

Raymarine®



i70 / i70s INSTRUMENT

Operation instructions

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Software updates



Check the Raymarine website for the latest software releases for your product.
www.raymarine.com/software

Product documentation



The latest versions of all English and translated documents are available to download in PDF format from the website: www.raymarine.com/manuals.
Please check the website to ensure you have the latest documentation.

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Chapter 1: Important information

Caution: Sun covers

- If your product is supplied with a sun cover, to protect against the damaging effects of ultraviolet (UV) light, always fit the sun cover when the product is not in use.
- To avoid potential loss, sun covers must be removed when travelling at high speed, whether in water or when the vessel is being towed.

TFT Displays

The colors of the display may seem to vary when viewed against a colored background or in colored light. This is a perfectly normal effect that can be seen with all color Thin Film Transistor (TFT) displays.

Water ingress

Water ingress disclaimer

Although the waterproof rating capacity of this product meets the stated water ingress protection standard (refer to the product's *Technical Specification*), water intrusion and subsequent equipment failure may occur if the product is subjected to high-pressure washing. Raymarine will not warrant products subjected to high-pressure washing.

Disclaimer

Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

Raymarine is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

Declaration of conformity

FLIR Belgium BVBA declares that the following products are in compliance with the EMC Directive 2014/30/EU:

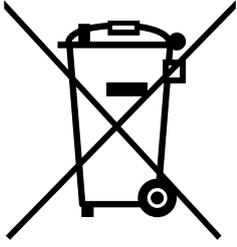
- i70s multifunction instrument display, part number E70327

The original Declaration of Conformity certificate may be viewed on the relevant product page at www.raymarine.com/manuals.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment which contains materials, components and substances that may be hazardous and present a risk to human health and the environment when WEEE is not handled correctly.



Equipment marked with the crossed-out wheeled bin symbol indicates that the equipment should not be disposed of in unsorted household waste. Local authorities in many regions have established collection schemes under which residents can dispose of waste electrical and electronic equipment at a recycling center or other collection point. For more information about suitable collection points for waste electrical and electronic equipment in your region, refer to the Raymarine website: www.raymarine.eu/recycling.



Warranty registration

To register your Raymarine product ownership, please visit www.raymarine.com and register online.

It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

IMO and SOLAS

The equipment described within this document is intended for use on leisure marine boats and workboats NOT covered by International Maritime Organization (IMO) and Safety of Life at Sea (SOLAS) Carriage Regulations.

Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Raymarine cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine cannot accept liability for any differences between the product and this document. Please check the Raymarine website (www.raymarine.com) to ensure you have the most up-to-date version(s) of the documentation for your product.

Chapter 2: Document and product information

Chapter contents

- [2.1 Product documentation on page 12](#)
- [2.2 Applicable software version on page 13](#)
- [2.3 Applicable products on page 13](#)

2.1 Product documentation

The following documentation is applicable to your product:

This and other Raymarine product documents are available to download in PDF format from www.raymarine.com.

i70s documentation:

- **81401** — i70 / i70s Operation Instructions (This document)
- **87420** — i70s Instrument Display Installation Instructions
- **87425** — i70 Instrument Display Installation Instructions

User manuals Print Shop

Raymarine provides a Print Shop service, enabling you to purchase a high-quality, professionally-printed manual for your Raymarine product.

Printed manuals are ideal for keeping onboard your vessel, as a useful source of reference whenever you need assistance with your Raymarine product.

Visit <http://www.raymarine.co.uk/view/?id=5175> to order a printed manual, delivered directly to your door.

For further information about the Print Shop, please visit the Print Shop FAQ pages: <http://www.raymarine.co.uk/view/?id=5751>.

Note:

- Accepted methods of payment for printed manuals are credit cards and PayPal.
- Printed manuals can be shipped worldwide.
- Further manuals will be added to the Print Shop over the coming months for both new and legacy products.
- Raymarine user manuals are also available to download free-of-charge from the Raymarine website, in the popular PDF format. These PDF files can be viewed on a PC / laptop, tablet, smartphone, or on the latest generation of Raymarine multifunction displays.

Document illustrations

Your product and if applicable, its user interface may differ slightly from that shown in the illustrations in this document, depending on product variant and date of manufacture.

All images are provided for illustration purposes only.

Document conventions

The following conventions are used throughout this document:

- **Highlight** — The term 'highlight' refers to using the **UP** or **DOWN** buttons to highlight an item.
- **Select** — The term 'select' refers to using the **UP** or **DOWN** buttons to highlight an item, and then pressing the **OK** button to select the item.
- **Scroll** — The term 'scroll' refers to using the **UP** or **DOWN** buttons to move up or down a menu to an item that is not currently shown onscreen.
- **Adjust** — The term 'adjust' is used to denote using the **UP** or **DOWN** buttons to change a numeric value or slider bar control.
- **Enable** — The term 'enable' refers to using the **UP** or **DOWN** buttons to highlight a toggle switch and press **OK** to activate the switch (when activated the switch background will turn green and the toggle is positioned to the right).
- **Disable** — The term 'disable' refers to using the **UP** or **DOWN** buttons to highlight a toggle switch and press **OK** to deactivate the switch (when deactivated the switch background will turn gray and the toggle is positioned to the left).

2.2 Applicable software version

Product software is updated regularly to add new features and improve existing functionality.

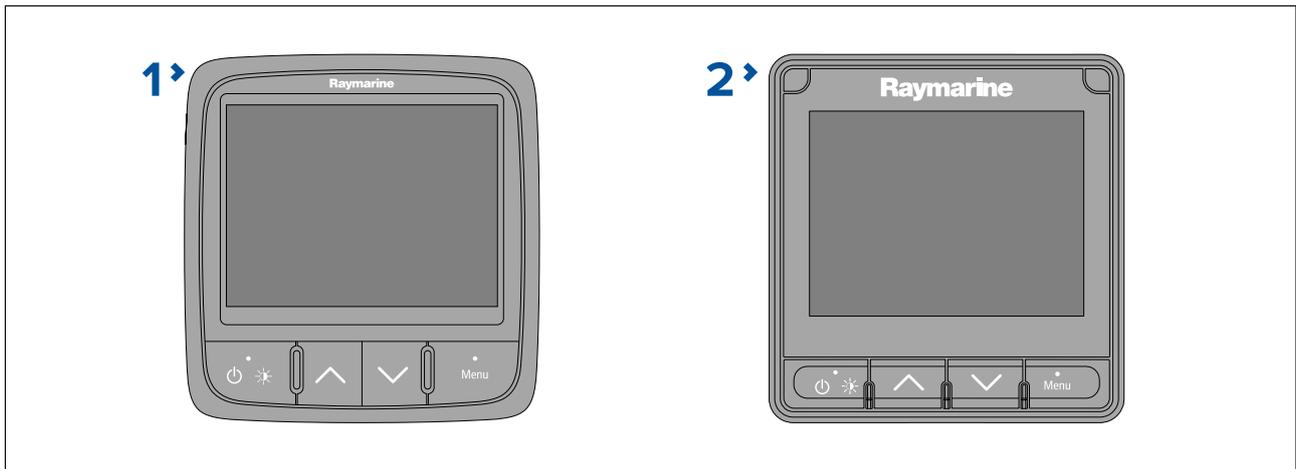
This document has been updated to reflect displays running software version 3.20.

Check the website for the latest software and user manuals:

- www.raymarine.com/software
- www.raymarine.com/manuals

2.3 Applicable products

This document is applicable to the products shown below.



1. **i70** (E22172)
2. **i70s** (E70327)

Chapter 3: Getting started

Chapter contents

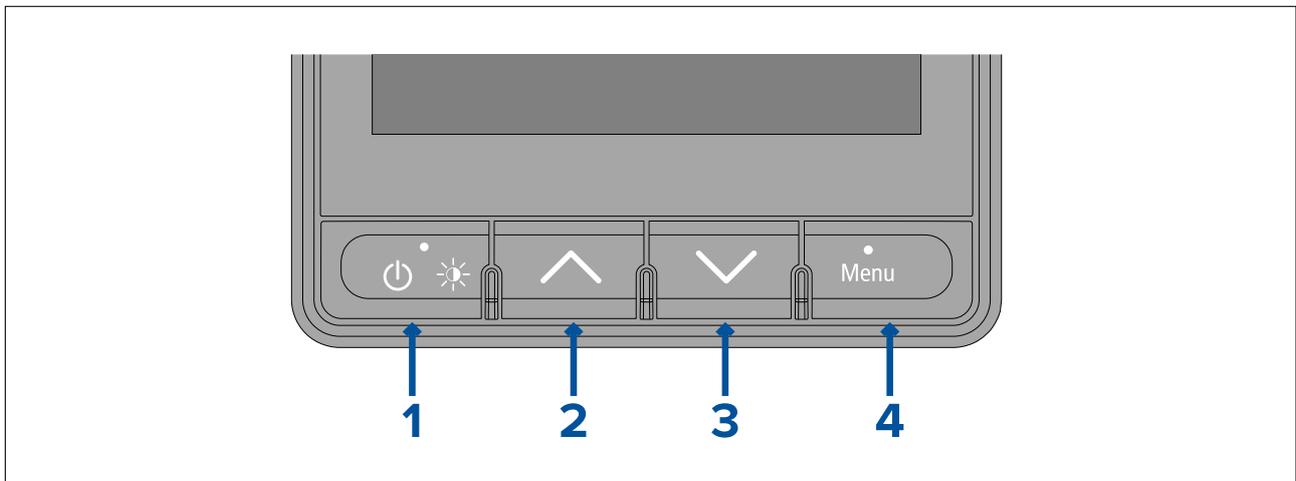
- 3.1 Controls on page 16
- 3.2 Power on page 16
- 3.3 Completing the set up wizard on page 17
- 3.4 Display settings on page 17
- 3.5 Multiple data sources (MDS) on page 21
- 3.6 Quick options menu on page 22
- 3.7 Software updates on page 22

3.1 Controls

Use the buttons to operate the display. Each button has multiple functions.

Note:

The i70s is pictured below. The i70 and i70s have the same control buttons.



1. **Power**
 - Power on
 - Power off
 - Open Brightness page
 - Cancel
 - Back
2. **Up**
 - Next Favorite page
 - Move up in menu
 - Increase a numeric value
3. **Down**
 - Previous Favorite page
 - Move down in menu
 - Decrease a numeric value
4. **Menu**
 - Open menu
 - Select menu item
 - OK
 - Save

3.2 Power

Powering on the display

The display will automatically power on when power is applied to the SeaTalkng[®] backbone, unless the display has previously been powered off using the **Power** button.

With the display powered off:

1. Press and hold the **Power** button until the screen turns on (approximately 2 seconds).

Powering off the display

The display can be powered off using the **Power** button.

1. Press and hold the **Power** button until the count down timer reaches zero and the screen turns off.

Note:

When powered off, the display may still draw a small amount of power from the battery, if this is a concern unplug the power supply or switch off at the breaker.

3.3 Completing the set up wizard

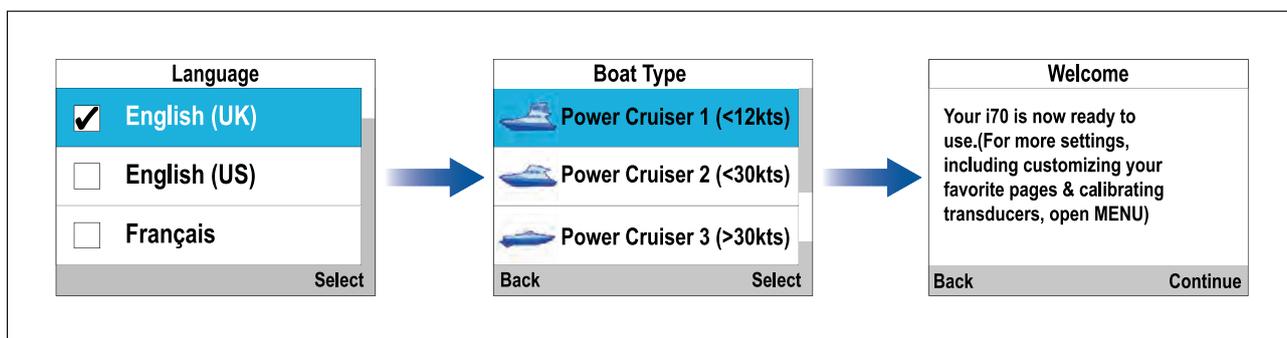
If the display is being switched on for the first time or after a factory reset the set up wizard will be launched.

The set up wizard guides you through the following basic configuration settings:

1. Language selection
2. Boat type selection
3. Welcome message

Note:

The set up wizard may be skipped if these settings have already been configured another display in the system.



1. Select the user interface language that you want to use.
2. Select the boat type that closely matches your vessel's hull type.
3. Select **Continue**.

The large pilot view page is displayed.

3.4 Display settings

Adjusting the display's brightness

The display's brightness level can be adjusted.

1. Press the **Power** button.
The Brightness page is displayed.
2. Use the **Up** and **Down** buttons to adjust the brightness to the required level.
3. Select **Ok**.

The display brightness page will time-out after 2 seconds, saving the new brightness level.

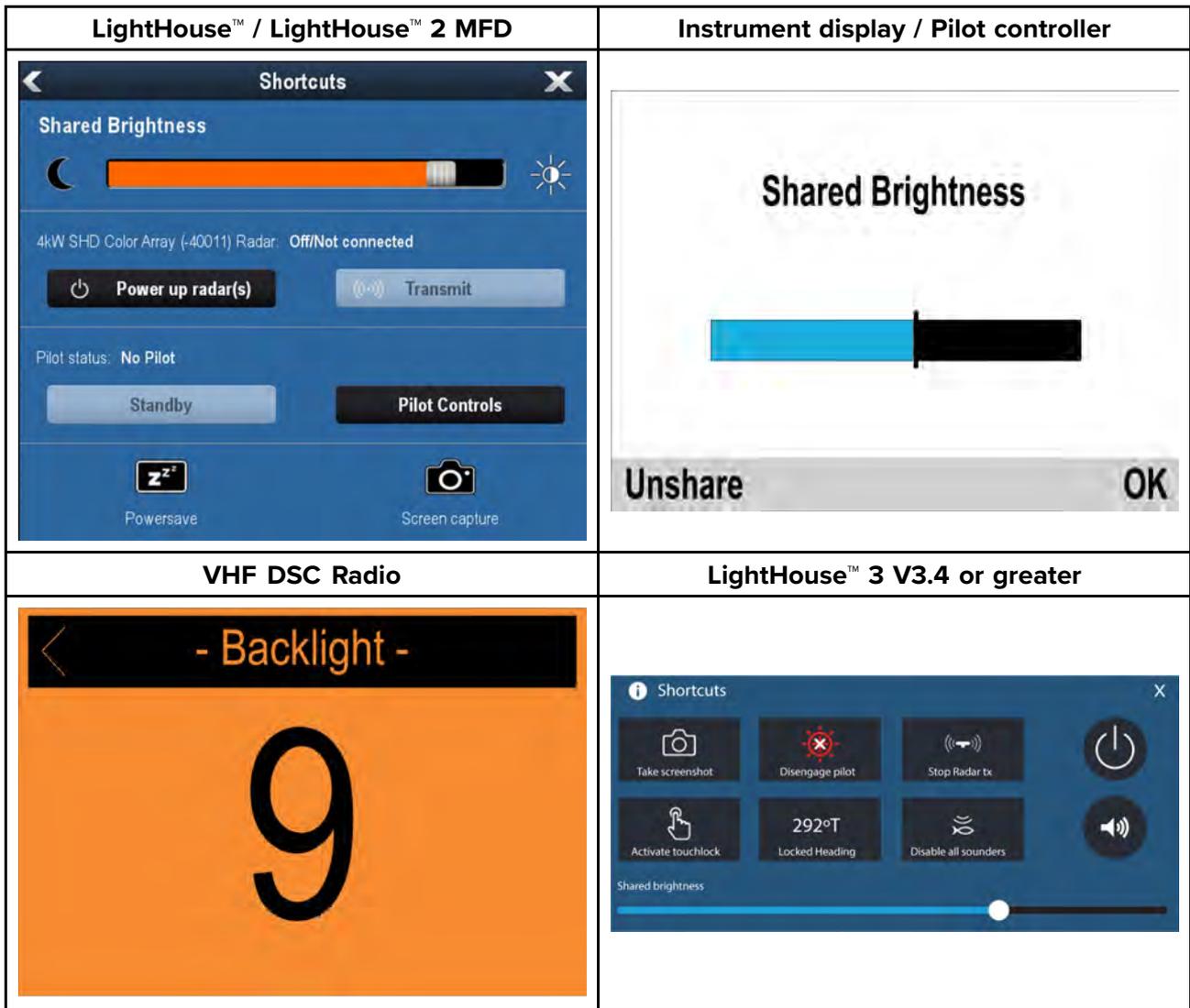
Shared Brightness

Shared brightness enables simultaneous brightness adjustment of all products that are part of the same group.

The following products are compatible with shared brightness:

- LightHouse™ 3 MFDs using software version 3.4 or greater.
- LightHouse™ or LightHouse™ 2 powered MFDs.
- SeaTalkng® Instrument displays and Pilot controllers.
- SeaTalkng® VHF DSC Radios.
- RMK-9 and RMK-10 remote buttonpads.

Any adjustments to the shared brightness level will be applied to all products assigned to the same group.



Multiple brightness groups can be configured. For example, these groups could be used to reflect the physical location of products on your vessel e.g.: helm and flybridge.

Shared brightness requires:

- all products to be compatible with the shared brightness function (see list of compatible products above).
- the **Shared brightness** setting set to On for all products in the brightness group.
- products to be assigned to network groups.
- all the products in each group to be synchronized.

Assigning A Network Group

To enable the shared brightness and color, displays must be assigned to the same network group.

Compatible instrument displays and pilot controllers will also share their color scheme.

From the **Network Group** menu: (**Menu > Set-up > System Set-up > Network Group**)

1. Select the network group that you want to assign the display to.

Available groups are:

- None (default)
- Helm 1
- Helm 2
- Cockpit
- Flybridge
- Mast
- Group 1 — Group 5

2. Select **Brightness/Color Group**.
3. Select **This Group**.
4. Select **Sync**.

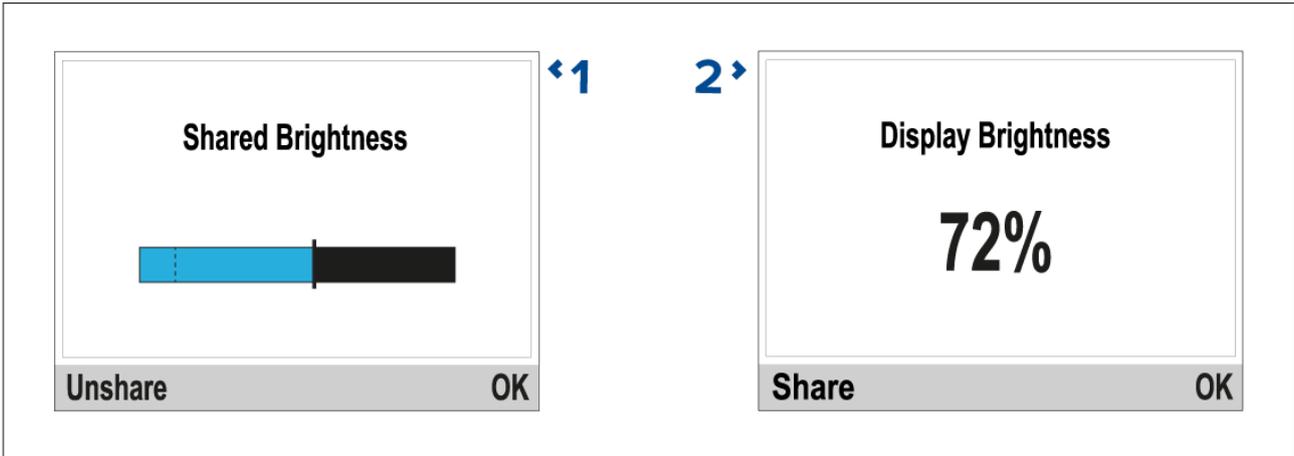
The System will now synchronize all displays assigned to the same group.

5. Select **OK**.
6. Carry out steps 1 to 5 on all displays.

When the brightness level is adjusted it will effect all displays assigned to the same group.

Unsharing the display

Displays can be removed from shared brightness so that brightness is individual to the display.

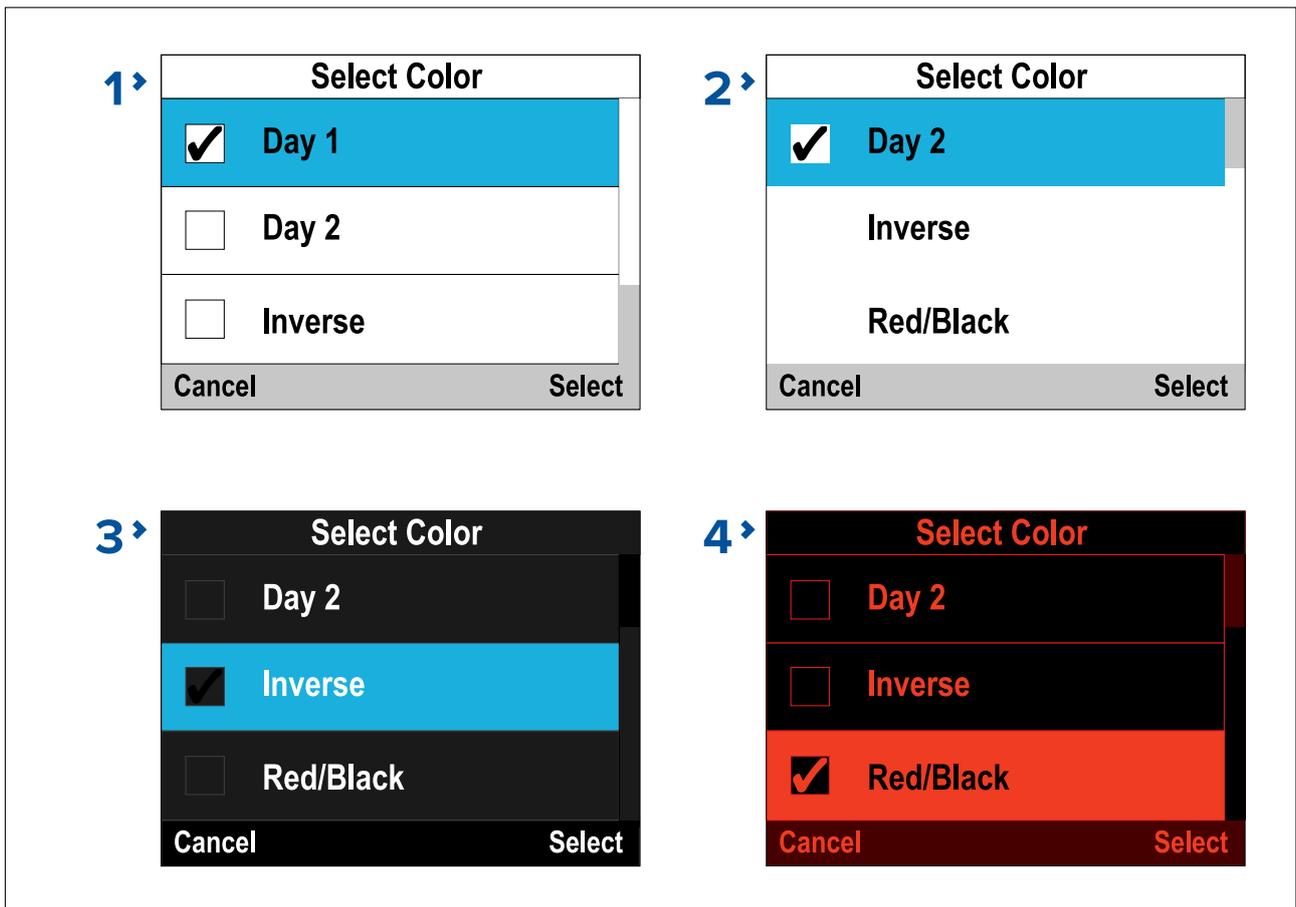


1. With the Shared brightness adjustment page displayed, select **Unshare** to revert to individual display brightness.
2. With the Display brightness page displayed, select **Share** to switch back to shared brightness.

Color schemes

The display's color scheme can be changed.

The available color schemes can be accessed from the **Colors** menu: (**Menu > Display Settings > Colors**)



1. **Day 1**
2. **Day 2**
3. **Inverse**
4. **Red/Black**

Note:
 If the display is part of a shared brightness network group the color scheme will change on all displays that support color schemes and are assigned to the same network group.

Display response

Setting the display response

Display response determines how quickly the values displayed onscreen are changed when changes occur in the received data. Setting the display response to a low value will dampen data fluctuations to provide a more stable reading. Setting the display response to a higher value will reduce the damping to make readings more responsive.

From the **Display Settings** menu: (Menu > Display Settings)

1. Select **Display Response**.
2. Select the data type:
 - Speed
 - Depth
 - Wind Speed
 - Wind Angle
 - Heading
3. Adjust the value as required.

By default response values are set to 12.

4. Select **Save**.

3.5 Multiple data sources (MDS)

MDS is a Raymarine scheme for managing multiple sources of identical data types on the same network (e.g.: in an MFD network you may have more than one source of GPS / GNSS position data).

The MFD will automatically select a preferred data source (device) to use for that data type.

MDS can be used for the following data types:

- Depth
- Speed through water
- Heading
- GPS
- GPS Datum
- Wind
- Time & Date

If you do not want to use the automatically selected data source you can manually select your preferred data source.

Note:

For MDS to be available on your system, all products in the system that report data must be MDS-compliant. The system will report any products that are NOT MDS-compliant. It may be possible to upgrade the software for these non-compliant products, to make them compliant. Visit the Raymarine website (www.raymarine.com) to obtain the latest software for your products.

If MDS-compliant software is not available for the product and you do NOT want to use the system's preferred data source, you must remove any non-compliant products from the system. You should then be able to select your preferred data source.

Once you have completed setting up your preferred data sources, you may be able to add non-compliant products back into the system.

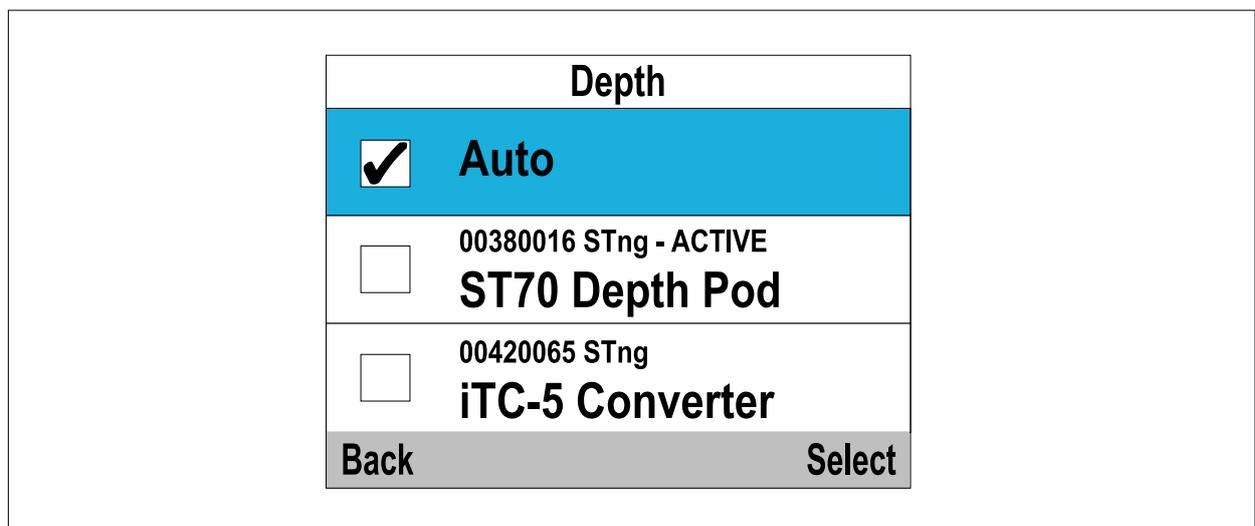
Selecting a preferred data source

You can select your preferred data source for data items that can be shown on the display.

From the **System Set-up** menu: (**Menu > Set-up > System Set-up**)

1. Select **Data Sources**.
2. Select the Data type.

The unit will now search for and display a list of all sources for the selected data type.



3. Select your preferred data source, or
4. Select **Auto** to allow the system to decide.

'ACTIVE' is displayed next to the data source that is the current source for the data type.

3.6 Quick options menu

Quick Options menu (**Menu > Quick Options**) is a dynamic menu that includes options relative to the Favorite page or Quick View page or data items on the page currently being viewed.

The following options are available:

- **Add to favorites** — Available on Data (quick view) pages (Adds the current page to the favorites pages)..
- **Edit page** — Available on all Favorite pages (Change page contents / data items).
- **Select Speed Type** — Available on Engine pages (Switch between **SOG** (Speed Over Ground) and **Speed Through Water** (STW) data items).
- **Select Data** — Available on Engine pages (Switch between **Coolant Temperature** and **Trim Position** data items).
- **View AIS targets** — Available on the AIS page (Only shown if there is Heading or stable COG data available).
- **AIS range** — Available on the AIS page (Changes the range used on the AIS page).
- **AIS Silent mode** — Available on the AIS page (Enables and disables transmission of AIS data).
- **Start timer** — Available on the Race timer page.
- **Stop timer** — Available on the Race timer page.
- **Reset timer** — Available on the Race timer page.
- **Adjust start times** — Available on the Race timer page.
- **Time scale** — Available on pages with data graphs (Use to adjust the time scale used on the graph).
- **Reset Max.** — Available on pages where a maximum values for a data item is displayed (e.g.: Max speed).
- **Reset Min.** — Available on pages where a minimum values for a data item is displayed (e.g.: Min depth).
- **Reset Ave.** — Available on pages where a average values for a data item is displayed (e.g.: Ave speed).

3.7 Software updates

The software running on the product can be updated.

- Raymarine periodically releases software updates to improve product performance and add new features.
- The software on many products can be updated using a connected and compatible multifunction display (MFD).
- Refer to www.raymarine.com/software/ for the latest software updates and the software update procedure for your specific product.

Important:

- To prevent potential software-related issues with your product, always follow the relevant update instructions carefully and in the sequence provided.
- If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine technical support.

Caution: Installing 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 an incomplete update is not covered by Raymarine warranty.
- By downloading the software update package, you agree to these terms.

Chapter 4: Transducer calibration

Chapter contents

- 4.1 Transducer calibration on page 24
- 4.2 Depth calibration on page 24
- 4.3 Speed calibration on page 25
- 4.4 Wind calibration on page 34
- 4.5 Rudder reference calibration on page 38
- 4.6 Compass calibration on page 39

4.1 Transducer calibration

The transducers listed below can be calibrated using the display.

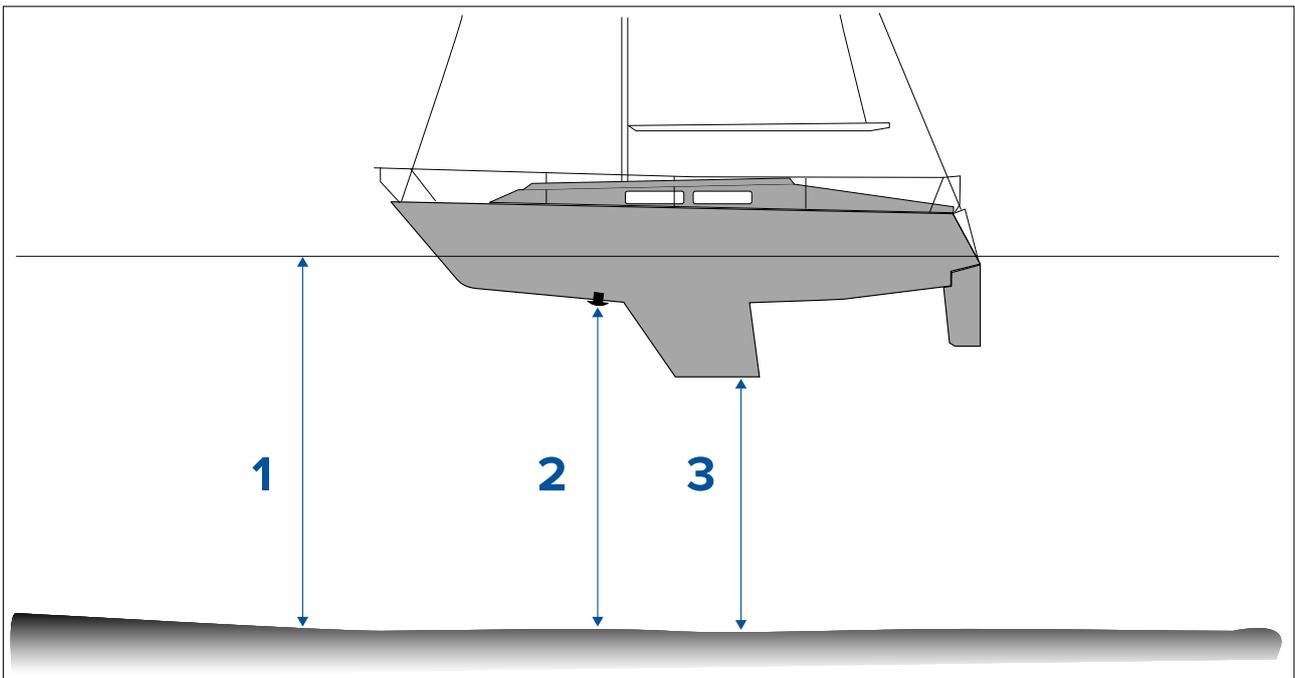
- **Depth transducers** — Connected via iTC-5 or a legacy depth pod.
- **Speed and temperature transducers** — Connected via iTC-5 or a legacy speed pod.
- **Wind transducers** — Connected via iTC-5 or a legacy wind pod.
- **Smart transducers** — Connected directly to SeaTalkng® backbone.
- **Fluxgate compass** — Connected via an iTC-5
- **Rudder reference transducer** — Connected via an iTC-5

4.2 Depth calibration

Depth Offset

Depths are measured from the transducer face to the bottom (e.g.: seabed). An offset value can be applied to the depth data so that the displayed depth reading represents the depth reading taken from either the keel (negative offset) or the waterline (positive offset).

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



1. **Waterline offset** — Values greater than zero (Positive values) represent a waterline offset
2. **Transducer** — Zero offset represents the depth from the transducer's location
3. **Keel offset** — Values less than zero (Negative values) represent a keel offset

Setting the depth offset

The depth calibration consists of setting a depth offset that is relevant to your depth transducer's location.

From any favorite page:

1. Select **Menu**.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

The display will search for and display a list of connected devices. (i.e. iTC-5, DST or transducer pod).

5. Select the device that the transducer you are calibrating are connected to.
A list of available transducer data is displayed.
6. Select **Depth**⁽¹⁾.

Important:

(1) Step only applicable to iTC-5.

7. Select **Depth Offset**.
8. Select **Depth From**:
A list of transducer offsets is displayed:
 - Waterline
 - Keel
 - Transducer (default)
9. Select the location that you want depth measurements to be taken from.
After selection the depth offset page is displayed. If you have selected Waterline or Keel an offset must be applied.
10. Select **Offset**:
11. Use the **Up** and **Down** buttons to adjust the depth offset to the required value.
The offset value should be the same as the measured distance:
 - from the transducer face to the Waterline, or
 - from the transducer face to the bottom of the Keel.
12. Select **Save**.

Setting an incorrect depth offset could lead to your vessel running aground.

4.3 Speed calibration

Speed transducer calibration is required as transducer performance is affected by a number of variables such as transducer location, shape of the hull and water flow characteristics. The purpose of performing Speed calibration is to ensure that the speed readings at the instrument are a true indication of the vessel's actual speed.

In order to achieve accurate results, speed calibration must be carried out in calm conditions with zero tide and zero current.

Speed calibration aligns the instrument's log speed (Speed Through Water) to:

- Speed Over Ground (SOG), or
- a referenced speed

Calibrating using SOG

For most installations a 1 Point Speed Calibration is all that is required.

If the 1 point calibration does not provide sufficiently accurate readings or you require a higher level of precision for your speed readings then a Speed Run Calibration can be carried out. It is advisable to carry out the Speed Run Calibration at as many speeds as possible. This is particularly important for planing vessels.

⁽¹⁾Conventional speed transducers have a maximum of 5 calibration speeds, and smart transducers (e.g. DST800) have up to 8.

If required each calibration point can also have a calibration factor applied to further align the log speed reading across different vessel speeds.

Note:

⁽¹⁾The Speed Run Calibration cannot be performed when the transducer is connected to a Speed Pod.

Calibrating without SOG

For most installations a 1 Point Speed Calibration is all that is required. The calibration must be performed using a way of estimating actual vessel speed and adjusting the displayed reading so that the log speed matches the your estimated speed.

Note:

A Speed Run Calibration can only be performed if SOG data is available.

If required, further calibration points can be added and a calibration factor can be applied to further align the log speed with actual vessel speed.

	iTC-5		Smart (DST)		Speed pod	
	SOG	No SOG	SOG	No SOG	SOG	No SOG
1 Point Speed Calibration	✓	✓	✓	✓	✓	✓
Speed Run Calibration	✓	✗	✓	✗	✗	✗
Manual Calibration	✓	✓	✓	✓	✓	✓

1 Point Speed Calibration

To perform a 1 Point Speed Calibration follow the steps below.

Prerequisites:

- For best results SOG data should be available, or an alternative method of estimating vessel speed must be used (e.g. vessel speed can be estimated using [Nautical Measured Mile Markers](#) or similar landmarks of a known distance apart).
- You will need to be underway, with sufficient space to maneuver unhindered.
- In order to achieve accurate results, water conditions must be calm with zero tide and zero current.

With a favorite page displayed:

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

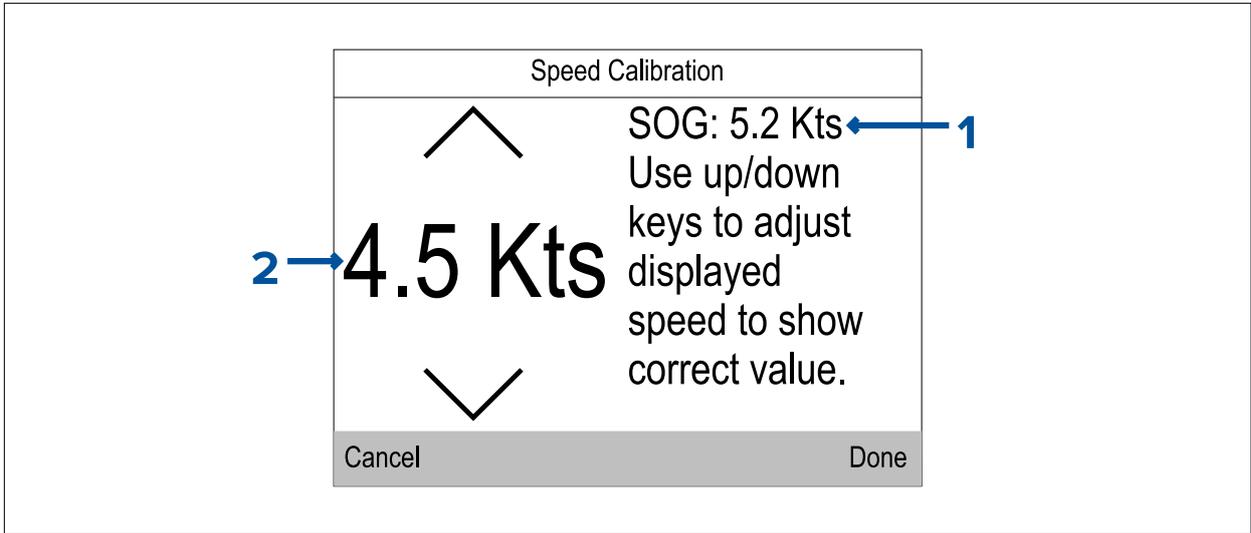
The display will search for and show a list of connected devices. (i.e. iTC-5, DST or transducer pod)

5. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed,
6. ⁽¹⁾Select **Speed**.

Important:

(1) Step only applicable to iTC-5.

7. Select **Speed Calibration**.
8. Select **Adjust speed up/down**.
The 1 Point Speed Calibration page is displayed.



1	SOG speed reading
2	Current speed reading

If SOG data is not available then the SOG value will display dashes.

9. Accelerate your vessel to a steady, typical cruising speed.
10. Use the **Up** and **Down** buttons to adjust the current speed reading so that it matches the SOG reading or matches your estimated speed.
11. Select **Done** when both values are the same.
The calibration complete page is displayed.
12. Select **OK**.

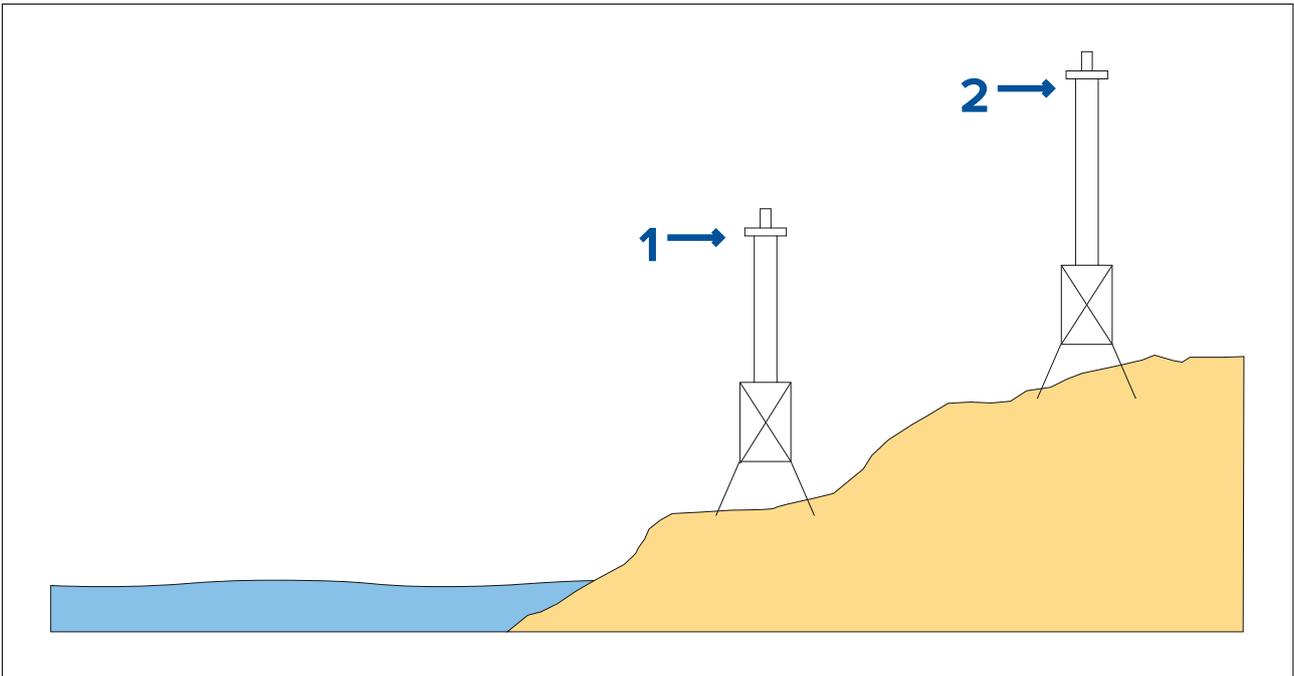
If you experience significant deviation between SOG and log speed readings at different vessel speeds then a Speed Run Calibration should be performed. Refer to the [Performing a Speed Run Calibration using SOG](#) section for details.

Nautical measured mile markers

When neither SOG data or any other reliable means of estimating Speed Through the Water (STW) is available, Nautical measured mile markers can be used to help calibrate Log speed. Nautical measured mile markers are identified by two pairs of posts or towers. The distance between each pair of markers is 1 nautical mile.

Each marker in a pair is separated by distance and elevation from its partner. The front marker is closer to the water and shorter than the marker behind it.

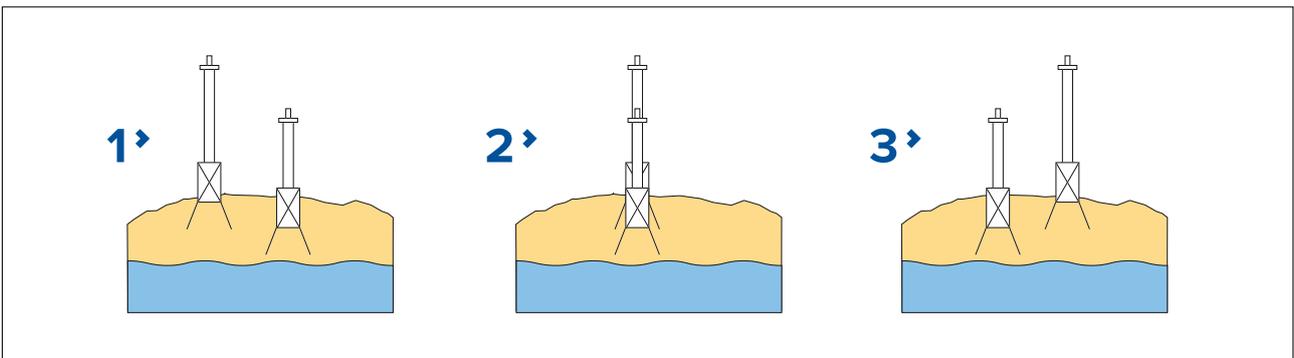
Markers — side view



1. Front marker
2. Rear marker

When the 2 markers appear vertically aligned your vessel is on the correct range line to begin a measured mile run.

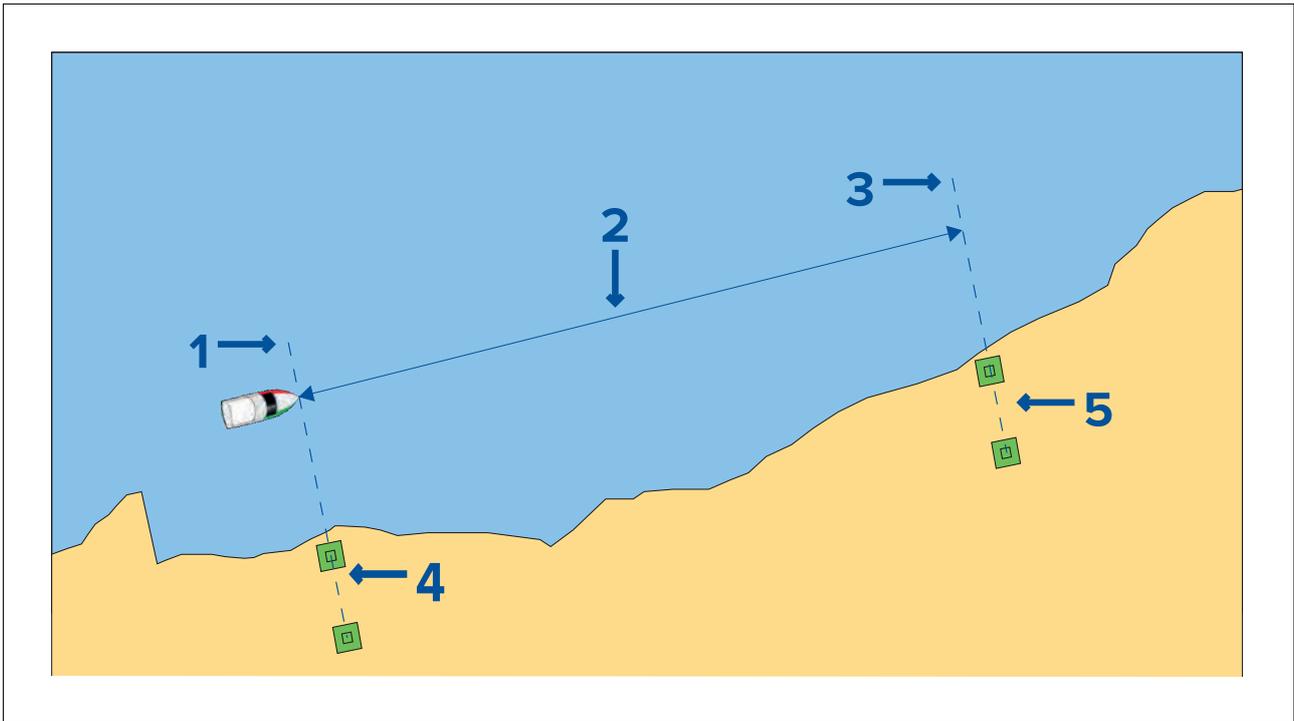
Marker alignment (viewed from vessel)



1. Vessel left of range line
2. Vessel on range line
3. Vessel right of range line

The vessel should already be at top speed and as the first pair of markers appear aligned a stopwatch should be started, when the vessel passes the second pair of aligned markers the stopwatch is stopped.

Measuring a nautical mile



1. Starting point (start stopwatch)
2. Measured mile
3. End point (stop stopwatch)
4. First pair of markers
5. Second pair of markers

To provide a more accurate reading the vessel should make between 4 to 6 runs in both directions to allow for tide and wind conditions. The average of the time taken over all runs should be used to calculate Log Speed.

The Log speed can then be worked out by taking the distance travelled (1 nautical mile) and dividing it by the average time taken to perform the run . The resulting calculation is your average speed in knots.

Performing a Speed Run Calibration using SOG

If a higher level of precision is required than that achieved with the 1 Point Speed Calibration procedure, a Speed Run Calibration should be performed. The Speed Run Calibration will ensure that the Log Speed reading is accurate over the vessel's full speed range.

Prerequisites:

- SOG data must be available.
- You will need to be underway, with sufficient space to maneuver unhindered.
- In order to achieve accurate results, water conditions must be calm with zero tide and zero current.

Note:

Speed Run Calibration cannot be performed when the transducer is connected using a Speed Pod.

The steps below detail the method of calibrating speed transducers connected using an iTC-5 or smart transducers (e.g.: DST800).

With a Favorite page displayed:

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

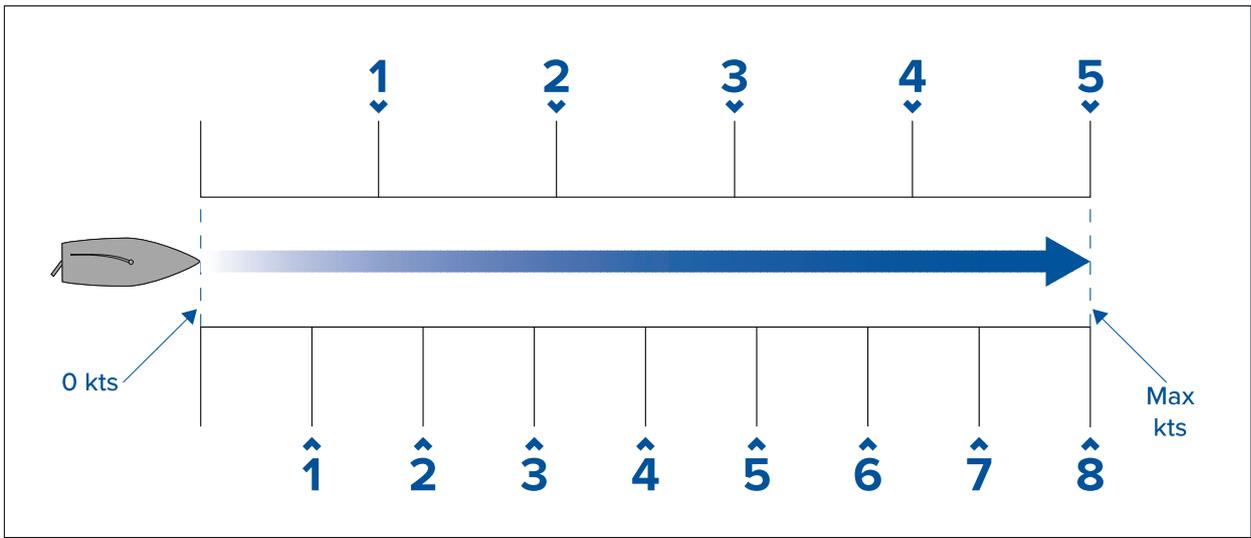
The display will search for and show a list of connected devices. (i.e. iTC-5 or DST)

5. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed.
6. (1)Select **Speed**.

Important:
(1)Step only applicable to iTC-5.

7. Select **Speed Calibration**.
8. Select **New cal using SOG**.

You will need to add calibration points at a range of speeds spanning the full speed range of the vessel. Conventional transducers can have up to 5 calibration points and smart transducers can have up to 8. Ideally the calibration points should be taken at regular increments throughout the speed range with the last calibration point being close to the vessel's top speed.



With the Speed Transducer connected to a Speed Pod the 5 calibration points are fixed in sequence at 2, 4, 8, 16 and 32 knots. When adding calibration points during the Speed Run Calibration ensure vessel speed is as close to the fixed calibration point speeds as possible, as the calibration factor applied will be the difference between the actual vessel speed and the fixed calibration point speed.

9. Select **Start**.
10. Ensure the vessel's speed is steady at your first calibration point speed and select **Add**.
11. Repeat step 10 for all remaining calibration points, ensuring that the calibration points are equally spaced throughout your vessel's speed range from stationary to top speed.
Once all calibration points have been successfully added the Calibration complete message is displayed.
12. Select **OK**.

Calibration table

By default speed transducers include a default set of calibration points which are overwritten during the normal speed calibration process. The calibration points are stored in the calibration table. The calibration table can be accessed from the Advanced menu.

From the **Advanced** menu you can:

- View the existing calibration table
- Adjust the existing calibration points (Add, Edit or Delete calibration points)
- Enter a new calibration table
- Check Log Speed against SOG
- Reset the calibration table to factory defaults

Viewing the calibration table

Calibration points are stored in the calibration table.

From a favorite page:

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

The display will search for and show a list of connected devices. (i.e. iTC-5, DST or transducer pod)

5. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed,
6. ⁽¹⁾Select **Speed**.

Important:

(1)Step only applicable to iTC-5.

7. Select **Speed Calibration**.
8. Select **Advanced**.
9. Select **View cal table**.

The calibration table is displayed.

1 >

Speed Calibration		
Uncal.	Factor	Calibrated
2.0Kts	x1.00	2.0Kts
4.0Kts	x1.00	4.0Kts
8.0Kts	x1.00	8.0Kts
Back		

2 >

Speed Calibration		
PaddleWheel	Prev.	New
0.6 Hz	0.6 Kts	---
5.1 Hz	1.8 Kts	---
11.9 Hz	3.4 Kts	---
Back		

1. Speed transducer connected via iTC-5 or speed pod.
2. Smart DST transducer connected directly to SeaTalk ^{ng}.

10. Use the **Up** and **Down** buttons to scroll up and down through the table.
11. Select **Back** to return to the Advanced Menu.

Checking speed

Your current speed can be checked at any time from the **Advanced** menu.

From the Advanced menu:

1. Select **Check speed**.

The Check speed page is displayed:

Speed	
Speed	7.5 Kts
SOG	8.0 Kts
OK	

The Check speed page can also be accessed from the calibration table adjustment page: **Advanced > Adjust cal table > Start > Options > Check speed**.

Manually calculate a calibration factor

New calibration factors can be calculated manually following the steps below.

Prerequisites:

- You will need to be underway, with sufficient space to maneuver unhindered.
 - To ensure accuracy, water conditions should be calm with zero tide and zero current.
 - You will need to calibrate each calibration speed point, starting with the lowest
1. Run your vessel at a steady speed, approximately that of the selected calibration speed, over a measured distance making a note of:
 - The measured distance in nautical miles
 - The current speed value in knots
 - The time in minutes it takes to cover the measured distance
 2. Calculate the actual speed over the measured distance using the calculation: $(\text{Speed} = (60 \times \text{Distance}) / \text{Time})$ '60' is used to ensure the calculation is in minutes rather than hours or tenths of an hour.
e.g. Distance (D) = 14 nautical miles, Time (T) = 105 minutes (1 hour 45 minutes) so:
 - $S = (60 \times D) / T$
 - $S = (60 \times 14) / 105$
 - $S = 840 / 105$
 - $S = 8 \text{ kts}$

If the calculated speed is:

- the same as the current speed, (noted during the Speed Run Calibration) then the calibration is correct at this speed so no action is required.
- not the same as the current speed. Calculate a new, corrected calibration factor, as follows: e.g. if actual speed equals 8 kts, indicated speed was 7.5 kts and the old calibration factor was 1.4 then:
 - new cal factor = actual speed x old factor / indicated speed
 - new cal factor = $8 \times 1.4 / 7.5$
 - new cal factor = $11.2 / 7.5$
 - new cal factor = 1.49

Adding a Calibration point

Calibration points can be manually added to the Calibration table. The amount of Calibration points that can be stored is determined by the type of speed transducer and method of connection.

From the Transducer set up menu: **Menu > Set-up > Transducer set-up > Continue** :

1. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed.
2. ⁽¹⁾Select **Speed**.

Important:

(1)Step only applicable to iTC-5.

3. Select **Speed Calibration**.
4. Select **Advanced**.
5. Select **Adjust Calibration**.
6. Select **Start**.
The current Calibration table is displayed.
7. Select the relevant Calibration point from the table.
8. Select **Options**.
9. Select **Add cal point**.
10. Use the **Up** and **Down** buttons to adjust the displayed Log speed to match current SOG if available or to match your estimated actual speed.
11. Select **Add**.
12. Select **OK**.

13. Repeat steps 7 to 11 for each Calibration point you want to add.

The more Calibration points you add the higher the accuracy of Log speed will be.

Note:

If the text appears red then the new reading deviates too far from the stored reading. You will need to add a Calibration point closer to the stored reading a try again.

Editing a Calibration point

Existing Calibration points can be edited.

From the **Advanced** menu:

1. Select **Adjust cal table**.
2. Select **Start**.
3. Highlight the relevant Calibration point from the table.
4. Select **Options**.
5. Select **Edit cal point**.
The Calibration point adjustment page is displayed.
6. Use the **Up** and **Down** buttons to adjust the Calibration point for the selected speed to match your new Calibration speed.
7. Select **Done** to return to the Calibration table.
8. Repeat steps 4 to 7 for all Calibration points that require adjustment.
9. Select **Finish** when all of the required Calibration points have been adjusted.

Deleting a Calibration point

Calibration points can be deleted from the Calibration table.

From the **Adjust cal table** menu:

1. Select **Start**.
2. Highlight the Calibration point you want to delete.
3. Select **Options**.
4. Select **Yes** to delete.
The Calibration point is deleted from the Calibration table.

Resetting the Calibration table

The Calibration table can be reset to factory default values by following the steps below:

From the Advanced Menu:

1. Select **Reset to defaults**.
2. Select **Yes**.
3. Select **OK**.

The Calibration table is reset to factory default values.

Entering a new Calibration table

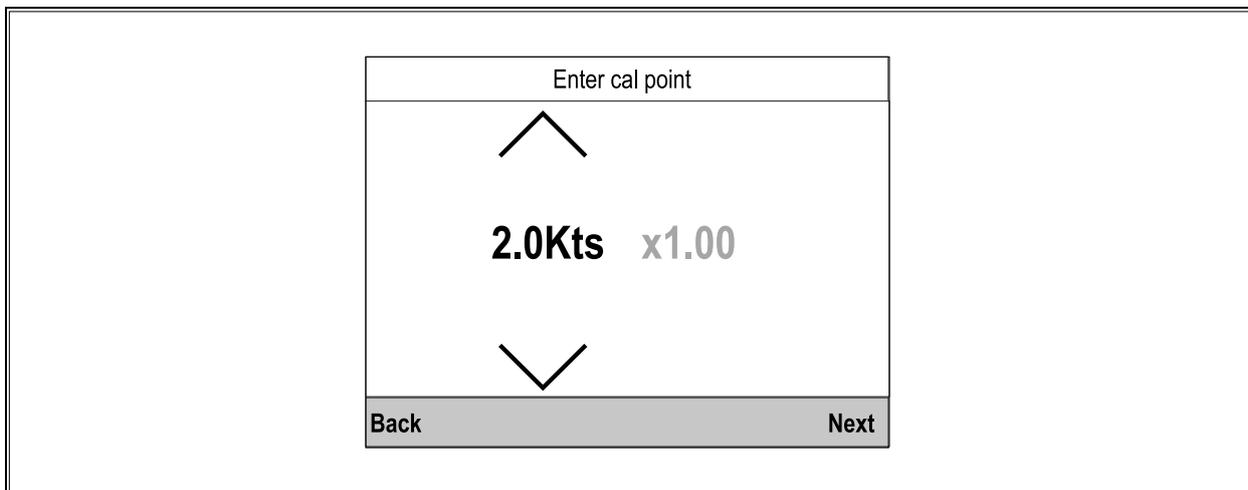
A new Calibration table can be added manually. The new Calibration table will replace the existing table which is deleted. This is useful when you have been provided a specific calibration table for your hull type.

Note:

You will need to work out your Calibration factors for each Calibration point before you can create the new Calibration table.

From the **Advanced** menu:

1. Select **Enter new cal table**.
2. Select **Start**.
All existing Calibration points are deleted and you will be prompted to enter new Calibration points.



3. Use the **Up** and **Down** buttons to select the desired speed that you want to add a Calibration point for.
4. Select **Next**.
5. Use the **Up** and **Down** buttons to adjust the Calibration factor to the correct value.
6. Select **Done**.
7. Select **Add** to add the next Calibration point.
8. Repeat steps 3 to 7 for all Calibration points you want to add.
9. Select **Finish** when all Calibration points have been added.
10. Select **OK**.

Calibrating Water temperature

The Water temperature reading can be calibrated as follows:

You will need a suitable thermometer to measure the temperature of the water.

From a favorite page:

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

The display will search for and show a list of connected devices. (i.e. iTC-5, DST or transducer pod)

5. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed.
6. (1)Select **Speed**.

Important:

(1)Step only applicable to iTC-5.

7. Select **Current Temperature** option.
8. Use a suitable thermometer to measure the actual water temperature.
9. Use the **Up** and **Down** buttons to match the displayed Water temperature to the actual measured water temperature.
10. Select **Save** to save the reading.

4.4 Wind calibration

Calibrating wind

Calibration of wind transducers is important to ensure accurate data is displayed.

Prerequisites:

- You will need to be underway, with sufficient space to turn in a large slow circle unhindered.

- Conditions should be calm (i.e. a slight sea) and a steady breeze. Try to ensure the vessel is not rolling or pitching too much.

From a favorite page:

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Transducers Set-up**.
4. Select **Continue**.

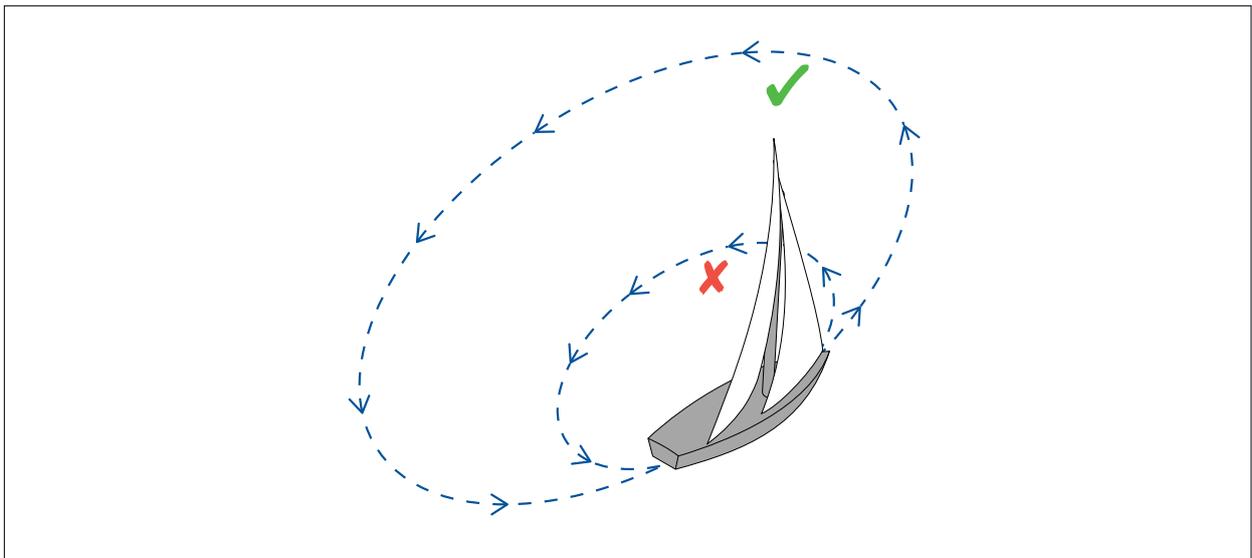
The display will search for and show a list of connected devices. (i.e. iTC-5, DST or transducer pod)

5. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed,
6. ⁽¹⁾Select **Wind**.

Important:

(1) Step only applicable to iTC-5.

7. Select **Calibrate Wind Xdcr**.
8. Keep the vessel speed below 2 kts and observing the screen, start to turn the vessel in a circle, then select **Start**.
9. Continue turning the vessel in circles until 'Complete' is displayed onscreen.
If your rate of turn is too fast during calibration, a 'Slow down' message is displayed. If this happens, reduce your rate of turn, this can be achieved by slowing down and / or steering in a wider circle.



10. Select **Continue**.
11. If required, use the **UP** and **DOWN** buttons to manually adjust the offset.
12. Press **SELECT** to complete the calibration process and save the settings.

If required, you can manually adjust each part of the calibration steps by selecting the relevant options from the **Wind** menu.

Aligning the wind transducer

This procedure ensures that the sensors in the wind transducer are correctly calibrated to record rotation of the wind vane.

Prerequisites:

- You will need to be underway, with sufficient space ahead to proceed unhindered.
- Conditions should be calm (i.e. a slight sea) and a steady breeze. Try to ensure the vessel is not rolling or pitching too much.

From the list of transducers found:

1. Select the device that the transducer(s) you are calibrating are connected to.
A list of available transducer data is displayed,

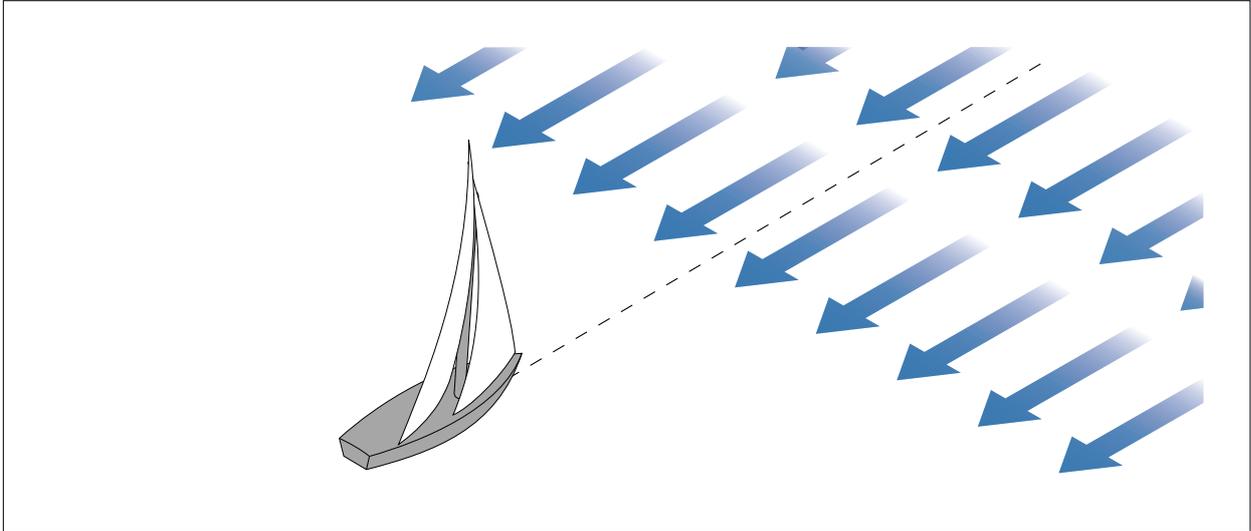
2. ⁽¹⁾Select **Wind**.

Important:

(1) Step only applicable to iTC-5.

3. Select **Align Wind Xdcr**.

4. Now steer your vessel directly into the wind and select **Continue**.



Adjusting the wind transducer

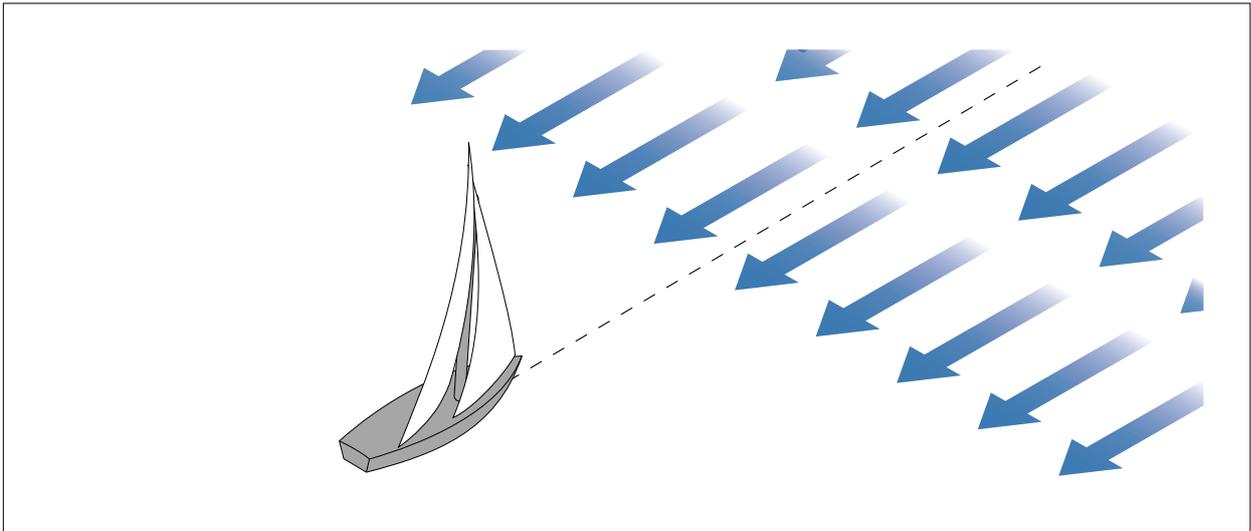
Adjusting the wind transducer compensates for any small errors which may exist in the alignment of the wind transducer.

Prerequisites:

- You will need to be underway, with sufficient space to proceed unhindered.
- Conditions should be calm (i.e. a slight sea) and a steady breeze. Try to ensure the vessel is not rolling or pitching too much.

From the list of transducers found:

1. Steer your vessel directly into the wind



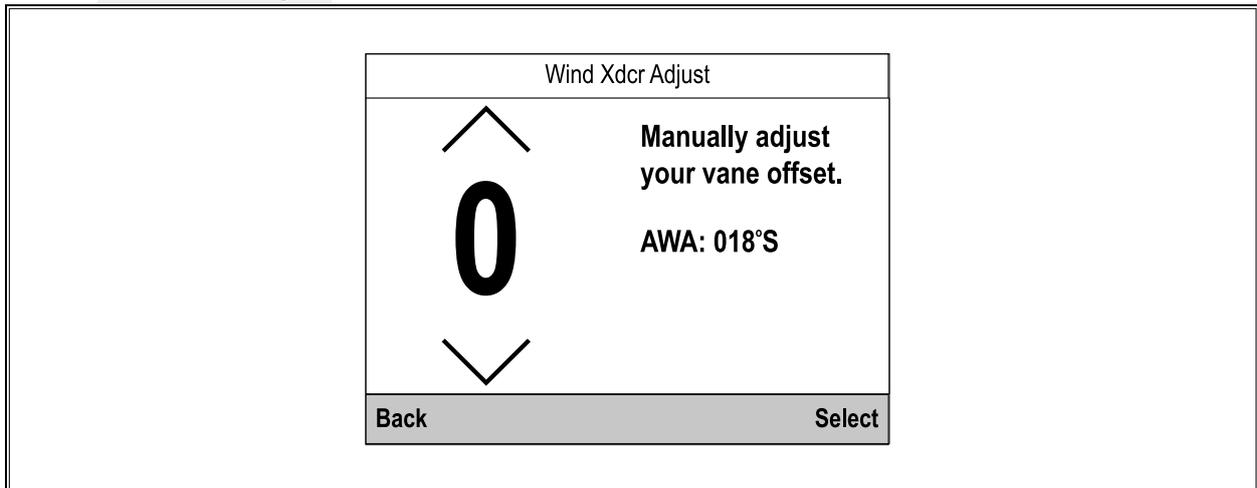
With your vessel sailing directly into the wind the Apparent Wind Angle (AWA) should be 0 degrees.

2. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed.
3. ⁽¹⁾Select **Wind**.

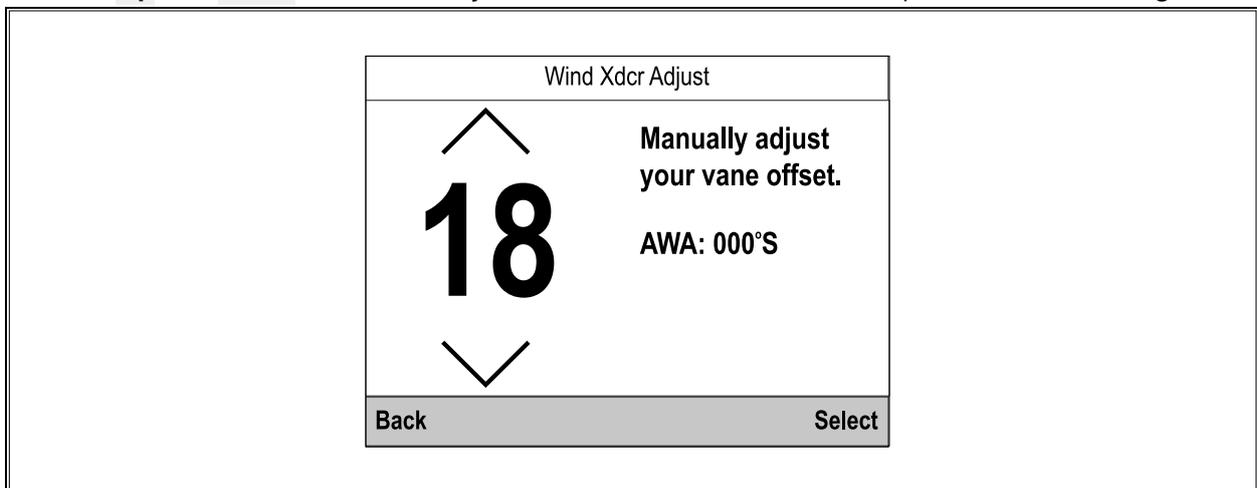
Important:

(1)Step only applicable to iTC-5.

4. Select **Wind Xdcr Adjust**.



5. Use the **Up** and **Down** buttons to adjust the offset value so that the reported AWA is 0 degrees.



6. Select **Select**.

Adjusting apparent wind speed

Adjusting the Apparent Wind Speed (AWS) reading compensates for any small errors which may exist in the apparent wind speed reading.

Prerequisites:

- To apply an offset to your AWS readings an accurate reference for AWS must be used to compare the instrument's AWS reading against.
- Conditions should be calm (i.e. a slight sea) and a steady breeze. Try to ensure the vessel is not rolling or pitching too much.

From the list of transducers found:

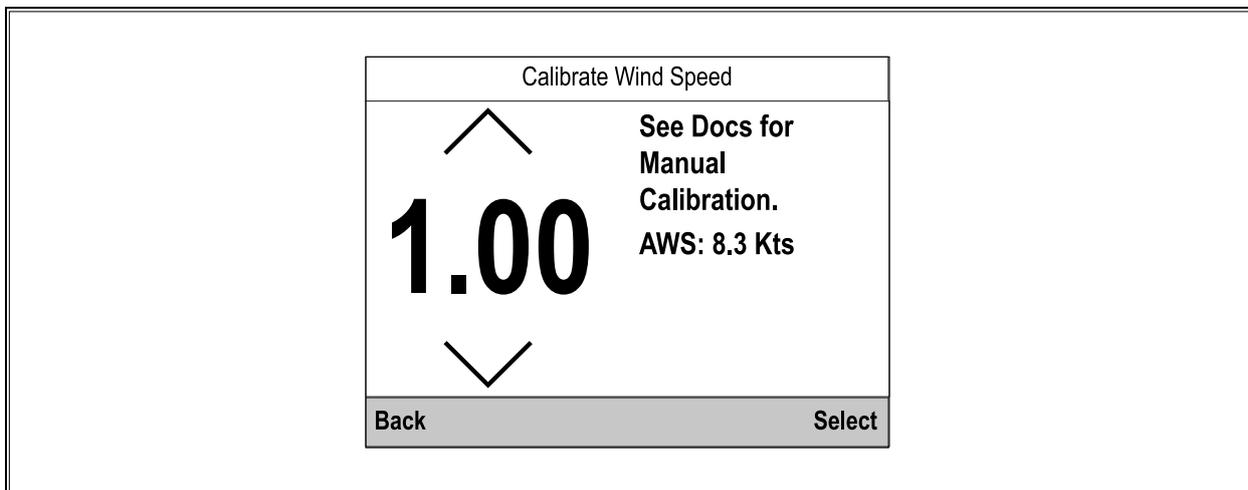
1. Select the device that the transducer you are calibrating is connected to.
A list of available transducer data is displayed.
2. ⁽¹⁾Select **Wind**.

Important:

(1)Step only applicable to iTC-5.

3. Select **App Wind Speed**.

The AWS calibration factor page is displayed.



4. Use the **Up** and **Down** buttons to adjust the calibration factor until the AWS reading matches your referenced source of AWS.

The Calibration Factor default is 1.00 the Calibration Factor can be adjusted from 0.25 to 2.00.

5. Select **Select** to save the Calibration factor.

4.5 Rudder reference calibration

You can calibrate a rudder reference transducer that is connected to an iTC-5.

The rudder reference transducer must be connected to the rudder reference connection of the iTC-5. Rudder reference transducers connected to an autopilot must be calibrated using the pilot controller.

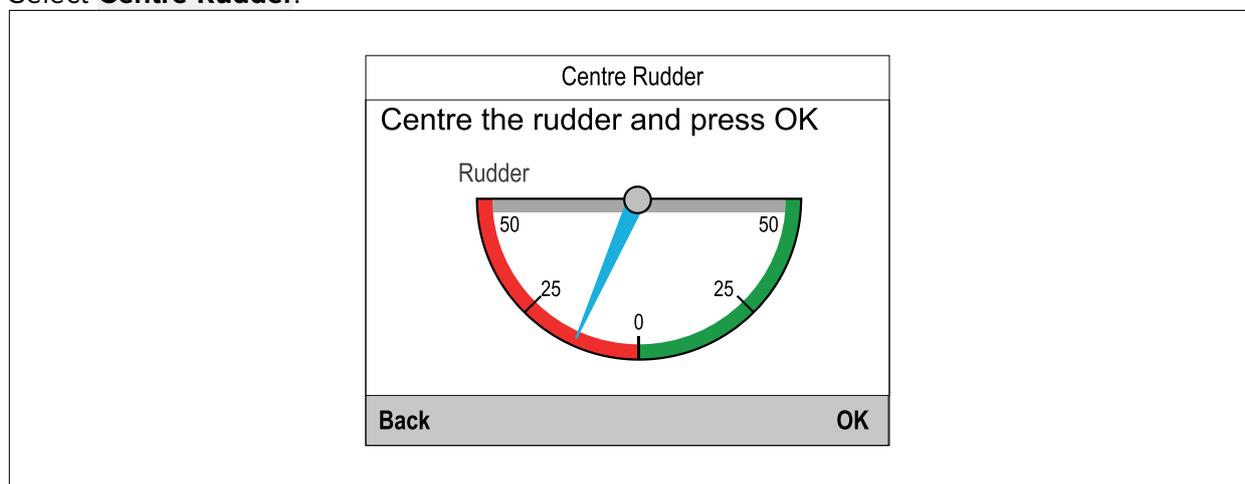
Centering the Rudder

To calibrate rudder position follow the steps below.

Centering the Rudder requires a method of knowing the Rudder's actual position.

From the Transducer Set-up menu (**Menu > Set-up > Transducer Set-up:**

1. Select **Continue**.
The display will search for and display a list of connected devices. (i.e. iTC-5, DST or transducer pod)
2. Select **iTC-5**.
A list of available transducer data is displayed,
3. Select **Rudder**.
4. Select **Centre Rudder**.



5. Turn the steering until your Rudder is centred.

The Rudder reference transducer has indicators on its base and on the rudder arm, ensure these marks are lined up.

6. When the Rudder is centered, select **OK**.
7. Select **Back** to return to the Rudder calibration menu.

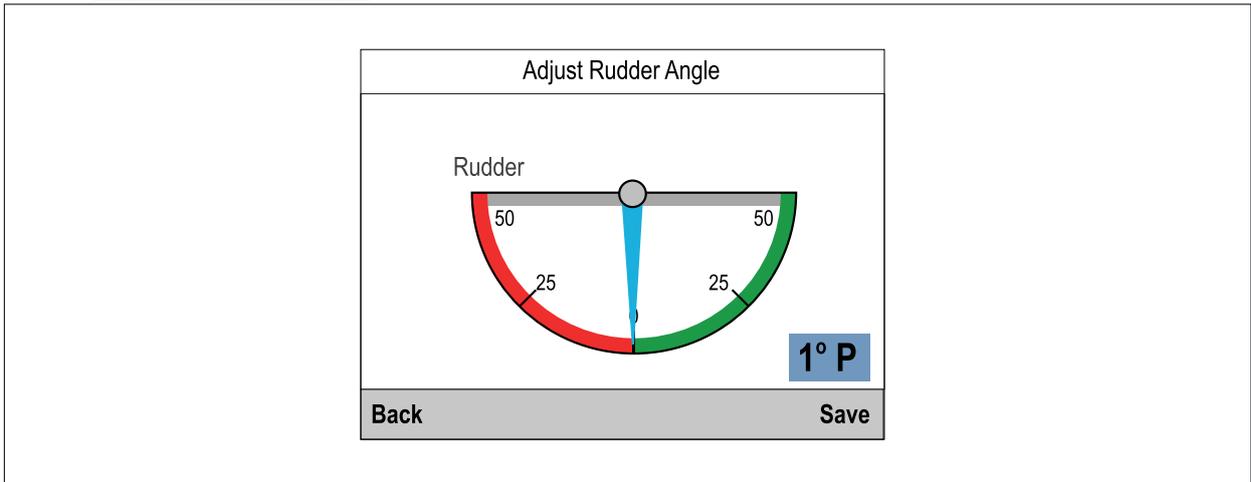
Adjusting the Rudder Angle

Rudder Angle can be adjusted manually.

Manual adjustment of the Rudder Angle requires a method of knowing the Rudder's actual position.

From the Transducer Set-up menu (**Menu > Set-up > Transducer Set-up**):

1. Ensure that the rudder is centered.
2. Select **iTC-5**.
A list of available transducer data is displayed.
3. Select **Rudder**.
4. Select **Adjust Rudder Angle**.



5. Use the **Up** and **Down** buttons to adjust the pointer so that the pointer and the reported Rudder Angles are both zero.
6. Select **Save**.

Inverting the Rudder

If the display's Rudder pointer moves in the opposite direction (i.e. when you turn the Rudder starboard the pointer moves port) this can be corrected by inverting the Rudder.

From the Transducer Set-up menu (**Menu > Set-up > Transducer Set-up**):

1. Ensure that the rudder is centred.
2. Select **iTC-5**.
A list of available transducer data is displayed.
3. Select **Rudder**.
4. Select **Invert Rudder Angle**.
5. If the pointer is pointed in the opposite direction than that expected, select **Invert**.

4.6 Compass calibration

You can use the display to calibrate a Fluxgate compass.

The compass must be connected to the compass connection of the iTC-5. Compasses connected to an autopilot must be calibrated using a Pilot Controller.

Swinging the Compass

You will need to turn your vessel in slow circles while the system automatically makes adjustments to account for compass deviation. Each 360-degree circle should take no less than two minutes, and you should complete at least two circles.

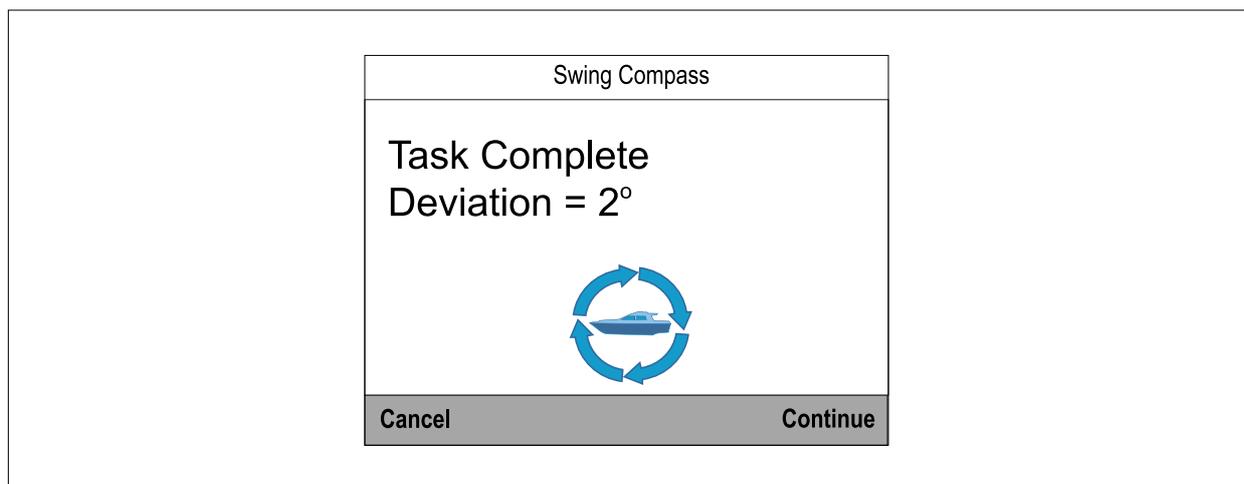
It is recommended that a second display or MFD is used to display heading data, whilst performing the Compass Swing.

From the Transducer Set-up menu (**Menu > Set-up > Transducer Set-up**):

1. Select **Continue**.
A list of connected devices is displayed. (i.e. iTC-5, DST or transducer pod)
2. Select **iTC-5**.
A list of available transducers is displayed,
3. Select **Compass**.
4. Select **Swing Compass**.
5. Start moving vessel in slow even circles, then press **Start**.
6. Keep vessel speed below 2 knots. Watch the display to ensure your turn rate is not too fast. If the message 'Slow Down — turn rate too fast' is displayed reduce your rate of turn, this can be achieved by slowing down and / or steering in a wider circle.

If the 'Slow Down — turn rate too fast' message is displayed the current circle will have to be repeated.

When the Compass has been successfully calibrated, a message will be displayed showing the detected compass deviation.



7. If the deviation is greater than 15 degrees you will need to relocate the Compass farther away from metal items or items that may cause interference, then repeat the calibration process. If you still find a deviation of more than 15 degrees, contact your Raymarine dealer for advice. If the deviation is within acceptable limits, press **Continue**.

Setting the Compass Offset

You can manually apply an offset to the compass heading by following the steps below.

To apply an offset you require a source of heading such as the ship's compass.

From the Transducer Set-up menu (**Menu > Set-up > Transducer Set-up**):

1. Ensure that the Rudder is centred
2. Select **iTC-5**.
A list of available transducers is displayed.
3. Select **Compass**.
4. Select **Compass Offset**.
5. Steer your vessel on a steady course.
6. Use the **Up** and **Down** buttons to adjust the compass offset until the displayed heading matches the heading of the ship's compass.
7. Select **Save**.

Chapter 5: Favorite Pages

Chapter contents

- [5.1 Favorite pages on page 42](#)
- [5.2 Customizing pages on page 50](#)

5.1 Favorite pages

Data is displayed on Favorite pages. By default 7 Favorite pages are created. The default page's layout and content are dependent on the boat type selected during the startup wizard.

The data displayed on each page can be customized. Pages can be deleted and new pages can be created. The maximum number of pages the display can hold is 10. There must always be a minimum of 1 page.

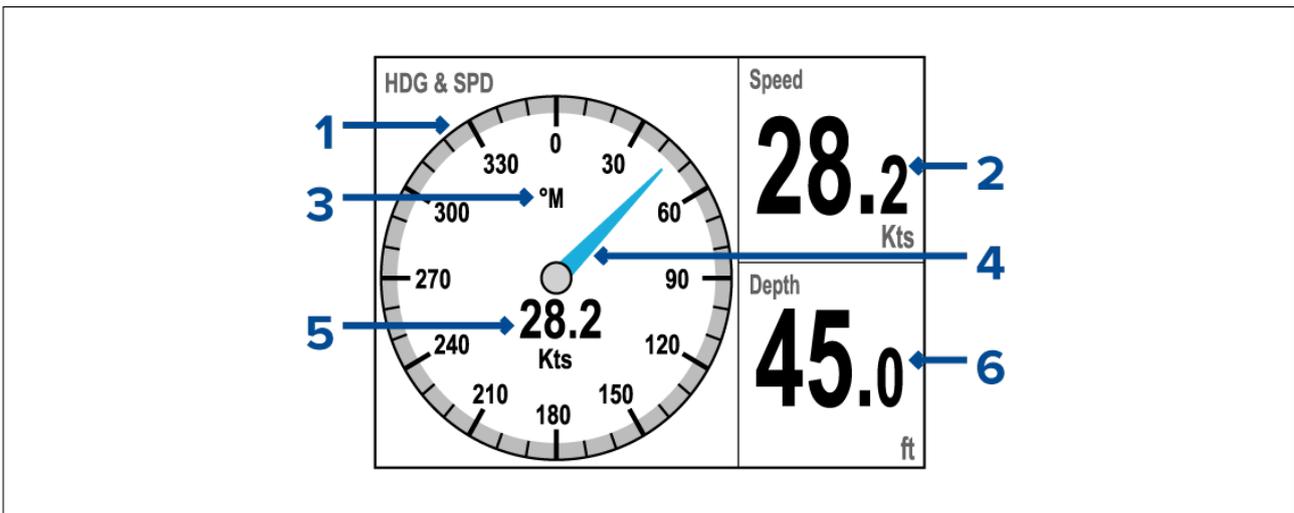
Pages are customized using the **Favorite pages** menu: **Menu > Favorite Pages**

For more information on boat data refer to [Chapter 6 Data \(quick view\)](#).

Heading & speed favorite page

The Heading and speed page is available for all boat types.

The Heading and speed favorite page consists of the following:

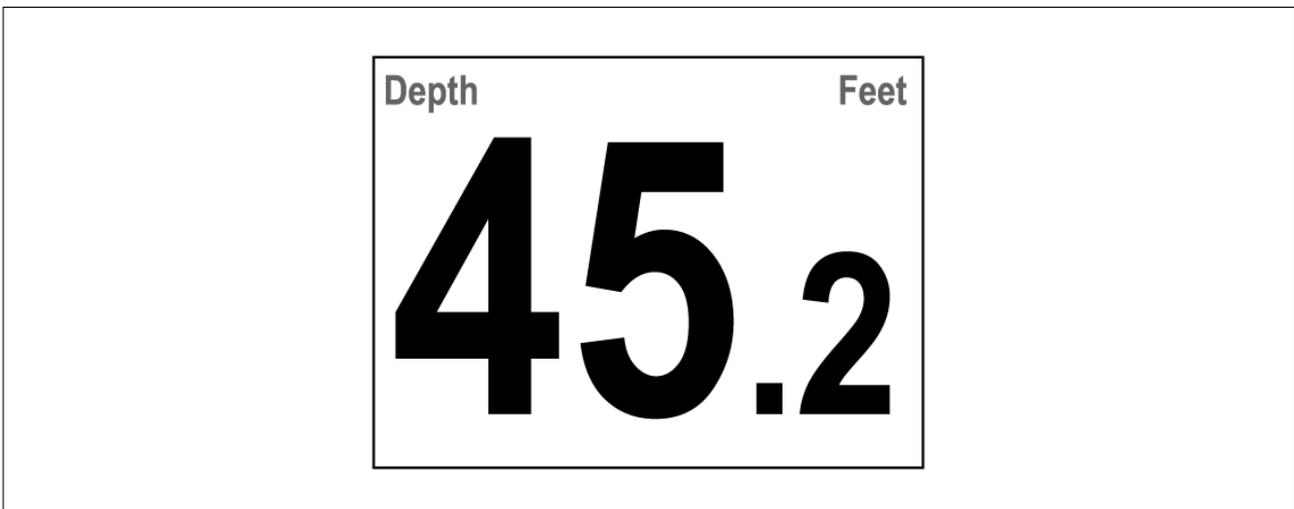


1. Compass dial
2. Speed
3. Heading mode (M = Magnetic, T = True)
4. Heading indicator needle
5. Speed
6. Depth

Digital depth favorite page

The Digital depth page is available for all boat types.

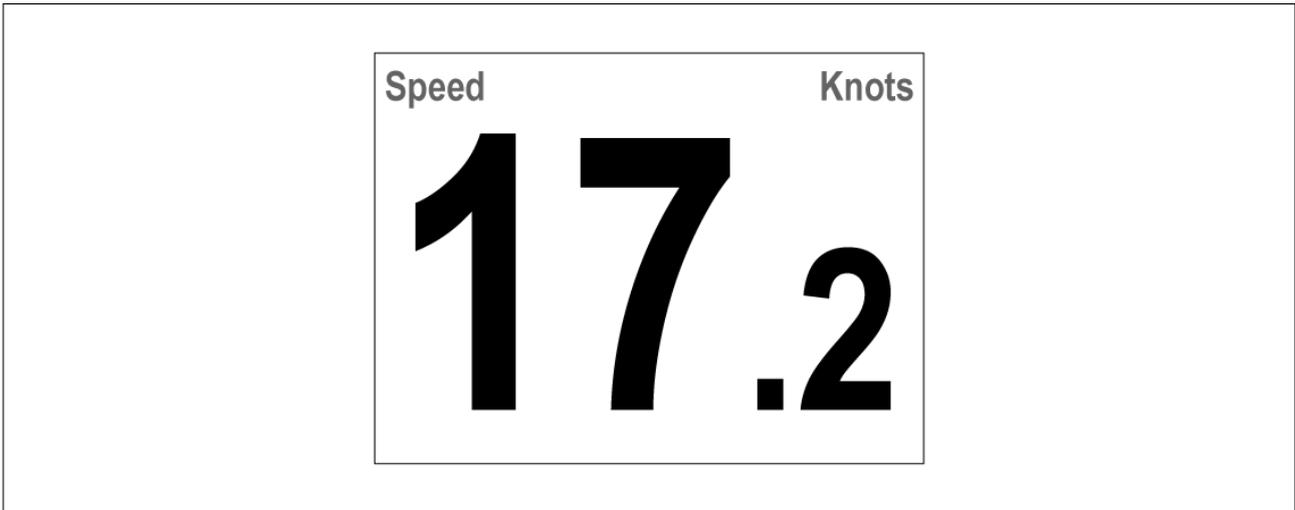
The Digital depth favorite page displays current water depth value.



Digital speed favorite page

The Digital speed page is available for all sailing boat types.

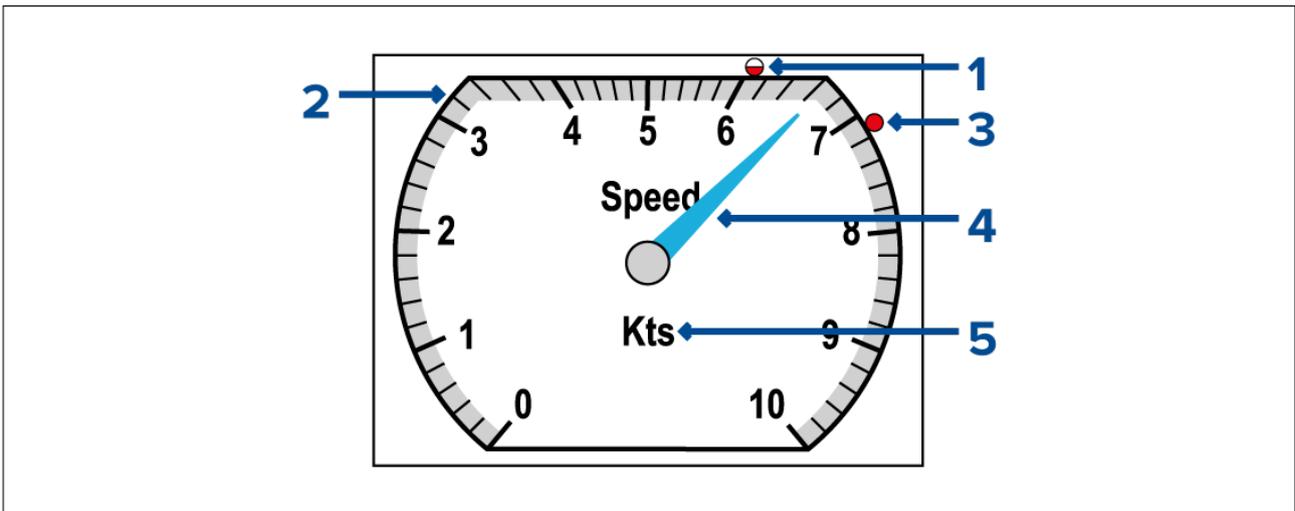
The Digital speed favorite page displays current speed through water value.



Speed dial favorite page

The Speed dial page is available for all motor boat types.

The Speed dial favorite page displays current speed through water value.



1. Average speed indicator (The average speed indicator can be reset from the Quick options menu: **Menu > Quick Options > Reset Ave. Speed.**)
2. Speed dial (The speed dial range will change dynamically depending on speed.)
3. Maximum speed indicator (The maximum speed indicator can be reset from the Quick options menu: **Menu > Quick Options > Reset Max. Speed.**)
4. Current speed indicator needle
5. Speed unit of measure

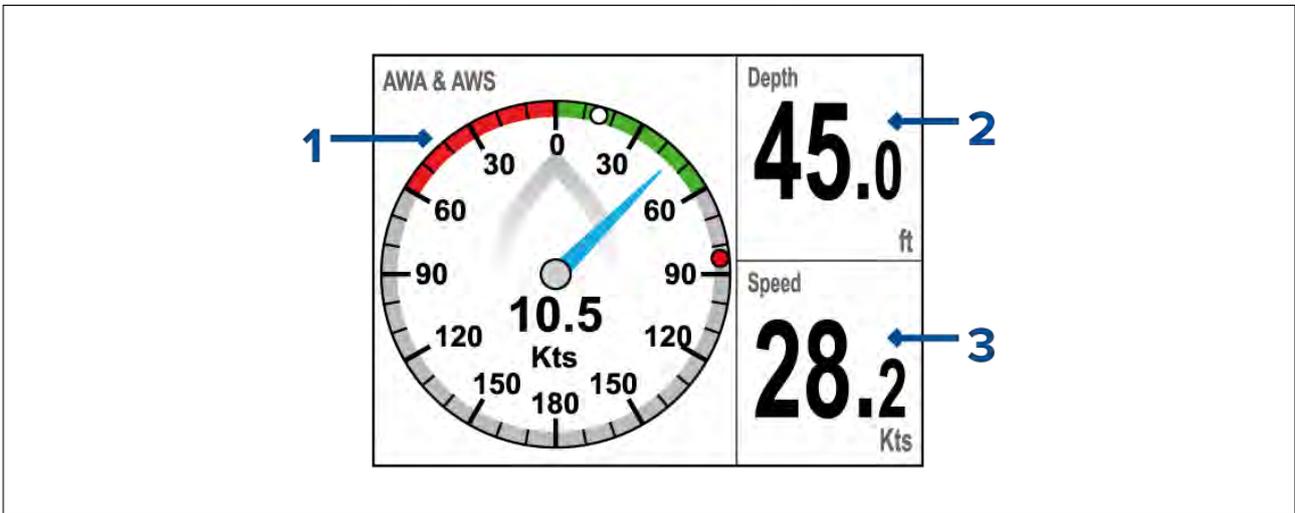
Note:

The Average speed and Maximum speed indicators are reset each time the display's power supply switched off.

AWA & AWS favorite page

The AWA & AWS page is available for all sailing boat types.

The AWA & AWS favorite page displays AWA (Apparent Wind Angle), AWS (Apparent Wind Speed), current depth and current Speed values.



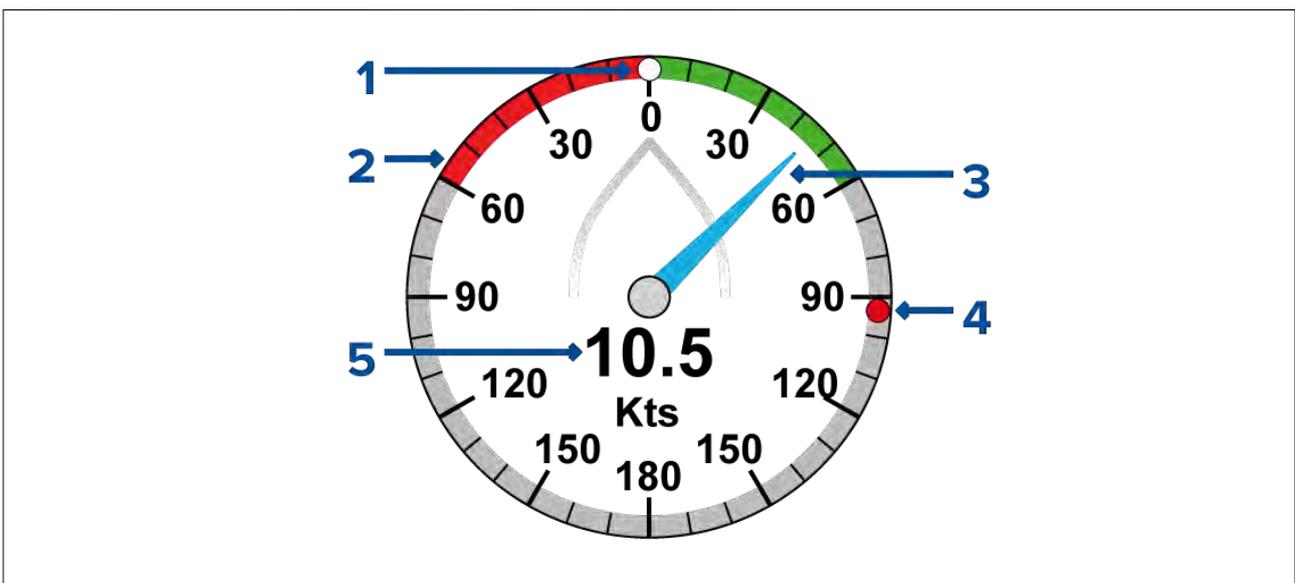
1. AWA (Apparent Wind Angle) / AWS (Apparent Wind Speed) dial
2. Digital Depth
3. Digital Speed

AWA/AWS dial overview

The AWA/AWS dial identifies the current Apparent Wind Angle (AWA), Apparent Wind Speed (AWS), minimum wind angle, and maximum wind angle.

It's important to be aware that Apparent Wind is different from True Wind, because wind direction and strength become a lot more complicated once a vessel starts to move. When this happens, the wind direction and strength measurements start reflecting a combination of not only the wind conditions, but also the vessel's *movement* and how it is affected by those wind conditions. In this respect, True Wind speed and angle data reflects the wind conditions with respect to a static object. In contrast, Apparent Wind speed and angle data reflects the wind conditions with respect to a vessel *when it is underway*.

Note:
 As part of the wind transducer calibration process, you can also adjust the Apparent Wind Speed (AWS) reading to compensate for any small errors which may exist in the data being received from the connected wind transducer. For more information, refer to: [p.37 – Adjusting apparent wind speed](#)



1. Minimum AWA indicator (The minimum AWA indicator can be reset from the Quick options menu: **Menu > Quick Options > Reset Min. AWA.**)
2. AWA dial
3. Current AWA

- Maximum AWA indicator (The maximum AWA indicator can be reset from the Quick options menu: **Menu > Quick Options > Reset Max. AWA.**)
- Apparent Wind Speed (AWS)

Note:

When tacking to the wind, the minimum and maximum AWA indicators will help to show how the wind direction is changing.

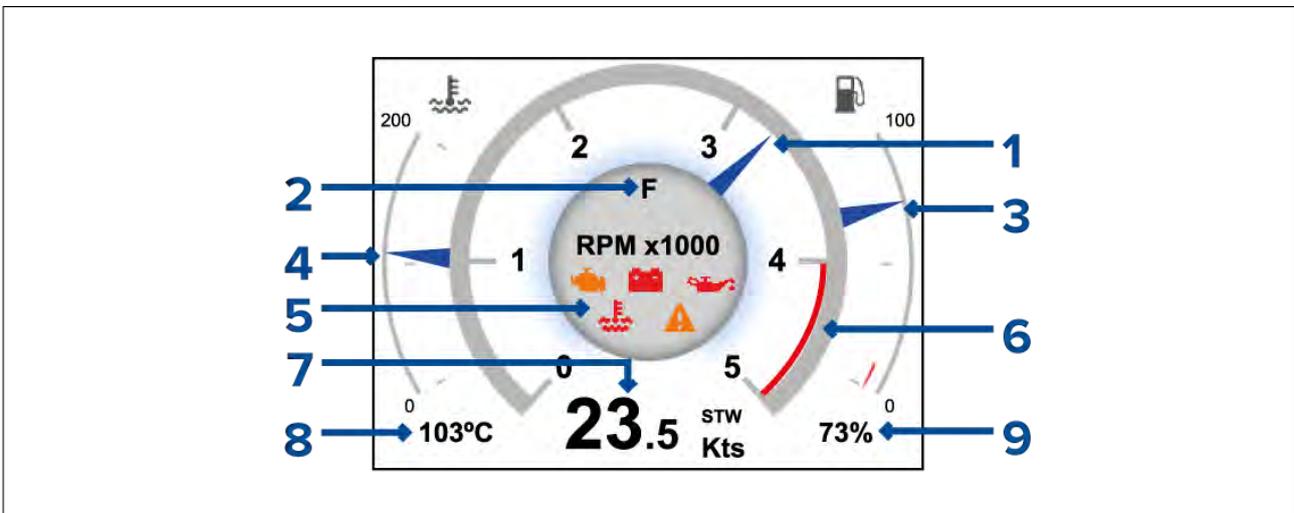
Note:

The AWA/AWS dial can also be added as a fullscreen favorite page. For instructions refer to: [p.50 – Customizing pages](#)

Single engine page

The Single engine page is available for RIB, Outboard and Pro fishing boat types.

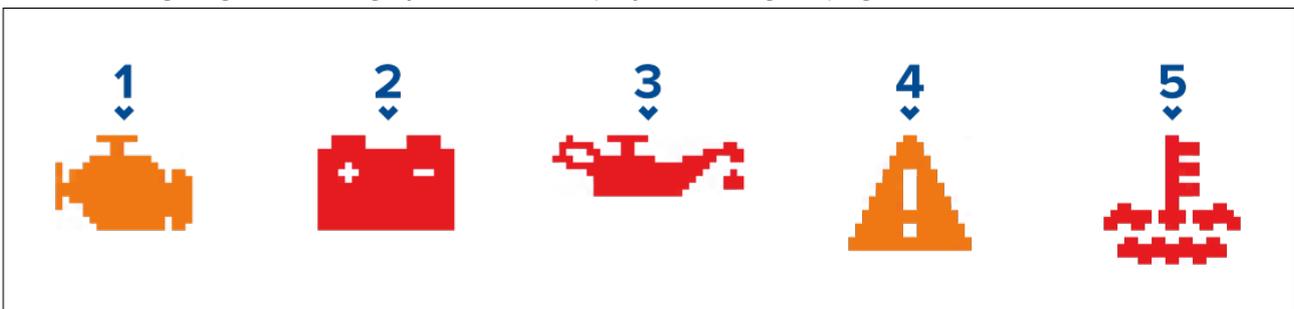
The Single engine favorite page displays current engine data, engine management warnings and Speed through water.



- Engine RPM indicator
- Fuel remaining indicator
- Engine coolant temperature dial
- Engine management indicators
- Speed through water
- Engine coolant temperature digital
- Fuel remaining digital

Engine warning symbols

The following engine warning symbols are displayed on engine pages.



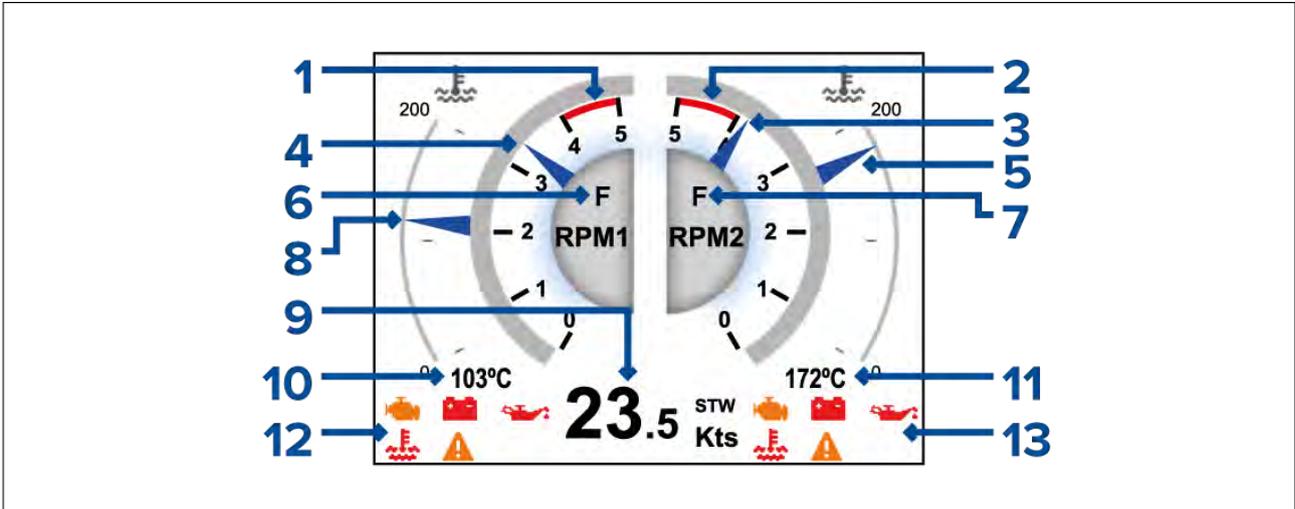
- Check engine indicator** — Displayed when an engine fault has occurred.
- Battery indicator** — Displayed when a system voltage alarm is active.
- Oil indicator** — Displayed when an engine oil related alarm is active.
- Warning indicator** — Displayed when an engine alarm or warning is active.

5. **Coolant indicator** — Displayed when an engine coolant related alarm is active.

Dual engine favorite page

The Dual engine page is available for Workboat, Inboard speedboat, all Power cruisers and Sport fishing boat types.

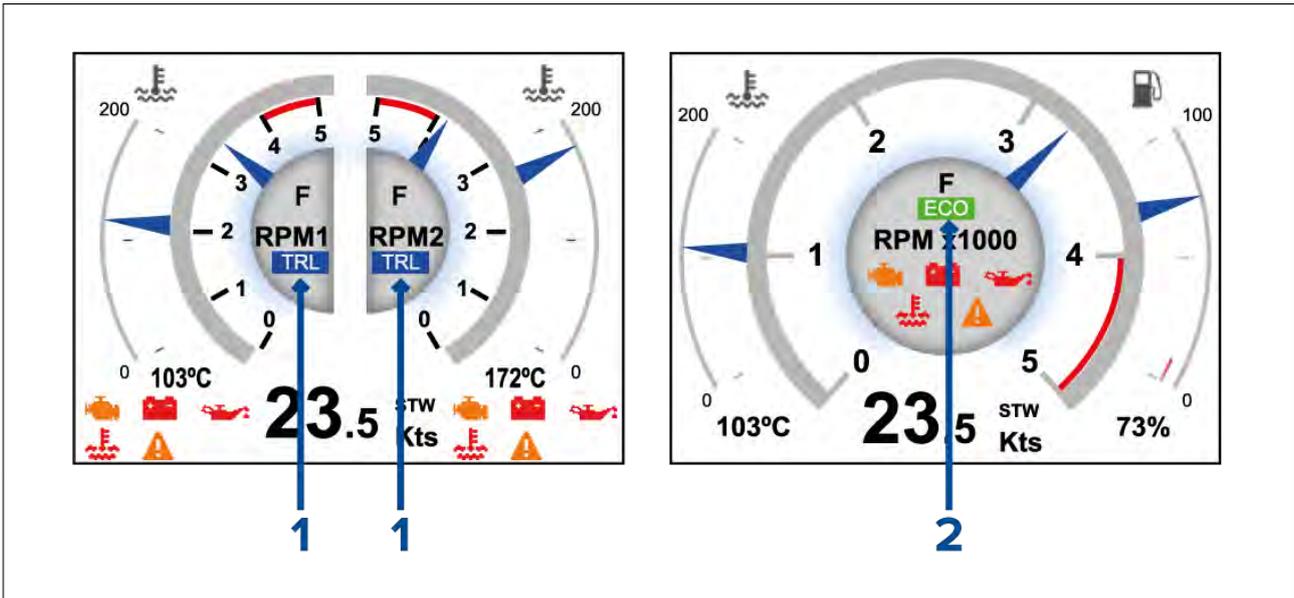
The Dual engine favorite page displays current engine data, engine management warnings and Speed through water.



1. Engine 1 RPM red zone
2. Engine 2 RPM red zone
3. Engine 2 RPM indicator
4. Engine 1 RPM indicator
5. Engine 2 coolant temperature dial
6. Engine 1 transmission gear
7. Engine 2 transmission gear
8. Engine 1 coolant temperature dial
9. Speed through water
10. Engine 1 coolant temperature digital
11. Engine 2 coolant temperature digital
12. Engine 1 management indicators
13. Engine 2 management indicators

Honda engine page

When connected to compatible Honda engines the Engine dial pages include indicators for Honda's ECO and Trolling modes.



1. Trolling mode indicator
2. ECO mode indicator

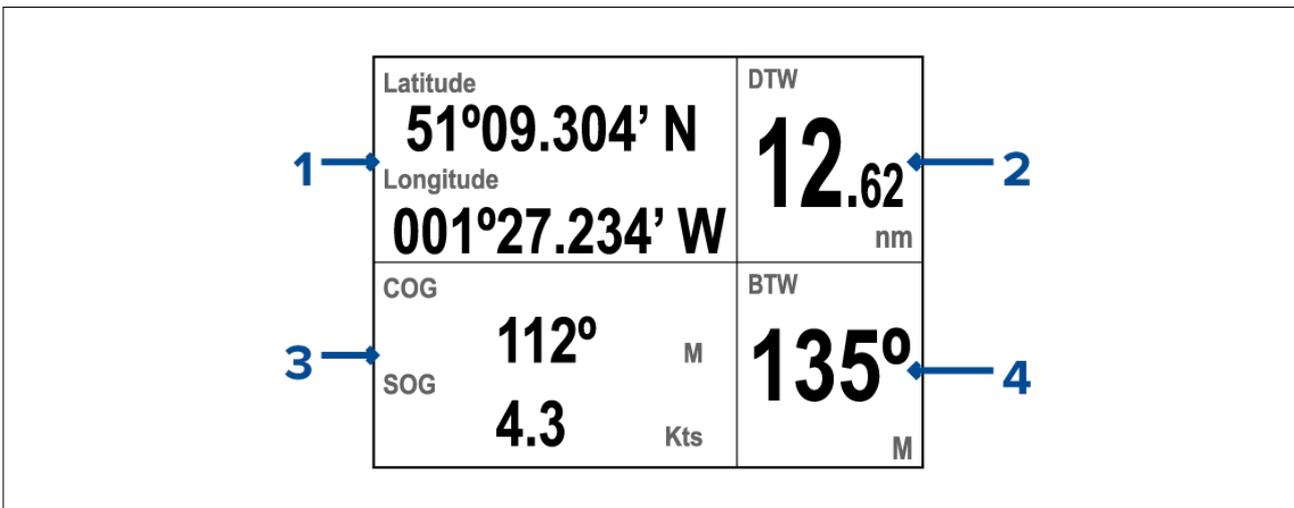
Note:

If trolling mode and ECO mode are activated at the same time the Trolling mode indicator will be displayed.

Quad-split data page

The Quad split page is available for all boat types.

The Quad-split data favorite page displays the following data:

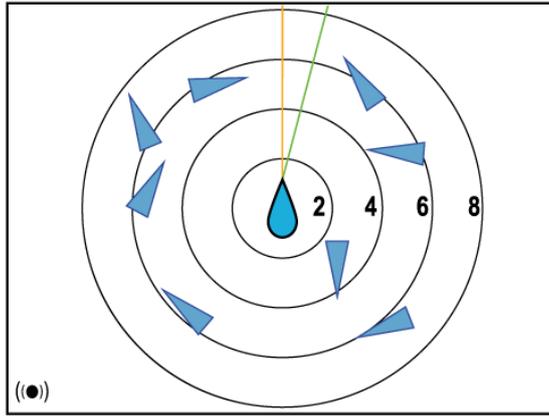


1. Latitude and Longitude
2. Distance to Waypoint (DTW)
3. Course Over Ground (COG) and Speed Over ground (SOG)
4. Bearing to Waypoint (BTW)

AIS page

The AIS page is available for all boat types.

The AIS favorite page displays AIS targets in relation to your vessel's position.

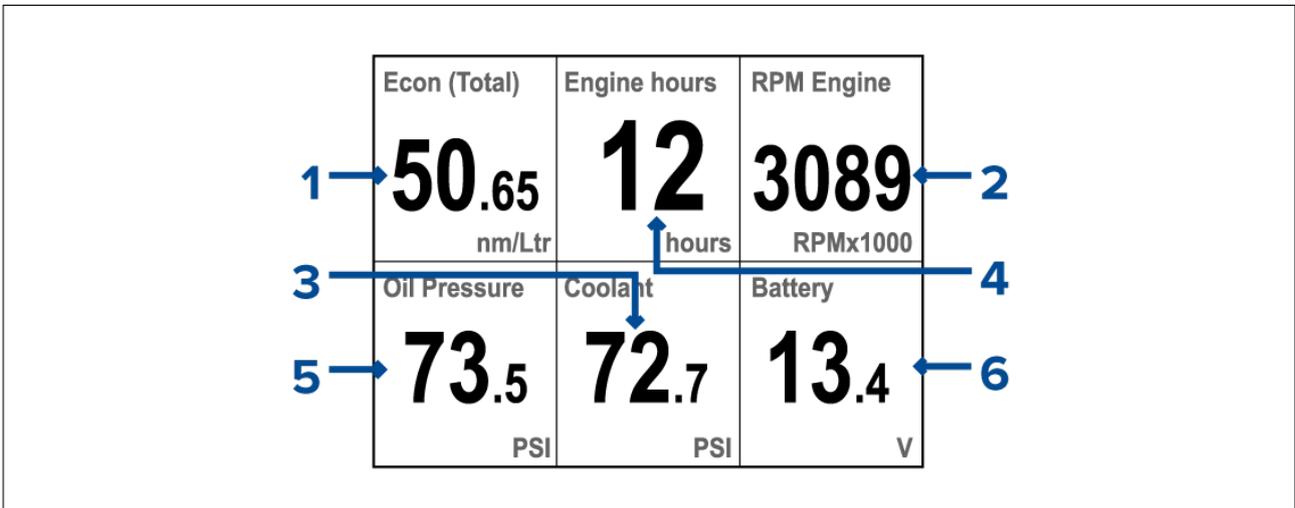


For more details refer to: [p.59 – AIS](#)

6 Way-split data page

The 6 Way-split page is available for all boat types.

The 6 Way-split data favorite page displays the following data:

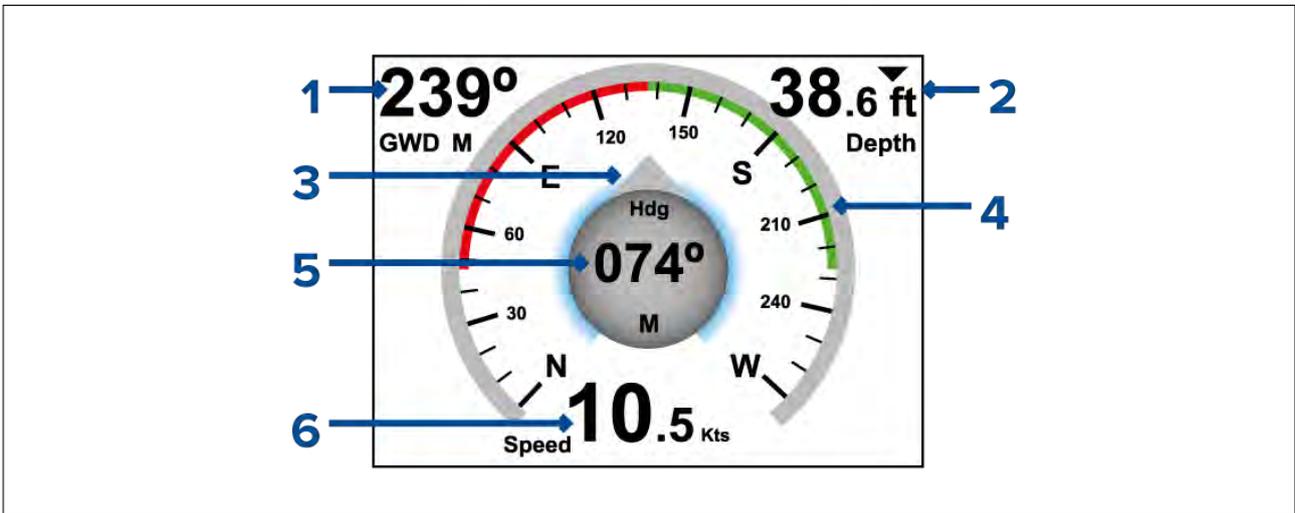


1. Fuel economy
2. Engine RPM
3. Engine coolant pressure
4. Engine hours
5. Oil pressure
6. Battery voltage

Heading and wind page

The Heading and wind page is available for all boat types.

The Heading and wind favorite page displays heading and wind data.



1. Ground wind direction
2. Water depth
3. Heading indicator
4. Compass
5. Heading
6. Speed

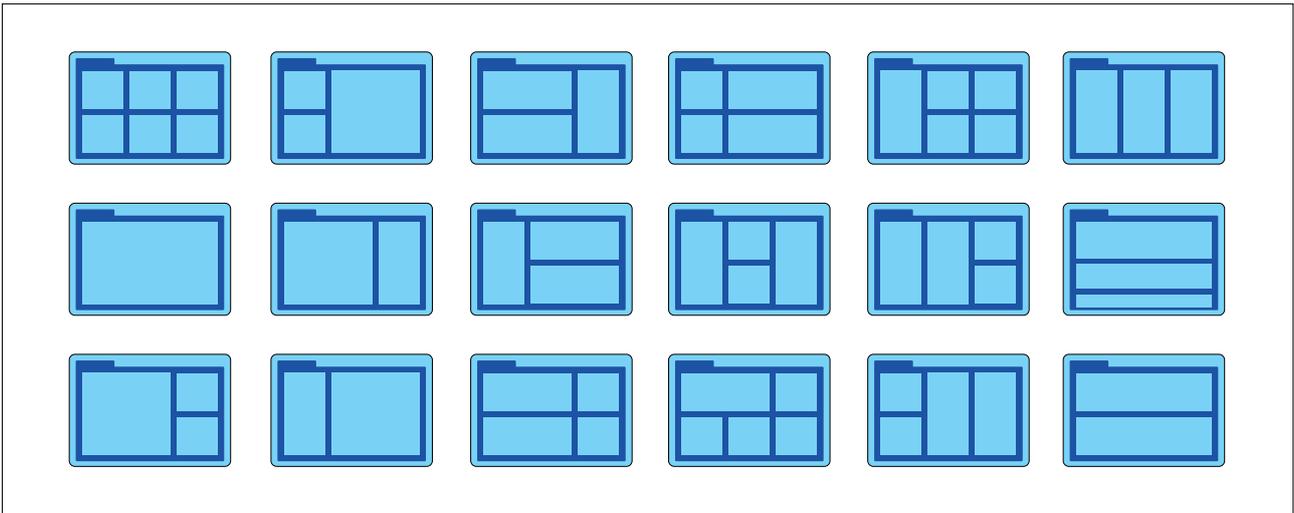
Favorite pages menu settings

The following settings are available from the Favorite pages menu:

- **Edit page** — Select and customize the data displayed on existing Favorite pages.
- **New page** — Select a layout for the new page and add data items.
- **Delete page** — Select and delete existing Favorite pages.
- **Page order** — Change the order of Favorite pages.
- **Rollover** — Set the display to cycle through Favorite pages at a timed interval. The available options are:
 - Off
 - 2 Seconds
 - 5 Seconds
 - 10 Seconds
- **Activate Page Lock** — *This option is only visible after pressing and holding the Menu button for 5 seconds.* When Page Lock is active, the Favorite Page options are hidden (“locked”). The purpose of this feature is to prevent accidental changes to customized pages. For more information, refer to: [p.51 — Activating and deactivating Page Lock](#)
- **About Fav. Pages** — Display information about Favorite pages.

Favorite page layout

Data items are displayed within data panes on Favorite pages. The data panes can be arranged in various layouts. The following layouts are available when creating new Favorite pages.



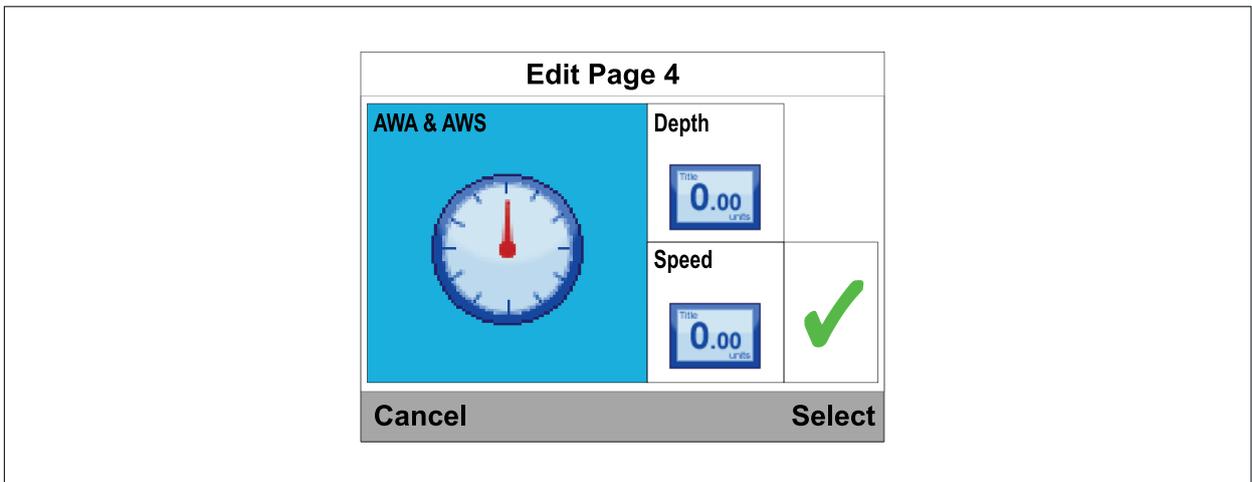
5.2 Customizing pages

Customizing an existing page

The data displayed on each page can be changed.

With the page that you want to edit displayed onscreen:

1. Select **Menu**.
2. Select **Quick Options**.
3. Select **Edit Page**.
4. Select the page that you want to edit.



5. Use the **Up** and **Down** buttons to highlight the data item that you want to change.
6. Press the **Menu** button to choose a new data item.
7. Select a data category.
8. Select the required data item and format.

If a data item cannot be displayed in the selected data pane it will be grayed out.

9. Follow steps 5 to 8 for the remaining data items that you want to change.
10. When finished highlight the tick and select **Save**.

Pages can also be edited from the **Favorite Pages** menu: (**Menu > Favorite Pages > Edit Page**).

Adding a page

Follow the steps below to add a new Favorite page.

From the **Favorite pages** menu:

1. Select **New Page**.
If there are already 10 Favorite pages, you must first delete an existing page before a new page can be created.
2. Select a page layout.
3. Select a data pane.
4. Browse the data categories list and select the data item that you want to display.
5. Complete steps 2 and 3 for all remaining data panes.
6. When finished highlight the tick and select **Save**.

The new page is added to the bottom of the current set of Favorite pages.

Deleting a page

To delete a page follow the steps below.

From the **Favorite pages** menu: (**Menu > Favorite Pages**).

1. Select **Delete Page**.
2. Select a the page that you want to delete.
3. Select **Yes**.

Changing the page order

Follow the steps below to change the order that Favorite pages appear.

From the **Favorite pages** menu: (**Menu > Favorite Pages**).

1. Select **Page order**.
2. Select the page you wish to move.

Page numbers are shown momentarily when you manually cycle through Favorite pages.

3. Use the **Up** and **Down** buttons to select the new location for the page.
4. Select **Save**.

Setting page Rollover

The Rollover feature enables the display to automatically cycle through all Favorite pages at a timed interval.

From the **Favorite Pages** menu:

1. select **Rollover**.
2. Select a time interval.

Selecting **Off** deactivates page rollover.

Activating and deactivating Page Lock

When activated, the Page Lock feature hides the Favorite Page options, to prevent accidental changes to customized pages.

To **activate** the Page Lock feature:

1. Press and hold the **Menu** button for 5 seconds, until the Main Menu is displayed.
2. Select **Favorite Pages**
3. Select **Activate Page Lock**.
4. Press the **Menu** button to select **Lock**.
5. Select **OK** to return to the Favorite Pages menu.
6. Ensure that the pages are locked by selecting **Back** repeatedly until you return to the main instrument display (i.e. no menu displayed), then press the **Menu** button to display the Main Menu. Check that the **Favorite Pages** menu option is not available (hidden).

To **deactivate** the Page Lock feature:

With no menu displayed, press and hold the **Menu** button for 5 seconds, until the Main Menu is displayed. Then select **Favorite Pages**, and select the **Deactivate Page Lock** option. Finally, select **OK**.

Chapter 6: Data (quick view)

Chapter contents

- [6.1 Data \(quick view\) on page 54](#)

6.1 Data (quick view)

Any data item can be viewed fullscreen, without being adding to a Favorite page using the **Data (quick view)** menu.

The **Data (quick view)** menu can be accessed form the Main menu.

Data (quick view) items can be quickly added as Favorite pages from the **Quick Options** menu (**Menu > Quick Options > Add to Favorite**).

Data items

The table below shows a list of data items available to display on Favorite pages and when using the **Data (quick view)** menu. Data items can be displayed in digital and dial formats Historical data items are displayed in graphical format. The formats available are data item dependent.

Note:

The data described in the table below is dependent on the devices that are connected to your system.

Data category	Favorite page data Items	Data (quick view) data items
Battery ⁽¹⁾	<ul style="list-style-type: none"> • Battery Volts • Battery Amps • Battery Temperature • Battery Charge 	<ul style="list-style-type: none"> • Battery Amps • Battery Temperature • Battery Volts • Battery Charge
Boat	<ul style="list-style-type: none"> • Heave • Tilt – Inclination • Pitch • Rate of Turn • Trim Tabs • Gray Water Tank • Black Water Tank • Fresh Water Tank 	<ul style="list-style-type: none"> • Rate of Turn • Tilt – Inclination • Heave • Pitch
Depth	<ul style="list-style-type: none"> • Depth • Max Depth • Min Depth • Depth History 	<ul style="list-style-type: none"> • Depth • Depth history • Max Depth • Min Depth
Distance	<ul style="list-style-type: none"> • Log • Trip 	<ul style="list-style-type: none"> • Log • Trip
Engine ⁽¹⁾	<ul style="list-style-type: none"> • Engine Hours • Trim Position • Engine RPM • Oil Pressure • Oil Temperature • Coolant Pressure • Coolant Temperature • Boost Pressure • Load • Alternator Potential • Transmission Oil Pressure 	<ul style="list-style-type: none"> • Boost Pressure • Coolant Pressure • Coolant Temperature • Engine Hours • Engine RPM • Oil Pressure • Oil Temperature • Trim Position • Load • Engine Tilt • Alternator Potential

Data category	Favorite page data Items	Data (quick view) data items
	<ul style="list-style-type: none"> • Transmission Oil Temperature • Transmission • 2 Engine Overview • 1 Engine Overview 	<ul style="list-style-type: none"> • Transmission Oil Pressure • Transmission Oil Temperature • Transmission • Fuel Flow Rate 1 • Fuel Flow – average 1 • Fuel Pressure 1 • 2 Engine Overview • 1 Engine Overview
<p>Fuel ⁽¹⁾ Fuel management is dependent on engine data that is available on SeaTalk^{ng}.</p>	<ul style="list-style-type: none"> • Economy • Total Fuel vol • Total Fuel % • Est. Fuel Remaining • Fuel Used (Trip) • Distance To Empty • Time to Empty • Fuel Flow Rate Total • Fuel Level Vol 1 • Fuel Level % 1 	<ul style="list-style-type: none"> • Economy • Total Fuel vol • Total Fuel % • Est. Fuel Remaining • Fuel Used (Trip) • Distance To Empty • Time to Empty • Fuel Flow Rate Total • Fuel Level Vol 1 • Fuel Level % 1
<p>Environment</p>	<ul style="list-style-type: none"> • Sea Temperature • Max Sea Temperature • Min Sea Temperature • Sea Temperature History • Barometric Pressure • Barometric Pressure History • Air Temperature • Max Air Temperature • Min Air Temperature • Air Temperature History • Sunset / Sunrise • Set • Drift • Wind Chill Apparent • Wind Chill True • Dew Point • Humidity 	<ul style="list-style-type: none"> • Air Temperature • Air Temperature History • Barometric Pressure • Barometric Pressure History • Dew Point • Drift • Drift History • Humidity • Min Air Temperature • Max Air Temperature • Sea Temp • Min Sea Temp • Max Sea Temp • Sea Temperature History • Set • Set History • Set & Drift Pair • Sunset / Sunrise • Wind Chill Apparent • Wind Chill True

Data category	Favorite page data Items	Data (quick view) data items
GPS	<ul style="list-style-type: none"> • SOG (Speed Over Ground) • SOG History • Max. SOG • Avg. SOG • COG (Course Over Ground) • COG History • COG and SOG • Latitude • LAT & LON • Longitude • SATS (Satellites) • HDOP (Horizontal Dilution Of Precision) • SATS + HDOP 	<ul style="list-style-type: none"> • COG (Course Over Ground) • COG History • COG and SOG (Speed Over Ground) • HDOP (Horizontal Dilution Of Precision) • Latitude • LAT & LON • Longitude • SATS (Satellites) • SATS + HDOP • SOG • SOG History • Max. SOG • Avg. SOG
Heading	<ul style="list-style-type: none"> • Heading • Heading & Speed • Heading History • Locked Heading • Locked Heading Error & Locked Heading • Tack Heading • Heading (Multi-gauge) 	<ul style="list-style-type: none"> • Heading • Heading & Speed • Heading History • Locked Heading • Locked Heading Error & Locked Heading • Tack Heading • Heading (Multi-gauge)
Navigation	<ul style="list-style-type: none"> • Active Waypoint Name • Waypoint ID • Course Made Good (CMG) • CMG & DMG (Distance Made Good) • CMG & VMG • Distance Made Good (DMG) • CMG & DMG • BTW (Bearing To Waypoint) • BTW & DTW (Distance To Waypoint) • Pitch • DTW • XTE (Cross Track Error) • ETA (Estimated Time of Arrival) • TTG (Time To Go) • Course to Steer (CTS) • CTS & XTE • Rolling Road • Turn 	<ul style="list-style-type: none"> • Active Waypoint Name • Waypoint ID • Course Made Good (CMG) • CMG History • BTW (Bearing To Waypoint) • DTW (Distance To Waypoint) • BTW & DTW • Distance Made Good (DMG) • CMG & DMG • CMG & VMG (Velocity Made Good) • Course to Steer (CTS) • CTS & XTE (Cross Track Error) • Pitch • ETA (Estimated Time of Arrival) • TTG (Time To Go) • XTE • XTE History • Rolling Road • Turn

Data category	Favorite page data Items	Data (quick view) data items
	<ul style="list-style-type: none"> • Turn & DTW 	<ul style="list-style-type: none"> • Turn & DTW
Pilot	<ul style="list-style-type: none"> • Pilot Heading • Pilot Heading & Speed • Pilot Status • Rudder Angle 	<ul style="list-style-type: none"> • Pilot Heading • Pilot Heading & Speed • Pilot Status • Rudder Angle
Speed	<ul style="list-style-type: none"> • Speed • Trolling Speed • Max Speed • Average Speed • VMG Windward (Velocity Made Good Winward) • VMG WPT (Waypoint) • Boat Speed & SOG (Speed Over Ground) • Speed History 	<ul style="list-style-type: none"> • Average Speed • Boat Speed & SOG (Speed Over Ground) • Max Speed • Speed • Speed History • Trolling Speed • VMG Windward (Velocity Made Good Winward) • VMG Windward History • VMG WPT (Waypoint) • VMG WPT History
Time	<ul style="list-style-type: none"> • Local Time • Time & Date • Clock • Race Timer 	<ul style="list-style-type: none"> • Clock • Local Time • Time & Date • Race Timer
Wind	<ul style="list-style-type: none"> • AWS (Apparent Wind Speed) • AWS History • AWS Min • AWS Max • AWA (Apparent Wind Angle) • AWA & AWS • AWA (CH) & AWS • AWA & VMG (Velocity Mad Good) • AWA History • AWA Min • AWA Max • TWS (True Wind Speed) • TWS History • TWS Min • TWS Max • TWA (True Wind Angle) • TWA & TWS • TWA (True Wind Angle) (CH) & TWS • TWA & VMG 	<ul style="list-style-type: none"> • AWA (Apparent Wind Angle) • AWA History • AWA & AWS (Apparent Wind Speed) • AWA (CH) & AWS • AWA & VMG (Velocity Mad Good) • AWA Max • AWA Min • AWS • AWS History • AWS Max • AWS Min • Beaufort • Cardinal • GWD (Ground Wind Direction) • GWD History • GWD & Beaufort • TWD (True Wind Direction) • TWD History • TWA (True Wind Angle)

Data category	Favorite page data Items	Data (quick view) data items
	<ul style="list-style-type: none"> • TWA History • TWA Min • TWA Max • GWD (Ground Wind Direction) • GWD & Beaufort • GWD History • Cardinal • Beaufort • TWD (True Wind Direction) • TWD History 	<ul style="list-style-type: none"> • TWA History • TWA & TWS (True Wind Speed) • TWA (CH) & TWS • TWA & VMG • TWA Max • TWA Min • TWS • TWS History • TWS Max • TWS Min
AIS	<ul style="list-style-type: none"> • AIS (Automatic Identification System) 	<ul style="list-style-type: none"> • AIS (Automatic Identification System)

Note:

(1) There may be more than one device configured, Data items will be available for each configured device.

Chapter 7: AIS

Chapter contents

- [7.1 Automatic Identification System \(AIS\) overview on page 60](#)
- [7.2 AIS target symbols on page 61](#)
- [7.3 Setting AIS range on page 62](#)
- [7.4 Viewing AIS target information on page 62](#)
- [7.5 Enabling and disabling AIS Silent mode on page 63](#)

7.1 Automatic Identification System (AIS) overview

When an AIS receiver/transceiver is connected to your system, the AIS feature enables you to receive information broadcast by other AIS equipped vessels, and to view these vessels as targets relative to your vessel. The AIS feature is standalone, settings and alarms cannot be shared with other AIS enabled products on your system.

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.

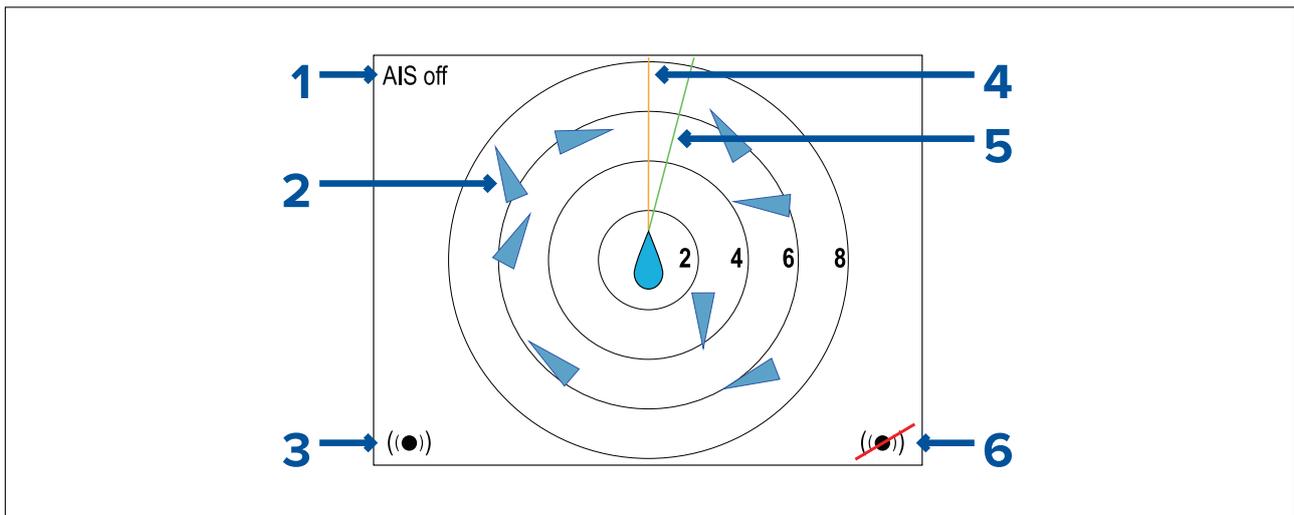
Note:

It is not mandatory for vessels to be fitted with operational AIS equipment. Therefore, you should not assume that ALL vessels in your area are displayed.

With AIS data available on your system the AIS Favorite page can:

- display targets for any other local vessel that are equipped with an AIS-transceiver.
- 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 alarms and safety-related messages.

AIS information is displayed on the screen as shown below:



1. AIS messages (See AIS messages in table below)
2. AIS targets
3. Dangerous targets alarm on
4. Heading line
5. COG line
6. Dangerous targets alarm off

Note:

Where unstable or no heading or COG data is available AIS targets and your vessel icon will not be displayed.

AIS Messages

- **AIS off** — AIS switched off
- **Alarm on icon** — Transmitting, alarm is active.
- **Silent** — Silent mode is enabled AIS not transmitting.
- **Alarm on** — Silent mode is enabled & alarm is active.

- **Alarm off icon** — Transmitting & Alarms are switched off
- **Data lost** — Transmitting. AIS target lost.
- **No fix** — No GNSS (GPS) fix
- **Insufficient COG/Hdg data** — Unstable COG or heading data

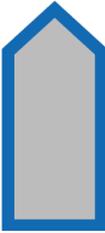
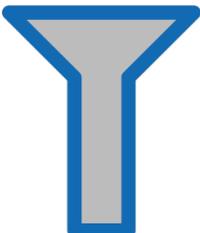
Note:

- If no AIS message is displayed then the AIS is enabled and transmitting.
- A maximum of 25 targets can be displayed, where more than 25 targets are in range 'Max targets' message is displayed onscreen.

7.2 AIS target symbols

Different symbols are used to signify different types of AIS target.

AIS target symbols

	Standard vessel		Yacht
	Aid To Navigation (AToN)		Commercial vessel
	Virtual Aid To Navigation (AToN)		High speed vessel
	Land base station		

AIS target symbol status

	<p>Dangerous target — The targets outline will turn red and flash when the target is within a specified distance (CPA) or time (TCPA). Dangerous target alarm sounds if enabled.</p>		<p>AToN off position — The target's outline will be red if the AToN is off position.</p>
	<p>Lost target — The target will display a red cross through it and flash, if the signal of a dangerous target is not received for 20 seconds. Target in latest predicted position. Alarms sounds if enabled. Target with red cross and flashes.</p>		<p>AToN off position and dangerous— The target's outline will be black and the symbol will flash if the AToN is off position and dangerous.</p>
	<p>Uncertain target — The target's is displayed with a dashed outline if the target's CPA / TCPA values are uncertain.</p>		

7.3 Setting AIS range

The AIS page displays AIS targets that appear within the distance specified in the AIS Range setting.

The AIS range can be adjusted from the **Quick Options** menu (**Menu > Quick Options**)

1. Select **AIS Range**.
2. Use the **Up** and **Down** buttons to select the desired range.

7.4 Viewing AIS target information

You can view information about AIS targets.

From the Quick Options menu (**Menu > Quick Options**):

1. Select **View AIS targets**.
2. Use the **Up** and **Down** buttons to select an AIS target.
The Name of the vessel will be displayed on the screen.
3. Select **Info** to view detailed target information.
The information displayed is dependent on the type of target selected.
 - Vessel name
 - MMSI number
 - Vessel type
 - Call sign
 - SOG
4. Use the **Up** and **Down** buttons to scroll through the data.
5. To return to the AIS page, select **Back**.

7.5 Enabling and disabling AIS Silent mode

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.

Silent mode can be enabled and disabled from the **Quick Options** menu (**Menu > Quick Options**)

1. Select **AIS Silent mode**.
2. Select **Silent** to stop your AIS position and details being transmitted, or
3. Select **Transmit** to allow your AIS position and details to be received by other AIS equipped vessels.

Chapter 8: Fuel manager

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- [8.1 Fuel manager overview on page 66](#)
- [8.2 Fuel manager menu on page 66](#)
- [8.3 Setting up the fuel manager on page 67](#)
- [8.4 Setting tank fill on page 67](#)
- [8.5 Fuel calculations on page 67](#)
- [8.6 Using Fuel manager on page 68](#)
- [8.7 Reset fuel usage on page 68](#)

8.1 Fuel manager overview

The fuel manager feature displays essential data about the fuel of your vessel.

Fuel manager estimates the amount of fuel onboard, based on you logging each time you fill up, the total fuel capacity, and how much fuel is burned by the engine(s). This data is used to estimate the distance and time until fuel depletion. Additionally, fuel manager can display engine fuel flow rate and economy.

Important:

- To ensure accurate calculations you must record all fuel you add to your fuel tanks using either the **Set all tanks full** or **Add partial fill** settings.
- This system is not a substitute for other fuel calculations. You should not rely on the Fuel manager calculations for accurate voyage planning or in emergency and safety critical situations.
- Fuel estimates are specific to each display.

The Fuel manager requires the following NMEA 2000 PGNs to be available on your system:

- Fuel Used (PGN 127497), or
- Fuel flow rate (PGN 127489).

Detect fuel messages

Fuel manager generates fuel estimates based on **Fuel Used (Trip)** or **Fuel Flow Rate** messages.

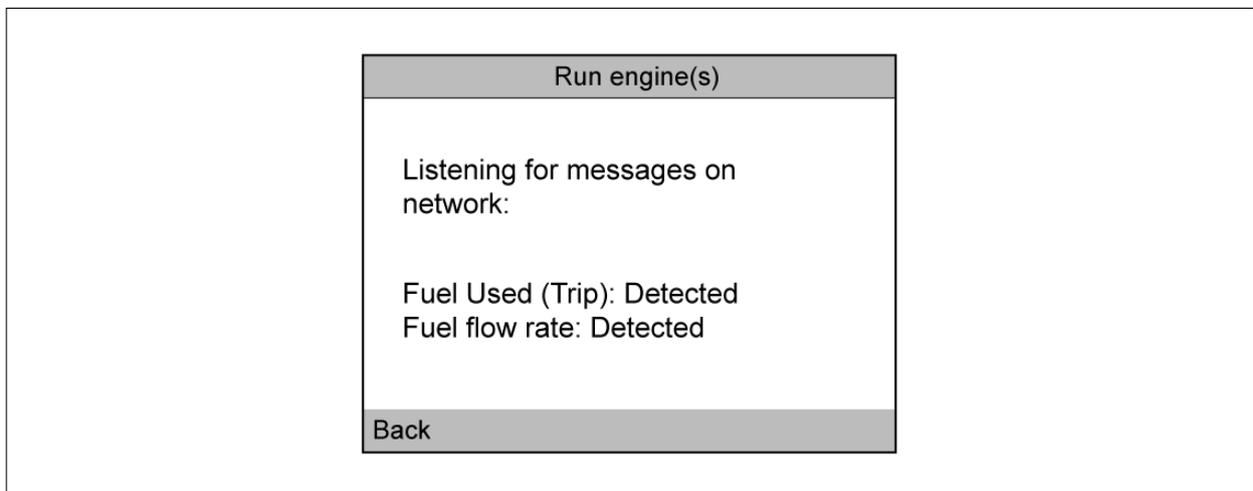
You can see which of these messages are available on your system from the Fuel Manager's **Set-up** menu (**Menu > Fuel manager > Set-up**):

1. Start your vessel's engines.
2. Select **Detect fuel messages**.

The screen will update to identify which messages are detected.

Note:

After 15 seconds if no message is detected then the status will display "**Not found**".



8.2 Fuel manager menu

The Fuel manager menu allows you to set up and use the Fuel manager.

- **Set all tanks full** — Sets all tanks to the maximum value specified in the Total fuel capacity setting.
- **Add partial fill** — Allows you to add a specific volume of fuel that you have added.
- **Fuel Manager:** — Enables and disabled the fuel manager calculations.
- **Set-up** — Set-up information for the Fuel manager.
 - About Fuel Manager — View information about the Fuel manager

- Total Fuel Capacity — Specify the total fuel capacity of your fuel tanks.
- Fuel Calculations — Switch fuel calculation between Fuel Used (Trip) and Fuel flow rate.
- Detect fuel messages — Scans the system for available, supported fuel related messages.

8.3 Setting up the fuel manager

The Fuel manager requires setting up before it can be used.

Important:

You will need to fill your fuel tanks to capacity before calculations can be made. This is listed as step 6 below but could also be performed before starting the procedure.

From the **Fuel manager** menu: (**Menu > Fuel manager**)

1. Select **Fuel Manager**:
2. Select **Enter now**.
3. Use the **Up** button to adjust the value to match the total fuel capacity of your fuel tanks.
4. Select **Save**.
5. Select **OK**.
6. Fill your fuel tanks to capacity.
7. Select **Set all tanks full**
8. Select **OK**.

The Fuel manager will now perform fuel calculations

8.4 Setting tank fill

Before using Fuel manager you must log the amount of fuel on-board.

In the **Fuel Manager** menu:

1. For first time set-up:
 - i. Select **Set all tanks full** .
2. For all subsequent fueling, either:
 - i. Select **Add partial fill** and enter the volume of fuel you filled the tank(s) with.
 - ii. Select **Set all tanks full** if you filled the tank(s) to maximum capacity.

Important: If you enter the wrong amount of fuel this can be corrected by entering a minus value as a partial fuel fill, this will reduce the total amount of fuel remaining by the amount entered.

The fuel manager is now calibrated and capable of providing fuel usage estimates.

Note:

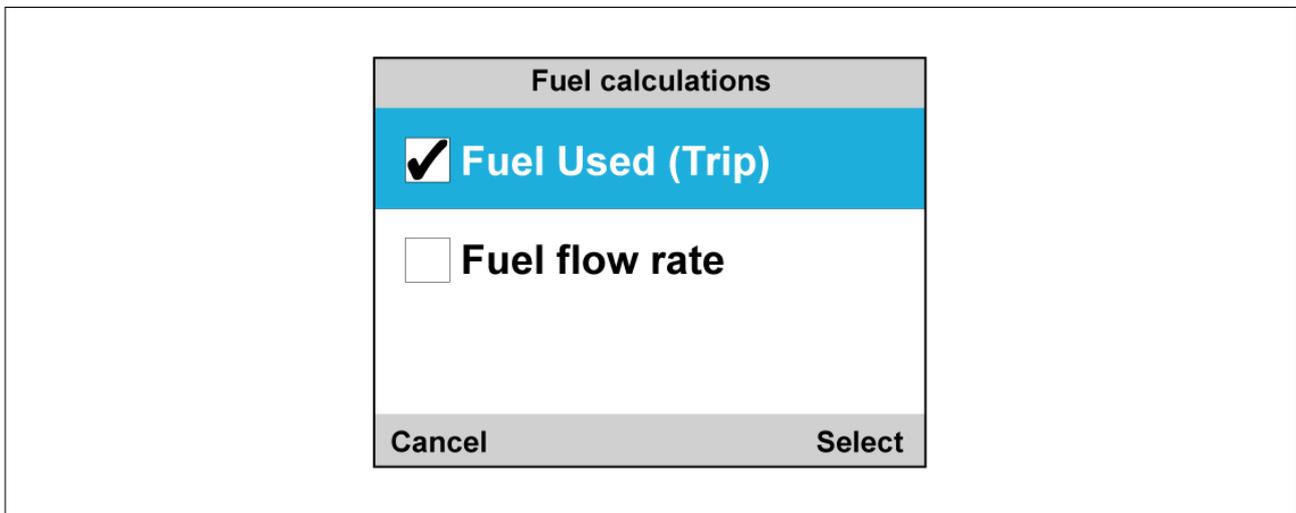
- Make sure to log any additional fueling by repeating either step above.
- Fuel remaining calculations are an estimate and will be inaccurate if fuel fills are not entered, entered incorrectly, or if fuel is used by other sources (e.g.: generators).

8.5 Fuel calculations

Fuel manager can calculate your vessel's fuel estimates using trip data or fuel flow rate data.

To choose fuel manager's method for calculating, from the **Fuel Manager** screen:

1. Select **Set-up**.
2. Select **Fuel calculations**.
3. Either:
 - i. Select **Fuel Used (Trip)**.
 - ii. Select **Fuel flow rate**.



Fuel manager will now calculate fuel estimates based on the chosen variable.

8.6 Using Fuel manager

Once fuel manager has been set up it provides fuel estimates.

Fuel estimates for favorite pages

You can display various fuel estimates on the favorite pages.

Refer to [Chapter 5 Favorite Pages](#) for more information on how to create favorite pages.

Fuel estimates menu items

From the **Favorite Pages** menu you can choose the **Fuel** category to bring up the available fuel management options in the table below.

Note: Some Fuel manager estimates are dependent on Fuel Used (Trip) or Fuel Flow Rate Messages.

- **Economy** — The distance achieved per measurement of fuel. (Distance/Volume, Volume/Distance, or Volume/100 Distance Unit)
- **Est. Fuel Remaining** — Estimated fuel available for use.
- **Fuel Used (Trip)** — Amount of fuel used on the current trip.
- **Fuel Used (Season)** — Amount of fuel used this season.
- **Distance to Empty** — Distance until fuel depletion. (Only available with Fuel Flow Rate Messages) (GPS Required)
- **Time to Empty** — Amount of time until fuel depletion. (Only available with Fuel Flow Rate Messages)
- **Fuel Flow Rate total** — Amount of fuel that is used over time.

Note:

- There are also several dial styled options to display **Fuel Flow Rate total** on the favorite pages.
- Distance to Empty and Time to Empty values are based on estimated fuel remaining calculations which do not take into account the effects of weather and tide on fuel usage.

8.7 Reset fuel usage

You can manually reset fuel manager's fuel usage estimates.

From the **Main Menu**:

1. Select **Quick Options**.
2. Either:
 - i. Select **Reset Fuel Used Season** to reset the amount of fuel used this season (including the current trip).

- ii. Select **Reset Trip Fuel Used** to reset the amount of fuel used on the current trip.

Chapter 9: Race timer settings

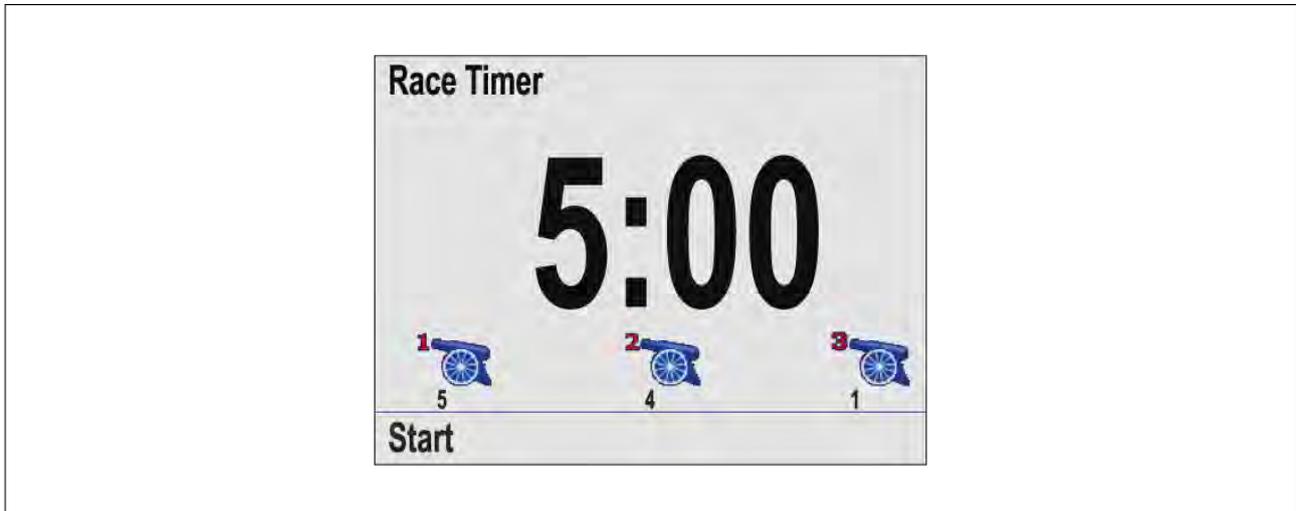
Chapter contents

- [9.1 Setting the Race Timer on page 72](#)
- [9.2 Using the Race Timer on page 72](#)

9.1 Setting the Race Timer

The Race Timer is used to show the time elapsed since the start of a race. The Race Timer has 3 countdown timers. When a timer count down is complete (reaches zero) then the Race Timer will start to count up.

If the Race Timer has not been added as a Favorite Page then it can be accessed from the **Data (Quick View)** menu: **Menu > Data (Quick View) > Time > Race Timer**.



With the Race Timer page displayed:

1. Press the **Menu** button.
2. Select **Quick Options**.
3. Select **Adjust start timers**.
4. Select a start timer
5. Use the **Up** and **Down** buttons to adjust the timer to the required value.
6. Select **Save**.
7. Complete steps 4 to 6 for each start timer you want to adjust.

9.2 Using the Race Timer

With the Race Timer page displayed:

1. Select **Start**.

The first start timer will begin to count down, audible beeps are sounded as follows:

- Double beep every minute.
- Beep Three times at the start of the last 30 seconds.
- Beep every second for the last 10 seconds.
- Beep for two seconds when the timer reaches zero

2. You can select **Skip** to skip to the next start timer.

*With the third start timer counting down you can select **Count up** to start the timer counting up from zero.*

3. You can stop the start timer count down by selecting **Stop** from the **Quick Options** menu.
4. When stopped, you can resume the count down by selecting **Resume**.
5. The Race Timer page can be reset by selecting **Reset Timer** from the **Quick Options** menu.

Note: You can view other Favorite pages and menus whilst the Race Timer is running.

Chapter 10: Alarms

Chapter contents

- [10.1 Alarms on page 74](#)
- [10.2 Active Engine Alarms on page 75](#)
- [10.3 Alarm settings on page 75](#)

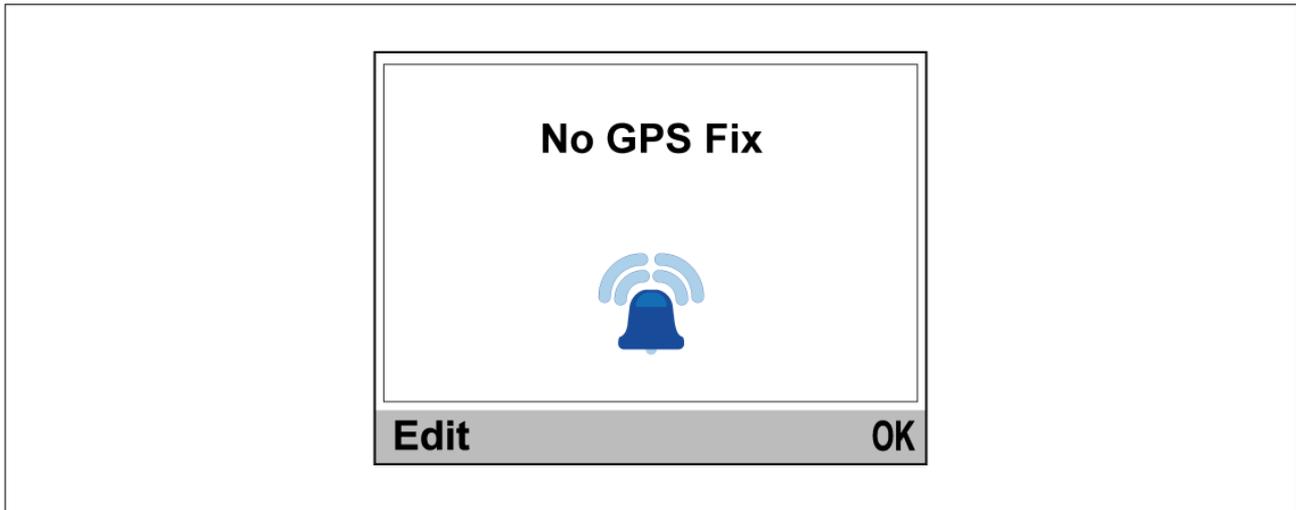
10.1 Alarms

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

Some examples of alarms are:

- Anchor alarm — Used when anchored, this alerts you to a change in depth which could mean that the chain length requires adjusting.
- Depth and speed alarms — These alarms alert you when your depth or speed moves outside of specified limits, for example a minimum depth.
- MOB (Man Overboard) alarm — Received from an MOB system.

When an alarm occurs, a message is displayed and an audible alarm may sound.



You can either:

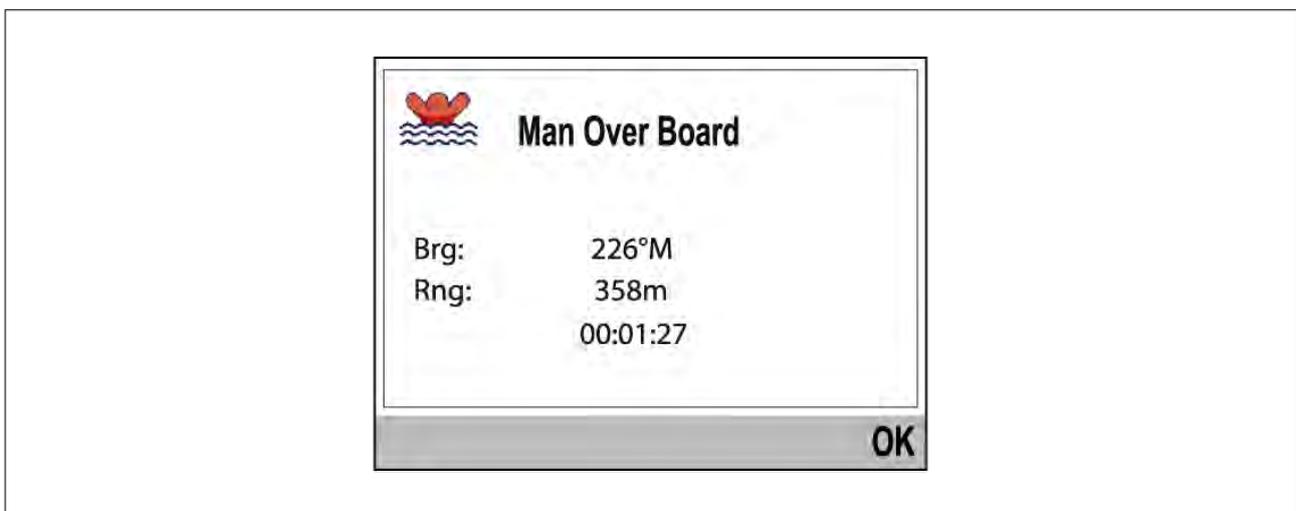
- Silence the alarm, or
- Silence the alarm and edit the alarm settings.

Note:

With the exception of the Alarm clock, Speed and Sea temperature; SeaTalk[®] systems will only be able to switch alarms on and off, SeaTalkng[®] systems will also be able to adjust settings.

Man overboard (MOB) alarm

In the event of a MOB alarm, the instrument provides details to help find the MOB target.



- Brg: Bearing to MoB waypoint.
- Rng: Range to MoB waypoint.
- Elapsed time since start of MoB alarm.

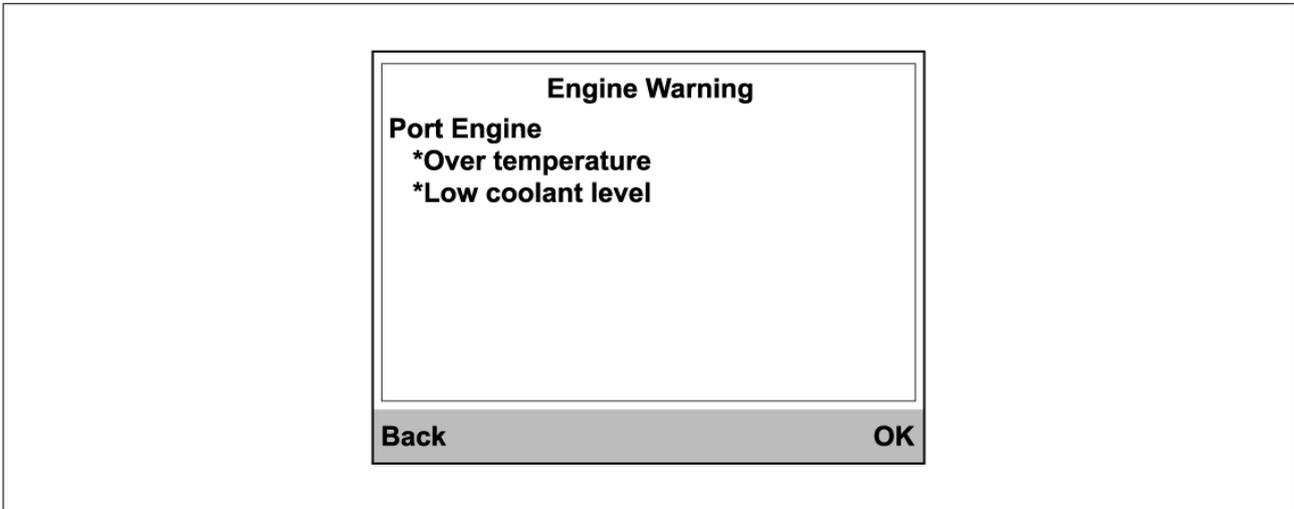
Note:

Bearing and Range require GNSS (GPS) data to be available on the network.

10.2 Active Engine Alarms

When engine alarms are active they can be viewed from the **Active Engine Alarms** page.

The **Active Engine Alarms** page can be accessed from the **Alarms** menu: **Menu > Alarms > Active Engine Alarms**



When the alarm condition has cleared the alarm will be removed from the list.

10.3 Alarm settings

Alarms are used to alert you to a hazard or situation requiring your attention. Alarms are triggered based on their specified thresholds. Alarms are transmitted on the network the display is connected to i.e.: SeaTalk® or SeaTalkng® networks for display at other compatible devices.

Note:

In order to set alarm thresholds a valid data source for the alarm is required.

Depth alarms

Depth alarms can be enabled and disabled and alarm threshold values can be set from the **Depth** menu: **Menu > Alarms > Settings > Depth**. The following depth alarms are available:

- **Shallow** — The Shallow alarm is triggered when the detected water depth is shallower than the specified value.
- **Deep** — The Deep alarm is triggered when the detected water depth is deeper than the specified value.
- **Shallow anchor** — The Shallow anchor alarm is triggered when the detected water depth is shallower than the specified value.
- **Deep anchor** — The Deep anchor alarm is triggered when the detected water depth is deeper than the specified value.

Note:

The Shallow and Deep alarms are intended to be used when underway. The Shallow anchor and Deep anchor alarms are intended for use when at anchor.

Speed alarms

Speed alarms can be enabled and disabled and alarm threshold values can be set from the **Speed** menu: **Menu > Alarms > Settings > Depth**. The following speed alarms are available:

- **Boat Speed High** — The Boat speed high alarm is triggered when vessel speed exceeds the specified value.

- **Boat Speed Low** — The Boat speed low alarm is triggered when vessel speed drops below the specified value.

Temperature alarms

Temperature alarms can be enabled and disabled and alarm threshold values can be set from the **Temperature** menu: **Menu > Alarms > Settings > Temperature**. The following temperature alarms are available:

- **Sea Temp. High** — The Sea temp high alarm is triggered when the water temperature rises above the specified temperature.
- **Sea Temp. Low** — The Sea temp low alarm is triggered when the water temperature drops below the specified temperature.

Wind alarms

Wind alarms can be enabled and disabled and alarm threshold values can be set from the **Wind** menu: **Menu > Alarms > Settings > Wind**. The following wind alarms are available:

- **AWS High** — The Apparent Wind Speed (AWS) high alarm is triggered when the AWS rises above the specified speed.
- **AWS Low** — The Apparent Wind Speed (AWS) low alarm is triggered when the AWS drops below the specified speed.
- **AWA High** — The Apparent Wind Angle (AWA) high alarm is triggered when the AWA is greater than the specified angle.
- **AWA Low** — The Apparent Wind Angle (AWA) low alarm is triggered when the AWA is less than the specified angle.
- **TWS High** — The True Wind Speed (TWS) high alarm is triggered when the TWS rises above the specified speed.
- **TWS Low** — The True Wind Speed (TWS) low alarm is triggered when the TWS drops below the specified speed.
- **TWA High** — The True Wind Angle (TWA) high alarm is triggered when the TWA is greater than the specified angle.
- **TWA Low** — The True Wind Angle (TWA) low alarm is triggered when the TWA is less than the specified angle.

Other alarms

Other alarms can be enabled and disabled and alarm threshold values can be set from the **Other** menu: **Menu > Alarms > Settings > Other**. The following other alarms are available:

- **Alarm Clock** — The alarm clock alarm is triggered at the specified **Time**. The alarm clock can be switched between **24 hour** clock and **AM/PM** from the **Format** menu.
- **Off Course** — The off course alarm is triggered, during active navigation when your vessel is more than the specified degrees off its track.
- **MOB** — When enabled, if a Man overboard (MOB) alarm is triggered on an MFD on the same network the MOB alarm will also be triggered on the display.
- **Battery Low** — The battery low alarm is triggered when the supply voltage to the display drops below the specified voltage.

AIS alarms

AIS safety message and dangerous targets alarms can be enabled and disabled and the dangerous target alarm thresholds can be adjusted from the AIS menu: **Menu > Alarms > Settings > Other > AIS**. The following settings are available:

- **Safety Messages** — Enables and disable display of AIS related safety messages on the display.
- **Dangerous Targets** — When enabled, the dangerous targets alarm is triggered when an AIS target will reach the distance from your vessel specified in the **Safe zone** setting within the time period specified in the **Time to Safe Zone** setting.
- **Safe Zone** — Specifies the distance for the safe zone of the dangerous targets alarm.
- **Time to Safe Zone** — Specifies the time it will take for an AIS target to reach the safer zone to trigger the dangerous target alarm.

Note:

Other AIS related alarms are also shown on the display when triggered by connected AIS hardware.

Engine alarms

Engine alarms can be enabled and disabled from the Other menu: **Menu > Alarms > Settings > Other > Engines**. When enabled, supported engine alarms will be shown on the display.

Fuel alarms

When the Fuel manager has been set up fuel related alarms can be enabled and disabled and alarm thresholds can be set from the Other menu: **Menu > Alarms > Settings > Other** . The following fuel related alarms are available:

- **Estimated Fuel Remaining** — The alarm is triggered when the remaining fuel drop lower than the specified fuel capacity.
- **Time to Empty** — The alarm is triggered when the fuel manager calculates that the time drops below the specified time.
- **Distance to Empty** — The alarm is triggered when the fuel manager calculates that the distance until the tank is empty drops below the specified distance.

Honda engine alarms

When engine alarms are enabled the display supports Honda engine specific alarms received from compatible Honda engines.

Chapter 11: Setup menu

Chapter contents

- 11.1 Setup menu on page 80
- 11.2 Transducer set-up menu on page 80
- 11.3 User preferences menu on page 82
- 11.4 System Set-up menu on page 84

11.1 Setup menu

The Set-up menu provides settings to configure the unit.

- **Transducer Set-up** — Set up and calibrate transducers as detailed in Transducer calibration chapter: [p.23 — Transducer calibration](#)
- **User Preferences** — Configure the following options:
 - Time & Date — Refer to: [p.82 — Time and date](#)
 - Units — Refer to: [p.82 — Units of measure](#)
 - Language — Refer to: [p.82 — User interface languages](#)
 - Boat Type — Refer to: [p.83 — Boat types](#)
 - Boat Details — Refer to: [p.83 — Boat details](#)
 - Variation — Refer to: [p.83 — Variation](#)
 - Key Beep — Refer to: [p.83 — Key beep](#)
- **System set up** — Configure network groups and data sources. The following options are available:
 - Network group — Refer to: [p.84 — Network group](#)
 - Brightness/Color Group — Refer to: [p.84 — Brightness and color group](#)
 - Data Sources — Refer to: [p.84 — Data sources](#)
 - About System Set Up — Provides information about the System set-up menu.
- **Simulator** — Enables and disables simulator mode. The simulator produces simulated data to enable you to practice operating the display.

Note: The simulator will not produce simulated data if live data sources are present on the SeaTalkng[®] network.

- **Factory reset** — Delete user settings and restore the display to its factory default settings.
- **Diagnostics** — Information About the display, devices connected to the network and the diagnostics self test. The following options are available:
 - About display — View hardware and software details for your display.
 - About system — Allows you to search the SeaTalkng[®] network and shows information about the products found.
 - Self Test — The product has a built in self test which can help to diagnose faults. The following tests are performed during a self test:
 - ◆ Memory test
 - ◆ Button test
 - ◆ Display test
 - ◆ Buzzer test
 - ◆ Illumination test

11.2 Transducer set-up menu

The **Transducer Set-up** menu enables calibration of connected transducers.

The Transducer set-up menu is accessed from the **Set-up** menu: **Menu > Set-up > Transducer Set-up**
iTC-5

The **iTC-5** menu enables setup and calibration of transducers connected using an iTC-5. The following calibration options are available when the relevant transducer is connected:

- **Depth** — For depth calibration details refer to: [p.24 — Depth calibration](#)
- **Speed** — For speed calibration details refer to: [p.25 — Speed calibration](#)
- **Wind** — For wind calibration details refer to: [p.34 — Wind calibration](#)
- **Rudder reference** — For rudder reference calibration details refer to: [p.38 — Rudder reference calibration](#)
- **Compass** — For compass calibration details refer to: [p.39 — Compass calibration](#)

Depth

The **Depth** menu provides transducer details and calibration settings. The following options are available:

- **Details** — The details menu displays information about the installed transducer or interface such as serial number and software version etc.
- **Depth Offset** — The depth offset menu allows you to configure the location depth readings are taken from and specify the distance the location is from the transducer face. For depth calibration details refer to: [p.24 — Depth calibration](#)

Speed

The **Speed** menu enables set-up and calibration of speed transducers. The following options are available:

- **Details** — The details menu displays information about the installed transducer or interface such as serial number and software version etc.
- **Speed calibration** — The speed calibration menu provides options for calibrating your speed transducer. For speed calibration details refer to: [p.25 — Speed calibration](#)
- **Calibrate water temperature** — Enter a temperature offset so that the displayed reading matches manually taken water temperature. For water temperature calibration details refer to: [p.34 — Calibrating Water temperature](#)

Wind

The **Wind** menu enables set-up and calibration of wind transducers. The following options are available:

- **Details** — The details menu displays information about the installed transducer or interface such as serial number and software version etc.
- **Calibrate vane** — Access the wind calibration wizard. For wind calibration details refer to: [p.34 — Wind calibration](#)
- **App wind speed calibration** — Enter an AWS offset value so that the displayed reading matches an accurate wind speed reference.

DST800 / DST810

The **DST800 / DST810** menu enables set-up and calibration of compatible DST (Depth, Speed, and Temperature) smart transducers. The following calibration options are available:

- **Details** — The details menu displays information about the installed transducer or interface such as serial number and software version etc.
- **Depth offset** — The depth offset menu allows you to configure the location depth readings are taken from and specify the distance the location is from the transducer face. For depth calibration details refer to: [p.24 — Depth calibration](#)
- **Speed calibration** — The speed calibration menu provides options for calibrating your speed transducer. For speed calibration details refer to: [p.25 — Speed calibration](#)
- **Temperature offset** — Enter a temperature offset so that the displayed reading matches manually taken water temperature. For water temperature calibration details refer to: [p.34 — Calibrating Water temperature](#)

DT800 / DT810

The **DT800 / DT810** menu enables set-up and calibration of compatible DT (Depth and Temperature) smart transducers. The following calibration options are available:

- **Details** — The details menu displays information about the installed transducer or interface such as serial number and software version etc.
- **Depth offset** — The depth offset menu allows you to configure the location depth readings are taken from and specify the distance the location is from the transducer face. For depth calibration details refer to: [p.24 — Depth calibration](#)
- **Temperature offset** — Enter a temperature offset so that the displayed reading matches manually taken water temperature. For water temperature calibration details refer to: [p.34 — Calibrating Water temperature](#)

11.3 User preferences menu

Time and date

The **Time & Date** menu provides date and time format options and a time offset setting to compensate for any time zone difference between local time and the Universal Time Constant (UTC).

The following options are available:

Date format	Time format	Time offset
<ul style="list-style-type: none"> • mm/dd/yy • dd/mm/yy 	<ul style="list-style-type: none"> • 12hr • 24hr 	<ul style="list-style-type: none"> • -13 to +13 hours

Units of measure

The **Units** menu enables you to specify the units of measure used for data items.

The following options are available:

Speed units <ul style="list-style-type: none"> • kts — knots • mph — miles per hour • km/h — Kilometers per hour 	Distance (long) units <ul style="list-style-type: none"> • nm — Nautical miles • sm — Statute miles • km — Kilometers 	Distance (short) units <ul style="list-style-type: none"> • ft — Feet • m — Metres
Depth units <ul style="list-style-type: none"> • ft — Feet • m — Metres • fa — Fathoms 	Wind speed units <ul style="list-style-type: none"> • kts — knots • m/s — metres per second 	Temperature units <ul style="list-style-type: none"> • °C — degrees centigrade • °F — degrees fahrenheit
Flow rate units <ul style="list-style-type: none"> • UK Gal/H — UK gallons per hour • US Gal/H — US gallons per hour • LPH — Liters per hour 	Heading type <ul style="list-style-type: none"> • Mag — magnetic • True 	Pressure units <ul style="list-style-type: none"> • PSI — pounds per square inch • Bar — bar • kPa — Kilo pascals
Volume units <ul style="list-style-type: none"> • UK Gallons • US Gallons • ltr — liter 	Economy units <ul style="list-style-type: none"> • Distance per volume • Volume per distance • Ltr/100km 	

User interface languages

The **Language** menu allows you to select the language that will be used for the display's user interface.

The following options are available:

English (UK)	English (US)	Chinese	Croatian	Danish
Dutch	Finnish	French	German	Greek
Italian	Japanese	Korean	Norwegian	Polish
Portuguese (Brazilian)	Russian	Spanish	Swedish	Turkish

Boat types

The **Boat Type** menu allows you to select a boat type that is similar to your vessel. The boat type selection determines the default setup of the display including which default favorite pages are available.

The following options are available:

Race Sail	Sail Cruiser	Catamaran	Workboat
RIB	Outboard Speedboat	Inboard Speedboat	Power Cruiser 1 (<12kts)
Power Cruiser 2 (<30kts)	Power Cruiser 3 (>30kts)	Sport Fishing	Pro Fishing

Boat details

The **Boat Details** menu allows you to configure engine, battery and fuel related settings.

The following options are available:

- **Number of engines** — Configure the display for 1 to 5 engines.
- **Number of batteries** — Configure the display for 1 to 16 batteries.
- **Number of fuel tanks** — Configure the display for 1 to 5 fuel tanks.
- **Max RPM range** — Configure the Maximum RPM for your engines. This will be used on engine RPM dials.
- **RPM Red Zone** — Configure the start of the RPM red zone for your engines. This will be used on engine RPM dials.

Note:

If **Max RPM range** and / or **RPM Red Zone** are set to **Auto** then values transmitted by the engine will be used, otherwise the default range will be used.

Variation

Variation is the local difference between True north which does not change and Magnetic north which changes slightly each year. Cartography generally uses True north and Magnetic north is the direction a magnetic compass points. Variation changes depending on your geographic location and date. The **Variation** menu provides options to compensate for variation.

The following options are available:

- **Variation mode** — Variation mode can be set to the following:
 - **On** — With variation switched on you can set the amount of variation using the **Variation range** option.
 - **Off** — With variation switched off variation will be used.
 - **Slave** — When networked to another device (e.g.: an MFD or pilot controller) that provides magnetic variation the display will automatically switch to slave mode and use the variation provided by that device.
- **Variation range** — When **Variation mode** is switched on your magnetic heading readings will be adjusted by the amount specified.

Key beep

By default every time a button is pressed the display will beep. The beep can be enabled and disabled using the Key beep option.

11.4 System Set-up menu

Network group

The **Network group** menu allows you to add multiple displays to a group so that when the color scheme or brightness is changed on one display the changes are applied to all displays in that group.

The groups available are:

- None
- Helm 1
- Helm 2
- Cockpit
- Flybridge
- Mast

There are also 5 undefined groups available.

Brightness and color group

The **Brightness / color group** menu enables synchronization of the display's brightness and color scheme to be the same as other displays in the same network group.

The following options are available:

- This display
- This group

Data sources

The **Data sources** menu allows you to view available data sources and if required, to select your referred data sources.

The available data sources are:

- GPS position
- GPS Datum
- Time & Date
- Heading
- Depth
- Speed
- Wind

Chapter 12: System checks and troubleshooting

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- [12.1 Troubleshooting on page 86](#)
- [12.2 Power up troubleshooting on page 87](#)
- [12.3 System data troubleshooting on page 88](#)
- [12.4 Miscellaneous troubleshooting on page 89](#)
- [12.5 Performing a Factory Reset on page 90](#)

12.1 Troubleshooting

The troubleshooting information provides possible causes and corrective action required for common problems associated with installation and operation of your product.

Before packing and shipping, all Raymarine products are subjected to comprehensive testing and quality assurance programs. If you do experience problems with your product this section will help you to diagnose and correct problems in order to restore normal operation.

If after referring to this section you are still having problems with your product, please refer to the Technical support section of this manual for useful links and Raymarine Product Support contact details.

12.2 Power up troubleshooting

Product does not turn on or keeps turning off

Possible causes	Possible solutions
Blown fuse / tripped breaker.	<ol style="list-style-type: none"> 1. Check condition of relevant fuses and breakers and connections, replace if necessary. (Refer to the <i>Technical Specification</i> section of your product's installation instructions for fuse ratings.) 2. If fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections	<ol style="list-style-type: none"> 1. Check that the power cable connector is correctly orientated and fully inserted into the display connector and locked in position. 2. Check the power supply cable and connectors for signs of damage or corrosion, and replace if necessary. 3. With the display turned on, try flexing the power cable near to the display connector to see if this causes the unit to restart or lose power. Replace if necessary. 4. Check the vessel's battery voltage and the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion. Replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary.
Incorrect power connection	The power supply may be wired incorrectly, ensure the installation instructions have been followed.

Product will not start up (restart loop)

Possible causes	Possible solutions
Power supply and connection	See possible solutions from the table above, entitled 'Product does not turn on or keeps turning off'.
Software corruption	<ol style="list-style-type: none"> 1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine website. 2. On display products, as a last resort, attempt to perform a 'Power on Reset'. Be aware that this will delete all settings / presets and user data (such as waypoints and tracks), and revert the unit back to factory defaults.

12.3 System data troubleshooting

Aspects of the installation can cause problems with the data shared between connected equipment. Such problems, their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Instrument, engine or other system data is unavailable at all displays.	Data is not being received at the display.	Check the data bus (e.g. SeaTalk^{ng}) wiring and connections.
		Check the overall integrity of the data bus (e.g. SeaTalk^{ng}) wiring.
		If available refer to the reference guide for the data bus (e.g. SeaTalk^{ng} reference manual).
	Data source (e.g. instrument display or engine interface) is not operating.	Check the source of the missing data (e.g. instrument display or engine interface).
		Check the power to the SeaTalk bus.
		Refer to the manufacturer's handbook for the equipment in question.
Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.	
Instrument or other system data is missing from some but not all displays.	Network problem.	Check that all required equipment is connected to the network.
		Check the status of the Raymarine network Switch.
		Check that SeaTalk^{hs} / RayNet cables are free from damage.
	Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.
Position data is not displayed on VHF radio	VHF radio NMEA 0183 input not isolated / incorrect polarity	<ul style="list-style-type: none"> • Check that the radio has an Isolated NMEA 0183 input. • Check polarity of NMEA 0183 wires.

12.4 Miscellaneous troubleshooting

Miscellaneous problems and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Display behaves erratically: <ul style="list-style-type: none"> • Frequent unexpected resets. • System crashes or other erratic behavior. 	Intermittent problem with power to the display.	Check relevant fuses and breakers.
		Check that the power supply cable is sound and that all connections are tight and free from corrosion.
		Check that the power source is of the correct voltage and sufficient current.
	Software mismatch on system (upgrade required).	Go to www.raymarine.com and click on support for the latest software downloads.
	Corrupt data / other unknown issue.	Perform a factory reset. <div style="background-color: #f0f0f0; padding: 5px; margin-top: 5px;"> <p>Important: This will result in the loss of any settings and data (such as waypoints) stored on the product. Save any important data to a memory card before resetting.</p> </div>

12.5 Performing a Factory Reset

To reset your unit to factory default settings follow the steps below.

Note: Performing a factory reset will erase all saved data and customized settings.

1. Press the **Menu** button.
2. Select **Set Up**.
3. Select **Factory Reset**.
4. Select **Yes**.

Your unit will now reset itself to factory default settings.

Chapter 13: Technical support

Chapter contents

- [13.1 Raymarine product support and servicing on page 92](#)
- [13.2 Viewing product information on page 93](#)

13.1 Raymarine product support and servicing

Raymarine provides a comprehensive product support service, as well as warranty, service, and repairs. You can access these services through the Raymarine website, telephone, and e-mail.

Product information

If you need to request service or support, please have the following information to hand:

- Product name.
- Product identity.
- Serial number.
- Software application version.
- System diagrams.

You can obtain this product information using diagnostic pages of the connected MFD.

Servicing and warranty

Raymarine offers dedicated service departments for warranty, service, and repairs.

Don't forget to visit the Raymarine website to register your product for extended warranty benefits: <http://www.raymarine.co.uk/display/?id=788>.

United Kingdom (UK), EMEA, and Asia Pacific:

- E-Mail: emea.service@raymarine.com
- Tel: +44 (0)1329 246 932

United States (US):

- E-Mail: rm-usrepair@flir.com
- Tel: +1 (603) 324 7900

Web support

Please visit the "Support" area of the Raymarine website for:

- **Manuals and Documents** — <http://www.raymarine.com/manuals>
- **Technical support forum** — <http://forum.raymarine.com>
- **Software updates** — <http://www.raymarine.com/software>

Worldwide support

United Kingdom (UK), EMEA, and Asia Pacific:

- Help desk: <https://raymarine.custhelp.com/app/ask>
- Tel: +44 (0)1329 246 777

United States (US):

- Help desk: <https://raymarine.custhelp.com/app/ask>
- Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)

Australia and New Zealand (Raymarine subsidiary):

- E-Mail: aus.support@raymarine.com
- Tel: +61 2 8977 0300

France (Raymarine subsidiary):

- E-Mail: support.fr@raymarine.com
- Tel: +33 (0)1 46 49 72 30

Germany (Raymarine subsidiary):

- E-Mail: support.de@raymarine.com
- Tel: +49 40 237 808 0

Italy (Raymarine subsidiary):

- E-Mail: support.it@raymarine.com
- Tel: +39 02 9945 1001

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es

- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

- E-Mail: support.nl@raymarine.com
- Tel: +31 (0)26 3614 905

Sweden (Raymarine subsidiary):

- E-Mail: support.se@raymarine.com
- Tel: +46 (0)317 633 670

Finland (Raymarine subsidiary):

- E-Mail: support.fi@raymarine.com
- Tel: +358 (0)207 619 937

Norway (Raymarine subsidiary):

- E-Mail: support.no@raymarine.com
- Tel: +47 692 64 600

Denmark (Raymarine subsidiary):

- E-Mail: support.dk@raymarine.com
- Tel: +45 437 164 64

Russia (Authorized Raymarine distributor):

- E-Mail: info@mikstmarine.ru
- Tel: +7 495 788 0508

13.2 Viewing product information

1. Press the **Menu** button.
2. Select **Set-up**.
3. Select **Diagnostics**.
4. Select **About Display**.

A range of information is displayed, including the software version and Serial number.

5. Use the **Up** and **Down** buttons to cycle through the information.

Appendix A Supported NMEA 2000 PGN list

Administration PGNs

- **59392** — ISO Acknowledge (Receive / Transmit)
- **59904** — ISO Request (Receive / Transmit)
- **60928** — ISO Address Claim (Receive / Transmit)
- **126208** — NMEA — Request, Commanded, Acknowledged Group Function (Receive / Transmit)
- **126464** — PGN Transmit and Receive List (Receive / Transmit)
- **126996** — Product Information (Receive / Transmit)

Raymarine® provides field programmability of the Device and System Instances within PGN 60928 which can be commanded via use of PGN 126208 as required by the latest **NMEA 2000** standard.

Data PGNs

- **127237** — Heading/Track Control (Receive)
- **127245** — Rudder (Receive / Transmit)
- **127250** — Vessel Heading (Receive / Transmit)
- **127251** — Rate of Turn (Receive / Transmit)
- **127257** — Attitude (Receive)
- **127258** — Magnetic Variation (Receive / Transmit)
- **127488** — Engine Parameters, Rapid Update (Receive)
- **127489** — Engine Parameters, Dynamic (Receive)
- **127493** — Transmission Parameters, Dynamic (Receive) **In software version 3.20 onwards**, the following warnings are supported:
 - Check Transmission
 - Over Temperature
 - Low Oil Pressure
 - Low Oil Level
 - Sail Drive
- **127496** — Trip Parameters, Vessel (Receive)
- **127497** — Trip Parameters, Engine (Receive)
- **127498** — Engine Parameters, Static (Receive)
- **127505** — Fluid Level (Receive)
- **127508** — Battery status (Receive)
- **128259** — Speed, (Receive / Transmit)
- **128267** — Water Depth (Receive / Transmit)
- **128275** — Distance Log (Receive / Transmit)
- **129025** — Position, Rapid Update (Receive / Transmit)
- **129026** — COG & SOG, Rapid Update (Receive / Transmit)
- **129029** — GNSS Position Data (Receive / Transmit)
- **129033** — Time & Date (Receive / Transmit)
- **129038** — AIS Class A Position Report (Receive)
- **129039** — AIS Class B Position Report (Receive)
- **129040** — AIS Class B Extended Position Report (Receive)
- **129041** — AIS Aids to Navigation (AtoN) Report (Receive)
- **129044** — Datum (Receive / Transmit)
- **129283** — Cross Track Error (Receive / Transmit)
- **129284** — Navigation Data (Receive / Transmit)
- **129291** — Set & Drift, Rapid Update (Receive)
- **129801** — AIS Addressed Safety Related Message (Receive)
- **129802** — AIS Safety Related Broadcast Message (Receive)
- **129809** — AIS Class B "CS" Static Report, Part A (Receive)

- **129810** — AIS Class B "CS" Static Report, Part B (Receive)
- **130306** — Wind Data (Receive / Transmit)
- **130310** — Environmental Parameters (Receive / Transmit)
- **130311** — Environmental Parameters (Receive / Transmit)
- **130576** — Small Craft Status (Receive)
- **130577** — Direction Data (Receive)

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