B&G

Zeus³S
Operator Manual

ENGLISH

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 maritime safety practices.

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This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

Governing language

This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

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Navico product references

This manual refers to the following Navico products:

- Broadband Radar™ (Broadband Radar)
- Broadband 3G™ (Broadband 3G Radar)
- Broadband 4G™ (Broadband 4G Radar)
- DownScan Overlay™ (Overlay)
- ForwardScan™ (ForwardScan)
- Genesis® (Genesis)
- Halo™ Pulse Compression Radar (Halo Radar)

Compliance statements

Europe

Navico declare under our sole responsibility that the product conforms with the requirements of:

- CE under RED 2014/53/EU

United States of America

Navico declare under our sole responsibility that the product conforms with the requirements of:

- 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

> ⚠ Warning: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

→ *Note:* This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver is connected
- Consult the dealer or an experienced technician for help

ISED Canada

This device complies with ISED (Innovation, Science and Economic Development) Canada's license-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

La traduction française de ce document est disponible sur le site Web du produit.

Australia and New Zealand

Navico declare under our sole responsibility that the product conforms with the requirements of:

- level 2 devices of the Radiocommunications (Electromagnetic Compatibility) standard 2017
- radiocommunications (Short Range Devices) Standards 2014

About this manual

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

Images used in this manual might not exactly match the screen on your unit.

Important text conventions

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 19.3. The manual is continually updated to match new software releases. The latest available manual version can be downloaded from the following website:

Translated manuals

Available translated versions of this manual can be found on the following website:

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 storage device connected to the unit or copied to the unit's internal memory.
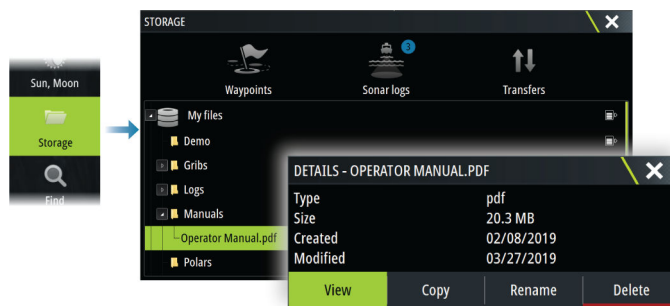
Device registration

You are prompted to register your device during startup. You can also register it by following the instructions when selecting the registration option in the system settings dialog or system controls dialog.

Contents

1 Introduction

Front controls

A   **Touch screen**

B   **Pages/Home**
- Press to open the Home page for page selection and setup options.

C   **WheelKey** - user configurable key. Refer to *"Configurable WheelKey"* on page 18.
Default without an autopilot connected to the system:
- Short press: toggles between panels on split screen.
- Long press: maximizes active panel on split screen.

Default with an autopilot connected to the system:
- Short press: opens the autopilot controller and puts the autopilot in standby mode.
- Long press: toggles between panels on split screen.

D   **Menu key**
- Press to display the active panel's menu.

E   **Rotary knob**
- Turn to zoom or scroll the menu, press to select an option.

F   **Enter key**
- Press to select an option or to save settings.

G   **Exit key**
- Press to exit a dialog, return to previous menu level, and clear the cursor from the panel.

H   **MOB**
- Press simultaneously the Enter and Exit keys to create a MOB at the vessel's position.

I   **Arrow keys**
- Press to activate the cursor or to move the cursor.
- Menu operation: press to navigate through menu items and to adjust a value.

J   **Mark key**
- Press to place waypoint at vessel position or at cursor position when the cursor is active.
- Press and hold to open the Plot dialog from where you can select options to add new or manage existing waypoints, routes and tracks

K   Power key
- Press and hold to turn the unit ON/OFF.
- Press once to display the System Controls dialog. Repeat short presses to toggle through the default dimming levels.

L   Card reader door

Card reader

A memory card can be used for:
- Chart data
- Software updates
- Transfer of user data
- Logging user data
- System backup

→ *Note:* Do not download, transfer or copy files to a chart card. Doing so can damage chart information on the chart card.

The protective door should always be securely shut immediately after inserting or removing a card, in order to prevent possible water ingress.

Home page

The Home page is accessed from any operation by selecting the Home button.
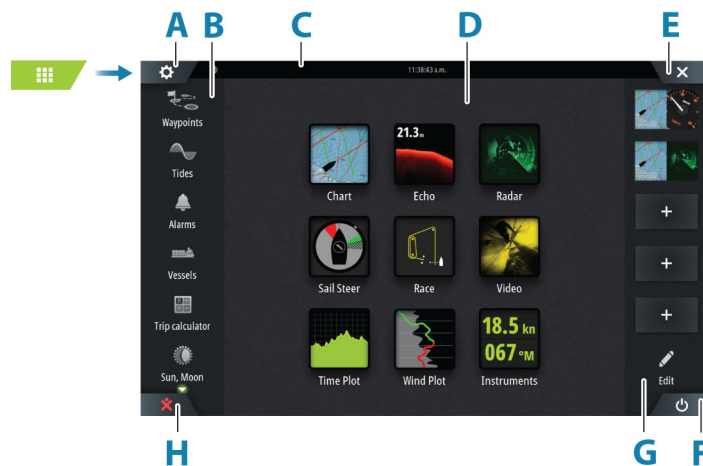
A	Settings button
B	Toolbar
C	Status bar
D	Application page buttons
E	Close button, closes the current panel.
F	System Controls button
G	Favorites bar
H	Man Over Board (MOB) button

Settings button

Select to access application and feature settings dialogs. These dialogs are used to configure the feature during installation and for making user settings. The settings dialogs are explained toward the end of each application chapter.

Toolbar buttons

Provide access to options and tools that are not specific to any panel. For toolbar button explanations, refer to *"Tools and settings"* on page 122.

Status bar

Shows the status of the system. For definitions of status bar icons, refer to *"Status bar icon definitions"* on page 137.

Application buttons

Select an application button to open it. The application buttons that appear on the home page depend on what applications are setup in your system.

Press and hold an application button to display predefined split pages for the application. Select a predefined split page button to open the split page.

System Controls button

Opens the System Controls dialog. The System Controls dialog provides quick access to basic system settings. Refer to *"System controls dialog"* on page 16.

Favorites bar

The favorites bar lists preconfigured pages and favorite pages you have made. Select a favorite page button to open the page.

Favorite pages can be single or multiple-panel pages. The unit display size determines the number of application panels that can be included on a favorite page.

The favorites bar also provides favorite page editing tools. All favorite pages can be modified. For information how to add and modify favorite pages, refer to *"Customizing favorite pages"* on page 19.

Favorite bar as pop-up on a page

The favorite bar can be displayed on any application page by:

- Pressing and holding the Home key
- Pressing and holding the Home button
- Pressing and holding the Pages key on a remote controller
- Simultaneously pressing the Ctrl and semicolon (;) keys on a keyboard

Man Overboard waypoint

If an emergency situation should occur, you can save a Man Overboard (MOB) waypoint at the vessel's current position.

Create a MOB

To create a Man Overboard (MOB) waypoint:

- Select the MOB button on the Home page
- Simultaneously press the Enter and Exit keys
- Press the MOB key on a remote controller

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 can be created. The vessel continues to show navigation information to the initial MOB waypoint. Navigation to subsequent MOB waypoints needs to be done manually.

Delete a MOB
A MOB waypoint can be deleted from the menu when the MOB is activated.

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

Application pages

A	Home/pages button
B	Application panel
C	Menu button
D	Control bar

Application panels
An application panel shows the application and provides a menu with customize options. The application panels and the menu options are further explained in each application chapter in this manual.

Predefined split pages
A predefined split page shows more than one application page on a panel.

You can adjust the split on a predefined split page. Refer to *"Adjusting the split on multiple panel pages"* on page 20.

Menu button
Displays the menu of the active panel. Use menu options to customize the image. The panel menu options are further explained later in this manual in each application chapter.

Instrument bar

The instrument bar displays information from sensors connected to the system.

By default, the instrument bar is shown on the panel. You can turn the instrument bar off.

You can select the predefined bar to be shown and you can change the information displayed in the predefined bar. Refer to *"Customizing the instrument bar"* on page 19.

Control bar

The control bar contains buttons for launching controllers or features enabled in your system. The different controllers are described in applicable chapters later in the manual.

2

Basic operation

Turning the system on and off

The system is turned on by pressing the Power key.

Press and hold the Power key to turn the unit off.

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

You can also turn the unit off from the System Controls dialog.

First time startup

When the unit is started for the first time, or after a reset, the unit displays a series of dialogs. Respond to the dialog prompts to make fundamental settings.

You can perform further setup and later change settings using the system settings dialogs.

Touchscreen, keyboard and mouse operation

For touchscreen, keyboard and mouse operation details, refer to the *"Appendix"* on page 135.

Remote controllers

You can connect a remote controller to the network and remotely control the unit. A separate manual is included with the remote controller.

Smart devices can also be connected to the unit and remotely control the unit. For information about how to connect smart devices to remotely control the unit, refer to *"Remote control of the MFD"* on page 116.

System controls dialog

The System Controls dialog provides quick access to basic system settings.

The buttons displayed on the dialog vary with operational mode and connected equipment. For those functions that toggle on and off, a highlighted button indicates the function is activated.

Display the dialog by:

- pressing the power key
- selecting the system controls button on the home page
- swiping down from the top of the screen on application pages
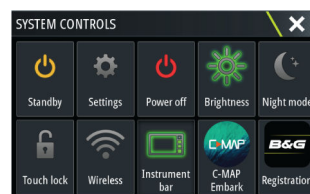
Activating functions

Select the button of the function you want to open, set or toggle on or off. For those functions that toggle on and off, a highlighted button indicates the function is activated.

Standby mode

In Standby mode, 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

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

The display backlighting can also be adjusted from the System Controls dialog.

Night mode

The night mode can be activated from the System Controls dialog.

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

Locking the touchscreen

You can temporarily lock a touch screen to prevent accidental operation of the system.

You lock the touch screen from the system controls dialog.

When the touch lock is active, you can still operate the unit from the keys or from a remote controller.

You remove the lock function by pressing on the power key.

Instrument bar

Toggles the Instrument bar on/off for the current page only.

Registration

Guides you how to register your device.

Screen capture

To take a screen capture:

• Simultaneously press the pages key and the power key

Screen captures are saved to internal memory.

3

Customizing your system

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 storage browser. When a picture is chosen as the wallpaper, it is automatically copied to the Wallpaper folder.
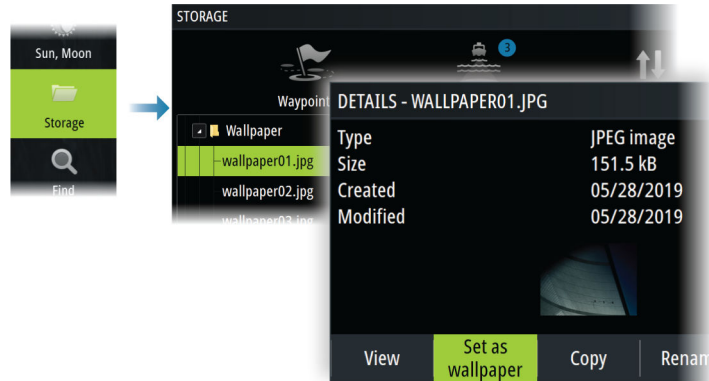
Configurable WheelKey

Configures the action of the WheelKey on the front of the unit.

To configure the Wheel key, select Configure WheelKey on the System Setting dialog.

Customizing the long press feature

You can specify if the long press on the panel opens the menu or displays the cursor assist feature on the panel.
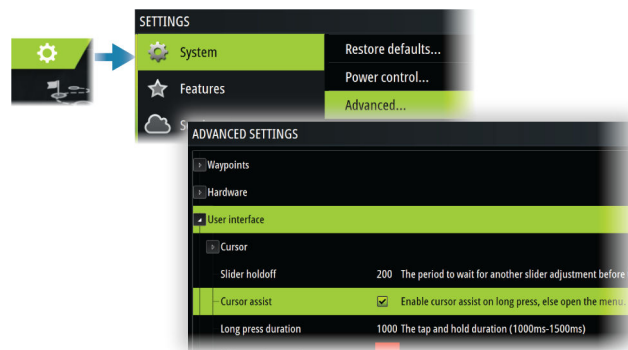
Multiple panel pages

Panel sizes in a multiple panel page can be adjusted from the System Controls dialog. Refer to *"Adjusting the split on multiple panel pages"* on page 20.

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 menu of an active panel.
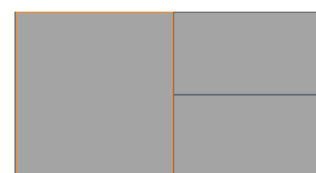
2 panels page   *3 panels page*

The shadow cursor on a multiple panel page

When using the cursor on a sonar (sonar, DownScan, or SideScan) image on a multiple panel page, the cursor is shadowed on the other sonar (sonar, DownScan, and SideScan), chart and radar panels.

Customizing favorite pages

Adding new favorite pages

→ *Note:* The unit display size determines the number of favorite pages allowed and the number of application panels that can be included on a favorite page.
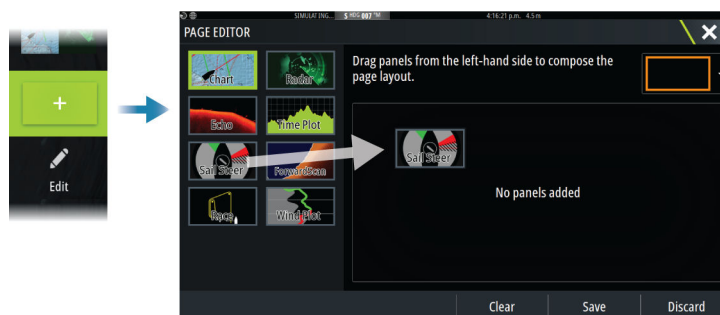
Edit favorite pages

Select the edit button in the favorite panel and then:

•   Select the X icon on a favorite button to remove the page
•   Select the tool icon on a favorite button to display the page editor dialog
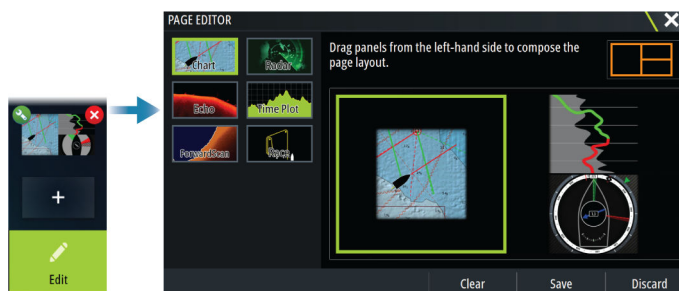
Customizing the instrument bar

→ *Note:* You must activate the instrument bar in the application to access the instrument bar menu.

Setting the appearance of the instrument bar

The instrument bar includes Bar 1 and Bar 2.

•   Bar 1 can be global for all pages, or customized for each page
•   Bar 2 is customized for each page

By default, bar 1 is shown on the panel.

You can select to display bar 1 and bar 2 at the same time.

You can turn bar 2 ON/OFF from the edit menu option.
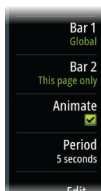
Turning the instrument bar ON or OFF

By default, the Instrument bar is shown on the panel.

You can turn the instrument bar ON/OFF from the System Controls dialog.

Changing data

You can change data from the menu.
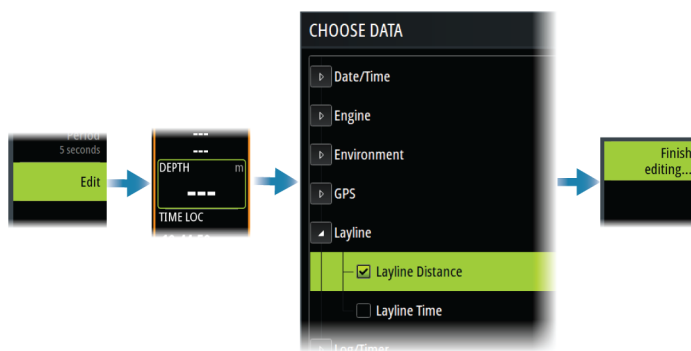
Reset the instrument bar

You can reset the instrument bar from the edit menu option to show the predefined default gauges.

Adjusting the split on multiple panel pages

1. Open the multiple panel page
2. Open the System Controls dialog
3. Select the adjust splits option. The adjustment icon appears on the multiple panel page.
4. Select the adjustment icon and move the split to the desired position
5. Use menu options to save or discard your changes.
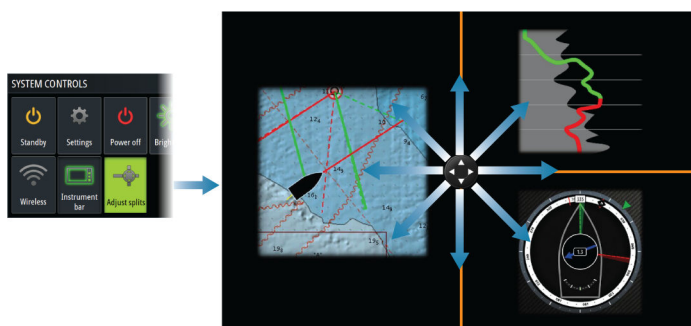
Enabling or disabling features

A compatible device connected to the unit should automatically be identified by the system. If not, enable the feature from the advanced settings dialog.

Activating/deactivating features and applications

Use the system settings features option to activate/deactivate features and applications.

Manage features and applications

You can manage and install/uninstall the features and apps. When a feature/app is uninstalled, the icon is removed from the home page. The feature/application can be installed again.

Feature unlock

Some additional features can be sold separately. These features can be unlocked by entering an unlock code.

Select the feature you want to unlock. Follow the instructions to purchase and enter the feature unlock code.

After a feature unlock code is entered in the unit, the feature is available for use.

➜ *Note:* The feature unlock option is only available if your unit supports a locked feature.

Password Protection

You can set a PIN code to prevent unauthorized access to your system's settings. Refer to *"PIN code"* on page 124.

H5000 integration

The unit integrates with B&G's H5000 Instrument and Autopilot system.

The H5000 icon will be available in the **Tools** panel on the **Home** page when an H5000 system is available on the network.

Separate documentation is provided with the H5000 system. Refer to this documentation for how to install and configure the H5000 system.

4 Charts

The Chart panel
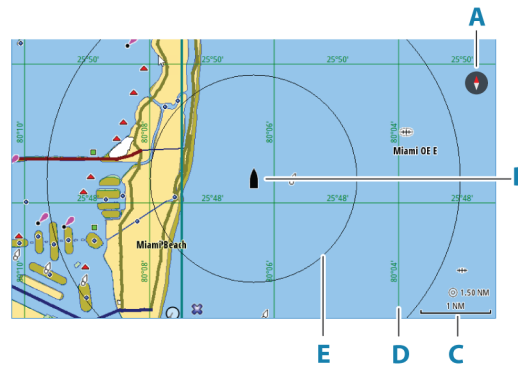
A	North indicator
B	Vessel
C	Chart range scale
D	Grid lines*
E	Range rings*

* Optional chart items. Optional chart items can be turned on/off individually from the chart settings dialog.

Chart data

The system can be delivered with preloaded cartography.

For a full selection of supported charts, visit the product web site.

→ *Note:* Chart menu options vary depending on the chart you are using.

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 preloaded 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 preloaded cartography.

Selecting chart source

Available chart sources are listed in the menu.

If you have identical chart sources available, the system automatically selects the chart with most chart details for your displayed region.

Showing dual chart sources

If you have different chart sources available, you can show two different chart sources simultaneously on a page that has two chart panels.

Activate each chart page and select its source in the menu.

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.

If heading information is not available, the vessel icon orientates itself using COG (Course over Ground).
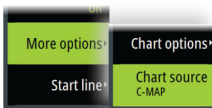
Zooming the chart

The chart range scale and range rings interval (when turned on) are shown on the chart panel. You change the scale by zooming the chart in or out.

⊙ 5.0 NM
2 NM

Panning the chart

You can move the chart in any direction by:

- Dragging the screen
- Move the cursor to the edge of the chart panel using the arrow keys

Chart orientation

You can specify how the chart is rotated in the panel.
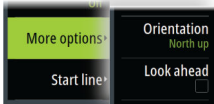
Chart orientation button

In addition to using the menu to specify the chart orientation, you can also select the chart orientation button on the panel to toggle between different orientations.

The red arrow in the chart orientation button indicates the north direction.

North up
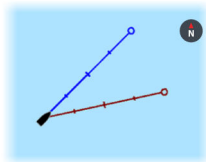
Displays the chart with north upward.

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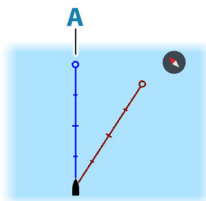
Displays the chart with the vessel's heading (**A**) directed upward. Heading information is received from a compass. If heading is not available, then the COG from the GPS is used.

Course up
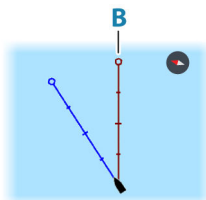
The chart direction is depending on if navigating or not:

- When navigating: the desired course line (**B**) is oriented up
- When not navigating: the direction the vessel is actually traveling (COG) is oriented up

Look ahead

Moves the vessel icon on the panel to maximize your view ahead of the vessel.

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.
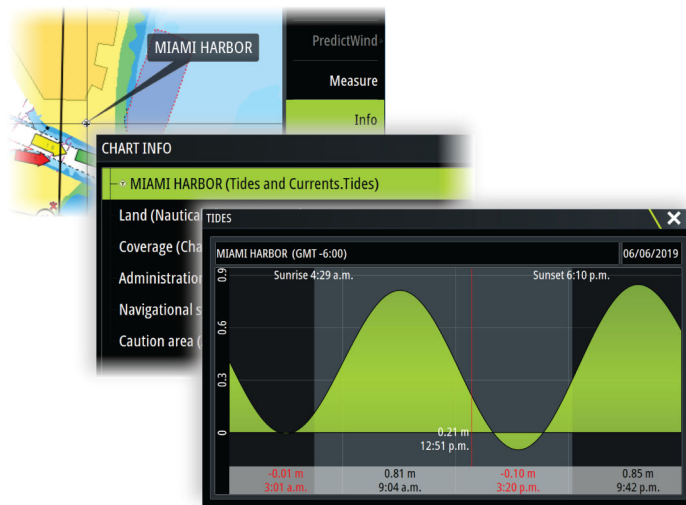
Using the cursor on the panel

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

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

Go to cursor

You can navigate to a selected position on the image by positioning the cursor on the panel, and then using the go to cursor menu option.

The cursor assist function

→ **Note:** The cursor assist function is available if it is enabled. Refer to *"Customizing the long press feature"* on page 18.

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 where you want to measure the distance to. 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. The measuring points can be repositioned by dragging either icon while the measuring function is active.

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

The start measuring function can also be started without an active cursor. Both measuring icons are then initially located at the vessel position. The grey icon follows the vessel as the
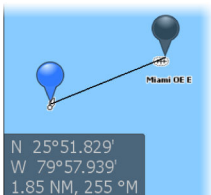
vessel moves, while the blue icon remains at the position given when you activated the function. The measuring points can then be repositioned by dragging either icon.

Terminate the measuring function by selecting the finish measuring option.

Creating routes 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 the remaining routepoints
5. Save the route by selecting the save option in the menu.

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.

FIND FROM VESSEL	✕
Select a category of items you wish to search for	

Measure		Waypoints	Chart Items
Find...	→	Routes	Coordinates
Overlay		Tracks	Vessels
		Fuel	
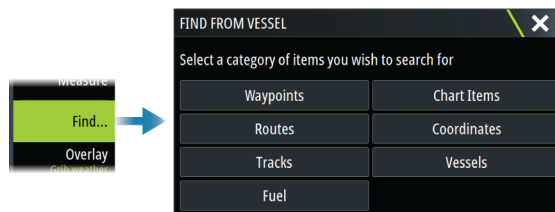
➔ **Note:** You must have a SiriusXM Marine subscription to search for fueling stations.

➔ **Note:** You must have 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 rotate (**A**) and the pan (**B**) 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.

To return the chart to vessel position use the return to vessel option.

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. Refer to *"Chart orientation"* on page 23.

Tracks

Opens the Tracks dialog. Use this dialog to manage tracks, refer to *"Tracks"* on page 41.

Color tracks based on data

A track can be colored based on what source data and the high/low limits you set:

• You can specify the source (data type) to be colored. To turn off coloring, select source **None**.

• Select the high and low options to set high and low values.
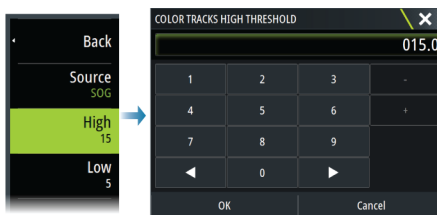
The colors can be shades of green, yellow, and red. Green is for the high limit you set. Yellow is the value that is the average of the high and low. Red is for the low limit. If the value is between the high and the middle values, it appears as a greenish-yellow color. If the value is between the middle and the low, it appears as an orange color.

➔ *Note:* By default, tracks are colored according to the color setting in the Edit Track dialog. Coloring tracks based on source data overrides the coloring specified in the Edit Track dialog.

If two or more charts are displayed in a split panel, changing the color source or high/low values on one chart does not change the other charts.

Chart overlay

You can add overlays on the chart panel.

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

Information about the overlay menu options are described in more detail below or in their separate sections in this manual.

Heat map overlay

The Heat map overlay feature shows a history of water temperature coloring on the chart. A water temperature source is needed to provide the temperature data for the overlay.

The color range is adjusted automatically based on the minimum and maximum temperatures recorded.
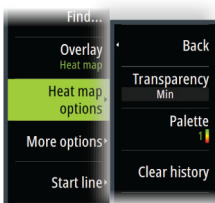
Transparency

Adjusts the transparency of the overlay. With a minimum transparency setting, the panel details are almost hidden by the overlay.

Palette

Specifies the colors used to show water temperatures. A legend is shown on the panel that identifies the colors associated with the recorded temperatures.

Clear history

Deletes all heat map data gathered up to the moment it is selected. Heat map data is automatically deleted when the unit is turned off.

PredictWind weather and routing

For information about PredictWind weather and PredictWind routing, refer to *"PredictWind"* on page 59.

C-MAP charts

All possible menu options for 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 a C-MAP chart.

→ **Note:** A menu option is greyed out if the feature is not available on the chart displayed.

C-MAP tides and currents

The system can display 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.
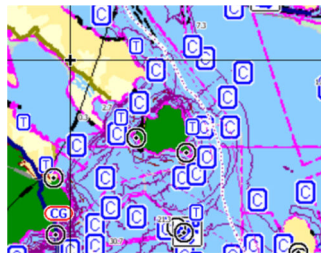
Static Current and Tide icons
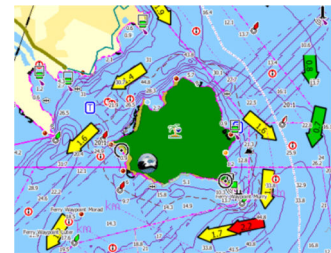
Dynamic Current icons

C-MAP specific chart options

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.
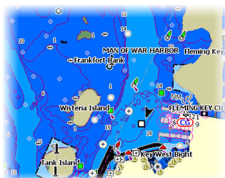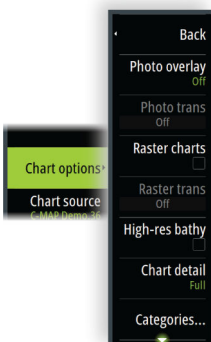
No Photo overlay

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.
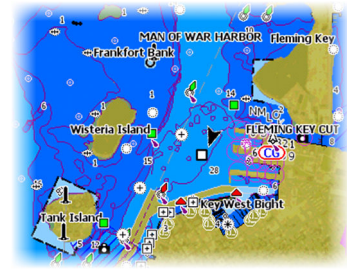
| *Minimum transparency* | *Transparency at 80* |

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.

Chart detail
- Full - displays all available information for the chart in use.
- Medium - displays minimum information sufficient for navigation.
- Low - displays 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.

Chart categories
Several categories and sub-categories are included. You can turn on/off individually depending on which information you want to see.

The categories listed in the dialog are dependent on the charts used.

Shaded relief
Shades seabed terrain.

No contours
Removes contour lines from the chart.

Depth palette
Controls the Depth palette used on the map.
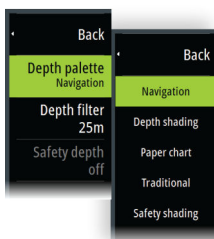
Navigation

Color shades depth areas based on depth range values set by the system. If the depth is within a certain range the system will select the exact color of that range. It colors darker shades of blue in shallower water and whiter in deeper water.

Depth shading

Color shades depth areas based on the depth value of the depth range shade. The system will interpolate a color based on the depth within the range. It colors darker shades of blue in deeper water and whiter in shallower water.

Paper chart

Color shades the depths similar to the National Oceanic and Atmospheric Administration (NOAA) colors present in the paper charts.

Traditional

Color shades depth areas based on the data defined by the chart data. Charts have their own color palette that is defined in the chart data.

Safety shading

Color shades depth areas based on the safety depth limit. The limit determines which depths will be drawn without blue shading.

Depth filter

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

Safety depth

Charts use different shades of colors to distinguish between shallow and deep water. After enabling the safety shading depth palette, specify the desired safety depth limit and the color/shading for different depths.

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.
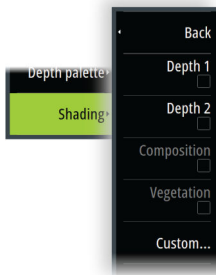
Depth 1 and Depth 2

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.

Genesis Layer

The Genesis Layer displays high-resolution contours contributed by Genesis users that have passed a quality check.

This option toggles the Genesis layer on/off on the chart image.

Available only if the C-MAP chart contains Genesis Layer data.

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.

You can also get a message if you try to use a restricted feature when the Navionics chart card is not activated. To activate the card, contact Navionics.
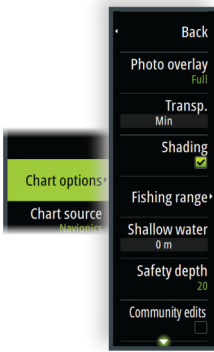
Navionics specific chart options

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

Chart shading

Shading adds terrain information to the chart.

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.
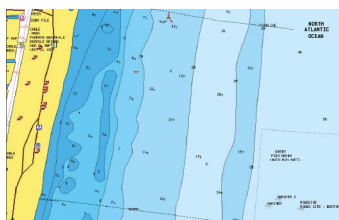
No Depth highlight range
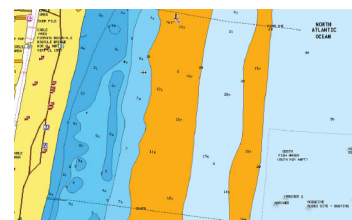
Depth highlight range: 6 m - 12 m

Shallow water highlight

This highlights areas of shallow water between 0 and the selected depth (up to 10 meters/30 feet).
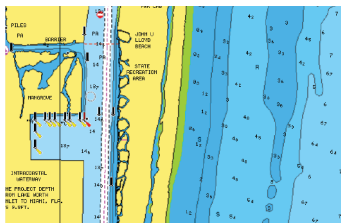
No shallow water highlighted
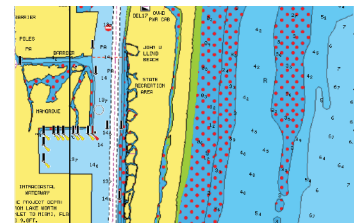
Shallow water highlight: 0 m - 3 m

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.

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

The system supports the Navionics SonarChart feature.

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

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.

When you select SonarChart Live overlay the menu expands to display SonarChart Live options.
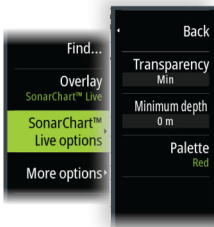
Transparency

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.

Palettes

Used for selecting the image's color palette.

SCL History

Select to display previously recorded data on the chart overlay.

SC Density

Controls the density of the SonarChart and SonarChart Live contours.

Colored seabed areas

Used for displaying different depth areas in different shades of blue.

Navionics Dynamic tides 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.
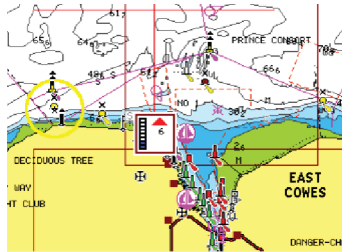
Dynamic tide information
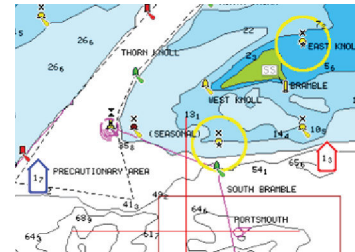
Dynamic current information

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.

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.

Contours depth

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

Presentation type

Displays 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.

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.

Chart settings

The options in the chart settings dialog depends on which chart source is selected in the system.
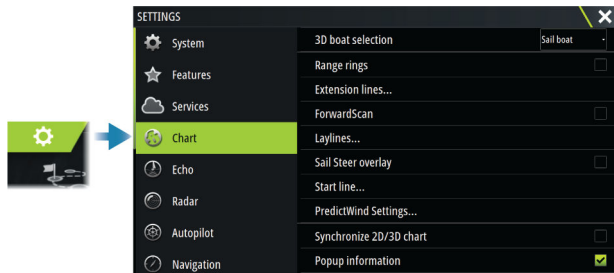
3D boat selection

Determines which icon to use on 3D charts.

Range rings

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

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

Extension lines

Sets the lengths of the extension lines for your vessel and for other vessels shown as AIS targets.

Select to show or hide the heading and course extension lines for your vessel.

Extension length

A: Heading

B: Course Over Ground (COG)
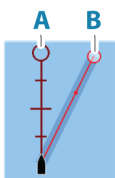
The length of the extension line is either set as a fixed distance, or to indicate the distance the vessel moves in the selected time period. If no options are turned on for the vessel then no extension lines are shown.

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

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

For other vessels, COG data is included in the message received from the AIS system.

ForwardScan

If you have ForwardScan and this option is selected, the ForwardScan heading extension is shown on the chart. Refer to *"Heading extension"* on page 101.

Laylines

Configures the options for laylines on the chart and on the SailSteer panels.

The image shows laylines from mark/waypoint with limits.
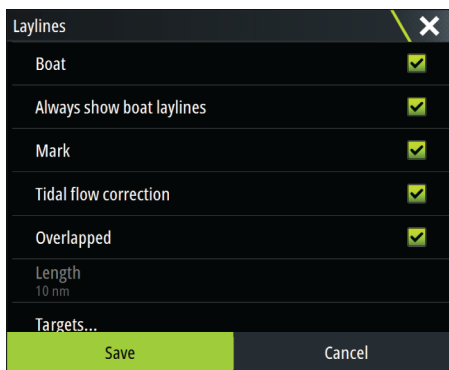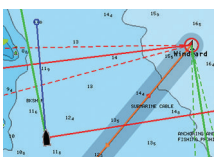
Boat
Displays laylines from boat, indicating the target course.

Always show boat laylines
Displays boat laylines.

Mark
Displays laylines from mark/waypoint, indicating the target course to sail to reach the mark/waypoint.

Tidal flow correction
Applies the system calculated tidal vector to the laylines to adjust for tidal flow.

Overlapped
Extends the laylines beyond the tack/gybe intersection.

Length
Sets the length of the laylines.

→ **Note:** This option is only available if Boat is not selected.

Targets
Defines the target for a given TWS (True Wind Speed). The targets can be read from an H5000 CPU Polar table, live measurements, manually entered upwind and downwind angles, or from the targets table.
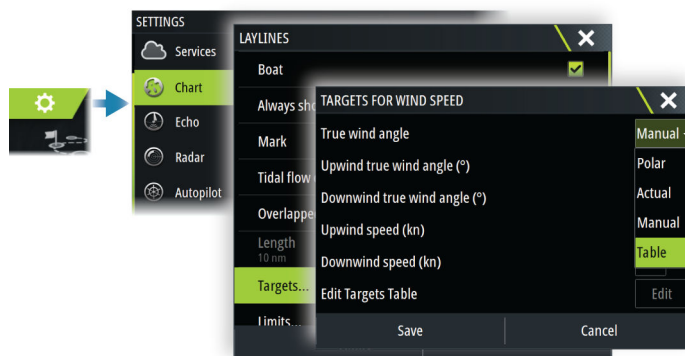
• Laylines targets table
  Edit the targets table to specify Upwind True Wind Angle (TWA), Upwind Boat Speed (BS), Downwind TWA, and Downwind BS values for different true wind speeds. Accurate table information gives the system a better basis for creating target laylines.
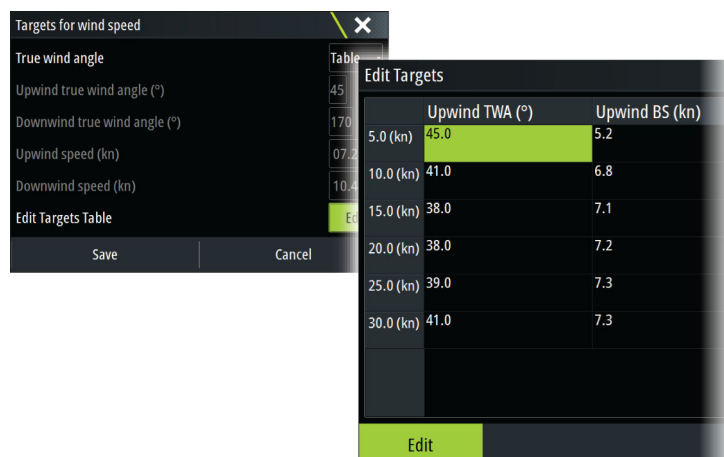
Limits

Gives a useful overview of historic layline data. Dotted lines either side of the layline show how far each way the wind has shifted over the selected time period, to allow you to identify wind shift phases and judge when to tack accordingly.

SailSteer overlay

Turns on/off viewing of SailSteer image overlay on the chart. Refer to *"SailSteer overlay"* on page 49.

Start line

Select this option to specify if the start line, its laylines, and neutral lines appear on the chart, and if/when to hide start line after start.

PredictWind Settings

Used to enter your PredictWind credentials and specify how to download weather files. The credentials are also used when downloading routes from the PredictWind web site.

For more information about PredictWind weather, refer to *"PredictWind weather"* on page 59. For more information about PredictWind routing, refer to *"PredictWind weather routing and departure planner"* on page 63.

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

Determines whether basic information for panel items is displayed when you select the item.

Grid lines

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

Course highway

Adds a graphic presentation of cross track error (XTE) limits to the route. For setting the XTE limit, refer to *"XTE limit"* on page 46.

Waypoints, Routes, and Tracks

Turns on/off displaying of these items on chart panels.

→ *Note:* To display tracks on the chart panel, the Display option in the Tracks dialog and the tracks option in the chart settings dialog both have to be enabled.

5 Waypoints, routes, and tracks

Waypoints, Routes, and Tracks dialogs

These dialogs give access to advanced edit functions and settings for these items.
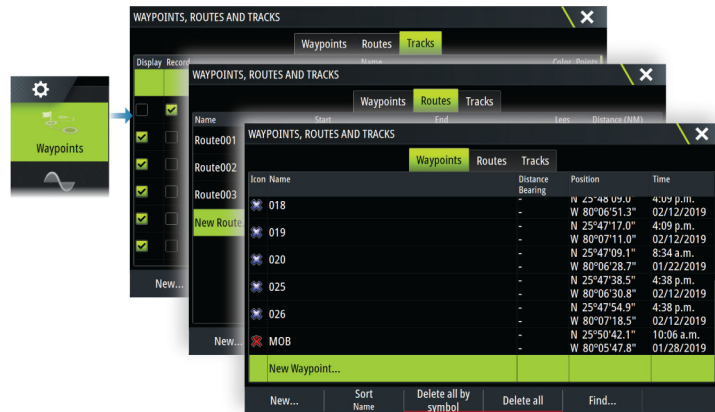
The Plot dialog

Press and hold the waypoint key to open the Plot dialog. Select an option to add new or manage existing waypoints, routes or tracks.
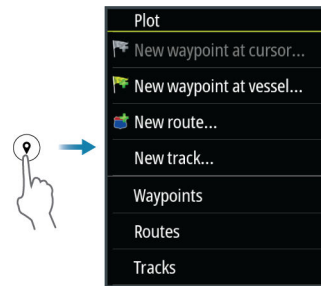
Waypoints

About waypoints

A waypoint is a user generated mark positioned on the:
- chart
- echosounder image
- radar image

Each waypoint has an exact position with latitude and longitude coordinates.

A waypoint positioned on the echosounder 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

Save a waypoint at the cursor position if active or at the vessel's position if the cursor is not active.

To save a waypoint:
- Press the rotary knob
- Press the Mark key
- Select the new waypoint option in the menu
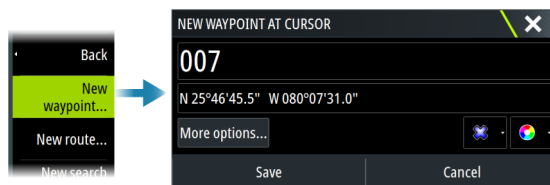
Moving a waypoint

A waypoint can be moved from the position if active and if the waypoint is selected in the menu.

To move a waypoint to a new position, select the move waypoint menu option and then select the new waypoint location on the image.

To save the waypoint at the new position, select the finish moving menu option

Edit a waypoint

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

The dialog is activated by selecting the waypoint, and then selecting edit from the menu.

The dialog can also be accessed from the waypoints tool on the home page.

Deleting waypoints

You can delete a waypoint by selecting the delete menu option when the waypoint is activated on the panel.

You can also delete a waypoint by selecting it in the routes dialog and then deleting it in the edit waypoint dialog.

You can delete all waypoints or waypoints by symbols from the system using the waypoints dialog.

You can delete MOB waypoints the same way.

You can back-up your waypoints, routes and tracks before deleting them, refer to *"Maintenance"* on page 128.

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 *"Alarm dialogs"* on page 127.

Routes

About 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.
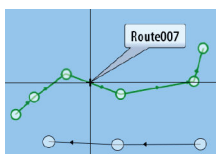
Creating a new route on the chart panel

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.
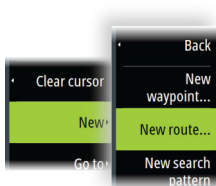
Create a race route

A race route has waypoints with rounding indicators and a waypoint indicating the finish line. When the race route is being followed, only the next rounding indicator is shown on the

chart. The part of the route that has not been navigated is highlighted orange. When a part of the route has been navigated it turns black.

To create a race route, do the following:

1. Turn on the race route feature by selecting the Race option in the Advanced Settings dialog Features directory.

When the race route feature is selected, the Race mode option is available on the Edit Route dialog.
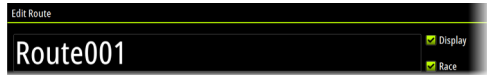
2. Open the route in the Edit Route dialog, select the Race mode option, add rounding indicators and specify a waypoint as the finish line. Refer to *"Setting rounding indicators"* on page 38. If you do not set the indicators, the system will add them based on what it thinks is correct.

Setting rounding indicators

To set rounding indicators and indicate a waypoint as the finish line, edit the route using the Edit Route dialog. When the race option is selected, the rounding column is available.

Once the rounding indicator and finish waypoint indicator are set they are shown on the race route on the chart.

The current rounding setting is shown in the column for each waypoint in the race route. Change the indicator for a waypoint by selecting one of the options in the drop-down list:

- Auto, auto determination of rounding
- Port, round to port
- Stbd, round to starboard
- Finish, waypoint is the finish line

Select **Save** to save your settings.

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.

Creating routes using existing waypoints

A new route can be created by combining existing waypoints from the Routes dialog. The dialog is activated by using the Waypoints tool on the Home page and then selecting the Routes tab.

Routes - bulk insert waypoints

Use the bulk insert option to enter a list of waypoints separated by commas (for example 21,22,23,24) to create a new route or add multiple waypoints to an existing route.

1. Make a note of the waypoints you want to bulk enter. You do not have to enter the full waypoint ID, just enough of it to distinguish it.
2. Select Routes on the Tool panel
3. Select the New button and then select the Create using route list option. Alternatively, scroll down the list of existing routes and select New Route.

4. Select the first row in the New route dialog, so that it is highlighted

5. Select the Bulk Insert button
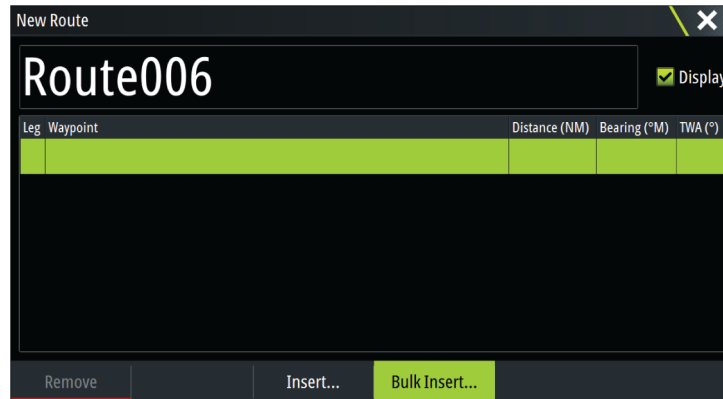
6. Enter a list of waypoints separated by commas (for example; 21,22,23,24). You can include rounding indicators in the bulk entry by adding either .P (for Port) or .S (for Starboard) to the waypoints (for example; 21.S, 22.P, 23.S, 24.P). The system changes the route to a race route if rounding indicators are included in the bulk entry.

7. Select Enter. If the system finds more than one waypoint that has similar IDs, it will choose one and advise you which one it has chosen. If the system does not find a waypoint with a similar ID to what you entered, then a dialog opens and informs you of the items it did not find.

8. (Optional) Give the route a name by selecting the system given name and use the virtual keyboard to enter the name.

9. Select save.

Converting tracks to routes

You can convert a track to a route from the edit track dialog. The dialog is activated by activating the track, and then:

- Selecting the track's pop-up
- Pressing the rotary knob
- Selecting the track in the menu

The edit track dialog can also be accessed by selecting the waypoints 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. To enter boat settings, refer to *"System settings"* on page 123.

→ **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 the Dock-to-dock Autorouting menu option, 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 the accept option 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 the keep option 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 the save option 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*

PredictWind weather and routing

For information about PredictWind weather and PredictWind routing, refer to *"PredictWind"* on page 59.

The edit route dialog

You can manage routes and routepoints, and change route properties using the Edit Route dialog. This dialog is activated by selecting an active route's pop-up or from the menu by selecting the route then the details option.

The dialog can also be accessed by using the Waypoints tool on the Home page and then selecting a route in the dialog.

Select a routepoint in the edit dialog to insert a new routepoint after it or remove the routepoint.

When adding routepoints, you can insert bulk waypoints. You can also use the bulk insert option to insert route race waypoints with rounding indicators. Refer to *"Routes - bulk insert waypoints"* on page 38.

Select the display option to show the route on the chart.

Select Race to convert the route to a race route and edit the rounding indicators on route waypoints. Refer to *"Setting rounding indicators"* on page 38. If it is a race route, the system will add the rounding indicators to what it thinks is correct based on the angles.

Edit Route

Route001

☑ Display
☑ Race

Leg	Waypoint	Distance (NM)	Bearing (°M)	TWA (°)	Rounding
0	Rpt001				Stbd
1	Rpt002	2.97	211		Port
2	Rpt003	5.95	295		Stbd
3	Rpt004	3.21	045		Finish

Remove   Insert...   Bulk Insert...   PredictWind
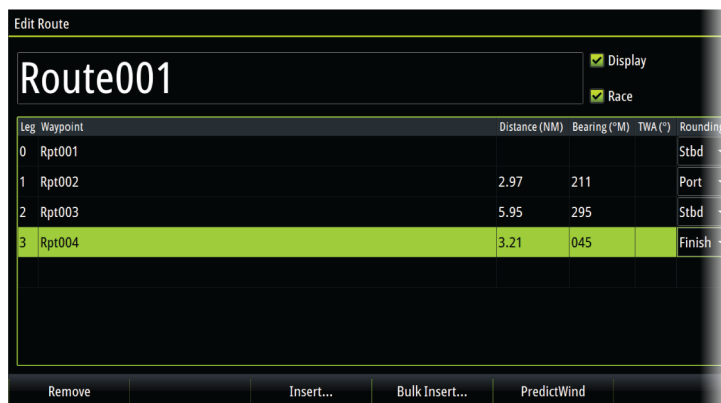
Deleting routes

You can delete a route by selecting the delete menu option when the route is activated on the panel.

You can also delete a route by selecting it in the routes dialog and then deleting it in the edit route dialog.

You can delete all routes from the system using the routes dialog.

You can back-up your waypoints, routes and tracks before deleting them, refer to *"Maintenance"* on page 128.

Tracks

About tracks

Tracks are a graphical presentation of the historical path of the vessel. They allow for retracing where your boat has travelled.

Example of the Tracks dialog:

WAYPOINTS, ROUTES AND TRACKS

Waypoints | Routes | **Tracks**

Display	Record	Name	Color	Points
☑	■	Today's activity track		0
☐	☐	Track003		1
☐	☐	Track004		1
☐	☐	Track001		2
☐	☐	Track002		25
☑	☐	Wed Dec 4 2019, 11:20 a.m.		0
☑	☐	Wed Oct 9 2019, 8:47 a.m.		0

New...   Settings   Delete all   Find...

Recording and displaying tracks

When the recording of a new track is started, the old one is hidden to de-clutter the chart panel. If Display is enabled on the old track, it will continue to show on the chart panel.

➔ *Note:* To display tracks on the chart panel, both the Display option in the Track dialog and the Tracks option in the Chart settings dialog have to be enabled.

Creating a new track

You can start a new track from the Tracks dialog. The dialog is activated by:
- Using the Waypoints tool on the Home page and selecting the Tracks tab.
- Selecting the New track or Tracks option on the Plot dialog.
- Selecting the Tracks option in the chart menu.

The edit tracks dialog
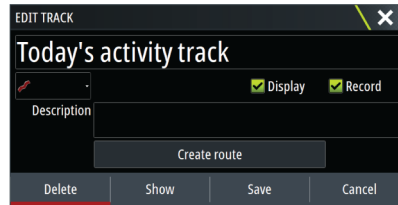
You can manage a track and change a track's properties using the edit track dialog. This dialog is activated by selecting a track's pop-up or by selecting the track in the chart menu.

The dialog can also be accessed by using the Waypoints tool on the Home page and then selecting a track in the Tracks dialog.

Coloring tracks

To color tracks:

- Select the track in the Tracks dialog and set the color for the entire track in the Edit Track dialog.
- Select to let the system color the track based on source data and high/low settings. Refer to *"Color tracks based on data"* on page 25.

Deleting tracks

You can delete a track by selecting it in the tracks dialog and then deleting it in the edit track dialog.

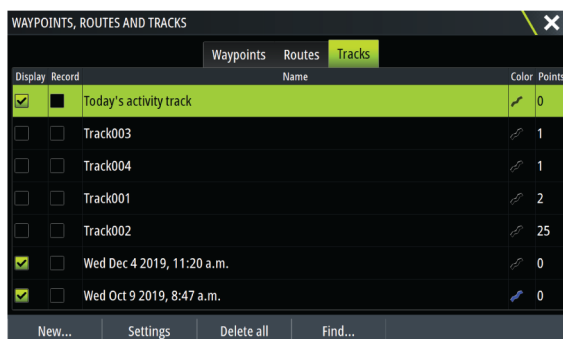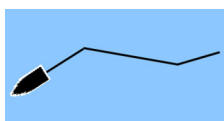You can delete all the tracks from the system using the tracks dialog.

You can back-up your waypoints, routes and tracks before deleting them, refer to *"Maintenance"* on page 128.

Track logging settings

Tracks 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 track points based on time settings, distance, or by letting the system position a waypoint automatically when a course change is registered.

The logging settings can be made from the Tracks settings dialog or by selecting the Settings button in the Tracks dialog.

C-MAP Embark

You can access the C-MAP Embark web site from a PC or use the C-MAP Embark app on your smart device to manage:

- waypoints
- routes
- tracks

Use the unit's C-MAP Embark feature to synchronize between the unit and C-MAP Embark.

➔ *Note:* PredictWind waypoints are not included in the C-MAP Embark feature.

Requirements

- An account with C-MAP Embark
- To synchronize, the unit must be connected to the internet.

Synchronizing

To synchronize the MFD and C-MAP Embark, open the C-MAP Embark feature from the System Controls dialog or the Services settings dialog.

After sign-in, the system advises the last time synchronizing occurred and the following options are available:

- Change - use to change sign-in credentials
- Auto Synchronize - synchronizing occurs periodically in the background when connected to the internet
- Synchronize now - synchronizing occurs immediately
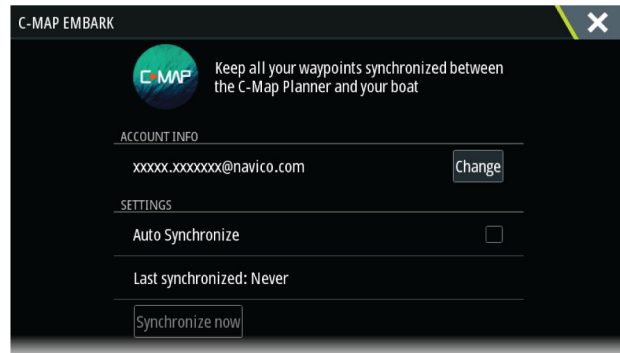
6

Navigating

About 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 tracks"* on page 36.

Navigate to cursor position

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

Position the cursor at the selected destination on the panel, and then select the go to cursor menu option.

➔ *Note:* The go to cursor menu option is not available if you are already navigating.

Navigating to a waypoint

You can navigate to a waypoint:

- from a chart
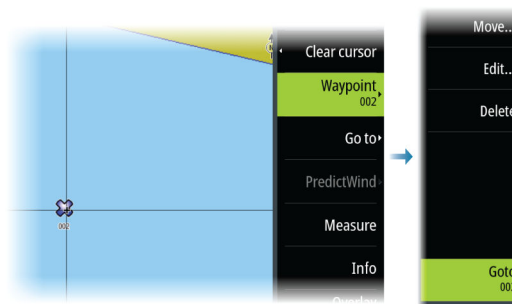
- using the waypoint dialog
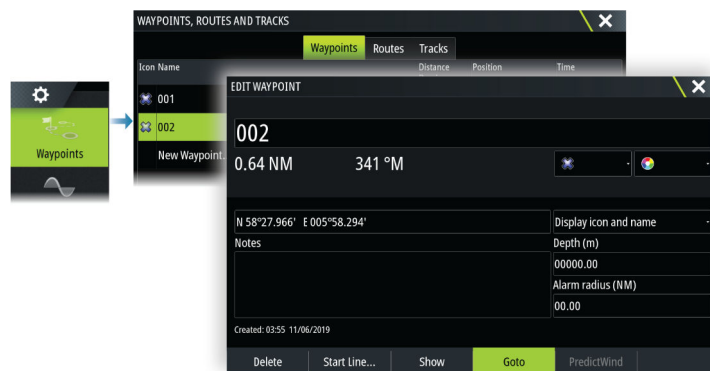
When navigating to a waypoint, the menu expands and shows options for canceling and for restarting the navigation from current vessel position.

Navigating a route

You can start navigating a route from:

- the chart panel
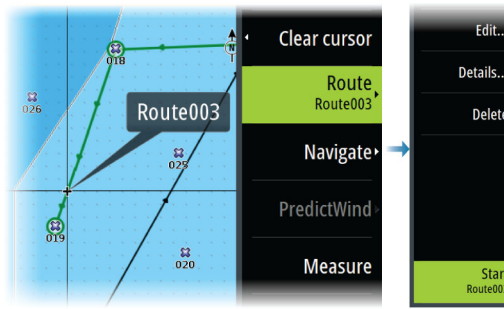
- the route dialog
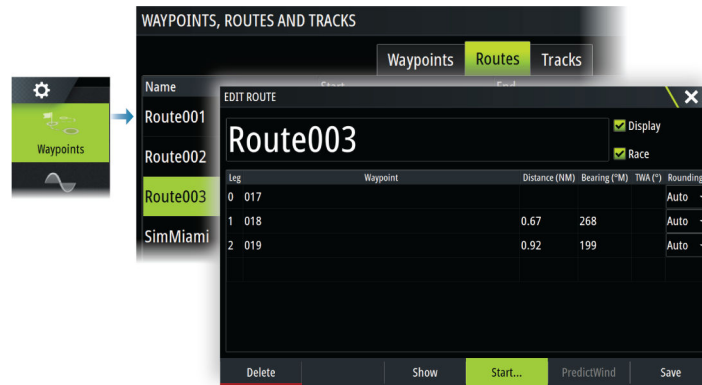
When route navigation is viewed, the menu expands and shows options for canceling the navigation, for skipping a waypoint, and for restarting the route from current vessel position.

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.

Navigating with the autopilot

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

→   *Note:* The prompt to set the autopilot to navigation mode is disabled if the boat type is set to SAIL in the Autopilot Commissioning dialog.

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 the autopilot chapter of the autopilot being used.

Navigation settings
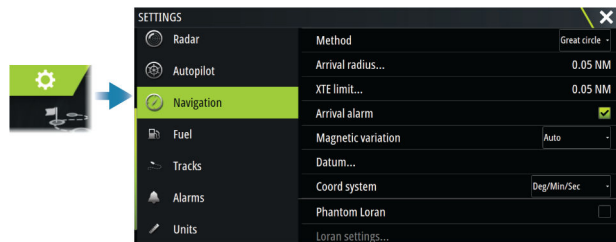
Navigation method

Different methods are available for calculating the distance and bearing between any two geographical points.

The Great circle route is the shortest path between two points. However, if you are to travel along such a route, it would be difficult to steer manually as the heading would constantly be changing (except in the case of due north, south, or along the equator).

Rhumb lines are tracks of constant bearing. It is possible to travel between two locations using Rhumb line computation, but the distance would usually be greater than if Great circle is used.

Arrival radius

Sets an invisible circle around the destination waypoint. The vessel is considered arrived at the waypoint when it is within this radius.

When you are navigating a route, the arrival radius defines the point at which a turn is initiated.
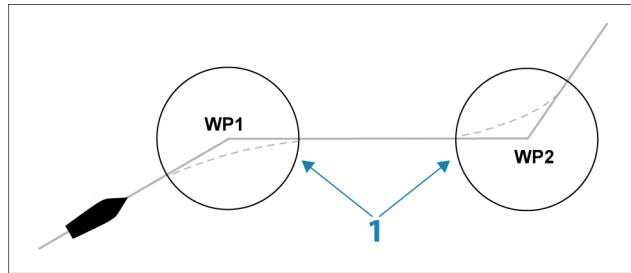
The arrival circle (**1**) should be adjusted according to boat speed. The higher the speed, the wider the circle.

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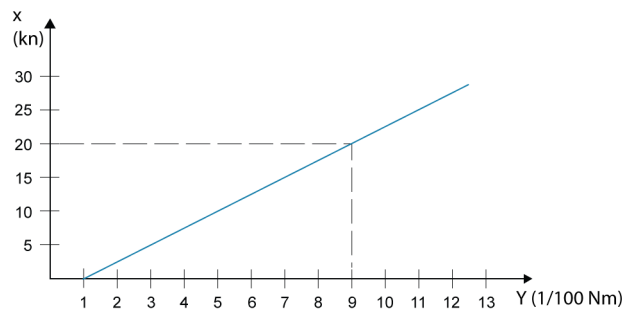
→ **Note:** The distance between any waypoints in a route must not be smaller than the radius of the waypoint arrival circle.

XTE limit

Defines how far the vessel can deviate from the selected route. If the vessel goes beyond this limit, an alarm is activated.

Arrival alarm

When the arrival alarm is enabled, an alarm is activated when the vessel reaches the waypoint or when it is within the specified arrival radius.

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.

Datum

This system uses the WGS datum format, which is a standard for use in cartography and satellite navigation (including GPS).

You can change the datum format to match other systems.

Coordinate system

Used to set the geographic coordinate system used on your system.
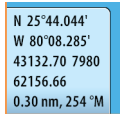
Phantom Loran

Enables use of Phantom Loran positioning system.

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.

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SailSteer panel

The SailSteer panel provides a composite view of key sailing data. All data is displayed relative to the yacht's bow, providing a clear and easy to understand image of important sailing data.

The SailSteer panel can be shown as a full screen panel, or in a multi-panel page.

The number of data fields included in the panel is dependent on available panel size.

1	User configurable data fields
2	Vessel heading
3	COG (Course Over Ground)
4	Apparent wind*
5	Port and starboard laylines.
6	Magnetic or True reference
7	TWA (True Wind Angle) - Green if on TWA upwind or downwind. Blue if off target by 10° or more, or on a free leg. The indicator will fade from blue to green the closer you get to the exact angle.*
8	Bearing to current waypoint
9	Active (next) waypoint ID, routepoint ID, or cursor
10	Rudder angle
	→ **Note:** Only visible if a valid rudder source is available on the system.
11	Magnetic variation
12	Tide rate and relative direction*

* Optional images. You can turn the optional images on/off from the menu.

Selecting data fields for the SailSteer panel

Data sources connected to the system can be viewed on the SailSteer panel.

1. Select the SailSteer panel to make it active.
2. Select the **MENU** button and select the edit option.
   - Edit mode is indicated in top of the panel.
3. Select the instrument field you want to change.
   - The selected field has a highlighted frame.
4. Select the **MENU** button again to select info.
5. Repeat the steps to change other instrument fields.
6. Save your settings by selecting the save option in the menu.

Sail Time calculations

The system calculates the time and distance to a waypoint taking into consideration that the vessel is sailing on a layline course to the waypoint. Data showing time calculations will be indicated with an -S extension:

DTW-S	Sailing Distance to Waypoint
TTW-S	Sailing Time to Waypoint
ETA-S	Sailing Estimated Time of Arrival

SailSteer overlay

You can overlay the SailSteer image on the Chart. You toggle the SailSteer image overlay on and off in the Chart setting dialog.
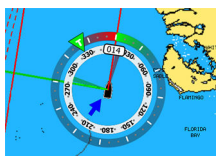
→ **Note:** If both the SailSteer image and autopilot compass overlays are enabled then only the SailSteer overlay is shown.

→ **Note:** SailSteer overlay is not shown when the cursor is activate or when panning the chart. Select the clear cursor option to display the SailSteer overlay again.

→ **Note:** If the **Look ahead** menu option is selected, then the **Heading up** orientation must also be selected in order to display the SailSteer overlay. If the **Look ahead** menu option is not selected, then the SailSteer overlay is displayed with all the orientation settings: **North up**, **Heading up**, and **Course up**.

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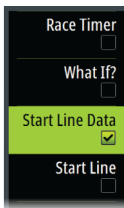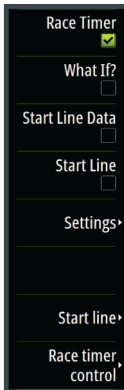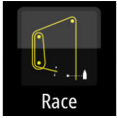
Race panel

Use the Race panel to:

- Display and control the race timer
- Create and manage the race start line
- Display race start line data
- Display the race start line in a chart diagram on the Race panel
- Display tactical information for the current leg or next leg

Select the Race button on the Home page to display the Race panel.

Race

Display options

Use the Race panel menu to specify if you want to display the Race Timer, What if? data, Start Line Data, or Start Line display (display the boat and start line in graphical format).

Race Timer ☑
What If? ☐
Start Line Data ☐
Start Line ☐
Settings ›
Start line ›
Race timer control ›

Start Line on Chart panel

You can display a race start line overlaid on the Chart panel. The start line data can be displayed in the Instrument page. If you have an H5000 CPU on your network, start line data is calculated by the H5000 CPU. Otherwise the data is calculated in the MFD.

Viewing the start line on the chart panel allows the navigator to assess around the starting area for hazards. Use the laylines to see where the likely tracks into and out of the starting area will be relative to the chart data.

The solid black line indicates the start line (between the two starting marks) on the chart panel. You can switch off the start line overlaid on the Chart if desired.
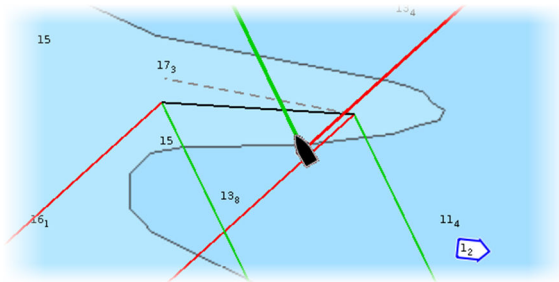
Start Line Data panel

Select the **Start Line Data** menu option to show the Start Line Data panel. The Start Line Data panel shows start line data and a graphical representation of the start line. It displays boat distance from the start line, tide direction, recommended start end bias and what advantage in degrees and distance the biased end will give.

Race Timer ☐
What If? ☐
Start Line Data ☑
Start Line ☐
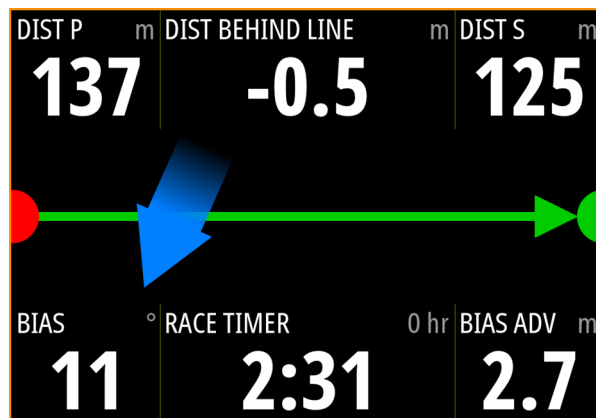
(red half circle outline)	(green half circle outline)	Start line end not set (position not recorded)
(red filled half circle)	(green filled half circle)	Start line end set (position recorded)
(red striped half circle)	(green striped half circle)	Start line end stale (historic start line position) Start line end becomes stale at 23:59 hrs on the day it was recorded but remains valid.
(grey bar)		Invalid start line - One or more ends invalid (position not recorded)
(blue bar)		Start line - Blue - Square line - No bias advantage
(red left arrow)		Start line - Red & Arrow left - Port end bias
(green right arrow)		Start line - Green & Arrow right - Starboard end bias
(blue diagonal arrow)		Tide direction indicator

Data displayed on start line panel

The following data is displayed on the start line panel:

- DIST P - Distance to port end of start line
- DIST BEHIND LINE - Distance to start line (perpendicular)
- DIST S - Distance to starboard end of start line
- BIAS - Start line bias angle
- RACE TIMER - Time on the race timer
- BIAS ADV - Bias advantage (meters or boat lengths)

Setting up a start line

The start line is a visual aid that shows the distance from the boat to the start line, tide direction, recommended start end bias, and what advantage in degrees and distance the biased end will give. The start line is a line between the port and starboard end points.

→ *Note:* If you have an H5000 CPU on your network, the start line information between the MFD and the H5000 is shared. The start line data numbers are calculated on the H5000 CPU and sent across the network. There is only one start line. If you set the start line on the MFD, it will show on the H5000 Graphic Display and vice-versa.

→ *Note:* Before setting the start line position it is important that the GPS Bow offset is updated to negate the difference between the GPS position and the bow of the vessel. This setting is made in the Advanced settings dialog under Instruments. Your Boat settings must also be entered in the Boat settings dialog which is available from the Chart settings dialog.

Menu options let you use different methods for setting the port and starboard start line ends. You can *ping* them, set them at cursor position, specify coordinates, and set one based on the setting of the other. You can also edit waypoints to create start line end points. After the ends are set you can *nudge* each end to move them, if needed.

The menu options to set the port and starboard start line end points are available in both the Chart panel and the Race panel.

Setting start line end points by pinging

Setting the start line end points by pinging requires maneuvering the boat to each end of the start line and then pinging.

→ *Note:* Before setting the start line position using the ping method, it is important that the Bow offset is updated to negate the difference between the GPS position and the bow of the vessel.
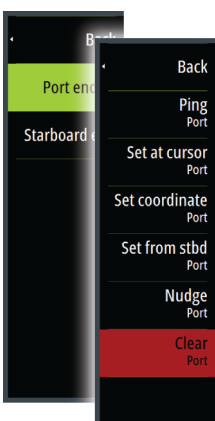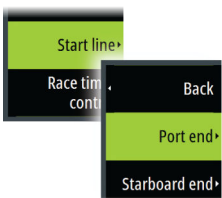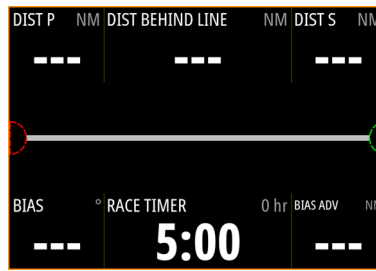
1. Approach the port end of the start line.

2. When the boat reaches the port end of the start line, open the menu and select **Start Line**, **Port end**, and then **Ping port**. The port end mark on the start line panel becomes solid red, indicating it is set.
3. Approach the starboard end of the start line.

4. When the boat reaches the starboard end of the start line, open the menu and select **Start Line**, **Starboard end**, and then **Ping Starboard**. The starboard end mark on the start line panel becomes solid green indicating it is set.

The start line end points are set and can be viewed on the Chart panel and Start line panel.
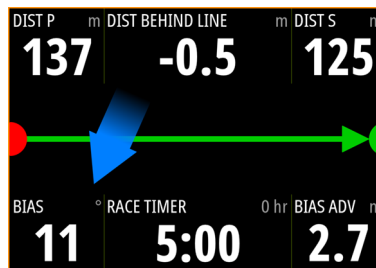
Setting end points at cursor position

1. Open the Chart panel and move the cursor to the position in the chart where you want the port end point to be.
2. Open the menu and select **Start line**, **Port end**, and then **Set at cursor**.
3. Repeat steps 1 and 2 for the starboard end point.

The start line end points are set and can be viewed on the Chart panel and Start line panel.

Setting end points at coordinates

Select the **Set coordinate Port** and then the **Set coordinate Starboard** menu options to enter the coordinates of the port and starboard end points.

Setting end points from each other

Use the **Set from stbd Port** and **Set from port Starboard** menu options to set the Range and Bearing of the end points from each other.

Removing end points and the start line

Use the **Clear Port** or **Clear Starboard** menu options to remove the start points. When both are removed, the start line is removed.
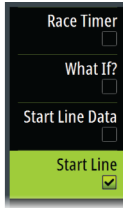
Start Line display

Select the **Start Line** menu option to show the Start Line display in the Race panel. The Start Line display shows the configured start line in scale with your boat, allowing you to clearly see distance to line and position relative to the laylines. All start settings are also shown on this display.
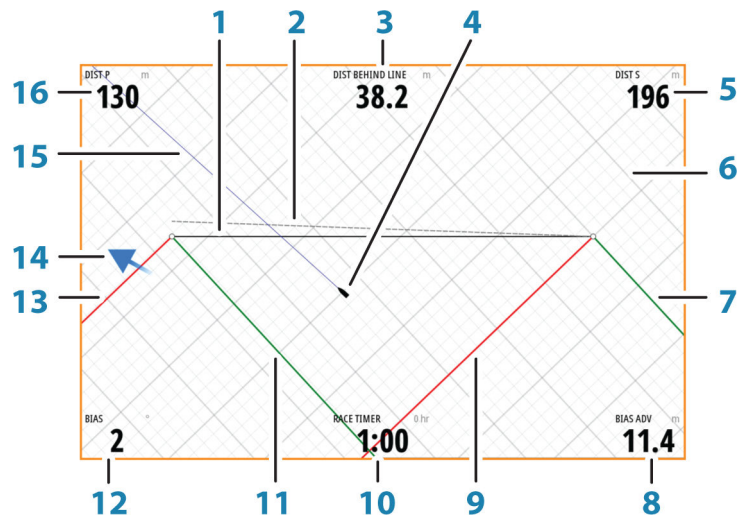
1	Start line
2	Square wind line - drawn from biased start line end perpendicular to True Wind Direction
3	Distance (perpendicular) behind line
4	Boat (drawn to scale)
5	Distance to starboard end of start line
6	Grid
7	Starboard tack layline to the starboard start line end point
8	Advantage gained by starting at favored end
9	Port tack layline to the starboard start line end point
10	Race Timer
11	Starboard tack laylines to the port start line end point
12	Start Line bias angle
13	Port tack laylines to the port start line end point
14	Tide arrow (relative to start line)
15	Extension line
16	Distance to port end of start line

In addition, when a target boat speed is available (from the Hercules Polar table, laylines targets table, or manual setting in the Laylines setup, refer to *"Laylines"* on page 33) a Zero Burn line may be shown, parallel with the start line, which indicates the distance you should be from the starting line as time counts down.

Settings
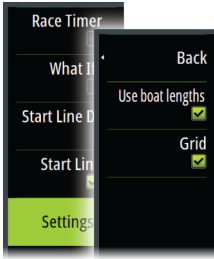
Boat lengths

Select the **Use boat lengths** setting to show the distance behind the line and Bias advantage in boat length data measurements on the Start line panel. Showing the measurements in boat lengths can give a clearer indication of the distance from your boat to the start line.

Show layline grids

Select **Grid** to show layline grids in the start line diagram. The grid is a background that is aligned with the laylines. They can give a clearer indication of possible runs to the start line.

What if?

Select the **What if?** in the menu to display navigation data in the Race panel and to change variables to see what could happen. This is a tool for assessing potential changes in wind or tide in current and future legs of the course.

Deselect **Live** and enter parameters for the wind, tide, or both to see how data might change for the leg. For example, if you can see the sea breeze building in with boats sailing different angles on the horizon, you can enter this data to estimate the effect.
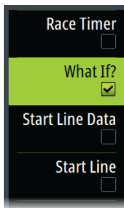
Boat to Rpt001			320 °M 9142 NM
True Wind	008 °M	12.0 kn	☑ Live
Tide	311 °M	20.2 kn	☑ Live
	Port	Starboard	
Heading	342 °M	342 °M	
COG	320 °M	320 °M	
Boat Speed	7.5 kn	7.5 kn	
SOG	27.7 kn	27.7 kn	
TWA	27°	27°	
AWA	16°	16°	
AWS	19.0kn	19.0kn	
Distance	9141.61 NM	9141.61 NM	
Time	330	330	
Prev	Current Leg		Next

Race timer

The race timer can be used to countdown to zero from a specified time, ideal for counting down to a race start. It can also be used to count up from zero to record the elapsed time. You can start and stop the timer, reset it, sync it, and specify a start value.

You can display the Race timer from the Race panel menu, or by selecting Trip Calculator from the Tools panel.

The Timer set value is in hh:mm, the timer counter shows in mm:ss, with the hours showing to the right of the minutes and seconds.
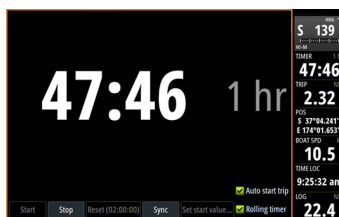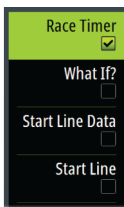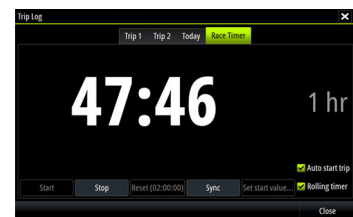
Race timer panel   *Race Timer in the Trip Log*
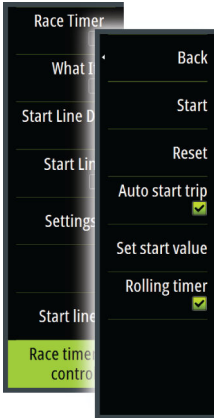
Race timer controls

You can access Race timer controls from the Race panel menu. You can also access them at the bottom of the Race timer panel displayed from the Home page and the Race timer panel displayed from the Trip Calculator (Tool panel). Different controls are enabled depending on if the timer is started or stopped.
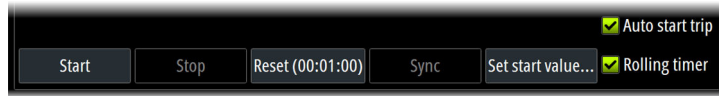
Set start value

Set a time value which the timer shall use to count down to the start time of the race. The timer starts counting down when you select Start.

Start/Stop timer

The timer can be started at any time by selecting **Start**. If a time value is preset, the timer counts down. If the start value is set to zero (00:00) when the timer is started, the timer begins counting up, recording the elapsed time.

To stop the timer from counting select **Stop**.

Reset

Resets the timer to the start value. If the timer is running when **Reset** is selected, it continues to run from the start value.

Sync

When the timer is counting down selecting **Sync** synchronizes the time up or down to the nearest full minute.

Auto start trip

When Auto start trip is selected, the Trip Log records your time and mileage from the moment the countdown timer begins counting up from zero.

Rolling timer

When **Rolling timer** is selected, the timer restarts the countdown timer every time it reaches zero. It continues to do this until the timer is stopped.

9

Time and Wind plots

The system can present data history in different plots. The plots can be displayed in full page, or combined with other panels.

The Time plot panel

The Time plot panel consists of two predefined layouts. You switch between the layouts by selecting the left and right panel arrows. You can also select the layout from the menu.

You can select which data to present on a time plot panel, and you can define the time range for each plot.
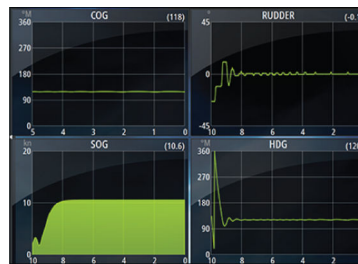
Layout 1
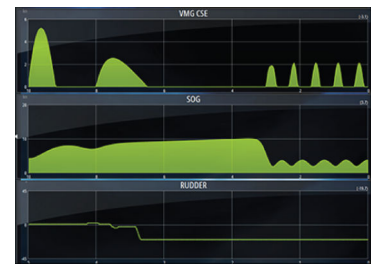
Layout 2

Missing data

If the data is unavailable, the relevant plot turns into a dashed line and flattens out at the point the data was lost. When the data becomes available again, a dashed line joins up the two points showing an average trend line bridging the missing data.

Selecting data

Each data field can be changed to show the preferred data type and the time range.

1. Select the edit option from the menu
2. Activate the field you want to edit
3. Change the information type and eventually the range
4. Save your changes

The data available for the Time plots are by default the sources used by the system. If more than one data source is available for a data type you can select to show alternative data source in the Time plot. You change the data type by using the data source option in the menu.

The Wind Plot panel

A Wind Plot is a special type of Time Plot specifically designed to help understand recent changes in wind speed and direction.

The Wind Plot can be displayed as a dual or combined view.

In the plots, X axis = degrees and Y axis = minutes.
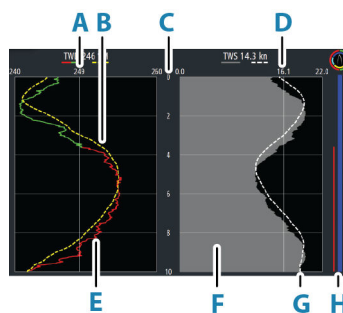
Dual view
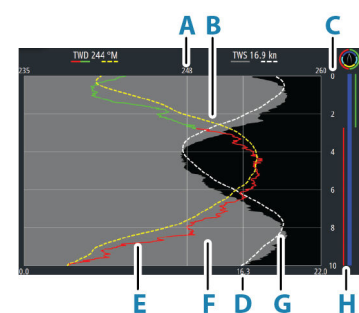
Combined view

A   True Wind Direction (TWD) average*

B	TWD trend*
C	Time range
D	True Wind Speed (TWS) average*
E	TWD plot
F	TWS plot
G	TWS trend*
H	Tack bar*

* Optional items. Optional items can be turned on/off individually from the Wind Plot panel menu.
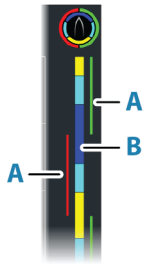
Tack bar

The tack bar shows which tack you are currently sailing on (A) and a point of sail/pre-start status bar (B) corresponding to the data recorded at the time. Tack bar data uses the same time scale as the main Wind Plot window.

Select the tack bar to view the tack bar legend.
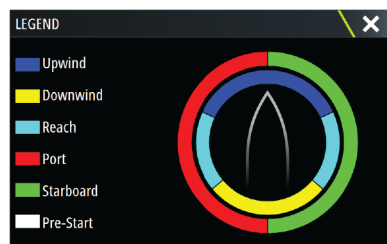
Setting up the page

Use the Wind Plot panel menu to set up the page.

Time range

Sets the time range interval.

Trend averaging

Sets the amount of averaging applied to the Trend line. A low setting shows the highest detail (closest to the raw data, lowest amount of damping), and a high setting shows a smoother trend (highest amount of damping). A medium setting is a good balance between raw and damped data.

TWD options

Display options
Sets the plot to show TWD only, TWD trend only or both the TWD and trend.

Average line
Shows or hides the TWD average line (calculated over the time range) on the plot image.

Tack colors
Select to show the TWD in starboard (green) or port (red) colors depending on the current wind angle or unselect to show the TWD as a constant (blue) color.

TWS options

Display options
Sets the plot to show TWS only, TWS trend only or both the TWS and trend.

Average line
Shows or hides the TWS average line (calculated over the time range) on the plot image.

Tack bar option

Show
Shows or hides the tack bar.

Start line
Shows or hides the race start line on the tack bar.

The start line is only shown on the tack bar when it is enabled, and when the race timer is started and counting down to zero.

When the start line is enabled and the race timer is started, the white line (B) on the tack bar represents the race timer. The tack bar shows the start line as a horizontal line (A) across the tack bar representing the time the race timer will reach zero. When the race timer reaches zero the white line will change to the appropriate color according to your point of sail.

Tack averages
Displays a table listing the tack averages over the current time period. This display can be useful for checking calibration or average performance on each tack.

TACK AVERAGES	Port	Starboard
TWA (°)	-40	42
TWD (°M)	249	243
TWS (kn)	15.0	16.2
Boat Speed (kn)	9.1	5.9
Heading (°M)	288	201

Mode option
Sets the Wind Plot as a dual or combined view.

The combined view is designed to allow full use of the Wind Plot in a smaller panel, for example alongside a chart window.
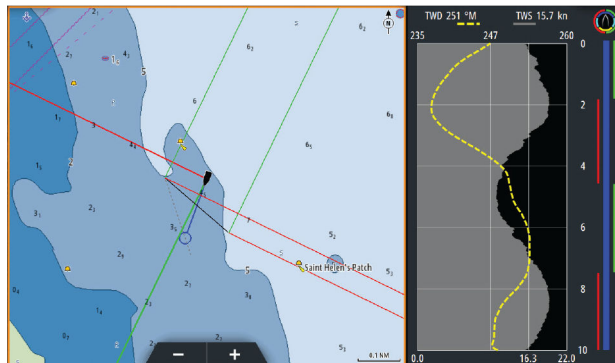
10

PredictWind

PredictWind weather and PredictWind routes can be displayed on charts.

PredictWind weather

PredictWind weather can be displayed as GRIB weather overlay on the chart. To use this functionality, the appropriate PredictWind subscription is required.

Only one weather file can be displayed on the chart at a time.

The PredictWind GRIB weather file can be made available for display as overlay on the chart the following ways:

- Download PredictWind files automatically or manually from the PredictWind web site using the unit's internet connection as follows:
  - Turn on GRIB weather overlay from the Chart menu, refer to *"Turn on GRIB weather overlay"* on page 59
  - Enter your PredictWind login credentials in the unit, refer to *"PredictWind login credentials"* on page 59
  - If you want the system to automatically download the files from PredictWind, specify automatic download High resolution, Offshore (lower resolution), or both. Refer to *"Automatically download PredictWind weather files"* on page 60.
  - If you want to manually download the files from PredictWind, use the Download forecast option in the Chart menu. Refer to *"Manually download PredictWind weather files"* on page 60.
  - Import the file into memory to overlay it on the chart, refer to *"Specify PredictWind GRIB overlay file"* on page 62
- Download PredictWind files to a portable storage device connected to a PC and then import a file from the storage device into the unit's memory as follows:
  - Download PredictWind weather files to a portable storage device connected to a PC
    Note: Do not use a map memory card. Downloading files to a map card can corrupt the map card.
  - Connect the storage device to the unit
  - Turn on GRIB weather overlay from the Chart menu, refer to *"Turn on GRIB weather overlay"* on page 59
  - Import the file into memory to overlay it on the chart. You can import a weather file directly from the storage device or from any directory available to the File manager. Refer to Specify PredictWind GRIB overlay file *"Specify PredictWind GRIB overlay file"* on page 62.

Turn on GRIB weather overlay

To view GRIB weather overlay on the chart and expand the chart menu to display GRIB weather menu options, turn on the GRIB weather overlay feature from the chart menu.

PredictWind login credentials

To automatically or manually download weather files from the PredictWind web site, enter your PredictWind login credentials in the PredictWind GRIB weather dialog.

Access the PredictWind GRIB weather dialog from the Chart settings dialog.

Select Email and enter your PredictWind login email address.

Select Password and enter your PredictWind password.
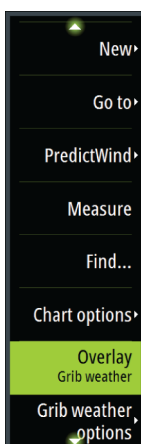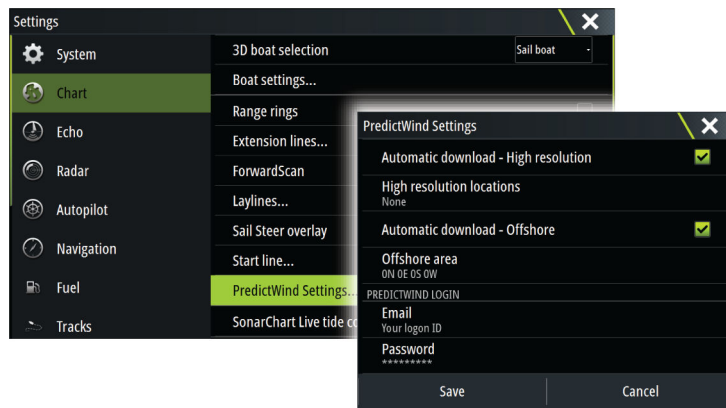
Automatically download PredictWind weather files

The automatic download feature allows your system to regularly check for weather updates and download the latest data.

Specify if you want to automatically download High resolution (refer to *"High resolution"* on page 60) or Offshore - lower resolution (refer to *"Offshore area (lower resolution)"* on page 61) or both types of GRIB data.

➔ *Note:* High Resolution downloads require a PredictWind Professional subscription.

➔ *Note:* To download data from PredictWind, the unit must have an internet connection and your PredictWind login credentials must be entered in the system (refer to *"PredictWind login credentials"* on page 59). When an internet connection is made the system will automatically login to PredictWind with your credentials and start downloading weather data as specified in the PredictWind GRIB Weather dialog.

Manually download PredictWind weather files

To download a PredictWind weather file manually, select the Download forecast option in the Chart menu to display the Select forecast type dialog. Use the Select forecast type dialog to specify the type and area.

➔ *Note:* To manually download data from PredictWind, the unit must have an internet connection. The Download forecast option is only available if you have turned on GRIB weather overlay on the Chart menu (refer to *"Turn on GRIB weather overlay"* on page 59), and your PredictWind login credentials are entered in the system (refer to *"PredictWind login credentials"* on page 59).
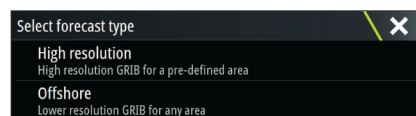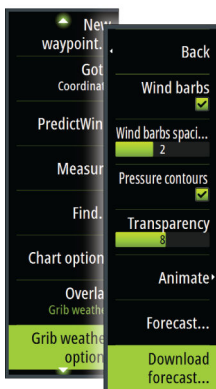
When the GRIB download is complete, the MFD will display a message to show the task is complete. To view the downloaded GRIB file on the chart, select the downloaded file from the Forecast menu option. Refer to *"Specify PredictWind GRIB overlay file"* on page 62.

High resolution

Download location areas are displayed on the chart. Select or deselect single or multiple locations. The selected areas are highlighted. You can add and remove locations by selecting Automatic download locations later.
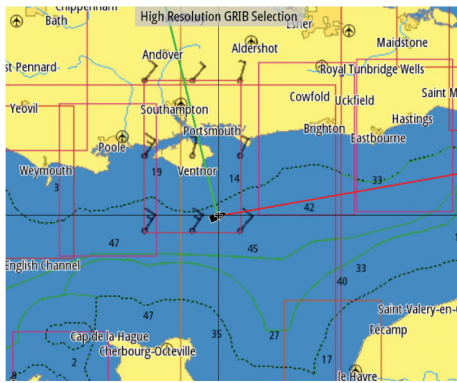
Specify the settings for the high resolution GRIB download, refer to *"PredictWind download settings"* on page 61.
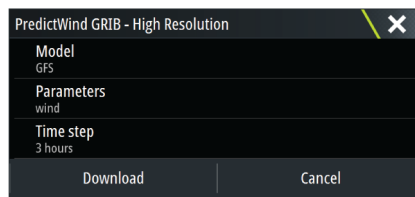
Offshore area (lower resolution)

The chart is displayed when you select the offshore area (lower resolution) option with an expandable rectangle. Drag the rectangle's corner markers to create the area rectangle you want to download GRIB weather for.

After you create your offshore area rectangle, choose the select option.

Specify the settings for the offshore (lower resolution) GRIB download, refer to *"PredictWind download settings"* on page 61.
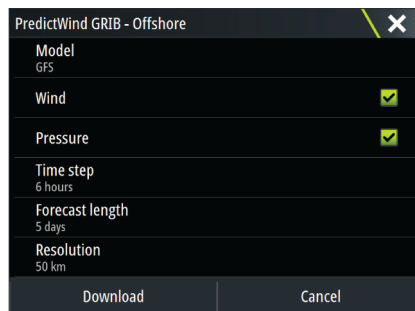
PredictWind download settings

Model

Allows you to select from the GRIB model options:
- PWE (PredictWind Forecast) - PredictWind forecast based on the weather observation from the European Centre for Medium-Range Weather Forecast.
- GFS (Global Forecast System) - a weather observation file from the National Oceanic and Atmospheric Administration (NOAA) of the USA Department of Commerce.

- CMCF (Canadian Meteorological Centre Forecast) – PredictWind forecast based on the weather observation from the Canadian Meteorological Centre. Available for Offshore GRIB only.
- GFSF (Global Forecast System Forecast) - PredictWind forecast based on the weather observation from the National Oceanic and Atmospheric Administration (NOAA) of the USA Department of Commerce. Available for Offshore GRIB only.

Wind and Pressure
When downloading Offshore GRIB only, you can select Wind and/or Pressure data.

When downloading High Resolutions files, the options are WIND or ALL. Specifying ALL will download wind and pressure data.

Time step
The size of the time step in the downloaded forecast. For example, a 3 hour time step could provide weather data for 1200, 1500, 1800 etc., where a 6 hour time step could only provide 1200, 1800 etc. Smaller steps require larger downloads.

Forecast length
The period of the forecast in days.

Resolution
GRIB resolution, select 50 or 100 kilometers between forecast points. Available for Offshore GRIB only.

Specify PredictWind GRIB overlay file
The Forecast menu option shows the GRIB file which is currently displayed on the chart. If no file is displayed on the chart, then the menu option does not show a GRIB file.
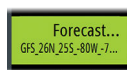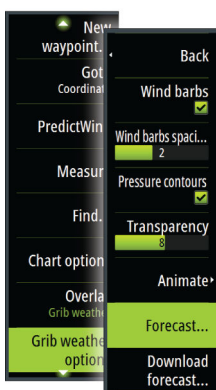
Forecast...	Forecast...
GFS_26N_25S_-80W_-7...	
GRIB file displayed on the chart	*No GRIB file displayed on the chart*

Select the Forecast menu option to open the GRIB Weather dialog.

GRIB Weather ✕

Import file...

CURRENT GRIB FILE
PWC_W_50k_2d_3h...161121_0515.grb
Date: 21-nov-16 03:00, Days: 2, X-Res: 18.1NM, Y-Res: 30.0NM

OK
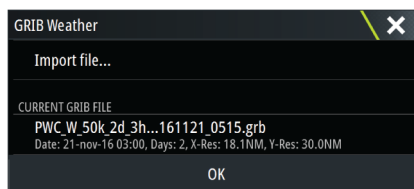
The GRIB Weather dialog shows which GRIB file is currently displayed as overlay on the chart and which files are available for display.

Available GRIB files are files downloaded manually or automatically from PredictWind to the Gribs directory. If you copy GRIB files from a storage device to the Gribs directory using the file manager, they will be listed as available GRIB files.

Select an available GRIB file to import it into memory and display it as overlay on the chart. Select the Import file option to import a GRIB file into memory from the storage device or any directory available to the File manager.

→ *Note:* GRIB data that is imported overwrites the GRIB data in memory.

Expired GRIB files
The system identifies GRIB files that have expired and moves them from the available GRIB files list to the expired GRIB files list. Expired files are files where the time of the final forecast has passed. Select the Delete expired GRIB files option to delete these expired files from the system.

PredictWind weather routing and departure planner

PredictWind Weather routing is an online weather routing service for creating the fastest or safest route for your trip based on weather conditions.

The departure planner is an online service that advises the best day to depart on a coastal or offshore trip. It summarizes the wind conditions you will encounter the next 4 days of departure.

PredictWind routing can also provide a weather forecast for your destination. This information is available in the Summary panel.

Requirements

- Internet connection – the unit must have an internet connection
- Appropriate PredictWind subscription/account
- PredictWind login credentials entered in the PredictWind settings dialog.
- Your boat performance details are entered in the polar table
- Polars define the performance of your boat in different wind and wave conditions. It is important to define this accurately, so the optimal route is as accurate as possible.

Set up and usage

1. Connect your unit to the internet. Refer to *"Internet connection"* on page 114.
2. Enter your PredictWind credentials in the PredictWind settings dialog.
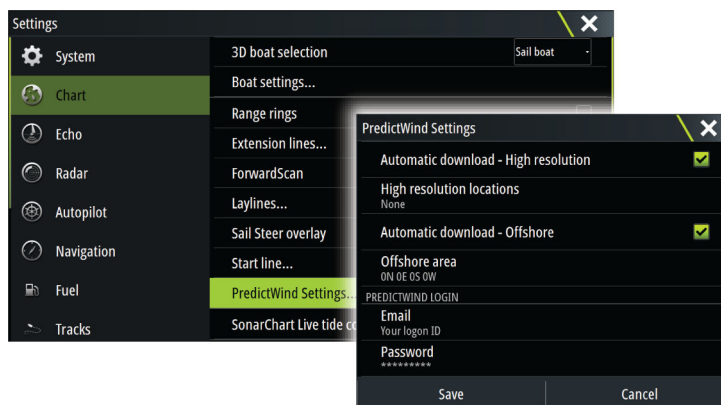
3. Launch the PredictWind routing feature, the following options are available:

- Route to cursor

  a. Activate the cursor on the chart.

  b. Select the PredictWind menu option.

  c. Select the route to cursor menu option to specify route to cursor information. For specifying details refer to *"PredictWind Routing dialog options"* on page 64.

  d. Select Download to request a new route from PredictWind.

- Route to coordinate

  a. Select the PredictWind menu option.

  b. Select the route to coordinate menu option to display the PredictWind Routing dialog.

  c. Select the destination option to set the destination coordinate and select OK. The PredictWind Routing dialog opens showing the destination coordinate you specified.

  d. Select options in the PredictWind Routing dialog to specify route to coordinate information. For specifying details refer to *"PredictWind Routing dialog options"* on page 64.

  e. Select Download to request a new route from PredictWind.
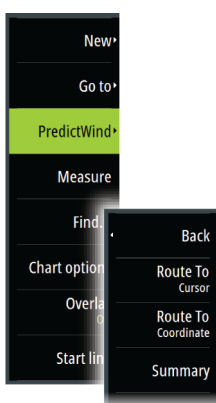
- Route to waypoint

  a. Do one of the following:
     - Use the Find menu option, select Waypoints and then select the waypoint in the list to open the Edit Waypoint dialog.
     - Select the waypoints button in the toolbar and select the waypoint in the list to open the Edit Waypoint dialog.
     - Select the waypoint on the chart. This lists the selected waypoint in the menu. Select the waypoint in the menu and then Details in the expanded menu to open the Edit Waypoint dialog.

  b. Select PredictWind to specify route to waypoint information. For specifying details refer to *"PredictWind Routing dialog options"* on page 64.

  c. Select Download to request a new route from PredictWind.

- Use existing route

  a. Do one of the following:
     - Use the Find menu option and select the route in the list to open the Edit Route dialog.
     - Select the waypoints button in the toolbar and select the route in the list to open the Edit Route dialog.
     - Select the route on the chart. This lists the selected route in the menu. Select the route in the menu and then Details in the expanded menu to open the Edit Route dialog.

  b. Select PredictWind to specify routing information. For specifying details refer to *"PredictWind Routing dialog options"* on page 64.

  c. Select Download to request a new route from PredictWind.

If there is an internet connection and proper account credentials entered in the PredictWind settings dialog, a route will be downloaded from PredictWind.

PredictWind Routing dialog options
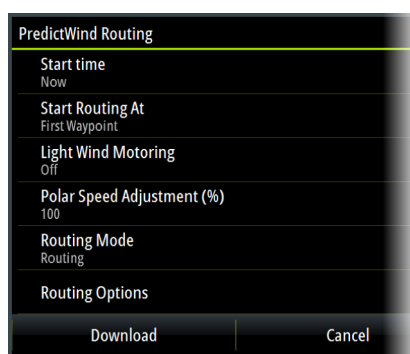
Start Time
Specify the start date and time. If **Now** is selected, the date and time options are disabled.

Start Routing At
Specify to PredictWind if you want weather routing to start from the current vessel position or to start weather routing at the first waypoint in the route.

Light Wind Motoring
Specify light wind motoring options:
- Motoring speed
- The wind speed at which you would stop sailing and start motoring

Polar Speed Adjustment

Adjust the polar speed by a percentage. If, for example, you are delivering a boat short handed and expect the boat performance to be slower than your Polar by 20%, apply 80% to the Polar Speed Adjustment.

→ **Note:** The polar must be selected in your PredictWind Account settings that you access

Routing Mode
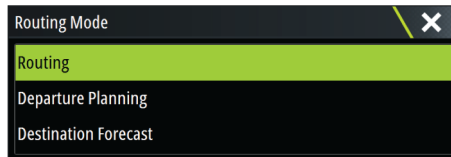
You can select one of the following modes:

- Routing - Opens the PredictWind Routing dialog with Routing Options enabled. Select Routing Options to specify the wind speeds and swells you want to avoid on the route.
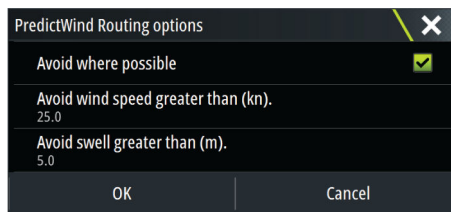
- Departure Planning - Opens the PredictWind Routing dialog with Departure Options enabled. Select Departure Options to specify the time you want to space the departures (1 hour, 3 hours, 6 hours, 12 hours or 24 hours) and the forecast model (GFS/ECMWF or PWE/PWG) you want PredictWind to use.

- Destination Forecast - Select this option to request destination forecast information from PredictWind.

Routing and destination forecast details are provided in the Summary panel.

Download Management

To view the status of any ongoing route downloads select the Files icon on the Tool panel and then Transfers to see transfer status. When a download completes, the route is drawn on the chart. Old routes are deleted when the new route becomes available. If a route is being followed when a new one is downloaded it will continue to be followed until navigation is finished.

PredictWind routing summary

Select the Summary option in the PredictWind menu to view detailed routing information.

Additional summary information is available for wind, current, route, and swell.

Select **Follow** to sail the route.

11

Autopilot

Safe operation with the autopilot

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

> ⚠ Warning: Ensure the autopilot has been installed correctly, commissioned and calibrated before use.

→ **Note:** For safety reasons a physical standby key should be available.

→ **Note:** The WheelKey can be configured to be a standby key. Refer to *"Configurable WheelKey"* on page 18.

Do not use automatic steering when:

- In heavy traffic areas or in narrow waters
- In poor visibility or extreme sea conditions
- When in areas where use of an autopilot is prohibited by law

When using an autopilot:

- Do not leave the helm unattended
- Do not place any magnetic material or equipment near the heading sensor used by the autopilot system
- Verify at regular intervals the course and position of the vessel
- Always switch the autopilot to standby and reduce speed in due time to avoid hazardous situations

Autopilot alarms

For safety reasons it is recommended to turn on all autopilot alarms when operating the autopilot.

For more information, refer to *"Alarms"* on page 126.

Selecting active autopilot

If 2 autopilot computers are configured for MFD control, only one of them can be active at a time. We recommend you only power up one at a time.

The Autopilot controller

The Autopilot controller has a fixed position on the left-side of the page.

The following Autopilot controller options are available:

- Autopilot controller, showing active mode, heading, rudder and various steering information depending on active autopilot mode. Manual adjustments to the set heading/course can only be made when the port and starboard arrow indicators are illuminated red and green.
- Mode selection, includes access to tack or gybe options.
- Tack or Gybe selection, available when in Heading hold or Wind mode and boat type is set to Sail in the autopilot commissioning dialog.

| Autopilot controller | Mode selection | Start tack | Start gybe |
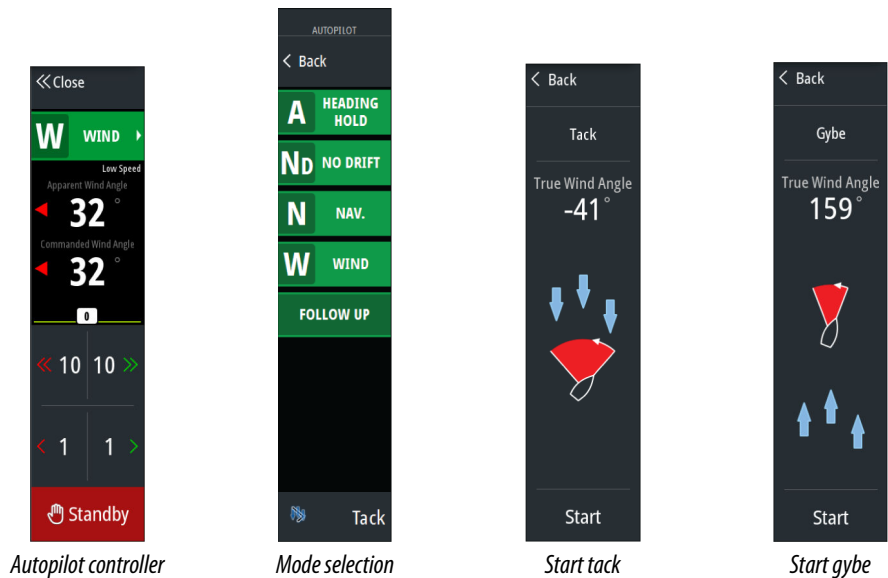
Engaging and disengaging the autopilot

To engage the autopilot:

- Select the engage button to activate last active mode
- Select the mode button to display the list of available modes, then select the preferred mode
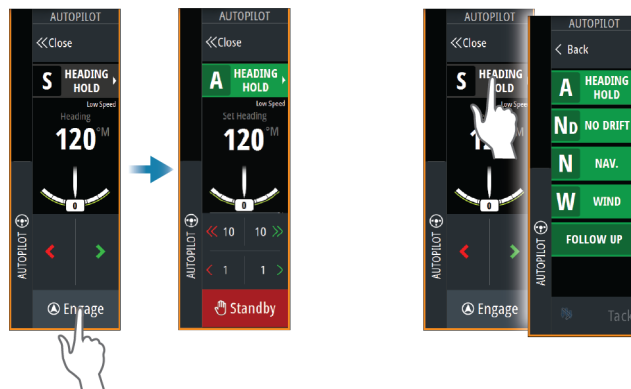
The autopilot will engage in the selected mode, and the autopilot controller will change to show active mode options.

To disengage the autopilot:

- Select the standby button

When the autopilot is in standby, the boat must be steered manually.

Autopilot indication

The status bar shows autopilot information as long as an autopilot computer is connected.

Autopilot modes

The autopilot has several steering modes. The number of modes and features within the mode depend on the autopilot computer, the boat type and available inputs.

Non-Follow Up mode (NFU)

In this mode the port and starboard buttons are used to control the rudder.

Activate this mode by selecting the port or starboard button when the autopilot is in standby.

Follow-Up mode (FU)

In this mode the rudder moves to a set rudder angle. The rudder position is maintained at the set angle.

To change the set rudder angle
- Select the port or starboard button
- With the autopilot controller active, turn the rotary knob

Heading hold mode (A)

In this mode the autopilot steers the vessel on the set heading.

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

➔ **Note:** In this mode the autopilot does not compensate for any drifting caused by current and/or wind (**W**).

To change the set heading
- Select a port or starboard button
- With the autopilot controller active, turn the rotary knob

An immediate heading change takes place. The heading is maintained until a new heading is set.

Tacking in Heading hold mode

➔ **Note:** Only available when the boat type is set to sail (autopilot configuration).

➔ **Note:** Tacking should only be performed into the wind and must be tried out in calm sea conditions with light wind to find out how it works on your vessel.

Tacking in heading hold mode changes the heading by a fixed tack angle, either to port or starboard.

The rate of turn during the tack/gybe is set by the tack time in the autopilot settings dialog. Refer to *"Autopilot settings"* on page 71.

To initiate a tack:
- Selecting the tack button in the mode list, then selecting the tack direction.
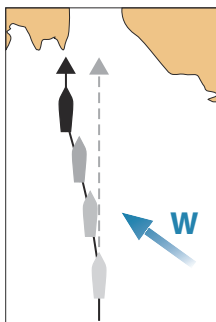
NoDrift mode

In NoDrift mode the vessel is steered along a calculated track line, from present position and in a direction set by the user.

When the mode is activated, the autopilot will draw an invisible track line based on current heading from the vessel's position. The autopilot will now use the position information to calculate the cross track distance, and automatically steer along the calculated track.

➔ **Note:** If the vessel is drifting away from the track line due to current and/or wind (**W**), the vessel will follow the line with a crab angle.

To change the set track line
- Select a port or starboard button
- With the autopilot controller active, turn the rotary knob

NAV mode

> ⚠ Warning: NAV mode should only be used in open waters. Navigation mode must not be used while sailing, as course changes may result in unexpected tacks or gybes.

Prior to entering NAV mode you must be navigating a route or towards a waypoint.
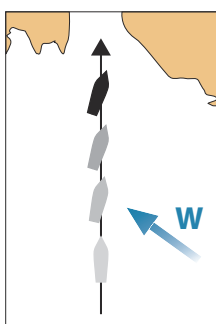
In NAV mode the autopilot automatically steers the vessel to a specific waypoint location, or along a pre-defined route. Position information is used to change the course to steer to keep the vessel on the track line to the destination waypoint.

→ *Note:* For information about navigation, refer to *"Navigating"* on page 44.

NAV mode options
While in NAV mode the following buttons are available in the autopilot controller:
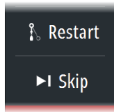
Restart
Restarts the navigation from the vessel's current position.

Skip
Skips the active waypoint and steers towards the next waypoint. This option is only available when navigating a route with more than one waypoint between the vessel position and the end of the route.

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

→ *Note:* This is different from selecting standby which does not stop current navigation.

Turning in NAV mode
When the vessel reaches a waypoint, the autopilot will give an audible warning and display a dialog with the new course information.

There is a limit for the allowed automatic course change to next waypoint in a route:

- If the required course change to the next waypoint is less than the course change limit, the autopilot will automatically change the course
- If the required course change to next waypoint is more than the set limit, you are prompted to verify that the upcoming course change is acceptable. If the turn is not accepted, the vessel will continue with the current set heading.

The course change limit setting depends on the autopilot computer. Refer to the autopilot computer documentation.

Wind mode

→ *Note:* Wind mode is only available when the boat type is set to Sail. It is not possible to activate wind mode if wind information is missing.

In wind mode the autopilot captures the current wind angle as steering reference, and adjusts the heading of the boat to maintain this wind angle.

The autopilot will keep the boat on the set wind angle until a new wind angle is set.

> ⚠ Warning: In wind mode the autopilot steers to the apparent or true wind angle and not to a compass heading. Any wind shift could result in the vessel steering on an undesired course.

To change the set wind reference angle
- Select a port or starboard button
- With the autopilot controller active, turn the rotary knob

An immediate change of wind reference angle takes place.

Tacking and gybing in wind mode
The tack/gybe option in wind mode mirrors the set wind angle on the opposite tack.

Tacking and gybing in wind mode can be performed when sailing with apparent or true wind as the reference. In either case the true wind angle must be less than 90° (tacking) and more than 120° (gybing).

The rate of turn during the tack/gybe is set by the tack time in the autopilot settings dialog. Refer to *"Autopilot settings"* on page 71.

To initiate a tack or gybe:

- Select the Tack/Gybe option in the mode list

➔ **Note:** The autopilot will temporarily add a 5° bear-away on the new tack to allow the boat to pick up speed. After a short period the wind angle will return to the set angle.

Autopilot settings

The Autopilot settings dialog depends on which autopilot computer that is connected to the system. If more than one autopilot is connected, the Autopilot settings dialog shows option for the active autopilot.

The autopilot settings can be split between settings done by the user, and settings done during installation and commissioning of the autopilot system.

- User settings can be changed for various operational conditions or user preferences.
- Installation settings are defined during commissioning of the autopilot system. No changes should later be done to these settings.

The following sections describe the user settings per autopilot computer. For installation settings, refer to the installation manual.

Common user settings

The following user settings are common to all autopilots.

Chart compass

Select to display a compass symbol around your boat on the chart panel. The compass symbol is off when the cursor is active on the panel.
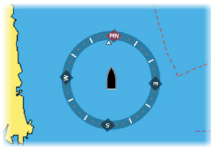
H5000 Specific user settings
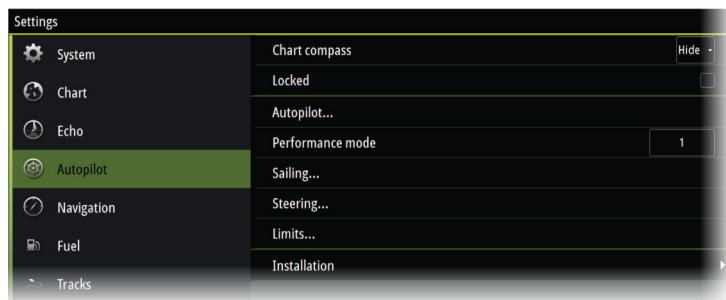
Performance

The Performance controls the response of the autopilot steering. There are five levels of performance modes:

- Level one consumes the least amount of power when steering the autopilot and offers the slowest response
- Level five consumes the most power and has the highest response

The performance mode is indicated in the top right corner of the status display in the Autopilot controller.

Sailing
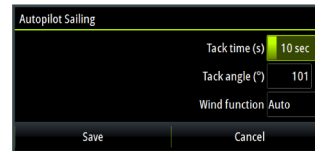
This option allows for manually changing parameters that were set during the commissioning of the autopilot computer. For more details of the settings, refer to the separate documentation for the autopilot computer.

- Tack time: Controls the rate of turn (tack time) when performing a tack in Heading hold and Wind mode.

- Tack angle: Controls the angle that the boat will tack to between 50º - 150º in Heading hold mode

- Wind function: Select what wind function the autopilot will use when in wind mode
  - Auto:
    If TWA is <70º: Wind mode will use AWA
    If TWA is ≥70º: Wind mode will use TWA
  - Apparent
  - True

Steering
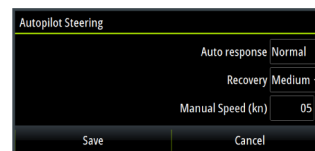
This option allows for manually changing parameters that were set during the commissioning of the autopilot computer. For more details of the settings, refer to the separate documentation for the autopilot computer.

- Auto response: controls the rate that which the autopilot reacts to any environmental influences on the vessels desired course
  - Off: The autopilot will always remain in the response mode selected
  - Economy: The autopilot will need to sense large environmental changes before increasing the response setting
  - Normal: The autopilot will need to sense moderate environmental changes before increasing the response settings
  - Sport: The autopilot will be most sensitive to changing conditions and will automatically increase its response rate to counter environmental changes

- Recovery: Allows the user to set the sensitivity to course errors and how the autopilot will react to unexpected events, for example sudden wave or wind shifts. This function allows the autopilot to instantaneously increase the steering response to its maximum setting (Perf 5), and make a rapid recovery. The Recovery will automatically switch off after 15 seconds or when the heading error has been corrected. The autopilot will then resume the previous response setting and continue normal operation.
  - Off
  - Narrow: The autopilot is most sensitive to sudden course changes corrected
  - Medium: The autopilot is configured to the medium value when correcting sudden course changes
  - Wide: The autopilot is least sensitive to sudden course changes

- Manual speed: If neither boat speed or SOG data is available and or deemed reliable a manual value for speed source can be entered and used by the autopilot to aid steering calculations

Limits

This option allows for manually changing parameters that were set during the commissioning of the autopilot computer. For more details of the settings, refer to the separate documentation for the autopilot computer.

Allows control of the True Wind Angle range where Gust and True Wind Speed response can be configured and controlled.

- TWA min: Minimum True Wind Angle that gust and True Wind Speed response operate in.
- TWA max: Maximum True Wind Angle that gust and True Wind Speed response operate in.
- Bear away max: Maximum angle the vessel will bear away during stability control
- Cruising speed: The preferred cruising speed for this vessel (comfortable and economical)
- Rudder limit: Determines the maximum rudder movement in degrees from midship position that the autopilot can command the rudder in the automatic modes. The Rudder limit setting is only active during autosteering on straight courses, NOT during course changes. Rudder limit does not affect Non-Follow-up steering.
- Off course limit: Defines the limit for the off course alarm

NAC-2/NAC-3 specific user settings

Autopilot

Switches the view to the last active page.

Steering

These options allow for manually changing low speed and high speed parameters that were set during the commissioning of the autopilot computer. For more details, refer to the separate documentation for the autopilot computer.

Selecting the low speed option or the high speed option opens dialogs the following parameters can be changed.

- Turn rate: Preferred turn rate used while turning in degrees per minute.
- Rudder gain: This parameter determines the ratio between commanded rudder and the heading error. The higher rudder value the more rudder is applied. If the value is too small it will take a long time to compensate for a heading error, and the autopilot will fail to keep a steady course. If the value is set too high the overshoot will increase and the steering will be unstable.
- Counter rudder: Relation between change in heading error and applied rudder. Higher counter rudder will reduce applied rudder faster when approaching the set heading.
- Auto trim: Controls how aggressively the autopilot will apply rudder to compensate for a constant heading offset, e.g. when external forces such as wind or current affects the heading. Lower auto trim will give faster, limitation of a constant heading offset.

- Init rudder: Defines how the system moves the rudder when switching from manual steering to an automatic mode.

- Rudder limit: Determines the maximum rudder movement in degrees from midship position that the autopilot can command the rudder in the automatic modes. The Rudder limit setting is only active during autosteering on straight courses, not during course changes. Rudder limit does not affect Follow-up or Non-Follow-up steering.
- Off heading limit: Sets the limit for the off heading alarm. An alarm occurs when the actual heading deviates from the set heading more than the selected limit.
- Rudder limit: Determines the maximum rudder movement in degrees from midship position that the autopilot can command the rudder in the automatic modes. The Rudder limit setting is only active during autosteering on straight courses, not during course changes. Rudder limit does not affect Follow-up or Non-Follow-up steering.
- Off heading limit: Sets the limit for the off heading alarm. An alarm occurs when the actual heading deviates from the set heading more than the selected limit.
- Track response: Defines how fast the autopilot shall respond after having registered a cross track distance.
- Track approach angle: Defines the angle used when the vessel is approaching a leg. This setting is used both when you start navigating and when you use track offset.
- Course change confirm angle: Defines the limits for course change to next waypoint in a route. If the course change is more than this set limit, you are prompted to verify that the upcoming course change is acceptable.

Sailing

→ **Note:** Sailing parameters are only available when the boat type is set to Sail.
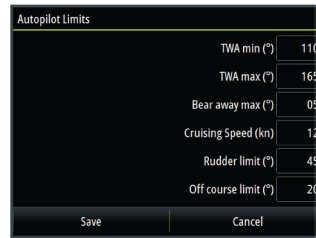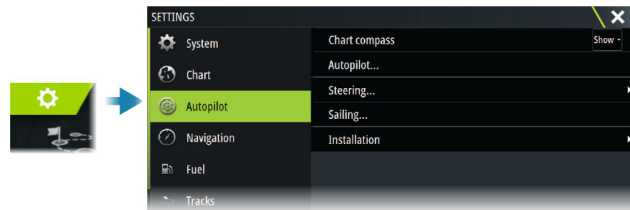
This option allows for manually changing parameters that were set during the commissioning of the autopilot computer. For more details of the settings, refer to the separate documentation for the autopilot computer.

- Tack time: Controls the rate of turn (tack time) when performing a tack in wind mode.
- Tack angle: Controls the angle that the boat will tack to between 50º - 150º in Heading hold mode.
- Wind function: Select what wind function the autopilot will use when in wind mode.
  - Auto:
    If TWA is <70º, Wind mode will use AWA.
    If TWA is ≥70º, Wind mode will use TWA.
  - Apparent
  - True
- Manual speed: If neither boat speed or SOG data is available and or deemed reliable a manual value for speed source can be entered and used by the autopilot to aid steering calculations.

12 Radar

About radar

Several radar sensors are supported.

This chapter describes features and options for a variety of supported radars. The features and options available to you are dependent on the radar antenna(s) connected to your system.

The Radar panel
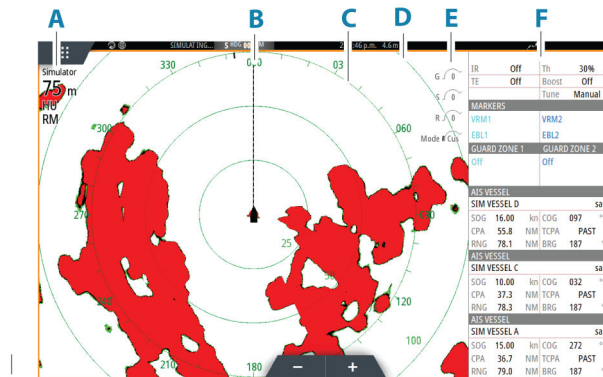
A	Radar information window
B	Heading line*
C	Compass*
D	Range rings *
E	Quick image controls
F	Data bar**

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

** You can show or hide the data bar using the data bar option in the radar settings dialog.

Dual radar

You can connect to any combination of two supported radars and see both radar images at the same time.

→ **Note:** Interference will be seen on the Broadband Radar on most ranges when a pulse or Halo radar, and a Broadband radar are transmitting at the same time on the same boat. We recommend to only transmit on one radar at a time. For example, transmit Broadband radar for typical navigational usage, or pulse or Halo radar to locate weather cells, defined coastlines at a distance and to trigger Racons.

You can select a dual radar panel by pressing and holding the Radar application button on the home page, or by creating a favorite page with two radar panels.

Selecting the radar source

You specify the radar in the Radar panel by selecting one of the available radars in the radar source menu option. If you have a multiple Radar panel, the radar is set individually for each radar panel. Activate one of the radar panels, and then select one of the available radars in the radar source menu option. Repeat the process for the second radar panel, and select an alternative radar for this panel.

→ **Note:** The 3-digit radar source number is the last 3 digits of the radar's serial number.

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.

➔ **Note:** A heading sensor must be present in the system for radar overlay.

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 Radar menu. The following modes are available:

Power off

The power to the radar scanner is turned off. **Power off** is only available when radar is in standby mode.

Standby

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

➔ **Note:** You can also put the radar in standby mode from the **System Controls** dialog.

Transmit

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

➔ **Note:** You can also put the radar in transmit mode from the **System Controls** dialog.

Radar Range

You adjust radar range by selecting the zoom icons on the radar panel.

Dual range

When connected to a radar with dual range capability, it is possible to run the radar in Dual Range mode.

The radar appears in the radar sources menu as two virtual radar sources A and B. Range and radar controls for each virtual radar source are fully independent and the source can be selected for a particular chart or radar panel in the same manner as dual radar described in *"Selecting the radar source"* on page 75.

➔ **Note:** Some controls that are related to physical properties of the radar itself are not independent of source. These are Fast Scan, Antenna Height and Bearing alignment.

MARPA is fully independent and up to 10 targets may be tracked for each virtual radar source.

Up to two independent Guard Zones may also be defined for each virtual radar source.

Radar sector blanking

If your radar has sector blanking capability, you can define up to four sectors on the PPI inside which no radar data is transmitted. This enables you to blank-out interference caused by features on your boat or from a secondary radar. The blanking occurs on the main radar

image and radar overlay on a chart. An enabled sector is shown as a magenta outline with 3 arcs crossing the blanking area. To specify radar sector blanking, refer to the unit's installation manual.
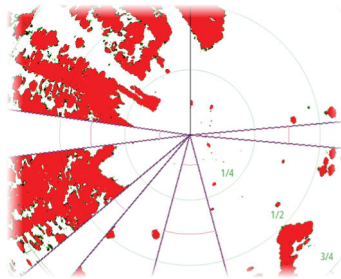
Main radar PPI

Radar overlay on a chart

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.

The radar control images are located in the upper right corner of the radar panel. You can adjust the image settings by selecting the radar control image or by pressing the rotary knob. The selected control expands and displays its name in full and a slide bar is displayed. You can then adjust the value by turning the rotary know or by using the slide bar.

You can also adjust the image settings from the radar menu.

Menu options can vary depending on your radar's capability.
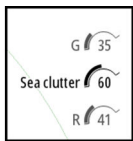
Radar modes

Use modes are available with preset control settings for different environments. Not all modes are available for all radar transceivers.

Modes in dual ranges

When connected to a radar with dual range capability, it is possible to run the radar in Dual Range mode.

Modes can be set independently for each range. For example, you can have Offshore mode for range A and Weather mode for range B. However, interaction between ranges occurs in some cases:

- When using Bird mode for both ranges, maximum range is restricted to 24 NM and range resolution is reduced.
- Fast scan - The antenna rotation speed is set to the slower of the two modes selected. For example, Fast Scan is disabled when using Harbor and Weather modes because Fast Scan is Off in Weather mode.
- The Interference reject setting can affect the interference seen or removed on both ranges.

Directional clutter rejection

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, or by pressing and holding the rotary knob.

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 for all radar systems except Halo, in addition to the manual mode where you can adjust the settings. For all radar systems except Halo, you select Sea clutter modes from the menu, or by a long press on the rotary knob. You can only adjust the Sea clutter value in manual mode.

Auto Sea Offset

To allow fine tuning of the Sea control while in Auto mode (Auto uses directional adaptive clutter rejection), the Auto setting may be offset.

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.

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.

Go to cursor

You can navigate to a selected position on the image by positioning the cursor on the panel, and then using the go to cursor menu option.

The cursor assist function

→ *Note:* The cursor assist function is available if it is enabled. Refer to *"Customizing the long press feature"* on page 18.

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.

Advanced radar options

Menu options can vary depending on your radar's capability.

Noise Rejection

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.

→ *Note:* To get maximum range performance from the 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. In some areas where extreme high interference may exist, try OFF for best radar image.
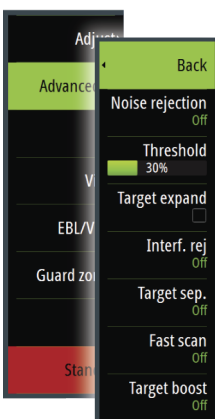
Radar threshold

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

Controls the target discrimination of the radar (separation between objects is more prominent).

Fast scan

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

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

View menu options vary depending on your radar antenna.

VelocityTrack

➔ **Note:** When VelocityTrack is enabled antenna rotation speed may be reduced.

➔ **Note:** When operating the radar in Dual range mode with one of the ranges set to 36 nm or more, increased VelocityTrack coloring noise over land areas may be seen.

Doppler coloring is a navigation aid to distinguish moving targets approaching or diverging from your vessel. The radar indicates if a target is approaching or diverging from your vessel when both these conditions are true:

- The target's relative speed is greater than the VelocityTrack speed threshold.
- The target is not geo-stationary (e.g. land or a marker buoy).

The following options are available:

- Off - turns off Doppler coloring
- Normal - approaching targets and diverging targets are colored.
- Approaching targets - only approaching targets are colored

The color of approaching and diverging targets depends on the palette used:

- Diverging targets are blue colored on all radar image palettes.
- Approaching target colors on radar image palettes:
    - Black/Red palette - Yellow

- White/Red palette - Yellow
- Black/Green palette - Red
- Black/Yellow palette - Red

VelocityTrack settings

Use this dialog to set speed thresholds of targets to be colored.

The speed threshold can be defined to apply for the radar source of the selected radar panel only, or to all radar sources connected to the system. The setting is only applied to those radars powered and connected at the time the setting is made. If the all radar sources option is selected, newly connected radars will use the specified values automatically.

VelocityTrack examples

Approaching and diverging moving targets can be indicated as neutral (not colored) in some circumstances. The navigator should be aware of these situations to safely use the VelocityTrack feature as an aid for collision avoidance.

Examples of how VelocityTrack behaves in 2 navigation scenarios is illustrated below. The illustrations show a target (**A**) crossing own vessel's (**B**) path.
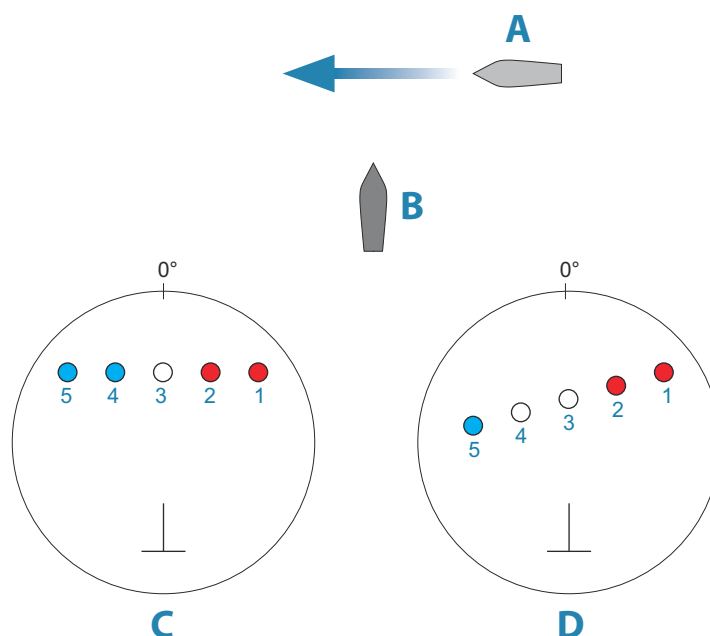
The examples show the target movement (1-5) over 5 radar scans with the radar in relative motion mode.

In example **C**, own vessel COG is 0°, and speed is 0 knots.

In example **D**, own vessel COG is 0°, and speed is 10 knots.

In both examples, the target COG is 270°, and the speed is 20 knots.

The colors in the examples are according to the colors used for black/green and black/yellow radar palettes:

- Red (**C1**/**C2** and **D1**/**D2**), indicating the target is on an approaching path to own vessel. Its relative speed at that point is greater than the VelocityTrack speed threshold.
- Not colored (**C3** and **D3/D4**), indicating it is temporarily neutral because its relative speed at that point is less than the VelocityTrack speed threshold.
- Blue (**C4**/**C5** and **D5**), indicating the target is diverging away from own vessel and its relative speed at that point is greater than the VelocityTrack speed threshold.

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).

Head-up

In head-up mode, the heading line on the PPI is oriented on the 0° on the bearing scale and towards the top of the screen. The radar image is displayed relative to own ship, and when the ship turns the radar image rotates.

➔ **Note:** Head-up is only available in relative motion mode, and it is the only orientation mode available if the radar is not connected to a heading source.

North up

In North up mode the 0° indication on the PPI represents north. The heading line on the PPI is oriented according to own ship heading obtained from the compass. When the ship turns the heading line changes its direction according to the ship's heading, while the radar image remains stabilized.

The North up orientation is not available if no heading source is connected to the radar. If heading data is lost, the system will automatically switch to Head-up orientation.

Course up

In Course up mode, the top of the bearing scale indicates the ship's true course measured from north at the time Course up was activated. When the ship turns the bearing scale remains fixed, while the heading line rotates with the ship's yawing and course change.

The Course up orientation is reset by re-selecting the Course up mode.

Radar motion mode

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

Relative motion

In relative motion your vessel remains in a fixed location on the Radar PPI, and all other objects move relative to your position.

You select the position of the fixed location as described in *"Offsetting the PPI center"* on page 82.

True motion

In true motion your vessel and all moving targets move across the Radar PPI as you travel. All stationary objects remain in a fixed position. When the vessel's symbol reaches 75% of the PPI radius (**A**), the radar image is redrawn with the vessel symbol re-positioned (**B**) 180° opposite the current heading bearing.
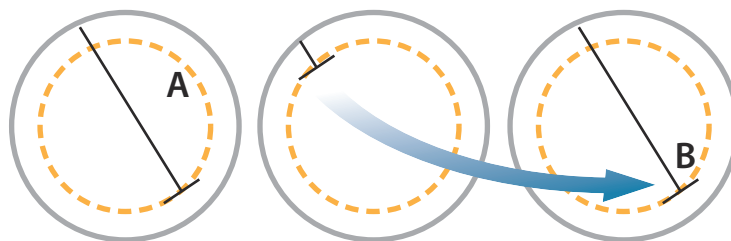
When true motion is selected, the true motion reset option is available from the menu. This allows for manually resetting the radar image and vessel symbol to its starting position.

→ **Note:** True motion is only available when the PPI is in either north up or course up orientation mode.

Offsetting the PPI center

You can set the antenna position origin to a different location on the radar PPI. The options described in the next sections are available.

| *PPI center: Center* | *PPI center: Look Ahead* | *PPI Center: Offset* |
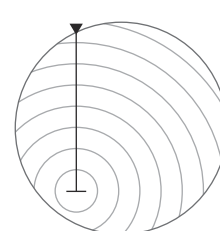
→ **Note:** The bearing scale is according to the Consistent Common Reference Point (CCRP), while the offset sets the radar antenna position on the PPI. The maximum off-centering allowed is 75% of the radius at the current range. This may result in the CCRP being outside of the bearing scale. In such cases the measurements are still taken by the CCRP and the bearing scale is compressed accordingly.

Center
The Center option resets the antenna position to the center of the PPI.

Look ahead
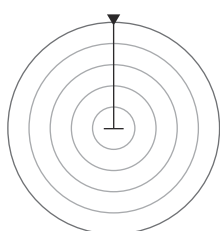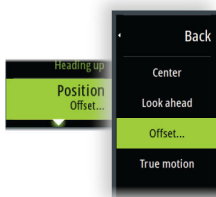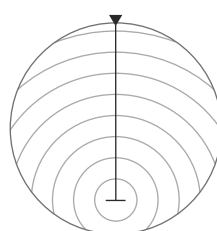The Look ahead option is used to maximize the view ahead of the vessel. When selected the PPI center is placed at 70% of the radius of the PPI, 180° opposite the top of the display.

→ **Note:** Look ahead is only available for Heading Up radar orientation.

Offset
This option allows you to use the cursor for selecting the PPI center.

Move the cursor to the preferred offset position, and confirm your selection.

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.
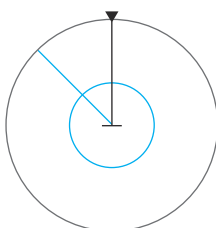
Defining an EBL/VRM marker
1. Ensure that the cursor is not active
2. Activate the menu, select **EBL/VRM**, then select **EBL/VRM 1** or **EBL/VRM 2**
   - The EBL/VRM is now positioned on the radar image

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 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 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 to save your settings.
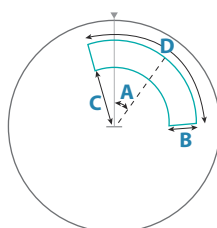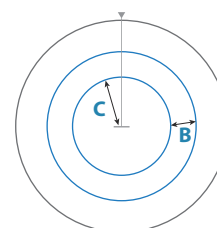
Shape: Sector   *Shape: Circle*

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 85.

MARPA tracking is an important tool for collision avoidance.

→ *Note:* MARPA requires heading data for both the radar and the unit.

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 before activating the menu.

Viewing MARPA target information

If the pop-up is activated, you can select a MARPA target to display basic target information. Information for the 3 MARPA targets closest to the vessel is also displayed in the data bar.

When a target is selected, detailed information for the target can be displayed from the menu.

You can display information about all MARPA targets by using the Vessels tool option on the Home page.

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).

Recording radar data

You can record radar data and save the file internally in the unit, or save it onto a storage device connected to the unit.

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.

→ **Note:** The record menu option is available if recording is turned on in the Advanced system settings.

If more than one radar is available, you can select which source you want to record.

Radar settings
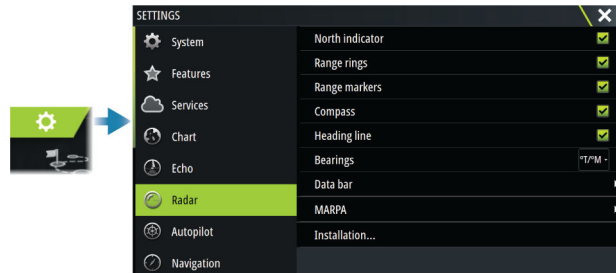
Radar symbology

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

History length

Trails can be used to visualize the previous positions of a tracked target.

The history length defines the time presentation of the trail.

Safe ring

A safe ring 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 89.

Installation

The Installation option is used for radar installation, described in the separate Radar or the unit's installation manuals.

13

AIS

About AIS

If a compatible AIS (Automatic Identification System) is connected to the system, AIS targets 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 and radar images.

The AIS is 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.
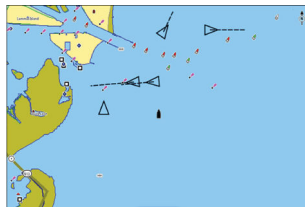
AIS vessels on a chart panel
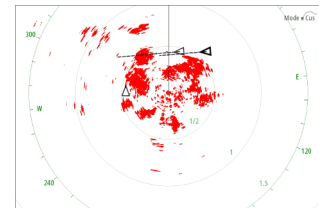
AIS vessels on a radar panel
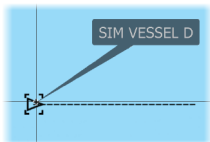
Selecting an AIS target

When you select an AIS icon, the symbol changes to selected target symbol. Only one target can be selected at a time.

→ *Note:* Pop-up information must be enabled to see the vessel's name. Refer to *"Chart settings"* on page 32.

Searching for AIS vessels

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.

Displaying target information

The vessels dialog

The vessels dialog displays a list of all targets.

By default, the dialog lists targets, arranged by distance to own vessel. You can select to change the sort order, and to display only a selected target type.

The vessels dialog also lists received AIS messages.
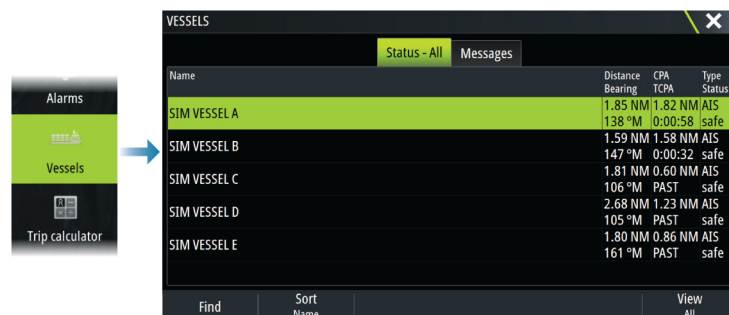
AIS vessel details

Detailed information about an AIS target is available from the AIS vessels details dialog.

To display the dialog:

- select the AIS pop-up
- select the info option in the menu

AIS information on radar panels

The radar data bar includes information about 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 or NMEA 0183, a DSC call can be initiated to other vessels from the unit.

The call option is available in the AIS vessel details dialog, and in the vessel status dialog. Refer to *"Displaying target information"* on page 86.

DSC Vessel tracking

DSC (Digital Selective Calling) is a semi-automated method of requesting or receiving position data from a vessel with a DSC VHF radio. For more information on how to use this, refer to your VHF radio manual.

There are various types of DSC position messages, including distress calls. The type of message made determines information sent with the call, and how the radio and MFD respond to the incoming call.

When a DSC message has been received, the MFD will display a DSC vessel icon on the chart panel and radar panel at the received coordinates. In addition, some radios will send COG and SOG with the position data. This allows for correct orientation of the icon.

When receiving a distress message you will see an alarm box informing you that a message has been received. This can be read under the messages tab on the vessels dialog. Select the vessels button in the toolbar to display the vessels dialog.

AIS SART

When an AIS SART (Search and Rescue Transponder) 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:	972035502
Latitude:	S 36°34.897'
Longitude:	E 174°51.571'
Bearing (°M):	348
Distance (mi):	17.8
Ignore	Save waypoint	Activate MOB
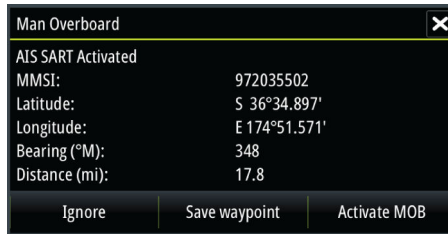
You have the following options:

- 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.
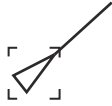
Vessel alarms

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.
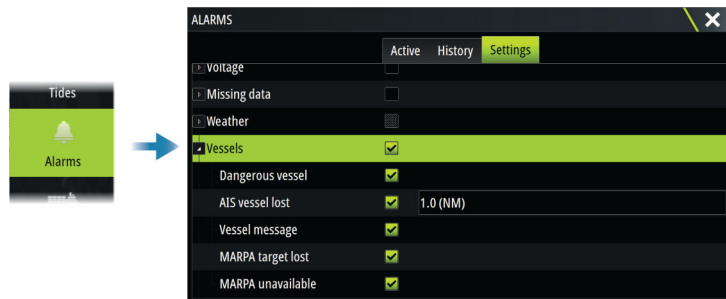
AIS target symbols

	Safe AIS target with course extension line turned off. Bold lines indicates dangerous AIS target.
	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".
	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.
	AIS SART (AIS Search And Rescue Transmitter).
	AtoN (Aids To Navigation)

Vessel settings
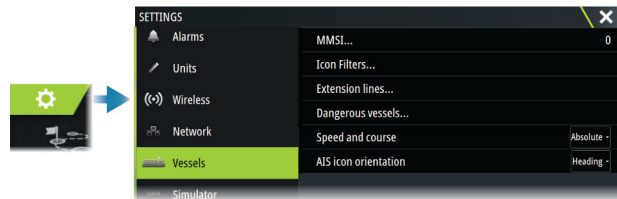
MMSI

Used for entering your own MMSI (Maritime Mobile Service Identity) number into the system. You need to have this number entered to receive addressed messages from AIS and DSC vessels. You also need to have your MMSI number entered to avoid seeing your own vessel as an AIS target.

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.
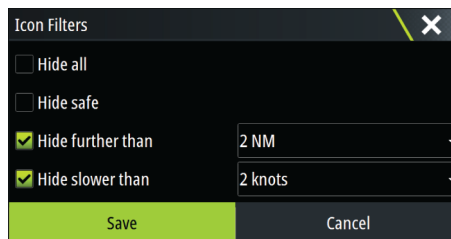
Extension lines

Defines the length of course over ground and heading extension lines for your own vessel and for other vessels.

The length of the extension lines is set to indicate the distance the vessel will move in the selected time period.

Your own vessel heading information is read from the active heading sensor, and COG information is received from the active GPS. For other vessels COG data is included in the message received from the AIS system.

Defining dangerous vessels

You can use the CPA (Closest point of approach) and TCPA (Time to closest point of approach) values to define when a target should be considered as dangerous. When a target comes within the distance for CPA or within the time limit for TCPA, the symbol changes to the dangerous target symbol.

Dangerous Vessels	✕
Vessels are considered dangerous when their closest point of approach is predicted to be less than the following distance, within the specified time.	
Closest point of approach (m)	0152
Time to closest point of approach (mm:ss)	05:00
Save	Cancel
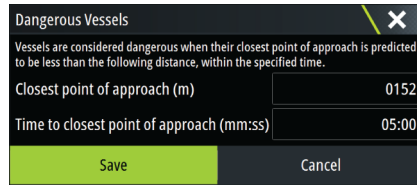
Speed and course

The extension line can be used to indicate speed and course for targets, either as absolute (true) motion or relative to your vessel.

AIS icon orientation

Sets the orientation of the AIS icon, either based on heading or COG information.

14 Echosounder

About

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

Requirements

The unit has a built-in echosounder. A compatible echosounder transducer is required.

The image
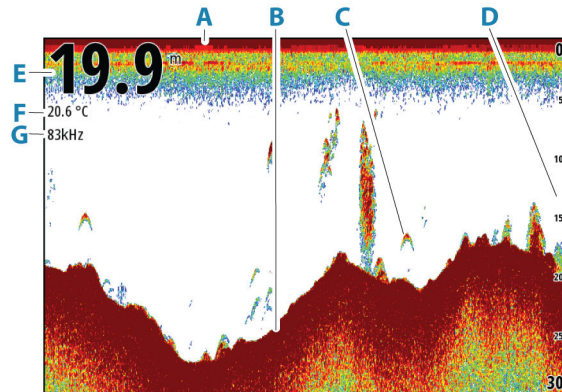
A	Surface
B	Bottom
C	Fish arches
D	Range scale
E	Depth
F	Temperature
G	Frequency

Multiple sources

You can specify the source for the image in the active panel. You can display different sources simultaneously using a multi-panel page configuration.

For more information on how to select the source for a panel, refer to *"Source"* on page 94.

Zooming the image

You can zoom the image.

kHz / 4x

The zoom level is shown on the image. If the cursor is active, the system zooms in where the cursor is positioned.
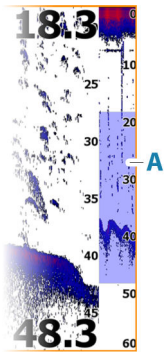
Zoom bar

The zoom bar (**A**) 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 panel

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

When you position the cursor on the panel, the image pauses and the cursor information window is activated. The depth and range of the cursor is shown at the cursor position.

Viewing history

Whenever the cursor is shown on the panel, the history bar (**A**) is shown at the top of the panel. The history bar shows the image you are currently viewing in relation to the total image history stored.

You can view history by panning the image.

To resume normal scrolling, clear the cursor.
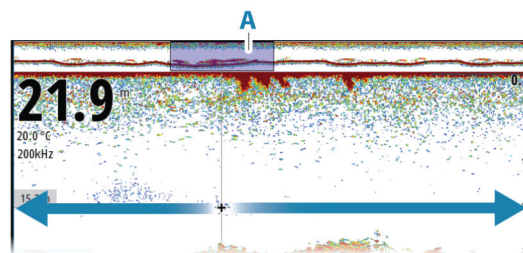
Recording log data

Start recording log data

You can start recording log data and save the file internally in the unit, or save it onto a storage device connected to the unit.

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.

Specify recording settings in the recording dialog.
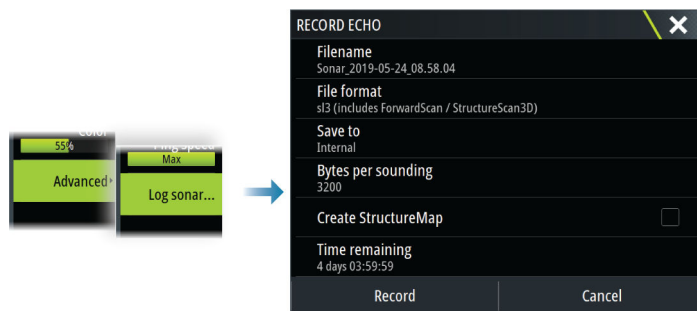
Stop recording log data

Use the stop logging option to stop recording log data.
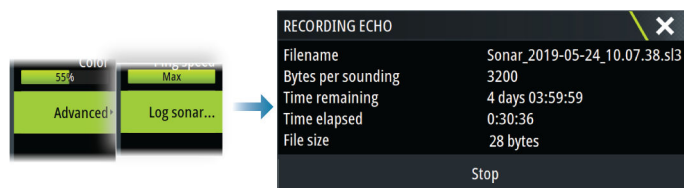
Viewing recorded data

Both internally and externally stored sounder records can be reviewed when the view sonar log option is selected in the echo settings dialog. Refer to *"Echosounder settings"* on page 96.

Upload sonar logs to C-MAP Genesis

To upload sonar logs to C-MAP Genesis do one of the following:

- Use the services option. Follow the prompts to sign in and transfer the log files to C-MAP Genesis.
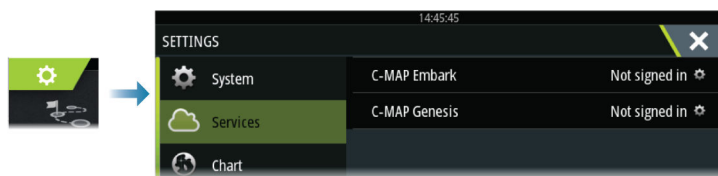
- Use the Storage dialog. Select the sonar logs icon and the logs you want to transfer. If you are already signed in to C-MAP Genesis the files are transferred. If you are not signed in, select the transfers icon and follow the prompts to sign in and transfer the log files to C-MAP Genesis. You can sign in and transfer files at a later time when the unit is connected to the internet.
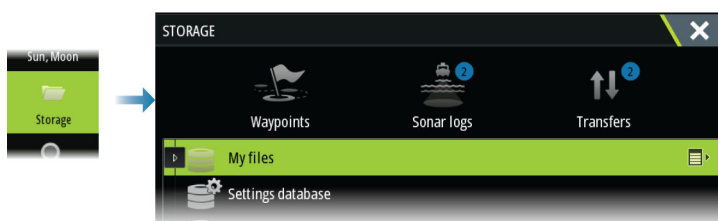
Customizing the image

Use the menu to customize the image. When the cursor is active, some options in the menu are replaced with cursor mode features. Select the clear cursor option to return to the normal menu.
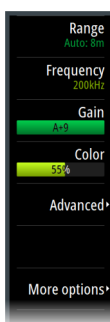
Range

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

→ **Note:** Setting a deep range in shallow water may cause the system to lose track of the depth.

Preset range levels

Select a preset range level manually from the menu.

Auto range

In auto range, the system automatically displays the whole range from the water surface to the bottom.

Select the range option and then the auto option in the menu.

Custom range

This option allows you to manually set both upper and lower range limits.

Set a custom range by selecting the range menu option and then the custom option.

→ **Note:** Setting a custom range puts the system in manual range mode.

Frequency

The unit supports several transducer frequencies. Available frequencies depend on the transducer model that is configured for use.

- A low frequency, for example 50 kHz, will go deep. It generates a wide cone but is more sensitive to noise. It is good for bottom discrimination and wide area search.
- A high frequency, for example 200 kHz, offers higher discrimination and is less sensitive to noise. It is good for separating targets and for higher speed vessels.

Gain

The gain controls the sensitivity. The more you increase the gain, the more details are shown on the image. However, a higher gain setting may introduce more background clutter. If the gain is set too low, weak echoes might not be displayed.

A manual and an automatic gain mode are available. By default, the gain is set to Auto.

Color

Strong and weak echo signals have different colors to indicate the different signal strengths. The colors used depend on which palette you select.

The more you increase the color setting, the more echoes are displayed in the color at the strong return end of the scale.

Source

➔ **Note:** Available only if multiple sources with the same capability are available.

Used to specify the source for the image in the active panel.

You can display different sources simultaneously, using a multi-panel page configuration. Menu options for each panel are independent.

➔ **Note:** Using transducers at the same frequency can cause interference.

For source setup information, refer to the Zeus³S Installation Manual.

Measuring distance

The cursor can be used to measure the distance between the positions of two observations on the image.

1. Position the cursor on the point from where you want to measure the distance
2. Select the measure menu option

➔ **Note:** The measure option is not available unless the cursor is placed on the image.

3. Position the cursor on the second measuring point
   - A line is drawn between the measuring points, and the distance listed in the Cursor Information window
4. Continue selecting new measuring points if required

Use menu options to re-position the start point and the end point as long as the measuring function is active.

Select the finish measuring menu option to resume normal image scrolling.

Advanced options

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

Noise rejection

Filters out signal interference and reduces on-screen clutter.

TVG

Wave action and boat wakes can cause onscreen clutter near the surface. The TVG (Time Variable Gain) 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.
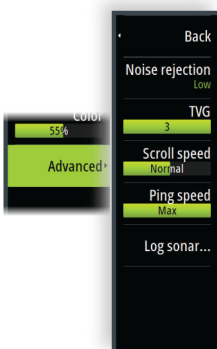
→ **Note:** In certain conditions it may be necessary to adjust the scroll speed to get a more useful image. Such as adjusting the image to a faster speed when vertically fishing without moving.

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.

Log sonar
Select to start and stop recording of echosounder log data. For more information, refer to *"Recording log data"* on page 92.

More options
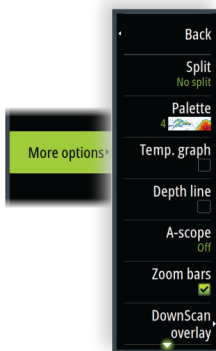
Split screens

Zoom
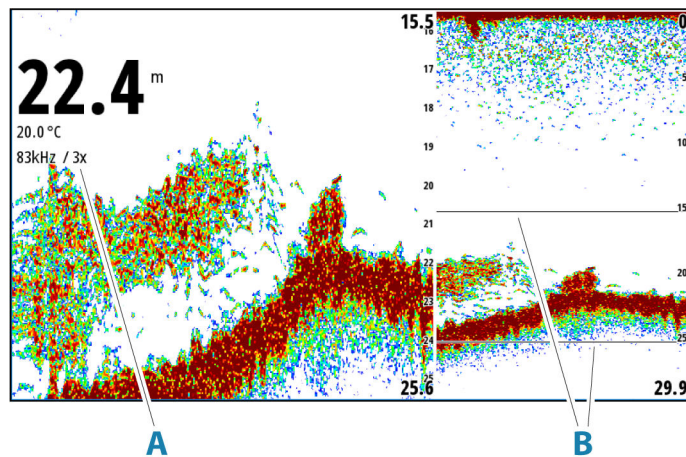
| **A** | Zoom level |
| **B** | Zoom bars |

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.

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.

Move the zoom bars up/down on the image to view different depths of the water column.

Bottom lock
The bottom lock mode is useful when you want to view targets 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.

Palettes
Used for selecting the image's color palette.

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 image.

Depth line

When toggled on, a line is shown on the bottom surface. The depth line makes easier to distinguish the bottom from fish and structures.

Amplitude scope

The amplitude scope is a display of an echo sounding on the panel. The strength of the actual echoes are indicated by both width and color intensity.

Zoom bar

The zoom bar (**A**) is displayed when you zoom the image.

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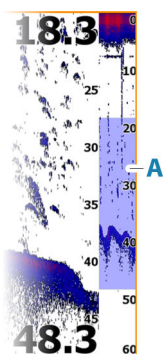
Overlay DownScan

When a DownScan capable transducer is connected to your system, you can overlay DownScan images on the regular Echosounder image.

When overlay DownScan is activated, the Echosounder panel menu expands to include basic DownScan options.

Pause

Pauses the image, allowing you to examine the image in detail.

The pause function stops the echosounder from pinging. The system is not collecting data when paused in this manner.

Fish ID

You can select how you want the fish targets 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.
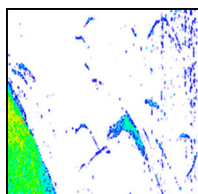
Traditional fish arches	Fish symbols	Fish symbols and depth indication
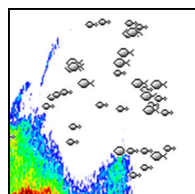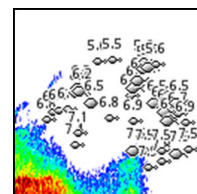
➔ **Note:** Not all fish symbols are actual fish.

Echosounder settings

Internal echosounder CH1 and CH2

When selected, the internal echosounder channel is available for selection in the echosounder panel menu.

When unselected, this option disables the internal echosounder channel in the unit. It will not be listed as an echosounder source for any unit on the network. Unselect this option for channels with no transducer connected.

Network Echosounder

Select to share transducers from this unit with other units connected on the Ethernet network. In addition, the setting must be selected in order to see other enabled sonar devices on the network.

When unselected, transducers connected to this unit cannot be shared with other units connected on the network, nor can it see other sources on the network that have this feature enabled.

For more information about how to setup the echosounder, refer to the separate Installation manual.

Network echosounder mode

The network echosounder mode setting selects whether only one or multiple echosounder sources can be selected at the same time.

➔ **Note:** Single source is automatically selected if there are older legacy echosounders on the network. You cannot change this setting if older legacy echosounders are on the network. Multi-source mode should be selected if no legacy echosounder is connected to the network.

➔ **Note:** When changing the mode to multi-source you must wait 30 seconds and then power down all sources for. Wait 1 minute, then restart all connected sources.

View sonar log

Used to view 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 image. If more than one channel was recorded in the selected log file, you can select which channel to display.

Structure depth offset

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 vessel to the bottom, set the offset equal to the vertical distance between the transducer and the lowest part of the vessel, **A** (negative value).
- To show the depth from the water surface to the bottom, set the offset equal to the vertical distance between the transducer and the water surface, **B** (positive value)
- For depth below transducer, set the offset to 0.

Installation

Used for installation and setup. See the separate Installation manual.

Restore echosounder defaults

Restore echosounder settings to the factory supplied defaults.

Use network depth and temp data

Selects from which network source depth and temperature data is shared on the NMEA 2000 network.

ForwardScan installation

Available when the ForwardScan feature is connected.

For setup information, refer to *"ForwardScan installation settings"* on page 101.

15 ForwardScan

About ForwardScan

ForwardScan sonar is a navigational aid that helps you monitor the underwater environment in front of your vessel while carrying out slow speed maneuvers.

To use the ForwardScan feature you must have a ForwardScan transducer mounted on your vessel.

With dual sonar capability a sonar/CHIRP and a ForwardScan transducer can be connected directly to the unit.

The ForwardScan transducer must be connected to a compatible sonar module (or another unit which has built-in sonar shared over the network).

If you have both a sonar/CHIRP and a ForwardScan transducer connected to different sonar modules (or another unit which has built-in sonar shared over the network), you can view both simultaneously on a single device.

> ⚠ **Warning:** Do not rely on this equipment as your principle source of navigation or hazard detection.

> ⚠ **Warning:** Do not use this equipment to gauge depth or other conditions for swimming or diving.

The ForwardScan image
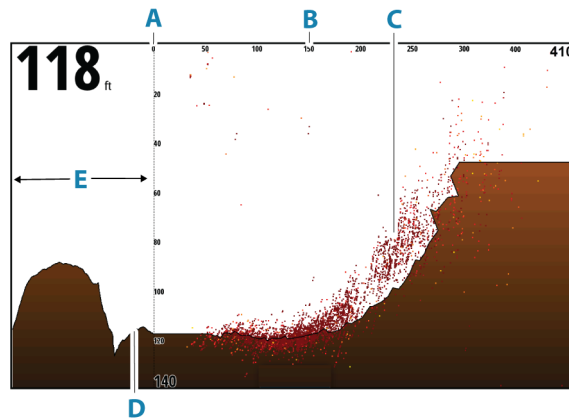
A	Depth range scale and vessel position
B	Forward range scale
C	Point data
D	Bottom
E	Depth history
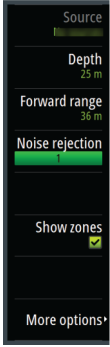
Setting up the ForwardScan image

Source

→ *Note:* Available only if multiple sources with the same capability are available.

Used to specify the source for the image in the active panel.

You can display different sources simultaneously, using a multi-panel page configuration. Menu options for each panel are independent.

→ *Note:* Using transducers at the same frequency can cause interference.

For source setup information, refer to the Zeus³S Installation Manual.

Depth

Controls depth range. Depth range is set to auto mode by default.

Forward range

Controls the forward looking search range. Maximum Forward range is 91 meters (300 feet).

Noise rejection

Filters out signal interference and reduces on-screen clutter.

Show zones

Displays warning zones (yellow) and critical zones (red) on the screen. Refer to *"Critical forward range and Critical depth"* on page 101.

More options
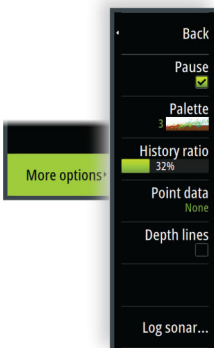
Pause

Pauses the image, allowing you to examine the image in detail.

The pause function stops the echosounder from pinging. The system is not collecting data when paused in this manner.

Palettes

Used for selecting the image's color palette.

History ratio

Controls how much sounder history is shown behind the boat. The higher the ratio, the more history will be shown.

Point data

By default, ForwardScan only shows the bottom. Select this option to specify to view no sounder data points, all data points, or only points (objects) in the water column.

Depth lines

Displays lines on the screen that make it easier to quickly estimate depth and the underwater objects.

Recording ForwardScan data

Displays the record dialog. ForwardScan log data can be recorded by selecting the correct file format (sl3) in the record dialog. For more information, refer to *"Recording log data"* on page 92.

Heading extension

Use the chart heading extension to monitor ForwardScan on the chart panel. Heading extension colors are based on the ForwardScan alarm values.
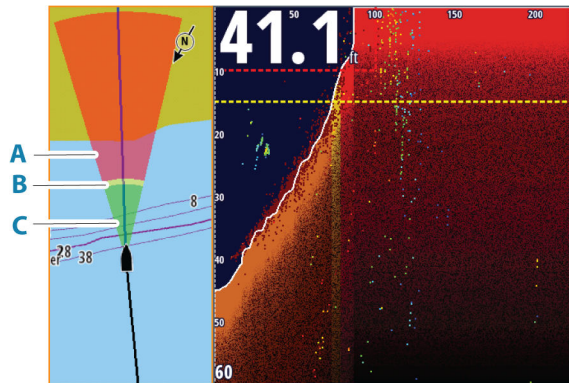
A   Red - Critical

B   Yellow - Warning

C   Green - Safe

Setting up ForwardScan extensions

Select ForwardScan in the chart settings dialog to view the ForwardScan heading extension on the chart panel.
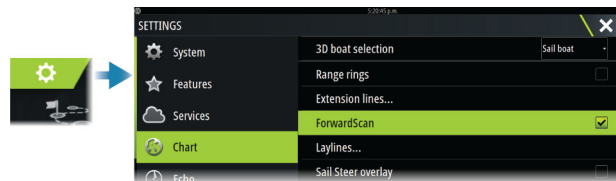
ForwardScan installation settings

Specify the setup in the ForwardScan installation dialog.
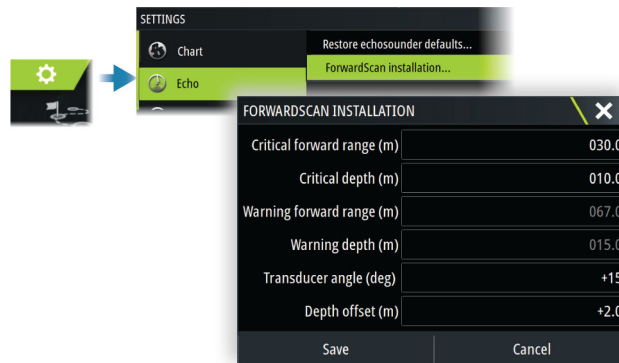
Critical forward range and Critical depth

Critical Forward Range and Critical Depth are user-selected thresholds that define a critical zone forward of your vessel.

If the alarm is turned ON and you travel into water shallow enough to cross into the critical zone, the Critical Zone alarm is activated.

To receive Critical Zone alarms, enable the Forward range alarm in the Alarm settings dialog. For more information about enabling alarms, refer to *"Alarms"* on page 126.

You can show the critical warning zones on the image by activating the Show zones menu option.
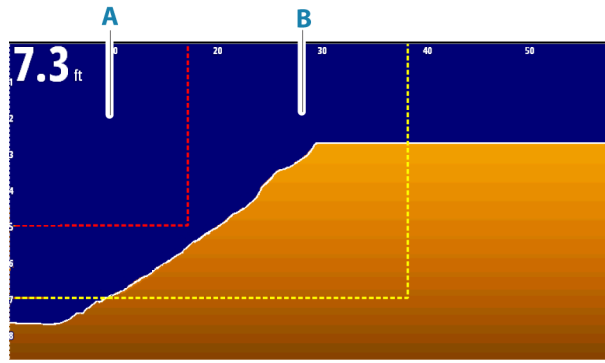
A	Critical zone
B	Warning zone

Warning forward range and warning depth

Set the warning forward range and warning depth thresholds that define the warning zone lines shown on the ForwardScan image.

Offset angle

The offset angle is used to fine tune the transducer angle if the transducer is not installed parallel to the waterline.

If the mounting angle of the transducer is off, the image can be misrepresented.

The angle can be adjusted from 0 (vertical) to 20°.

> ⚠ Warning: Adjustments to the offset angle value should be done with caution. Large variations in the offset angle value can distort depth data, increasing the risk of striking underwater obstructions.

Depth offset

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 vessel to the bottom, set the offset equal to the vertical distance between the transducer and the lowest part of the vessel, **A** (negative value).
- To show the depth from the water surface to the bottom, set the offset equal to the vertical distance between the transducer and the water surface, **B** (positive value)
- For depth below transducer, set the offset to 0.

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Instruments

About Instrument panels

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

➔ **Note:** To include fuel/engine information, engine and tank information has to be configured from the Settings panel.

Dashboards

A set of dashboard styles are predefined to display vessel, navigation, angler and instrument 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*　　*Instrument dashboard*

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

Customizing the Instruments panel

You can customize the Instruments 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 Instruments 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 either press and hold on the gauge you want to change and select the information to be displayed or do the following:

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
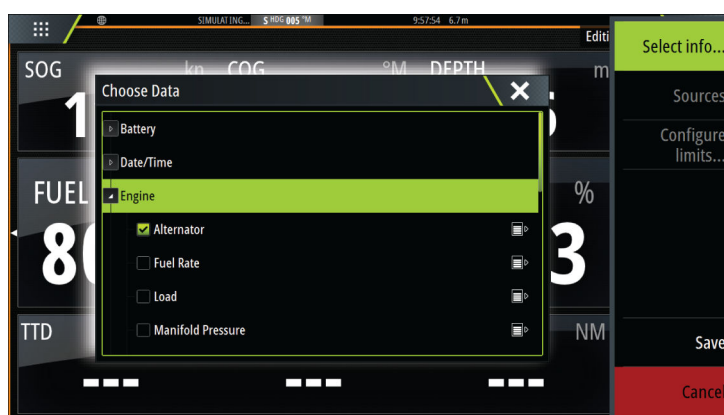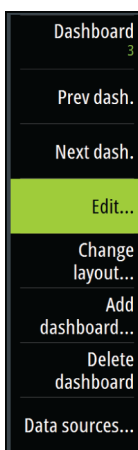
17 Weather

About the weather feature

The system includes weather functionality that allows the user to view forecast data overlaid on the chart. This helps gaining a clear understanding of the weather conditions that are likely to appear.

The system supports weather data in GRIB format, available for download from various weather service suppliers.

The system also supports weather data from SIRIUS Marine Weather Service. This service is available only in North America.

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.

N   24°03.491'
W 81°30.898'
115.5 NM, 224 °M
Moderate rain
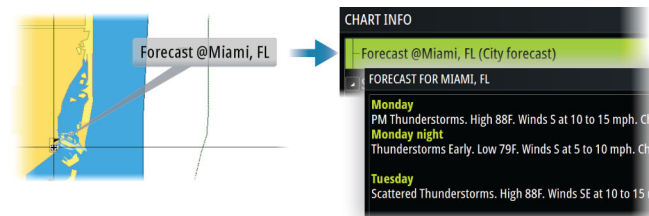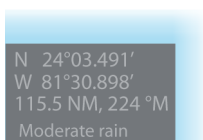
GRIB weather

A GRIB file contains forecast information for a set number of days. It is possible to animate the weather data, which shows how weather systems are developing.

Importing GRIB data

GRIB data imported into memory can be displayed as chart overlay. The file can be imported from any location that can be seen in the storage manager.

➔ *Note:* GRIB data that is imported overwrites the GRIB data in memory.

You can import the GRIB files:

• From the storage manager
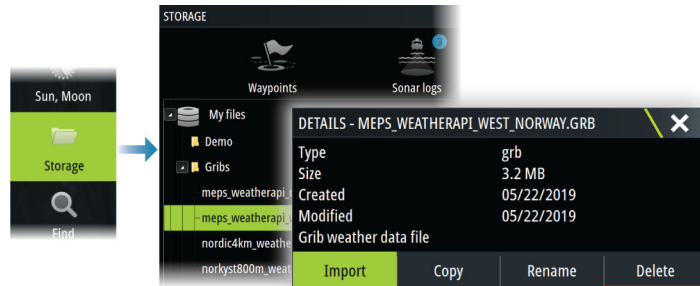
• From the forecast menu option on the chart panel. The Grib weather option is only available if Grib weather is set as the overlay on the chart.
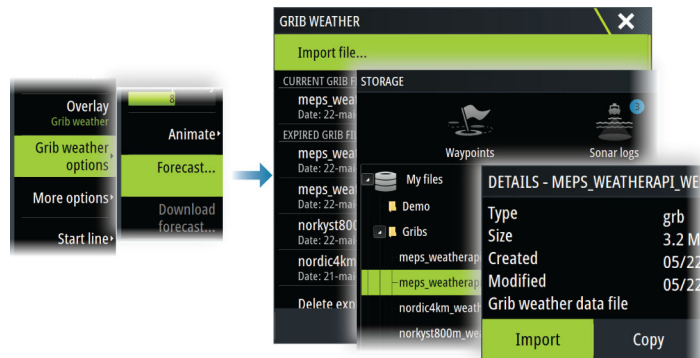
Displaying GRIB weather as overlay

Imported GRIB weather data can be displayed as an overlay on your chart panel.

When the GRIB weather overlay option is selected, the chart menu increases to show GRIB weather options. From this menu you can select which weather symbols you want to display, set the distance between the barbs, and adjust the opaqueness of the weather symbols.
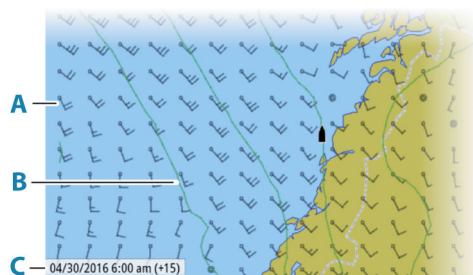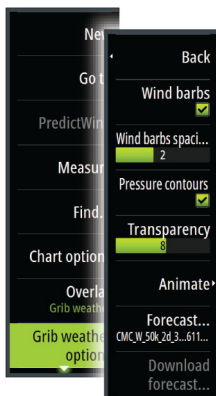
A	Wind barbs
B	Pressure contours
C	GRIB information window

GRIB information window

The GRIB information window shows the date and time for the GRIB weather forecast, and the selected forecast time in brackets. A negative value in the brackets indicates historic weather data.

If you select a position on the chart, the information window expands to include weather details for the selected position.

Animating GRIB weather forecast

The GRIB data contains forecast information for a set number of days. It is possible to animate the weather data and to show the predicted forecast for a specific time and date. The time scales vary depending on the file you are using.

The time shift is shown in brackets in the GRIB information window. The time is relative to the current time as provided by a GPS device connected to the system.

Select time and animation speed from the menu.

PredictWind weather and routing

For information about PredictWind weather and PredictWind routing, refer to *"PredictWind"* on page 59.

SiriusXM weather

About SiriusXM weather

→ *Note:* SiriusXM weather is available for North America only.

When a Navico satellite weather receiver module is connected to your system and with the appropriate subscription, Sirius marine weather information is available.

The options available depend on the satellite weather receiver module connected to your system and your subscription.

Sirius 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.
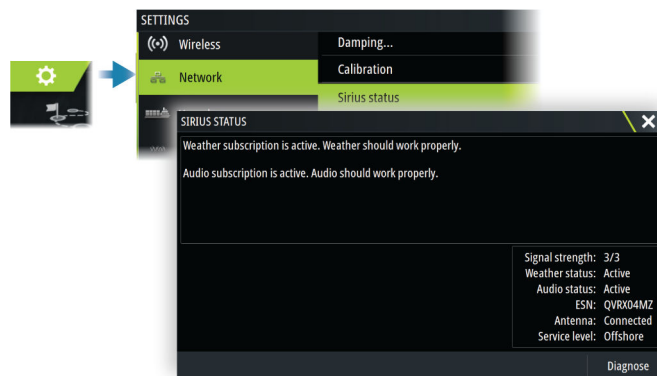
The status panel shows signal strength is indicated as 1/3 (weak), 2/3 (good) or 3/3 (preferred). It also includes antenna status, service level, and the electronic serial number for the weather module.

Sirius weather panel

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.
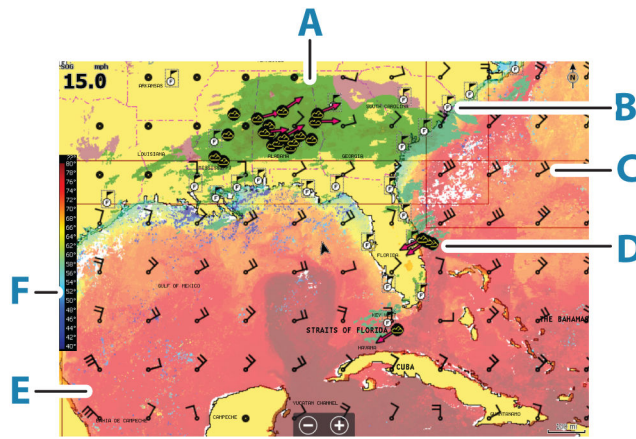
A	Precipitation color shading
B	City forecast icon
C	Wind barb
D	Storm icon
E	SST color bar
F	SST color shading

Local weather

The local weather dialog shows current weather and weather forecast for your current location.
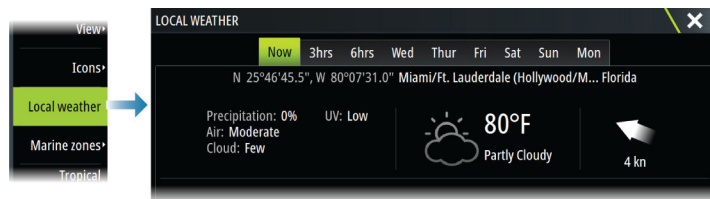
Weather options

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. Refer to *"Adjusting color codes"* on page 109.

Forecast wave indication

Colors can be used to indicate forecast wave height. The highest waves are dark red, while the lowest are blue.
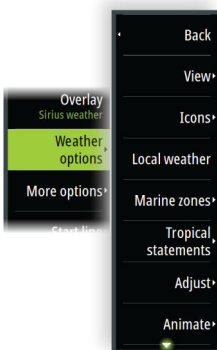
You can define how the color codes are used to identify the wave height. Refer to *"Adjusting color codes"* on page 109.

Forecast wind barbs
Forecast wind barbs can be shown or hidden on the weather panel.

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.

Select an icon to display detailed weather information.

	City forecast
	Surface observation
	Tropical storm tracking; past (grey) - present (red) - future (yellow)
	Hurricane (category 1-5) tracking; past (grey) - present (red) - future (yellow)
	Tropical disturbance/depression tracking; past (grey) - present (red) - future (yellow)
	Storm attributes
	Lightning
	Watch box location and warning
	Marine zone location

Marine zone

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 and view its forecast. You can also select a marine zone as your current zone of interest to be notified of any weather warnings in that zone.

12.0
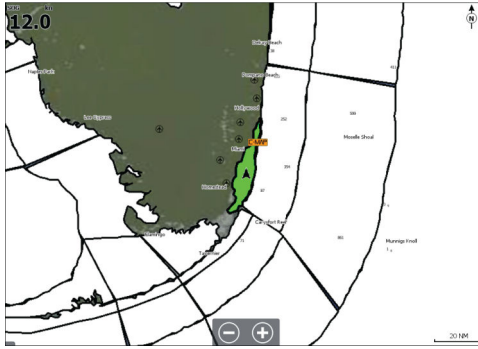
Tropical statements

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 weather graphics

The weather information you have turned on is recorded. 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 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 panel.

Time: -3 hours

Transparency

Adjusts the transparency of the overlay.

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.
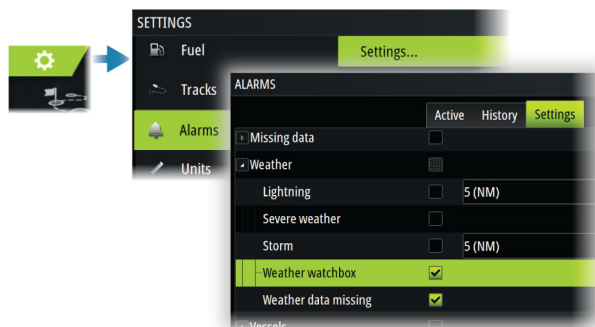
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Video

About the video function

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

For information about how to connect the camera, see the unit's separate installation manual.

The video panel

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

If more than one source is available, you can select to view one channel source only or to cycle the image between available video sources.

The cycle period can be set from 5 to 120 seconds.

Additional options

Depending on the selected video source the options in the menu may vary.

The settings are adjusted individually for each video source.
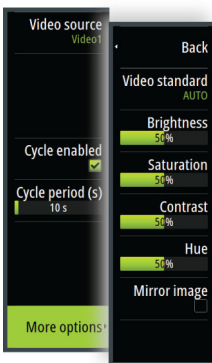
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Audio

About the audio function

If a compatible audio server is properly installed/connected and setup with your system, you can use the unit to control and customize the audio system on your vessel.

For installation, setup and connection information, refer to the unit's installation manual and to the documentation included with the audio device.

The Audio controller

The control buttons, tools and options vary from one audio source to another.
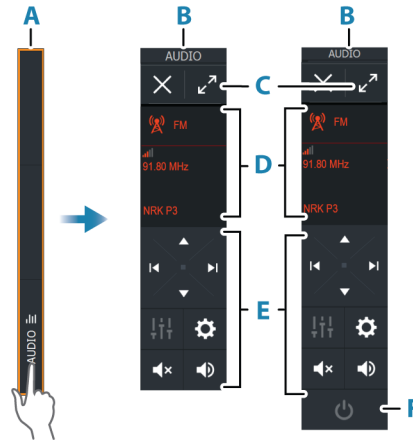
A	Control bar
B	Audio controller, small and large displays
C	Maximize button, expands the audio controller
D	Source and source information
E	Control buttons
F	ON/OFF button The OFF button is located in the source list on small displays.

Setting up the audio system

Audio server

If multiple audio sources are connected to the same network, one of the devices must be selected as the audio server. If only one device is present, it is the selected audio server by default.

Setting up the speakers

→ **Note:** The number of mixer options depends on active audio server.
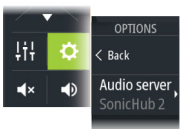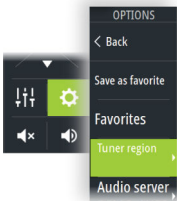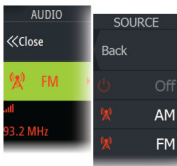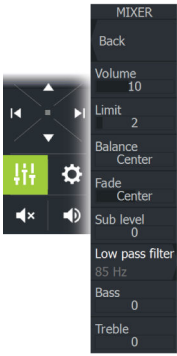
Speaker zones

This device can be set up to control different audio zones. The number of zones depends on the audio server connected to your system.

You can adjust balance, volume and volume limit settings individually for each zone. Adjustments to the bass and tremble settings will alter all zones.

Master volume control

By default, the volume for all speaker zones are adjusted when you adjust the volume.

You can adjust each speaker zone individually. You can also define which zones that shall be altered when you adjust the volume.

Selecting audio source

Use the source button to display the list of audio source. The number of sources depends on the active audio server.

Bluetooth devices

If your audio server supports Bluetooth, Bluetooth will be listed as a source.

Use the Bluetooth icon in the audio controller to pair the audio server with a Bluetooth enabled device such as a smart phone or tablet.

Using an AM/FM radio

Selecting the tuner region

Before using FM, AM or a VHF radio, you must select the appropriate region for your location.

Radio channels

To tune in to an AM/FM radio channel:

- press and hold the left or right audio control button

To save a channel as a favorite:

- select the favorite menu option

To page through favorite channels:

- select the up or down audio control button

List of favorite channels

The favorite list can be used for selecting a channel, and for deleting the saved channels from the list.
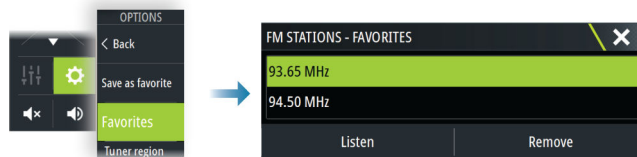
Sirius radio

→ **Note:** Sirius radio is available in North America only.

If you have a compatible Sirius XM receiver connected to your system, you can control the receiver from the Audio control bar.

Sirius 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.

Lists of Sirius channels

Several options are available for displaying the Sirius channels.
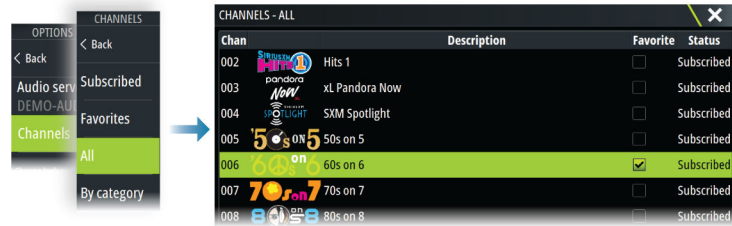
Sirius favorite channels

You can create your favorite channels from within the list of all channels and the list of subscribed channels.

Selecting a Sirius channel

To select a channel:

- select the left or right audio control button

To page through favorite channels:

- select the up or down audio control button

Locking channels

You can lock selected Sirius channels from being broadcasted. A user selected 4-digit code must be entered to lock and unlock channels.

Viewing DVD video

If your audio server supports DVD playback, you can control the DVD player from the audio controller when the audio source is set to DVD.

Video standard

Select the video format for the Audio server to match the display connected to the Audio server.
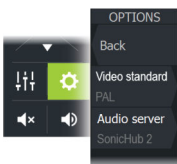
20 Internet connection

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.

Ethernet connection

The unit is automatically connected to the internet when connected to an Ethernet network with internet access.

WiFi connection

Use the WiFi functionality to:
- Connect the unit to the internet. For more information, refer to *"Wireless settings"* on page 114.
- Connect the unit to wireless devices such as smart-phones and tablets. The smart-phones and tablets can then be used to remote view and control the unit. For more information, refer to *"Remote control of the MFD"* on page 116.

Wireless settings

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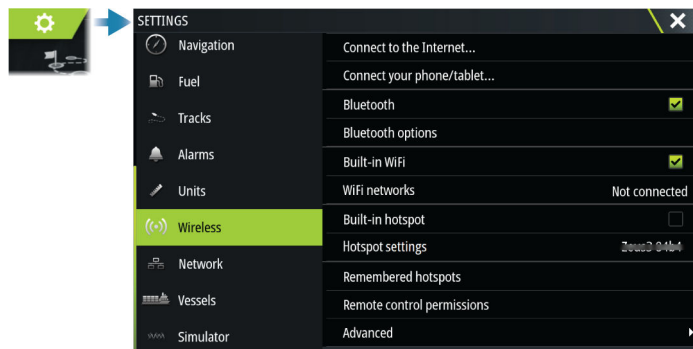
Connect to the internet

Used for connecting to a hotspot which has internet access.

When connected, the text changes to include Already connected.

Connect your phone/tablet

Used for connecting a phone or tablet to the MFD. Refer to *"Remote control of the MFD"* on page 116.

Bluetooth

Enables the built-in Bluetooth functionality.

Bluetooth devices

Displays the Bluetooth device dialog. Use this dialog to pair or remove pairing to Bluetooth enabled devices.

Select a device to:
- display device details
- connect, disconnect or remove the device from the device list

Built-in WiFi

Select this option to enable or disable the internal WiFi.

Disabling the internal WiFi reduces the unit's power consumption.

WiFi networks

Shows the WiFi network connection status. If the MFD is connected to the internet (WiFi hotspot), the hotspot name (SSID) is shown.

Hotspot settings

Select to display the MFD's hotspot network name (SSID) and key. Only available when the MFD built-in hotspot is turned on.

Remembered hotspots

Displays hotspots the unit has been connected to in the past.

Remote controllers

When a wireless device (smart phone or tablet) is connected, it should appear in the Remote controllers list. Selecting the always allow option means the device can automatically connect without needing to re-enter a password. This dialog also allows you to disconnect devices that no longer require access.

Wireless devices

This dialog shows the available wireless devices.

Select a device to display additional details.

Advanced

Tools are available within the software to assist in fault-finding and setting up the wireless network.

DHCP Probe

The wireless module contains a DHCP server that allocates IP addresses for all the MFDs, and devices in a network. If integrating with other devices, such as a 3G modem or satellite phone, other devices in the network may also be acting as DHCP servers. To make it easy to find all DHCP servers on a network, dhcp_probe may be run from the unit. Only one DHCP device may be operational on the same network at a time. If a second device is found, turn off its DHCP feature if possible. Refer to the device's own instructions for further assistance.

➔ **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 cannot provide support related to their use.

Iperf

Iperf is a commonly used network performance tool. It is provided for testing wireless network performance around the vessel so weak spots or problem areas can be identified. The application must be installed on and run from a tablet device.

The unit must be running Iperf server before initiating the test from the tablet. On exiting the page, Iperf automatically stops running.

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Remote control of the MFD

Remote control options

The following options are available for remotely controlling your MFD:
- a smartphone or a tablet, connected to the same WiFi hotspot as the MFD(s)
- a compatible remote control unit connected to the same NMEA network as the MFD. The documentation included with the remote control unit provides connection and usage information.
- a smartphone or a tablet, connected to an MFD acting as a WiFi access point

→ **Note:** For safety reasons, some functions cannot be controlled from a remote unit.

Smartphones and tablets

The Link app

The Link app must be used to connect a phone or tablet to the MFD.

When connected, the Link app on the phone or tablet can be used to:
- Remotely view and control the system
- Back-up and restore settings
- Back-up and restore waypoints, routes and tracks

The Link app can be downloaded from the relevant phone/tablet application store.

Connecting via a hotspot

If you connect a phone/tablet and the MFD(s) to the same hotspot, you can use your phone/tablet to control all MFDs on the same network.
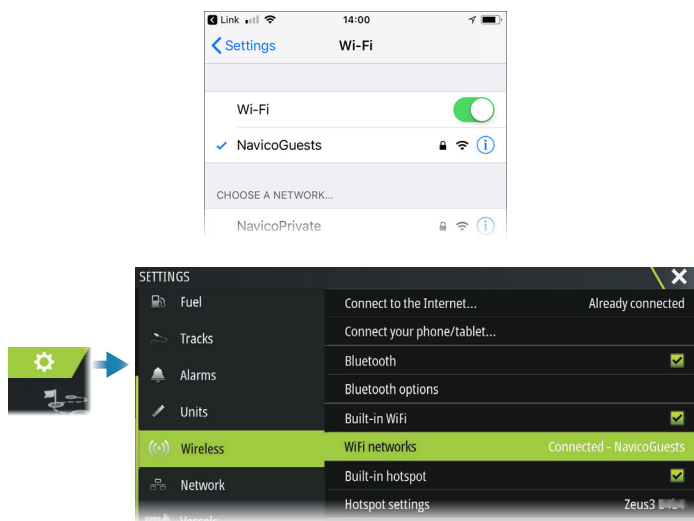
Connecting to an MFD acting as an access point

If you do not have access to a WiFi network, you can connect your phone/tablet directly to the MFD.
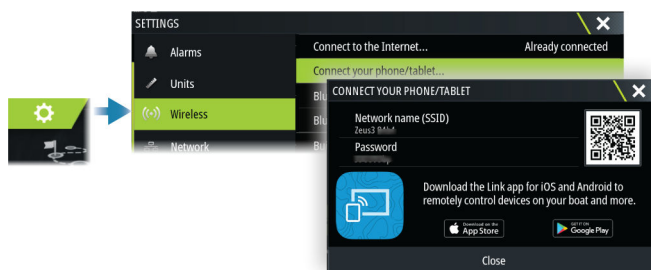
The MFD network name (SSID) will be displayed as an available network in the phone/tablet.

Using the Link app

Start the Link app to display MFD(s) available for remote control. The list includes both connected and not connected MFDs.

Select the MFD you want to control. If the MFD is not connected, follow the instructions on the MFD and on the table/phone to connect.
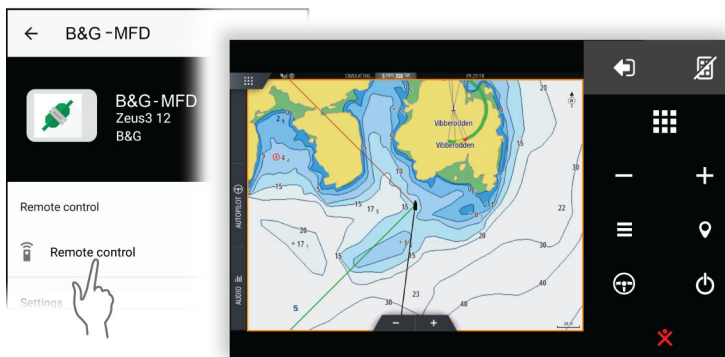
Managing WiFi connected remotes

You can change the access level and remove the WiFi connected remote controllers.
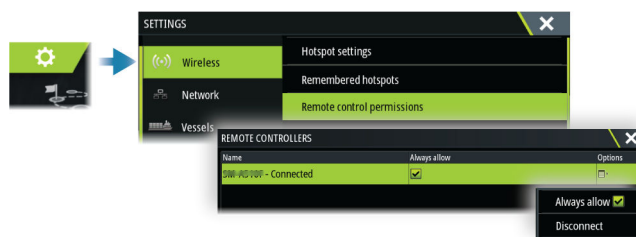
22

Using your phone with the MFD

About phone integration

The following functions are available when connecting a phone to the unit:

- read and send text messages
- view caller ID for incoming calls

➔ **Note:** It is possible to use a smartphone to remotely control the MFD. See *"Remote control of the MFD"* on page 116.

iPhone limitations:

- only incoming calls and messages received while the phone is connected to the MFD are available
- messages cannot be sent from the MFD. iPhone does not support sending messages from connected Bluetooth devices.

Connecting and pairing a phone

➔ **Note:** Bluetooth must be enabled on your phone before you can connect to the MFD.

➔ **Note:** If you want to pair a phone while another phone is connected to the MFD, see *"Managing Bluetooth devices"* on page 120.

➔ **Note:** You must always connect to a phone from the MFD, not the other way around.

Use the phone icon in the toolbar to connect your phone to the MFD. When the icon is selected the following happens:

- Bluetooth is turned ON in the MFD
- the Bluetooth dialog opens, listing all Bluetooth enabled devices within range

To pair a phone listed as **other devices** in the dialog:

- select the phone you want to pair, and follow the instructions on the phone and on the MFD

When paired, the phone is moved to the **paired device** section in the dialog.

To connect a paired phone:

- select the phone you want to connect to

 When the phone and the unit are connected, a phone icon is shown on the status bar.

Incoming messages and phone notifications will now pop-up on the MFD.

Phone notifications

After the phone and unit are paired and connected, use the phone icon to display the list of messages and the call history.
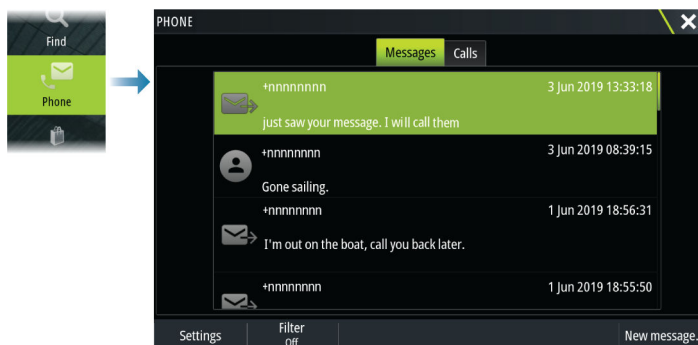
By default, the message list shows all messages. The list can be filtered to show only sent or received messages.

Creating a text message

→ *Note:* This option is not available for iPhones.

To create a new text message:
• select the new message option in the message dialog

To respond to a text message or to a phone call:
• select the message or call you want to respond to
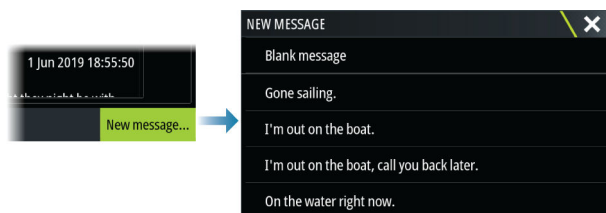
Responding to an incoming call
A call must be answered or rejected from the phone.
You can respond to an incoming call by a text message (not available for iPhones).

Message settings
You can define message templates and set how you want the alert to appear in the settings dialog.
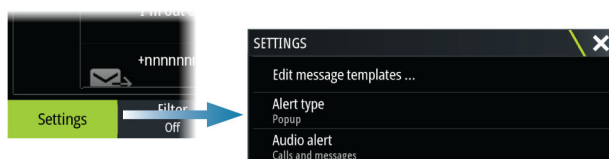
Phone troubleshooting

Not possible to connect an iPhone
The first time an MFD attempts to connect to an iPhone, the following errors might appear:
• connection failing, giving a message saying that the phone is not available for connection
• the phone does not list the correct name for the MFD

If this happens, try the following:
• reboot the MFD and restart the phone
• check that the phone is not connected to any other Bluetooth devices
• manually set the iPhone to allow notifications from the MFD:
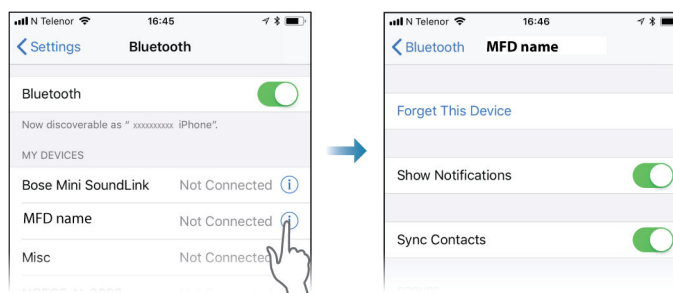
Missing notifications

By default, the connection profile for the phone is set to **auto**.

The connection profile should be changed to **alternative** if one of the following issues occurs:

- the phone is connected and the alert type is set to pop-up or notification, but there is either no alert or the alert is very delayed
- the phone is connected and there is no sound on the phone when talking

See details for how to display the device details in *"Managing Bluetooth devices"* on page 120.

To change the alert setting for the phone notifications, see *"Message settings"* on page 119.

Text messages appearing on the iPhone, but not on the MFD

Check that the text app is not open and active on the iPhone.

Managing Bluetooth devices

Bluetooth enabled devices within range are shown in the Bluetooth devices dialog. Refer to *"Bluetooth devices"* on page 114.

23 Simulator

About

The simulation feature lets you see how the unit works without being connected to sensors or other devices.

The status bar indicates if the simulator is toggled on.
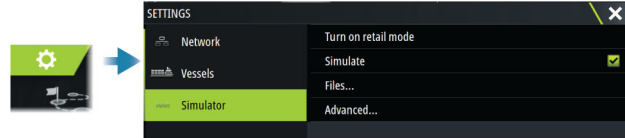
Retail mode

In this mode a retail demonstration for the selected region is shown.

If you operate the unit when retail mode is running, the demonstration pauses.

After a time-out period, retail mode resumes.

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

Simulator source files

You can select which data files that are used by the simulator. It can be either pre-recorded data files included in your device, your own recorded log files, or log files on a mass storage device connected to the unit.
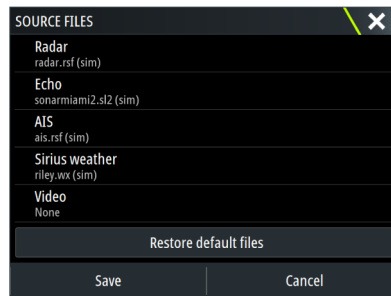
Advanced simulator settings

The advanced simulator settings allows for manually controlling the simulator.
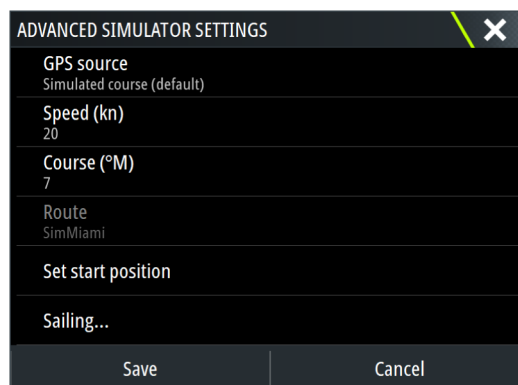
24

Tools and settings

This chapter includes description for tools and for settings that are not specific to any application panel.

For application settings, refer to the relevant chapter for the application.

Tools and settings are available from the Home page.

The toolbar
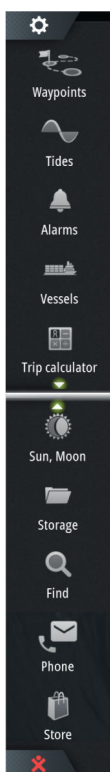
Waypoints

Includes waypoints, routes, and trails dialogs used for managing these user defined items.

Tides

Displays tide information for the tide station nearest to your vessel. The system will show available tide stations, selected one from the list to see details.

Alarms

Dialogs for active and historical alarms. Also including the alarm settings dialog, listing options for all available system alarms.

Vessels

The status list displays status and available information for the following vessel types:

- AIS
- DSC

See details in *"AIS"* on page 86.

Trip calculator

Displays voyage and engine information, with reset options for data. It also provides Race Timer controls.

Today

Today shows an accumulation of logged trip data that occurs on today's calendar date. Logging occurs when enabled and while the vessel exceeds the threshold speed set for Today.

Trip 1

Trip 1 shows an accumulation of data from all logged trips since the last Trip 1 reset. Trip 1 logging and calculating occurs when enabled and while the vessel speed exceeds the Trip 1 threshold setting.

Trip2

Trip 2 shows an accumulation of data from all logged trips since the last Trip 2 reset. Trip 2 logging and calculating occurs when enabled and while the vessel speed exceeds the Trip 2 threshold setting.

Options

Panel options:

- Check box - enables/disables logging of data for that trip panel only. When enabled, logging only occurs while the vessel exceeds the speed threshold.
- Adjust - adjusts the speed threshold. Data is recorded in that trip panel only while the vessel exceeds the speed threshold.
- Reset - provides a drop down list where you can reset field values to 0 for that trip panel.
  - Time - resets Trip hours to 0.
  - Distance - resets Trip (distance) and DSTWR (distance through water) to 0.
  - Water Distance - resets DSTWR to 0.

- Average Speed - resets average speed to 0.
- Maximum Speed - resets maximum speed to 0.
- All - resets all above values to 0.
• Set - sets the total trip distance.

Race Timer

Provides controls for the Race Timer, refer to *"Race timer"* on page 54.

Sun, Moon

Displays sunrise, sunset, moonrise and moonset for a position based on entered date and the position's latitude/longitude.

Storage

Access to the file management system. Use to browse and manage the contents of the unit's internal memory and storage devices connected to the unit.

Find

Search function for chart items (waypoints, routes, tracks, etc.).

Phone

Used for connecting a phone to the MFD. See *"Using your phone with the MFD"* on page 118.

Store

Connects to the Navico internet store. At the store you can browse, purchase, acquire feature unlock keys, download compatible charts/maps for your system and much more.

→ **Note:** The unit must be connected to the internet to use this feature. Refer to *"Internet connection"* on page 114.

Settings

System settings
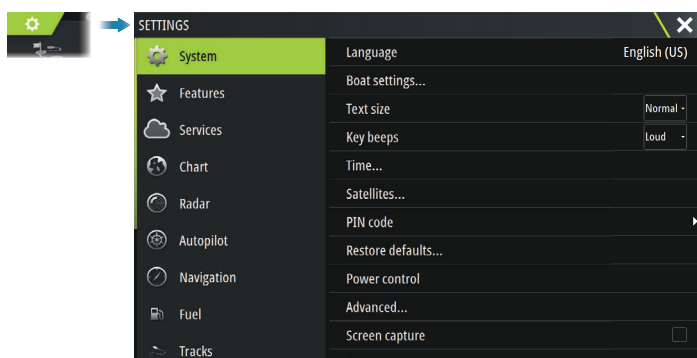
Language

Controls the language used on this unit.

Boat settings

Used to specify the physical attributes of the boat.

Text size

Used for setting the text size in menus and dialogs.

Key beeps

Controls the loudness of the beep sound that occurs when physical interaction is made with the unit.

Time
Configure time settings to suit vessel location, along with time and date formats.

Satellites
The Satellites option displays a graphical view and numeric values for available satellites.

→ **Note:** The content in the Satellites dialogs varies with connected antenna.
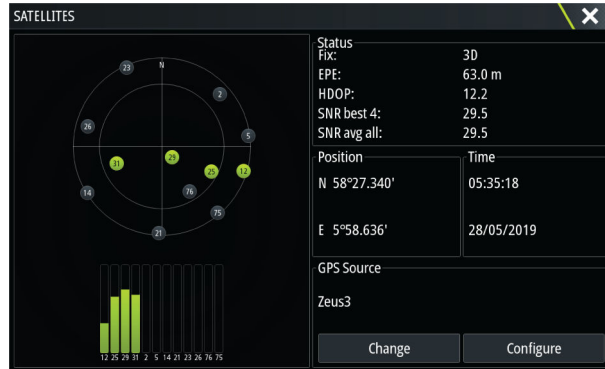
From within this dialog you can select and configure the active GPS sensor.

PIN code
Sets a PIN code to prevent unauthorized access to your system's settings.

Note: Record the PIN code and store it in a safe place.

When you establish password protection, the PIN code must be entered when any of the following are selected. After the correct PIN code is entered, all of them can be accessed without re-entering the PIN code.

- Settings, activated from the home page or system controls dialog
- Alarms, activated from the toolbar
- Storage, activated from the toolbar
- Store, activated from the toolbar

Restore defaults
Restores selected settings to default factory values.
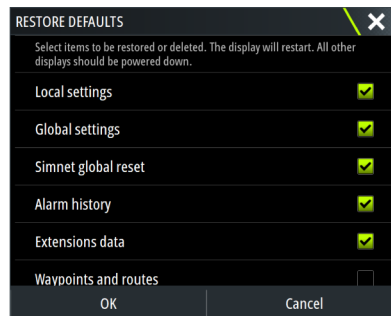
Power control
Setting that determines unit's response to the signal applied to the power control wire. For more information, refer to the unit's installation manual.

Advanced
Used for configuration of advanced settings and how your system displays various user interface information.

Registration
Guides you how to register your device.

About

Displays copyright information, software version, and technical information for this unit.

The Support option accesses the built-in service assistant, refer to *"Service report"* on page 130.

Services

Used for accessing web sites that provide feature services.

25

Alarms

About the alarm system

The system continuously checks for dangerous situations and system faults while the system is running.

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 alarm
Orange	Important alarm
Yellow	Standard alarm
Blue	Warning
Green	Lite warning

Alarm indication

An alarm situation is indicated with:

- an alarm pop up message
- an alarm icon in the status bar, and with the status bar pulsing with the color of the alarm

If you have enabled the siren, the alarm message is followed by an audible alarm.

A single alarm is displayed with the name of the alarm as the title, and details for the alarm.

If more than one alarm is active at the same time, the alarm pop-up can display 3 alarms. The alarms are listed in the order they occur with the last activated alarm at the top. The remaining alarms are available in the alarms dialog.
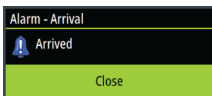
Acknowledging a message

The alarm dialog options for acknowledging a message vary depending on the alarm:

- Close
  Sets the alarm state to acknowledged. 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 alarm settings dialog.

There is no time-out on a message or the siren. They remain active until they are acknowledged or until the reason for the message is rectified.

Alarms
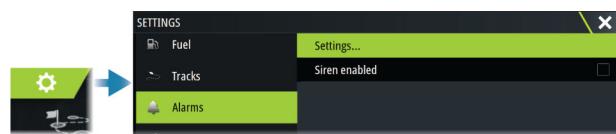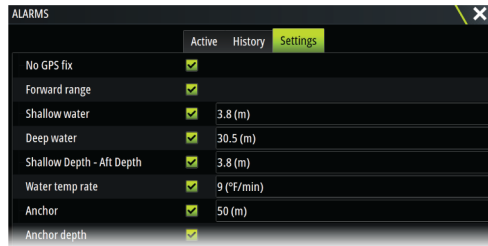
Siren enabled

Enables/disables the siren.

Alarm dialogs

The alarm dialogs are activated from the Alarm settings dialog or by selecting the Alarm button on the toolbar.

Active alarms

Lists all active alarms with details. Alarms remain active until the alarm is acknowledged or the reason for the alarm is removed.

Alarms history

Lists the alarm history with time stamp. The alarms remain in the list until they are manually cleared.

Settings

List of all available alarm options in the system, with current settings.

From this list you can activate, deactivate and change alarm limits.

26 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.

Sun cover

It is recommended that you always fit the sun cover when the unit is not in use.

Cleaning the display unit

To clean the screen:

- A micro-fiber or a soft cotton cloth should be used to clean the screen. Use plenty of water to dissolve and take away salt remains. Crystallized salt, sand, dirt, etc. can scratch the protective coating if using a damp cloth. Use a light fresh water spray then wipe the unit dry with a micro-fiber or a soft cotton cloth. Do not apply pressure with the cloth.

To clean the housing:

- Use warm water with a dash of liquid dish soap or detergent.

Avoid using abrasive cleaning products or products containing solvents (acetone, mineral turpentine, etc.), acid, ammonia, or alcohol as they can damage the display and plastic housing.

Do not:

- use a jet or high pressure wash

Checking the connectors

Push the connector plugs into the connector. If the connector plugs are equipped with a lock or a position key, ensure that it is in the correct position.

Touchscreen calibration

Use the system setting option to calibrate the touchscreen.
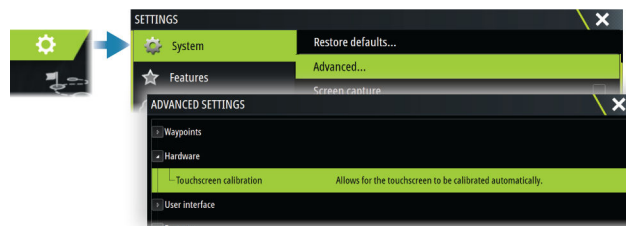
Software updates

Before initiating an update to the unit, be sure to back up any potentially valuable user data. Refer to *"Backing up your system data"* on page 130.

Installed software and software updates

The about dialog shows the software version currently installed on this unit (**A**).

If the unit is connected to internet, the dialog also shows available software updates (**B**).
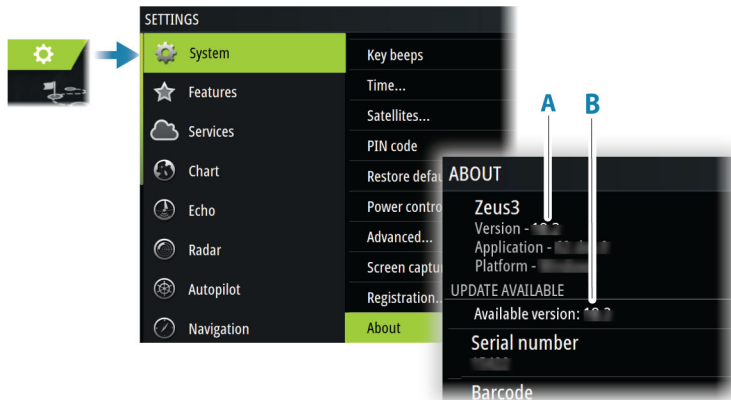
Update the software when connected to internet

If the unit is connected to internet, the system will automatically check for software updates for the unit and for connected devices.

➔ **Note:** Some software update files might be larger than the space available in the unit. If so, you will be prompted to insert a storage device.

➔ **Note:** Do not add software update files to a chart card.

➔ **Note:** Do not turn off the unit or a remote device until the update is completed, or until you are prompted to restart the unit.

You will be notified if new software updates are available. You can also manually start the update(s) from the Updates dialog.

Update the software from a storage device

Transfer the update file(s) to a compatible storage device, and then insert the storage device in the unit.

➔ **Note:** Do not add software update files to a chart card.

To update this unit only:
- restart the unit to start the update from the storage device

To update this unit or a connected device:
- Select the update file in the dialog

➔ **Note:** Do not turn off the unit or a connected device until the update is completed, or until you are prompted to restart the unit.

Service report

The system has a built-in service assistant that creates a report about the unit. The service report is used to assist in technical support enquiries.

It can also include information about devices connected to the network(s).

The report includes the software version, serial number, and information from the settings file.

If you call technical support before creating the report, you can enter an incident number to assist with tracking. You can attach screenshots and log files to the report.

➔ **Note:** There is a 20MB limit for the report attachments.

The report can be saved to a storage device and emailed to support.

You can also upload it directly if you have an internet connection.

Backing up your system data

It is recommended to regularly copy user data and your system settings database as part of your back-up routine.

Waypoints

The waypoints option in the storage dialog allows for managing user data.

Export format

The following formats are available for export:

- **User Data File version 6**
  Used to export waypoints, routes and colored tracks/trails.
- **User Data File version 5**
  Used to 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**
  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
- **User data file version 2 (no depth)**
  Can be used when transferring user data from one system to a legacy product
- **GPX (GPS Exchange, no depth)**
  This is the format most used on the web that shares among most GPS systems. Use this format if you are taking data to a competitor's unit.

Export all waypoints

The export option is used for exporting all waypoints, routes, tracks and trips.

Export region

The export region option allows you to select the area from where you want to export data.

1. Select the export region option
2. Drag the boundary box to define the desired region
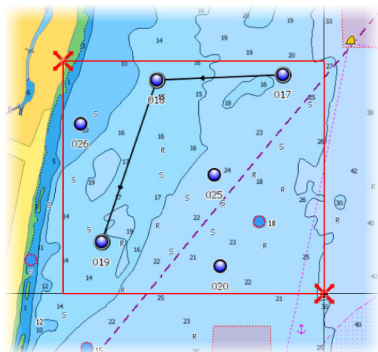
3. Select the export option from the menu
4. Select the appropriate file format
5. Select the export option to export to the memory card

Purging user data

Deleted user data are stored in the unit's memory until the data is purged. If you have numerous deleted, unpurged user data, purging may improve the performance of your system.

→ *Note:* When user data is deleted and/or purged from the memory, it cannot be recovered.

Exporting the settings database

Use the settings database option in the storage dialog to export your user settings.
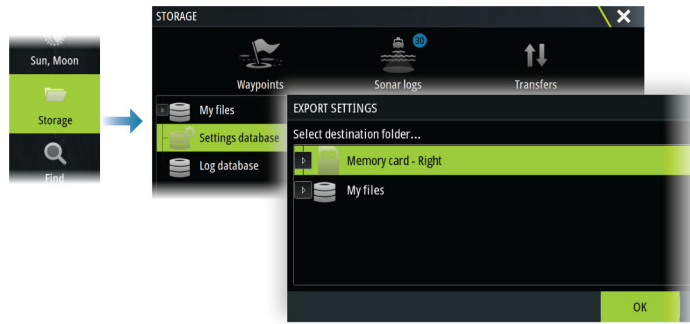
Import system settings

> ⚠ **Warning:** Importing system settings overwrites all existing system settings.
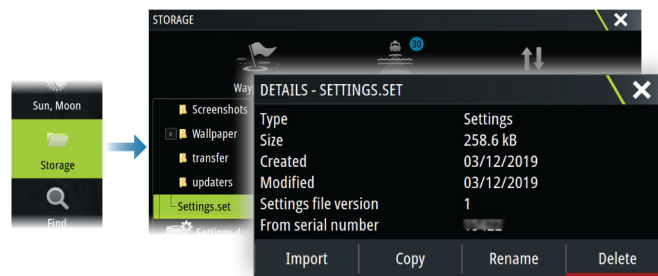
1   Connect a storage device to the unit
2   Browse the memory and select the desired backup file to start the import

27 Integration of 3rd party devices

Several 3rd party devices can be connected to the unit. 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.

FLIR camera control

If a compatible FLIR M-series camera is available on the Ethernet network, you can display the video and control the camera from the system.

When the connection is established to a compatible FLIR camera, the menu changes to include access to FLIR camera controls.

→ **Note:** You can take over camera control from any unit connected to the Ethernet network.

Establishing connection with the FLIR video camera

When a video panel is active, the unit automatically recognizes the compatible FLIR camera if it is available on the Ethernet network.

→ **Note:** When there is a DHCP server present on the Ethernet network, the FLIR camera needs to be configured and set to have a Static IP Address before the connection can be established. For instructions on how to configure your specific FLIR camera model, refer to FLIR documentation.

→ **Note:** Only one FLIR camera can be connected to the Ethernet network.

When you activate a video panel, the system starts searching the Ethernet network for a compatible FLIR camera.

Lost connections are indicated on the panel. Select the indication to re-establish the connection.

When the connection is established the menu changes to include access to FLIR camera control.

→ **Note:** You can take over camera control from any compatible unit connected to the Ethernet network.

Panning and tilting the FLIR camera

When the connection to the FLIR camera is established, pan and tilt panel buttons appear on the video panel. The left and right arrow buttons control the camera's pan. The up and down arrow buttons tilt the camera.

Select one of the arrow buttons on the panel to control the camera. The camera continues to move for as long as you press the button.

Zooming the FLIR video image

You zoom the video image by using the zoom panel buttons.

There are two zoom options available, depending upon your selected FLIR camera source option:

- Digital zoom
  Only available when the camera is in Infrared mode. In this mode, the zoom is represented in levels (0, 2 and 4 times zoom). Each press on a zoom button increments or decrements the zoom level.
- Optical zoom
  Available in daylight mode. In this mode, the camera continues to zoom for as long as you press a zoom panel button.

The FLIR camera source options

The FLIR camera includes both daylight and infrared video sources.

When the infrared source is selected, the following options are available:

- Toggle color scheme
  Cycles through FLIR's video output color scheme. Each of these schemes maps a different color to a different temperature.
- Toggle polarity
  Inverts the color scheme.

FUSION-Link integration

Compatible FUSION-Link devices connected to the system can be controlled from the system.

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

Refer to *"Audio"* on page 111 for more information.

BEP CZone integration

The unit 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 toolbar 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 unit's 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 instrument panels.

You switch between a panel's dashboards by swiping left or right on the panel 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 *"Instruments"* on page 103.

Naviop

If this device is on the same NMEA 2000 network as a Naviop Loop system, this device can be used to operate the Naviop Loop system.

For details, refer to the documentation following the Naviop system.

28 Appendix

Touchscreen operation

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
x1	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
3s	Press and hold: • On any panel with a cursor to either activate the cursor assist feature or open the menu. Refer to *"Customizing the long press feature"* on page 18. • On the Instrument bar to open the Choose data dialog. • On a panel button on the home page to see available split screen options. • On a favorite button on the home page to enter edit mode.
	Scroll through a list of available options without activating any option. On a slide bar, move the slide up or down.
	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.
	Pinch to zoom out on the chart or on an image. ➔ *Note:* Not available for zooming sonar images.
	Spread to zoom in on the chart or on an image. ➔ *Note:* Not available for zooming sonar images.

Keyboard operation

To connect a keyboard, a free USB port on the unit is required.

All keys on the keyboard work as usual when entering text in a text field.

Keyboard operation and shortcuts are shown in the table below. Unless noted all references are single short presses on the key.

→ **Note:** The shortcuts refer to US keyboard layout. Some shortcuts may not work on different national keyboards.

Keyboard keys	Function
Menu	Opens the menu
Ctrl + M	
F1	Opens the Home page
Ctrl + P	
F2	Opens the Chart page
Ctrl + H	
F3	Opens the Radar page
Ctrl + R	
F4	Opens the Echo page
Ctrl + E	
F5	Opens the SailSteer page
Ctrl + N	
F6	Opens the Instrument page
Ctrl + I	
F12 (press and hold)	Positions a MOB mark at vessel position
Ctrl (double click)	Switches control to next monitor connected to the unit (USB port must be set to switchable) → **Note:** This is not applicable for all units.
Ctrl + B	Centers the chart on vessel position
Ctrl + D	Switches between panels on a multi-panel page
Ctrl + G	Opens the Goto menu
Ctrl + K	Places a waypoint at vessel/cursor position
Ctrl + L	Acts as the Wheel key, which can be configured.
Ctrl + O	Opens the New Waypoint dialog
Ctrl + Q	Opens the System Controls dialog
Ctrl + S	Switches the autopilot system to STANDBY mode
Ctrl + U	Switches the autopilot system to Heading hold mode
Ctrl + ;	Displays the Favorite panel as pop-up on active page
Ctrl + \	Take screenshot
PrintScn	
Esc	Cancels changes and returns to previous menu level Closes an open menu
Enter	Activates/confirms current selection
Arrow keys	Move the cursor on the panel, and maneuvers in the menus/dialogs. On a slide bar, up/down arrows to move the slide up or down.
- and +	Zoom

Mouse operation

To connect a mouse, a free USB port on the unit is required.

The mouse pointer becomes visible when you move the mouse, and it will auto-hide after a few seconds of inactivity.

- Press the left key to position the cursor on a panel or to select an option.
- Press and hold the left key and drag the mouse to:
  - Perform drag, flick, or swipe actions
  - Select text in an input field
  - Pan a chart
  - Pan to view sonar history or depth
  - Move the slide up or down on a slide bar
- Use the scroll wheel to zoom a zoomable panel or image, or to scroll through menu and dialog options.
- The use of the right key depends on if the cursor is active or not.
  - With active cursor: press the right key to display information about the item at cursor position.
  - Without active cursor: press the right key to toggle the panel menu on/off.

Status bar icon definitions

Depending on your system and set up, the following icons can appear on the status bar:

Icon	Definition
	Alarm - a standard (yellow), important (orange) or critical (red) alarm is sent. To remove the icon in the status bar, acknowledge the alarm in the Alarms dialog. If needed, change the alarm setting or remedy the situation so the same alarm is not resent immediately by the system.
A 005 °M FU Set RDR 8° N CTS 074 °M ND 005 °M S HDG 005 °M	Autopilot modes: Auto-Heading hold, Follow up, Navigation, No drift, Standby. Use the autopilot controller to select an autopilot mode.
	Downloading files, e.g.: software update file, logs from C-MAP Genesis, GRIB weather files, PredictWind routes, etc.
	The unit is connected to the internet. The unit can be used to download or upload files to the internet.
	GPS signal strength: strong, medium, and weak. The placement of the GPS and obstructions between it and satellites can affect the signal strength. In some cases, a well-placed external GPS antenna might be needed.
	GPS signal strength with the Wide Area Augmentation System (WAAS) is strong, medium, and weak.
	An external keyboard is connected to the unit.
	An external mouse is connected to the unit.

Icon	Definition
	A mobile (cell) phone is connected to the unit via Bluetooth.
SIMULATING...	The system is simulating. Turn ON/OFF the simulator from the simulator settings dialog.
	Radar is paused. If you want the radar to transmit, select the transmit option in the Radar page menu.
	Radar is transmitting. If you want to pause the radar, select the pause option in the Radar page menu.
	A compatible remote controller is connected to the unit.
	The system is synchronizing data during startup.
	File transfer problem, caused by an interruption in the internet communication.
	Uploading files, e.g.: service report, C-MAP genesis, route files to PredictWind, etc.

B&G

B&G

Zeus³S
Installation Manual

ENGLISH

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 maritime safety practices.

NAVICO HOLDING AS AND ITS SUBSIDIARIES, BRANCHES AND AFFILIATES DISCLAIM ALL LIABILITY FOR ANY USE OF THIS PRODUCT IN A WAY THAT MAY CAUSE ACCIDENTS, DAMAGE OR THAT MAY VIOLATE THE LAW.

This manual represents the product as at the time of printing. Navico Holding AS and its subsidiaries, branches and affiliates reserve the right to make changes to specifications without notice.

Governing language

This statement, any instruction manuals, user guides and other information relating to the product (Documentation) may be translated to, or has been translated from, another language (Translation). In the event of any conflict between any Translation of the Documentation, the English language version of the Documentation will be the official version of the Documentation.

- CE under RED 2014/53/EU

United States of America

Navico declare under our sole responsibility that the product conforms with the requirements of:

- 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

> ⚠ Warning: The user is cautioned that any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

→ *Note:* This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not

occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that of the receiver is connected
- Consult the dealer or an experienced technician for help

ISED Canada

This device complies with ISED (Innovation, Science and Economic Development) Canada's license-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

La traduction française de ce document est disponible sur le site Web du produit.

Australia and New Zealand

Navico declare under our sole responsibility that the product conforms with the requirements of:

- level 2 devices of the Radiocommunications (Electromagnetic Compatibility) standard 2017
- radiocommunications (Short Range Devices) Standards 2014

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.

Trademarks

Navico® is a registered trademark of Navico Holding AS.

B&G® is a registered trademark of Navico Holding AS.

Bluetooth® is a registered trademark of Bluetooth SIG, Inc.

CZone™ is a trademark of Power Products LLC.

FLIR® is a registered trademark of FLIR.

HDMI® and HDMI™, the HDMI Logo, and High-Definition Multimedia Interface are trademarks or registered trademarks of HDMI Licensing LLC in the United States and other countries.

NMEA® and NMEA 2000® are registered trademarks of the National Marine Electronics Association.

SD™ and microSD™ are trademarks or registered trademarks of SD-3C, LLC in the United States, other countries or both.

Navico product references

This manual refers to the following Navico products:

- Broadband Radar™ (Broadband Radar)
- ForwardScan™ (ForwardScan)
- GoFree™ (GoFree)
- Halo™ Pulse Compression Radar (Halo Radar)
- StructureScan® (StructureScan)

About this manual

Images used in this manual might not exactly match the screen on your unit.

Important text conventions

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.

Intended audience

This manual is written for system installers.

The manual assumes that the reader has basic knowledge about this type of equipment with regards to:

- installation work to be carried out
- nautical terminology and practices

Translated manuals

Available translated versions of this manual can be found on the following website:

Contents

1 Introduction

Parts included
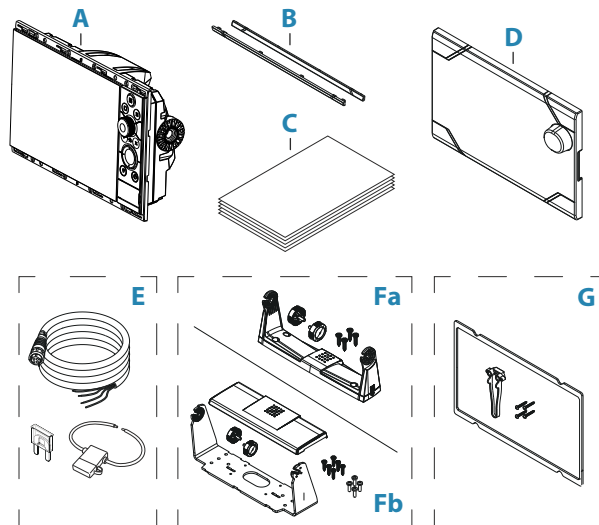
A	Display unit
B	Bezel trim
C	Documentation pack
D	Sun cover
E	Power cable kit
	• Power cable
	• Fuse
	• Fuse holder
Fa	U-bracket kit - 9" units
	• Plastic U-bracket
	• Bracket knobs
	• Mounting screws
	- 4x #10x3/4" self-tapping pan head
Fb	U-bracket kit - 12" units
	• Metal U-bracket
	• Bracket cover
	• Bracket knobs
	• Mounting screws
	- 6x #14x1" self-tapping pan head
	- 4x M4x12 pan head
G	Panel mounting kit
	• Gasket
	• Screw jig
	• Mounting screws
	- 9" and 12" units: 8x #4x1/2" self-tapping pan head
	- 16" units: 12x #4x1/2" self-tapping pan head

→ *Note:* U-bracket kit for 16" units is sold separately.

Front controls
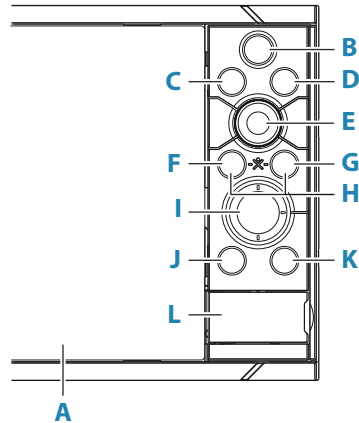
A   **Touch screen**

B   **Pages/Home**
- Press to open the Home page for page selection and setup options.

C   **WheelKey** - user configurable key. Refer to *"Configure WheelKey"* on page 26.
Default without an autopilot connected to the system:
- Short press: toggles between panels on split screen.
- Long press: maximizes active panel on split screen.

Default with an autopilot connected to the system:
- Short press: opens the autopilot controller and puts the autopilot in standby mode.
- Long press: toggles between panels on split screen.

D   **Menu key**
- Press to display the active panel's menu.

E   **Rotary knob**
- Turn to zoom or scroll the menu, press to select an option.

F   **Enter key**
- Press to select an option or to save settings.

G   **Exit key**
- Press to exit a dialog, return to previous menu level, and clear the cursor from the panel.

H   **MOB**
- Press simultaneously the Enter and Exit keys to create a MOB at the vessel's position.

I   **Arrow keys**
- Press to activate the cursor or to move the cursor.
- Menu operation: press to navigate through menu items and to adjust a value.

J   **Mark key**
- Press to place waypoint at vessel position or at cursor position when the cursor is active.
- Press and hold to open the Plot dialog from where you can select options to add new or manage existing waypoints, routes and tracks.

K   Power key
- Press and hold to turn the unit ON/OFF.
- Press once to display the System Controls dialog. Repeat short presses to toggle through the default dimming levels.

L   Card reader door

Card reader

A memory card can be used for:
- Chart data
- Software updates
- Transfer of user data
- Logging user data
- System backup

→ **Note:** Do not download, transfer or copy files to a chart card. Doing so can damage chart information on the chart card.

The protective door should always be securely shut immediately after inserting or removing a card, in order to prevent possible water ingress.

Connectors

Connectors

9" units
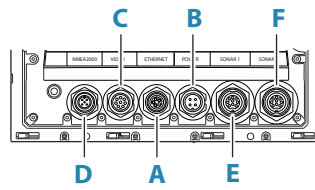
12" units
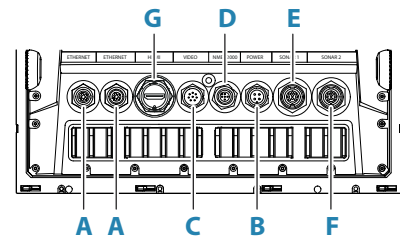
16" units
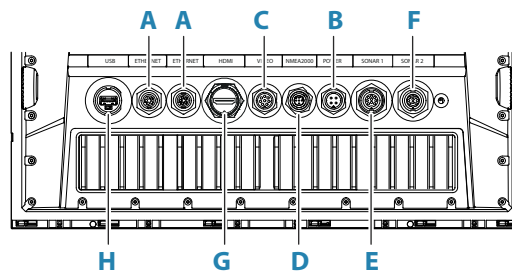
A	**Ethernet**	- Ethernet network
B	**Power**	- power, power control, and external alarm
C	**Video**	- composite video and NMEA0183
D	**NMEA 2000**	- NMEA 2000 data
E	**Sonar CH1**	
F	**Sonar CH2**	
G	**HDMI**	- HDMI video output
H	**USB connector**	- mouse, keyboard or mass storage

2 Installation

General mounting guidelines

> ⚠ Warning: Do not install the unit in a hazardous/flammable atmosphere.

→ **Note:** Choose a mounting location that will not expose the unit to conditions that exceed the technical specifications.

Mounting location

Ensure that the selected area allows for:

- Cable routing, cable connection and cable support.
- Connection and use of portable storage devices.
- Viewing any LED indicators.
- Easy access to serviceable parts.

Do also consider:

- The free space around the unit to allow for adequate cooling.
- The mounting surface's structure and strength, with regard to the weight of the equipment.
- Any mounting surface vibration that might damage the equipment.
- Hidden electrical wires that might be damaged when drilling holes.

Ventilation

Inadequate ventilation and subsequent overheating of the unit will cause unreliable operation and reduced service life.

Ventilation behind units is recommended for all units which are not bracket mounted.

Examples of enclosure ventilation options, in order of preference, are:

- Positive pressure air from the vessel's air conditioning system.
- Positive pressure air from local cooling fans (fan required at input, fan optional at outlet).
- Passive airflow from air vents.

Electrical and radio frequency interference

This unit conforms to the appropriate Electromagnetic Compatibility (EMC) regulations. To ensure that the EMC performance is not compromised, the following guidelines apply:

- Separate battery used for the vessel engine.
- Minimum 1 m (3 ft) between the device, the device's cables and any transmitting equipment or cables with radio signals.
- Minimum 2 m (7 ft) between the device, the device's cables and the SSB radio.
- More than 2 m (7 ft) between the device, the device's cables and the radar beam.

WiFi

It is important to test the WiFi performance before the location of the unit is decided.

Construction material (steel, aluminum, or carbon) and heavy structure might affect WiFi performance.

The following guidelines apply:

- Select a location where there is a clear, direct line of sight between WiFi connected units.
- Keep the distance between WiFi units as short as possible.
- Mount the WiFi unit at least 1 m (3 ft) away from:
  - Other WiFi enabled products.
  - Products that send wireless signals in the same frequency range.
  - Equipment that might generate interference.

Compass safe distance

The unit outputs electromagnetic interference that can cause inaccurate readings on a nearby compass. To prevent compass inaccuracy the unit must be mounted far enough away so the interference does not affect compass readings. For minimum compass safe distance, refer to *"Technical specifications"* on page 42.

GPS

It is important to test the GPS performance before the location of the unit is decided.

Construction material (steel, aluminum, or carbon) and heavy structure might affect GPS performance. Avoid a mounting location where metal obstacles block the view of the sky.

A well placed external GPS module can be added to overcome poor performance.
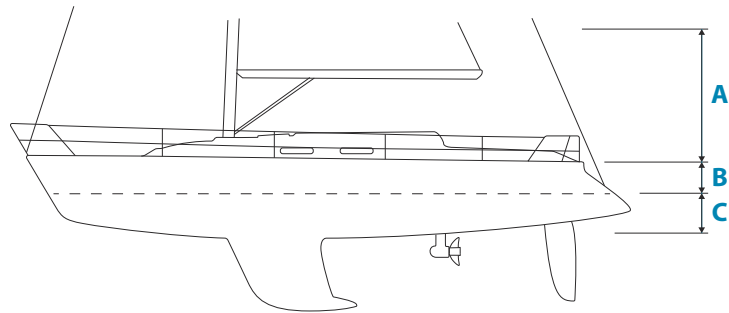
A	Optimal location (above deck)
B	Less effective location
C	Not recommended location

➔ **Note:** Consider the lateral swinging if mounting the GPS sensor high above the sea level. Roll and pitch might give false positions and affect the true directional movement.

Touchscreen

Touchscreen performance can be affected by the location of the unit. Avoid locations where the screen is exposed to:

• Direct sunlight.
• Prolonged rainfall or floating water.

U-bracket mounting

1   Place the bracket in the desired mounting location. Ensure that the chosen location has enough height to accommodate the unit fitted in the bracket, and allows tilting of the unit. Also adequate space is required on both sides to allow tightening and loosening of the knobs.

2   Mark the screw locations using the bracket as a template, and drill pilot holes.

3   Screw down the bracket using fasteners that are suitable for the material you are mounting the bracket on.

4   For metal brackets, install the plastic cover over the lower part of the bracket.

5   Mount the unit to the bracket using the knobs. Hand tighten only.

The screws shown below are for illustration purposes only. Use fasteners that are suitable for the material you are mounting the bracket on.
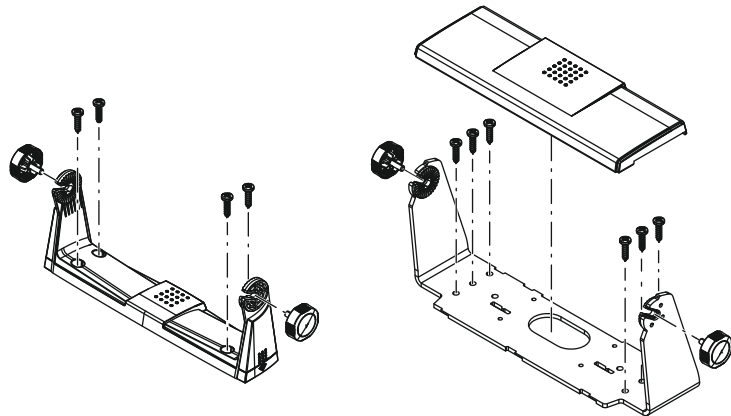
Panel mounting

Refer to the separate mounting template for panel mounting instructions.

Bezel fitment and removal
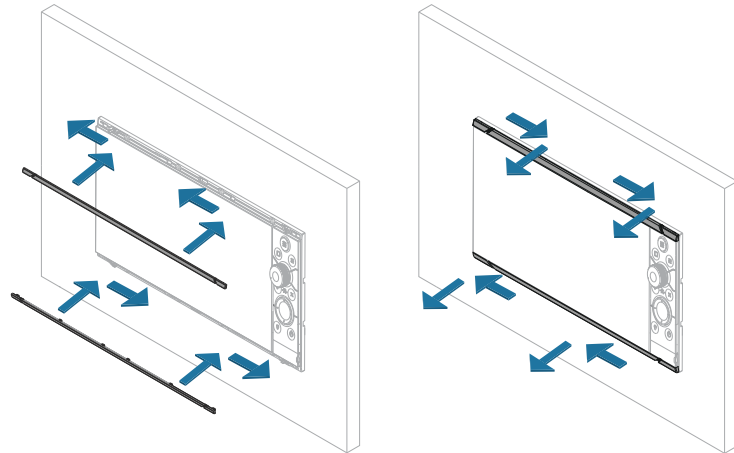
→ **Note:** The unit in the illustration is an example only.

3

Wiring

Connectors

Different models have different connectors. For available connectors and connector layout refer to *"Connectors"* on page 10.

Wiring guidelines

Don't:

- Make sharp bends in the cables.
- Run cables in a way that allows water to flow down into the connectors.
- Run the data cables adjacent to radar, transmitter, or large/high current carrying cables or high frequency signal cables.
- Run cables so they interfere with mechanical systems.
- Run cables over sharp edges or burrs.

Do:

- Make drip and service loops.
- Use cable-ties on all cables to keep them secure.
- Solder/crimp and insulate all wiring connections if extending or shortening the cables. Extending cables should be done with suitable crimp connectors or solder and heat shrink. Keep joins as high as possible to minimize possibility of water immersion.
- Leave room adjacent to connectors to ease plugging and unplugging of cables.

⚠ **Warning:** Before starting the installation, be sure to turn electrical power off. If power is left on or turned on during the installation, fire, electrical shock, or other serious injury may occur. Be sure that the voltage of the power supply is compatible with the unit.

⚠ **Warning:** The positive supply wire (red) should always be connected to (+) DC with a fuse or a circuit breaker (closest available to fuse rating).

Power

The power connector is used for power, power control and for external alarm output.

Power connector details
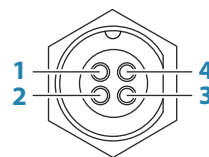
Unit socket (male)

Pin	Purpose
1	DC negative
2	External alarm
3	Power control
4	+12/24 V DC

Power connection

The unit is designed to be powered by 12 or 24 V DC system.

It is protected against reverse polarity, under voltage, and over voltage (for a limited duration).

A fuse or circuit breaker should be fitted to the positive supply. For recommended fuse rating refer to *"Technical specifications"* on page 42.
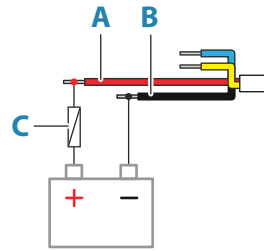
Key	Purpose	Color
A	+12/24 V DC	Red
B	DC negative	Black
C	Fuse	

Power control connection

The yellow wire in the power cable can be used to control how the unit is turned on and off.

Power controlled by power key

The unit will turn on/off when the power key on the unit is pressed.

Leave the yellow power control wire disconnected and tape or heat-shrink the end to prevent shorting.

Power control by supply power

The unit will turn on/off without using the power key when power is applied/removed.

Connect the yellow wire to the red wire after the fuse.

→ **Note:** The unit cannot be powered down by power button, but can be put in to standby mode (the screen backlight turns off).
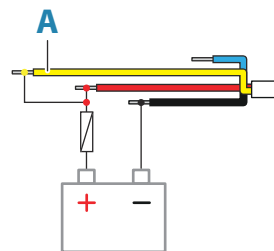
Key	Purpose	Color
A	Power control wire, connected to supply power	Yellow

Power controlled by ignition

The unit will turn on once ignition is turned on to start engines.

→ **Note:** Engine start batteries and house batteries should have a common ground connection.
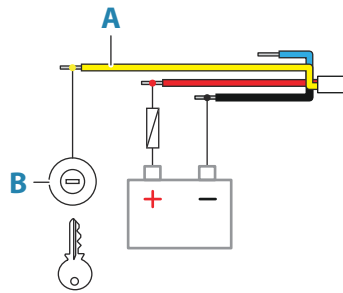
Key	Purpose	Color
A	Power control wire	Yellow
B	Ignition switch	

Power controlled by power bus

The yellow power control wire can either be an input that will turn on the unit when power is applied, or an output that turns on other devices when the unit is powered on. It can be configured at the installation stage to control the power state of displays and compatible devices. When commissioning the system, the unit can be set to be a power control slave or power control master.
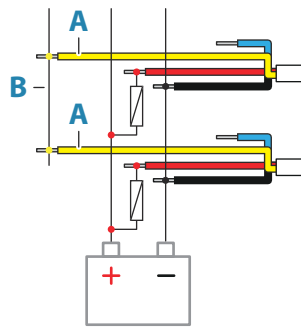
Key	Purpose	Color
A	Power control wire	Yellow
B	Power control bus	

If a unit is configured as power control master and turned on by the power key, it will output voltage on the power bus. This will power on both other power master units and power slave units. If a unit is set to power control slave, it cannot be powered down using its own power key while a power control master unit is turned on. Pressing the power key will set the unit to standby. If all power control masters are off, power control slaves can be turned on and off using their own power key. However, this will not turn on any other units connected to the power bus.

External alarm
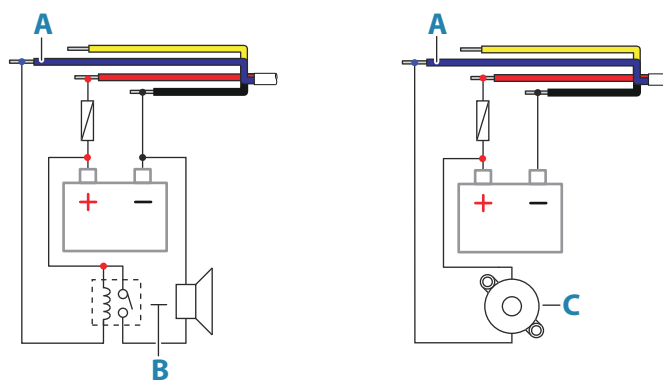
For sirens that draw more than 1 A, use a relay.

Key	Purpose	Color
A	External alarm output	Blue
B	Siren and relay	
C	Buzzer	

NMEA 2000

The NMEA 2000 data port allows receiving and sharing of a multitude of data from various sources.

Connector details

Unit socket (male)
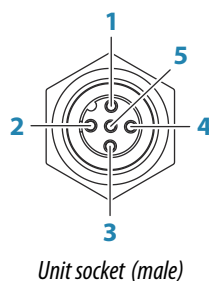
Pin	Purpose
1	Shield
2	NET-S (+12 V DC)
3	NET-C (DC negative)
4	NET-H
5	NET-L

Plan and install an NMEA 2000 network

An NMEA 2000 network consists of a powered backbone from which drop cables connect to NMEA 2000 devices. The backbone needs to run within 6 m (20 ft) of the locations of all products to be connected, typically in a bow to stern layout.

The following guidelines apply:

- The total length of the backbone should not exceed 100 meters (328 ft).
- A single drop cable has a maximum length of 6 meters (20 ft). The total length of all drop cables combined should not exceed 78 meters (256 ft).

- A terminator must be installed at each end of the backbone. The terminator can be a terminator plug or a unit with built-in terminator.
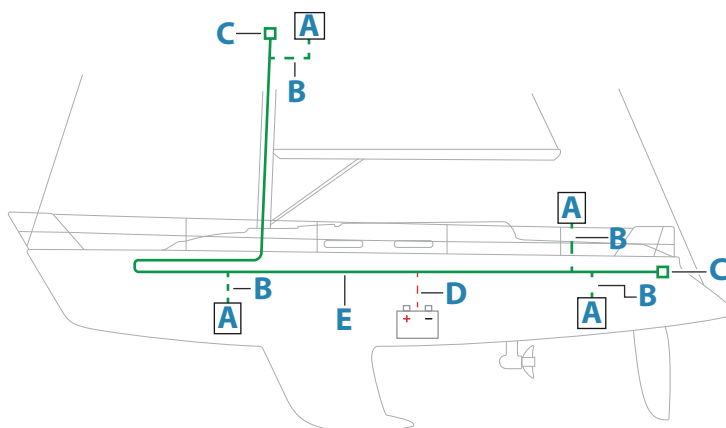
A	NMEA 2000 device
B	Drop-cable
C	Terminator
D	Power supply
E	Backbone

Powering the NMEA 2000 network

The network requires its own 12 V DC power supply, protected by a 3 amp fuse.

For smaller systems: connect power at any location in the backbone.

For larger systems: connect power at a central point in the backbone to balance the voltage drop of the network. Make the installation such that the load/current draw on each side of the power node is equal.

→ **Note:** 1 LEN (Load Equivalency Number) equals 50 mA current draw.
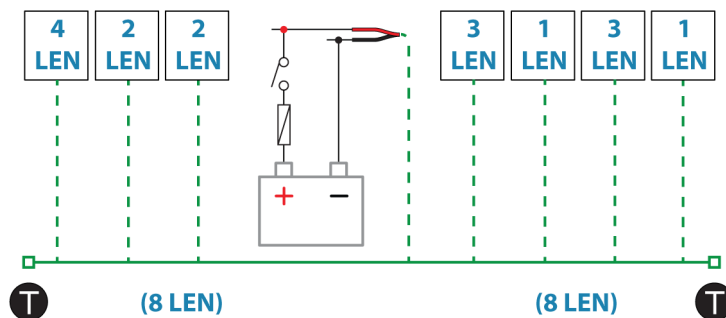
→ **Note:** Do not connect the NMEA 2000 power cable to the same terminals as the engine start batteries, autopilot computer, bow thruster or other high current devices.

Video IN and NMEA 0183

The unit has a combined Video IN and NMEA 0183 connector. The connector is labelled VIDEO on the rear of the unit.

Connector details
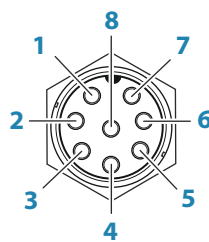
Unit socket (male)

Pin	Purpose
1	Video 1 Ground
2	Video 1 (+)
3	Video 2 Ground
4	Video 2 (+)
5	NMEA 0183 TX_B
6	NMEA 0183 TX_A
7	NMEA 0183 RX_A
8	NMEA 0183 RX_B

VIDEO IN/NMEA 0183 cable

→ **Note:** This cable (part number 000-00129-001) is not included with the unit.
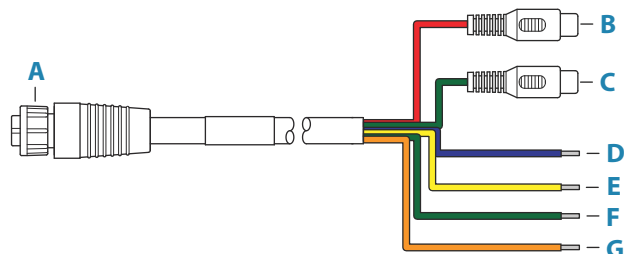
Key	Color	Purpose
A		Video in/data cable connector to unit
B	Red	Camera input 1 (RCA coaxial connector)
C	Green	Camera input 2 (RCA coaxial connector)
D	Blue	NMEA 0183 TX_B
E	Yellow	NMEA 0183 TX_A
F	Green	NMEA 0183 RX_A
G	Orange	NMEA 0183 RX_B

Video input

The unit can be connected to a composite video source, and display video images on its display.

→ **Note:** Camera cables are not supplied, and will need to be selected to suit termination - RCA at the unit, and typically BNC or RCA plug at the camera end.

→ **Note:** The video images will not be shared with another unit via the network. It is only possible to view video on the unit connected to the video source.

→ **Note:** Both NTSC and PAL formats are supported.

Video input configuration

Configurations to video input are made in the video panel. Refer to the Operator Manual for more information.

NMEA 0183

The unit has a built in NMEA 0183 serial interface, providing both input and output. The port(s) uses the NMEA 0183 (serial balanced) standard, and can be configured in the software for different baud rates up to 38,400 baud.

Talkers and listeners

Only one talker (output device) can be connected to a serial input (RX) on the unit, in accordance with the NMEA0183 protocol. However, an output port (TX) on the unit may be connected to up to three listener (receiver) devices, dependent on the hardware capabilities of the receiver.

Ethernet

The Ethernet port(s) can be used for transfer of data and synchronization of user created data. It is recommended that each device in the system is connected to the Ethernet network.

No special setup is required for establishing an Ethernet network.

Ethernet connector details
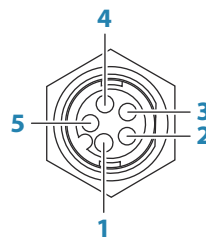
Unit socket (female)

Pin	Purpose
1	Transmit positive TX+
2	Transmit negative TX-
3	Receive positive RX+
4	Receive negative RX-
5	Shield

Ethernet expansion device

Connection of network devices can be made via an Ethernet expansion device. Additional expansion devices can be added to provide the required number of ports.

Sonar CH1 - blue connector

Supports:

- Sonar / CHIRP Sonar

→ **Note:** A 7-pin transducer cable can be connected to a 9-pin port using a 7-pin to 9-pin adaptor cable. However, if the transducer has a paddle wheel speed sensor, the water-speed data will not be displayed on the unit.

Connector details
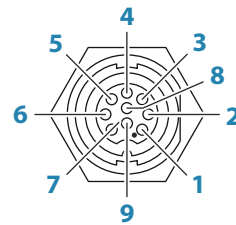
Unit socket (female)

Pin	Purpose
1	Drain/Ground
2	Not used
3	Not used
4	Transducer -
5	Transducer +
6	Not used
7	Not used
8	Temp +
9	Transducer ID

Sonar CH2 - black connector

Supports:

- Sonar / CHIRP Sonar
- ForwardScan

→ **Note:** A 7-pin transducer cable can be connected to a 9-pin port using a 7-pin to 9-pin adaptor cable. However, if the transducer has a paddle wheel speed sensor, the water-speed data will not be displayed on the unit.

Connector details
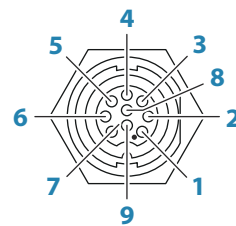
Unit socket (female)

Pin	Purpose
1	Drain/Ground
2	Starboard +
3	Starboard -
4	Transducer -
5	Transducer +
6	Port +
7	Port -
8	Temp
9	Transducer ID

HDMI out

The unit can be connected to an external monitor to replicate video at a remote location. The image is shown on the external monitor at the units own native resolution, so the external monitor should support the same resolution or be able to scale.

➔ **Note:** Some HDMI TV displays may apply over-scan, which will in effect crop the image possibly causing loss of important content. Check the display manual for an option to disable over-scan or adjust scaling.

HDMI connector details

Unit socket (female)

The unit is equipped with standard HDMI (Type A) connector(s).

HDMI cable requirements

➔ **Note:** The unit should be turned off prior to connecting or disconnecting an HDMI cable.

While the HDMI standard does not state maximum cable length, signal may be compromised on long runs. Only use Navico or other high quality HDMI certified cables. 3rd party cables should be tested before installation. On runs over 10 m it may be required to add an HDMI amplifier or use HDMI-CAT6 adaptors.

USB port

The USB port can be used to:
- Connect a keyboard.
- Connect a mouse.
- Charge a connected device. For maximum output power refer to the *"Technical specifications"* on page 42.
- Connect a storage device.
- Connect a card reader.

➔ **Note:** If you want to read chart cards using a USB card reader connected to the USB port, an MI10 USB card reader is required.

The USB devices should be standard PC compatible hardware.

➔ **Note:** USB cable length should not exceed 5 m when using regular cables. Lengths over 5 m may be possible with the use of an active USB cable.

USB connector details
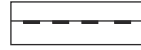
Unit socket (female)

The unit is equipped with standard USB type-A connector(s).

4 System setup

Turning the system on and off

The system is turned on by pressing the Power key.

Press and hold the Power key to turn the unit off.

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

You can also turn the unit off from the System Controls dialog.

➜ **Note:** If the unit power is controlled by the power control wire, refer to power control wiring for details about turning the unit on and off.

First time startup

When the unit is started for the first time, or after a reset, the unit displays a series of dialogs. Respond to the dialog prompts to make fundamental settings.

You can perform further setup and later change settings using the system settings dialogs.

System setup sequence

1 **General settings** - refer to *"System settings"* on page 25.
  - Make general settings as desired.
  - Configure the power control.

2 **Advanced settings** - refer to *"Advanced"* on page 26.
  - Enable or disable features.
  - Review the advanced setting options and make changes as desired.

3 **Source selection** - refer to *"Network settings"* on page 36.
  - Make sure that the proper external data sources have been selected.

4 **Feature setup**
  - Configure specific features as described later in this chapter.

The settings dialog

The system setup is done from the settings dialog.
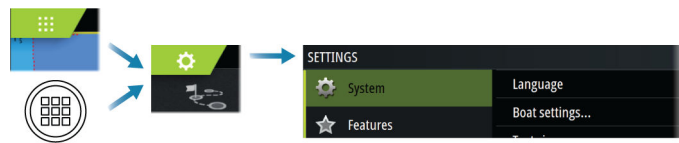
System settings
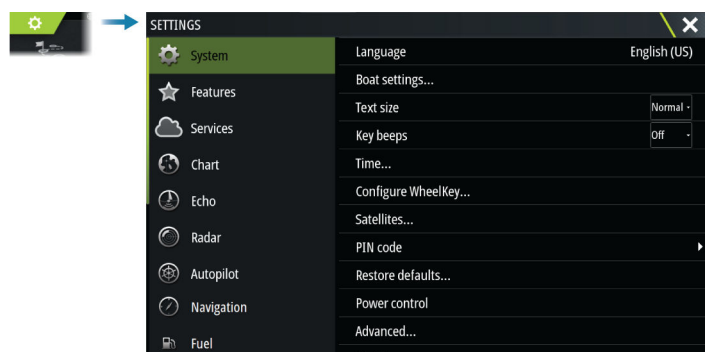
Boat settings

Used to specify the physical attributes of the boat.

Time

Configure time settings to suit vessel location, along with time and date formats.

Configure WheelKey

Configures the action of the WheelKey on the front of the unit.

PIN code

Sets a PIN code to prevent unauthorized access to your system's settings.

Note: Record the PIN code and store it in a safe place.

When you establish password protection, the PIN code must be entered when any of the following are selected. After the correct PIN code is entered, all of them can be accessed without re-entering the PIN code.

- Settings, activated from the home page or system controls dialog
- Alarms, activated from the toolbar
- Storage, activated from the toolbar
- Store, activated from the toolbar

Power control setup

Determines unit response to signals applied to the power control wire. Refer to *"Power control connection"* on page 16.

This setting is only applicable if the yellow wire is used for power control.

- Set to slave if the power control wire is connected directly to power, the ignition switch, or to a stand-alone switch. The unit should also be set to slave if you want the unit to behave as a slave when connected to a power control bus.
- Set to master to make this unit turn other devices connected to the power control bus on and off.

When a master unit is turned on or off, all units connected to the same power control bus turns on or off.

While a master unit is on, a slave unit cannot be turned off.

If no master unit is turned on, slave units can be turned on and off individually.

Advanced

Used for configuration of advanced settings and how your system displays various user interface information.

Enabling or disabling features

Use the feature option to enable or disable features that are not automatically enabled or disabled by the system.
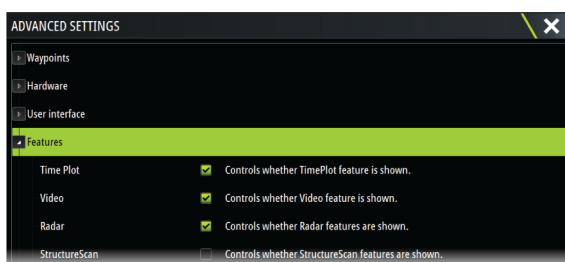
Rotating mast compensation

If the vessel is fitted with a rotating mast it will impact any sensors or radar mounted to it. Provided the mast is also fitted with a sensor to measure rotation, the effect can be compensated for.

→ **Note:** If using H5000 with a rotating mast, use mast rotation for wind needs to be disabled as the H5000 CPU will automatically correct the wind information relative to the vessel.
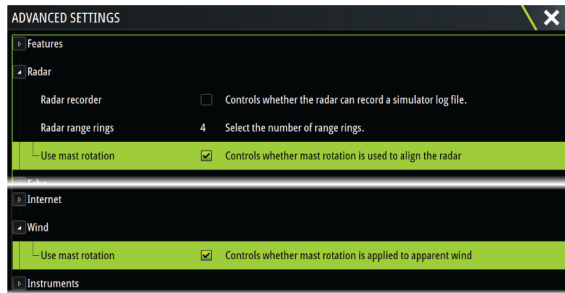
SOG as boat speed and COG as heading
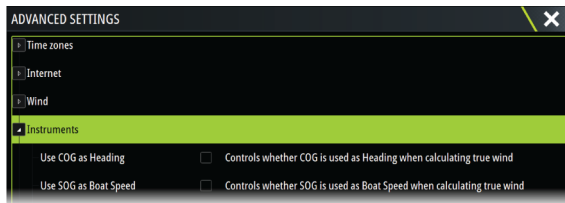
Use SOG as boat speed
If boat speed is not available from a paddle wheel sensor, it is possible to use speed over ground from a GPS. SOG will be displayed as boat speed and used in the true wind calculations and the speed log.

Use COG as heading
If heading data is not available from a compass sensor, it is possible to use COG from a GPS. COG will be used in the true wind calculations.

→ **Note:** The autopilot cannot be operated using COG as the heading source. COG cannot be calculated when stationary.

GPS offset - start line configuration
In order for the start line feature to work at it's optimum, the exact position of the vessels bow must be known. This is achieved by entering position offsets for the GPS sensor. These offsets combined with heading data will allow the software to accurately determine the bows distance from the start line.
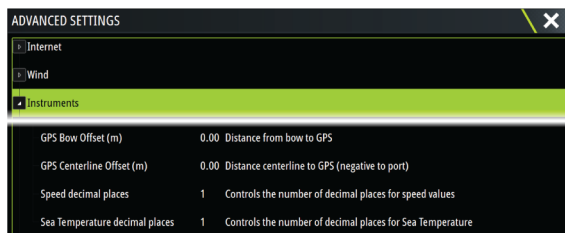
GPS Bow Offset
Enter the distance from bow to GPS (always a positive value)

→ **Note:** Ensure the bow offset includes any projections forward of the hull, such as a bowsprit.

GPS Centerline offset
Enter the distance from vessel centerline to GPS (negative to port)

Activating/deactivating features and applications
Use the system settings features option to activate/deactivate features and applications.

Manage features and applications

You can manage and install/uninstall the features and apps. When a feature/app is uninstalled, the icon is removed from the home page. The feature/application can be installed again.

Feature unlock

Some additional features can be sold separately. These features can be unlocked by entering an unlock code.

Select the feature you want to unlock. Follow the instructions to purchase and enter the feature unlock code.

After a feature unlock code is entered in the unit, the feature is available for use.

➔ **Note:** The feature unlock option is only available if your unit supports a locked feature.

Alarms
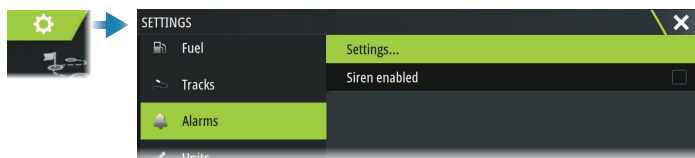
Settings

List of all available alarm options in the system, with current settings.

From this list you can activate, deactivate and change alarm limits.

Siren enable

The Siren enabled option must be set in order for the unit to activate the buzzer when an alarm condition arises.

Its setting also determines the operation of the external alarm output.

Radar installation

The radar system requires radar sensor specific settings in order to adjust for a number of variables found in different installations.

➔ **Note:** The installation settings available depends on the radar type and model.
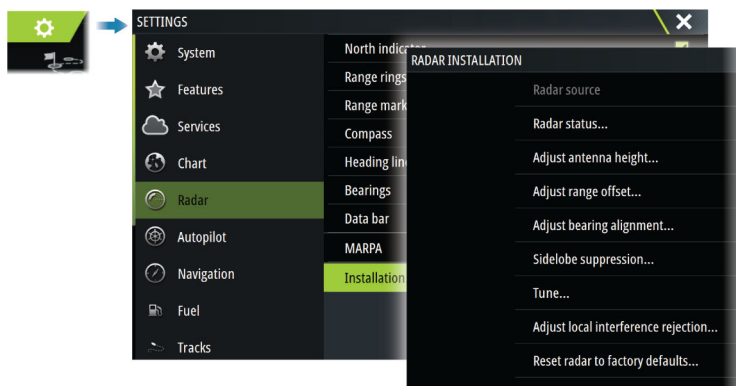
Radar source

In a system with more than one radar sensor, the device to configure is selected from this menu.

➔ **Note:** Radars that support dual radar mode are represented twice in the source list, with an A and B suffix.

Radar status

Displays scanner information and scanner features, primarily used for information and to assist with fault finding.
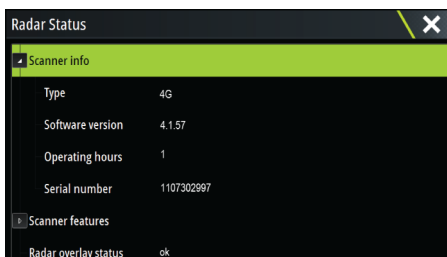
Adjust antenna height

Set the radar scanner height relative to the water surface. The Radar uses this value to calculate the correct STC settings.

Select antenna length

Select the proper antenna length.

Adjust range offset

The radar sweep should commence at your vessel (a radar range of zero). You may need to adjust the radar range offset to achieve this. If this is set incorrectly, a large dark circle in the center of the sweep might occur. You might notice straight objects such as straight sea walls or piers having curves or an indentation. Objects close to your vessel may appear pulled in or pushed out.

Adjust the range offset as below when the vessel is about 45 to 90 m (50 to 100 yards) from a straight-walled jetty or similar feature that produces a straight line echo on the display.

1　Position the vessel in relation to the jetty.

2　Adjust the range offset to make the jetty echo appear as a straight line on the display.
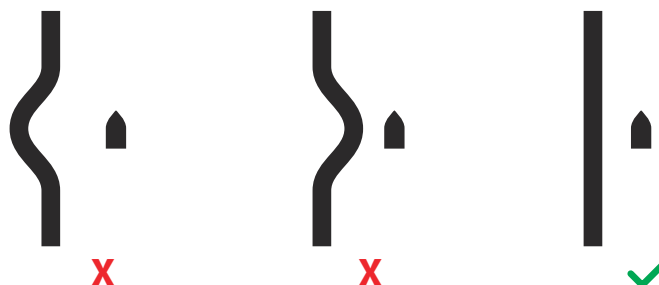
Adjust bearing alignment

This option is used to align the heading marker on the screen with the center line of the vessel. This will compensate for any slight misalignment of the scanner during installation.

Misalignment that is not corrected for will compromise target tracking and can result in dangerous misinterpretation of potential navigation hazards.

Any inaccuracy will be evident when using MARPA or chart overlay.

1 Point the vessel towards a stationary isolated object, or towards a far range AIS target where the AIS icon matches the radar echo.

2 Adjust the coarse and fine bearing alignment so that the heading line touches the end of the selected object, or the radar target matches the AIS target.

→ **Note:** Adjustments to bearing alignment has to be done before Use mast rotation is enabled.

Sidelobe suppression

Occasionally false target returns can occur adjacent to strong target returns such as large ships or container ports. This occurs because not all of the transmitted radar energy can be focused into a single beam by the radar antenna, a small amount of energy is transmitted in other directions. This energy is referred to as sidelobe energy and occurs in all radar systems. The returns caused by sidelobes tend to appear as arcs.

→ **Note:** This control should only be adjusted by experienced radar users. Target loss in harbor environments may occur if this control is not adjusted correctly.

When the radar is mounted where there are metallic objects near the radar, sidelobe energy increases because the beam focus is degraded. The increased sidelobe returns can be eliminated using the sidelobe suppression control.

By default, this control is set to auto and normally should not need to be adjusted. However, if there is significant metallic clutter around the radar, sidelobe suppression may need to be increased.

To adjust the sidelobe suppression value:

1. Set radar range to between 1/2 nm to 1 nm and the sidelobe suppression to auto
2. Take the vessel to a location where sidelobe returns are likely to be seen. Typically, this would be near a large ship, container port, or metal bridge.
3. Traverse the area until the strongest sidelobe returns are seen.
4. Change auto sidelobe suppression to OFF, then adjust the sidelobe suppression control just enough to eliminate the sidelobe returns. You may need to monitor 5-10 radar sweeps to be sure they have been eliminated.
5. Traverse the area again and readjust if sidelobes returns still occur.

Sector blanking

Radar installed in close proximity to a mast or structure could cause unwanted reflections or interference to appear on the radar image. Use the sector blanking feature to stop the radar from transmitting on up to four sectors in the image.

→ **Note:** Sectors are setup relative to the heading line of the radar. The bearing of the sector is measured from the center line of the sector.

→ **Note:** Sector blanking should be applied very carefully to avoid reducing the radar's usefulness in identifying valid and potentially dangerous targets.
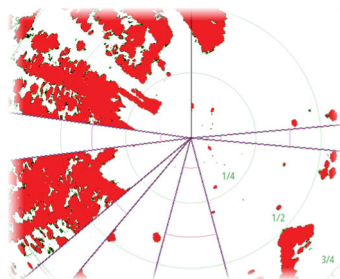
Main radar PPI

Radar overlay on a chart

Adjust open array park angle

The park angle is the final resting position of the antenna relative to the heading line of the radar when the radar is set to standby. The antenna will stop rotating at the desired offset.

Adjust local interference reject

Interference from some onboard sources can interfere with the Broadband radar. One symptom of this could be a large target on the screen that remains in the same relative bearing even if the vessel changes direction.

Halo light

Controls the levels of the Halo Radar blue accent lighting. The accent lighting can only be adjusted when the radar is in standby mode.

→ *Note:* The blue accent pedestal lighting might not be approved for use in your boating location. Check your local boating regulations before turning the blue accent lights ON.

Tune

The automatic tuning will work well in most installations. The manual tuning is used if it is required to adjust the result from an automatic tuning.

Reset radar to factory defaults

Clears all user and installer settings applied to the selected radar source, and restores factory settings.

→ *Note:* Use this option with caution. Take note of current settings first, especially those set by the operator if radar has already been in active service.

Echosounder settings

Internal echosounder CH1 and CH2

When selected, the internal echosounder channel is available for selection in the echosounder panel menu.

When unselected, this option disables the internal echosounder channel in the unit. It will not be listed as an echosounder source for any unit on the network. Unselect this option for channels with no transducer connected.

Network Echosounder

Select to share transducers from this unit with other units connected on the Ethernet network. In addition, the setting must be selected in order to see other enabled sonar devices on the network.

When unselected, transducers connected to this unit cannot be shared with other units connected on the network, nor can it see other sources on the network that have this feature enabled.

Network echosounder mode

The network echosounder mode setting selects whether only one or multiple echosounder sources can be selected at the same time.

→ *Note:* Single source is automatically selected if there are older legacy echosounders on the network. You cannot change this setting if older legacy echosounders are on the

network. Multi-source mode should be selected if no legacy echosounder is connected to the network.

→ *Note:* When changing the mode to multi-source you must wait 30 seconds and then power down all sources for. Wait 1 minute, then restart all connected sources.

Structure depth offset

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 vessel to the bottom, set the offset equal to the vertical distance between the transducer and the lowest part of the vessel, **A** (negative value).
- To show the depth from the water surface to the bottom, set the offset equal to the vertical distance between the transducer and the water surface, **B** (positive value)
- For depth below transducer, set the offset to 0.

Use network depth and temp data

Selects from which network source depth and temperature data is shared on the NMEA 2000 network.

Installation

Use this dialog to setup and configure available sources.

Source

Select this option to display a list of sources available for setup. The settings you make in the rest of the dialog pertain to the source selected.

Source name

Select this option to set a descriptive name for the selected transducer.

Search depth

Noise may cause the echosounder to search for unrealistic depths. By setting the search depth manually the system displays echoes received from objects within the set depth range.

Depth offset

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 vessel to the bottom, set the offset equal to the vertical distance between the transducer and the lowest part of the vessel, **A** (negative value).
- To show the depth from the water surface to the bottom, set the offset equal to the vertical distance between the transducer and the water surface, **B** (positive value)
- For depth below transducer, set the offset to 0.

Water speed calibration

Water speed calibration is used to adjust the speed value from the paddle wheel to match the actual boat speed through the water. Actual speed can be determined from GPS speed over ground (SOG) or by timing the boat over a known distance. Water speed calibration should be performed in calm conditions, with minimal wind and current movement.

Increase this value above 100 % if the paddle wheel is under reading, and decrease this value if it is over reading. For example, if the average water speed reads 8.5 knots (9.8 MPH) and SOG records 10 knots (11.5 MPH) the calibration value needs to be increased to 117 %. To calculate the adjustment, divide the SOG by the paddlewheel speed, and multiply the product by 100.

Calibration range: 50-200 %. Default is 100 %.

Water speed averaging

Averages water speed by measuring your speed at a selected interval of time. Water speed intervals range from one to thirty seconds. For example if you select five seconds, your displayed water speed will be based on averaging over 5 seconds of sampling.

Calibration range: 1-30 seconds. Default is 1 second.

Water temperature calibration

Temperature calibration is used to adjust the water temperature value from the sonar transducer. It may be required to correct for localized influences to the measured temperature.

Calibration range: -9.9° - +9.9°. Default is 0°.

➔ **Note:** Water temperature calibration only appears if the transducer is temperature capable.

Transducer type

➔ ***Note:*** The transducer type is automatically set for transducers that support Transducer ID (XID) and is not user selectable.

Transducer type is used for selecting the transducer model connected to the sonar module. The transducer selected will determine what frequencies the user can select during sonar operation. In some transducers with built-in temperature sensors, the temperature reading may be inaccurate or not available at all if the wrong transducer is selected. Transducer temperature sensors are one of two impedances - 5k or 10k. Where both options are given for the same model transducer, refer to paperwork supplied with transducer to determine impedance.

Restore echosounder defaults

Restore echosounder settings to the factory supplied defaults.

ForwardScan installation

Available when a ForwardScan transducer is connected.

For setup information, refer to the Operator Manual.

Autopilot settings

The Autopilot settings dialog depends on which autopilot computer that is connected to the system. If more than one autopilot is connected, the Autopilot settings dialog shows option for the active autopilot.

The autopilot settings can be split between settings done by the user, and settings done during installation and commissioning of the autopilot system.

- User settings can be changed for various operational conditions or user preferences.
- Installation settings are defined during commissioning of the autopilot system. No changes should later be done to these settings.

The following sections describe the installation settings per autopilot computer. For user settings, refer to the Operator manual.

H5000 specific installation settings

For setup and commissioning of the H5000, refer to the documentation included with the H5000 system.

NAC-2/NAC-3 specific installation settings

For setup and commissioning of the NAC-2 or NAC-3, refer to the commissioning manual included with the autopilot computer.

Fuel settings

The fuel utility monitors a vessel's fuel consumption. This information is totaled to indicate trip and seasonal fuel usage, and is used to calculate fuel economy for display on instrument pages and the data bar.

To use the utility, a Navico Fuel Flow sensor, or a NMEA 2000 engine adaptor cable/gateway with Navico Fuel Data Storage device must be fitted to the vessel. The Navico Fuel Flow sensor does not require the use of a separate Fuel Storage device. Refer to the engine manufacturer or dealer for information on whether or not your engine provides a data output, and what adaptor is available to connect to NMEA 2000.

Once the physical connection is made, ensure source selection is completed. Multiple engine installations using Fuel Flow sensors, or Fuel Data Storage devices, require setup of related engine location in the Device list. For general source selection information, refer to *"Network settings"* on page 36.

Vessel setup

The Vessel setup dialog must be used to select the number of engines, the number of tanks and vessel's total fuel capacity across all tanks.
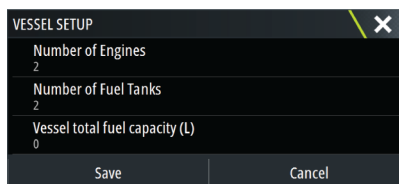
Fuel remaining measurement

The Fuel remaining measurement can be determined from fuel used by engine(s), or fuel level from tank sensors. Nominal fuel consumption is required to set the scale on the fuel economy gauge. This value should be determined from experience, over time. Alternatively the boat builder or designer may be able to give an approximate value to use.

→ **Note:** Fuel remaining measurement taken from level sensors while underway can get inaccurate readings due to vessel movement.

→ **Note:** Nominal fuel consumption setting should be determined taking into account typical vessel loads. That is, filled fuel and water tanks, stowed tender, supplies, etc.

Fuel flow configuration

After the number of engines is set, it is required to set which fuel flow sensor is connected to which engine. Under Device list on the Network page, view the Device Configuration dialog for each sensor, and set the Location to match the engine the device is connected to.

Unconfigure - defaults the device which clears all user settings.

Reset Fuel Flow - restores only the Fuel K-Value setting, if set in Calibrate. Only Navico devices can be reset.
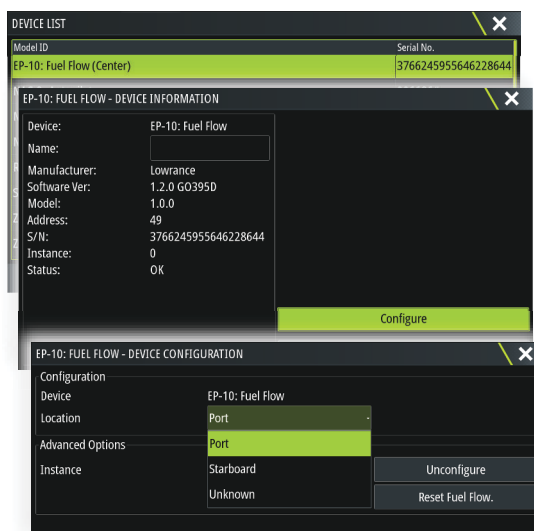
Calibrate

Calibration may be required to accurately match measured flow with actual fuel flow. Access calibration from the Refuel dialog. Calibration is only possible on Navico's Fuel Flow sensor.

1. Start with a full tank and run the engine as it would normally be operated.

2. After at least several liters (a few gallons) have been used, the tank should be fully refilled, and the Set to full option selected.
3. Select the Calibrate option.
4. Set the actual amount used based on amount of fuel added to the tank.
5. Select OK to save settings. The Fuel K-Value should now show a new value.

→ **Note:** To calibrate multiple engines repeat the steps above, one engine at a time. Alternatively, run all engines simultaneously, and divide the Actual amount used by the number of engines. This assumes reasonably even fuel consumption on all engines.

→ **Note:** The Calibrate option is only available when Set to full is selected, and a Fuel Flow is connected and set up as a source.

→ **Note:** A maximum of 8 engines is supported using Fuel Flow sensors.

Fuel Level

With the use of a Navico Fluid Level device connected to a suitable tank level sensor, it is possible to measure the amount of fuel remaining in any equipped tank. The number of tanks must be set in Vessel Setup dialog, initiated from the Fuel setting options page, to allow discrete tank assignment of the Fluid Level devices.

Select Device list on the Network page, and view the Device Configuration dialog for each sensor, and set the Tank location, Fluid type, and Tank size.

For setting up the Instrument bar or a gauge on the Instrument page with Fluid Level device data, refer to the Operator Manual.

→ **Note:** A maximum of 5 tanks is supported using Fluid Level devices.

→ **Note:** Tank data that is output by a compatible engine gateway can also be displayed, however tank configuration for such a data source is not possible from this unit.

Wireless settings

Provides configuration and setup options for the wireless functionality.

For further details about wireless setup and connectivity, refer to the Operator Manual.

Network settings
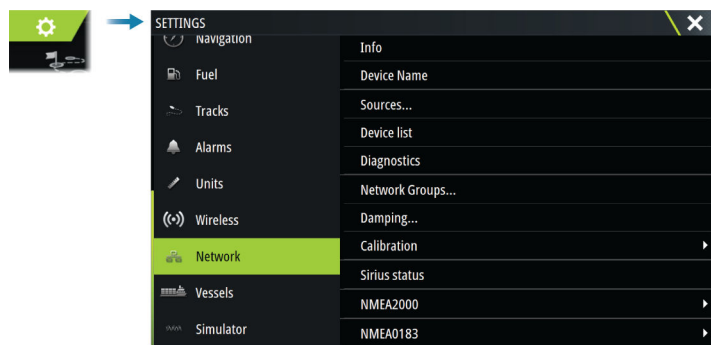
Device name

Assigning a name is useful in systems using more than one device of the same type and size.

Sources

Data sources provide live data to the system.

When a device is connected to more than one source providing the same data, the user can choose the preferred source. Before commencing with source selection make sure all external devices and networks are connected and turned on.
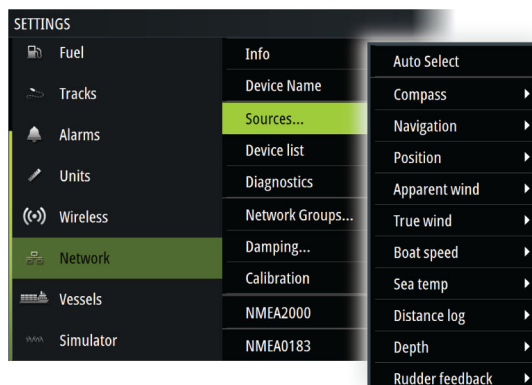
Auto Select

The Auto Select option looks for all sources connected to the device. If more than one source is available for each data type, selection is made from an internal priority list. This option is suitable for the majority of installations.

Manual source selection

Manual selection is generally only required where there is more than one source for the same data, and the automatically selected source is not the one desired.
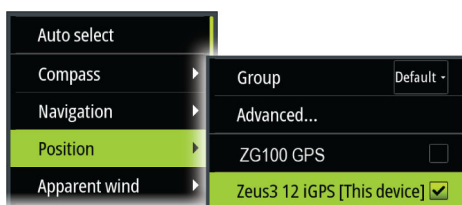
Group source selection

The unit can use the same data sources that all other products on the network use, or alternatively use a data source independently from other units.

If the unit is part of a source group, all source selection changes will affect all units belonging to the same group.

→ **Note:** In order to enable group selection, the unit must be set to the Default group.

Devices with no selected group can use different sources than the rest of the network devices.

Advanced source selection

This allows the most flexible and precise manual control over which devices provide data.

Occasionally auto select might not assign the desired source, which can be corrected using the advanced source selection.

Device list

Selecting a device in this list will bring up additional details and options for the device.

All devices allow allocation of an instance number in the configure option. Set unique instance numbers on any identical devices on the network to allow the unit to distinguish between them. The data option shows all data being output by the device.

→ **Note:** In most cases, setting the instance number on a 3rd party product is not possible.

Diagnostics

Provides information useful for identifying an issue with the network.

NMEA 2000

Provides information on NMEA 2000-bus activity.

→ **Note:** The following information might not always indicate an issue that can be simply resolved with minor adjustment to network layout or connected devices and their activity on the network. However, Rx and Tx errors are most likely indicating issues with the physical network, which can be resolved by correcting termination, reducing backbone or drop lengths, or reducing the number of network nodes (devices).

UDB

Provides information on Ethernet activity.

Network groups

This function is used to control parameter settings, either globally or in groups of units. The function is used on larger vessels where several units are connected via a network. By assigning several units to the same group, a parameter update on one unit will have the same effect on the rest of the group members.

If any of the settings require discrete control, set the group to None.

Damping

If data appears erratic or too sensitive, damping may be applied to make the information appear more stable. With damping set to off, the data is presented in raw form with no damping applied.

Calibration

An offset (positive or negative) can be applied to correct data inaccuracies from NMEA 2000 sources. The offset is set on the NMEA 2000 device.

→ **Note:** Select the advanced option to adjust local offsets for this display only.

→ **Note:** It is typically not possible to calibrate 3rd party sensors. However, a local offset can be applied.

NMEA 2000 setup

Receive waypoint

Select this option to allow another device capable of creating and exporting waypoints via NMEA 2000 to transfer directly to this unit.

Send waypoint

Select this option to allow this unit to send waypoints to another device via NMEA 2000.

→ **Note:** The system can only transmit or receive one waypoint at a time on creation of that waypoint. For bulk import or export of waypoints see the operator manual.

NMEA 0183 setup

The NMEA 0183 port(s) must be set to suit the speed of connected devices, and can be configured to output only the sentences required by listening devices.

Receive waypoint

Select this option to allow a device capable of creating and exporting waypoints via NMEA 0183 to transfer directly to this unit.

Baud rate

This should be set to correspond with devices connected to the NMEA 0183 input and output. The input and output (Tx, Rx) use the same baud rate setting.

→ **Note:** AIS transponders typically operate at NMEA 0183-HS (high speed), and will require the baud rate to be set to 38,400.

Serial output

Selection determines whether the data is output via Tx lines, and will enable editing of the output sentences list.

Serial output sentences

This list allows control over which sentences that are transmitted to other devices from the NMEA 0183 port. Due to the limited bandwidth of NMEA 0183 it is desirable to only enable the data that is required. The less sentences that are selected, the higher the output rate of the enabled sentences.

Ethernet/WiFi

The NMEA 0183 data stream is output and made available to tablet devices and PCs, via WiFi or Ethernet connection. The dialogue provides IP and port data typically required for configuring the application on the third party device.

→ **Note:** Other MFDs cannot decode this information back to NMEA 0183, to use the data as a source. To share data a physical NMEA 2000 or NMEA 0183 connection is still required.

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3rd party support

CZone

CZone connection to NMEA 2000

When interfacing to CZone network it is recommended to use a BEP Network interface bridge to join the two network backbones together.

The CZone / NMEA 2000 Network interface bridge isolates the power of the two networks, but allows data to be freely shared between both sides.

The Interface Bridge can also be used for expansion of the NMEA 2000 network, when the maximum node limit (node = any device connected to network) for the network has been reached or the maximum cable length of 150 m will be exceeded. Once an Interface Bridge has been fitted, a further 40 nodes and additional cable length can be added.

The Network Interface is available from your BEP dealer.
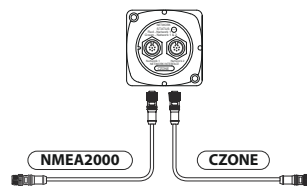
CZone setup
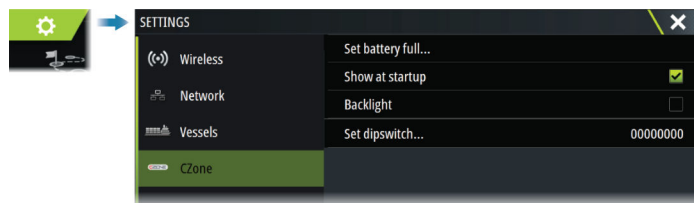
In order to communicate with the CZone modules connected to the network, the unit must be assigned a unique CZone Display Dipswitch setting.

The functionality of the CZone system is determined by the CZone Config File which is stored on all CZone modules and the Zeus³S. The file is created using the CZone Configuration Tool, a specialized PC application available from BEP Marine Ltd, and associated CZone distributors.

For more information, refer to the documentation provided with your CZone system.

Assigning the dipswitch setting

Every product capable of controlling and viewing CZone devices must be assigned a virtual dipswitch setting. This setting is unique for each device. Typically it is set after the configuration file already exists on the CZone system, but it may also be set in advance. To do so, access the CZone menu on the Settings page.

When the configuration is already available on the network, it will immediately commence uploading to the Zeus³S once the dipswitch is set. Allow this to complete, without interruption.

Setting CZone to display at startup

With this option selected, the CZone control page is shown first, every time the Zeus³S is powered up.

Backlight

Enabling this causes the Zeus³S to synchronize its backlight setting with that of any CZone Display Interfaces set up to share backlight settings.

➔ *Note:* CZone Config also needs to have the Zeus³S set as a controller.

Naviop

If this device is on the same NMEA 2000 network as a Naviop Loop system, this device can be used to operate the Naviop Loop system.

For details, refer to the documentation following the Naviop system.

FLIR camera setup

Compatible FLIR cameras are plug and play when used in conjunction with a device acting as a DHCP host.

FLIR settings can be found in the advanced settings dialog.
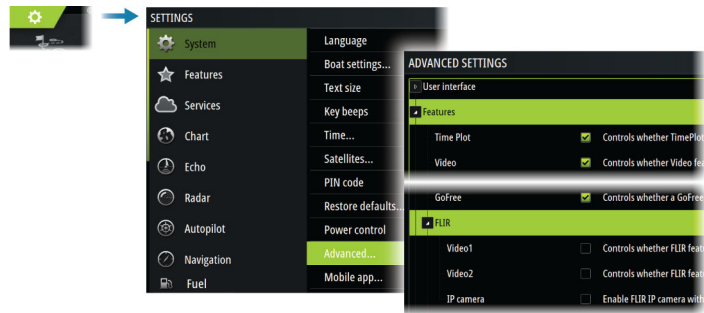
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Appendix

Technical specifications

Technical specifications

Display	
Resolution	
9" unit	1280 x 720
12" unit	1280 x 800
16" unit	1920 x 1080
Type	High Visibility SolarMax HD® IPS optically bonded TFT
Brightness	1200 nits
Touch screen	Full touch screen (multi-touch)
Viewing angles in degrees (typical value @ contrast ratio = 10)	80° top/bottom, 80° left/right
Electrical	
Supply voltage	12/24 V DC (10 - 31.2 V DC min - max)
Power consumption - Max	
9" unit	23 W +- 4 W
12" unit	30 W +- 5 W
16" unit	45 W +- 5 W
Recommended fuse rating	
9" unit	5 A
12" unit	5 A
16" unit	5 A
Environmental	
Operating temperature range	-15°C to +55°C (5°F to 131°F)
Storage temperature	-20°C to +60°C (4°F to 140°F)
Waterproof rating	IPX 6 and 7
Humidity	IEC 60945 Damp heat 66°C (150°F) at 95% relative (48 hr)
Shock and vibration	100 000 cycles of 20 G
Position	Built-in 10 Hz GNSS receiver for GPS and GLONASS, supports combinations with Galileo, Beidou, QZSS. SBAS (WAAS, EGNOS, MSAS, GAGAN).
Interface/Connectivity	
Ethernet	
9" unit	1 port (5-pin connector)
12" and 16" units	2 ports (5-pin connector)
NMEA 2000	1 port (Micro-C)
NMEA 0183	1 talker/listener (4800, 9600, 19200, 38400 baud - via optional adaptor cable)
Sonar	2 ports
Video input	2 ports (Composite video RCA - via optional adaptor cable)

Video output	
9" unit	Not applicable
12" and 16" units	1 port (HDMI 1.4 sink and HDCP)
Data card reader	2 slots (microSD, max 32 GB, FAT32)
Wireless	802.11b/g/n
Bluetooth	Bluetooth 4.0 with support for Bluetooth Classic
USB	
9" and 12" units	Not applicable
16" unit	1 port (USB A) Output: 5 V DC, 1.5 A
Physical	
Dimensions (W x H x D)	Refer to *"Dimensional drawings"* on page 44
Weight (display only)	
9" unit	1.4 kg (3.11 lbs.)
12" unit	3.1 kg (6.83 lbs.)
16" unit	4.7 kg (10.25 lbs.)
Compass Safe Distance - Metric, imperial	50 cm (1.7 ft)
Mounting type	Bracket (Supplied) or panel mount

Dimensional drawings

9" unit

310.9 mm (12.24")
287.0 mm (11.30")
179.5 mm (7.07")
166.3 mm (6.55")
296.2 mm (11.66")

131.0 mm (5.15")
18.5 mm (0.73")
69.6 mm (2.74")
66.6 mm (2.62")

12" unit

377.1 mm (14.85")
351.5 mm (13.84")
240.6 mm (9.47")
225.3 mm (8.87")
349.0 mm (13.74")

170.3 mm (6.70")
18.5 mm (0.73")
78.1 mm (3.07")
106.7 mm (4.20")

16" unit

462.1 mm (18.19")
436.5 mm (17.19")
263.9 mm (10.39")
256.0 mm (10.08")
434.0 mm (17.09")

170.3 mm (6.70")
18.5 mm (0.73")
79.6 mm (3.13")
106.8 mm (4.21")
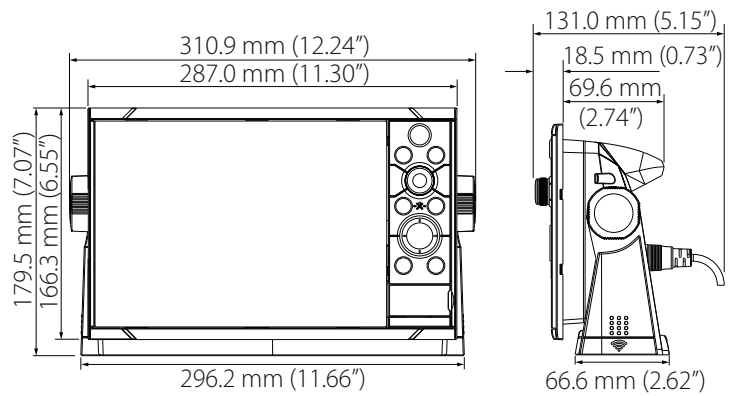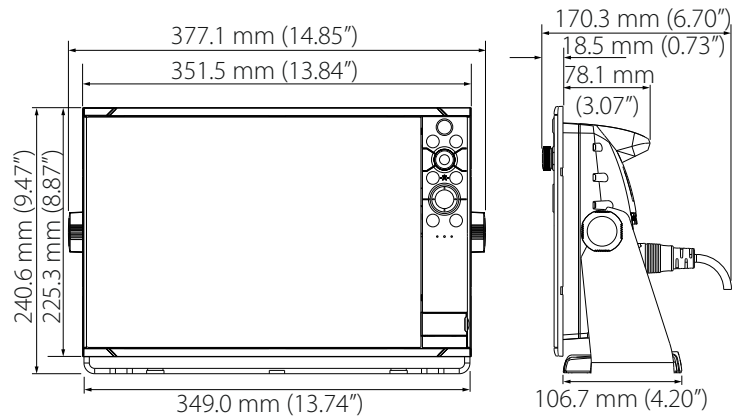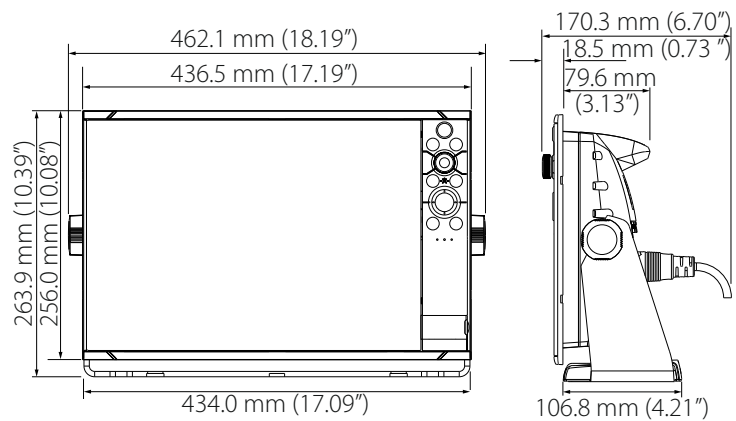
Supported data

NMEA 2000 compliant PGN List

NMEA 2000 PGN (receive)

59392	ISO Acknowledgement
59904	ISO Request
60160	ISO Transport Protocol, Data Transfer
60416	ISO Transport Protocol, Connection M.
65240	ISO Commanded Address
60928	ISO Address Claim
126208	ISO Command Group Function
126992	System Time
126996	Product Info
126998	Configuration Information
127233	Man Overboard Notification (MOB)
127237	Heading/Track Control
127245	Rudder
127250	Vessel Heading
127251	Rate of Turn
127252	Heave
127257	Attitude
127258	Magnetic Variation
127488	Engine Parameters, Rapid Update
127489	Engine Parameters, Dynamic
127493	Transmission Parameters, Dynamic
127500	Load Controller Connection State / Control
127501	Binary Status Report
127503	AC input status
127504	AC Output Status
127505	Fluid Level
127506	DC Detailed Status
127507	Charger Status
127508	Battery Status
127509	Inverter Status
128259	Speed, Water referenced
128267	Water Depth
128275	Distance Log
129025	Position, Rapid Update
129026	COG & SOG, Rapid Update
129029	GNSS Position Data
129033	Time & Date
129038	AIS Class A Position Report
129039	AIS Class B Position Report
129040	AIS Class B Extended Position Report
129041	AIS aids to Navigation

129283	Cross Track Error
129284	Navigation Data
129539	GNSS DOPs
129540	AIS Class B Extended Position Report
129545	GNSS RAIM Output
129549	DGNSS Corrections
129551	GNSS Differential Correction Receiver Signal
129793	AIS UTC and Date Report
129794	AIS aids to Navigation
129798	AIS SAR Aircraft Position Report
129801	Cross Track Error
129802	AIS Safety Related Broadcast Message
129283	Cross Track Error
129284	Navigation Data
129539	GNSS DOPs
129540	GNSS Sats in View
129794	AIS Class A Static and Voyage Related Data
129801	AIS Addressed Safety Related Message
129802	AIS Safety Related Broadcast Message
129808	DSC Call Information
129809	AIS Class B "CS" Static Data Report, Part A
129810	AIS Class B "CS" Static Data Report, Part B
130060	Label
130074	Route and WP Service - WP List - WP Name & Position
130306	Wind Data
130310	Environmental Parameters
130311	Environmental Parameters
130312	Temperature
130313	Humidity
130314	Actual Pressure
130316	Temperature, Extended Range
130569	Entertainment - Current File and Status
130570	Entertainment - Library Data File
130571	Entertainment - Library Data Group
130572	Entertainment - Library Data Search
130573	Entertainment - Supported Source Data
130574	Entertainment - Supported Zone Data
130576	Small Craft Status
130577	Direction Data
130578	Vessel Speed Components
130579	Entertainment - System Configuration Status
130580	Entertainment - System Configuration Status
130581	Entertainment - Zone Configuration Status
130582	Entertainment - Zone Volume Status
130583	Entertainment - Available Audio EQ Presets
130584	Entertainment - Bluetooth Devices

| 130585 | Entertainment - Bluetooth Source Status |

NMEA 2000 PGN (transmit)

60160	ISO Transport Protocol, Data Transfer
60416	ISO Transport Protocol, Connection M.
126208	ISO Command Group Function
126992	System Time
126993	Heartbeat
126996	Product Info
127237	Heading/Track Control
127250	Vessel Heading
127258	Magnetic Variation
127502	Switch Bank Control
128259	Speed, Water referenced
128267	Water Depth
128275	Distance Log
129025	Position, Rapid Update
129026	COG & SOG, Rapid Update
129029	GNSS Position Data
129283	Cross Track Error
129285	Navigation - Route/WP Information
129284	Navigation Data
129285	Route/Waypoint Data
129539	GNSS DOPs
129540	GNSS Sats in View
130074	Route and WP Service - WP List - WP Name & Position
130306	Wind Data
130310	Environmental Parameters
130311	Environmental Parameters
130312	Temperature
130577	Direction Data
130578	Vessel Speed Components

NMEA 0183 supported sentences

TX / RX - GPS

Name	Description	RX	TX
DTM	Datum reference	X	
GGA	Global positioning system (GPS) fix data	X	X
GLC	Geographic position - Loran-C		
GLL	Geograpic position - Latitude/longitude	X	X
GSA	GNSS DOP and active satellites	X	X
GNS	GNSS fix data	X	
GSV	GNSS satellites in view	X	X
VTG	Course over ground and ground speed	X	X
ZDA	Time and date	X	X

TX / RX - Navigation

Name	Description	RX	TX
AAM	Waypoint arrival alarm		X
APB	Heading/track controller (autopilot) sentence B		X
BOD	Bearing origin to destination		X
BWC	Bearing and distance to waypoint - Great circle		X
BWR	Bearing and distance to waypoint - Rhumb line		X
RMB	Recommended minimum navigation information		X
XTE	Cross-track error - measured		X
RTE	Routes	X	
WPL	Waypoint location	X	

TX / RX - Sonar

Name	Description	RX	TX
DBT	Depth below transducer	X	X
DPT	Depth	X	X
MTW	Water temperature	X	X
VLW	Dual ground/water distance	X	X
VHW	Water speed and heading	X	X

TX / RX - Compass

Name	Description	RX	TX
HDG	Heading, deviation and variation	X	X
HDT	Heading true	X	
THS	True heading and status	X	X
ROT	Rate of turn	X	

TX / RX - Wind

Name	Description	RX	TX
MWD	Wind direction and speed	x	x
MWV	Wind speed and angle	x	x

TX / RX - AIS / DSC

Name	Description	RX	TX
DSC	Digital selective calling information	x	
DSE	Expanded digital selective calling	x	
VDM	AIS VHF data-link message	x	
VDO	AIS VHF data-link own-vessel report	x	

→ **Note:** AIS sentences are not bridged to or from NMEA 2000.

TX / RX - MARPA

Name	Description	RX	TX
TLL	Target latitude and longitude		x
TTM	Tracked target message		x

→ **Note:** These are only output sentences.

Radar

Name	Description	RX	TX
RSD	Radar system data		*x
OSD	Own ship data		*x

→ **Note:** *x - only transmitting when the radar panel is displayed.

MISC

Name	Description	RX	TX
MOB	Man over board notification	x	
VBW	Dual ground/water speed	x	
XDR	Transducer measurement	x	x

B&G

ADDENDUM for Zeus³S Operator Manual

The synchronize feature

The C-MAP Embark button in the system controls dialog is replaced with a Synchronize my data button. The C-MAP Embark option in the Services Settings dialog is also replaced with a Synchronize my data option.

Example of the Synchronize my data button in the system controls dialog:

Using the synchronize feature

You can use a browser you can sign-in to your B&G app account from your mobile device or tablet to manage (create new, change, move, and delete):

- Waypoints
- Routes
- Tracks

Use the MFD's Synchronize my data option to synchronize between the MFD and your B&G app account.

→ **Note:** PredictWind waypoints are not included in the Synchronize my data feature.

Requirements

- An account with the B&G mobile app

→ **Note:** Your C-MAP Embark or C-MAP app account credentials can be used to sign-in to the mobile app. You do not need to create a separate mobile app account.

- To synchronize, the unit must be connected to the internet. To connect the unit to the internet, refer to the operator manual.

Synchronizing

To synchronize the MFD data and your B&G app account data open the Synchronize my data feature from the System Controls dialog or the Services settings dialog.

After sign-in, the system advises the last time synchronizing occurred and the following options are available:

- Edit - use to change sign-in credentials
- Auto Synchronize - synchronizing occurs periodically in the background when connected to the internet
- Synchronize now - synchronizing occurs immediately

Learn more about marine GPS navigation we have.