Raymarine®

# i70 / i70s

## Operation Instructions

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**English (en-US)**
Document number: 81401 (Rev 6)

# CONTENTS


CHAPTER 1 IMPORTANT INFORMATION ..... 9
Product warnings ..... 9
Water ingress ..... 9
Regulatory notices ..... 9
TFT Displays ..... 9
Disclaimer ..... 9
PSTI Compliance ..... 9
Warranty policy and registration ..... 10
IMO and SOLAS ..... 10
Technical accuracy ..... 10
Publication copyright ..... 10

CHAPTER 2 DOCUMENT INFORMATION ..... 11
2.1 Applicable products ..... 12
2.2 Product documentation ..... 12
Printed (hardcopy) product manuals ..... 12
2.3 Document conventions ..... 12
2.4 Document illustrations ..... 13
2.5 Glossary ..... 13

CHAPTER 3 SOFTWARE DETAILS ..... 14
3.1 Applicable software version ..... 15
3.2 New software features ..... 15
3.3 Software compatibility ..... 15
3.4 Compatible peripheral product software ..... 15
3.5 Software updates ..... 15
Checking hardware and software information ..... 16
Performing software updates ..... 16

CHAPTER 4 GETTING STARTED ..... 17
4.1 Controls ..... 18
4.2 Switching on the display ..... 18
4.3 Switching off the display ..... 18
4.4 Completing the set up wizard ..... 18
4.5 Adjusting the display's brightness ..... 18
4.6 Shared Brightness ..... 19
Assigning A Network Group ..... 19
Unsharing the display ..... 20
4.7 Changing the color scheme ..... 20
4.8 Setting the display response ..... 20
4.9 Multiple data sources (MDS) ..... 21
Selecting a preferred data source ..... 21
4.10 Quick options menu ..... 22

CHAPTER 5 TRANSDUCER CALIBRATION ..... 23
5.1 Transducer calibration ..... 24
5.2 Depth calibration ..... 24
Depth transducer offset ..... 24
Setting the depth offset ..... 24
5.3 Speed calibration ..... 25
One point Speed Calibration ..... 26
Nautical measured mile markers ..... 26
Performing a Speed Run Calibration using SOG ..... 27
Calibration table ..... 28
Calibrating Water temperature ..... 31
5.4 RSW-Series wind transducer configuration ..... 31

Configuring the RSW-Series wind transducer using i70 / i70s instrument display .....33
RSW-Series wind transducer internal compass calibration .....33
Resetting compass calibration (i70 / i70s) .....33
5.5 Wind calibration .....34
Calibrating wind .....34
Aligning the wind transducer .....34
Adjusting the wind transducer .....35
Adjusting apparent wind speed .....35
5.6 Rudder reference calibration .....36
Centering the Rudder .....36
Adjusting the Rudder Angle .....36
Inverting the Rudder .....37
5.7 Compass calibration .....37
Swinging the Compass .....37
Setting the Compass Offset .....38

CHAPTER 6 FAVORITE PAGES ..... 39
6.1 Favorite pages .....40
Heading & speed favorite page .....40
Digital depth favorite page .....40
Digital speed favorite page .....40
Speed dial favorite page .....40
AWA & AWS favorite page .....41
Single engine page .....42
Dual engine favorite page .....42
Honda engine page .....43
Quad-split data page .....43
AIS page .....43
6 Way-split data page .....43
Heading and wind page .....44
Favorite pages menu settings .....44
Favorite page layout .....44
6.2 Customizing pages .....45
Customizing an existing page .....45
Adding a page .....45
Deleting a page .....45
Changing the page order .....45
Setting page Rollover .....45
Activating and deactivating Page Lock .....46

CHAPTER 7 DISPLAY DATA ..... 47
7.1 Data (quick view) .....48
7.2 Display data .....48
Battery data .....48
Boat data .....48
Depth data .....48
Distance data .....48
Engine data .....49
Fuel data .....49
Environment data .....49
GPS data .....50
Heading (data items) .....50
Navigation data .....50
Pilot data .....51
Speed data .....51
Time data .....51
Wind data .....51

AIS feature ....52

CHAPTER 8 AIS .... 53

8.1 Automatic Identification System (AIS) overview ....54
8.2 AIS target symbols....55
8.3 Setting AIS range ....55
8.4 Viewing AIS target information....55
8.5 Enabling and disabling AIS Silent mode ....56

CHAPTER 9 FUEL MANAGER.... 57

9.1 Fuel manager overview....58
9.2 Detecting fuel messages ....58
9.3 Setting up the fuel manager....58
9.4 Setting tank fills ....58
9.5 Fuel data on favorite pages ....59
9.6 Switching fuel calculations....59
9.7 Reset fuel usage ....59
9.8 Fuel manager menu....59

CHAPTER 10 RACE TIMER SETTINGS .... 60

10.1 Setting the Race Timer....61
10.2 Using the Race Timer....61

CHAPTER 11 ALARMS.... 62

11.1 Alarms....63
Man overboard (MOB) alarm ....63
11.2 Active Engine Alarms ....63
11.3 Alarm settings....64
Honda engine alarms....65

CHAPTER 12 SETUP MENU .... 66

12.1 Setup menu....67
12.2 Transducer Set-up menu ....67
12.3 iTC-5 calibration settings ....67
12.4 Depth calibration settings ....68
12.5 Speed calibration settings....68
12.6 Wind calibration settings....68
12.7 Rudder calibration settings ....68
12.8 Compass calibration settings ....68
12.9 RSW-Series wind calibration settings ....69
12.10 DT800/DT810 calibration settings....69
12.11 DST800/DST810 calibration settings ....69
12.12 User Preferences menu ....70
12.13 System set-up menu....73
12.14 Diagnostics menu....74

CHAPTER 13 SYSTEM CHECKS AND TROUBLESHOOTING .... 75

13.1 Troubleshooting ....76
13.2 Power up troubleshooting ....76
13.3 System data troubleshooting....77
13.4 Miscellaneous troubleshooting ....78
13.5 Performing a Factory Reset ....78

CHAPTER 14 TECHNICAL SUPPORT .... 79

14.1 Raymarine technical support and servicing ....80
14.2 Checking hardware and software information ....81

APPENDIX A SUPPORTED NMEA 2000 PGN LIST .... 83

APPENDIX B GLOSSARY .... 84

APPENDIX C I70-SERIES SOFTWARE RELEASE HISTORY .... 88

APPENDIX D DOCUMENT CHANGE HISTORY ..... 90

# CHAPTER 1: IMPORTANT INFORMATION

## Product warnings

### Caution: Sun covers

• Sun covers are used to protect the display screen against the damaging effects of ultraviolet (UV) light. If your product is supplied with a sun cover always ensure it is fitted when the product is not in use.

• To avoid potential loss of the sun cover, ensure that the sun cover is removed when travelling at high speed, whether in the water or when the vessel is being towed.

• To avoid potential screen damage, ensure that the rear surface of the sun cover and the display screen are clean and free from debris before placing the sun cover on the screen.

### 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 not installed correctly or subjected to high-pressure washing. Raymarine will not warrant products subjected to high-pressure washing.

## Regulatory notices

### 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.

### 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.

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### PSTI Compliance

For products sold into the United Kingdom (UK), use the following link to obtain the product's Statement of Compliance with the *Product Security and Telecommunications Infrastructure* (PSTI) Regulations:

Visit the following web address and enter the product's model name or number (SKU) into the provided search field:

- www.bit.ly/rym-sec-com

## Warranty policy and registration

Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online: www.bit.ly/rym-warranty

It is important that you register your product to receive full warranty benefits. Your product package includes a barcode label indicating the serial number of the unit. This serial number is also provided on a label affixed to the product itself. You will need this serial number when registering your product online.

## 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.

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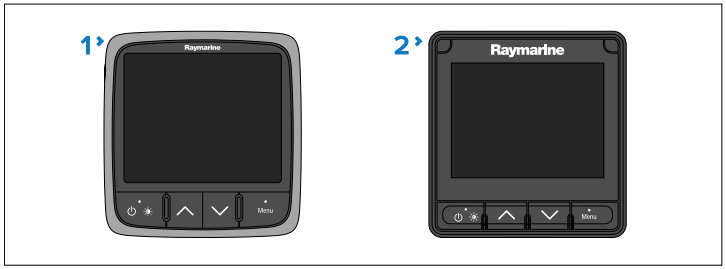
# CHAPTER 2: DOCUMENT INFORMATION

## CHAPTER CONTENTS


- 2.1 Applicable products — page 12
- 2.2 Product documentation — page 12
- 2.3 Document conventions — page 12
- 2.4 Document illustrations — page 13
- 2.5 Glossary — page 13

## 2.1 Applicable products

This document is applicable to the products shown below.




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

## 2.2 Product documentation

The following documentation is applicable to your product:

### Applicable documents

| Document | Description | Link |
|---|---|---|
| **81401** | Operation Instructions (This document) | www.bit.ly/i70s-docs |
| **87420** | i70s Installation Instructions | www.bit.ly/i70s-docs |
| **87425** | i70 Installation Instructions | www.bit.ly/i70-docs |

### Printed (hardcopy) product manuals

All applicable user documentation for your product is available on our website to view or download free-of-charge. If you would prefer a **printed** (hardcopy) product manual, a Print Shop service is available, enabling you to purchase a high-quality, professionally-printed manual for your product, delivered directly to your door.

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

Printed manuals are provided by a third-party (**Lulu Press**).

To order a printed manual, use the Lulu Press website link provided below. The manual will then be printed and delivered to the address you specify. Once an order is placed, it typically takes Lulu Press approximately 5 to 10 working days to print and deliver a printed manual.

| Supplier | How to purchase |
|---|---|
| lulu | 1. Click the following link.<br>2. In the displayed search field, enter the required document number, e.g. *81406*<br>www.bit.ly/rym_printshop |

**Note:**

- Accepted methods of payment for printed manuals are credit cards and PayPal.
- Printed manuals can be shipped worldwide.

## 2.3 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).

## 2.4 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.

## 2.5 Glossary

A glossary of common terms and abbreviations used in this document can be found in the appendix.

Refer to: **p.84 — Glossary**

# CHAPTER 3: SOFTWARE DETAILS

## CHAPTER CONTENTS


- 3.1 Applicable software version — page 15
- 3.2 New software features — page 15
- 3.3 Software compatibility — page 15
- 3.4 Compatible peripheral product software — page 15
- 3.5 Software updates — page 15

## 3.1 Applicable software version

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

This document has been updated to reflect the following product(s) and software version:

| Product | Applicable software version |
|---|---|
| i70 / i70s | v3.24 |

Check the website for the latest software:

| i70 / i70s software download link |
|---|
| https://bit.ly/i70-download |

## 3.2 New software features

The following new features have been added to releases v3.23 / v3.24 of the i70 / i70s operating system.

- Added support for configuring the RSW-Wired series of wind transducers. For details, refer to: **p.31 — RSW series wind transducer configuration**
- Added ability to receive NMEA 2000 PGNs 130312 and 130316 (including Dew point).
- Added ability for TWD (True Wind Direction) readings to automatically use SOG (Speed Over Ground) if STW (Speed Through Water) is not available.
- Added Position data format options to the *[Units]* menu.

## 3.3 Software compatibility

The software version installed on Raymarine products must be compatible with the version of software installed on your display.

**Note:**
Where possible, you should always update your Raymarine products' software to the latest available versions.

## 3.4 Compatible peripheral product software

Below is a list of peripheral products which require software updates in order to remain compatible with the features and improvements introduced in the i70 / i70s v3.23 and v3.24 software updates:

| Product | New software version |
|---|---|
| iTC-5 | v1.13 |

## 3.5 Software updates

Raymarine regularly issues software updates for its products, which provide new and enhanced features and improved performance and usability. It's important to ensure that you have the latest software for your products by regularly checking the Raymarine website for new software releases.

To check for the latest software updates and the software update procedure for your specific product(s), refer to: www.bit.ly/rym-software

Unless otherwise stated, software updates for Raymarine products are performed using a Raymarine MFD / chartplotter.

- Where applicable, you should always backup your user data and settings before performing a software update.
- To update SeaTalk NG products, you must use the datamaster MFD / chartplotter which is physically connected to the SeaTalk NG backbone.
- Ethernet (RayNet) products can be updated from any MFD / chartplotter on the same network as the product to be updated.
- In order to perform a software update, any connected Autopilot or Radar must be switched to Standby.
- The MFD / chartplotter "Check online" feature is only available when connected to the Internet.

**Note:**
If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine technical support.

## Checking hardware and software information

You can check current hardware details and software version from the *[About display]* menu.

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.

### 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 product(s) 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.

## Performing software updates

Software updates for this product are performed from a Raymarine MFD / Chartplotter.

For instructions on how to update product software, refer to the *software update* instructions included in the *Operation instructions* for your MFD / Chartplotter:

| MFD / Chartplotter software | Document | Link |
|---|---|---|
| **LightHouse 2** | Operation Instructions (**81360**) | www.bit.ly/LH2-docs |
| **LightHouse 3** | Advanced Operation Instructions (**81370**) | www.bit.ly/LH3-docs |
| **LightHouse 4** | Advanced Operation Instructions (**81406**) | www.bit.ly/LH4-docs |
| **LightHouse Sport** (Element) | Operation Instructions (**81388**) | www.bit.ly/element-docs |

# CHAPTER 4: GETTING STARTED

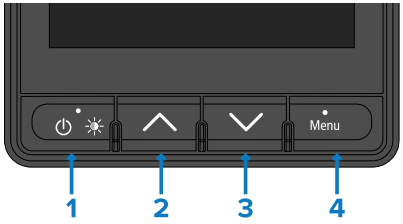
## CHAPTER CONTENTS


- 4.1 Controls — page 18
- 4.2 Switching on the display — page 18
- 4.3 Switching off the display — page 18
- 4.4 Completing the set up wizard — page 18
- 4.5 Adjusting the display's brightness — page 18
- 4.6 Shared Brightness — page 19
- 4.7 Changing the color scheme — page 20
- 4.8 Setting the display response — page 20
- 4.9 Multiple data sources (MDS) — page 21
- 4.10 Quick options menu — page 22

# 4.1 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]* — *Switch on*, *Switch off*, *Open brightness page* and *Back*.
2. *[Up]* — *Next favorite page*, *Move up in menu* and *Increase a numeric value*.
3. *[Down]* — *Previous favorite page*, *Move down in menu* and *Decrease a numeric value*.
4. *[Menu]* — *Open menu*, *Select menu item*, *OK* and *Save*.

# 4.2 Switching on the display

The display will automatically switch on when power is applied to the SeaTalk NG backbone, unless the display has previously been switched off using the *[Power]* button. If the *[Power]* button has been used to switch off the display then it must be used to switch the display back on again.

With the display powered but switched off:

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

# 4.3 Switching off the display

The display can be switched 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 switched off, the display may still draw a small amount of power from the battery, if this is a concern unplug the SeaTalk NG power supply or switch off at the breaker.

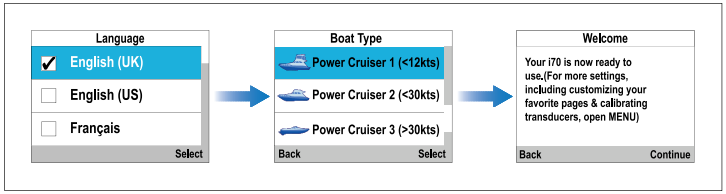
# 4.4 Completing the set up wizard

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 for 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.

# 4.5 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.*

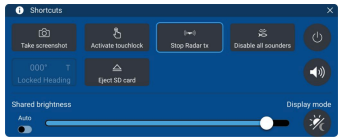
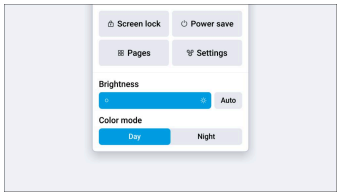
## 4.6 Shared Brightness

Shared brightness enables simultaneous brightness adjustment of all products that are part of the same group. For example, these groups could be used to reflect the physical location of products on your vessel (e.g.: helm and flybridge).

The following products are compatible with shared brightness:

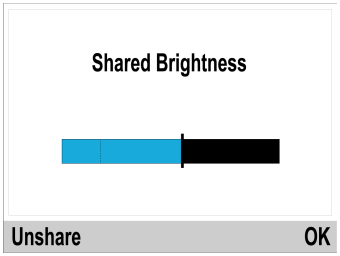
- Alpha-Series Performance Displays
- LightHouse 4 MFDs.
- LightHouse 3 MFDs using software v3.4.102 or later.
- SeaTalk NG Instrument displays and Pilot controllers.
- SeaTalk NG VHF DSC Radios.
- RMK-9 and RMK-10 remote keypads.

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

| LightHouse 4 / LightHouse 3 | Alpha-Series Performance Displays |
|---|---|
|  |  |





| VHF DSC Radio | Instrument display / Pilot controller |
|---|---|
| |  |





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.

**Note:**
If any display in the system has automatic brightness enabled, the brightness of all displays in the same group will be automatically adjusted and synchronized, whenever a brightness adjustment is made on any of the displays in the group.

### 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*

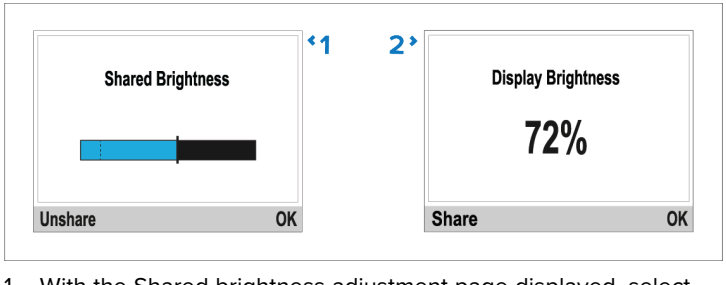
2. Select *[Brightness/Color Group]*.
3. Select *[This Group]*.
4. Select *[Sync]*.

   *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.



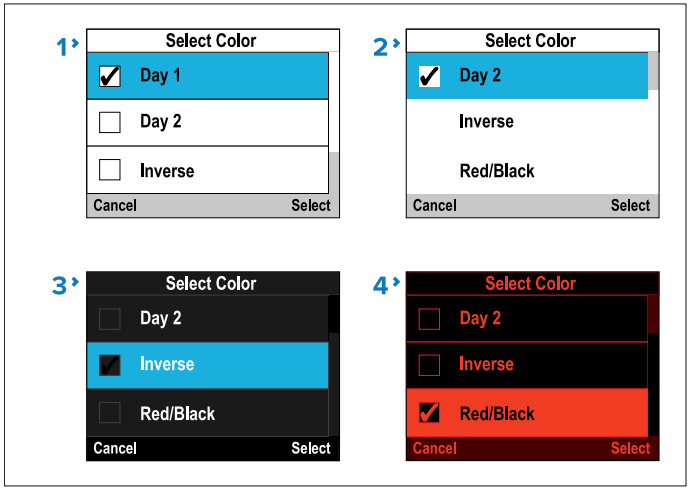

1. With the Shared brightness adjustment page displayed, select *[Unshare]* to revert to individual display brightness.
2. With the Display brightness page displayed, select *[Share]* to switch back to shared brightness.

## 4.7 Changing the color scheme

The display's color scheme can be changed.
From the *[Colors]* menu: *[Menu > Display Settings > Colors]*

1. Select a color scheme from the list

   *The available color schemes are:*




| *Item* | *Color scheme* |
|---|---|
| *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.

## 4.8 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]*.

# 4.9 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 GNSS (GPS) 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.

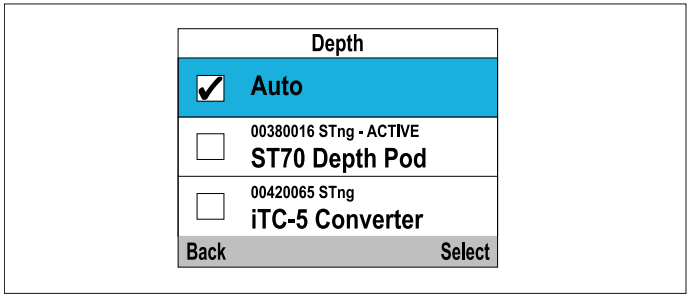
**Note:**
For MDS to be available on your system, all products in the system that report data must be MDS-compliant. The system will report any products that are NOT MDS-compliant. It may be possible to upgrade the software for these non-compliant products, to make them compliant. Visit the Raymarine website to obtain the latest software for your products: https://bit.ly/rym-software
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.*

# 4.10 Quick options menu

The *[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).

# CHAPTER 5: TRANSDUCER CALIBRATION

## CHAPTER CONTENTS


- 5.1 Transducer calibration — page 24
- 5.2 Depth calibration — page 24
- 5.3 Speed calibration — page 25
- 5.4 RSW-Series wind transducer configuration — page 31
- 5.5 Wind calibration — page 34
- 5.6 Rudder reference calibration — page 36
- 5.7 Compass calibration — page 37

# 5.1 Transducer calibration

The transducers listed below can be calibrated/configured using the display.

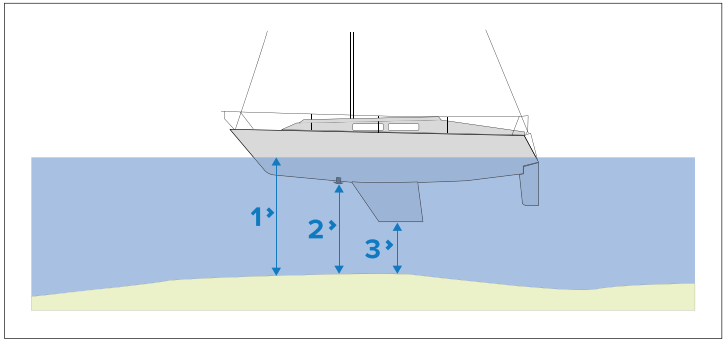
- **Depth transducers** — Connected via iTC-5 or a legacy depth pod.
- **Speed and temperature transducers** — Connected via iTC-5 or a legacy speed pod.
- **Wind transducers** — Connected directly to the SeaTalk NG backbone, via an iTC-5 or via a legacy wind pod.
- **Smart transducers** — Connected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

# 5.2 Depth calibration

## Depth transducer offset

Depth is 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 setting a waterline or keel offset, establish the vertical distance between the transducer and waterline or the bottom of your vessel's keel, as appropriate. Then set this distance as the depth offset value.




1. **Waterline** — The depth reading will be increased from the transducer's default reading.
2. **Transducer** — This is the default reading from the transducer (zero offset applied).
3. **Keel** — The depth reading will be decreased from the transducer's default reading.

## Setting the depth offset

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

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

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 is connected to.

   A list of available transducer data is displayed.
6. Select *[Depth]*

   *This step is only applicable when calibrating a depth transducer connected via an 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]*.

## 5.3 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.

**Prerequisites:**

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 one point (quick) Speed Calibration will suffice.

If the one point calibration does not provide sufficiently accurate readings or you require a higher level of precision for your speed readings, a Speed Run Calibration can be carried out. It is advisable to carry out the Speed Run Calibration at as many different 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 one point (quick) Speed Calibration will suffice. The calibration must be performed using a method of estimating actual vessel speed, and then adjusting the displayed reading so that the log speed matches 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 |
| One point (quick) Speed Calibration | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Speed Run Calibration | ✓ | ✗ | ✓ | ✗ | ✗ | ✗ |
| Manual Calibration | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |

## One point Speed Calibration

Quick calibration procedure for speed transducers.

**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. For more information, refer to: **Nautical Measured Mile Markers**
- 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.

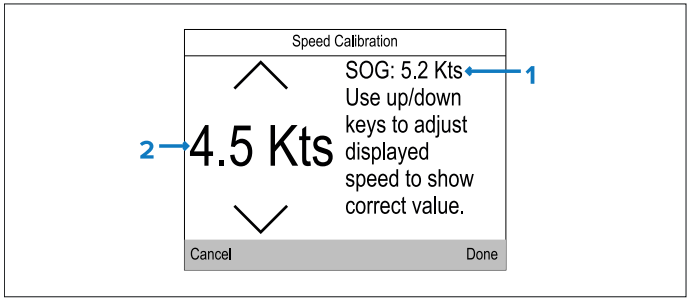
1. Press the *[Menu]* button.
2. Select *[Set-up]*.
3. Select *[Transducers Set-up]*.
4. Select *[Continue]*.

   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 is connected to the transducer you are calibrating.

   A list of available transducer data is displayed.
6. (1)Select *[Speed]*.

   *(This step is only applicable when calibrating a speed transducer connected via an iTC-5.)*
7. Select *[Speed Calibration]*.
8. Select *[Adjust speed up / down]*.

   The one point Speed Calibration page is displayed.




| | Description |
|---|---|
| 1 | SOG speed reading |
| 2 | Current speed reading |

If SOG data is not available, the SOG value is displayed as 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]*.

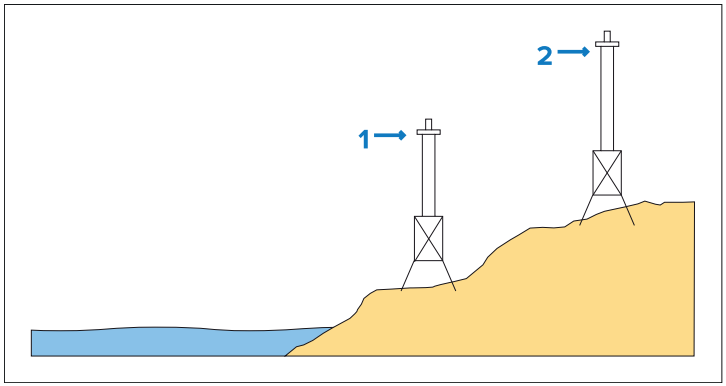
If you experience significant deviation between SOG and log speed readings at different vessel speeds, a Speed Run Calibration should be performed. For more information, refer to the following section: **Performing a Speed Run Calibration using SOG**

## 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.

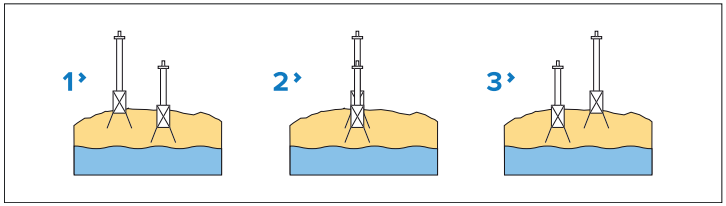
### Markers — side view




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.

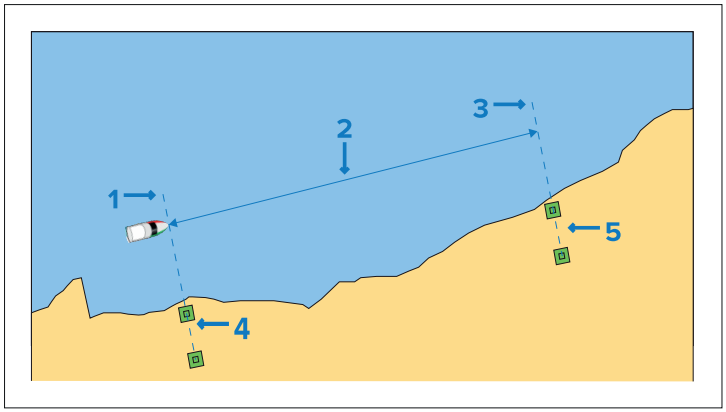
### Marker alignment (viewed from vessel)




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 one point (quick) 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:

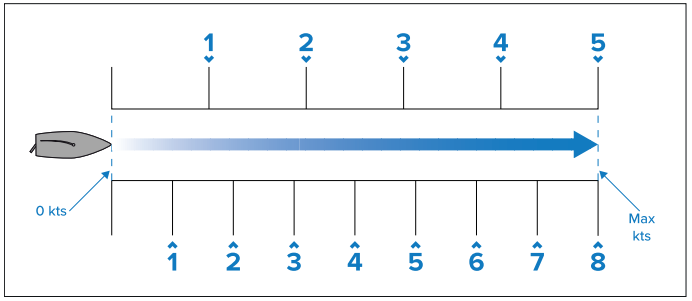
1. Press the *[Menu]* button.
2. Select *[Set-up]*.
3. Select *[Transducers Set-up]*.
4. Select *[Continue]*.

   The display will search for and show a list of connected devices. (i.e. iTC-5 or DST)
5. Select the device that is connected to the transducer you are calibrating.

   A list of available transducer data is displayed.
6. (1)Select *[Speed]*.

   *(This step is only applicable when calibrating a speed transducer connected via an 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:

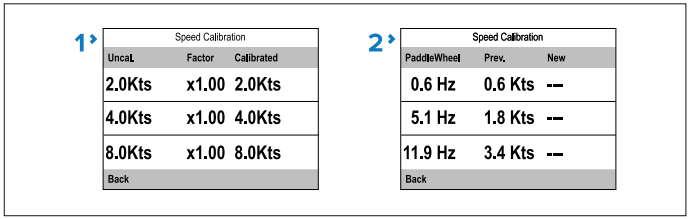
1. Press the *[Menu]* button.
2. Select *[Set-up]*.
3. Select *[Transducers Set-up]*.
4. Select *[Continue]*.

   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]*.

   *This step is only applicable when calibrating a speed transducer connected via an iTC-5.*
7. Select *[Speed Calibration]*.
8. Select *[Advanced]*.
9. Select *[View cal table]*.

   The calibration table is displayed.




   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.

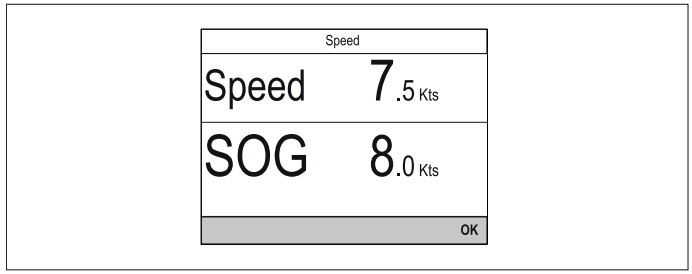
### Checking speed

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:




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: (Speed = (60 x Distance) / 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 x D) / T
   - S = (60 x 14) / 105
   - S = 840 / 105
   - S = 8 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 x 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]*.

   *This step is only applicable when calibrating a speed transducer connected via an 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

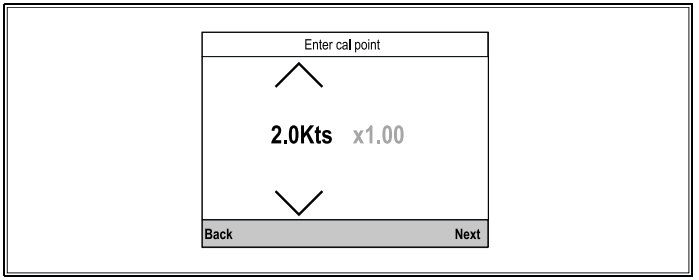
A new Calibration table can be added manually. The new Calibration table will replace the existing table which is deleted. This is useful when you have been provided a specific calibration table for your hull type.

**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 an 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]*.

   *This step is only applicable when calibrating a speed transducer connected via an 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.

## 5.4 RSW-Series wind transducer configuration

The RSW-Series wind transducers require configuration to ensure accurate readings are presented.

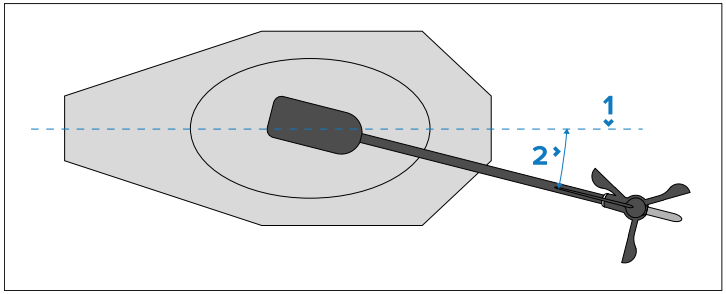
**It is recommended that wind transducers are installed facing directly forwards, inline with the mast centerline**. If this is not possible then an angle of the offset from the mast centerline must be configured as follows:

- On a non-rotating mast where a heading sensor is present, the wind transducer will automatically compensate for any offset between installation angle and vessel centerline (heading).
- On a non-rotating mast where no heading sensor is present and the transducer has not been installed facing directly forwards, it

is important that an offset is applied to account for the difference between the mast's centerline and the transducer's installation angle.

- On a non-rotating mast, if poor heading sensor readings are affecting wind readings, vessel heading can be ignored. However, an offset must be applied to account for the difference between the vessel's centerline and the transducer's installation angle.
- On a rotating mast a heading sensor is required so that wind readings compensate for mast angle. It is important that an offset is applied to account for the difference between the mast's centerline and the transducer's installation angle. The transducer will automatically compensate for the difference between heading and mast angle.

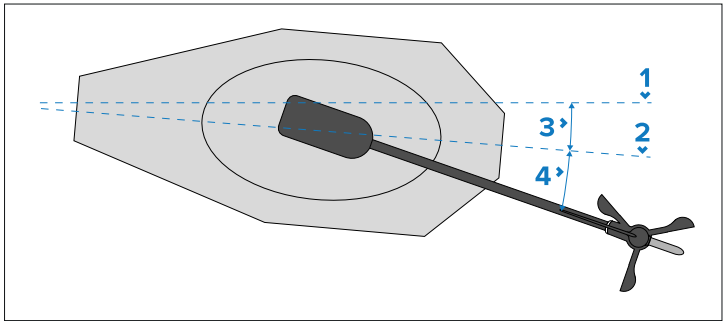
## Non-rotating mast example




1. Vessel / mast centerline.
2. Offset angle.

**Note:**
Offset only needs to be entered if there is no heading sensor present on the network.

## Rotating mast example

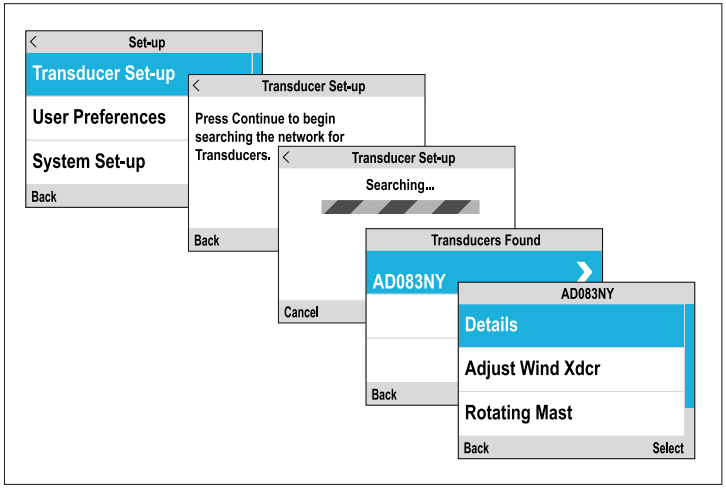



1. Vessel centerline.
2. Mast centerline.
3. Mast rotation.
4. Offset angle.

**Note:**
A heading sensor and, where applicable, offset angle is required.

## Configuring the RSW-Series wind transducer using i70 / i70s instrument display

The RSW-Series wind transducers can be configured using an i70 / i70s instrument display, running software version v3.23 or later.




The RSW-Series wind transducer configuration is initiated from the *[Transducer Set-up]* menu: *[Menu > Set-up > Transducer Set-up]*

1. Select *[Continue]* to search for connected transducers.
2. Select your RSW-Series wind transducer from the list.
3. If your vessel has a rotating mast:
   i. Select *[Rotating Mast]* and select *[On]*.
   ii. If applicable, select *[Adjust Wind Xdcr]* and use the *[Up]* and *[Down]* buttons to enter the offset value for your transducer.

   - *A heading sensor is required for rotating masts.*
   - *The offset should be measured from the mast's centerline to the transducer. This may be different from the vessel centerline.*
4. If your vessel does not have a rotating mast and does not have a heading sensor; if applicable, select *[Adjust Wind Xdcr]* and use the *[Up]* and *[Down]* buttons to enter the offset value for your transducer.

   - *The offset should be measured from the vessel's / mast's centerline to the transducer.*
5. If your vessel does not have a rotating mast but does have a heading sensor, no offset value is required. However, if poor heading data is affecting wind data readings, you can enable *[Ignore Heading]* and if applicable, use the *[Up]* and *[Down]* buttons to enter the offset value for your transducer from the *[Adjust Wind Xdcr]* menu.

## RSW-Series wind transducer internal compass calibration

The RSW-Series wind transducer's internal compass needs to compensate for local and the Earth's magnetic fields. This is achieved using an automatic process known as linearization.

### Initial linearization

When the RSW-Series wind transducer is first installed and powered-up (or after a factory reset or compass reset) the linearization process will start automatically.

Linearization requires no user input.

The time it takes to complete the linearization will vary according to the characteristics of the vessel, the installation environment and the levels of magnetic interference.

You can speed-up the linearization process by completing full 360° turns at a speed of between 3 and 15 knots.

After the initial linearization has completed, the RSW-Series wind transducer will continue to monitor and adapt its calibration to ensure optimum performance in current conditions.

## Resetting compass calibration (i70 / i70s)

If significant reading anomalies are experienced, the compass calibration process may need to be reset.

From the *[Transducer Set-up]* menu: *[Menu > Set-up > Transducer Set-up]*.

1. Select *[Continue]*.
2. Select the RSW-Series wind transducer from the list.
3. Select *[Restart Compass]*.
4. Select *[Yes]*.

The calibration is reset and will start again automatically once the calibration conditions are met.

# 5.5 Wind calibration

## Calibrating wind

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

**Note:**
The following details apply to legacy Long arm and Short arm wind vane transducers and the Rotavecta wind transducer.

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:

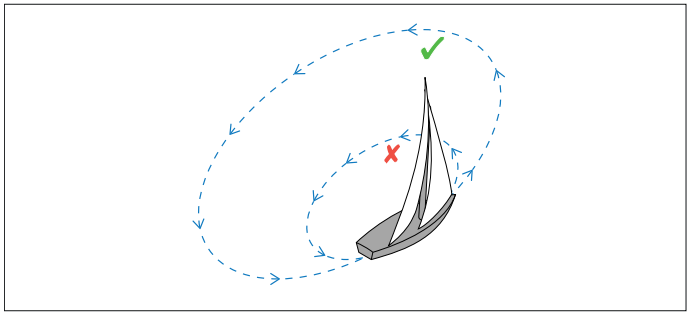
1. Press the *[Menu]* button.
2. Select *[Set-up]*.
3. Select *[Transducers Set-up]*.
4. Select *[Continue]*.

   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]*.

   *This step is only applicable when calibrating a wind transducer connected via an 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.

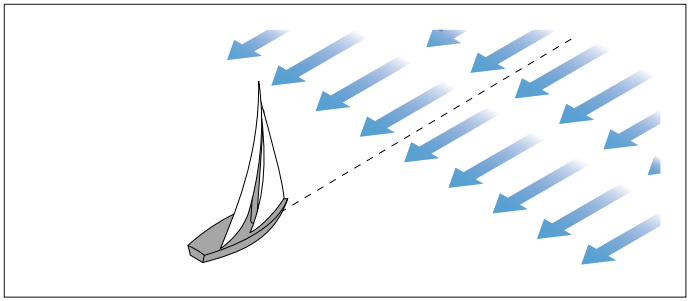
From the list of transducers found:

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]*.

   *This step is only applicable when calibrating a wind transducer connected via an iTC-5.*
3. Select *[Align Wind Xdcr]*.

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



## Adjusting the wind transducer

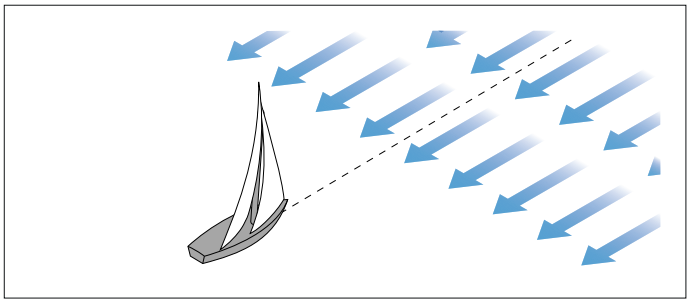
Adjusting the wind transducer compensates for any small errors which may exist in the alignment of the wind transducer.

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:

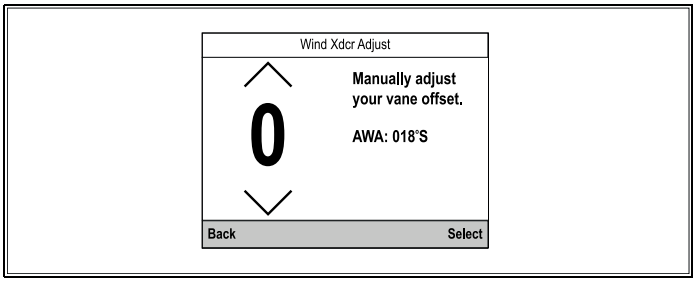
1. Steer your vessel directly into the wind



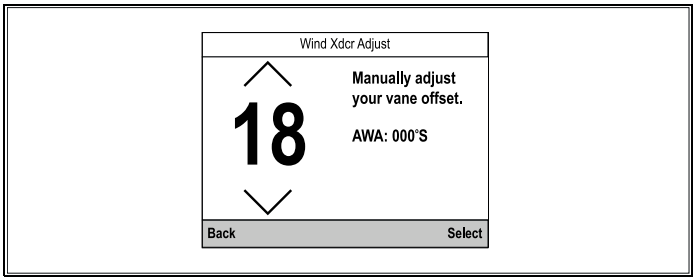
   With your vessel sailing directly into the wind the Apparent Wind Angle (AWA) should be 0 degrees.
2. Select the device that the transducer you are calibrating is connected to.

   A list of available transducer data is displayed.
3. [1]Select *[Wind]*.

   *This step is only applicable when calibrating a wind transducer connected via an 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.

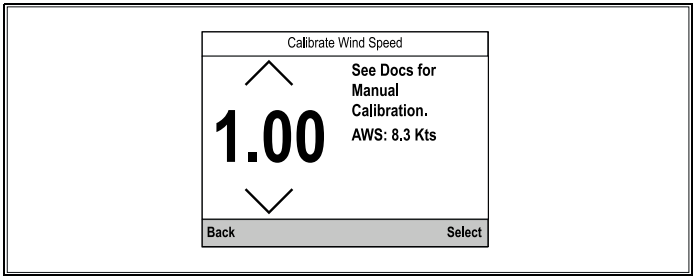
   A list of available transducer data is displayed.

2. (1)Select *[Wind]*.

   *This step is only applicable when calibrating a wind transducer connected via an 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.

# 5.6 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]*.

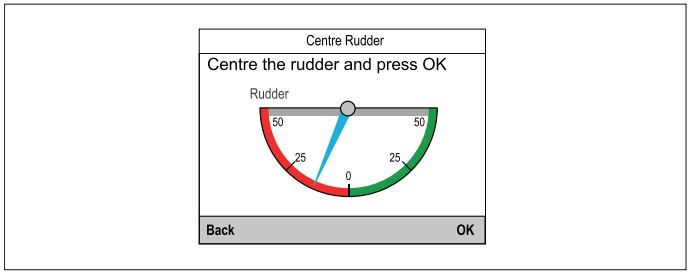
1. Select *[Continue]*.

   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.

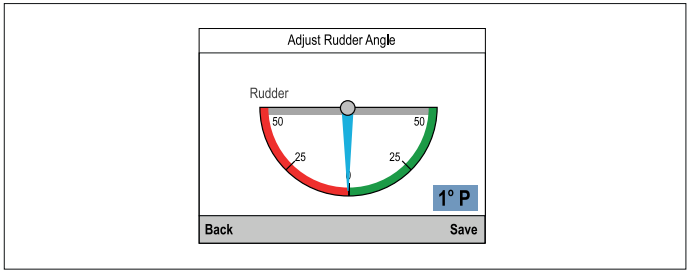
From the Transducer Set-up menu: *[Menu > Set-up > Transducer Set-up]*

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]*.

# 5.7 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 2 minutes, and you should complete at least 2 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]*

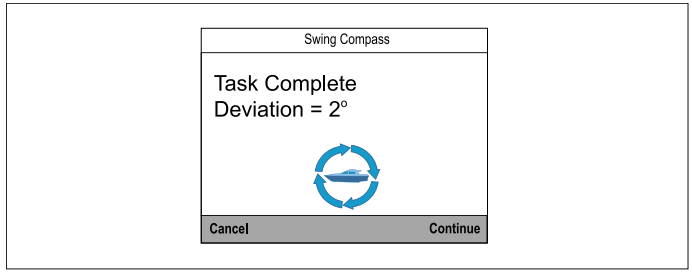
1. Select *[Continue]*.

   A list of connected devices is displayed. (e.g.: 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 6: FAVORITE PAGES

## CHAPTER CONTENTS


- 6.1 Favorite pages — page 40
- 6.2 Customizing pages — page 45

# 6.1 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.

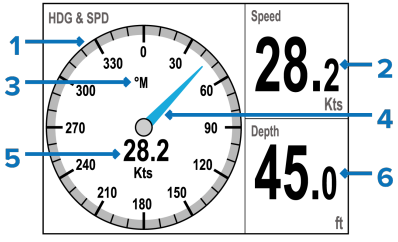
Pages are customized using the *[Favorite pages]* menu: *[Menu > Favorite Pages]*

For more information on boat data, refer to: **p.47 — 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:

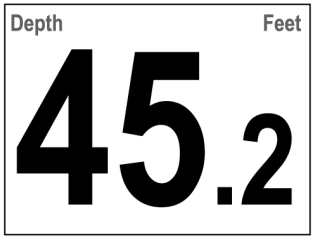



1. Compass dial
2. Speed
3. Heading mode (M = Magnetic, T = True)
4. Heading indicator needle
5. Speed
6. Depth

## Digital depth favorite page

The Digital depth page is available for all boat types.

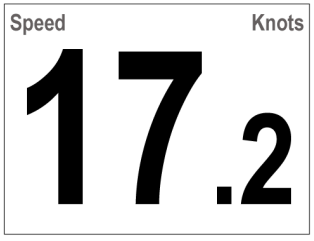
The Digital depth favorite page displays current water depth value.




## Digital speed favorite page

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

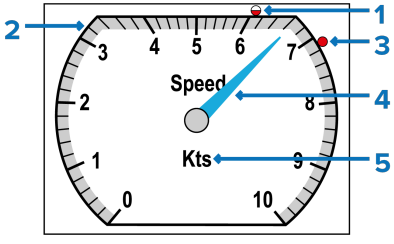
The Digital speed favorite page displays current speed through water value.




## 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.



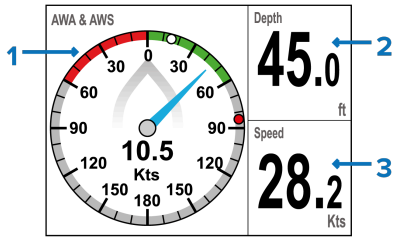
1. Average speed indicator (The average speed indicator can be reset from the Quick options menu: *[Menu > Quick Options > Reset Ave. Speed]*.)
2. Speed dial (The speed dial range will change dynamically depending on speed.)
3. Maximum speed indicator (The maximum speed indicator can be reset from the 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.



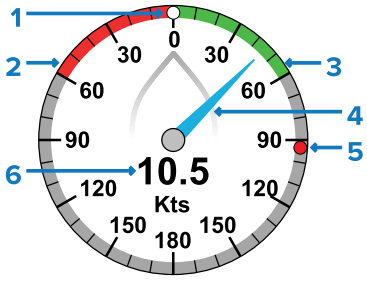

1. AWA (Apparent Wind Angle) / AWS (Apparent Wind Speed) dial
2. Digital Depth
3. Digital Speed

### 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.35 — 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. Red close hauled angles (between 0° and 60° port)
3. Green close hauled angles (between 0° and 60° starboard)
4. Current AWA.

5. Maximum AWA indicator. The maximum AWA indicator can be reset from the Quick options menu: *[Menu > Quick Options > Reset Max. AWA]*.

6. Apparent Wind Speed (AWS).

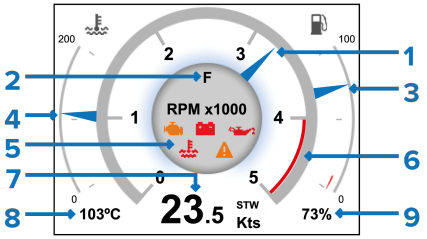
**Note:**
When tacking to the wind, the minimum and maximum AWA indicators will help to show how the wind direction is changing.

The AWA/AWS dial can also be added as a fullscreen favorite page. For further information, refer to: **p.45 — 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.




1. Engine RPM indictor
2. Fuel remaining indicator
3. Engine coolant temperature dial
4. Engine management indicators
5. Speed through water
6. Engine coolant temperature digital
7. Fuel remaining digital

### Engine warning symbols

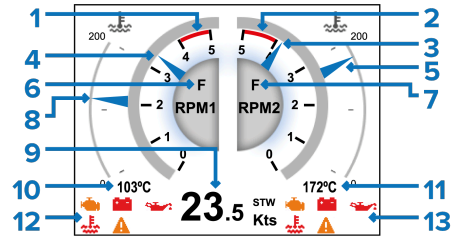
The following engine warning symbols are displayed on engine pages.

1. **Check engine indicator** — Displayed when an engine fault has occurred.
2. **Battery indicator** — Displayed when a system voltage alarm is active.
3. **Oil indicator** — Displayed when an engine oil related alarm is active.
4. **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.

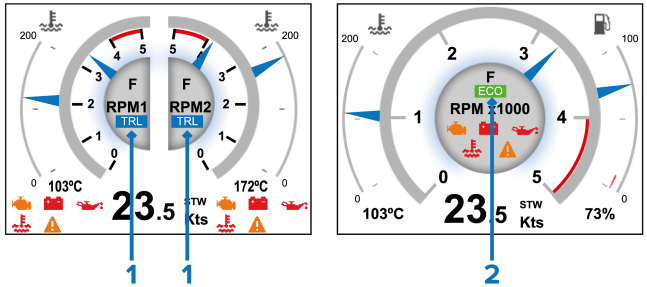



1. Engine 1 RPM red zone
2. Engine 2 RPM red zone
3. Engine 2 RPM indicator

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.



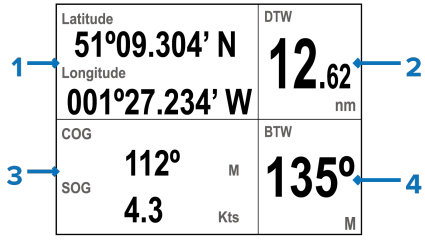

1. Trolling mode indicator
2. ECO mode indicator

**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:

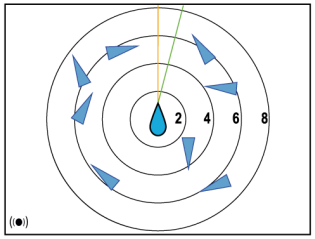



1. Latitude and Longitude
2. Distance to Waypoint (DTW)
3. Course Over Ground (COG) and Speed Over ground (SOG)
4. Bearing to Waypoint (BTW)

## 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.

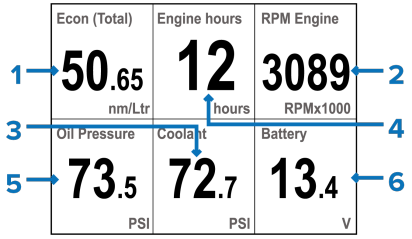



For more details refer to: **p.53** — AIS

## 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:

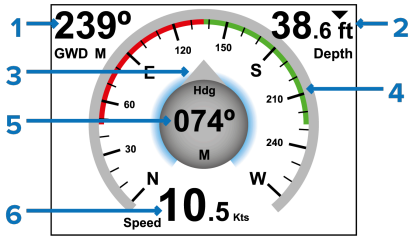



1. Fuel economy
2. Engine RPM
3. Engine coolant pressure
4. Engine hours
5. Oil pressure
6. Battery voltage

## 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

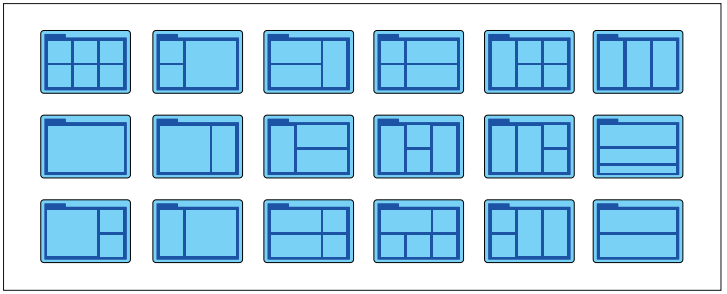
## Favorite pages menu settings

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.46 — 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.



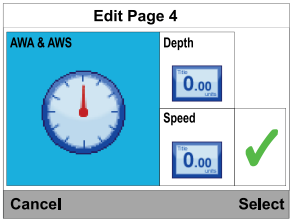
# 6.2 Customizing pages

## 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 7: DISPLAY DATA

## CHAPTER CONTENTS


- 7.1 Data (quick view) — page 48
- 7.2 Display data — page 48

# 7.1 Data (quick view)

The *[Data (quick view)]* menu can be used to view data in fullscreen, without the need to add then to a Favorite page.

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]*.

# 7.2 Display data

Data transmitted by compatible devices connected to the same network as the display, as well as data generated by the display, can be shown as data items on *[Favorite pages]* and when using the *[Data (quick view)]* menu. Data items are organized into categories. 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.

The available data items are dependent on the devices that are connected to your system. If a device transmitting the data is not on the system the data item value will show as 3 dashes '- - -'.

**Note:**

• Standard NMEA 2000 PGNs are listed next to the relevant data items.

• Supported Raymarine and third-party proprietary messages are not listed.

To view a list of all supported NMEA 2000 PGNs, refer to: **p.83 — Supported NMEA 2000 PGN list**

## Battery data

Batteries are detected automatically by the display.

The following data items are available in the *[Battery]* category:

- *Volts*
- *Battery volts* (PGN 127508)
- *Battery current* (PGN 127508)
- *Battery temperature* (PGN 127508)
- *Charge* (PGN 127506)

The data items will be available for each detected battery.

## Boat data

Boat data requires supported sensors to be connected.

The following data items are available in the *[Boat]* category:

- *Heave*
- *Roll* (PGN 127257)
- *Pitch* (PGN 127257)
- *Rate of turn* (PGN 127251)
- (1) *Trim tabs*(1) (PGN 130576)
- (1) *Gray Water Tank* (PGN 127505)
- (1) *Black Water Tank* (PGN 127505)
- (1) *Fresh Water Tank* (PGN 127505)

**Note:**
(1)Not available in the *[Data (quick view)]* menu.

## Depth data

Depth data requires a compatible instruments or sonar transducer connected to the display.

The following data items are available in the *[Depth]* category:

- *Depth* (PGN 128267)
- *Max Depth*
- *Min Depth*
- *Depth History*

## Distance data

Distance data requires a compatible speed transducer and or GNSS receiver.

The following data items are available in the *[Distance]* category:

- *Trip* (PGN 128275)
- *Log* (PGN 128275)

## Engine data

Engine data requires the display to be connected to a supported engine management system. Depending on manufacturer a compatible engine interface or gateway may be required.

The following data items are available in the *[Engine]* category:

- *Engine hours* (PGN 127489)
- *Trim position* (PGN 127488)
- *RPM* (PGN 127488)
- *Oil pressure* (PGN 127489)
- *Oil temperature* (PGN 127489)
- *Coolant pressure* (PGN 127489)
- *Coolant temperature* (PGN 127489)
- *Boost pressure* (PGN 127488)
- *Load* (PGN 127489)
- *Alternator Potential* (PGN 127489)
- *Transmission Oil Pressure* (PGN 127493)
- *Transmission Oil Temperature* (PGN 127493)
- *Transmission* (PGN 127493)
- (1)*Engine Tilt* (PGN 127488)
- (1)*Fuel Flow Rate 1* (PGN 127489)
- (1)*Fuel Flow – average 1*
- (1)*Fuel Pressure 1* (PGN 127489)
- *2 Engine Overview page*
- *1 Engine Overview page*

**Note:**
(1)Only available in the *[Data (quick view)]* menu.

## Fuel data

The fuel data category include items related to fuel management. Fuel management is dependent on engine data being available on the SeaTalk NG backbone.

The following data items are available in the *[Fuel]* category:

- *Fuel Economy* (PGN 127497) — The distance achieved per measurement of fuel (Distance/Volume, Volume/Distance, or Volume/100 Distance Unit).
- *Total Fuel* (PGN 127505)
- *Total Fuel %*
- *Est. fuel remaining* (PGN 127496) — Estimated fuel available for use.
- *Fuel Used (Trip)* (PGN 127497) — Amount of fuel used on the current trip.
- *Fuel Used (Season)* (PGN 127497) — Amount of fuel used this season.
- *Distance to Empty* (PGN 127496 & 129026) Distance until fuel depletion (Only available with Fuel Flow Rate message. A GNSS receiver is required)
- *Time to Empty* (PGN 127496) Amount of time until fuel depletion (Only available with Fuel Flow Rate message).
- *Fuel Flow Rate Total* (PGN 127497 / PGN 127489) — Amount of fuel that is used over time.
- *Fuel Level Vol 1*
- *Fuel Level % 1*

**Note:**
Distance to Empty and Time to Empty values are based on estimated fuel remaining calculations and do not take into account the effects of weather and tide on fuel usage.

Fuel data items require the Fuel manager to be set up. For details refer to: **p.57 — Fuel manager**

## Environment data

Environmental data items require connection of compatible sensors and transducers.

The following data items are available in the *[Environment]* category:

- *Sea Temperature* (PGN 130310 / 130311 / 130312 / 130316)
- *Max Sea Temperature*
- *Min Sea Temperature*
- *Sea Temperature History*
- *Barometric Pressure* (PGN 130310)
- *Barometric Pressure History*
- *Air Temperature* (PGN 130310)
- *Min Air Temperature*
- *Max Air Temperature*
- *Air Temperature History*
- *Sunset / Sunrise*
- *Set* (PGN 129291)
- (1)*Set History*
- *Drift* (PGN 129291)
- (1)*Drift History*
- *Set & Drift Pair* (PGN 129291)
- *Wind Chill Apparent* (PGN 130312 / 130316)
- *Wind Chill True*
- *Dew Point* (PGN 130312 / 130316)
- *Humidity* (PGN 130310 / 130311 / 130313)

**Note:**
(1)Only available in the *[Data (quick view)]* menu.

## GPS data

The GPS data category contains data items related to the GNSS receiver in use by your display.

The following data items are available in the *[GPS]* category:

- *SOG* (Speed Over Ground) (PGN 129026)
- *SOG History*
- *Max. SOG*
- *Avg. SOG*
- *COG* (Course Over Ground) (PGN 129026)
- *COG History*
- *COG and SOG* (PGN 129026)
- *Latitude* (PGN 129025 / 129029)
- *Longitude* (PGN 129025 / 129029)
- *LAT & LON* (PGN 129025 / 129029)
- *SATS* (Satellites) (PGN 129029)
- *HDOP* (Horizontal Dilution Of Precision) (PGN 129029)
- *SATS + HDOP* (PGN 129029)

## Heading (data items)

Heading data requires a connected sensor providing vessel heading.

The following data items are available in the *[Heading]* category:

- *Heading (PGN 127250)*
- *Heading & Speed* (PGN 127250 / 128259)
- *Heading History*
- *Locked Heading*
- *Error & Locked Heading*
- *Tack Heading*
- *Heading (Multi-gauge)*

## Navigation data

Navigation data requires a compatible sensor providing position related data. Active navigation is required for waypoint and route related data items.

The following data items are available in the *[Navigation]* category:

- *Active Waypoint Name*
- *Waypoint ID*
- *Course Made Good* (CMG)
- (1)*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* (PGN 129283)
- *Pitch* (PGN 127257)
- *ETA* (Estimated Time of Arrival) (PGN 129284)
- *TTG* (Time To Go)
- *XTE* (Cross Track Error) (PGN 129283)
- [1]*XTE History*
- *Rolling Road*
- *Turn*
- *Turn & DTW*

**Note:**
[1]Only available in the *[Data (quick view)]* menu.

## Pilot data

An Autopilot and Rudder reference transducer is required for pilot data items.

The following data items are available in the *[Pilot]* category:

- *Pilot Heading*
- *Pilot Heading & Speed Pair* (PGN 128259 Speed)
- *Pilot Status*
- *Rudder angle* (PGN 127245)

## Speed data

Speed data includes data items related to vessel speed.

The following data items are available in the *[Speed]* category:

- *Speed* (Speed through water / Vessel speed) (PGN 128259)
- *Trolling Speed* (PGN 128259)
- *Max Speed*
- *Average Speed*
- *VMG Windward* (Velocity Made Good to Windward)
- *VMG Windward History*
- *VMG WPT* (Waypoint)
- *VMG WPT History*
- *Boat Speed & SOG* (Speed Over Ground) (PGN 128259 & 129026)
- *Speed History*

## Time data

Time data requires a compatible device to be connected providing time data.

The display the following data items are available in the *[Time]* category:

- *Local Time* (PGN 129033)
- *Time & Date* (PGN 129033)
- *Clock* (PGN 129033)
- *Race Timer*

## Wind data

Wind data requires a compatible wind transducer to be connected.

The following data items are available in the *[Wind]* category:

- *AWS* (Apparent Wind Speed) (PGN 130306)
- *AWS History*
- *AWS Min*
- *AWS Max*
- *AWA* (Apparent Wind Angle) (PGN 130306)
- *AWA & AWS* (PGN 130306)
- *AWA (CH) & AWS* (PGN 130306)
- *AWA & VMG* (Velocity Mad Good)
- *AWA History*
- *AWA Min*
- *AWA Max*
- *TWS* (True Wind Speed) (PGN 128259 & 130306)
- *TWS History*
- *TWS Min*
- *TWS Max*

- *TWA* (True Wind Angle) (PGN 128259 & 130306)
- *TWA & TWS* (PGN 128259 & 130306)
- *TWA (CH) & TWS* (PGN 128259 & 130306)
- *TWA & VMG*
- *TWA History*
- *TWA Min*
- *TWA Max*
- *GWD* (Ground Wind Direction) (PGN 130306 / 129026)
- *GWD & Beaufort*
- *GWD History*
- *Cardinal*
- *Beaufort*
- * *TWD* (True Wind Direction) (PGN 128259 / 129026 & 130306 & 127250)
- *TWD History*

**Note:**
* TWD will be calculated based on SOG (PGN 129026) when Speed Through Water (PGN 128259) is not available.

## AIS feature

AIS requires a compatible AIS receiver/transceiver.

For details of the AIS feature refer to: **p.53 — AIS**

# CHAPTER 8: AIS

## CHAPTER CONTENTS


- 8.1 Automatic Identification System (AIS) overview — page 54
- 8.2 AIS target symbols — page 55
- 8.3 Setting AIS range — page 55
- 8.4 Viewing AIS target information — page 55
- 8.5 Enabling and disabling AIS Silent mode — page 56

# 8.1 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.

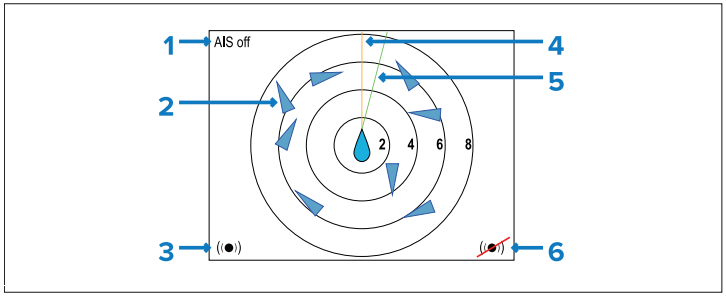
AIS uses digital radio signals to broadcast 'real-time' information between vessels and shore-based stations via dedicated VHF radio frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data.

**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 vessels 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 list below).
2. AIS targets.
3. Dangerous targets alarm on.
4. Heading line.
5. COG line.
6. Dangerous targets alarm off.

**Note:**

• If no AIS message is displayed then AIS is enabled and transmitting.

• A maximum of 25 targets can be displayed. Where more than 25 targets are in range, a 'Max targets' message is displayed onscreen.

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

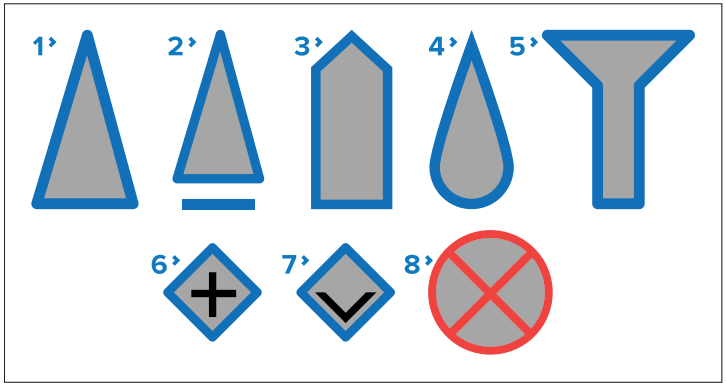
**AIS messages**

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

## 8.2 AIS target symbols

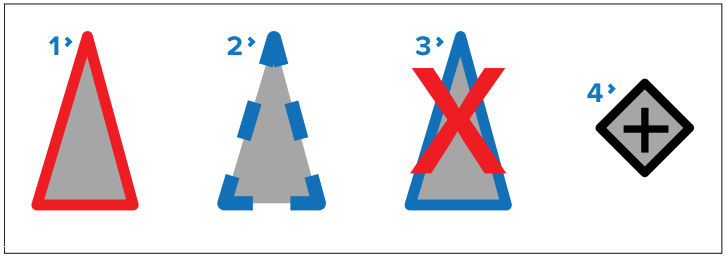
Different symbols are used to identify different types of AIS target. The symbols appearance will change to identify the target's status.

### AIS target symbols




1. Standard vessel
2. High speed vessel
3. Commercial vessel
4. Yacht
5. Land base station
6. Aid To Navigation (AToN)
7. Virtual AToN
8. Search And Rescue Transponder (SART)

### AIS target symbol status




1. Dangerous target — If a target is within a specified distance CPA (Closest Point of Approach) or time TCPA (Time to Closest Point of Approach) the symbol's outline will turn red and flash. If enabled, the Dangerous target alarm will sound when a target becomes dangerous.
2. Uncertain target — If the target's CPA / TCPA values are uncertain the symbols's outline will have a dashed outline.
3. Lost target — If data from a dangerous target is not received for 20 seconds, the symbol will be displayed with a red cross through it and flash. If enabled, the Lost target alarm will sound.
4. AToN off position — If an AToN is off position the symbol's outline will turn red.

## 8.3 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.

## 8.4 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]*.

## 8.5 Enabling and disabling AIS Silent mode

AIS silent mode enables you to disable the transmitting functions of an AIS transceiver. This is useful when you do not want to transmit your vessel's AIS data to other AIS equipped vessels, 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 9: FUEL MANAGER

## CHAPTER CONTENTS


- 9.1 Fuel manager overview — page 58
- 9.2 Detecting fuel messages — page 58
- 9.3 Setting up the fuel manager — page 58
- 9.4 Setting tank fills — page 58
- 9.5 Fuel data on favorite pages — page 59
- 9.6 Switching fuel calculations — page 59
- 9.7 Reset fuel usage — page 59
- 9.8 Fuel manager menu — page 59

# 9.1 Fuel manager overview

The 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, the Fuel manager can display engine fuel flow rate and economy.

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.

**Note:**

- 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.

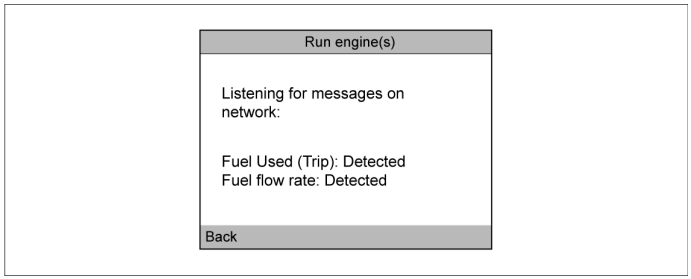
# 9.2 Detecting fuel messages

The Fuel manager generates fuel estimates based on NMEA 2000 PGNs: *[Fuel Used (Trip)]* (PGN 127497) or *[Fuel Flow Rate]* (PGN 127489).

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:**
If no message is detected after a period of 15 seconds, the "*[Not found]*" status message is displayed.

3. Select *[Back]*.

# 9.3 Setting up the fuel manager

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

1. First fill your fuel tanks to capacity.
2. Select *[Menu]*.
3. Select *[Fuel Manager]*.
4. Select *[Set-up]*.
5. Select *[Total Fuel Capacity]*.
6. Use the *[Up]* and *[Down]* buttons to adjust the value to match your fuel tanks total fuel capacity.
7. Select *[Save]*.
8. Select *[Back]*.
9. Select *[Set all tanks full]*
10. Select *[OK]*.

The Fuel manager will now perform fuel calculations

# 9.4 Setting tank fills

To maintain accurate calculations you must enter the volume of each fuel fill in the Fuel manager.

From the *[Fuel Manager]* menu:

1. Select either:
   i. *[ Set all tanks full]*, or
   ii. *[Add partial fill]*.
2. For partial fills, enter the volume of fuel.

   *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.*

**Note:**
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).

## 9.5 Fuel data on favorite pages

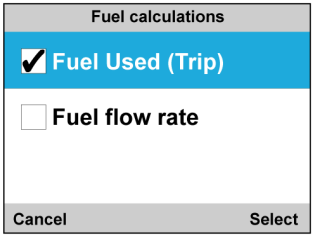
You can display fuel data on favorite pages.

For more information on how to create favorite pages, refer to the following section: **p.39 — Favorite Pages**

For details on the available fuel data items refer to: **p.49 — Fuel data**

## 9.6 Switching fuel calculations

The method used for fuel calculations can be switched at any time.




1. Select *[Set-up]* from the Fuel manager menu: *[Menu > Fuel manager]*.
2. Select *[Fuel calculations]*.
3. Select either:
   i. *[Fuel Used (Trip)]*, or
   ii. *[Fuel flow rate]*.

The Fuel manager will now calculate fuel estimates using the chosen method.

## 9.7 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.

## 9.8 Fuel manager menu

The menu provides the settings required 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 the 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.

# CHAPTER 10: RACE TIMER SETTINGS

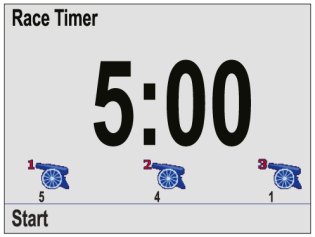
## CHAPTER CONTENTS


- 10.1 Setting the Race Timer — page 61
- 10.2 Using the Race Timer — page 61

# 10.1 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.

# 10.2 Using the Race Timer

With the Race Timer page displayed:

1. Select *[Start]*.

   The first star 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 11: ALARMS

## CHAPTER CONTENTS


- 11.1 Alarms — page 63
- 11.2 Active Engine Alarms — page 63
- 11.3 Alarm settings — page 64

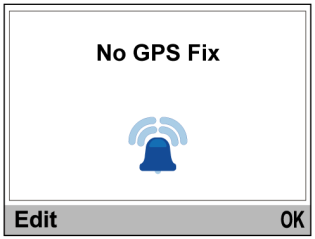
# 11.1 Alarms

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.



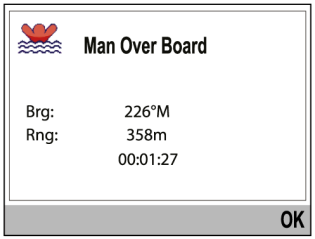

You can either:

- 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 1 systems will only be able to switch alarms on and off, whereas SeaTalk NG 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.



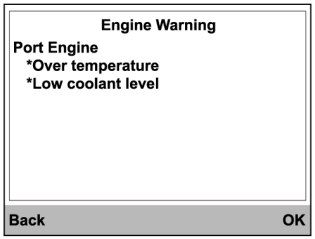

- Brg: Bearing to MoB waypoint.
- Rng: Range to MoB waypoint.
- Elapsed time since start of MoB alarm.

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

# 11.2 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 access from the *[Alarms]* menu: *[Menu > Alarms > Active Engine Alarms]*




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

## 11.3 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.

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

**Note:**

• *[Shallow anchor]* and *[Deep anchor]* alarms are available when both the display and a depth data source are on the same SeaTalk NG network. If the display is connected to SeaTalk 1, only one *[Anchor]* alarm will be available.

• The Shallow and Deep alarms are intended to be used when underway. The 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 > Speed]*. 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.
- *[Man Over Board]* — 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 or disables the 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 safe zone and 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 or 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 or 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]* — This alarm is triggered when the amount of remaining fuel drops lower than the specified fuel capacity.
- *[Time to Empty]* — This alarm is triggered when the fuel manager calculates that the fuel tank will be emptied once the time specified has elapsed, based on the current vessel speed.
- *[Distance to Empty]* — This alarm is triggered when the fuel manager calculates that the fuel tank will be emptied once the distance specified has been reached, based on the current vessel speed.

## Honda engine alarms

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

# CHAPTER 12: SETUP MENU

## CHAPTER CONTENTS


- 12.1 Setup menu — page 67
- 12.2 Transducer Set-up menu — page 67
- 12.3 iTC-5 calibration settings — page 67
- 12.4 Depth calibration settings — page 68
- 12.5 Speed calibration settings — page 68
- 12.6 Wind calibration settings — page 68
- 12.7 Rudder calibration settings — page 68
- 12.8 Compass calibration settings — page 68
- 12.9 RSW-Series wind calibration settings — page 69
- 12.10 DT800/DT810 calibration settings — page 69
- 12.11 DST800/DST810 calibration settings — page 69
- 12.12 User Preferences menu — page 70
- 12.13 System set-up menu — page 73
- 12.14 Diagnostics menu — page 74

## 12.1 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 user preference options as detailed in: **p.70 — User Preferences menu**
- *[System set up]* — Configure network groups and data sources as detailed in: **p.73 — 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 SeaTalk NG 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 as detailed in: **p.74 — Diagnostics menu**

## 12.2 Transducer Set-up menu

The *[Transducer Set-up]* menu provides access to the calibration settings for the connected transducers. Where a transducer is connected via another device (e.g.: an iTC-5) selecting that device from the list will provide the calibration options for each of the devices connected transducers.

The *[Transducer set-up]* menu is accessed from the *[Set-up]* menu:
*[Menu > Set-up > Transducer Set-up]*
Depending on connected devices the following options will be available from the *[Transducer set-up]* menu:

| Settings | Details |
|---|---|
| *[Performance Wind]* | Refer to: **p.69 — Performance wind calibration settings** |
| *[iTC-5]* | Refer to: **p.67 — iTC-5 calibration settings** |
| *[DST800/DST810]* | Refer to: **p.69 — DST800/DST810 calibration settings** |
| *[DT800/DT810]* | Refer to- : **p.69 — DT800/DT810 calibration settings** |
| *[Depth pod]* | Refer to: **p.68 — Depth calibration settings** |
| *[Speed pod]* | Refer to: **p.68 — Speed calibration settings** |
| *[Wind pod]* | Refer to: **p.68 — Wind calibration settings** |

Selecting a device will display the transducer's calibration options or a list of transducers connected to the device.

## 12.3 iTC-5 calibration settings

Selecting iTC-5 from the *[Transducer Set-up]* menu will display a list of transducers that are physically connected to the iTC-5.

The following calibration options are available when the relevant transducer is connected:

| Setting | Description |
|---|---|
| *[Details]* | The details menu displays information about the installed transducer or interface such as serial number and software version etc. |
| *[Depth]* | Refer to: **p.68 — Depth calibration settings** |
| *[Speed]* | Refer to: **p.68 — Speed calibration settings** |
| *[Wind]* | Refer to: **p.68 — Wind calibration settings** |
| *[Rudder]* | Refer to: **p.68 — Rudder calibration settings** |
| *[Compass]* | Refer to- : **p.68 — Compass calibration settings** |
| *[Debug Level]* | Allows a debug level to be set. This setting should only be used for troubleshooting purposes when directed by Raymarine Technical support. |

## 12.4 Depth calibration settings

Depth transducers connected via the iTC-5 or via a legacy transducer pod can be calibrated from the *[Depth]* calibration menu.

The following options are available:

| Setting | Description |
|---|---|
| *[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**

## 12.5 Speed calibration settings

Speed, and Speed & Temperature transducers connected via the iTC-5 or via a legacy transducer pod, can be calibrated from the *[Speed]* calibration menu.

The following options are available:

| Setting | Description |
|---|---|
| *[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.31 — Calibrating Water temperature** |

## 12.6 Wind calibration settings

Wind transducers connected via the iTC-5 or via a legacy transducer pod can be calibrated from the *[Wind]* calibration menu.

The following options are available:

| Setting | Description |
|---|---|
| *[Calibrate Wind Xdcr]* | Access the wind calibration wizard. |
| *[Align Wind Xdcr]* | Perform transducer alignment. |
| *[Adjust Wind Xdcr]* | Provide an offset value to compensate for small errors in transducer alignment. |
| *[App wind speed]* | Enter an AWS offset value so that the displayed reading matches an accurate wind speed reference. |

For Wind calibration details refer to: **p.34 — Wind calibration**

## 12.7 Rudder calibration settings

A Rudder reference transducer connected via the iTC-5 can be calibrated from the *[Rudder]* calibration menu.

The following options are available:

| Setting | Description |
|---|---|
| *[Centre Rudder]* | Establish the Rudder's centre position. |
| *[Adjust Rudder Angle]* | Manually adjust the Rudder's reported angle to account for minor deviations. |
| *[Invert Rudder Angle]* | Inverts the rudder's direction. |

For Rudder reference calibration details refer to: **p.36 — Rudder reference calibration**

## 12.8 Compass calibration settings

A fluxgate compass connected via the iTC-5 can be calibrated from the *[Compass]* calibration menu.

The following options are available:

| Setting | Description |
|---|---|
| *[Swing compass]* | Establish compass deviation. |
| *[Compass Offset]* | Apply offset to account for deviation. |

For Fluxgate compass calibration details refer to:
**p.37 — Compass calibration**

## 12.9 RSW-Series wind calibration settings

RSW-Series wind transducers that are connected via SeaTalk NG/NMEA 2000 can be calibrated from the relevant *[Performance Wind]* calibration menu.

The *[Performance wind]* menu enables configuration of RSW-Series wind transducers. The following options are available:

| Setting | Description |
|---|---|
| *[Details]* | The details menu displays information about the installed transducer or interface such as serial number and software version etc. |
| *[Adjust Wind Xdcr]* | Add an offset value for the RSW-Series transducer. |
| *[Rotating Mast]* | Enable and disable calculations for rotating masts. |
| *[Ignore Heading]* | Ignore data from the heading sensor. |
| *[Debug Level]* | Allows a debug level to be set. This setting should only be used for troubleshooting purposes when directed by Raymarine Technical support. |

For details on configuring an RSW-Series wind transducer, refer to:
**p.33 — Configuring RSW wind using i70/i70s instrument display**

## 12.10 DT800/DT810 calibration settings

DT800/DT810 Depth and Temperature) smart transducers that are connected via SeaTalk NG/NMEA 2000iTC-5 can be calibrated from the *[DT800/DT810]* calibration menu.

The following calibration options are available:

| Setting | Description |
|---|---|
| *[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.31 — Calibrating Water temperature** |

## 12.11 DST800/DST810 calibration settings

DST800/DST810 Depth, Speed and Temperature) smart transducers that are connected via SeaTalk NG/NMEA 2000iTC-5 can be calibrated from the *[DST800/DST810]* calibration menu.

The following calibration options are available:

| Setting | Description |
|---|---|
| *[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** |

| Setting | Description |
|---|---|
| *[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.31 — Calibrating Water temperature** |

# 12.12 User Preferences menu

The *[User Preferences]* menu enables you to customize the settings for your instrument.

## Time & Date

| Description | Options |
|---|---|
| *[Date format]*<br>These options enable you to customize the date format to your requirements. | • *mm/dd/yy*<br>• *dd/mm/yy* |
| *[Time format]*<br>These options enable you to customize the time format to your requirements. | • *12hr*<br>• *24hr* |
| *[Time offset]*<br>These options enable you to specify a local time offset from Universal Time Constant (UTC), to compensate for any time zone difference. | • *–13 to +13 hours* |

## Units

| Description | Options |
|---|---|
| *[Speed]*<br>Enables you to specify the units that will be used to display values related to vessel speed. | • *kts* — knots.<br>• *mph* — miles per hour.<br>• *km/h* — Kilometers per hour. |
| *[Distance (long)]*<br>Enables you to specify the (long-form) units that will be used to display values related to distance over water. | • *nm* — Nautical miles.<br>• *sm* — Statute miles.<br>• *km* — Kilometers. |
| *[Distance (short)]*<br>Enables you to specify the (short-form) units that will be used to display values related to distance over water. | • *ft* — Feet.<br>• *m* — Metres. |
| *[Depth]*<br>Enables you to specify the units that will be used to display values related to water depth. | • *ft* — Feet<br>• *m* — Metres<br>• *fa* — Fathoms |
| *[Wind speed]*<br>Enables you to specify the units that will be used to display values related to wind speed. | • *kts* — knots.<br>• *m/s* — metres per second. |
| *[Temperature]*<br>Enables you to specify the units that will be used to display values related to temperature. | • *°C* — degrees centigrade.<br>• *°F* — degrees fahrenheit. |
| *[Flow rate]*<br>Enables you to specify the units that will be used to display fuel flow rates. | • *UK Gal/H* — UK gallons per hour.<br>• *US Gal/H* — US gallons per hour.<br>• *LPH* — Liters per hour. |

| Description | Options |
|---|---|
| *[Heading]*<br>Enables you to specify the units that will be used to display values related to vessel heading. | • *Mag* — magnetic.<br>• *True* |
| *[Pressure]*<br>Enables you to specify the units that will be used to display values related to pressure. | • *PSI* — pounds per square inch.<br>• *Bar* — bar.<br>• *kPa* — Kilo pascals. |
| *[Volume]*<br>Enables you to specify the units that will be used to display fuel volume values. | • *UK Gallons*<br>• *US Gallons*<br>• *ltr* — liter. |
| *[Position]*<br>Enables you to specify the units that will be used to display values related to vessel position. | • *DD°MM'.MMM*<br>• *DD:MM:SS*<br>• *DD:MM:SS.S*<br>• *DD:MM.MMM*<br>• *DD°MM'SS*<br>• *DD°MM.MMM'* |
| *[Economy units]*<br>Enables you to specify the units that will be used to display fuel economy values. | • *Distance per volume*<br>• *Volume per distance*<br>• *Litres per 100km* |

## Language

| Description | Options |
|---|---|
| *[Language]* selection determines the language that will be used for all on-screen text, labels, menus, and options. | • *English (UK)*<br>• *English (US)*<br>• *Chinese*<br>• *Croatian*<br>• *Danish*<br>• *Dutch*<br>• *Finnish*<br>• *French*<br>• *German*<br>• *Greek*<br>• *Italian*<br>• *Japanese*<br>• *Korean*<br>• *Norwegian*<br>• *Polish*<br>• *Portuguese (Brazilian)*<br>• *Russian*<br>• *Spanish*<br>• *Swedish*<br>• *Turkish* |

## Boat type

| Description | Options |
|---|---|
| *[Boat type]* selection determines the default configuration that will be used for the units and favorite pages. | • *Race Sail*<br>• *Sail Cruiser*<br>• *Catamaran*<br>• *Workboat*<br>• *RIB*<br>• *Outboard Speedboat*<br>• *Inboard Speedboat*<br>• *Power Cruiser 1 (<12kts)*<br>• *Power Cruiser 2 (<30kts)*<br>• *Power Cruiser 3 (>30kts)*<br>• *Sport Fishing*<br>• *Pro Fishing* |

## Boat details

| Description | Options |
|---|---|
| *[Number of engines]*<br>Enables you to specify the number of engines that your vessel has. | • *1–5* |
| *[Number of batteries]*<br>Enables you to specify the number of batteries fitted to your vessel. | • *1–5* |
| *[Number of fuel tanks]*<br>Enables you to specify the number of fuel tanks fitted to your vessel. | • *1–5* |

| Description | Options |
|---|---|
| *[Max RPM range]*<br>Enables you to specify the engine RPM range that will be displayed as the “maximum” (i.e. when your engine is operating in its maximum range). | • *Auto (default)*<br>• *3000 rpm*<br>• *4000 rpm*<br>• *5000 rpm*<br>• *6000 rpm*<br>• *7000 rpm*<br>• *8000 rpm*<br>• *9000 rpm*<br>• *10000 rpm* |
| *[RPM Red Zone]*<br>Enables you to specify the engine RPM range that will be displayed as the “red zone” (i.e. when your engine is operating in its upper range). | • *Auto (default)*<br>• *Custom value* |

## Variation

| Menu item and Description | Options |
|---|---|
| *[Variation mode]*<br>Enables you to enable or disable magnetic variation, or specify whether a slave source should be used. | • *Off (default)*<br>• *On*<br>• *Slave* |
| *[Variation range]*<br>Enables you to specify the range for the magnetic variation, in degrees. | • *-30° — +30°* |

## Key beep

| Menu item and Description | Options |
|---|---|
| *[Key beep]* selection allows you to enable or disable the audible beep that occurs when pressing buttons. | • *On (default)*<br>• *Off* |

## 12.13 System set-up menu

The *[System set-up]* menu enables users to customize the following user settings:

| Menu item & description | Options |
|---|---|
| *[Network group]*<br>Allows adding multiple units together in a group so that when the color scheme or brightness is changed on one unit the changes are applied to all units in the group. | *[Predefined groups]*<br>• *None*<br>• *Helm 1*<br>• *Helm 2*<br>• *Cockpit*<br>• *Flybridge*<br>• *Mast*<br>*[Undefined]*<br>• *Group-1— Group-5* |
| *[Brightness / color group]*<br>Enables synchronization of the displays brightness and color to be the same as the other units in the same group. | *[Sync brightness / color]*<br>• *This display*<br>• *This group* |
| *[Data sources]*<br>Allows you to view and select preferred data sources.<br>• *[Select data source]*<br>• *[Data source found]*<br>• *[Data source details]* | *[Select data source]*<br>• *GPS position*<br>• *GPS Datum*<br>• *Time & Date*<br>• *Heading*<br>• *Depth*<br>• *Speed*<br>• *Wind*<br>*[Data source found]*<br>• Model name — Serial number & Port ID<br>*[Data source details]*<br>• Device name<br>• Serial No.<br>• Port ID<br>• Status or No data |
| *[About system set-up]*<br>Provides information about the System set-up menu. | N / A |

## 12.14 Diagnostics menu

You can access diagnostics details from the *[Diagnostics]* menu: *[Menu > Set-up > Diagnostics]*.

| Menu item & description | Options |
|---|---|
| *[About display]*<br>Allows you to view information about the display you are using: | • Software version<br>• Hardware version<br>• Bootloader version<br>• Temperature<br>• Volts<br>• Max. volts<br>• Current<br>• Max. current<br>• Run time<br>• Deviation (If available) |
| *[About Pilot]*<br>Allows you to view information about the autopilot you are using:<br>**Note:**<br>The **About Pilot** menu is only available on Pilot controllers. | • NMEA Code<br>• Product ID<br>• Serial number<br>• Description<br>• Software version<br>• PCB Number<br>• CAN Volts<br>• Unit Volts<br>• Operating hours<br>• Deviation |
| *[About system]*<br>Allows you to search the SeaTalk NG network and display information about the products found. | • Model number<br>• Serial number<br>• Software version<br>• Hardware version<br>• Volts |
| *[Self test]*<br>The product has a built in self test which can help to diagnose faults. Self-tests include:<br>• *Memory test*<br>• *Button test*<br>• *Display test*<br>• *Buzzer test*<br>• *Illumination test* | N / A |

# CHAPTER 13: SYSTEM CHECKS AND TROUBLESHOOTING

## CHAPTER CONTENTS


- 13.1 Troubleshooting — page 76
- 13.2 Power up troubleshooting — page 76
- 13.3 System data troubleshooting — page 77
- 13.4 Miscellaneous troubleshooting — page 78
- 13.5 Performing a Factory Reset — page 78

# 13.1 Troubleshooting

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

Before packing and shipping, all 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 to restore normal operation.

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

# 13.2 Power up troubleshooting

Troubleshooting assistance with typical causes of power-related issues, and their solutions.

## Product does not power up, or keeps switching off

| Possible causes | Possible solutions |
|---|---|
| **Blown fuse / tripped breaker:** | 1. Check condition of relevant fuses and breakers and connections, replace if necessary. (Refer to the *Power Connections* section of your product's Installation Instructions for fuse ratings.)<br>2. If fuse keeps blowing, check for cable damage, broken connector pins, or incorrect wiring. |
| **Poor / damaged / insecure power supply cable / connections:** | 1. Check that the power cable connector is correctly orientated and fully inserted into the product's *Power* connector, and locked in position.<br>2. Check the power supply cable and connectors for signs of damage or corrosion, and replace if necessary.<br>3. With the product switched on, try carefully flexing the power cable near to the product's *Power* connector to see if this causes the unit to restart or lose power. Replace if necessary.<br>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.<br>5. With the product under load, using a multi-meter, check for high voltage drop |

| Possible causes | Possible solutions |
|---|---|
| | across all connectors / fuses etc, and replace if necessary. |
| **Incorrect power connection:** | The vessel's power supply may be wired incorrectly. Ensure that the product's *Installation Instructions* have been followed completely. |

### 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 power up, or keeps switching off*'. |
| **Software corruption:** | 1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from: www.bit.ly/rym-software<br>2. If your product includes a display: as a last resort, attempt to perform a 'Power on Reset'. Be aware that this will delete all settings / presets and user data, and revert the unit back to factory default settings. |

## 13.3 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.

### Instrument, engine or other system data is unavailable at all displays:

| Possible causes | Possible solutions |
|---|---|
| Data is not being received at the display: | Check the data bus (e.g. SeaTalk NG) wiring and connections. |
| Data source (e.g. instrument display or engine interface) is not operating: | Check the overall integrity of the data bus (e.g. SeaTalk NG) wiring. |
| Software mismatch between equipment may prevent communication: | If available refer to the reference guide for the data bus (e.g. SeaTalk NG reference manual). |

### Instrument or other system data is missing from some but not all displays:

| Possible causes | Possible solutions |
|---|---|
| Network problem. | • Check that all required equipment is connected to the network.<br>• Check the status of the Raymarine network Switch.<br>• Check that SeaTalk NG / 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:

| Possible causes | Possible solutions |
|---|---|
| VHF radio **NMEA 0183** input not isolated / incorrect polarity | • Check that the radio has an Isolated **NMEA 0183** input.<br>• Check polarity of **NMEA 0183** wires. |

## 13.4 Miscellaneous troubleshooting

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

### Product behaves erratically (frequent unexpected resets / system crashes, or other erratic behavior):

| Possible causes | Possible solutions |
|---|---|
| **Intermittent problem with power to the product.** | • Check relevant fuses and breakers.<br>• Check that the power supply cable is sound, and that all connections are tight and free from corrosion.<br>• Check that the power source is of the correct voltage, and that sufficient current is being provided to the product. |
| **Software mismatch on system (upgrade required):** | Go to https://bit.ly/rym-software for the latest software downloads. |
| **Corrupt data / other unknown issue:** | Perform a factory reset — refer to the relevant *Installation Instructions* document.<br>**Important:**<br>This will result in the loss of any settings and user data stored on the product. Save any important data to a memory card before resetting. |

## 13.5 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 14: TECHNICAL SUPPORT

## CHAPTER CONTENTS


- 14.1 Raymarine technical support and servicing — page 80
- 14.2 Checking hardware and software information — page 81

# 14.1 Raymarine technical 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.

## Servicing and warranty

Raymarine offers dedicated service departments for warranty, service, and repairs.
Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online:

- www.bit.ly/rym-warranty

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

- Web: www.bit.ly/rym-service
- Tel: +44 (0)1329 246 932

**United States (US):**

- Web: www.bit.ly/rym-service
- Tel: +1 (603) 324 7900

## Web support

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

- **Manuals and Documents** — www.bit.ly/rym-docs
- **Technical support forum** — www.bit.ly/rym-support
- **Software updates** — www.bit.ly/rym-software

## Telephone and online support

| Region | Contact details |
|---|---|
| **All regions** | **Online support:** www.bit.ly/rym-support |
| **United Kingdom (UK) and EMEA** | **Telephone:** +44 (0)1329 246 777<br>**Address:** Marine House, Cartwright Drive, Fareham, PO15 5RJ, UK. |
| **United States (US)** | **Telephone:** Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)<br>**Address:** 110 Lowell Road, Hudson, NH 03051, USA. |
| **Australia and New Zealand** (Raymarine subsidiary) | **Telephone:** +61 2 8977 0300<br>**Address:** Suite 1.01, 26 Rodborough Road, Frenchs Forest, NSW, 2086, Australia. |
| **France** (Raymarine subsidiary) | **Telephone:** +33 (0)1 46 49 72 30<br>**Address:** 35 avenue Michel Crépeau, 17000 La Rochelle - France. |
| **Germany** (Raymarine subsidiary) | **Telephone:** +49 40 237 808 0<br>**Address:** Atlantic-Haus, Zirkusweg 1, 20359 Hamburg. |
| **Italy** (Raymarine subsidiary) | **Telephone:** +39 02 9945 1001<br>**Address:** Via L. Manara 2, 20812 Limbiate (MB), Italy. |
| **Spain** (Authorized Raymarine distributor) | **Telephone:** +34 96 2965 102<br>**Email:** sat@azimut.es |
| **Netherlands / Benelux** (Authorized Raymarine distributor) | **Telephone:** +31 (0)26 3614 905<br>**Address:** Florijnweg 21G, 6883 JN VELP, Nederland. |

| Region | Contact details |
|---|---|
| **Sweden**<br>(Raymarine subsidiary) | **Telephone:** +46 (0)317 633 670<br>**Address:** Bolshedens Industriväg 18, 427 50 Billdal, Sweden. |
| **Finland**<br>(Raymarine subsidiary) | **Telephone:** +358 (0)207 619 937<br>**Address:** Suomalaistentie 1-3, 02270 Espoo, Finland. |
| **Norway**<br>(Raymarine subsidiary) | **Telephone:** +47 692 64 600<br>**Address:** Årvollskogen 30, 1529 Moss, Norway. |
| **Denmark**<br>(Raymarine subsidiary) | **Telephone:** +45 437 164 64<br>**Address:** Centervej 7, 4600 Køge, Denmark. |
| **Russia**<br>(Distributor) | **Telephone:** Tel: +7 495 788 0508<br>**Email:** info@mikstmarine.ru |

## 14.2 Checking hardware and software information

You can check current hardware details and software version from the *[About display]* menu.

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 v3.20 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)
- **127506** — DC detailed status (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)
- **130312** — Temperature (Receive)
- **130316** — Temperature, Extended Range (Receive)
- **130576** — Small Craft Status (Receive)
- **130577** — Direction Data (Receive)

# Appendix B Glossary

## Navigation glossary

Common terms and abbreviations used in navigation.

| Term | Meaning |
|---|---|
| **Active navigation** | Active navigation is the term used when the display is performing navigation to a destination point.<br>The destination point can be a 'Goto' (to an onscreen cursor position or a single waypoint), or part of a 'Follow' (to a waypoint within a route). |
| **AIS (Automatic Identification System)** | A tracking system enabling you to receive positional information broadcast by other vessels, and to transmit positional information for your own vessel. AIS is used to identify, locate and track marine vessels in the chart and radar applications.<br>An AIS receiver or transceiver is required to view AIS information. |
| **Auto range** | A mode that ranges the chart application automatically, to ensure both the vessel and target waypoint are always visible. |
| **Course Over Ground (COG)** | COG is the actual direction of travel, relative to fixed land. Vessel heading may differ from COG due to the effects of currents, tide and wind.<br>COG is transmitted by GNSS (GPS) receivers.<br>Supported data:<br>• NMEA 2000: PGN 129026<br>• NMEA 0183: RMC |
| **Course up (CU / C-up)** | The chart or radar is orientated so as to show your current course directly ahead of your vessel icon. The chart will rotate so that your Course Over Ground (COG) is always upward on the screen. |
| **Cross Track Error (XTE)** | The amount of deviation from your intended course, expressed as a distance. In the event that you steer off-track, you can create a new course to the target by selecting "Restart XTE" on your pilot controller or multifunction display. |
| **Direction of Relative Motion (DRM)** | The direction a target is travelling in relation to your own vessel's direction and speed. |
| **Follow** | The action whereby the display is placed in active navigation following a route. |
| **GNSS (Global Navigation Satellite System)** | A constellation of Earth orbiting satellites that can be used to plot latitude, longitude, altitude, Course Over Ground (COG), and Speed Over Ground (SOG).<br>Current available GNSS are:<br>• *GPS* (USA)<br>• *BeiDou* (China)<br>• *Galileo* (EU)<br>• *GLONASS* (Russia) |
| **Goto** | The action whereby the display is placed in active navigation travelling to a cursor location or a single waypoint. |
| **Head up (HU / H-up)** | The chart or radar is orientated so as to show your current heading directly ahead of your vessel icon at all times. As your vessel changes direction, the chart or radar image rotates accordingly to reflect the new bearing. In Head-up, the motion mode is fixed to Relative motion. |

| Term | Meaning |
|---|---|
| **Heading (HDG)** | Compass direction of travel. Heading can be relative to True north or Magnetic north. Heading can be transmitted from a ship's compass or heading sensor.<br>Supported data:<br>• NMEA 2000: PGN 127237 / 127250<br>• NMEA 0183: HDG / HDM / HDT |
| **Latitude (Lat)** | A geographic coordinate which indicates the position of a point on the Earth that is either north or south of the equator. When provided as a coordinate, the number of degrees is determined in relation to how far (0° to 90°) north or south the coordinate is from the Earth's equator — where 90° refers to either the North Pole or South Pole and 0° refers to the equator. One degree of latitude is approximately equivalent to 60 nautical miles. |
| **Longitude (Lon)** | A geographic coordinate which indicates the position of a point on the Earth that is either east or west of the prime meridian. When provided as a coordinate, the number of degrees is determined in relation to how far (0° to 180°) east or west the coordinate is from the prime meridian. |
| **North up (NU / N-up)** | The chart or radar image is orientated so that true north is always upward on the screen. As your vessel changes direction, vessel icon (chart) or ship heading line (radar) rotate accordingly to show your relative position to true north. |
| **Rate of Turn (RoT)** | RoT is the speed at which your vessel turns in a given direction, typically when under autopilot control. |

| Term | Meaning |
|---|---|
| **Relative Motion (RM)** | In the Chart and Radar applications, relative motion mode fixes your vessel's position and the chart or radar image moves relative to your vessel.<br>In Relative Motion mode you can use the *[Boat position]* setting to determine whether the vessel position is fixed in the *Center* of the chart display or has a *Partial offset*, or *Full offset*. Selecting the partial or full offset has the effect of increasing the view ahead. |
| **Route (RTE)** | A series of waypoints typically used to assist with journey planning and navigation. A route is displayed on screen as a series of waypoints linked by a line. |
| **Speed of Relative Motion (SRM)** | The velocity of a target relative to your own vessel's velocity (E.g.: If you are travelling in the same direction as a target, the relative speed will be the difference between your vessel's speed and the target's speed. If you are travelling towards / away from each other then relative speed is the combination of both vessel's speeds). |
| **Speed Over Ground (SOG)** | The actual speed of travel, relative to fixed land. Vessel speed may differ from STW due to the effects of currents, tide and wind.<br>SOG is transmitted by GNSS (GPS) receivers.<br>Supported data:<br>• NMEA 2000: PGN 129026<br>• NMEA 0183: RMC |
| **Speed Through Water (STW)** | The speed of your vessel through the water, also known as boat speed. Due to tide and current this will be different than Speed Over Ground (SOG).<br>STW is measured by a speed transducer.<br>Supported data:<br>• NMEA 2000: PGN 128259<br>• NMEA 0183: VHW |

| Term | Meaning |
|---|---|
| **Time To Go (TTG)** | The time remaining until you reach the destination point. |
| **Track** | A visible trail displayed in the Chart app on a multifunction display, showing the passage you have taken. The trail consists of a series of track points which are created automatically. You can save the track to create a permanent record of where you have been. You can also create a new route from a track. |
| **True Motion (TM)** | True Motion mode fixes the chart position and the vessel icon moves across the screen. As the vessel's position approaches the edge of the screen, the chart image is automatically redrawn to reveal the area ahead of the vessel.<br>As the vessel's position approaches the edge of the display, the image is automatically redrawn to reveal the area ahead of the vessel.<br><br>**Note:**<br>True Motion mode is not available when the orientation is set to "Head-up". |
| **Waypoint (WPT)** | A position marked on the screen to indicate a location to navigate to. Waypoint positions are defined by Longitude / Latitude coordinates, and can be saved for future use. As well as acting as position markers, waypoints are also the building blocks used to create routes. Waypoints can be created and displayed in the Chart, Radar, and Fishfinder apps on a multifunction display. |

## Sailing glossary

Common terms and abbreviations used in sailing.

| Term | Meaning |
|---|---|
| **Apparent Wind** | The wind flow observed when the vessel is in motion, relative to the vessel's heading. Apparent wind is different from True wind in that it takes into account your vessel's movement, i.e.: speed and direction of travel. Apparent wind is the raw data that is reported by wind transducers, which can then be used in conjunction with other data sources to calculate True wind.<br>Supported data:<br>• NMEA 2000: PGN 130306<br>• NMEA 0183: MWV |
| **Apparent Wind Angle (AWA)** | The wind angle observed when the vessel is in motion, relative to the vessel's heading. AWA is a combination of the true angle of the wind and the angle that is experienced due to the direction and speed of travel. |
| **Apparent Wind Speed (AWS)** | The wind speed observed when the vessel is in motion. AWS is a combination of the true speed of the wind and the speed at which you are travelling. |

| Term | Meaning |
|---|---|
| **Close-hauled / Beating** | Generally, when sailing upwind, the tighter the angle at which the vessel sails with respect to the wind, the faster the vessel will travel. When a vessel's sails are pulled in tightly to the vessel's centerline in order to maximize the vessel's speed when travelling upwind, it is known as sailing "Close-hauled" or "beating". There's a "no-go" zone directly into the wind where a vessel cannot sail in a forward motion. Also, sailing too close to the wind ("pinching") can reduce both speed and efficiency in terms of the vessel's forward motion. Therefore, maximizing forward motion when sailing upwind requires the optimization of both the vessel's sail rigging and the vessel's angle with respect to the wind direction, which is typically 30 to 45 degrees. |
| **Distance to Tack** | The travel distance remaining until you need to tack. |
| **Distance to Line** | Distance remaining to the closest point along the race start line. |
| **Downwind** | Moving in the direction that the wind is blowing. |
| **Ground Wind Direction (GWD)** | The direction of the wind relative to north, as observed on land. This is the actual direction the wind is blowing.<br>In addition to Apparent Wind Angle (AWA), Course Over Ground (COG) from a GNSS receiver is also required in order to calculate GWD. |
| **Ground Wind Speed (GWS)** | The wind speed observed when stationary, as observed on land. GWS is the actual speed at which the wind is blowing over land.<br>In addition to Apparent Wind Speed (AWS), Speed Over Ground (SOG) data from a GNSS receiver is also required in order to calculate GWS. |

| Term | Meaning |
|---|---|
| **Header** | A wind shift which causes your vessel to turn more downwind. |
| **Laylines** | Vector lines showing the course the boat will take when sailing at the optimum angle to the wind, on either tack. |
| **Leeway** | The difference in angle between desired heading and actual course, caused by sideways movement of a sailing boat due to the wind. |
| **Lift** | A wind shift which allows your boat to turn upwind and closer to your destination. |
| **Line bias** | The distance advantage conferred by crossing the start line at the favored end (the end which is more upwind) of the race start line. |
| **Polar table** | A performance profile for a vessel, showing the vessel speed achievable at varying angles to the wind, with varying wind speed. In sailing, the Velocity Made Good (VMG) principle demonstrates that travelling in a straight line is not always the quickest route, and polars enable you to optimize your vessel's performance to its best advantage, by improving the accuracy of laylines to display how far you need to sail on a current tack to reach a target waypoint after tacking, and taking wind conditions into consideration. |
| **RSW-Wired** (Raymarine Smart Wind) | The Raymarine Smart Wind transducer series. The RSW-Wired series of transducers include a built-in attitude sensor, which is used to provide more accurate readings than standard wind transducers. |
| **Sail plan** | Sail configuration recommendations based on wind conditions. |
| **Sailing upwind** | Sailing close to the wind direction. |

| Term | Meaning |
|---|---|
| **Tack** | A course change made by a sailing vessel, by turning its heading into and through the wind. |
| **Tacking** | The zig-zag maneuver a sailing vessel makes when travelling upwind. |
| **Time To Burn (TTB)** | The time remaining during race start countdown before the vessel needs to start moving towards the start line at full speed. |
| **Time to Tack** | The amount of time remaining until you need to tack, if the current course and speed are maintained based on the calculated laylines. |
| **True Wind** | The actual wind flow; the wind flow that you experience on the water, when stationary. True wind is calculated from Apparent wind data from a wind transducer and STW (Speed Through Water) data from a speed transducer. |
| **True Wind Angle (TWA)** | The angle of the wind over water, relative to the vessel's bow, observed when stationary. |
| **True Wind Direction (TWD)** | The direction of the wind relative to North. This is the actual direction in which the wind is blowing.<br>In addition to Speed Through Water (STW), Heading data is also required in order to calculate TWD. |
| **True Wind Speed (TWS)** | The wind speed observed when stationary, on the water. TWS is the actual speed at which the wind is blowing over water. |
| **Velocity Made Good (VMG)** | Sailing term related to the component of a sail vessel's velocity vector that is in the direction of true wind. |
| **Wind shift** | The amount of variation in True Wind Direction (TWD) over time. |

# Appendix C i70-Series software release history

The following is a cumulative list of the new features introduced in subsequent releases of the i70-Series software, since the initial release (v1.08; October 2011).

**This list includes *new features* only. It does NOT include software maintenance items, such as bug fixes or performance improvements.**
To download the software, and view the complete list of all software updates, including new features, bug fixes, and performance improvements, visit:

| i70-Series software download link |
|---|
| www.bit.ly/i70-download |

## i70-Series v3.23 / v3.24 new features:

(Software release dates: *August 2024* / *March 2025*)

- Added support for configuring the RSW-Wired series of wind transducers.
- Added ability to receive NMEA 2000 PGNs 130312 and 130316 (including Dew point).
- Added ability for TWD (True Wind Direction) readings to automatically use SOG (Speed Over Ground) if STW (Speed Through Water) is not available.
- Added Position data format options to the *[Units]* menu.
- Engine alarms now auto-cancel when alarm state is removed.
- All RPM dials now have 5 or 10 minor indices between each major index.
- Supports true wind from NMEA 2000 values.
- Allows a debug level to be set. This setting should only be used for troubleshooting purposes when directed by Raymarine Technical support.

## i70-Series v3.20 new features:

(Software release date: *September 2020*)

- Added NMEA 2000 'transmission discrete status' field support - within PGN 127493.

## i70-Series v3.19 new features:

(Software release date: *August 2020*)

- Support for engine icons on the bespoke engine pages.
- Addition of the Honda specific engine alarms.
- Addition of the Honda engine Trolling mode indication.
- Change to the color palettes to better match Axiom-Series displays.
- Support for the calibration of DST810 (Replacement for the obsolete Airmar DST800).
- True Wind Direction TWD now available in both *[Magnetic]* and *[True]* when an MFD / Chartplotter is in the system.

## i70-Series v3.16 new features:

(Software release date: *April 2019*)

- Dual page selection added to Favorite pages. Dual data pages (two items) can now be selected when creating a custom page.
- *[Fuel manager]* added:
  - Fuel Economy — Distance achieved per measurement of fuel.
  - Est. Fuel Remaining — Estimated fuel available.
  - Fuel Used (Trip) — Amount of fuel used on current trip.
  - Fuel Used (Season) — Amount of fuel used this season.
  - Distance to Empty — Distance until fuel depletion.
  - Time to Empty — Amount of time until fuel depletion.
  - Fuel Flow Rate — Amount of fuel used over time.

## i70-Series v3.11 new features:

(Software release date: *November 2017*)

- Maintenance release.

## i70-Series v3.08 new features:

(Software release date: *February 2017*)

- Added the ability to select Engine trim in the bespoke engine pages.

## i70-Series v3.07 new features:

(Software release date: *August 2016*)

- Added support for Honda ECO mode in the Engine data pages. The ECO mode is only supported if a compatible Honda engine is directly interfaced via NMEA 2000 (it is not supported via an ECI-100 v1.20).

## i70-Series v3.06 new features:

(Software release date: *June 2016*)

- Maintenance release.

## i70-Series v3.05 new features:

(Software release date: *May 2016*)

- Added support for calibrating the P79s (NMEA 2000) In-hull depth smart transducer.
- Now fully compliant with the NMEA 2000 standard.

## i70-Series v2.22 new features:

(Software release date: *May 2016*)

- The choice of STW or SOG can now be selected in the Engine overview data pages.
- General software enhancements.

## i70-Series v2.18 new features:

(Software release date: *October 2014*)

- Maintenance release.

## i70-Series v2.17 new features:

(Software release date: *August 2014*)

- Speed calibration process now improved to include three levels. (Single point, Add Points & Advanced).
- Analogue rudder angle dial can now be displayed as a full page.
- MOB pop up page added & Alarm can be silenced.

- Improvements to MDS (Multiple Data Sources) functionality.
- Depth alarms now cancelled on any display globally.
- Graphic history pages now show vertical scale.
- Fuel flow rate bar can now be selected.
- *[About System]* added to *[Diagnostic]* Menu. The menu will search & display devices found on the SeaTalk NG network.

### i70-Series v1.25 new features:

(Software release date: *May 2012*)

- Added full compatibility for the iTC-5 (instrument Transducer Converter). This allows full calibration and set-up of all transducer variants supported by the iTC-5.

### i70-Series v1.15 new features:

(Software release date: *January 2012*)

- Modification to Temperature calibration.
- Trip value can now be reset. The Trip value has the following functions:
  - i70 & Speed Pod – Trip stored in i70 and is individual to each display.
  - i70 & DST800 – Trip stored in DST and is a single global Trip.
  - i70 & iTC-5 – Trip stored in iTC-5 and is a single global Trip.

### i70-Series V1.01 bootcode:

(Software release date: *January 2012*)

- This was a bootcode upgrade to support v1.15 software.

### i70-Series v1.08 new features:

(Software release date: *October 2011*)

- Initial release.

## Appendix D Document change history

The following changes have been made to this document, since its initial release.

**Important:**
This document (81401) replaces document 81364.

| Document number: | Document name: |
|---|---|
| **81401** | i70 / i70s Operation Instructions |

### Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 6 | October 2025 | v3.24 |

- Minor editorial improvements.

### Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 5 | April 2025 | v3.24 |

- Updated to reflect software release v3.24.

### Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 4 | August 2024 | v3.23 |

- Updated software version to v3.23.
- Updated new features list.
- Added new compatible peripheral software list.
- Updated TWD PGNs and added note.
- Restructured Transducer Set-up menu details and added missing details for Compass and Rudder settings.
- Added iTC-5 Debug menu.
- Added Software release history details.

## Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 3 | January 2024 | v3.22 |

- Updated layout and style to latest standards.
- Added Glossary of terms.
- Software updates section has been re-written, for greater clarity
- Added configuration details for RSW-Wired series wind transducers.
- Added new software features list.
- Updated AWA dial to detail close hauled angles.
- Restructured data items and added PGNs against data items.
- Updated and restructured Fuel manager chapter.
- Added SART symbol to AIS symbols.
- Added document change history.
- Added Distance (long), Distance (short), Position and Economy units to User Preferences menu details.

## Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 2 | August 2021 | v3.20 |

- Added details of page lock feature.

## Changes:

| Revision | Date | Applicable software version(s) |
|---|---|---|
| 1 | May 2021 | v3.20 |

- Initial public release.

# Index


6 Way-split data ..... 43

## A

Add to favorites ..... 22
Adjust start times ..... 22
Adjusting the Rudder ..... 36
AIS ..... 43, 54
  Messages ..... 54
  Range ..... 55
  Silent mode ..... 56
AIS range ..... 22
AIS Silent mode ..... 22
AIS target
  Information ..... 55
  Status ..... 55
  Symbols ..... 55
Alarms ..... 63
  Man overboard ..... 63
Applicable documents ..... 12
AWA & AWS ..... 41
AWA (Apparent Wind Angle) ..... 41
AWS (Apparent Wind Speed) ..... 41

## B

Battery data ..... 48
Boat data ..... 48
Boat details ..... 72
Boat type ..... 72
Boat type selection ..... 18
Brightness ..... 19
  Shared ..... 19–20
  Unshare ..... 20
Buttons ..... 18

## C

Calibration
  Compass ..... 37
  Depth ..... 24
  Rudder ..... 36
  Speed ..... 25–31
  Water temperature ..... 31
  Wind ..... 34–35
Centering the Rudder ..... 36
Color scheme ..... 20
Compass ..... 40
  Calibration settings ..... 68
  Deviation ..... 37
  Offset ..... 38
Compass calibration ..... 37
Controls ..... 18

## D

Data ..... 50
  Battery ..... 48
  Boat ..... 48
  Depth ..... 48
  Distance ..... 48
  Engine ..... 49
  Environment ..... 49
  Fuel ..... 49
  Heading ..... 50
  Navigation ..... 50
  Pilot ..... 51
  Speed ..... 51
  Time ..... 51
  Wind ..... 51
Data (quick view) ..... 48
Data items ..... 48
Data sources ..... 21
  Selection ..... 21
Depth ..... 40
Depth and temperature transducer
  Calibration settings ..... 69
Depth calibration ..... 24
Depth data ..... 48
Depth offset ..... 24
Depth transducer
  Calibration settings ..... 68
Depth, speed and temperature transducer
  Calibration settings ..... 69

Diagnostics ..... 67
Digital Speed ..... 40
Display brightness ..... 18
Display response ..... 21
Distance data ..... 48
Document conventions ..... 12
Document history ..... 90–91
Documentation ..... 12
Dual engine ..... 42

## E

ECO mode ..... 43
Edit page ..... 22
Engine data ..... 49
Engine warning symbols ..... 42
Environment data ..... 49

## F

Factory reset ..... 67
Favorite page
  6 Way-split data page ..... 43
  AIS page ..... 43
  AWA & AWS ..... 41
  Customizing ..... 45
  Digital depth ..... 40
  Digital speed ..... 40
  Dual engine ..... 42
  Heading & speed ..... 40
  Heading and wind ..... 44
  Quad-split data page ..... 43
  Single engine ..... 42
  Speed dial ..... 40
Favorite pages
  Customize ..... 40
  Delete page ..... 45
  Fuel data ..... 59
  Menu ..... 40, 44
  New page ..... 45
  Page Lock ..... 46
  Page order ..... 45
  Rollover ..... 45
Fuel data ..... 49
Fuel manager ..... 58
  Detecting fuel messages ..... 58
  PGNs ..... 58
  Reset fuel ..... 59
  Set-up ..... 59
  Setting tank fill ..... 58
  Setting up ..... 58
  Settings ..... 59
  Switching Fuel calculations ..... 59

## G

Glossary
  Navigation ..... 84
  Sailing ..... 86
GNSS(GPS)
  Data ..... 50
GNSS(GPS) data ..... 50

## H

Heading ..... 40
Heading and wind ..... 44
Heading data ..... 50
Honda ..... 43, 65

## I

Inverting the Rudder ..... 37
iTC-5
  Menu options ..... 67

## K

Key beep ..... 72

## L

Language ..... 71

Language selection ..... 18

## M

Manual calibration factors ..... 29
Menus
  Setup ..... 67
Multiple data sources (MDS) ..... 21

## N

Navigation
  Glossary ..... 84
Navigation data ..... 50
Network groups ..... 19
New features ..... 88–90
NMEA 2000 ..... 83

## P

Page layout ..... 44
Page Lock ..... 46
Performance Wind transducer
  Calibration settings ..... 69
PGNs ..... 83
Pilot data ..... 51
Power off ..... 18
Power on ..... 18
Power troubleshooting ..... 76
Printed manual ..... 12
Product documentation ..... 12
Product support ..... 80

## Q

Quad-split data ..... 43
Quick options ..... 22

## R

Reset ..... 22
Reset timer ..... 22
Rotating mast ..... 33
RSW transducer
  Calibration settings ..... 69
RSW Wired
  Configuration ..... 33
Rudder reference
  Calibration settings ..... 68

## S

Sailing
  Glossary ..... 86
Select Data ..... 22
Select Speed Type ..... 22
Service Center ..... 80
Set-up wizard ..... 18
Shared brightness ..... 19
Shared Brightness ..... 19
Simulator ..... 67
Single engine ..... 42
Software updates ..... 15–16
Software version ..... 15
Speed ..... 40
Speed calibration ..... 25, 29
  Adding calibration points ..... 30
  Calibration table ..... 28–29
  Deleting calibration points ..... 30
  Editing calibration points ..... 30
  Measured mile ..... 26
  Mile markers ..... 26
  New calibration table ..... 31
  one point ..... 25–26
  Reset calibration table ..... 30
  Speed Run ..... 25–26
  Speed Run calibration ..... 26–27
Speed check ..... 29
Speed data ..... 51
Speed dial ..... 40
Speed transducer
  Calibration settings ..... 68
Start timer ..... 22
Stop timer ..... 22

Swing compass ..... 37
Switching on ..... 18
System set up ..... 67

## T

Technical support ..... 80
Time and date ..... 70
Time data ..... 51
Time scale ..... 22
Transducer calibration ..... 24
Transducer connection methods ..... 24
Transducer Set-up ..... 67
Trolling mode ..... 43
Troubleshooting ..... 76, 78
  Miscellaneous ..... 78
  Power ..... 76
  System data ..... 77

## U

Units of measure ..... 70
Upgrading, software ..... 15
User preferences
  Boat details ..... 72
  Boat type ..... 72
  Key beep ..... 72
  Language ..... 71
  Time and date ..... 70
  Units of measure ..... 70
  Variation ..... 72
User Preferences ..... 67

## V

Variation ..... 72
View AIS targets ..... 22

## W

Warranty ..... 10, 80
Water temperature calibration ..... 31
Wind calibration ..... 34
  Adjustment ..... 35
  Alignment ..... 34
Wind data ..... 51
Wind dial ..... 41
Wind speed calibration ..... 35
Wind transducer
  Calibration settings ..... 68
  Configuration ..... 33