icon on the chart or radar panel the symbol changes to Selected target symbol, and the vessel's name is displayed.

You can display detailed information for a target by selecting the AIS pop-up, or from the menu when the target is selected.
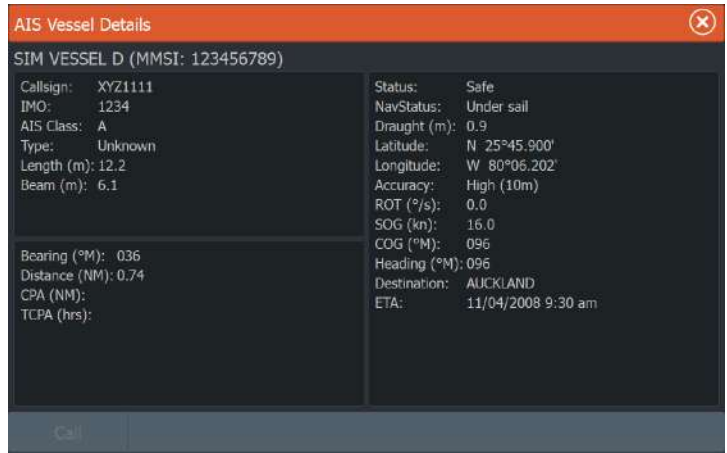
AIS information on radar panels

The radar data bar includes information on up to 3 AIS targets.

The targets are listed with the closest target on top, and are color coded to indicate target status.

Calling an AIS vessel

If the system includes a VHF radio supporting DSC (Digital Select Calling) calls over NMEA 2000, you can initiate a DSC call to other vessels from the HDS Carbon.

The call option is available in the **AIS Vessel Details** dialog, and in the **Vessel** status dialog activated from the **Tools** panel.

From the **Call** dialog you can change channel or cancel the call. The **Call** dialog is closed when the connection is established.
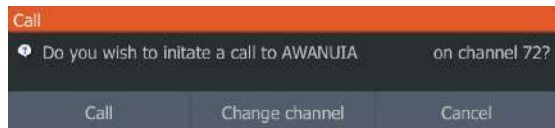
AIS SART

When an AIS SART (Search and Rescue beacon) is activated, it starts transmitting its position and identification data. This data is received by your AIS device.

If your AIS receiver is not compliant with AIS SART, it interprets the received AIS SART data as a signal from a standard AIS transmitter. An icon is positioned on the chart, but this icon is an AIS vessel icon.

If your AIS receiver is compliant with AIS SART, the following takes place when AIS SART data is received:

- An AIS SART icon is located on the chart in the position received from the AIS SART
- An alarm message is displayed

If you have enabled the siren, the alarm message is followed by an audible alarm.

→ **Note:** The icon is green if the received AIS SART data is a test and not an active message.

AIS SART alarm message

When data is received from an AIS SART, an alarm message is displayed. This message includes the AIS SART's unique MMSI number, and its position, distance, and bearing from your vessel.

Man Overboard	⊗
AIS SART Activated	
MMSI:	972035505
Latitude:	S 36.46561°
Longitude:	E 174.83642°
Bearing (°M):	187
Distance (NM):	5.31
Ignore	Save waypoint	Activate MOB

You have the following options:

- Ignore the alarm
  - The alarm is muted and the message closed. The alarm does not reappear

→ **Note:** If you ignore the alarm, the AIS SART icon remains visible on your chart, and the AIS SART remains in the Vessels list.

- Save the waypoint

- The waypoint is saved to your waypoint list. This waypoint name is prefixed with MOB AIS SART - followed by the unique MMSI number of the SART. For example, MOB AIS SART - 12345678.
• Activate the MOB function
  - The display switches to a zoomed chart panel, centered on the AIS SART position
  - The system creates an active route to the AIS SART position

→ **Note:** If the MOB function is already active, this will be terminated and replaced by the new route towards the AIS SART position!

→ **Note:** If the AIS stops receiving the AIS SART message, the AIS SART remains in the Vessels list for 10 minutes after it receives the last signal.

If you select the AIS SART icon on the chart panel, then you can see the AIS MOB details.

Vessel alarms

You can define several alarms to alert you if a target shows up within predefined range limits, or if a previously identified target is lost.
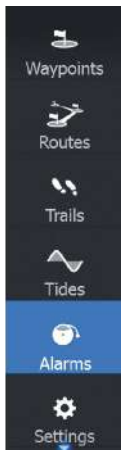
Dangerous vessel

Controls whether an alarm will be activated when a vessel comes closer than the distance for CPA within the time limit for TCPA. Refer to *"Defining dangerous vessels"* on page 150.

AIS vessel lost

Sets the range for lost vessels. If a vessel is lost within the set range, an alarm occurs.

→ **Note:** The check box controls whether the alarm pop-up box is displayed and if the siren goes on. The CPA and TCPA define when a vessel is dangerous regardless of the enabled or disabled state.

Vessel message

Controls whether an alarm will be activated when a message is received from an AIS target.

Vessel settings
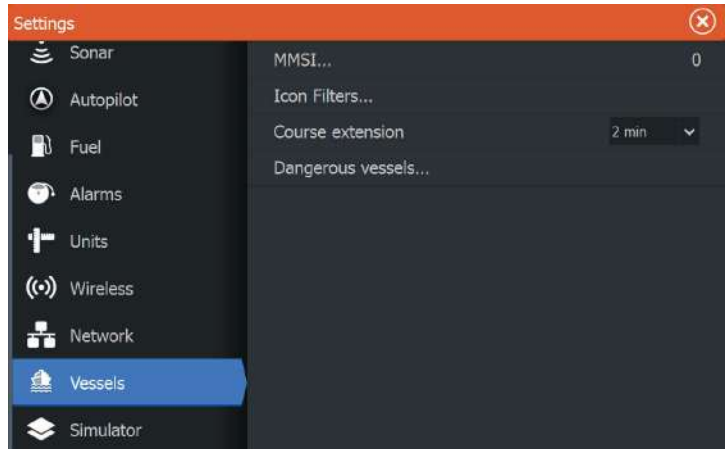
Your vessel's MMSI number

You need to have your own MMSI (Maritime Mobile Service Identity) number entered in the system to receive addressed messages from AIS and DSC vessels.

It is also important to have the MMSI number entered to avoid seeing your own vessel as an AIS target on the chart.

➔ **Note:** The Vessel message option in the alarm settings must be toggled on for any MMSI message to be displayed.

Icon filters

By default, all targets are shown on the panel if an AIS device is connected to the system.

You can select not to show any targets, or to filter the icons based on security settings, distance, and vessel speed.
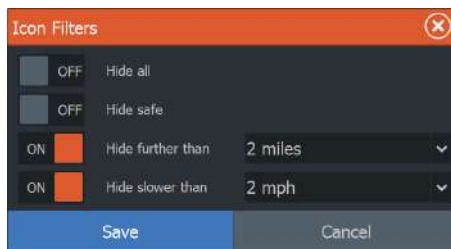
Course extension lines
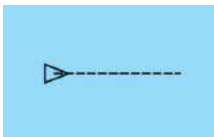
You can set the length of the Course Over Ground (COG) extension lines for other AIS vessels. The length of the extension lines is either set as off, as a fixed distance, or to indicate the distance the vessel will move in the selected time period. If Off is selected, then no COG extension lines are shown for the vessel. For information about extension lines for your vessel, refer to *"Extension lines"* on page 52.

Defining dangerous vessels

You can define an invisible guard zone around your vessel. When a target comes within the set limits, the symbol changes to the Dangerous target symbol. An alarm is triggered if activated in the Alarm settings panel.

19

Audio

If a SonicHub server, a FUSION marine entertainment system, or NMEA 2000 audio system is connected to the NMEA 2000 network, you can use the HDS Carbon to control and customize the audio system on your vessel.

When connected to a WM-3 Satellite module with an active subscription, you can include SiriusXM products on your system. You can also connect a SiriusXM radio to a FUSION system. Sirius audio and weather service covers inland U.S. waters and coastal areas into the Atlantic and Pacific oceans, Gulf of Mexico, and the Caribbean Sea. The SiriusXM products received vary depending on your selected subscription package.

Before you can start using your audio equipment, it must be installed according to the HDS Carbon Installation manual and to the documentation included with the audio device.

Enabling audio

A compatible audio device connected to the NMEA 2000 network should automatically be identified by the system. If not, enable the feature from the **Advanced Settings** dialog.
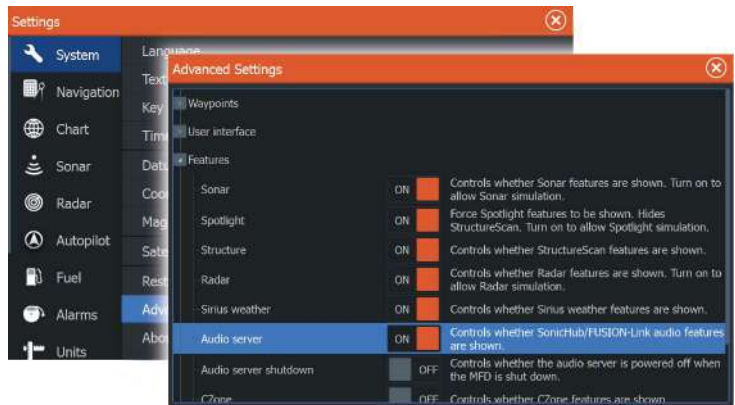
Audio server

If a SonicHub server and a FUSION system are connected to the same network, one of the devices must be selected as the Audio

server. If only one of the devices is present, it is the selected Audio
server by default.

SonicHub 2

A SonicHub 2 connected to the NMEA 2000 network is supported.

SonicHub 2 Device Information

Open the Network Settings dialog and select the SonicHub 2 device
in the Device list. This opens the SonicHub 2 Device Information
dialog.
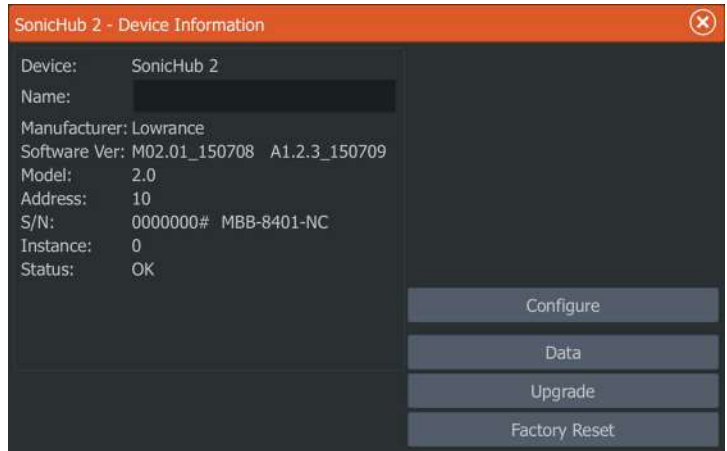
Configure

Select to configure the device.

Upgrade

Updates the device software.

→ *Note:* A USB memory stick with the software upgrade must be plugged into the device. Periodic software updates may be available from the product website. Detailed instructions for how to install the software are included with the upgrade files.

Factory Reset

Resets the device to factory defaults.

SonicHub 2 is Bluetooth enabled

The SonicHub 2 is a Bluetooth enabled device. You can use the SonicHub 2's built-in Bluetooth wireless to connect it to Bluetooth enabled audio devices.

To pair the SonicHub 2 to a Bluetooth enabled device select the Bluetooth devices option. Choose the Bluetooth device you want to pair to from the list of available devices and then select Pair.

The SonicHub 2 connects to the paired device.

Connecting and disconnecting paired devices

The SonicHub 2 automatically connects to a device when you pair them. You can pair it to several devices but only one device can be connected at a time.

You can manually disconnect and connect the SonicHub 2 to paired devices.

To disconnect a paired device, select the paired device in the device list and then select **Disconnect**.
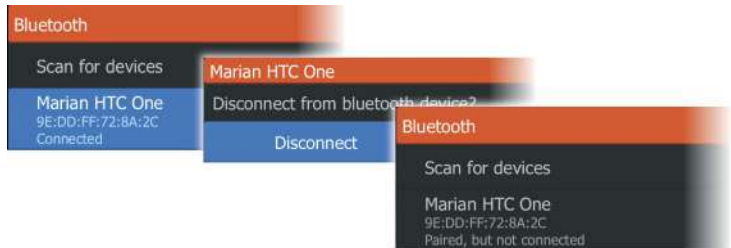
To connect to a paired device, select the paired device in the device list and then select **Connect**.
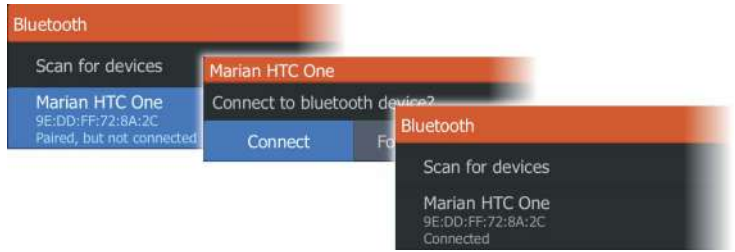
Pandora

The SonicHub 2 supports streaming music from Pandora from an Android device (over Bluetooth) or IOS device (over USB and Bluetooth).

→ **Note:** You must be in a valid location to use Pandora. Refer to the Pandora website for more information.

Use menu controls to run Pandora on the smart device.

The Media bar

When audio is enabled, the Media bar appears at the bottom of the screen on all pages. The information in the Media bar varies depending on the active audio source. Select the Media bar to replace the application menus with Audio menus.
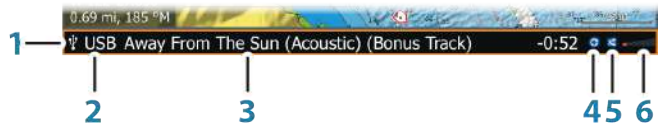
1 Media bar

2 Audio source

3 Track, file, or station information

4 Repeat - shown only when repeat is on

5 Shuffle - shown only when shuffle is on

6 Volume level

Setting up the audio system

Selecting audio source

You can switch between available audio sources from the menu.

→ *Note:* The Mic source selects a high voltage level input allowing you to broadcast loud hailer messages over the audio system.

Volume

Master volume control

By default the volume for all speaker zones are adjusted when you adjust the master volume.

Audio controls

Use the menu to control the playback. The menu options vary depending on the active audio device.

Device explorer

You can use the **device menu** or **Device explorer** menu options to access the source's native menu or file structure, which can be used to select tracks. An example of an USB Device explorer:

Audio options

Use the **Options** menu option to repeat or shuffle tracks or albums, and to open the Mixer. The options vary depending on the active audio device.

Audio mixer

Use the Mixer to:

- Adjust the balance, volume, and volume limits individually for each zone.
- Adjust the bass and treble, and the balance between zones.
- Turn on or off individual speaker zones in the **Master control**.

The Mixer options vary depending on the activated audio device. The following is an example of the USB source mixer option for the **All Zones**:
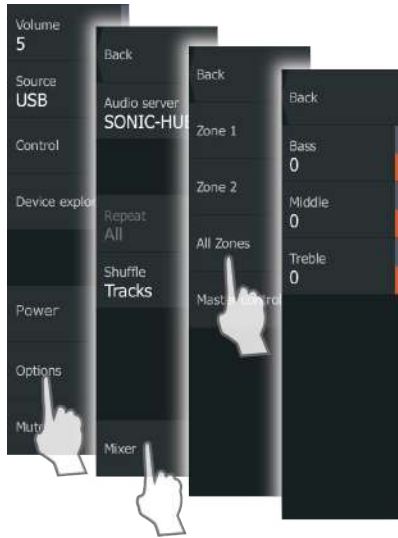
Auxiliary sources

AUX and AUX 2 (labeled AUX and SAT IN on the SonicHub) can be used for Sirius radio and external audio devices that support RCA connectivity. Sirius radio playback can be controlled when a Lowrance weather module is connected to SAT IN. Other auxiliary audio sources only have volume control.

Detaching Sirius from the AUX source

If a Sirius radio is connected to the FUSION radio/server, the AUX source is automatically attached to the Sirius feed. **Sirius** then appears in the source list when the FUSION server is active.

To use the AUX source for a different device, the Sirius must be detached from the AUX source.

→ *Note:* To use SiriusXM, an optional SiriusXM tuner must be connected to the FUSION server.

Radio

Selecting tuner region

Before playing FM or AM radio, and using a VHF radio, you must
select the appropriate region for your location.

Radio favorites

When a channel is tuned in, you can add the station to the favorite's
list. All favorite channels can be viewed, selected, and deleted from
the Favorites dialog.
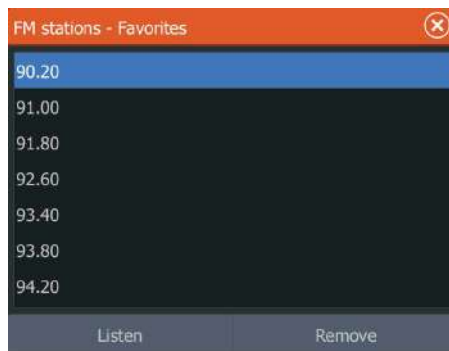
Sirius radio (North America only)

Channels list
The channels list displays all available Sirius channels, whether or not you have a subscription for the channel.

Favorites list
You can create a list of your favorite Sirius channels from within the channels list. You cannot add unsubscribed channels.

Locking channels
You can lock selected Sirius channels from being broadcasted. A 4-digit-code must be entered to lock channels and the same code entered to unlock the channels.

DVD video

You can view DVD video from a FUSION-Link device on units with a Video Adapter cable (000-11010-001), sold separately.

Controlling DVD video

1. Insert a DVD into the device.
2. Open the **Home** page and select the **Video** page.
3. Activate the Audio panel and select **DVD** as the source on the menu.
4. Select the **Control** menu option.
5. Use the menu options to control the playback.

20

SiriusXM weather

When connected to a Navico Weather module, you can subscribe and include Sirius audio and Sirius Marine Weather Service on your system (North America only).

Depending on your selected subscription package, Sirius audio and weather service covers a variety of North American inland waters and coastal areas.

Sirius status panel

When the weather module is connected to the system, you get access to the Sirius status panel.

The status panel shows signal strength is indicated as 1/3 (weak), 2/3 (good) or 3/3 (preferred). It also includes antenna status, service level, and the electronic serial number for the weather module.
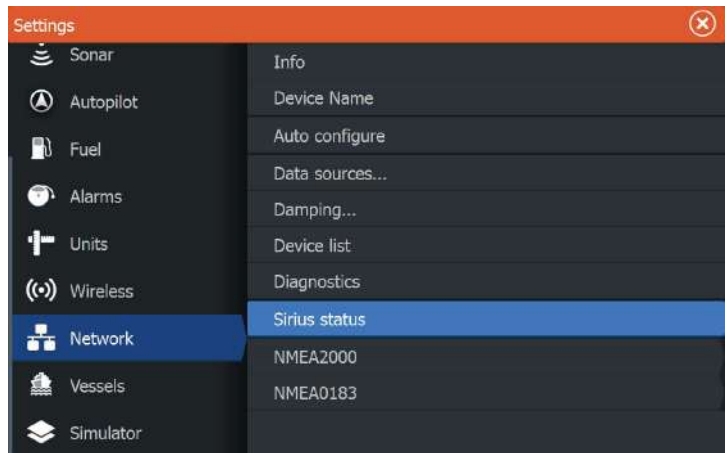
Sirius weather display

Sirius weather can be displayed as an overlay on your chart panel.

When weather overlay is selected, the chart menu increases to show the available weather options.
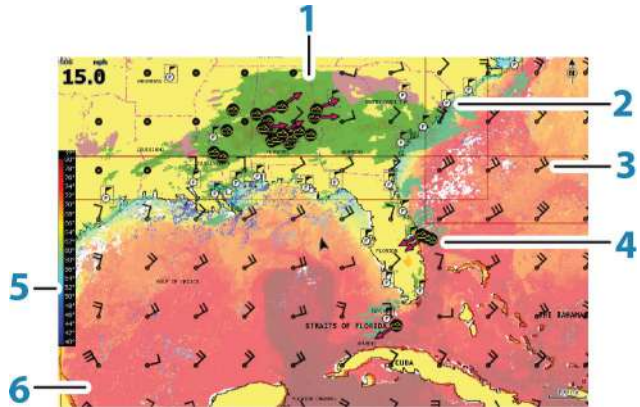
1	Precipitation color shading
2	City forecast icon
3	Wind barb
4	Storm icon
5	SST color bar
6	SST color shading

Use the Sirius weather option menu to select which weather symbology that should be displayed and how they should appear on the chart panel.

Wind barbs

The rotation of the wind barbs indicate the relative wind direction, with the tail showing the direction the wind is coming from. In the graphics below, the wind comes from the northwest.

Wind speed is indicated by a combination of small and large barbs at the end of the wind tail.

◎	Zero knots / Indeterminate wind direction
	Small barb = 5 knots
	Large barb = 10 knots

Arrow barb = 50 knots

If a combination of 5 and 10 knot barbs are shown on a tail, then add them together to give you the total wind speed. The example below shows 3 x large barb + 1 x small barb = 35 knots, and 60 knots indicated with 1 x arrow barb + 1 x large barb.

Wind speed: 35 knots

Wind speed: 60 knots

Showing weather details

If pop-up is enabled, you can select a weather icon to display the identity of the observation. If you select the pop-up, detailed information about the observation is displayed. You can also display the detailed information from the menu when the weather icon is selected.

Sirius view options

Precipitation

Shades of color are used to show precipitation type and intensity. The darkest color indicates the highest intensity.

Rain	From light green (light rain) - yellow - orange - to dark red (heavy rain)
Snow	Blue
Mixed	Pink

Sea Surface Temperature (SST)

You can show the sea surface temperature as color shading or as text.

When color coding is selected, the SST color bar is shown on the left side of the display.

You define how the color codes are used to identify sea surface temperature. See *"Adjusting color codes"* on page 167.

Wave indication

Colors are used to indicate forecasted wave height. The highest waves are dark red, while the lowest are blue.

You can define how the color codes are used to identify the wave height. Refer to *"Adjusting color codes"* on page 167.

Surface features

Turns surface features on/off. Surface features include fronts, isobars, and pressure points. Surface features cannot be shown at the same time as Wind.

Cloud tops

Turn Cloud tops on/off. Cloud tops indicate the height of the top of the clouds. The color palette used is grey with darker greys indicating lower clouds. Cloud tops cannot be shown at the same time as Precipitation or Echo Tops.

→ **Note:** This feature is only available for certain SiriusXM subscriptions.

Echo tops

Turns Echo tops on/off. Echo tops indicate the tops of storms. The color palette used is the same as for Precipitation. Echo tops cannot be shown at the same time as Precipitation or Cloud Tops.

→ **Note:** This feature is only available for certain SiriusXM subscriptions.

Weather icons

Several weather icons are available to show current or predicted weather conditions. You can select an icon to display detailed weather information.

	City forecast
	Surface observation

𝟞𝟞𝟞	Tropical storm tracking; past (grey) - present (red) - future (yellow)
𝟝𝟝𝟝	Hurricane (category 1-5) tracking; past (grey) - present (red) - future (yellow)
L L L	Tropical disturbance/depression tracking; past (grey) - present (red) - future (yellow)
● ● ⚡	Storm attributes
⚡	Lightning
⬡⚠	Watch box location and warning
⬩	Marine zone location

Local weather

Select the Local weather menu option to display the Local weather dialog. This dialog shows weather forecast and alerts for the area.

Select a time-slot tab to see the forecast for it.

Back

View

Icons

Local weather

Marine zones

Tropical statements

Adjust

Animate
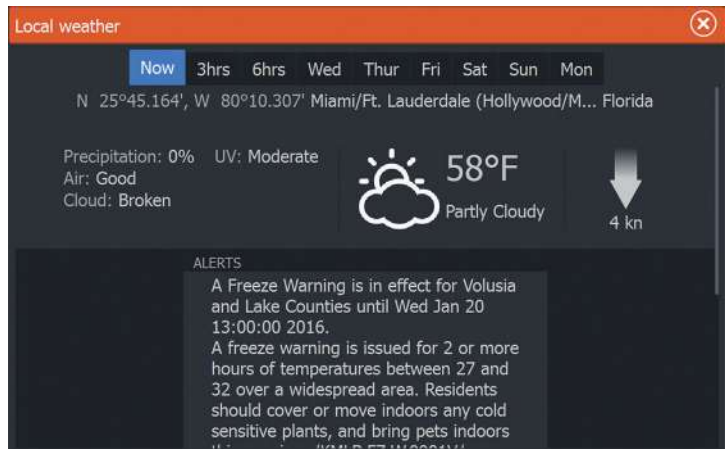
Marine zones

Depending on your selected subscription, SiriusXM services includes access to weather reports for U.S. and Canadian Marine Zones, with the exception of the high seas zones.

You can select a marine zone on a chart and view its forecast. You can also select a marine zone as your current zone of interest and you will be notified of any weather warnings in that zone.

Tropical statements

You can read tropical statements including information about tropical weather conditions. These statements are available for the entire Atlantic and the Eastern Pacific.

Adjusting color codes

You can define the sea surface temperature range and wave height color coding.

The temperature above warm and below cool values is displayed as progressively darker red and darker blue.

Waves higher than the maximum value are indicated with progressively darker red. Waves lower than the minimum value are not color coded.

Animating Sirius weather graphics

The HDS Carbon records the weather information you have turned on, and this information can be used to animate past or future weather conditions. The amount of information available in the system depends on the amount of weather activity; the more complex it is, the less time that is available for animation.

You can animate the past or the future, depending on which weather view you have turned on:

- With precipitation overlay, you can animate for the past and only assume weather conditions in the immediate future.
- With colored wave height overlay, you can animate the future (the predictions).

When activated, the time for the current graphic animation is displayed in the lower left corner of the chart panel.

Weather alarms

You can setup lightning or storm alarms to occur when the conditions are within a certain range of your vessel.

You can also set up an alarm as a severe weather forecast alarm issued for your chosen marine zone.
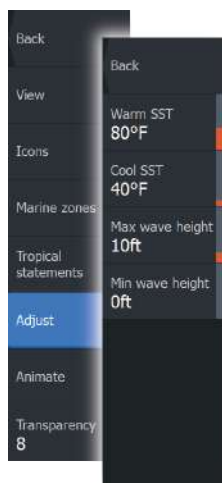
A watchbox is defined by the National Weather Service. When the alarm for watchbox is turned on, an alarm occurs when your vessel is entering or inside a watchbox.

21

Tools

By default, the Tools panel includes icons used for accessing options and tools that are not specific to any panel.

When external equipment is integrated to the unit, new icons might be added to the Tools panel. These icons are used for accessing the external equipment's features.

Waypoints/routes/trails

List of waypoints, routes, and trails with details.

Select the waypoint, route, or trail you want to edit or delete.

Tides

Displays tide information for the tide station nearest to your vessel.

Select the arrow panel buttons to change the date, or select the date field to access the calendar function.

Available tide stations can be selected from the menu.

Alarms

Active alarms
List of active alarms.

Alarm history
List of all alarms with time stamp.

Alarm settings
List of all available alarm options in the system, with current settings.

Settings

Provides access to application and system settings.

System settings
The system settings provides access to the following:

Language
Controls the language used on this unit for panels, menus, and dialogs. Changing the language causes the unit to restart.

Text size
Used for setting the text size in menus and dialogs.

Default setting: Normal

Key beeps
Controls the loudness of the beep sound when a key is pressed.

Default setting: Loud

Time
Controls the local time zone offset, and the format of the time and date.

Datum
Most paper charts are made in the WGS84 format, which also is used by the HDS Carbon.

If your paper charts are in a different format, you can change the datum settings accordingly to match your paper charts.

Coordinate system
Several coordinate systems can be used to control the format for latitude and longitude coordinates displayed on the chart panel.

Magnetic variation
Magnetic variation is the difference between true bearings and magnetic bearings, caused by different locations of the Geographic and the Magnetic north poles. Any local anomalies such as iron deposits might also affect the magnetic bearings.

When set to Auto, the system automatically converts magnetic north to true north. Select manual mode if you need to enter your own local magnetic variation.

Satellites
Status page for active satellites.

WAAS (and EGNOS) differential position correction can be configured to ON or OFF.

Restore defaults
Allows you to select which settings are to be restored to their original factory settings.

> ⚠ **Warning:** If waypoints, routes, and trails are selected, they are permanently deleted.

Advanced

Shows a panel with more advanced settings. Used for setting how your system displays various user interface information. In addition, controls which features are shown in the interface.

About

Displays copyright information, software version, and technical information for this unit.

The Support option accesses the Network analyzer and service assistant, refer to *"Network analyzer and service assistant"* on page 179.

Navigation

Provides options and dialogs where you specify settings for your navigation, such as arrival radius, XTE limit, XTE Alarm, Trails, and Logging Type. Refer to *"Navigation settings"* on page 66.

Chart

Provides options and dialogs where you specify settings for your charts. Settings and display options made in the Chart settings page are common for all chart panels. Refer to *"Chart settings"* on page 51.

Sonar

Provides options and dialogs where you specify settings for your sonar. Refer to *"Sonar settings"* on page 78.

Radar

Provides options and dialogs where you specify settings for your radar. Refer to *"Radar settings"* on page 142.

Autopilot

Provides options where you specify settings for your autopilot. Refer to *"Autopilot settings"* on page 109.

Fuel

Provides a dialog showing total fuel used, fuel used per trip, and fuel used per season. In addition, it provides access to configuration engine and tanks, and calibration of tanks (refuel) dialogs. Refer to the Installation Manual.

Alarms

Provides the option to enable the siren. It also provides a dialog where you specify turning on alarms for items, and includes active alarm information and alarm history.

Units

Provides setup of units of measure used on various data types.

Wireless

Provides dialogs where you set remote controllers, view wireless devices, and customize advanced settings. For more information about using this panel, refer to *"Wireless settings"* on page 127.

Network

Provides information about your network, settings options, and configuration options. For more information about using this panel, refer to the Installation Manual.

Vessels

Provides dialogs where you define your vessel's MMSI, set icon filters, set course extension length, and specify dangerous vessels settings of closest point of approach and time to closest point of approach. For more information about using this panel, refer to *"Vessel settings"* on page 149.

Simulator

Provides for manually controlling the simulator. For more information, refer to *"Simulator"* on page 102.

Vessels

Status listing
List of all AIS, MARPA, and DSC vessels with available information.

Message listing
List of all messages received from other AIS vessels with time stamp.

Sun, Moon

Displays sunrise, sunset, moonrise and moonset for a position based on entered date and the position's latitude/longitude.

Trip calculator

Trip 1 / Trip 2
Displays voyage and engine information, with reset option for all data fields.

Today
Displays voyage and engine information for current date. All data fields are automatically reset when the date changes.

Files

File management system, used to browse the contents of the unit's internal memory and inserted SD card.

Viewing files
Select a file in the Files panel and then the view file option in the **Details** dialog.

Copying files to a card in the card reader
You can copy screen captures and logs to a card in the card reader. You can also export System Settings, Waypoints, Routes, and Trails to a card. Exporting files is covered in the section *"Maintenance"* on page 178.

Find

Search function for chart items (waypoints, routes, trails, etc.).

GoFree Shop

→ **Note:** The built-in wireless functionality must be connected to an external wireless hotspot in order to access the GoFree Shop. Refer to *"Connect and disconnect from a wireless hotspot"* on page 123.

Opens the GoFree Shop web site. At the GoFree Shop you can browse, purchase, and download compatible charts for your system. You can also upload your Sonar logs to be shared on Social Map charts. When you log on, the system automatically gives you a notification if a new software version is available for your system. If an update is available, you can download it to a card slot or defer the download until later.

22

Alarms

Alarm system

The system continuously checks for dangerous situations and
system faults while the system is running. When an alarm situation
occurs, an alarm message pops up on the screen.

If you have enabled the siren, the alarm message is followed by an
audible alarm, and the switch for external alarm becomes active.

The alarm is recorded in the alarm listing so that you can see the
details and take the appropriate corrective action.

Type of messages

The messages are classified according to how the reported situation
affects your vessel. The following color codes are used:

Color	Importance
Red	Critical
Orange	Important
Yellow	Standard
Blue	Warning
Green	Light warning

Single alarms

A single alarm is displayed with the name of the alarm as the title,
and with details for the alarm.
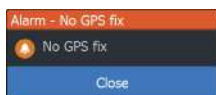
Multiple alarms

If more than one alarm is activated simultaneously, then the alarm
message displays a list of up to 3 alarms. The alarms are listed in the
order they occur with the alarm activated first at the top. The
remaining alarms are available in the Alarms dialog.
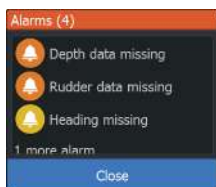
Acknowledging a message

The following options are available in the alarm dialog for acknowledging a message:

- **Close**
  Sets the alarm state to acknowledged, meaning that you are aware of the alarm condition. The siren / buzzer stops and the alarm dialog is removed.
  However, the alarm remains active in the alarm listing until the reason for the alarm has been removed.
- **Disable**
  Disables the current alarm setting. The alarm does not show again unless you turn it back on in the Alarms dialog.

There is no time-out on the alarm message or siren. They remain until you acknowledge the alarm or until the reason for the alarm is removed.

Alarms dialog

All alarms are setup in the Alarms Settings dialog.
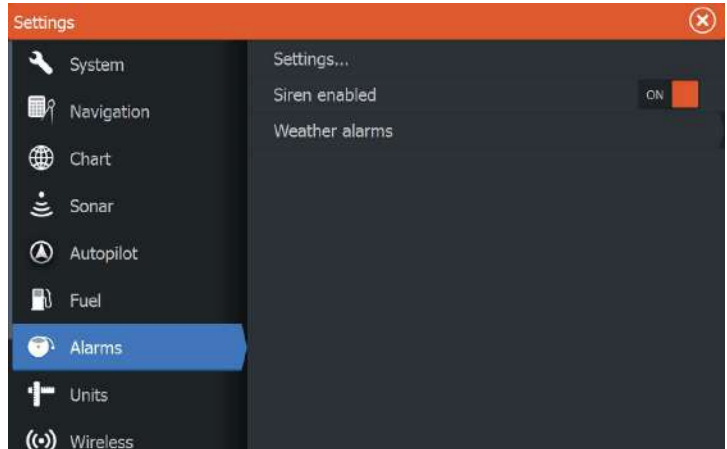
The alarm dialogs can also be activated from the Tools panel. The alarm dialogs include information about active alarms and alarm history.

23 Maintenance

Preventive maintenance

The unit does not contain any field serviceable components. Therefore, the operator is required to perform only a very limited amount of preventative maintenance.

It is recommended that you always fit the supplied protective sun cover when the unit is not in use.

Checking the connectors

The connectors should be checked by visual inspection only.

Push the connector plugs into the connector. If the connector plugs are equipped with a lock, ensure that it is in the correct position.

Touchscreen calibration

→ **Note:** Ensure the screen is clean and dry before doing the calibration. Do not touch the screen unless prompted to do so.

In some cases it may be required to re-calibrate the touch screen. To re-calibrate your touchscreen, do the following:

1. Turn the unit off
2. Press and hold the **Waypoint** key, and turn the unit on
3. Continue to press in the **Waypoint** key during power on, until the calibration utility screen comes up
4. Follow the instructions on the screen to perform the calibration.

When completed, the unit returns to the application screen.

NMEA Data logging

All serial output sentences sent over the NMEA TCP connection are logged to an internal file. You can export and review this file for service and fault finding purposes.

The maximum file size is predefined. If you have added several other files to the system (file recordings, music, pictures, PDF files), this may reduce the allowed file size for the log file.

The system logs as much data as possible within the file size limitation, and then it starts overwriting the oldest data.
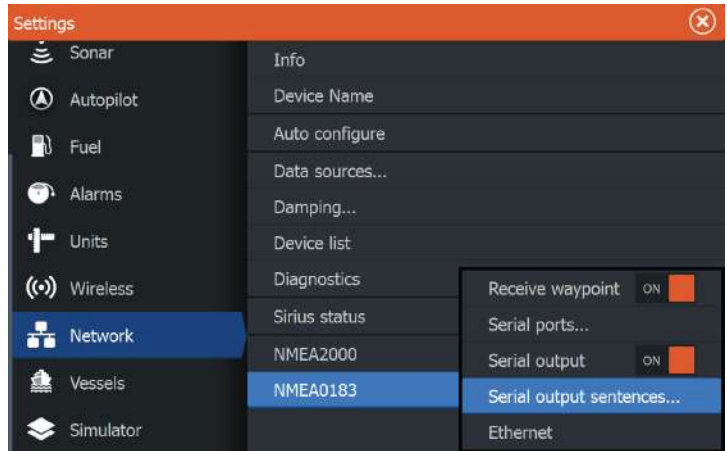
Exporting the log file

The log file can be exported from the files dialog.

When you select the Log database you are prompted to select a destination folder and filename. Once accepted, the log file is written to the chosen location.

Software upgrades

Before initiating an update to the unit itself, be sure to back up any potentially valuable user data. Refer to *"Backing up your system data"* on page 181.

The system or the Network analyzer and service assistant can advise software updates are available.

Network analyzer and service assistant

The system has a built-in service assistant that creates a report of the devices installed on the NMEA 2000 and Ethernet network such as the software versions, serial numbers, and information from the settings file to assist in technical support enquiries.

To use the analyzer, open the About page of the System settings dialog and select Support. Two options are displayed:

Create report

Analyzes your network and prompts you for information required for support and creates the report with information automatically gathered from the network. You can add screenshots and log files that will be attached to the report. There is a 20MB limit for the report attachments. You can save the report to a memory card and email it to support or upload it directly if you have an internet connection. If you call technical support first, you can enter an incident number to assist with tracking.

Check system for updates

Analyzes your network and checks if updates are available for compatible devices.

→ **Note:** Connect your unit to the internet to check for the latest available software versions. The software versions will be up to date as of the last time you updated your unit or connected to the internet.

Update software

→ **Note:** Remove any mapping cards from your unit and install a memory card with sufficient storage before downloading software updates or creating and saving reports to the memory card.

→ **Note:** Do not turn off the MFD or device until the update is completed or you are prompted to restart the unit or device being updated.

1. If your MFD is connected to the Internet, you can download the software update from the **Updates Dialog** into a memory card.
2. Insert the card containing the software updates in your MFD.
3. Select the item to be updated in the **Updates Dialog** and follow the prompts.

As you respond to the prompts the update occurs. Prompts may request that you restart the device to complete the update. You can restart devices to complete the update later at a more convenient time.

Backing up your system data

Waypoints, Routes, and Trails that you create are filed in your system. It is recommended to regularly copy these files and your system settings files as part of your back-up routine. The files can be copied to a card inserted in the card reader.

There are no export file format options for the system settings file. The following output formats are available for exporting Waypoints, Routes, and Trails files:

- **User Data File version 5**
  This is used to import and export waypoints and routes with a standardized universally unique identifier (UUID), which is very reliable and easy to use. The data includes such information as the time and date when a route was created.
- **User Data File version 4**
  This is best used when transferring data from one system to another, since it contains all the extra bits of information these systems store about items.
- **User Data file version 3 (w/depth)**
  Should be used when transferring user data from one system to a legacy product (Lowrance LMS, LCX)
- **User data file version 2 (no depth)**
  Can be used when transferring user data from one system to a legacy product (Lowrance LMS, LCX)
- **GPX (GPS Exchange, no depth)**
  This is the format most used on the web that shares among most GPS systems in the world. Use this format if you are taking data to a competitor's unit.

Export all Waypoints, Routes and Trails

Use the export option if you want to backup all Waypoints, Routes, and Trails on your system.
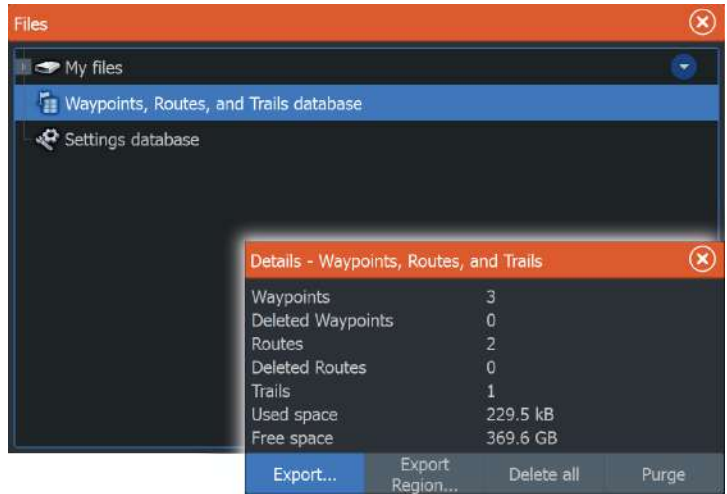
Export region

The export region option allows you to select the area from where you want to export data.

1. Select Export region
2. Drag the boundary box to define the desired region

3. Select the export option from the menu
4. Select the appropriate file format
5. Select the serial port field to start the export

Purging Waypoints, Routes and Trails

Deleted Waypoints, Routes and Trails are stored in the display unit's memory until the data is purged. This is necessary to allow user data to be synchronized across multiple units on an Ethernet network. If you have numerous deleted, unpurged Waypoints, purging may improve the performance of your system.

→ **Note:** When user data is purged from the memory, it cannot be recovered.

Touchscreen operation

24

Basic touchscreen operation on the different panels is shown in the table below.

The panel sections in this manual have more information about panel specific touchscreen operation.

Icon	Description
	Tap to: • Activate a panel on a multi-panel page • Position the cursor on a panel • Select a menu and a dialog item • Toggle a checkbox option on or off • Show basic information for a selected item
	Press and hold: • On any panel with a cursor to activate the cursor assist feature • On a panel button to see available split screen options • On a favorite button to enter edit mode
	Scroll through a list of available options without activating any option.
	Flick to quickly scroll through e.g. the waypoint list. Tap the screen to stop the scrolling.
	Pan to position a chart or Sonar image on the panel.

Icon	Description
	Pinch to zoom out on the chart or on an image.
	Spread to zoom in on the chart or on an image.

Index