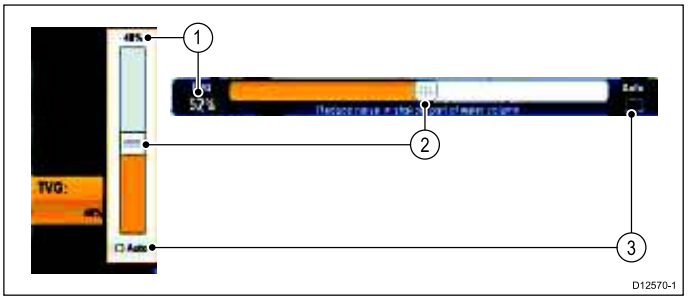
ii. The onscreen **Up** and **Down** arrows — Touchscreen displays.

3. To access the on-screen numeric keypad:
   - Touch operation — Select the onscreen keypad icon from the numeric adjust control.
   - Non-Touch operation — Press and hold the **Ok** button.

   The onscreen numeric keypad is displayed.
4. Enter the required value.
5. Select **Ok** to exit the numeric keypad and return to the menu.

Using slider bar controls

Slider bar controls provide a graphical representation of numeric data and enables you to quickly change setting values.

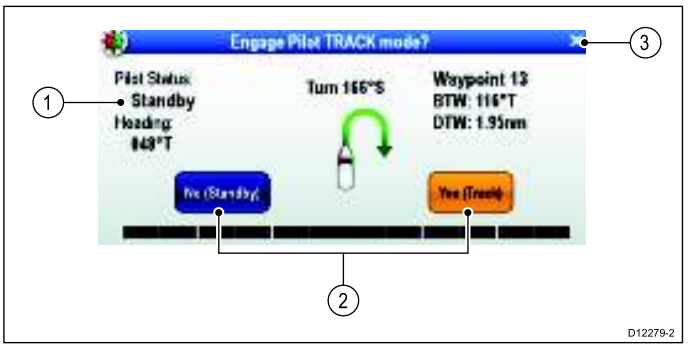


Item	Description	Non—Touch operation	Touch operation
1	Current value	N/A	N/A
2	Slider control	Use the **Rotary control** to adjust value	Slide the slider **Up** or **Down** to adjust value.
3	Auto	Press **Ok** button to switch between Auto and manual adjustment.	Select to switch between Auto and manual adjustment.

Using control dialogs

Control dialogs enable you to control externally connected equipment, such as an autopilot unit.

The following diagram shows the main features of a typical control dialog:



Screen item	Description
1	**Status** — provides status information for the connected equipment. For example, the Pilot Control dialog displays the locked heading and current navigation mode for a connected autopilot unit.
2	**Control icons** — provide direct control of the connected equipment. For example, the Pilot Control dialog **Standby** and **Track** icons enable you to instruct a connected autopilot unit to perform specific functions.
3	**Close** — Closes the control dialog.

6.8 Basic touchscreen operations

Placing and moving the cursor using touch

To place or move the cursor around the screen on a touchscreen multifunction display follow the steps below.

1. Touch the screen at any position on the screen to place the cursor there.

Touchscreen lock

On a multifunction display with HybridTouch you can lock the touchscreen to prevent accidental use.

For example, locking the touchscreen is particularly useful in rough water or weather conditions.

The touchscreen can be locked and unlocked from the homescreen. The touchscreen can only be unlocked using physical buttons.

Locking the touchscreen - touch only displays

When a touch only display is paired with an optional remote keypad the touchscreen can be locked.

From the Homescreen:

1. Select the **Set-up** icon.
2. Select **Touch-Lock** so that On is highlighted.

The touchscreen is now locked.

Unlocking the touchscreen - touch only displays

To unlock the touchscreen of a touch only display when paired with a remote keypad follow the steps below.

From the Homescreen:

1. Select the **Set-up** icon.
2. Select **Touch-Lock** so that Off is highlighted.

The touchscreen is now unlocked.

6.9 Multi-Touch gestures

Raymarine a Series and gS Series multifunction displays support multi-touch.

Multi-touch means that the display is capable of recognizing multiple simultaneous touch inputs. This means that you can use 2 or more fingers on the screen at the same time to perform multi-touch gestures.

Pinch to Zoom

The pinch to zoom gestures can be performed on multifunction displays that support multi-touch.

Pinch to zoom consists of 2 actions:

- Move 2 fingers apart to zoom in.
- Move 2 fingers together to zoom out.

Pinch to Zoom can be used in the following applications:

- Chart application.
- Weather application.

6.10 Initial set up procedures

Once your display has been installed and commissioned, Raymarine recommends that you perform an initial set up procedure.

Startup wizard

When you power-up the display for the first time or after a system reset a Startup Wizard is displayed. The wizard guides you through the following basic configuration settings:

1. Language
2. Vessel type
3. Units of measure
4. Total fuel capacity
5. Number of batteries
6. Number of engines
7. Number of fuel tanks

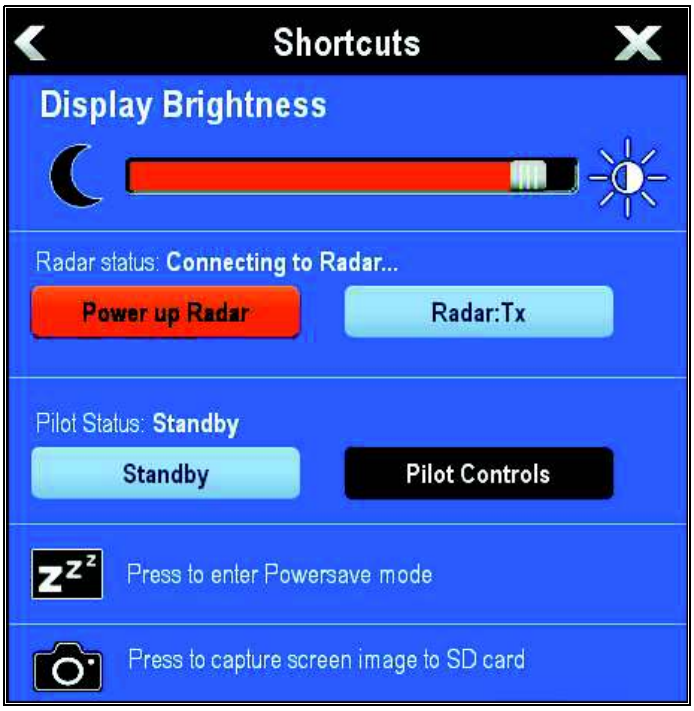
Note: These settings can also be set at any time using the menus accessible from **Homescreen > Customize**.

Additional settings

In addition to the settings covered by the Wizard, it is also recommended that the following initial set up tasks are completed:

- Set your date and time preferences.
- Adjust the display brightness (and set up a shared brightness scheme if appropriate).
- Designate the data master.
- Select the GPS data source.
- Familiarize yourself with the product using Simulator Mode.

Adjusting the display brightness



1. Press the **POWER** button once.
   The Shortcuts menu is displayed.
2. Adjust the brightness to the required level using the on-screen brightness slider bar control, or
3. Touch the Sun icon to increase the brightness level or the Moon icon to decrease the brightness level.

Note: The brightness level can also be increased by pressing the **Power** button multiple times.

Adjusting the display brightness

1. Press the **POWER** button once.
   The Shortcuts menu is displayed.
2. Adjust the brightness to the required level using the **Rotary control**.

Note: The brightness level can also be increased by pressing the **Power** button multiple times.

Setting the vessel minimum safe depth

With the homescreen displayed:

1. Select **Customize**.
2. Select **Boat Details**.
3. Select **Min. Safe Depth**.
4. Adjust the setting as appropriate.

Note: The units for the depth measurement are based on those specified in the **Homescreen > Customize > Units Set-up > Depth Units** menu.

Setting time and date preferences

With the homescreen displayed:

1. Select **Customize**.
2. Select **Time and Date Set-up**.
3. Use the **Date Format**, **Time Format**, and **Local Time: UTC** menu items to set your time and date preferences.

Data master

Any system containing more than one networked multifunction display must have a designated data master.

The data master is the display which serves as a primary source of data for all displays, it also handles all external sources of information. For example the displays may require heading information from the autopilot and GPS systems, usually received through a SeaTalk^{ng} or NMEA connection. The data master is the display to which the SeaTalk, NMEA and any other data connections are made, it then bridges the data to the SeaTalk^{hs} network and any compatible repeat displays. Information shared by the data master includes:

- Cartography
- Routes and waypoints
- Radar
- Sonar
- Data received from the autopilot, instruments, the engine and other external sources.

Your system may be wired for redundancy with data connections made to repeat displays. However these connections will only become active in the event of a fault and/or reassignment of the data master.

In an autopilot system which does not contain a dedicated pilot control head the Data master also acts as the control for the autopilot.

Designating the data master

For systems with 2 or more displays the following task must be performed on the multifunction display that you want to designate as the data master.

With the homescreen displayed:

1. Select **Set-up** .
2. Select **Maintenance**.
3. Select **Data Master**.
4. Select the display that you want to designate as the data master.

Simulator mode

The Simulator mode enables you to practice operating your display without data from a GPS antenna, radar scanner, AIS unit, or fishfinder.

The simulator mode is switched on / off in the **System Setup Menu**.

Note: Raymarine recommends that you do NOT use the simulator mode whilst navigating.

Note: The simulator will NOT display any real data, including any safety messages (such as those received from AIS units).

Note: Any system settings made whilst in Simulator mode are NOT transmitted to other equipment.

Enabling and disabling simulator mode

You can enable and disable simulator mode by following the steps below.

With the homescreen displayed:

1. Select **Set-Up** .
2. Select **System Settings**.
3. Select **Simulator:**.
4. Select On to turn simulator mode on, or
5. Select Off to turn simulator mode off.

Note: The Demo movie option is for retail demonstration purposes only.

Disabling and enabling the auxiliary alarm

If there is more than one alarm fitted (e.g. auxiliary alarm and remote keypad) then the auxiliary alarm can be enabled or disabled.

From the homescreen:

1. Select **Set-up**.
2. Select **Remote Devices**.
3. Select **Auxiliary Alarm**.
4. Select **Auxiliary Alarm**.
   Selecting Auxiliary Alarm will switch the auxiliary alarm On and Off.

Note: If the auxiliary alarm is the only alarm in the system then it is permanently enabled.

Pairing the keypad

The keypad can control 1 or more multifunction displays. Multiple keypads can be connected to a system. Each keypad can be paired with up to 4 multifunction displays.

With the keypad connected to the multifunction display:

1. Select **External Keypad** from the External Devices menu: **homescreen > Set-up > System Settings > External Devices > External Keypad**.
2. Select **Pair Keypad**.
3. Press any button on the external keypad.
4. From the pop-up message select the orientation of the keypad.

   Either landscape or portrait orientations are available.

The keypad is now paired.

Unpairing the keypad

The keypad can be unpaired from an individual display.

1. Select **External Keypad** from the External Devices menu: **homescreen > Set-up > System Settings > External Devices > External Keypad**.
2. Select **Clear Pairings**.
3. Select **Yes** to unpair the keypad with the display.

6.11 Enabling autopilot control

Enabling the autopilot control function — SeaTalk and SPX SeaTalk^{ng} autopilots

To enable control of your SeaTalk or SPX SeaTalk^{ng} autopilot using your multifunction display follow the steps below.

From the Homescreen:

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **Autopilot Control** so that On is highlighted.

   Selecting Autopilot Control will switch the control between On and Off.

On a system containing multiple displays the pilot control is enabled on all displays at the same time.

Enabling the autopilot control function — Evolution autopilots

To enable control of your Evolution autopilot using your multifunction display follow the steps below.

From the Homescreen.

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **External Devices**.
4. Select **Pilot Set-up**.
5. Select **Pilot control** so that On is highlighted.

   Selecting Pilot control will switch the Autopilot control function on and off.

6.12 Engine identification

Engine data can be displayed on your MFD using the Data application, which provides some preset Engine pages for displaying some of the most common types of engine data.

Important: Before you can display Engine data on your MFD, you must:

- Ensure that your MFD is running LightHouse software version 8 or later.
- **Refer to the important "Engine instancing" and "Engine identification wizard" information.**
- Make the data connections, according to the instructions provided in the **87202 ECI Installation instructions**.
- Ensure all data buses are powered up (including engine data CAN buses, gateways, and also the SeaTalkng bus).
- Start the engine. Ensure that you follow any applicable sequencing rules, as specified in the **"Engine instancing"** information.
- Run the **Engine identification wizard** to complete any "instancing" required and ensure that your engines are displayed in the correct order in the Data application.

Engine instancing and setup

Before you can display engine data on your MFD, setup and “instancing" may be required.

Note: Engine setup and instancing is NOT required for single engine vessels.

Most engine data configurations can be setup using the "Engine Identification" wizard available on Raymarine MFDs running LightHouse software version 8 or later. However, for some multiple engine installations, it may be necessary to first have your engines "instanced" correctly by your engine representative / dealer (assigned a unique ID / address).

The following table details the different types of engine supported, and the setup requirements for each:

Engine CAN bus protocol	Number of engines	Engine CAN bus configuration	Number of ECI units required	Setup via wizard on MFD required	Engine instancing by Dealer required
NMEA 2000	1	Single CAN bus	1	✗	✗
NMEA 2000	2+	Single shared CAN bus	1	✗	✓
NMEA 2000	2+	Separate CAN bus for each engine	1 for each CAN bus	✓	✗
J1939	1	Single CAN bus	1	✗	✗
J1939	2+	Single shared CAN bus	1	✓	✗
J1939	2+	Separate CAN bus for each engine	1 for each CAN bus	✓	✗

Using the engine identification wizard

If your engine data appears in the wrong order on the engine data pages you can correct this by running the engine identification wizard.

From the Homescreen:

1. Select **Set-up > System Settings > External Devices > Engines Set-up**.
2. If required change the number of engines your vessel has by selecting **Num. of Engines:** and entering the correct number of engines.

   You can select up to 5 engines.
3. Select **Identify engines**.

Important: It is important that only one engine is running at a time, to ensure that the system can isolate the correct engine data message.

4. Follow the onscreen prompts to complete the engine identification wizard.

   The engines that will be included in the identification wizard are determined by the Number of engines set during step 2 above.
   i. Switch Off ALL vessel engines and select **Next**.

      The wizard will run through all engines (max of 5 as defined in step 2 above) from port to starboard in sequence.
   ii. Turn On the **port engine** and select **OK**.

      The wizard will now listen for data and assign the engine instance as the port engine.
   iii. Turn On the **center port engine** and select **OK**.

      The wizard will now listen for data and assign the engine instance as the center port engine.
   iv. Turn On the **center engine** and select **OK**.

      The wizard will now listen for data and assign the engine instance as the center engine.
   v. Turn On the **center starboard engine** and select **OK**.

      The wizard will now listen for data and assign the engine instance as the center starboard engine.
   vi. Turn On the **starboard engine** and select **OK**.

      The wizard will now listen for data and assign the engine instance as the starboard engine.
5. Select **OK** on the Identify Engines confirmation dialog.

The engines will now appear in the correct location on the engine data page.

6.13 Enabling AIS functions

Before proceeding ensure your AIS unit is connected to NMEA Port 1.

With the homescreen displayed:

1. Select **Set-Up**.
2. Select **System Settings**.
3. Select **NMEA Set-Up**.
4. Select **NMEA Input Port 1**.
5. Select the AIS 38400 option.
6. Select **Back** to return to the **System Settings** menu.
7. Select **External Devices**.
8. Select **AIS Unit Set-up**.
   The AIS Unit Set-up menu is displayed.
9. Adjust the AIS options as appropriate.

6.14 Software updates

Raymarine's multifunction display software is updated regularly to provide new and enhanced features and improved performance and usability. You should ensure you have the latest software by regularly checking the Raymarine website for new software.

You can identify your multifunction display's current software version from the Limitations on Use (LoU) splash screen:

The software version can also be identified from the **Maintenance** menu.

The software update process can be used to update all multifunction displays and remote keypads that are connected to the same network.

Caution: Downloading software updates

The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.

Ensure that the unit has a reliable power supply and that the update process is not interrupted.

Damage caused by incomplete updates are not covered by Raymarine warranty.

By downloading the software update package, you agree to these terms.

Updating the software

Software updates can be downloaded from the Raymarine website.

To perform a software update you will need:

- A PC or Apple Mac with an internet connection and a card reader.
- A FAT 32 formatted MicroSD card with SD card adaptor.

Note: Do not use a cartography chart card to save software update or user data / settings files.

1. Go to the Raymarine website www.raymarine.com
2. Click the **Service and Support** from the top banner.
3. Select **Software Updates** from the drop down list.
4. Select the relevant product.
5. Compare the latest available software against the software version on your multifunction display.
6. If the software on the website is newer than the software on your multifunction display select the option to download the software.
7. Place the MicroSD card into an SD card adaptor.
8. Place the SD card adaptor into the card reader of your PC or Mac.
9. Unzip the downloaded software update zip file to the MicroSD card.
10. Remove the MicroSD card from the SD card adaptor.
11. Backup your user data and settings by following the procedure described in section 8.4 Saving user data and user settings.

12. Insert the MicroSD card into the card reader of your multifunction display.

    After a few seconds your multifunction display will alert you that a software update is available and which multifunction displays and remote keypads require the update.

    The software alert is only displayed once per power cycle.

13. Select **Yes** to begin the software update.

    The following steps will now take place:

    1. All networked multifunction displays will reboot and commence a simultaneous software update (During the software update the display with the software update memory card inserted will display a progress indicator.
    2. Once the networked displays have been updated the display containing the software update memory card will reboot and commence the software update.
    3. Once all displays have been updated the system will check to see if any connected remote keypads require a software update.

14. If you have a remote keypad connected then select **Yes** to update the keypad software update.

    When the software update process has been completed a confirmation pop-up is displayed.

15. Select **OK** to confirm.
16. Remove the MicroSD card from the card reader.
17. Perform a factory reset of your multifunction displays following the procedure described in section 8.6 Resetting your system.
18. Restore any saved user data and settings by following the procedure described in section 8.4 Saving user data and user settings

Note: Turning on a display whilst it has a software update memory card inserted will start a standalone software update on that display only.

Chapter 7: System checks

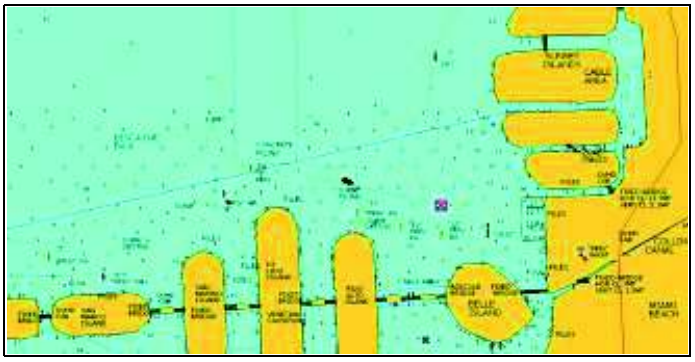
Chapter contents

7.1 GPS Check

Checking GPS operation

You can check that the GPS is functioning correctly using the chart application.

1. Select the Chart page.



2. Check the screen.

   With the chart displayed, you should see:

   Your boat position (indicates a GPS fix). Your current position is represented by a boat symbol or solid circle. Your position is also displayed in the data bar under VES POS.

   A solid circle on the chart indicates that neither heading nor Course Over Ground (COG) data is available.

Note: Raymarine recommends that you check the displayed vessel position in the chart application against your actual proximity to a known charted object. GPS receivers typically have an accuracy of between 5 and 15 m.

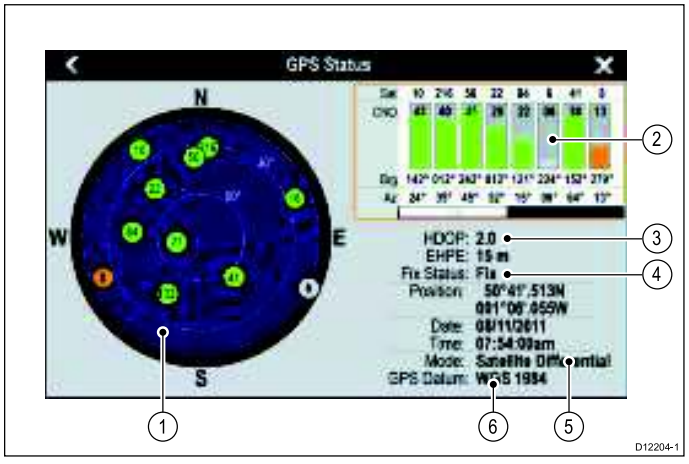
Note: A GPS Status screen is available within the Setup menu of Raymarine multifunction displays. This provides satellite signal strength and other relevant information.

GPS setup

The GPS setup options enable you to configure a GPS receiver.

The Global Positioning System (GPS) is used to position your vessel on the chart. You can set up your GPS receiver and check its status from the GPS Status option in the **System Settings** menu. For each tracked satellite, the screen provides the following information:

- Satellite number.
- Signal strength bar.
- Status.
- Azimuth angle.
- Elevation angle.
- A sky-view to show the position of tracked satellites.



Item	Description
1	**Sky view** — a visual representation of the position of tracked satellites.
2	**Satellite status** — displays the signal strength and status of each satellite identified in the sky view diagram on the left of the screen. The colored bars have the following meanings: • Grey = searching for satellite. • Green = satellite in use. • Orange = tracking satellite.
3	**Horizontal Dilution of Position (HDOP)** — a measure of GPS accuracy, calculated from a number of factors including satellite geometry, system errors in the data transmission and system errors in the GPS receiver. A higher figure signifies a greater positional error. A typical GPS receiver has an accuracy of between 5 and 15 m. As an example, assuming a GPS receiver error of 5 m, an HDOP of 2 would represent an error of approximately 15 m. Please remember that even a very low HDOP figure is NO guarantee that your GPS receiver is providing an accurate position. If in doubt, check the displayed vessel position in the chart application against your actual proximity to a known charted object. **Estimated Horizontal Position Error (EHPE)** — a measure of GPS accuracy, this indicates that your position is within a circle radius of the stated size 67% of the time.
4	**Fix status** — indicates the actual mode the GPS receiver is reporting (No Fix, Fix, D Fix or SD Fix).
5	**Mode** — the mode currently selected by the GPS receiver.
6	**Datum** — The GPS receiver's datum setting affects the accuracy of the vessel position information displayed in the chart application. In order for your GPS receiver and multifunction display to correlate accurately with your paper charts, they must be using the same datum.

The accuracy of the GPS receiver depends on the parameters detailed above, especially the azimuth and elevation angles which are used in triangulation to calculate your position.

7.2 Radar check

Warning: Radar scanner safety

Before rotating the radar scanner, ensure all personnel are clear.

Warning: Radar transmission safety

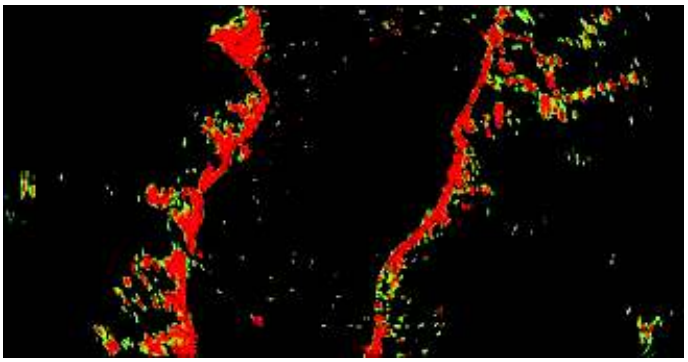
The radar scanner transmits electromagnetic energy. Ensure all personnel are clear of the scanner when the radar is transmitting.

Checking the radar

From the Radar application:

1. Select **Menu**.
2. Select **Power** so that On is highlighted.
   The Radar scanner will now initialize in standby mode. This process will take approximately 70 seconds.
3. Select **Radar** so that Transmit is highlighted.
   The radar scanner should now be transmitting and receiving.
4. Check that the radar screen is operating correctly.

Typical HD radar screen



Note: The example above is representative of the enhanced output provided by a HD radar scanner.

Points to check:

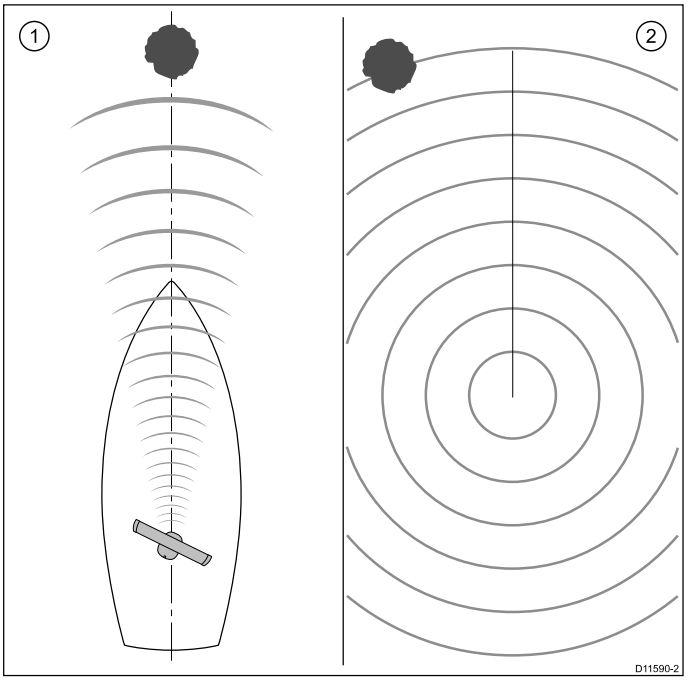
- Radar sweep with echo responses are shown on screen.
- Radar status icon rotating in top right hand corner of the status bar.

Check and adjust bearing alignment

Bearing alignment

The radar bearing alignment ensures that radar objects appear at the correct bearing relative to your boat's bow. You should check the bearing alignment for any new installation.

Example misaligned radar



Item	Description
1	Target object (such as a buoy) dead ahead.
2	Target displayed on the radar display is not aligned with the Ship's Heading Marker (SHM). Bearing alignment is required.

Checking the bearing alignment

1. With your vessel under way: Align the bow with a stationary object identified on the radar display An object between 1 & 2 NM distant is ideal.
2. Note the position of the object on the radar display. If the target is not under the ships heading marker (SHM), there is an alignment error and you will need to carry out bearing alignment adjustment.

Adjusting the bearing alignment

Once you have checked the bearing alignment you can proceed and make any required adjustments.

With the radar application displayed:

1. Select **Menu**.
2. Select **Radar Set-up** .
3. Select **Advanced**.
4. Select **Bearing Alignment**.
   Selecting Bearing Alignment displays the numeric adjust control.
5. Adjust the setting so that the selected target is under the Ship's Heading Marker.
6. Select **Back** or **Ok** when complete.

7.3 Sonar check

Sonar transducer and sonar module selection

You must select the sonar transducer and Sonar module that you want to use in the displayed Fishfinder application pane.

Sonar module selection

- Sonar and DownVision™ variant displays are fitted with an internal sonar module.
- All variants allow you to connect a compatible external sonar module or use an internal sonar module from a networked display.
- The sonar channel you want to use must be selected from the Fishfinder menu.

Transducer selection

- Sonar variant displays allow direct connection of a Raymarine OR a Minn Kota sonar transducer.
- DownVision™ variant displays allow direct connection of Raymarine DownVision™ transducers.
- All variants allow the connection of a Raymarine sonar transducer via a compatible external sonar module.
- For all variants use the **Transducer Set-Up** menu in the Fishfinder application to specify the transducer you want to use.

Selecting the sonar channel

To select the channel you want to display follow the steps below.

From the Fishfinder application:

1. Select **Menu**.
2. Select **Channel**.

   The Channel selection page is displayed.
3. Select the tab for the sonar module you want to use.

   A list of available channels for the selected sonar module is displayed.
4. Select a channel from the list.

The Channel selection page will close and the Fishfinder application will now show the selected channel.

Selecting the sonar transducer

With the fishfinder application displayed:

1. Select **Menu**.
2. Select **Set-Up**.
3. Select **Transducer Set-Up**.
4. Select **Transducer**.

   A list of transducers is displayed.
5. Select the transducer you want to use.

Selecting the speed transducer

With the fishfinder application displayed:

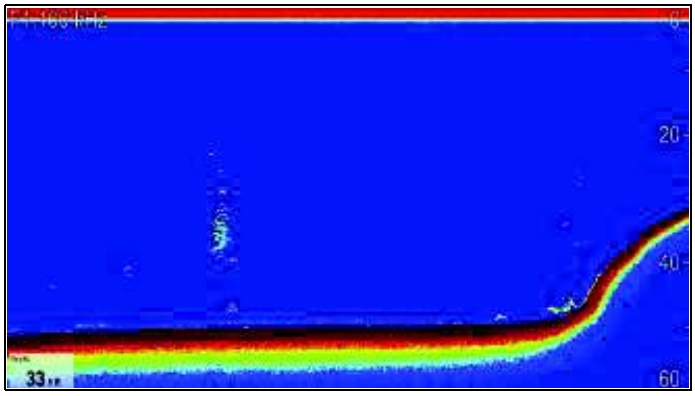
1. Select **Menu**.
2. Select **Set-Up**.
3. Select **Transducer Set-Up**.
4. Select **Speed Transducer**.

   A list of transducers is displayed.
5. Select your speed transducer from the list.

Checking the sonar

Sonar checks are made using the fishfinder application.

1. Select a fishfinder page from the Homescreen.



2. Check the fishfinder display.

   With the fishfinder active you should see:

   - Depth reading (indicates the transducer is working). The depth is shown in a databox in the bottom left of the screen.

   If the databox is not present it can be turned on from the Presentation menu: **Menu > Presentation > Databoxes Set-up**.

Fishfinder Transducer Calibration

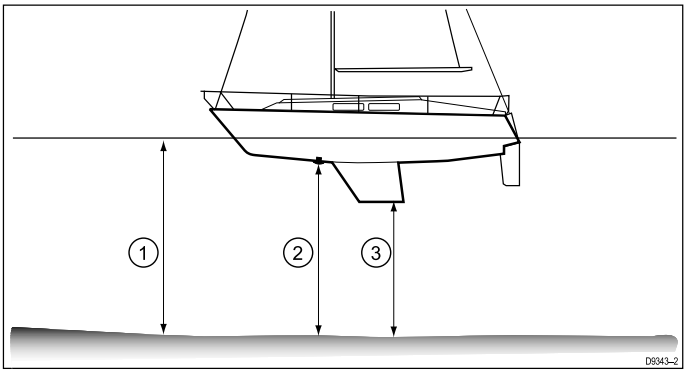
Your fishfinder transducer must be calibrated correctly to achieve accurate depth readings.

The multifunction display receives the image from a sonar module which processes sonar signals from a transducer mounted in the water. If the transducer is equipped with a speed paddle wheel and temperature-sensing thermistor, the sonar module calculates speed and temperature. To ensure accurate readings, it may be necessary to calibrate the transducer(s) by applying offsets to depth, speed and temperature. As these settings are held in the sonar module and relate to the transducer, they are applied system-wide.

Depth Offset

Depths are measured from the transducer to the sea bed, but you can apply an offset value to the depth data, so that the displayed depth reading represents the depth to the sea bed from either the keel or the water-line.

Before attempting to set a waterline or keel offset, find out the vertical separation between the transducer and either the waterline or the bottom of the keel on your vessel, as appropriate. Then set the appropriate depth offset value.



1	Waterline offset
2	Transducer / Zero offset
3	Keel offset

If an offset is not applied, displayed depth readings represent the distance from the transducer to the sea bed.

Setting the depth offset

From the fishfinder application:

1. Select **Menu**.
2. Select **Set-up**.
3. Select **Transducer Set-up**.
4. Select **Depth Offset**.

   The depth offset numeric adjust control is displayed.

5. Adjust the offset to the required value.

Setting the speed offset

From the fishfinder application:

1. Select **Menu**.
2. Select **Set-up**.
3. Select **Transducer Set-up**.
4. Select **Speed Offset**.
   The speed offset numeric adjust control is displayed.
5. Adjust the offset to the required value.

Setting the Temperature offset

1. Select **Menu**.
2. Select **Set-up**.
3. Select **Transducer Set-up**.
4. Select **Temperature Offset**.
   The temperature offset numeric adjust control is displayed.
5. Adjust the offset to the required value.

7.4 Thermal camera setup and checks

To ensure correct operation of the thermal camera you should setup and check the camera's main functions.

Before proceeding ensure that the camera is connected correctly, according to the instructions provided. If your system includes the optional Joystick Control Unit (JCU) and PoE (Power over Ethernet) injector, ensure these units are also connected correctly.

Set up the camera

You will need to:

- Adjust the image (contrast, brightness, and so on).
- Check camera movement (pan, tilt and home functions) (if applicable).

Adjusting the thermal camera image

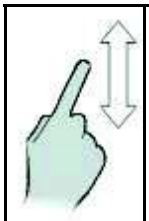
With the thermal camera application displayed:

1. Select **Menu**.
2. Select **Adjust Contrast**.
3. Select the Contrast, Brightness, or Color option as appropriate.
   The relevant numeric adjust control is displayed.
4. Adjust the value as required.
5. Select **Back** or **Ok** to confirm the new value.

Pan, Tilt, Zoom (PTZ) cameras

Panning and tilting, and the thermal image

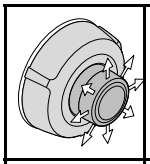
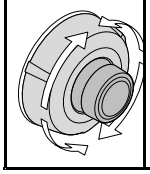
On a touchscreen multifunction display you can pan and tilt the thermal camera image using the touchscreen.

	Move your finger up and down the screen to tilt the camera up or down.
	Move your finger left and right on the screen to rotate the camera left or right (panning).

Panning, Tilting and zooming the thermal image

On a multifunction display with physical buttons or when using a remote keypad you can pan, tilt and zoom the thermal camera image using the UniControl.

In some circumstances it may be better to use just the UniControl's rotary and joystick controls to manipulate the thermal camera view. For example, this method is ideal for finer control over the camera and is particularly useful in rough sea conditions.

	UniControl joystick — is used for rotating the camera left or right (panning), or tilting the camera up or down.
	UniControl rotary — is used to zoom in and out.

Resetting the thermal camera to the home position

When connected to a pan, tilt thermal camera the home position of the camera can be set.

In the thermal camera application:

1. Select **Menu**.
2. Select **Camera Home**.

   The camera returns to its currently defined home position, and the “Home” icon appears on-screen momentarily.

Chapter 8: Managing display data

Chapter contents

8.1 Memory cards and chart cards

MicroSD memory cards can be used to back up / archive data (e.g. Waypoint, and Tracks). Once data is backed up to a memory card old data can be deleted from the system, creating capacity for new data. The archived data can be retrieved at any time. Chart cards provide additional or upgraded cartography.

It is recommended that your data is backed up to a memory card on a regular basis. Do NOT save data to a memory card containing cartography.

Compatible cards

The following types of MicroSD cards are compatible with your display:

- Micro Secure Digital Standard-Capacity (MicroSDSC)
- Micro Secure Digital High-Capacity (MicroSDHC)

Note:

- The maximum supported memory card capacity is 32 GB.
- MicroSD cards must be formatted to use either the FAT or FAT 32 file system format to enable use with your MFD.

Speed class rating

For best performance it is recommended that you use Class 10 or UHS (Ultra High Speed) class memory cards.

Chart cards

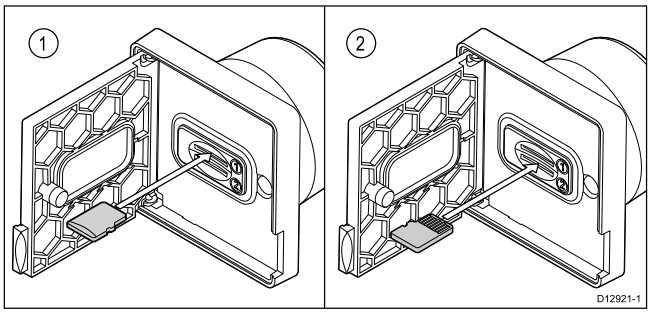
Your product is pre-loaded with electronic charts (worldwide base map). If you wish to use different chart data, you can insert compatible chart cards into the unit's memory card reader.

Use branded chart cards and memory cards

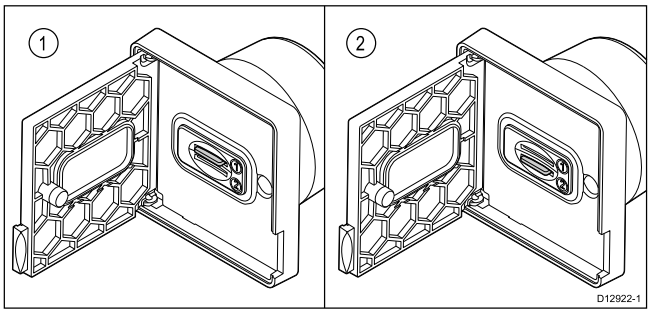
When archiving data or creating an electronic chart card, Raymarine recommends the use of quality branded memory cards. Some brands of memory card may not work in your unit. Please contact customer support for a list of recommended cards.

8.2 Inserting a memory card or chart card

1. Open the card reader door.
2. Insert the card, as shown in the diagram below. For slot 1, the card contacts should be facing DOWN. For slot 2, the card contacts should be facing UP. Do NOT force the card. If the card does not fit easily into the slot, check the orientation.



3. Gently press the card all the way in to the card slot, as shown in the diagram below. The card is secure when an audible click is heard.



4. To prevent the ingress of water and consequent damage, close the card reader door.

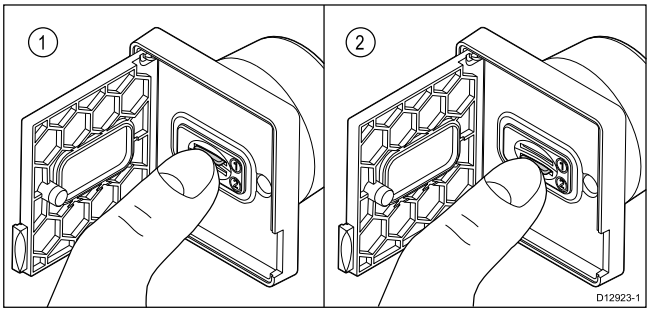
8.3 Removing a memory card or chart card

From the homescreen:

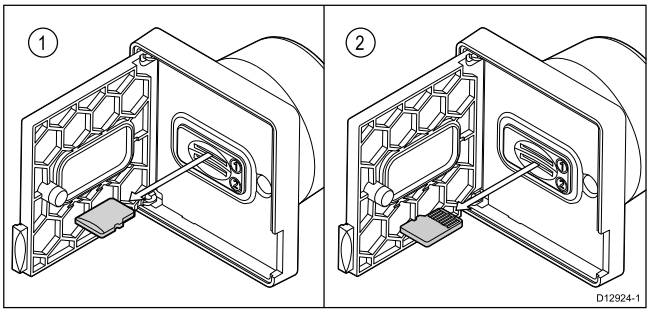
1. Select **My Data**.
2. Select **Eject Card**.

   A message is displayed prompting you to select the memory device you want to eject.
3. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.
4. Open the card reader door.
5. Push the edge of the card towards the unit, until an audible click is heard.

   The card is released from the card slot mechanism, as shown in the following diagram:



6. Use your fingers to pull the card clear of the card slot, using the edge of the card.



7. To prevent the ingress of water and consequent damage, close the chart card door.

Note: You can also power off the multifunction display and follow steps 4 to 7 above.

8.4 Saving user data and user settings

You can save your waypoints, routes, tracks and user settings to a memory card. Waypoints, routes and tracks are saved as gpx data files. The gpx file format is a device-independent data format making it easy to exchange data between your display and other GPS devices / software that support the gpx file format.

Type of data	Description	Notes
Waypoints (user data)	Each waypoint group can be saved separately	
Routes (user data)	Each route can be saved separately	
Tracks (user data)	Each track can be saved separately	
User settings	Saves the settings you've made in the set-up menus to a single archive file.	Only 1 user settings archive file can be saved per memory card.

Note: It is recommended that you save your user data and user settings to a memory card on a regular basis.

Note: Do NOT save user data or settings to a chart card containing cartography.

Saving all user data to a memory card

You can save all user data to one archive file.

With the Homescreen displayed:

1. Ensure you have a memory card (NOT a chart card) inserted into a card slot.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Save Data to Card**.
5. Select **Save All**.

   The on-screen keyboard is displayed.
6. Using the on-screen keyboard enter the filename you want to save the file as.
7. Select **SAVE**.

   If your display has more than 1 card slot then a message is displayed prompting you to select the slot you want to save data to, if your display only has 1 card slot then you will not be prompted.
8. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.

   A confirmation dialog is displayed.
9. Select **OK**.

Saving waypoints to a memory card

With the Homescreen displayed:

1. Ensure you have a memory card (NOT a chart card) inserted into a card slot.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Save Data to Card**.
5. Select **Save Waypoints to Card**.

   The Waypoint Group list is displayed.

6. Select the group or groups you want to save, or select **Select All**.
7. Select **Save**.
   The on-screen keyboard is displayed.
8. Using the on-screen keyboard enter the filename you want to save the file as.
9. Select **SAVE**.
   If your display has more than 1 card slot then a message is displayed prompting you to select the slot you want to save data to, if your display only has 1 card slot then you will not be prompted.
10. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.
    A confirmation dialog is displayed.
11. Select **OK**.

Saving routes to a memory card

With the Homescreen displayed:

1. Ensure you have a memory card (NOT a chart card) inserted into a card slot.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Save Data to Card**.
5. Select **Save Routes to Card**.
   The Routes list is displayed.

6. Select the route or routes you want to save, or select **Select All**.
7. Select **Save**.
   The on-screen keyboard is displayed.
8. Using the on-screen keyboard enter the filename you want to save the file as.
9. Select **SAVE**.
   If your display has more than 1 card slot then a message is displayed prompting you to select the slot you want to save data to, if your display only has 1 card slot then you will not be prompted.
10. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.
    A confirmation dialog is displayed.
11. Select **OK**.

Saving tracks to a memory card

With the Homescreen displayed:

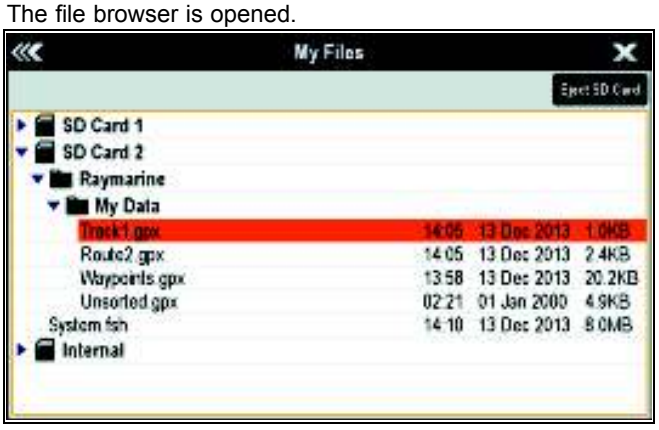
1. Ensure you have a memory card (NOT a chart card) inserted into a card slot.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Save Data to Card**.
5. Select **Save Tracks to Card**.
   The Tracks list is displayed.

6. Select the track or tracks you want to save, or select **Select All**.
7. Select **Save**.
   The on-screen keyboard is displayed.
8. Using the on-screen keyboard enter the filename you want to save the file as.
9. Select **SAVE**.
   If your display has more than 1 card slot then a message is displayed prompting you to select the slot you want to save data to, if your display only has 1 card slot then you will not be prompted.
10. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.
    A confirmation dialog is displayed.
11. Select **OK**.

Importing waypoints, routes, or tracks from a memory card

With the Homescreen displayed:

1. Ensure you have a memory card containing the user data in gpx format in one of the card slots.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Retrieve from Card**.
   The file browser is opened.



5. Browse to and select the file you want to import.
   A confirmation dialog is displayed.
6. Select **OK**.

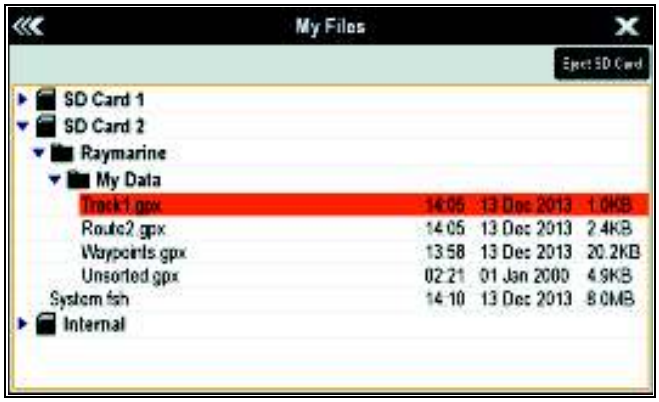
Note: When Routes and Tracks are imported they will be hidden by default, to display the imported routes and tracks please refer to the Showing or hiding routes and tracks section.

Erasing user data files from a memory card

With the Homescreen displayed:

1. Ensure you have the memory card containing the data in one of the card slots.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Erase from Card**.

   The file browser is opened.



5. Browse to and select the file you want to erase.

   A confirmation dialog is displayed.
6. Select **Yes**.

Erasing waypoints, routes, and tracks from the system

Note: The following procedure permanently erases selected or ALL waypoints, routes, or tracks stored on the display. BEFORE proceeding, ensure that you backup any data that you want to keep on to a memory card.

With the Homescreen displayed:

1. Select **My Data**.
2. Select **Import/Export**.
3. Select **Erase from System**.
4. Select **Erase Waypoints from System**, **Erase Routes from System**, or **Erase Tracks from System**, as appropriate.
5. Select the specific data items you want to erase, or select **Erase All**.

   A message is displayed prompting you for confirmation.
6. Select **Yes** to proceed with the deletion, or **No** to cancel the operation.

Backing up user settings to a memory card

With the Homescreen displayed:

1. Ensure you have a memory card (NOT a chart card) in one of the card slots.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Backup Settings**.

   If your display has more than 1 card slot then a message is displayed prompting you to select the memory device you want to save the settings to, if your display only has 1 card slot then you will not be prompted.
5. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.

   A confirmation dialog is displayed.
6. Select **OK**.

Restoring user settings from a memory card

With the Homescreen displayed:

1. Ensure you have the memory card containing the user data in one of the card slots.
2. Select **My Data**.
3. Select **Import/Export**.
4. Select **Restore Settings**.

   If your display has more than 1 card slot then a message is displayed prompting you to select the memory device you want to retrieve settings from, if your display only has 1 card slot then you will not be prompted.
5. Select **SD1** for a memory card in the top card slot, or **SD2** for a memory card in the bottom card slot.

   A confirmation dialog is displayed.
6. Select **OK**.

Save and restore items

The table below details the data items and settings which will be saved to and restored from a memory card on your multifunction display.

Homescreen and system settings

Application	Setting
Homescreen	Default page configuration
System settings	Position mode
	Text size
	Shared brightness
	Brightness group
	TD set-up
	Simulator
	Bearing mode
	MOB Data type
	Variation source
	Manual variation
	Language
	Date format
	Time format
	Local time offset
	Distance units
	Distance subunits
	Speed units
	Depth units
	Temperature units
	Pressure units
	Volume units
System settings — integration	Autopilot control
	DSC message
	SeaTalk alarms
	Bridge NMEA heading
Multiple data sources	GPS position source
	Heading source
	Depth source
	Speed source
	Wind source
Databar set-up	Databar content (cell 1 to 6)
	Compassbar
	Status icon
GPS status	GPS screen

Alarms

Application	Setting
Alarms	Anchor alarm
	Timer
	Alarm clock
	Temperature alarm
	Arrival alarm
	Offtrack alarm
	Collision alarm
	Guard zone sensitivity
	Fish alarm
	Fish alarm depth limit
	Shallow depth alarm
	Deep depth alarm
	AIS dangerous target alarm

Chart application — Cartography settings

Application	Setting
Cartography	Data overlay cell 1 on / off
	Data overlay cell 1 content
	Data overlay cell 2 on / off
	Data overlay cell 2 content
	Chart object menu
	Chart display
	Chart grid
	2D shading
	Community layer
	Chart text
	Chart boundaries
	Spot soundings
	Safety contour
	Depth contour
	Deep water color
	Hide rocks
	Nav marks
	Nav marks symbols
	Light sectors
	Routing systems
	Caution areas
	Marine features
	Land features
	Business services
	Panoramic photos
	Roads
	Additional wrecks
	Aerial photo overlay
	colored seabed areas
	Vessel icon
	Vessel size

Radar application

Application	Setting
Radar	Select scanner
	Range rings

AIS Layer

Application	Setting
AIS Layer	Displayed target types
	AIS safety messages
	Buddy tracking
	Silent mode

Data application

Application	Setting
Data	Datapages and content
	Datapage order
	Color theme
	Dial color
	Number of engines
	Maximum tachometer range

Fishfinder application

Application	Setting
Fishfinder	Configure preset frequencies

Weather application

Application	Setting
Weather	Wind symbol
	Watchbox alerts

Boat details

Application	Setting
Boat	Fuel economy units
	Low fuel threshold
	Fuel alarm on/off
	Total fuel capacity

8.5 Screenshots

You can take a screenshot of what is currently displayed on the screen.

Screenshots are saved to a MicroSD card in .bmp (bitmap) format. The saved image can be viewed from any device capable of viewing bitmap images.

Taking a screenshot

You can take a screenshot by following the steps below.

1. Insert a MicroSD card with suitable free space available into the card reader.
2. Press the **Power** button.
   The Shortcuts page is displayed:
3. Select the **Camera** icon.
   A confirmation message is displayed.
4. Select **Ok**.
   The screenshot is now saved to the MicroSD card.

Tip If your multifunction display has a **Back** button you can also take a screenshot by pressing and holding the **Back** button until the confirmation message appears.

Selecting the SD card slot for screenshots

If your multifunction display has 2 card reader slots, you must select which card slot to save the screenshot to.

From the homescreen.

1. Select **Customize**.
2. Select **Display Preferences**.
3. Select **Screenshot File:**.
4. Select either **MicroSD 1** or **MicroSD 2**.

Viewing a screenshot on the multifunction display

You can view images on the multifunction display.

1. Insert a MicroSD card containing the screenshot or image into the MicroSD card slot of your multifunction display.
2. From the homescreen, select **My Data**.
3. Select **Images and Video**.
   The file browser dialog is displayed.
4. Use the file browser to locate the file on the MicroSD card.
5. Select the file you want to view.
   The file will now open.
6. Select **Back** or **Close** to close the image.

8.6 Resetting your system

Your system may be reset to its factory default settings if required.

There are 2 types of reset operation, both of which affect the current display you are using, AND any networked displays.

- Settings reset.
- Settings and data reset.

Settings reset

This option resets your setup menus, page sets, and databar settings to factory default. It will NOT affect your waypoints, routes, or tracks data.

Settings and data reset

In addition to the settings reset detailed above, performing a settings and data reset will also remove ALL waypoints, routes, and tracks data.

Resetting system settings

With the homescreen displayed:

1. Select **Set-up**.
2. Select **Maintenance**.
3. Select **System Settings Reset**.
   A message is displayed prompting you to confirm the action.
4. Select **Yes** to proceed with the settings reset, or **No** to cancel.

Resetting system settings and data

Note: Performing a settings and data reset erases ALL waypoints, routes, and track data from your system. BEFORE proceeding with a settings and data reset, ensure that you backup any data that you want to keep on to a memory card.

With the homescreen displayed:

1. Select **Set-up**.
2. Select **Maintenance**.
3. Select **System Settings and Data Reset**.
   A message is displayed prompting you to confirm the action.
4. Select **Yes** to proceed with the settings and data reset, or **No** to cancel.

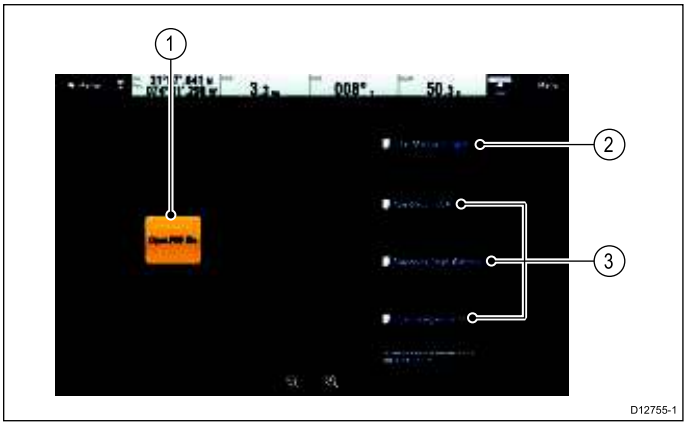
Chapter 9: Document viewer application

Chapter contents

9.1 Document viewer overview

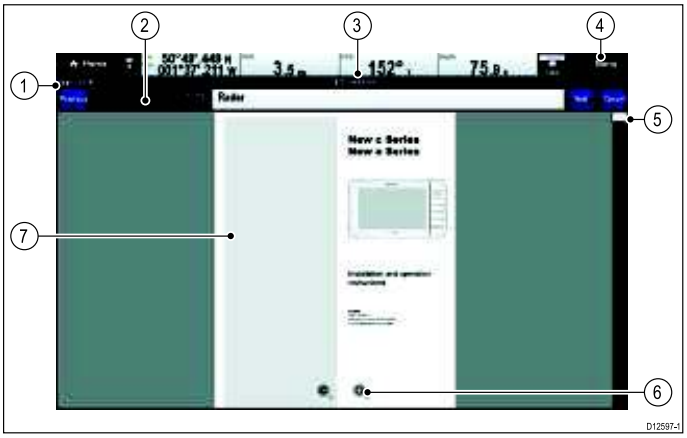
You can view PDF documents on your multifunction display.

The document viewer is available from the homescreen and is used to view and search PDF documents (such as product handbooks).



1	Opens the MicroSD card file browser.
2	Opens the user manual stored on the multifunction display.
3	Opens the relevant license agreement information.

Note: The document viewer does not support password protected documents or documents containing security certificates. An error message will be displayed if you try to open such documents.



1	Current page number (page x of y).
2	Find (search) tool bar (only displayed when searching a document). **Note:** The Previous, Next and Cancel buttons are only shown on touch-only products. For non-touch and Hybridtouch products the physical buttons are used.
3	Filename of the current PDF.
4	Document viewer menu.
5	Scroll bar.
6	On-screen zoom controls (Touchscreen displays only).
7	PDF document content.

The following options are available from the document viewer menu:

- **Open File** — Allows you to browse a MicroSD card or the MFD's internal storage for a PDF document to open.
- **Go to page:** — Allows you to jump to a specific page number.
- **Find** — Allows you to search the document for specific words.
- **Fit to Height** — Scales the open document to fit the height of the application window.
- **Fit to Width** — Scales the open document to fit the width of the application window.
- **Close File** — Closes the open document.

Opening the user manual

The product user manual is stored on the internal memory.

From the homescreen:

1. Select **Doc Viewer**.
2. Select **User Manual**.

   The product user manual is opened.

Note: The User manual can also be opened by selecting the **User Manual** icon from the Homescreen.

Opening a PDF document

You can open PDF documents stored on a MicroSD card by following the steps below.

Note: When saving PDF documents to MicroSD cards, ensure you do not overwrite important data.

1. Save the required PDF document to a MicroSD card.
2. Insert the MicroSD card into the multifunction display's MicroSD card slot.
3. Select **Menu**.
4. Select **Open File**.

   The file browser dialog is displayed.
5. Browse the MicroSD card containing the document you want to view.
6. Select the document you want to view.

   The document will now open.
7. If the 'Cannot Open File' error message is displayed, select **Ok** to confirm and then try opening the document again. Check that the PDF is not corrupted. Also ensure that the PDF does not include password protection or a security certificate. These PDF file security features are not supported by the document viewer application.

Note: Large filesize PDF documents may take a while to open.

Closing an open document

Each Doc viewer instance is separate, the last document opened will automatically open next time you select that instance of the Doc viewer unless it its closed using the Close File menu option.

With a document open

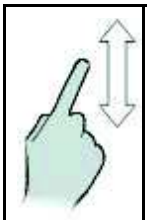
1. Select **Menu**.
2. Select **Close file**.

   The document is close and the main Doc viewer page is displayed.

Browsing an open document

On touchscreen displays you can browse pdf documents as detailed below.

With a pdf document open:

	• Move your finger up to scroll down the document. • Move your finger down to scroll up the document.
	When the document width is greater than the width of the application window, move your finger left or right to pan the width of the document.

Note: You can also use the scroll bars to navigate through the document.

Browsing an open document

On HybridTouch and non-touch displays you can browse pdf documents by following the steps below.

With a pdf document open:

1. Move the Joystick **Up** or **Down** to move up and down through the document.
2. Move the Joystick **Left** or **Right** to pan left and right.

Changing the zoom factor

On touchscreen displays you can change the zoom factor of the open document by following the steps below.

With a pdf document open:

1. Select the on-screen **Zoom in** icon to zoom in, or
2. Select the on-screen **Zoom out** icon to zoom out.

Changing the zoom factor

On HybridTouch and non-touch displays (excluding the e7 and e7D) you can change the zoom factor of the open document by following the steps below.

With a pdf document open:

1. Use the **Range out** button to zoom out, or
2. Use the **Range in** button to zoom in.

Note: New a Series and e7 / e7D multifunction displays do not have Range in and Range out button.

Note: On a New c Series display only the **Rotary control** can be used to change the zoom factor.

Selecting a page

You can skip to the page you want to view by entering the page number.

With a pdf document open:

1. Select **Menu**.
2. Select **Go to page:**.
   The numeric keypad is displayed.
3. Enter the page number of the page you want to view.
4. Select **Ok** to view the page.

Using document hyperlinks

On touchscreen displays you can use internal document hyperlinks.

With a pdf document opened on a page containing a hyperlink:

1. Momentarily touch your finger on the hyperlink.
   You will be taken to the hyperlinked page.

Note: Document hyperlinks cannot be activated on a New c Series display.

Searching for text

To use the find function to search for text on touch only display follow the steps below.

With a pdf document open:

1. Select **Menu**.
2. Select **Find**.
   The on-screen keyboard is displayed.
3. Enter the keyword you want to find.
4. Select **SAVE**.
   The document viewer will enter find mode and:
   - You may see a 'Searching' icon while all occurrences are found.
   - The find tool bar is displayed.
   - The first occurrence of the keyword is highlighted.
5. Select **Next** to find the next occurrence of the keyword, or
6. Select **Previous** to go back to the last occurrence of the keyword.
7. You can select **Cancel** at any time to close the find tool bar and return to the normal viewing.

Searching for text

On HybridTouch and non-touch displays you can use the find function to search for text in an open pdf document by following the steps below.

With a pdf document open:

1. Press the **Menu** button.
2. Select **Find**.
   The on-screen keyboard is displayed.
3. Enter the keyword you want to find.
4. Select **SAVE**.
   The document viewer will enter find mode and:
   - You may see a 'Searching' icon while all occurrences are found.
   - The find tool bar is displayed.
   - The first occurrence of the keyword is highlighted.
5. Move the **Joystick Down** to go to the next occurrence of the keyword, or
6. Move the **Joystick Up** to go to the previous occurrence of the keyword.
7. You can press the **Back** button at any time to close the find tool bar and return to the normal viewing.

Keyword not found

The document viewer will let you know if the keyword you have searched for does not appear in the document.

If the keyword is not found then the find tool bar will display an exclamation mark and a pop-up message is displayed on-screen.

Selecting **New Search** will take you back to the on-screen keyboard so that you can try a different keyword. Selecting **Cancel** will close the find tool bar and resume normal operation.

Chapter 10: Autopilot control

Chapter contents

10.1 Autopilot control

You can use your multifunction display to control your autopilot. If connected to an Evolution autopilot then pilot settings will also be available.

Note: For information on connecting your multifunction display to a Raymarine autopilot system, refer to the documentation that accompanied your autopilot.

With the Autopilot Control function enabled, you can use your multifunction display to:

- Engage the autopilot in Track mode (Goto a specified position or follow a route).
- Engage the autopilot is Auto mode (Remain on the current heading).
- Adjust the current locked heading.
- Disengage the autopilot.
- Silence the waypoint arrival alarm.
- Adjust pilot settings (Evolution autopilots only)

Note: In a system that does not include a dedicated pilot head the data master multifunction display cannot be switched off or put into PowerSave mode whilst the autopilot is engaged.

The Pilot Control dialog is displayed in the following situations:

- When the physical **Pilot** button is pressed.
- When **Pilot Controls** is selected from the shortcuts page.
- When you select **Menu > Navigate > Goto Waypoint** , **Goto Cursor** or **Follow Route** option in the chart application.
- When you select **Goto Waypoint** or **Goto Cursor** using the chart context menu.
- When you place the cursor over an active route or waypoint on the chart and select **Stop Goto**, **Stop Follow** or **Advance Waypoint** from the context menu.
- When you are following a route or going to a waypoint or cursor position, and select **Menu > Navigate > Stop Goto**, **Stop Follow**, or **Advance Waypoint**.
- When you arrive at a target waypoint.

Note:
When arriving at a waypoint, the dialog title bar turns red to indicate waypoint arrival.

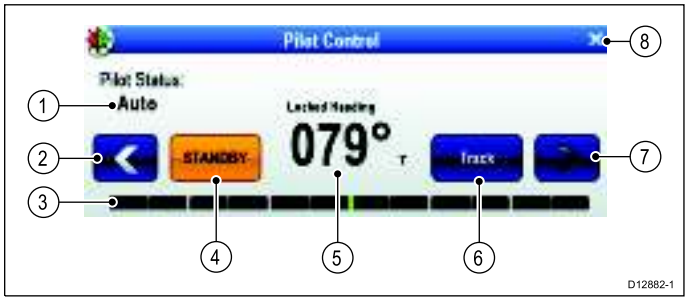
Pilot Control dialog (standby)

The example below shows the Pilot Control dialog options when the Pilot Control dialog is opened from the menu or using the dedicated Pilot button.

Selecting auto will engage the autopilot and maintain the current heading.

Pilot Control dialog (Auto)

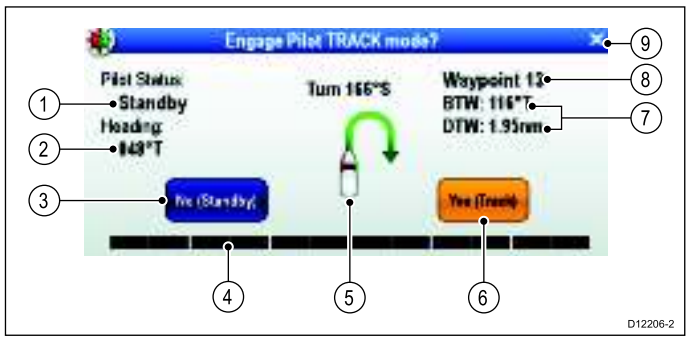
The example below shows the Pilot Control dialog options when Auto (locked heading) has been engaged.



Item	Description
1	Pilot Status — Current pilot mode.
2	**Left Arrow** — Decrease locked heading angle.
3	Rudder bar — Indicates the position of the rudder.
4	**STANDBY** — Disengages the autopilot and returns to manual vessel control.
5	Current locked heading.
6	**Track** — Engages the autopilot in Track mode and automatically steers your vessel to a target waypoint or along a route plotted on your chartplotter.
7	**Right Arrow** — Increase locked heading angle.
8	**Close** — Closes the Pilot Control dialog.

Pilot Control dialog (Starting navigation)

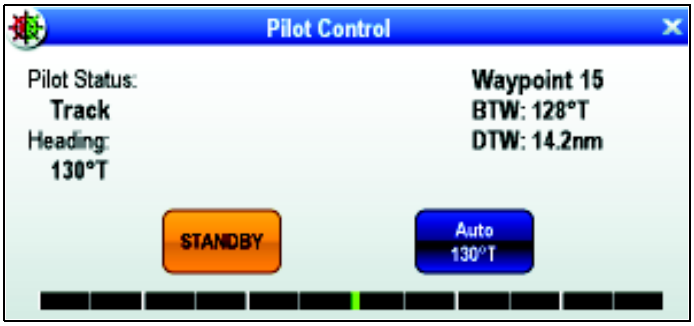
The example below shows the Pilot Control dialog options when **Goto Cursor**, **Goto Waypoint** or **Follow Route** has been selected.



Item	Description
1	Pilot Status — Current pilot mode.
2	Current Heading.
3	**No (Standby)** — Disengages the autopilot and returns to manual vessel control.
4	Rudder bar — Indicates the position of the rudder.
5	Turn angle — The turn angle is only available for SeaTalkng autopilots. This indicates the direction and severity of turn.
6	**Yes (Track)** — Engages the autopilot in Track mode and automatically steers your vessel to a target waypoint or along a route plotted on your chartplotter.
7	Distance to next waypoint (DTW) and Bearing to next waypoint (BTW).
8	Next Waypoint name.
9	**Close** — Closes the Pilot Control dialog.

Pilot Control dialog (Track)

The example below shows the Pilot Control dialog options when in track mode.



Enabling autopilot control

Enabling the autopilot control function — SeaTalk and SPX SeaTalkng autopilots

To enable control of your SeaTalk or SPX SeaTalkng autopilot using your multifunction display follow the steps below.

From the Homescreen:

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **Autopilot Control** so that On is highlighted.
   Selecting Autopilot Control will switch the control between On and Off.

On a system containing multiple displays the pilot control is enabled on all displays at the same time.

Enabling the autopilot control function — Evolution autopilots

To enable control of your Evolution autopilot using your multifunction display follow the steps below.

From the Homescreen.

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **External Devices**.
4. Select **Pilot Set-up**.
5. Select **Pilot control** so that On is highlighted.
   Selecting Pilot control will switch the Autopilot control function on and off.

Disengaging the autopilot

> **Caution: Disengaging the autopilot**
>
> On integrated multifunction displays that do not have a dedicated pilot button, in an emergency the autopilot can be disengaged by pressing and holding the Power button.

Disengaging the autopilot using the Power button

On integrated multifunction displays that do not have a dedicated pilot button, when the autopilot is engaged it can be disengaged using the power button. This is useful in emergency situations, especially on touch only displays in the event the touchscreen becomes unresponsive due to adverse weather conditions e.g. rain.

With the autopilot engaged:

1. Press and hold the **Power** button.
   A 'Setting pilot to STANDBY' warning is displayed and an audible alarm is sounded.
2. Continue to hold the **Power** button and the pilot will be placed into standby mode then the Pilot control dialog is displayed.

Disengaging the autopilot using the shortcuts page

You can disengage the autopilot from the Shortcuts page.

With the autopilot engaged:

1. Press and release the **POWER** button.
2. Select **Standby**.
   The Pilot Status change confirmation pop-up is displayed.
3. Select **Yes** to disengage the autopilot.

The autopilot is disengaged (put into standby) and the Pilot Control dialog is displayed.

Disengaging the autopilot using the pilot button

On multifunction displays which have a dedicated pilot button or when using a remote keypad you can disengage the autopilot using the Pilot button.

With the autopilot engaged:

1. Press the **Pilot** button.

The autopilot is disengaged (put into standby) and the Pilot Control dialog is displayed.

Disengaging the autopilot from the chart application

On all multifunction display variants the autopilot can be disengaged from the chart application's menu.

In the chart application with the autopilot engaged:

1. Select **Menu > Navigate > Stop Goto** or **Stop Follow**.
   The Pilot Control dialog is displayed.
2. Select **STANDBY**.
   The Pilot Status change confirmation pop-up is displayed.
3. Select **Yes** to disengage the autopilot.

The autopilot is disengaged (put into standby).

Disengaging the autopilot from the homescreen

On Touchscreen displays the autopilot can be disengaged from the Homescreen.

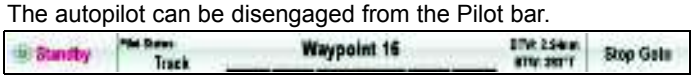
From the Homescreen:

1. Select **Standby**.
   The Pilot Status change confirmation pop-up is displayed.
2. Select **Yes** to disengage the autopilot.

The autopilot is disengaged (put into standby).

Disengage the autopilot from the pilot bar

The autopilot can be disengaged from the Pilot bar.



With the Pilot Bar displayed.

1. Select **Standby**.

Refer to 10.2 Pilot Bar for further information on the Pilot Bar.

Engaging the autopilot

Engaging the autopilot using the pilot button

On multifunction displays which have a dedicated pilot button or when using a remote keypad you can engage the autopilot using the Pilot button.

With the autopilot disengaged:

1. Press the **Pilot** button.
   The pilot control dialog is displayed.
2. Select **Auto**.
   The autopilot is engaged and will maintain the current heading.

> **Note:** You can also automatically engage the autopilot by pressing and holding the **Pilot** button.

Engaging the autopilot from the chart application menu

You can engage the autopilot in track mode using the application menu.

In the chart application:

1. Select **Menu > Navigate > Goto Cursor**, **Goto Waypoint**, or **Follow Route** as appropriate.
   The Pilot Control dialog is displayed.
2. Select **Yes (Track)**.

Engaging the autopilot using the context menu

You can engage the autopilot in track mode using the context menu.

From the chart application context menu.

1. Select any of the following options from the Chart context menu:
   - **Goto Waypoint**
   - **Goto Cursor**
   - **Follow Route**
   - **Follow from Here**
   - **Follow Route in Reverse**

   The pilot control dialog is displayed.
2. Select **Yes (Track)**.

Manually displaying the pilot control dialog box

You can also open the Pilot Control dialog at any time from the homescreen or chart application.

1. From the homescreen:
   i. Select **Set-up**.
   ii. Select **Pilot Controls**.
2. From the chart application:
   i. Select **Menu**.
   ii. Select **Navigate**.
   iii. Select **Pilots Controls**.

10.2 Pilot Bar

The Pilot Bar provides autopilot status information. For touchscreen displays you can disengage the autopilot using the Pilot Bar.

Pilot Bar — Track mode

Pilot Bar — Auto mode

The Pilot Bar is displayed when autopilot control is enabled, the Pilot Bar is switched on and the autopilot is engaged.

When the autopilot is disengaged the Pilot Bar is hidden.

On a system containing multiple displays the Pilot Bar can be disabled or enabled on each display.

Enabling the Pilot Bar

When connected to a SeaTalk or SeaTalkng SPX autopilot the Pilot Bar can be enabled by following the steps below.

From the Homescreen, with autopilots controls enabled:

1. Select **Customize**.
2. Select **Display Preferences**.
3. Select **Pilot Control Bar** so that Shown is highlighted.

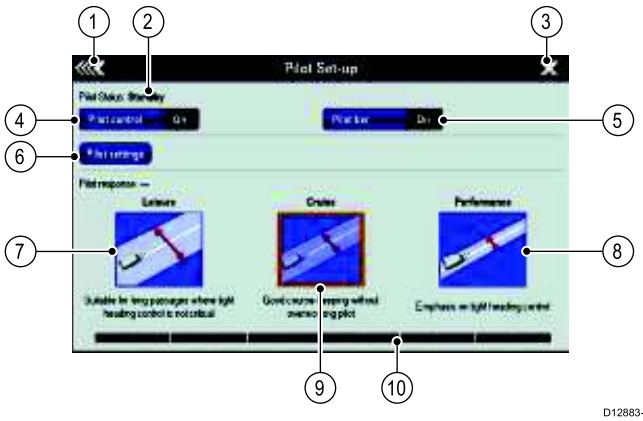
   Selecting Pilot Control Bar will switch the Pilot Bar between Shown and Hidden.
4. Engage the autopilot.

The Pilot Bar is now displayed at the bottom of the screen in all applications whilst the autopilot is engaged.

Note: When connected to an Evolution autopilot the Pilot Bar is enabled from the Pilot Set-up page.

10.3 Pilot Set-up

When connected to an Evolution autopilot the Pilot Set-up page is available.



1	**Back** — Go back to the previous menu.
2	Pilot Status — Current pilot mode.
3	**Close** — Closes the pilot set-up page and displays the homescreen.
4	**Pilot control** — Switches autopilot control via the multifunction display on and off.
5	**Pilot bar** — Switches the Pilot bar on and off.
6	**Pilot settings** — Displays available pilot settings that can be configured from the multifunction display. **Note:** The **Pilot settings** menu is only available on the data master multifunction display.
7	**Leisure** — Places the autopilot in Leisure mode. Leisure mode is suitable for long passages where tight heading control is not critical.
8	**Performance** — Places the autopilot in Performance mode. Performance mode provides good course keeping without overworking the autopilot.
9	**Cruise** — Places the autopilot in Cruise mode. Cruise mode provides tight heading control.
10	Rudder bar — Indicates the position of the rudder.

Accessing the Pilot Set-up page.

When connected to an Evolution autopilot you can access the Pilot Set-up page by following the steps below.

From the Homescreen:

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **External Devices**.
4. Select **Pilot Set-up**.

10.4 Pilot settings

The Pilot settings option is available on a data master multifunction display when it is integrated with an Evolution autopilot.

The Pilot settings enable the setup and commissioning of an Evolution autopilot using a multifunction display.

The Pilot settings include the following options:

- Vessel Settings
- Drive Settings
- Sail Boat Settings
- Commissioning

Initial setup and commissioning

Vessel settings

The vessel settings are designed to provide optimum steering performance for typical vessels.

It is important to complete the vessel hull type selection as part of the initial set-up, as it forms a key part of the autopilot calibration process. You can also access the options at any time by selecting **Pilot Settings > Vessel settings** from the Pilot Set-up page.

Vessel setting include the following options:

- Vessel Hull Type
- Drive Type
- Compass Offset
- Calibration Lock

Vessel hull type selection

The vessel hull type options are designed to provide optimum steering performance for typical vessels.

It is important to complete the vessel hull type selection as part of the initial set-up, as it forms a key part of the commissioning process. You can also access the options at any time with the pilot in Standby from the Pilot Set-up page by selecting: **Pilot Settings > Vessel Settings > Vessel Hull Type**.

As a general guide, select the option that most closely matches your vessel type and steering characteristics. The options are:

- **Sail**.
- **Sail (slow turn)**.
- **Sail Catamaran**.
- **Power**
- **Power (slow turn)**.
- **Power (fast turn)**.

It is important to be aware that steering forces (and therefore rate-of-turn) vary significantly depending on the combination of vessel type, steering system, and drive type. Therefore, the available vessel hull type options are provided for guidance only. You may wish to experiment with the different vessel hull type options, as it might be possible to improve the steering performance of your vessel by selecting a different vessel type.

When choosing a suitable vessel type, the emphasis should be on safe and dependable steering response.

Important: If you change the vessel type **after** completing the Dockside wizard, all commissioning settings will be reset to default settings, and you will need to complete the Dockside wizard again.

Selecting a vessel hull type

The Vessel hull type can be accessed from the Pilot Set-up page.

1. Select **Pilot Settings**.
2. Select **Vessel Settings**.
3. Select **Vessel Hull Type**.
4. Select the option that most closely matches your vessel type.
   The new selection is applied.

Selecting a drive type

Drive type selection is available from the dockside wizard, and also from the Vessel settings menu: **Pilot Set-up > Pilot Settings > Vessel Type > Drive type**.

With the **Drive Type** menu displayed:

1. Select your drive type from the list.

Note: The drive types available are dependant on the ACU type. If your drive type is not listed contact your Raymarine dealer for advice.

2. Select **OK** to save your setting and display the next set-up page.

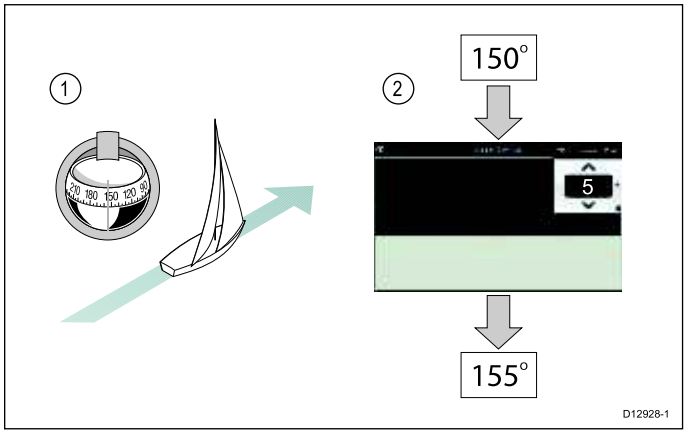
Note: You can cancel the Dockside wizard at any time by selecting **STANDBY**.

Aligning heading

The autopilot heading can be aligned to the ship's compass using the Compass offset setting.

Note: To perform this procedure you will need a networked device such as an instrument, pilot control head or multifunction display to have the current autopilot heading shown onscreen.

Many factors can cause a difference between heading and course over ground (COG), you must align the heading so it matches the vessel's steering compass (or a known transit bearing).



1. Set your vessel on a known heading and check the steering compass.
2. Check the autopilot heading on your multifunction display.
3. From the Pilot Set-up page select **Pilot Settings**.
4. Select **Vessel Settings**.
5. Select **Compass Offset**.
6. Adjust the Compass Offset so that the autopilot heading will match the steering compass heading.

   e.g. If the steering compass heading was 155° and autopilot heading was 150° applying a compass offset of 5° would mean that the steering compass and autopilot heading are aligned.

The compass offset will be changed automatically if required when the align compass to GPS procedure is carried out.

Drive settings

The drive settings are designed to provide optimum drive performance.

It is important to check and where necessary adjust the drive settings to suit your drive setup.

Drive settings include the following settings:

- *Rudder Damping.
- Auto Turn.
- Power Steer.
- Reverse rudder ref.
- Rudder Offset.
- Rudder Limit.
- Hard Over Time.

Note: *The rudder damping setting should not be adjusted without first seeking advice from Raymarine technical support.

Setting the auto turn angle

You can specify the angle at which the vessel will turn when performing an Auto Turn using a connected Pilot control Head.

From the Pilot Set-up page:

1. Select **Pilot Settings**.
2. Select **Drive Settings**.
3. Select **Auto Turn**.
4. Adjust the auto turn setting to the required value.
5. Select **Back** or **Ok** to confirm the setting.

Power Steer

If you have a joystick or a p70R pilot control head connected to your autopilot you can select its mode of operation. For detailed information refer to the documentation that accompanied your joystick or your p70R.

The modes of operation are as follows:

- **Off** — Joystick control is turned off.
- **Proportional** — Proportional mode applies rudder in proportion to joystick movement — the further the joystick is held over, the greater the applied rudder.
- **Bang-Bang** — Bang-bang modes applies continuous rudder in the direction of the joystick movement, to improve control, the speed of rudder movement changes with the angle of the joystick. For maximum speed, push the joystick hard over. If you return the joystick to the center position, the rudder will remain in its current position.

Reversing the rudder reference phase

On vessels fitted with a rudder reference transducer, if the rudder bar moves in the wrong direction you can correct this by reversing the phase of the rudder reference.

Note: This procedure is not required on vessels without a rudder reference transducer.

From the Pilot Set-up page:

1. Select **Pilot Settings**.
2. Select **Drive Settings**.
3. Select **Reverse Rudder Ref**.

   Selecting Reverse Rudder ref will switch between On and Off.

Setting the rudder offset

On vessels fitted with a rudder reference transducer, you can set an offset to the rudder's center position if required.

Note: This procedure is not required on vessels without a rudder reference transducer.

Note: To perform this procedure it is desirable to have a networked device such as an instrument, pilot control head or multifunction display that can display the current rudder position onscreen whilst making this adjustment.

1. Use the steering wheel to center the rudder.
2. From the Pilot Set-up page select **Pilot Settings**.
3. Select **Drive Settings**.
4. Select **Rudder Offset**.
5. Adjust the Rudder Offset value until the rudder bar shows the rudder in the central position.

   The rudder adjustment is limited to ± 9° if the adjustment required to center the rudder bar position is beyond these limits then the alignment of the rudder reference sensor will need to be physically adjusted.

Setting the rudder limits

On vessels fitted with a rudder reference transducer the rudder limits must be set. The rudder limit is used to set the rudder control. The rudder limits should be set to just inside the mechanical end stops to prevent unnecessary load on the steering system.

Note: This procedure is not required on vessels without a rudder reference transducer.

Note: To perform this procedure it is desirable to have a networked device such as an instrument, pilot control head or multifunction display that can display the current rudder position onscreen whilst making this adjustment.

The limits should be set to approximately 5° less than the maximum rudder angle.

1. Turn the steering wheel all the way to port and note the angle on the rudder bar.
2. Turn the steering wheel all the way to starboard and note the angle on the rudder bar.
3. From the Pilot Set-up page select **Pilot Settings**.
4. Select **Drive Settings**.
5. Select **Rudder Limit**.
6. Adjust the rudder limit to be 5° less than the lowest angle noted in steps 1 and 2 above.
7. Select **Back** or **OK** to confirm the settings.

Setting the hard over time

Once the hard over time has been established it can be set following the steps below.

From the Pilot Set-up page:

1. Select **Pilot Settings**.
2. Select **Drive Settings**.
3. Select **Hard Over Time**.
4. Enter your hard over time in seconds.

Sail boat Settings

When the vessel type has been set to a sail boat the Sail Boat settings menu will be available.

Sail boar settings consist of the following options:

- **Wind Trim Response** — Wind trim response controls how quickly the autopilot system responds to changes in the wind direction. A higher wind trim setting will result in a system that is more responsive to wind changes.
- **Gybe Inhibit** — With gybe inhibit turned on, to prevent accidental gybes, the autopilot will prevent the vessel from performing a turn away from the wind. With gybe inhibit turned off, you can perform an AutoTack into or away from the wind. Gybe inhibit does not effect Auto Turn.
- **Wind Trim** — This option determines whether the vessel steers to Apparent or True wind in when in Wind Vane mode.

Commissioning

You can commission an Evolution autopilot using the Pilot settings menu on your multifunction display. All set-up and commissioning procedures must be carried out before using the autopilot.

Commissioning the autopilot system consists of the following procedures:

- Vessel Hull Type selection.
- Drive Type selection.
- Rudder check
- Motor check

Commissioning pre-requisites

Before commissioning your system for the first time, check that the following processes have been carried out correctly:

- Autopilot system installation completed in accordance with the Installation instructions.
- SeaTalk^{ng} network installed in accordance with the SeaTalk^{ng} Reference Manual.
- Where fitted, the GPS receiver has been installed and connected in accordance with the associated Installation instructions.

Check also that the commissioning engineer is familiar with the installation and components of the autopilot system including:

- Vessel type.
- Vessel steering system information.
- What the autopilot will be used for.
- System layout: components and connections (you should have a schematic of the vessel's autopilot system).

Vessel hull type selection

The vessel hull type options are designed to provide optimum steering performance for typical vessels.

It is important to complete the vessel hull type selection as part of the initial set-up, as it forms a key part of the commissioning process. You can also access the options at any time with the pilot in Standby from the Pilot Set-up page by selecting: **Pilot Settings > Vessel Settings > Vessel Hull Type**.

As a general guide, select the option that most closely matches your vessel type and steering characteristics. The options are:

- **Sail**.
- **Sail (slow turn)**.
- **Sail Catamaran**.
- **Power**
- **Power (slow turn)**.
- **Power (fast turn)**.

It is important to be aware that steering forces (and therefore rate-of-turn) vary significantly depending on the combination of vessel type, steering system, and drive type. Therefore, the available vessel hull type options are provided for guidance only. You may wish to experiment with the different vessel hull type options, as it might be possible to improve the steering performance of your vessel by selecting a different vessel type.

When choosing a suitable vessel type, the emphasis should be on safe and dependable steering response.

Important: If you change the vessel type **after** completing the Dockside wizard, all commissioning settings will be reset to default settings, and you will need to complete the Dockside wizard again.

Selecting a vessel hull type

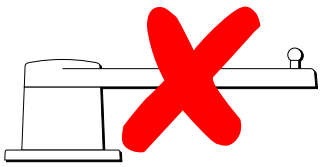
The Vessel hull type can be accessed from the Pilot Set-up page.

1. Select **Pilot Settings**.
2. Select **Vessel Settings**.
3. Select **Vessel Hull Type**.
4. Select the option that most closely matches your vessel type.
   The new selection is applied.

Performing the Dockside wizard

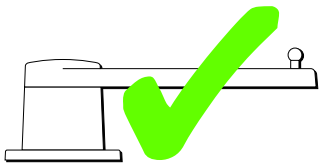
The dockside wizard must be completed before the Evolution autopilot system can be used for the first time. The Dockside wizard guides you through the steps required for commissioning.

The Dockside wizard contains different steps depending on whether you have a rudder reference transducer fitted to your vessel:



The following Dockside wizard procedures only apply to vessels **without** a rudder reference transducer:

- Drive Type selection.
- Rudder Limit setting.
- Hard-over time setting (Raymarine recommends that this information is specified once the dockside wizard and Rudder Drive check is complete, using the Hard Over Time menu option).
- Rudder Drive check.



The following Dockside wizard procedures only apply to vessels **with** a rudder reference transducer:

- Drive Type selection.
- Align Rudder (rudder alignment).
- Rudder Limit setting.
- Rudder Drive check.

To access the wizard, ensure the pilot is in **standby** mode and then from the Pilot Set-up page:

1. Select **Pilot Settings**.
2. Select **Commissioning**.
3. Select **Dockside Wizard**.

Selecting a drive type

Drive type selection is available from the dockside wizard, and also from the Vessel settings menu: **Pilot Set-up > Pilot Settings > Vessel Type > Drive type**.

With the **Drive Type** menu displayed:

1. Select your drive type from the list.

Note: The drive types available are dependant on the ACU type. If your drive type is not listed contact your Raymarine dealer for advice.

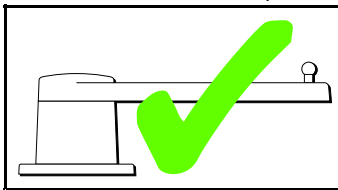
2. Select **OK** to save your setting and display the next set-up page.

Note: You can cancel the Dockside wizard at any time by selecting **STANDBY**.

Checking the rudder alignment

This procedure establishes port and starboard rudder limits for systems using a rudder reference transducer.

The rudder check forms part of the dockside wizard.



The following procedure only applies to vessels with a rudder reference transducer.

1. Center the rudder and select **OK**.
2. When prompted, turn the rudder hard to port and select **OK**.
3. When prompted, turn the rudder hard to starboard and select **OK**.
4. When prompted, turn the rudder back to centre and select **OK**.

Note: You can cancel Dockside wizard at any time by selecting **STANDBY**.

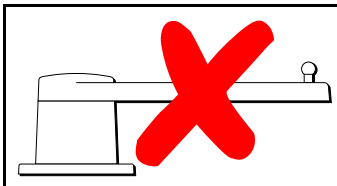
Rudder limit setting

As part of the Dockside wizard, the system will set-up the rudder limits.

- **For vessels with a rudder reference transducer** — This procedure establishes the rudder limit. The rudder limit will be displayed with a message confirming that the rudder limit has been updated. This value can be changed if required.
- **For vessels without a rudder reference transducer** — A default of 30 degrees is displayed, and can be changed as required.

Hard over time

The hard over time setting can be specified as part of the Dockside wizard.



The following information only applies to vessels without a rudder reference transducer.

- **If you already know the hard-over time** for your vessel's steering system: enter this time during the Dockside wizard procedure.
- **If you do NOT know the hard-over time** for your vessel's steering system: skip this step during the Dockside wizard by selecting **SAVE**, complete the Dockside wizard procedure. Once the wizard is complete, calculate and adjust the hard-over time.

Checking the rudder drive

As part of the Dockside wizard, the system will check the drive connection. Once it has completed the check successfully, a message will appear asking if it is safe for the system to take the helm.

During this procedure the autopilot will move the rudder. Ensure it is safe to proceed before selecting **OK**.

When in the Dockside wizard, with the Motor Check page displayed:

1. Center and let go of the rudder.
2. Disengage any rudder drive clutch.
3. Select **CONTINUE**.
4. Check it is safe to proceed before selecting **OK**.

   For vessels **with** a rudder reference transducer, the autopilot will now automatically move the rudder to port and then starboard.
5. For vessels **without** a rudder reference transducer, you will be asked to confirm the rudder turned to port by selecting **YES** or **NO**.
6. Select **OK** if it is safe to engage the rudder in the opposite direction.
7. You will be asked to confirm the rudder turned to starboard by selecting **YES** or **NO**.
8. Dockside wizard is now complete, select **CONTINUE**.

Note: If you confirmed a "NO" response for the rudder movement to both port and starboard, the wizard will exit. It is possible that the steering system did not move the rudder in any direction, and it will be necessary to check the steering system before completing the Dockside wizard procedure again.

Note: If the rudder moves in the opposite direction than expected you may need to reverse the phase of the rudder reference unit. This can be achieved by accessing: **Pilot Set-up > Pilot Settings > Drive Settings > Reverse Rudder Ref**.

You can cancel Dockside wizard at any time by pressing **STANDBY**.

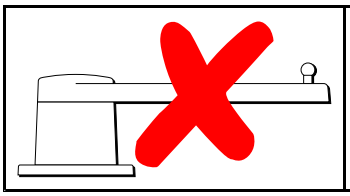
Warning: Rudder check

If no rudder reference has been fitted you MUST ensure that adequate provision is made to prevent the steering mechanism from impacting the end stops.

Adjusting the hard-over time

On vessels **without** a rudder reference transducer, it is important to set the hard-over time limits correctly, to ensure accurate autopilot operation. Hard-over time is the time it takes the vessel's steering system to drive the rudder from full port to full starboard.

Before attempting the following procedure, ensure that you've observed and understood the Rudder check warning provided in this document.



The following information only applies to vessels without a rudder reference transducer.

1. With the autopilot in 'Standby' mode, **manually turn the helm full to port**.
2. Place the autopilot in 'Auto' mode.
3. Using a stopwatch, **start the timer**, and then immediately:
4. Turn 180 degrees from your current heading.
5. Once the rudder has reached the rudder limit that was specified as part of the Dockside wizard, **stop the timer**.
6. To calculate your hard-over time, take the measured time and double it.
7. Now access the **Hard Over Time** menu to specify this hard-over time.

Setting the hard over time

Once the hard over time has been established it can be set following the steps below.

From the Pilot Set-up page:

1. Select **Pilot Settings**.
2. Select **Drive Settings**.
3. Select **Hard Over Time**.
4. Enter your hard over time in seconds.

Compass linearization

With Evolution autopilot systems, when the EV unit is first installed and powered-up, its internal compass needs to compensate for local magnetic variations and the earth's magnetic field. This is achieved using an automatic process known as linearization, which forms an important part of the autopilot installation, commissioning and set-up process.

Linearization

In Evolution systems, the linearization process is performed automatically by the EV unit as a background task when the vessel's speed is between 3 and 15 knots, no user intervention is required however at least a 270 degree turn is required. The process will occur during your first voyage with the autopilot system, and will typically take no more than 30 minutes, but this does vary according to the characteristics of the vessel, the installation environment of the EV unit, and the levels of magnetic interference at the time of conducting the process. Sources of significant magnetic interference may increase the time required to complete the linearization process. Examples of such sources include:

- Marine pontoons.
- Metal-hulled vessels.
- Undersea cables.

Note: You can speed-up the linearization process by completing a 360 degree turn (at a speed of 3 – 15 knots). You can also restart the linearization process at any time by selecting the **Restart Compass** menu item.

Use the compass deviation indicator

The use of the compass deviation indicator on the pilot control head may be useful in this process, particularly if the EV unit has been installed in a location on the vessel where the levels of magnetic interference are too high for the EV unit to compensate appropriately. If this is the case, the deviation display will indicate a value of 25 degrees or higher. In this scenario, Raymarine highly recommends that the EV unit is moved and re-installed in a location which is subject to less magnetic interference. If "- -" is displayed as the Deviation value, it means that linearization has not been successfully completed yet.

Check the compass heading data

As part of the autopilot system commissioning process, Raymarine recommends that you check the compass heading value displayed on your autopilot control head or multifunction display, against a good known heading source on various headings. This will help you to determine when the EV unit has completed its linearization process.

Note: Once the linearization process has completed, it is possible that the heading value may have a slight offset of 2 to 3 degrees. This is common where installation space is limited, and the EV unit cannot be properly aligned to the vessel's longitudinal axis. In this case, it is possible to manually adjust the compass offset value using the pilot control head or multifunction display, and fine-tune the heading to an accurate value.

Note: Do NOT rely on the heading accuracy until you are satisfied that compass linearization and alignment is complete.

System monitoring and adaptation

To ensure optimum performance, after the initial linearization process is complete the EV continues to monitor and adapt the compass linearization to suit current conditions.

If the conditions for linearization are less than ideal, the automatic linearization process temporarily pauses until conditions improve again. The following conditions can cause the linearization process to temporarily pause:

- Boat speed is less than 3 knots.
- Boat speed is greater than 15 knots.
- Rate-of-turn is too slow.
- Significant external magnetic interference is present.

Compass lock

Once you are satisfied with the compass accuracy, you can lock the setting to prevent the autopilot system from completing a further automatic linearization in the future.

This feature is particularly useful for vessels in environments that are exposed to strong magnetic disturbances on a regular basis (such as offshore wind farms or very busy rivers, for example). In these situations it may be desirable to use the Compass lock feature to disable the continuous linearization process, as the magnetic interference may build a heading error over time.

Note: The compass lock may be released at any time, to allow the compass continuous linearization to restart. This is particularly useful if planning a long voyage. The earth's magnetic field will change significantly from one geographical location to another, and the compass can continuously compensate for the changes, ensuring you maintain accurate heading data throughout the voyage.

Aligning compass to GPS

You can align the autopilot compass to your COG heading.

Aligning the compass must be performed whilst heading into the tide or in slack water.

From the Pilot Set-up page:

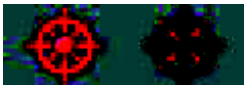
1. Select **Pilot Settings**.
2. Select **Commissioning**.
3. Select **Align Compass to GPS**.
4. Steer your vessel on a steady course and then select **Start**.
5. Ensure sufficient vessel speed, if you are going too slow a 'Go Faster' message is displayed.
6. If the alignment is successful select **OK** to complete the procedure.

If required this procedure will automatically correct the compass offset value accessible from the Vessel Settings menu.

Note: If the alignment fails it means that the pilot sensor is more than a 10° deviation between your COG heading and the pilot sensor, in this situation the pilot sensor position must be checked.

10.5 Autopilot status symbols

The autopilot status is indicated in the databar.

Symbol	Description
	Autopilot is in Standby mode.
	Autopilot is in Track mode.
	Autopilot is in Auto mode.
	No autopilot detected.
	Autopilot alarm active.
	Dodge mode is active.
	Fish mode is active.
	Autopilot calibration.
	Power steering active.
	Wind Vane mode is active.

10.6 Autopilot alarms

The autopilot function provides alarms to alert you to situations that require action.

Your multifunction display shows autopilot alarms, regardless of whether there is active navigation on the system. If autopilot control is enabled, and an alarm is raised by the autopilot, the multifunction display provides an audible alarm sound (providing that the alarm has not already been silenced). The **Pilot Control** dialog is displayed, indicating a new alarm. Additionally, the autopilot status icon is displayed in red, and remains red until the alarm is cleared.

Silencing autopilot alarms

1. Select **Dismiss**.

   The alarm is silenced and the autopilot remains engaged in auto mode, continuing on the current locked heading.
2. Select **Auto**.

   The alarm is silenced and the autopilot remains engaged in auto mode, continuing on the current locked heading.
3. Select **Track**.

   The alarm is silenced and the autopilot 'tracks' to the next waypoint.

Silencing autopilot alarms and disengaging autopilot

1. Select **STANDBY**.

The alarm is silenced, and the autopilot is disengaged and put in standby mode.

Chapter 11: Alarms and Man over board functions

Chapter contents

11.1 Using Man Overboard (MOB) functions

Man overboard

If you lose a person or object overboard, you can use the Man Overboard (MOB) function to mark the position that the vessel was at when the MOB function was activated.

The MOB function is available at all times, regardless of which application is running. MOB can be set to Dead Reckoning or Position mode. Dead Reckoning mode will take into consideration the effects of wind and tides. This usually provides a more accurate course. Position mode does not take these factors into account.

To obtain a MOB position, your multifunction display must have a GPS position fix. If you're using dead reckoning, heading and speed data must also be available.

When MOB is **activated**:

- An audible MOB alarm is sounded.
- An MOB alarm dialog box is displayed.
- The system sends MOB alarms to other Raymarine equipment.
- The active chart application is changed to a low-detail 2D view, with an initial range of 15 m (50 ft). Motion mode is set to Auto Range.
- The active radar application range is changed to 230 m (760 ft).
- All Goto and Follow functions are disabled in all applications. Navigation to any active waypoint is stopped and any existing navigation function is cancelled.
- If position or heading and speed information is available a MOB waypoint is placed at the current vessel position in any application that is capable of showing waypoints and vessel position.
- MOB data is displayed in the databar, replacing the existing data.
- MOB data is displayed on the homescreen, replacing the status icons.
- As the vessel moves away from the MOB position a dotted line is displayed, joining the MOB position with the vessel's position.

When the MOB alarm is **cancelled**:

- MOB data is removed from the relevant applications.
- The chart application motion mode is reset.
- The chart is centered on the vessel and pitch / rotation set to default.
- GOTO and route functions are restored.
- The databar mode is reset.
- A MOB normal mode signal is sent to any instrument on SeaTalk.

Activating the man overboard (MOB) alarm

On multifunction displays with physical buttons or when using a remote keypad you can use the WPT (MOB) button to activate the MOB alarm

1. Press and hold the **WPT / MOB** button for 3 seconds.

Activating the man overboard (MOB) alarm — Touch only displays

On a Touch only display you can use the onscreen WPT (MOB) icon to activate the MOB alarm

1. Press and hold the onscreen **WPT / MOB** icon for 3 seconds.

Silencing the MOB alarm.

The MOB alarm can be silenced by following the steps below.

With a MOB alarm active:

1. Select **Ok** on the MOB alarm dialog.
   The alarm will be silenced but remains active.

Cancelling the man overboard (MOB) alarm — Touch only display

On a Touch only display you can cancel the MOB alarm and resume normal operation follow the steps below:

1. Press and hold the onscreen **WPT / MOB** icon for 4 seconds.
   The MOB alarm is cancelled and normal operation is resumed.

Cancelling the man overboard (MOB) alarm

On a multifunction display with physical buttons or when using a remote keypad you can cancel the MOB alarm and resume normal operation follow the steps below:

1. Press and hold the **WPT / MOB** button for 4 seconds.
   The MOB alarm is cancelled and normal operation is resumed.

11.2 Alarms

Alarms alert you to a situation or hazard requiring your attention.

You can set up alarms to alert you to certain conditions, such as collision warnings and temperature limits.

Alarms are raised by system functions, and also external equipment connected to your multifunction display.

When an alarm sounds a message dialog is displayed on your multifunction display and any networked displays. The dialog states the reason for the alarm.

You can configure the behavior of certain alarms by selecting the Edit option on the message dialog or by using the **Alarms** menu, accessible from the homescreen via the **Set-Up** icon.

Silencing/Cancelling alarms

To silence/cancel an active alarm:

1. Select **Ok** on the alarm message dialog.

Note: Once silenced some alarms may remain active.

Alarms menu

Menu item	Description	Options
MOB Data Type	Determines whether Position or Dead Reckoning (DR) data is displayed. Assuming that your vessel and the MOB are subject to the same tide and wind effects, the Dead Reckoning setting normally gives a more accurate course.	• Dead Reckoning • Position (default)
Alarm Clock	When set to On, an alarm is triggered at the time you specify for the Alarm Clock Time setting.	**Alarm Clock** • Off (default) • On **Alarm Clock Time** • 00:00 (default) • 00.01 to 24:00 hrs
Anchor Drift	When set to On, the Anchor Drift alarm is triggered when your vessel drifts from your anchor position by more than the distance you specify for the Anchor Drift Range setting.	**Anchor Drift** • Off (default) • On **Anchor Drift Range** • 0.01 — 9.99 nm (or equivalent units)
Countdown Timer	When set to On, counts down the time period you specify for the Timer Period setting, and triggers an alarm when zero is reached.	**Countdown Timer** • Off (default) • On **Timer Period** • 00h00m (default) • 00h01m to 99h59m
AIS Targets	When set to On, the alarm for Dangerous Targets is enabled. This option is only available when an AIS unit is detected. Refer to the AIS section for details.	**Dangerous Targets** • On (default) • Off
Engine Alarms	When set to On then warning alarms from connected engine management systems will be displayed on the multifunction display.	**Engine Alarms** • On (default) • Off
Fishfinder Deep	If this option is set to On, an alarm is triggered when the depth exceeds the value that you specify. This option is only available when a sonar module is detected. **Note:** The Fishfinder Deep alarm limit cannot be set to a value less than the Shallow Limit.	**Fishfinder Deep** • Off (default) • On **Deep Limit** • 2 ft (or equivalent units) to the maximum of the transducer range
Fishfinder Shallow	If this option is set to On, an alarm is triggered when the depth drops below the value that you specify. This option is only available when a sonar module is detected. **Note:** The Fishfinder Shallow alarm limit cannot be set to a value greater than the Deep Limit.	**Fishfinder Shallow** • Off (default) • On **Shallow Limit** • 2 ft (or equivalent units) to the maximum of the transducer range
Fish	If the Fish alarm and fish depth limits alarm are set to On, a warning sounds is triggered if any target meets the sensitivity level and is within the Shallow Fish Limit and Deep Fish Limit that you specify. The following items are available in the sub-menu: • **Fish** — Switches fish alarm On and Off. • **Fish Sensitivity** — If the Fish alarm is set to On, an alarm is triggered when the fish return strength reaches the sensitivity that you specify. • **Fish Depth Limits** — Switches depth limits On and Off. • **Shallow Fish Limit** — Specifies the lower value for the Fish Alarm Depth Limit.	**Fish** • Off (default) • On **Fish Sensitivity** • 1 to 10 **Fish Depth Limits** • On • Off (default) **Shallow Fish Limit**

Menu item	Description	Options
	• **Deep Fish Limit** — Specifies the upper value for the Fish Alarm Depth Limit.	• 2 ft (or equivalent units) to the maximum of the transducer range **Deep Fish Limit** • 2 ft (or equivalent units) to the maximum of the transducer range
Fuel Manager	In the fuel manager alarm options you can switch the low fuel warning alarm on or off and specify the fuel level at which the alarm is triggered.	**Low Fuel** • On • Off (default) **Fuel Level** • 0 to 99999
Guard Zone	The Guard Zone feature in the radar application triggers an alarm when a target is within a specified zone. You can adjust the sensitivity of the alarm. Ensure that the sensitivity is not set too low, or targets may be missed and the alarm will not be triggered.	**Guard Zone Sensitivity** • 1% to 100%
Off Track	When set to On, during active navigation an alarm is triggered when your vessel steers off-track more than the value you specify for the Off Track XTE setting.	**Off Track Alarm** • Off (default) • On **Off Track XTE** • 0.01 to 9.99 nm (or equivalent units)
Water Temperature	When set to On, triggers an alarm when the water temperature is equal to or lower than the limit you specify for the Lower Temp Limit or equal to or greater than the limit you specify for the Upper Temp Limit setting.	**Water Temperature** • Off (default) • On **Lower Temp Limit** • 60 degrees fahrenheit (or equivalent units) • –09.9 to +99.7 degrees fahrenheit (or equivalent units) **Upper Temp Limit** • 75 degrees fahrenheit (or equivalent units) • –09.7 to 99.9 degrees fahrenheit (or equivalent units)
Waypoint Arrival	When you arrive at a waypoint, an alarm is triggered. This setting allows you to specify the distance from the target waypoint at which the alarm is triggered. The units used for this setting are based on the units you specify for distance in the Units Set-up menu.	0.01 to 9.99 nm (or equivalent units)

Accessing the alarms menu

From the homescreen:

1. Select **Set-up**.
2. Select **Alarms**.
   The Alarms menu is displayed.
3. Select the appropriate alarm category.

Chapter 12: DSC VHF radio integration

Chapter contents

12.1 DSC VHF radio integration

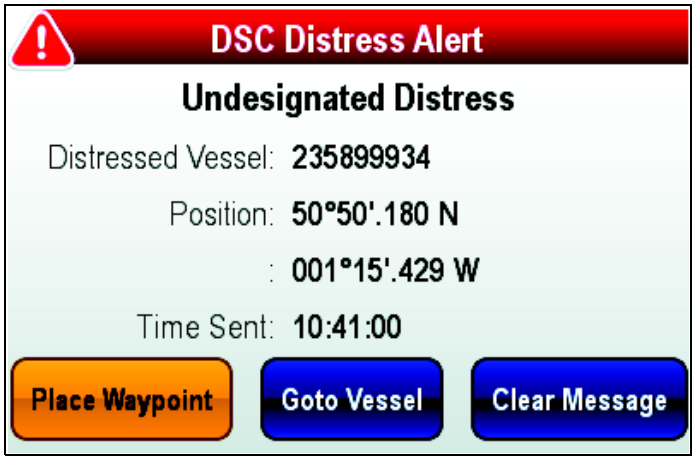
You can connect your DSC VHF radio to your multifunction display and show distress message information and GPS position data for other vessels.

Connecting a DSC VHF radio to your multifunction display provides the following additional functionality:

- Distress Messages — when your DSC VHF radio receives a DSC message or alarm from another DSC VHF radio, the vessel identification (MMSI), GPS position, and time of distress message is displayed on your multifunction display. With the distress message displayed you can use the buttons provided to: clear the message, place a waypoint on the chart at the GPS position of the distressed vessel, or immediately start navigating (Goto Vessel) to the GPS position of the distressed vessel.
- Position Data — the “Position Request” button on your DSC VHF radio enables you to send and receive GPS position data to and from other vessels equipped with a DSC VHF radio.

For information on installing and operating your DSC VHF radio, refer to the handbook that accompanies the radio.

The following image shows an example of a distress message displayed on a multifunction display:



12.2 Enabling DSC VHF radio integration

With the homescreen displayed:

1. Select **Set-up**.
2. Select **System Settings**.
3. Select the **DSC Alerts** option so that On is displayed.

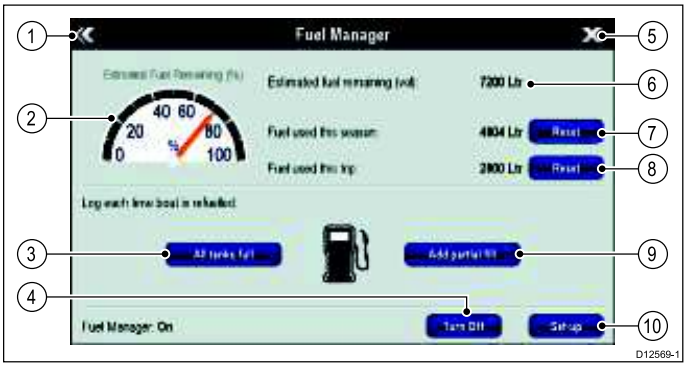
Chapter 13: Fuel manager

Chapter contents

13.1 Fuel manager overview

The fuel manager provides an estimate of fuel remaining, and the distance and time which can be travelled before the tanks are empty. In order to calculate these values, you must configure the total capacity of fuel available to the engines and log each time you add fuel. The fuel manager also allows you to set a low fuel warning alarm which is sounded when the vessel's estimated fuel falls below a specified value.

The fuel manager page provides current calculation estimates and controls to enable use of the fuel manager feature.



Item	Option	Description
1	**Back**	Back to System Set-up menu — New e Series only (For New c Series use the **Back** button).
2	Estimated fuel remaining (%)	Graphical representation of percentage of fuel remaining in the fuel tank(s).
3	**All tanks full**	Resets fuel remaining to full tank capacity.
4	**Turn On/Off**	Turn fuel manager On or Off.
5	**Close**	Back to Homescreen — New e Series only (For New c Series use the **Home** button).
6	Estimated fuel remaining (vol)	Volume of fuel remaining in the fuel tank(s).
7	**Reset** (Fuel used this season.)	Reset the fuel used this season to zero.
8	**Reset** (Fuel used this trip.)	Reset the fuel used this trip to zero.
9	**Add partial fill**	Specify fill amount by volume
10	**Set-up**	Specify settings for fuel manager.

In order to use the fuel manager you must:

- Connect a compatible engine interface to each engine you wish to monitor (to provide fuel flow rate data to the network).
- Enter the total fuel capacity of the vessel’s fuel tanks.
- Turn on the fuel manager feature.
- Fill the fuel tanks to full.
- Select ‘All tanks full’.
- Log each subsequent fuel fill whether partial or full.

Note:

Fuel manager estimates the amount of fuel onboard, based on the user logging each time you fill up, the total fuel capacity, and how much fuel is burned by the engine(s). Any incorrect entry could dramatically affect the estimated fuel usage and capacity which could result in a shortage of fuel. This system is not a substitute for other types of fuel calculations.

Total fuel onboard is an estimate and will be inaccurate if fuel fills are not entered, or fuel is used by other sources (e.g. generators etc.). Estimated distance and time to empty will be based on the fuel remaining calculation and values do not include weather/tide effects.

You should not rely on the fuel manager calculations for accurate voyage planning or in emergency and safety critical situations.

Enabling the fuel manager

To turn the fuel manager on and off follow the steps below.

From the homescreen.

1. Select **Set-up**.
2. Select **Fuel Manager**.
3. Select **Turn On**.
   The fuel manager disclaimer is displayed.
4. Select **ACCEPT** to accept the disclaimer and start using the fuel manager.
   The Initialize fuel manager pop-up is displayed.
5. Select **OK**.

The fuel manager will start the next time the **All tanks full** icon is pressed.

Disabling the fuel manager

From the fuel manager page:

1. Select **Turn Off**.
   The deactivate fuel manager pop-up message is displayed.
2. Select **Yes** to turn off the fuel manager.

Setting up fuel manager

To set up the required settings for the fuel manager follow the steps below.

With the Fuel Manager page displayed:

1. Select **Set-up**.
2. Select **Total Fuel Capacity**.
   The numeric keypad is displayed.
3. Enter your vessel’s total fuel capacity.
4. Select **Ok**.
5. Select **Economy Units**.
   A list of available options is displayed:
   - Distance per Volume
   - Volume per Distance
   - Litres per 100km
6. Select the required economy units.
7. Select **Fuel Calculations** to select the desired method of calculation.
   The following options are available:
   - Fuel Used (PGN127497)
   - Fuel Flow Rate

Note: If the Fuel Used (PGN127497) is not available on your network you will need to use the Fuel Flow Rate option. When Fuel Flow Rate is selected then your multifunction display must remain powered on whilst the engines are running to enable the fuel calculation to be made.

8. Select **Back** to go back to the **Fuel Manager** page.

Fuel logging

You must ensure **all** fuel fills are recorded using the fuel manager.

From the fuel manager page:

1. When filling the tanks until full select **All tanks full**.
   The estimated fuel remaining is reset to the value of your fuel tanks capacity.
2. When only partially filling the tank make a note of the volume of fuel added to the tank and then select **Add partial fill**.
3. Enter the value noted earlier this will be added to your current fuel remaining figure.

Note: It is recommended that you perform an 'All tanks full' fill up as regularly as possible as partial fills will cause a higher cumulative inaccuracy in the provided calculations.

Setting the low fuel alarm

Using the fuel manager also allows you to set a low fuel alarm which, if activated, is sounded when your vessel's remaining fuel falls to a specified value.

With the fuel manager turned on and set up correctly:

1. From the homescreen select **Set-Up**.
2. Select **Alarms**.
3. Select **Fuel manager**.
   The low fuel alarm settings are displayed.
4. Select **Low Fuel** so that On is highlighted.
   Selecting **Low Fuel** will turn the low fuel alarm On or Off.
5. Select **Fuel Level**.
   The fuel level numeric adjust control is displayed.
6. Adjust the fuel level to the required value.

The low fuel alarm will now be sounded when the fuel remaining in the tank falls to the value specified.

Note: By default the low fuel alarm is switched off.

Resetting fuel used readings

You can reset the value of the fuel used this season or fuel used this trip by following the steps below.

From the fuel manager page:

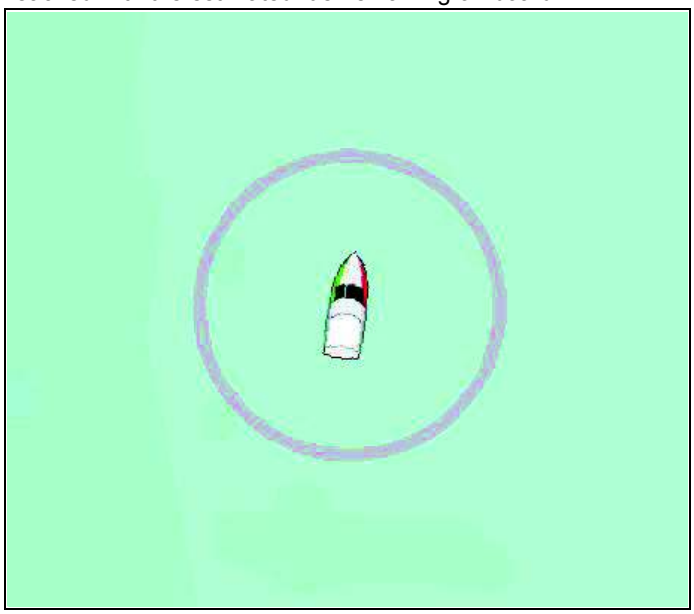
1. Select **Reset** against fuel used this season, or
2. Select **Reset** against fuel used this trip.

The value is set to zero after **Reset** has been selected.

Note: Performing a Season reset automatically resets the trip value.

Fuel range rings

The fuel range ring gives an estimated range that can be reached with the estimated fuel remaining on-board.



The fuel range ring can be displayed graphically in the chart application and indicates an estimated range that can be reached with the:

- Current rate of fuel consumption.
- Estimated fuel remaining on-board.
- Course remaining in a straight line.
- Current speed maintained.

Note:

The fuel range ring is an estimated range that can be reached at the current rate of fuel consumption, of the fuel onboard and based on a number of external factors which could either extend or shorten the projected range.

This estimate is based on data received from external fuel management devices, or via the Fuel Manager. It does not take into account prevailing conditions such as tide, current, sea state, wind etc.

You should not rely on the fuel range ring feature for accurate voyage planning or in emergency and safety critical situations.

Enabling the fuel range ring

From the chart application, in 2D view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Fuel Range Ring** so that On is selected.
   The fuel range ring pop-up message is displayed.
5. Select **OK** to turn on the fuel range rings.

Chapter 14: AIS function

Chapter contents

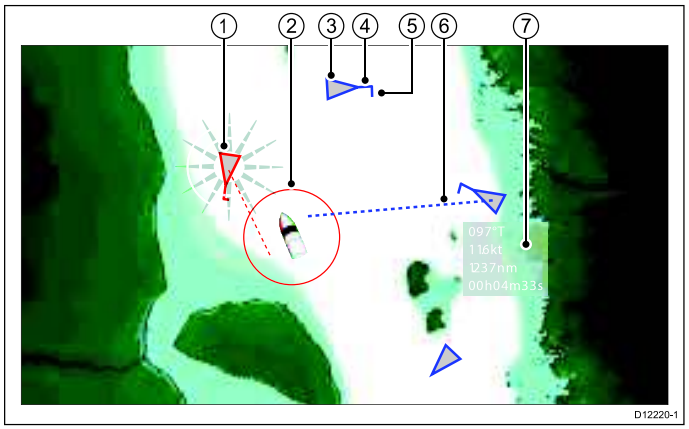
14.1 AIS overview

The AIS feature enables you to receive information broadcast by other vessels, and to add these vessels as targets in the chart and radar applications.

With an optional AIS unit connected to your system you can:

- Display targets for any other AIS-equipped vessels.
- Display voyage information being broadcast by these targets, such as their position, course, speed and rate-of-turn.
- Display basic or detailed information for each target vessel, including safety-critical target data.
- Set up a safe zone around your vessel.
- View AIS alarm and safety-related messages.
- Add AIS-equipped friends and regular contacts to a “Buddy List”

AIS information is displayed in the form of an overlay in the chart and radar applications. Additional data is displayed in a dialog box, for example:



Item	Description
1	Dangerous target (flashes).
2	Safe zone (defined by distance and / or time).
3	AIS target vessel.
4	Heading.
5	Direction of turn.
6	COG/SOG vector.
7	Safety critical data.

AIS-equipped vessels in the surrounding area are displayed in the chart or radar application as triangular targets. Up to 100 targets are displayed. As the vessel’s status changes, the symbol for the target changes accordingly.

Vectors can be displayed for each target. These vectors indicate the vessels direction of travel and the distance it will travel over a specified period of time (COG / SOG vector). Targets displayed with their vectors are referred to as ‘active targets’ and are scaled according to the size of the vessel. The larger the vessel, the larger the target. You can either display all targets or just dangerous targets.

How AIS Works

AIS uses digital radio signals to broadcast ‘real-time’ information between vessels and shore-based stations via dedicated VHF radio frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data. The AIS features complement the radar application, as AIS can operate in radar blind spots and can detect smaller vessels equipped with AIS.

Note: It may not be mandatory for vessels to be fitted with operational AIS equipment. Therefore, you should not assume that your multifunction display will show ALL vessels in your area. Due prudence and judgement should be exercised. AIS should be used to complement radar, NOT substitute it.

AIS Simulator Mode

Raymarine recommends that you use the simulator function to familiarize yourself with the AIS features. When the simulator function is enabled (**homescreen > Set-up > System Settings > Simulator**), it displays 20 AIS targets within a 25 nm range. These targets are displayed using the appropriate AIS target's status symbol, and move around the screen as if they were real targets.

Note: Incoming safety messages are NOT displayed while the simulator is enabled.

14.2 AIS prerequisites

You must have suitable AIS hardware connected to your multifunction display to make use of the AIS functionality.

In order to run AIS, you will need:

- A receive-only AIS unit or a full AIS transceiver (a unit that sends and receives).
- A VHF antenna.
- A GPS - to provide position data.
- The AIS layer enabled in the chart or radar application, as appropriate.

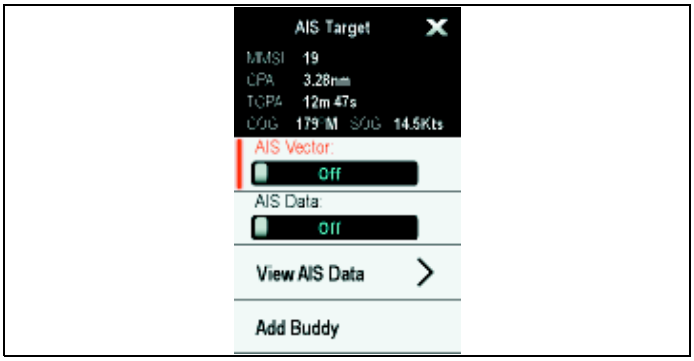
Note: A receiver will allow you to receive data about other vessels in your area but will not allow other vessels to 'see' you. A full transceiver transmits and receives AIS data, and therefore allows you to receive data about other vessels. It also enables other AIS-equipped vessels to see and receive information about your vessel. This could include position, course, speed and rate of turn data.

When the AIS unit is connected to your multifunction display, the status of the unit is indicated by an AIS icon in the status bar.

You can connect an AIS unit to your multifunction display using NMEA0183 or SeaTalk^{ng}, depending on the AIS unit. If connecting using NMEA0183, you will now need to specify the 38,400 baud setting (**homescreen > Set-up > System Settings > NMEA Set-up**) for the NMEA input port that communicates with the AIS transceiver or receiver.

14.3 AIS context menu

The AIS function includes a context menu which provides AIS target information and menu items.



The context menu provides the following AIS target data:

- MMSI
- CPA
- TCPA
- COG
- SOG

The context menu also provide the following menu items:

- **AIS Vector** — Switch target vectors On and Off.
- **AIS Data** — Switch on screen target data On and Off.
- **View Full Data**
- **Add Buddy** — Add target to the buddy directory.
- **Acquire Target** (only available if Radar overlay is switched on.)
- **Slew thermal camera** (only available when thermal camera is connected and operating.)

Accessing the context menu

You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

14.4 Enabling AIS

Enabling AIS in the Chart application

To enable the AIS overlay in the Chart application follow the steps below.

To enable the AIS overlay your system must include an AIS receiver or transceiver. The AIS overlay is not available in 3D view.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **AIS:** so that On is selected.

   Selecting AIS: switches the AIS between On and Off.

For AIS information refer to Chapter 14 AIS function.

Enabling AIS in the radar application

From the radar application:

1. Select **Menu**.
2. Select **Targets**.
3. Select **Display AIS Targets**.
4. Select the relevant option from the list.

   From the **Display AIS Targets** menu you can switch on **All** AIS targets, only **Dangerous** AIS targets or switch AIS targets **Off**.

14.5 Displaying AIS vectors

You must have the correct data available before AIS vectors can be displayed.

A target is defined as active when it has the following data displayed graphically:

- A COG/SOG vector indicating the predicted distance that a target will travel within a given period of time.
- A heading and direction of turn indicator.

Enabling and disabling AIS vectors

From the chart or radar application:

1. Select an AIS target.

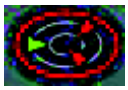
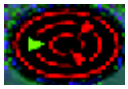
   The AIS target context menu is displayed.
2. Select **AIS Vector**.

   Selecting AIS Vector will switch between On and Off.

Note: The same target vector and safe zone settings apply to both radar MARPA and AIS targets.

14.6 AIS status symbols

AIS status is indicated by a symbol in the databar.

Symbol	Description
	AIS unit is switched on and operating.
	AIS currently unavailable.
	AIS unit is switched off, or not connected.
	AIS unit is in Silent Mode.
	AIS unit is in Silent Mode, with active alarms.
	AIS unit is connected and switched on, but has active alarms.
	AIS unit is connected and switched on, but the dangerous and lost alarm is disabled.

14.7 AIS silent mode

AIS silent mode enables you to disable AIS transmissions

AIS silent mode enables you to disable the transmitting functions of your AIS equipment. This is useful when you do not want to transmit your vessel's AIS data to other AIS receivers, but still wish to receive data from other vessels.

Note: Not all AIS equipment supports silent mode. For more information, refer to the documentation that accompanies your AIS unit.

Enabling and disabling AIS silent mode in the Chart application

From the Chart application:

1. Select **Menu**.
2. Select **AIS Options** or ***Radar & AIS Options**.
3. **Select **Targets**.
4. Select **AIS Set-up**.
5. Select **Silent Mode**.

   Selecting Silent Mode will switch AIS silent mode On and Off.

Note:

*When Radar overlay is also enabled the menu name becomes **Radar & AIS Options**.

** Step 3 is only required when Radar overlay is enabled.

Enabling and disabling AIS Silent Mode in the radar application

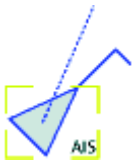
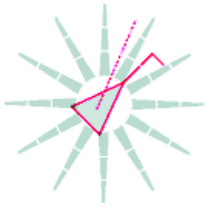
From the Radar application:

1. Select **Menu**.
2. Select **Targets**.
3. Select **AIS Set-up**.
4. Select **Silent Mode**.

   Selecting AIS Silent Mode will switch silent mode On and Off.

14.8 AIS target symbols

Your multifunction display shows a range of symbols to represent the different types of AIS target.

Target type	Description	Symbol
Transmitting target	Target is moving or at anchor (Target is not activated, dangerous or lost).	
Activated target	Target activated — that is, AIS vector displayed. Vector line (optional) shows predicted distance travelled within a given time.	
Selected target	Target selected with cursor. Can view detailed data.	
Dangerous target	Targets within specified distance (CPA) or time (TCPA). Dangerous target alarm sounds if enabled. Target red and flashing.	
Uncertain target	Calculated CPA / TCPA value uncertain.	
Lost target	When the signal of a dangerous target not received for 20 seconds. Target in latest predicted position. Alarms sounds if enabled. Target flashes.	
Buddy target	Target has previously been added to the Buddy List.	
Aid To Navigation (AToN) target (Real)	AToN target is ON position.	
Aid To Navigation (AToN) target (Real)	AToN target is OFF position.	
Aid To Navigation (AToN) target (Virtual)	AToN target is ON position.	
Aid To Navigation (AToN) target (Virtual)	AToN target is OFF position.	
Land base station target	Land base station target is ONLINE.	
Search and rescue transponders (SARTS) target	SARTS target	
Search and rescue aircraft (SARS) target	SARS target	
Military and law enforcement target	Only displayed when connected to approved STEDS-EAIS AIS hardware.	

14.9 Displaying detailed AIS target information

From the chart or radar application:

1. Select an AIS target.
   The AIS target context menu is displayed.
2. Select **View AIS Data**.

AIS Data

The table below shows the AIS target information which if available will be displayed on the multifunction display:

- Type
- Status
- Destination
- Last Seen
- ETA
- MMSI
- Call Sign
- IMO No.
- Length
- Beam
- Draught
- Heading
- ROT
- Position
- COG
- SOG
- CPA
- TCPA

Note: Available data is dependant upon what information is being transmitted from the target vessel and the type of AIS unit connected to your system.

14.10 Viewing all AIS targets

- From the Chart application with only the AIS overlay enabled go to: **Menu > AIS Options > Targets > View AIS List**
- From the Chart application when the Radar overlay is also enabled go to: **Menu > Radar & AIS Options > Targets > View Targets Lists > View AIS List**.
- From the Radar application go to **Menu > Targets > View Target Lists > View AIS List**.

1. Highlight an AIS target from the list.

   When an AIS target is highlighted the following details are displayed in the list:

   - MMSI
   - Range
   - Bearing
   - Buddy
   - Type

   This list can be filtered to show only buddies or all targets.

   If available the following data is also shown for the highlighted target:

   - SOG
   - COG
   - ROT
   - Position
   - Heading

2. To view full AIS target information Select a target from the list and then select **View Full Target Data**.

   The AIS target info dialog is displayed showing all available data for the selected target.

14.11 Using AIS to avoid collisions

You can use the AIS safe zone and safety message functions to help you avoid collisions with other vessels and objects.

Safe Zones

A safe zone is a ring centred on your vessel within which a target is considered dangerous. It is displayed in the radar or chart applications as a red ring.

This AIS safe zone uses the same criteria as MARPA and will deem a target dangerous if it comes within a specified distance of your vessel (closest point of approach or CPA) within a specified time (time to closest point of approach or TCPA). The CPA and TCPA are calculated using COG/SOG and position from the AIS target.

When your system recognizes a dangerous AIS target:

- The target symbol changes to red and flashes.
- The dangerous alarm dialog is displayed (this can be disabled if required).
- The dangerous alarm sounds (this can be disabled if required).

Note: When the AIS unit is connected and functioning, the system will check for dangerous targets within the safe zone and if enabled issue an alarm whenever necessary. Dangerous target alarm operates irrespective of the status of the AIS target display, or the safe zone ring.

Safety Messages

When the status of the AIS Safety Messages function is set to On, any incoming safety messages from surrounding vessels, shore stations and mobile stations are displayed in a dialog box. If known, the message will include the sending vessel's position in latitude / longitude. You will have the option to:

- Remove the message (**Ok**).
- Place a waypoint on your chart / radar to mark the sending vessel's position (**Place Waypoint**).
- Goto the sending vessel's position (**Goto Waypoint**).

Note: You will NOT receive any safety messages in Simulator mode (**homescreen > Set-up > System Settings > Simulator**).

Showing the Safe Zone Ring in the Chart application

To show the Safe Zone ring follow the instructions below:

From the Chart application:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Safe Zone Ring** so that **Show** is selected.

   Selecting Safe Zone Ring will switch the zone ring between hidden to visible.

Showing the Safe Zone Ring in the Radar application

To show the Safe Zone ring follow the instructions below:

From the Radar application:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Safe Zone Ring** so that **Show** is selected.

   Selecting Safe Zone Ring will switch the zone ring between hidden to visible.

Enabling and disabling AIS safety messages in the Chart application

From in the Chart application:

1. Select **Menu**.
2. Select **AIS Options** or ***Radar & AIS Options**.
3. **Select **Targets**.
4. Select **AIS Set-up**.

5. Select **Safety Messages**.
   Selecting Safety Messages will switch between safety messages On and Off.

Note:

*When Radar overlay is also enabled the menu name becomes **Radar & AIS Options**.

** Step 3 is only required when Radar overlay is enabled.

Enabling and disabling AIS safety messages in the radar application

From in the radar application:

1. Select **Menu**.
2. Select **Targets**.
3. Select **AIS Set-up**.
4. Select **Safety Messages**.
   Selecting Safety Messages will switch between safety messages On and Off.

Displaying safety-critical AIS information

From the chart or radar application:

1. Select the AIS target.
   The AIS target context menu is displayed.
2. Select **AIS Data** so that On is highlighted.
   Selecting AIS Data will switch between AIS data On and Off.

The Safety critical AIS data will now be displayed next to the target in the application.

14.12 Target options

The Target options menu for the Chart application and Radar application are shown below.

Parameter	Description	Options
Vector Length	The length of the vector lines displayed depends on the distance that an AIS target travels in the time period that you specify for this setting.	• 0.5 min • 1 min • 3 min • 6 min • 12 min • 30 min • 60 min
Target History	Targets' previous position will be plotted as a target icon with lighter shading than the actual target for the time specified.	• Off (default) • 0.5 min • 1 min • 3 min • 6 min

14.13 AIS alarms

The AIS functions generate a number of alarms to alert you to dangerous or lost targets.

In addition to the dangerous target alarm, the system generates an alarm when a dangerous target becomes a lost target i.e. its signal has not been received for 20 seconds.

Your AIS receiver generates local alarms which are displayed and sounded on your multifunction display whenever an alarm condition exists on the unit.

Local AIS alarms

When the connected AIS unit generates an alarm, your multifunction display shows a local alarm message and indicates the alarm status in the status bar.

Active AIS alarms log

The active alarm log shows the status of each local alarm. This log can be accessed as follows:

- from the Chart application when only the AIS overlay is enabled by going to: **Menu > AIS Options > AIS Set-up > AIS Alarms Log**
- from the Chart application when the Radar overlay is also enabled by going to: **Menu > Radar & AIS Options > Targets > AIS Set-up > AIS Alarms Log**
- from the Radar application by going to **Menu > Targets > AIS Set-up > AIS Alarms Log**.

Acknowledging AIS alarms

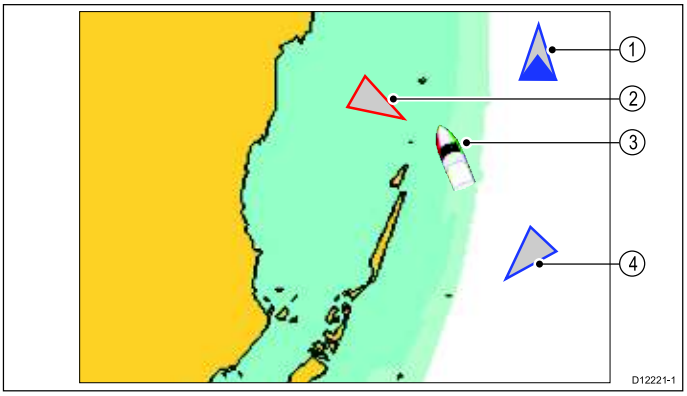
In the chart or radar application:

1. Select **Ok** on the alarm dialog box.

Note: An AIS alarm remains active until it is acknowledged on your multifunction display.

14.14 Buddy tracking

The Buddy Tracking feature enables you to add AIS-equipped friends and regular contacts to a “Buddy List” on your multifunction display. As soon as a vessel on your Buddy List sails into the range of your AIS unit, the vessel icon changes to indicate this.



Item	Description
1	Buddy icon
2	Dangerous target icon
3	Own vessel icon
4	Normal AIS icon

How it works

When the AIS Layer is enabled in the chart or radar application, AIS targets are shown on your display. You can add any AIS target to a “Buddy List”, each entry consisting of an MMSI number, and an optional name. Subsequently, whenever Buddy Tracking is enabled on your multifunction display, and a “Buddy” vessel with an MMSI number sails into the range of your AIS receiver, an AIS Buddy icon is displayed. Up to 100 vessels may be added to the Buddy List.

Pre-requisites

The following items are required for the Buddy Tracking feature:

- For the purposes of using the Buddy Tracking feature, it is assumed that your display is already connected to a suitable AIS unit.
- Only transmitting AIS-equipped vessels will be detected.

Enabling and disabling buddy tracking in the Chart application

From the Chart application, with the AIS overlay enabled:

1. Select **Menu**.
2. Select **AIS Options** or ***Radar & AIS Options**.
3. Select **Targets**.
4. Select **Display buddies**.
   Selecting Display buddies will switch the buddy tracking feature On and Off.

Note:

*When Radar overlay is also enabled the menu name becomes **Radar & AIS Options**.

Enabling and disabling buddy tracking in the radar application

From the radar application, with AIS enabled:

1. Select **Menu**.
2. Select **Targets**.
3. Select **Display buddies**.
   Selecting Display buddies will switch the buddy tracking feature On and Off.

Adding a vessel to your buddy list

In the chart or radar application:

1. Select the AIS target.
   The AIS target context menu is displayed.
2. Select **Add Buddy**.
   i. Select **Yes** to enter a name for the buddy vessel
   ii. Select **No** to save the vessel to your buddy list without entering a name for the buddy vessel.

The vessel will now be added to your buddy directory.

Adding an AIS buddy from the AIS target list

The AIS target list can be accessed from:

- the Chart application with only the AIS overlay enabled: **Menu > AIS Options > Targets > View AIS List**.
- the Chart application with the Radar and AIS overlays enabled: **Menu > Radar & AIS Options > Targets > View Target Lists > View AIS List**.
- the Radar application: **Menu > Targets > View Target Lists > View AIS List**

From the AIS list:

1. Select an AIS target.
2. Select **Add Buddy**.
   i. Select **Yes** to enter a name for the buddy vessel
   ii. Select **No** to save the vessel to your buddy list without entering a name for the buddy vessel.

The vessel will now be added to your buddy directory.

Editing a buddy's details

From the chart or radar application:

1. Select the AIS buddy target.
   The AIS buddy context menu is displayed.
2. Select **View Buddy List**.
3. Select the buddy you wish to edit.
   The Buddy options dialog is displayed.
4. To change the MMSI number select **Edit Buddy MMSI** or.
   The MMSI number must be 9 digits.
5. Select **Edit Buddy Name** to change the buddy name.
   This could be the name of the vessel, or the name of the friend who owns the vessel, for example
6. Enter the new details and select **SAVE**.
   You will be returned to the buddy list.

Deleting a buddy

From the chart or radar application:

1. Select the AIS buddy target.
   The AIS buddy context menu is displayed.
2. Select **Remove Buddy**.
3. Select **Yes** to confirm.
   The buddy has now been removed from the list.

The buddy list can also be accessed from:

- the Chart application with only the AIS overlay enabled: **Menu > AIS Options > AIS Options > > Targets > View Buddy List**.
- the Chart application with the Radar and AIS overlays enabled: **Menu > Radar & AIS Options > Targets > View Target Lists > View Buddy List**.
- the Radar application: **Menu > Targets > View Target Lists > View Buddy List**.

Displaying additional buddy information

From the chart or radar application:

1. Select the AIS buddy target.
   The AIS buddy context menu is displayed.
2. Select **Buddy Data** so that On is highlighted.
   Selecting Buddy Data will switch data between On and Off.

The Buddy MMSI and Name will now be displayed next to the buddy icon.

Chapter 15: Waypoints, Routes and Tracks

Chapter contents

15.1 Waypoints overview

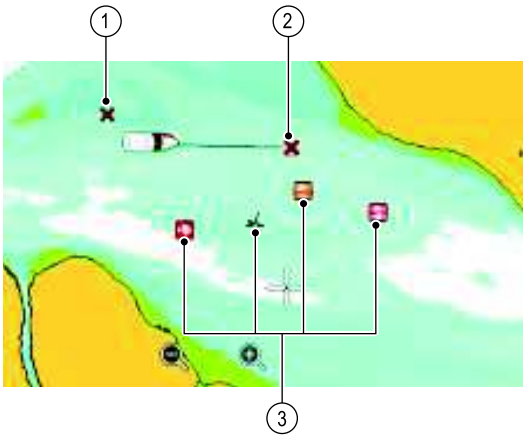
Waypoints are position markers used for the purposes of navigation. Your multifunction display can create waypoints, which can then be selected for active navigation.

There are a range of features for placing, navigating and managing waypoints, these can be accessed from the Waypoints menu and Waypoint context menu. Waypoints are represented on-screen using customizable waypoint symbols. Waypoint can be created, moved, deleted, exported to memory card or imported from a memory card.

Waypoint display examples

Waypoints in the chart application

In the chart application both active and inactive waypoints are shown. An active waypoint is the one that you are navigating to.

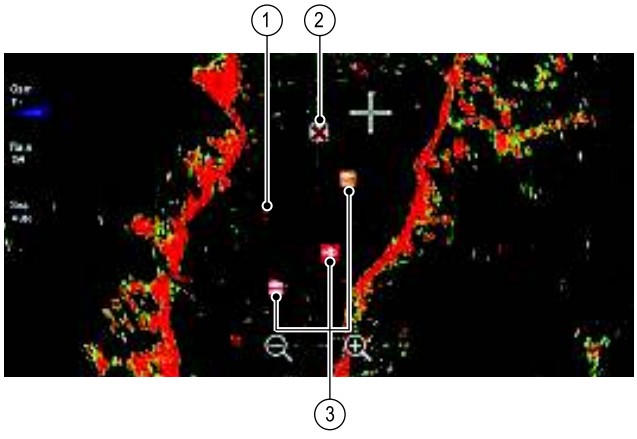


Item	Description
1	Inactive waypoint
2	Active waypoint
3	Alternative waypoint symbols

The default waypoint symbol is a red ‘X’. Alternative symbols can be used if required.

Waypoints in the radar application

In the radar application both active and inactive waypoints are shown. An active waypoint is the one that you are navigating to.

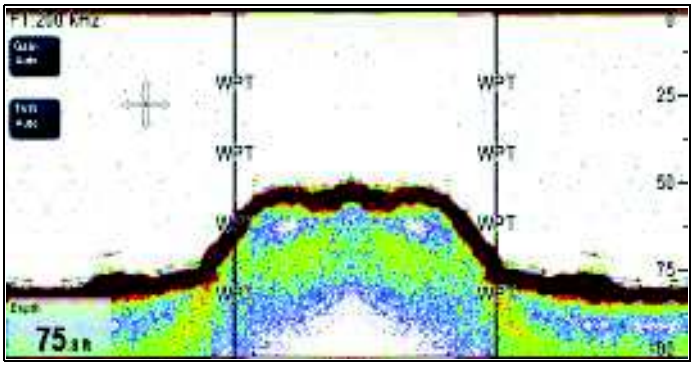


1. Inactive waypoint
2. Active waypoint
3. Alternate waypoint symbols

The default waypoint symbol is a red ‘X’. Alternative symbols can be used if required.

Waypoints in the fishfinder application

Waypoints in the fishfinder application are represented by a vertical line labelled WPT.



Waypoint (MOB) button / icon

Depending on the multifunction display variant there will be either a Waypoint (MOB) button or an on-screen icon.

WPT button		• c Series • e Series • RMK-9 keypad
WPT icons		• a Series • gS Series

Throughout this manual the term: Select **WPT**, refers to pressing the physical **WPT** button or pressing the on-screen **WPT** icon.

Waypoint context menu

Placing the cursor over a waypoint in the chart or radar applications displays a context menu showing the waypoint's positional data and menu items.

The context menu provides the following positional data for the waypoint in relation to your vessel:

- Latitude
- Longitude
- Range
- Bearing

For inactive waypoints the following menu items are available:

- **Goto Waypoint**
- **Follow From Here** (only available when waypoint is part of a route.)
- **Edit Waypoint**
- **Erase Waypoint**
- **Remove Waypoint** (only available when waypoint is part of a route.)
- **Move Waypoint**
- **Measure**
- **Build Route**
- **Acquire Target** (only available if Radar overlay is switched on.)

- **Slew thermal camera** (only available when thermal camera is connected and operating.)

For active waypoints the following menu items are available:

- **Stop Goto**
- **Restart XTE**
- **Advance Waypoint**
- **Measure**
- **Build Route**
- **Acquire Target** (only available if Radar overlay is switched on.)
- **Slew thermal camera** (only available when thermal camera is connected and operating.)

Accessing the context menu

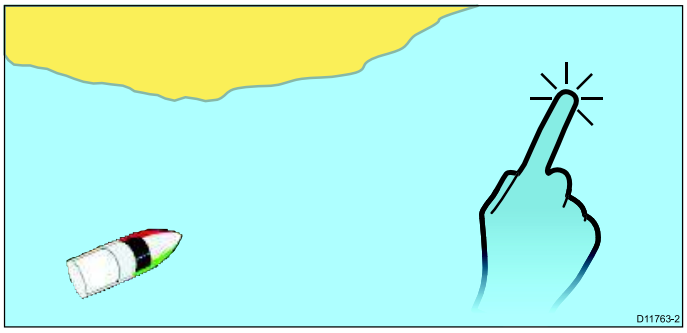
You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

Waypoint placement

Placing a waypoint

You can place a waypoint on a multifunction display with a touchscreen by following the steps below.



From the chart, radar or fishfinder application:

1. Select and hold the required location on screen.
   The context menu is displayed.
2. Select **Place Waypoint**.
   The Waypoint Saved dialog is displayed.

3. Select the **Symbol field** to change the symbol that will be used to display the waypoint in the Chart or Radar application.
4. Select the **Name field** to change the name of the waypoint.
5. Select the **Group field** to change the group that the waypoint is assigned to.
6. Select **OK** to confirm the waypoint details.

Note: If there is no user interaction with the Waypoint saved dialog for approximately 5 seconds then the waypoint is saved with the default settings and the dialog is closed automatically.

Placing a waypoint

From the chart, radar or fishfinder application:

1. Position the cursor at the required position.
2. Press the **WPT** button.
   The context menu is displayed.
3. Select **Place Waypoint**.
   The Waypoint Saved dialog is displayed.

4. Select the **Symbol field** to change the symbol that will be used to display the waypoint in the Chart or Radar application.
5. Select the **Name field** to change the name of the waypoint.
6. Select the **Group field** to change the group that the waypoint is assigned to.
7. Select **OK** to confirm the waypoint details.

Note: If there is no user interaction with the Waypoint saved dialog for approximately 5 seconds then the waypoint is saved with the default settings and the dialog is closed automatically.

Placing a waypoint at your vessel's position

In addition to positional information, a waypoint placed at the vessel position will capture temperature and sounded depth information (if you have the appropriate sensors connected to your system).

From the chart, radar or fishfinder application:

1. Select **WPT**.
   The waypoint menu is displayed.
2. Select **WPT** again or select **Place Waypoint At Vessel** from the menu.
   The Waypoint Saved dialog is displayed.

3. Select the **Symbol field** to change the symbol that will be used to display the waypoint in the Chart or Radar application.
4. Select the **Name field** to change the name of the waypoint.
5. Select the **Group field** to change the group that the waypoint is assigned to.
6. Select **OK** to confirm the waypoint details.

Note: If there is no user interaction with the Waypoint saved dialog for approximately 5 seconds then the waypoint is saved with the default settings and the dialog is closed automatically.

Placing a waypoint at a known position

You can place a waypoint at a specified location using latitude and longitude coordinates:

1. Select **WPT**.
2. Select **Place Waypoint At Lat/Lon**.
   The waypoint details dialog is displayed.

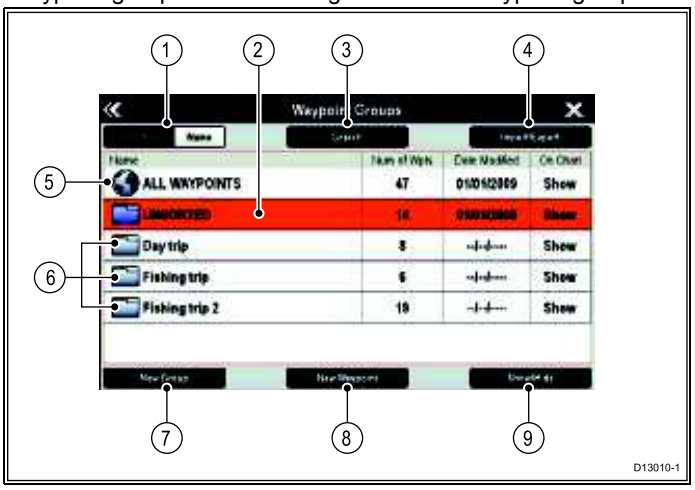
3. Select the **Position** field.
4. Enter the Latitude/Longitude position.
5. Select **SAVE**.
6. You can also edit the waypoint symbol, name and group by selecting the relevant fields.
7. Select **Close** or **Back** to close the dialog.

Waypoint groups

Waypoints are organized into groups. By default all waypoints are placed in the “UNSORTED” group.

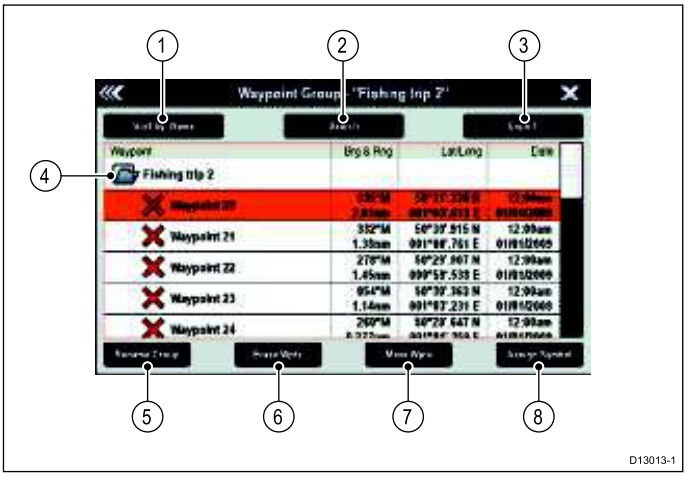
New waypoint groups can be created and each waypoint can be assigned to a waypoint group. For example; you could create a waypoint group called “Fishing” and place all of your waypoints where you caught fish into that group.

Waypoint groups can be managed from the Waypoint groups list.



1. **Sort By:** — Waypoint groups can be sorted by name or by date by selecting the **Sort By:** field.
2. **Unsorted** — By default new waypoints are added to the **UNSORTED** waypoint group. Selecting the group will display a list of all waypoints that have not been assigned to a specific group.
3. **Search** — You can search for waypoints using keywords by selecting **Search**.
4. **Import/Export** — Waypoints can be exported to or imported from a microSD card by selecting **Import/Export**. Refer to 8.4 Saving user data and user settings for details.
5. **All waypoints** — Selecting **ALL WAYPOINTS** displays a list of all waypoints saved on your system.
6. **Waypoint Groups** — All waypoint groups are displayed in the list.
7. **New Group** — A new waypoint group can be added by selecting **New Group**.
8. **New Waypoint** — New waypoints can be added manually by selecting **New Waypoint**.
9. **Show/Hide** — You can choose which waypoint groups are displayed and which groups are hidden by selecting the relevant group from the list and then selecting **Show/Hide**.

Selecting a waypoints group from the list displays a list of all waypoints in that group. Additional functions are available to help manage your waypoints.



1. **Sort By:** — Sort waypoints by Name, Range, Symbol or Date.
2. **Search** — Search for waypoints using keywords.
3. **Export** — Exports the waypoint group currently displayed to a memory card.
4. **Waypoint group** — This is the currently selected waypoint group.
5. **Rename Group** — Rename the current group.
6. **Erase Wpts** — Erase all waypoints in the group.
7. **Move Wpts** — Move all waypoints in the group.
8. **Assign Symbol** — Assign a new symbol to all waypoints in the group.

Displaying the waypoint group list

From any application:

1. Select **WPT**.
2. Select **Waypoints**.
   The waypoint group list is displayed.

Making a new waypoint group

With the Waypoint Group List displayed:

1. Select **New Group**.
   The on-screen keyboard is displayed.
2. Use the on-screen keyboard to enter the required name for the new group.
3. select **SAVE** .

Renaming a waypoint group

With the Waypoint group list displayed:

1. Select the group you want to rename.
   Group details are displayed.
2. Select **Rename Group**.
   The on-screen keyboard is displayed.
3. Using the on-screen keyboard change the group name as required.
4. Select **SAVE**.

Assigning a new symbol to a waypoint group

You can assign a new waypoint symbol to all the waypoints in a group.

From the Waypoint group list:

1. Select the group that you want to assign a new waypoint symbol to.
   A group details list is displayed showing all waypoints in the selected group.

2. Select **Assign Symbol**.
   A list of all available symbols is displayed.
3. Select the symbol that you want to use for the waypoints in the selected group.
   A confirmation dialog is displayed.
4. Select **Yes** to apply the new symbols to the waypoints, or select No to **cancel**.

Moving a waypoint to a different group

With the Waypoints group list displayed:

1. Select **ALL WAYPOINTS**.
   A list of all waypoints currently on your system is displayed.
2. Select the waypoint you want to move.
   The waypoint details page is displayed.
3. Select the **Group** field
   A list of all groups is displayed.
4. Select the **Group** that you want to move the waypoint to, or
5. Select **Create New Group** to move the waypoint to a new group.

The waypoint is moved to the selected group.

Moving all waypoints in a group to a different group

You can move all waypoints in a group to a different group.

With the Waypoints group list displayed:

1. Select the Group that contains the waypoints you want to move.
2. Select **Move Wpts**.
   A list of all groups is displayed.
3. Select the group from the list that you want to move the waypoints too.
   A confirmation dialog is displayed.
4. Select **Yes** to move the waypoints or **No** to cancel.

The waypoints have now been moved to the new group.

Erasing all waypoints in a group

You can erase all waypoints in a selected group.

With the waypoint groups list displayed:

1. Select the group that contain the waypoints you want to erase.
   A list is displayed showing all waypoints in the selected group.
2. Select **Erase Wpts**.
   A confirmation dialog is displayed.
3. Select **Yes** to erase all waypoints in the group, or **No** to cancel.

All of the waypoints in the selected group are erased from the system and the group will now be empty.

Erasing a waypoint group

Before you can erase a waypoint group you must move or erase all the waypoints assigned to that group.

With the Waypoint Group displayed:

1. Select the waypoint group that you want to erase.
2. Select **Erase Group**.
   The group is deleted from the system.

Waypoint information

When you create a waypoint, the system assigns information regarding the location marked. You can view and edit the details of any waypoint that has been created and stored.

The following information is assigned or captured for each waypoint:

- **Symbol** (a default symbol is assigned, or you can select an alternative.)
- **Name** (a default name is assigned, or you can select an alternative.)
- **Position** (Latitude and Longitude of the waypoint.)
- **Bearing** and **Range** (Bearing and range from vessel.)
- **Temperature** (requires appropriate sensor, only for waypoints captured at the vessel position.)
- **Depth** (requires appropriate sensor, only for waypoints captured at the vessel position.)
- **Date** and **time**
- **Comment** (you can add your own text comments to a waypoint.)

From the waypoint information page you can also perform the following actions:

- **Goto** (Start active navigation to the waypoint.)
- **Show on Chart** (Show the waypoint location in the chart application.)
- **Delete** (Delete the waypoint from the waypoints list.)

Displaying the waypoint list

From any application:

1. Select **WPT**.
2. Select **Waypoint List**.
   The waypoint list is displayed.

> **Note:** The waypoint list can also be accessed directly from the Homescreen by selecting **WPT**. or by going to the **My Data** menu and selecting **Waypoint List**.

Editing waypoint details

With the Waypoint List displayed:

1. Select the waypoint you want to edit.
   The waypoint information page is displayed.
2. Select the field you want to edit.
3. Use the on-screen keyboard to make the changes, then select the on-screen keyboard's **SAVE** button.

Editing a waypoint using the context menu

With the application page displayed:

1. Select the waypoint symbol on-screen.
   The waypoint context menu is displayed.
2. Select **Edit Waypoint**.
   The edit waypoint dialog is displayed.
3. Select the field you want to edit.
4. Use the on-screen keyboard to make the changes, and then select the on-screen keyboard's **SAVE** key.

Moving waypoints

Moving a waypoint using the context menu

With the application page displayed:

1. Select the waypoint symbol on-screen.
   The waypoint context menu is displayed.
2. Select **Move Waypoint**.
3. Select the new position for the waypoint.

Moving a waypoint by entering new coordinates

With the Waypoint List displayed:

1. Select **All Waypoints**.
2. Select the relevant waypoint.
   The waypoint information page is displayed.
3. Select the Position field.
4. Use the on-screen keyboard to make the changes, and then select the on-screen keyboard's **SAVE** key.

Erasing waypoints

Erasing a waypoint using the context menu

With the application page displayed:

1. Select the waypoint symbol on-screen.
   The waypoint context menu is displayed.
2. Select **Erase Waypoint**.
   The erase waypoint pop up message is displayed.
3. Select **Yes** to confirm, or **No** to cancel.

Erasing a waypoint using the waypoint list

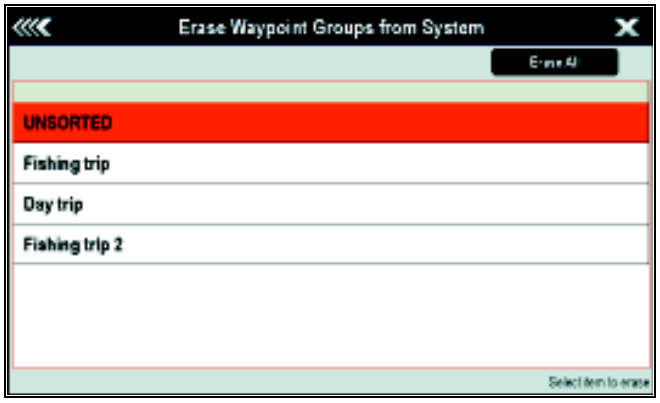
With the Waypoint List displayed:

1. Select **All Waypoints**.
2. Select the waypoint you want to erase.
   The waypoint information page is displayed.
3. Select **Erase**.
   The erase waypoint pop up message is displayed.
4. Select **Yes** to confirm, or **No** to cancel.

Erasing all waypoints

From the homescreen:

1. Select **My Data**.
2. Select **Import/Export**.
3. Select **Erase From System**.
4. Select **Erase Waypoints From System**.
   A list of all waypoint groups is displayed.



5. Select **Erase All**.
   The confirm delete pop up message is displayed.
6. Select **Yes** to confirm, or **No** to cancel.

Waypoint search

The waypoint search feature allows you to search for waypoints on your system.

The search feature is available by selecting **Search** from the Waypoints list.

Waypoints can be searched for by:

- Name or keyword
- Symbol
- Area

From the search results you can erase all the waypoints in the search list, move them to an existing or new waypoint group or assign all of the waypoints the same waypoint symbol.

Searching for waypoints by name or keyword

Waypoints can be searched for by name or keyword.

From the Waypoints list:

1. Select **Search**.
   The search page is displayed.
2. Use the on-screen keyboard to enter the waypoint name or keyword.
3. Select **Search**.
   The search results are displayed.

4. Select **Erase Wpts** to erase the list of waypoints from your system, or
5. Select **Move Wpts** to move the waypoints to a new or existing group, or
6. Select **Assign Symbol** to assign a new symbol to all the waypoints in the search results list.

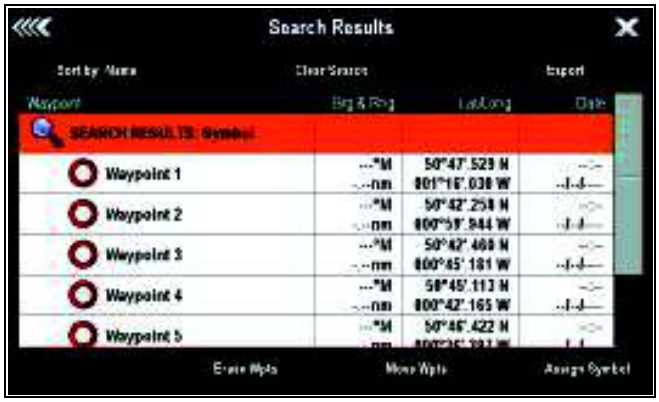
You can also select a waypoint from the list to view its details, or if accessed from the Chart application set a goto or display the waypoint in the Chart application.

Searching for waypoints by symbol

Waypoints can be searched for by waypoint symbol.

From the Waypoints list:

1. Select **Search**.
   The search page is displayed.
2. Select **Symbol**.
   The waypoints symbol list is displayed.
3. Select the symbol that is assigned to the waypoint(s) you want to search for.
   A list of all waypoints using the selected symbol is displayed.



4. Select **Erase Wpts** to erase the list of waypoints from your system, or
5. Select **Move Wpts** to move the waypoints to a new or existing group, or
6. Select **Assign Symbol** to assign a new symbol to all the waypoints in the search results list.

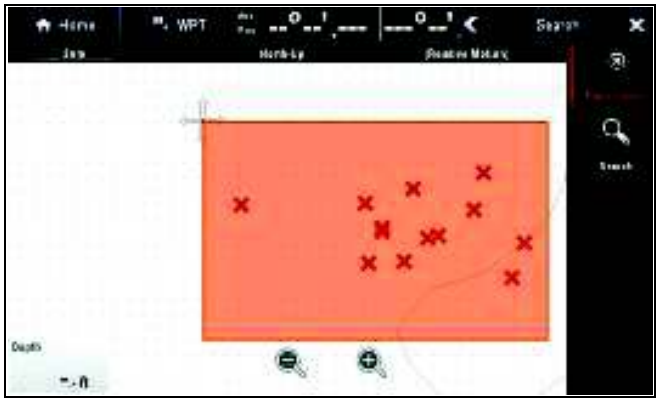
You can also select a waypoint from the list to view its details, or if accessed from the Chart application set a goto or display the waypoint in the Chart application.

Searching for waypoints by area

Waypoints can be searched for by selecting an area in the Chart application.

From the Chart application:

1. Select **Menu**.
2. Select **My Data**.
3. Select **Waypoints**.
   The waypoints list is displayed.
4. Select **Search**.
   The search page is displayed.
5. Select **Area**.
   The Chart application is displayed with the area search menu open.
6. Select the location for the first corner point of the search area.
7. Select the location for the opposite corner of the search area.
   A box is drawn on the screen which covers the selected area.



   If the box is drawn in the wrong place you can draw a new area by selecting 2 new corner points.
8. Select **Search** from the menu.
   A list of all waypoints in the selected area is displayed.

9. Select **Erase Wpts** to erase the list of waypoints from your system, or
10. Select **Move Wpts** to move the waypoints to a new or existing group, or
11. Select **Assign Symbol** to assign a new symbol to all the waypoints in the search results list.

You can also select a waypoint from the list to view its details, set a goto or display the waypoint in the Chart application.

Waypoint symbols

A Range of waypoint symbols are available that can be used to represent different waypoint types.

	Black Cross		Red Cross
	Black Circle		Red Circle
	Black Square		Red Square
	Black Triangle		Red Triangle
	Blue Cross		Green Cross
	Blue Circle		Green Circle
	Blue Square		Green Square
	Blue Triangle		Green Triangle
	Anchor		Wreck
	Buoy		Fuel
	Toilets		Restaurant
	Ramp		Caution
	Green racemark anti-clockwise		Green Racemark clockwise
	Yellow racemark anti-clockwise		Yellow Racemark clockwise

	Red racemark anti-clockwise		Red Racemark clockwise
	Marker		Restriction
	Bottom Mark		Top Mark
	Route Start		Route End
	Diver Down		Diver Down 2
	Oil Rig		Filled Circle
	FAD (Fish Attracting Device)		Concrete Rubble
	Seaweed		Oyster
	Green Can		Green Nun
	Red Can		Red Nun
	Yellow Can		Yellow Nun
	Fish Trap		Brushpile
	Preferred Marks		Post
	Ledge		Fish
	Fish 1 Star		Fish 2 Star
	Fish 3 Star		School Fish
	Lobster		Small Fish

	Rocks		Reef
	Private Reef		Public Reef
	Dolphin		Shark
	Billfish		Tank
	Reef Ball		Sailboat
	Sportsfisher		Trawler
	Swimmer		Martini
	Tree		Tower
	Hill or Peak		Bridge
	Airplane		Car
	Skull		Diamond T
	Diamond Quarter		Filled Triangle

Showing and hiding waypoint groups

From the chart or radar application:

1. Select **WPT**.
2. Select **Display Wpts on: Chart**, or **Display Wpts on: Radar** depending on the application you have open.

   The Show/Hide waypoints list is displayed.

In the example above the Day Trip group will not be displayed in the Chart application.

3. Select **Sort by:** to switch between Groups and Symbols.
   A list of Symbols or Groups is displayed.
4. Select the Group or Symbol from the list that you want to show or hide.
   If **Show** is displayed in the list then the group or symbols will be displayed, if **Hide** is displayed in the list then the group or symbols are not displayed in the application.
5. Repeat Step 4 for each waypoint group or symbol type you want to show or hide.
6. Alternatively to show or hide all waypoints select **Show All** or **Hide All** to show or hide all waypoints.

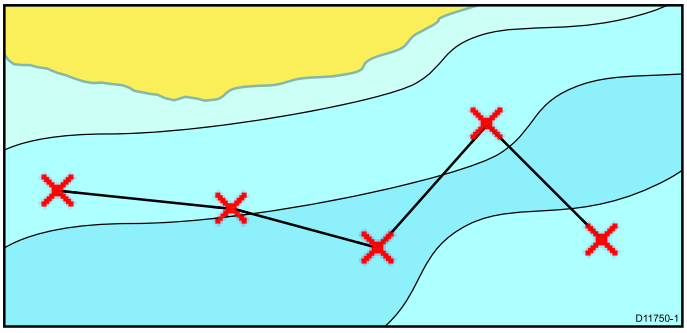
The list of waypoints and symbols can also be accessed from the application menu:

- Chart application: **Menu > My Data > Waypoints**.
- Radar application: **Menu > Presentation > Select WPTs To Display**.

15.2 Routes

A route is a series of waypoints typically used to assist with passage planning and navigation.

A route is displayed on screen as a series of waypoints linked by a line.



Route features

There are a range of route features for building, navigating and managing routes.

The route features allow you to:

- Build and save a route for use when required (stored in the route list).
- Navigate (follow) routes.
- Manage and edit routes stored on the system.
- Build a route from an existing track.

Route features are accessed from the chart application:

- by selecting an existing route.
- by using the **Build Route** option from the chart context menu.
- by using the Chart application menu: **Menu > Navigate > Follow Route** or **Build Route**.

Note: The Route List can also be accessed from the homescreen by selecting **My Data** and then **Routes**.

Route building

A route can consist of a combination of:

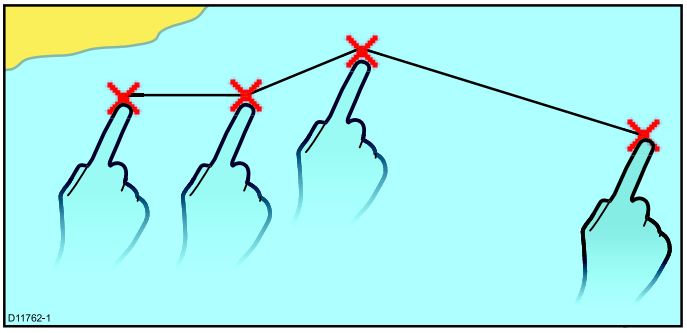
- New waypoints
- existing waypoints
- an existing track

As each waypoint is added, it is assigned an index number corresponding to its position in the route and drawn on the chart using the currently specified symbol. The following should be noted:

- When a route is being built it is not active and does not affect any current navigation.
- You cannot save a new route if any of the waypoints within it are currently active.

Building a route

You can build a route on a touchscreen multifunction display by following the steps below.



From the chart application:

1. Select and hold a location on screen.
   The chart context menu is displayed.

2. Select **Build Route**.
   The build route menu is displayed.
3. Select a location on screen to be the starting position.
4. Select relevant locations to place subsequent waypoints in order.
   The route is saved and displayed as each waypoint is placed.
5. When complete select **Finish Build**.
   The finish route build pop up message is displayed.
6. Select **Follow** to immediately follow the route. or
7. Select **Edit** to change the route name or change the route color. or
8. Select **Exit** to save the route and return to the chart application.

Note: If you place a waypoint at the wrong position, select **Undo Waypoint** from the Route Menu.

Building a route

From the chart application:

1. Select **Menu**.
2. Select **Navigate**.
3. Select **Build Route**.
   The build route menu is displayed.
4. Select **Place Wpt**.
5. Using the **Joystick** select a location on screen.
6. Press the **Ok** button to place the first waypoint in the route.
7. Use the **Joystick** and the **Ok** button to place subsequent waypoints.
   The route is saved and displayed as each waypoint is placed.
8. When your route is complete select **Finish Build**.
   The finish route build pop up message is displayed.
9. Select **Follow** to immediately follow the route. or
10. Select **Edit** to change the route name or change the route color. or
11. Select **Exit** to save the route and return to the chart application.

Note: If you place a waypoint at the wrong position, select **Undo Waypoint**.

Building a route using the waypoint list

From the chart application:

1. Select **Menu**.
2. Select **Navigate**.
3. Select **Build Route**.
   The build route menu is displayed.
4. Select **Use WPT List**.
   The waypoint list is displayed.
5. Select the required waypoint.
   You will be taken back to the build route menu.
6. Add subsequent waypoints to the route.
   The route is saved and displayed as each waypoint is placed.
7. When your route is complete select **Finish Build**.
   The finish route build pop up message is displayed.
8. Select **Follow** to immediately follow the route. or
9. Select **Edit** to change the route name or change the route color. or
10. Select **Exit** to save the route and return to the chart application.

Note: If you select the wrong waypoint, select **Undo Waypoint** from the route menu.

Adjusting chart range while building a route

From the Build Route menu:

1. Use the on-screen **Range In** and **Range Out** icons to range in and out of the chart.

Adjusting the chart range while building a route

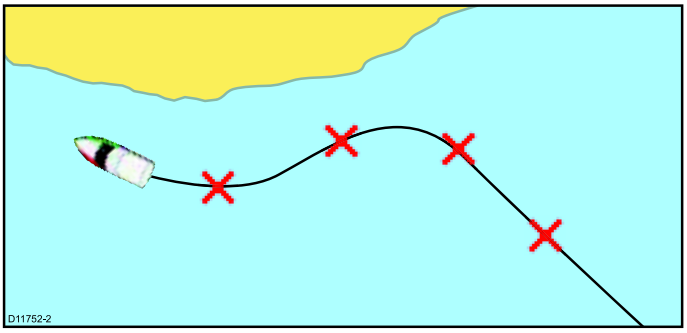
From the Build Route menu:

1. Use the **Range In** and **Range Out** buttons to range in and out of the chart.

Build a route from a track

You can create a route from a recorded track.

When a track is converted the system creates the closest route through the recorded track, using the minimum number of waypoints. Each waypoint created will be saved with the depth and temperature data (if applicable) for that position.



Note: If a track break occurs, only the last segment is converted to a route.

Building a route from a track

From the Track List:

- accessed from the homescreen: **My Data > Tracks**
- accessed from the chart application: **Menu > My Data > Tracks**

1. Select the Track you want to convert to a route.
   The track options dialog is displayed.
2. Select **Create Route From Track**.
   On completion, the maximum deviation of the route from the recorded track is displayed in a dialog and the new route is added to the route list. It can now be displayed, edited and erased etc. in the same way as other routes in the system.
3. Select **Ok** to confirm.
4. Select **Edit** to change the name and line color of the created route.

Building a route from a track displayed on the chart

From the chart application:

1. Select the required track.
   The track context menu is displayed.
2. Select **Create Route From Track**.
   On completion, the maximum deviation of the route from the recorded track is displayed in a pop up message and the new route is added to the route list. It can now be displayed, edited and erased etc. in the same way as other routes in the system.
3. Select **Ok** to confirm.
4. Select **Edit** to change the name and line color of the created route.

Review or edit a route

There are a variety of attributes associated with routes. These can be reviewed and edited.

You can:

- Show or hide a route on the chart screen.
- Review details of the route
- Change the name or color of a route.
- Add, move and remove waypoints from a route.
- Change the route lines width.

Note: An active route can be edited, with the exception of the active waypoint. If a waypoint being edited becomes active, then the system shall cancel the edit; the waypoint shall remain in its original position.

Showing or hiding routes and tracks

From the chart application:

1. Select **Menu**.
2. Select **My Data**.
3. Select **Routes** or **Tracks**.
4. Select **Show/Hide**.
5. Select the route or track to switch between Show and Hide.

Selecting a route to review or edit

1. Do one of the following to select the required route:
   - From the chart application, select a route on screen to display the route context menu.
   - From the chart application, select: **Menu > My Data > Routes** and select the required route from the list.
   - From the Homescreen, select: **My Data > Routes** and select the required route from the list.

Adding a waypoint to a route on the chart screen

From the chart application:

1. Select the appropriate leg of the route.
   The route context menu is displayed.
2. Select **Insert Waypoint**.
3. Select the location for the new waypoint.
   The leg of the route is stretched to include the new waypoint.

Removing a waypoint from a route

From the chart application:

1. Select the waypoint you want to erase.
   The waypoint context menu is displayed.
2. Select **Remove Waypoint**.
   The Remove waypoint dialog is displayed.
3. Select **Yes** to confirm or **No** to cancel the action.

The waypoint will be removed from the route but will still be available.

Moving a waypoint within a route

From the chart application:

1. Position the cursor over the waypoint you want to move.
   The waypoint context menu is displayed.
2. Select **Move Waypoint**.
3. Select the new location for the waypoint.

Erasing routes

Erasing a displayed route

From the chart application:

1. Select the route.
   The Route context menu is displayed.
2. Select **Erase Route**.
   The erase route pop up message is displayed.
3. Select **Yes** to confirm, or **No** to cancel the action.

Erasing a route using the route list

From the Chart application menu or the Homescreen:

1. Select **My Data**.
2. Select **Routes**.
   The route list is displayed.
3. Select the route you want to erase.
4. Select **Erase route**.
   The erase route dialog is displayed.
5. Select **Yes** to confirm, or **No** to cancel the action.

Note: You can delete any route, except for the one that you are currently following. When you erase a route, only those waypoints associated with that route are deleted.

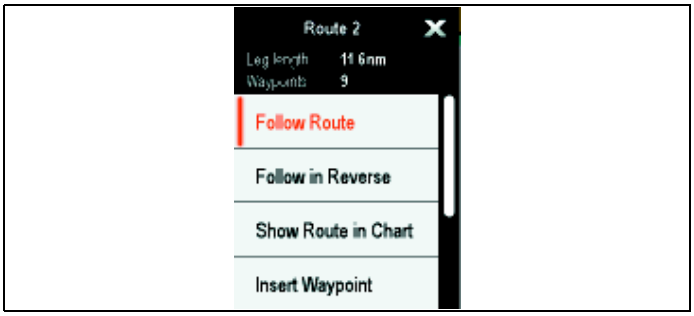
Erasing all routes

From the homescreen:

1. Select **My Data**.
2. Select **Import/Export**.
3. Select **Erase from System**.
4. Select **Erase Routes from System**.
   The erase routes from system dialog is displayed.
5. Select **Erase All**.
   The confirm delete dialog is displayed.
6. Select **Yes** to confirm, or **No** to cancel the action.

Route context menu

Placing the cursor over a route in the chart application displays a context menu showing the leg of the route highlighted by the cursor and menu items.



The context menu provides the following menu items:

- **Follow Route**
- **Follow Route In Reverse**
- **Hide Route**
- **Insert Waypoint**
- **Edit Route**
- **Erase Route**
- **Add Route Leg**
- **Acquire Target** (only available if Radar overlay is switched on.)

When following a route the context menu options change to:

- **Stop Follow**
- **Restart XTE**
- **Advance Waypoint**
- **Insert Waypoint**
- **Edit Route**
- **Erase Route** — Disabled
- **Add Route Leg**
- **Acquire Target** (only available if Radar overlay is switched on.)

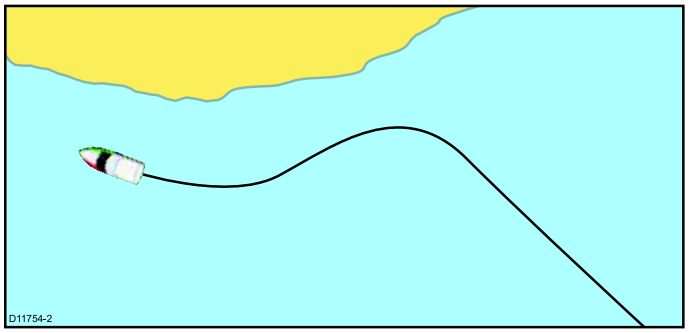
Accessing the context menu

You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

15.3 Tracks

A track is an on-screen trail that shows the passage you have taken. This trail is made up of a series of track points which are created automatically. You can save the track to create a permanent record of where you have been



With tracks you can:

- Review where you have been.
- Create a route from a track.

Creating a track

From the chart application menu:

1. Select **Navigate**.
2. Select **Start Track**.
   The start track pop up message is displayed.
3. Select **Ok**.
   As you navigate your vessel, your journey is automatically recorded as a track.

Note: If the power fails whilst a track is being recorded or the position fix is lost, a break will occur in the track.

Note: If the maximum number of tracking points is reached, you will be warned. The track will continue to be recorded with the earlier tracking points being overwritten.

4. To complete your track select **Stop Track** from the **Navigate** menu: **Menu > Navigate > Stop Track**.
   The track stopped pop up message is displayed.
5. Select **Save**, **Erase** or **Cancel**.
   - **Save** — Will save the track and open the Edit track Properties dialog where you can name the track and choose a color for the track line.
   - **Erase** — Will erase the track.
   - **Cancel** — Will cancel the Stop Track action.

Track interval

The track interval specifies the time period or distance between the points in a track.

You can adjust the interval between track points and choose the interval type (i.e. distance or time), which can help ensure best use of the available storage.

The settings are available from the Tracks Set-up options.

- **Record Track By** — specifies the interval type (Auto / Time / Distance).
- **Track Interval** — specifies the interval value (e.g. 15 minutes).

For example when creating a track for a long journey, an interval set to Auto could result in rapid use of all of the storage available for track points. In this case selecting a higher value for the Track Interval would provide capacity for a longer track.

Setting the track interval

From the My Data menu in the Chart application or on the Homescreen:

1. Select **Tracks**.
2. Select **Track Set-up**.
3. Select **Record Tracks By:** and set to the appropriate value:
   - Auto— The track interval is automatically set (Auto will minimize track points whilst maintaining correlation between the track and the actual path followed).
   - Time— The track points are placed at regular intervals of time.
   - Distance— The track points are placed at regular intervals of distance.
4. Select the **Track Interval** and set to the appropriate value:
   - Units of time (available if “record track by” is set to time).
   - Units of distance (available if “record track by” is set to distance).
   - Not available — no Track Interval is available if the “record track by” is set to auto).

Reviewing and editing a track

You can review and edit aspects of the tracks stored.

You can:

- Erase a track.
- Create a route from a track.
- Show or hide a track on the chart (only available from the chart application).
- Change the name of a track.
- Change the color of a track.

Showing or hiding routes and tracks

From the chart application:

1. Select **Menu**.
2. Select **My Data**.
3. Select **Routes** or **Tracks**.
4. Select **Show/Hide**.
5. Select the route or track to switch between Show and Hide.

Selecting a track to review or edit

1. Do one of the following to select the required track:
   - From the Chart application, select a track on screen to display the track context menu.
   - From the Chart application, go to the following menu: **Menu > My Data > Tracks** , and select the required track.
   - From the Homescreen, select: **My Data > Tracks** and select the required track.

You can then proceed and review or edit the required track using the options available.

Erasing tracks

Erasing a track

From the My Data menu:

1. Select **Tracks**.
   The track list is displayed.
2. Select the track you want to erase.
3. Select **Erase Track**.
   The erase track pop up message is displayed.
4. Select **Yes** to confirm, or **No** to cancel the action.

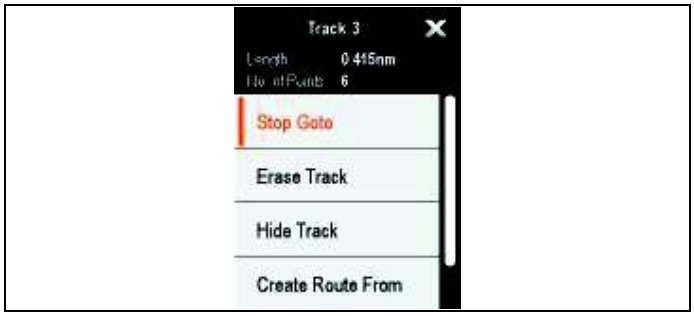
Erasing all tracks

From the Homescreen:

1. Select **My Data**.
2. Select **Import/Export**.
3. Select **Erase from System**.
4. Select **Erase Tracks from System**.
   The tracks list is displayed.
5. Select **Erase All**.
   The confirm delete dialog is displayed.
6. Select **Yes** to confirm, or **No** to cancel the action.

Track context menu

Selecting a track in the chart application displays a context menu showing the track length, number of points and menu items.



The context menu provides the following menu items:

- **Stop Goto** (only available during active navigation.)
- **Erase Track**
- **Hide Track**
- **Create Route From**
- **Rename**
- **Edit Color**
- **Acquire Target** (only available if Radar overlay is switched on.)

When creating a track the context menu options change to:

- **Stop Goto** (only available during active navigation.)
- **Stop Track**
- **Erase Route** — Disabled
- **Create Route From**
- **Rename**
- **Edit Color**
- **Acquire Target** (only available if Radar overlay is switched on.)

Accessing the context menu

You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

15.4 Import and Export

Waypoints, Routes and Tracks can be imported and exported using a memory card.

For details on importing and exporting waypoints, routes and tracks refer to: 8.4 Saving user data and user settings.

15.5 Waypoints, routes and tracks storage capacity

The display can store the following quantities of waypoints, routes and tracks

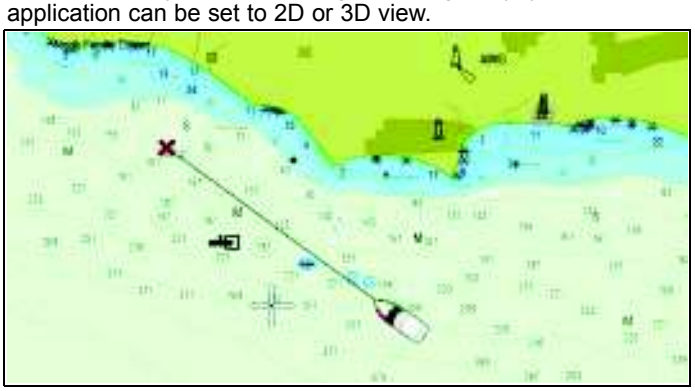
Waypoints	• 3000 waypoints • 100 waypoint groups, each group can contain up to 3000 waypoints
Routes	• 150 routes, each route can contain up to 200 waypoints
Tracks	• 15 tracks, each track can contain up to 10,000 points

Chapter 16: Chart application

Chapter contents

16.1 Chart application overview

The chart application provides route planning and navigation features. The Chart application is pre-loaded with a basic world base map. Compatible electronic charts can be used to expand the information and detail regarding your surroundings and charted objects. Depending on cartography type the chart application can be set to 2D or 3D view.



Typical chart application tasks include :

- Monitoring your vessel location and heading.
- Interpreting your surroundings.
- Measuring distance and bearing.
- Navigating using waypoints.
- Planning, and Navigating using routes.
- Keeping track and recording your course.
- Viewing information for charted objects.
- Monitoring fixed and moving objects using radar overlay.
- Monitoring AIS equipped vessels in your vicinity using AIS overlay.
- Monitoring US and Canadian weather information using the NOWRad overlay.
- Displaying aerial photos using the aerial overlay.

Note: To obtain full 3D detail, you must have chart cards containing 3D cartography for the appropriate geographic area.

The chart application can be customized. You can:

- Alter the way the chart is drawn in relation to your vessel and the direction you are travelling in (chart orientation and motion mode).
- Manage and edit chart data you have entered.
- Control the level of detail displayed on-screen.

Chart datum

The chart datum setting affects the accuracy of the vessel position information displayed in the chart application.

In order for your GPS receiver and multifunction display to correlate accurately with your paper charts, they must be using the same datum.

The default datum for your multifunction display is WGS1984. If this is not the datum used by your paper charts, you can change the datum used by your multifunction display, using the system preferences page. The system preferences page can be accessed from the homescreen: **Set-up > System Settings > System Preferences > System Datum**.

When you change the datum for your multifunction display, the chart grid will subsequently move according to the new datum, and the latitude/longitude of the cartographic features will also change accordingly. Your multifunction display will attempt to set up any GPS receiver to the new datum, as follows:

- If your multifunction display has a built in GPS receiver it will automatically correlate each time you change the datum.
- If you have a Raymarine GPS receiver using SeaTalk or SeaTalkng, it will automatically correlate each time you change the datum on the multifunction display.
- If you have a Raymarine GPS receiver using NMEA0183, or a third-party GPS receiver, you must correlate it separately.

It may be possible to use your multifunction display to correlate an NMEA0183 GPS receiver. From the homescreen go to **Set-up > System settings > GPS Set-up > View Satellite Status**. If the datum version is displayed, it may be possible to change it. From the homescreen go to **Set-up > System settings > Data Sources > GPS Datum**.

Note: Raymarine recommends that you check the displayed vessel position in the chart application against your actual proximity to a known charted object. A typical GPS has an accuracy of between 5 and 15 m.

Chart context menu

The Chart context menu provides the cursors positional data and shortcuts to menu options.

The method of selecting a chart object using a touchscreen display depends on the **Context Menu** setting in the chart **Set-up** menu, which can be set to Touch or Hold.

The context menu provides the following positional data for the cursor position in relation to your vessel:

- Latitude
- Longitude
- Range
- Bearing

The following menu items are available:

- **Goto Cursor** / **Stop Goto** / **Stop Follow**
- **Place Waypoint**
- **Photo**
- **Tide Station** (only available if a tide station is selected.)
- **Current Station** (only available if a current station is selected.)
- **Pilot Book** (only available at certain ports.)
- **Animate** (only available if a tide or current station is selected.)
- **Chart Objects**
- **Find Nearest**
- **Measure**
- **Build Route**
- **Acquire Target** (only available if Radar overlay is switched on.)
- **Slew thermal camera** (only available when thermal camera is connected and operating.)

Accessing the context menu

You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

Selecting context menu settings

On touchscreen multifunction displays you can choose how chart object context menus are a accessed.

From the Homescreen:

1. Select **Customize**.

2. Select **Display Preferences**.
3. Select **Chart Ctxt Menu** to switch between Touch or Hold.
   - Hold — requires you to touch and hold on a chart object to access the context menu.
   - Touch — requires you to touch a chart object to access the context menu.

16.2 Electronic charts overview

Your multifunction display includes basic world base maps. Electronic charts provide additional cartographic information.

The level of cartographic detail shown varies for different chart types, geographic locations and chart scales. The chart scale in use is indicated by the on-screen scale indicator, the value displayed is the distance that the line represents across the screen.

You can remove and insert chart cards at any time. The chart screen is automatically redrawn when the system detects that a compatible chart card has been inserted or removed.

Using a dual view page it is possible to display different cartography types simultaneously.

Caution: Care of chart and memory cards

To avoid irreparable damage to and / or loss of data from chart and memory cards:

- DO NOT save data or files to a card containing cartography as the charts may be overwritten.
- Ensure that chart and memory cards are fitted the correct way around. DO NOT try to force a card into position.
- DO NOT use a metallic instrument such as a screwdriver or pliers to insert or remove a chart or memory card.

LightHouse charts

With the introduction of the LightHouse II software, Raymarine multifunction displays now support the use of Raymarine's new LightHouse charts.

LightHouse charts are derived from vector and raster based charts, the LightHouse chart engine enables Raymarine to offer new chart types and regions from around the globe.

Refer to the Raymarine website: for the latest information on available LightHouse charts.

Raster charts

Raster charts are an exact copy / scan of an existing paper chart. All information is embedded directly in the chart. Ranging in and out of raster charts will make everything appear larger or smaller on the screen, including text. When changing the Chart application's orientation everything on the chart will rotate, including the text. As raster charts are a scanned image the file size is normally bigger when compared to the vector equivalent.

Vector charts

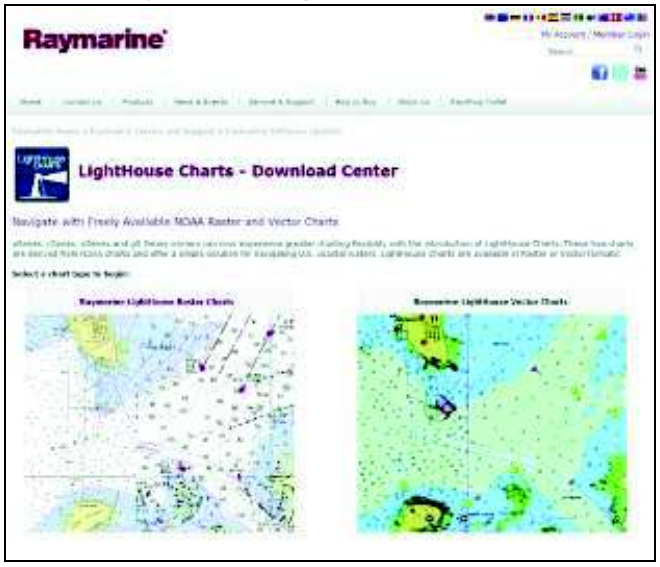
Vector charts are computer generated, consisting of a series of points and lines that make up the chart. Chart objects and overlays on vector charts can be switched on and off and chart objects can be selected to provide further information. Ranging in and out of vector charts will make geographical features appear larger or smaller on the screen, however text and chart objects will remain the same size regardless of range. When changing the Chart application's orientation geographical features will rotate but text and chart objects will remain in the correct orientation for the display. As vector charts are generated rather than a scanned image the file size is normally smaller when compared to the raster equivalent.

Downloading LightHouse™ charts

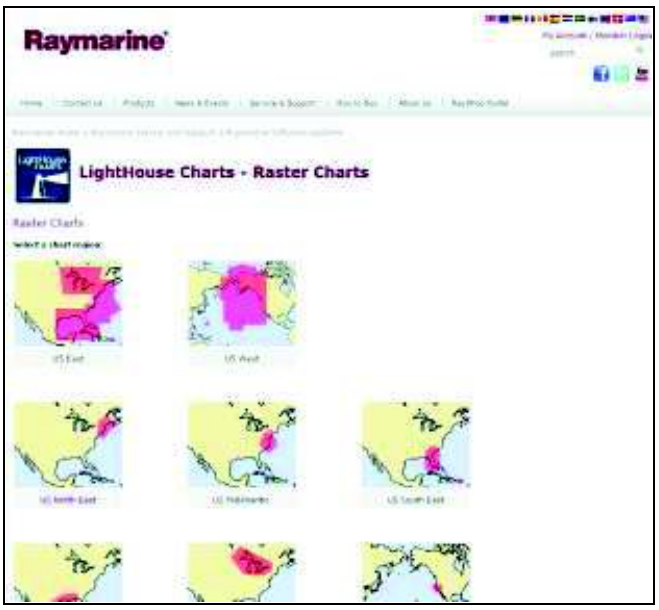
LightHouse™ charts can be downloaded through the Raymarine website.

Important: You must read and agree to the LightHouse™ charts End User License Agreement (EULA) before downloading and using LightHouse™ charts.

1. Go to the LightHouse charts page of the Raymarine website: http://www.raymarine.com/lighthousecharts/.



2. Select either the Raster or Vector charts.
   The Chart regions page is displayed.



3. Select your region.
   The chart region download page is displayed.

4. Click **'View the terms of use'**.
5. Read and ensure you FULLY understand the End User License Agreement (EULA).

   You should only proceed to the next step if you agree to the terms of the EULA.
6. Enter your details in the relevant fields.
7. Click the check box against 'I have read and agree to the LightHouse Charts terms of use.
8. Click **Download Chart**.
   The download should start automatically. A link is provided if the download does not commence.

Note:

- Due to the file size the download may take some time.
- Download times will differ depending on connection speed.
- As the files are large it is recommended that you use a download manager / accelerator which can speed up your download time and ensure that if the download fails the download can be resumed rather than downloading the entire file again.

9. Wait for the download to finish.

The downloaded file can now be unzipped / extracted to memory card for use with your multifunction display.

Unzipping files to memory card

The LightHouse charts download file must be unzipped / extracted to memory card for use on your multifunction display.

Note: The instructions below are provided for guidance only. Depending on your PC's operating system and the archiving (zip) software in use the steps required may differ slightly from those shown below. If you are unsure please consult your operating system's and or archiving software's help files.

To unzip / extract charts with a filesize over 4GB you may need to install 3rd-party archiving (zip) software such as 7zip: http://www.7–zip.org/.

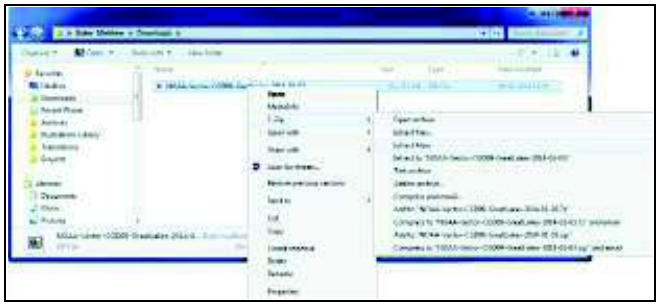
Ensure you have a memory card with sufficient space for the charts you want to download. The File size is displayed on each chart region's download page.

For best performance it is recommended that you use Class 10 or UHS (Ultra High Speed) class memory cards.

1. Locate the downloaded file.

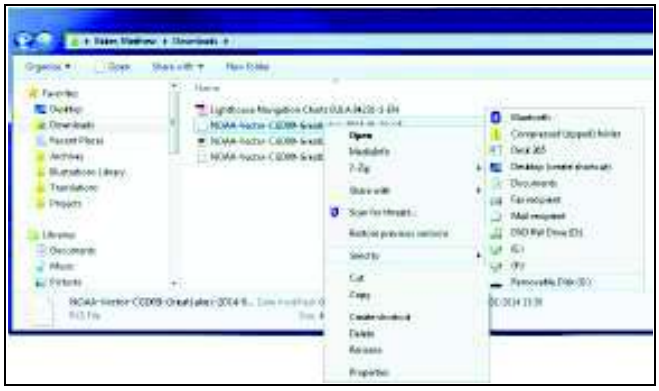
   The file will be stored in the folder you selected or in your normal downloads folder.

2. Right click on the file and select the **Extract Here** option from the zip options.



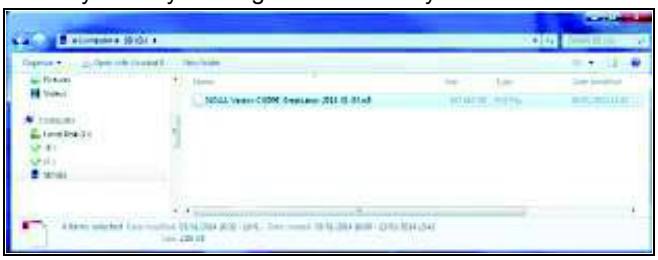
3. Once all files have been extracted select the chart files.

4. Right click and choose **Send to > Removable Disk**



   The Chart files will now be copied to your memory card.

5. Check that the files have been successfully placed on your memory card by viewing its contents in your file browser.



6. Safely remove your memory card from your PC's card reader.
7. Insert your memory card into the card reader of your multifunction display.
8. Open the Chart application on your multifunction display.
9. Select the new chart from the **Chart selection** menu: **Menu > Presentation > Chart Selection**.

The Chart screen will be redrawn to display the newly selected chart type.

Navionics charts

Your multifunction display is compatible with Navionics cartography.

The following Navionics cartography types are available for your multifunction display:

- Ready to Navigate
- Silver
- Gold
- Gold+
- Platinum
- Platinum+
- Fish'N Chip
- Hotmaps

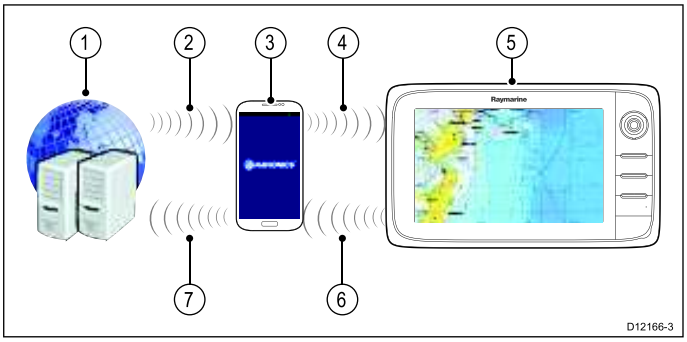
To check the current availability of Navionics chart cards and types, please visit www.navionics.com or www.navionics.it.

Note: Refer to the Raymarine website (www.raymarine.com) for the latest list of supported cartography.

Navionics mobile marine app

You can wirelessly synchronize data between your multifunction display (MFD) and a mobile device that is running the Navionics mobile marine app.

The synchronization downloads Navionics Freshest Data from your mobile device to your MFD and uploads sonar logs from your MFD to your mobile device. Waypoints and routes can also be synchronized between your mobile device and MFD.



1	Navionics servers
2	Download Navionics Freshest Data to mobile device (internet connection required)
3	Mobile device running Navionics mobile app
4	Download Navionics Freshest Data to MFD (Wi-Fi connection to MFD required)
5	MFD
6	* Upload Sonar Logs and Community edits to mobile device (Wi-Fi connection to MFD required)
7	** Upload Sonar Logs and Community edits anonymously to Navionics servers (internet connection required)

Note:

* To participate in Navionics Sonar Charts, Sonar logging must be enabled on your MFD. Sonar Logs can be enabled from the Chart application menu: **Menu > Depth & Contour > Sonar Logs**.

** The Sonar logs shall be uploaded to Navionics servers anonymously.

To use this feature you must first:

1. Download and install the Navionics Mobile Marine app, available from the relevant app store.
2. Subscribe to Navionics Freshest Data.
3. Download Freshest data to your mobile device.
4. Enable Wi-Fi in the System Settings on the MFD.
5. Enable Wi-Fi on your mobile device.
6. Select the MFD Wi-Fi connection from the list of available Wi-Fi networks on your mobile device.

Navionics Freshest Data

Navionics offer a 12 month subscriptions to their Freshest Data service, which includes updates to nautical charts, sonar charts and community edits layer.

Nautical charts — Navionics 2D charts.

Sonar Charts — High definition bathymetry chart layer created by combining multiple data sources including Sonar Logs provided by Navionics community users.

Community Edits — Edits made by Navionics users.

To obtain Freshest Data insert your Navionics chart card into your PC, visit the Navionics website www.navionics.com and **Click** Downloads & Updates.

16.3 Navigation options

The chart application provides features to help navigate to a chosen location.

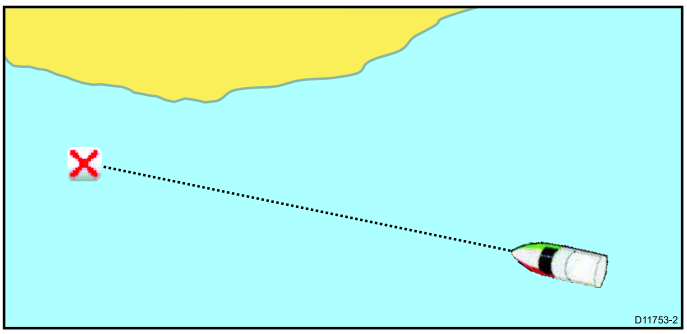
The navigation options are found in the Navigate menu: **Menu > Navigate**

- **Pilot Controls** — Accesses the Pilot Control Dialog, when Autopilot Control is enabled.
- **Goto Cursor** — Will set the cursor position as the active destination.
- **Goto Waypoint** — Provides options to navigate to a waypoint stored on the system
- **Stop Goto** — Stops the Goto Cursor or Goto Waypoint.
- **Stop Follow** — Stops following the current route.
- **Restart XTE** — Restarts the Cross Track Error.
- **Advance Waypoint** — When following a route, skips to the next waypoint in the route.
- **Follow Route** — Provides options to navigate to a route stored on the system
- **Start Track / Stop Track** — Will initiate a track on screen to plot your course as you progress or stop a track that is currently being created.
- **Build Route** — Provides options to build a route.

Refer to Chapter 15 Waypoints, Routes and Tracks for details on creating waypoints, routes and tracks.

Navigation

Navigating to a waypoint on the screen



From the chart or radar application:

1. Select the waypoint.
   The waypoint context menu is displayed.
2. Select the **Goto Waypoint**.

Note: With an active waypoint selected you can select **Stop Goto** option from the waypoint context menu at any time to cancel the action.

Navigating to a waypoint using the waypoints group list

From the Chart application:

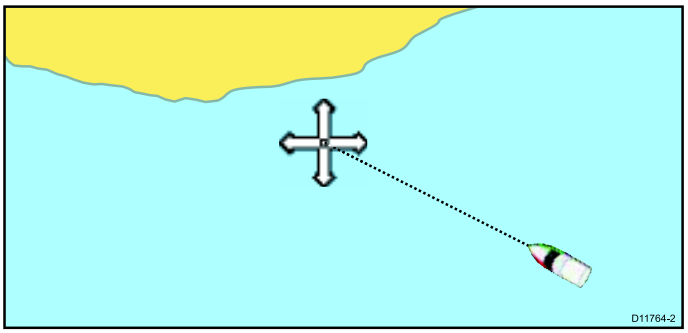
1. Select **WPT**.
   The waypoint menu is displayed.
2. Select **Waypoints**.
   The waypoints group list is displayed.
3. Browse the group list for the relevant waypoint.
4. Select the waypoint.
   The waypoint options dialog is displayed.
5. Select **Goto**.

Navigating to a location on the chart

From the chart application:

1. Select the required location on-screen.
   The chart context menu is displayed.
2. Select **Goto Cursor**.

Navigating to the cursor position on the chart using the menu



From the chart application:

1. Position the cursor at the desired destination on the chart.
2. Select **Menu**.
3. Select **Navigate**.
4. Select **Goto Cursor**.

Cancelling navigation to a waypoint

1. Select any position anywhere on-screen.
   The waypoint context menu is displayed.
2. Select **Stop Goto**.
3. Alternatively, in the chart application, go to: **Menu > Navigate > Stop Goto**.

Note: Once navigation is no longer active, the waypoint symbol returns to its normal state, and the dashed line between your vessel and the waypoint is removed.

Arriving at a waypoint

As your vessel approaches a waypoint, the waypoint arrival alarm provides a warning.

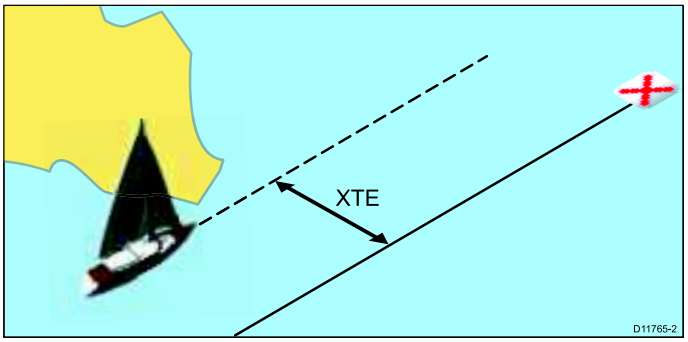
1. Select **Ok** on the waypoint arrival alarm pop up message.

Once the alarm is acknowledged, the next waypoint is selected, and the display updates to indicate the next leg of the route.

Note: You can set the approach distance (radius) at which the waypoint arrival alarm will sound using the **Alarms** menu from the homescreen: **Set-up > Alarms > Waypoint Arrival**.

Cross Track Error (XTE)

Cross Track Error (XTE) is the amount of deviation from your intended route or waypoint, expressed as a distance.



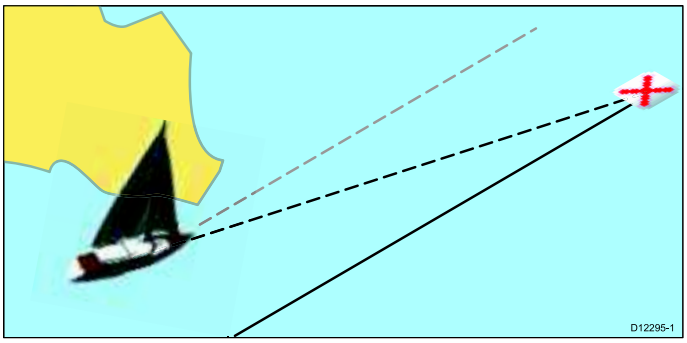
In the event that you steer off-track, you can go straight to your target by resetting XTE.

Resetting Cross Track Error (XTE)

While following a route in the chart application:

1. Select the route.
   The route context menu is displayed.
2. Select **Restart XTE**.

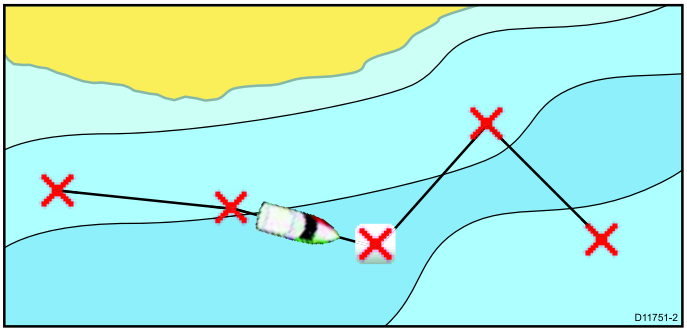
Resetting XTE results in a new course from the current vessel position to the current target waypoint. This does not affect your saved route.



You can also reset the XTE from the Navigate Menu: **Menu > Navigate > Restart XTE**.

Navigating a route

You can follow any route stored on the display. When following a route you visit each waypoint in order. You may also use the follow route options in conjunction with a compatible autopilot to automatically navigate along your chosen route.



There are a number of ways to select the follow route option:

- Using a stored route within the route list.
- From a selected waypoint or any leg within a route.

You can also follow any route in reverse order.

Following a stored route

From the chart application:

1. Select **Menu**.
2. Select **Navigate**.
3. Select **Follow Route**.
   The Route list is displayed.
4. Select the route you want to follow.
5. Select **Follow Route**, or
6. Select **Follow Route in Reverse** to follow the route in reverse order.

Cancelling navigation of a route

From the chart application:

1. Select the Route.
   The route context menu is displayed.
2. Select **Stop Follow**.

Advancing to the next waypoint in a route

You can skip the current active waypoint and advance to the next waypoint in a route at any time.

While following a route in the chart application:

1. Select the route.
   The route context menu is displayed.
2. Select **Advance Waypoint**.

Note: If the current destination is the last waypoint, the chart advances on to the first waypoint in the route.

16.4 Chart ranging and panning

Ranging in and out

The table below shows the Range controls available for each display variant.

	**Rotary Control**	• c Series • e Series • RMK-9 keypad
	**Range in** and **Range out** buttons	• c Series • e Series (excluding e7 and e7D • RMK-9 keypad
	**Range in** and **Range out** on-screen icons	• a Series • e Series • gS Series **Note:** e Series and gS Series on-screen range controls can be enabled and disabled from the Homescreen: **Customize > Display Preferences > Range Controls**
	Multi-Touch gesture — Pinch to Zoom	• a Series • gS Series

Panning the chart

You can pan the chart area on a touchscreen multifunction display by following the steps below.

In the chart application:

1. Swipe your finger across the screen from right to left to pan right.
2. Swipe your finger across the screen from left to right to pan left.
3. Swipe your finger across the screen from top to bottom to pan up.
4. Swipe your finger across the screen from bottom to top to pan down.

Panning the chart

You can pan the chart area on a non-touchscreen multifunction display by following the steps below.

From the chart application:

1. Move the **Joystick** in the direction you want to pan.

16.5 Chart selection

You can select the cartography type to be used in the Chart application. The Chart selection applies to the active Chart instance. You must have the necessary cartography chart cards inserted into your multifunction display in order to display different cartography type.

Selecting a cartography type

You can select the cartography type you want to display in the Chart application.

Ensure you have inserted the chart card that contains the cartography type you want to display.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Chart Selection**.
   A list of available cartography is displayed.
3. Select the cartography type you want to display
   The Chart window is re-drawn to show the select cartography type.

16.6 Vessel position on the chart display

Your current position is represented on-screen by the vessel symbol.

The vessel symbols are only displayed when heading or COG data is available.

The vessel symbol varies depending on selected settings and the availability of heading data.

	Motor Vessel	The motor vessel symbol is used when the vessel type selected during the initial set up wizard is a motor vessel.
	Sail Vessel	The sail vessel symbol is used when the vessel type selected during the initial set up wizard is a sail vessel.
	Small Vessel	The small vessel symbol is used when the **Boat Size** setting is set to Small.
	Black dot	A black dot is displayed when heading and COG data is not available.

Vessel position data can also be shown in the databar.

Locating your vessel

The vessel icon can be repositioned to the center of the screen by following the steps below.

1. Select the Find Ship icon:  located on the left hand side of the screen.

Locating your vessel

The vessel icon can be repositioned to the center of the screen by following the steps below.

1. Select **Menu**.
2. Select **Find Ship**.

16.7 Chart orientation

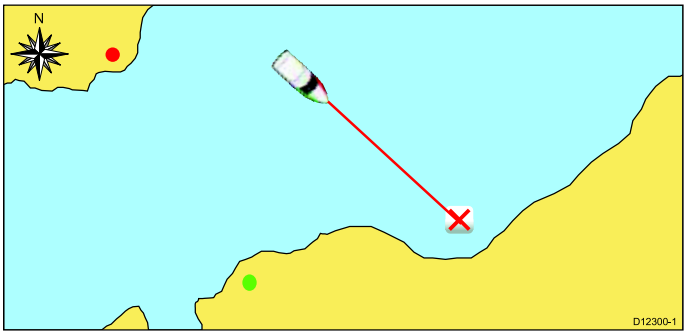
The orientation of a chart refers to the relationship between the chart and the direction that you are travelling in.

It is used in conjunction with motion mode to control how your vessel and chart relate to one another and how they are displayed on screen.

The mode you choose applies to the active chart instance, and is restored at power up.

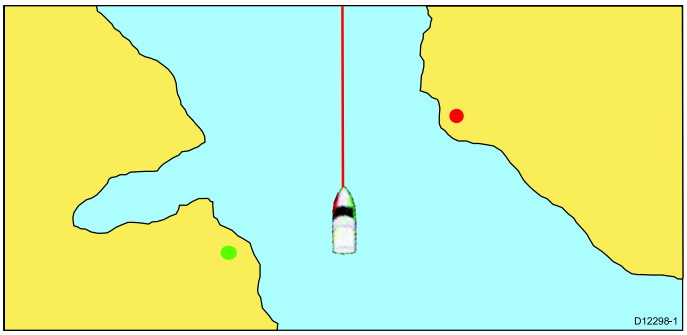
The following options are available:

North–Up



In North Up mode, the chart orientation is fixed with true north upwards. As your heading changes the vessel symbol moves accordingly. This is the default mode for the chart application.

Head-Up

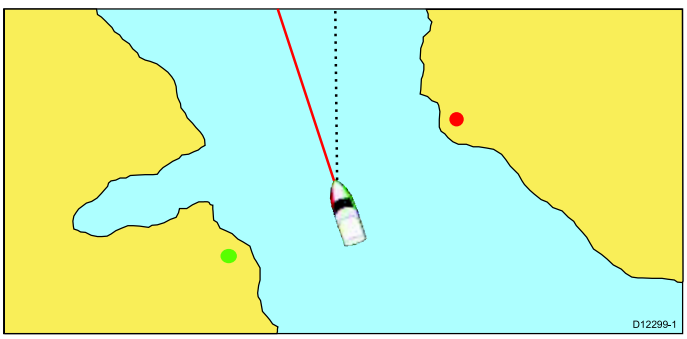


Head Up mode displays the chart with your vessel's current heading upwards. As the heading changes the vessel symbol remains fixed and the chart picture rotates accordingly.

Note: To prevent continuous backwards and forwards rotations as the vessel yaws from side-to-side, the chart will not update unless the heading changes by at least 10 degrees from the last displayed orientation.

Note: It is not possible to select Head Up when the motion mode is set to True.

Course-Up



In Course Up mode, the chart picture is stabilized and shown with your current course upwards. As your vessel's heading changes, the ship symbol moves accordingly. If you select a new course, the picture will reset to display the new course upwards. The reference used for Course Up depends upon the information available at a given time. The system always prioritizes this information in the following order:

1. Bearing from origin to destination, i.e. intended course.
2. Locked heading from an Autopilot.

3. Bearing to waypoint.
4. Instantaneous heading.

If heading data becomes unavailable whilst in this mode, a warning pop up message is displayed and the chart uses 0° heading in relative motion.

Setting the chart orientation

From the chart application menu:

1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **Chart Orientation**.
4. Select Head Up, North Up, or Course Up option, as appropriate.

   Once selected the screen will update to reflect the new orientation.

16.8 Chart motion mode

The motion mode controls the relationship between the chart and your vessel.

Whilst motion mode is active, as your vessel moves, the chart is redrawn to keep the vessel on-screen. The 3 motion modes are:

- **Relative Motion (default)**
- **True Motion**
- **Auto Range**.

Note: In the 3D chart view, only Relative Motion mode is available.

The current motion mode applies to the active instance of the chart application.

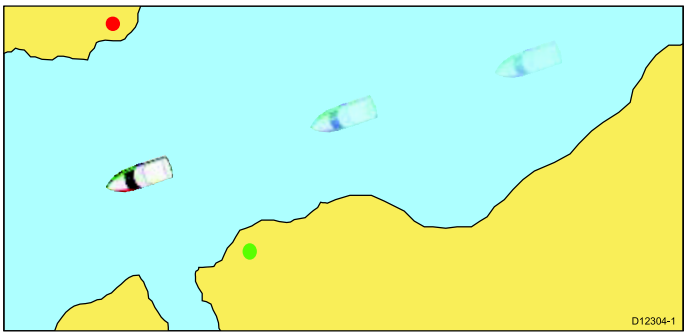
When you pan the chart the motion mode is no longer active. This is indicated in the status bar by brackets around the motion mode — for example, (Relative Motion). This enables you to view another area of the chart whilst navigating. To reset the motion mode and return your vessel to the screen, select the **Find Ship** icon or select **Find Ship** from the menu. Manually changing the range or panning the chart in auto range also suspends motion mode. The default setting is relative motion with the boat icon positioned in the center of the screen. The mode that you select is restored at power up.

Boat positions (Relative Motion only)

Position	Example
Center	
Partial Offset	
Full Offset	

When the motion mode is set to Relative Motion, the position of your vessel is fixed on-screen and the chart picture moves relative to your vessel. You can use the **Menu > Presentation > View & Motion > Boat Position:** menu options to determine whether the vessel is fixed in the center of the window or offset. If you change the position to Partial Offset or Full Offset, the view ahead of your vessel will be increased.

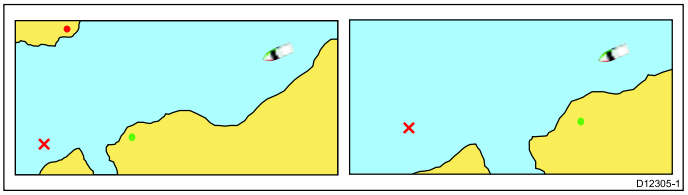
True Motion



When the motion mode is set to True Motion, the chart is fixed and the vessel moves in true perspective to fixed landmasses on-screen. As the vessel's position approaches the edge of the screen, the chart picture is automatically reset to reveal the area ahead of the vessel.

Note: It is not possible to select True Motion when the orientation is set to Head Up.

Auto Range



Auto Range selects and maintains the largest possible scale of chart that will display both the vessel and the target waypoint. Auto range is not available if radar-chart synchronization is on.

Setting the motion mode

To change the motion mode follow the steps below.

From the chart application menu:

1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **Motion Mode:**.
4. Select True Motion, Relative Motion, or Auto Range option as appropriate.

Once selected the screen will update to reflect the new mode.

Changing the position of the boat icon

From the chart application menu:

1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **Boat Position**.
4. Select **Center**, **Partial Offset**, or **Full Offset** as appropriate.

16.9 Chart views

If supported by your cartography type, the Chart application can be set to either 2D or 3D view.

Selecting 2D and 3D chart views

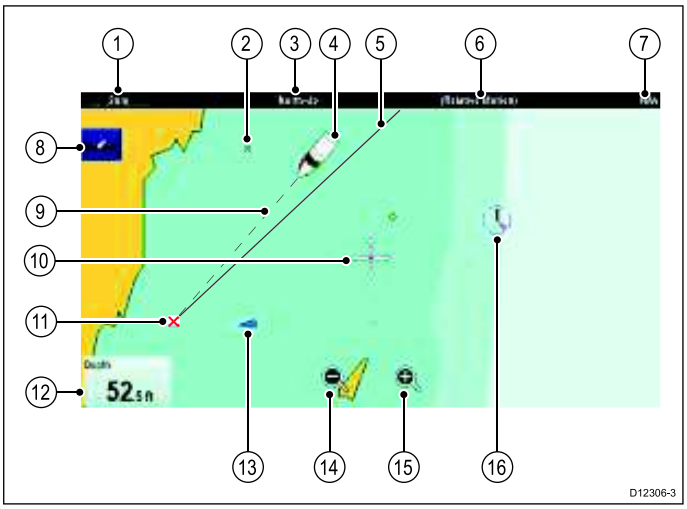
You can switch between 2D and 3D views in the chart application if supported by your cartography.

From the chart application menu:

1. Select **Presentation** .
2. Select **View & Motion**.
3. Select **Chart View** to select 2D or 3D.

2D chart view

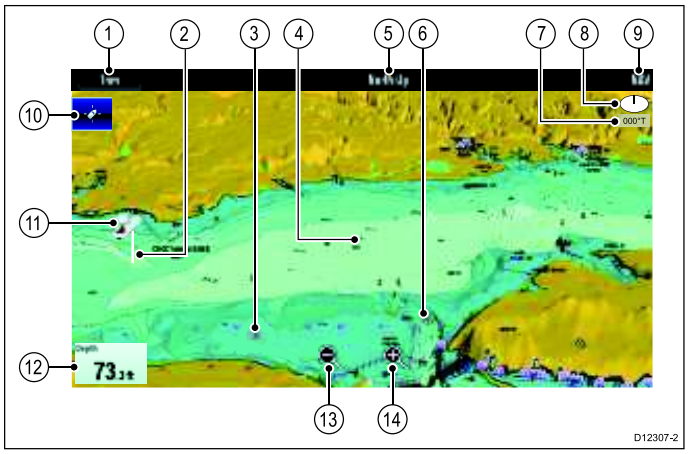
The 2D chart view can display a range of information to help you navigate.



Item	Description
1	**Range** — horizontal chart scale indicator (shown in selected system units).
2	**Waypoint** — inactive.
3	**Orientation** — states the orientation mode that the chart is using (North-up, Head-up, or Course-up).
4	**Vessel symbol**— shows your current position.
5	**Navigation origin line** — during navigation, shows a solid line from the starting point to the target waypoint. The starting point can be the vessel's original location, the point of XTE reset or the point the current leg of a route was initiated.
6	**Motion mode** — states the current motion mode (Relative, True, or Auto Range).
7	**Chart type** — indicates the type of chart in use — Fish or Navigation.
8	**Find ship icon** — used to find and center your vessel on the chart.
9	**Vessel position line** — during navigation, shows a dotted line from the vessel's current position to the target waypoint.
10	**Cursor** — used to select chart objects and move around the chart area.
11	**Target waypoint** — current target waypoint.
12	**Databoxes** — used to display data such as depth on the chart screen.
13	**AIS target** — a vessel broadcasting AIS information (optional).
14	**Range out** — select icon to range out (Touchscreen displays only).
15	**Range in** — select icon to range in (Touchscreen displays only).
16	**Cartographic objects** — level of cartographic objects is determined by the cartography type.

3D chart view

The 3D view can display a range of information to help you navigate.

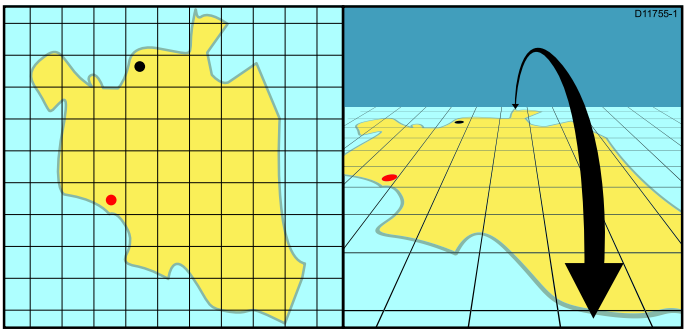


Item	Description
1	**Range** — horizontal chart scale indicator (shown in selected system units).
2	**Depth Scale** — approximate depth beneath your vessel (optional).
3	**Waypoint** — optional.
4	**Center-of-view** — the white cross indicates the center of chart view at the water level (optional).
5	**Orientation** — states the orientation mode that the chart is using.
6	**Cartographic objects** — use the Cartography Set-up menu to choose which objects to display.
7	**Rotation** — shows in degrees true, how far the on-screen view has been rotated from your vessel's heading and the tilt angle of your vessel.
8	**North arrow** – 3D indication of True North in relation to the chart view. The north arrow also tilts to indicate pitch angle.
9	**Chart type** — indicates the type of chart in use — Fish or Navigation.
10	**Find ship icon** — used to find and center your vessel on the chart.
11	**Vessel symbol** — your vessel's current position.
12	**Data overlay** — used to display data such as depth on the chart screen.
13	**Range out** — use icon to range out (Touchscreen displays only).
14	**Range in** — use icon to range in (Touchscreen displays only).

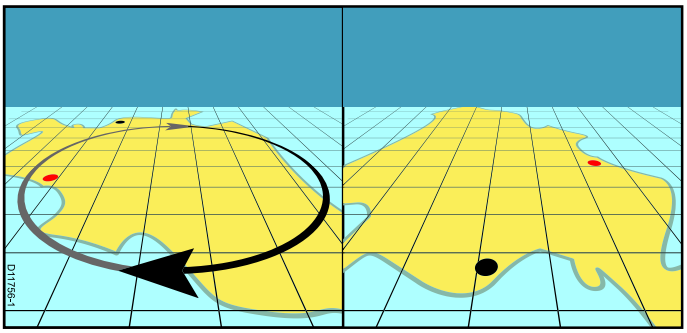
Manipulating the 3D chart view

From the chart application:

1. With the chart in 3D mode, go to the Adjust Viewing Angle menu: **Menu > Adjust Viewing Angle**.
2. Select **Adjust:** so that Pitch and rotate is highlighted.
3. To adjust the pitch:
   i. Non-touchscreen or HybridTouch displays — Move the **Joystick Up** or **Down** to adjust the pitch
   ii. HybridTouch or Touch only displays — Swipe your finger up or down across the screen to adjust the pitch.



4. To adjust the rotation:
   i. Non-touchscreen or HybridTouch displays — Move the **Joystick Left** or **Right** to adjust the rotation
   ii. HybridTouch or Touch only displays — Swipe your finger left or right across the screen to adjust the rotation.



3D Display Options

The following options are available with the Chart application in 3D view:

- **Center Of View** — Switches a cross hair on and off at the center of the screen at sea level.
- **Exaggeration** — Adjusting the exaggeration has the effect of vertically stretching objects on the chart, making it easier to see their shape and position.
- **Transducer Cone** — Switches on and off a transducer cone indicating the coverage of a fishfinder transducer.
- **Depth Scale** — Switches on and off a depth scale at your vessel position.

Enabling center of view

In 3D view, to enable the center of view cross hair at sea level follow the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **3D Display Options**.
4. Select **Center of View** so that On is highlighted.
   Selecting centre of view will switch the cross hair on and off.

Adjusting the 3D exaggeration

In the 3D chart view.

From the Chart application menu:

1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **3D Display Options**.
4. Select **Exaggeration:**.
   The Exaggeration numeric adjust control is displayed.
5. Adjust the numeric adjust control to the required setting, between 1.0 and 20.0
6. Select **Ok** or **Back** to confirm the setting and close the numeric adjust control.

Enabling transducer cone

In 3D view, to enable the transducer cone which indicates the coverage of your fishfinder transducer follow the steps below.

From the Chart application menu:

1. Select **Presentation**.

2. Select **View & Motion**.
3. Select **3D Display Options**.
4. Select **Transducer Cone** so that On is highlighted.
   Selecting Transducer cone will switch the function on and off.

Enabling depth scale

In 3D view, to enable a depth indicator at your vessel's location follow the steps below.

From the Chart application menu:

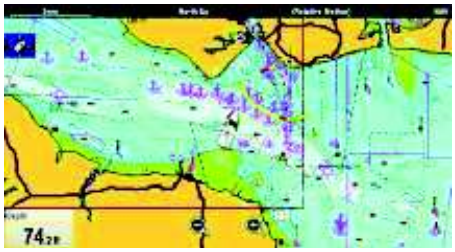
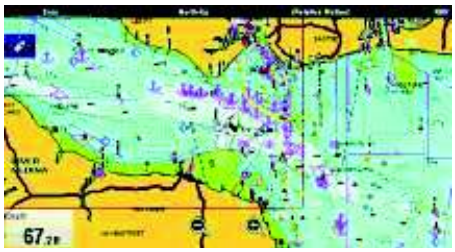
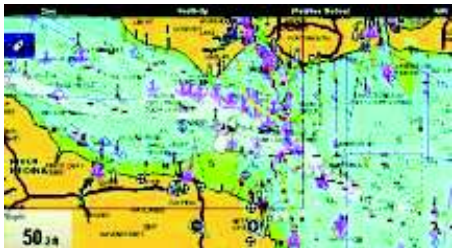
1. Select **Presentation**.
2. Select **View & Motion**.
3. Select **3D Display Options**.
4. Select **Depth Scale:** so that On is highlighted.
   Selecting depth scale will switch depth indicator on and off.

16.10 Chart display

The Chart Display menu option determines the level of detail that is displayed on-screen.

The Chart display menu option is only available when using vector based cartography.

The Chart display options are shown below.

Simple	
Detailed	
Extra Detailed	

The level of detail shown on-screen is also affected by the cartography **Chart detail** settings. Refer to Chart detail for information.

Changing the chart display detail

From the Chart application menu:

1. Select **Presentation**.
2. Select **Chart Detail**.
   The following options are available:
   - Simple
   - Detailed
   - Extra Detailed
3. Select the required option.

16.11 Overlays

The chart has a number of overlays that display different views and information. The overlays require electronic charts with the appropriate feature support and may also require additional hardware and service subscriptions.

You can overlay the following data onto a 2D chart to give greater depth of information. The overlays available are:

- * **AIS** — View and track AIS targets. This overlay is not available in 3D view.
- * **Radar** — Overlay radar onto the chart. This overlay is not available in 3D view.
- ** **Aerial** — Provides an aerial / satellite photography overlay.
- ** **Aerial Overlay:** — Determines the coverage of the aerial overlay.
- * **NOWRad** — Provides the NOWRad weather radar overlay. This overlay is not available in 3D view.
- **Databoxes** — Select whether databoxes are displayed on-screen and what data is displayed.
- **Chart Grid** — Determines whether grid lines representing longitude and latitude are displayed on the chart.
- ** **2D Shading** — Determines whether terrain shading is displayed in 2D view.
- ** **Community Edits** — Determines whether the community layer is enabled or disabled.
- ** **Chart Text** — Determines whether chart text is displayed (place names and so on).
- **Chart Boundaries** — Determines whether a line indicating the chart boundary is displayed.
- **Range Rings**— View range rings in the Chart application. This overlay is not available in 3D view.
- **Safe Zone Ring** — View safe zone ring. This overlay is not available in 3D view.
- **Fuel Range Ring** — View the fuel range ring. This overlay is not available in 3D view.
- **Boat Size** — Determines the size of the boat icon on-screen.
- **Waypoint Name** — Determines whether the Waypoint names are displayed next to waypoints.
- **Route Width** — Determine the width of route lines on-screen.
- **Track Width** — Determine the width of track lines on-screen.

Note:

* Additional hardware required.

** If supported by your cartography type.

Enabling AIS in the Chart application

To enable the AIS overlay in the Chart application follow the steps below.

To enable the AIS overlay your system must include an AIS receiver or transceiver. The AIS overlay is not available in 3D view.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **AIS:** so that On is selected.

   Selecting AIS: switches the AIS between On and Off.

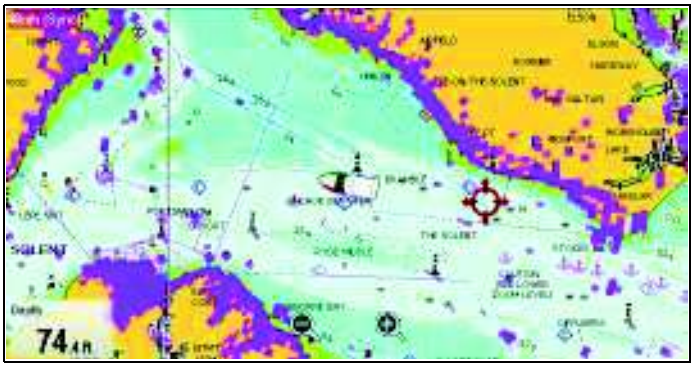
For AIS information refer to Chapter 14 AIS function.

Radar overlay

You can overlay Radar and MARPA functions in the Chart application to provide target tracking or to help you distinguish between fixed objects and other marine traffic.

You can enhance the use of your chart by combining it with the following radar features:

- MARPA.
- Radar overlay (for distinguishing between fixed and moving objects).



Note: In order to use the Radar overlay feature you must use an external source for magnetic heading (e.g. fluxgate compass), you cannot use COG data for radar overlay.

Viewing MARPA targets on the chart

The Mini Automatic Radar Plotting Aid (MARPA) function is used for target tracking and risk analysis. When MARPA targets are being tracked they are displayed in the chart application regardless of whether Radar overlay is switched on. Associated MARPA functions can be accessed using the chart menu.

Using radar overlay to distinguish between fixed and moving objects

You can overlay radar image data over your chart image allowing better distinction between fixed objects and other marine traffic. For best results, switch on Radar-Chart synchronization to ensure radar range and chart scale are synchronized.

Enabling radar overlay

With the radar turned on and transmitting and with the chart application in 2D view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Radar**.

   The radar overlay opacity slider bar control is displayed showing the current opacity percentage.
5. Adjust the slider bar to the required opacity, or
6. Select **Off** to turn the radar overlay off.

Accessing radar controls on the chart

From the chart application:

1. Select **Menu**.
2. Select **Radar Options** or **Radar & AIS Options**.

Note: Any changes made to the radar options from the chart application will be applied to the radar application.

Chart scale and radar range synchronization

You can synchronize the radar range in all radar windows with the chart scale.

When synchronization is switched on:

- The radar range in all radar windows changes to match the chart scale.
- ‘Sync’ is indicated in the top left-hand corner of the chart window.
- If you change the radar range, in any radar window, all synchronized chart views change scale to match.
- If you change the scale of a synchronized chart window, all radar windows change range to match.

Synchronizing the chart and radar range

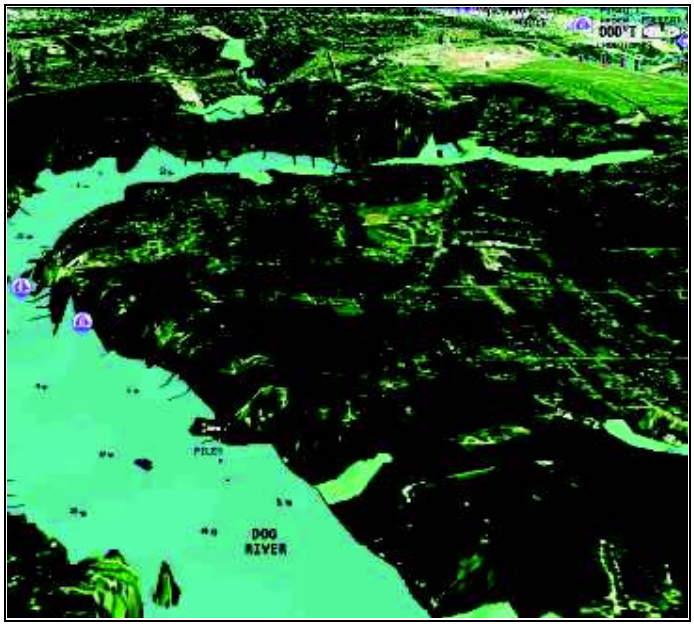
In the 2D chart view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **View & Motion**
4. Select **Chart Sync**.
5. Select **Radar**.

Note: Radar range synchronization is not available when the chart motion mode is set to Auto Range.

Aerial photo overlay

Your electronic charts may include aerial photography.



Aerial photos cover the navigable waters up to 3 miles inside the coastline. The resolution is dependent on the region covered by the chart card.

Enabling aerial photo overlay

From the chart application:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Aerial**.

   The aerial opacity slider bar control is displayed showing the current opacity percentage.
5. Adjust the slider bar to the required opacity, or
6. Select **Off** to turn the aerial overlay off.

Specifying the aerial overlay area

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Aerial Overlay:**.

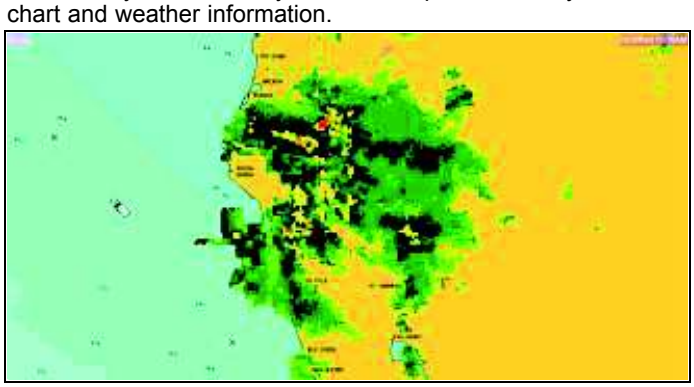
   A list of overlay options is displayed.
4. Select either On Land, On Land and Shallows, or On Land and Sea.

   The chart display is redrawn showing the new overlay selection.

NOWRad weather overlay

With a suitable weather receiver connected to your multifunction display, you can overlay NOWRad weather information on the chart display.

The NOWRad weather overlay provides NOWRad weather information and reports in the chart application. You can adjust the intensity of the overlay to achieve optimal visibility of both chart and weather information.



Note: The NOWRad weather overlay can only be used in North America and its coastal waters.

Enabling NOWRad weather overlay on the chart

In the 2D chart view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **NOWRad**.

   The NOWRad opacity slider bar control is displayed showing the current opacity percentage.
5. Adjust the slider bar to the required opacity, or
6. Select **Off** to turn the NOWRad overlay off.

Viewing weather reports from the chart application

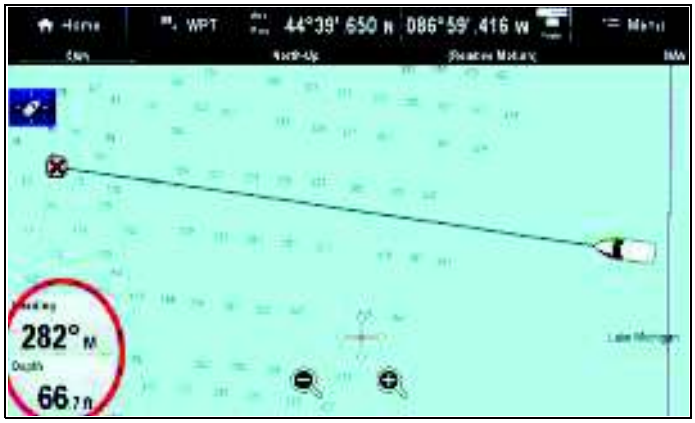
In the 2D chart view:

1. Select **Menu**.
2. Select **Weather Reports**.
3. Select **Report At** to switch between weather reports from Ship or Cursor location.
4. Select either Tropical Statements, Marine Warnings, Marine Zone Forecasts, or Watchbox Warnings.

Databoxes

Databoxes can be displayed in the application window.

The databoxes can be switched on and off and the data that is displayed can be customized.



Customizing databoxes in the chart application

To switch databoxes on and off and to select data to display follow the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlay**.
3. Select **Databoxes**.
4. Select **Databox 1 > On**.
5. Select **Databox 2 > On**.
6. Choose the **Select Data** option for the relevant databox.
7. Select the category that reflects the type of data you want to display in the databox. For example, Depth data.
8. Select the data item.

   The data you selected is displayed onscreen in the appropriate databox.

Chart grid

You can overlay a grid onto the Chart application

The Chart grid represents the lines of latitude and longitude.

By default the Chart grid is switched off.

Switching the chart grid on and off

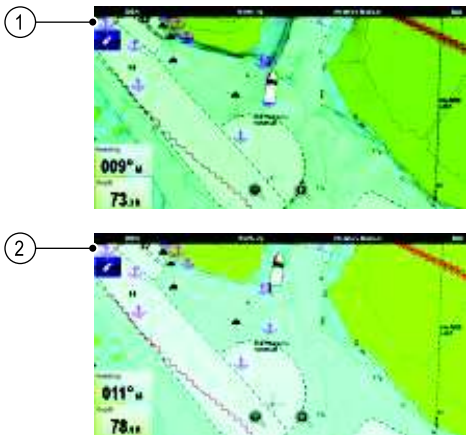
The Chart grid can be switched on and off by following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Chart Grid:** so that On is selected to turn the grid on, or
4. Select **Chart Grid:** so that Off is selected to turn the grid off.

2D shading

If supported by your cartography type, you can switch shading of land and sea contours on and off.



1. 2D shading On.
2. 2D shading Off

By default 2D shading is switched on.

Switching 2D shading on and off

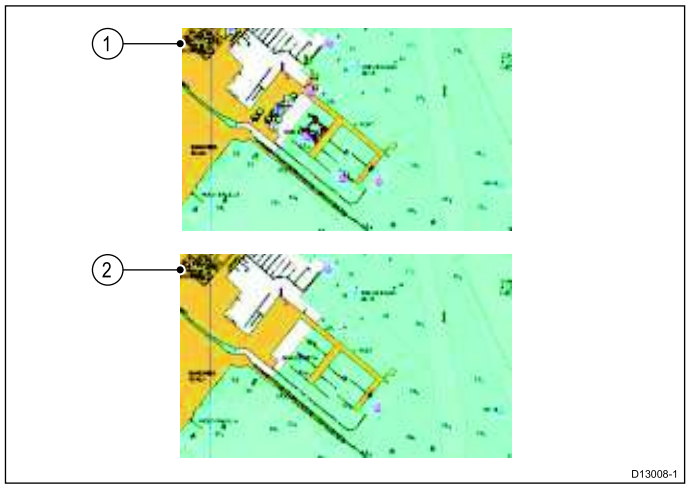
2D shading can be switched on and off by following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **2D Shading:** so that On is selected to turn the shading on, or
4. Select **2D Shading:** so that Off is selected to turn the shading off.

Community layer

If supported by your cartography type, you can display User Generated Content (UGC) on the Chart application.



1. Community feature On.
2. Community feature Off.

To check if your Navionics cartography supports community edits downloads please refer the Navionics website: for information and instructions on downloading the updates to your chart card.

Switching the community edits on and off

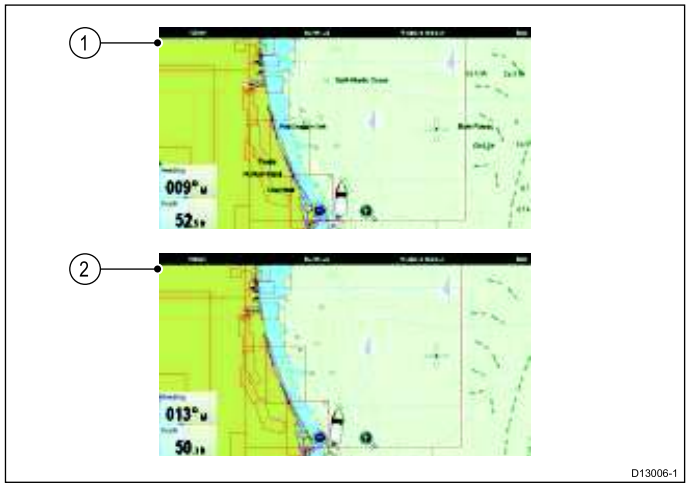
If supported by your cartography type, the User Generated Content (UGC) overlay can be switched on and off by following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Community Edits:** so that On is selected to display UGC, or
4. Select **Community Edits:** so that Off is selected to turn off UGC.

Chart text

If supported by your cartography type, chart text such as place names and caution text etc. can be switched on and off.



1. Chart text On.
2. Chart text Off.

The default setting for Chart text is On.

Switching chart text on and off

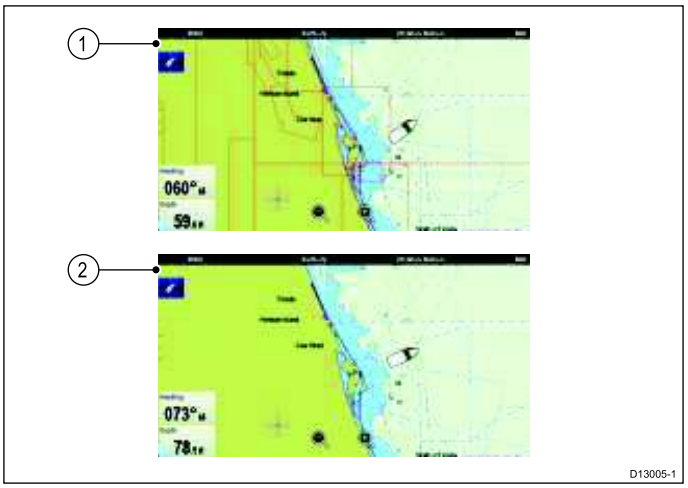
The Chart text can be switched on and off by following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Chart Text:** so that On is selected to turn chart text on, or
4. Select **Chart Text:** so that Off is selected to turn chart text off.

Chart boundaries

Chart boundary lines can be shown on-screen, these lines indicate the boundary of the cartography currently in use.



1. Chart boundaries On.
2. Chart boundaries Off.

By default Chart boundary lines are switched On.

Switching chart boundary lines on and off

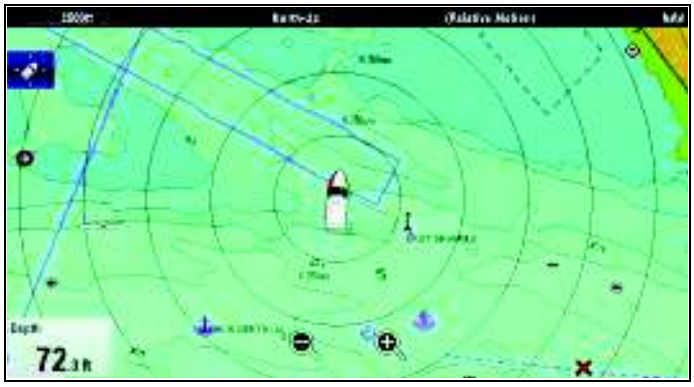
Chart boundary lines can be switched on and off by following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Chart Boundaries:** so that On is selected to display boundary lines, or
4. Select **Chart Boundaries:** so that Off is selected to turn the boundary lines off.

Range rings

Range rings provide an on-screen incremental representation of distance from your vessel to help you judge distances at a glance.



The rings are always centred on your vessel, and the scale varies to suit your current chart range. Each ring is labelled with the distance from your vessel.

By default range rings are switched off. Range rings are not displayed in 3D view.

Switching range rings on and off

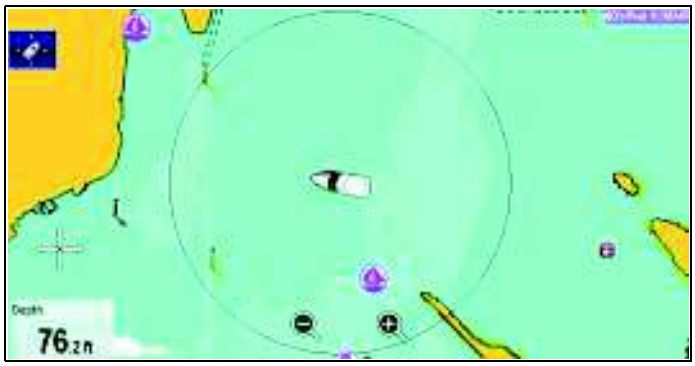
The range rings can be switched on and off by following the steps below.

With the Chart application in 2D view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Range Rings:** so that On is selected to display Range Rings, or
5. Select **Range Rings:** so that Off is selected to turn the Range Rings off.

Safe Zone Ring

The chart application can display and configure a MARPA / AIS safe zone ring.



The safe zone ring shares its configuration with the Radar applications safe zone ring, however can be displayed independently of the safe zone ring in the Radar application.

If a MARPA or AIS target will reach the safe zone ring within the time to safe zone selected an alarm is sounded.

Showing the Safe Zone Ring in the Chart application

To show the Safe Zone ring follow the instructions below:

From the Chart application:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Safe Zone Ring** so that **Show** is selected.

   Selecting Safe Zone Ring will switch the zone ring between hidden to visible.

Setting up the Safe Zone Ring

You can adjust the Safe Zone Ring radius, the time to Safe Zone and choose whether AIS targets trigger the Safe Zone alarm from the Safe Zone Ring Set-up menu.

The Safe Zone Set-up menu can be accessed as follows:

- From the Radar application: **Menu > Zones > Safe Zone Set-up**.
- From the Chart application with only the AIS overlay enabled: **Menu > AIS Options > Safe Zone > Safe Zone Set-up**.
- From the Chart application with only the Radar overlay enabled: **Menu > Radar Options > Safe Zone > Safe Zone Set-up**.
- From the Chart application with the AIS and Radar overlays enabled: **Menu > Radar & AIS Options > Safe Zone > Safe Zone Set-up**.

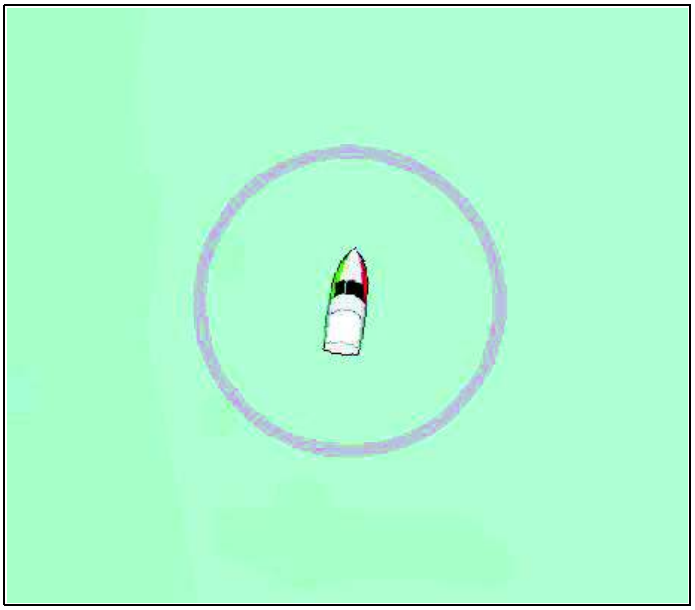
From the Safe Zone Set-up menu:

1. Select **Safe Zone Radius**.
   i. Select the required radius for the safe zone.
2. Select **Time to Safe Zone**.
   i. Select the required time period.
3. Select **AIS Alarm** so that On is highlighted.

   Selecting AIS Alarm will switch the dangerous target alarm between On and Off.

Fuel range rings

The fuel range ring gives an estimated range that can be reached with the estimated fuel remaining on-board.



The fuel range ring can be displayed graphically in the chart application and indicates an estimated range that can be reached with the:

- Current rate of fuel consumption.
- Estimated fuel remaining on-board.
- Course remaining in a straight line.
- Current speed maintained.

Note:

The fuel range ring is an estimated range that can be reached at the current rate of fuel consumption, of the fuel onboard and based on a number of external factors which could either extend or shorten the projected range.

This estimate is based on data received from external fuel management devices, or via the Fuel Manager. It does not take into account prevailing conditions such as tide, current, sea state, wind etc.

You should not rely on the fuel range ring feature for accurate voyage planning or in emergency and safety critical situations.

Enabling the fuel range ring

From the chart application, in 2D view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Fuel Range Ring** so that On is selected.
   The fuel range ring pop-up message is displayed.
5. Select **OK** to turn on the fuel range rings.

Disabling the Fuel Range Ring

From the chart application, in 2D view:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Overlays**.
4. Select **Fuel Range Ring** so that Off is selected.

Changing the size of the vessel symbol

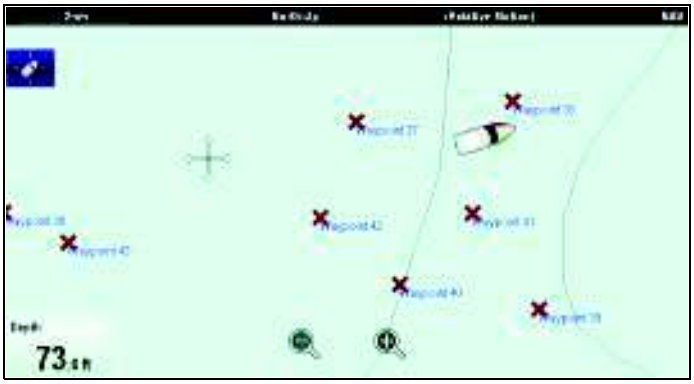
The vessel symbol size can be changed following the steps below.

From the Chart application menu:

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Boat Size:** so that Large is selected to show the large vessel symbols, or
4. Select **Boat Size:** so that Small is selected to show the small vessel symbol.

Displaying waypoint names

Waypoint names can be shown next to their respective waypoint symbols.

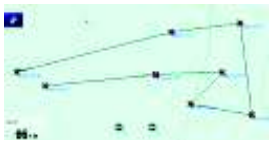
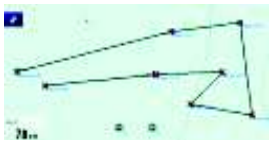


From the Chart application menu.

1. Select **Presentation**.
2. Select **Overlays**.
3. Select **Waypoint Name:** so that Show is selected to display the waypoint names, or
4. Select **Waypoint Name:** so that Hide is selected to hide the waypoint names.

Route and Track widths

The width of route and track lines can be changed.

Setting	Route	Track
Thin		
Normal		
Thick		

Changing route or track line widths

The width of the line that make up routes and tracks can be changed by following the steps below.

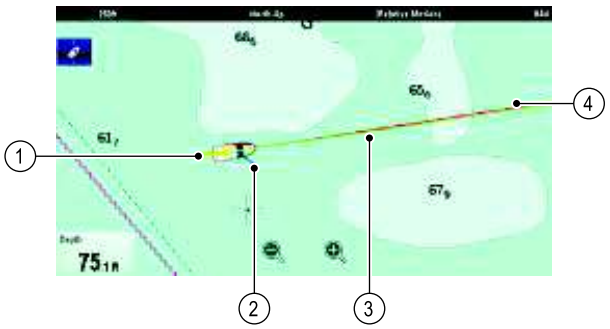
From the Chart application menu.

1. Select **Presentation**.
2. Select **Overlays**.
3. Select either **Route Width** or **Track Width** as required.
4. Select the width you require from the list.

16.12 Chart vectors

Chart vectors are available for heading, COG, wind direction and tide direction. Chart vectors are only available in 2D view.

A range of vector graphics can be displayed in the chart application when in 2D chart view. The following vectors can be independently enabled or disabled:



Item	Descriptions
1	**Wind arrow** — wind direction is displayed as a yellow line with solid arrow heads pointing towards your vessel, indicating the wind direction. The width of the arrow indicates the wind strength.
2	**Tide arrow** — tide is displayed as a blue line with solid arrow head pointing away from your vessel, in the direction of the tidal set. The width of the arrow indicates the tide strength.
3	**HDG (heading) vector** — a red line shows the vessel's heading. An arrow head is used if the vector length is set to a value other than infinite.
4.	**COG (Course Over Ground) vector** — a green line indicates the vessel's actual course. A double arrow head is used if the vector length is set to a value other than infinite.

Note: If Speed Over Ground (SOG) or heading data is not available, vectors cannot be displayed.

Vector length

The length of the HDG and COG vector lines can be set to the distance your vessel will travel in the time you specify at your current speed or they can be set to infinite.

Enabling and disabling chart vectors

You can enable and disable the available chart vectors by following the steps below.

In 2D chart view:

From the Chart application menu:

1. Select **Presentation**.
2. Select **Vectors**.
3. Select the relevant menu item to switch **Heading Vector**, **COG Vector**, **Tide Arrow**, or **Wind Arrow** On or Off as appropriate.

Setting vector length and width

You can specify the length and width of the heading and COG vectors by following the steps below.

In 2D chart view.

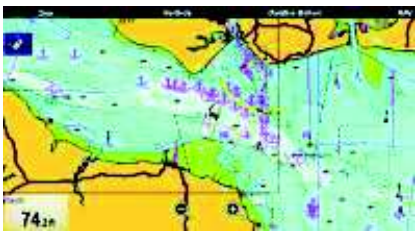
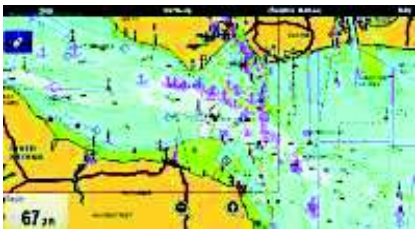
From the Chart application menu:

1. Select **Presentation**.
2. Select **Vectors**.
3. Select **Vector Length**.
   A list of times is displayed .
4. Select a time setting or select Infinite.
5. Select **Vector Width**.
   A list of widths is displayed.
6. Select either Thin, Normal or Wide.

16.13 Cartography objects

Chart detail

The chart detail setting determines the amount of detail shown in the Chart application.

Low	
High	

Selecting the Low option for the **Chart Detail** disables the following objects and overlays:

- Community Edits
- Chart Text
- Chart Boundaries
- Light Sectors
- Routing Systems
- Caution Areas
- Marine Features
- Land Features
- Roads
- Additional Wrecks
- Color Seabed Areas
- Depth Contours

Changing the level of chart detail

From the chart application menu:

1. Select **Presentation**.
2. Select **Objects**.
3. Select **Chart Detail** to switch between High or Low, as appropriate.

Cartography objects

If supported by you cartography type, cartographic objects can be individually switched on and off. The table below show a list of these objects.

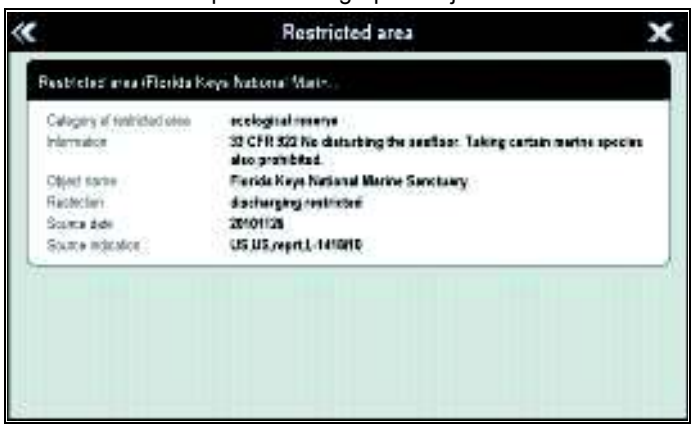
The Objects menu is accessed from: **Menu > Presentation > Objects**.

Note: The Objects menu is only available when the cartography in use supports these features.

Object (Menu item)	Description	Options
Show Rocks	Determines the depth at which rocks are displayed in the chart application.	• 0–6 ft / 0–2 m / 0–1 fa • 0–18 ft / 0–5 m / 0–3 fa • 0–30 ft / 0–10 m/ 0–5 fa • 0–50 ft / 0–15 m / 0–8 fa • 0–60 ft / 0–20 m / 0–10 fa • All (default)
Nav. Marks	Determines whether navigation marks are displayed on the chart: • **Off** — navigation marks are NOT displayed. • **On** — navigation marks are displayed.	• Off • On (default)
Nav. Mark Symbols	Determines which set of navigation mark symbols is used — International, or US. These symbols correspond to paper charts.	• International (default) • US
Light Sectors	Determines whether the sector of light cast by a fixed beacon is displayed or not. • **Off** — sector of light is NOT displayed. • **On** — sector of light is displayed.	• Off • On (default)
Routing Systems	Determines whether routing data is displayed or not. • **Off** — routing data is NOT displayed. • **On** — routing data is displayed.	• Off • On (default)
Caution Areas	Determines whether caution data is displayed or not. • **Off** — caution data is NOT displayed. • **On** — caution data is displayed.	• OFF • ON (default)
Marine Features	When this menu item is set to On, the following water-based cartographic features are displayed: • Cables. • Nature of seabed points. • Tide stations. • Current stations. • Port information.	• Off • On (default)
Land Features	When this menu item is set to On, land-based cartographic features are displayed.	• Off • On (default)
Business Services	When this menu item is set to On, symbols indicating the location of a business will be shown.	• Off • On (default)
Panoramic Photos	Determines whether panoramic photos are available for landmarks such as ports and marinas.	• Off • On (default)
Roads	Determines whether major coastal roads are displayed on the chart: • **Off** — coastal roads are NOT displayed. • **On** — coastal roads are displayed.	• Off • On (default)
Additional Wrecks	Determines whether extended information for new wrecks is displayed.	• Off • On (default)
Colored Seabed Areas	Provides greater definition of the seabed. This applies only to limited areas where the extra detail is available.	• Off (default) • On

16.14 Object information

If supported by your cartography type, you can view detailed information about specific cartographic objects.



Depending on the cartography type you are using, you can view some or all of the following additional information:

- Details of each cartographic object that is marked on the chart, including source data for structures, lines, open sea areas etc.
- Details of ports, port features, and business services.
- Pilot book information (similar to what you would see in a marine almanac). Pilot book information is available at certain ports.
- Panoramic photos of ports and marinas. The availability of photos is indicated by a camera symbol on the chart display.

You can also search for the nearest instance of a particular chart object using the **Find Nearest** option. The following object can be searched for:

- **Port (Search by name** — Navionics charts only.
- **Waypoints**
- **Ports** — Navionics charts only.
- **Tide Station** — Navionics charts only.
- **Current Station** — Navionics charts only.
- **Obstructions**
- **Wrecks**
- **Port Services**
- **Business Services** — Navionics charts only.
- **Small Craft Facility** — LightHouse charts only.
- **Harbor Facility** — LightHouse charts only

This information can be accessed using the **Chart Objects** or **Find Nearest** options from the chart context menu:

- Select a chart object on screen and choose **Chart Objects** from the chart context menu to view information about the selected object.
- Select **Find Nearest** from the chart context menu to search for objects close by.

Displaying chart object information

From the chart application:

1. Select an object.
   The chart context menu is displayed.
2. Select **Chart Objects**.
   The Chart Object Dialog is displayed.
3. Selecting available options will display detailed information about that item.
4. Selecting the position in the dialog will close the information dialog and position the cursor over the object.

Searching for the nearest chart object or service

From the chart application:

1. Select a location on screen.
   The chart context menu is displayed.
2. Select **Find Nearest**.
   A list of chart object types is displayed.
3. Select the chart object or service in the list.
   A list is displayed of the available instances of that particular object or service.
4. Select the item that you want to find.
   The cursor will be repositioned over the selected object or a list of instance will be displayed.

Searching for a port by name

From the chart application:

1. Select a location on screen.
   The chart context menu is displayed.
2. Select **Find Nearest**.
   A list of chart object types is displayed.
3. Select **Port (search by name)** from the list.
   The on–screen keyboard is displayed.
4. Use the on-screen keyboard to enter the desired port name.
5. Select **SAVE**.
   The search results are displayed.
6. Select the position against an entry in the list to reposition the cursor over that position.

Displaying pilot book information

From the chart application, when a port symbol is displayed for a port which has a pilot book:

1. Select the port symbol.
   The chart context menu will be displayed.
2. Select **Pilot Book**.
3. Select the relevant chapter.

Displaying panoramic photos

From the chart application, when a camera symbol is displayed, indicating the availability of a photo:

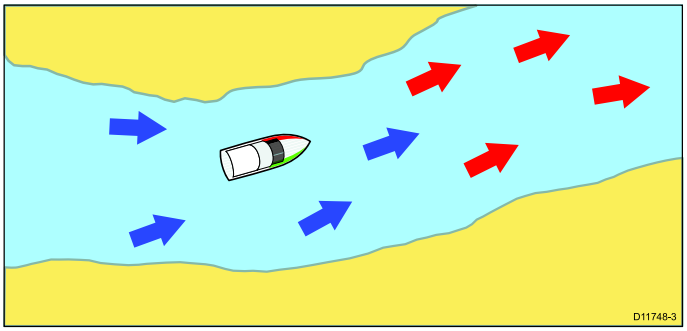
1. Select the camera symbol.
   The chart context menu is displayed.
2. Select **Photo**.
   The photo is displayed on screen.

Note: Not all cartography types are capable of displaying panoramic photos.

Current information

Animated current information

The electronic charts may allow animation of the current information current stations.

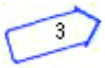


Animated current information is available in the chart application wherever a diamond-shaped symbol with a "C" is displayed:

	This symbol identifies the location of a current station and the availability of current information for the location.

When you select a current station symbol the chart context menu is displayed, which provides the **Animate** option.

When you select **Animate** the animate menu is displayed and the diamond-shaped current symbols are replaced with dynamic current arrows which indicate the direction and strength of the currents:

	Current animation.

- Arrows indicate the direction of current flows.
- The length of the arrow indicates the flow rate.
- The color of the arrow indicates the flow speed:
  - **Red**: increasing current flow speed.
  - **Blue**: decreasing current flow speed.

The animation can be viewed continuously or incrementally at a time interval that you specify. You can also set the date for the animation, and start or restart the animation at any point within a 24-hour period. If the system does not have a valid date and time the date used will be midday for the system default date.

Note: Not all electronic charts support the animated currents feature. Check the Navionics website: www.navionics.com to ensure the features are available on your chosen cartography level.

Viewing animated current information

From the chart application:

1. Select diamond-shaped current icon.
   The chart context menu is displayed.
2. Select **Animate**.
   The animate menu is displayed and the current icons are replaced with dynamic current arrows

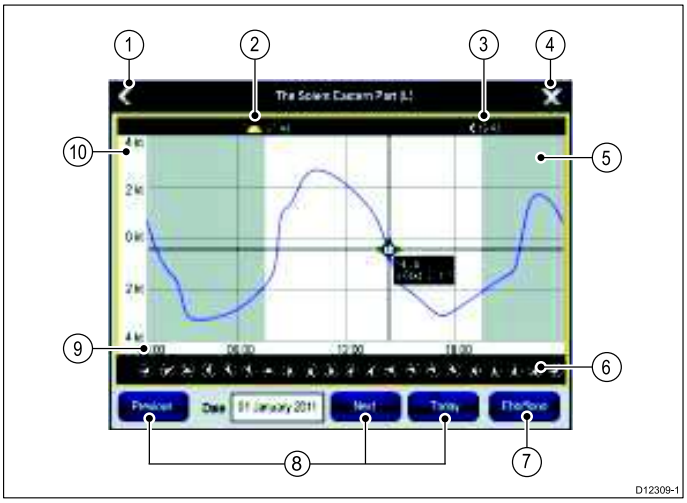
Controlling animations

From the chart application, with the animate menu displayed:

1. To start or stop the animation, select **Animate:** to switch between Play and Pause.
2. To view the animation in steps, select **Step Back** or **Step Forward**.
3. To set the animation step interval, pause any playing animations, and then select **Set Time Interval**.
4. To set the animation date, select **Set Date** and then using the on screen keyboard enter the required date.
5. To set the animation date to the current date select **Today**.
6. To set the animation date to 24 hours previous to the current date select **Previous Day**.
7. To set the animation date to 24 hours ahead of the current date select **Next Day**.

Current graphs

Current graphs provide a graphical view of current activity.



1. **Back** — Return to the previous menu or view.
2. **Sunrise indicator** — Indicates when the sun rises.
3. **Sunset indicator** — Indicates when the sun sets.
4. **Exit** — Closes the dialog.
5. **Nightfall indicator** — The greyed-out section of the graph indicates when nightfall occurs.
6. **Current direction** — Indicates the direction of current (relative to north).
7. **Ebb/Flood** — Displays a list showing ebb, slack and flood tides.
8. **Date navigation** — Use the icons to move to the next or previous day.
9. **Time** — The horizontal axis of the graph indicates time, in accordance with the time format specified in the **Units Set-up** options.
10. **Current speed** — The vertical axis of the graph indicates speed, in accordance with the speed preferences specified in the **Units Set-up** options

Note: The data provided in the current graphs is for information purposes only and should NOT be relied upon as a substitute for prudent navigation. Only official government charts and notices to mariners contain all the current information needed for safe navigation. Always maintain a permanent watch.

Displaying details of currents

From the chart application:

1. Select the  diamond-shaped current icon.
   The chart context menu is displayed.
2. Select **Current Station**.
   The graph for the selected station is displayed.

Tide information

Animated tide information

The electronic charts may allow animation of the tide information tide stations.

Animated tide information is available in the chart application wherever a diamond-shaped symbol with a "T" is displayed:

	This symbol identifies tide stations and the availability of tide information for the location.

When you select a tide station symbol the chart context menu is displayed, which provides the **Animate** option.

When you select **Animate** the animate menu is displayed and the diamond–shaped symbols are replaced with dynamic tide bar which indicates the predicted tide height for the actual time and date:

	Tide animation.

- Tide height is indicated by a gauge. The gauge is comprised of 8 levels, which are set according to the absolute minimum / maximum values of that particular day.
- The color of the arrow on the tide gauges indicates changes in the tide height:
  - **Red**: increasing tide height.
  - **Blue**: decreasing tide height.

The animation can be viewed continuously or incrementally at a time interval that you specify. You can also set the date for the animation, and start or restart the animation at any point within a 24-hour period. If the system does not have a valid date and time the date used will be midday for the system default date.

Note: Not all electronic charts support the animated tides feature. Check the Navionics website: www.navionics.com to ensure the features are available on your chosen cartography level.

Viewing animated tide information

From the chart application:

1. Select diamond-shaped tide icon.
   The chart context menu is displayed.

2. Select **Animate**.
   The animate menu is displayed and the tide icon is replaced with a dynamic tide bar indicator.

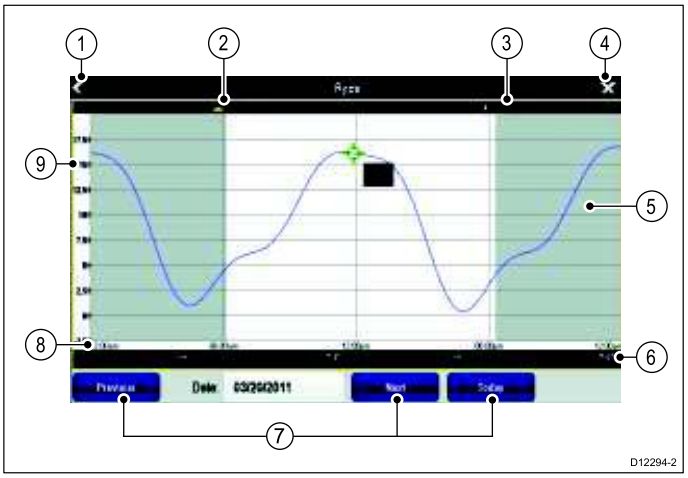
Controlling animations

From the chart application, with the animate menu displayed:

1. To start or stop the animation, select **Animate:** to switch between Play and Pause.
2. To view the animation in steps, select **Step Back** or **Step Forward**.
3. To set the animation step interval, pause any playing animations, and then select **Set Time Interval**.
4. To set the animation date, select **Set Date** and then using the on screen keyboard enter the required date.
5. To set the animation date to the current date select **Today**.
6. To set the animation date to 24 hours previous to the current date select **Previous Day**.
7. To set the animation date to 24 hours ahead of the current date select **Next Day**.

Tide graphs

Tide graphs provide a graphical view of tidal activity.



1. **Back** — return to the previous menu or view.
2. **Sunrise indicator** — indicates when the sun rises.
3. **Sunset indicator** — indicates when the sun sets.
4. **Exit** — closes the dialog.
5. **Nightfall indicator** — the greyed-out section of the graph indicates when nightfall occurs.
6. **Low / High Tide** — Indicates the time at which low or high tide occurs.
7. **Date navigation** — Use the icons to move to the next or previous day.
8. **Time** — The horizontal axis of the graph indicates time, in accordance with the time format specified in the System Settings.
9. **Depth** — The vertical axis of the graph indicates tidal water depth. The units for the depth measurement are based on those specified in the **Homescreen > Customize > Units Set-up > Depth Units** menu.

Note: The data provided in the tide graphs is for information purposes only and should NOT be relied upon as a substitute for prudent navigation. Only official government charts and notices to mariners contain all the current information needed for safe navigation. Always maintain a permanent watch.

Displaying details of tides

From the chart application:

1. Select the diamond-shaped tide icon.
   The chart context menu is displayed.
2. Select **Tide Station**.
   The graph for the selected station is displayed.

16.15 Depth & Contour options

If supported by your cartography type, the following depth and contour settings are available.

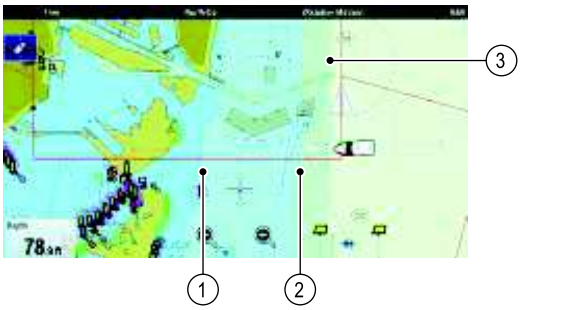
Note: The menu items available are dependant upon your cartography type. The depth options are dependant upon the units of measure in use on your system.

Menu item	Cartography type	Description	Options
Show Soundings	LightHouse vector charts and Navionics	Determines the depth at which depth soundings are displayed.	• None • 0–30 ft / 0–10 m / 0–5 fa • 0–60 ft / 0–20 m / 0–10 fa • 0–180 ft / 0–50 m / 0–30 fa • 0–500 ft / 0–150 m / 0–83 fa • All (default)
Show Contours	Navionics	Determines whether contours are displayed.	• Off • 0–6 ft / 0–2 m / 0–1 fa • 0–18 ft / 0–5 m / 0–3 fa • 0–30 ft / 0–10 m / 0–5 fa • 0–50 ft / 0–15 m / 0–8 fa • 0–60 ft / 0–20 m / 0–10 fa • All (default)
Shallow Contour	LightHouse charts	Determines the depth at which the Shallow contour is displayed. The Shallow contour cannot be set to a value greater than the Safety or Deep contours.	• Off • 6 ft / 2 m / 1 fa • 12 ft / 3 m / 2 fa (default) • 18 ft / 5 m / 3 fa • 20 ft / 6 m / 4 fa • 30 ft / 10 m / 5 fa • 50 ft / 15 m / 8 fa • 60 ft / 20 m / 10 fa
Safety Contour	LightHouse charts	Determines the depth at which the Safety contour is displayed. The Safety contour cannot be set to a value less than the Shallow contour or higher than the Deep contour.	• Off • 6 ft / 2 m / 1 fa • 12 ft / 3 m / 2 fa • 18 ft / 5 m / 3 fa • 20 ft / 6 m / 4 fa • 30 ft / 10 m / 5 fa (default) • 50 ft / 15 m / 8 fa • 60 ft / 20 m / 10 fa
Deep Contour	LightHouse vector charts and Navionics	Determines the depth at which the Deep contour is displayed. The Deep contour cannot be set to a value less than the Shallow or Safety contours.	• Off • 6 ft / 2 m / 1 fa • 12 ft / 3 m / 2 fa • 18 ft / 5 m / 3 fa • 20 ft / 6 m / 4 fa • 30 ft / 10 m / 5 fa • 50 ft / 15 m / 8 fa (default) • 60 ft / 20 m / 10 fa
Deep Water Color	Navionics	Determines the color of deep water.	• White (default) • Blue
Sonar Logs	Navionics	Allows logging of depth and position data to your Navionics chart card. This data will be sent to Navionics to improve the contour detail of Sonar Charts on your multifunction display. Refer to the Navionics website www.navionics.com for instructions on how to upload your sonar logs.	• On • Off

Depth soundings and contours

If supported by your cartography type, depth soundings and contours can be used in the Chart application to provide awareness of water depth.

When using vector based cartography you can adjust the depth at which the contours and soundings appear on-screen.



1. Shallow contour
2. Safety contour
3. Deep contour

The Depth & Contours menu can be accessed from: **Menu > Presentation > Depth & Contours**.

16.16 My Data options

The My Data menu provides access to your user data.

The options are found in the **My Data** menu: **Menu > My Data**.

- **Waypoints** — View the waypoints group list.
- **Routes** — View the Routes list.
- **Tracks** — View the Tracks list.

Refer to Chapter 15 Waypoints, Routes and Tracks for further details.

16.17 Multiple chart synchronization

You can synchronize the heading, range, and position information across multiple chart views and networked displays.

When chart synchronization is enabled:

- It is indicated by “CHRT Sync” in the chart application title bar.
- Any changes made to the heading, range or position in any chart instance will be reflected in all other chart instances.

Note: When the 2D and 3D chart views are synchronized, the Motion Mode is always Relative Motion.

Synchronizing multiple chart instances

From the chart application:

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Chart Sync**.
4. Select Chart from the list.

   A tick is placed next to the selected option.
5. Repeat the steps above for each chart instance and if required on each networked multifunction display you want to sync the chart view.

Note: You cannot sync to another chart if radar sync is turned on.

16.18 Measuring distances and bearings

You can use the databar and context menu information you can use the measure function to measure distances in the chart application.

You can determine the distance and bearing:

- from your vessel to the position of the cursor;
- between two points on the chart.

Measuring from vessel position to cursor

From the chart application:

1. Select the location on screen that you want to measure the distance or bearing from your vessel.
   The chart context menu will be displayed.
2. Select **Measure**.
   The following will happen:
   - The measure menu will be displayed.
   - A line will be drawn from the cursor position to the center of the screen.
   - The cursor location will be moved at the center of the screen.
   - The bearing and distance will be displayed next to the new cursor location.
3. From the measure menu select **From** so that Ship is selected.
   The ruler line is re-drawn from the cursor position to your vessel.
4. You can now adjust the ruler position by moving the cursor to the desired location.
5. If you want the ruler displayed after you have closed the measure menu, select **Ruler:** so that On is highlighted.
   Selecting ruler will switch the ruler On and Off.
6. Select Back or Ok to close the measure menu leaving the current measurement on-screen.

Measuring from point to point

From the chart application:

1. Select the location on screen that you want to measure the distance or bearing from your vessel.
   The chart context menu will be displayed.
2. Select **Measure**.
   The following will happen:
   - The measure menu will be displayed.
   - A line will be drawn from the cursor position to the center of the screen.
   - The cursor location will be moved at the center of the screen.
   - The bearing and distance will be displayed next to the new cursor location.
3. Select **From** so that Cursor is selected.
   Selecting measure from will switch between Ship and Cursor.
4. You can now adjust the end point by moving the cursor to the desired location.
5. You can also **Swap Direction** of the ruler so that the bearing becomes the bearing from end point to start point.
6. If you want the ruler displayed after you have closed the measure menu, select **Ruler** so that On is highlighted.
   Selecting display ruler will switch the ruler On and Off.
7. Select **Back** or **Ok** to exit the measure menu leaving the current measurement on-screen.

Repositioning the ruler

You can reposition a ruler by following the steps below.

1. Select the current ruler.
   The ruler context menu is displayed.
2. Select **Measure**.

You can now reposition the ruler as required.

Chapter 17: Fishfinder application

Chapter contents

17.1 How the fishfinder works

The fishfinder application uses a sonar module and a suitable sonar transducer. The sonar module interprets signals from the transducer and builds up a detailed underwater view. Various sonar technologies are available, all of which work on the same basic principles.

The sonar transducer sends pulses of sound waves into the water and measures the time it takes for the sound wave to travel to the bottom and back. The returning echoes are affected by bottom structure and by any other objects in their path, for example reefs, wrecks, shoals or fish. The Sonar module interprets these signals and builds up a detailed underwater view which is displayed in the Fishfinder application.

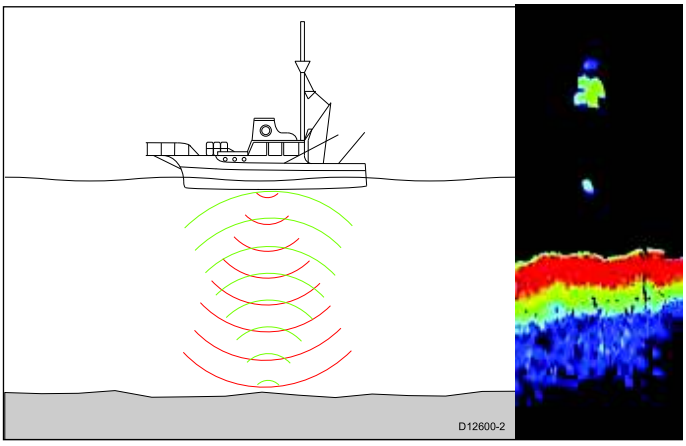
The Fishfinder application uses colors and shading to indicate the strength of the returns. You can use this information to determine the bottom structure, the size of fish and other objects in the water, such as debris or air bubbles

Note: Some transducers include additional sensors to measure water temperature and/or speed.

17.2 Sonar technologies

Traditional sonar technology

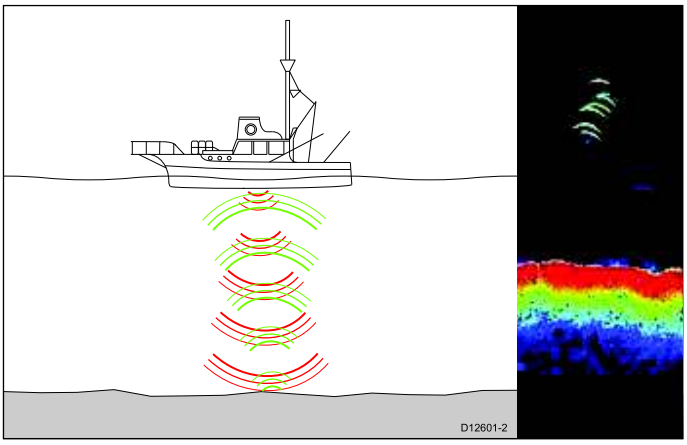
Traditional sonar uses a single carrier frequency or carrier wave for the sonar ping. The sonar works by measuring the time it takes the ping echo to return to the transducer to determine target depth.



CHIRP technology

CHIRP sonars use a swept frequency 'CHIRP' signal which can distinguish between multiple close targets, this enables the sonar to display multiple targets instead of large combined targets that you would see when using traditional non-CHIRP sonar.

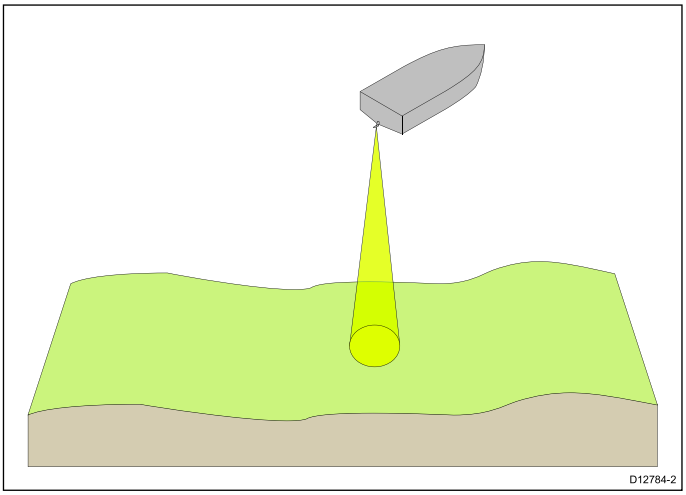
Benefits of CHIRP include improvements to target resolution, bottom detection even through bait balls and thermoclines and detection sensitivity.



CHIRP Sonar overview

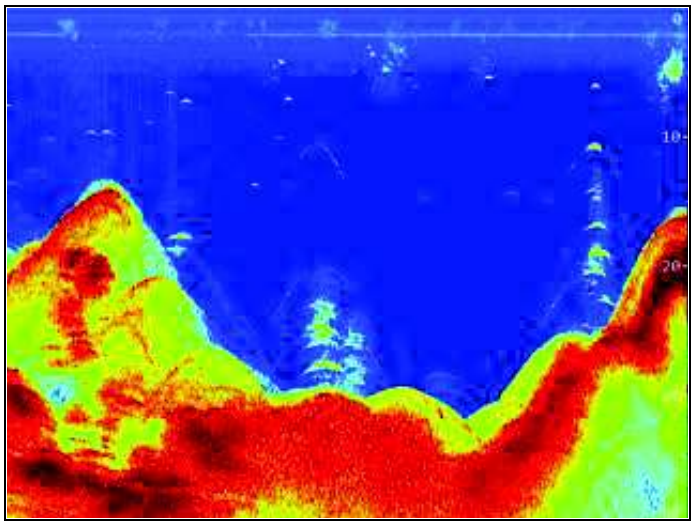
CHIRP sonar produces a conical shaped beam, the coverage of the conical beam is the water column directly beneath the vessel

Conical beam



Sonar is effective at a range of speeds. In deeper waters the CHIRP bandwidth is automatically optimized to improve bottom lock and the detection of moving objects (e.g. fish) in the wider water column.

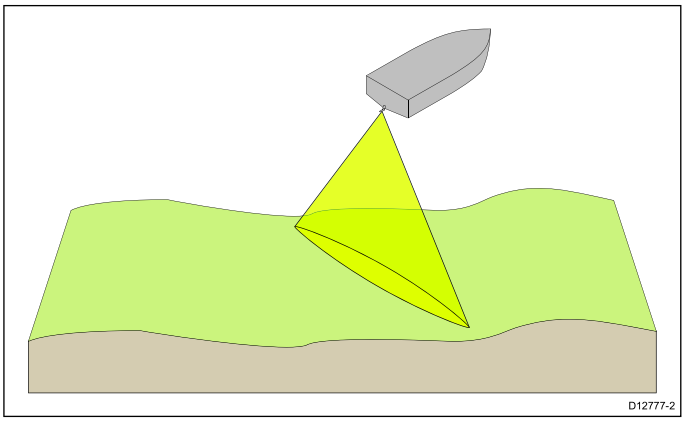
CHIRP sonar screen example



CHIRP DownVision™ overview

DownVision™ produces a wide–angle side-to-side beam and a thin fore-to-aft beam. The coverage of the DownVision™ beam is a water column directly beneath and to the sides of the vessel.

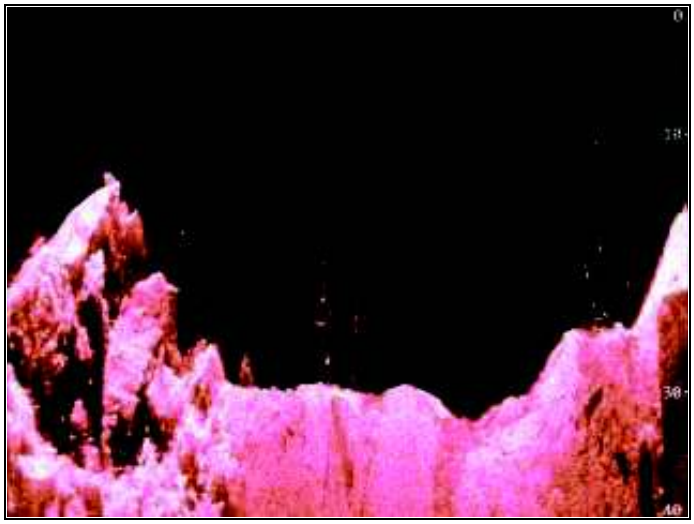
DownVision™ beam



DownVision™ is effective at lower vessel speeds. In deeper waters the CHIRP bandwidth is automatically optimized to improve bottom lock and the detection of moving objects (e.g. fish) in the wider water column.

The wide, thin beam produces clear target returns. The use of CHIRP processing and a higher operating frequency provide a more detailed image, making it easier to identify bottom structures around which fish may reside.

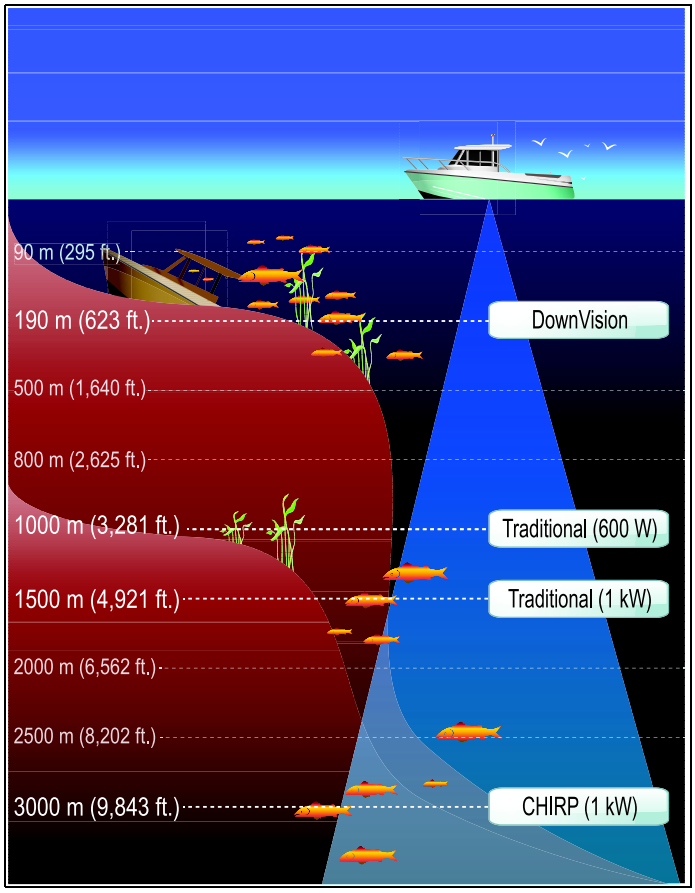
CHIRP DownVision™ screen example



17.3 Raymarine sonar modules

You can find details on Raymarine's sonar modules below.

The depth shown below for DownVision™ sonar modules is typical achievable depth, depending on the connected transducer in optimum water conditions. The depths shown for Traditional and CHIRP sonar modules are the maximum depths achievable depending on connected transducer in optimum water conditions.



Sonar module	Technology / Description
CP450C	CHIRP external
CP100	DownVision™ external
Dragonfly	DownVision™ internal
a68 / a78	DownVision™ internal
CP300	Traditional external
a67 / a77	Traditional internal
c97 / c127	Traditional internal
e7D / e97 / e127	Traditional internal
DSM25 / DSM30 / DSM300	Legacy external

17.4 Fishfinder overview

The Fishfinder application helps to interpret what is under the water around your vessel.

The various functions and features of the fishfinder application include:

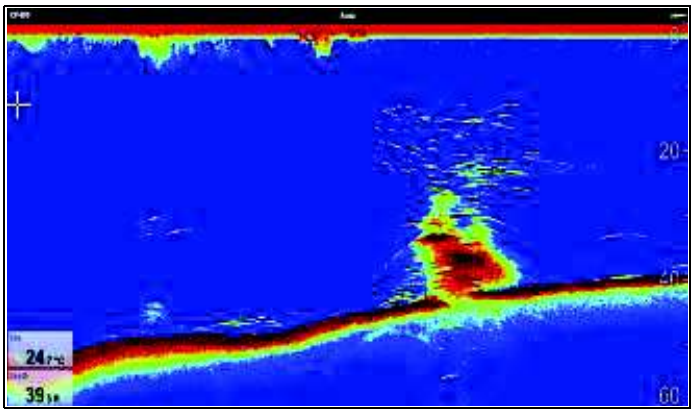
- Channel selection (Active sonar module and frequency).
- *Display modes (Zoom, A-Scope or Bottom Lock).
- Automatic or manual range control.
- Sensitivity settings to help optimize and simplify the displayed image.
- Pausing and adjusting the speed of the scrolling image.
- Using waypoints to mark a position.
- Determining depths and distances of targets.
- Fishfinder alarms (fish, depth or water temperature).

Note: * The display modes available are dependent on the sonar channel / module being displayed.

Fishfinder screen

The Fishfinder application displays a scrolling image from right to left across the screen of the water under your vessel. Each Fishfinder application pane can be independently configured to show a different sonar module / frequency.

Example CHIRP screen



Example DownVision™ screen

The Fishfinder window includes the following features:

- The bottom together with any bottom structure such as reefs and shipwrecks etc.
- Target images indicating fish.
- A status bar indicating the current sonar module and channel in use.
- Bottom depth.
- * On-Screen controls.

Note: * On-screen controls are only available on multifunction displays with a touchscreen and are dependent on the sonar module and channel that is being displayed.

Fishfinder application panes

All panes showing an instance of the Fishfinder application is independent and any changes made to the Channel selection or Display mode are automatically saved against that pane of the application.

Multiple pages can be set up on the Homescreen which can be used to display different combinations of Channel and Display mode.

Fishfinder context menu

The Fishfinder application context menu which displays data and shortcuts to menu items.

The context menu provides the data for the position of the cursor:

- Depth
- Range

The context menu also provide the following menu items:

- **Place Waypoint**
- **Place Marker**
- * **Move Marker**
- * **Erase Marker**

Note: * Only available if a marker has been placed.

Accessing the context menu

You can access the context menu by following the steps below.

1. Non-touchscreen and HybridTouch displays:
   i. Selecting a location, object or target on-screen and pressing the **Ok** button.
2. HybridTouch and Touch only displays:
   i. Selecting an object or target on-screen.
   ii. Selecting and holding on a location on-screen.

17.5 Multiple sonar module support

Your multifunction display supports multiple active sonar modules on the same network.

You can select which sonar channel you want to be displayed on-screen. Only 1 channel can be displayed at a time in a single Fishfinder application pane. Multiple channels can be displayed at the same time using custom splitscreen pages. Alternatively multiple custom pages could be set up to suit individual requirements.

Channel	Description	Sonar module
Auto	Automatically selects the best frequency for bottom tracking	CP300, CP450C, Sonar variant multifunction displays
50 kHz / 83 kHz	Good for deeper waters and for a wide sonar beam	CP300, CP450C, Sonar variant multifunction displays
100 kHz	Good detail at most depths, with moderately wide sonar beam	CP450C
160 kHz	Gives good detail in shallow waters	CP450C
200 kHz	Gives the best detail in shallow waters	CP300, Sonar variant multifunction displays
Low CHIRP	Good target separation in deep water	CP450C
Medium CHIRP	Good all round performance, with great target separation	CP450C
High CHIRP	Best for clear target separation in shallow waters and bottom detail	CP450C
DownVision™	Gives photo like images of bottom structure	CP100, DownVision™ variant multifunction displays
Sonar (200 kHz CHIRP)	Targets bait and predator fish with wide sonar beam	CP100, DownVision™ variant multifunction displays

Note:

1. The channels available are dependent on the sonar module and its connected transducer.
2. DownVision™ sonar modules include both a DownVision™ channel and a traditional sonar channel.

Selecting the sonar channel

To select the channel you want to display follow the steps below.

From the Fishfinder application:

1. Select **Menu**.
2. Select **Channel**.
   The Channel selection page is displayed.
3. Select the tab for the sonar module you want to use.
   A list of available channels for the selected sonar module is displayed.
4. Select a channel from the list.

The Channel selection page will close and the Fishfinder application will now show the selected channel.

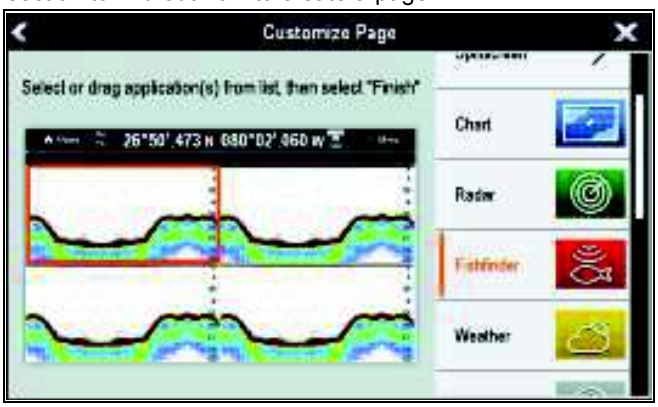
Displaying multiple sonar channels

Up to 4 sonar channels can be viewed at the same time by creating a custom splitscreen page that includes multiple Fishfinder application instances.

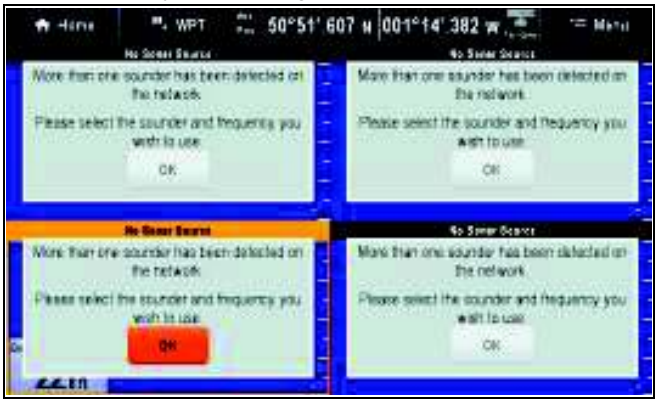
Important: Your ping rate may be reduced if you display different channels from the same sonar module at the same time.

1. Create a new splitscreen page using multiple instances of the Fishfinder application.

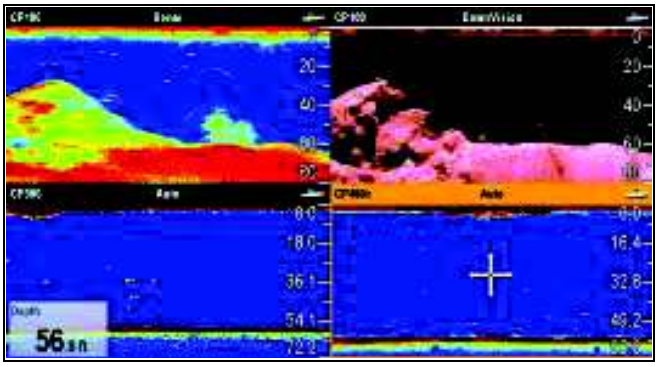
   Refer to the Changing an existing page on the homescreen section to find out how to create a page.



2. Open the newly created page.



3. Select the **Ok** button in one of the Fishfinder panes.
4. Select to channel that you want to view in the selected pane.
   Refer to the Selecting the sonar channel section for details on selecting a sonar channel.
5. Repeat steps 3 and 4 for each pane on the splitscreen page.



Depth data source

Where multiple sources of depth data exist on a system and the depth Data Source is set to Auto then the system will automatically select the optimum source for depth data.

The system will set the data source for depth according to the priority table below:

1st	CP450C	SeaTalkhs
2nd	CP300	SeaTalkhs
3rd	DSM300	SeaTalkhs
4th	DSM30	SeaTalkhs
5th	Traditional sonar variant multifunction displays	SeaTalkhs / internal
6th	DownVision™ variant multifunction display	SeaTalkhs / internal
7th	CP100	SeaTalkhs
8th	Instrument / multifunction display	SeaTalkng
9th	Instrument	SeaTalk
10th	Instrument / multifunction display	NMEA 0183

If multiple sonar modules of the same type are present on a SeaTalkhs network then the unit with the highest serial number will be selected as the preferred data source. For SeaTalkng and NMEA 0183 networks the unit with the highest CAN address is selected.

If the preferred depth data source becomes unavailable then the system will automatically select the next highest priority data source.

Refer to the Data Source menu section for details on selecting preferred data sources.

Important: Depth offset must be set for all installed transducers to ensure consistent and accurate data shown. Refer to the Depth Offset section for details.

17.6 Custom channels

Custom channels can be created from each sonar module's default channels; excluding Auto channels. This enables some settings to be customized and saved as a separate channel. These channels can then be assigned to individual Fishfinder application panes. Up to 10 custom channels can be created for each connected sonar module.

When changed the following settings are saved to the channel that is currently displayed:

- Sensitivity settings
- Range settings
- Frequency tuning — Only 2 frequency settings can be saved per transducer / sonar module combination.

Note: Performing a Sonar Reset will erase all custom channels for the current sonar module.

Creating a custom channel

To create a custom channel follow the steps below.

From the Fishfinder application menu:

1. Select **Channel**.
   The Channel selection page is displayed.
2. Select the tab for the sonar module you want to create a custom channel for.
3. Select the **Channel options** icon located next to the channel that you want to use, or
4. using non–touch controls, select the channel and then press and hold the **Ok** button until the options screen is displayed.
5. Select **Copy Channel**.
   The on-screen keyboard is displayed.
6. Enter the name you want to assign to your new channel.
7. Select **SAVE**.
   The new channel is now available in the channel list for the relevant sonar module.

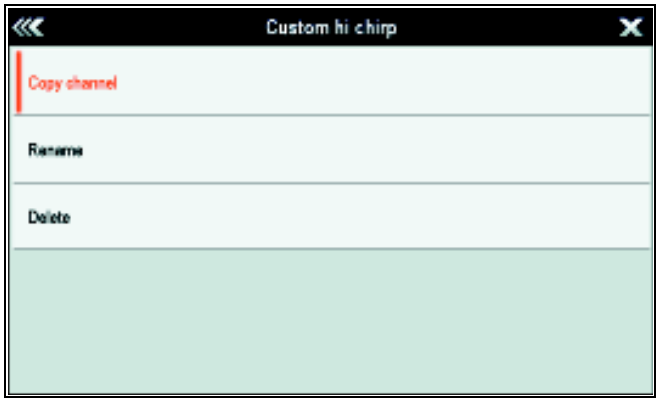
8. Select the new channel to display it in the Fishfinder application pane.
   Changes made to the Sensitivity, Range or Frequency tuning settings are automatically saved to the channel displayed.

You can now assign the new channel to a Fishfinder application pane.

Renaming custom channels

With the Channel selection page displayed:

1. Select the tab for the sonar module that contains the channel you want to rename.
2. Select the **Channel options** icon next to the custom channel.
   The custom channel options page is displayed



3. Select **Rename**.
   The on-screen keyboard is displayed.
4. Enter the new name for the channel.
5. Select **SAVE**.

Deleting custom channels

With the Channel selection page displayed:

1. Select the tab for the sonar module that contains the channel you want to delete.
2. Select the **Channel options** icon next to the custom channel.
3. Select **Delete**.
   A confirmation dialog is displayed.
4. Select **Yes**.

The custom channel has now been removed from your system.

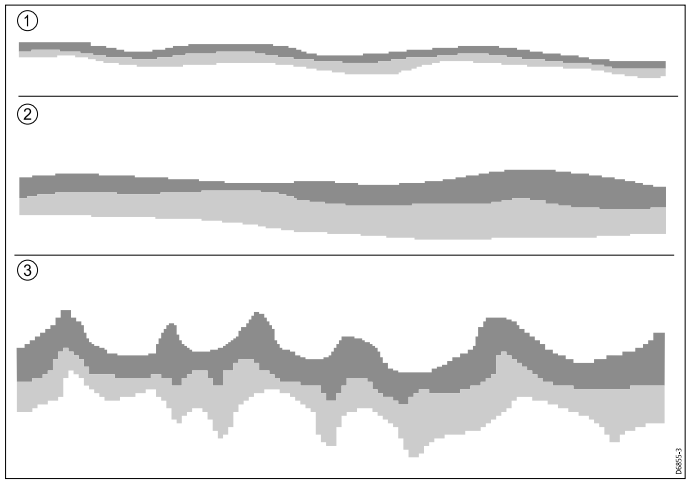
17.7 The sonar image

Interpreting the bottom using sonar

It is important to understand how to correctly interpret the bottom structure represented on-screen.

The bottom usually produces a strong echo.

The following images show how different bottom conditions are represented on-screen:



Item	Description
1	A hard bottom (sand) produces a thin line.
2	A soft bottom (mud or seaweed cover) produces a wide line.
3	A rocky or uneven bottom or a wreck produces an irregular image with peaks and troughs.

The dark layers indicate a good echo; the lighter areas indicate weaker echoes. This could mean that the upper layer is soft and therefore allowing sound waves to pass to the more solid layer below.

It is also possible that the sound waves are making two complete trips – hitting the bottom, bouncing off the vessel, then reflecting off the bottom again. This can happen if the water is shallow or the bottom is hard.

Factors influencing the sonar display

The quality and accuracy of the display can be influenced by a number of factors including vessel speed, depth, object size, background noise and transducer frequency.

Vessel speed

The shape of the target changes along with your speed. Slower speeds return flatter, more horizontal marks. Higher speeds cause the target to thicken and arch slightly, until at fast speeds the mark resembles a double vertical line.

Target depth

The closer the target to the surface, the larger the mark on screen.

Water depth

As water depth increases signal strength decreases, resulting in a lighter onscreen image of the bottom.

Size of the target

The larger the target, the larger the return on the fishfinder display. The size of a fish target is also dependent upon the size of the fish's swim bladder rather than its overall size. The swim bladder varies in size between different breeds of fish.

Clutter / Background noise

The fishfinder picture may be impaired by echoes received from floating or submerged debris, air bubbles or even the vessel's movement. This is known as 'Noise' or 'Clutter' and is controlled by the Sensitivity Settings. The system can automatically control some settings according to depth and water conditions. You can also adjust the settings manually if required.

Transducer frequency

The same target will appear differently when using different transducer frequencies. The lower the frequency the broader the mark.

Recovering lost bottom

If the seabed floor (bottom) is lost then follow the steps below to recover the bottom depth.

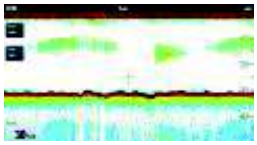
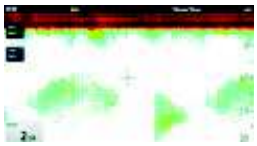
From the fishfinder application:

1. Ensure your vessel is in clear undisturbed water.
2. If range is set to Manual, adjust the range to the known, charted depth of your location. or
3. If range is set to Auto then switch the range to manual and adjust the range to the known, charted depth of your location.
4. Once bottom has been regained you can switch range mode back to Auto.

17.8 Range

The Range function enables you to define the range of depth that you see in the Fishfinder application. In Auto Range, the Fishfinder application automatically adjusts the range to ensure the water column and bottom are always displayed. In Manual Range, you can adjust the range displayed on-screen to suit your needs.

The table below shows examples of the Range function used with different sonar types.

	Traditional and CHIRP channels	**DownVision™ channel**
Auto Range		
Manual Range		

Changing the depth range

You can choose from either:

- **Automatic** adjustment whereby the display automatically shows the shallowest required range.
- **Manual** adjustment of the depth range, up to the maximum depth allowed by the Fishfinder application.

From the Fishfinder application menu:

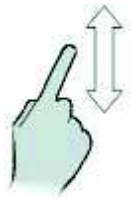
1. Select **Range**.
2. Select **Range** to switch between Auto and Man.
3. With manual mode selected you can now adjust the depth range shown on-screen.

Note: With the **Range** menu displayed you cannot use the **Rotary Control** to range in and out. To use the **Rotary control** to range in and out, first close the **Range** menu.

Range in and out

The method of ranging in and out of the Fishfinder application is dependent upon the multifunction display variant being used.

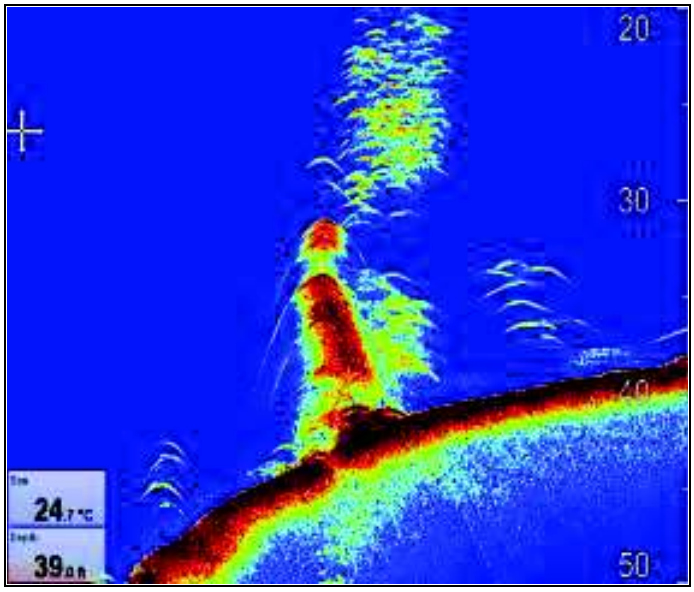
The table below shows the Range controls available for each display variant.

	Controls	**Multifunction displays**
	**Rotary Control**	• c Series • e Series • RMK-9 keypad
	**Range in** and **Range out** buttons	• c Series • e Series (excluding e7 and e7D • RMK-9 keypad
	Slide the screen **Up** or **Down**	• a Series • e Series • gS Series

Range shift

The Range Shift function enables a specific area of the water column to be displayed on-screen.

In the below example the top 20 feet of the water column is not displayed



Using range shift

The default setting adjusts the display to keep the bottom in the lower half of the screen. Alternatively you can shift the image within the current range.

From the application menu, with **Range** set to Manual:

1. Select **Range**.
2. Select **Range Shift**.

   The range shift dialog is displayed.
3. Adjust the setting to the required value.

   You will see the range changing on the screen as you adjust the setting.
4. Select **Back** or press the **Ok** button to confirm the setting and close the range shift dialog.

17.9 Fishfinder scrolling

The fishfinder image scrolls from right to left. You can pause the scrolling or adjust the scroll speed, to ease placing of waypoints or VRMs onscreen.

Scroll speed

You can adjust the speed at which the fishfinder image scrolls. A faster speed provides more detail which may be useful when you are looking for fish. If you select a slower speed the information remains on the display for longer.

Scroll pause

You can pause the display to see a ‘snapshot’ of the fishfinder image. When the image is paused scrolling stops but the depth indication continues to be updated.

Adjusting the scroll speed

The default scroll speed is 100%, the scroll speed can be adjusted following the steps below.

From the Fishfinder application menu:

1. Select **Presentation**.
2. Select **Scroll Speed**.

   The Scroll speed numeric adjust control is displayed.
3. Adjust the scroll speed to the required setting.

   Adjustment increments are as follows:

   - 10% increments for values between 10% and 100%
   - 100% increments for values between 100% and 500%
4. Select **Back** or **Ok** to confirm and close the numeric adjust control.

Pausing the screen

The Fishfinder application can be paused.

From the Fishfinder application:

1. Select **Menu**.
2. Select **Scrolling** so that Pause is highlighted.

   Selecting Scrolling again will resume the scrolling.

17.10 Fishfinder display modes

Selecting a fishfinder display mode

From the fishfinder application:

1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Select Mode:**.
4. Select the required display mode:
   - None
   - Zoom
   - * A-Scope
   - * Bottom Lock

Note: * Not available on the DownVision™ channel on DownVision™ sonar modules.

Fishfinder zoom mode

The zoom display mode magnifies a region of the fishfinder screen to display more detail.

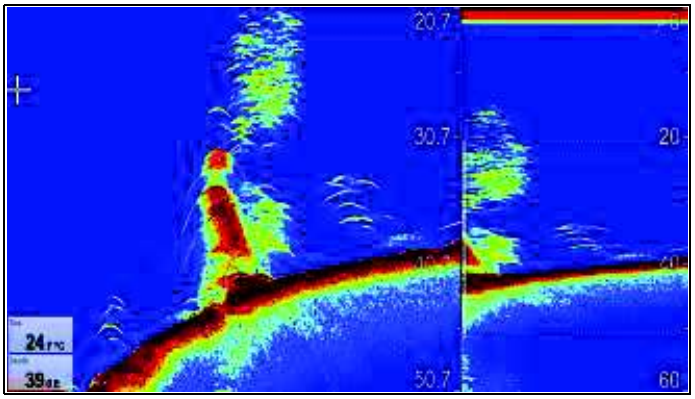
This zoom option enables you to:

- Replace the standard fishfinder image with the zoomed image, or display the zoomed image alongside the standard fishfinder image.
- Set the zoom factor to a predefined level, or adjust it manually.
- Reposition the zoomed portion of the image to a different point in the display.

When the range increases, the area shown in the zoom window also increases.

Zoom split

With the zoom display mode you can split the screen and display the zoomed image alongside the standard fishfinder image (ZOOM SPLIT). The zoomed section is indicated on the standard fishfinder screen by a zoom box.



Selecting split screen in zoom mode

From the fishfinder application, with the zoom display mode selected:

1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Zoom** so that Split is highlighted.
   Selecting Zoom will switch between Split and Full.

Adjusting the fishfinder zoom factor

When the display mode is set to Zoom, you can select a zoom factor or adjust it manually.

From the Fishfinder application, with the display mode set to Zoom.

1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Zoom Factor**.
4. Select a preset Zoom Factor (**x2**, **x3**, **x4**) or select **Manual**
   Once selection is made you will be returned to the Display Mode menu.
5. If Manual is chosen select **Manual Zoom**
   The manual zoom factor numeric adjust dialog is displayed.
6. Adjust the setting to the required value.
7. Select **Back** or use the **Ok** button to confirm the setting.

Adjusting the position of the fishfinder zoomed area

When the Zoom display mode is selected, the system automatically selects a zoom position so that the bottom details are always shown in the lower half of the screen. If required, you can reposition the portion of the image to be zoomed so that an alternative area is displayed.

From the Fishfinder application, with Zoom display mode selected:

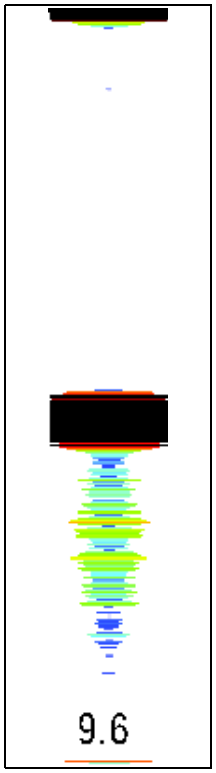
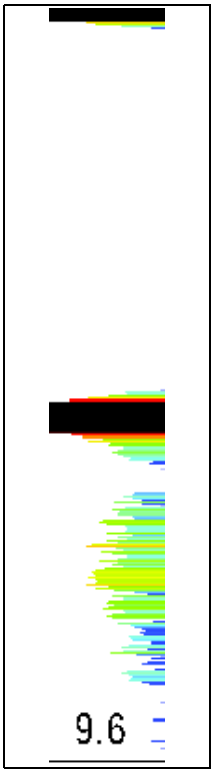
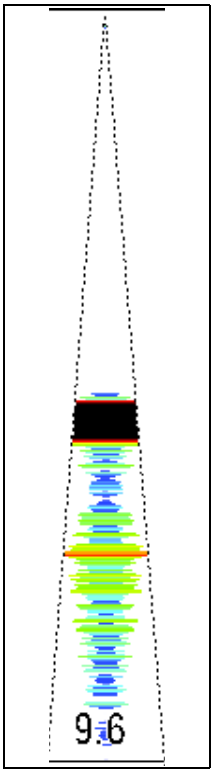
1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Zoom Position** so that Man is selected.
   Selecting the zoom position will switch between Man and Auto.
4. Select **Man Zoom Pos:**.
   The Zoom position numeric adjust control is displayed.
5. Adjust the setting to the required value.
6. Select **Back** or **Ok** to close the menu.

Fishfinder A-Scope mode

The A-Scope mode enables you to view a live (rather than historical) image of the seabed and fish directly below your vessel.

The standard fishfinder display shows a historical record of fishfinder echoes. If required, you can display a live image of the bottom structure and the fish directly below the transducer by using the A-Scope feature. The width of the bottom covered by the A-Scope is indicated at the bottom of the window. A-Scope provides a more precise and easier to interpret indication of the target strength.

There are three A-Scope modes:

Mode 1	Mode 2	Mode 3
		
The A-scope image is centred in the window.	The left-hand side of the Mode 1 image is expanded to give a more detailed view.	The A-scope image angles outward as signal width increases with depth.

The numbers displayed at the bottom when in A-Scope mode indicate the approximate diameter (in selected depth units) of the conical beam's coverage of the bottom.

Selecting A-Scope mode

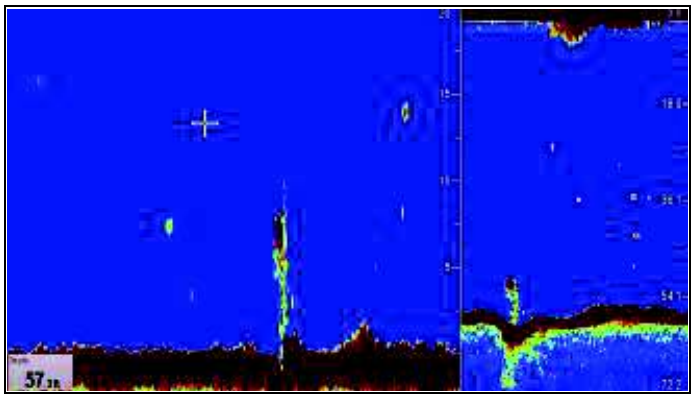
From the fishfinder application, with the A-Scope display mode selected:

1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Select Mode:**.
4. Select **A-Scope**.
5. Select **A-Scope:** to display the list of A-Scope modes.
6. Select the required mode.

Bottom Lock

The Bottom Lock display mode applies a filter which flattens the image of the bottom and makes any objects on or just above it easier to see. This feature is particularly useful for finding fish that feed close to the bottom.

Adjusting the range of the bottom lock image allows you to view more bottom details. You can also reposition the image on the screen to anywhere between the bottom of the window (0%) and the middle of the window (50%) using the Bottom Shift control.



Adjusting the bottom lock range/position

From the fishfinder application, with bottom lock display mode selected:

1. Select **Menu**.
2. Select **Display Mode**.
3. Select **Bottom Lock** to switch between Full screen and Split screen
4. Select **B-Lock Range**.
   Selecting Bottom Lock Range will display the B-Lock Range numeric adjust dialog.
5. Adjust the setting to the required value.
6. Select **Back** or use the **Ok** button to confirm the setting.
7. Select **B-Lock Shift** to reposition the image onscreen.
   Selecting Bottom Lock Shift will display the B-Lock Shift numeric adjust dialog.
8. Adjust the setting to the required value.
9. Select **Back** or use the **Ok** button to confirm the setting.

17.11 Presentation menu options

The **Presentation** menu provides access to features which provide additional on-screen detail.

The table below shows the available Presentation options.

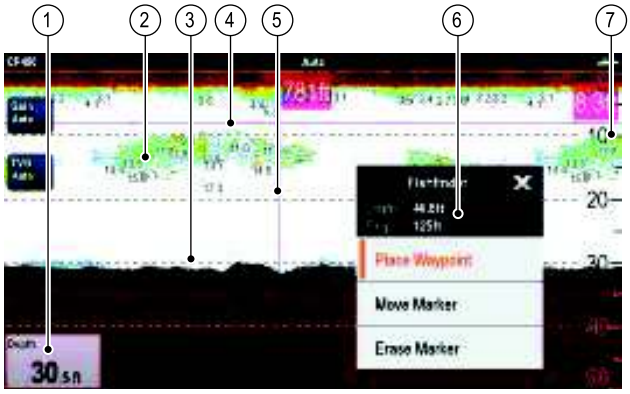
Menu Item	Description	Options
***Target Depth ID**	Controls whether the depth of identified targets are displayed. The level of targets displayed is directly linked to the level of Fish Alarm sensitivity.	• On • Off
Depth Lines	Controls whether horizontal lines indicating depth are displayed.	• On • Off
***White Line**	When set to On, this option displays a white line along the contour of the seabed. This helps to distinguish objects close to the bottom.	• On • Off
***Bottom Fill**	When set to On, this option displays a solid color fill for the seabed.	• On • Off
Color Palette	Various color palettes are available to suit different conditions and your personal preferences.	**Traditional / CHIRP sonar channels** • Classic Blue • Classic Black • Classic White • Sunburst • Greyscale • Inverse Greyscale • Copper • Night Vision **DownVision™ channels** • Copper • Inv. Copper • Slate Grey • Inv. Slate Grey
Scroll Speed	Specify the fishfinder scroll speed.	• 10% — 500%
Gain controls	Controls whether or not the on-screen sensitivity settings are displayed.	• Show (default) • Hide
Databoxes Set-up	Allows you to set up and display/hide up to 2 databoxes in the bottom left corner of the screen: • Databox 1 • Select Data • Databox 2 • Select Data	**Databox 1** • On • Off **Select Data** Allows selection of a data type by category. **Databox 2** • On • Off **Select Data** Allows selection of a data type by category.

Note:

- * Not available on DownVision™ channels.

17.12 Depth and distance

The fishfinder application provides a number of features to help you determine depths and distances. These features detailed below:



	Description
1	**Depth reading** — current depth of bottom.
2	**Depth Target ID** — depths are displayed against recognized targets. The sensitivity of these IDs is directly linked to the Fish Alarm sensitivity; the greater the fish alarm sensitivity, the greater the number of labelled targets.
3	**Depth lines** — horizontal dashed lines drawn at regular intervals to indicate the depth from the surface.
4	**Horizontal VRM marker** — indicates the depth of the target.
5	**Vertical VRM marker** — indicates the distance behind your vessel.
6	**Cursor Depth** — this is the depth of the cursor position. **Cursor Range** — this is the range from your vessel to the cursor position.
7	**Depth markers** — these numbers indicate depth.

Measuring depth and distance with VRM

You can use a Variable Range Marker (VRM) to determine an object's depth and distance behind your vessel. These markers consist of a horizontal (depth) line and a vertical (distance) line, each of which are labelled with the appropriate measurement.

From the Fishfinder application:

1. Select **Menu**
2. Select **Scroll** so that Pause is highlighted (This may make it easier to position the marker).

   Selecting Scroll will switch the scroll between Pause and Resume.
3. Select the location you want to place the marker.
4. Open the **Fishfinder context menu**.
5. Select **Place Marker**.

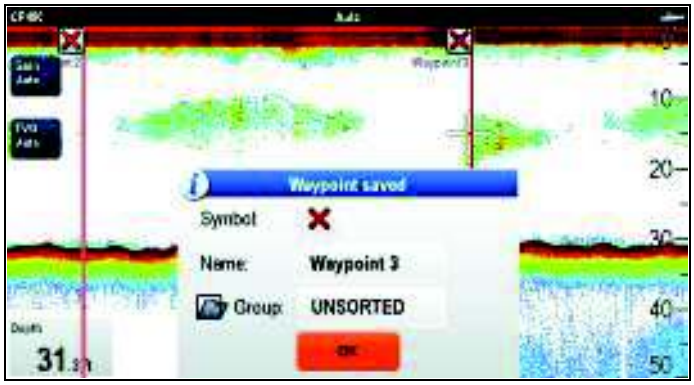
   Once placed you can move the marker by selecting **Move Marker** from the Fishfinder context menu.

Note: The VRM is only available in Bottom Lock mode when viewing the display mode in **Split** screen.

17.13 Waypoints in the Fishfinder application

Placing a waypoint in the Fishfinder application enables you to mark a position so that you can return to it later.

When a waypoint is placed its details are added to the waypoint list and a vertical line showing the waypoint symbol is displayed on-screen. The waypoints can then be navigated from the Chart application.



Placing a Waypoint in the fishfinder application

From the fishfinder application:

1. Select and hold the required location.
   The fishfinder context menu is displayed.
2. Select **Place Waypoint**.

Placing a waypoint using the WPT button or icon

From the fishfinder application:

1. Select **WPT**.
   The waypoint menu is displayed.
2. Whilst the waypoint menu is open:
   - Select **WPT** again to place a waypoint at your vessels position, or
   - Select the appropriate option: Place Waypoint At Vessel, Place Waypoint At Cursor or Place Waypoint At Lat/lon.

Placing a Waypoint using the context menu

You can place a waypoint in the fishfinder application using the context menu.

From the Fishfinder context menu:

1. Select **Place Waypoint**.
   The Waypoint is placed at the cursors location. and the new waypoint dialog is displayed.
2. Select **Ok** to accept the default waypoint details, or
3. Select a field to edit the new waypoint's details.

17.14 Sensitivity settings

The **Sensitivity settings** menu provides access to features and functions which enhance what is displayed on-screen. In most situations default values should be adequate.

The table below shows the sensitivity settings available for each sonar module type.

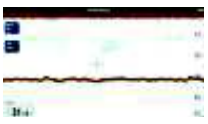
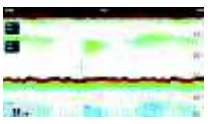
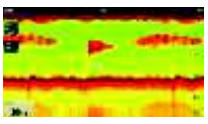
	DownVision™	CHIRP external	Traditional external	Traditional internal	Legacy external
Gain	Yes	Yes	Yes	Yes	Yes
Auto Gain Modes	No	No	No	Yes	Yes
Color Gain	No	Yes	Yes	Yes	Yes
Contrast	Yes	No	No	No	No
TVG	No	Yes	Yes	Yes	Yes
Auto TVG Modes	No	Yes	Yes	No	No
Noise Filter	Yes	No	No	No	No
Color Threshold	Yes	Yes	Yes	Yes	Yes
Power Mode	No	Yes	Yes	Yes	Yes

Note: * Auto TVG modes are disabled when TVG is set to manual.

Gain

The gain settings alter the way the sonar module processes background noise. Adjusting the gain settings can improve the sonar image, however for optimum performance in most conditions, we recommend that you use the auto settings.

The gain control determines the strength above which echoes are displayed on-screen.

		
20% Manual Gain	Auto Gain	80% Manual Gain

Auto

In Auto mode the sonar module automatically adjusts the gain setting to suit current conditions.

When connected to a Legacy sonar module or a Traditional internal sonar module 3 Auto Gain modes are available:

- Cruising (Low)
- Trolling (Med)
- Fishing (Fast)

.

Manual

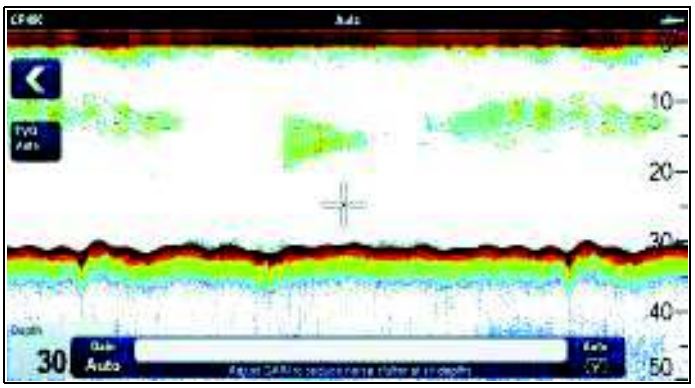
If necessary you can set the gain controls manually, between a value of 0% to 100%. This value should be set high enough to see fish and bottom detail but without too much background noise. Generally a high gain is used in deep and/or clear water; a low gain in shallow and/or murky water.

The new values remain set even when you switch off the display.

On-screen gain controls

Touch only and HybridTouch multifunction displays have on-screen gain controls.

Selecting the on-screen gain control will display the gain settings:



When connected to a Legacy sonar module or a traditional internal sonar module the automatic gain has 3 modes.

When connected to external CHIRP, external Traditional or DownVision™ sonar modules gain modes are not required.

When in manual mode the slider bar control is shown.

Enabling and disabling on-screen gain controls

You can enable and disable the on-screen gain controls by following the steps below.

On a touchscreen multifunction display, with the relevant application displayed.

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Gain Controls**.

   Selecting Gain Controls will switch between showing and hiding the on-screen controls.

Note: When the on-screen Gain controls are set to Hidden then the Gain settings can be accessed directly from the application menu: **Menu > Gain**.

Adjusting gain manually using on-screen controls

1. Select the on-screen **Gain** control located on the left hand side of the fishfinder application.
2. Select the **Auto** box to switch between Auto and Manual gain.
3. With **Auto** deselected, select and hold the **Slider** and move **Left** to decrease value or **Right** to increase value.

Setting the auto gain mode using the on-screen controls

1. Select the on-screen **Gain** control located on the left hand side of the fishfinder application.
2. Select the **Auto** box so that a tick is displayed in the box.
3. Select the required **Auto Gain Mode**.

Adjusting fishfinder gain using the menu

The fishfinder gain setting can be accessed from the fishfinder menu.

From the fishfinder application:

1. Select **Menu**.
2. Select **Sensitivity Settings**.
3. Select **Gain**.

   The Gain adjust dialog is displayed
4. Adjust the gain control to the required setting, or
5. Select **Auto**.

   A tick is displayed in the **Auto** box to signify automatic gain is enabled.

Setting auto gain mode using the menu

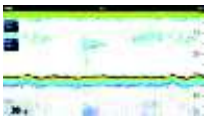
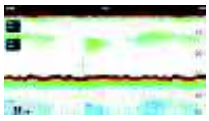
When using a Legacy sonar module or a Traditional internal sonar module 3 Auto Gain modes are available. The Auto Gain mode can be set by following the steps below.

From the Fishfinder application menu:

1. Select **Sensitivity Settings**.
2. Select **Auto Gain Mode**.
3. Select the required auto gain mode.

Color gain

Traditional, CHIRP and Legacy sonar channels use different colors to determine the strength of an echo. You can adjust the color gain manually between 0% and 100% or set it to automatic.

		
20% Manual Color Gain	Auto Color Gain	80% Manual Color Gain

Color gain sets the lower limit for the strongest echo color. All echoes with a signal strength above this value are displayed in the strongest color. Those with a weaker value are divided equally between the remaining colors.

- Setting a low value produces a wide band for the weakest color, but a small signal band for the other colors.
- Setting a high value gives a wide band for the strongest color, but a small signal band for the other colors.

Adjusting the color gain

To adjust the color gain on Legacy and Traditional and CHIRP sonar channels follow the steps below.

From the Fishfinder application:

1. Select **Menu**.
2. Select **Sensitivity settings**.
3. Select **Color Gain**.

   The color gain slider bar control is displayed.
4. Adjust the control to the required value.
5. Select **Back** to confirm setting and close slider bar, or
6. Select **Auto** to enable automatic color gain.

Contrast

DownVision™ uses monochrome shading to determine the strength of an echo. You can adjust the contrast manually between 0% and 100% or set it to automatic.

		
20% Manual Contrast	Auto Contrast	80% Manual Contrast

Contrast sets the lower limit for the strongest echo shade. All echoes with a signal strength above this value are displayed in the lightest shade. Those with a weaker value are divided equally between the remaining shades.

- Setting a low value produces a wide band for the darkest shade, but a small signal band for the other shades.
- Setting a high value gives a wide band for the lightest shade, but a small signal band for the other shades.

Adjusting the contrast

To adjust the contrast setting follow the steps below.

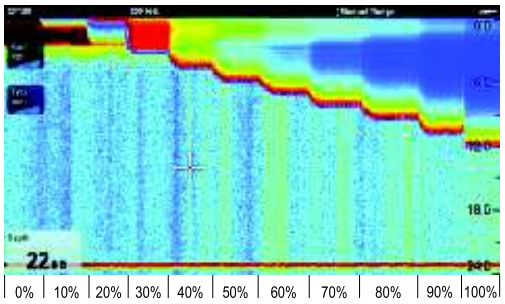
From the Fishfinder application:

1. Select **Menu**.
2. Select **Sensitivity settings**.

3. Select **Contrast**.
   The Contrast slider bar control is displayed.
4. Adjust the control to the required value.
5. Select **Back** to confirm setting and close slider bar, or
6. Select **Auto** to enable automatic contrast.

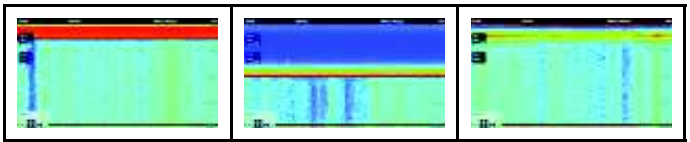
Time Varied Gain (TVG)

The Time Varied Gain (TVG) setting controls the amount of attenuation applied throughout the water column, which provides a balance of shallow water returns (where echoes are strong) against deep water returns (where echoes are weak) so that targets of the same size produce echoes of the similar size regardless of target depth. The TVG setting can be manually set from 0% to 100% or set to automatic.



- A higher TVG setting will produce weaker targets / less clutter on-screen.
- A lower TVG setting will produce stronger targets / more clutter on-screen.

Note: TVG values between 0% and 30% represent top out mode control, values between 31% and 100% represent TVG control.



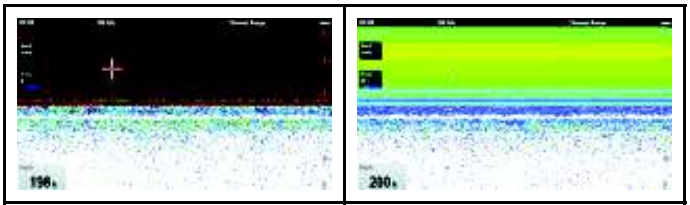
31% TVG	100% TVG	Auto TVG

Note: TVG has no effect in simulator mode however top out mode (0% to 30%) does.

Top out mode

Top out mode is a digital filter that is combined with the TVG control. The top out mode filter reduces noise and clutter from the top portion of the sonar beam.

Top out mode is active when TVG values are between 0% and 30%. TVG values between 31% and 100% represent actual TVG control.



0% TVG	30% TVG

Setting TVG to Automatic

The TVG setting can be set to automatic by following the steps below.

From the Fishfinder application:

1. Select **Menu**.
2. Select **Sensitivity Settings**.
3. Select **TVG**.
   The TVG slider bar control is displayed.
4. Select **Auto** so that a tick is placed in the auto box.

Auto TVG mode

When TVG is set to automatic 3 auto TVG modes are available, depending on sonar module in use.

The auto TVG modes available are as follows:

- Low
- Medium
- High

Auto TVG modes are only available on Legacy sonar modules and Traditional internal sonar modules.

Selecting an auto TVG mode

Follow the steps below to select an Auto TVG mode.

From the Fishfinder application, with TVG set to Auto:

1. Select **Menu**.
2. Select **Sensitivity Settings**.
3. Select **Auto TVG**.
4. Select the required setting: Low, Medium or High.

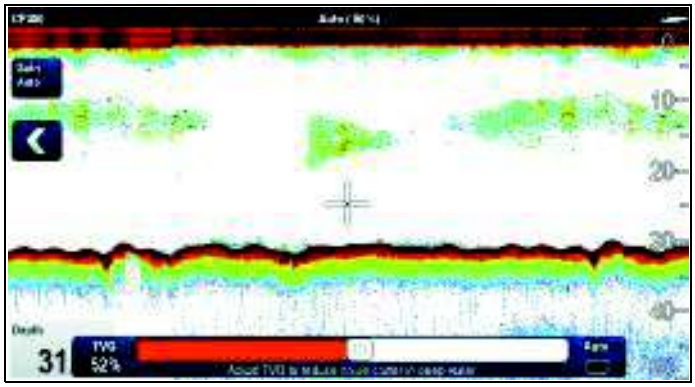
Manually adjusting TVG

From the Fishfinder application menu:

1. Select **Sensitivity Settings**.
2. Select **TVG**.
   The TVG slider bar control is displayed.
3. Adjust the slider bar control to the required setting.
   Values between 31% and 100% represent TVG control.
4. Select **Back** or **OK** to close slider bar control.

On-screen TVG controls

Touch only and HybridTouch multifunction displays have on-screen TVG controls.



Selecting the on-screen TVG control will display the TVG settings.

When connected to an external CHIRP sonar modules (excluding DownVision™) and external Traditional sonar modules (excluding legacy) the automatic TVG has 3 modes.

When in manual mode the slider bar control is shown.

Enabling and disabling on-screen gain controls

You can enable and disable the on-screen gain controls by following the steps below.

On a touchscreen multifunction display, with the relevant application displayed.

1. Select **Menu**.
2. Select **Presentation**.
3. Select **Gain Controls**.
   Selecting Gain Controls will switch between showing and hiding the on-screen controls.

Note: When the on-screen Gain controls are set to Hidden then the Gain settings can be accessed directly from the application menu: **Menu > Gain**.

Adjusting TVG manually using on-screen controls

Touch only and HybridTouch multifunction displays have on-screen TVG controls.

1. Select the on-screen **TVG** control located on the left hand side of the Fishfinder application.
2. Select the **Auto** box to switch between Auto and Manual TVG.
3. Adjust the setting to the required value.

Setting auto TVG using the on-screen controls

Touch only and HybridTouch multifunction displays have on-screen TVG controls.

1. Select the on-screen **TVG** control located on the left hand side of the fishfinder application.
2. Select the **Auto** box to select Auto TVG mode.
3. When connected to external CHIRP sonar modules (excluding DownVision™) and external traditional sonar modules (excluding legacy) you can select an auto TVG mode,

Noise Filter

The Noise Filter is available on DownVision™ sonar modules. The Noise Filter reduces the amount of clutter displayed on-screen by varying the gain throughout the column of water.

The Noise Filter can be set to automatic or adjusted manually:

- **Automatic** — In Auto mode the Noise Filter is set to 20%.
- **Manual** — You can adjust the Noise Filter manually, between a value of 0% to 100%.
  - A low value decreases the depth at which the filter is applied.
  - A high value increases the depth at which the filter is applied.

The new values remain set even when you switch off the display.

Adjusting the Noise Filter

Follow the steps below to adjust the Noise Filter.

From the Fishfinder application:

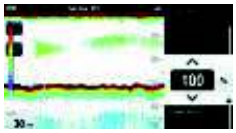
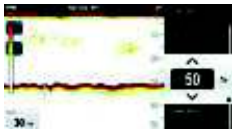
1. Select **Menu**.
2. Select **Sensitivity Settings**.
3. Select **Noise Filter**.
   The Noise filter slider bar control is displayed.
4. Adjust the Noise Filter to the required value, or
5. Select the **Auto** check box to switch to Auto mode.

Note: The Noise filter can also be adjusted by selecting the on-screen **N. Filter** control.

Color threshold

Color threshold determines the signal strength below which targets are not shown. Traditional and CHIRP sonar use different colors to determine signal strengths whilst DownVision™ uses monochrome shading.

The Color Threshold setting is a global setting. When the color threshold value is changed all Fishfinder application panes on all networked multifunction displays will share the same color threshold value.

Color threshold	Traditional / CHIRP channels	DownVision™ channel
100% (default)		
50%		

A low setting would result in only the strongest colors or lightest shades being displayed.

Adjusting the color threshold

The color threshold's default value is 100%, you can adjust this setting so that less colors / shades are displayed.

From the Fishfinder application menu:

1. Select **Sensitivity Settings**.
2. Select **Color Threshold**.
3. Adjust the color threshold to the required value.
4. Select **Ok** to confirm setting and close the numeric adjust control.

Power mode

Power mode controls the power level of the transducer. Power mode can be set to automatic or adjusted manually between 0% and 100%. Power mode is only available on CHIRP, Traditional and Legacy sonar modules.

- **Auto** — This is the default setting. When auto is selected the sonar module automatically determines the optimum setting based on the current depth, speed, and (bottom) signal strength.
- **Manual** — You can adjust the power level between in 1% increments. Lower power levels are normally used in depth ranges less than 2.4 m (8 ft.) and higher power levels are typically selected for depths greater than 3.7 m (12 ft.).

Adjusting the transducer power level

From the Fishfinder application menu:

1. Select **Sensitivity settings**.
2. Select **Power Mode**.
   The power mode slider bar control is displayed.
3. Adjust the slider bar to the required setting, or
4. Select **Auto** to set automatic power mode.