

# LIGHTHOUSE 3

VERSION 3.7XX

Advanced operation instructions

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Check the Raymarine website for the latest software releases for your product.  
[www.raymarine.com/software](http://www.raymarine.com/software)

## Product documentation



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

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# Contents

<b>Chapter 1 Important information .....</b>	<b>15</b>
Disclaimers .....	15
Open source license agreements .....	15
Warranty registration .....	15
Technical accuracy .....	15
<b>Chapter 2 Document and product information .....</b>	<b>17</b>
2.1 Product documentation .....	18
Video tutorials .....	18
Applicable software version .....	18
Compatible MFDs .....	18
New software features .....	19
User manuals Print Shop .....	19
<b>Chapter 3 General information .....</b>	<b>21</b>
3.1 MFD and LightHouse apps .....	22
3.2 Sidebar .....	23
Customizing Sidebar data .....	23
Switching sidebars .....	23
3.3 Data overlays .....	24
Data overlay and Sidebar data items .....	24
3.4 Menus .....	25
Controls and settings .....	25
3.5 MFD app settings menu .....	27
3.6 Editing the split ratio of a Splitscreen app page .....	28
<b>Chapter 4 Set up .....</b>	<b>29</b>
4.1 MFD physical buttons .....	30
4.2 Axiom and Axiom XL .....	33
Powering on the display .....	33
Powering off the display .....	33
Switching on and off at the breaker .....	33
4.3 Axiom Pro, eS Series and gS Series .....	34
Powering on the display .....	34
Powering off the display .....	34
4.4 Switching on and off at the breaker .....	35
4.5 Getting started .....	36
First power up .....	36
First power up Data master selection .....	36
Startup wizard .....	36
First power up Limitation on Use acknowledgement .....	37
Multiple data sources (MDS) .....	37

Data sources menu.....	37
Identifying engines .....	38
Configuring Transducer settings .....	39
RealVision™ 3D AHRS calibration.....	39
Assigning a function to the User Programmable Button (UPB).....	40
Performing a settings or factory reset.....	40
Importing user data.....	40
<b>4.6 Shortcuts .....</b>	<b>41</b>
Taking a screenshot .....	41
Activating touchlock .....	41
Radar standby.....	42
Autopilot shortcuts.....	42
Adjusting brightness .....	42
Disabling all sounders.....	42
Bluetooth volume control .....	42
<b>4.7 Memory card compatibility .....</b>	<b>44</b>
Removing MicroSD card from its adaptor.....	44
Inserting a MicroSD card — Axiom variants .....	45
Inserting a MicroSD card — Axiom Pro variants.....	45
Inserting external storage devices - RCR.....	46
<b>4.8 Software updates .....</b>	<b>47</b>
Updating software using a memory card.....	47
Updating software via the internet .....	47
<b>4.9 Device pairing.....</b>	<b>48</b>
Pairing a RMK remote keypad .....	48
Pairing with a Quantum Radar scanner .....	48
Pairing a Bluetooth speaker .....	48
<b>Chapter 5 Homescreen .....</b>	<b>49</b>
5.1 Accepting the Limitations on Use .....	50
5.2 Homescreen overview .....	51
5.3 MFD Apps.....	52
5.4 Creating / Customizing an App page.....	54
5.5 User profiles.....	55
Demo profiles .....	55
5.6 Status area .....	57
Status area icons .....	57
5.7 Satellite navigation / positioning .....	59
GNSS (GPS) Status.....	59
GNSS (GPS) Settings.....	59
5.8 My data .....	61
Fuel/trip manager .....	61

Files .....	63
Import/export .....	63
PDF viewer.....	65
5.9 Alarms.....	67
Alarm manager .....	67
Alarm settings .....	69
External alarm speaker / buzzer .....	71
Acknowledging alarms .....	71
Digital switching alarms .....	72
5.10 Man Overboard (MOB).....	73
MOB mode.....	73
5.11 Settings .....	74
Selecting display language.....	75
Boat details.....	75
Units of measure.....	76
Data master .....	76
Shared Brightness .....	77
Customizing the splashscreen.....	79
NMEA 0183 settings.....	79
5.12 Connecting to a wireless display .....	81
Disconnecting a wireless display.....	81
Unpairing a wireless display .....	82
<b>Chapter 6 Autopilot control .....</b>	<b>83</b>
6.1 Autopilot control.....	84
Engaging the autopilot — Locked heading.....	84
Engaging the autopilot — Navigation .....	84
Engaging and disengaging the autopilot - physical buttons.....	85
Disengaging the autopilot .....	85
6.2 Pilot sidebar .....	86
6.3 Pilot pop-up.....	88
6.4 Autopilot Control — Advanced settings .....	89
<b>Chapter 7 Waypoints, Routes and Tracks .....</b>	<b>91</b>
7.1 Waypoints .....	92
Placing a waypoint.....	92
Waypoint management.....	92
7.2 Routes .....	95
Creating a Route .....	95
Autorouting.....	96
Importing a route .....	96
Route management .....	97
7.3 Tracks .....	99

Creating a track .....	99
Converting a track to a route .....	99
Track management.....	99
<b>Chapter 8 Chart app .....</b>	<b>101</b>
8.1 Chart app overview.....	102
Chart app controls .....	103
Chart ranging and panning .....	103
Chart app context menu .....	103
Selecting a chart card .....	104
Chart modes .....	105
Vessel details.....	106
Object selection and information.....	106
Layers .....	107
View and motion.....	108
Camera tracking .....	108
8.2 Navigation .....	109
Navigating to a waypoint or point of interest.....	109
Restarting cross track error (XTE) .....	109
Following a Route .....	109
8.3 Target tracking .....	110
Target vectors.....	110
Dangerous targets alarm .....	111
Radar settings.....	112
AIS settings.....	112
AIS target symbols.....	113
8.4 Tides mode .....	115
Using animation controls .....	115
Setting a specific date for animations.....	116
Tide station information .....	116
Current station information .....	117
Displaying Tide or Current graphs.....	119
8.5 Find nearest .....	120
Search using find nearest.....	121
8.6 SonarChart™ Live .....	122
Enabling SonarChart Live .....	122
8.7 UAV Chart integration.....	123
Showing or hiding the UAV icon.....	123
Performing a UAV Goto .....	123
8.8 ClearCruise™ Augmented Reality .....	125
Field of View .....	125
8.9 Chart settings menu.....	127

<b>Chapter 9 Weather mode</b>	<b>133</b>
9.1 Weather mode	134
9.2 Activating your SiriusXM receiver	135
Weather receiver status	135
9.3 Animated weather	136
9.4 Weather mode context menu	138
9.5 Weather Radar layer	139
9.6 Cities and Surface observation stations layers	140
9.7 Cloud top and Lightning layers	141
9.8 Storm cast and Storm tracks layers	142
9.9 Sea surface temperature and Surface pressure layers	143
Surface pressure patterns	144
9.10 Wind and Watchbox layers	145
9.11 Wave direction, height and period layers	147
<b>Chapter 10 Sonar app</b>	<b>149</b>
10.1 Sonar app overview	150
Sonar app controls	150
RealVision 3D controls	151
10.2 Opening the Sonar app	153
10.3 Sonar channels	156
Selecting a Sonar channel	156
10.4 Placing a Waypoint (Sonar, DownVision and SideVision)	157
Placing a waypoint RealVision 3D	157
10.5 Sonar scroll back	159
10.6 Sonar sensitivity controls	160
10.7 Sonar settings menu	161
<b>Chapter 11 Radar app</b>	<b>165</b>
11.1 Radar app overview	166
Radar app controls	166
Radar app context menu	167
Camera tracking	167
11.2 Radar feature comparison	169
Compatible Radar scanners	171
11.3 Opening the Radar app	172
Putting the Radar into Standby	173
Powering down your Radar	173
11.4 Set up	174
Selecting a Radar scanner	174
Dual range	174
Timed Radar transmission	175
Setting open array antenna size	175

Bearing alignment.....	175
11.5 Radar modes .....	176
11.6 Range and bearing .....	177
VRM (Variable Range Marker) / EBL (Electronic Bearing Line).....	177
11.7 AIS targets.....	179
AIS target list.....	179
AIS target symbols.....	180
AIS settings .....	181
11.8 Radar targets .....	182
Radar target acquisition data source requirements.....	182
Radar target symbols.....	183
Acquiring a target manually .....	184
Automatic target acquisition .....	184
Radar target list.....	185
Target settings.....	186
Onscreen target settings .....	188
Clearing / resetting trails.....	188
Target context menu .....	189
11.9 Dangerous targets alarm .....	190
11.10 Guard zone alarms .....	191
11.11 Doppler Radar overview.....	192
Doppler mode.....	192
Doppler data source requirements.....	193
11.12 Radar sensitivity controls.....	194
11.13 Radar settings .....	195

## **Chapter 12 Dashboard app ..... 199**

12.1 Dashboard app overview.....	200
Dashboard app controls .....	200
Navigation and Sailing dials.....	201
Switching data page .....	201
Selecting Data pages to display .....	201
12.2 Customizing existing Data pages .....	202
Available data items.....	202
12.3 Dashboard settings menu.....	207

## **Chapter 13 Video app ..... 209**

13.1 Video app overview.....	210
Video app pages .....	210
Renaming video feeds.....	211
Video app controls .....	211
Pan, Tilt, Zoom (PTZ) camera controls .....	212
13.2 Opening the Video app.....	213



Selecting a video feed .....	214
13.3 Video app settings .....	215
<b>Chapter 14 ClearCruise (Object Detection and Augmented Reality) .....</b>	<b>219</b>
14.1 ClearCruise™ features .....	220
14.2 Camera setup for Augmented Reality .....	221
14.3 AR200 setup for Augmented Reality .....	223
14.4 ClearCruise™ object detection overview .....	224
ClearCruise settings (Object Detection) .....	225
14.5 Augmented Reality (AR) overview .....	226
14.6 Augmented Reality flags .....	227
Selected flags .....	227
Goto flag .....	229
14.7 ClearCruise settings (Augmented Reality) .....	230
Range limit .....	231
14.8 Roll correction .....	232
14.9 AR200 Calibration (Linearization) .....	234
Magnetic deviation .....	234
AR200 calibration settings .....	234
Continual monitoring and adaptation .....	235
Compass lock .....	236
<b>Chapter 15 Audio app .....</b>	<b>237</b>
15.1 Audio app overview .....	238
Compatible entertainment systems .....	238
Audio app controls .....	239
15.2 Opening the Audio app .....	242
15.3 Getting started .....	244
Selecting an audio zone .....	244
Selecting an audio source .....	244
Muting and unmuting .....	244
Browsing for tracks .....	244
Browsing for stations/channels .....	245
Saving presets .....	245
Powering off entertainment systems .....	245
15.4 Audio app menu options .....	246
Audio app settings menu .....	246
Adjusting balance and fade controls .....	247
<b>Chapter 16 UAV (Unmanned Aerial Vehicle) app .....</b>	<b>249</b>
16.1 UAV disclaimer .....	250
16.2 UAV app overview .....	251
Compatible UAVs .....	252
UAV sport mode .....	252

UAV app settings menu .....	252
16.3 UAV pre-requisites .....	254
Removing the RC cable .....	254
UAV controller connection .....	254
16.4 UAV precautions.....	256
No-fly zones.....	256
16.5 Getting started .....	257
16.6 UAV app page.....	258
16.7 Opening the UAV app .....	259
16.8 Launching the UAV .....	261
16.9 Controlling the UAV in flight.....	262
16.10 Retrieving your UAV .....	263
16.11 Disconnect UAV remote controller from MFD .....	264
16.12 Fish on / Circle me mode.....	265
16.13 UAV Chart integration.....	266
Showing or hiding the UAV icon.....	266
Performing a UAV Goto .....	266
16.14 UAV Emergency procedures .....	268
<b>Chapter 17 LightHouse apps.....</b>	<b>269</b>
17.1 LightHouse app launcher.....	270
LightHouse apps.....	270
17.2 LightHouse app requirements.....	271
17.3 Internet connection.....	272
Connecting to the internet.....	272
Wi-Fi settings .....	272
17.4 Bluetooth speaker set up.....	273
Enabling and disabling Bluetooth.....	273
Bluetooth Settings .....	273
Pairing a Bluetooth speaker .....	273
Bluetooth volume control .....	274
<b>Chapter 18 Mobile app support.....</b>	<b>275</b>
18.1 Raymarine mobile apps.....	276
18.2 Connecting a mobile device to your MFD .....	277
18.3 Controlling your MFD using RayControl .....	278
18.4 Controlling your MFD using RayRemote .....	279
18.5 Viewing your MFD screen using RayView.....	280
18.6 Navionics plotter sync.....	281
<b>Chapter 19 Troubleshooting .....</b>	<b>283</b>
19.1 Troubleshooting .....	284
19.2 Diagnostic product information.....	285
Saving product information.....	285

19.3 Power up troubleshooting .....	286
Performing a power on reset — Axiom™ .....	286
Performing a power on reset - Axiom Pro.....	287
Performing a Power on Reset - eS and gS Series MFDs .....	287
19.4 Radar troubleshooting.....	288
19.5 GNSS (GPS) troubleshooting.....	289
19.6 Sonar troubleshooting.....	290
19.7 Camera troubleshooting .....	293
19.8 Augmented Reality (AR) Troubleshooting .....	295
19.9 Wi-Fi troubleshooting .....	296
19.10 Wireless display troubleshooting .....	299
19.11 Data troubleshooting .....	300
19.12 Touchscreen troubleshooting.....	301
<b>Chapter 20 Technical support.....</b>	<b>303</b>
20.1 Raymarine product support and servicing .....	304
Viewing product information (LightHouse™ 3).....	305
20.2 Learning resources.....	306
<b>Appendix A NMEA 0183 sentence support .....</b>	<b>307</b>
<b>Appendix B NMEA 2000 PGN support .....</b>	<b>308</b>
<b>Appendix C Document change history .....</b>	<b>310</b>
<b>Appendix D Hardware compatibility.....</b>	<b>314</b>
<b>Appendix E LightHouse 3 on eS and gS Series.....</b>	<b>315</b>



## Chapter 1: Important information



### Warning: Ensure safe navigation

This product is intended only as an aid to navigation and must never be used in preference to sound navigational judgment. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating this or any other Raymarine product.



### Warning: Radar transmission safety

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



### Warning: Sonar operation

- NEVER operate the sonar with the vessel out of the water.
- NEVER touch the transducer face when the sonar is powered on.
- SWITCH OFF the sonar if divers are likely to be within 7.6 m (25 ft) of the transducer.

## Disclaimers

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.

This product uses digital chart data, and electronic information from Global Navigation Satellite Systems (GNSS) which may contain errors. Raymarine does not warrant the accuracy of such information and you are advised that errors in such information may cause the product to malfunction. 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 chart data or information utilized by the product and supplied by third parties.

This product supports electronic charts provided by third party suppliers which may be embedded or stored on memory card. Use of such charts is subject to the supplier's End-User Licence Agreement.

## Open source license agreements

This product is subject to certain open source license agreements. Copies of the license agreements can be found on the Raymarine website: [www.raymarine.com/manuals/](http://www.raymarine.com/manuals/).

## Warranty registration

To register your Raymarine product ownership, please visit [www.raymarine.com](http://www.raymarine.com) and register online.

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

## Technical accuracy

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





## Chapter 2: Document and product information

### Chapter contents

- [2.1 Product documentation on page 18](#)

## 2.1 Product documentation

The following documentation is applicable to your product:

All documents are available to download in PDF format from the Raymarine website [www.raymarine.com](http://www.raymarine.com).

Description	Part number
LightHouse 3 Basic operation instructions	81369
LightHouse 3 Advanced operation instructions	81370
LightHouse™ 2 to LightHouse™ 3 upgrade procedure	81378
Axiom MFD Installation instructions	87298
Axiom Pro MFD Installation instructions	87319
Axiom XL MFD Installation instructions	87344
RMK-10 Remote Keypad Installation and operation instructions	81367
RMK-9 Remote Keypad Installation and operation instructions	81351

### Video tutorials

A range of tutorial videos is available on the Raymarine website to assist you in learning how to use your product.

<http://www.raymarine.com/multifunction-displays/lighthouse3/tips-and-tricks>

### Applicable software version

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

This handbook is applicable to MFD operating system software: LightHouse™ 3 Release 3.7.

Check the website for the latest software and user manuals:

- [www.raymarine.com/software](http://www.raymarine.com/software)
- [www.raymarine.com/manuals](http://www.raymarine.com/manuals)

### Compatible MFDs

The LightHouse™ 3 operating system is compatible with the MFDs listed below.

Software version	Compatible MFDs
LH3.7 LH3.6 LH3.5	<ul style="list-style-type: none"><li>• Axiom XL</li><li>• Axiom Pro</li><li>• Axiom</li><li>• eS Series</li><li>• gS Series</li></ul>
LH3.4 LH3.3	<ul style="list-style-type: none"><li>• Axiom Pro</li><li>• Axiom</li><li>• eS Series</li><li>• gS Series</li></ul>
LH3.2	<ul style="list-style-type: none"><li>• Axiom Pro</li><li>• Axiom</li></ul>
LH3.1	<ul style="list-style-type: none"><li>• Axiom</li></ul>
LH3.0	<ul style="list-style-type: none"><li>• Axiom</li></ul>

## New software features

The following new features have been added to Release 3.7 of the LightHouse™ 3 operating system.

- ClearCruise™ Augmented Reality features have been added to the Video app
- ClearCruise™ The Augmented Reality camera's Field of View (FOV) overlay has been added to the Chart app.
- Backup and restore (import / export) of MFD settings.
- Dashboard app custom "Digital switching" pages backup (export) function added.
- New LightHouse™ apps: Mazu and Seakeeper.

## User manuals Print Shop

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

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

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

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

### Note:

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



## Chapter 3: General information

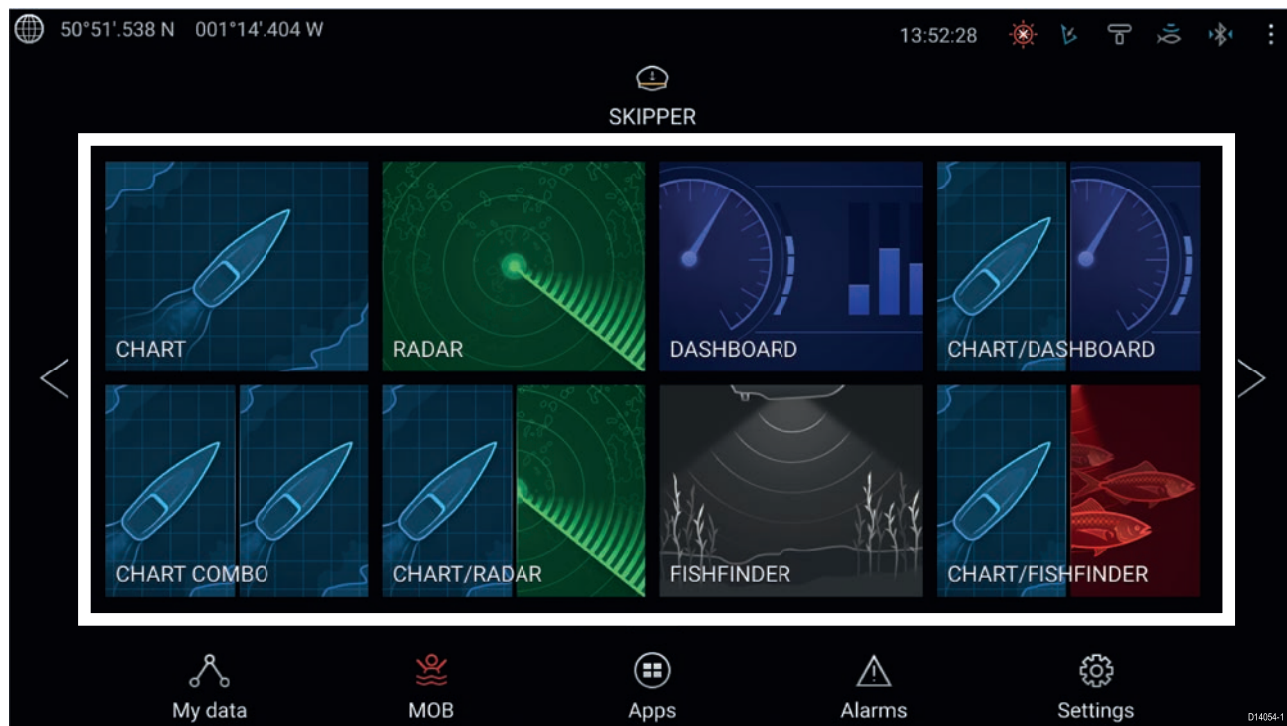
### Chapter contents

- [3.1 MFD and LightHouse apps on page 22](#)
- [3.2 Sidebar on page 23](#)
- [3.3 Data overlays on page 24](#)
- [3.4 Menus on page 25](#)
- [3.5 MFD app settings menu on page 27](#)
- [3.6 Editing the split ratio of a Splitscreen app page on page 28](#)

## 3.1 MFD and LightHouse apps

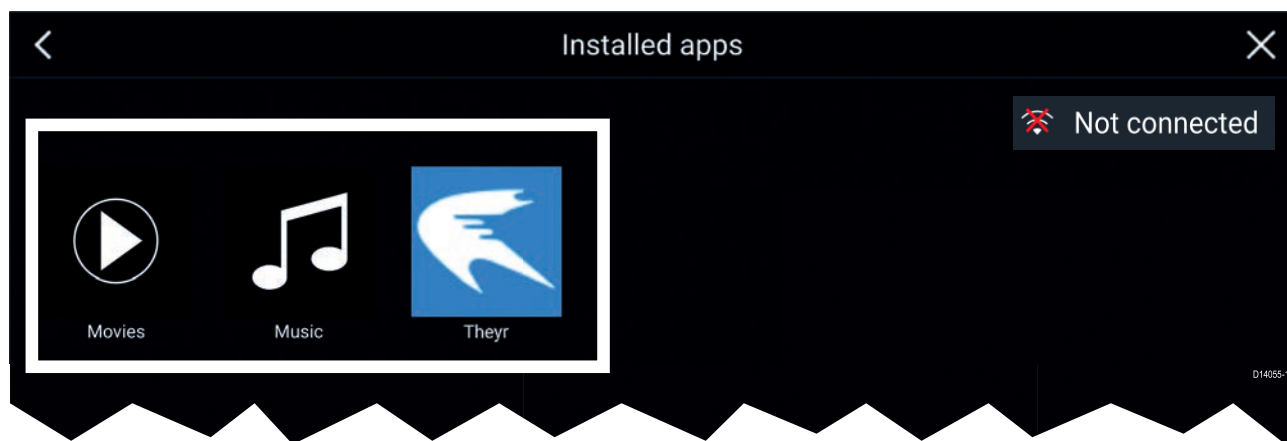
Depending on your MFD variant 2 types of app may be available on your display.

### MFD apps



MFD apps are opened from app page icons available on the Homescreen, these apps include Chart, Radar, Fishfinder etc. MFD apps are available on all MFDs running the LightHouse™ 3 operating system. Multiple apps can be displayed simultaneously by creating splitscreen app pages.

### LightHouse™ apps



LightHouse™ apps are developed entirely by 3rd parties and are approved by Raymarine. These apps are available from the LightHouse app launcher found on the Homescreen. LightHouse™ apps are only available on the Axiom™ range of MFDs.



## 3.2 Sidebar

The Sidebar is available in all apps and provides quick access to system data. By default the Sidebar is set up to display navigation data.



The Sidebar is displayed automatically in the Chart app when a Goto or follow is initiated. It can also be displayed at anytime by sliding your finger from left to right from the left edge of the screen. Swiping right to left will hide the Sidebar.

To customize the displayed data, press and hold on the Data item you want to change and select **Edit** from the pop-over options.

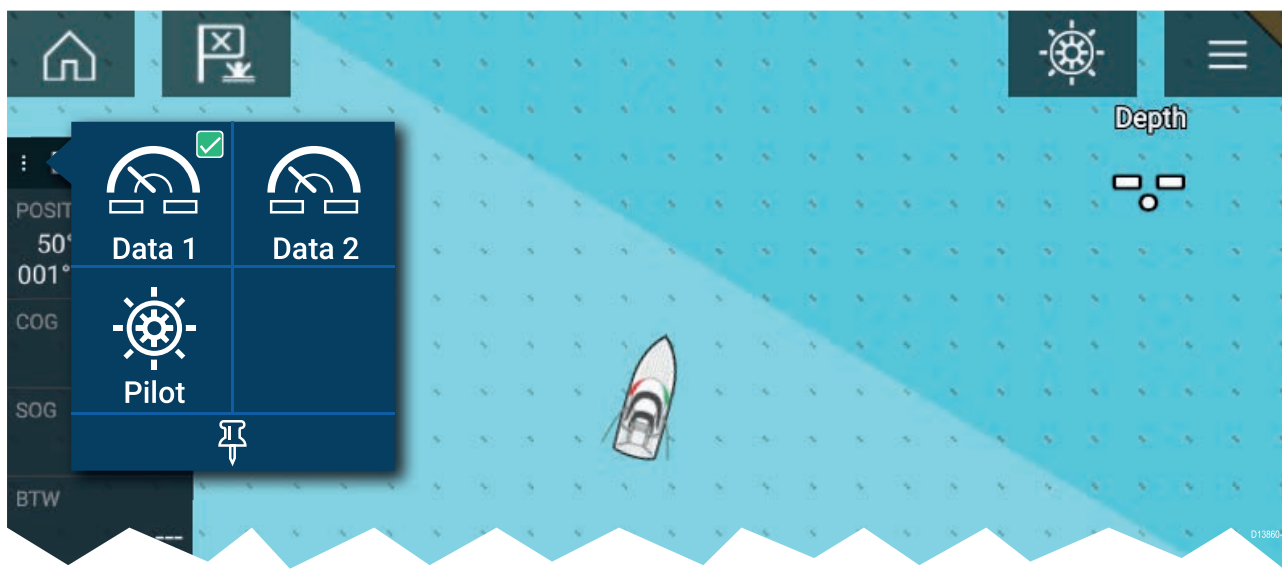
### Customizing Sidebar data

The data displayed in the Sidebar can be customized by following the steps below.

1. Open any app and from the left edge of the screen swipe from left to right.
2. Press and hold on the Data type you want to customize.
3. Select Edit from the pop-over menu.
4. Select the data type you want to be displayed.

### Switching sidebars

Different Sidebars are available.

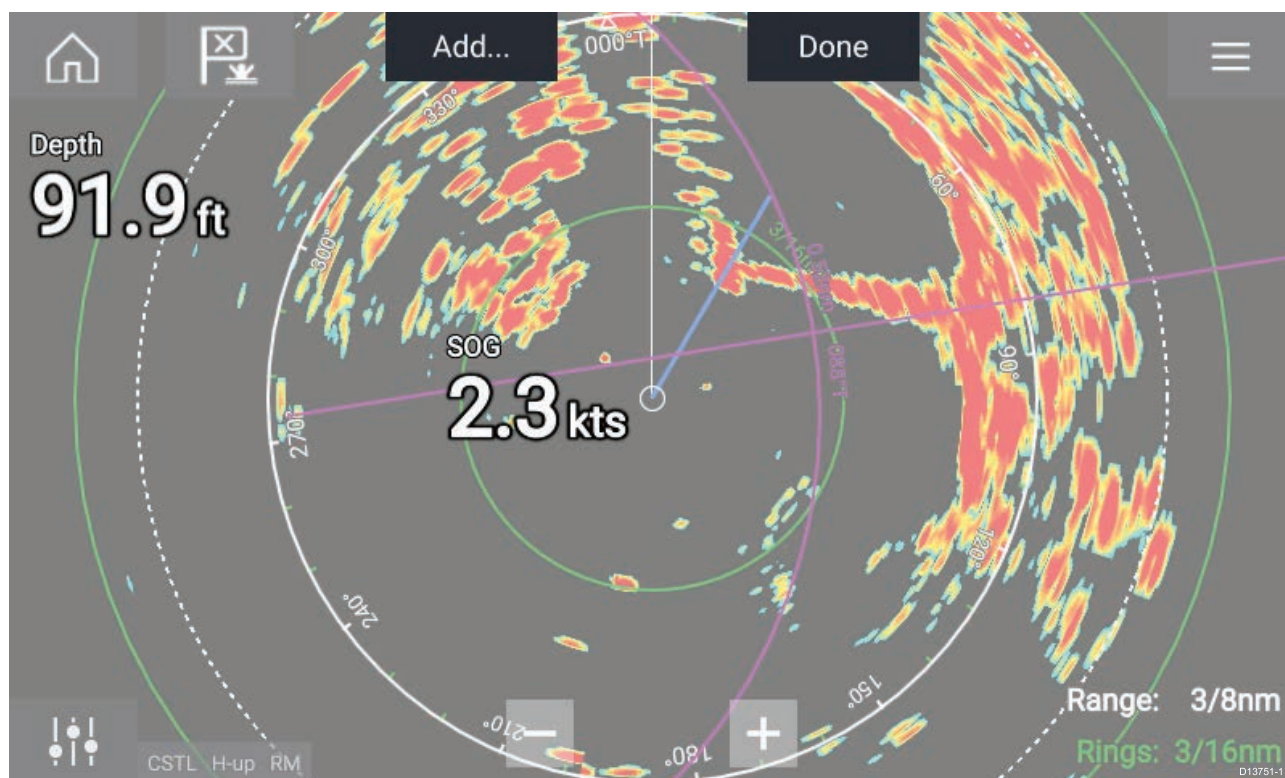


To switch Sidebars:

1. Select the **Sidebar selection** icon.
2. Select the Sidebar you want to use.
3. You can also pin the Sidebar so that it is always displayed onscreen in the app you are in.

### 3.3 Data overlays

System data can be overlaid onto the Chart, Radar, Sonar or Camera apps. Some apps have Data overlays enabled by default.



Data overlays can be placed anywhere on the app page and can be placed over any app in a Splitscreen app page.

Data overlays can be customized from: **Menu > Settings > Page Settings > Edit data overlays.**

In edit mode, drag the data overlay to the desired location. Touch and hold a Data overlay to display the pop-over menu, where you can **Edit**, **Move**, **Resize** or **Delete** the Data overlay.

Select **Add** to add another overlay or **Done** to exit edit mode.

#### Data overlay and Sidebar data items

The following data items are available to be displayed in Data overlays and Sidebars.

<b>GPS Position (one line)</b> (GNSS position)	<b>Heading</b>
<b>GPS Position (two line)</b> (GNSS position)	<b>STW</b> (Speed Through Water)
<b>Local time</b>	<b>Bearing to waypoint</b>
<b>Depth</b>	<b>Distance to waypoint</b>
<b>Water temperature</b>	<b>Supply voltage</b>
<b>Cursor position</b>	<b>Waypoint TTG</b> (Time To Go)
<b>COG</b> (Course Over Ground)	<b>Waypoint ETA</b> (Estimated Time of Arrival)
<b>SOG</b> (Speed Over ground)	

## 3.4 Menus

The different types of menu available in LightHouse™ 3 are shown below.

	<p><b>Main menu</b></p> <p>Each MFD app includes a main menu. Main menus provide access to the MFD app's features and settings via menu options and menu pages.</p> <p> The Main menu is displayed on the right side of the screen when the Menu icon is selected.</p> <p>Selecting <b>Back</b> (&lt;), <b>Close</b> (X) or selecting an area of the screen away from the menu will close the menu.</p> <p>Selecting a menu item with a right arrow (&gt;) will open a menu page or other menu options for that item.</p>
	<p><b>Menu pages</b></p> <p>Menu pages are accessed from main menu options and icons found on the Homescreen.</p> <p>Menu pages are fullscreen pages containing menu options and settings, menu pages are usually set out in tabs with each tab containing options relevant to the tab's title.</p> <p>Selecting tab titles will display the contents for that tab.</p> <p>Selecting <b>Back</b> (&lt;), <b>Close</b> will close the menu.</p>
	<p><b>Context menus</b></p> <p>Context menus are available in MFD apps. Context menus are accessed by selecting an object or location within the MFD app. Context menus provide context sensitive information and options.</p> <p>Selecting <b>more options</b> will display further contextual menu options.</p> <p>Selecting <b>Close</b> (X) or selecting an area of the screen away from the menu will close the menu.</p>
	<p><b>Pop-over menus</b></p> <p>Pop-over menus are available on the Homescreen, in MFD apps and from Menu pages. Pop-over options provide access to further menu options and settings.</p> <p>Selecting an area of the screen away from the menu will close the menu.</p>

## Controls and settings

Common menu controls and options are detailed below.

	<p><b>Toggle switch</b></p> <p>Toggle switches are used to enable (switch on) or disable (switch off) various features and settings.</p> <p>When enabled (switched on) the white circle will be moved right and the switch's background will be filled Green.</p>
	<p><b>Page down</b></p> <p>Selecting will page down the current menu or page.</p> <p>When displayed you can also swipe the page to scroll up or down.</p>

<div data-bbox="164 129 552 219">Helm 1</div>	<p><b>Setting field</b></p> <p>Setting fields show the selected value for that control. Selecting a setting field will display the available options relevant to the options available. Depending on available options this could be in the following formats:</p> <ul style="list-style-type: none"> <li>• Pop-over options (selection list)</li> <li>• Numeric value control</li> <li>• Onscreen keyboard</li> <li>• File browser</li> <li>• Selection list (full page)</li> </ul>
<div data-bbox="164 544 552 633">Settings</div>	<p><b>Setting button</b></p> <p>Setting buttons are available on Menu pages and Notification / Alarm messages to access further settings or confirm setting changes or changed MFD state.</p>

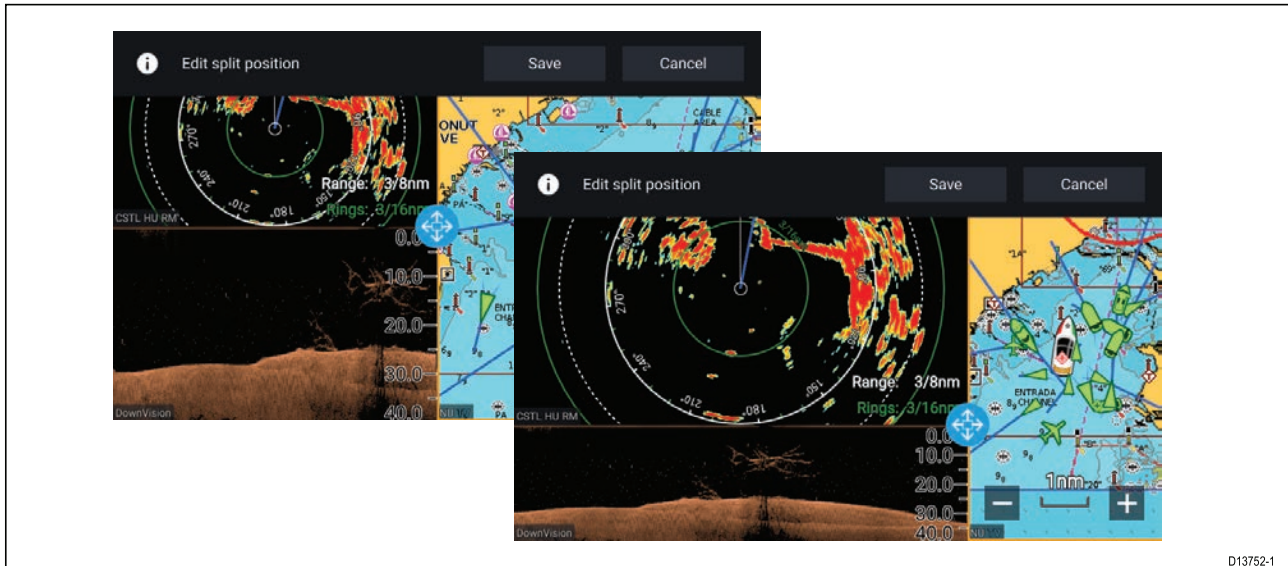
## 3.5 MFD app settings menu

Each MFD app includes a settings menu that provides access to the app's settings and features.



The settings menu in each MFD app is signified by the Settings icon, found in the main app menu.

### 3.6 Editing the split ratio of a Splitscreen app page



With a Splitscreen app page displayed:

1. Select **Edit split ratio** from the **Page settings** tab: **Menu > Settings > Page settings > Edit split ratio**.
2. Drag the Resize icon to create the desired split ratio.
3. Select **Save**.



## Chapter 4: Set up

### Chapter contents

- [4.1 MFD physical buttons on page 30](#)
- [4.2 Axiom and Axiom XL on page 33](#)
- [4.3 Axiom Pro, eS Series and gS Series on page 34](#)
- [4.4 Switching on and off at the breaker on page 35](#)
- [4.5 Getting started on page 36](#)
- [4.6 Shortcuts on page 41](#)
- [4.7 Memory card compatibility on page 44](#)
- [4.8 Software updates on page 47](#)
- [4.9 Device pairing on page 48](#)





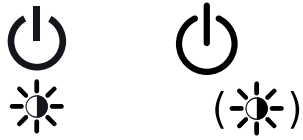
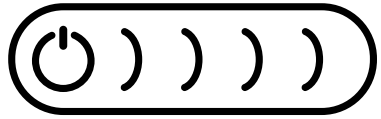
## 4.1 MFD physical buttons


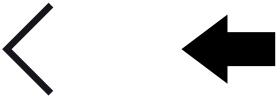


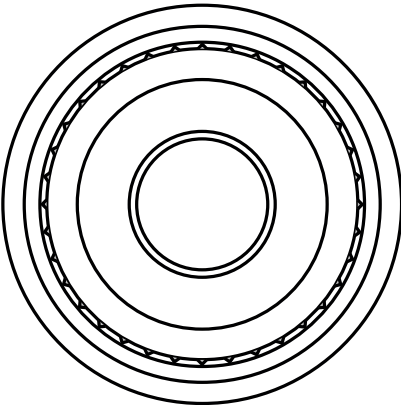
The table below shows the physical buttons that are available on LightHouse™ 3 compatible MFDs and remote keypads, along with their function.

**Note:**

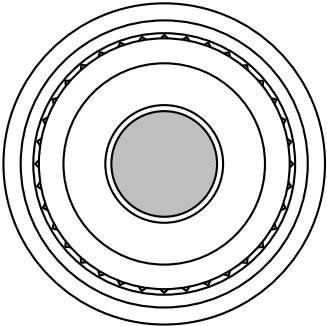
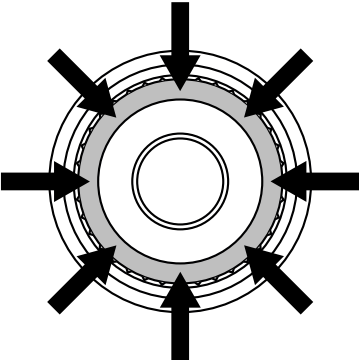
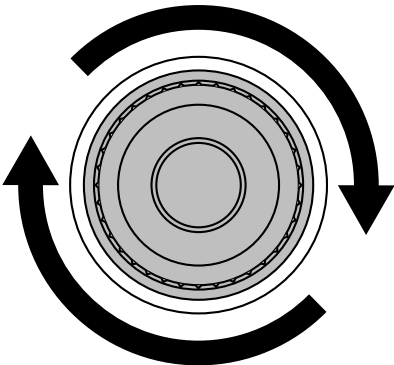
- Where 2 button symbols are shown, the symbols on the left represent Axiom™ Pro variant MFDs or RMK-10 keypad, and the symbols on the right represent an eS Series MFD or RMK-9 keypad.
- Axiom MFDs and gS Series MFDs only have a single power button.

### Physical MFD buttons

Control	Button	Function
	<b>Home</b>	Press to display the Homescreen.
	<b>Menu</b>	Press to open or close menus.
	<sup>(1)</sup> <b>User Programmable Button (UPB)</b>	You can select which function this button controls. Refer to <a href="#">Assigning a function to the User Programmable Button (UPB)</a> for more information.
	<b>Waypoint / MOB</b>	Press momentarily to place a waypoint at your vessel's location. A long press activates the Man overboard (MOB) alarm.
	<b>Power</b>	Press to power on the MFD. When the MFD is powered on, pressing this button displays the Shortcuts page.
	<sup>(2)</sup> <b>Power swipe</b>	Swipe to power on the MFD. When the MFD is powered on, swipe again to display the Shortcuts page.

Control	Button	Function
<b>STBY</b> <b>Standby</b> (Auto)      (Auto)	<b>Pilot</b>	Press momentarily to display or hide the Pilot sidebar. A long press engages the autopilot in locked heading mode, or disengages an active autopilot.
	<b>Switch</b>	Press momentarily to switch the active pane in a splitscreen page. A long press expands the selected pane.
	<b>Back</b>	Press to return to the previous menu or dialog.
	<b>Range In</b>	Press to Range or Zoom In.
	<b>Range Out</b>	Press to Range or Zoom Out.
	<b>Uni-controller</b>	The Uni-controller consists of a center <b>OK</b> button, <b>Directional</b> controls and a <b>Rotary</b> knob.

## MFD Uni-controller

Control	Control	Function
	<b>Ok</b>	Push the button to confirm a selection.
	<b>Directional</b>	Use the 8-way directional controls to reposition the cursor onscreen.
	<b>Rotary</b>	Turn clockwise to Range or Zoom In and counterclockwise to Range or Zoom out.

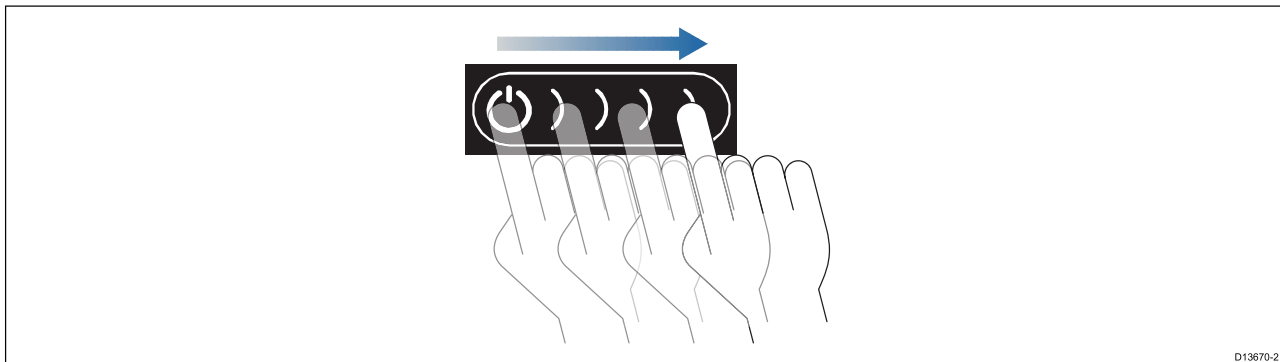
### Note:

- <sup>(1)</sup> The UPB is only available on Axiom™ Pro MFDs.
- <sup>(2)</sup> The Power swipe is only available on Axiom™ MFDs.

## 4.2 Axiom and Axiom XL

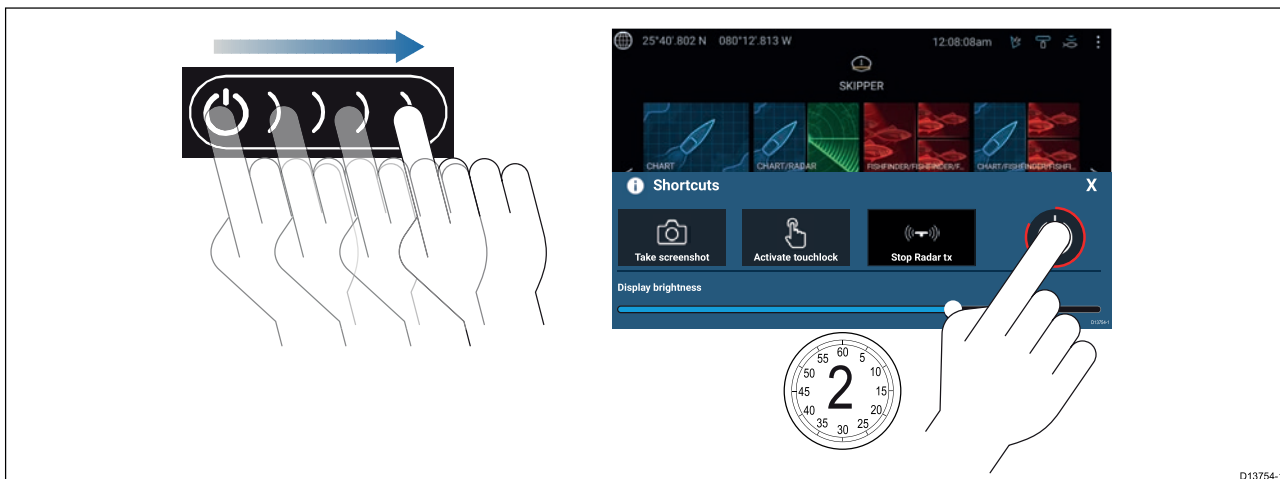
### Powering on the display

When power is available to the MFD but the MFD is switched off, the Power symbol will be illuminated. To power on the display:



1. Swipe your finger from left to right across the **Power** button swipe area.  
The MFD will power up.

### Powering off the display



1. Swipe your finger from left to right across the **Power** button swipe area.  
The Shortcuts menu is displayed.
2. Press and hold the **Power symbol** until the screen switches off.

#### Note:

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

### Switching on and off at the breaker

If you wish to ensure that the MFD is not consuming any power then it must be switched off at the breaker or have the power cable unplugged.

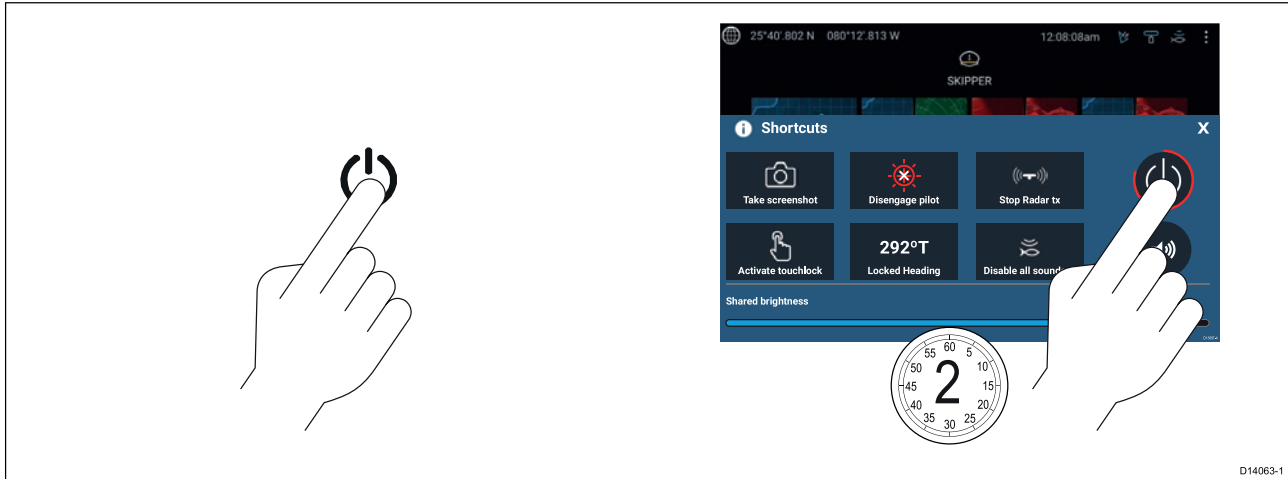
When the breaker is switched back on, or the cable is reconnected, the MFD will resume in the same power state that it was in when it was switched off.

## 4.3 Axiom Pro, eS Series and gS Series

### Powering on the display

1. Press the power button to power on the display.

### Powering off the display



1. Press the **Power** button.
2. From the Shortcuts page press and hold the power icon for approximately 2 seconds.

Alternatively you can press and hold the **Power** button for approximately 6 seconds to power off your display.

#### Note:

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

## **4.4 Switching on and off at the breaker**

If you wish to ensure that the MFD is not consuming any power then it must be switched off at the breaker or have the power cable unplugged.

When the breaker is switched back on, or the cable is reconnected, the MFD will resume in the same power state that it was in when it was switched off.

## 4.5 Getting started

### First power up

When you power up your new Multifunction Display (MFD) for the first time a number of actions are required.

The list below shows the actions that should be performed on your new MFD:

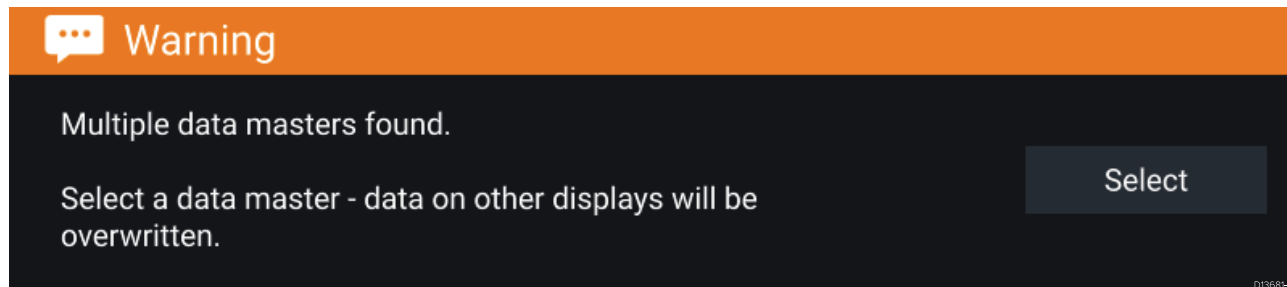
1. **Power** on the display.
2. Select your **Data master** (only required on networks with more than 1 MFD).
3. Complete the **Startup wizard** (the wizard will not be shown if you are connecting to an existing system that has already been set up).
4. Read and agree to the **Limitations on Use** disclaimer.
5. Select/check your preferred **Data sources**, if required.
6. Perform **Engine identification**, if required.
7. Select/check **Transducer settings**, if required

### First power up Data master selection

Networks containing more than 1 MFD must have a designated Data master. The Data master is the primary MFD in the network and should be the MFD that is connected to the SeaTalkng<sup>®</sup> / NMEA 2000 CAN bus network and any other devices and sources of data in your system. The Data master bridges the data over the SeaTalkhs<sup>™</sup> network to any compatible networked 'repeater' MFDs.

By default your MFD will be set as a Data master. If you are connecting to a network that already includes MFDs then on first power up you will be requested to confirm your Data master.

The "Multiple Data masters found" warning will be displayed whenever a new MFD is added to your network.



You can change your Data master at anytime by selecting **Assign as Data master** against a MFD listed in the Network tab of the Settings menu: **Homescreen > Settings > Network**.

### Startup wizard

If the MFD is being installed as a stand alone installation or as part of a new system, then the first time the MFD is powered up the Startup wizard will be displayed. The Startup wizard will help you configure important settings on your MFD.

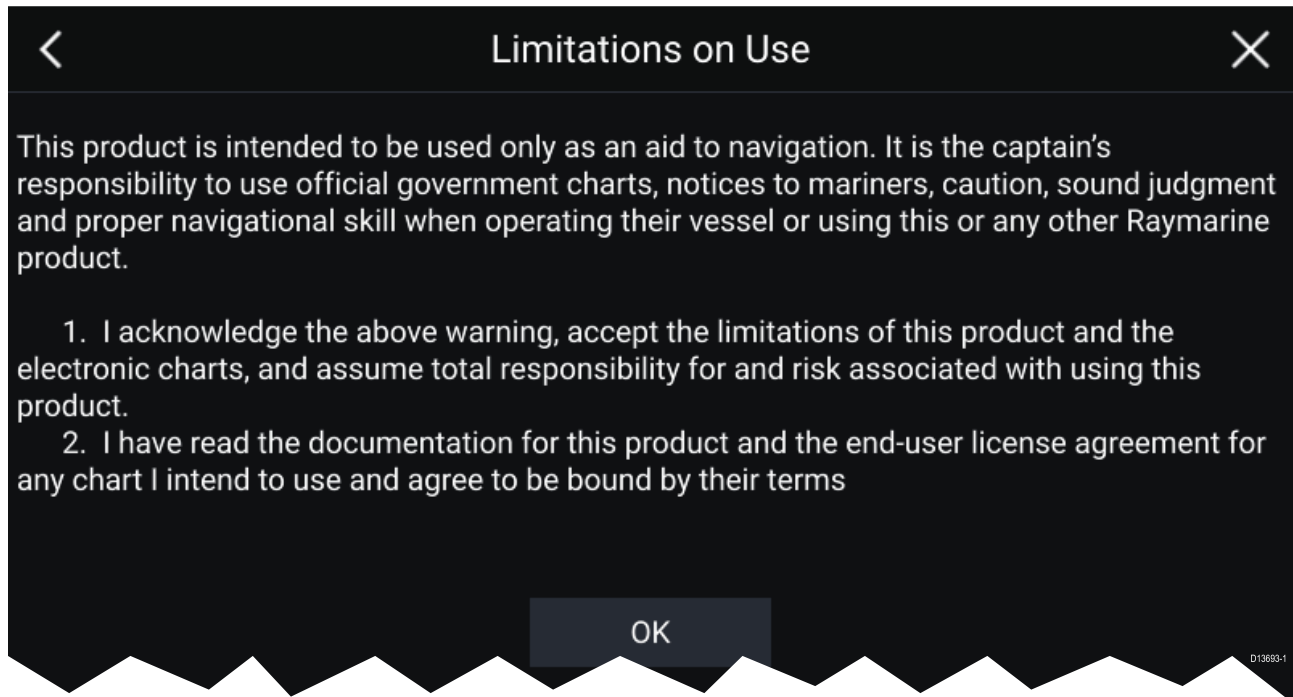
Follow the onscreen instructions and configure the relevant settings.

The Startup wizard will also be displayed after a **Factory reset** is performed.



## First power up Limitation on Use acknowledgement

After you have completed the Startup wizard the Limitation on Use (LoU) disclaimer is displayed.



You must read and agree to the terms in order to use your MFD.

Selecting **OK** means you have accepted the terms of use.

## Multiple data sources (MDS)

Multiple data sources is a Raymarine scheme for managing multiple sources of identical data types on any single network. An example is multiple sources of GPS data.

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

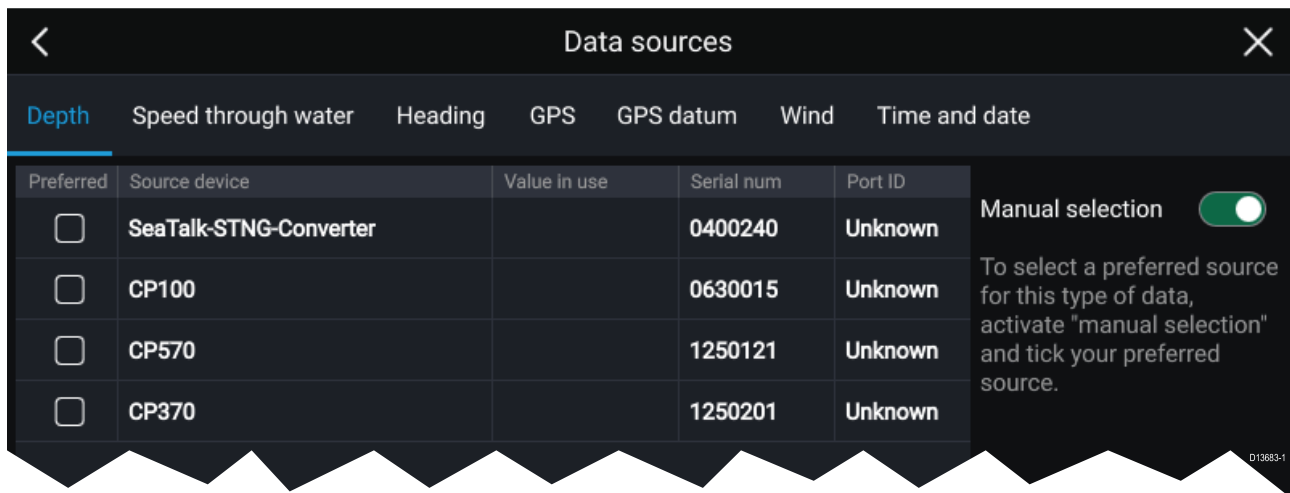
If MDS-compliant software is not available for the product and you do NOT want to use the system's preferred data source, you must remove any non-compliant products from the system. You should then be able to select your preferred data source.

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

## Data sources menu

When a system includes multiple sources of a data type, such as depth data, the system will choose the most appropriate source for the data. If you prefer, you can manually select your own data source.

The **Data sources** menu can be accessed on your Data master MFD, from the **Settings** menu: **Homescreen > Settings > Network > Data sources**.



Each tab enables you to view and select your preferred data source. The currently active data source will display its current value in use. Data source selection can be manual or set to automatic:

- **Auto** — your MFD will automatically select a device.
- **Manual** — you can manually select your preferred device.

Networked MFDs will automatically be updated to use the Data sources selected on your Data master MFD.

## Identifying engines

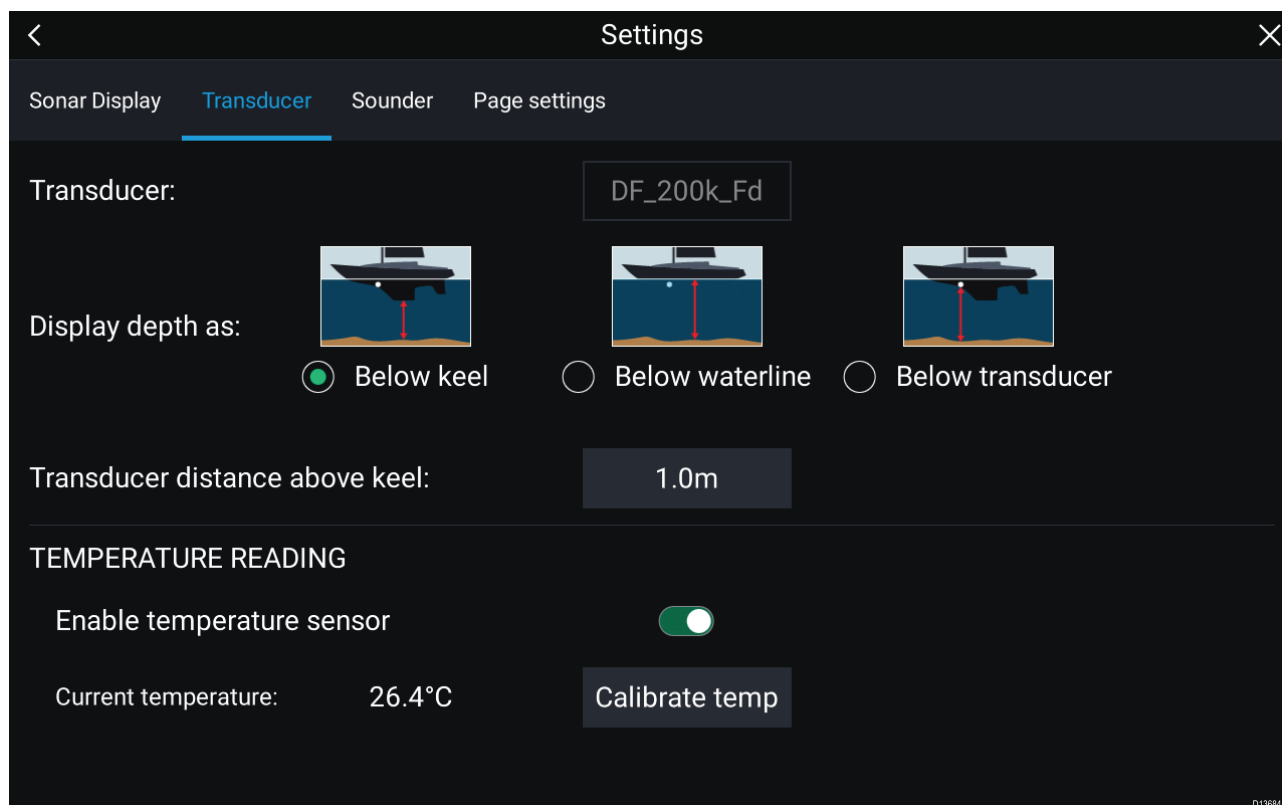
Engine data can be displayed on your MFD if your engines are transmitting the relevant supported data on to the MFD network. If your system has mislabelled your engines then you can correct this using the Engine identification wizard.

The Engine identification wizard can be accessed from the Boat details tab: **Homescreen > Settings > Boat details > Identify engines.**

1. Ensure the correct number of engines is selected in the **Num of Engines:** box.
2. Select **Identify engines.**
3. Follow the onscreen prompts to complete the engine identification wizard.

## Configuring Transducer settings

For systems set up with Sonar, you should configure your transducer settings.

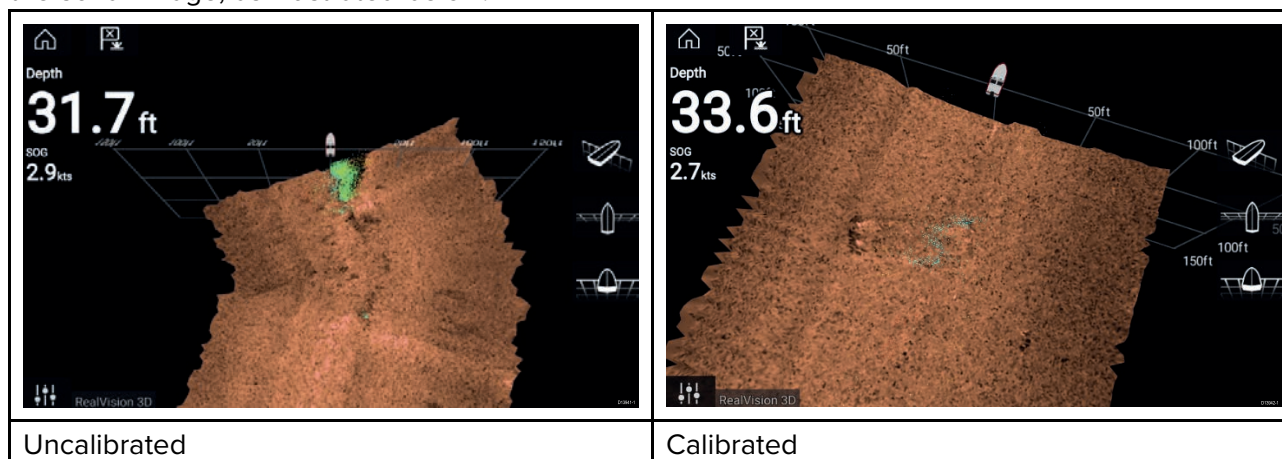


1. Select **Transducer** from the Sonar app's **Settings** menu: **Menu > Settings > Transducer**
2. Select how you want your depth to appear:
  - i. Below transducer (default) — No offset required
  - ii. Below keel — Enter the distance between the transducer face and the bottom of the Keel.
  - iii. Below waterline — Enter the distance between the bottom of your Keel and the waterline.
3. If your transducer includes a temperature sensor then you can also configure temperature settings as follows:
  - i. Enable or disable temperature readings as required.
  - ii. If enabled, check the temperature reading against the actual water temperature.
  - iii. If the current reading requires adjustment, select **Calibrate temp** and enter the difference between your 2 readings.

## RealVision™ 3D AHRS calibration

RealVision™ 3D transducers include a built-in AHRS (Attitude and Heading Reference Sensor), which measures the motion of your vessel to assist in the rendering of sonar images. After installation all RealVision™ 3D transducers require calibration.

An uncalibrated transducer can produce an offset to the front edge of the render of the bottom in the sonar image, as illustrated below.



Calibration is an automatic process and starts after your vessel has turned approximately 100° at a speed of between 3 –15 knots. Calibration requires no user input, however at least a 270° turn is required before the calibration process can determine the local deviation and apply a relevant offset.

The time it takes to complete the calibration process will vary according to the characteristics of the vessel, the installation environment of the transducer, and the levels of magnetic interference at the time of conducting the process. Sources of significant magnetic interference may increase the time required to complete the calibration process. Certain areas with substantial magnetic deviation may require extra circles or “figure of 8” manoeuvres to be performed. Examples of such sources of magnetic interference include:

- Marine pontoons
- Metal-hulled vessels
- Underwater cables

**Note:**

The Calibration process will require repeating after a **Sonar reset** or **MFD Factory reset**.

## Assigning a function to the User Programmable Button (UPB)

You can assign a function to the User Programmable Button on an Axiom™ Pro MFD.

1. Press and hold the **User Programmable Button** on the MFD.
2. Select the required function from the list.

You can also assign a function to the **User Programmable Button** from the Settings menu:  
**Homescreen > Settings > This Display > User Configurable Key.**

## Performing a settings or factory reset

Performing a **Factory reset** will erase ALL user data and reset the MFD's settings to Factory default values. Performing a **Settings reset** will restore your MFD's settings to factory defaults, whilst retaining user data.

1. Select **Settings reset**, from the **This display** tab: **Homescreen > Settings > This display > Settings reset** to perform a settings reset.
2. Select **Factory reset**, from the **This display** tab: **Homescreen > Settings > This display > Factory reset** to perform a factory reset.

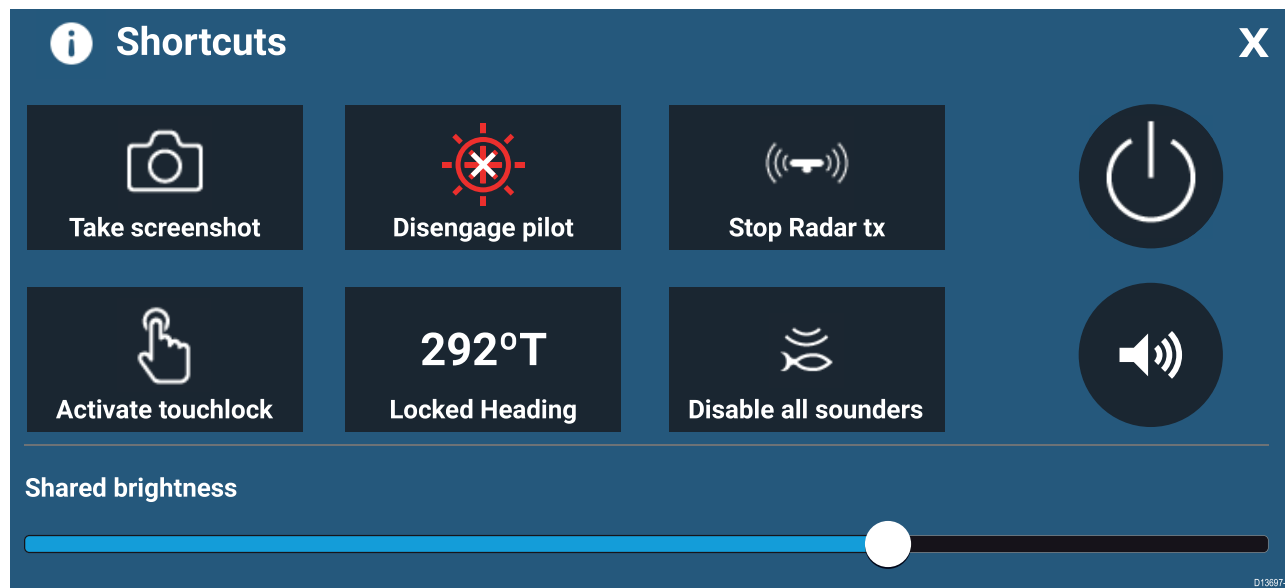
## Importing user data

You can import user data (i.e.: Waypoints, Routes and Tracks) to your MFD.

1. Insert the MicroSD card that contains your user data files into a card reader slot on your MFD or connected card reader.
2. Select **Import from card** from the Import/export page: (**Homescreen > My data > Import/export > Import from card**).
3. Select the relevant SD card slot from the file browser and then navigate to your User data file (.gpx).
4. Select the relevant GPX file.  
Your user data has now been imported.
5. Select **OK**.

## 4.6 Shortcuts

The Shortcuts menu can be accessed by swiping left to right across the **Power** button swipe area on an Axiom™ or Axiom™ XL MFD, or by pressing the **Power** button on an Axiom™ Pro , eS Series or gS Series MFD.



The following shortcuts are available:

- Take Screenshot
- Activate Touchlock
- Engage / Disengage autopilot
- Adjust Locked heading
- Stop Radar transmitting
- Disable all Sounders
- Power off
- Adjust Bluetooth speaker volume
- Adjust Brightness

### Taking a screenshot

You can take a screenshot and save the image to external memory.

1. Swipe your finger from left to right across the **Power** button swipe area (applies only to Axiom™ or Axiom™ XL MFDs). Alternatively, press the **Power** button momentarily.

The Shortcuts menu is displayed.

2. Select **Take screenshot**.

The screenshot will be saved in .png format to the **Screenshot file** location. The Screenshot file location can be selected from the **This Display** tab located in the **Settings** menu: **Homescreen > Settings > This Display > Screenshot file:**.

#### Note:

Due to protected content restrictions you cannot take a screenshot when the video input on an Axiom™ Pro or the Video 2 or HDMI input on an Axiom™ XL MFD is displayed onscreen.

### Activating touchlock

In rough weather conditions precipitation may lead to erroneous touches being detected by the touchscreen. In these conditions you can use touchlock to prevent this.

1. Select **Activate touchlock** from the **Shortcuts** menu.

*With touchlock activated the touchscreen will be disabled. To re-enable the touchscreen, swipe from left to right across the **Power** button swipe area.*

## Radar standby

You can place a transmitting Radar in Standby from the Shortcuts menu.

1. Select **Stop Radar tx** from the **Shortcuts** menu.

## Autopilot shortcuts

When Autopilot control is enabled, the Shortcuts page provides an Autopilot icon which can be used to engage and disengage your autopilot. When the autopilot is engaged in Locked heading mode you can also adjust the locked heading from the Shortcuts page.

## Adjusting brightness

LCD brightness can be adjusted from the Shortcuts page.

With the Shortcuts page displayed (accessible via the Power button):

1. Move the **Display brightness** control along the slider bar to adjust the brightness.

*With the Shortcuts menu displayed you can also use the **Power** button or the **Power** button swipe area to increase the brightness level in increments, by repeating the left to right swipe. Please note, the swipe area is only available on Axiom™ or Axiom™ XL displays.*

## Disabling all sounders

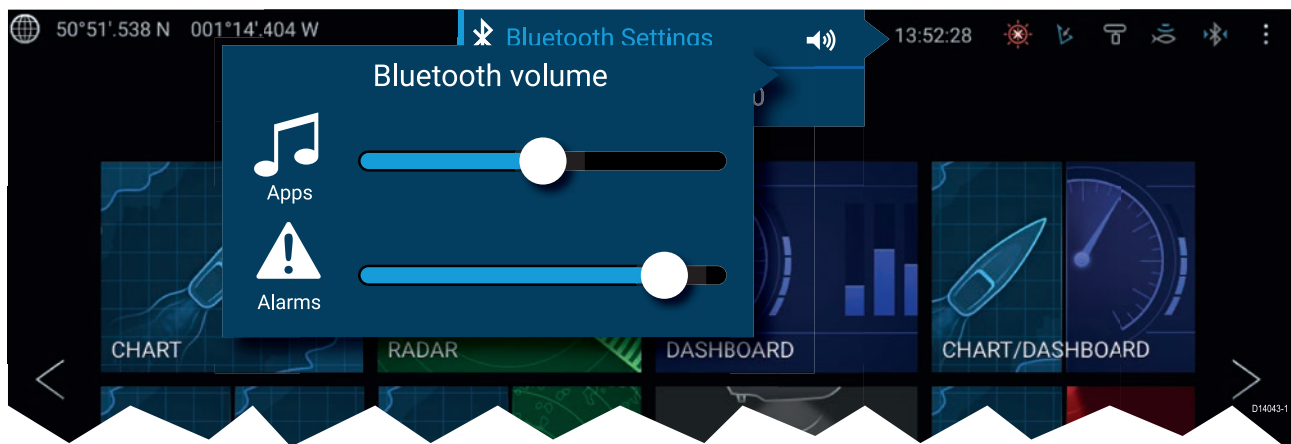
In systems with multiple sonar modules, you can stop all sonar modules from pinging.

1. Select **Disable all sounders** from the shortcuts menu.

## Bluetooth volume control

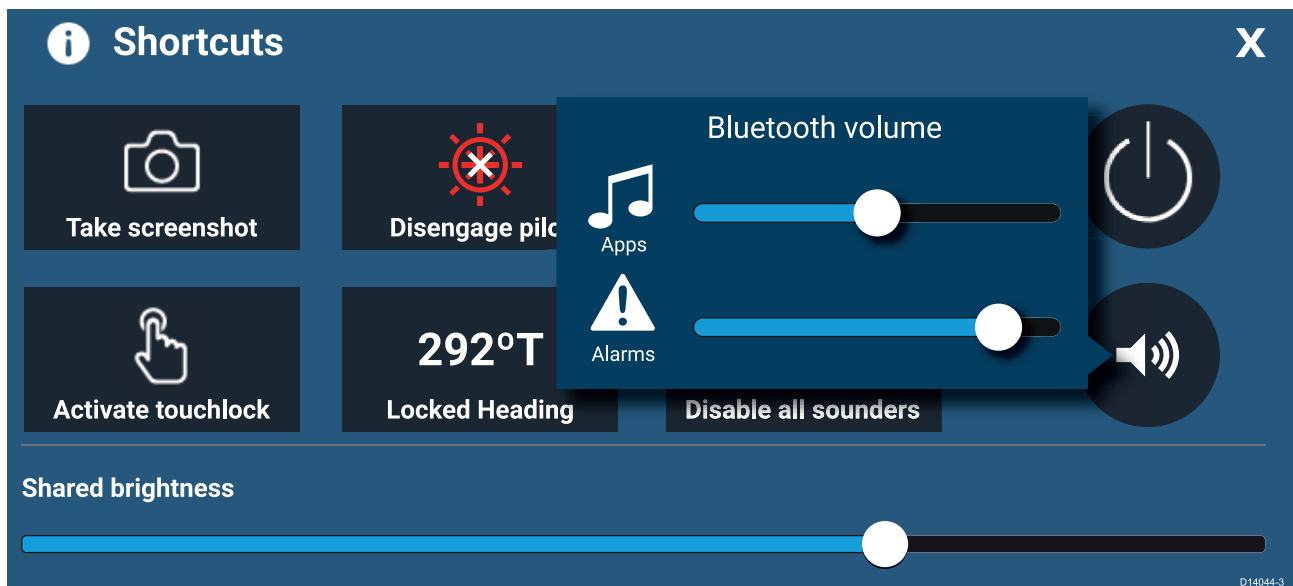
When your MFD is connected to a Bluetooth speaker, controls will be available to adjust speaker volume.

### Homescreen



From the Homescreen select the Status area and then select the Speaker symbol to display the Bluetooth volume control for LightHouse™ app and MFD alarms.

## Shortcuts page



Press or swipe the **Power** button to display the Shortcuts page and then select the speaker symbol to display the Bluetooth volume control for LightHouse™ apps and MFD alarms.

## 4.7 Memory card compatibility

MicroSD memory cards can be used to backup / archive data (e.g. Waypoints, Routes and Tracks). Once data is backed up to a memory card, old data can be deleted from the system. The archived data can be retrieved at any time. It is recommended that your data is backed up to a memory card on a regular basis.

### Compatible cards

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

Type	Size	Native card format	MFD supported Format
MicroSDSC (Micro Secure Digital Standard Capacity)	Up to 4GB	FAT12, FAT16 or FAT16B	NTFS, FAT32
MicroSDHC (Micro Secure Digital High Capacity)	4GB to 32GB	FAT32	NTFS, FAT32
MicroSDXC (Micro Secure Digital eXtended Capacity)	32GB to 2TB	exFAT	NTFS, FAT32

- **Speed class rating** — For best performance it is recommended that you use Class 10 or UHS (Ultra High Speed) class memory cards, or better.
- **Use branded memory cards** — When archiving data it is recommended that you use good quality branded memory cards.

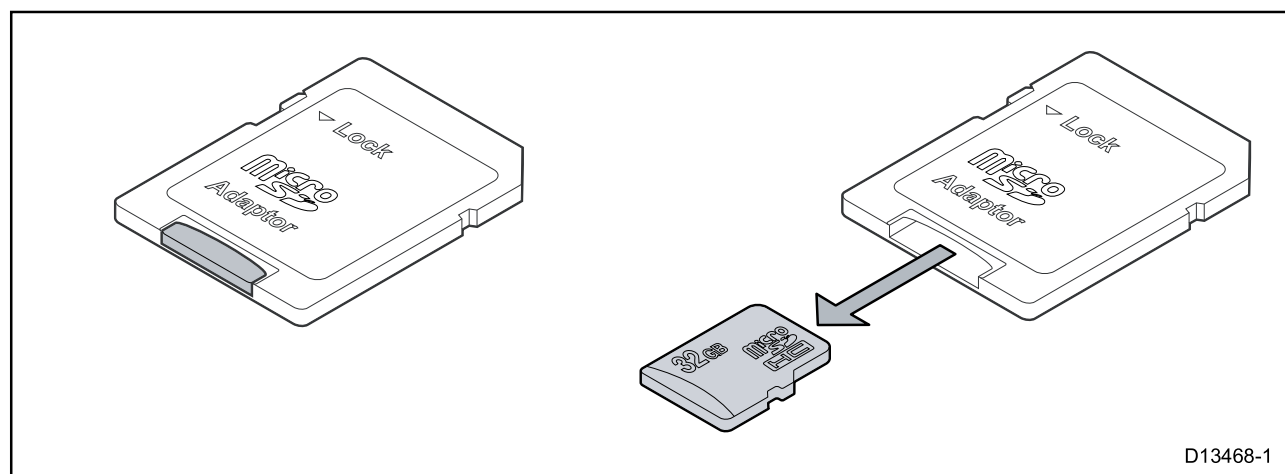
### Caution: Care of chart and memory cards

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

- Ensure that chart and memory cards are fitted the correct way around. DO NOT try to force a card into position.
- DO NOT use a metallic instrument such as a screwdriver or pliers to insert or remove a chart or memory card.

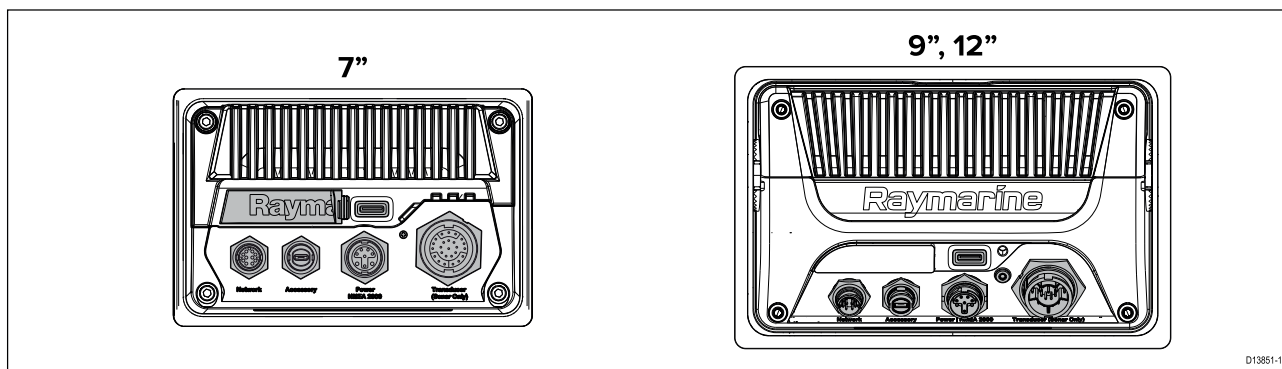
### Removing MicroSD card from its adaptor

MicroSD memory and cartography chart cards are usually supplied inserted into an SD card adaptor. The card will need to be removed from the adaptor before inserting into your display.





## Inserting a MicroSD card — Axiom variants

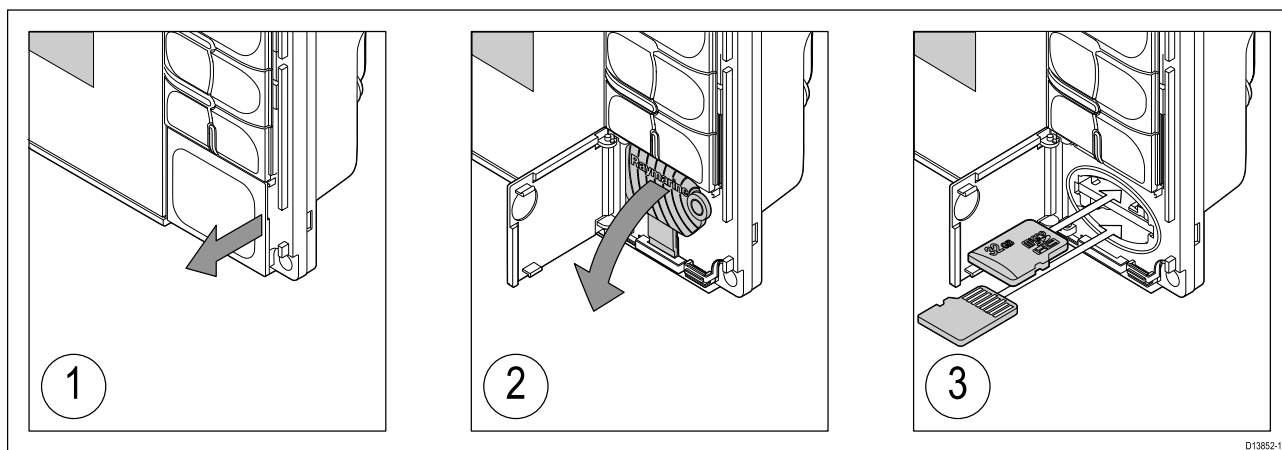


1. Pull back the microSD card reader cover as shown above.
2. Insert your microSD card with the contacts facing down.
3. Close the cover and ensure it is seated correctly.

### Removing a MicroSD card

1. Select **Eject SD card** from the **Import/export** page: **Homescreen > My data > Import/export > Eject SD card.**
2. Remove the MicroSD card from the Rear of the MFD.
3. Ensure you close the card reader's cover.

## Inserting a MicroSD card — Axiom Pro variants



1. Open the card reader door.
2. Pull down the card reader cover.
3. Insert the card into a card slot and push until it clicks into place.

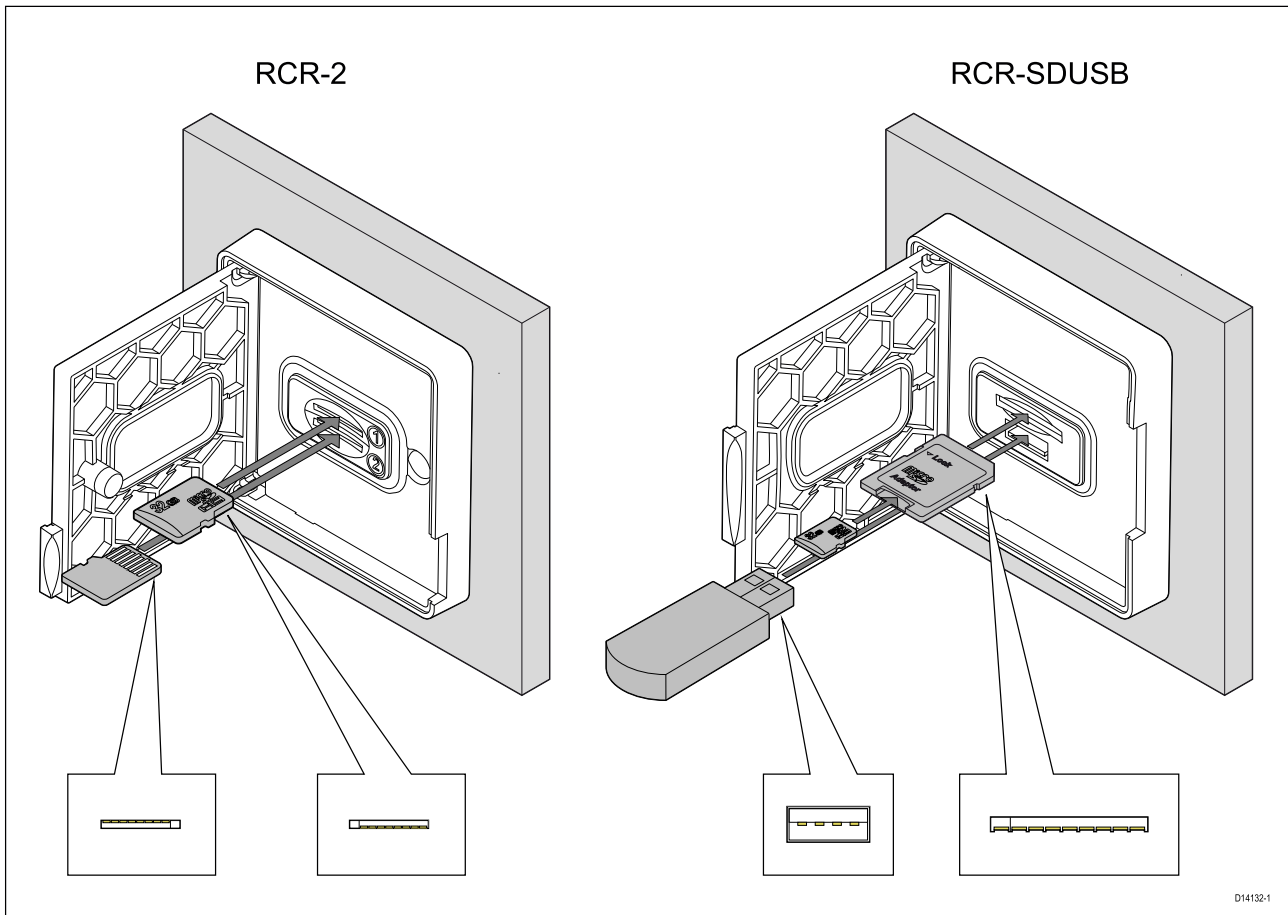
**Note:** When inserting a card into the lower card slot the memory card must be orientated with the contacts pointing upwards.

### Removing a MicroSD card - Axiom Pro

With the card reader door open and cover pulled down:

1. Push the card in until it clicks.
2. Pull the card free from the card slot.

## Inserting external storage devices - RCR



1. Open the card reader door.
2. Insert the storage device into a card slot and push until it clicks into place.
  - RCR-SDUSB slot 1 — With the contacts facing down, insert an SD card (or an SD card adaptor containing a MicroSD card) into the upper slot, labelled (1), and push until it clicks into place.
  - RCR-SDUSB slot 2 — With the contacts facing down, insert a USB drive directly into the lower slot, labelled (2).
  - RCR-2 slot 1 — With the contacts facing down, insert a MicroSD card into the upper slot and push until it clicks into place.
  - RCR-2 slot 2 — With the contacts facing up, insert a MicroSD card into the lower slot and push until it clicks into place.

### Removing external storage (SD and MicroSD)

With the card reader door open:

1. Push the card in until it clicks.
2. Pull the card free from the card slot.

### Removing external storage USB drive

With the card reader door open and cover pulled down:

1. Pull the drive free from the card slot.

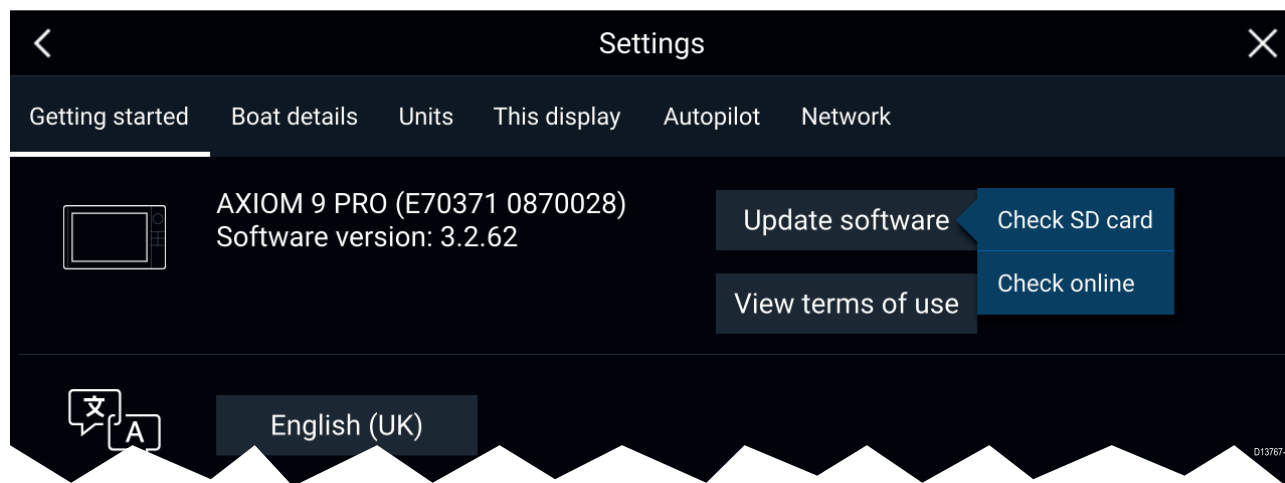
### **Caution: Ensure card reader cover or door is securely closed**

To prevent water ingress and consequent damage to the product, ensure that the card reader door or cover is firmly closed.

## 4.8 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.

[www.raymarine.com/software](http://www.raymarine.com/software)



### Note:

- It is recommended that you always backup your User data before performing a software update.
- To update compatible SeaTalkng® products you must use the designated Datamaster MFD that is physically connected to the SeaTalkng® backbone.
- In order to perform a software update any connected autopilot or Radar must be switched to Standby.
- The MFD's "Check online" feature is only available when the MFD has an Internet connection.
- To check which products are compatible with the MFD software update process, please refer to the website: [www.raymarine.com/software](http://www.raymarine.com/software).

## Updating software using a memory card

Compatible SeaTalkhs® and SeaTalkng® products can be updated by following the steps below.

1. Check the software version of your product.

*Refer to the documentation supplied with your product for information on checking software version.*

2. Check the latest available software on the Raymarine website: (**www.raymarine.com > Support > Software Updates**).
3. Download the software package.
4. Copy the files to MicroSD card.
5. With your MFD powered on, insert the MicroSD card into the card reader slot.  
Your MFD will automatically detect software files.
6. Follow the onscreen instructions to update your product software.
7. Alternatively you can select **Check SD card** from the **Update software** pop-over options on the Getting started tab: (**Homescreen > Settings > Getting started > Update Software**).

## Updating software via the internet

Compatible SeaTalkhs® and SeaTalkng® products can be updated by following the steps below.

1. Select **Update software** from the Getting started tab: (**Homescreen > Settings > Getting started**).
2. Select **Check online** from the pop-over menu.
3. To set up a Wi-Fi connection select **Wi-Fi settings** and connect to the required Wi-Fi access point/hotspot.
4. Select **Start** and then follow any onscreen instructions.

## 4.9 Device pairing

### Pairing a RMK remote keypad

You can control your MFD with an RMK keypad.

From the **This display** tab of the **Settings** menu: **Homescreen > Settings > This display** .

1. Select **Pair keypad**.
2. Follow the onscreen instructions to pair your keypad.

*Ensure you select the correct orientation for the keypad during the pairing process.*

3. Repeat steps 1 and 2 on each MFD you want to control from your keypad.

**Note:**

Please refer to the controls section of your keypad's documentation for details on controlling MFDs using a keypad.

### Clear pairing (RMK)

1. Select **Clear pairings** to unpair ALL RMK keypads currently paired with the MFD.

### Pairing with a Quantum Radar scanner

You can connect a Quantum Radar scanner to your MFD using Wi-Fi.

Pre-requisites:

- Ensure you have connected your Quantum Radar scanner in accordance with the instructions provided with the Radar scanner.
- Ensure you know your Radar scanner's SSID and passcode.

1. Select **Pair with Quantum** from the **This display** tab: **Homescreen > Settings > This display > Pair with Quantum**.
2. Follow the onscreen instructions to pair with your Quantum Radar.

*The pairing process may take several minutes to complete.*

*For more information on the Quantum Radar pairing process (including troubleshooting information), refer to the Quantum Radar Installation instructions documents.*

### Pairing a Bluetooth speaker

Before attempting to pair with a Bluetooth speaker, ensure that the speaker is switched on and discoverable.

With your MFD's Bluetooth enabled:

1. From the Bluetooth settings page, select the relevant device from the **Available devices** list.
2. If requested, confirm the bluetooth pairing code.

If pairing is successful the speaker will appear in the **Paired devices** list and display the **Connected** message.

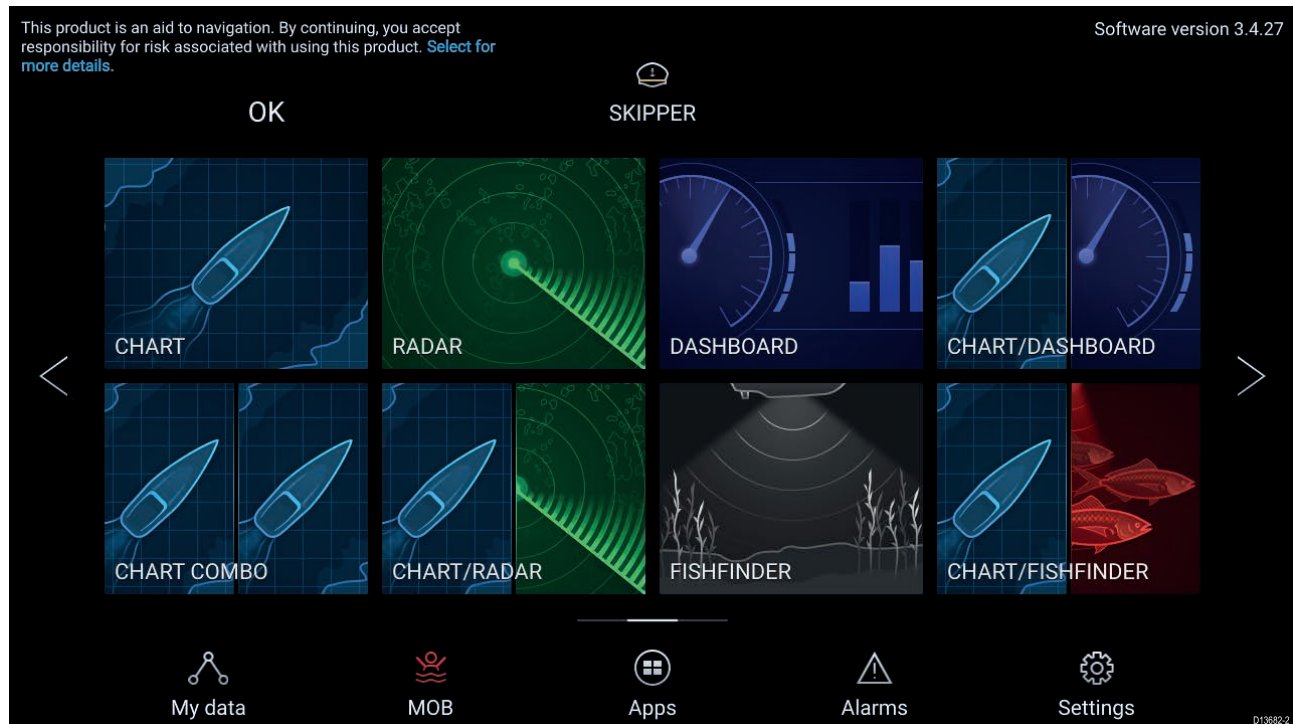
## Chapter 5: Homescreen

### Chapter contents

- 5.1 Accepting the Limitations on Use on page 50
- 5.2 Homescreen overview on page 51
- 5.3 MFD Apps on page 52
- 5.4 Creating / Customizing an App page on page 54
- 5.5 User profiles on page 55
- 5.6 Status area on page 57
- 5.7 Satellite navigation / positioning on page 59
- 5.8 My data on page 61
- 5.9 Alarms on page 67
- 5.10 Man Overboard (MOB) on page 73
- 5.11 Settings on page 74
- 5.12 Connecting to a wireless display on page 81

## 5.1 Accepting the Limitations on Use

After your MFD has powered up the Homescreen is displayed.

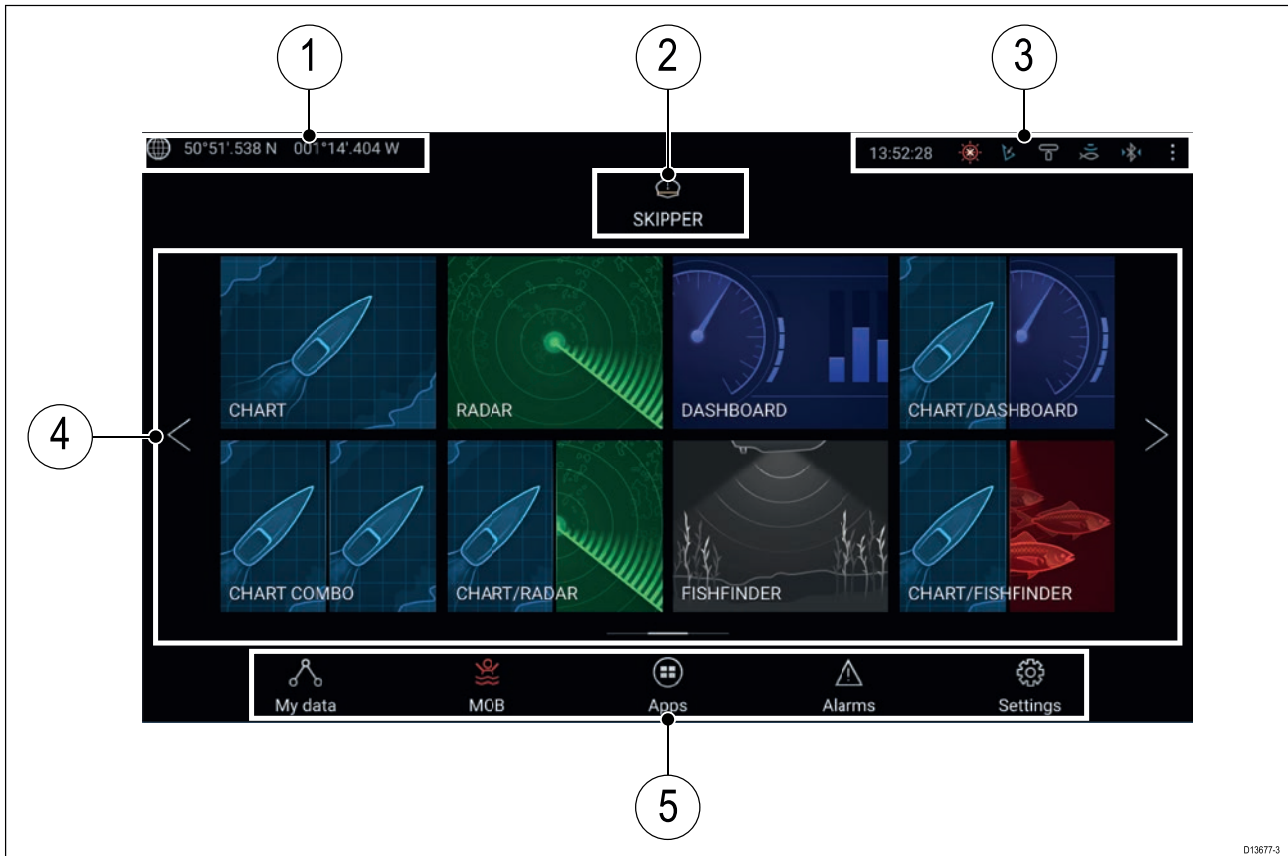


1. Before using the MFD you must accept the Limitations on Use (LoU) disclaimer. To view the full LoU Disclaimer, select 'more details'.

*The LoU acknowledgment is displayed each time the display is powered on and for each new user profile. The full LoU text can be accessed at any time from the **Getting started** tab: **Homescreen > Settings > Getting started > View terms of use.***

## 5.2 Homescreen overview

All settings and apps can be accessed from the Homescreen.



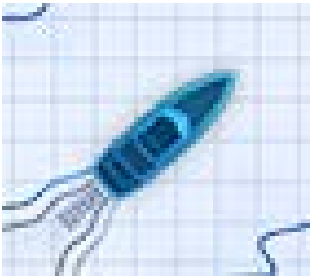
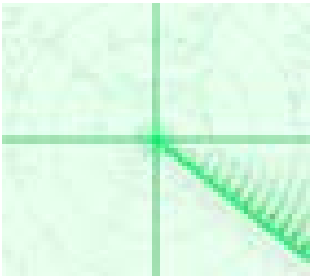
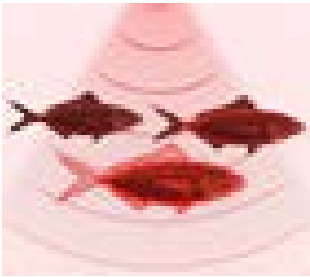
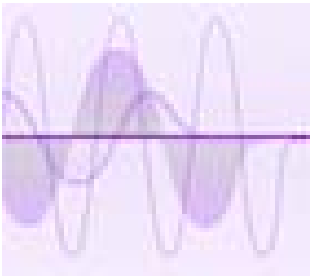

1. **GNSS position/fix details** — Select the area to view fix accuracy and access GNSS settings.
2. **Profile** — Select the area to change the profile in use or to create, edit or delete profiles.
3. **External devices and system time** — Select this area to access Bluetooth settings, Disengage your autopilot or adjust the UTC time offset.
4. **App page icons** — Select an icon to open the relevant MFD app page. Use the **Left** and **Right** arrows, or swipe your finger left or right across the area to cycle through the available Homescreen pages.
5. **Settings and data** — This area provides access to the **Settings**, **Alarms**, **Apps** and **My data** menus. You can also activate the **Man Over Board (MOB)** alarm and disengage your autopilot.

### Note:



When more than 1 display is connected to the same network, then the Homescreen of the MFD designated as Data Master will be mirrored on all MFDs.

## 5.3 MFD Apps

MFD apps are displayed on your MFD in App pages. Each app page is accessed from the app page icons on the Homescreen. App pages can include more than 1 app. The available MFD apps are:

	<b>Chart</b> — The Chart app displays electronic cartographic information from your Chart cards and when used in conjunction with a GNSS receiver, plots your vessel's position. The Chart app can be used to mark specific locations using Waypoints, build and navigate Routes or keep a record of where you have been by recording a Track.
	<b>Radar</b> — The Radar app is a situational awareness aid that displays a graphical representation of your surroundings in relation to your vessel using the echo/target returns from a connected Radar scanner. The Radar app allows you to track targets and measure distances and bearings
	<b>Sonar</b> — The Sonar app uses a connected sonar module and transducer to help you to find fish by building up an underwater view of bottom structure and targets in the water column covered by your transducer.
	<b>Audio</b> — The Audio app allows you to control audio from a connected compatible entertainment system.
	<b>Video</b> — The Camera app allows you to control and view feeds coming from connected video equipment such as an IP camera or Thermal camera.



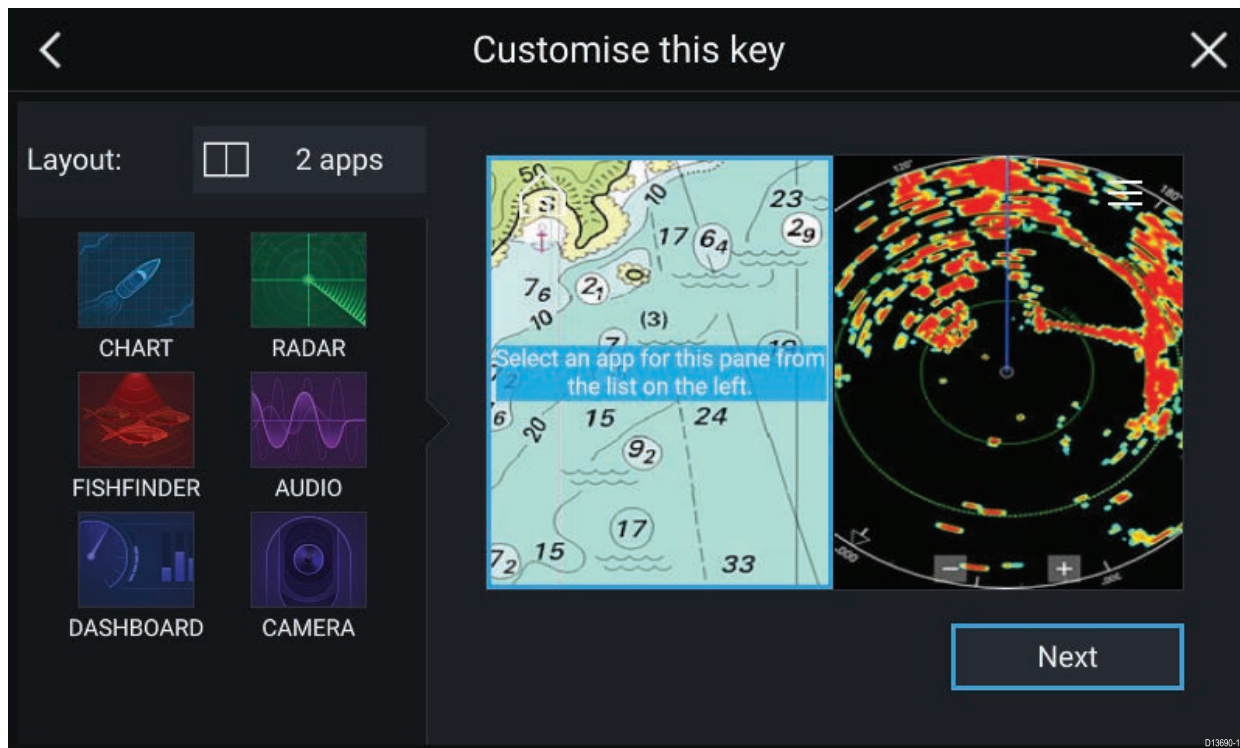
	<p><b>Dashboard</b> — The Dashboard app provides data readings from connected sensors and equipment. The Dashboard app is also used for controlling, configured, compatible, Digital Switching hardware.</p>
	<p><b>UAV</b> — The UAV (Unmanned Aerial Vehicle) app provides remote controls, settings and video display, including flight data for your compatible UAV device.</p>

## 5.4 Creating / Customizing an App page

1. Press and hold on an existing App page icon to display pop-over options.

*You can Customize, Rename or Delete app pages from the pop-over options.*

2. Select **Customize** from the pop-over options to change page layout and apps used. To Create a new page press and hold on a blank space on the Homescreen.



3. Select the **Layout:** option to change the page layout.
4. Select the icons for the Apps that you want to be displayed on the page.
5. Select **Next** and give the page a memorable name.
6. Select **Save**.

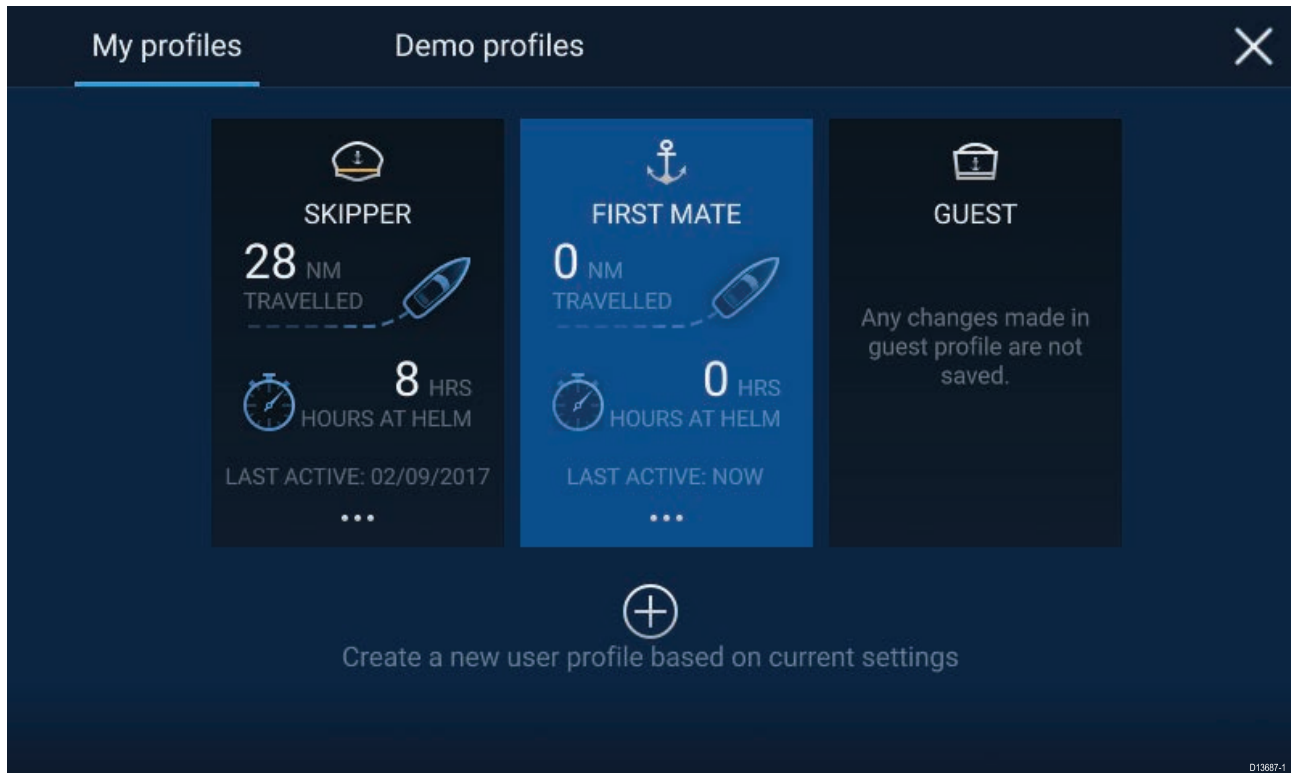
The page is saved and the new App page icon will be shown on the Homescreen.

## 5.5 User profiles

You can share your MFD with other users by creating user profiles on your MFD. Profiles enable you to retain your own personal settings whilst letting other users personalize the MFD's settings to their preference.

**Note:** User data such as Waypoints, Routes, Tracks, images and video recordings etc. will be available to all users.

You can access the Profiles page by selecting the Profile Icon on the Homescreen.



Selecting the **Plus (+)** icon will create a new profile based on the profile that is currently in use.

MFD settings changes are unique to the profile in use and are retained the next time the profile is used.

The distance and time that a profile has been active is displayed for each profile.

Profile names and icons can be customized. You can also reset the distance and time for each profile.

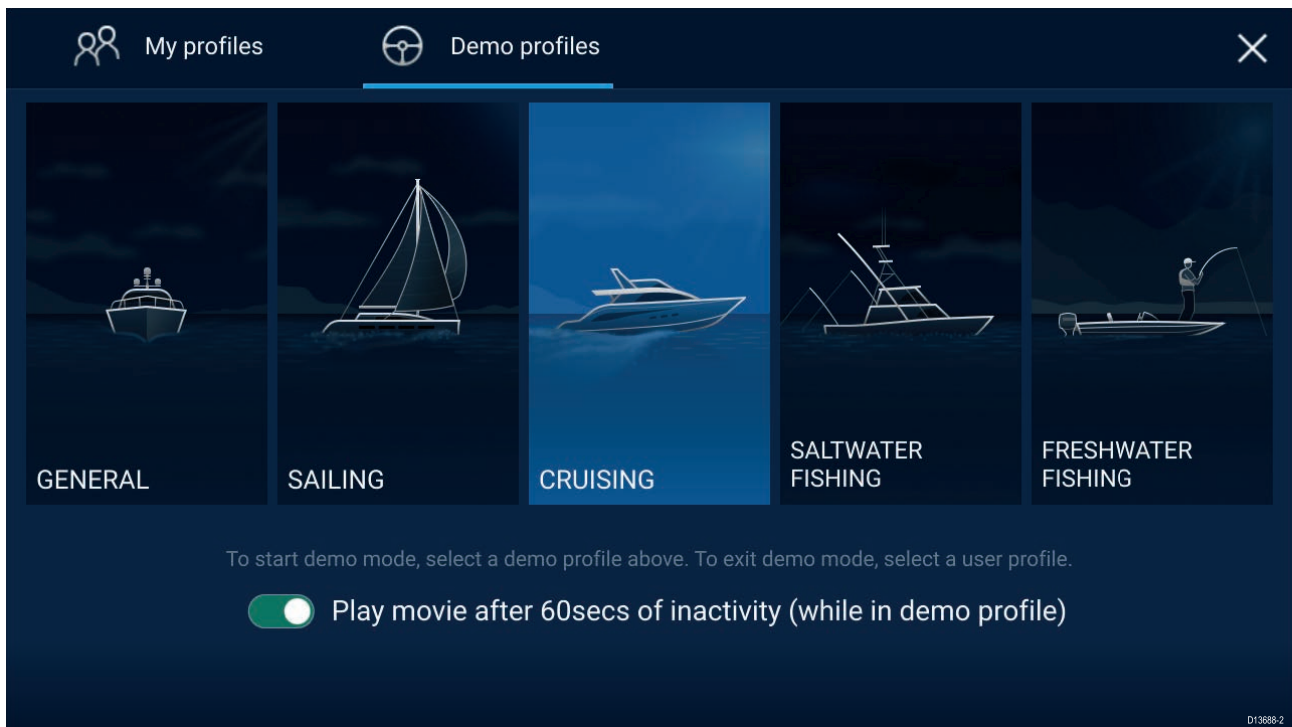
A Guest profile is available for temporary users. Setting changes to the Guest profile are not retained. Each time the Guest profile is activated the settings are based on the last used profile.

When the MFD is rebooted the last used profile will be active.

Demo profiles are also available to help you practice operating your MFD with simulated data.

### Demo profiles

Profiles are available for simulation and demonstration purposes. A demo movie, stored on external storage, can also be set to play when a demo profile is activated and inactivity has been detected for 60 seconds.



Selecting a Demo profile will provide your MFD with simulated data to help you practice operating your display.

**Important:**

- It is recommended that Demo profiles are NOT activated whilst navigating.
- Demo profiles will NOT display any real data, including safety warnings and messages.
- Any settings changes made will not affect User profiles.

### Demo movie requirements

A demo movie file can be set to play when a demo profile is active and the MFD has not been used for 60 seconds.

Demo movie files must be in the .mov file format and encoded using the H.264 video codec standard. The Demo movie files must be saved to an external storage device connected to the MFD. Demo movies are not shared across networked MFDs.

When the Demo movie feature is activated the system will search for a demo movie file associated with the active demo profile. If an associated file cannot be found then the generic demo.mov is played. See below for filename details.

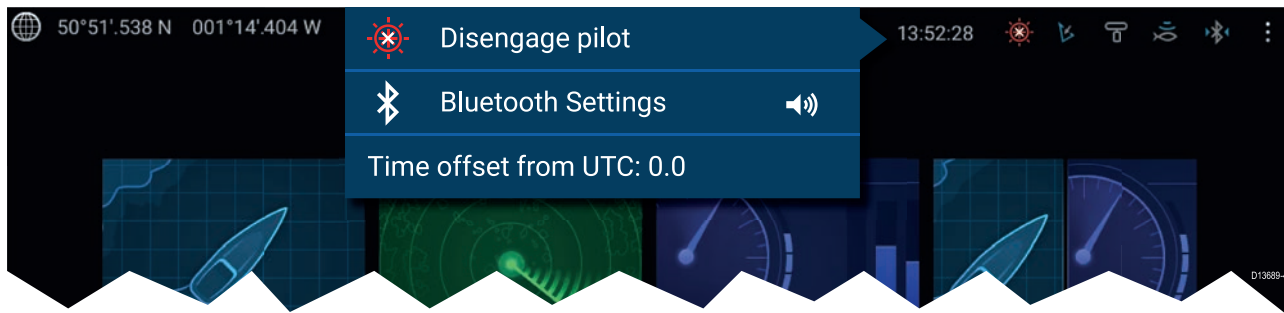
Demo profile	Associated filename
General	demo_general.mov
Sailing	demo_sailing.mov
Cruising	demo_cruising.mov
Saltwater fishing	demo_salt.mov
Freshwater fishing	demo_fresh.mov
Plays in all demo profiles if an associated demo file is not found.	demo.mov

If an MFD is powered off with the demo movie active then the next time the MFD is powered on the demo movie will play immediately after boot up.

Any interaction with the Touchscreen or physical buttons will stop the movie playing and return you to the active demo profile.

## 5.6 Status area

You can view the status of connected peripheral devices using the MFD's Status area, located at the top right of the Homescreen. This area also displays the **Time** and identifies when the MFD is in **Touchlock** mode.



### Status area icons

The status area provides icons which identify the status of connected Autopilot, AIS, Radar, Sonar/Transducer, and Bluetooth devices.

### Pop-over menu options

From the **Options** pop-over you can:

- Disengage your autopilot.
- Access Bluetooth settings and volume controls.
- Adjust the Time offset from UTC.

### Status area icons

The icons displayed in the Status area signify the current status of certain connected devices.



#### AIS

Icon	Status	Icon	Status
	AIS transmitting and receiving		AIS receive only (e.g. Silent Mode)
	AIS Error		




#### Autopilot

Icon	Status	Icon	Status
	Autopilot engaged		




## Bluetooth

Icon	Status	Icon	Status
	Bluetooth on / not connected		Bluetooth connected / paired


## Radar

Icon	Status	Icon	Status
	Radar transmitting		Radar standby
	Radar error		

## Sonar / Transducer

Icon	Status	Icon	Status
	Sonar pinging		Sonar not pinging
	Sonar error		

## Touchlock

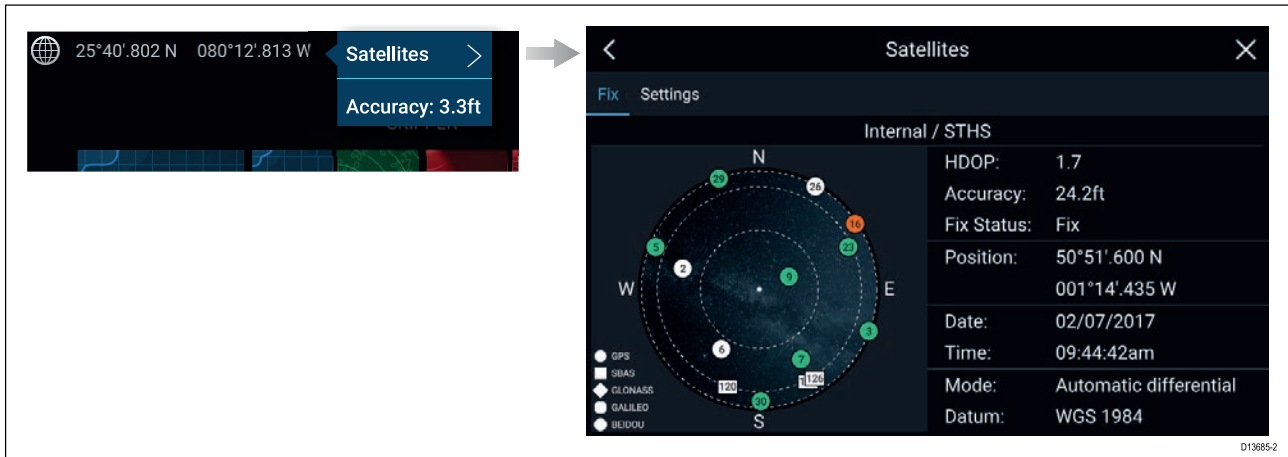
Icon	Status	Icon	Status
	Touchlock active		

## 5.7 Satellite navigation / positioning

### GNSS (GPS) Status

Your vessel's GNSS (GPS) position is provided in the top left corner of the Homescreen. You can access fix accuracy and settings by selecting the area.

If latitude and longitude is displayed on the Homescreen, you have a valid position fix. If the text turns red, your fix accuracy is low.

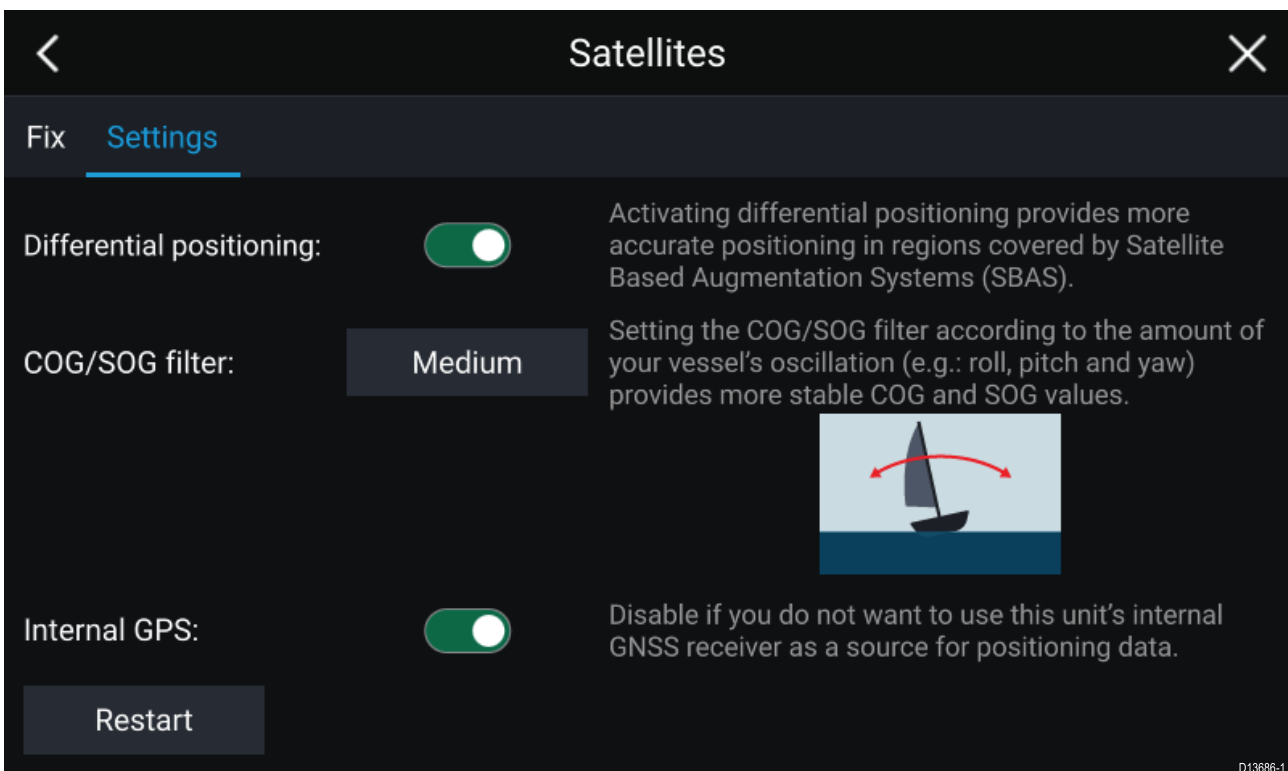


The sky view on the left side of the page shows the position of navigation satellites and the constellation they belong to. The color of the satellite identifies its status:

- Grey = searching for satellite.
- Green = satellite in use.
- Orange = tracking satellite.

### GNSS (GPS) Settings

The settings for your GNSS (GPS) receiver (internal or external) can be accessed from the **Satellites** menu: **Homescreen** > **GNSS pop-over** > **Satellites** > **Settings**.



From the GNSS Settings tab you can:

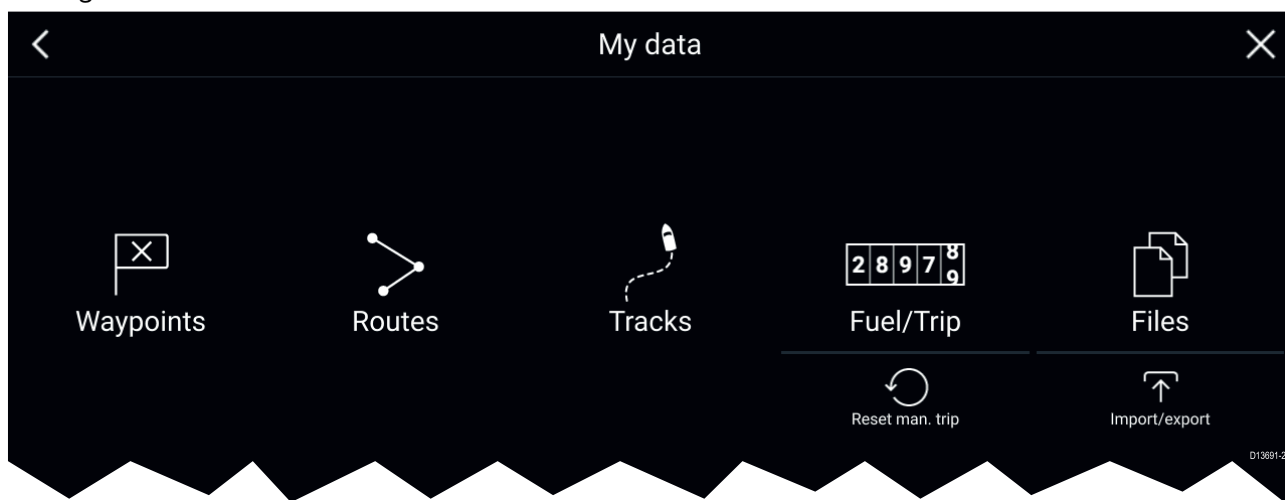
- activate and deactivate use of Differential positioning (SBAS)

- set the COG/SOG filter according to your vessel's oscillation, which provides more stable COG and SOG readings
- enable and disable your MFD's internal GNSS (GPS) receiver. Disable it if you do not want to use this unit's internal GNSS (GPS) receiver as a source for positioning data.
- restart the GNSS (GPS) receiver that is being used as the source for your positioning data.



## 5.8 My data

Selecting **My data** from the Homescreeen provides access to user data such as **Waypoints**, **Routes**, **Tracks**, **Fuel** and **Trip** data and also media **Files**. You can also **Import/export** User data and MFD settings.



Selecting **Waypoints**, **Routes** or **Tracks** displays the relevant list, where you can manage and customize your data.

Selecting **Fuel/Trip** displays the Fuel manager and Trip counters.

Selecting **Reset man. trip** resets the **Trip (Manual)** counter to zero.

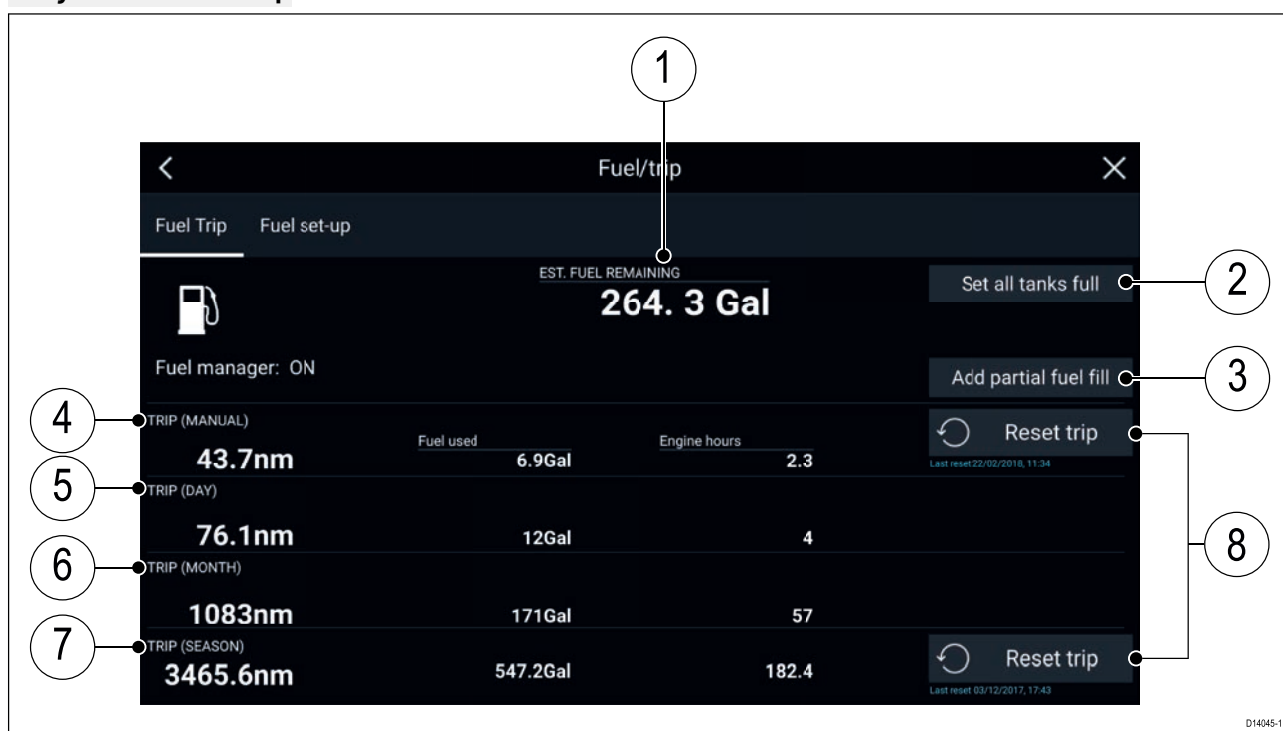
Selecting **Files** opens a file browser.

Selecting **Import/export** allows you to backup or restore user data and MFD settings using an external storage device.

### Fuel/trip manager

The fuel/trip manager collects trip data automatically based on distance travelled and provides an estimate of how much fuel you have remaining based on user inputted fuel refill data.

The Fuel/trip manager can be accessed by selecting **Fuel/Trip** from the **My Data** page: **Homescreeen** > **My Data** > **Fuel/Trip**.



1. Estimated fuel remaining
2. **Set all tanks full** — Select when you have filled up all tanks.
3. **Add partial fuel fill** — Select to enter a specific volume of fuel during a partial tank fill.

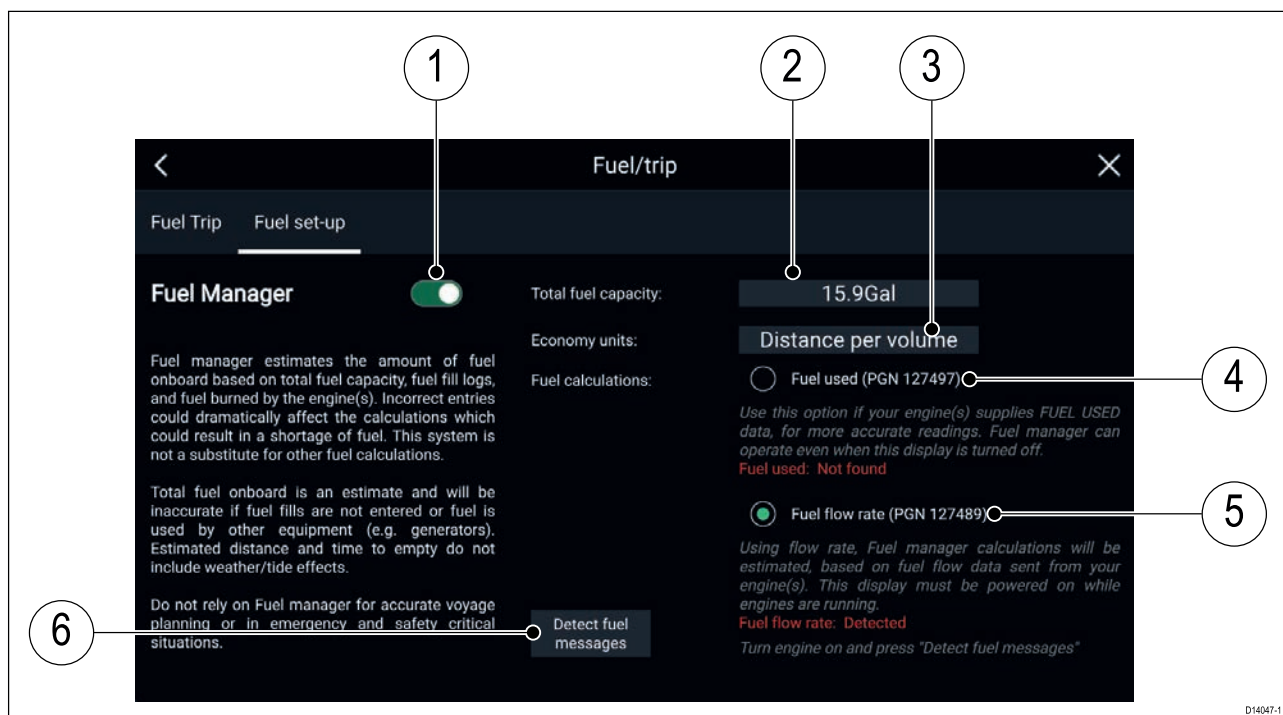
**Note:** If you enter the wrong amount of fuel this can be corrected by entering a minus value as a partial fuel fill, this will reduce the total amount of fuel remaining by the amount entered.

4. Trip (Manual) — accumulates data until reset.
5. Trip (Day) — resets automatically when local time passes midnight.
6. Trip (Month) — resets automatically on the 1st day of the month.
7. Trip (Season) — accumulates data until reset.
8. **Reset trip** — The **Trip (Manual)** and **Trip (Season)** logs can be reset by selecting the relevant **Reset Trip** button.

**Note:**

- The Fuel manager estimates the amount of fuel remaining onboard based on logging each time you fill up, your vessel's total fuel capacity, and how much fuel is burned by your engine(s). Incorrect entries will affect the fuel calculations which could result in a shortage of fuel.
- The Fuel remaining calculation is 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).
- Distance to Empty and Time to Empty values are based on estimated fuel remaining calculations which do not take into account the effects of weather and tide on fuel usage.
- 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 set up



1. Enable/Disable Fuel manager.
2. **Total fuel capacity** — Sum of total capacity of all your fuel tanks.
3. **Economy units** — Economy units used in data overlays, Side bars or the Dashboard app.
4. **Fuel used (PGN 127497)** — Use this option if your engine(s) supply Fuel used data. When Fuel used is selected the Fuel manager will continue to operate when the MFD is switched off. This option usually provides more accurate readings.
5. **Fuel flow rate (PGN 127489)** — this option estimates fuel calculations based on fuel flow rate data sent by your engine(s). Your MFD must remain switched on, whilst engines are running.
6. **Detect fuel messages** — If you are unsure which engine messages your engine provides, select this option to determine the correct message.

## Setting up the Fuel manager

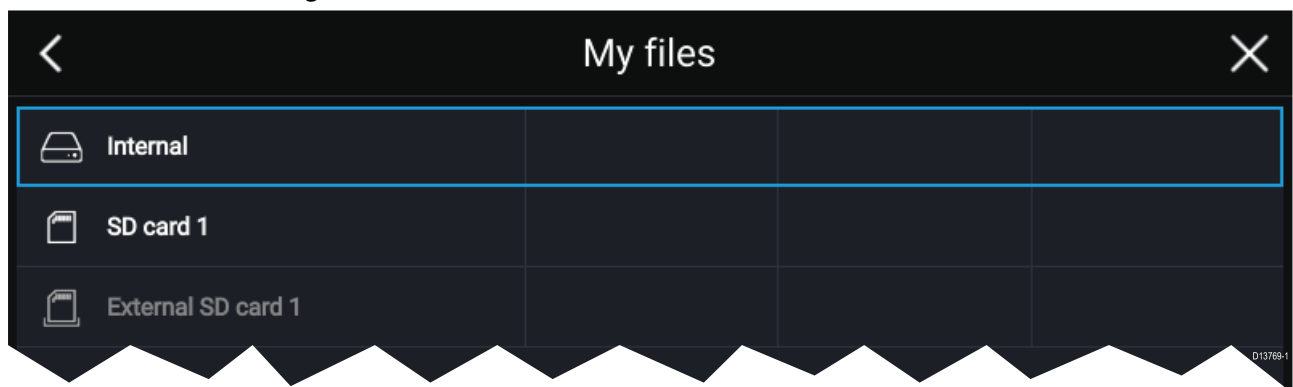
To start using the Fuel manager you must first specify the total capacity of your fuel tanks, and then fill the tanks to set a reference level for the Fuel manager.

From the Fuel set-up page: **Homescreen > My Data > Fuel/Trip > Fuel set-up:**

1. Select the box next to **Total fuel capacity:** and enter the total capacity of all of your fuel tanks.
2. Select the **Fuel manager** toggle switch to enable the Fuel manager.
3. Select the box next to **Economy units:** and select either: Distance per volume, Volume per distance, or Litres per 100km.
4. Select either **Fuel used (PGN 127497)** or **Fuel flow rate (PGN 127489)**. If you are unsure, select **Detect fuel messages** to detect which messages are available to your MFD.
5. Fill up your fuel tanks.
6. Once the tanks are full, select **Set all tanks full** from the Fuel Trip page.
7. Log each subsequent fuel fill whether partial or full.

## Files

The file browser can be used to **Open** and **Delete** photos / images and PDF documents, saved to external storage, and can also be used to **Import** or **Delete** user data and MFD settings files) saved to external storage.



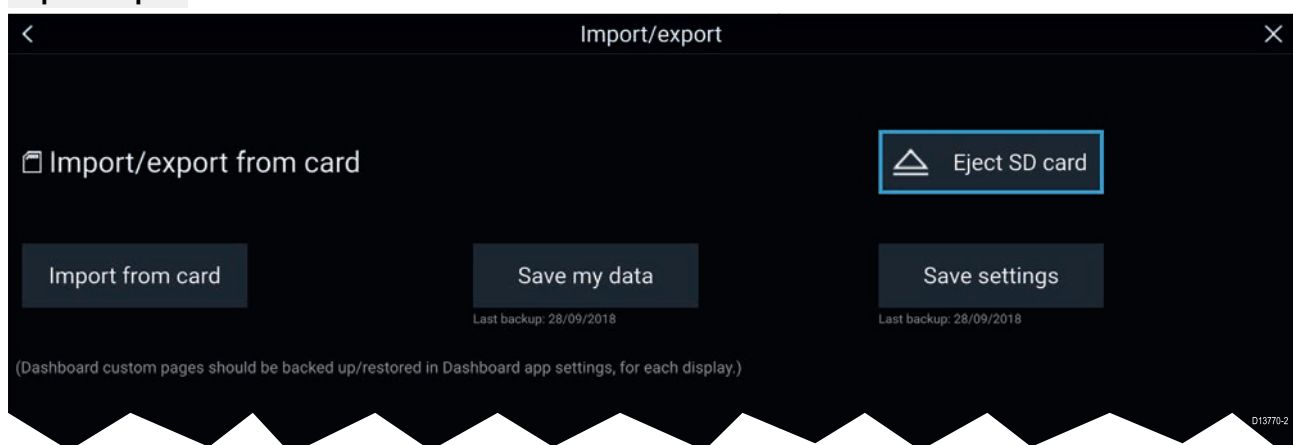
- Selecting a storage device expands its contents, allowing you to browse the contents.
- Selecting an image or PDF file provides pop-over options to open or delete the file.
- Selecting a user data (.gpx) or MFD settings (.lh3) file provides pop-over options to **Import** or **Delete** the file.

### Note:

Only file types that are supported by your MFD will be visible in the browser.

## Import/export

User data and MFD settings can be imported and exported from your MFD. User data (Waypoint, Routes and Tracks) is saved in the common .gpx file format. MFD settings will be saved in .lh3 format. The Import/export page can be accessed from the My data page: **Homescreen > My data > Import/export.**



## Saving user data (My data)

You can backup your user data (waypoints, routes and tracks) to an external storage device.

1. Insert a memory card into a card reader slot on your MFD.
2. Select **Save my data** from the Import/export page: **Homescreen > My data > Import/export**.  
A pop-over menu is displayed.
3. Select:
  - **Save all data** to save (export) all waypoints, routes and tracks.
  - **Save waypoints** to save (export) all waypoints.
  - **Save routes** to save (export) all routes.
  - **Save tracks** to save (export) all tracks.
4. Select the relevant card slot from the Info dialog.
5. Select **Save** to save the user data using the default filename. Alternatively:
  - i. Use the onscreen keyboard to enter your own filename and select **Save**.
6. Select **OK** to return to the Import/export page, or select **Eject card** to safely remove the memory card.

## Saving MFD settings

You can backup your MFD's settings to an external storage device, allowing you to restore your personalized MFD settings at a later date.

### Important:

- Saving your MFD settings will also save any new or customized dashboard pages.
- Digital switching dashboard pages will not be saved when saving your MFD's settings.

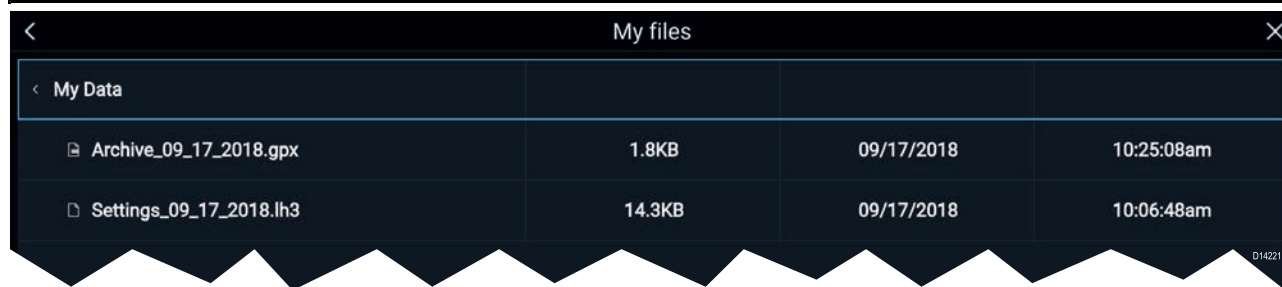
1. Insert a memory card into a card reader slot on your MFD.
2. Select **Save settings** from the Import/export page: **Homescreen > My data > Import/export**.
3. Select the relevant card slot from the Info dialog.
4. Select **Save** to save the user data using the default filename. Alternatively:
  - i. Use the onscreen keyboard to enter your own filename and select **Save**.
5. Select **OK** to return to the Import/export page, or select **Eject card** to safely remove the memory card.

## Importing user data or MFD settings from a memory card

You can restore user data (waypoints, routes and tracks) from an external storage device.

### Important:

- Restoring your MFD settings will also restore any new or customized dashboard pages.
- Digital switching dashboard pages will not be restored when importing your MFD's settings.



1. Insert the memory card containing your saved data into a card reader slot.
2. Select **Import from card** from the Import/export page: **Homescreen > My data > Import/export**.  
The file browser is displayed
3. Navigate to the gpx or lh3 file that you want to import.  
*User data and MFD settings files will be located in the **|Raymarine|My Data|** folder on your memory card.*
4. Select the file.  
The import will commence.

5. If importing a gpx file, select **OK** when complete, alternatively
6. If importing MFD settings, select **Yes** to confirm restoring your MFD's settings.

*Your MFD will reboot to complete the process.*

## PDF viewer

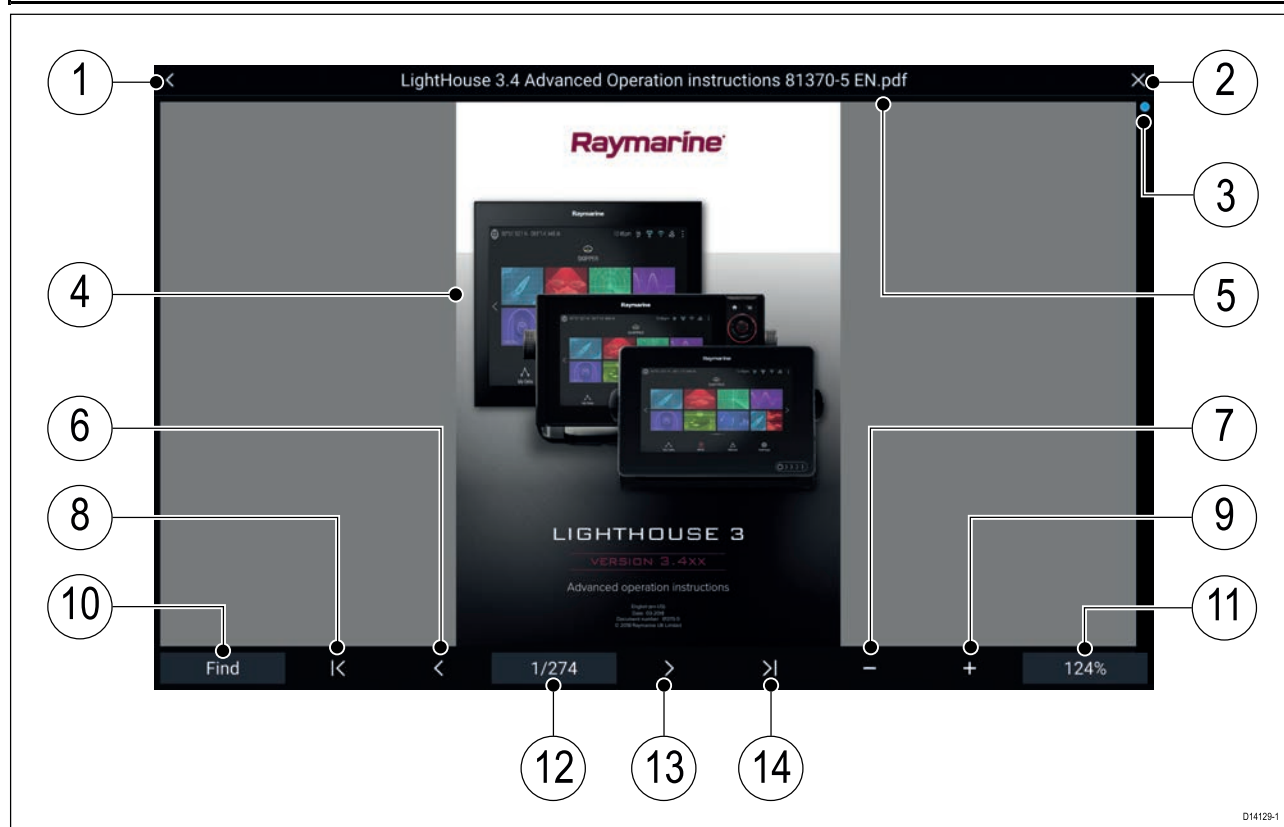
PDF files saved to an external storage device can be viewed using the File browser.

A typical use for the PDF viewer is to display Raymarine product handbooks that you've downloaded from the Raymarine website.

PDF files must first be copied to a MicroSD card using an external device (such as a PC or tablet). Then the MicroSD card can be inserted into the MFD's card slot and browsed using the File browser.

### Note:

Secured PDF documents (encrypted with certificate or password) are not supported.



D14129-1

1. **Back** — Select to go back to the previous screen.
2. **Close** — Select to close the document and go back to the File browser.
3. **Position indicator** — Indicates the position of the current page within the document. You can also drag the indicator to scroll through the document.
4. **Document** — PDF document pages
5. **Document filename** — The filename of the current PDF.
6. **Page back** — Select to go back to the previous page.
7. **Zoom out** — Select to zoom out in 10% increments.
8. **First page** — Select to go back to the first page of the document.
9. **Zoom In** — Select to increase zoom in 10% increments.
10. **Find** — Select to open the onscreen keyboard and enter a word or phrase to search for.
11. **Zoom** — Select to use **Page Width** and **Page Height** pop-over options.
12. **Pages** — Indicates current page and total number of pages. You can also select the **Pages** setting field to enter a specific page number to view.
13. **Page forward** — Select to go to the next page.
14. **Last page** — Select to go to the last page in the document.

## Searching a PDF

You can search for a word or term using the Find function.



With the PDF displayed in the viewer:

1. Select **Find:**.
2. Enter the word or search term.
3. Select **FIND**.

The document will scroll to the first occurrence of the searched term, which will be highlighted. You can use the **Right arrow** and **Left arrow** to cycle to the previous or next occurrence of the searched term, you can search for another term by selecting **Find:** and entering a new term, or you can cancel the find function by selecting **Cancel**.

## 5.9 Alarms

Alarms are used to alert you to a situation or hazard requiring your attention. Alarms are triggered by system functions and external devices connected to the MFD (Multifunction Displays). Alarms are displayed on all networked MFDs.

Alarms are color coded to signify their severity:

### Dangerous alarms



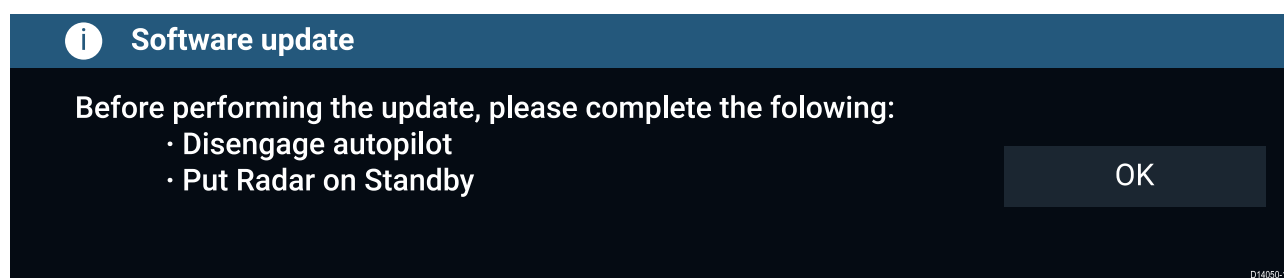
**Red** — A Red notification is used to signify a dangerous alarm condition, immediate action is required due to a potential or immediate danger to life or vessel. Dangerous alarms are accompanied by an audible tone. The Dangerous alarm notification and audible tone will continue to be displayed until acknowledged or the conditions that triggered the alarm are no longer present. Acknowledged alarms may remain active whilst the alarm condition persists but will not trigger further onscreen or audible notifications.

### Warning alarms



**Orange** — An Orange notification is used to signify a warning alarm condition. Warnings alarms are used to signify that there has been a change in situation that you need to be aware of. Warnings alarms are accompanied by an audible tone. The warning alarm notification and audible tone will continue to be displayed until acknowledged or the conditions that triggered the alarm are no longer present. Acknowledged alarms may remain active whilst the alarm condition persists but will not trigger further onscreen or audible notifications.

### Notifications



**Blue** — A Blue notification is used to signify information requiring user acknowledgement. Unless they require user interaction, information notifications may self dismiss after 3 seconds. Information notifications are not accompanied by an audible tone and are not displayed in the Active alarms or Alarm history lists.

## Alarm manager

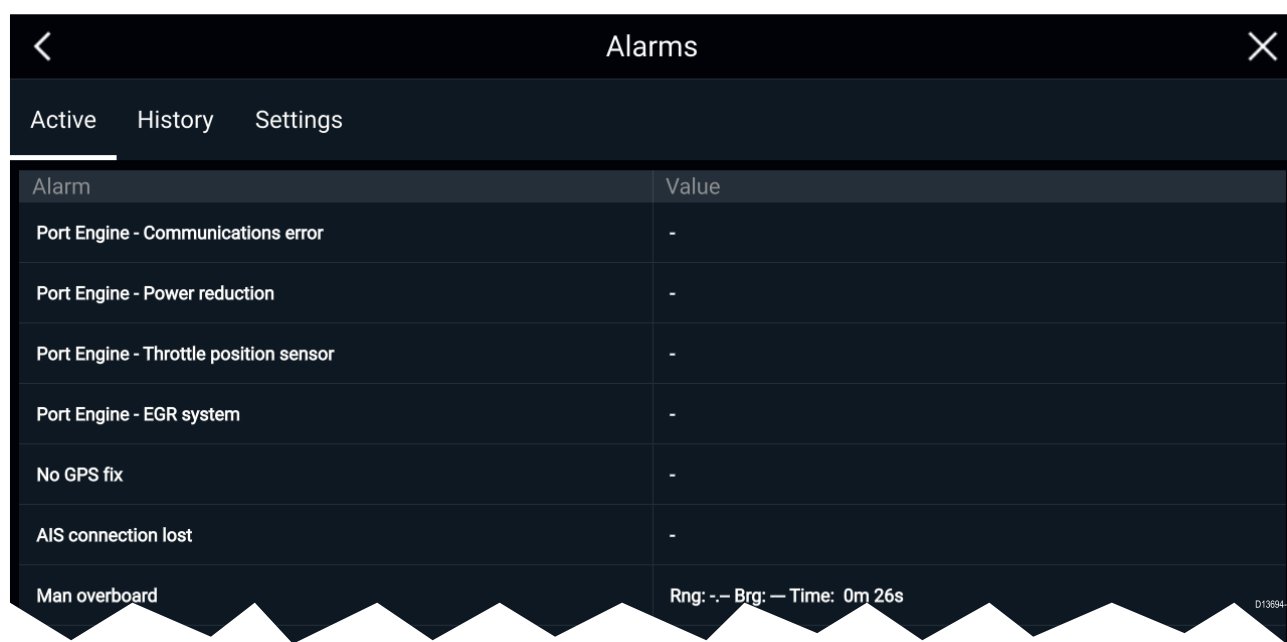
The Alarm manager is used to list current active alarms, enable and disable alarms, adjust alarm thresholds and view Alarm history.

### Active alarms

The Alarm manager can be accessed by selecting **Alarms** from the Homescreen.



### Example: Active alarms tab

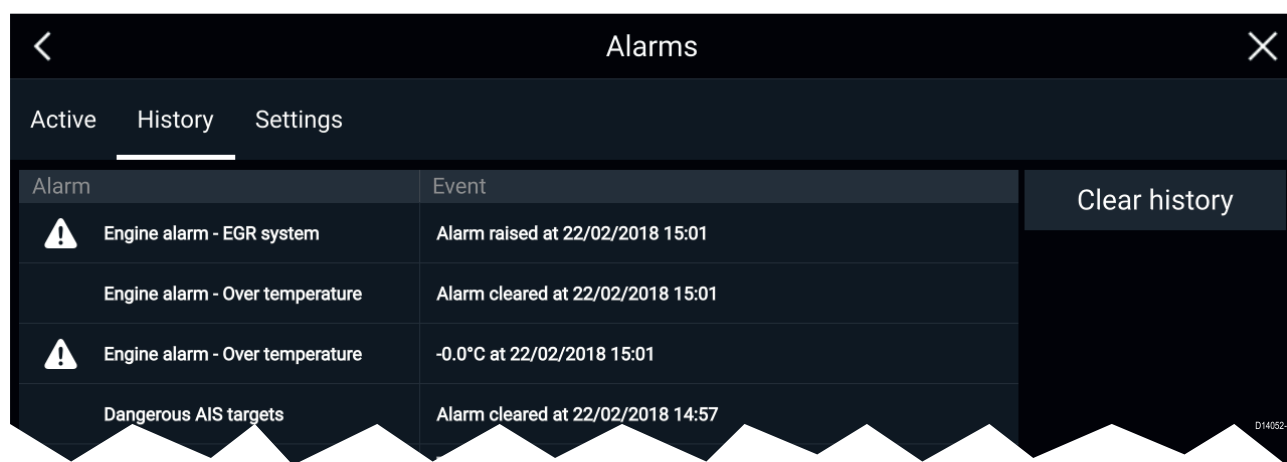


Alarm	Value
Port Engine - Communications error	-
Port Engine - Power reduction	-
Port Engine - Throttle position sensor	-
Port Engine - EGR system	-
No GPS fix	-
AIS connection lost	-
Man overboard	Rng: -.- Brg: — Time: 0m 26s

The Active alarms tab lists all alarms that are currently active. Alarms will remain active until the conditions that triggered the alarm are no longer present, e.g.: a Shallow depth alarm will automatically dismiss when the depth becomes deeper.

### Alarm history

#### Example: Alarm history tab



Alarm	Event	Clear history
⚠ Engine alarm - EGR system	Alarm raised at 22/02/2018 15:01	
Engine alarm - Over temperature	Alarm cleared at 22/02/2018 15:01	
⚠ Engine alarm - Over temperature	-0.0°C at 22/02/2018 15:01	
Dangerous AIS targets	Alarm cleared at 22/02/2018 14:57	

All Dangerous (Red) and Warning (Orange) alarms will appear in the Alarm history list. The history list will include an entry for the alarm being triggered (raised) and also for when the alarm is acknowledged (cleared). The Alarm field contains the name of the alarm and the events field contains details of the alarm condition and its time and date.

The Alarm history list can be cleared by selecting **Clear history**.

### Active alarm indication

Your MFD can be configured to provide active alarm indication from the Homescreen and from MFD apps. When enabled the Homescreen **Alarms** icon and MFD app's Home icon will indicate that an alarm is currently active.

Active alarm indication can be enabled and disabled from the alarms settings tab: **Homescreen > Alarms > Settings > Home button active alarm indicator**.





D14053-1

The Home icon will turn Red and have an exclamation mark placed inside it.

The Homescreen Alarms icon will display the number of active alarms.

## Alarm settings

Depending on connected peripheral hardware the alarms listed below can be enabled and disabled and where applicable alarms thresholds can be set or changed.

Alarm	Description	Options
<b>Dangerous Radar targets</b>	<p>If enabled, an alarm is triggered when Radar targets become dangerous. Radar targets are deemed dangerous when they are within the specified:</p> <ul style="list-style-type: none"> <li>• Safe distance — Closest Point of Approach (CPA), or</li> <li>• Time to reach safe distance — Time to Closest Point of Approach (TCPA)</li> </ul>	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Lost Radar targets</b>	<p>If enabled, an alarm is triggered when dangerous Radar targets become lost (i.e.: no Radar return from the target has been received for 20 seconds).</p>	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Dangerous AIS targets</b>	<p>If enabled, an alarm is triggered when AIS targets become dangerous. AIS targets are deemed dangerous when they are within the specified:</p> <ul style="list-style-type: none"> <li>• Safe distance — Closest Point of Approach (CPA), or</li> <li>• Time to reach safe distance — Time to Closest Point of Approach (TCPA)</li> </ul>	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

Alarm	Description	Options
<b>Guard zone 1</b>	If enabled, an alarm is triggered when Radar returns are detected within the specified guard zone 1.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Guard zone 2</b>	If enabled, an alarm is triggered when Radar returns are detected within the specified guard zone 2.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Waypoint arrival</b>	If enabled, when you arrive at a waypoint, an alarm is triggered. This setting allows you to enable the Waypoint arrival alarm and specify the radius of the waypoint arrival circle. The waypoint arrival circle is an imaginary circle around the destination waypoint. When your vessel crosses this circle the Waypoint Arrival alarm is triggered.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Arrival radius value
<b>Off track</b>	If enabled, during active navigation an alarm is triggered when your vessel steers off track by more than the specified Cross track error value.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Cross-track error value
<b>Anchor drift</b>	If enabled, an Alarm is triggered when your vessel drifts from your anchor position by more than the specified Drift range.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Drift range value
<b>Low fuel remaining</b>	If enabled, an alarm is triggered when the fuel remaining in your fuel tanks reaches the Fuel level specified. The Fuel manager must be enabled for alarms to be triggered.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Fuel level value
<b>DSC alarms</b>	If enabled, an alarm is triggered when DSC distress calls are received. A connected VHF radio is required in order to trigger DSC distress call alarms via the MFD.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>AIS safety messages</b>	If enabled, an alarm is triggered when AIS safety messages are received. A connected AIS device is required in order to display AIS safety messages via the MFD.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>MOB data type</b>	Determines whether the MOB waypoint is fixed at the position the alarm was triggered, or advances its position based on tide and wind effects. Dead reckoning normally provides a more accurate course.	<ul style="list-style-type: none"> <li>• Dead reckoning</li> <li>• Position (fixed)</li> </ul>

Alarm	Description	Options
<b>Fishing range</b>	If enabled, an alarm is triggered when your Depth reading reaches the depth specified in Shallow water arrival or Deep water arrival.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Shallow water arrival value Deep water arrival value
<b>Water temperature alarm</b>	If enabled, an alarm is triggered when the water temperature reading reaches the temperature specified in Lower temp limit or Upper temp limit.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul> Lower temp limit value Upper temp limit value
<b>Digital switching alarms</b>	When your system includes Digital switching a list of all configured Digital switching alarms will be displayed.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>AX8 camera messages</b>	If enabled, AX8 camera messages will be presented as alarms on your MFD. A connected AX8 camera is required in order to display camera messages via the MFD.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Engine alarms</b>	If enabled, alarms will be triggered when engine warning alarms are received from connected, compatible engine management systems or interfaces.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Home button active alarm indicator</b>	If enabled, when an alarm is active the onscreen Home icon is colored Red and contains a warning triangle.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

## External alarm speaker / buzzer

If your MFD has a built-in buzzer or is connected to a wired external buzzer then MFD alarms will trigger an audible tone. If you connect your MFD to a Bluetooth speaker then the alarm tone can also be heard from the speaker as well.

When connected to a Bluetooth speaker a separate volume control is available to control the volume of MFD Alarms sounded through the speaker. Please refer to the [Bluetooth speaker pairing](#) details.

## Acknowledging alarms

Follow the steps below to acknowledge an active alarm.

With an alarms notification displayed onscreen:

1. Select **OK**.

The notification is dismissed and the audible tone is stopped.

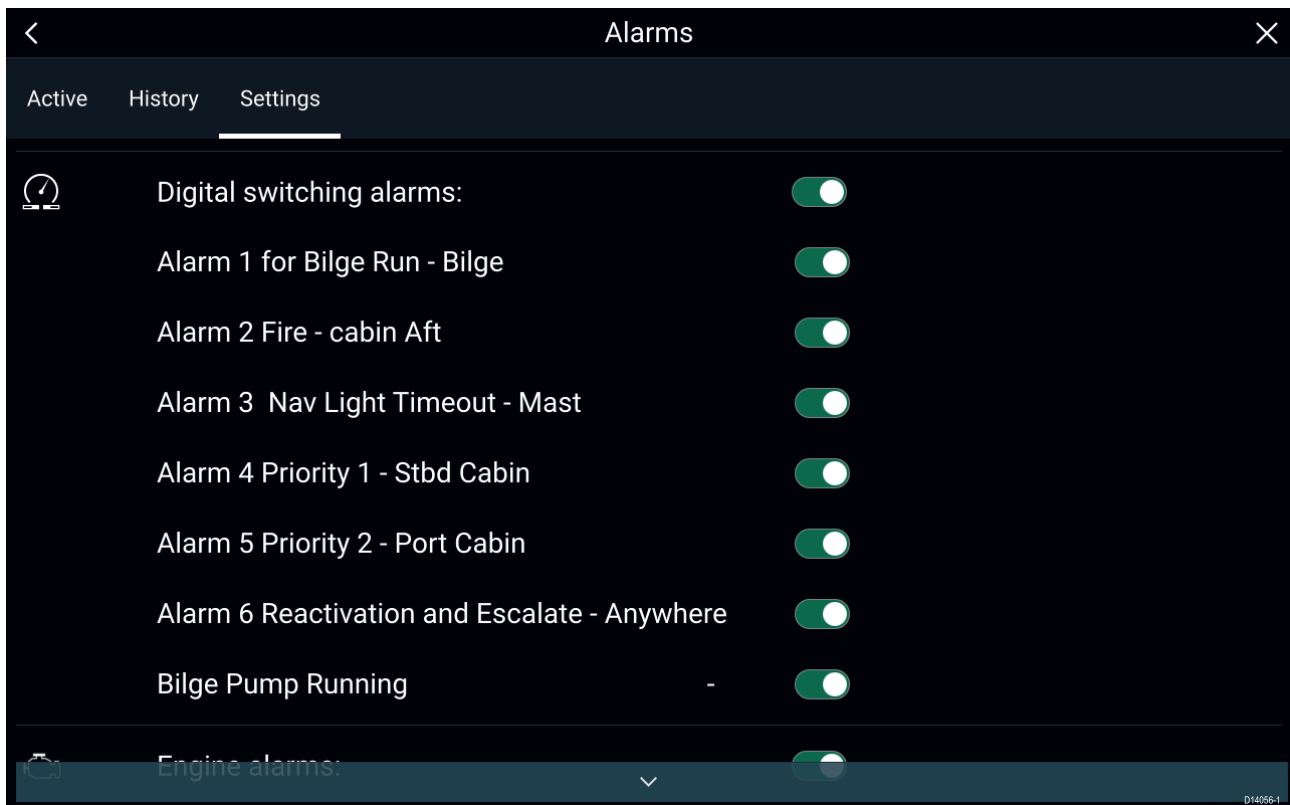
An acknowledged alarm remains active until the conditions that triggered the alarm are no longer present.

**Note:** If an alarm notification includes an **Edit** button, selecting it will display the relevant setting in the Alarms Settings tab so that, if required, you can change the alarm threshold.

## Digital switching alarms

When your MFD is connected to a Digital switching system, alarms specific to your installation can be enabled and disabled using the Alarm manager.

### Example: Digital switching alarms



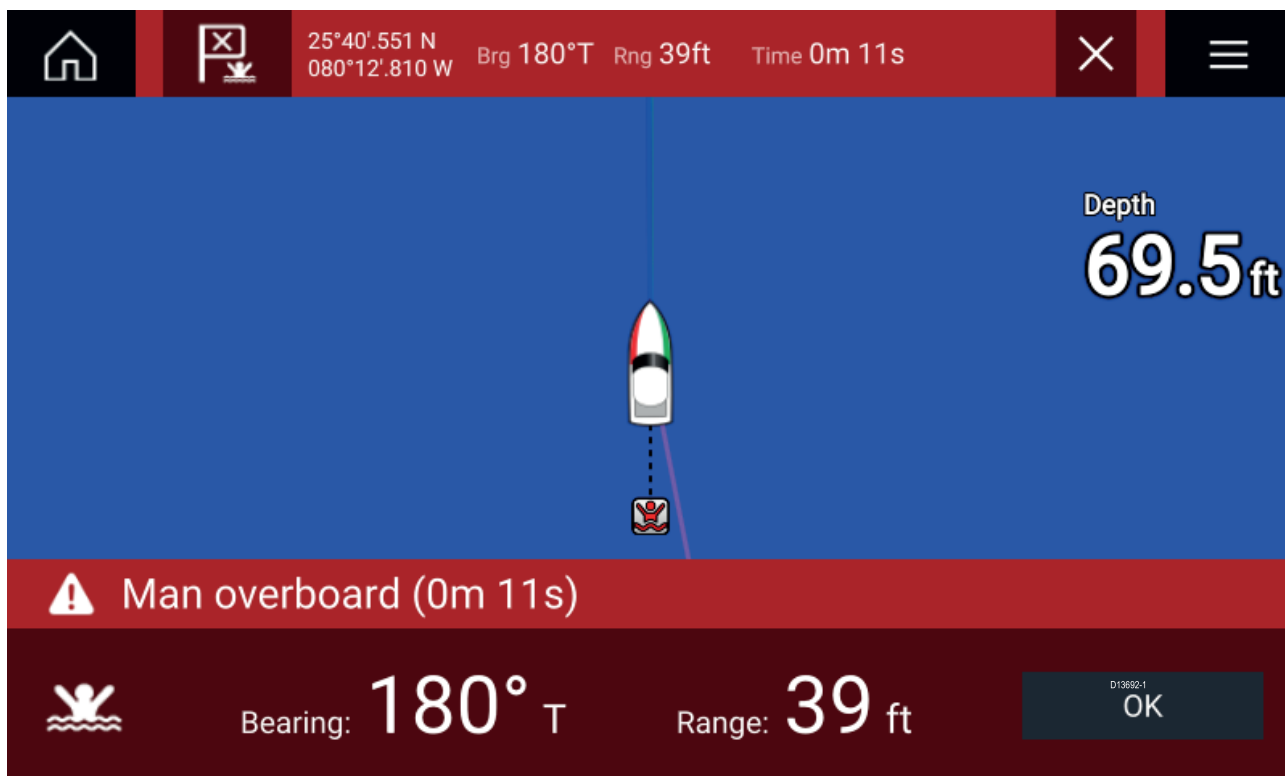
Each Digital switching system may be unique, with the alarms being defined when your system was configured.

## 5.10 Man Overboard (MOB)

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

The MOB feature can be activated by pressing and holding on the MOB icon:  on the

Homescreen or the waypoint / MOB icon: , displayed at the top of all apps.



The MOB feature requires your vessel to have a valid position fix from a GNSS (GPS) receiver. Dead reckoning mode also requires Heading and Speed data.

When you activate the MOB alarm:

- an audible alarm is sounded which is repeated every 30 seconds until the alarm is cancelled.
- a MOB Databar providing Bearing and range from MOB, and elapsed time since MOB was initiated, is displayed along the top of the screen. The Databar persists across apps and the Homescreen, and remains until the MOB alarm is cancelled.
- a MOB warning is displayed in the bottom of the screen, which requires acknowledgement.
- the Chart app is placed in a special MOB mode to help you navigate back to the point your vessel was at when the MOB was initiated.

### MOB mode

MOB can be set to Dead Reckoning or Position mode. Dead Reckoning mode will take into consideration the effects of wind and tides. This usually provides a more accurate course. Position mode does not take these factors into account. You can change the MOB mode at anytime from the Alarms menu: **Homescreen > Alarms > Settings > MOB data type:**

## 5.11 Settings

The Settings menu is accessible from the bottom of the Homescreen and contains important information and settings for your MFD.

The **Settings** menu is divided into different tabs, the settings available are:

Tab	Settings
<b>Getting started</b>	<ul style="list-style-type: none"><li>• View hardware and software information about your MFD.</li><li>• View cartography details for inserted chart cards.</li><li>• Update MFD software</li><li>• View the LoU disclaimer (<b>Getting started</b> tab).</li><li>• Change the user interface language.</li></ul>
<b>Boat details</b>	<ul style="list-style-type: none"><li>• Set boat icon and name.</li><li>• Configure Minimum safe depth, height and width.</li><li>• Configure engines.</li><li>• Configure batteries.</li><li>• Configure fuel tanks.</li></ul>
<b>Units</b>	<ul style="list-style-type: none"><li>• Configure preferred units of measurement.</li><li>• Configure Bearing mode.</li><li>• Configure variation.</li><li>• Configure GNSS (GPS) system datum.</li></ul>
<b>This display</b>	<ul style="list-style-type: none"><li>• Assign a Homescreen page or app to start on power up.</li><li>• Select save location for screenshots.</li><li>• <sup>(1)</sup>Configure User Programmable Button (UPB; Axiom Pro displays only).</li><li>• Configure Shared brightness.</li><li>• <sup>(2)</sup>Change or reset Splashscreen graphic.</li><li>• Pair / unpair connected RMK external keypads.</li><li>• <sup>(3)</sup>Enable / disable external alarm output.</li><li>• <sup>(2)</sup>Connect to a wireless display.</li><li>• Wi-Fi Sharing, pair with a wireless Quantum Radar scanner, configure Wi-Fi settings and set mobile app access.</li><li>• <sup>(2)</sup>Connect to a Bluetooth device.</li><li>• Perform a Settings or Factory reset.</li></ul>
<b>Autopilot</b>	<ul style="list-style-type: none"><li>• Enable / Disable Autopilot control.</li><li>• Set autopilot response.</li><li>• Access advanced autopilot settings.</li></ul>
<b>Network</b>	<ul style="list-style-type: none"><li>• View list of networked MFDs.</li><li>• Assign the MFD Data master.</li><li>• View software and network details for the MFD you are using.</li><li>• Save or Erase diagnostics logs to external storage.</li><li>• View and Save Diagnostic information about products connected to your MFD.</li><li>• <sup>(4)</sup>Set up NMEA 0183 options on an Axiom Pro.</li><li>• Assign your preferred data sources (Data master only).</li></ul>

**Note:**

- (1) Available on Axiom™ Pro MFDs.
- (2) Available on Axiom™, Axiom™ Pro and Axiom™ XL MFDs.
- (3) Available on Axiom™ XL and gS Series MFDs.
- (4) Available on Axiom™ Pro, Axiom™ XL, eS Series and gS Series MFDs.

## Selecting display language

You can choose which language you want the MFD to use.

1. Select the **Language** button from the **Getting started** tab: **Homescreen > Settings > Getting started**.
2. Select your desired language.

### User Interface languages

The following languages are available:

Arabic (ar-AE)	Bulgarian (bg-BG)	Chinese (Simplified) (zh-CN)	Chinese (Traditional) (zh-TW)
Croatian (hr-HR)	Czech (cs-CZ)	Danish (da-DK)	Dutch (nl-NL)
English (en-GB)	English (en-US)	Finnish (fi-FI)	French (fr-FR)
German (de-DE)	Greek (el-GR)	Hebrew (he-IL)	Hungarian (hu-HU)
Icelandic (is-IS)	Indonesian (Bahasa) (id-ID)	Italian (it-IT)	Japanese (ja-JP)
Korean (ko-KR)	Latvian (lv-LV)	Lithuanian (lt-LT)	Malay (Bahasa) (ms-MY ZSM)
Norwegian (nb-NO)	Polish (pl-PL)	Portuguese (Brazilian) (pt-BR)	Russian (ru-RU)
Slovenian (sl-SI)	Spanish (es-ES)	Swedish (sv-SE)	Thai (th-TH)
Turkish (tr-TR)	Vietnamese (vi-VN)		

## Boat details

To ensure correct operation and display of data you should set the Boat Details settings according to your requirements.

Boat details can be accessed from the **Settings** menu: **Homescreen > Settings > Boat Details**

Option	Description
<b>Boat /Icon:</b>	Selection determines the icon used to signify your vessel in the Chart app.
<b>Boat Name:</b>	Configures your system with your vessel's name.
<b>Min safe height:</b>	Enter your vessel's maximum unladen height from the waterline. To ensure adequate clearance, it is recommended that you add a safety margin to this figure to allow for variation caused by vessel movements.
<b>Min safe width:</b>	Enter your vessel's maximum width at its widest point. To ensure adequate clearance on both sides, it is recommended that you add a safety margin for port and starboard to this figure to allow for variation caused by vessel movements.
<b>Min safe depth:</b>	Enter your vessel's maximum depth when fully laden. This is the depth from the waterline to the lowest point on the vessel's keel. To ensure adequate clearance, it is recommended that you add a safety margin to this figure to allow for variation caused by vessel movements.
<b>Num of engines:</b>	Select the number of engines on your vessel. When connected to a compatible system, your MFD can monitor engine data.

Option	Description
<b>Identify engines:</b>	Once you have selected the number of engines, select <b>Identify engines</b> and follow the onscreen instructions to configure your engines. May require an extra hardware interface to enable engine data to be displayed.
<b>Num of Batteries:</b>	Configures your system with the number of batteries on your vessel.
<b>Fuel tanks:</b>	Configures your system with the number of fuel tanks on your vessel.

## Units of measure

You can select your preferred units for data readings from the **Units** tab of the **Settings** menu: **Homescreen > Settings > Units**.

Measurement	Units	Measurement	Units
<b>Distance units:</b>	<ul style="list-style-type: none"> <li>Nautical Miles</li> <li>NM &amp; m</li> <li>Statute Miles</li> <li>Kilometers</li> </ul>	<b>Volume units:</b>	<ul style="list-style-type: none"> <li>US Gallons</li> <li>Imperial Gallons</li> <li>Liters</li> </ul>
<b>Speed units:</b>	<ul style="list-style-type: none"> <li>Kts</li> <li>MPH</li> <li>KPH</li> </ul>	<b>Economy units:</b>	<ul style="list-style-type: none"> <li>Distance per Volume</li> <li>Volume per Distance</li> <li>Liters per 100 km</li> </ul>
<b>Depth units:</b>	<ul style="list-style-type: none"> <li>Meters</li> <li>Feet</li> <li>Fathoms</li> </ul>	<b>Wind speed units:</b>	<ul style="list-style-type: none"> <li>Knots</li> <li>Meters per Second</li> </ul>
<b>Temperature units:</b>	<ul style="list-style-type: none"> <li>Celsius</li> <li>Fahrenheit</li> </ul>	<b>Pressure units:</b>	<ul style="list-style-type: none"> <li>Bar</li> <li>PSI</li> <li>Kilopascals</li> </ul>
<b>Date format:</b>	<ul style="list-style-type: none"> <li>MM:DD:YYYY</li> <li>DD:MM:YYYY</li> <li>MM:DD:YY</li> <li>DD:MM:YY</li> </ul>	<b>Time format:</b>	<ul style="list-style-type: none"> <li>12hr</li> <li>24hr</li> </ul>

## Data master

Systems containing more than one MFD must have a designated Data master MFD. The Data master is the primary MFD in the network, and should be the MFD that is physically connected to the SeaTalkng® / NMEA 2000 CAN bus network, and any other devices and sources of data in your system. The Data master bridges the data over the SeaTalkhs™ network to any compatible networked 'repeater' MFDs.

Information shared by the Data master includes:

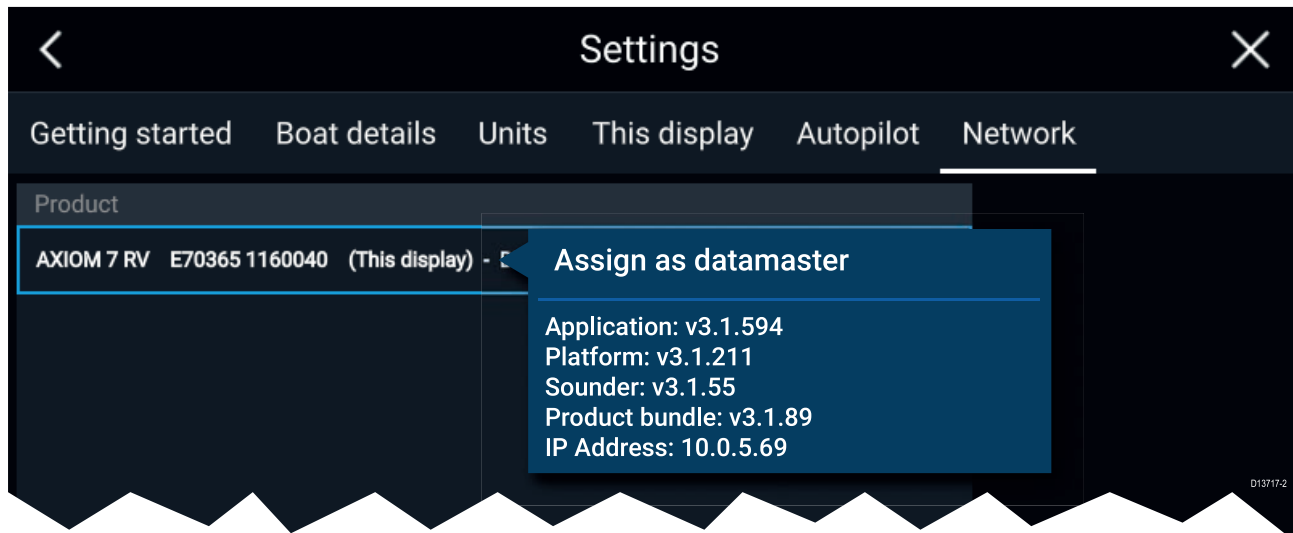
- Cartography
- Waypoints, Routes and Tracks
- Radar
- Sonar
- Data received from the autopilot, GNSS (GPS) receiver, instruments, transducers, the engine and any other compatible external sources.

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



## Switching Data Master

You can switch the MFD you want to be the Data master at any time.



From the Network tab: **Homescreen > Settings > Network:**

1. From the list, select the MFD you want to designate as the new Data master.
2. Select **Assign as Data Master** from the pop-over options.

## Shared Brightness

You can set up Shared Brightness groups which enables simultaneous brightness adjustment of all units that are part of the same group.

The following products are compatible with Shared Brightness:

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

Any adjustments to the Shared Brightness level will be reflected on all units assigned to the same group.



Multiple brightness groups can be configured. These groups could be used to reflect the physical location of units on your vessel. For example, the units at your helm can be set to one group, and the units on the flybridge can be set to a different group.

Shared Brightness requires:

- all units to be compatible with the Shared Brightness function (see list of compatible units above).
- the **Shared brightness** setting set to On for all units in the brightness group.
- units to be assigned to Network Groups.
- all the displays in that group to be synchronized.

### Setting up shared brightness

Before setting up Shared brightness on your MFD, ensure that all displays that you want to use Shared brightness are switched on and set to the same Display group as your MFD.

1. Select **This display** from the **Settings** menu: **Homescreen > Settings > This display**.
2. Select **Display group**.  
A list of available display groups is displayed.
3. Select the Display group that you want the MFD to be part of (All displays that you want to share brightness with must be set to the same group).
4. Enable **Shared brightness** using the Toggle switch.
5. Select **Sync**.

'Shared brightness active' is displayed when complete.

## Customizing the splashscreen

The standard AXIOM splashscreen, displayed on start up, can be customized on Axiom™, Axiom™ Pro, and Axiom™ XL displays.

Custom Image requirements:

- The customized image must be in .png, .bmp or .jpg format.
- Custom images cannot exceed the maximum resolution supported by your MFD.
- For optimum image quality, the resolution of the splashscreen image should match the resolution of your MFD. Refer to the following table: [Axiom screen resolutions](#).

### Note:

- Splashscreen settings are unique to each MFD and are not shared across the network with other MFDs.
- Custom splashscreens are not available on eS Series and gS Series MFDs that have been upgraded to run LightHouse 3 software.

1. Save your custom image to a MicroSD card and insert the card into a card reader slot on your MFD or connected card reader.
2. Select **This display** from the **Settings** menu: **Homescreen > Settings > This display**.
3. Select the image name next to **Splashscreen**.  
The file browser is displayed.
4. Browse to your custom image and select it.
5. Select **Yes**.  
The image is imported to your MFD's internal storage.

The next time your MFD powers up, your custom image will be displayed.

## Axiom screen resolutions

The screen resolutions for Axiom™, Axiom™ Pro, and Axiom™ XL displays are shown below.

MFD variant	Screen resolution
Axiom™ 7	800 x 480
Axiom™ 9	800 x 480
Axiom™ 12	1280 x 800
Axiom™ Pro 9	1280 x 720
Axiom™ Pro 12	1280 x 800
Axiom™ Pro 16	1920 x 1080
Axiom™ XL 16	1920 x 1080
Axiom™ XL 19	1920 x 1080
Axiom™ XL 22	1920 x 1080
Axiom™ XL 24	1920 x 1200

## Resetting the splashscreen graphic

1. Select **This display** from the **Settings** menu: **Homescreen > Settings > This display**.
2. Select the **Reset** from the Splashscreen section.
3. Select **Yes**.

The next time your MFD starts up the standard AXIOM splashscreen will be displayed.

## NMEA 0183 settings

NMEA 0183 devices can be connected to Axiom™ Pro, Axiom™ XL, eS Series, and gS Series MFDs using the NMEA 0183 wires on the supplied Power/Video/NMEA 0183 cable.

2 NMEA 0183 ports are available:

- **Port 1:** Input and output, 4,800 or 38,400 baud rate.
- **Port 2:** Input only, 4,800 or 38,400 baud rate.

The baud rate for each input port must be specified in the **NMEA set-up** menu (**Homescreen > Settings > Network > NMEA set-up** ).

**Note:**

- For Port 1, both the input and output communicate at the same baud rate. For example, if you have one NMEA 0183 device connected to Port 1 INPUT, and another NMEA 0183 device connected to Port 1 OUTPUT, both NMEA devices must use the same baud rate.

### NMEA 0183 settings

The following options are available from the **NMEA Set-up** menu.

Menu item	Description	Options
<b>NMEA Port 1</b>	Baud rate selection.	<ul style="list-style-type: none"> <li>• 4,800</li> <li>• 38,400</li> </ul>
<b>NMEA input port 2</b>	Baud rate selection.	<ul style="list-style-type: none"> <li>• 4,800</li> <li>• 38,400</li> </ul>
<b>Bridge heading</b>	Bridge heading data from NMEA 0183 to NMEA 2000 / SeaTalkng®	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
<b>Transmission mode</b>	<p>Switches between Single-ended and Differential transmission modes. The Differential transmission mode supports higher speeds, longer cable runs, and better data integrity. Differential mode works when connected to opto-isolated inputs, as specified by the NMEA 0183 standard. The Single-ended mode is required when sending a signal to a single-ended receiver device, such as a PC for example. Refer to the <i>NMEA 0400 Installation Standard</i> for wiring guidelines for the different transmission modes.</p> <div> <p><b>Note:</b> Only available on Axiom™ Pro and Axiom™ XL displays.</p> </div>	<ul style="list-style-type: none"> <li>• Single-ended</li> <li>• Differential</li> </ul>
<b>Individual outputs</b>	List of NMEA 0183 sentences for which the output can be disabled.	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>

## 5.12 Connecting to a wireless display

Axiom™, Axiom™ Pro, and Axiom™ XL MFDs can be connected to a wireless display using an external dongle or a display that has built-in support. When connected the MFD's screen is mirrored on the wireless display.

1. Follow the instructions provided with your wireless display / dongle to set up that specific device.
2. On the MFD, select the display icon found under **Wireless display:** on the **This Display** tab of the **Settings** menu: (**Homescreen > This Display > Wireless Display:**).

Your MFD will search for available wireless displays.



3. Select the display you want to use.
4. If your MFD has Wi-Fi Sharing enabled then a PIN number is displayed on the wireless display, input this pin number when requested by your MFD.
5. You may also be requested to allow the MFD to connect automatically in future, select **Yes** or **No** as appropriate on your wireless display.  
Your MFD screen will now be displayed on the select device.
6. To allow the wireless display to connect each time your MFD is powered on, enable **Connect on power up** from the pop-over options.



### Note:

1. Don't forget to check your wireless display for any required confirmations / acknowledgements during the connection process.
2. Some non Miracast-certified devices may not be able to connect with Wi-Fi Sharing enabled, in this case disable Wi-Fi Sharing and try again.
3. If you experience connection issues, try disabling and enabling the wireless display feature on your display and MFD, or power cycle both devices.
4. Once connected / paired to a wireless display do not change your MFD's Wi-Fi Passphrase, as on certain devices a factory reset maybe required to re-establish a connection.

## Disconnecting a wireless display

With a wireless display connection active:

1. Select Disconnect from the **This Display** tab: (**Homescreen > Settings > This Display > Wireless Display: > Disconnect**).

## Unpairing a wireless display

With the wireless display connection active:

1. Select the connected display from the Wireless display menu: (**Homescreen > Settings > This Display > Wireless Display**).
2. Select the connected display from the list of available displays.
3. Select **Unpair** from the pop-over menu.

## Chapter 6: Autopilot control

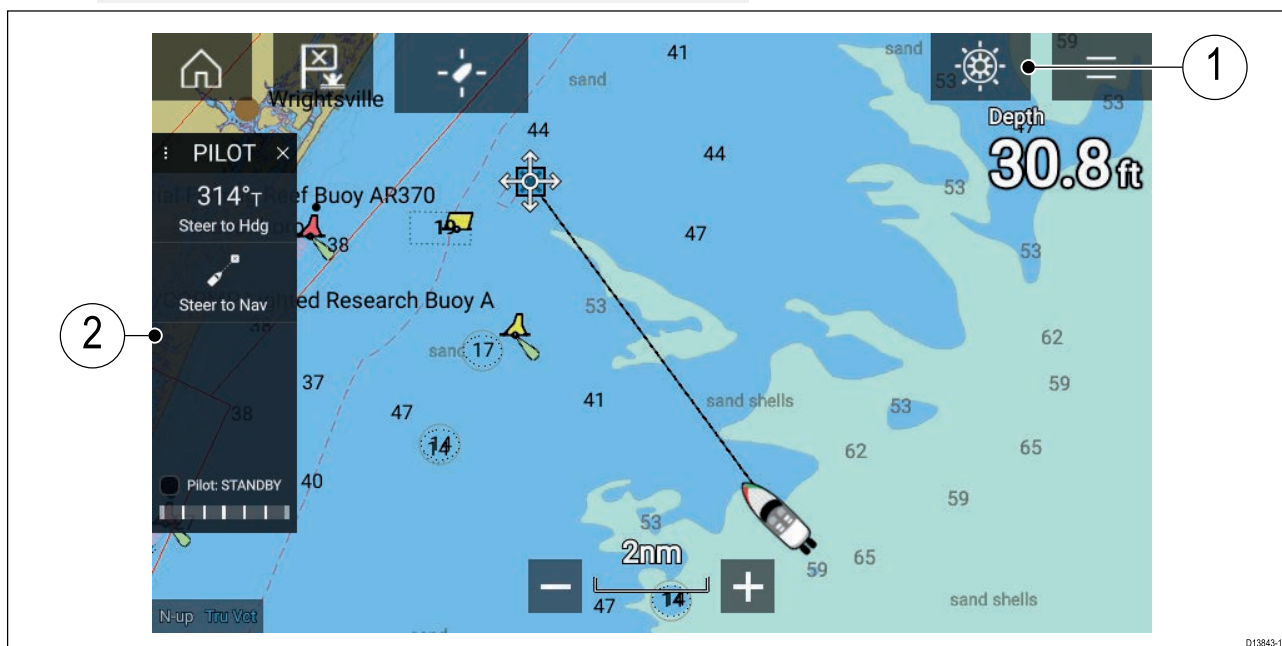
### Chapter contents

- [6.1 Autopilot control on page 84](#)
- [6.2 Pilot sidebar on page 86](#)
- [6.3 Pilot pop-up on page 88](#)
- [6.4 Autopilot Control — Advanced settings on page 89](#)

## 6.1 Autopilot control

Your MFD can be integrated with an Evolution autopilot system and act as the autopilot's controller. Please refer to the documentation supplied with your autopilot for details on installing and connecting your autopilot to your MFD.

Autopilot control from your MFD can be enabled and disabled from the **Autopilot** tab in the **Settings** menu: **Homescreen > Settings > Autopilot > Pilot control**.



1. **Pilot icon** — With **Autopilot control** enabled, the Pilot icon is displayed onscreen; selecting the icon displays the Pilot sidebar. When the Autopilot is engaged the Pilot icon is replaced with the Disengage pilot icon.
2. **Pilot sidebar** — The Pilot sidebar provides controls and information relating to your autopilot system. With the Autopilot engaged the Pilot sidebar's content is expanded to provide further controls and information. The Pilot sidebar can be hidden by swiping the sidebar to the left. The sidebar can be displayed again by swiping from the left of the screen towards the center of the screen.

### Engaging the autopilot — Locked heading

With Autopilot control enabled:

1. For Wheel and Tiller pilots, engage the mechanical drive by either engaging the wheel drive's clutch or attaching the pushrod onto the tiller pin.
2. Select the **Autopilot icon**.  
The Pilot sidebar is displayed.
3. Select **Steer to Hdg**.
4. Select **Engage pilot**.

### Engaging the autopilot — Navigation

With Autopilot control enabled:

1. For Wheel and Tiller pilots, engage the mechanical drive by either engaging the wheel drive's clutch or attaching the pushrod onto the tiller pin.
2. Initiate a Goto or Follow from the chart app.
3. Select the **Autopilot icon**.  
The Pilot sidebar is displayed.
4. Select **Steer to Nav**.
5. Select either **Engage pilot** or if a cross track error exists then select **ALONG route leg** or **DIRECT from here**.

Selecting **ALONG route leg** will steer along the original track.

Selecting **DIRECT from here** will plot a new track from your current position to the destination.

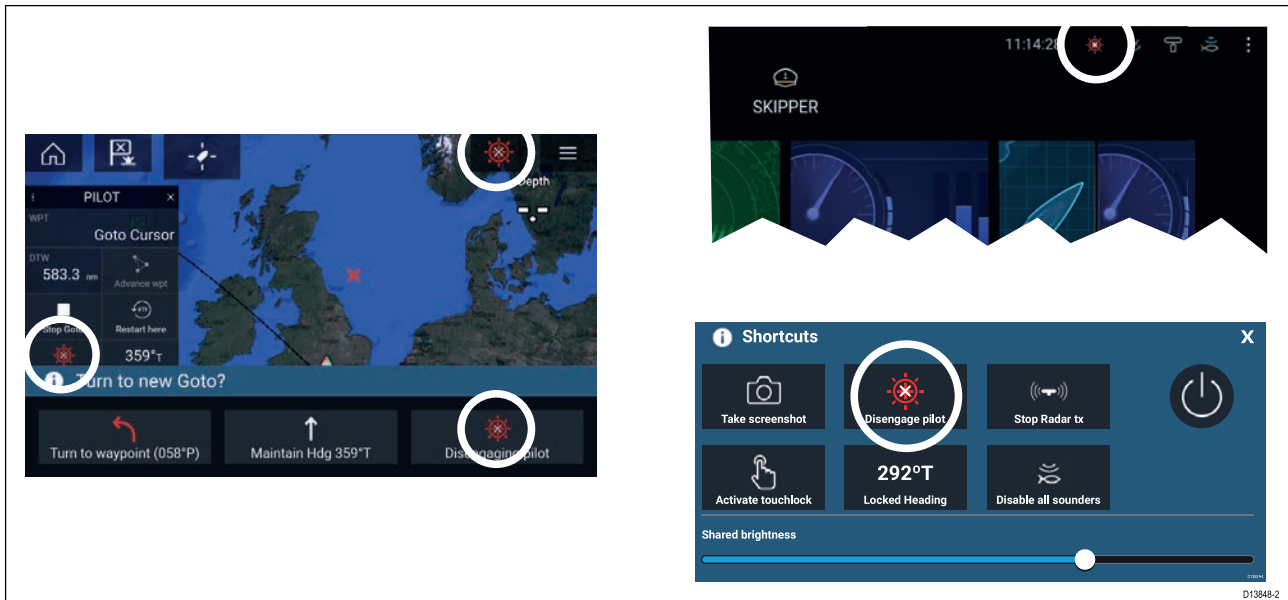


## Engaging and disengaging the autopilot - physical buttons

The process for engaging your autopilot using the physical buttons available on a RMK remote keypad or an Axiom Pro is shown below.

1. Press and hold the **Pilot** button to engage the autopilot in Locked heading mode.
2. Press the **Pilot** button again to disengage the autopilot.

## Disengaging the autopilot



You can disengage your autopilot at any time by selecting the **Disengage pilot icon**.

The **Disengage pilot icon** is available in all apps. It is also available on the Pilot sidebar, in Pilot pop up messages, on the Homescreen and on the Shortcuts page.

## 6.2 Pilot sidebar

Depending on the state of your autopilot the following information and controls are available on the Pilot sidebar.

**Note:** The Pilot sidebar is controlled using the Touchscreen.


### Pilot sidebar — Standby

	1	<b>Sidebar selection</b> Enables you to switch between Pilot and Data sidebars.
	2	<b>Close</b> Closes the Pilot sidebar.
	3	<b>Steer to Hdg</b> Enables you to engage the autopilot in locked heading (Auto) mode.
	4	<b>Steer to Nav</b> Enables you to engage the autopilot in Navigation (Track) mode.
	5	<b>Pilot status</b> Provides the status of the autopilot.
	6	<b>Rudder bar</b> Provides visual indication of rudder position.

### Pilot sidebar — Locked heading (Auto)

	1	<b>Heading</b> Displays your autopilot's current locked heading. Selecting displays the Locked Heading adjustment pop-over.
	2	<b>-1°</b> Selecting will adjust your locked heading by minus 1 degree.
	3	<b>+1°</b> Selecting will adjust your locked heading by plus 1 degree.
	4	<b>-10°</b> Selecting will adjust your locked heading by minus 10 degrees.
	5	<b>+10°</b> Selecting will adjust your locked heading by plus 10 degrees.
	6	<b>Disengage</b> Selecting will disengage your autopilot.
	7	<b>Steer to Nav</b> Selecting will engage your autopilot in Navigation mode.
	8	<b>Pilot state</b> Displays the current state / mode of your autopilot.

## Pilot sidebar — Navigation (Track)

 <p>The screenshot shows the PILOT sidebar with the following elements and callouts:</p> <ul style="list-style-type: none"> <li>1: Waypoint 1 header</li> <li>2: DTW 1.77 47 nm</li> <li>3: Advance wpt button</li> <li>4: Stop Route button</li> <li>5: Restart here button</li> <li>6: Disengage button (red X icon)</li> <li>7: 315°T Steer to Hdg button</li> <li>8: Pilot: NAVIGATION status bar at the bottom</li> </ul>	1 <b>Destination</b> Displays your current destination.
	2 <b>User customizable data</b> Displays user customizable data. Select to customize data.
	3 <b>Advance wpt</b> Selecting will advance your destination to the next waypoint in the current route.
	4 <b>Stop Route / Stop Goto</b> Selecting will stop current navigation.
	5 <b>Restart here</b> Selecting will restart the cross track error (XTE) at your current location.
	6 <b>Disengage</b> Selecting will disengage your autopilot.
	7 <b>Steer to Hdg</b> Selecting will switch your autopilot to Locked heading mode.
	8 <b>Pilot state</b> Displays the current state / mode of your autopilot.

## 6.3 Pilot pop-up

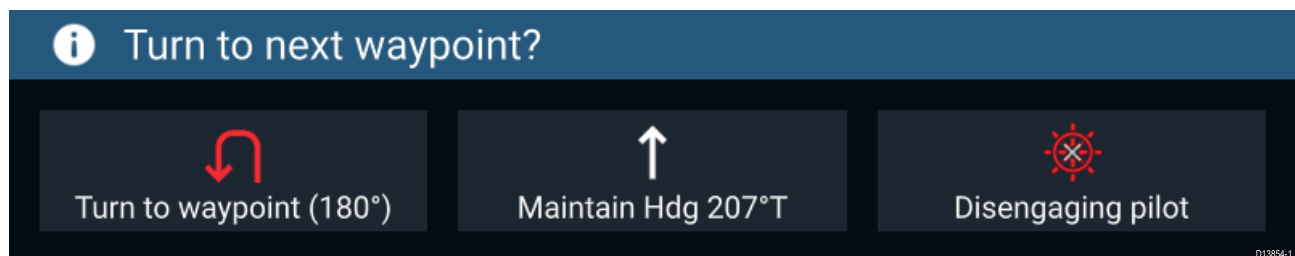
During active navigation, when you reach your current destination the Pilot pop-up is displayed.

### Goto



When performing a Goto the Pilot pop-up provides options to disengage the autopilot or to maintain the current course in Locked heading mode.

### Follow



When following a Route the Pilot pop-up provides options to make the required turn to the next waypoint, disengage the autopilot or to maintain the current course in Locked heading mode.

## 6.4 Autopilot Control — Advanced settings

Menu item	Description	Options
<b>Vessel hull type</b>	Selecting the hull type that is the closest match for your vessel provides optimum steering performance.	<ul style="list-style-type: none"> <li>• Sail</li> <li>• Sail (slow turn)</li> <li>• Sail Catamaran</li> <li>• Power</li> <li>• Power (slow turn)</li> <li>• Power (fast turn)</li> </ul>
<b>Drive type</b>	Selecting the drive type that matches your vessel's drive will provide optimum drive performance.	List of drives compatible with your ACU.
<b>Compass offset</b>	Adjust the Compass offset so that your autopilot's heading matches the ship's compass. The display of autopilot heading data requires a second networked MFD or pilot controller. Compass offset will be adjusted automatically during the <b>Align compass to GPS procedure</b> .	<ul style="list-style-type: none"> <li>• -10° to +10°</li> <li>• 0° (default)</li> </ul>
<b>Speed input <sup>(1)</sup></b>	Selects the source for speed data.	<ul style="list-style-type: none"> <li>• Auto (default)</li> <li>• Water speed (STW)</li> <li>• SOG</li> <li>• Default cruise speed</li> </ul>
<b>Cruise speed <sup>(1)</sup></b>	Set the Cruise speed value to your vessel's typical cruising speed.	<ul style="list-style-type: none"> <li>• 4.0kts to 60.0kts</li> </ul>
<b>Calibration lock</b>	The calibration lock is used to lock out specific calibration settings which if changed may require recommissioning of the autopilot system. If your system has been dealer installed then the lock may be turned on.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Dockside wizard</b>	Dockside calibration must be carried out before using your autopilot for the first time. The Dockside wizard guides you through the dockside calibration process. The steps included in the dockside wizard are dependent on whether you have a rudder reference transducer fitted to your vessel.	<ul style="list-style-type: none"> <li>• Drive type</li> <li>• Rudder limit</li> <li>• Align rudder</li> <li>• Hard over time</li> <li>• Rudder drive check</li> </ul>
<b>Restart compass</b>	Select to restart the compass linearization procedure.	<ul style="list-style-type: none"> <li>• Start</li> <li>• Cancel</li> </ul>
<b>Compass lock</b>	Locks the compass linearization so that further automatic linearization is not performed.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Align compass to GPS <sup>(1)</sup></b>	Follow the onscreen instructions to align your compass with your GPS heading.	
<b>Pilot factory reset</b>	Resets your autopilot's settings to factory default values.	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
<b>CCU debug level <sup>(1)</sup></b>	Sets a debug value for troubleshooting purposes. The debug level should only be set when requested by Technical Support as part of a troubleshooting process.	<ul style="list-style-type: none"> <li>• 0 to 63</li> </ul>

Menu item	Description	Options
<b>ACU debug level</b> <sup>(1)</sup>	Sets a debug value for troubleshooting purposes. The debug level should only be set when requested by Technical Support as part of a troubleshooting process.	<ul style="list-style-type: none"> <li>• 0 to 63</li> </ul>
<b>Rudder damping</b> <sup>(1)</sup>	Rudder damping is used to prevent the autopilot from “hunting” maneuvers. Always use the lowest acceptable value.	<ul style="list-style-type: none"> <li>• 1 to 9</li> <li>• 3 (default)</li> </ul>
<b>Auto turn angle</b> <sup>(1)</sup>	Determines the amount of course change when performing an auto turn.	<ul style="list-style-type: none"> <li>• 10° to 125°</li> <li>• 90° (default)</li> </ul>
<b>Power steering</b> <sup>(3)</sup>	Determines the behavior of the Rotary or Joystick.	<ul style="list-style-type: none"> <li>• Off</li> <li>• Proportional</li> <li>• Bang Bang</li> </ul>
<b>Reverse rudder ref</b> <sup>(3)</sup>	Inverts the rudder reference display graphic.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Motor phasing</b> <sup>(1)</sup>	Switches the polarity of your drive motor. Use if your drive polarity is inverted.	<ul style="list-style-type: none"> <li>• A</li> <li>• B</li> </ul>
<b>Rudder offset</b> <sup>(3)</sup>	Adjust to specify the rudder offset from amidships.	<ul style="list-style-type: none"> <li>• -10° to +10°</li> <li>• 30° (default)</li> </ul>
<b>Rudder limit</b>	Specifies how far the rudder can move before hitting its end stops. The value should be set to approximately 5° less than your maximum rudder angle.	<ul style="list-style-type: none"> <li>• 10° to 50°</li> <li>• 30° (default)</li> </ul>
<b>Hard over time</b>	Specifies the time it takes for the rudder to move from hard port to hard starboard or vice versa. The default value is determined by your <b>Drive type</b> selection.	<ul style="list-style-type: none"> <li>• 1 to 100.0 seconds</li> </ul>
<b>Gybe inhibit</b> <sup>(2)</sup>	When set to <b>Prevent Gybe</b> the autopilot will prevent you from performing an Auto tack away from the wind.	<ul style="list-style-type: none"> <li>• Allow Gybe</li> <li>• Prevent Gybe</li> </ul>
<b>Wind vane type</b> <sup>(2)</sup>	Selects whether wind data is True or Apparent.	<ul style="list-style-type: none"> <li>• Apparent</li> <li>• True</li> </ul>
<b>Wind shift alarm</b> <sup>(2)</sup>	Enables and disables the Wind shift alarm.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

**Note:**

(1) Option not available when **Calibration lock** is **On**.

(2) Only available when Vessel hull type is set to a Sailing vessel.

(3) Only available when a rudder reference transducer is connected.

## Chapter 7: Waypoints, Routes and Tracks

### Chapter contents

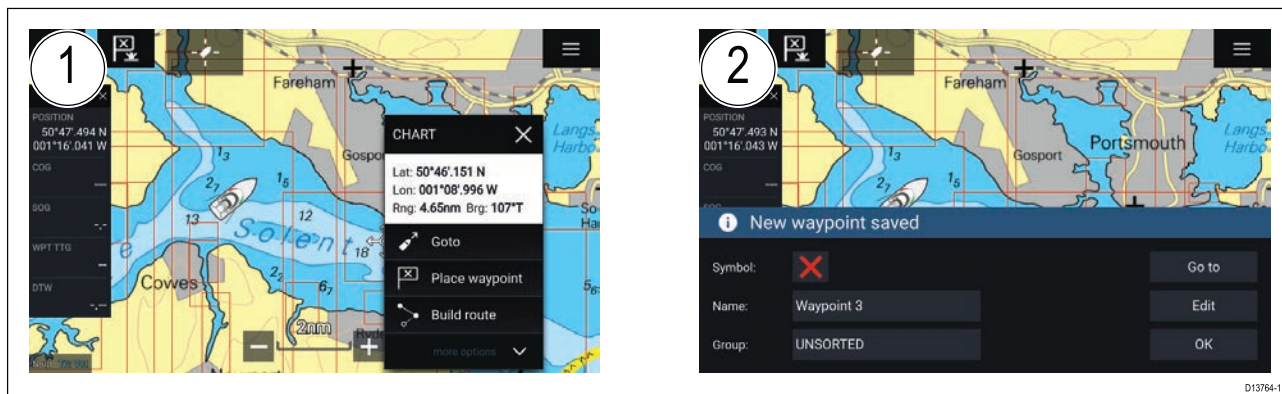
- [7.1 Waypoints on page 92](#)
- [7.2 Routes on page 95](#)
- [7.3 Tracks on page 99](#)

## 7.1 Waypoints

Waypoints are used to mark specific locations or points of interest. Waypoints can be used in the Chart, Radar and Sonar apps. Your MFD can store up to 10,000 waypoints which can be sorted into up to 200 waypoint groups.

In the Chart app you can navigate to a waypoint by selecting **Goto** from the Waypoint context menu.

### Placing a waypoint



1. Select and hold on the desired location and select **Place waypoint** from the context menu..
2. Select **Edit** to edit the waypoint details, **Goto** to navigate to the Waypoint, or **OK** to return to normal operation.



To place a waypoint at your vessel's current location press the Waypoint/MOB icon or physical button.

### Placing a waypoint at a specified lat/long

You can place a waypoint at a specified latitude and longitude.

1. Select **New waypoint at lat/long** from the New page in the Chart app menu: **Menu > New > New waypoint at lat/long**
2. Enter the latitude and longitude for the waypoint.
3. Select **Save**.

### Waypoint management

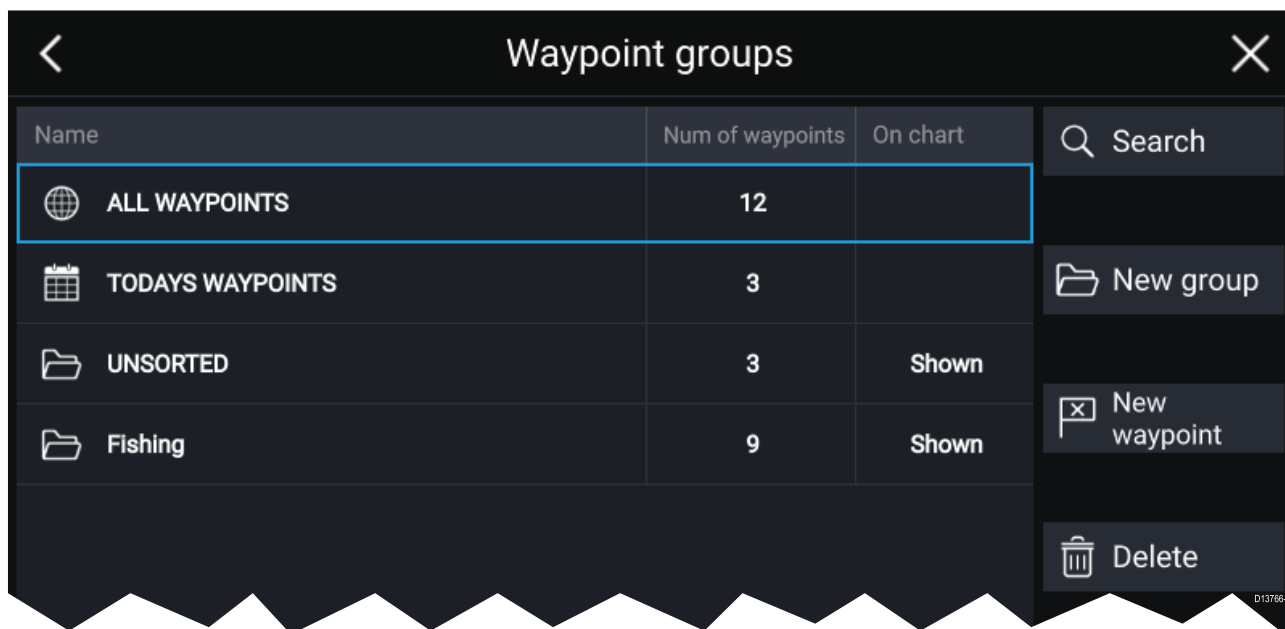
Waypoints are managed using the Waypoint list.

The Waypoint list can be accessed from the Homescreen and from the Chart app: **Homescreen > My data > Waypoints**, or **Chart app > Menu > Waypoints, routes, tracks > Waypoints**.

#### Waypoint list

The Waypoint list is sorted into groups. Selecting a group displays a list of all the waypoints included in that group. Selecting a waypoint displays the customizable details for that waypoint.

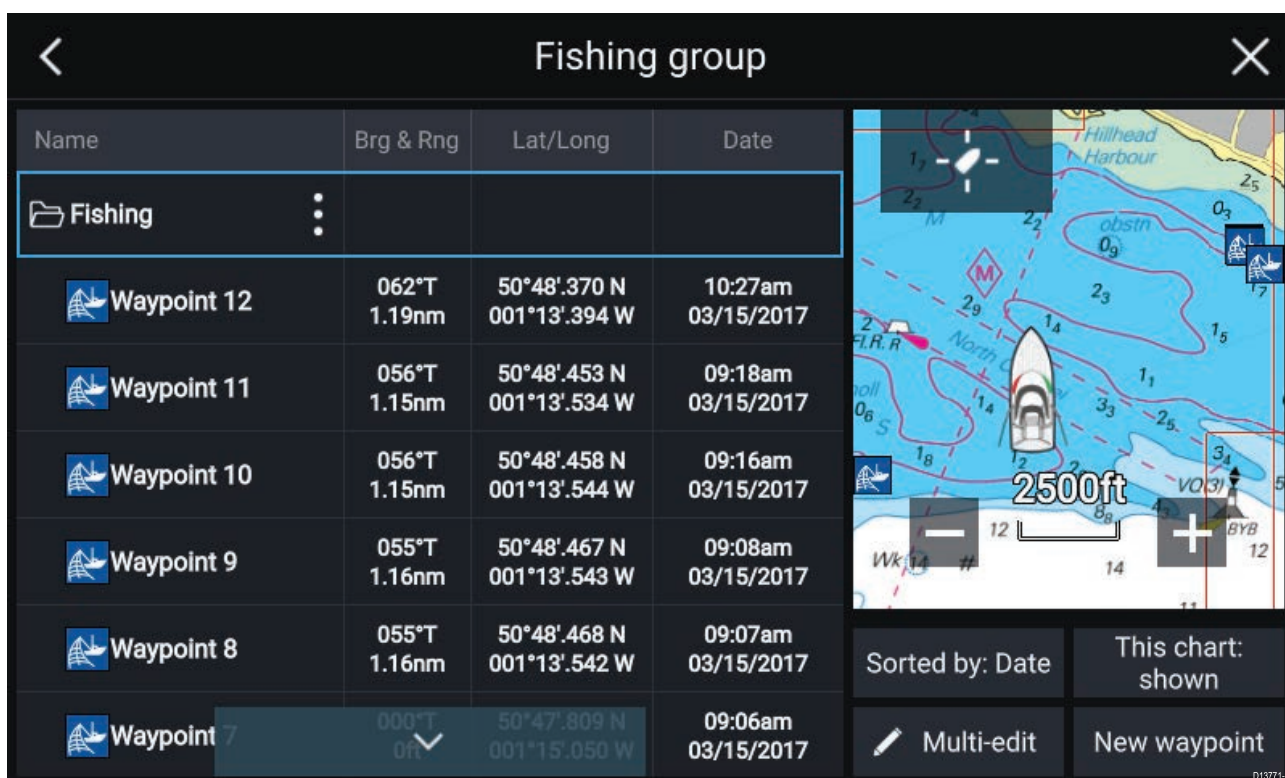




From the Waypoint list you can **Search** for a waypoint, Create a **New group**, Create a **New Waypoint** or **Delete** a waypoint group.

Selecting a Waypoint group from the list displays a list of all waypoints in that group.

### Group lists



If the Waypoint list is accessed from the Chart app menu, the selected group or waypoint is displayed in a Chart pane on the right of the screen.

You can **Rename**, **Delete** or **Hide/Show** the group by selecting the Group name at the top of the list.

From the group list you can change the list sort order, Hide/Show the Waypoint group in the current Chart app instance or create a **New waypoint**.

Use the **Multi-edit** option to make the same change to multiple Waypoints (e.g. change symbol, delete waypoints or move to a different group).

Select a waypoint to view its details.

## Waypoint details

<


Waypoint 10

×

Name:

Waypoint 10

Symbol:



Group:

Fishing

Position:

50°48'.458 N 001°13'.544 W

Bearing:

055.7°T

Range:

1.15nm

Water temp:

-.-

Depth:

-.-

Time:


09:16:12am

Date:

03/15/2017

Comment:

Good fishing



Delete

View on chart

Go to

D13772-1

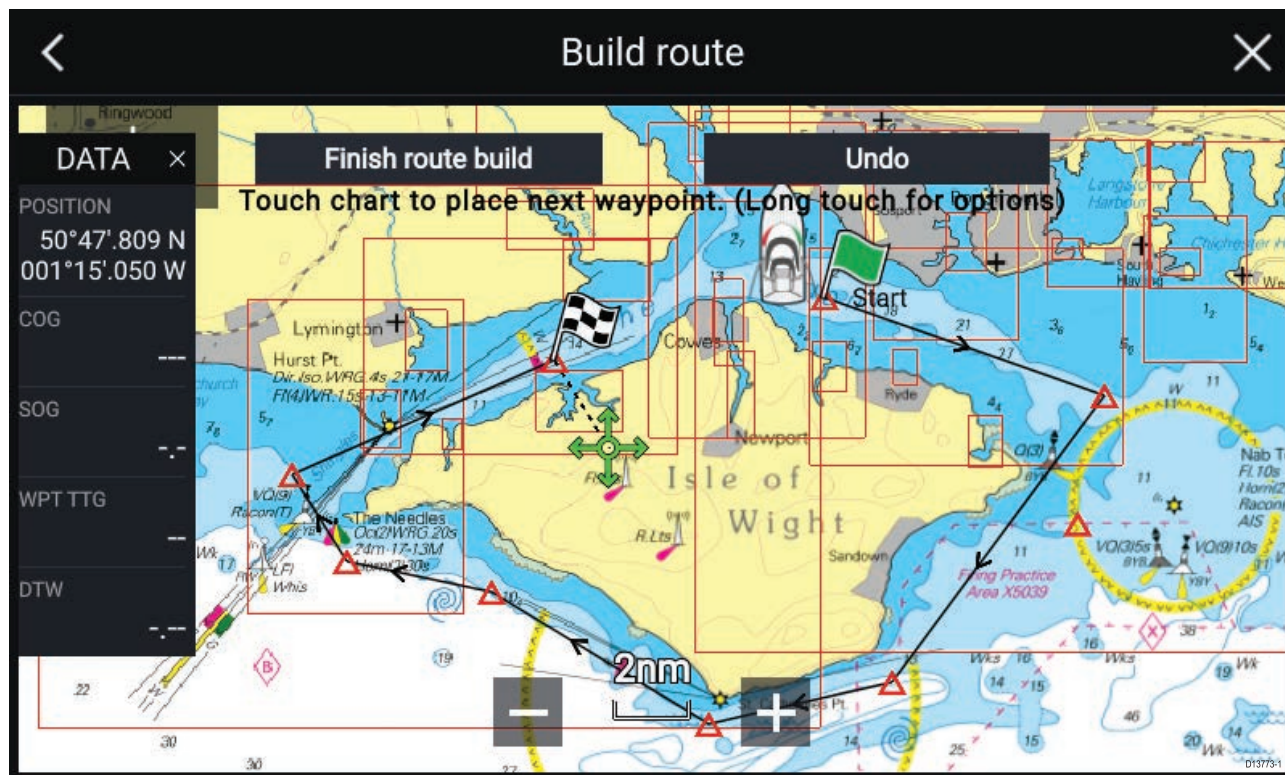
The details for the waypoint can be customized by selecting the relevant field. You can also **Delete** the waypoint, set a **Goto**, or **View on chart**.

## 7.2 Routes

Routes are used to plan your journey in advance. You can plan your journey directly on your MFD, or at home using software capable of exporting Waypoints and Routes in standard .gpx format, such as Raymarine's Voyage Planner software.

Routes consist of a number of waypoints. Your MFD can store up to 250 Routes, each Route consisting of up to 500 waypoints. The Route capacity limit is subject to your MFD's 10,000 Waypoint limit (for example, your MFD could store 20 Routes each containing 500 waypoints).

### Creating a Route



1. Select and hold on the location for the first waypoint.
2. Select **Build route** from the context menu.
3. Select the location for the second waypoint.  
The 2 waypoints will be joined by a line, creating the first leg of your route.
4. Select the location for subsequent waypoints.
5. Check your Route will be safe to follow, you can move the waypoints in your route by dragging them to a new location.
6. When your Route is complete select **Finish route build**.

#### Use Autorouting during route creation

Whilst building a route you can use Autorouting to automatically add a route leg to a route you have already started to create. The Autorouting features require compatible cartography.

1. Press and hold anywhere on screen and select either **Autoroute to wpt** or **Autoroute to here**.

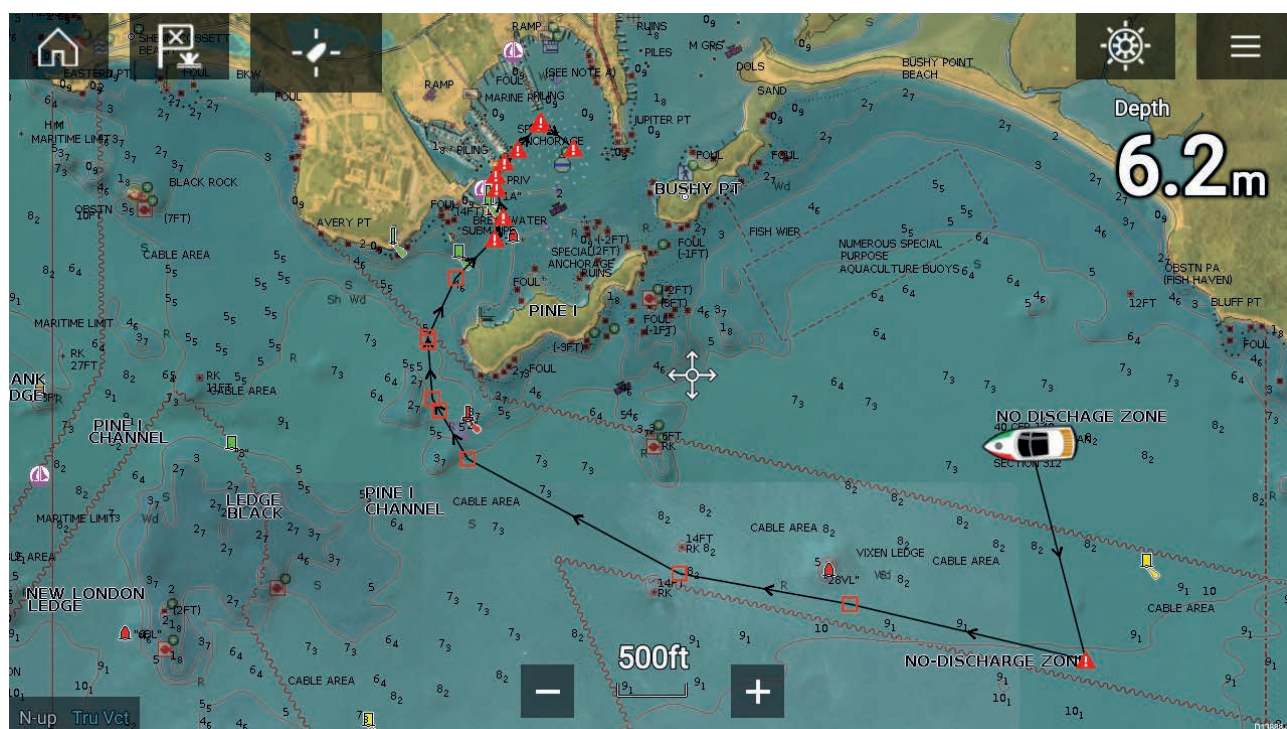
*Selecting **Autoroute to wpt** will allow you to select a waypoint from your Waypoints list to include in your route, selecting **Autoroute to here** will create a route leg to the cursor's current position.*

Once an Autoroute leg has been added you can select **Finish route build** or add further manual or autoroute route legs.



## Autorouting

Autorouting is available when using compatible cartography. Autorouting allows you to build a route automatically between a point on the chart and your vessel.



You can select any point on the Chart and from the Chart context menu select **Autoroute to here** or you can select **Autoroute to** from an existing waypoint's context menu to create a route automatically between your vessel and the chosen point.

The created route is generated by comparing data available on your cartography against the minimum safe distances specified in the **Boat details** menu: (**Homescreen > Settings > Boat details**).

Waypoints will not be placed in areas that conflict with your specified minimum safe distances. Caution symbols are used for waypoints that are near objects or restricted areas.

Never follow a route before checking each route leg is safe for your vessel.

### Reviewing an automatically generated route

Before following any route you must ensure that it is safe to do so.

Upon Route completion:

1. Range in on each route leg and waypoint that make up the Route.
2. Check either side of the route leg and around the waypoint for any possible obstructions.

*Obstructions can be charted objects or restricted areas. Routes generated automatically should use the caution waypoint symbol in areas where there are possible obstructions.*

3. Where obstructions exist move the necessary waypoints so that the waypoint and route leg is no longer obstructed.

### Importing a route

You can import routes created in standard gpx format.

1. Save your route to a memory card.
2. Insert the memory card into your MFD.
3. Select Import from card from the Import/export page: **Homescreen > My data > Import/export > Import from card**.
4. Locate and select the gpx file that contains your Route.  
The Route will be imported to your MFD.

## Route management

Routes are managed using the Route list.

The Route list can be accessed from the Homescreen and from the Chart app: **Homescreen > My data > Routes**, or **Chart app > Menu > Waypoints, routes, tracks > Routes**.

If the Route list is accessed from the Chart app menu, then the selected route is displayed in a Chart pane on the right of the screen.

### Route list

The 'Routes' screen displays a table with the following data:

Routes	Length	Num of wpts
Route 2	46.54nm	8
Route 3	3.31nm	2

To the right of the table is a map view showing the selected route (Route 2) in the Solent area, with waypoints marked by red triangles. The map includes labels for 'Southampton', 'Ports', 'Cowes', 'Isle of Wight', 'Needles', and 'St. Catherine's Pt'.

From the route list you can **Delete** routes or create a **New route** using existing waypoints.

To view a route plan, select a route and choose **View route plan**.

### Route plan

The route plan displays a list of all waypoints in the route and when accessed from the Chart app also includes a Chart pane showing the route's location.

The 'Route plan: Route 2' screen displays a table with the following data:

Route	Brg	Dist	ETA
Route 2			
Waypoint 21	143°T	2.03nm	--/--
Waypoint 36	115°T	8.62nm (10.64nm)	--/--
Waypoint 39	218°T	9.54nm (20.18nm)	--/--
Waypoint 40	257°T	5.46nm (25.64nm)	--/--
Waypoint 41	301°T	7.38nm (33.02nm)	--/--
		4.29nm	--/--

Below the table is a map view showing the route (Route 2) in the Solent area, with waypoints marked by red triangles. The map includes labels for 'Southampton', 'Ports', 'Cowes', 'Isle of Wight', 'Needles', and 'St. Catherine's Pt'. A distance of 5nm is indicated on the map.

At the bottom of the screen, there is a status bar showing 'Time: 11:34 03/17/2017' and a set of controls including 'Current SOG: 0.0kts', 'Follow', 'Reverse', 'Add waypoint', and 'Route options'.

From the Route plan you can:

- navigate the route by selecting **Follow**
- change the route direction by selecting **Reverse**

- add an existing waypoint to the route by selecting **Add waypoint**
- change route options by selecting **Route options**

By selecting a waypoint from the route plan you can change the waypoint order by moving the waypoint up and down the list. You can also remove the waypoint from the list, delete the waypoint, edit the waypoint details or start the Route follow from any waypoint in the route.

#### Route options

<b>Rename route</b>	Give the route a name.
<b>Color</b>	Change the color of the route, as displayed in the Chart app.
<b>Time</b>	Switch the time between ETA (Estimated Time of Arrival) and TTG (Time To Go).
<b>Speed</b>	Switch the speed between <b>Actual</b> (SOG) and <b>Planned</b> . When the speed is set to Planned you can select a desired speed for navigating the route.
<b>Hide/show on chart</b>	Choose whether the Route should be displayed in the Chart app or not.
<b>Export</b>	Export the route to a memory card.
<b>Delete route</b>	Delete the route.

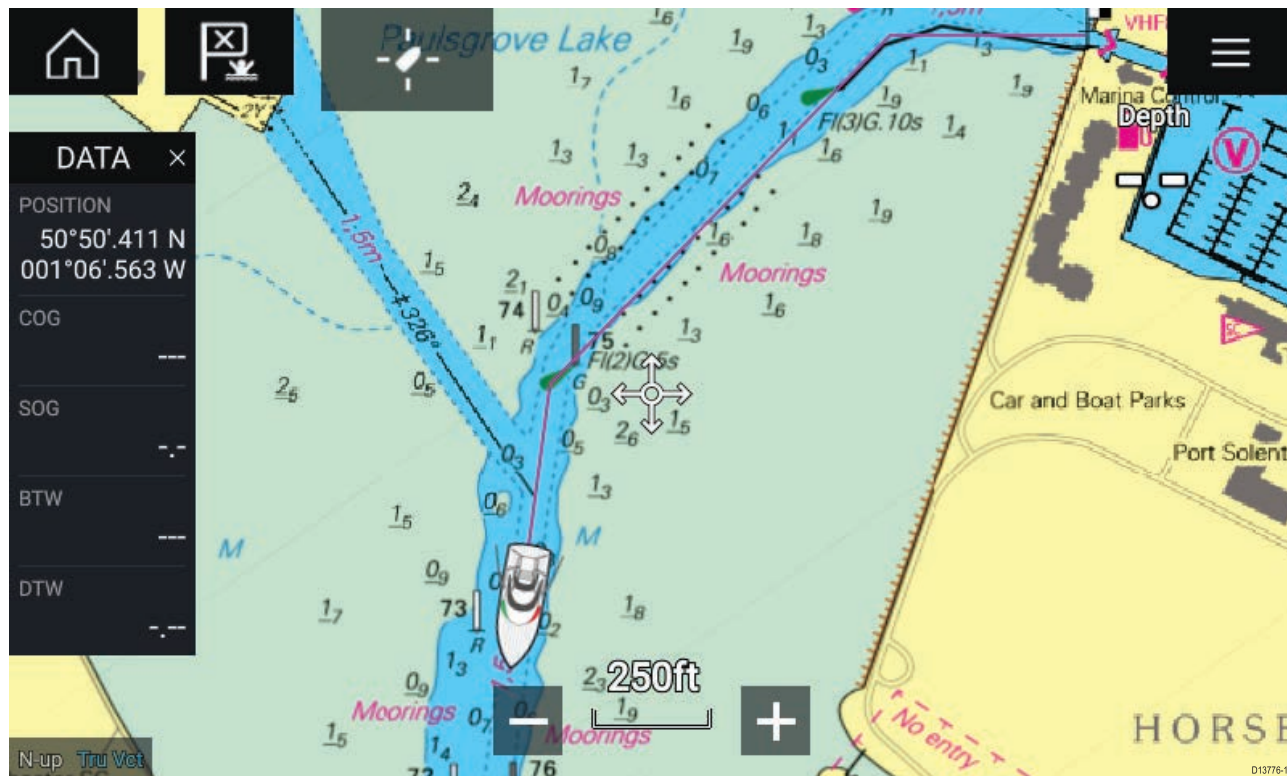
## 7.3 Tracks

Tracks are used to record where you have been. Tracks are made up of track points that are created at regular time or distance intervals. You can store up to 15 tracks on your MFD, each track can contain up to 10,000 points.

Tracks can be converted into Routes so that they can be followed.

### Creating a track

You can record your vessel's journey using Tracks.



1. Select and hold on your vessel icon to display the vessel pop-over options.
2. Select **Start track**.  
Your vessel's journey will now be recorded.
3. Select **Stop track** from the pop-over options when you have completed your track.
4. Select **Save** to save the track or **Delete** to remove the track.

You can also start a new track recording at anytime from the Chart menu: **Menu > New > Start a new track**. When using the Chart menu to start a track, if a track is already recording then it will be saved before the new track is started. Once a Track is saved it can be converted to a Route so that the same passage may be followed again at a later date.

### Converting a track to a route

From the Track list: **Menu > Waypoints, routes, tracks > Tracks**.

1. Select a track.
2. Select **Create route from track** from the pop-over options.
3. Select **OK**.

### Track management

Tracks are managed using the Track list.

The Track list can be accessed from the Homescreen and from the Chart app: **Homescreen > My data > Tracks**, or **Chart app > Menu > Waypoints, routes, tracks > Tracks**.

If the Track list is accessed from the Chart app menu, then the selected track is displayed in a Chart pane on the right of the screen.










## Track list

<

Track list

>

Name	Points	Length
 Track 8	8	3.56nm
 Track 9	8	0.90nm
 Track 10	2	361ft
 Track 11	2	194ft
 Track 12	2	217ft
 Track 13	5	2.46nm




Record by:

Interval:

Auto

Auto

 Delete

Start track

From the track list you can Start or Stop tracks recording, **Delete** a track or choose how tracks are recorded.

### Track interval

The track interval determines the time period or distance between track points when recording a track. You can choose whether to record track points by Time, by Distance or set to Auto.

- In **Auto** the track interval is set automatically to minimize the track points used whilst maintaining the actual path taken.
- When set to **Time**, you can choose a specified time period between track points.
- When set to **Distance** you can choose a specified distance between track points.

### Customize tracks

From the Track pop-over options you can:

- rename a track
- change track color
- create a route from a track
- delete a track
- hide/show the track in the Chart app.



## Chapter 8: Chart app

### Chapter contents

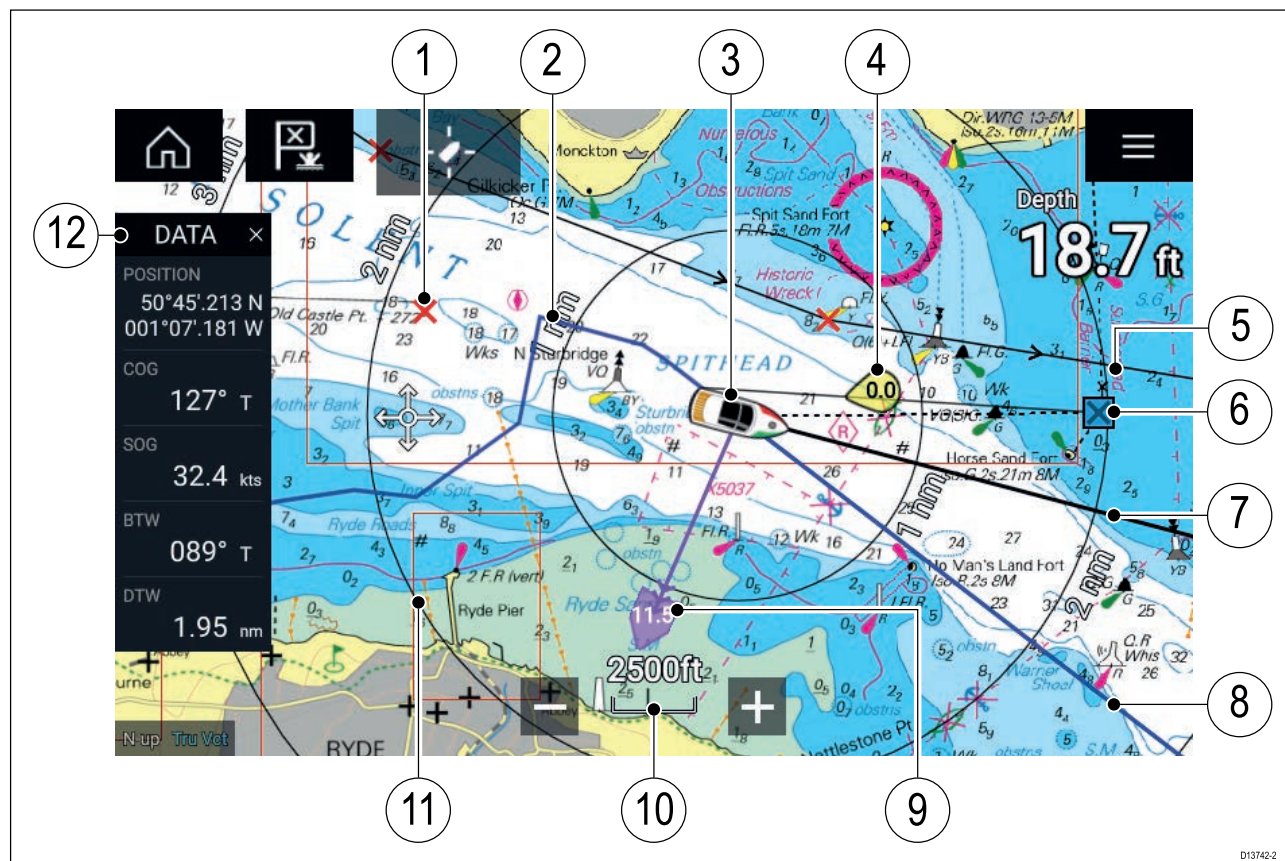
- [8.1 Chart app overview on page 102](#)
- [8.2 Navigation on page 109](#)
- [8.3 Target tracking on page 110](#)
- [8.4 Tides mode on page 115](#)
- [8.5 Find nearest on page 120](#)
- [8.6 SonarChart™ Live on page 122](#)
- [8.7 UAV Chart integration on page 123](#)
- [8.8 ClearCruise™ Augmented Reality on page 125](#)
- [8.9 Chart settings menu on page 127](#)

## 8.1 Chart app overview

The Chart app displays a representation of your vessel in relation to land masses and other charted objects, which enables you to plan and navigate to your desired destination. The Chart app requires a GNSS (GPS) position fix in order to display your vessel at the correct location on a world map.

For each instance of the Chart app you can select which electronic cartography you want to use. The selection will persist over a power cycle.







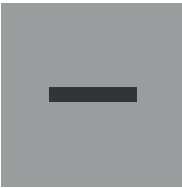
The Chart app can be displayed in both fullscreen and splitscreen app pages. App pages may consist of up to 4 instances of the Chart app.



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1	<b>Waypoint</b> Use waypoints to mark specific locations or points of interest.	2	<b>Track</b> You can record the passage your vessel takes using Tracks.
3	<b>Vessel icon</b> This icon represents your vessel, only displayed when a GNSS (GPS) position fix is available. The icon will be a black dot if no Heading is available).	4	<b>Wind indicator</b> Provides indication of wind direction and speed (Wind transducer required).
5	<b>Route</b> You can plan your route in advance by creating a Route using Waypoints to mark each route leg.	6	<b>Destination waypoint</b> During a Goto, this is the current destination waypoint.
7	<b>Heading line</b> If Heading data is available, a Heading vector for your vessel can be displayed.	8	<b>COG line</b> If COG data is available, you can display a COG vector for your vessel.
9	<b>Tide indicator</b> Provides tide Set and Drift indicators. Requires the following data: COG, Heading, SOG, and STW (Speed Through Water).	10	<b>Chart range</b> Identifies the scale for the displayed Chart range.
11	<b>Range rings</b> Provides a distance indication around your vessel at set intervals.	12	<b>Sidebar</b> The Sidebar contains system data that can be viewed in all apps.

## Chart app controls

Icon	Description	Action
	Home icon	Takes you to the Homescreen
	Waypoint / MOB	Place waypoint / hold down to activate Man overboard (MOB) alarm
	Pilot icon	Opens and closes the Pilot Sidebar
	Menu icon	Opens the app menu
	Find vessel	Centers your vessel onscreen.
	Range In	Decreases the range/distance displayed onscreen.
	Range Out	Increases the range/distance displayed onscreen.

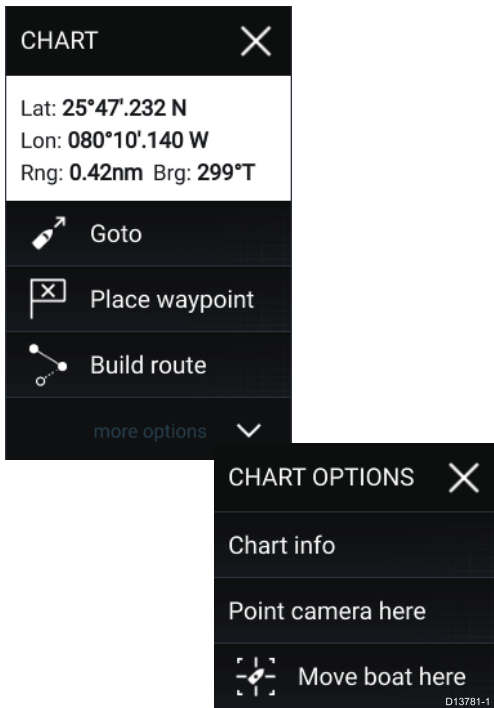
## Chart ranging and panning

You can change the range displayed in the Chart app using the onscreen Range controls or by using the pinch-to-zoom multi-touch gesture.

You can pan the chart area by swiping your finger across the chart.

## Chart app context menu

Context menus provide context sensitive menu options.



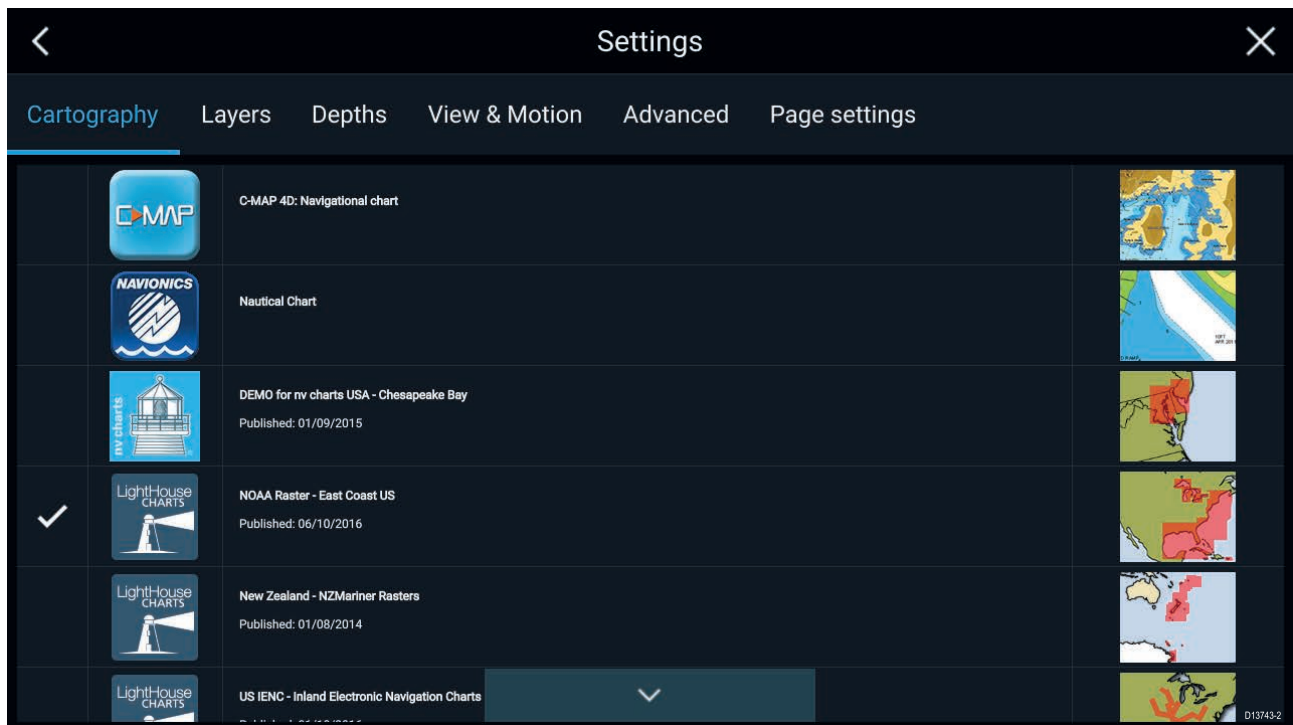
- Context menus are accessed in the Chart app by pressing and holding on a location or object.
- The context menu provides Latitude, longitude, range and bearing details for the selected location or object.
- The context menu provides quick access to relevant settings or features.
- Select **More options** to display further options.

**Note:**

The **Move boat here** option is only available in Demo/simulator mode.

## Selecting a chart card

You can use LightHouse™ charts and compatible Navionics and C-MAP electronic charts. The electronic chart cards must be inserted into the MFD's MicroSD card reader (or the card reader of an MFD on the same network).



From the Chart app menu:

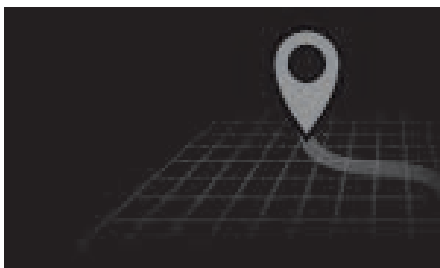
1. Select the **Settings** icon.
2. Select the cartography that you want to use from the Cartography tab.

You may choose a different chart for each instance of the Chart app, accessed from the Homescreen. Cartography selection will persist until changed.

## Chart modes

The Chart app provides preset modes that can be used to quickly set up the Chart app for your intended use.

To change Chart mode select the required mode from the app menu.



### **SIMPLE**

In Simple mode, chart detail is suppressed to provide a clearer, simpler view for navigation and only navigation related menu options are available. Settings changes are not saved.



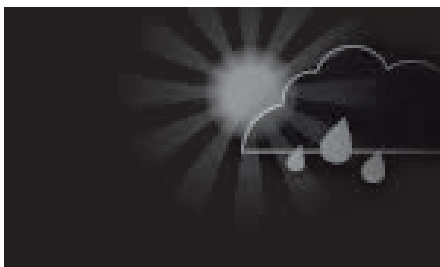
### **DETAILED**

Detailed is the default mode. Full chart detail and menu options are available. Settings changes are saved to the user profile in use.



### **FISHING CHART**

Fishing mode optimizes the Chart app for Fishing and if supported by your selected cartography, displays more detailed contour lines. Full menu options are available. Settings changes are saved to the user profile in use.



### **WEATHER**

Weather mode is available when the MFD is connected to a compatible Weather receiver (SR150).

Weather mode allows you to overlay weather data directly on the chart and view animated weather graphics or read weather reports. Only Weather related menu options are available. Settings changes are saved to the user profile in use.

For further details on Weather mode refer to: [Chapter 9 Weather mode](#)



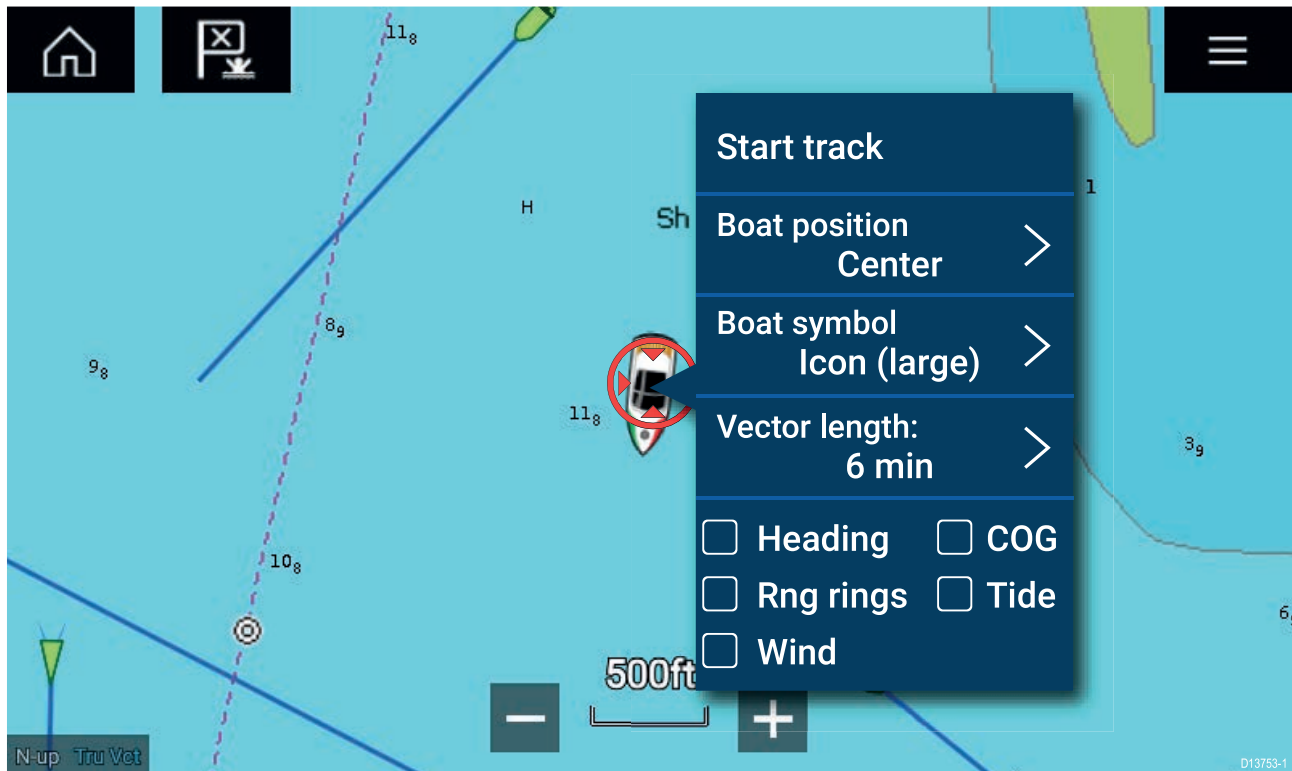
### **TIDES**

In Tides mode, Tide Station and Current Station icons are replaced with graphics representing Tide and Current conditions. Animation controls are displayed that enable playback of Tide and Current predictions over a 24 hour period.

Tides mode also suppresses chart detail, to enhance the Tide and Current graphics and enables own vessel Tide vector graphics.

## Vessel details

The Vessel details pop-over provides access to vessel-related settings.



From the Vessel details pop-over you can:

- start/stop a track.
- offset the position of the vessel symbol.
- change the symbol used to represent your vessel.
- set the length of vessel vectors.
- show / hide Heading and COG vectors.
- show / hide Range Rings.
- show / hide Tide and Wind graphics.

### Note:

In **Simple mode**, the only option available is Start/stop track.

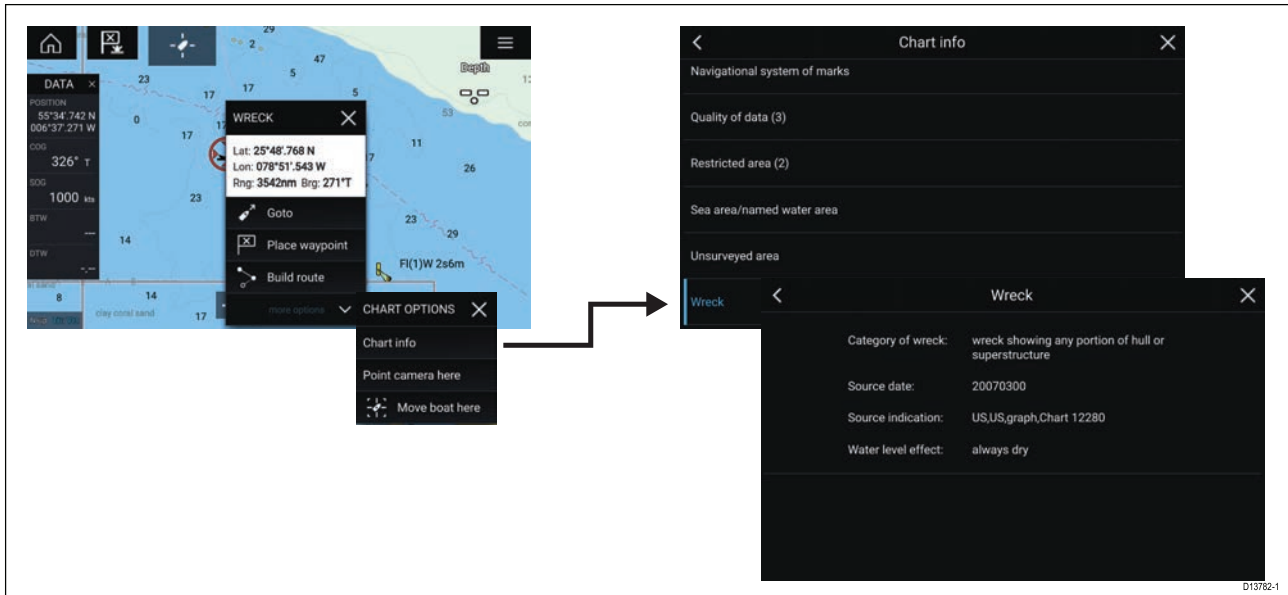
## Object selection and information

Charted objects, available on your cartography can be selected and object information can be viewed.



When you select an object the cursor will change to the Object cursor.





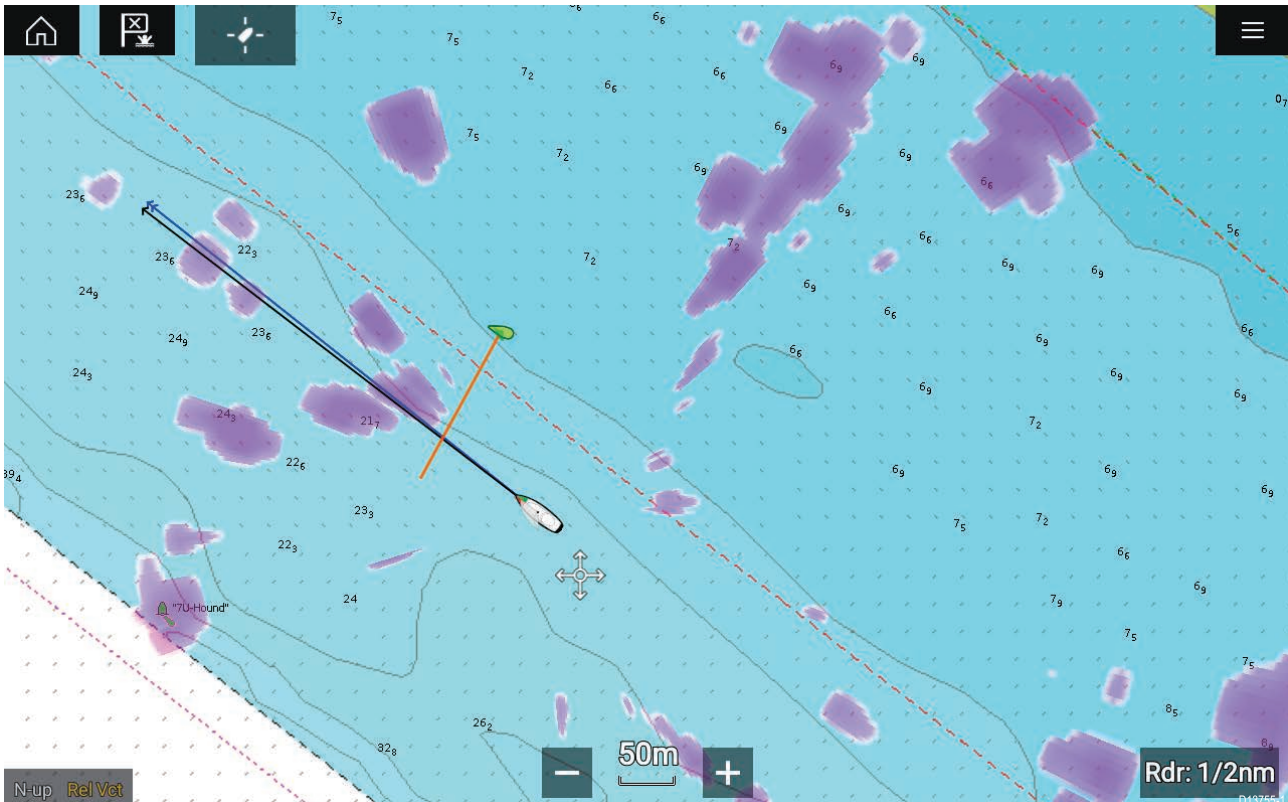
Selecting and holding on the object will display the object context menu.

From the context menu select: **More options > Chart info** and then select the object from the list to view its details.

In areas where there is a high concentration of charted objects, selecting **Nearby objects** from the context menu will display a list of objects located nearby for you to choose from.

## Layers

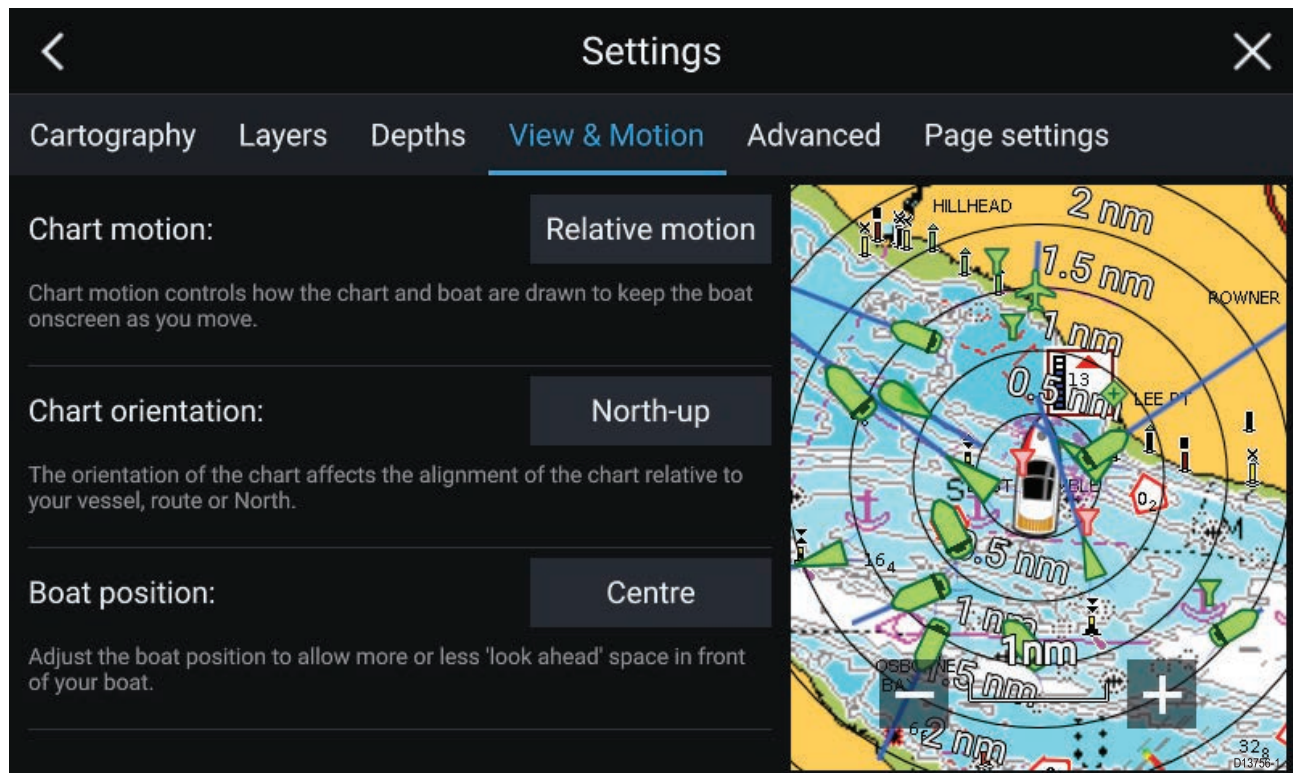
Layers are additional data views that can be overlaid (superimposed) on the Chart app. Types of layer include: aerial photographs, AIS targets, Radar image, range rings, tide graphs, weather Radar and crowd-sourced content.



The Layers tab in the Chart app Settings menu provides controls for the Chart layers: **Menu > Settings > Layers**.

## View and motion

The view and motion tab allows you to control how the chart is displayed in relation to your vessel.



### Chart motion

Chart motion controls how the chart and boat are drawn to keep the boat onscreen as you move.

### Chart orientation

The orientation of the chart affects the alignment of the chart relative to your vessel, route or North.

### Boat position

Adjust the boat position to allow more or less 'look ahead' space in front of your boat.

## Camera tracking

When connected to a compatible Pan and Tilt Thermal camera you can track targets or point your camera at a specific target or area.

2 options are available for camera tracking:

- **Point camera here** — Points the camera at a specific point onscreen, the camera will remain pointed at this area regardless of your own vessel's course.
- **Track with camera** — Tracks a selected target regardless of your own vessel's or target's course.

Camera tracking options are available from the Context menu in the Chart and Radar apps: **Context menu > more options > Point camera here**, or **Context menu > more options > Track with camera**.

### Automatic tracking

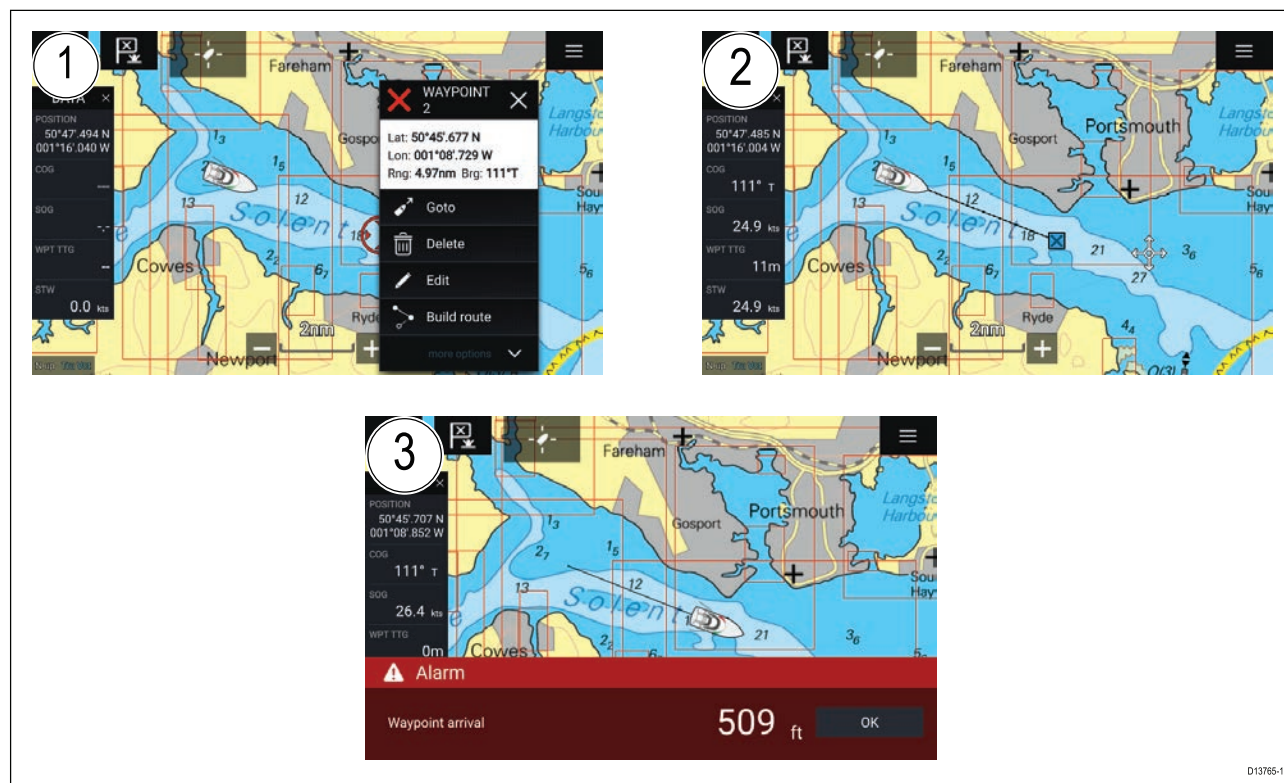
You can use the Camera app settings to configure automatic tracking for AIS, Radar and MoB targets: **Camera app > Menu > Settings > Camera motion > AUTO TRACKING**



## 8.2 Navigation

### Navigating to a waypoint or point of interest

You can perform a “Goto” to a Waypoint or specific location.



1. Select and hold on the waypoint or point of interest and select **Goto** from the context menu.

*You can stop the **Goto** at any time by selecting and holding anywhere in the Chart app and choosing **Stop**, or selecting another **Goto**.*

2. The Chart app will begin navigation, if required physically engage your autopilot.
3. An alarm will sound when you reach the waypoint.

You can also perform a Goto from the **Go** menu: **Menu > Go > Waypoint** or **Menu > Go > Lat/long**.

### Restarting cross track error (XTE)

A cross track error (XTE) occurs when your actual route diverges from your original planned route. Restarting XTE plots a new course directly from your current position to your destination, rather than continuing to follow the original planned route.

1. Select **Restart XTE** from the **Navigation** menu: **Menu > Navigation > Restart XTE**.

### Following a Route

You can follow a saved route.

With the Route displayed in the Chart app:

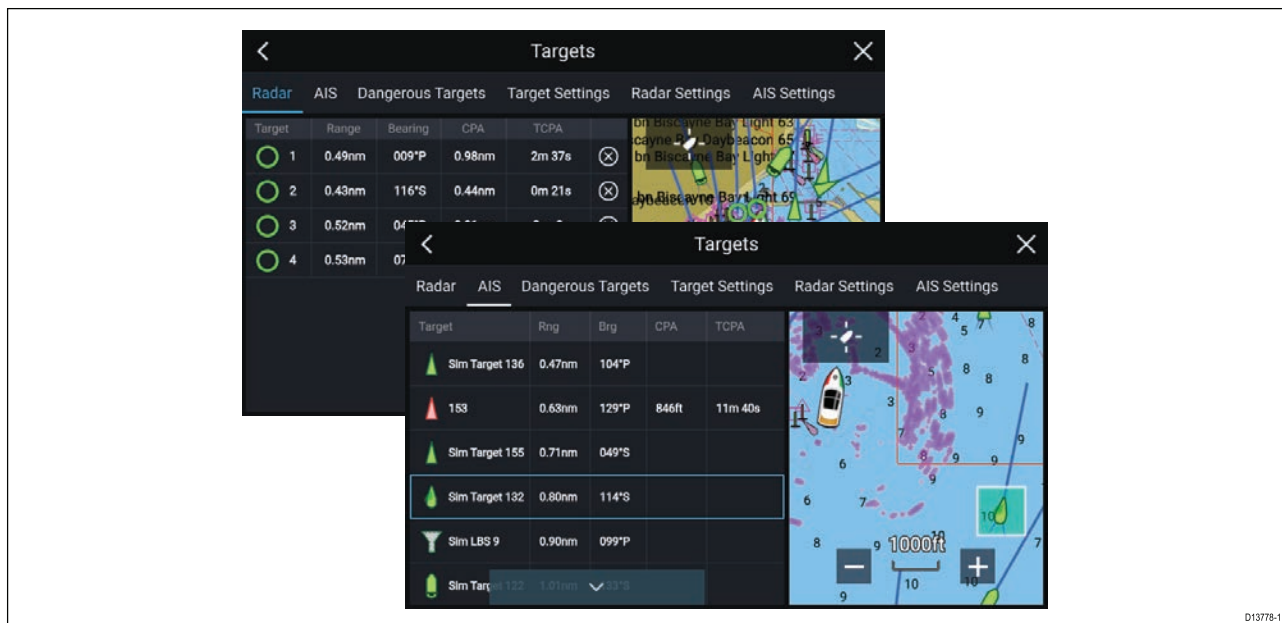
1. Select and hold on a Route leg within the Route you want to follow.
2. Select **Follow Route** from the Route context menu.

## 8.3 Target tracking

With compatible AIS and Radar hardware connected to your MFD, AIS and Radar targets can be tracked in the Chart and Radar apps.

When targets are being tracked they appear in the AIS or Radar targets list.

The target lists can be accessed by selecting **Targets** from the app menu: **Menu > Targets**, and then selecting the relevant tab.



Selecting a target from the list highlights the selected target in the **LiveView** app pane on the right of the page.

The list identifies: Target name, Range from your vessel, and Bearing. Where relevant, CPA (Closest point of approach) and TCPA (Time to Closest Point of Approach) values will also be displayed.

### AIS list

The AIS target list displays pop-over options which enable you to **View full target data** or add a target as an AIS buddy by selecting **Add as buddy**.

The Buddy feature enables you to add AIS-equipped friends and regular contacts to a “Buddy List” on your MFD. As soon as a vessel on your Buddy List comes within range of your AIS receiver, the onscreen vessel icon changes to indicate this.

AIS icons used for targets marked as buddies will be filled yellow. You can also rename buddy targets or remove targets from your buddy list.

### Radar list

The Radar target list can be **Sorted By:** target **Number** or its **Range** from your vessel.

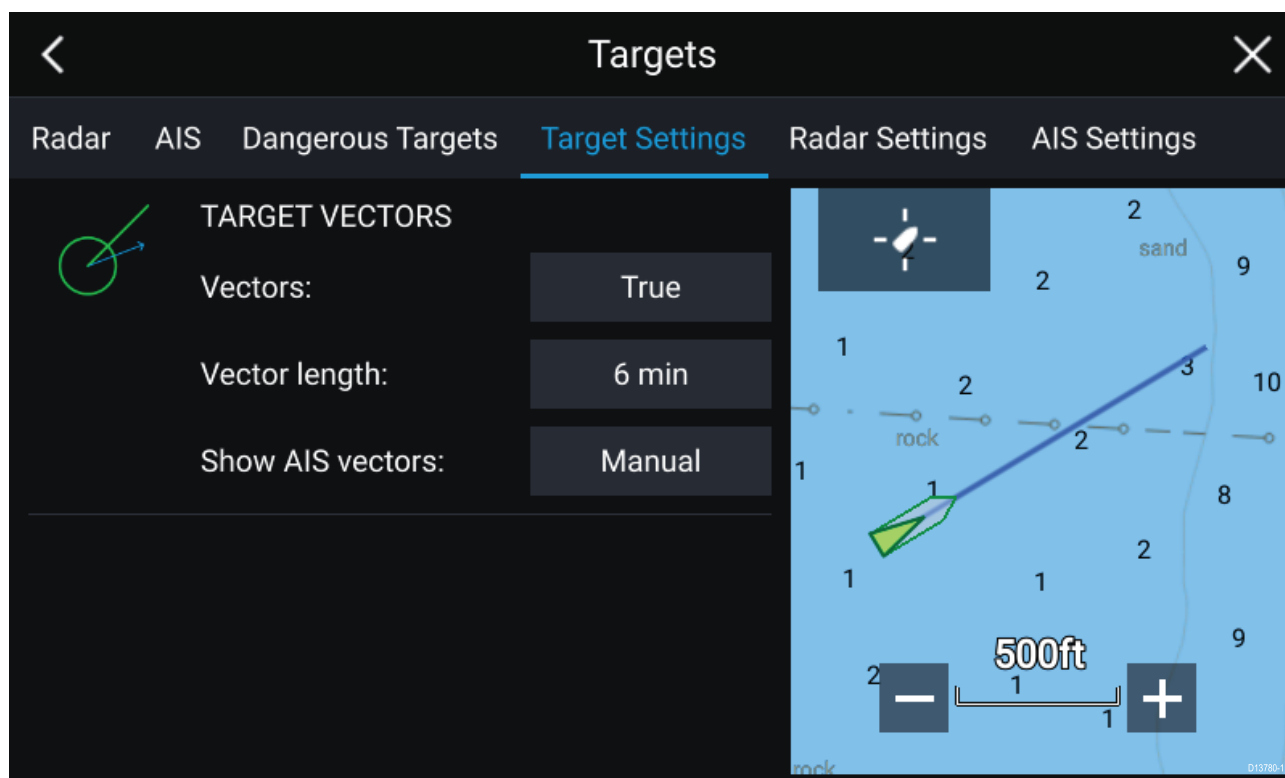
Radar targets can be cancelled individually by selecting the ‘X’ next to the target’s details in the list, or you can cancel all targets by selecting **Cancel all targets**.

You can display Radar target information onscreen by selecting **Target info** from the Radar target pop-over options.

### Target vectors

Vector graphics can be displayed for AIS targets.

Target vectors settings can be accessed from the **Target Settings** tab: **Menu > Targets > Target settings**.



The vectors can be set to **True** or **Relative**.

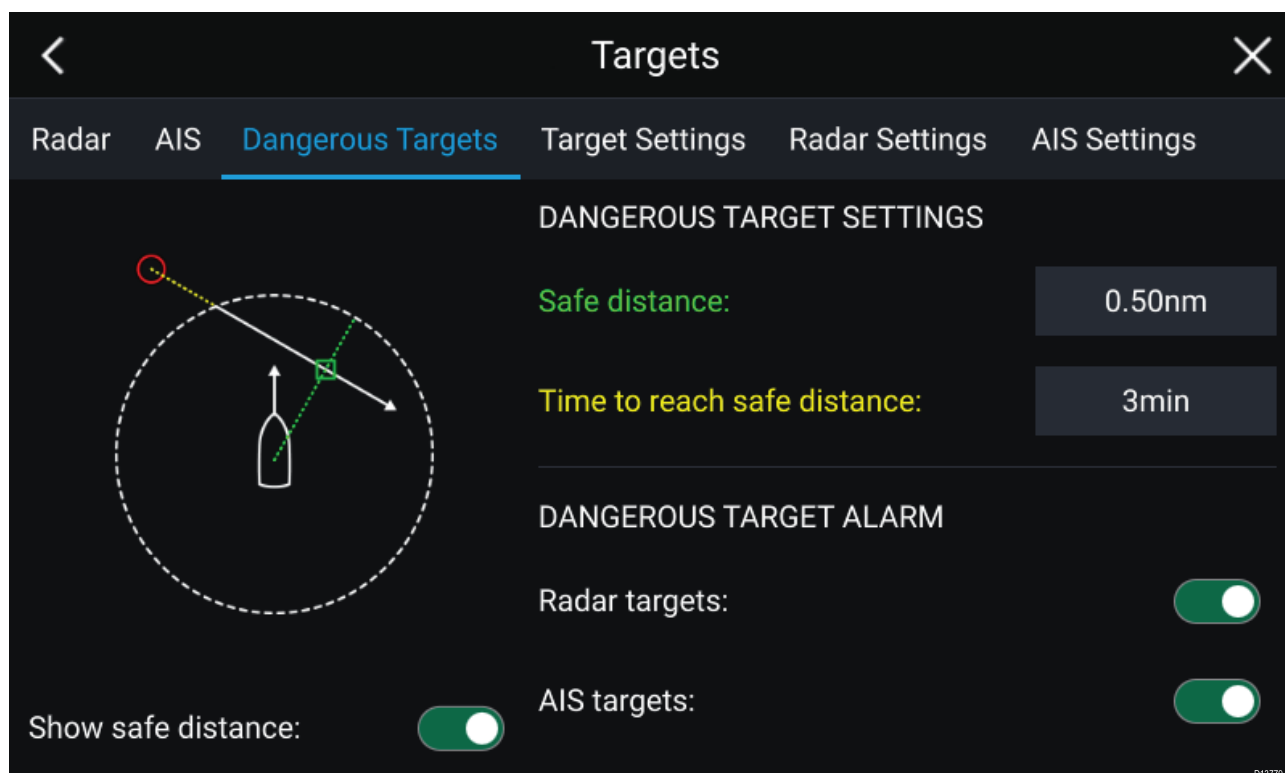
The Vector length identifies where the target will be after the specified time has passed. You can adjust the length of the vector by selecting a time from the **Vector length** pop-over options.

AIS vectors can be set to **All** (displayed for all targets) or **Manual** (only displayed when enabled using the target's context menu).

Target vectors can be enabled and disabled for individual targets: Press and hold on an AIS target to display the context menu, and then select **Vector**.

## Dangerous targets alarm

You can use the Dangerous targets alarm to notify you if a target will reach a specified distance from your vessel within a specified time.



To set up the Dangerous target alarm, first adjust the **Safe distance** to the desired value and then select a **Time to reach safe distance**. The alarm will be triggered if a tracked target will reach the specified Safe distance from your vessel within the time period selected.

You can select whether you want the Dangerous target alarm to track **Radar targets**, **AIS targets** or both.

You can display a Safe distance ring around your vessel in the Chart and Radar app using the **Show safe distance** control.

## Radar settings

When the Radar layer is enabled in the Chart app you can configure the **Radar settings** from the **Targets** menu: **Menu > Targets > Radar settings**.

Setting	Description	Options
<b>Radar selection</b>	When more than 1 Radar scanner is connected you can choose which Radar to use for the Radar layer in the Chart app.	List of available Radar scanners
<b>Transmit</b>	Start the Radar scanner transmitting or put it in Standby.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Dual range</b>	Enables and disables dual range on compatible Radar scanners	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Channel</b>	When Dual range is active, you can switch between channels.	<ul style="list-style-type: none"> <li>• 1</li> <li>• 2</li> </ul>
<b>Show Radar overlay</b>	Enables and disables the Radar layer in the Chart app.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Visibility</b>	Determines the visibility (opacity) of the Radar layer.	<ul style="list-style-type: none"> <li>• 0% to 100%</li> </ul>
<b>Palette</b>	Selects the color used for the Radar layer	<ul style="list-style-type: none"> <li>• Purple</li> <li>• Black</li> <li>• Red</li> </ul>
<b>Use Radar without heading data</b>	Enables use of Radar layer when Heading data is not available.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Range</b>	Determines the range used for the Radar layer.	Radar range values

## AIS settings

When the AIS layer is enabled in the Chart app you can configure **AIS settings** from the **Targets** menu: **Menu > Targets > AIS settings**.









Setting	Description	Options
<b>Show AIS targets in Chart / Show AIS targets in Radar</b>	Enables and disables AIS targets in the Chart and Radar apps.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Enhanced AIS targets</b>	Enables and disables the display of enhanced AIS target icons.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

Setting	Description	Options
<b>Show these AIS types</b>	Determines the types of AIS target displayed in the Chart and Radar apps.	<ul style="list-style-type: none"> <li>• All</li> <li>• Dangerous</li> <li>• Buddies</li> </ul>
<b>Hide static targets</b>	When enabled, an AIS target travelling under 2 knots will be hidden, unless it is or becomes dangerous.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Silent mode</b>	When enabled, your vessel's AIS device will not transmit your position or details.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

## AIS target symbols







By default, standard AIS symbols are used to identify AIS targets. You can enable enhanced AIS target symbols from the **Advanced Settings** menu: (**Menu > Settings > Advanced > Enhanced AIS targets**). With enhanced mode enabled, the enhanced symbols are used in place of the standard vessel symbols.

### Standard AIS symbols — type

	Vessel		SART (Search and Rescue Transponder)
	Land based station		ATON
	SAR (Search and Rescue)		Virtual ATON
	* Blueforce vessel		* Blueforce SAR







**Note:** \* Requires STEDS-EAIS hardware.

### Enhanced AIS symbols — type

	Sailing Vessel		Commercial
	High speed vessel / Wing In Ground vessel		Cargo vessel
	Passenger vessel		Other

Enhanced AIS symbols are scaled or outlined according to the reported size of the vessel.

**AIS symbol status**

	Lost (No border, crossed through)		Uncertain (Dashed outline)
	Buddy (Yellow fill)		Dangerous and Uncertain (Dashed outline and Flashes Red)
	Dangerous (Flashes Red)		ATON off position (Red border)

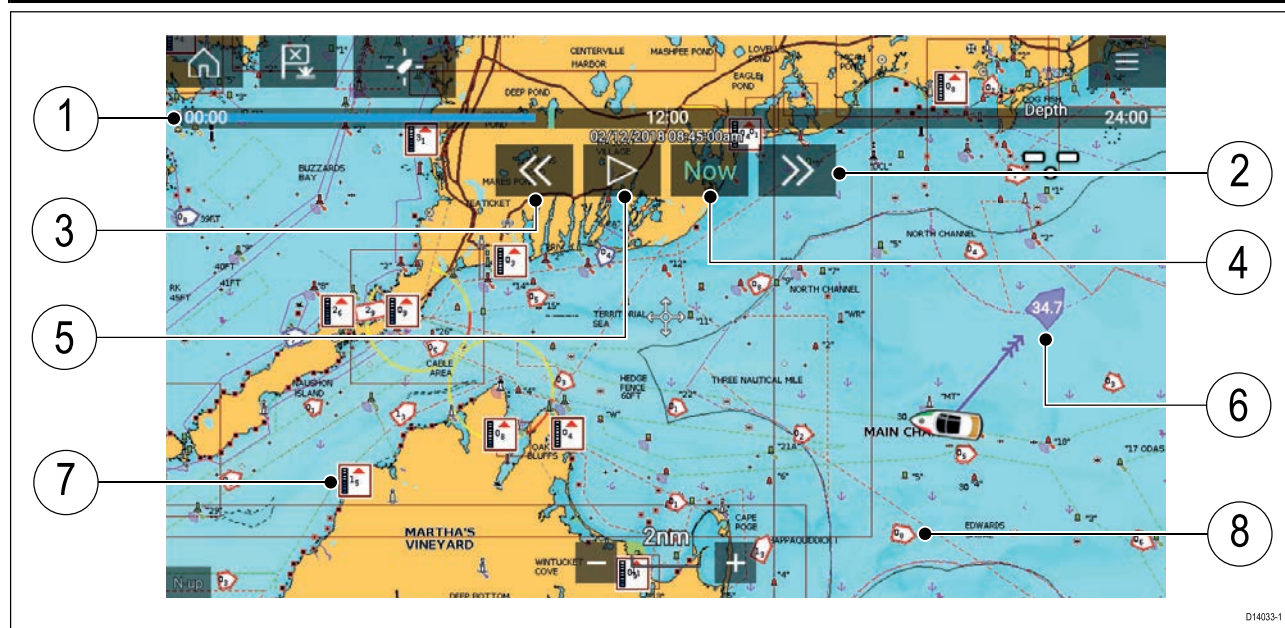


## 8.4 Tides mode

In Tides mode the Tides animation control is displayed onscreen and the Tide station and Current station symbols in the Chart app are replaced with dynamic graphics which identify Tide and Current conditions. You can use the animation controls to play Tide and Current predictions for a 24 hour period. The own vessel Tide vector is also enabled in Tides mode.

### Note:

- The Tides mode is only available if you have cartography that provides the Tides and Current data. Refer to your cartography provider for more information.
- The Tides mode requires accurate date information, usually taken from the GNSS (GPS) position data available to your MFD. Alternatively, you can input a specific date manually.



1. Animation progress bar — The progress bar is Blue for the current 24 hour period, or Green when playing animations from a different day.
2. Skip forwards — Skips forwards in user defined intervals, when the end of the progress bar is reached skipping forward will progress to the next day.
3. Skip backwards — Skips backwards in user defined intervals. When the beginning of the progress bar is reached, skipping backward will regress to the previous day.
4. Skip to the actual date / time — Position data is required from your GNSS (GPS) receiver to obtain current date and time.
5. Play / Pause animation — When the animation is playing it will cycle through the current 24 hour period continuously.
6. Own vessel tide (Set and Drift) vector.
7. Dynamic tide height graphic.
8. Dynamic current graphic.

### Important:

The data provided in the Tide and Current graphs and graphics is for information purposes only and must NOT be relied upon as a substitute for prudent navigation. Only official government charts and notices to mariners contain all the information needed for safe navigation.

## Using animation controls

The animation controls can be selected using the Touchscreen, alternatively you can use the MFD's physical buttons or a RMK controller to control animations as described below:

With the Chart app set to **Tides mode**.

1. Select **Animate tides** from the menu.
2. Use the **Left** button on the Uni-controller to skip forwards in user defined intervals.
3. Use the **Right** button on the Uni-controller to skip backwards in user defined intervals.

4. Use the Uni-controller's **OK** button to Play or Pause the animation.

You can define the User skip time interval from the Advanced menu: **Menu > Settings > Advanced > Tide animation interval**.

## Setting a specific date for animations

You can select a specific date for the Tide and Current animation predictions.

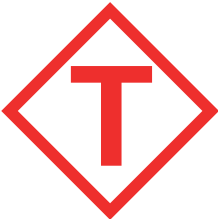
1. Select **Select date** from the main menu.
2. Use the **Up** and **Down** arrows to change the date to the required day.
3. Select **Save**.

The animation will be set for the specified date.

## Tide station information

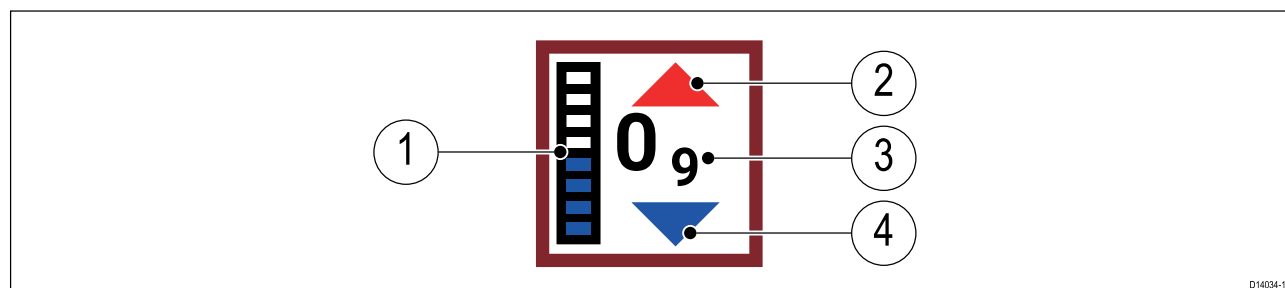
Depending on your cartography, Tide station information may be available at the location of Tide stations.

### Tide station symbol

	<p>The location of Tide stations is marked on the Chart using a diamond-shaped symbol with a 'T' in the middle.</p> <ul style="list-style-type: none"><li>• The symbol is colored Red when using Navionics cartography.</li><li>• The symbol is colored Black when using C-Map cartography.</li></ul>
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### Dynamic tide graphic

Using Navionics cartography, when the Tides layer is enabled or when the Chart app is in **Tides mode**, the standard symbol is replaced with a dynamic Tide height graphic:

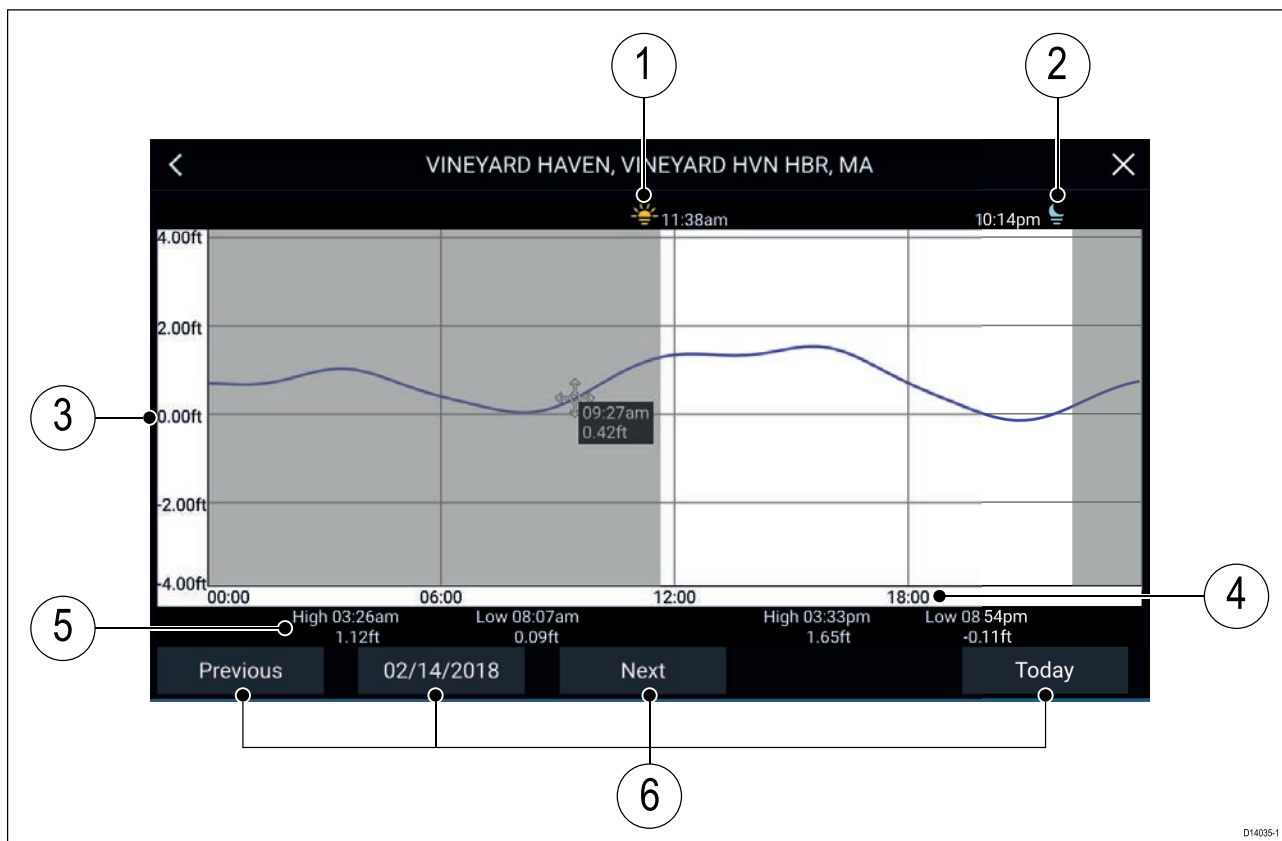


1. Tide bar — The tide bar plots the current tide height against the maximum predicted tide height for that day.
2. Red arrow indicates tide height is increasing.
3. Tide height — Tide height is displayed in user-selected depth units, with decimals displayed in subscript. Decimals are not shown for values of 10 or greater.
4. Blue arrow indicates tide height is decreasing.

### Tide graph

Tide graphs are available with applicable Navionics and C-Map cartography by selecting **more options** and then **Tide station** from the Tide station's context menu.





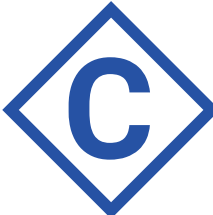
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1. **Sunrise** — Indicates time of sunrise.
2. **Sunset** — Indicates time of sunset.
3. **Height** — Provides tide height in selected units.
4. **Time** — Indicates time of day.
5. **Low / High tide** — Indicates the time of low and high tides.
6. **Time and date options** — Use the buttons to view previous, next or today's tide predictions, or enter a date by selecting the date field.

## Current station information


Depending on your cartography, Current station information may be available at the location of Current stations.

### Current station symbol


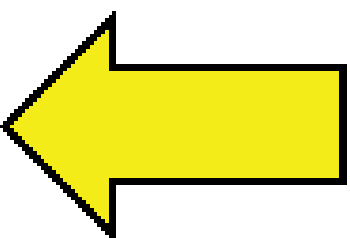
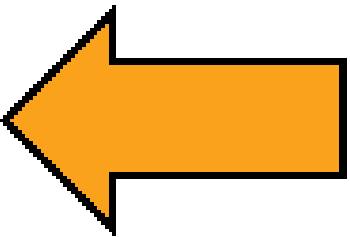
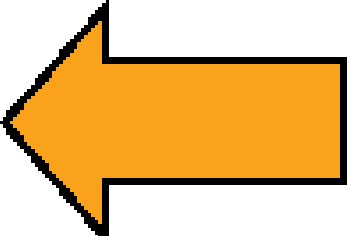
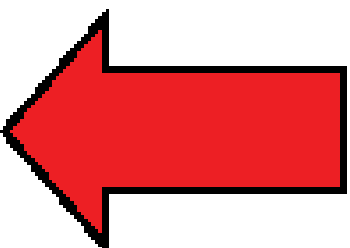
	<p>The location of Current stations is marked on the Chart using a diamond-shaped symbol with a 'C' in the middle.</p> <ul style="list-style-type: none"> <li>• The symbol is colored <b>Blue</b> when using applicable Navionics cartography.</li> <li>• The symbol is colored <b>Black</b> when using applicable C-Map cartography.</li> </ul>
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### Dynamic current graphic

When the Tides layer is enabled or when the Chart app is in **Tides mode**, the standard symbol is replaced with a dynamic Current graphic.

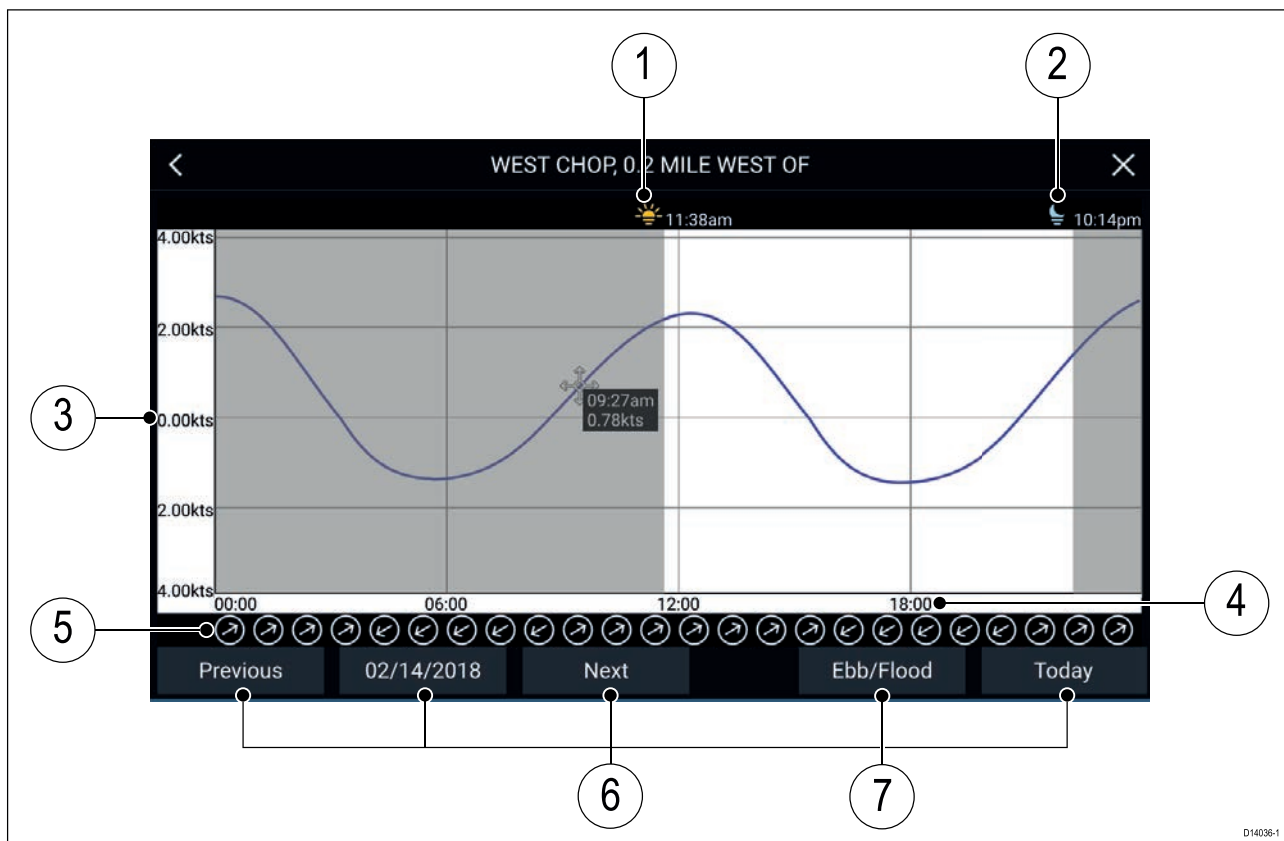
	<p>When using Navionics cartography the dynamic Current graphic is an arrow pointing in the direction of the current flow. Arrow length indicates the speed of the current; the longer the arrow, the faster the speed. The arrow's border indicates current status:</p> <ul style="list-style-type: none"> <li>• <b>Red</b> = increasing current speed.</li> <li>• <b>Blue</b> = decreasing current speed.</li> </ul> <p>Current speed is shown inside the arrow. Current speed is displayed in user-selected speed units, with decimals displayed in subscript. Decimals are not shown for values of 10 or greater.</p> <p>If tidal conditions are "slack", the word "SLACK" appears in a box with a Blue border.</p>
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When using C-Map cartography, arrows are used to indicate the direction of current flow. The size and color of the arrow indicates the strength of the current:

	Yellow	0 to 0.1 Knots
	Yellow	0.2 to 1.0 Knots
	Orange	1.1 to 2.0 Knots
	Orange	2.1 to 3.0 Knots
	Red	>3.0 Knots

### Current graph

Current graphs are available by selecting **more options** and then **Current station** from the Current station's context menu.



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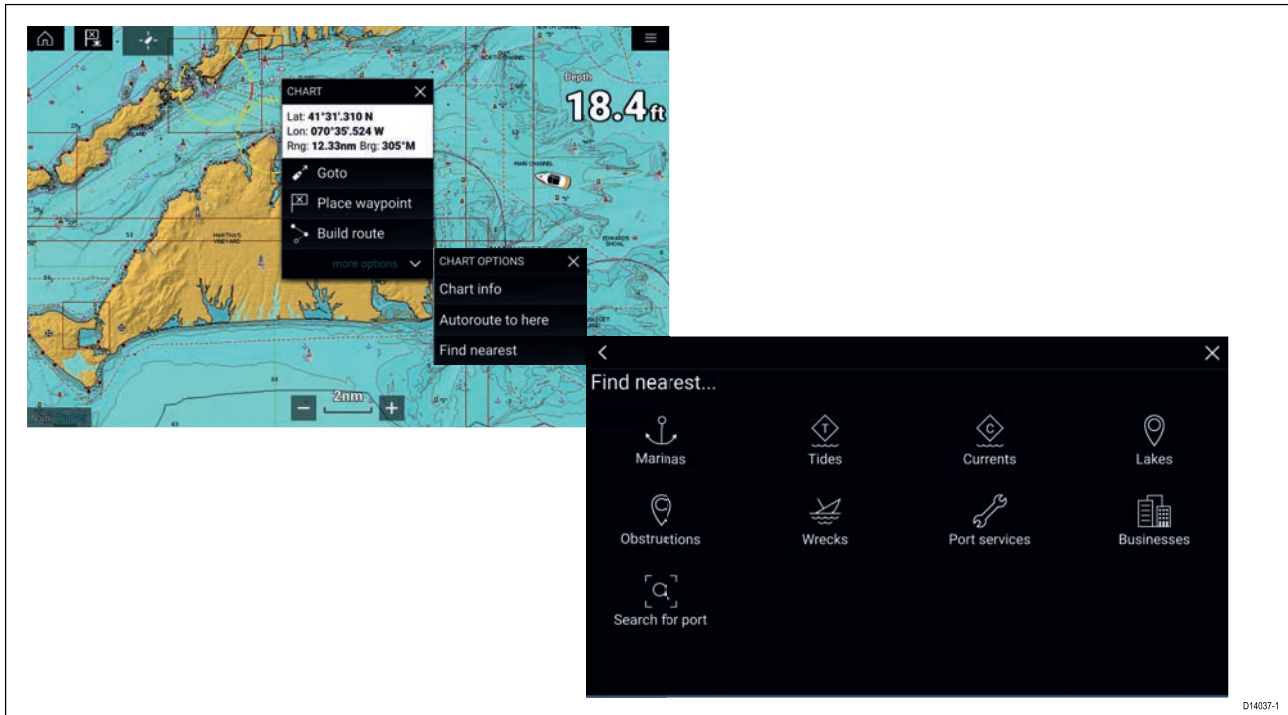
1. **Sunrise** — Indicates time of sunrise.
2. **Sunset** — Indicates time of sunset.
3. **Speed** — Provides current speed in selected units.
4. **Time** — Indicates time of day.
5. **Direction** — Indicates the direction of the current (relative to North).
6. **Time and date options** — Use the buttons to view previous, next or today's tide predictions, or enter a date by selecting the date field.
7. **Ebb / Flood** — Displays a list showing ebb, slack and flood tides.

## Displaying Tide or Current graphs

1. Select the relevant Tide or Current station symbol or dynamic graphic.
2. Select **more options** from the context menu.
3. Select **Tide station** or **Current station**

## 8.5 Find nearest

The Find nearest feature allows you to select a location and search for nearby objects.

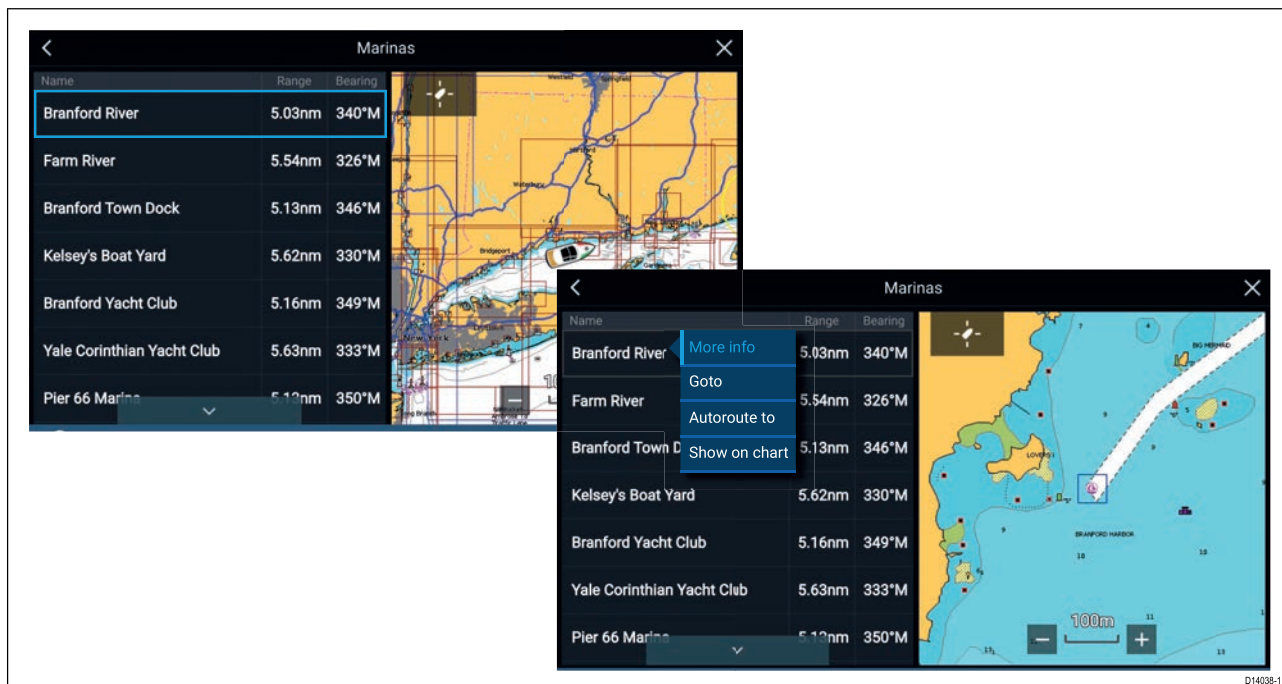


The objects available depend on the cartography type you are using:

Object	LightHouse	Navionics®	C-MAP®
Marinas	✗	✓	✓
Tide Station	✗	✓	✓
Current Station	✗	✓	✓
Lakes	✗	✓	✓
Obstructions	✓	✓	✓
Wrecks	✓	✓	✓
Port Services	✓	✓	✓
Businesses	✗	✓	✗
Port (Search by name)	✗	✓	✓
Point of Interest	✗	✗	✓
Outdoor Recreational Areas (ORA)	✗	✗	✓
ORA Services	✗	✗	✓
Small Craft Facility	✓	✗	✗
Harbor Facility	✓	✗	✗

## Search using find nearest

To search for nearby objects, follow the steps below.



### Note:

The list is sorted by an object's proximity to the selected location. However, the Range and Bearing displayed is relative to your vessel's position.

1. Select a location near where you want to search.  
The Chart context menu is displayed.
2. Select **more options**.
3. Select **Find nearest**.
4. Select the required object type.
5. If required, select a sub-category or when searching for a port, use the onscreen keyboard to enter a port name and select **Search**.
6. A list of nearby objects of the type selected is displayed.
7. Select an object from the list.  
The Pop-over menu is displayed and the **LiveView** on the right of the screen will highlight and zoom to the selected object.
8. From the Pop-over menu you can:
  - i. View more information about the object by selecting **More info**.
  - ii. Navigate to the selected object by selecting **Goto**.
  - iii. Create an automatic route to the selected object by selecting **Autoroute to**.
  - iv. Display the selected object in the Chart app by selecting **Show on chart**.

## 8.6 SonarChart™ Live

You can create personal bathymetry charts using your depth transducer and the SonarChart™ Live feature, available with compatible Navionics® electronic cartography cards.

**Note:** Before using SonarChart™ Live ensure you have correctly configured your transducer depth settings, as described in [Configuring Transducer settings](#).

When using SonarChart™ Live, new contour lines are drawn in real time on the screen based on your transducer's depth readings. Color shading is used to reflect depth, with dark red signifying the shallowest area. The sonar data is recorded to your cartography card and is shared with Navionics when you update your chart card online.

### Tide correction

SonarChart™ Live records the actual readings from your depth transducer under current tide / water level conditions. You can enable automatic adjustment of depth readings based on normalized low tide / low water level depth data taken from a nearby Tide station.

### Enabling SonarChart Live

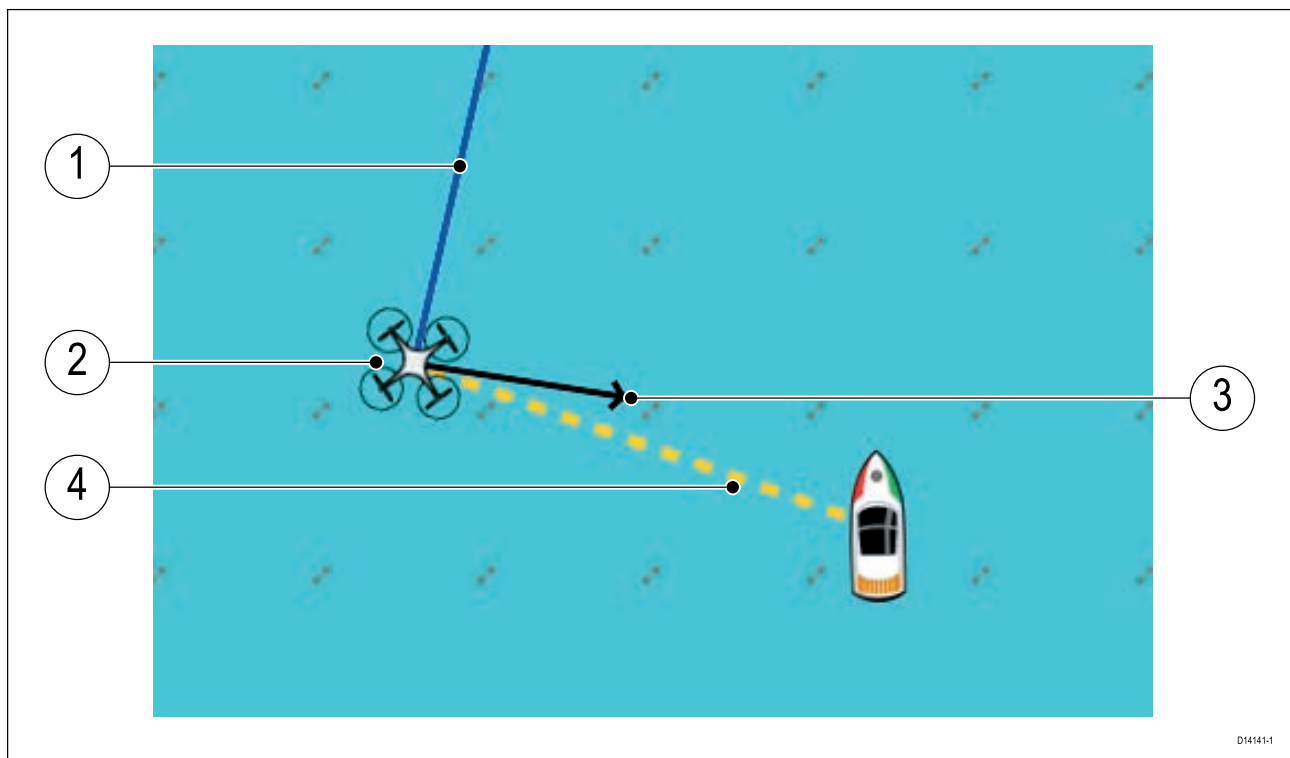
To enable creation of real time SonarChart™ Live bathymetry lines:

With your transducer depth settings correctly configured and compatible cartography selected:

1. Select the **Depth** tab from the Chart app settings menu: **Chart app > Menu > Settings > Depth**.
2. Enable **Sonar logging**.
3. Enable **SonarChart Live**.
4. Select the **Visibility** setting field, and adjust to your preferred value.
5. If required, enable **Tide correction**.

## 8.7 UAV Chart integration

When a compatible UAV with a GNSS (GPS) position fix is connected to your MFD, a UAV icon representing the position of the UAV is displayed in the Chart app.



1	<b>UAV COG</b> The direction of the Blue line indicates the UAV's current Course Over Ground (COG). The length of the line indicates the UAV's predicted position when the specified vector Reference period has passed. The Vector Reference period can be adjusted from the vessel icon's context menu.
2	<b>UAV Icon</b> Displayed when the <b>UAV</b> option is enabled in the Chart app settings, and your UAV has a GNSS (GPS) position fix.
3	<b>Camera heading</b> The Black Camera heading arrow is fixed to provide an indication of the direction the UAV's camera is pointing towards.
4	<b>Line to vessel</b> The Yellow dotted line represents the angle of the UAV's position relative to your vessel.

### Showing or hiding the UAV icon

The UAV icon is displayed by default in the Chart app. The icon can be hidden if required.

From the Chart app menu:

1. Select **Settings**.
2. Select the **Layers** tab.
3. Select the **UAV**: toggle switch.

Selecting the UAV toggle switch will make the UAV icon visible (on) or invisible (off).

### Performing a UAV Goto

When your UAV is in flight you can select a location or object in the Chart app and perform a **UAV Goto** (your UAV will fly to the selected location or object and hover).

1. Select a location or object in the Chart app.  
The Chart context menu is displayed.
2. Select **More**.

3. Select **UAV Goto**.

A UAV waypoint marker is placed to signify the UAV's destination and the UAV will fly to that location.

You can stop a UAV Goto at anytime by selecting the Red **Cancel UAV Goto** that is displayed onscreen in the UAV app, when a UAV Goto is active. Cancelling a UAV Goto will stop the Goto action and the UAV will hover in its current location.

A UAV Goto can be cancelled at any time by selecting **Stop UAV Goto** from the Chart context menu.

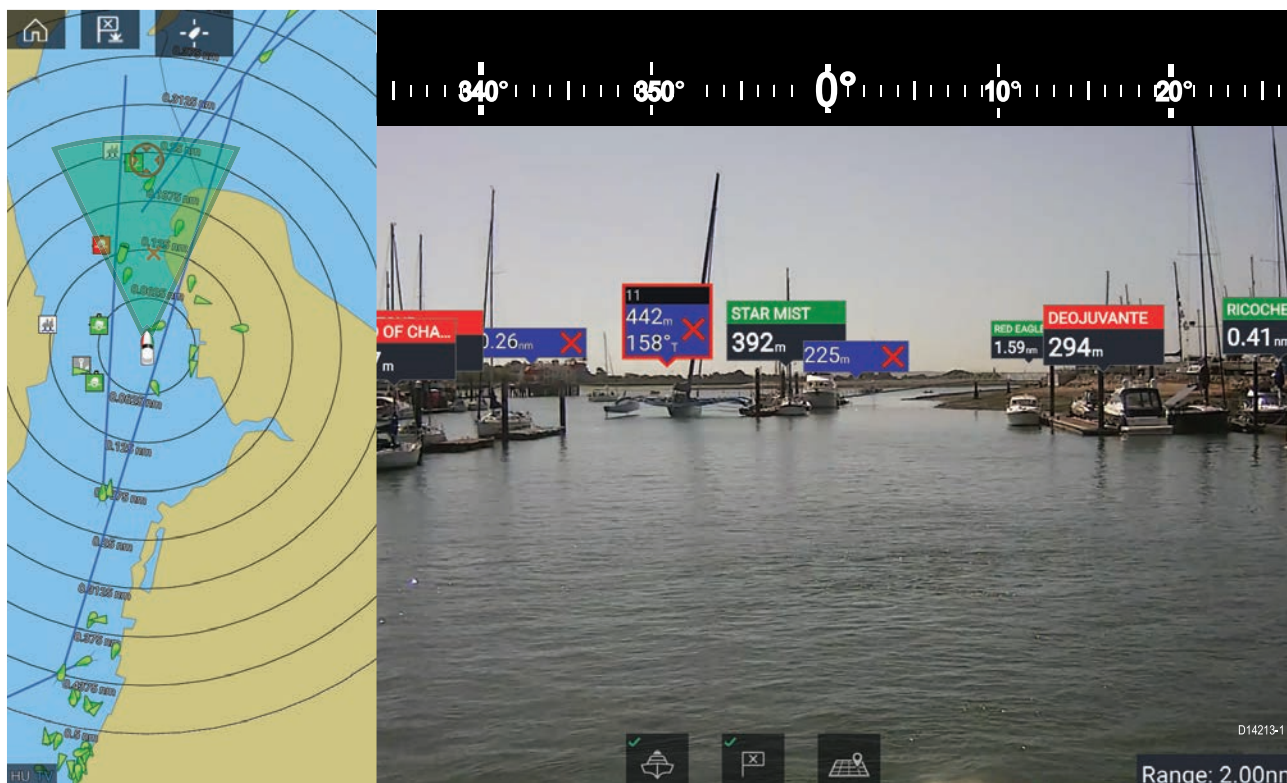


## 8.8 ClearCruise™ Augmented Reality

The Chart app has additional Augmented Reality features, which are available when an AR200 and a compatible IP camera are connected.

Augmented Reality features must also be enabled and configured in the Video app. For more information, refer to: [ClearCruise tab \(Augmented Reality\), p.216](#)

With the Augmented Reality features enabled, the AIS Target, Waypoint and Chart Object data available in the Chart app will also be available in the video app, where the data will be overlaid onto the live video feed.



For further information on ClearCruise™ Augmented Reality, refer to: [p.220 — ClearCruise™ features](#)

### Field of View

The Field of View (FOV) cone acts as a range indicator to illustrate the area of coverage of the camera with respect to displaying chart objects in the Video app as part of the ClearCruise™ Augmented Reality features.

Chart objects that are within the scope of the displayed FOV cone will be displayed in the Video app as “flags”. For more information on flags, refer to [p.227 — Augmented Reality flags](#)

The area of coverage of the FOV cone is determined by:

- The camera’s horizontal Field of View (FOV). This setting can be adjusted in the Video app: **Video settings > Camera Setup tab**.
- The Augmented Reality Range Limit. For information on the maximum range supported by the CAM210IP and CAM220IP cameras with respect to the display of Augmented Reality objects, refer to [p.231 — Range limit](#). You can also manually specify the maximum range limit; refer to [p.230 — ClearCruise settings \(Augmented Reality\)](#) for more information. When you adjust this setting, the FOV cone in the Chart app will change accordingly.



The FOV cone can be enabled/disabled in the Chart app settings: **Menu > Settings > Layers**.

## 8.9 Chart settings menu

The table below lists settings applicable to the Chart app and their location within the app's **Settings** menu. Available settings are dependent on the cartography in use. If a setting is not displayed then the feature is not compatible with your cartography. If a feature is grayed out then it requires a subscription to activate the feature.

### Cartography

Settings	Description	Options
<b>LightHouse Charts</b> <b>Navionics</b> <b>C-MAP</b>	Allows you to select the cartography that you want to use in the current Chart app.	<ul style="list-style-type: none"> <li>List of available cartography</li> </ul>

### Layers tab

Settings	Description	Options	Vendor
<b>Chart detail</b>	Allows you to select the level of detail displayed onscreen for vector based cartography.	<ul style="list-style-type: none"> <li>Low</li> <li>Medium</li> <li>High</li> </ul>	<ul style="list-style-type: none"> <li>All (Vector)</li> </ul>
<b>Aerial</b>	Enables and disables display of a photographic aerial overlay.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>Navionics</li> <li>C-MAP (Vector)</li> </ul>
<b>AIS</b>	Enables and disables display of AIS targets in the Chart app. Requires AIS hardware.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>
<b>Radar</b>	Enables and disables display of your Radar scanner's image in the Chart app. Requires Radar scanner hardware.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>
<b>Range rings</b>	Enables and disables display of Radar like range rings in the Chart app.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>
<b>FOV:</b>	<b>Field of View</b> Enables and disables ClearCruise™ augmented reality camera's field of view overlay in the Chart app.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>
<b>Weather Radar</b>	Enables Weather Radar precipitation data overlay on the Chart app. Only available when connected to a compatible SiriusXM weather receiver with a valid subscription.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>All</li> </ul>
<b>Tides</b>	Enables and disables display of Tide and Current graphics at Tide and Current stations in the Chart app.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>Navionics</li> </ul>
<b>EasyView</b>	Enables and disables magnification of useful icons and text, making them easier to read.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>Navionics</li> </ul>
<b>Community edits</b>	Enables and disables display of crowd sourced data.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>Navionics</li> </ul>
<b>High res bathy</b>	Enables and disables display of High Resolution Bathymetry charts which provides improved bottom detail, contours and structure.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>C-MAP</li> </ul>
<b>Sports fishing</b>	Allows you to display easy-to-use information pages about fishing locations including fish type, size, depth and reef and bottom composition.	<ul style="list-style-type: none"> <li>On</li> <li>Off</li> </ul>	<ul style="list-style-type: none"> <li>C-MAP</li> </ul>

Settings	Description	Options	Vendor
<b>Marine protected areas</b>	Allows clear identification of areas where commercial and recreational fishing is prohibited or restricted.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• C-MAP</li> </ul>
<b>Fishing AOI</b>	Enables and disables display of Fishing AOIs (Areas Of Interest).	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• C-MAP</li> </ul>
<b>ActiveCaptain</b>	Enables and disables display of crowd sourced data.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• C-MAP</li> </ul>

#### Depths tab

Settings	Description	Options	Vendor
<b>Show soundings</b>	Enables and disables display of depth soundings on the chart. When set to Manual depth soundings will be shown from zero to the maximum depth you specify.	<ul style="list-style-type: none"> <li>• None</li> <li>• Manual</li> <li>• All</li> </ul>	<ul style="list-style-type: none"> <li>• LightHouse (Vector)</li> <li>• Navionics</li> <li>• C-MAP</li> </ul>
<b>Show contours</b>	Enables and disables display of depth contours on the chart. When set to Manual, contours will be shown from zero to the maximum depth you specify.	<ul style="list-style-type: none"> <li>• None</li> <li>• Manual</li> <li>• All</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> <li>• C-MAP</li> </ul>
<b>Shallow water</b>	Determines the depth at which the Shallow contour is displayed. The Shallow contour cannot be set above the Safety or Deep contour value.	Numeric value	<ul style="list-style-type: none"> <li>• LightHouse (Vector)</li> </ul>
<b>Safe water from</b>	Determines the depth at which the Safety contour is displayed. The Safety contour cannot be set less than the Shallow contour or greater than the Deep contour.	Numeric value	<ul style="list-style-type: none"> <li>• LightHouse (Vector)</li> </ul>
<b>Deep water from</b>	Allows you specify the depth at which Deep water begins.	Numeric value	<ul style="list-style-type: none"> <li>• LightHouse (Vector)</li> <li>• Navionics</li> <li>• C-MAP</li> </ul>
<b>Deep water color</b>	Allows you to specify Deep water color	<ul style="list-style-type: none"> <li>• White</li> <li>• Blue</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> <li>• C-MAP</li> </ul>
<b>Sonar logging</b>	Allows logging of depth and position data to your Navionics chart card.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>
<b>SonarChart Live</b>	Enables and disables Navionics SonarChart Live feature which enables real time creation and display of high resolution bathymetry charts.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>
<b>Visibility</b>	Determines the transparency of the SonarChart data onscreen.	<ul style="list-style-type: none"> <li>• 0% to 100%</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>
<b>Tide correction</b>	Enables Sonar logging depth measurements to be offset by tide height data from nearby tide stations.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>
<b>Shallow depth shading</b>	Enables and disables identification of areas deemed to be shallow. When set to On, a red hatched area is displayed in areas deeper than the depth specified.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>

Settings	Description	Options	Vendor
<b>Density</b>	Selects the density of available depth contours.	<ul style="list-style-type: none"> <li>• Very high</li> <li>• High</li> <li>• Medium</li> <li>• Low</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>
<b>Fishing Range</b>	You can set up a Fishing Range by enabling <b>Fishing Range</b> and specifying a minimum depth and maximum depth. Areas on the chart that are between these depths will be colored White, areas outside of these depths will be colored Blue.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>	<ul style="list-style-type: none"> <li>• Navionics</li> </ul>

#### View & Motion tab

Settings	Description	Options
<b>Chart motion</b>	<p><b>Relative motion</b> In Relative motion mode the vessel icon remains fixed onscreen and the chart area moves relative to your position. In this mode you can adjust your vessel's fixed position using the Boat position setting.</p> <p><b>True motion</b> In True motion mode the chart is fixed and your vessel icon moves around the chart. As your vessel's position reaches the edge of the screen, the chart is redrawn to reveal the area in front of your vessel.</p> <p><b>Auto range</b> In Auto range the largest possible scale is maintained that will display both your vessel and the destination / target waypoint simultaneously.</p>	<ul style="list-style-type: none"> <li>• Relative motion</li> <li>• True motion</li> <li>• Auto range</li> </ul>
<b>Chart orientation</b>	<p><b>North-up</b> In North-up the top of the screen always points towards north. As your vessel's heading changes, the vessel icon rotates accordingly.</p> <p><b>Head-up</b> In Head-up the top of the screen always points towards your vessel's current heading, and as your heading changes the chart rotates accordingly.</p> <p><b>Course-up</b> In Course-up the top of the screen always points towards your destination, and as your destination changes the chart rotates accordingly.</p>	<ul style="list-style-type: none"> <li>• North-up</li> <li>• Head-up</li> <li>• Course-up</li> </ul>
<b>Boat position</b>	The boat position determines the position of your vessel icon onscreen. The default is Center but you can adjust this to provide a greater distance in front of your vessel. Your boat position can only be changed when Chart motion is set to Relative motion.	<ul style="list-style-type: none"> <li>• Center</li> <li>• Partial offset</li> <li>• Full offset</li> </ul>

## Advanced tab

Settings	Description	Options
<b>Chart orientation</b>	The orientation of the chart affects alignment relative to your vessel, route or North.	<ul style="list-style-type: none"> <li>• North-up</li> <li>• Head-up</li> <li>• Course-up</li> </ul>
<b>Enhanced AIS targets</b>	Switches between using standard and enhanced AIS targets.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Use Radar without heading data</b>	Enables use of Radar overlay without Heading data.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Cursor info boxes</b>	Allows display of the cursor's Range and Bearing from your vessel. When an object is highlighted the object name is also displayed.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Tide animation interval</b>	Allows you to select the time interval used for the Tide and Current animations in Tides mode.	<ul style="list-style-type: none"> <li>• 15 minutes to 2 hours in 15 minute steps.</li> </ul>
<b>Cartographic objects</b>	Enables and disables the display of cartographic objects. The settings available are dependent on the cartography in use.	<ul style="list-style-type: none"> <li>• Navigation marks</li> <li>• Navigation mark symbols</li> <li>• Rocks</li> <li>• Light sectors</li> <li>• Routing systems</li> <li>• Caution areas</li> <li>• Marine features</li> <li>• Land features</li> <li>• Business services</li> <li>• Panoramic photos</li> <li>• Roads</li> <li>• Additional wrecks</li> <li>• Colored seabed areas</li> </ul>
<b>Chart appearance</b>	Allows you to change the appearance of the Chart app. The settings available are dependent on the cartography in use.	<ul style="list-style-type: none"> <li>• 2D shading</li> <li>• Aerial overlay</li> <li>• Aerial overlay opacity</li> <li>• Relief shading</li> <li>• Visibility</li> <li>• Grid</li> <li>• Chart text</li> <li>• Chart boundaries</li> <li>• Text/symbol size</li> <li>• Deep water color</li> <li>• Community edits</li> </ul>
<b>My data appearance</b>	You can change how your User data appears in the Chart app.	<ul style="list-style-type: none"> <li>• Waypoints names</li> <li>• Route names</li> <li>• Track names</li> <li>• Route width</li> <li>• Track width</li> </ul>

Settings	Description	Options
		<ul style="list-style-type: none"> <li>• Vector width</li> <li>• Vector length</li> </ul>

#### Weather settings tab

Settings	Description
<b>Wind symbol</b>	Determines whether Arrows or Barbs are used for Wind direction graphics in Weather mode.
<b>Marine zone boundaries</b>	Determines whether marine boundaries are shown in Weather mode.
<b>Watchbox alerts</b>	Enables and disables Watchbox alerts.
<b>Watchbox range</b>	Determines the range from your vessel that Watchbox alerts are displayed
<b>Signal strength</b>	Displays the signal strength of a connected weather receiver.
<b>Receiver ESN</b>	Displays the Electronic Serial Number (ESN) of a connected weather receiver.

#### Note:

The Weather settings tab is only displayed when the Chart app is set to Weather mode.

#### Page settings tab

Settings	Description
<b>Data Overlays</b>	Enables configuration of Data overlays, which overlay key information from connected sensors onto the Chart, Radar, Sonar and Camera apps.
<b>Edit split ratio</b>	Enables you to customize the position of the partitions in splitscreen app pages. For example, 50/50, 70/30 etc.





## Chapter 9: Weather mode

### Chapter contents

- [9.1 Weather mode on page 134](#)
- [9.2 Activating your SiriusXM receiver on page 135](#)
- [9.3 Animated weather on page 136](#)
- [9.4 Weather mode context menu on page 138](#)
- [9.5 Weather Radar layer on page 139](#)
- [9.6 Cities and Surface observation stations layers on page 140](#)
- [9.7 Cloud top and Lightning layers on page 141](#)
- [9.8 Storm cast and Storm tracks layers on page 142](#)
- [9.9 Sea surface temperature and Surface pressure layers on page 143](#)
- [9.10 Wind and Watchbox layers on page 145](#)
- [9.11 Wave direction, height and period layers on page 147](#)

## 9.1 Weather mode

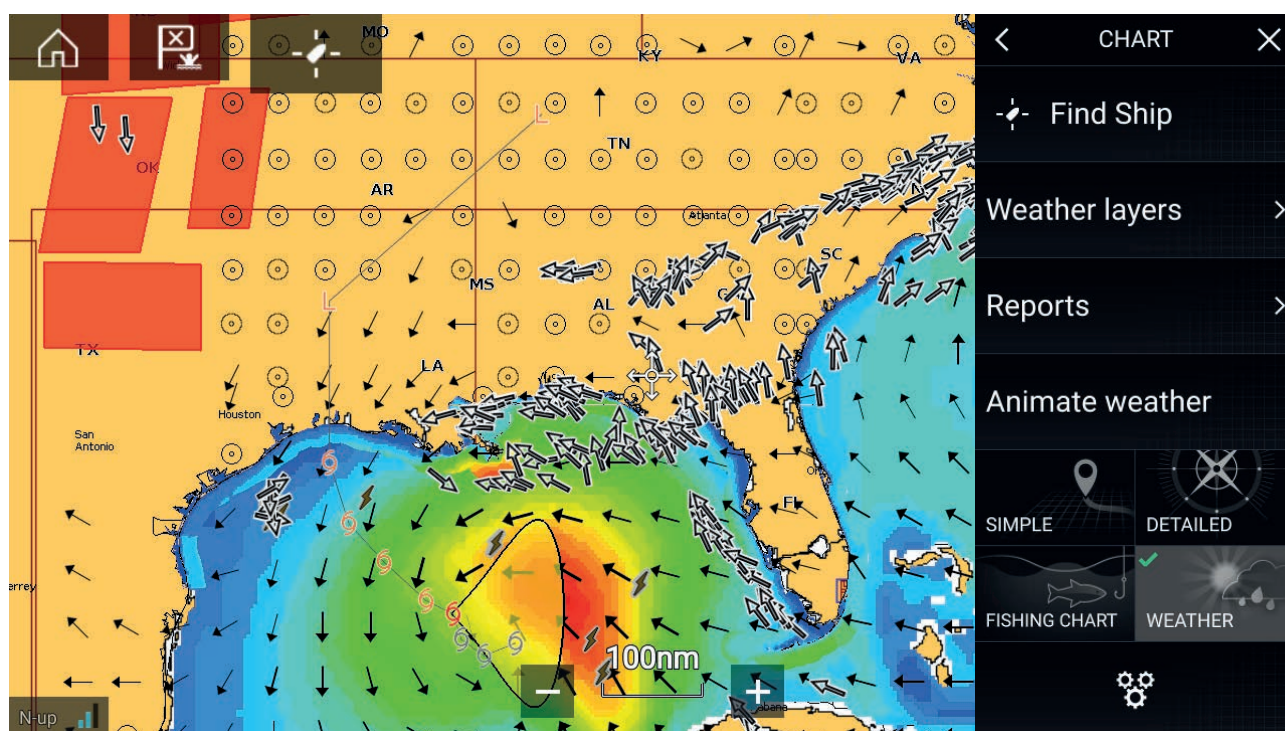
Weather mode is available in the Chart app if you have a weather receiver and valid subscription. Switching the Chart app to weather mode allows you to overlay weather data and information from your weather receiver.

To enter Weather mode, open the Chart app menu and select **WEATHER**.

Weather mode allows you to track weather systems in relation to your vessel by overlaying live, historical and forecasted weather data directly on the chart. In Weather mode you can also view animated weather graphics and read weather reports. Weather mode sets the **Chart detail** setting to Low and hides other data which increases the visibility of Weather data.

### Important:

- Compatible hardware and a valid subscription is required to enable Weather mode.
- By enabling Weather mode you agree to its terms of use.
- Do not use Weather mode for navigation.
- Weather data is only available in North America and its coastal waters.



Weather symbols are organized into layers, accessible from the Chart menu: **Menu > Weather layers**. Each layer can be enabled and disabled independently.

The following Layers are available:

<b>Weather radar</b>	<b>Surface pressure</b>
<b>Cities</b>	<b>Surface observation stations</b>
<b>Cloud top</b>	<b>Wind</b>
<b>Lightning</b>	<b>Watchbox</b>
<b>Sea surface temperature</b>	<b>Wave height</b>
<b>Storm cast</b>	<b>Wave period</b>
<b>Storm tracks</b>	<b>Wave direction (from)</b>

In Weather mode the **Chart orientation** is fixed in **North-Up**.

## 9.2 Activating your SiriusXM receiver

Your MFD is compatible with the SR150 SiriusXM receiver, which must be activated before using Weather mode on your MFD.

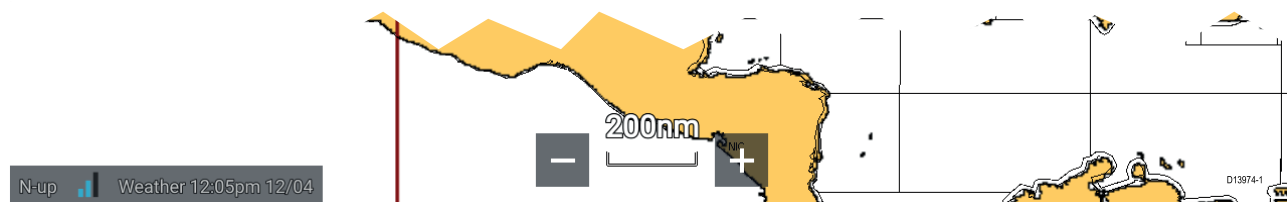
The following information is required to activate your receiver:

- Electronic Serial Number (ESN) — The ESN is printed on the product label located on the underside of your receiver. You can also access the ESN from the Weather settings tab in the Chart app: **(Menu > Settings > Weather > Receiver ESN)**.
  - Current billing information — If you already have a valid subscription.
  - Desired subscription package.
1. Obtain your receiver's ESN.
  2. Visit the Sirius Marine Weather website: <http://www.siriusxm.com/sxmmarine> and choose a subscription.
  3. Follow the link to activate your receiver online, Alternatively call 1-855-796-9847.

Once activated you will be able to enable Weather mode and display Weather layers in the Chart app.

### Weather receiver status

The status of your weather receiver is displayed in the app info area in the bottom left of the screen.



The app info area displays:

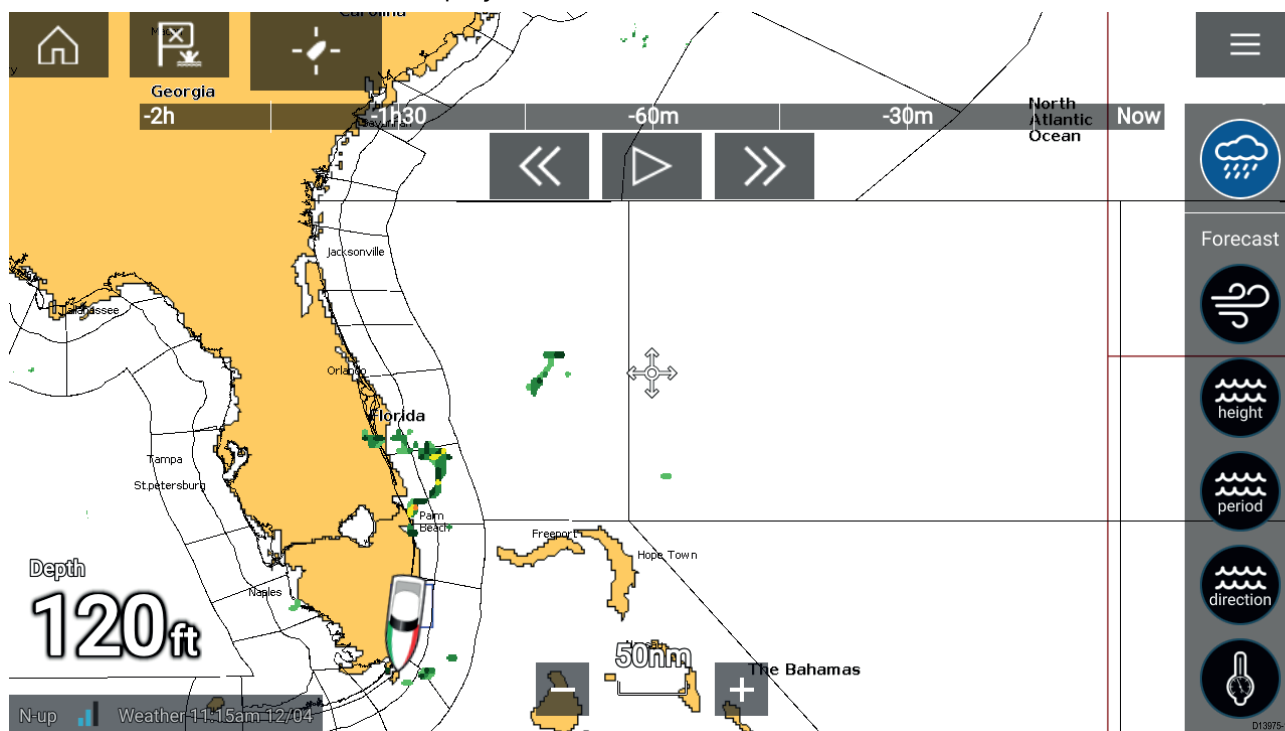
- signal strength of your Weather receiver.
- chart orientation mode — (N-up) orientation is fixed in weather mode.
- time and date related to the weather data being displayed.

## 9.3 Animated weather

In Weather mode you can play weather animations of historical **Weather radar** data and forecasted wind, wave and surface pressure data.

Weather animations can be accessed in Weather mode by selecting **Animate weather** from the menu.

When Animate weather is selected the animation player controls and symbols representing the type of animated data available are displayed onscreen.





### Player controls

Player controls include a progress bar, Play/Pause, Fast forward and rewind options.

### Animated weather data

Duration of forecasts are dependent on subscription type.

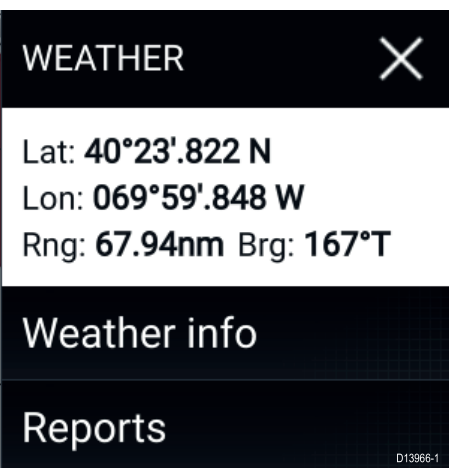
	<b>Weather Radar</b> Historical precipitation data for the previous 2 hours can be played.
	<b>Wind</b> Offshore wind forecast for up to 48 hours. High resolution coastal and inland wind forecast for up to 24 hours.
	<b>Wave height</b> Offshore wave height forecast for up to 48 hours. High resolution coastal wave height forecast for up to 24 hours. Great Lakes wave height forecast for up to 24 hours.
	<b>Wave period</b> Offshore wave period forecast for up to 48 hours. Great Lakes wave period forecast for up to 24 hours.

	<p><b>Wave direction</b>  Offshore wave direction forecast for up to 48 hours.  Great Lakes wave direction forecast for up to 24 hours.</p>
	<p><b>Surface pressure</b>  Surface pressure forecast for up to 48 hours.</p>

To exit Animate weather open the main **Menu**.

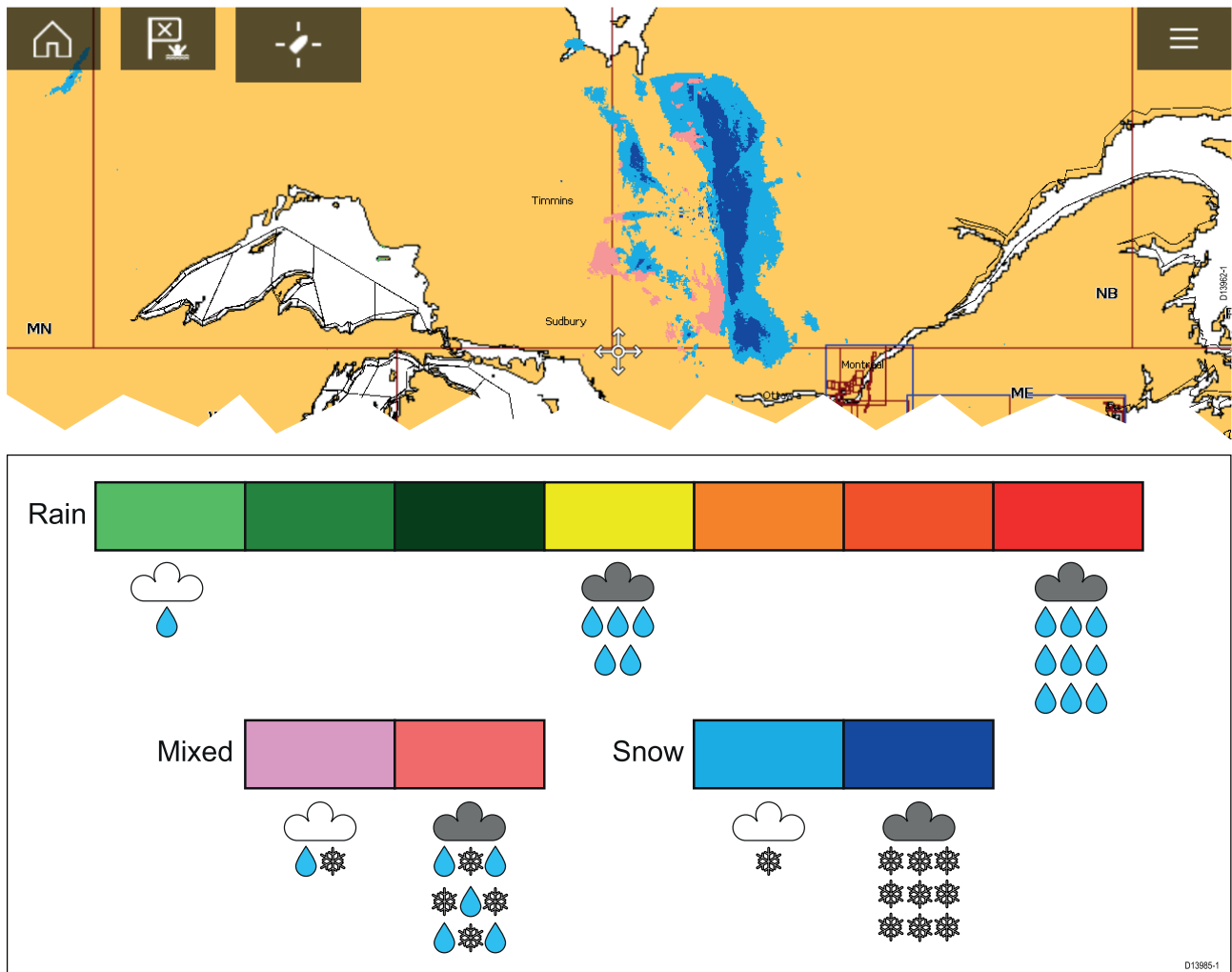
## 9.4 Weather mode context menu

The Weather context menu provides Lat/Lon and Range and Bearing information, relative to your vessel. The context menu also provides access to further weather-related data.

	<p>The context menu provides access to:</p> <ul style="list-style-type: none"><li>• Weather info</li><li>• Reports.</li></ul> <p>Depending on the symbol selected, the context menu also provides additional data when the Cities, Storm cast, Storm tracks or Watchbox option is selected.</p>
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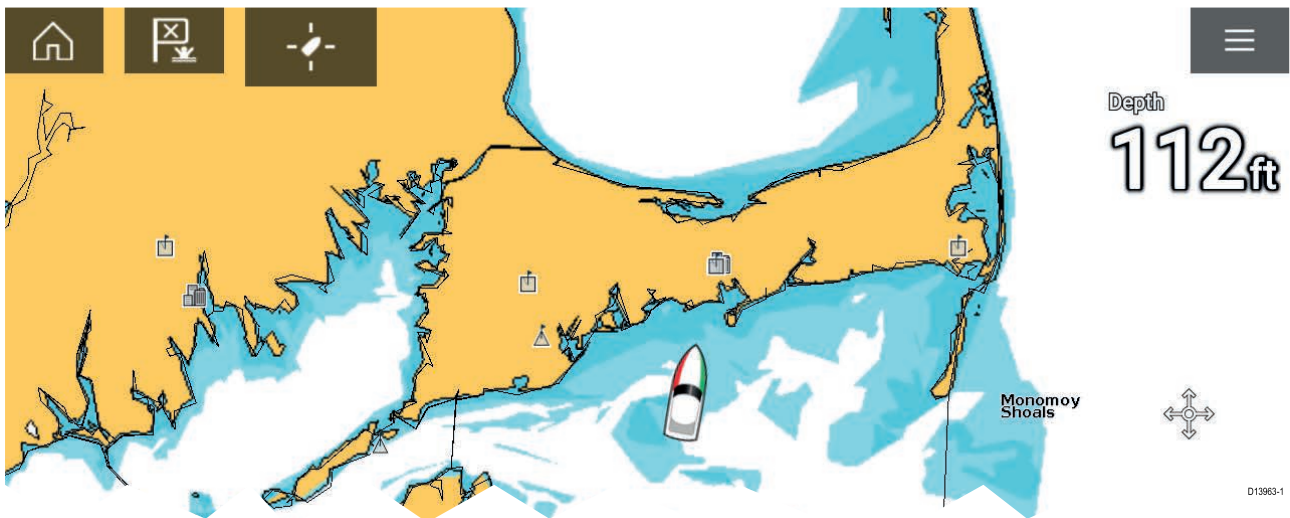
## 9.5 Weather Radar layer

With the Weather Radar layer enabled a color coded Radar image is displayed. This image shows a complete view of any precipitation across North America, including the type and intensity. Rain is shown as light green, dark green, yellow, orange and red as intensity increases. Hail, freezing rain and snow are represented with colors from bright pink to blue. The images are displayed as pixels on screen and the resolution of this feature is 2 km per pixel. Coverage includes the Continental US, Canada, and portions of Mexico/Caribbean.



## 9.6 Cities and Surface observation stations layers

The Cities layer and Surface observation stations layer display symbols which represent the location of Cities and Surface observation stations respectively. The symbols used for Surface observation stations also identify the station type.



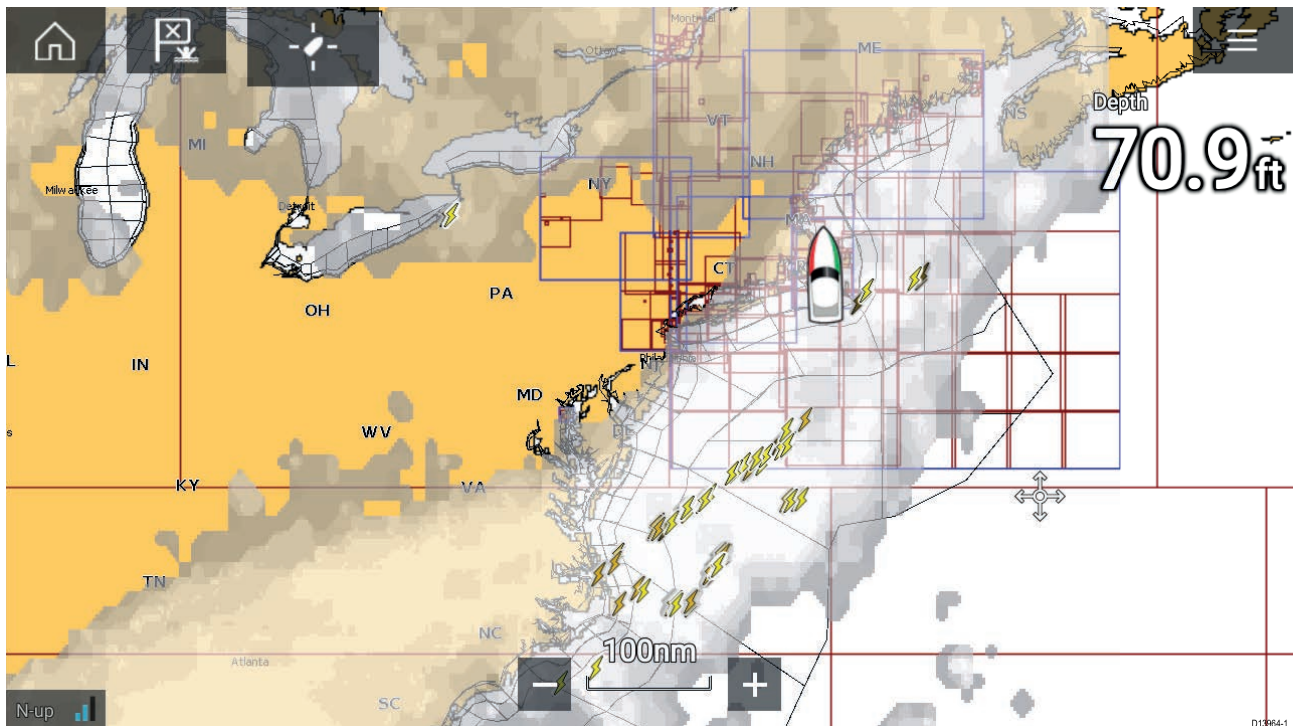
Layer	Symbol	Description
Cities		City
Surface observation station		Buoy station
		Coastal-marine automated network (C-MAN)
		Weather services international (WSI)
		National weather service (NWS)

City forecasts are available from the context menu when a City is selected.



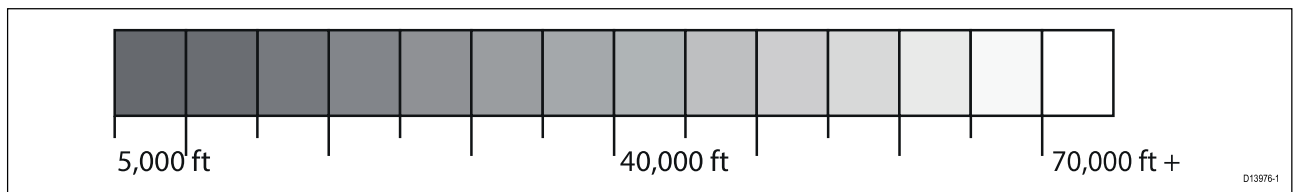
## 9.7 Cloud top and Lightning layers

The Cloud top layer provides a satellite image of current cloud coverage and the Lightning layer provides symbols to show the location of recent lightning strikes.





## Cloud tops

Cloud tops use Gray shading to identify cloud top height. The shading changes at 5,000 feet increments, from Dark Gray to White. Clouds lower than 5,000 feet are not displayed.



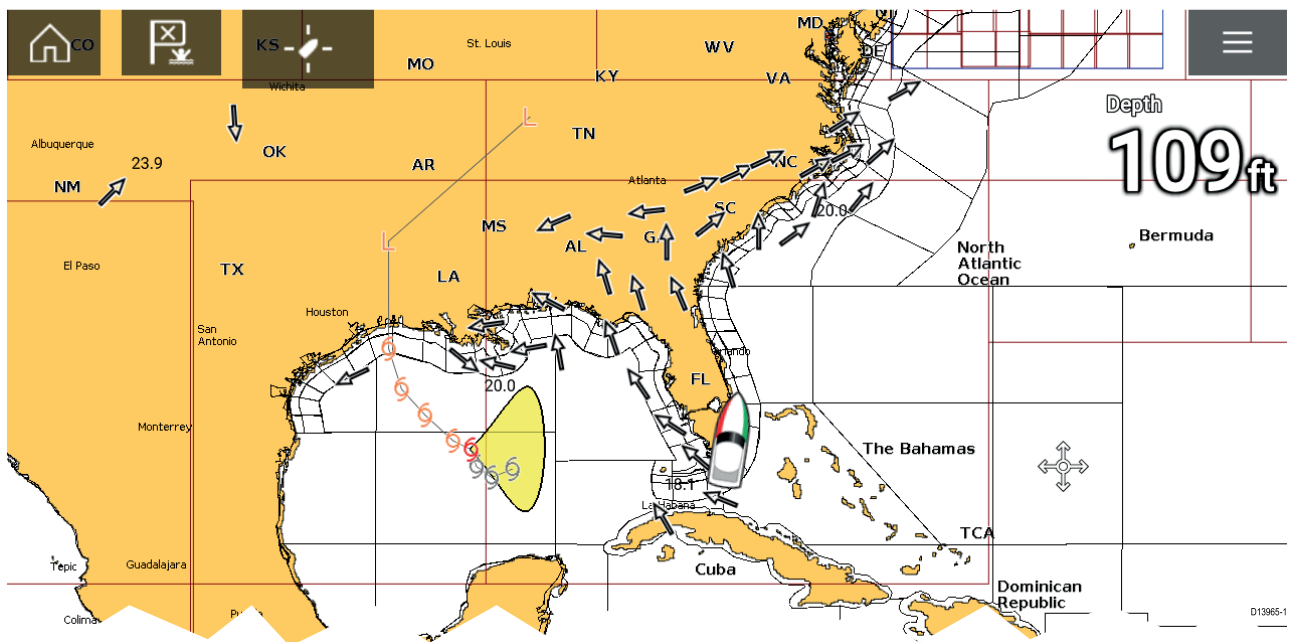
## Lightning

The shade of the lightning symbols represent the time the lightning strike was detected.

		
0 to 5 minutes ago	5 to 10 minutes ago	10 to 15 minutes ago

## 9.8 Storm cast and Storm tracks layers

The Storm cast layer displays arrows that show a storm's direction and speed. The Storm tracks layer identifies a storm's historic, current and forecasted path. Associated wind fields are also shown for the storm's current location.



### Storm tracks

Storm track symbols identify the type and time period of the storm.

Historical (Gray)	Current (Red)	Forecast (Orange)	Description
			Hurricane (Category 1–5)
			Tropical storm
			Tropical disturbance, tropical depression

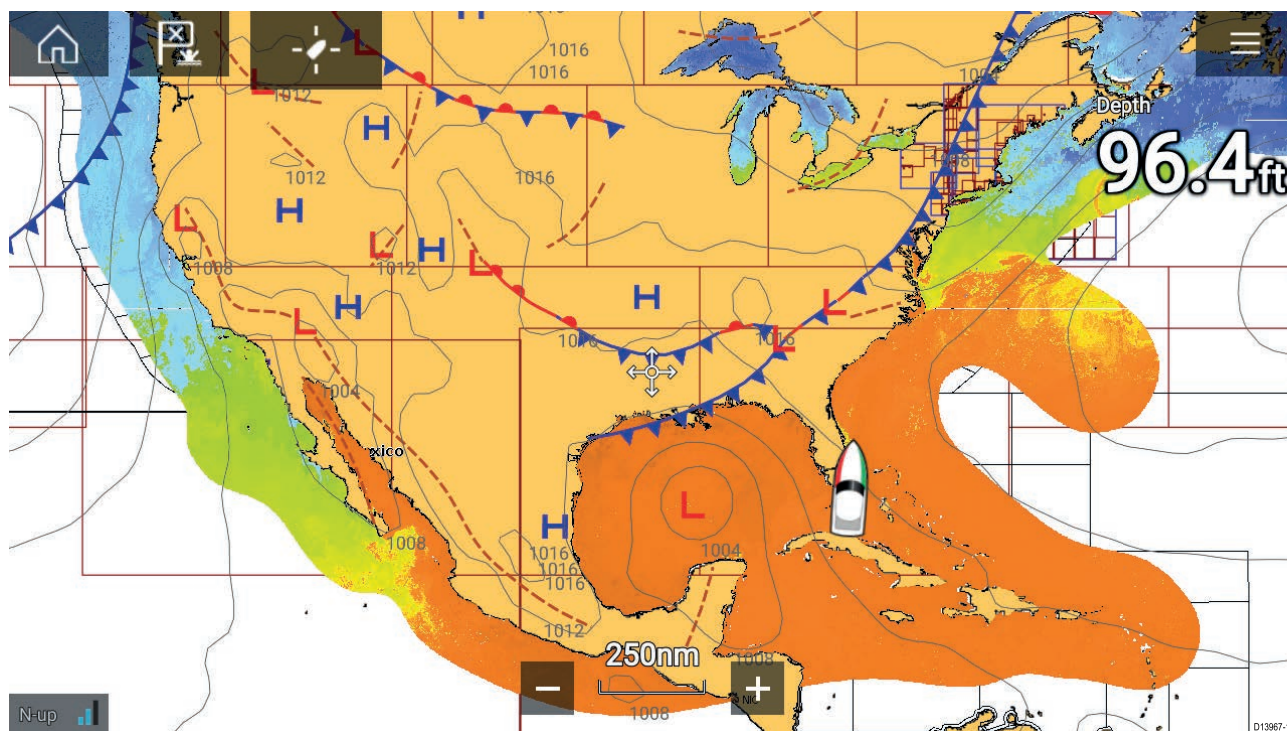
Storm data is available from the context menu when a symbol is selected.

Surface wind fields (Wind Radii) are shown using colored shapes representing the wind field area and speed.

- **Pink** — wind speed = 64 knots or greater.
- **Orange** — wind speed = 50 knots or greater.
- **Yellow** — wind speed = 34 knots or greater.

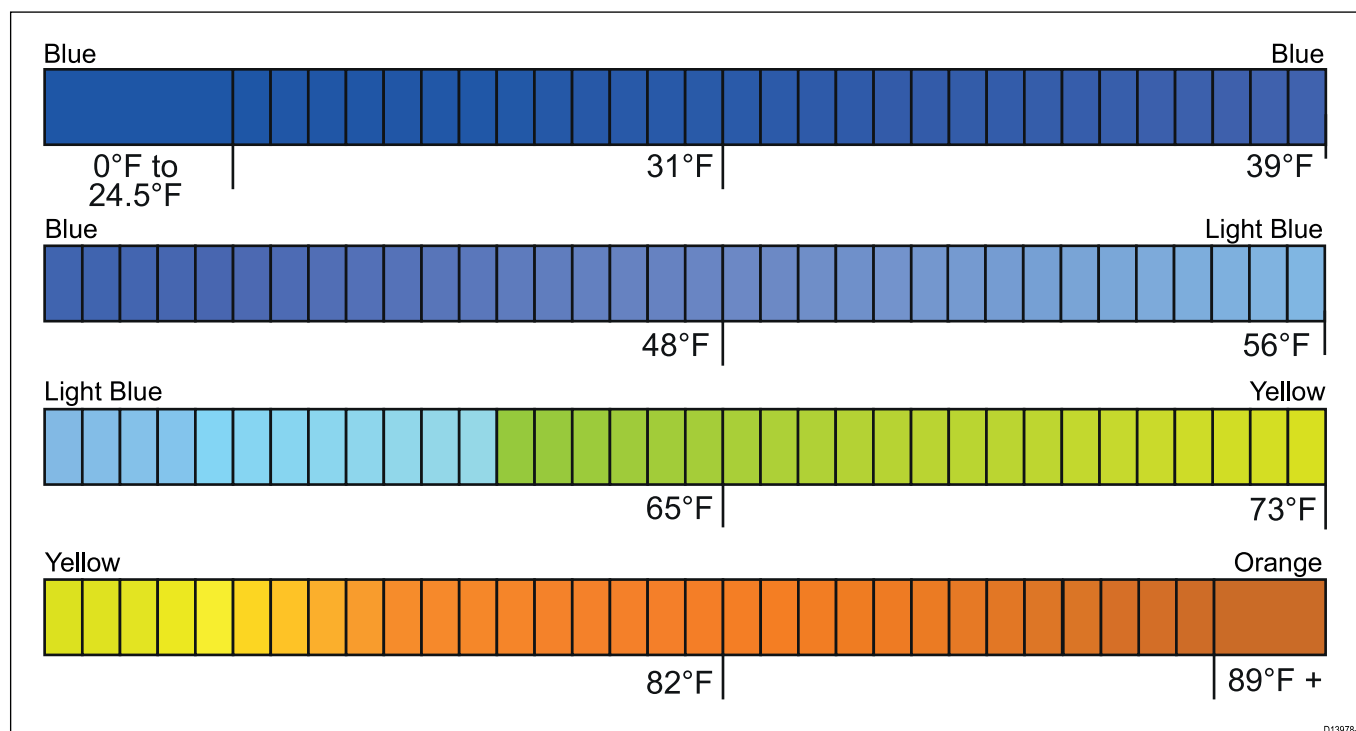
## 9.9 Sea surface temperature and Surface pressure layers

The Sea surface temperature layer uses color coding to identify water temperature. The Surface pressure layer uses standard pressure patterns and Isobars to identify surface pressure.












### Sea surface temperature color coding

The colors used for the Sea surface temperature are shown below:



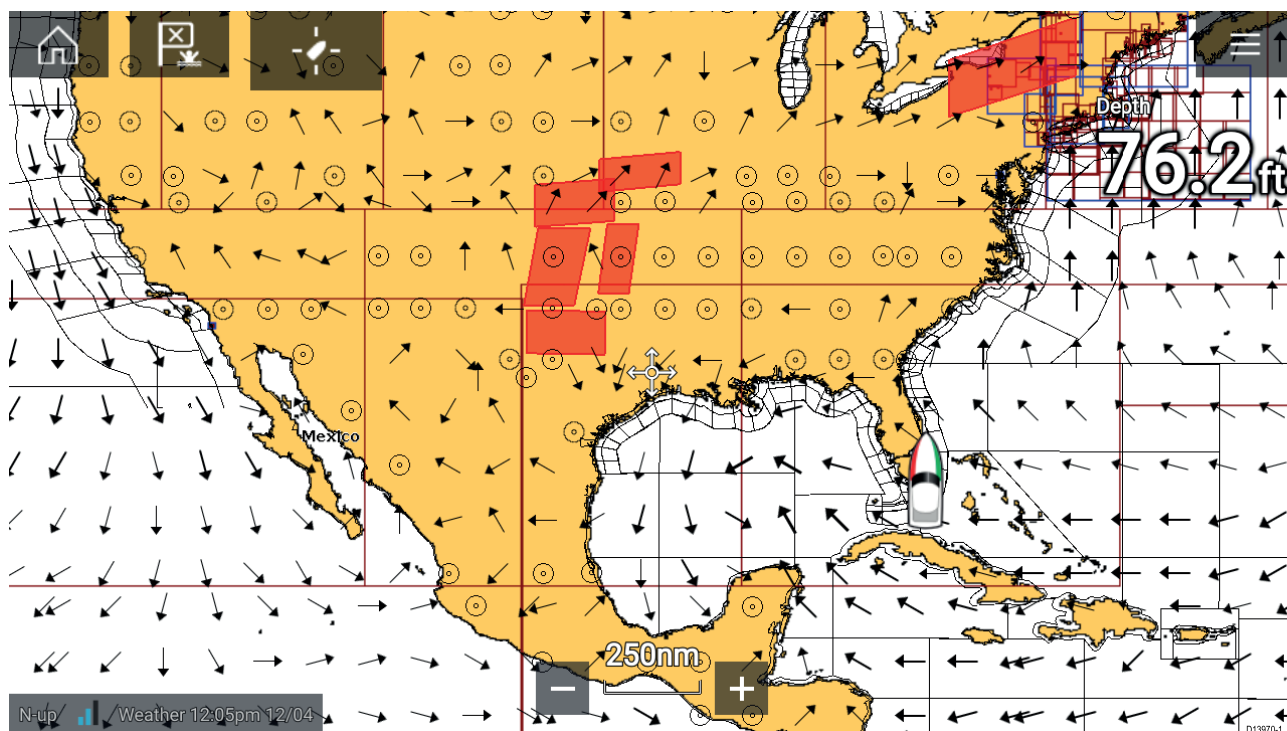
## Surface pressure patterns

The Surface pressure layer uses standard meteorological patterns to represent surface pressure conditions.

Symbol	Description
	High / low pressure (Blue and Red)
	Warm front (Red)
	Cold front (Blue)
	Occluded front (Purple)
	Stationary front (Red-Blue)
	Trough (Brown)
	Squall line (Red)
	Dry line (Red)
	Isobars (Gray)

## 9.10 Wind and Watchbox layers

The Wind layer uses Arrows or Barbs to identify wind direction and speed. The Watchbox layer identifies areas where severe weather is occurring or forecast within a specified range.



### Wind arrows

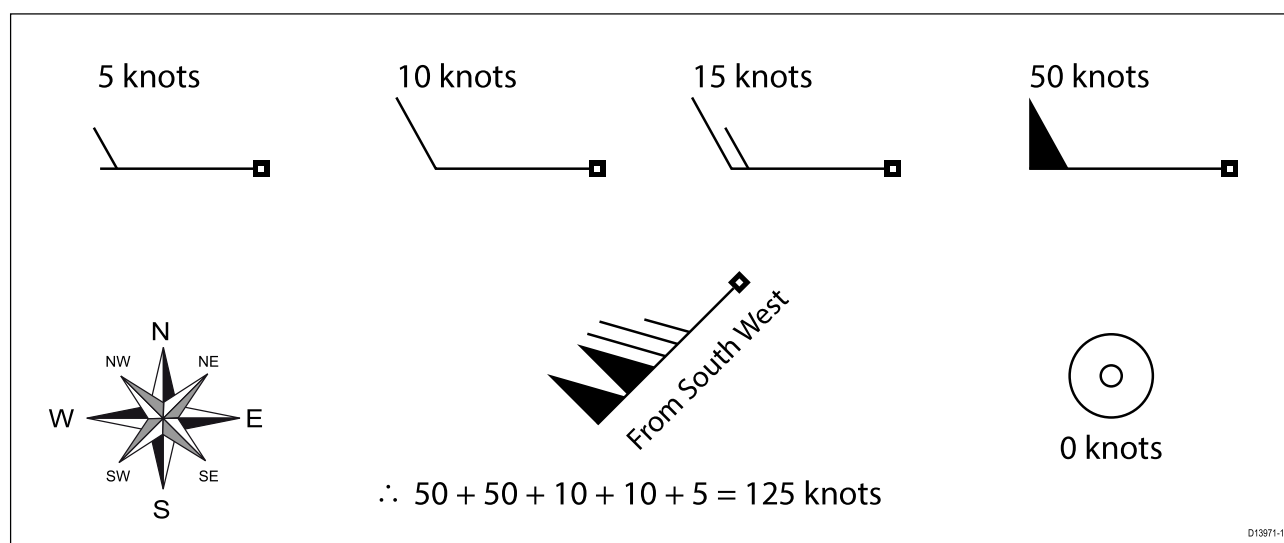
The direction of the arrow indicates wind direction and the size of the arrow indicates wind speed, the larger the arrow the greater the wind speed. Where conditions are calm a circular symbol is used.

You can switch between using Arrows or Barbs for Wind data from the Weather tab of the Chart menu: **Menu > Settings > Weather > Wind symbol.**

### Wind barbs

Wind barbs identify wind direction and speed.

Barbs provide a more accurate speed resolution than arrows.



Adding the half barbs, full barbs and flags together provides wind speed. The direction the barbs point towards indicates where the wind is coming from.

- Half barbs = 5 knots
- Full barbs = 10 knots
- Flag = 50 knots

## Watchbox

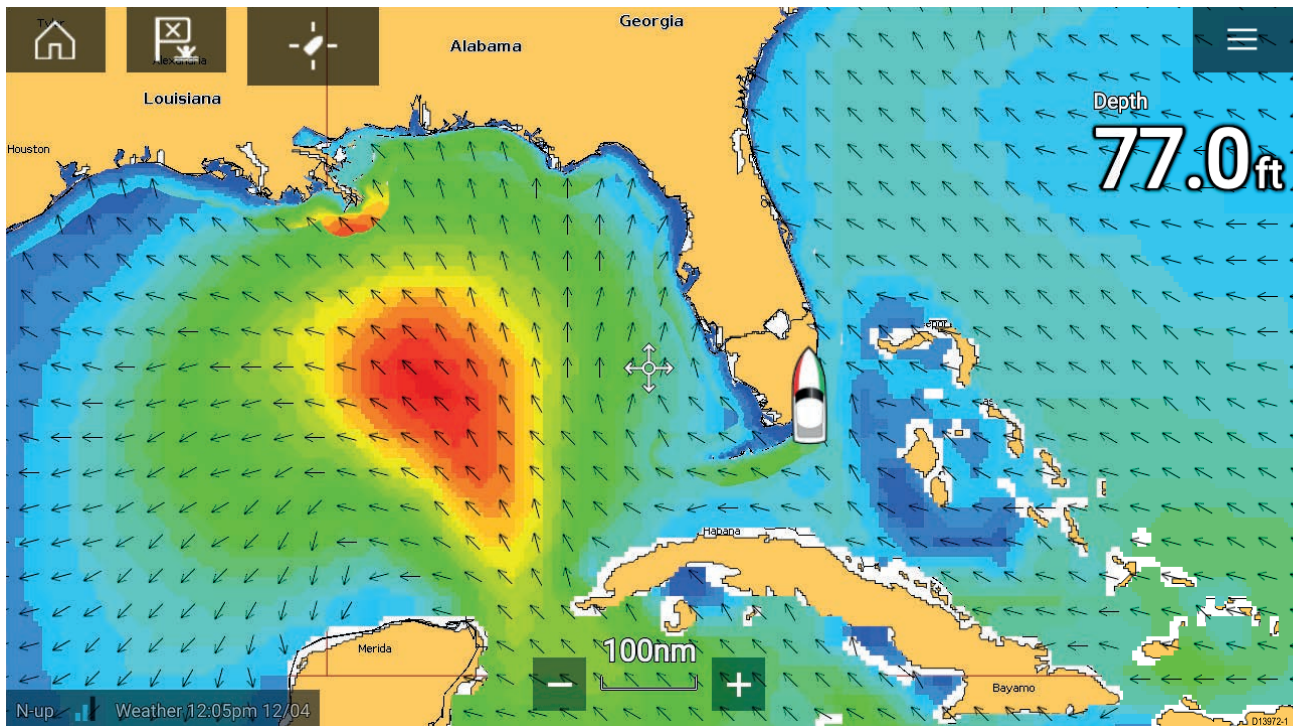
Selecting Watchbox data from the Weather context menu display the data associated with the Watchbox alert.

Watchbox alerts can be enabled and disabled from the Chart menu: **Menu > Settings > Weather > Watchbox alerts**.

You can also adjust the area that is monitored for Watchbox alerts using the **Watchbox range** control on the **Weather** tab.



## 9.11 Wave direction, height and period layers

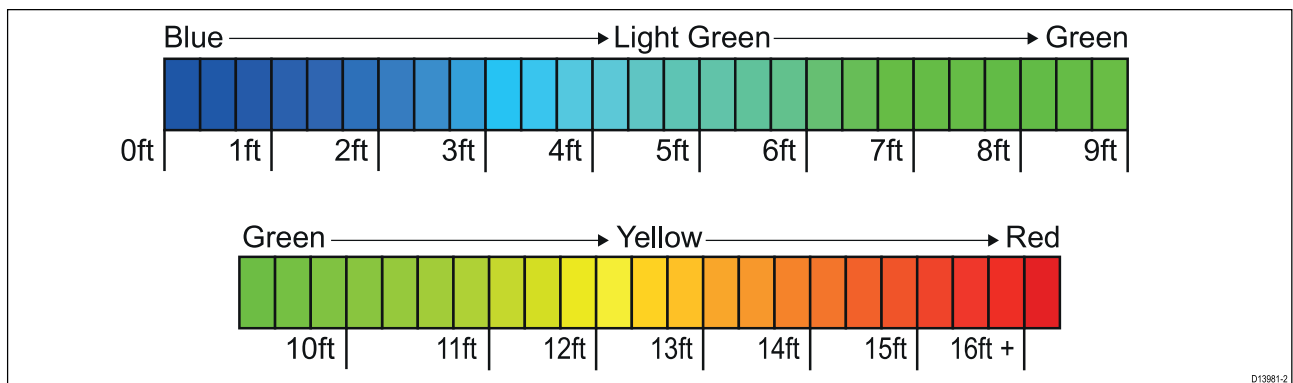


### Wave direction

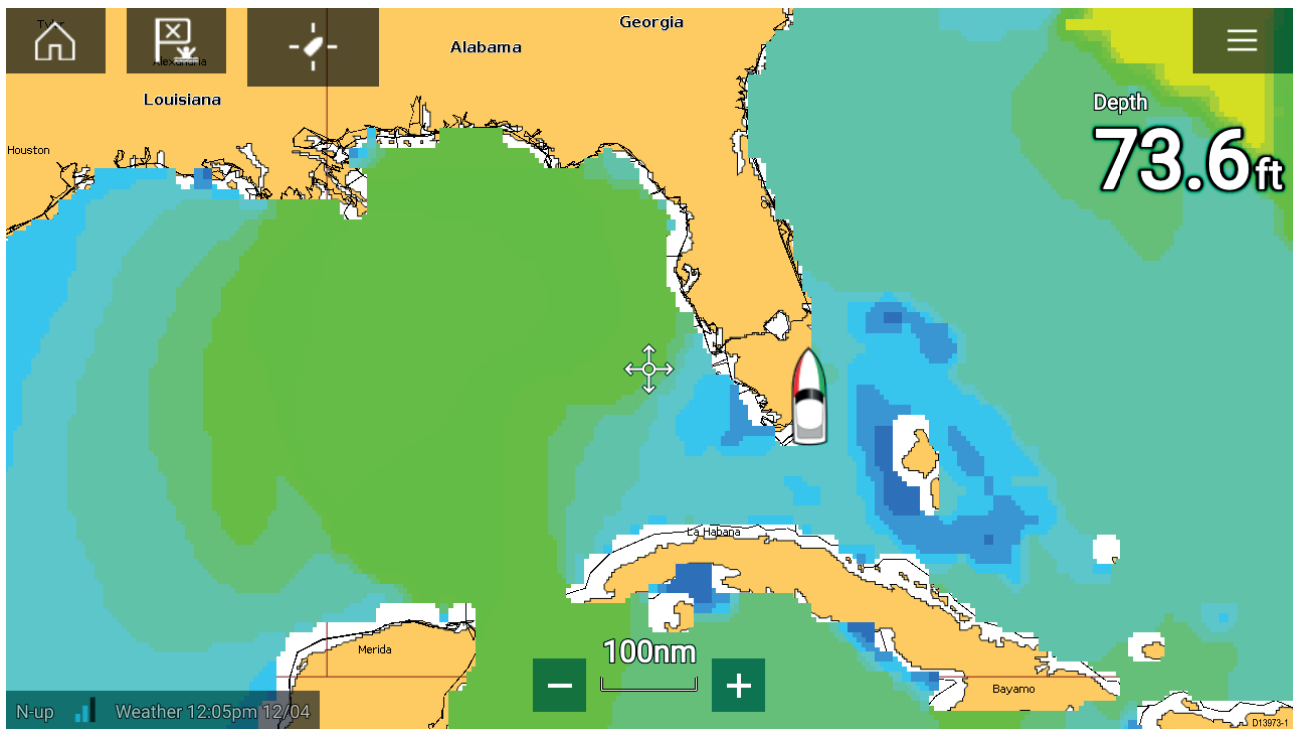
The **Wave direction** layer uses arrows to identify the direction of waves.

### Wave height

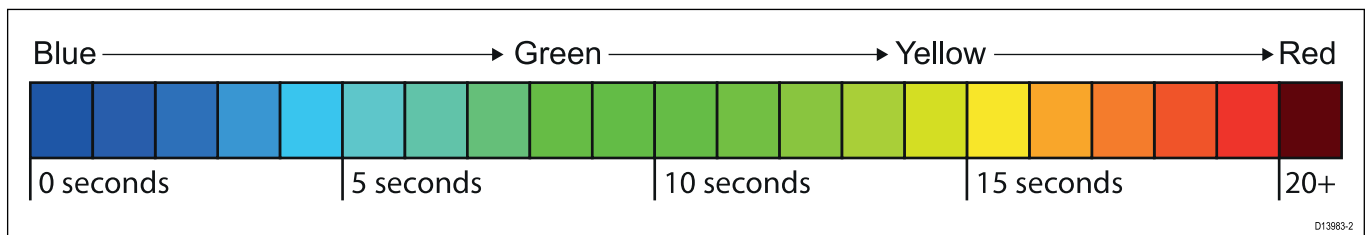
**Wave height** uses colors to identify the height of waves. The colors used are as follows:



## Wave period



**Wave period** uses colors to identify the gap between successive waves. The colors used are as follows:





## Chapter 10: Sonar app

### Chapter contents

- [10.1 Sonar app overview on page 150](#)
- [10.2 Opening the Sonar app on page 153](#)
- [10.3 Sonar channels on page 156](#)
- [10.4 Placing a Waypoint \(Sonar, DownVision and SideVision\) on page 157](#)
- [10.5 Sonar scroll back on page 159](#)
- [10.6 Sonar sensitivity controls on page 160](#)
- [10.7 Sonar settings menu on page 161](#)

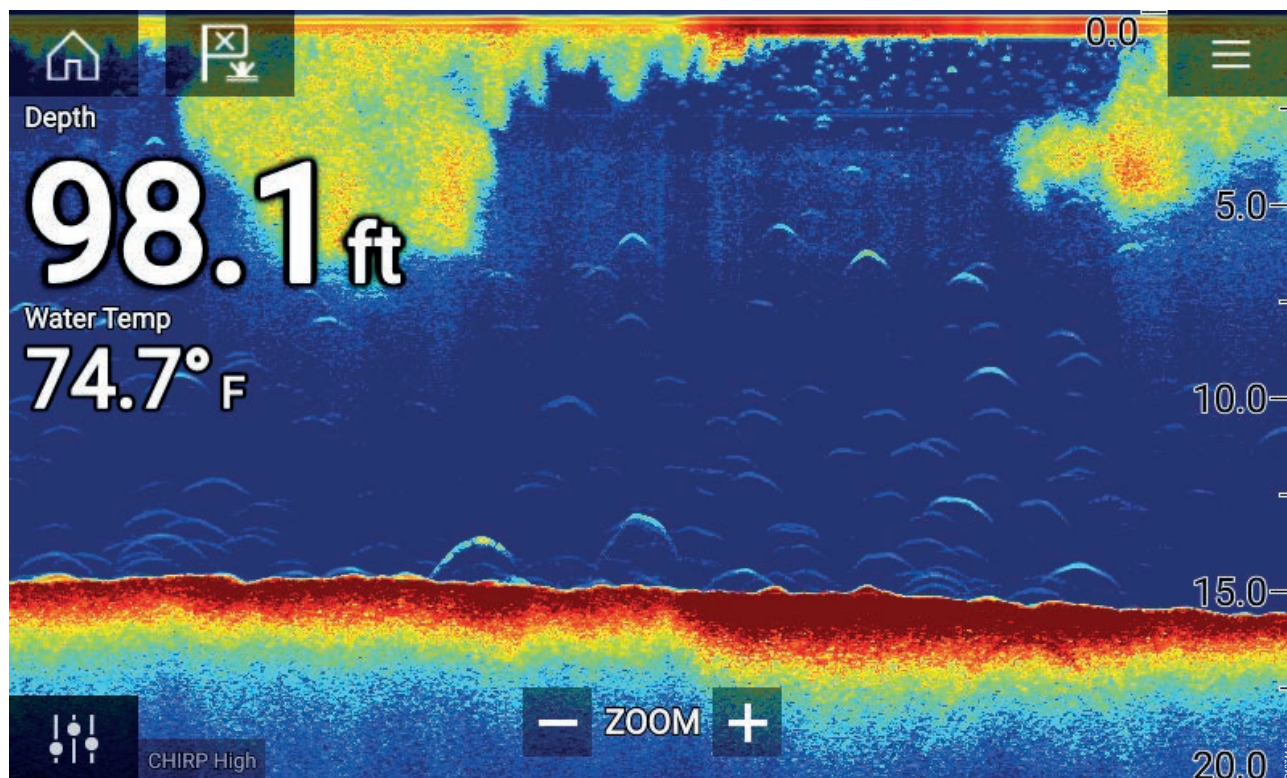
## 10.1 Sonar app overview

The Sonar app displays a visualization of the echoes received from a Sonar module and transducer. The Sonar app is compatible with Traditional, CHIRP, DownVision™, SideVision™ and RealVision™ 3D sonar modules and transducers. The Sonar app builds an underwater view of bottom structure and targets in the water column.



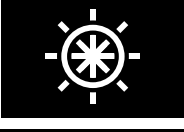

Multiple Sonar modules can be connected at the same time. Sonar modules can be internal (built-in to your MFD) or external (a separate box on your network).

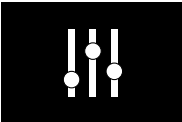

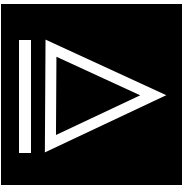

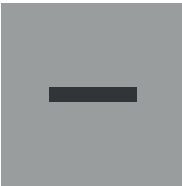
For each instance of the Sonar app you can select which Sonar module and channel that you want to use, the Sonar module and channel selection will persist over a power cycle.

The Sonar app can be displayed in both Fullscreen and splitscreen app pages. App pages may consist of up to 4 instances of the Sonar app.



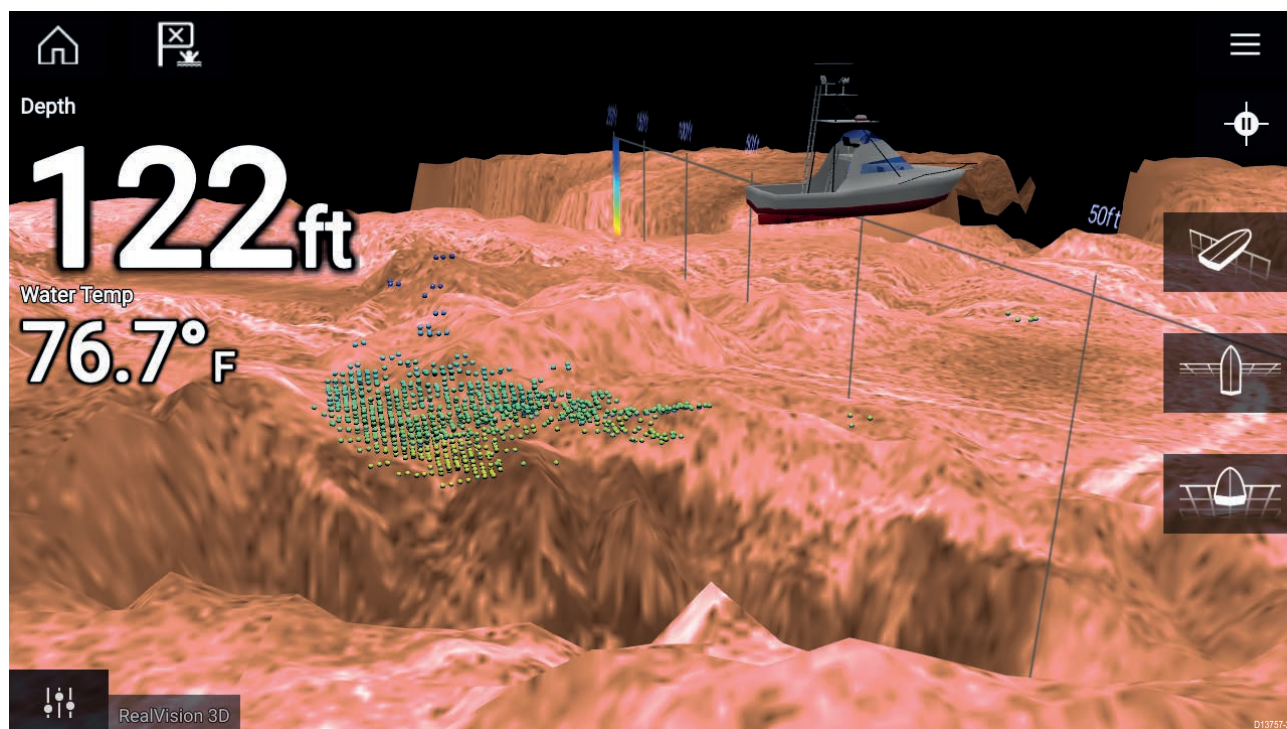
### Sonar app controls

Icon	Description	Action
	Home icon	Takes you to the Homescreen
	Waypoint / MOB	Place waypoint / activate Man overboard (MOB) alarm
	Pilot icon	Opens and closes the Pilot Sidebar
	Menu icon	Opens the app menu

Icon	Description	Action
	Image adjustment	Displays onscreen sensitivity / image adjustment controls
	Pause	Pause RealVision™ 3D sonar image.
	Unpause	When the Sonar app is paused, you can recommence scrolling by selecting the Unpause icon.
	Range/Zoom In	When <b>Auto range</b> is enabled, pressing the plus icon activates Zoom mode, subsequent presses will increase the Zoom factor. When Range is set to Manual pressing the Plus icon decreases the distance displayed onscreen. Auto range can be enabled and disabled from the Menu: <b>Menu &gt; Auto range.</b>
	Range/Zoom Out	When in Zoom mode, pressing the minus icon will decrease the Zoom factor and finally revert to normal mode. When Range is set to Manual pressing the Minus icon increases the distance displayed onscreen.

## RealVision 3D controls

When using RealVision 3D sonar you can manipulate the view using touch gestures.



### Touchscreen controls

- One finger swipe rotates the image.
- Two finger swipe pans the image around the screen.
- Pinch-to-zoom changes the magnification of the image.

- The Range control determines how far the sonar will ping.
- Press and hold onscreen to display the context menu

### **Physical buttons**

- **Ok** button pauses Sonar scrolling.
- **Back** button resumes Sonar scrolling.
- **Ok** button when paused opens the context menu.
- Use the Uni-controller's **Directional** (Up, Down, Left, Right) controls to rotate the image.
- Use the Uni-controller's **Rotary** control or a RMK's **Range In** and **Range Out** buttons to Range in and out.

## 10.2 Opening the Sonar app

The Sonar app is opened by selecting a page icon from the Homescreen that includes a Sonar app.

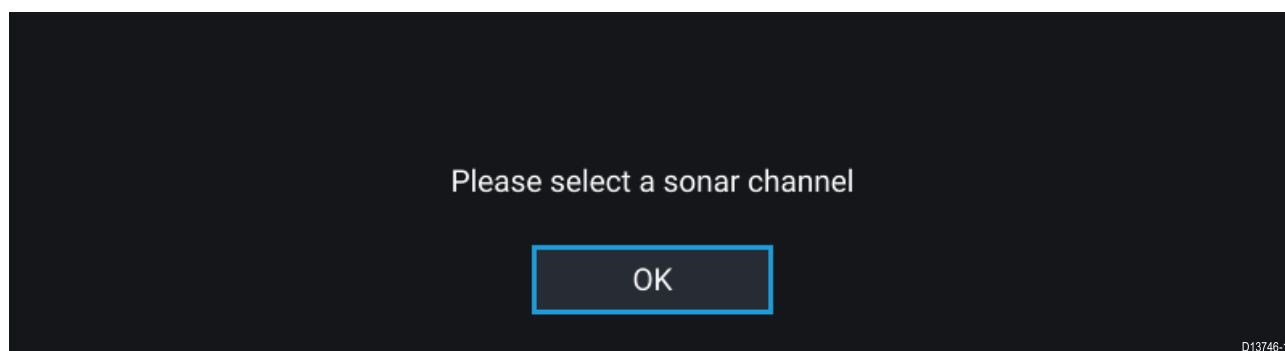
### Pre-requisites:

1. Ensure your Sonar module is compatible (check the latest details available on the Raymarine website). If in doubt please contact an authorized Raymarine dealer for advice.
2. Ensure you have installed your Sonar module in accordance with the documentation that was supplied with the module.

The Sonar app will open in 1 of 4 states:

### Please select a sonar channel

The first time you open a new app page that includes the Sonar app you will need to select a Sonar channel.



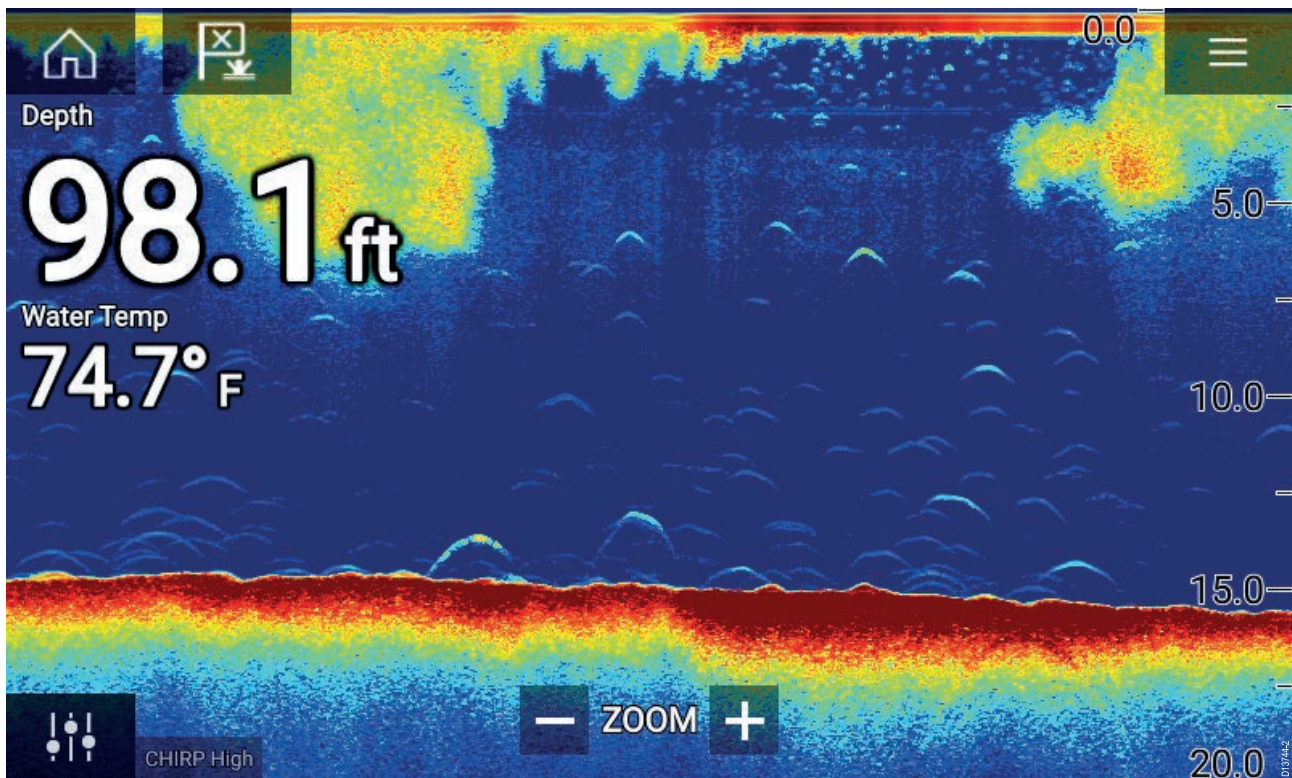
Select **OK** and then choose the Sonar channel you want to use from the list:



### Sonar on and pinging

If your Sonar app has already been set up then when the Sonar app is opened the Sonar image will be displayed and start scrolling.

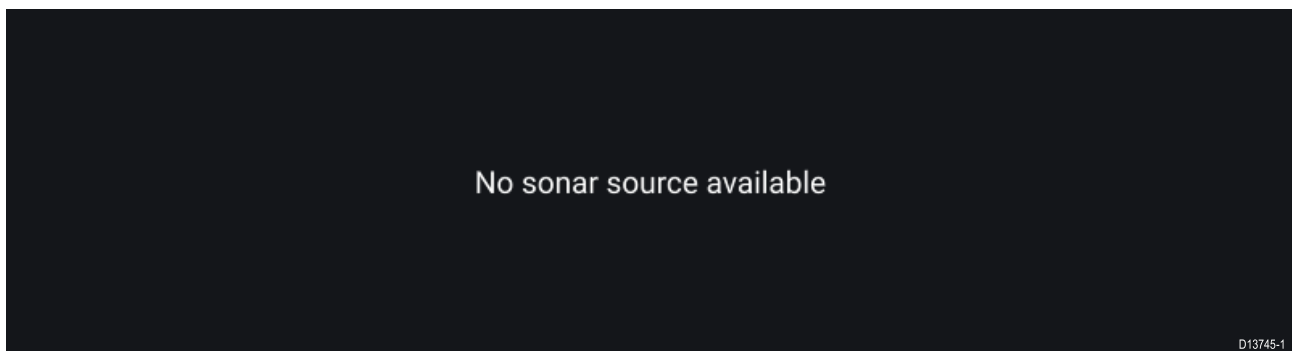




### No sonar source available

If the '**No sonar source available**' warning is displayed then either:

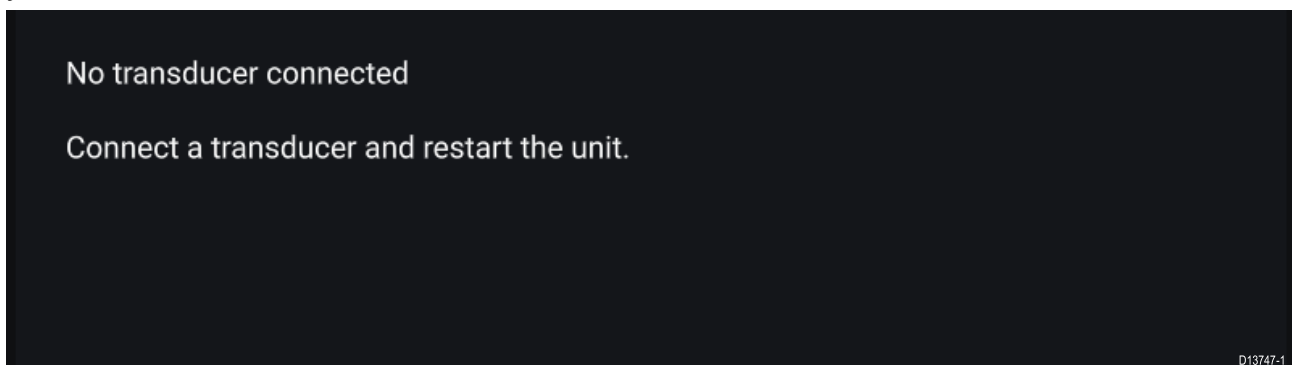
- your sonar module is still powering up.
- your MFD cannot establish a connection with your external Sonar module
- your Internal Sonar module has no transducer connected.



Check your external sonar module's network and power connection, check your MFD's network or transducer connection ensuring the connections and cabling is correct and free from damage, then power cycle your system. If the Sonar module is still not found then refer to your equipment's installation documentation for further troubleshooting information.

### No transducer connected

If the '**No transducer connected**' warning is displayed then your Sonar module cannot connect to your transducer.



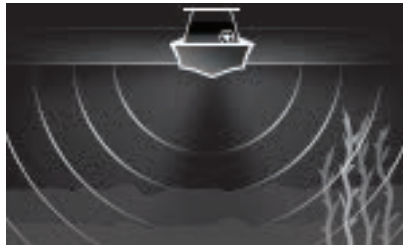
Check your transducer connection(s) are correct and free from damage, then power cycle your system. If the transducer is still not found then refer to your equipment's installation documentation for further troubleshooting information.

## 10.3 Sonar channels

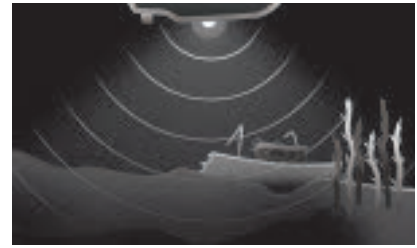
The Sonar channels that are available depend on the Sonar module and transducer you have connected.



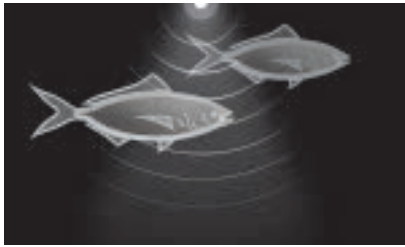
RealVision™ 3D



SideVision™



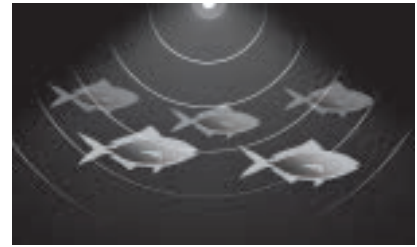
DownVision™



High CHIRP / High Frequency



Medium CHIRP / Medium Frequency



Low CHIRP / Low Frequency

### Selecting a Sonar channel

The first time you open a new Sonar app page you will be requested to select a channel, subsequently you can change the sonar channel by selecting a channel icon from the Sonar app menu.

1. Select a relevant channel icon from the Menu.
2. Alternatively select **All channels** from the Menu and then choose your desired sonar module and channel.



## 10.4 Placing a Waypoint (Sonar, DownVision and SideVision)

When you observe something of interest in the Sonar app you can place a waypoint at its location so that you can find the area again.

1. Select and hold on the point of interest onscreen.  
The Context menu is displayed and scrolling is paused, temporarily.
2. Select **Add Waypoint** from the context menu.

*The Sonar image will remain paused for approximately 10 seconds after the Waypoint has been placed.*

### Placing a waypoint RealVision 3D

To place a waypoint whilst viewing a RealVision 3D channel follow the steps below.

1. Select and hold a location onscreen.  
The Waypoint context menu and Red waypoint marker is displayed:



2. Select **Place waypoint** to create a waypoint at the marker's location, or
3. Select **Move position** to adjust the marker's position before creating the waypoint.



You can move the waypoint along its current axis by sliding 1 finger across the screen. You can also adjust the view onscreen using the usual 2 finger touch gestures.

4. When the marker is over the desired location select **Place waypoint** to save a waypoint at the marker's location.

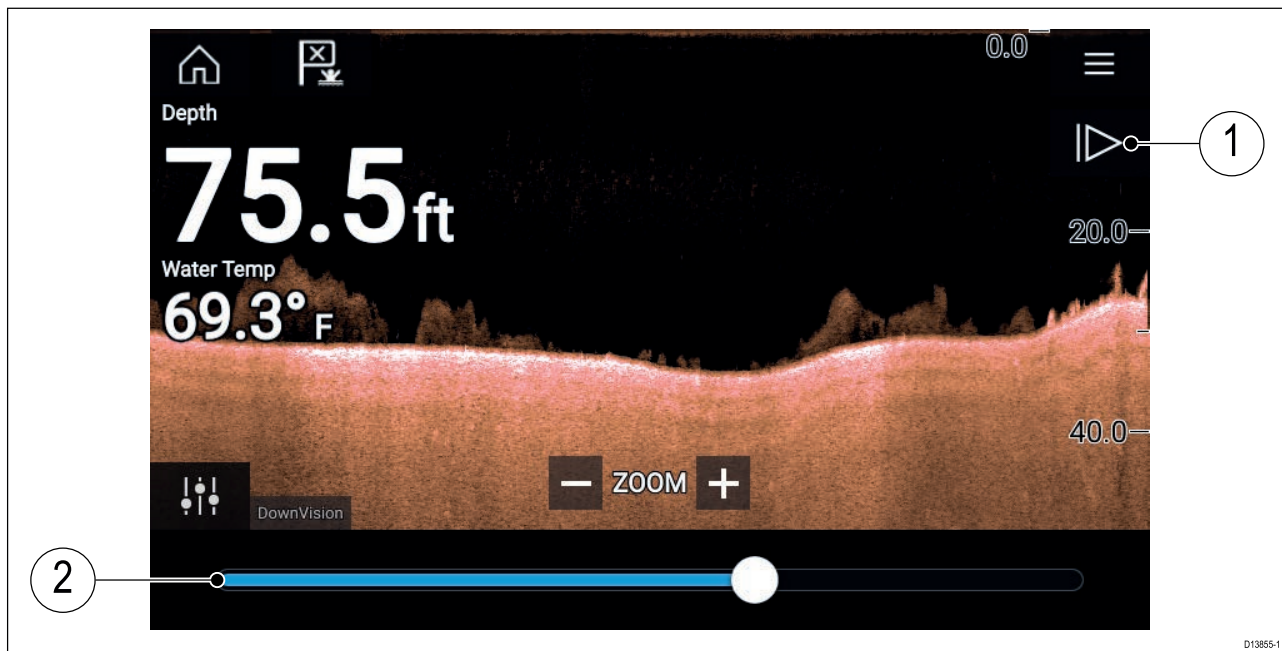
## 10.5 Sonar scroll back

You can “scroll back” in the Sonar app to view sonar history.

To activate sonar “scroll back”, perform the following:

- **Sonar and DownVision** — Swipe your finger left to right across the sonar screen.
- **SideVision** — Swipe your finger from the bottom to the top of the sonar screen.
- **RealVision 3D** — Select the onscreen **Pause** icon.

When sonar scroll back is active the sonar **Scroll back bar** and **Unpause** icons are displayed.



1. **Unpause** — Selecting this option resumes live sonar scrolling.
2. **Scroll back bar** — Use this to move back and forward through the available sonar history. You can either drag the position indicator right or left or select a specific location on the bar to jump to that position.

In Sonar, DownVision and SideVision channels, subsequent swipes will rewind the sonar history and swiping in the opposite direction will fast forward the sonar history.


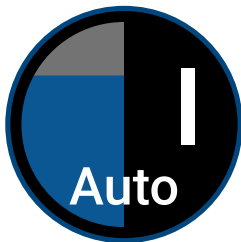



## 10.6 Sonar sensitivity controls

Optimum performance is usually achieved using the default settings. You can adjust the image using the Sensitivity controls to improve the displayed image. Sensitivity setting adjustment is also applied to the sonar history that is displayed when using sonar scroll back.



Sensitivity settings can be accessed using the onscreen **Image adjustment** icon, or the Adjust sensitivity menu option: **Menu > Adjust sensitivity**.

The Sensitivity controls available are dependant upon the Sonar module in use.

Control	Name	Description
	'G' Gain	The control determines the signal strength at which target returns are shown onscreen. The Gain control can be set to <b>Auto</b> or <b>Manual</b> . Depending on Sonar module, in Auto you can add an offset of up to $\pm 50\%$ . A higher value produces more target returns and noise onscreen.
	'I' Intensity, or 'CG' Color Gain	The control sets the lower limit for the color used for the strongest target returns. All target returns above this value are displayed in the strongest color. Those with a weaker value are divided equally between the remaining colors. The control can be set to <b>Auto</b> or <b>Manual</b> . Depending on Sonar module, in Auto you can add an offset of up to $\pm 50\%$ .
	'SF' Surface Filter , or 'NF' Noise filter	The control determines the amount of noise displayed onscreen by varying the gain throughout the water column. A lower value decreases the depth at which the control is applied. The control can be set to <b>Auto</b> or <b>Manual</b> .
	'TVG' Time Varied Gain	The control determines the amount of attenuation applied throughout the water column to ensure that targets of a similar size appear the same regardless of depth. A higher value produces weaker targets and less noise onscreen. The control can be set to 1 of 3 <b>Auto</b> modes or can be set to <b>Manual</b> .
	All to Auto	Sets all Sensitivity settings to <b>Auto</b> with 0% offset.

## 10.7 Sonar settings menu

The table below lists settings applicable to the Sonar app and their location within the app Settings menu. The settings available are dependant upon the Sonar module in use.

### Sonar display tab

Settings	Description	Options
<b>Color palette</b>	Various color palettes are available to suit different conditions or your personal preference.	List of color palettes.
<b>View selection buttons</b>	Enables and disables SideVision™ <b>Left</b> , <b>Right</b> and <b>Both</b> onscreen channel selection icons.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>A-scope</b>	A-Scope mode provides a splitscreen view that includes the normal scrolling sonar image and a smaller pane which shows a 'live' image of what is directly below your transducer.	<ul style="list-style-type: none"> <li>• Off</li> <li>• Center</li> <li>• Right</li> <li>• Cone</li> </ul>
<b>Bottom lock</b>	Bottom lock flips the range indication so that the bottom always appears flat.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Range lines</b>	Displays vertical range lines when viewing.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Depth lines</b>	Displays horizontal depth lines.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>White line</b>	Displays a solid white line along the bottom contour.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Bottom fill</b>	Displays a solid color fill for the bottom.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Color threshold</b>	Color threshold determines the signal strength below which target returns are not shown. A low value results in only the strongest colors or lightest shades being displayed.	<ul style="list-style-type: none"> <li>• 0% to 100%</li> </ul>
<b>Scroll speed</b>	Determines the scrolling speed for the Sonar image.	<ul style="list-style-type: none"> <li>• 10% to 500%</li> </ul>

### RealVision™ 3D — Sonar display tab

Settings	Description	Options
<b>Boat icon</b>	Choose which boat icon to use.	List of available Boat icons.
<b>Image stabilization</b>	Uses RealVision™ 3D transducer's built-in sensors to counter-act the rocking motion of your vessel to produce a stable sonar image.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Target colors</b>	Changes the color palette used for target returns.	List of color palettes.
<b>Color targets by</b>	Changes the way targets are colored. <b>Depth</b> colors targets according to their depth, a gradient scale can be shown on the 3D grid to aid depth identification. <b>Intensity</b> colors targets according to their size, the bigger the target the darker the color used.	<ul style="list-style-type: none"> <li>• Depth</li> <li>• Intensity</li> </ul>
<b>Show targets as</b>	Changes the method of rendering targets, <b>Point</b> provides the highest resolution, <b>Sphere</b> provides a lower resolution but increases target size for increased visibility.	<ul style="list-style-type: none"> <li>• Point</li> <li>• Sphere</li> </ul>

Settings	Description	Options
<b>Bottom colors</b>	Changes the color used for bottom structure.	List of colors.
<b>Background</b>	Changes the color used for the app background.	List of colors.
<b>View mode</b>	In <b>GPS track</b> mode the boat icon will remain in the same position and bottom structure and target detail will move in true relation to your vessel movements. In <b>Scrolling image</b> mode the sonar pings at a constant speed and displays a scrolling image behind the boat icon.	<ul style="list-style-type: none"> <li>• GPS track</li> <li>• Scrolling image</li> </ul>

#### Transducer tab

Settings	Description	Options
<b>Transducer</b>	Allows selection of Sonar transducer.	List of available transducers.
<b>Display depth as</b>	Determines the position from where depth readings are taken from.	<ul style="list-style-type: none"> <li>• Below keel</li> <li>• Below waterline</li> <li>• Below transducer</li> </ul>
<b>Speed transducer</b>	Allows selection of Speed transducer.	List of available transducers.
<b>Calibrate speed</b>	Allows you to enter an offset between actual measured speed and the current speed displayed by your transducer.	Offset value.
<b>Enable temperature sensor</b>	Enables and disables the selected transducer's temperature sensor.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Calibrate temp</b>	Allows you to enter an offset between actual measured water temperature and the current temperature displayed by your transducer.	Offset value.

#### Sounder tab

Settings	Description	Options
<b>Sounder name</b>	Allows you to rename your sonar module.	Onscreen keyboard.
<b>Ping enable</b>	Enables and disables transducer ping.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Ping rate limit</b>	Allows you to restrict the transducer's maximum ping rate to suit current conditions.	• 1 to 100
<b>Power mode</b>	Adjusts the transducer's signal strength. In <b>Auto</b> the sonar module will automatically determine the optimal power based on current depth, speed and bottom signal. In <b>Manual</b> you can adjust the power to the desired level.	• 1 to 100
<b>Ping rate</b>	Hyper ping should be used at speeds of up to 40 knots in shallower waters (6 metres or less). When the depth reaches 6 metres or above the ping rate will automatically reduce to normal until depth conditions are met.	<ul style="list-style-type: none"> <li>• Normal</li> <li>• Hyper</li> </ul>

Settings	Description	Options
<b>Dual channel ping mode</b>	On sonar modules that offer simultaneous dual channel operation, such as the CP570, The ping mode can be changed. <b>Auto</b> the Sonar app will select the best mode chosen based on range settings. <b>Independent pings</b> maximizes ping rate but may introduce interference. <b>Simultaneous pings</b> reduced ping rate and reduces chance of interference.	<ul style="list-style-type: none"> <li>• Auto</li> <li>• Independent pings</li> <li>• Simultaneous pings</li> </ul>
<b>Tune frequency</b>	Enables manual tuning of non-CHIRP frequency channels.	<ul style="list-style-type: none"> <li>• -50% to +50%</li> </ul>
<b>AHRS stabilization</b>	The AHRS built in to the RealVision™ 3D transducer is used to stabilize the sonar image onscreen based on your vessel's detected movements.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Reverse Port/Starboard</b>	When a RV100 transducer is hull/step mounted the transducer can be installed with the cable orientated towards either the bow or the stern of the vessel. On installations where the transducer cable is orientated towards the stern of the vessel then the <b>Reverse Port/Starboard</b> control must be enabled.	<ul style="list-style-type: none"> <li>• Enabled</li> <li>• Disabled</li> </ul>
<b>Interference rejection</b>	Removes interference caused by other transducers on your vessel or from vessels equipped with transducers close by.	<ul style="list-style-type: none"> <li>• Auto</li> <li>• Low</li> <li>• Medium</li> <li>• High</li> <li>• Off</li> </ul>
<b>2nd echo rejection</b>	The control helps to remove false target returns or false bottom that can be caused by signal reflection.	<ul style="list-style-type: none"> <li>• Off</li> <li>• Low</li> <li>• High</li> </ul>
<b>Reset sounder</b>	Resets the sonar module to factory default settings.	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>
<b>Reset trip</b>	In installations that include a speed transducer connected via the sonar module a trip log is automatically recorded. Selecting this option resets the sonar module's trip log.	<ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>

#### Page settings tab

Settings	Description
<b>Data Overlays</b>	Enables configuration of Data overlays, which overlay key information from connected sensors onto the Chart, Radar, Sonar and Camera apps.
<b>Edit split ratio</b>	Enables you to customize the position of the partitions in splitscreen app pages. For example, 50/50, 70/30 etc.





## Chapter 11: Radar app

### Chapter contents

- [11.1 Radar app overview on page 166](#)
- [11.2 Radar feature comparison on page 169](#)
- [11.3 Opening the Radar app on page 172](#)
- [11.4 Set up on page 174](#)
- [11.5 Radar modes on page 176](#)
- [11.6 Range and bearing on page 177](#)
- [11.7 AIS targets on page 179](#)
- [11.8 Radar targets on page 182](#)
- [11.9 Dangerous targets alarm on page 190](#)
- [11.10 Guard zone alarms on page 191](#)
- [11.11 Doppler Radar overview on page 192](#)
- [11.12 Radar sensitivity controls on page 194](#)
- [11.13 Radar settings on page 195](#)

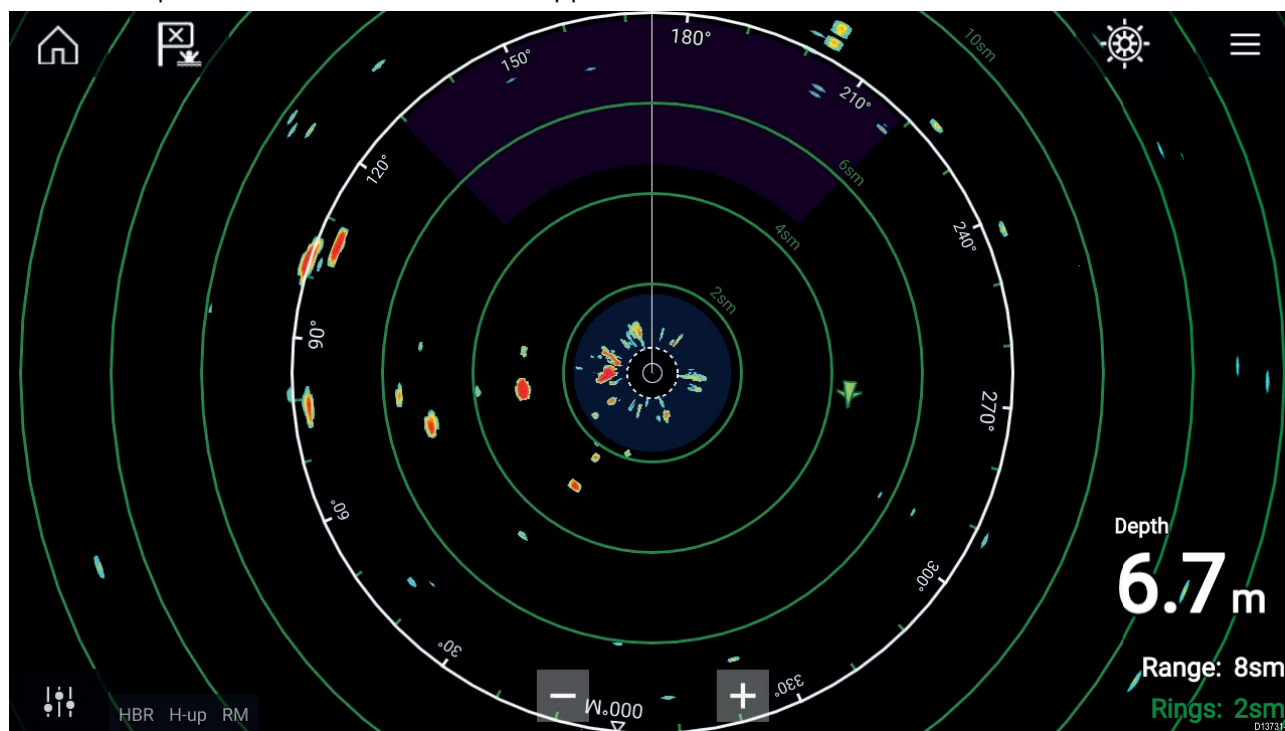
## 11.1 Radar app overview

The Radar app displays a visualization of the echoes received from a connected Radar scanner. The Radar app is a navigation aid used to help enhance collision and situational awareness by enabling target's distance and speed to be tracked in relation to your vessel.

Up to 2 Radar scanners can be connected at the same time. However, only 1 Radar in a system can be a Quantum™ Radar.

For each instance of the Radar app you can select which Radar scanner you want to use, the Radar scanner selection will persist over a power cycle.

The Radar app can be displayed in both Fullscreen and splitscreen app pages. App pages may consist of up to 2 instances of the Radar app.



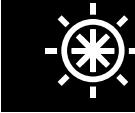



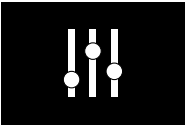
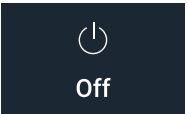
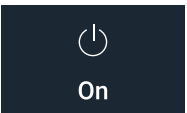
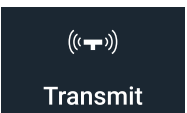

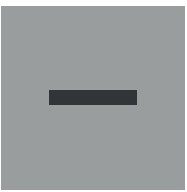
Tracked Radar targets and AIS targets are displayed using target symbols.

The Radar app allows you to configure alarms which are triggered when a target or object conflicts with the **Dangerous targets** or **Guard Zone** alarm settings.

The Range rings, bearing ring and VRM/EBLs can be used to identify a targets distance and heading in relation to your vessel.

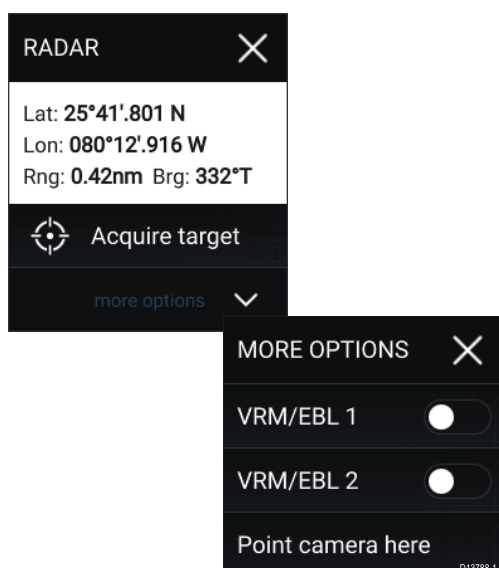
### Radar app controls

Icon	Description	Action
	Home icon	Takes you to the Homescreen
	Waypoint / MOB	Place waypoint / activate Man Overboard (MOB) alarm
	Pilot icon	Opens and closes the Pilot Sidebar
	Menu icon	Opens the App menu

Icon	Description	Action
	Image adjustment	Displays onscreen sensitivity / image adjustment controls
	Power Off	Powers down the current Radar scanner
	Power On	Powers up the selected Radar scanner
	Transmit	Start Radar transmission
	Range In	Decreases the distance displayed onscreen (minimum range: 1/16nm).
	Range Out	Increases the distance displayed onscreen (up to your Radar scanner's maximum range).

## Radar app context menu

Context menus provide context sensitive menu options.



- Context menus are accessed in the Radar app by selecting a location or target.
- The context menu provides Latitude, longitude, range and bearing details for the selected location or object.
- The context menu provides quick access to relevant settings or features.
- Select **More options** to display further options.

## Camera tracking

When connected to a compatible Pan and Tilt Thermal camera you can track targets or point your camera at a specific target or area.

2 options are available for camera tracking:

- **Point camera here** — Points the camera at a specific point onscreen, the camera will remain pointed at this area regardless of your own vessel's course.

- **Track with camera** — Tracks a selected target regardless of your own vessel's or target's course.

Camera tracking options are available from the Context menu in the Chart and Radar apps: **Context menu > more options > Point camera here**, or **Context menu > more options > Track with camera**.

### **Automatic tracking**

You can use the Camera app settings to configure automatic tracking for AIS, Radar and MoB targets:  
**Camera app > Menu > Settings > Camera motion > AUTO TRACKING**

## 11.2 Radar feature comparison

The range of features and settings that are available in the Radar app is dependent on the type of connected Radar scanner.

### Sensitivity controls

Features/settings	Radar type
Gain	<ul style="list-style-type: none"><li>• All</li></ul>
Color Gain	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• Quantum™ 2 Doppler</li><li>• Quantum™</li><li>• SuperHD™ Open Array</li><li>• HD Open Array</li><li>• HD Radome</li></ul>
Rain	<ul style="list-style-type: none"><li>• All</li></ul>
Sea Clutter	<ul style="list-style-type: none"><li>• All</li></ul>
FTC (Fast Time Constant)	<ul style="list-style-type: none"><li>• Digital Radome</li></ul>
Power Boost	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• SuperHD™ Open Array</li></ul>
Antenna Boost	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• SuperHD™ Open Array</li></ul>

### Gain Modes

Features/settings	Radar type
Buoy	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• SuperHD™ Open Array</li><li>• HD Open Array</li><li>• HD Radome</li></ul>
Harbor	<ul style="list-style-type: none"><li>• All</li></ul>
Coastal	<ul style="list-style-type: none"><li>• All</li></ul>
Offshore	<ul style="list-style-type: none"><li>• All</li></ul>
Bird	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• SuperHD™ Open Array</li><li>• HD Open Array</li><li>• HD Radome</li></ul>
Weather	<ul style="list-style-type: none"><li>• Quantum™ 2 Doppler</li><li>• Quantum™</li></ul>

### Features

Features/settings	Radar type
Doppler	<ul style="list-style-type: none"><li>• Quantum™ 2 Doppler</li></ul>
Dual Range	<ul style="list-style-type: none"><li>• Magnum Open Array</li><li>• SuperHD™ Open Array</li><li>• HD Open Array</li><li>• HD Radome</li></ul>
Interference Rejection	<ul style="list-style-type: none"><li>• All</li></ul>

Features/settings	Radar type
Interference Rejection Level	<ul style="list-style-type: none"> <li>• Quantum™ 2 Doppler</li> <li>• Quantum™</li> <li>• Digital Radome</li> </ul>
Target Expansion	<ul style="list-style-type: none"> <li>• All</li> </ul>
Expansion Level	<ul style="list-style-type: none"> <li>• Digital Radome</li> </ul>
Guard Zones	<ul style="list-style-type: none"> <li>• All = 2</li> </ul>
Guard Zone Sensitivity	<ul style="list-style-type: none"> <li>• All</li> </ul>
Radar Targets	<ul style="list-style-type: none"> <li>• Magnum Open Array = 25</li> <li>• Quantum™ 2 Doppler = 25</li> <li>• Quantum™ = 10</li> <li>• SuperHD™ Open Array = 25</li> <li>• HD Open Array = 25</li> <li>• HD Radome = 25</li> <li>• Digital Radome = 10</li> </ul>
Auto acquire (targets)	<ul style="list-style-type: none"> <li>• Magnum Open Array = 25</li> <li>• Quantum™ 2 Doppler = 25</li> </ul>
Tuning	<ul style="list-style-type: none"> <li>• Magnum Open Array</li> <li>• SuperHD™ Open Array</li> <li>• HD Open Array</li> <li>• HD Radome</li> </ul>
Transmit Frequency	<ul style="list-style-type: none"> <li>• Quantum™ 2 Doppler</li> <li>• Quantum™</li> </ul>
Scanner Rotation Speed	<ul style="list-style-type: none"> <li>• Magnum Open Array = 24 RPM / Auto (48 RPM)</li> <li>• Quantum™ 2 Doppler = 24 RPM</li> <li>• Quantum™ = 24 RPM</li> <li>• SuperHD™ Open Array = 24 RPM / Auto (48 RPM)</li> <li>• HD Open Array = 24 RPM / Auto (48 RPM)</li> <li>• HD Radome = 24 RPM / Auto (48 RPM)</li> <li>• Digital Radome = 24 RPM</li> </ul>
Sea Clutter Curve	<ul style="list-style-type: none"> <li>• All</li> </ul>
Parking Offset	<ul style="list-style-type: none"> <li>• Magnum Open Array</li> <li>• SuperHD™ Open Array</li> <li>• HD Open Array</li> </ul>
Antenna Size selection	<ul style="list-style-type: none"> <li>• Magnum Open Array</li> <li>• SuperHD™ Open Array = 4ft / 6ft</li> <li>• HD Open Array = 4ft / 6ft</li> </ul>
Timed Transmit	<ul style="list-style-type: none"> <li>• All</li> </ul>
Bearing Alignment	<ul style="list-style-type: none"> <li>• All</li> </ul>
MBS (Main Bang Suppression) Off	<ul style="list-style-type: none"> <li>• All</li> </ul>

Features/settings	Radar type
Tuning Preset	<ul style="list-style-type: none"> <li>• Magnum Open Array</li> <li>• SuperHD™ Open Array</li> <li>• HD Open Array</li> <li>• HD Radome</li> <li>• Digital Radome</li> </ul>
STC (Sensitivity Time Control) Preset	<ul style="list-style-type: none"> <li>• Digital Radome</li> </ul>
VRM/EBL (Variable Range Markers/Electronic Bearing Line)	<ul style="list-style-type: none"> <li>• All</li> </ul>
Display Timing	<ul style="list-style-type: none"> <li>• SuperHD™ Open Array = 0–767m</li> <li>• HD Open Array = 0–767m</li> <li>• HD Radome = 0–767m</li> <li>• Digital Radome = 0–153.6m</li> </ul>
Max Range	<ul style="list-style-type: none"> <li>• Magnum Open Array = 4kW = 72nm, 6kW = 96nm</li> <li>• Quantum™ 2 Doppler = 24nm</li> <li>• Quantum™ = 24nm</li> <li>• SuperHD™ Open Array = 72nm</li> <li>• HD Open Array = 72nm</li> <li>• HD Radome = 48nm</li> <li>• Digital Radome = 48nm</li> </ul>
Colors	<ul style="list-style-type: none"> <li>• Magnum Open Array = 256</li> <li>• Quantum™ 2 Doppler = 256</li> <li>• Quantum™ = 256</li> <li>• SuperHD™ Open Array = 256</li> <li>• HD Open Array = 256</li> <li>• HD Radome = 256</li> <li>• Digital Radome = 8</li> </ul>

## Compatible Radar scanners

- Magnum Open Array.
- Quantum™ 2 Doppler.
- Quantum™.
- SuperHD™ Open Array.
- HD Open Array.
- HD Radome.
- Digital Radome.

## 11.3 Opening the Radar app

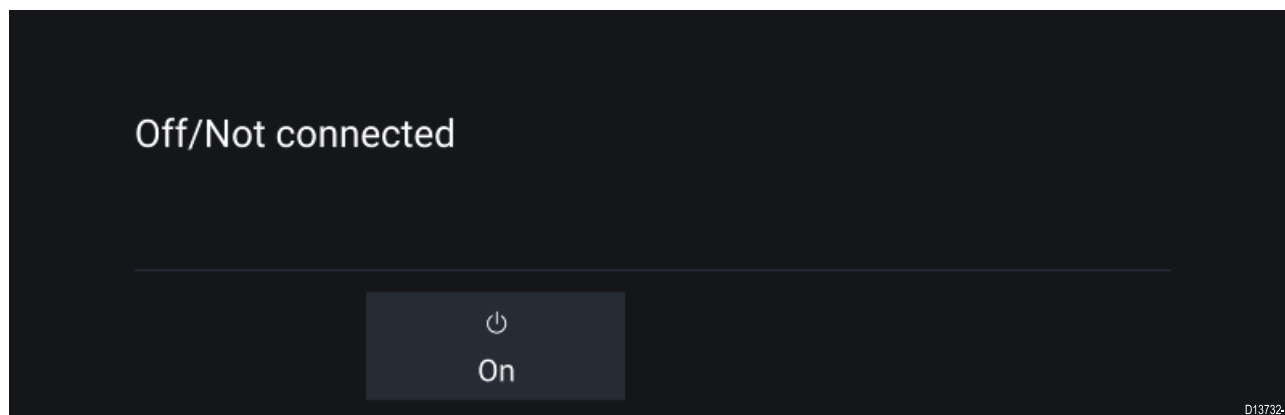
The Radar app is opened by selecting a page icon from the Homescreen that includes the Radar app.

### Pre-requisites:

1. Ensure your Radar scanner is compatible, check the latest details available on the Raymarine website, if in doubt please contact an authorized Raymarine dealer for advice.
2. Ensure you have installed your Radar scanner in accordance with the documentation that was supplied with your Radar.

The Radar app will open in 1 of 3 states:

### Off/Not Connected

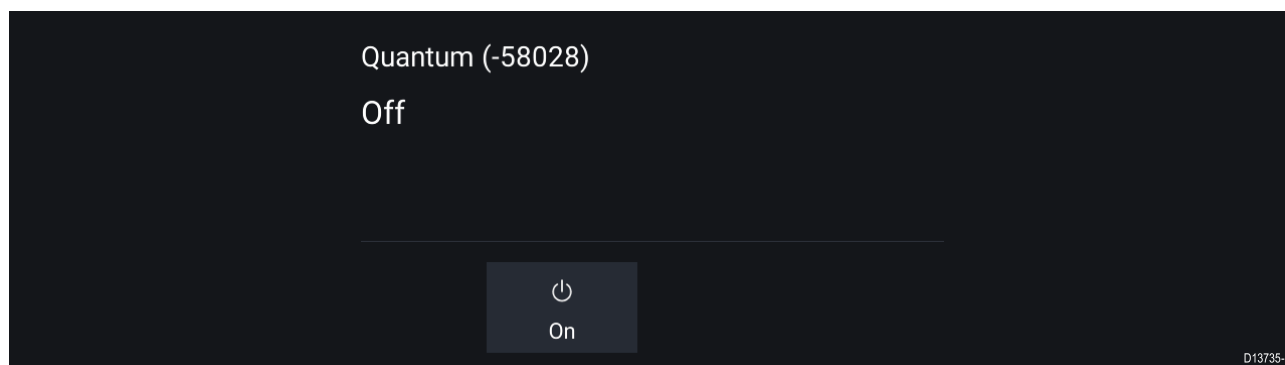


If the '**Off/Not Connected**' message is displayed then:

- your Radar scanner may be powered down, or
- your MFD cannot establish a connection with your Radar scanner

Select **On** to power up your Radar. If the '**Radar not found**' message is displayed then a connection could not be established, ensure that network and power connections to your Radar and MFD are correct and free from damage and then power cycle your system. If the Radar scanner can still not be found refer to your Radar's installation documentation for further troubleshooting information.

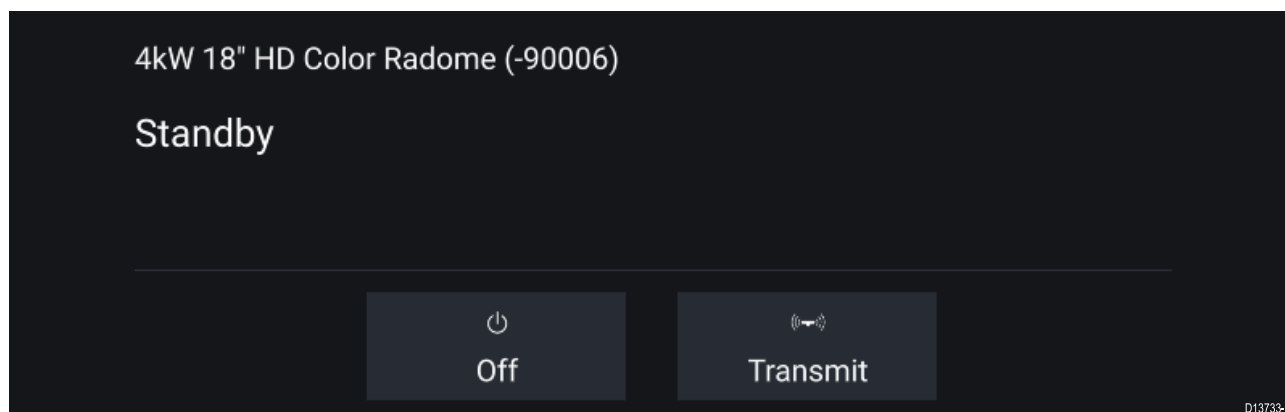
### Off



If the '**Off**' message is displayed then your Wi-Fi connected Radar scanner is paired but powered off, select **On** to power up your Radar

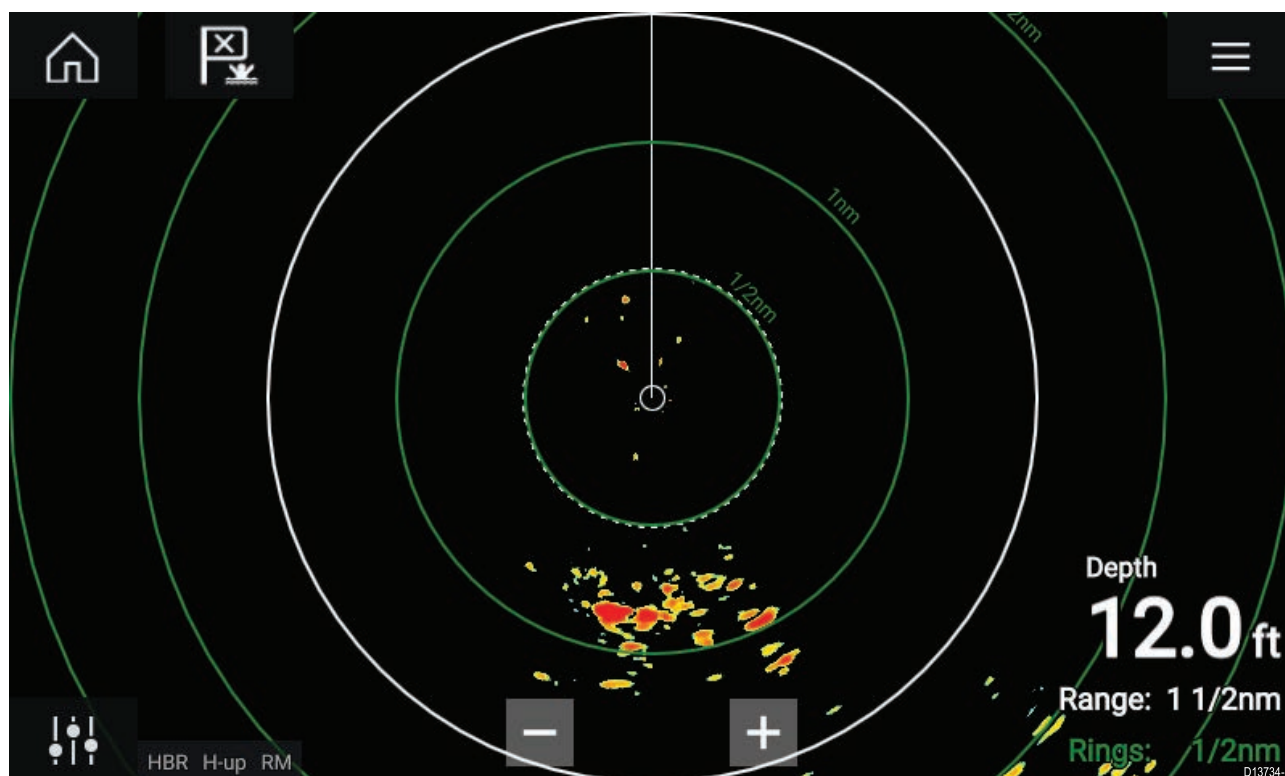


## Standby (Not transmitting)



If the '**Standby**' message is displayed then select **Transmit** to begin transmitting.

## Transmitting



If your Radar scanner is connected, powered up and transmitting then the Radar image is displayed and echoes/targets are displayed onscreen.

## Putting the Radar into Standby

With your selected Radar displayed onscreen:

1. Select Transmit from the main menu.  
The Radar scanner will stop transmitting and is put into **Standby** mode.

## Powering down your Radar

With your Radar scanner in Standby:

1. Select the **Off** icon.
2. Select **Yes** to confirm power down.

*The Radar scanner will still consume a small amount of power whilst it is powered off, this is to ensure the Radar can be powered back up quickly.*

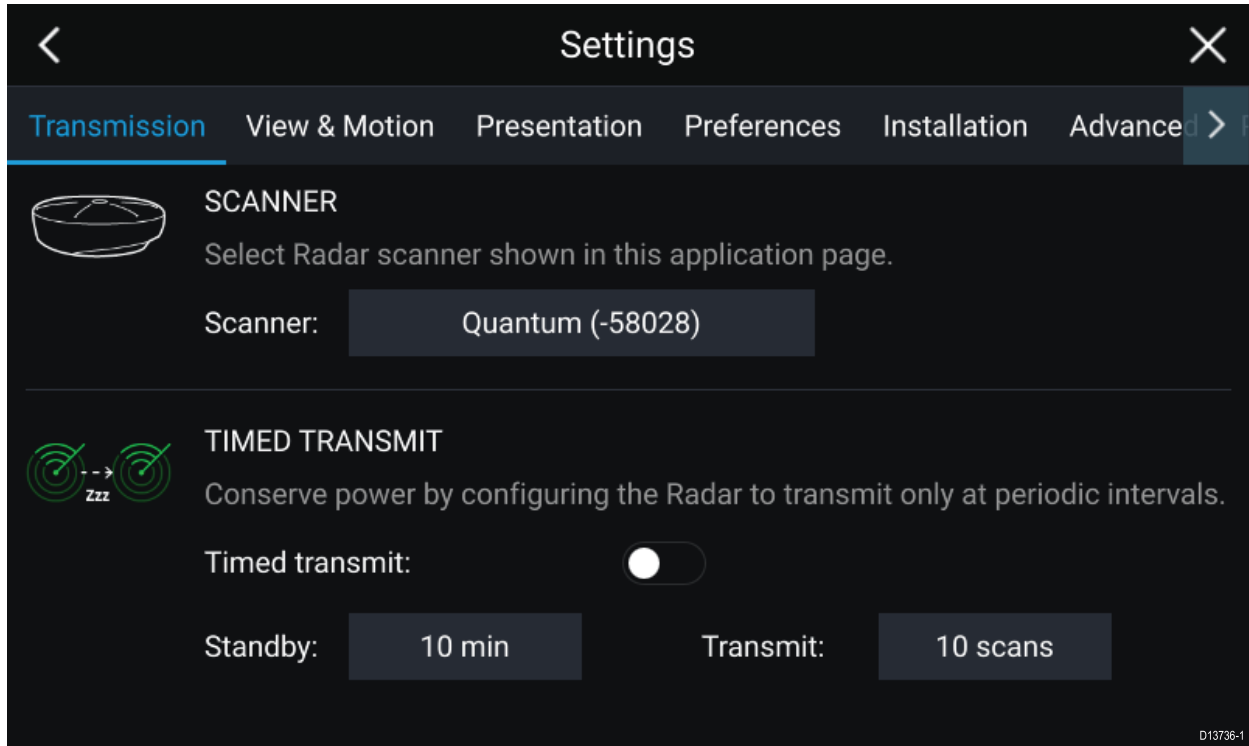
## 11.4 Set up

### Selecting a Radar scanner

On systems with 2 Radar scanners, you can select which Radar scanner is used in each instance of the Radar app.



1. Select the **Settings** icon from the Radar app menu.



2. Select the **Scanner:** box on the **Transmission** tab.  
A list of available Radar scanners is displayed.
3. Select the Radar scanner that you want to associate with the current instance of the Radar app.
4. Close the **Settings** page.

The current instance of the Radar app will change to display the selected Radar scanner. Radar scanner selection shall persist over a power cycle.

Alternatively, with the Radar powered off or in Standby, you can select switch Radar scanner by selecting **Change scanner**.



### Dual range

HD and SuperHD Radar scanners are capable of **Dual range**. Dual range enables you to view 2 ranges (i.e. Short range and Long range) simultaneously.

To view both ranges you will need to configure a splitscreen, dual Radar, app page that displays the same Radar scanner in each window. You can then enable **Dual Range** mode and set the **Channel** for each window from the **Transmission** tab: **Menu > Settings > Transmission**.

## Dual range limitations:

- Dual range cannot be enabled when Radar targets are being tracked (clear the target list and try again).
- When Dual range is enabled Radar target tracking is disabled.
- When Dual range is enabled Automatic Radar target acquisition is disabled.
- In Dual range the maximum rotation speed is 24rpm.
- When using a SuperHD Radar **Antenna boost** and **Power boost** controls are only applied to the Long range channel. Open Array Radar scanners running version 1.xx or 2.xx software will have the Short range channel's maximum range restricted to 3 nm.
- When Dual range is enabled on a Radar scanner running version 1.xx or 2.xx software the **Expansion** control will be disabled.

## Timed Radar transmission

To help conserve power you can configure your Radar to only transmit periodically.

From the Radar menu:

1. Select the **Settings** icon.  
The settings page is displayed.
2. Switch on **Time Transmit**: using the toggle switch.
3. Select **Standby**: and choose a time interval.
4. Select **Transmit**: and choose the number of rotations you want the Radar to perform.

The Radar will transmit for the specified number of rotations and then will switch to Standby for the specified time interval, the sequence will repeat until Timed Transmit is switched off.

The Timed transmit will revert to Off after a power cycle.

## Setting open array antenna size

When connected to an Open Array Radar Scanner you can configure the **Antenna size**. Setting the antenna size can help when setting a **Parking offset**.

From the Radar app:

1. Select **Menu > Settings > Transmission**.
2. Select the correct size for your Radar's antenna from the **Antenna size** option.

## Bearing alignment

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

### Checking alignment

Align the bow with a stationary object between 0.25 and 2 NM away.

Reduce the gain to make the target as small as possible on the screen.

Note the position of the object on the Radar screen. If the target is not under the ship's heading marker (SHM), then bearing alignment adjustment is required.

### Adjusting alignment

Adjust the **Bearing alignment** setting until the target object appears under the SHM.

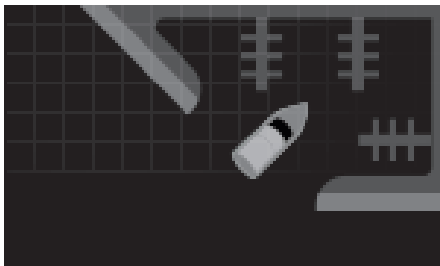
**Bearing alignment** setting can be accessed from the **Installation** tab: **Menu > Installation > Bearing alignment**.

**Note:** Heading (HDG) is displayed in the Radar application. Please be aware that bearing alignment refers to the **relative** bearing of **targets** to the vessel's bow using visual checks / traditional means.

## 11.5 Radar modes

The Radar app provides preset modes that can be used to quickly achieve the best picture depending on your current situation. Only Radar modes supported by your Radar scanner are shown.

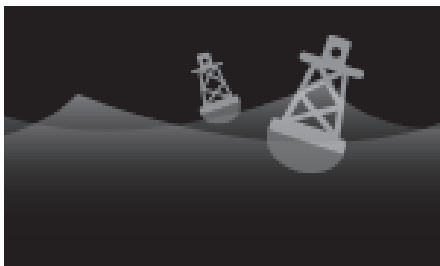
To change Radar mode select the required mode from the Radar app menu.



### HARBOR

Harbor mode takes into account land clutter that is typically encountered in a Harbor, so that smaller targets are still visible. This mode is useful when navigating in a Harbor.

**Radar scanners:** All.



### BUOY

Buoy mode enhances the detection of smaller targets such as mooring buoys, and is useful at ranges up to 3/4nm.

**Radar scanners:** SuperHD™ Open Array, HD Open Array and HD Radome.



### COASTAL

Coastal mode takes into account slightly higher levels of Sea clutter that are encountered out of Harbor areas. This mode is useful when in open water but keeping to coastal areas.

**Radar scanners:** All.



### OFFSHORE

Offshore mode takes into account high levels of Sea clutter so that targets are still visible, useful when navigating in open water away from the coast.

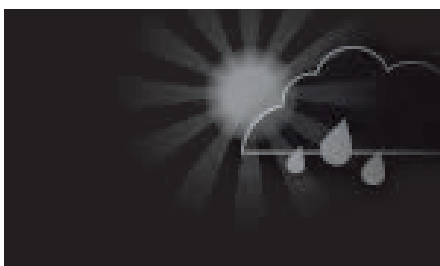
**Radar scanners:** All.



### BIRD

Bird mode optimizes the display to help identify flocks of birds, useful when trying to locate a fishing area.

**Radar scanners:** SuperHD™ Open Array, HD Open Array and HD Radome.



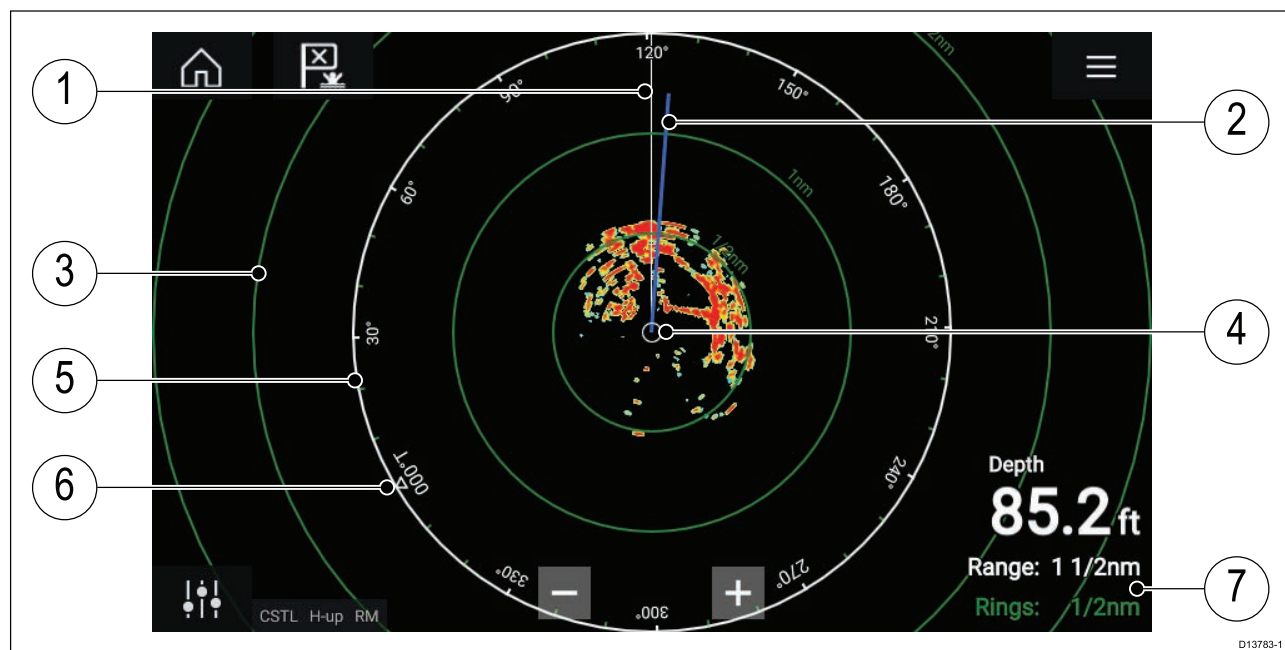
### WEATHER

Weather mode optimizes the display to help identify precipitation, useful for helping determine weather fronts.

**Radar scanners:** Quantum™ and Quantum™ 2 Doppler.

## 11.6 Range and bearing

The Radar app helps you identify a target's range (distance) and bearing from your vessel.



1. SHM (Ships heading marker).
2. COG/SOG line (Points in the direction of travel (COG), with the length of the vector providing an indication of speed (SOG)).
3. Range rings.
4. Vessel position.
5. Range and bearing indicator (The White ring identifies the distance from your vessel to the top edge of the screen. Bearing indicators are also provided around the ring).
6. North indicator (Always points North).
7. Current displayed Range and Ring separation distance (Range: identifies the distance from your vessel to the top edge of the screen. Rings: identifies the distance between each Range Ring).

The displayed range can be adjusted at anytime using the Range controls.

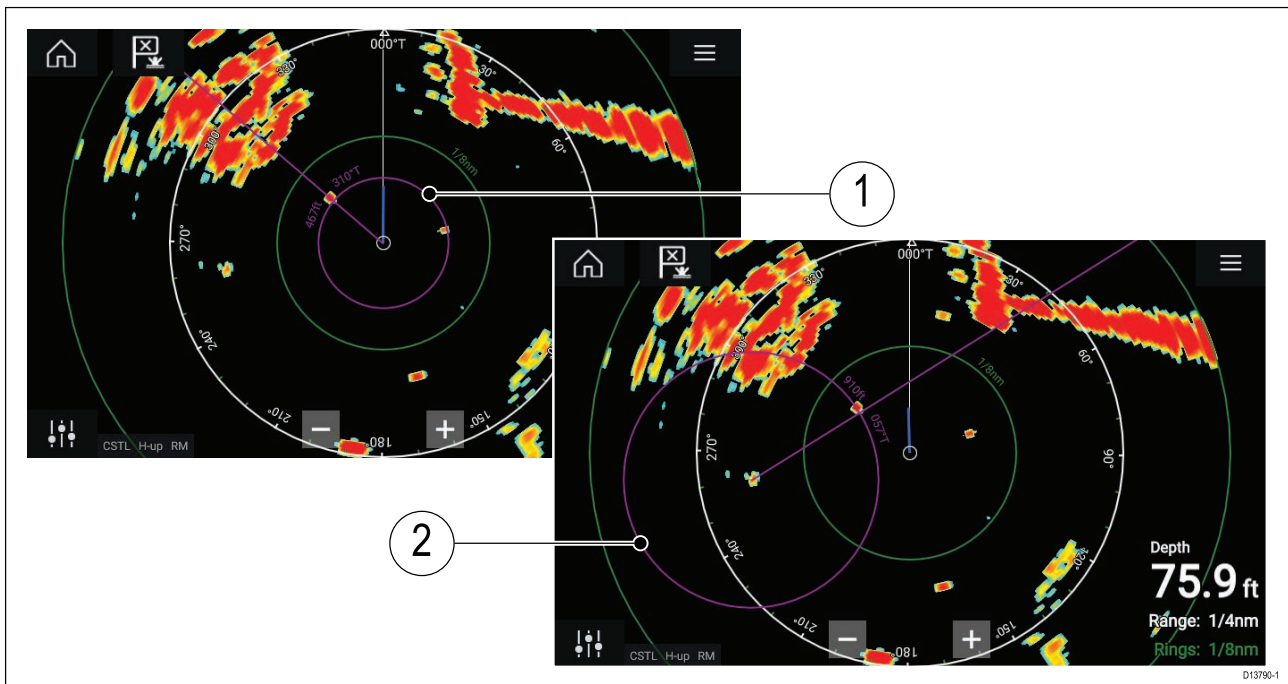
Range rings can be switched off from the Presentation tab: **Menu > Settings > Presentation > Range rings:**

You can also choose whether to display a numerical range indicator against each ring using the **Range ring labels:** option.

### VRM (Variable Range Marker) / EBL (Electronic Bearing Line)

VRM/EBL is used to determine a targets range and bearing from your vessel, or from another target. 2 VRM/EBLs are available which are enabled from the context menu.

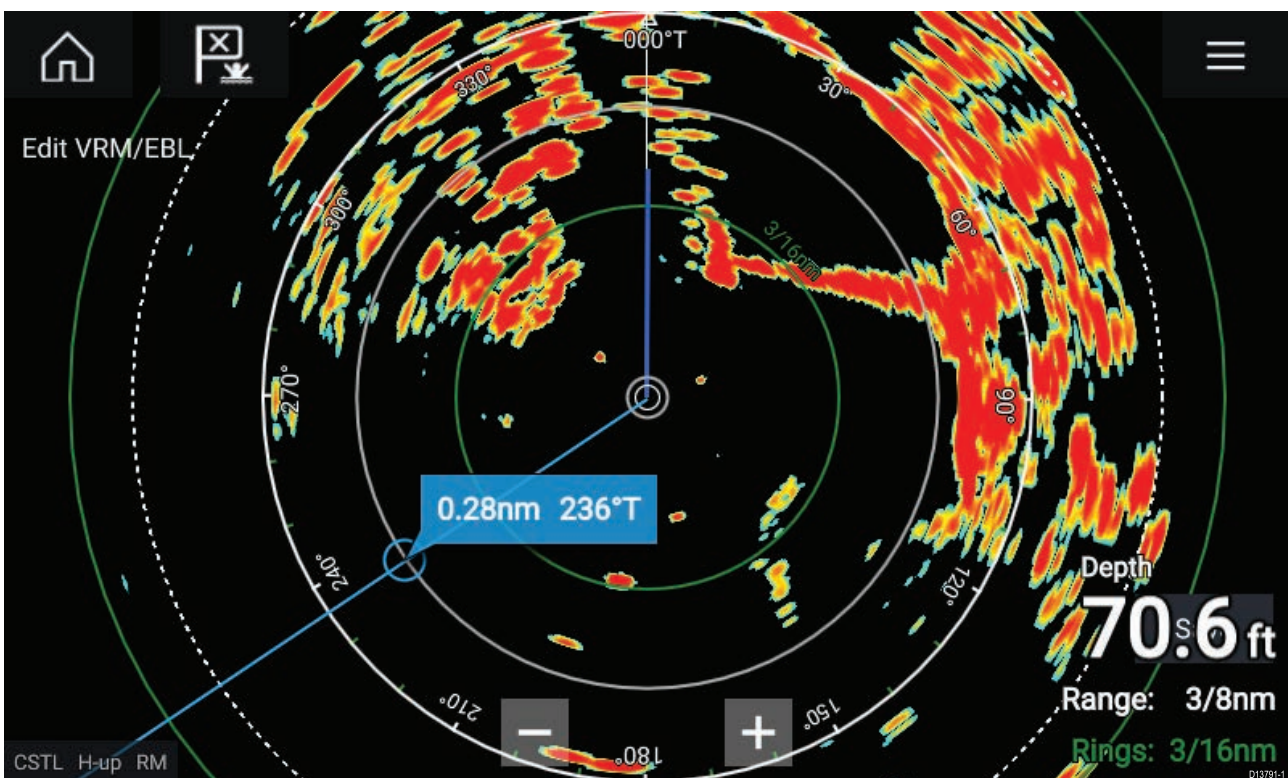
**Context menu > More options > VRM/EBL 1** or **Context menu > More options > VRM/EBL 2**



1. **Centered VRM/EBL** You can use a 'Centered' (on your vessel) VRM/EBL to determine the range and bearing of targets in relation to your vessel.
2. **Floating VRM/EBL** You can use a 'Floating' VRM/EBL to determine the range and bearing between 2 targets.

### Editing a VRM-EBL

Once a VRM/EBL has been placed you can adjust its size and position.



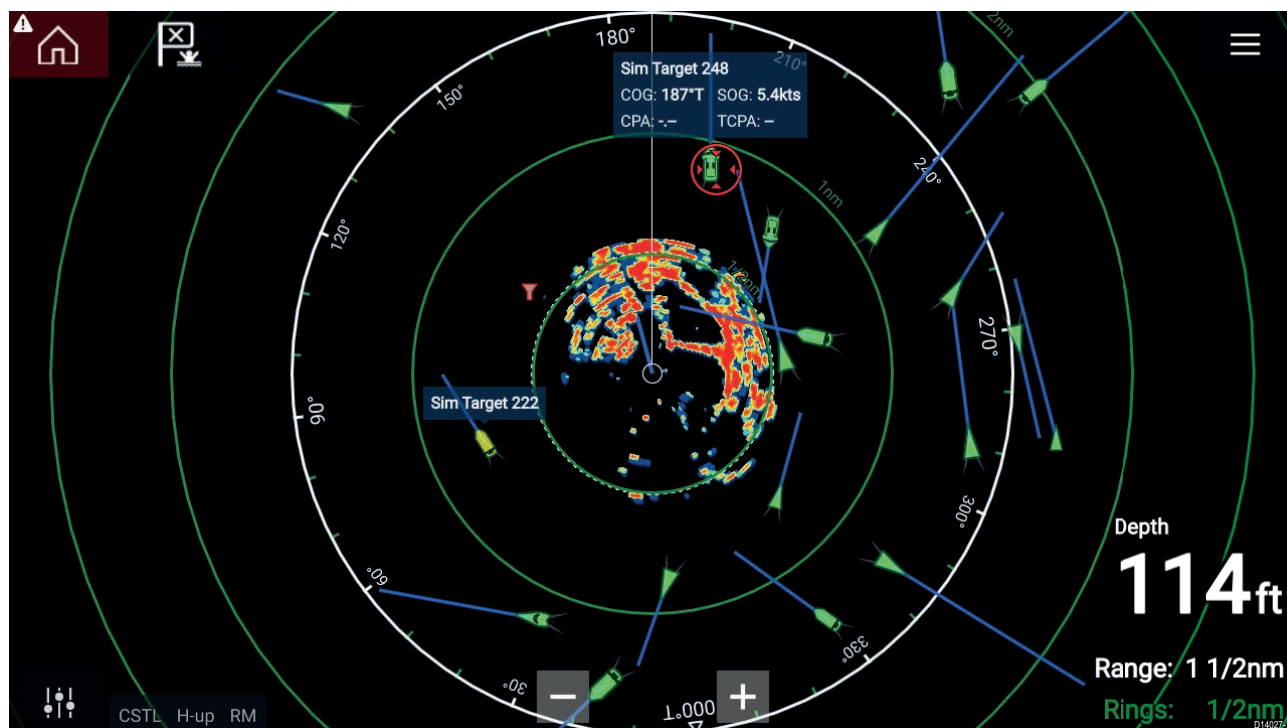
1. Select **Edit VRM/EBL** from the context menu.
2. To adjust the VRM/EBL select the desired target or drag the labelled circle to the target.
3. To create a floating VRM/EBL Drag the center circle to the desired target.



## 11.7 AIS targets

With compatible AIS hardware connected to your MFD, AIS targets can be automatically displayed in the Chart app and Radar app.

Tracked AIS targets are identified onscreen using target symbols.



Up to 100 AIS targets can be tracked simultaneously. If more than 100 targets exist, within your range, the 100 targets nearest to your vessel will be displayed.

Target vectors and information can be displayed for each target by selecting the relevant option from the AIS target context menu. The AIS target context menu is accessed by selecting the AIS target.

You can also select the type of AIS targets that should be displayed, i.e.: **All**, **Dangerous**, **Buddies** and hide static targets from the AIS Settings tab.

### AIS target list

AIS targets appear in the AIS target list.

The AIS target list can be accessed by selecting the **AIS** tab from the **Targets** menu: **Menu > Targets > AIS**.



The list identifies: Target name and Range and Bearing (from your vessel). Where relevant, CPA (Closest point of approach) and TCPA (Time to Closest Point of Approach) values are also shown.

Selecting a target from the list will highlight the selected target in the **LiveView** pane on the right of the screen and display Pop-over options. Pop-over options enable you to **View full target data** or add an AIS target a buddy by selecting **Add as buddy**.

AIS icons used for targets marked as buddies will be filled yellow. You can also rename buddy targets or remove buddies using the Pop-over options.

## AIS target symbols

By default, standard AIS symbols are used to identify AIS targets. You can enable enhanced AIS target symbols from the **Advanced Settings** menu: (**Menu > Settings > Advanced > Enhanced AIS targets**). With enhanced mode enabled, the enhanced symbols are used in place of the standard vessel symbols.







### Standard AIS symbols — type

	Vessel		SART (Search and Rescue Transponder)
	Land based station		ATON
	SAR (Search and Rescue)		Virtual ATON
	* Blueforce vessel		* Blueforce SAR

**Note:** \* Requires STEDS-EAIS hardware.









## Enhanced AIS symbols — type

	Sailing Vessel		Commercial
	High speed vessel / Wing In Ground vessel		Cargo vessel
	Passenger vessel		Other

Enhanced AIS symbols are scaled or outlined according to the reported size of the vessel.

## AIS symbol status

	Lost (No border, crossed through)		Uncertain (Dashed outline)
	Buddy (Yellow fill)		Dangerous and Uncertain (Dashed outline and Flashes Red)
	Dangerous (Flashes Red)		ATON off position (Red border)

## AIS settings

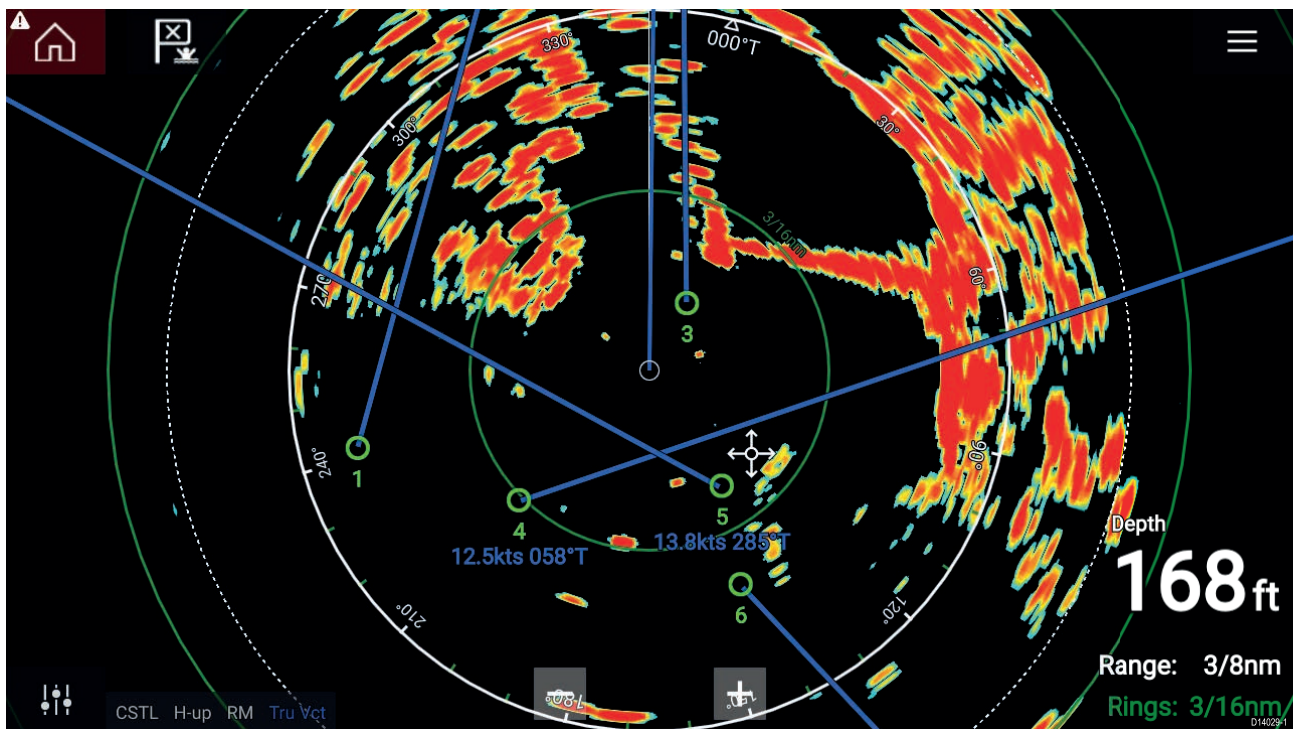
When the AIS layer is enabled in the Chart app you can configure **AIS settings** from the **Targets** menu: **Menu > Targets > AIS settings**.

Setting	Description	Options
<b>Show AIS targets in Chart / Show AIS targets in Radar</b>	Enables and disables AIS targets in the Chart and Radar apps.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Enhanced AIS targets</b>	Enables and disables the display of enhanced AIS target icons.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Show these AIS types</b>	Determines the types of AIS target displayed in the Chart and Radar apps.	<ul style="list-style-type: none"> <li>• All</li> <li>• Dangerous</li> <li>• Buddies</li> </ul>
<b>Hide static targets</b>	When enabled, an AIS target travelling under 2 knots will be hidden, unless it is or becomes dangerous.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Silent mode</b>	When enabled, your vessel's AIS device will not transmit your position or details.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

## 11.8 Radar targets

With a compatible Radar scanner connected to your MFD, radar targets can be tracked in the Chart app and Radar app. Depending on your Radar scanner, radar targets can be acquired manually or automatically, based on your configured **Guard zones**.

Tracked radar targets are identified onscreen using target symbols.



Multiple radar targets can be tracked simultaneously.

Target vectors and information can be displayed for each target.


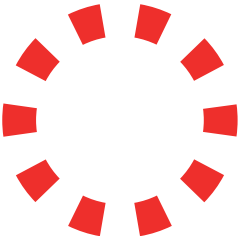
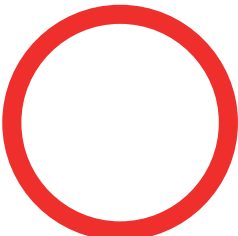

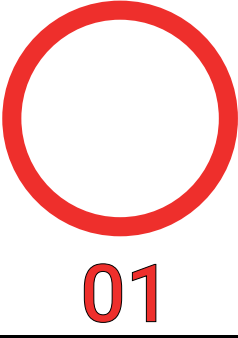

Radar target options are available from the Radar target context menu. The Radar target context menu provides options for you to **Cancel target**, **Show CPA** graphic or display **Target info** onscreen by selecting the relevant option. The Radar context menu is accessed by selecting the radar target.

### Radar target acquisition data source requirements

Radar target acquisition requires the following data sources to be available on your system (e.g. connected to your multifunction display, via SeaTalkng® or NMEA 0183).

Data type	Example data source
COG (Course Over Ground)	GPS or GNSS receiver (MFD internal receiver or external receiver).
SOG (Speed Over Ground)	GPS or GNSS receiver (MFD internal receiver or external receiver).
HDG / HDT (True Heading)	Compass or Autopilot sensor providing Fastheading data (e.g. Evolution EV-1 / EV-2).

## Radar target symbols

Symbol	Status	Description
	Acquiring target — Manual	Thin dashed Green circle
	Acquiring target — Auto	Thick dashed Red circle, flashes until acknowledged
	Auto-acquired target — Unacknowledged	Red circle, flashes until acknowledged
	Acquired target	Green circle with Target ID
	Dangerous target	Red circle with Target ID, flashes until acknowledged
	Lost target (Target not detected for 4 Radar scans)	Gray circle with Red cross through

Once acquired the target's COG (Course Over Ground) and SOG (Speed Over Ground) can be displayed below the target ID.

The Target info is colored Blue if COG and SOG values are True or Orange if values are Relative. Target info will turn Red if the target becomes dangerous.

## Acquiring a target manually

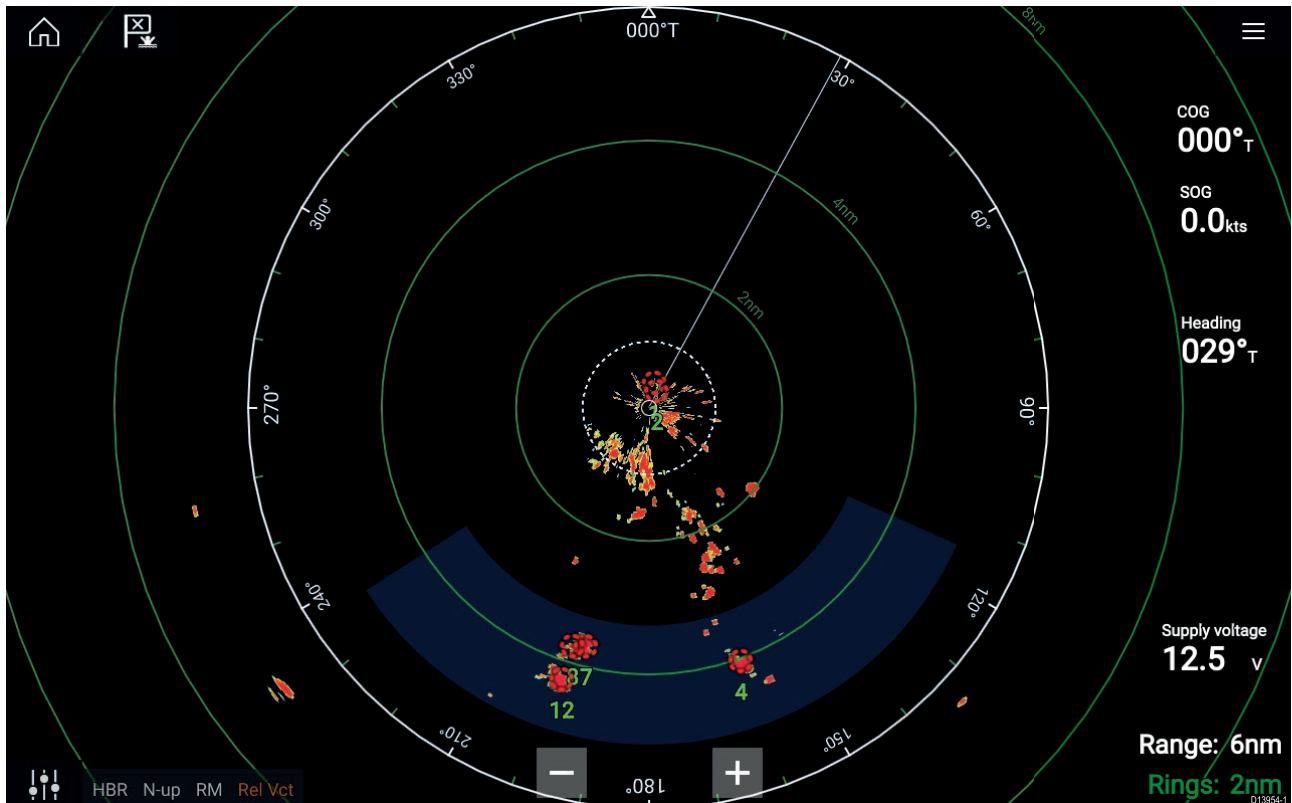
To acquire a Radar target manually using MARPA (Mini Automatic Radar Plotting Aid) follow the steps below.

With the Radar app, or Chart app with Radar overlay enabled:

1. Select the target.  
The context menu is displayed.
2. Select **Acquire target**.  
Once acquired the target will be tracked.

## Automatic target acquisition

With a compatible Radar scanner connected, Radar targets can be acquired automatically.



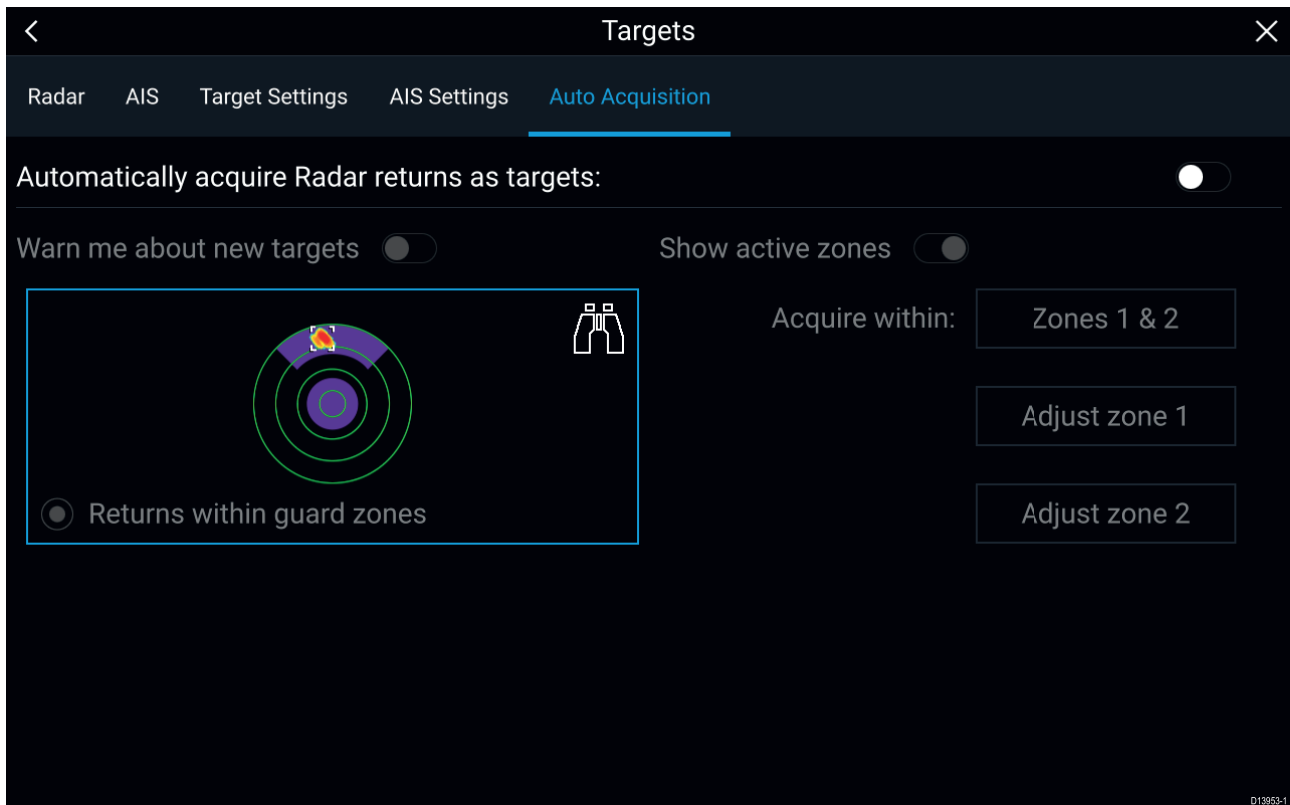
Once configured, targets which enter or appear in your chosen **Guard Zone(s)** will be automatically acquired.

### Note:

- Automatic target acquisition cannot be enabled at the same time as **Timed Transmit** or **Dual Range**.
- Automatic target acquisition will be temporarily paused if the Radar display range is 12nm or greater.

## Setting up automatic target acquisition

Follow the steps below to configure automatic target acquisition.

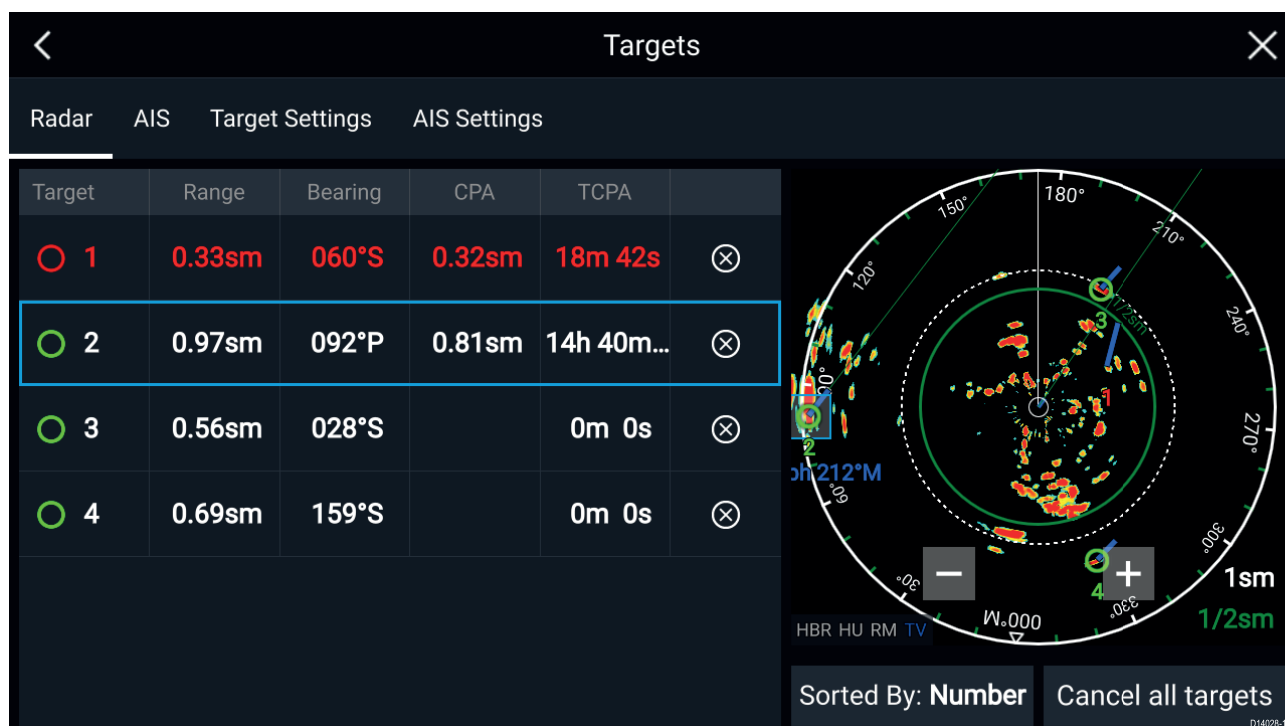


1. Select the **Auto Acquisition** tab from the Target menu: (**Menu > Targets > Auto Acquisition**).
2. Enable Automatic Target Acquisition by selecting the **Automatically acquire Radar returns as targets:** toggle switch.
3. Select the **Acquire within:** box and choose **Guard zone 1**, **Guard zone 2** or **Zones 1 & 2** as required.
4. To enable onscreen pop-up notifications of new targets which have been acquired automatically, select the **Warn me about new targets** toggle switch.  
When multiple targets are acquired simultaneously then an Info dialogue is displayed.
5. You can also adjust the size and position of the Guard zones directly from the **Auto Acquisition** page by selecting **Adjust zone 1** or **Adjust zone 2**.

## Radar target list

Tracked Radar targets appear in the Radar target list.

The AIS target list can be accessed by selecting the **Radar** tab from the **Targets** menu: **Menu > Targets > Radar**.



The list identifies: Target number and Range and Bearing (from your vessel). Where relevant, CPA (Closest point of approach) and TCPA (Time to Closest Point of Approach) values are also shown.

Selecting a target from the list will highlight the selected target in the **LiveView** pane on the right of the screen and display Pop-over options. Pop-over options enable you to **Cancel target**, **Show CPA** graphic or Display **Target info** by selecting the relevant option.

The Radar target list can be **Sorted By:** target **Number** or its **Range** from your vessel, by selecting the Sorted By: option at the bottom of the **LiveView**.

Radar targets can also be cancelled individually by selecting the 'X' next to the target's details in the list, or you can cancel all targets by selecting **Cancel all targets**.

## Target settings

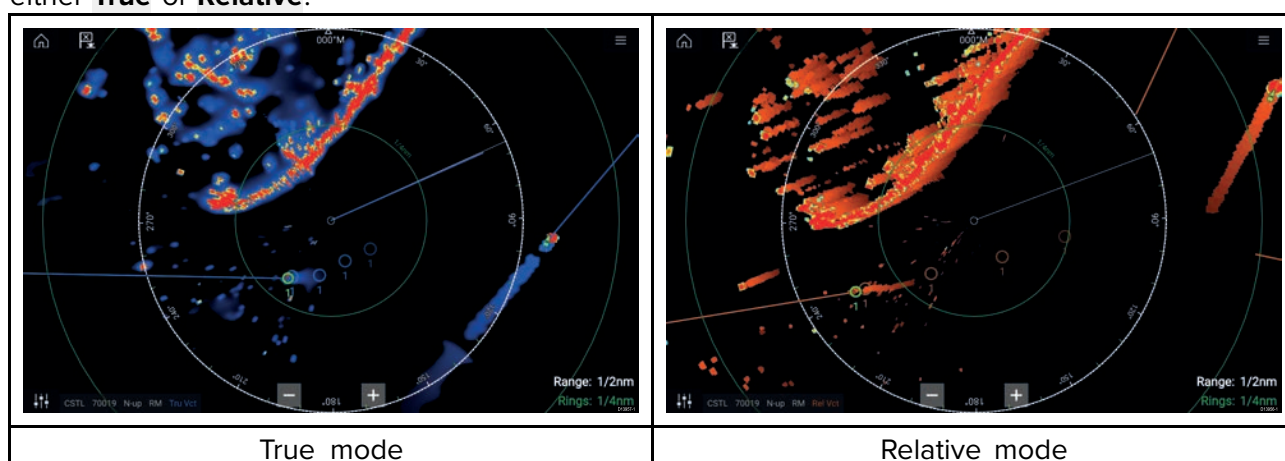
Target vectors, target history and object trail graphics can be displayed onscreen to improve situational and collision awareness.

Target settings can be accessed from the **Target Settings** tab: **Menu > Targets > Target settings**.

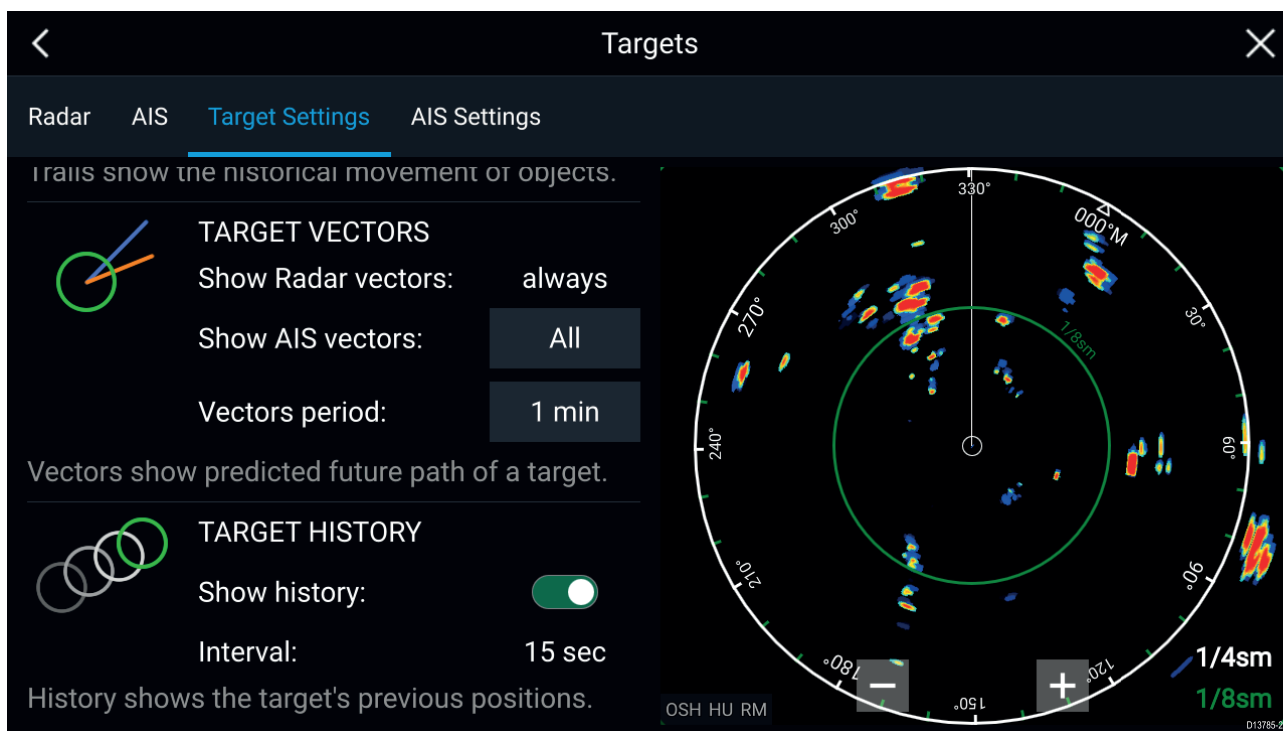
### Reference mode

Target settings can be configured to either **True** or **Relative** mode. In True mode, Trails, Vectors and History are colored Blue and are shown ground referenced (i.e. the object or target's actual Course Over Ground (COG)). In Relative mode, Trails, Vectors and History are colored Orange and are shown relative to your vessel's movement.

To switch the target reference mode, select the **REFERENCE MODE** setting. Alternatively, you can switch reference mode by selecting the onscreen **Image Adjustment** icon and then selecting either **True** or **Relative**.



The **Target Settings** reference mode is independent of your vessel's motion mode.



### Target vectors

Target vectors show the predicted future course of a target.

Target vectors for acquired Radar targets are always shown. By default, target vectors are also shown for all AIS targets. You can switch the **Show AIS vectors** to Manual, enabling you to switch vectors for AIS targets On or Off for each target individually, via the target context menu.

The length of the Vector line signifies where the target will be after the time specified in **Vector period** has passed. The Vector period can be adjusted by selecting the current **Vector period** value and choosing a time from the Pop-over options.

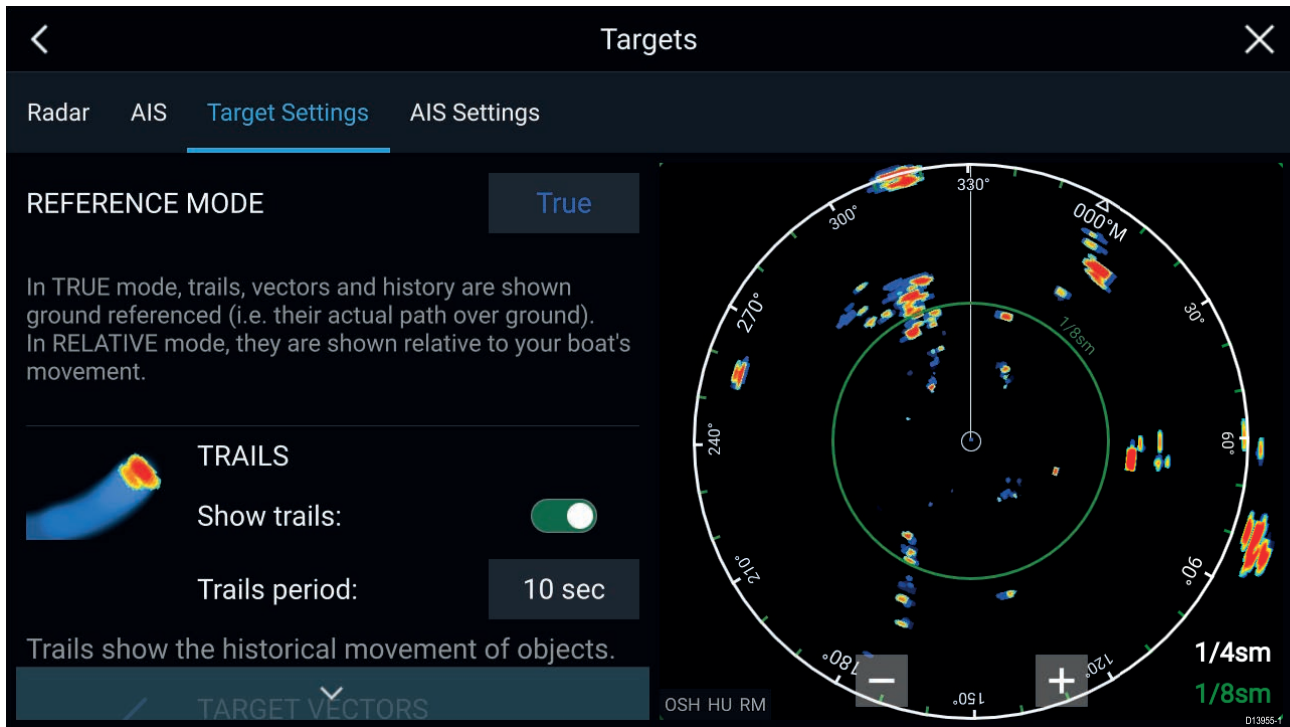
### Target history

Target history shows a target's previous positions.

Target history can be enabled or disabled using the **Show history** toggle switch.

Target history is plotted by displaying a target symbol at the vessel's position each time the value specified in the **Interval** setting has passed. The **Interval** is automatically calculated based on the target vector's **Vector period**, divided by 4.





## Trails

Trails plot the historical movements of objects (Radar returns) for the time specified in the **Trails period** setting.

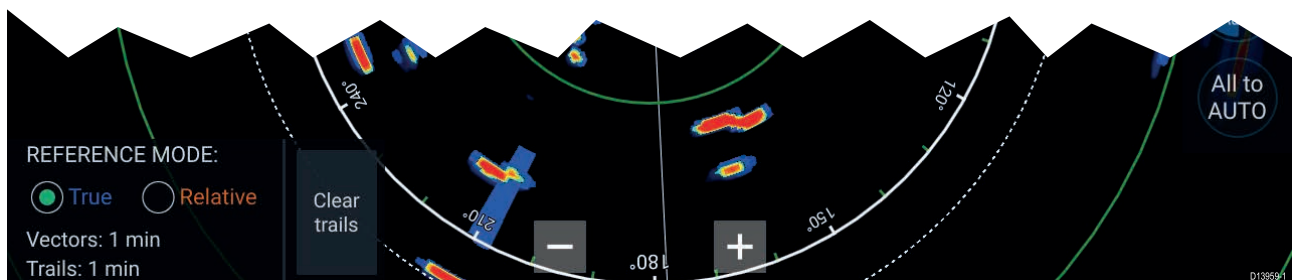
Trails are subject to the selected “Reference Mode” (i.e. **True**, to show actual motion over “ground” (COG), or **Relative**, to show motion relative to your vessel).

Trails can be enabled and disabled using the **Show trails** toggle switch.

Historical object position is shown as a colored trail behind the object.

## Onscreen target settings

Target settings and information are also available using the onscreen **Image adjustment** icon.



The following target settings and information is available:

- **REFERENCE MODE** — Choose whether Radar targets and objects are displayed in **True** or **Relative** reference mode.
- **Vector period and Trail interval** — Displays currently selected values.
- **Clear trails** — Clears and resets the trails displayed onscreen.

## Clearing / resetting trails

In an area with multiple target returns, trails can clutter the Radar image, reducing its ability to provide a target's path, under these circumstances you can remove all existing trails using the onscreen **Clear trails** option.

1. Select the onscreen **Image adjustment** icon.
2. Select **Clear trails**.



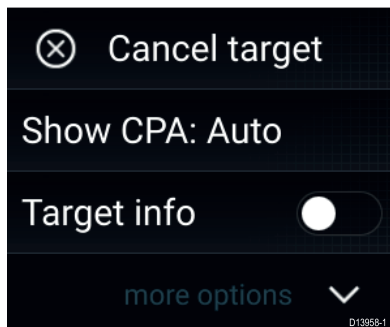
## Target context menu

A target context menu is available that provides quick access to useful target settings.

To open the Radar target context menu, select a target onscreen.



CPA: 779ft TCPA: 12m 50s  
COG: 334°M SOG: 1.0mph



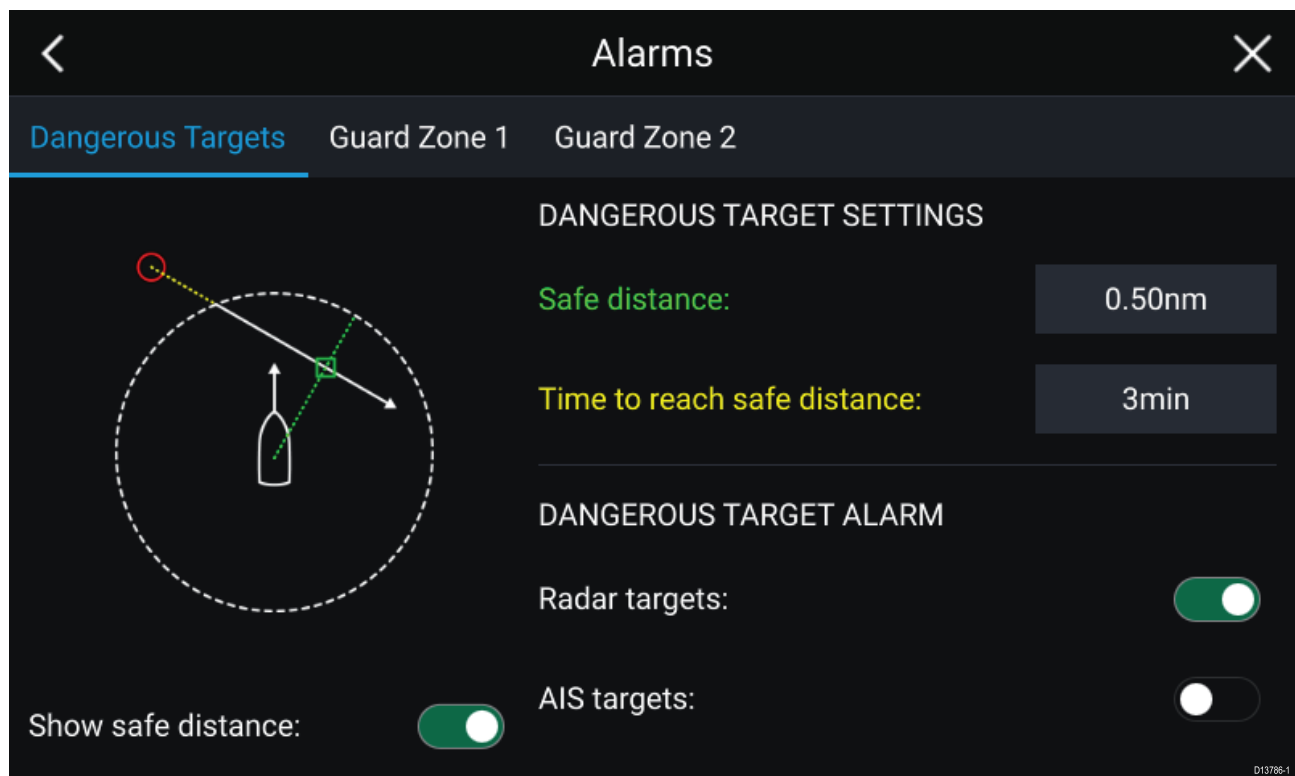
The Radar context menu provides CPA, TCPA, COG and SOG data for the selected target.

The context menu also provides the following target menu options:

- **Cancel target** — The Radar target will no longer be tracked.
- **Show CPA** — Determines whether CPA graphics are shown. The default option is Auto which displays CPA graphics for the target if it becomes dangerous. You can also set CPA graphics to On, which displays CPA graphics, if there is an intersect point between your vessel's current course and the target's. When set to Off no CPA graphics will be displayed for the target.
- **Target info** — Determines whether the target's SOG and COG information is displayed under the target onscreen.

## 11.9 Dangerous targets alarm

You can use the Dangerous targets alarm to notify you if a Radar or AIS target will reach a specified distance from your vessel within a specified time.



To set up the Dangerous target alarm, first adjust the **Safe distance** to the desired value and then select a **Time to reach safe distance**. The alarm will be triggered if a tracked target will reach the specified Safe distance from your vessel within the time period selected.

You can choose whether you want the Dangerous target alarm to trigger for Radar and / or AIS targets.

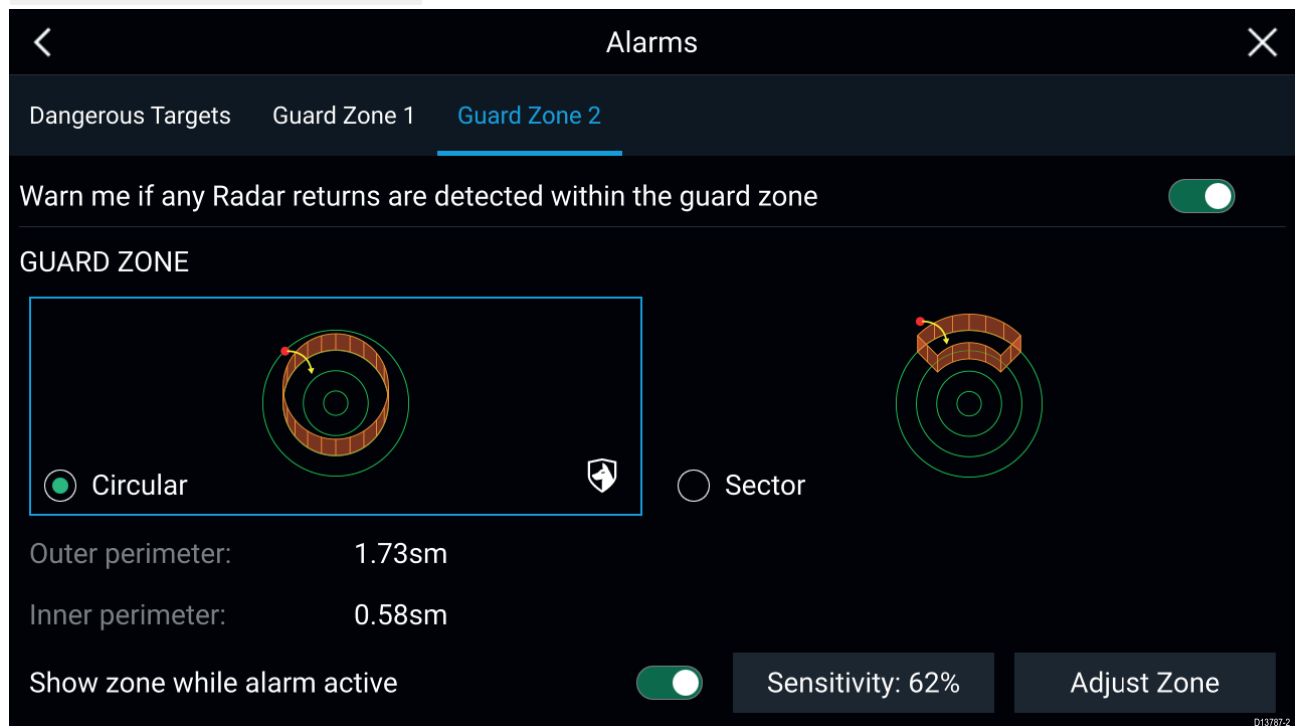
You can display a Safe distance ring around your vessel in the Radar app using the **Show safe distance** control.

## 11.10 Guard zone alarms

Guard zones alert you if a Radar return is detected within the Guard zone area.

2 Guard zones can be configured for each connected Radar scanner.

The Guard zones can be configured from the **Alarms** menu: **Menu > Alarms > Guard zone 1** or **Menu > Alarms > Guard zone 2**



A Guard zone can be configured as a sector or as a circle around your vessel.

Selecting **Adjust Zone** allows you to configure the size of the Guard Zone.



Adjust the guard zone's size by dragging the inner and outer perimeter end points (circles) to the desired locations.

Once configure select **Back**.

If required, you can also adjust the Guard zone sensitivity. Sensitivity determines the size at which objects trigger the alarm.

## 11.11 Doppler Radar overview

Doppler Radar technology makes it easier to track moving targets with significant ground speed exceeding 3 knots.

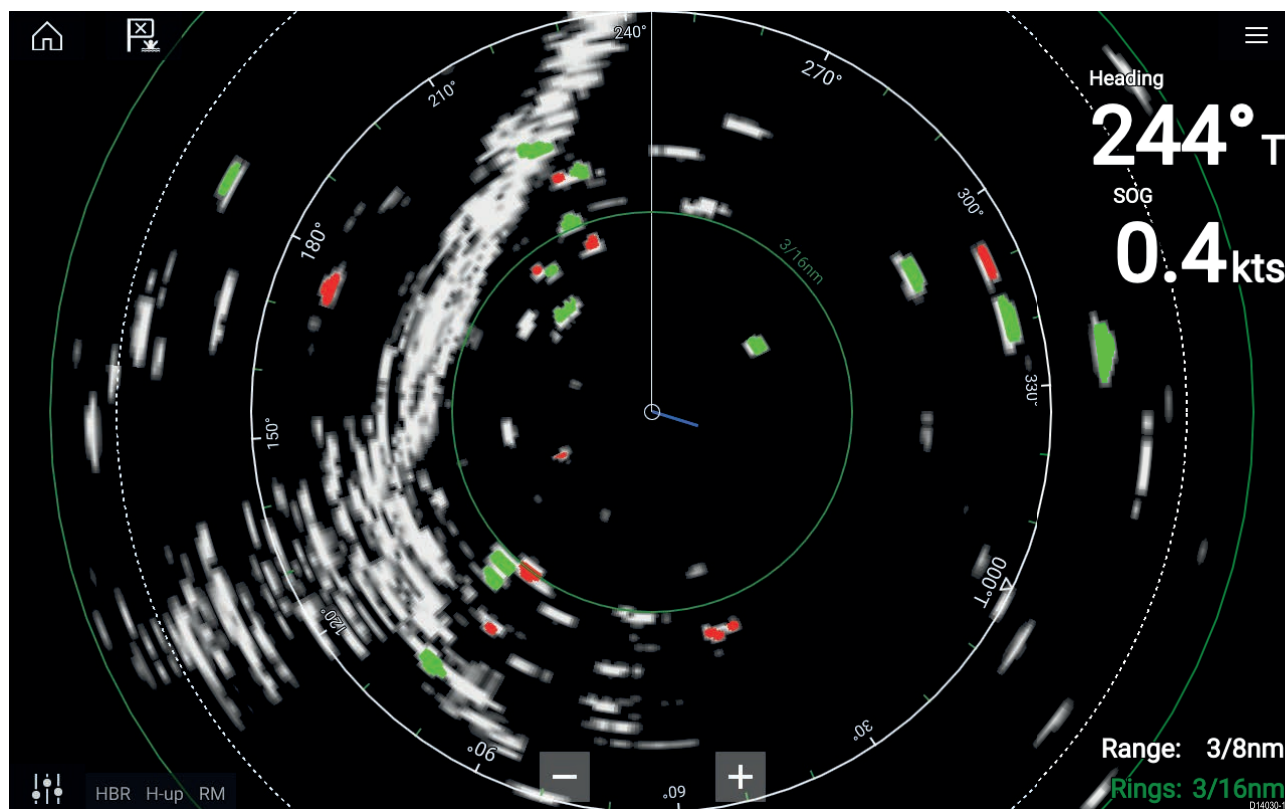
Typically Doppler Radar works best with objects that are moving directly towards or away from the vessel. Doppler Radar can highlight only those targets that are moving relative to the vessel (e.g. other boats, but not land or buoys, for example).

Doppler Radar works by transmitting a microwave signal which is then reflected off a desired moving target at a distance. By analyzing how the object's motion has altered the frequency of the returned signal, the Doppler Radar can interpret the variation to provide highly accurate measurements of a target's direction of travel, relative to the Radar scanner.

Doppler Radar technology is particularly beneficial in a marine environment, where poor weather conditions and visibility can make target tracking difficult. Additionally, it is not always easy to interpret the information displayed by traditional Radar technology. With the integration of Doppler information, the process of matching on-screen radar returns with real-world objects becomes a much simpler task.

### Doppler mode

When a compatible Radar is connected Doppler mode is available.



#### Doppler mode — Enabling and disabling

Doppler mode is enabled from the Main menu: **Menu > Doppler**.

With Doppler mode enabled the color palette will change to the default Doppler palette, all approaching targets will be colored Red and all targets moving away from you will be colored Green.

Doppler mode is suspended at ranges of 12 nm and greater. The Radar color palette will remain the same but targets will not be highlighted.

#### Doppler mode — Color palettes

Doppler has unique color palettes which help to ensure the Red and Green Doppler targets stand out from the Radar image. When Doppler is enabled the standard color palette setting will show only the unique Doppler color palettes: **Doppler grey**, **Doppler blue** and **Doppler yellow**.

The Color palettes can be selected from the Presentation tab: **Menu > Settings > Presentation**.

## Doppler data source requirements

Use of the Doppler Radar features requires the following data sources to be available on your system (e.g. connected to your multifunction display, via SeaTalkng® or NMEA 0183).

### Required data sources

Data type	Example data source
COG (Course Over Ground)	GPS or GNSS receiver (MFD internal receiver or external receiver).
SOG (Speed Over Ground)	GPS or GNSS receiver (MFD internal receiver or external receiver).

### Recommended data source

Data type	Example data source
HDG / HDT (True Heading)	Compass or Autopilot sensor providing Fastheading data (e.g. Evolution EV-1 / EV-2).

**Note:** A Heading data source is not essential for Doppler operation. However it will improve the performance of Doppler mode at slower speeds (< 15 knots), when tide set and leeway are present.


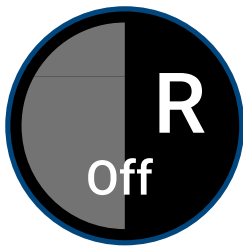
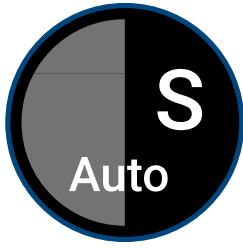


## 11.12 Radar sensitivity controls

Optimum performance is usually achieved using the default settings. You can adjust the image using the Sensitivity controls to improve the displayed image.



Sensitivity settings can be accessed using the onscreen **Image adjustment** icon, or the Adjust sensitivity menu option: **Menu > Adjust sensitivity**.

The Sensitivity controls available are dependant upon the Radar scanner in use.

Control	Name	Description
	'G' Gain	The control determines the signal strength at which target returns are shown onscreen. The Gain control can be set to <b>Auto</b> or <b>Manual</b> . A higher value produces more target returns and noise onscreen.
	'R' Rain	Precipitation appears on the Radar screen as lots of small echoes which continuously change size, intensity and position. The Rain control suppresses these echoes making it easier to identify real object. The higher the Rain control is set the more echoes will be suppressed.
	'S' Sea	Radar echoes from waves can clutter the Radar screen. The Sea control suppresses these echoes (for up to 5 nm depending on conditions) making it easier to identify real objects. The higher the Sea control is set the more echoes will be suppressed.
	'CG' Color Gain	The control sets the lower limit for the color used for the strongest target returns. All target returns above this value are displayed in the strongest color. Those with a weaker value are divided equally between the remaining colors. The control can be set to <b>Auto</b> or <b>Manual</b> .
	All to Auto	Sets all Sensitivity settings to <b>Auto</b> with 0% offset.

## 11.13 Radar settings

The Settings menu provides access to the Radar app's features and functions. The options available in the Settings menu are dependent on the type of Radar scanner connected.

### Transmission tab

Settings	Description	Options
<b>Scanner</b>	Allows you to select the Radar scanner that you want to use.	List of available Radar scanners.
<b>Dual range</b>	Enables and Disables dual range.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Channel</b>	Determines which channel is shown in the Radar app.	<ul style="list-style-type: none"> <li>• Channel 1</li> <li>• Channel 2</li> </ul>
<b>Antenna size selection</b>	Open Array Radar antenna size selection.	<ul style="list-style-type: none"> <li>• 4ft</li> <li>• 6ft</li> </ul>
<b>Timed transmit</b>	Enables and disables Timed transmit. Timed transmit configures your Radar to transmit at periodic intervals to conserve power.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Standby</b>	Determines the length of time the Radar is in Standby for in Time transmit mode.	<ul style="list-style-type: none"> <li>• 3 min</li> <li>• 5 min</li> <li>• 10 min</li> <li>• 15 min</li> </ul>
<b>Transmit</b>	Determines the amount of scans the Radar will perform when transmitting in Time transmit mode..	<ul style="list-style-type: none"> <li>• 10 scans</li> <li>• 20 scans</li> <li>• 30 scans</li> </ul>

### View & Motion tab

Settings	Description	Options
<b>Orientation</b>	<p><b>Head-up</b> The top of the screen always points towards your vessel's current heading and as your heading changes the Radar image rotates accordingly. In Head-up the motion mode is fixed to Relative motion.</p> <p><b>North-up</b> The top of the screen always points towards north and as your vessel's heading changes the SHM rotates accordingly.</p> <p><b>Course-up</b> In Course-up the top of the screen always points towards your destination and as your heading changes the SHM rotates accordingly.</p>	<ul style="list-style-type: none"> <li>• Head-up</li> <li>• North-up</li> <li>• Course-up</li> </ul>
<b>Motion mode</b>	<p><b>Relative motion</b> The position of your vessel remains fixed onscreen and the Radar image moves relative to your position. In Relative motion mode you can adjust your vessel's onscreen position using the Boat position setting.</p> <p><b>True motion</b> Stationary Radar targets remain fixed and moving targets, including your vessel, move in true perspective to each other and to landmass. As your vessel's position reaches the edge of the</p>	<ul style="list-style-type: none"> <li>• Relative motion</li> <li>• True motion</li> </ul>

Settings	Description	Options
	screen, the image is redrawn to reveal the area ahead. In True motion mode the boat position is fixed to <b>Full offset</b> .	
<b>Boat position</b>	The boat position determines the position of your vessel onscreen. You can adjust the Boat position to provide a greater distance ahead of your vessel. Your boat position can only be changed in <b>Relative motion</b> mode.	<ul style="list-style-type: none"> <li>• Center</li> <li>• Partial offset</li> <li>• Full offset</li> </ul>

#### Presentation tab

Settings	Description	Options
<b>Range rings</b>	Enables and disables Range rings in the Radar app.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Range ring labels</b>	Enables and disables Range ring distance labels in the Radar app.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Color palette</b>	Allows selection of the color palette.	List of color palettes.

#### Preferences tab

Settings	Description	Options
<b>VRM/EBL reference</b>	Determines the reference point used for VRM/EBLs.	<ul style="list-style-type: none"> <li>• True/Mag</li> <li>• Relative</li> </ul>
<b>Interference rejection</b>	Suppresses interference from other close by Radar scanners.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Interference rejection level</b>	Determines the level of suppression used. Only available when <b>Interference rejection</b> is enabled.	<b>Quantum™</b> <ul style="list-style-type: none"> <li>• Level 1 to Level 5</li> </ul> <b>Non-HD Digital Radomes</b> <ul style="list-style-type: none"> <li>• Normal</li> <li>• High</li> </ul>
<b>Target expansion</b>	When enabled, increases the Radar pulse length to provide larger target returns.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Expansion level</b>	Determines the level of expansion used. Only available when <b>Target expansion</b> is enabled.	<ul style="list-style-type: none"> <li>• Low</li> <li>• High</li> </ul>
<b>Tune adjust</b>	Allows you to adjust the Radar scanners receiver for maximum target returns. It is recommended that the Radar scanner is allowed to warm up for at least 10 minutes prior to making adjustments.	<ul style="list-style-type: none"> <li>• Auto</li> <li>• Manual (0% to 100%)</li> </ul>
<b>Radar speed</b>	Allows you to select the appropriate rotation speed for your range. The Auto option provides an increased refresh rate at Radar ranges up to 3 nm.	<ul style="list-style-type: none"> <li>• 24 RPM</li> <li>• Auto (24 / 48 RPM)</li> </ul>
<b>Transmit frequency</b>	Changing the Transmit frequency can reduce interference on the Radar image.	<ul style="list-style-type: none"> <li>• Low</li> <li>• Normal</li> <li>• High</li> </ul>



## Installation tab

Under normal circumstances it should not be necessary to adjust Installation settings.

Settings	Description	Options
<b>Bearing alignment</b>	Enables you to align the Radar image correctly in relation to your vessel's bow.	<ul style="list-style-type: none"><li>• 179.5° Port to 180° Starboard</li></ul>
<b>Parking offset</b>	Allows you to select the 'parked position of your Open Array's antenna The Open Array must be in Standby to adjust the parking offset.	<ul style="list-style-type: none"><li>• 0° to 359°</li></ul>
<b>Main Bang Suppression (MBS)</b>	MBS eliminates saturation immediately around your vessel. When adjusting <b>Zero range</b> it is recommended that MBS is set to Off.	<ul style="list-style-type: none"><li>• Off</li><li>• On</li></ul>
<b>Sea clutter curve</b>	Adjusts the Radar scanners sensitivity to Sea clutter.	<ul style="list-style-type: none"><li>• 1 to 8</li></ul>

## Advanced tab

Under normal circumstances it should not be necessary to adjust Advanced settings.

Settings	Description	Options
<b>Tune preset</b>	Radar tuning is controlled either automatically or manually, using the <b>Tune adjust</b> setting. Tune preset controls the range available to the <b>Tune adjust</b> control.	<ul style="list-style-type: none"><li>• 0 to 255</li></ul>
<b>STC preset</b>	The Sensitivity Time Control (STC) can be used to equalize targets across the image. If you find targets are brighter or dimmer nearer the center of the image adjust the STC preset until the desired result is achieved.	<ul style="list-style-type: none"><li>• 0% to 100%</li></ul>
<b>Zero range</b>	Zero range (Display timing) is used to configure the zero range of the Radar scanner so that objects appear at the correct distance.	<ul style="list-style-type: none"><li>• 0 to 153m / 502ft</li></ul>
<b>Reset</b>	Resets Installation and advanced settings to factory defaults.	<ul style="list-style-type: none"><li>• Yes</li><li>• No</li></ul>

## Page settings tab

Settings	Description
<b>Data Overlays</b>	Enables configuration of Data overlays
<b>Edit split ratio</b>	Enables you to customize the position of the partitions in splitscreen app pages.



## Chapter 12: Dashboard app

### Chapter contents

- [12.1 Dashboard app overview on page 200](#)
- [12.2 Customizing existing Data pages on page 202](#)
- [12.3 Dashboard settings menu on page 207](#)

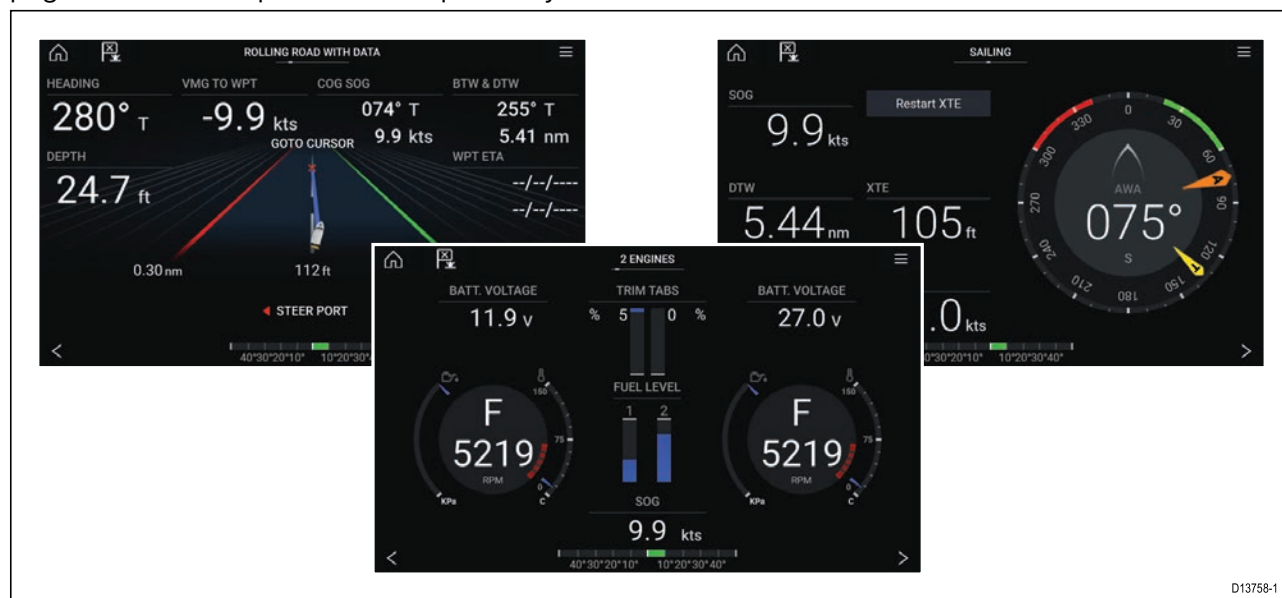
## 12.1 Dashboard app overview

The Dashboard app enables you to view system data. System data may be generated by your MFD or by devices connected to your MFD via SeaTalkng<sup>®</sup> / NMEA 2000 and SeaTalkhs<sup>™</sup>. The Dashboard app can also be configured to provide control of your compatible Digital Switching devices.

**Note:** For data to be available in the Dashboard app it must be being transmitted to your MFD from compatible hardware using supported protocols and messages.

The Dashboard app can be displayed in Fullscreen and half screen portrait app pages.




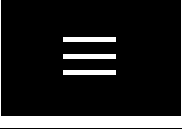
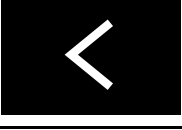
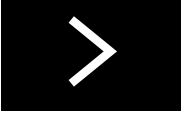
For each instance of the Dashboard app you can select which Data pages you want to use, the Data page selection will persist over a power cycle.



D13758-1

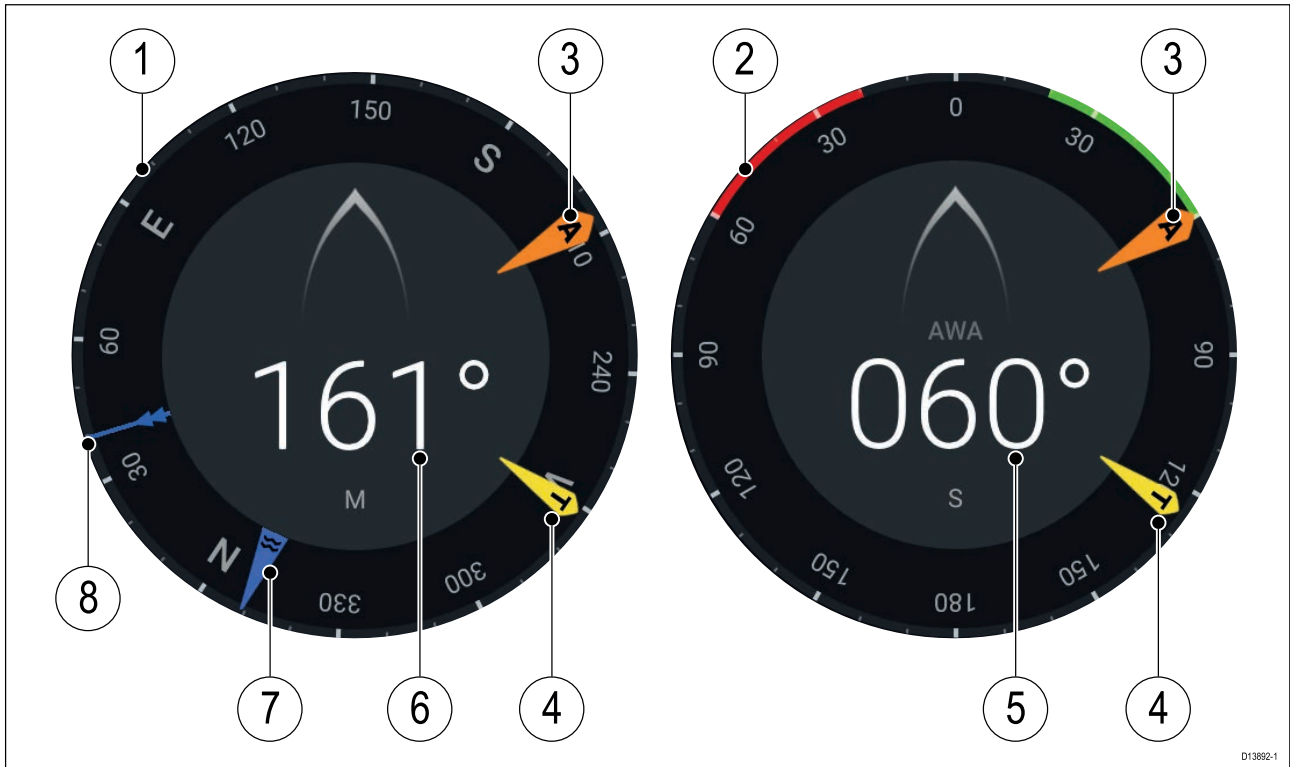
The Dashboard app is pre-configured with a number of customizable data pages.

### Dashboard app controls

Icon	Description	Function
	Home icon	Takes you to the Homescreen.
	Waypoint / MOB	Place waypoint / activate Man overboard (MOB) alarm.
	Pilot icon	Opens and closes the Pilot Sidebar
	Menu icon	Opens the app menu.
	Left arrow	Displays the previous data page.
	Right arrow	Displays the next data page.

## Navigation and Sailing dials

Navigation and Sailing dials are available which provide a compass dial with various data indicators.



1. Navigation dial
2. Sailing dial
3. Apparent Wind Angle (AWA) indicator
4. True Wind Direction (TWD) indicator
5. Apparent Wind Angle (AWA)
6. Heading
7. Tide direction indicator
8. Course Over Ground (COG) indicator

## Switching data page

1. Use the **Left arrow** and **Right arrow** buttons, located at the bottom of the screen, to cycle through the available data pages.
2. Alternatively, you can select a specific data page from the Dashboard app menu.

## Selecting Data pages to display

For each instance of the Dashboard app you can select which Data pages you want to be able to view.

1. Select the **Pages** tab: **Menu > Settings > Pages**.
2. Select the relevant page from the list.
3. Select **Hide page** from the pop-over options.

*The selected page will no longer be available in the current instance of the Dashboard app.*

*Selecting **Show page** for a hidden page will include the page in the app instance again.*

## 12.2 Customizing existing Data pages

The data items displayed on each page can be changed.

1. Select and hold on the relevant Data item.
2. Select **Edit** from the Data item pop-over menu.
3. Select the new Data item that you want to display.

Alternatively you can select **Customize page** from the app menu: **Menu > Customize page**.

### Available data items

The data items listed below can be added to a Dashboard data page or to an app's Data overlay.

Data type	Data item	Notes
<b>Battery</b>	<ul style="list-style-type: none"><li>• Temperature</li><li>• Voltage</li><li>• Current</li></ul>	Data items available for up to 5 batteries.
<b>Boat</b>	<ul style="list-style-type: none"><li>• Mast rotation</li><li>• Starboard Trim Tab</li><li>• Port Trim Tab</li><li>• Live Well</li><li>• Black Water</li><li>• Gray Water</li><li>• Fresh Water</li><li>• Roll</li><li>• ROT (Rate Of Turn)</li></ul>	
<b>Depth</b>	<ul style="list-style-type: none"><li>• Maximum Depth</li><li>• Minimum Depth</li><li>• Depth</li></ul>	
<b>Distance</b>	<ul style="list-style-type: none"><li>• Trip season</li><li>• Trip month</li><li>• Trip day</li><li>• Trip manual</li><li>• Ground Trip 4</li><li>• Ground Trip 3</li><li>• Ground Trip 2</li><li>• Ground Trip 1</li><li>• Ground Log</li><li>• Trip</li><li>• Log</li></ul>	

Data type	Data item	Notes
<b>Engine</b>	<ul style="list-style-type: none"> <li>• ECO Mode</li> <li>• Transmission Oil Temperature</li> <li>• Transmission Oil Pressure</li> <li>• Fuel Pressure</li> <li>• Average Fuel Rate</li> <li>• Instantaneous Fuel Economy</li> <li>• Engine Fuel Rate</li> <li>• Engine Tilt</li> <li>• Engine Hours</li> <li>• Engine Load</li> <li>• Coolant Temperature</li> <li>• Coolant Pressure</li> <li>• Alternator</li> <li>• Oil Pressure</li> <li>• Oil Temperature</li> <li>• Boost Pressure</li> <li>• RPM (Revolutions Per Minute)</li> <li>• RPM Engine Hours</li> </ul>	Data items available for up to 5 engines.
<b>Fuel</b>	<p>For tanks 1 to 5:</p> <ul style="list-style-type: none"> <li>• Fuel Economy</li> <li>• Fuel Rate (Total)</li> <li>• TTE (Time To Empty)</li> <li>• DTE (Distance To Empty)</li> <li>• Est. Fuel Level</li> <li>• Season Fuel</li> <li>• Total Trip Fuel</li> <li>• Trip Fuel</li> <li>• Est. Fuel</li> <li>• Fuel Level</li> </ul> <p>For <b>All tanks</b>:</p> <ul style="list-style-type: none"> <li>• Engine economy total</li> <li>• Fuel flow total</li> <li>• Time to empty</li> <li>• Distance to empty</li> <li>• Fuel used (season)</li> <li>• Fuel used (trip)</li> <li>• Est. fuel remaining</li> </ul>	Data items available for up to 5 fuel tanks. An 'All tanks' category is also available which combines data from all fuel tanks.

Data type	Data item	Notes
<b>Environment</b>	<ul style="list-style-type: none"> <li>• Humidity</li> <li>• Pressure</li> <li>• Drift from position</li> <li>• Apparent Wind Chill</li> <li>• True Wind Chill</li> <li>• Dew Point</li> <li>• Maximum Air Temperature</li> <li>• Minimum Air Temperature</li> <li>• Air Temperature</li> <li>• Maximum Water temperature</li> <li>• Minimum Water Temperature</li> <li>• Water Temperature</li> <li>• Set</li> <li>• Drift</li> <li>• Set &amp; Drift</li> </ul>	
<b>GPS</b>	<ul style="list-style-type: none"> <li>• COG (Course Over Ground )</li> <li>• Average SOG</li> <li>• Maximum SOG</li> <li>• SOG (Speed Over Ground)</li> <li>• Position</li> <li>• COG &amp; SOG</li> </ul>	
<b>Heading</b>	<ul style="list-style-type: none"> <li>• Locked Heading Error</li> <li>• Track Heading</li> <li>• Locked Heading</li> <li>• Heading</li> <li>• Locked Heading &amp; Locked Heading Error</li> <li>• Heading &amp; STW (Speed Through Water)</li> </ul>	
<b>Navigation</b>	<ul style="list-style-type: none"> <li>• BOTW (Bearing Origin To Waypoint)</li> <li>• XTE (Cross Track Error)</li> <li>• Next waypoint name</li> <li>• Original target distance</li> <li>• Next turn angle</li> <li>• Route ETA (Estimated Time of Arrival)</li> <li>• Route TTG (Time To Go)</li> <li>• Waypoint</li> <li>• Waypoint TTG</li> <li>• Target position</li> <li>• VMG (Velocity Made Good) to Waypoint</li> <li>• Waypoint ETA</li> <li>• DMG (Distance Made Good)</li> <li>• CMG (Course Made Good)</li> </ul>	



Data type	Data item	Notes
	<ul style="list-style-type: none"> <li>• DTW (Distance To Waypoint)</li> <li>• XTE (Cross Track Error)</li> <li>• BTW (Bearing To Waypoint)</li> <li>• Compass</li> <li>• CMG &amp; VMG to Waypoint</li> <li>• CMG &amp; DMG</li> <li>• BTW &amp; DTW</li> </ul>	
<b>Speed</b>	<ul style="list-style-type: none"> <li>• VMG to Wind</li> <li>• Average STW</li> <li>• Maximum STW</li> <li>• STW (Speed Through Water)</li> </ul>	
<b>Time</b>	<ul style="list-style-type: none"> <li>• Sunset Time</li> <li>• Sunrise Time</li> <li>• UTC (Universal Time Coordinated) Time</li> <li>• Local Time</li> <li>• UTC Date</li> <li>• Local Date</li> </ul>	
<b>Wind</b>	<ul style="list-style-type: none"> <li>• Cardinal Wind</li> <li>• Beaufort</li> <li>• GWD (Ground Wind Direction)</li> <li>• GWS (Ground Wind Speed)</li> <li>• TWD (True Wind Direction)</li> <li>• Minimum TWA (True Wind Angle)</li> <li>• Maximum TWA</li> <li>• TWA (CH) (Close Hauled)</li> <li>• TWA</li> <li>• Maximum TWS (True Wind Speed)</li> <li>• Minimum TWS</li> <li>• TWS</li> <li>• Minimum AWA (Apparent Wind Angle)</li> <li>• Maximum AWA</li> <li>• AWA (CH)</li> <li>• AWA</li> <li>• Minimum AWS (Apparent Wind Speed)</li> <li>• Maximum AWS</li> <li>• AWS</li> <li>• GWS &amp; GWD</li> <li>• AWA &amp; VMG to Wind</li> <li>• AWA (CH) &amp; AWS</li> <li>• AWA &amp; AWS</li> <li>• TWA &amp; VMG to Wind</li> </ul>	

Data type	Data item	Notes
	<ul style="list-style-type: none"> <li>• TWA (CH) &amp; TWS</li> <li>• TWA &amp; TWS</li> <li>• GWD &amp; Beaufort</li> </ul>	

## 12.3 Dashboard settings menu

### Pages tab

The Pages tab provides a list of all available pages.

Settings	Description	Options
Page list	<p>pop-over options allow you to customize the Dashboard app.</p> <p>You can rearrange pages, add new pages, rename existing pages or reset pages to default settings.</p> <div> <p><b>Note:</b> * You can only delete pages added using the Add page option.</p> </div>	<ul style="list-style-type: none"> <li>• Hide/Show page</li> <li>• Move up</li> <li>• Move down</li> <li>• Add page</li> <li>• * Delete page</li> <li>• Rename</li> <li>• Reset all</li> </ul>
<b>Add page</b>	You can add new dashboard pages that you can customize by selecting <b>Add page</b> .	Displays pop-over with page layouts.
<b>Import custom pages</b>	You can import digital switching pages . Please refer to Raymarine Product support for more details.	Displays file browser
<b>Export custom pages</b>	<p>You can export your digital switching pages so that they can be restored at a later date. You must use this feature if you wish to export or backup your digital switching pages, as digital switching pages are not included in the standard MFD “Backup and restore” process, which is used to backup user settings only.</p> <p>Please refer to Raymarine Product support for more details.</p> <p>Exporting digital switching pages must be performed on each MFD configuration.</p>	Save dialog

### Circuits tab

Settings	Description	Options
List of tripped channels	In digital switching systems the circuit tab provides a list of tripped channels. Tripped circuits can be acknowledged and reset from the pop-over options.	<ul style="list-style-type: none"> <li>• Acknowledged</li> <li>• Reset</li> </ul>

### Units tab

Measurement	Units	Measurement	Units
<b>Distance units:</b>	<ul style="list-style-type: none"> <li>• Nautical Miles</li> <li>• NM &amp; m</li> <li>• Statute Miles</li> <li>• Kilometers</li> </ul>	<b>Volume units:</b>	<ul style="list-style-type: none"> <li>• US Gallons</li> <li>• Imperial Gallons</li> <li>• Liters</li> </ul>
<b>Speed units:</b>	<ul style="list-style-type: none"> <li>• Kts</li> <li>• MPH</li> <li>• KPH</li> </ul>	<b>Economy units:</b>	<ul style="list-style-type: none"> <li>• Distance per Volume</li> <li>• Volume per Distance</li> <li>• Liters per 100 km</li> </ul>
<b>Depth units:</b>	<ul style="list-style-type: none"> <li>• Meters</li> <li>• Feet</li> <li>• Fathoms</li> </ul>	<b>Wind speed units:</b>	<ul style="list-style-type: none"> <li>• Knots</li> <li>• Meters per Second</li> </ul>

Measurement	Units	Measurement	Units
<b>Temperature units:</b>	<ul style="list-style-type: none"> <li>• Celsius</li> <li>• Fahrenheit</li> </ul>	<b>Pressure units:</b>	<ul style="list-style-type: none"> <li>• Bar</li> <li>• PSI</li> <li>• Kilopascals</li> </ul>
<b>Date format:</b>	<ul style="list-style-type: none"> <li>• MM:DD:YYYY</li> <li>• DD:MM:YYYY</li> <li>• MM:DD:YY</li> <li>• DD:MM:YY</li> </ul>	<b>Time format:</b>	<ul style="list-style-type: none"> <li>• 12hr</li> <li>• 24hr</li> </ul>

Settings	Description	Options
<b>Bearing mode</b>	Determines how bearing and heading data is displayed.	<ul style="list-style-type: none"> <li>• True</li> <li>• Magnetic</li> </ul>
<b>System Datum</b>	Determines the datum used by your MFD. This should be set to the same datum used by your paper charts.	List of available datums.
<b>Variation</b>	When set to <b>Auto</b> the MFD will automatically compensate for the naturally occurring offset of the Earth's magnetic field.	<ul style="list-style-type: none"> <li>• Auto</li> <li>• Manual</li> </ul>
<b>Manual variation</b>	When variation is set to <b>Manual</b> you can specify an offset.	<ul style="list-style-type: none"> <li>• 30° W to 30° E</li> </ul>

#### Advanced tab

Settings	Description	Options
<b>Maximum RPM</b>	You can select a maximum RPM for your engine dials, or allow the system to automatically configure the Maximum RPM.	<ul style="list-style-type: none"> <li>• Auto</li> <li>• 3,000 RPM to 10,000 RPM</li> </ul>
<b>Custom RPM Red zone</b>	You can create a custom Red zone for your RPM dials.	<ul style="list-style-type: none"> <li>• 0 RPM to 10,000 RPM</li> </ul>
<b>Wind angle response</b>	You can configure the rate at which Wind angle data is updated on the MFD. The Higher the response setting the faster the update rate will be.	<ul style="list-style-type: none"> <li>• 1 to 15</li> </ul>
<b>Wind speed response</b>	You can configure the rate at which Wind speed data is updated on the MFD. The Higher the response setting the faster the update rate will be.	<ul style="list-style-type: none"> <li>• 1 to 15</li> </ul>

#### Page settings tab

Settings	Description
<b>Data Overlays</b>	Enables configuration of Data overlays
<b>Edit split ratio</b>	Enables you to customize the position of the partitions in splitscreen app pages.

## Chapter 13: Video app

### Chapter contents

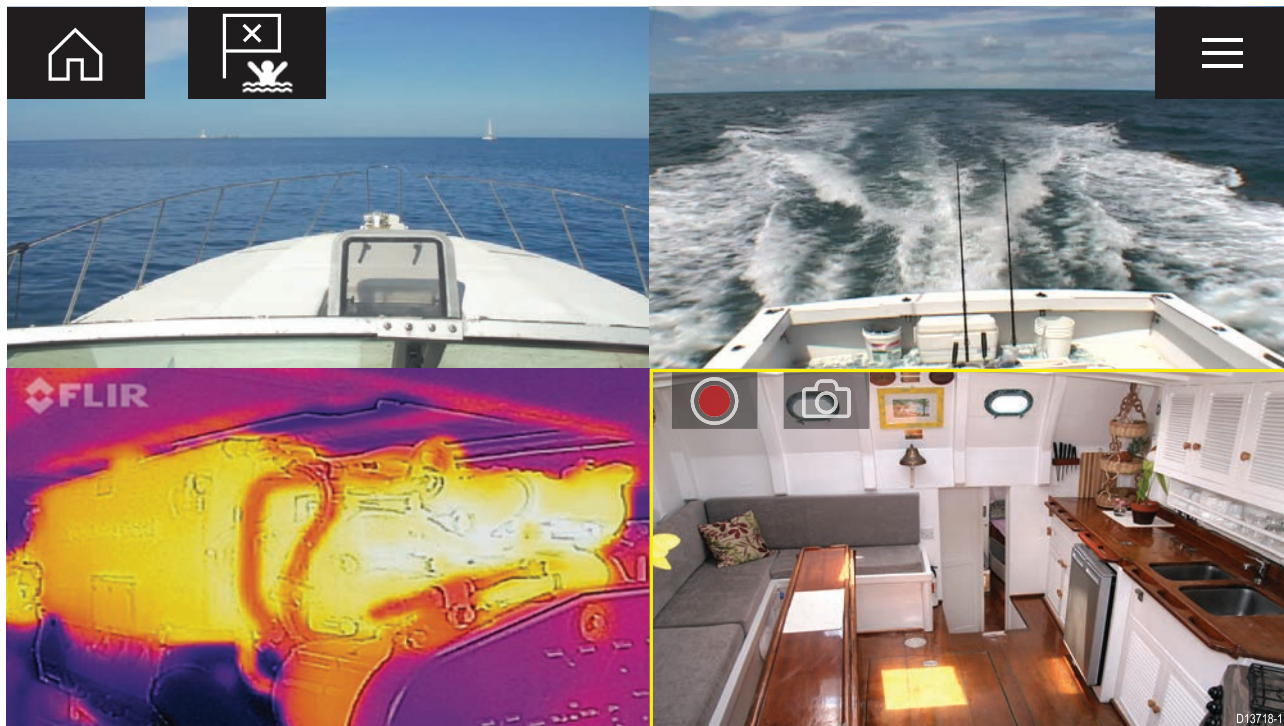
- [13.1 Video app overview on page 210](#)
- [13.2 Opening the Video app on page 213](#)
- [13.3 Video app settings on page 215](#)

## 13.1 Video app overview

Analog video feeds (Axiom™ Pro only) and IP (Internet Protocol) digital video feeds can be viewed, recorded and played back on the MFD using the Video app. Examples of video feeds include: CCTV cameras and Thermal imaging cameras, DVD player etc. It may also be possible to view analog video feeds from other sources using a suitable third party analog-to-IP video converter.

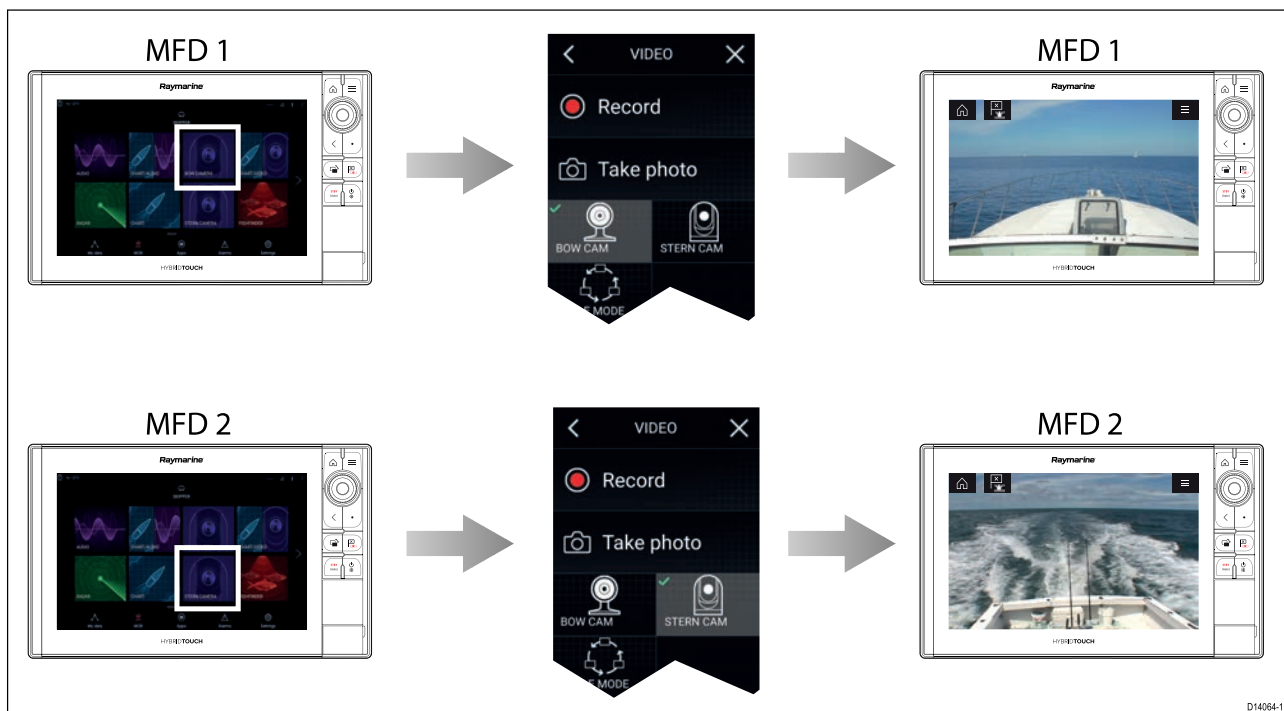
Up to 4 video feeds can be displayed simultaneously when using a splitscreen app page.

Axiom™ Pro MFDs will transmit a connected analog video feed over RayNet to enable the feed to be viewed on networked MFDs.



### Video app pages

Each Video app instance is unique, this means that once you have selected a feed to display in a Video app page then your feed selection is saved and the same feed will be displayed whenever that app page icon is opened from the Homescreen. If you open the same Video app page from a networked MFD, the same feed will be displayed on each MFD.



You can create additional Video app pages and assign a different feed to each. This will allow you to view multiple feeds on multiple networked MFDs simultaneously.

For example, if you want to display a different video feed on different networked MFDs, you must first create additional Video app pages.

**Note:**

When you have multiple Video app page icons on your Homescreen, you may wish to rename each icon to help you easily identify the feeds(s) assigned to each app page. For information on how to rename Homescreen icons, refer to:

[5.4 Creating / Customizing an App page](#)

## Renaming video feeds








In multi camera installations you can rename your feed from within the Video app.

From the Video app menu:

1. Select the icon for the camera you want to rename so that its feed is displayed.
2. Goto the Video app's **Settings** menu: **Menu > Settings**.
3. Select the **Camera setup** tab.
4. Select the Camera name field.
5. Use the onscreen keyboard to rename your feed and then select **Save**.

Repeat the above steps for each video feed you want to rename. You can also associate a different icon to your video feed by selecting on the **Icon** field.

## Video app controls

Icon	Description	Function
	Home icon	Takes you to the Homescreen
	Waypoint / MOB	Place waypoint / activate Man overboard (MOB) alarm
	Pilot icon	Opens and closes the Pilot Sidebar
	Menu icon	Opens the app menu
	Record	Start recording (Replaced by Stop icon whilst recording.)
	Stop	Stop recording (Replaced Record icon when not recording.)
	Take photo	Take a photo of what is currently displayed in the active feed.

## **Pan, Tilt, Zoom (PTZ) camera controls**

Extra controls are available for cameras that can pan, tilt or zoom.

Swiping your finger across the screen to pan or tilt the camera.

Use Pinch-to-Zoom to zoom in and out.

When not in use place the camera in the Parked position by selecting **Park camera** from the menu:

**Menu > Park camera**

Select **Home** from the menu: **Menu > Home** to move the camera to its Home position.



## 13.2 Opening the Video app

The Video app is opened by selecting an app page icon from the Homescreen which includes the Video app.

### Pre-requisites:

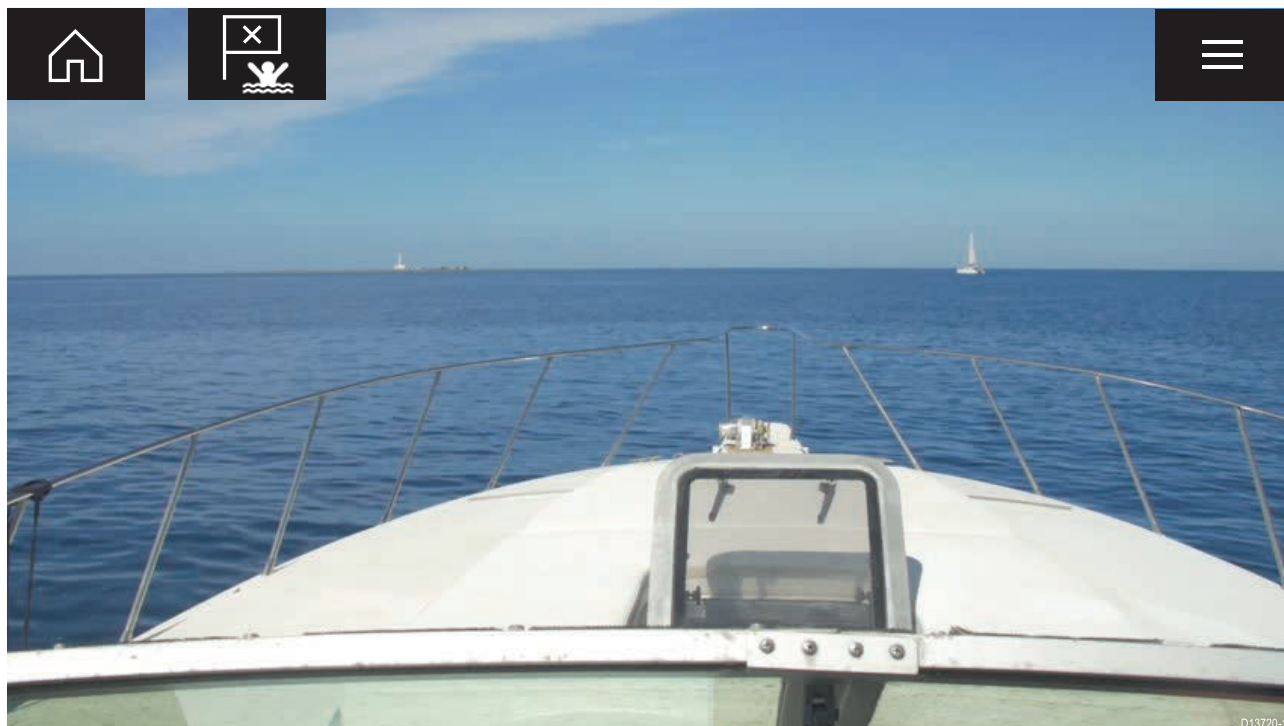
1. Ensure your video feed is compatible by checking the latest details available on the Raymarine website against your device's specification. If in doubt please contact an authorized Raymarine dealer for advice.
2. Ensure you have installed your video device in accordance with the documentation that was supplied with your device.

The Video app will open in 1 of 3 states:

**Note:** If the Video app is opened soon after powering on your system, you may have to wait for the device(s) to finish booting before the video feed is displayed.

### Video feed displayed

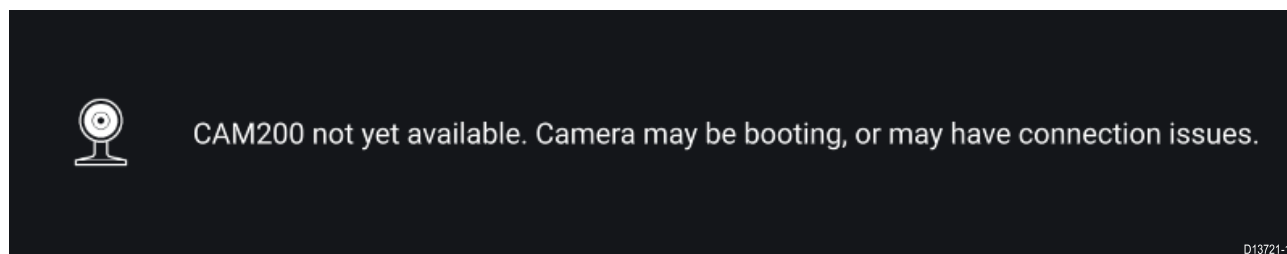
If your device is powered up and operational then the Device's video feed is displayed.



### Camera not yet available

The camera '**xxx not yet available.....**' message is displayed if:

- a Video app page is opened before the camera has finished booting up.
- connection to the camera is lost.

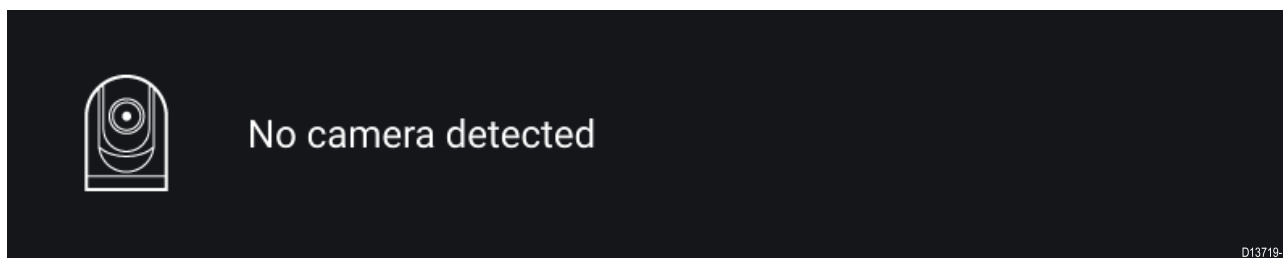


If the camera '**xxx not yet available.....**' message is displayed for more than 2 minutes, then your MFD cannot connect to your camera. Ensure network and power connections to your camera and MFD are correct and free from damage and then power cycle your system. If the camera feed is still not displayed, refer to your equipment's installation documentation for further troubleshooting information.

### No camera detected

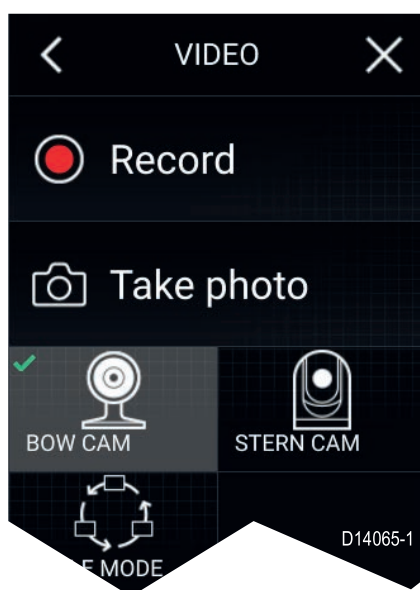
The '**No camera detected**' message is displayed if:

- a Video app page is opened for the first time and no compatible camera is connected.
- a Video app page is opened for the first time before the camera has finished booting up.



If the **'No camera detected'** message is displayed for more than 2 minutes, then your MFD cannot connect to your camera. Ensure network and power connections to your camera and MFD are correct and free from damage and then power cycle your system. If the camera feed is still not displayed, refer to your equipment's installation documentation for further troubleshooting information.

## Selecting a video feed



You can change the feed that is displayed in the Video app. From the Video app main menu, select the icon for the camera that you want to display.

## 13.3 Video app settings

The Settings menu provides access to the Video app's features and functions. The options available in the Settings menu are dependent on your system configuration and connected devices.

### Image tab

Settings	Description	Options
<b>Active feed</b>	On cameras with more than 1 payload you can select which feed to display in the Camera app.	<ul style="list-style-type: none"><li>• Thermal MSX</li><li>• Thermal</li><li>• Visible</li></ul>
<b>Palette</b>	Various color palettes are available to suit different conditions or your personal preference.	List of color palettes.
<b>Light</b>	For cameras that include a light, such as the AX8, use this setting to switch the camera's light on and off.	<ul style="list-style-type: none"><li>• On</li><li>• Off</li></ul>
<b>Scene</b>	The Scene presets provide settings that have been optimized for different running conditions.	<ul style="list-style-type: none"><li>• Day</li><li>• Night</li><li>• Docking</li><li>• High contrast</li></ul>
<b>Contrast</b>	Provides Contrast adjustment.	<ul style="list-style-type: none"><li>• 0% to 100%</li></ul>
<b>Brightness</b>	Provides Brightness adjustment.	<ul style="list-style-type: none"><li>• 0% to 100%</li></ul>
<b>Color</b>	Provides Color adjustment.	<ul style="list-style-type: none"><li>• 0% to 100%</li></ul>
<b>Flip image vertical</b>	Flips the camera image upside down, suitable for Ball-down installations.	<ul style="list-style-type: none"><li>• On</li><li>• Off</li></ul>
<b>Flip image horizontal</b>	Flips the camera image to provide a mirror image, suitable for rear view installations.	<ul style="list-style-type: none"><li>• On</li><li>• Off</li></ul>

### Camera setup tab

Settings	Description	Options
<b>Standby</b>	Activates or places your camera in standby.	<ul style="list-style-type: none"><li>• On</li><li>• Off</li></ul>
<b>Camera name</b>	Enables you to provide your camera with a memorable/unique name.	Displays the onscreen keyboard.
<b>Icon</b>	Allows you to select the icon to be used for the camera.	List of icons.
<b>On-screen icons</b>	Sets the level for the camera's built-in onscreen icons	<ul style="list-style-type: none"><li>• None</li><li>• Minimal</li><li>• All</li></ul>
<b>Heater</b>	Enables and disables the camera's built-in heater used to de-mist the camera lens.	<ul style="list-style-type: none"><li>• On</li><li>• Off</li></ul>

### Photo & Video recording tab

Settings	Description	Options
<b>Save files to:</b>	Determines the save location for photos and video recordings. <div><b>Note:</b> External SD 1 and USB Media are available when using the RCR-SDUSB Accessory.</div>	<ul style="list-style-type: none"><li>• SD 1</li><li>• External SD 1 USB Media</li></ul>

**ClearCruise tab (Object Detection)**

Settings	Description	Options
<b>Highlight detected objects</b>	Uses proprietary ClearCruise™ technology to highlight and track objects detected in the water.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Beep on detection</b>	When enabled the MFD will beep when an object is detected.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Display estimated range</b>	When enabled the MFD will display an estimated range for highlighted objects (objects must be closer than 300ft)	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

**ClearCruise tab (Augmented Reality)**

Settings	Description	Options
<b>AIS labels</b>	Display other vessels as flags (requires AIS).	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Hide static targets</b>	Hide AIS targets travelling under 2 knots (requires AIS).	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Waypoints</b>	Display Waypoints as flags.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Chart objects</b>	Display Chart objects as flags (requires compatible charts).	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Cartography source</b>	Select the cartography ClearCruise displays data from (requires compatible charts).	• Cartography source options
<b>Compass</b>	Display the Compass bar.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Range limit</b>	Set the maximum range flags will automatically be displayed from.	• 1/8nm to 13nm

**Camera motion tab**

Settings	Description	Options
<b>Camera height above the waterline</b>	To ensure correct alignment of the camera for tracking purposes the height the camera has been installed at, above the waterline, must be set.	• 0ft to 99ft
<b>Set forward position</b>	Allows you to adjust the Forward position for you camera Adjust the camera so that it is point in forward and select <b>Save</b> to set the forward position.	Displays the forward alignment picture
<b>Man overboard</b>	Enables and disables automatic tracking of a MOB alarm. The most recent target is tracked.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Dangerous AIS targets</b>	Enables and disables automatic tracking of Dangerous AIS targets. The most recent target is tracked.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Dangerous MARPA targets</b>	Enables and disables automatic tracking of Dangerous Radar targets. The most recent target is tracked.	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
<b>Enable scan</b>	Enables and disables Surveillance mode. Surveillance mode pans the camera left to right continuously to the specified speed	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>

Settings	Description	Options
<b>Scan width</b>	Determines how far the camera pans from left to right when in Surveillance mode.	<ul style="list-style-type: none"> <li>• Narrow</li> <li>• Medium</li> <li>• Wide</li> </ul>
<b>Scan speed</b>	Determines the speed at which the camera pans from left to right when in Surveillance mode.	<ul style="list-style-type: none"> <li>• Slow</li> <li>• Medium</li> <li>• Fast</li> </ul>

#### Page settings

Settings	Description
<b>Edit data overlays</b>	Edit data overlays.
<b>Edit split ration</b>	Customize the position of the partitions in splitscreen app pages.



## Chapter 14: ClearCruise (Object Detection and Augmented Reality)

### Chapter contents

- [14.1 ClearCruise™ features on page 220](#)
- [14.2 Camera setup for Augmented Reality on page 221](#)
- [14.3 AR200 setup for Augmented Reality on page 223](#)
- [14.4 ClearCruise™ object detection overview on page 224](#)
- [14.5 Augmented Reality \(AR\) overview on page 226](#)
- [14.6 Augmented Reality flags on page 227](#)
- [14.7 ClearCruise settings \(Augmented Reality\) on page 230](#)
- [14.8 Roll correction on page 232](#)
- [14.9 AR200 Calibration \(Linearization\) on page 234](#)

## 14.1 ClearCruise™ features

ClearCruise™ features are designed for enhancing situational awareness and aiding navigation. ClearCruise™ technology provides 2 separate features:

- Object Detection
- Augmented Reality (AR)

### Object Detection

**Object Detection** is a feature available for M100 and M200 Series thermal cameras. Intelligent thermal analytics technology provides audible and visual alerts when “non-water” objects are identified in the scene. Vessels, obstacles, and navigation markers can all be automatically identified by the camera without the need for Chart or Radar data.

#### Required components for Object Detection

- MFD: Axiom / Axiom Pro / Axiom XL, or eS Series / gS Series running LightHouse 3.
- Thermal Camera (M100 or M200 Series)
- LightHouse™ software (v3.0 or later)

For more information, refer to [p.224 – ClearCruise™ object detection overview](#)



### Augmented Reality

The **Augmented Reality** feature places layers of digital information directly over the top of the Video app's video feed. Data from the Chart app is used to generate informative text and images (flags) on the Video app. When calibrated correctly, ClearCruise™ Augmented Reality accurately overlays automatically-updating flags on the Video app so they overlap real-life objects.

#### Required components for Augmented Reality

- MFD (Axiom, Axiom Pro or Axiom XL)
- AR200 Augmented Reality Sensor
- IP camera (CAM210IP or CAM220IP)
- LightHouse™ software (v3.7 or later)

For more information, please refer to [p.226 – Augmented Reality \(AR\) overview](#)



**Note:** ClearCruise's performance is dependent on environmental conditions and is not a replacement for maintaining a visual watch.



## 14.2 Camera setup for Augmented Reality

Before using the Augmented Reality features, it's important to correctly install and setup your compatible camera.

Refer to the Installation manual for your camera to determine the correct physical installation and connections for using the camera as part of an Augmented Reality system.

A number of additional camera-related settings must be made in the Video app before the Augmented Reality features can be used:


- The camera height above the waterline.
- The direction the camera is facing.
- The horizontal field of view of the camera.

**Note:**


- The camera's height above the waterline and camera's view direction need to be physically measured for accurate camera installation.
- The camera's horizontal field of view is shown below.

Camera	Horizontal Field of View (FOV)
<b>CAM210IP</b>	53°
<b>CAM220IP</b>	51°


1. For first time setup, either:
  - i. Select the **Enter Details** prompt in the Video app.
  - ii. Select the **ClearCruise** tab in the Video app's Settings, **Video app > Settings > ClearCruise**. There will be a prompt to **Enter Details** using the **Camera Installation** page.
2. Go directly to the **Camera Installation** page in the Video app (**Settings > Camera Setup > Camera Installation**).
3. The **Camera Installation** page will offer a series of camera installation options which all need to be completed correctly.


**Camera height above waterline**

22.0ft

**Camera direction**

0°

**Calibrate horizon**

**Field of view**

40°

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**Note:**

Incorrect physical camera installation and incorrect settings provided in the camera setup page could result in an inaccurate Augmented Reality overlay.

- To adjust the values of **Camera height above waterline**, **Camera direction** and **Field of view**, select the value boxes of each option and adjust using the arrows.

Menu item	Options
Camera height above waterline	<ul style="list-style-type: none"> <li>• 0m to 50m</li> <li>• 0ft to 165ft</li> </ul>
Camera direction	<ul style="list-style-type: none"> <li>• 0° (Forward) (default)</li> <li>• 0° to 180°p (Port)</li> <li>• 0° to 180°s (Starboard)</li> </ul>
Field of view	<ul style="list-style-type: none"> <li>• 30° to 120°</li> <li>• 53° (CAM210)</li> <li>• 51° (CAM220)</li> </ul>

- To Calibrate horizon, use the **up**, **down**, **rotate left** and **rotate right** arrow keys until the red line is placed on the horizon. When the line is in position, select **Save**.

**Important:** Calibrating the horizon correctly is essential for accurate Augmented Reality overlay. Calibrating on calm water and in clear sight of the horizon is recommended.

<

Calibrate horizon

×

Move the line using the buttons (up, down, rotate left, rotate right) to place it exactly on the horizon. This will improve placement accuracy of Augmented Reality items.

When the line is in position, press Save.

Save

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## 14.3 AR200 setup for Augmented Reality

Before using the Augmented Reality features, it's important to correctly install and setup the AR200 Augmented Reality sensor.

Refer to the AR200 Installation manual (87372) to determine the correct physical installation and connections for using the AR200 as part of an Augmented Reality system.

## 14.4 ClearCruise™ object detection overview

Object detection provides audible and visual alerts when “non-water” objects are identified by connected M100/M200 Series cameras.

Objects that visually differ from the water will be identified by the camera as a “non-water” object.

The following features are available with Object detection:

- **Highlight detected objects** — Enables/disables object highlighting, which automatically identifies and highlights “non-water” objects.
- **Beep on detection** — Enables/disables a beep when an object is detected (**Highlight detected objects** must be enabled)
- **Display estimated range** — Enables/disables display of an object’s estimated range from your vessel (**Highlight detected objects** must be enabled, and object must be closer than approximately 100 m (~300 ft)).



Object detection can be particularly useful at night or visually limiting environments such as storms or fog.

In the event of an emergency, such as man overboard, Object detection could be a useful aid that helps to identify and predict the distance from the MOB.

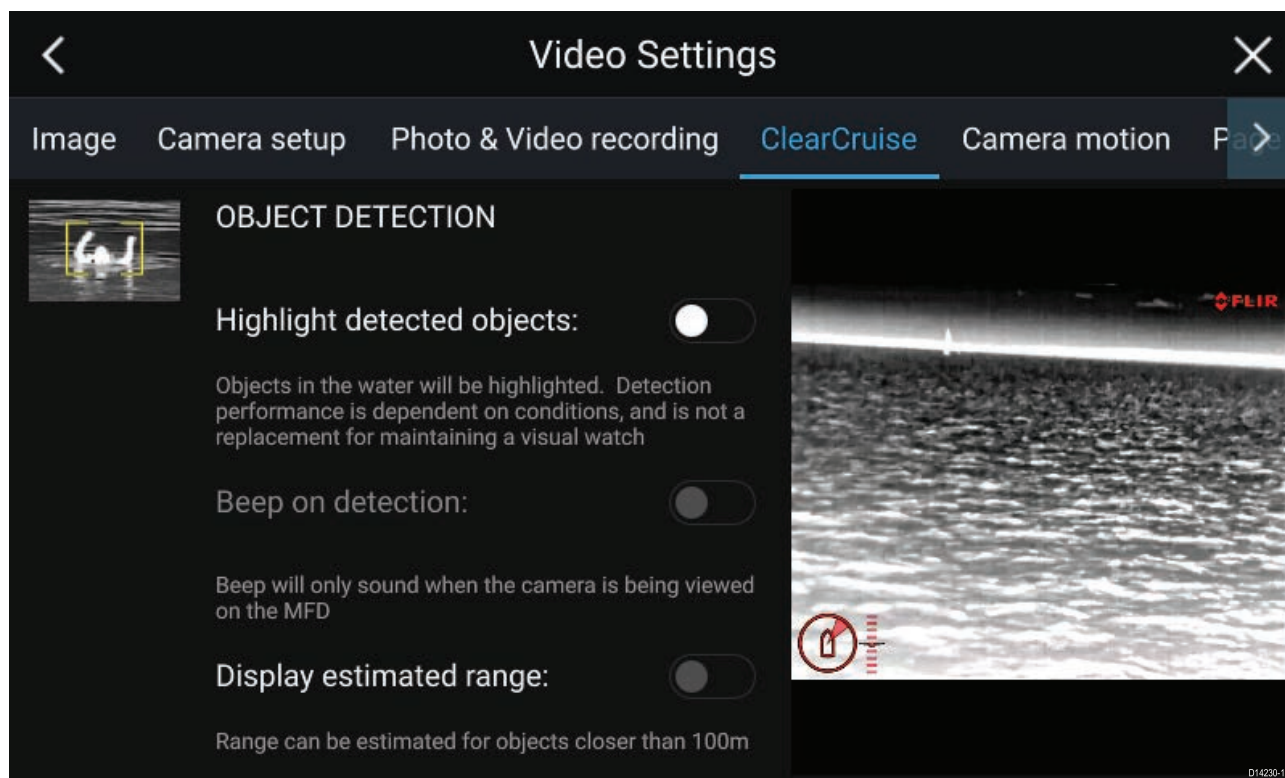


**Note:** ClearCruise’s performance is dependent on conditions and is not a replacement for maintaining a visual watch.

## ClearCruise settings (Object Detection)

Object Detection features and settings can be enabled and disabled in the **ClearCruise** tab in the Video app.

**Video app > Settings > ClearCruise**

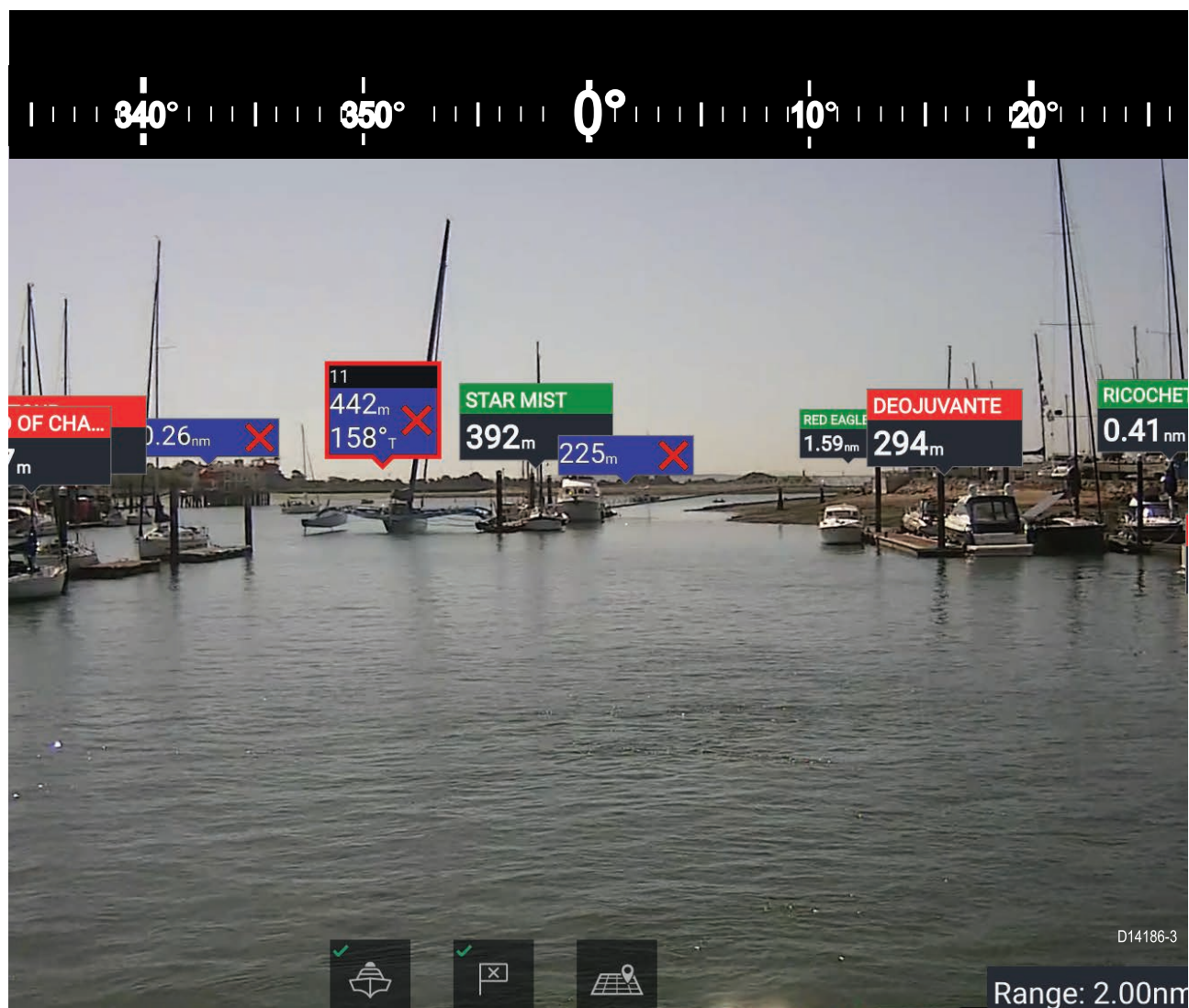


Setting	Description
<b>Highlight detected objects</b>	Enables/disables object highlighting.
<b>Beep on detection</b>	Enables/disables an audible beep when an object is detected ( <b>Highlight detected objects</b> must be enabled).
<b>Display estimated range</b>	Enables/disables display of an object's estimated range from your vessel ( <b>Highlight detected objects</b> must be enabled, and the object must be closer than approximately 100 m (~300 ft).



## 14.5 Augmented Reality (AR) overview

ClearCruise™ Augmented Reality uses data from the Chart app and displays this data in realtime as an overlay in the Video app.



The **Augmented Reality** feature places layers of digital information directly over the top of the Video app's video feed. Data from the Chart app is used to generate informative text and images (flags) on the Video app. When calibrated correctly, ClearCruise™ Augmented Reality accurately overlays automatically-updating flags on the Video app so they overlap real-life objects.

The Augmented Reality feature requires an Axiom, Axiom Pro or Axiom XL MFD, an AR200 sensor and a compatible camera.

For more information, refer to: [p.220 — ClearCruise™ features](#)

### Note:

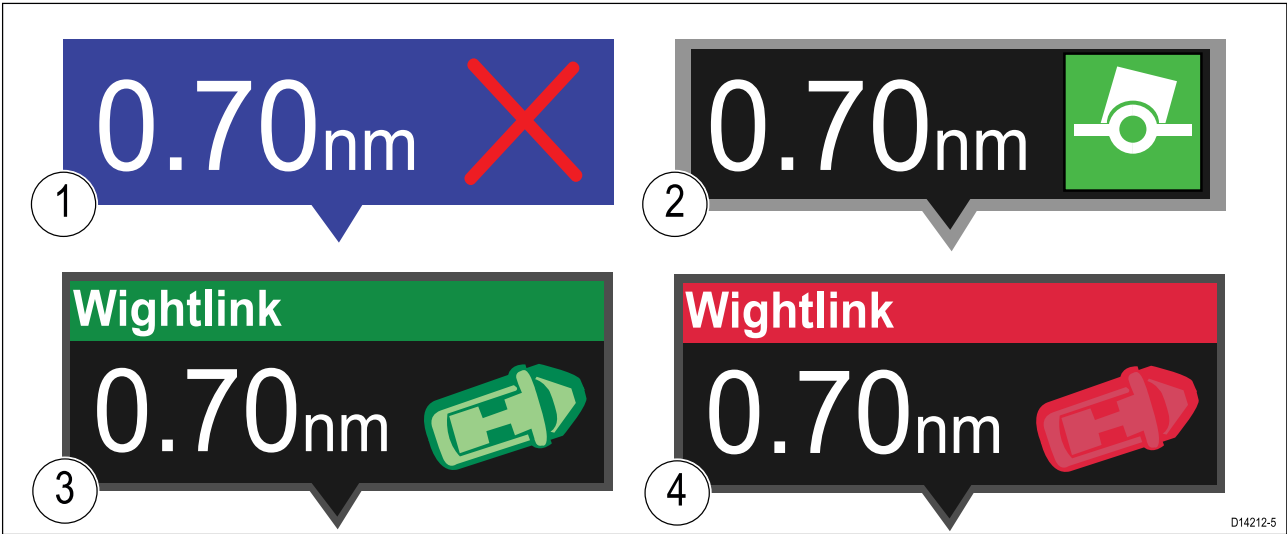
- The Augmented Reality feature requires correct camera calibration for accurate image overlay.
- The Augmented Reality feature serves as an aid to navigation and situational awareness only, and should not be solely relied on for precise navigation. Always maintain a visual watch.

**Important:** Rear-facing cameras with a flipped or mirrored image may not place Augmented Reality content as accurately as a forward-facing camera.

# 14.6 Augmented Reality flags

ClearCruise™ Augmented Reality displays AIS Targets, Waypoints and Chart Objects as individual Augmented Reality **Flags** in the Video app.

All flags display an icon and your vessel's distance from the target's location.



1	Waypoint flag
2	Chart Object flag (buoy)
3	AIS Target flag (passenger ferry; icon points in the direction of travel relative to the camera feed)
4	Dangerous AIS Target flag (passenger ferry; icon points in the direction of travel, relative to the camera feed)

**Note:** AIS flags update periodically; however, accurate placement is not guaranteed.

- AIS Targets, Waypoints and Chart Object flags can be quickly enabled/disabled via buttons on the Video app.
- The maximum range within which flags are automatically shown can also be adjusted in the Video app.
- For more information on adjusting flag settings, refer to: [p.230 — ClearCruise settings \(Augmented Reality\)](#)



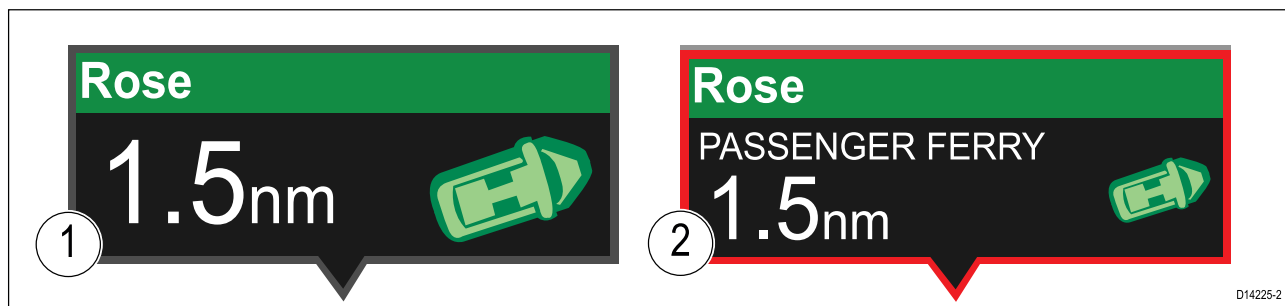
## Selected flags

Augmented Reality flags in the Video app can be selected (highlighted), providing access to more information about the object and additional features.

A flag is an onscreen visual overlay element displayed in the Video app when the Augmented Reality features are enabled. A flag represents an object from the Chart application: e.g. AIS target, Waypoint, or other chart object.

When a flag is selected, the corresponding object is also highlighted in the Chart app. Conversely, selecting an object in the Chart app highlights the corresponding flag in the Video app.

Only one flag may be selected at a time.



1	AIS Flag
2	Selected AIS Flag



Selecting a flag highlights it in red and provides additional information about the object in a context menu. The menu also provides additional features. The range of features available in the context menu depends on the type of object selected:

#### AIS Target Flag

Option	Description
<b>AIS Target name</b>	The name of the target vessel.
<b>Target data</b>	Vessel (name), CPA, TCPA, COG, SOG.
<b>View AIS data</b>	Displays the AIS data transmitted by the target vessel.
<b>Buddy (toggle ON/OFF)</b>	Add the vessel to your "Buddy List", with the option to rename it. The Buddy feature enables you to add AIS-equipped friends and regular contacts to a "Buddy List" on your MFD. As soon as a vessel on your Buddy List comes within range of your AIS receiver, the onscreen vessel icon changes to indicate this.



Option	Description
<b>Goto</b>	The Chart app will plot a direct route to the last known location of the target.
<b>Place waypoint</b>	The Chart app will place a waypoint at the last known location of the target.

### Waypoint Flag

Option	Description
<b>Waypoint name</b>	The name of the waypoint.
<b>Target data</b>	Lat, Lon, Rng, Brg.
<b>Goto</b>	The Chart app will plot a direct route to the last known location of the target.
<b>Delete</b>	Delete the waypoint.
<b>Edit</b>	Edit the waypoint's Name, Symbol, Group, Position, and add a Comment.

### Chart Object Flag

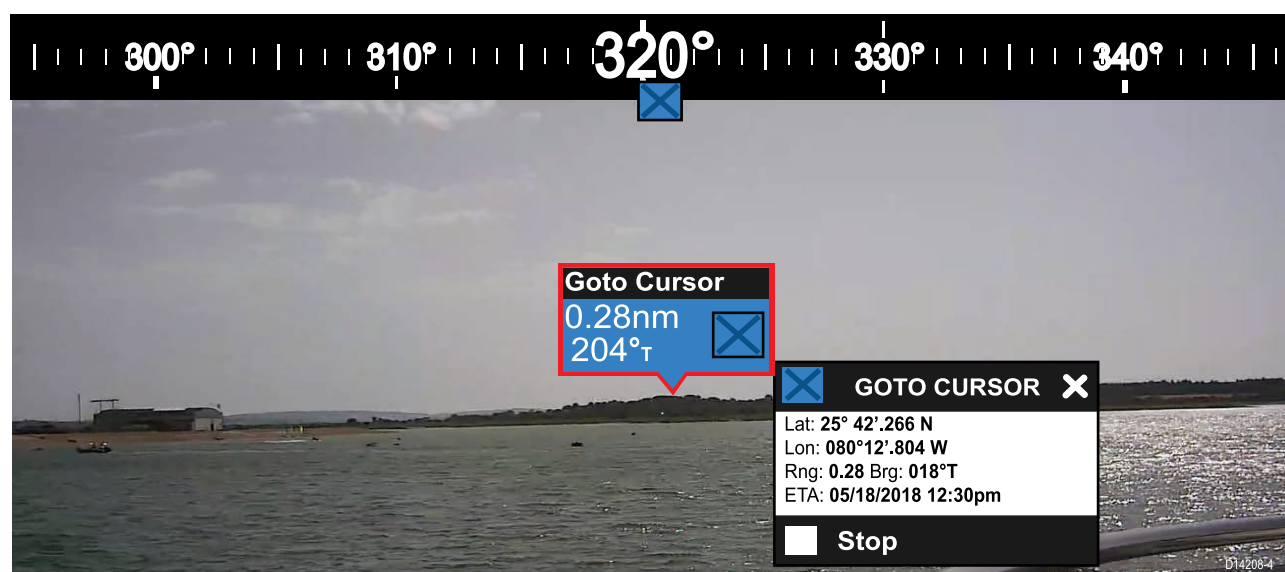
Option	Description
<b>Chart Object name</b>	The name of the chart object.
<b>Target data</b>	Lat, Lon, Rng, Brg.
<b>Goto</b>	The Chart app will plot a direct route to the last known location of the target.

## Goto flag

Selecting **Goto** on a selected Augmented Reality flag will plot a direct course to the flag's last known location.

A **Goto** flag will appear in the last known location of the selected flag in both the Video and Chart apps, and in the Video app's **Compass bar**. The flag is displayed with a Goto icon, as a blue copy of the original flag.

Selecting the **Goto** flag makes it a selected flag, and also displays a context menu providing more information about the location of the flag, and the option to stop a goto action.



- Selecting **Stop** removes the Goto flag from the Video app and Chart app.
- If the camera loses sight of the **Goto** flag, it will display red and green navigational arrows on the **Compass bar**, indicating whether you need to turn port or starboard to regain sight of the flag. However, this only works if the camera is forward-facing.

## 14.7 ClearCruise settings (Augmented Reality)

Augmented Reality settings can be edited in the **ClearCruise** tab in the Video app.

Setting	Description
<b>AIS labels</b>	Enables/disables the display of other vessels as Augmented Reality flags (requires AIS).
<b>Hide static targets</b>	Enables/disables the display of AIS targets travelling under 2 knots (requires AIS).
<b>Waypoints</b>	Enables/disables the display of Waypoint Augmented Reality flags.
<b>Chart objects</b>	Enables/disables the display of Chart objects (requires compatible charts).
<b>Cartography source</b>	Select the cartography source that the ClearCruise™ features will use for the display of chart objects in the Video app Augmented Reality features. (Requires compatible charts).
<b>Compass</b>	Enables/disables the display of the Compass bar in the Video app.
<b>Range limit</b>	Sets the maximum range at which the camera will detect and display Augmented Reality flags. This range is displayed visually in the Chart app with the “FOV cone”. Refer to: <a href="#">p.125 — Field of View</a> . For the maximum range supported by your camera, refer to: <a href="#">p.231 — Range limit</a>

Video Settings

Image
Camera setup
Photo & Video recording
**ClearCruise**
Page Settings

### AUGMENTED REALITY

AIS labels:

☐

Hide static targets

☒

Waypoints:

☒

Chart objects:

☐

Cartography source:

LH3

Compass:

☒

Range limit:

5.00nm

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### Note:

The variety of chart objects is dependent on the selected cartography source. For more information on different cartography sources, refer to: [p.120 — Find nearest](#)

## Range limit

The Range Limit is the maximum range at which ClearCruise™ can display AIS targets, Waypoints and Chart Object flags in the Video app.

The range limit can be checked using the Field of View (FOV) cone in the Chart app. All AIS targets, Waypoints and Chart Objects within the area of coverage of the FOV cone can be displayed as Augmented Reality flags in the Video app. For more information, refer to: [p.125 — Field of View](#)



### Note:

Some chart objects just outside of the FOV cone might still display in the Video app as flags.

The following table lists the maximum range supported by the CAM210IP and CAM220IP cameras, with respect to the display of Augmented Reality objects in the Video app.

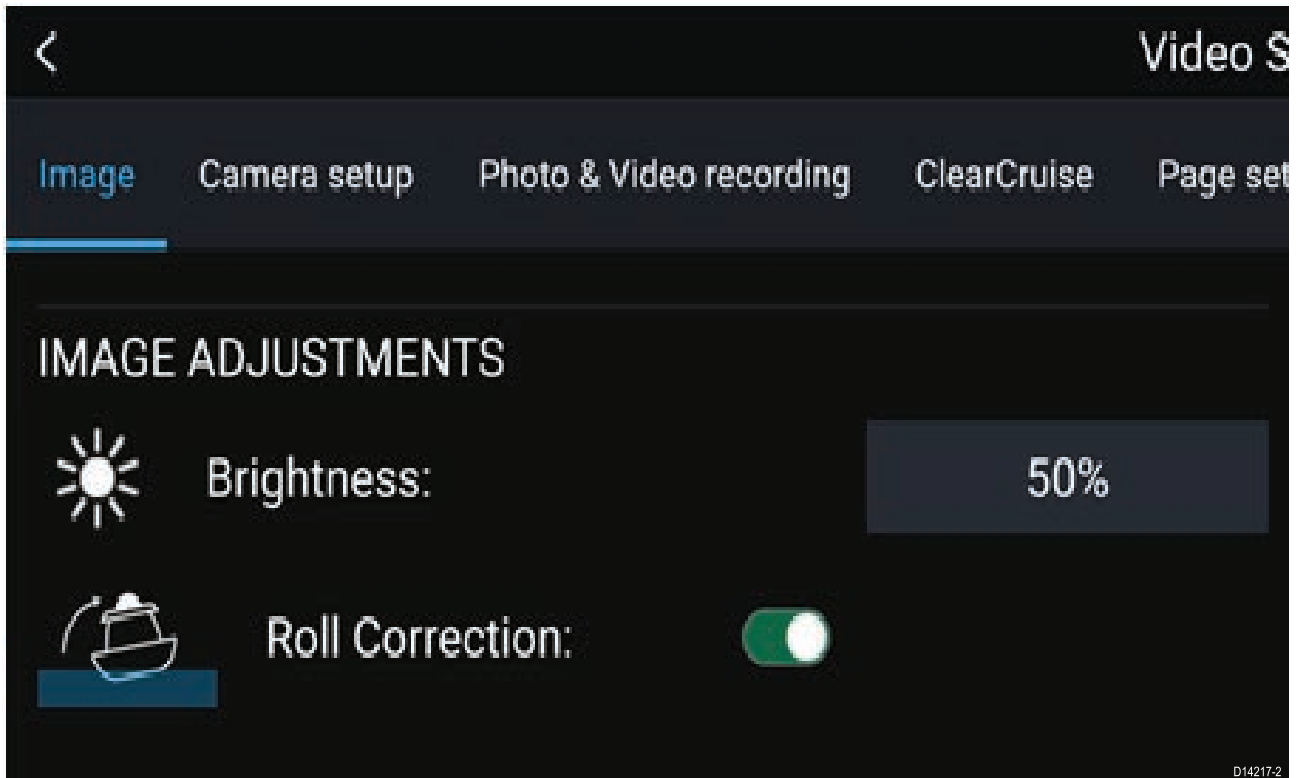
You can also specify this range limit manually in the Video app: **Video Settings > ClearCruise tab**. The range you specify must be the same as, or lower than, the maximum range listed in the following table. Any adjustments you make will be reflected in the FOV cone display in the Chart app.

Unit of measurement	Maximum Range
Nautical Miles	13
Statute Miles	15
Kilometers	24

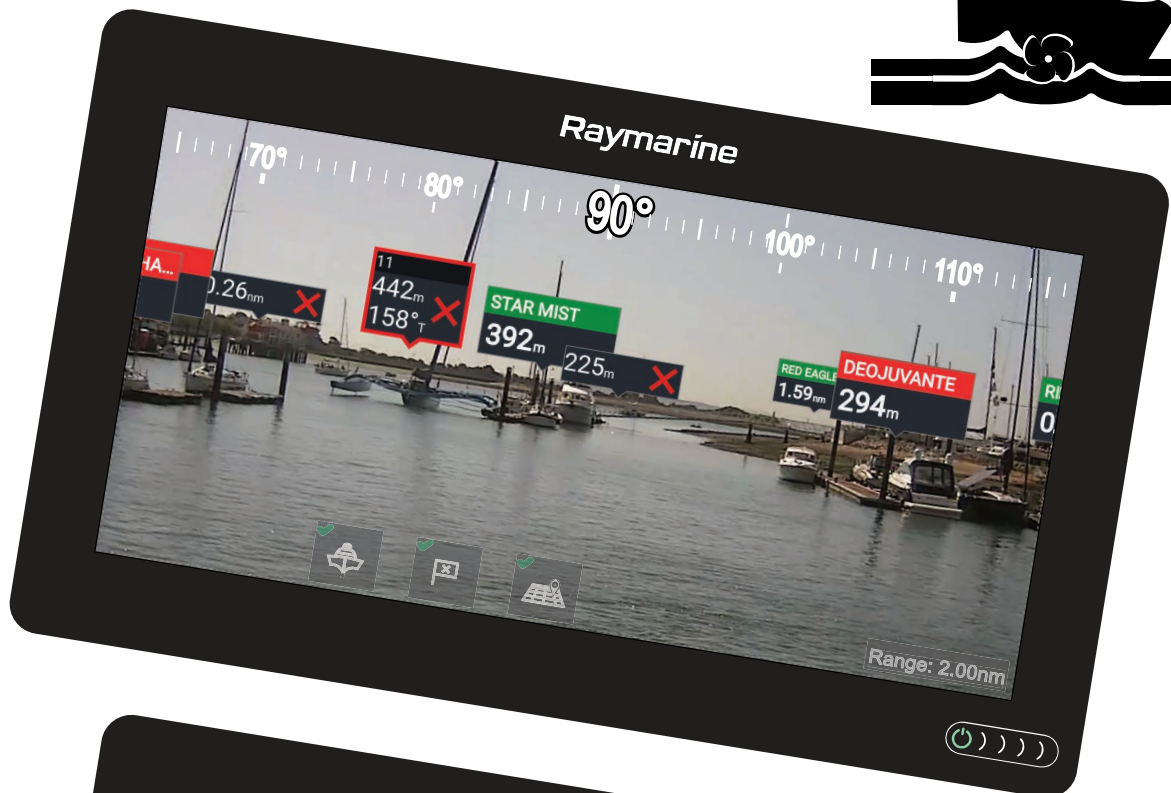
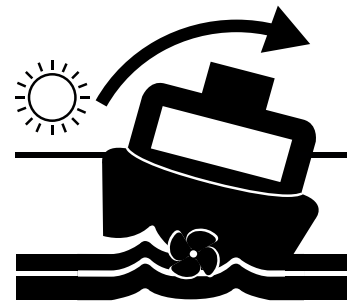
## 14.8 Roll correction

Roll Correction automatically adjusts the Video app image when the vessel tilts (rolls) to port or starboard.

Roll Correction can be enabled/disabled in the Video app: **Settings > Image**.



When enabled, the Roll Correction feature accounts for the boat tilting and stabilizes the video feed accordingly. This means that the video feed's horizon will be parallel with the actual horizon. When disabled, the video feed will tilt with the boat and the MFD screen.



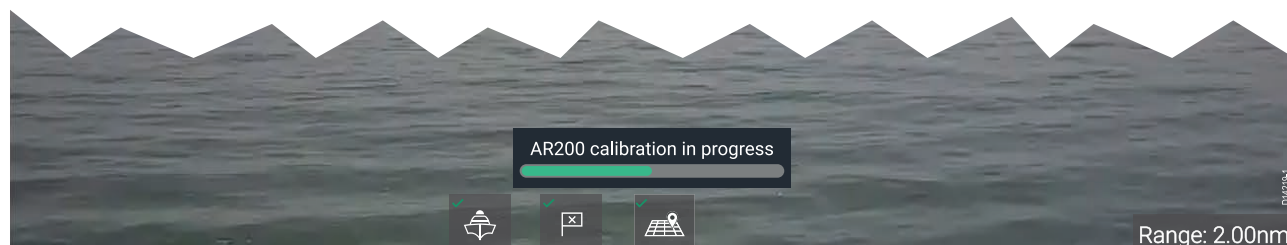
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1	Roll correction disabled
2	Roll correction enabled

## 14.9 AR200 Calibration (Linearization)

To enable accurate placement of Augmented Reality (AR) flags on the camera's video feed, the AR200's AHRS sensors need to compensate for local magnetic fields, as well as the Earth's magnetic fields.

Calibration is achieved using an automatic linearization process. The linearization process starts automatically after your vessel has turned approximately 100°, when travelling at a speed of between 3 to 15 knots. The linearization process requires no user input, however at least a 270° turn is required before linearization can be completed. The duration of the linearization process can be decreased by completing a full 360° turn, when travelling at a speed of between 3 to 15 knots. The linearization process can also be restarted at anytime.



In the Video app the Linearization progress bar is displayed when linearization is in progress. The bar is filled to indicate completeness, and will turn Red if the process is paused or otherwise interrupted.

The time taken to complete the linearization process will vary according to the characteristics of the vessel, the AR200's installation location, and the levels of magnetic interference present at the time linearization is performed.

Magnetic interference can be caused by objects onboard your vessel, such as:

- Speakers
- Electronic equipment
- Electrical cabling
- Metal bulkhead or hull

Magnetic interference can also be caused by external objects in close proximity to your vessel, such as:

- Metal hulled vessels
- Underwater electrical cables
- Marine pontoons

### Magnetic deviation

Magnetic deviation is the error induced in a compass caused by interference from local magnetic fields.

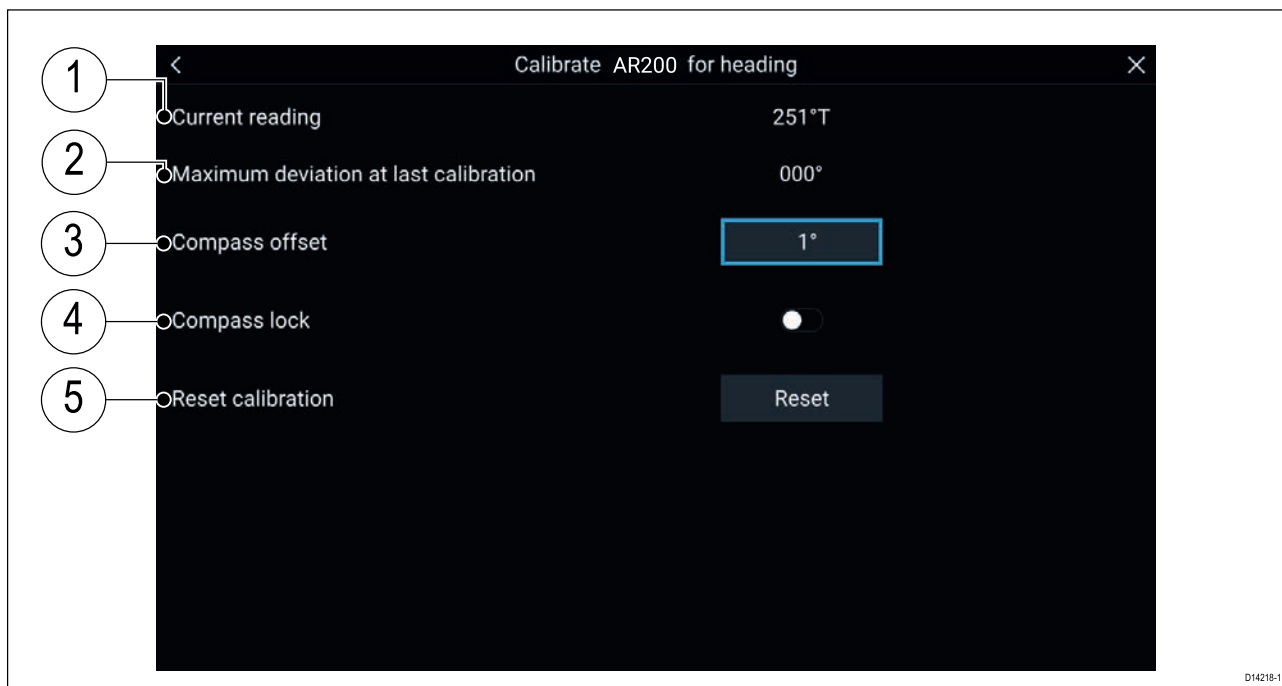
The automatic linearization process results in a deviation value being set for your AR200. If Augmented Reality flags in the Video app are not aligned with their onscreen objects, or the compass is out of alignment, you should check the AR200's current calibration settings. For instructions on how to do this, refer to: [p.234 — AR200 calibration settings](#)

### AR200 calibration settings

The calibration settings page provides access to the AR200's compass calibration options.

The AR200 calibration page can be accessed using your Data master MFD; from the Homescreeen select: **Settings > Network > Data sources > Heading > AR200 > Calibrate.**





1	<b>Current reading:</b> The current heading reported by the AR200.
2	<b>Maximum deviation at last calibration:</b> The maximum deviation reported during the last linearization process. <div> <b>Important:</b> <ul style="list-style-type: none"> <li>If the <b>Maximum deviation at last calibration</b> is 45° or above, it is recommended that the AR200 unit is moved and re-installed in a location which is subject to less magnetic interference.</li> </ul> </div> <b>Calibration in progress:</b> While linearization is in progress the progress percentage is displayed.
3	<b>Compass offset</b> Once the linearization process has completed, it is possible that the heading value may be slightly out of alignment. This is common where installation space is limited and the AR200 is not properly aligned with your vessel's longitudinal axis. In this case, it is possible to manually adjust the Compass offset.
4	<b>Compass lock</b> When enabled, the Compass lock prevents the continual monitoring and adaptation of the compass linearization process. For more information, refer to: <a href="#">p.236 – Compass lock</a> .
5	<b>Reset calibration</b> You can reset your AR200's current linearization settings by selecting <b>Reset calibration</b>

## Continual monitoring and adaptation

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

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

- significant magnetic interference is present
- vessel speed too slow or too fast
- rate-of-turn too slow or too fast

## Compass lock

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

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

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



## Chapter 15: Audio app

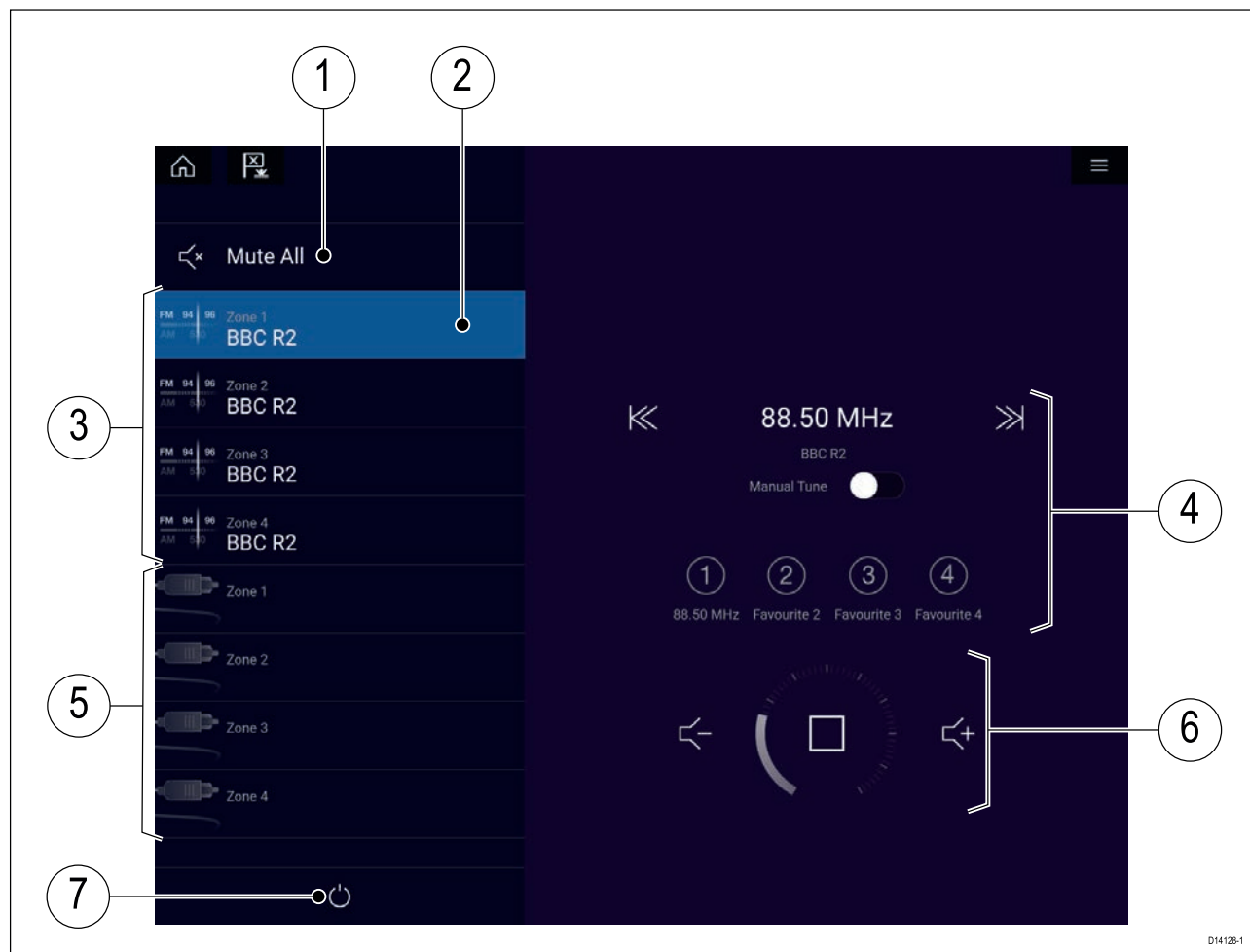
### Chapter contents

- [15.1 Audio app overview on page 238](#)
- [15.2 Opening the Audio app on page 242](#)
- [15.3 Getting started on page 244](#)
- [15.4 Audio app menu options on page 246](#)

## 15.1 Audio app overview

The Audio app can be used to control compatible entertainment systems that are connected to the same network as your MFD.

The Audio app can be displayed in Fullscreen and half screen portrait app pages.



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1. **Mute All** — Mutes all zones on the currently selected system.
2. Currently selected zone.
3. System 1 available zones.
4. Audio source and controls for currently selected zone.
5. System 2 available zones.
6. Zone volume and player controls for currently selected zone.
7. **Power** — Power on or off connected entertainment systems.

## Compatible entertainment systems

The table below lists compatible entertainment systems which have been approved for use with the MFD Audio app. The Audio app can be used to control up to 3 entertainment systems from the same manufacturer.

### Sirius XM receiver

Model number	Raymarine part number	Supported Network connection
SR150	E70161	Ethernet

## Rockford Fosgate entertainment systems

Model number	Raymarine part number	Supported Network connection
RMX8DH	E70394	NMEA 2000
RMX8BB	E70395	NMEA 2000
RMX5CAN	E70396	NMEA 2000

## Fusion entertainment systems



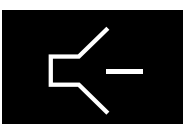


Model number	Supported Network connection
600	NMEA 2000
650	NMEA 2000
700	NMEA 2000
750	NMEA 2000 Ethernet
770	NMEA 2000 Ethernet
SRX400i	Ethernet
BB100	NMEA 2000
BB300	NMEA 2000
RA70	NMEA 2000
RA70N	NMEA 2000
RA205	NMEA 2000



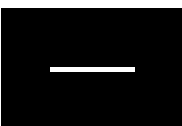
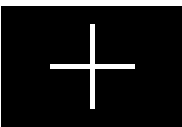






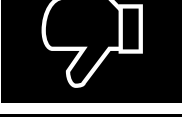

### Note:

Connecting entertainment systems from Fusion and Rockford Fosgate at the same time is not supported.

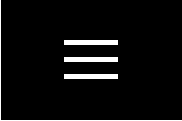



## Audio app controls

### Audio player controls

Icon	Description	Function
	Power Off	Powers off the Entertainment system.
	Mute All	Mutes all audio zones.
	Volume Down	Decreases volume for current zone.
	Volume Up	Increases volume for current zone.
	Forwards	<ul style="list-style-type: none"><li>• Skip to the next track (USB and Bluetooth)</li><li>• Seek/Search Forward (Radio)</li></ul>

Icon	Description	Function
	Backwards	<ul style="list-style-type: none"> <li>• Skip back to beginning of current track (USB and Bluetooth)</li> <li>• Seek/Search Backward (Radio)</li> </ul>
	Manual Tune	<ul style="list-style-type: none"> <li>• On (switches Forwards and Backwards icons with Manual Tune icons)</li> <li>• Off</li> </ul>
	Tune Up	Manually searches up for radio stations/channels.
	Tune Down	Manually searches down for radio stations/channels.
	Repeat	<ul style="list-style-type: none"> <li>• Off</li> <li>• Repeat Track</li> <li>• Repeat All</li> </ul>
	Shuffle	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
	Play	Select to commence playback.
	Pause	Select to Pause playback.
	Stop	Select to Stop (Mute) Radio devices.
	Like	Like a track (Pandora only).
	Dislike	Dislike a track (Pandora only).
	Radio presets	Save your favorite radio stations/channels to 4 preset buttons. Press and hold to save, press once to change to saved station/channel.

## Standard app controls

Icon	Description	Function
	Menu icon	Opens the app menu.
	Home icon	Takes you to the Homescreen.
	Waypoint / MOB	Place waypoint / activate Man overboard (MOB) alarm.
	Pilot icon	Opens and closes the Pilot Sidebar

## 15.2 Opening the Audio app

The Audio app is opened by selecting an app page from the Homescreen that includes the Audio app.

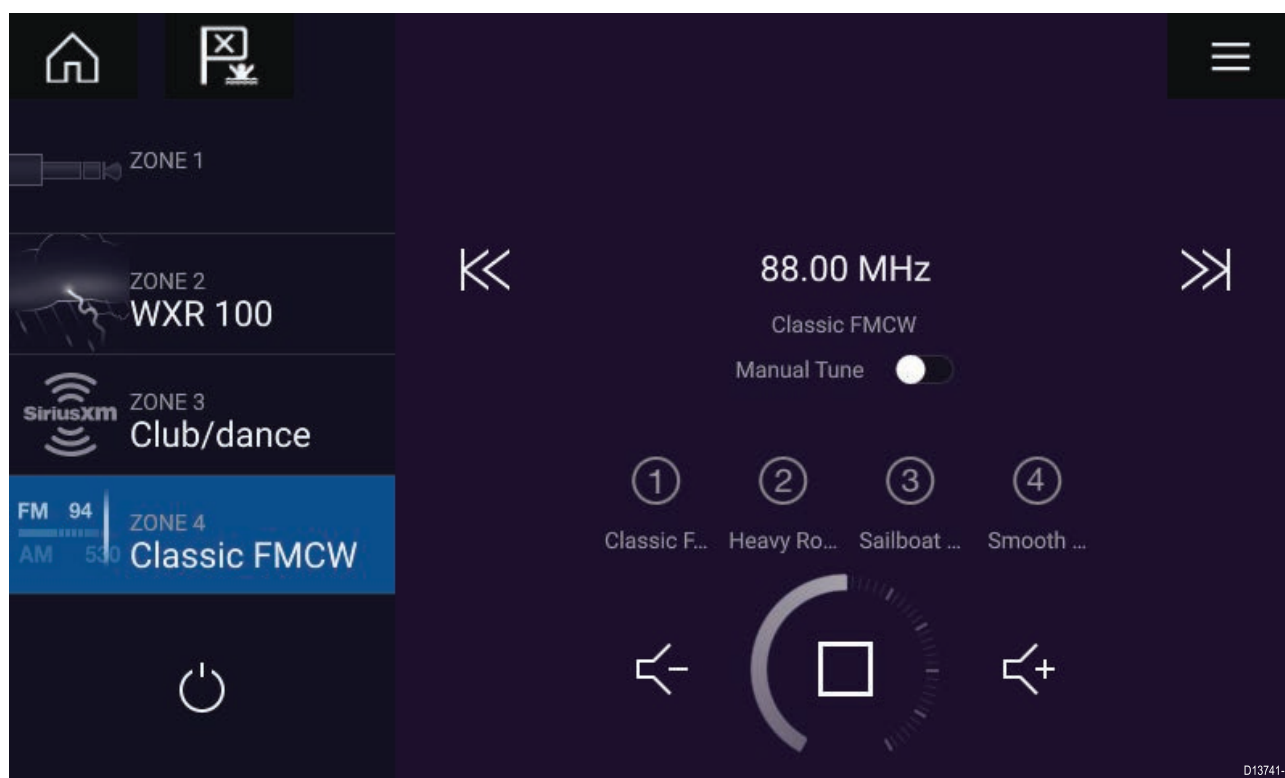
### Pre-requisites:

1. Ensure your Entertainment system(s) are compatible by checking the latest details available on the Raymarine website. If in doubt please contact an authorized Raymarine dealer for advice.
2. Ensure you have installed your Entertainment system(s) in accordance with the documentation that was supplied with the system.

The Audio app will open in 1 of 3 states:

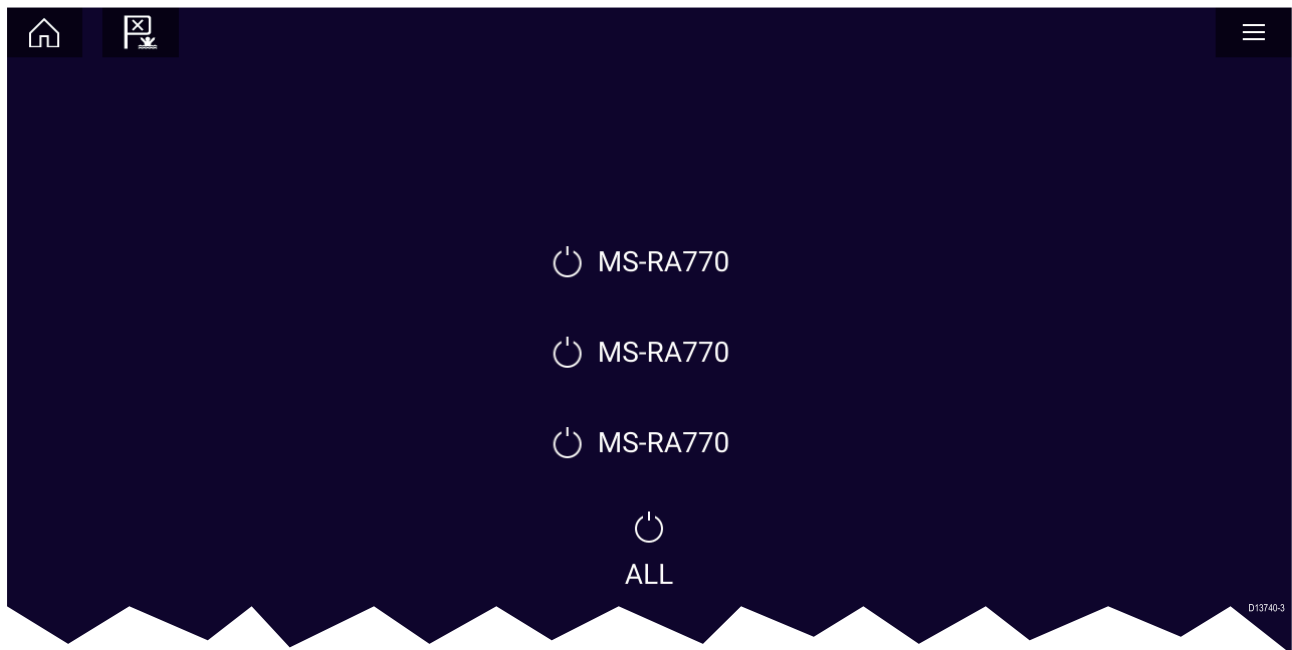
### Audio app displayed

If your Entertainment system is powered up and operational then the player controls are displayed and can be used to control your system.



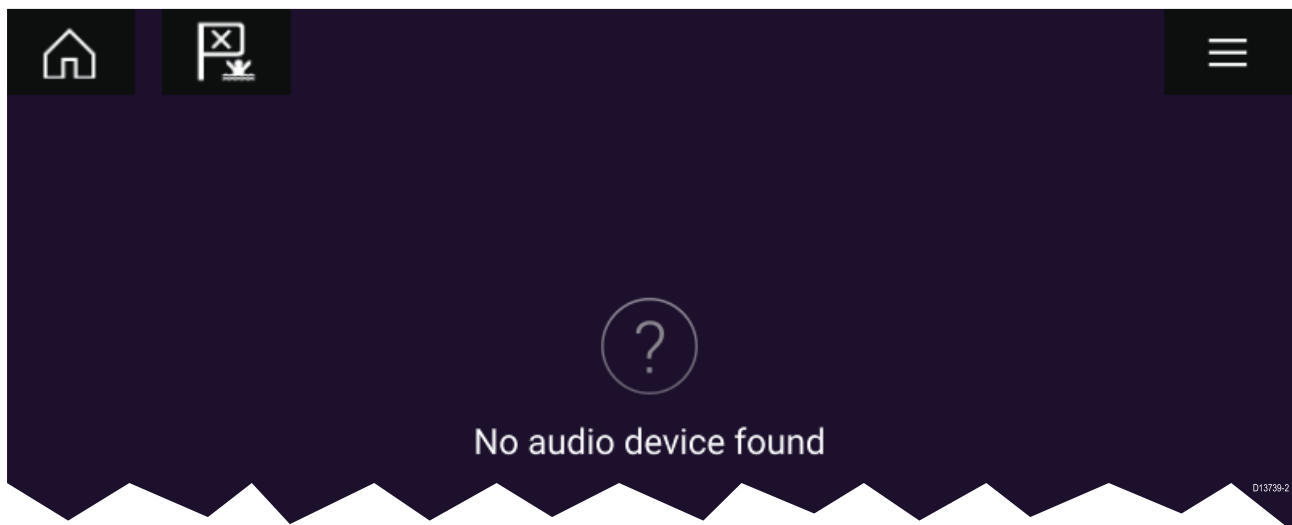
### Entertainment system powered off

If all Entertainment systems are powered off then a Power icon is displayed for each connected system. An icon is also displayed to power on All systems. Selecting the **Power icon** will switch your Entertainment system on. Selecting the All icon will power on all connected systems.



### No audio devices found

If the Audio app is opened soon after powering on your MFD, the '**No audio device found**' message may be displayed whilst the network is being established. If the message is displayed for more than 10 seconds, your MFD cannot connect to your Entertainment system(s). Ensure network and power connections to your Entertainment system(s) and MFD are correct and free from damage and then power cycle your system. If the Entertainment system(s) are still not displayed then refer to your equipment's installation documentation for further troubleshooting information.



## 15.3 Getting started

### Selecting an audio zone

If you have more than 1 zone configured, audio zones will be displayed on the left side of the screen. All zones for all connected systems will be displayed, grouped by entertainment system.

1. Select the required zone.

Details of the audio source playing in that zone are displayed along with audio controls.

#### Tip

Refer to the instructions provided with your entertainment system for details on naming your zones. This aids device and zone identification when multiple systems each with multiple zones are connected.

### Selecting an audio source

Before you can select an audio source from your MFD, the source must already be available to your Entertainment system's main control unit ("head unit").

1. Select an audio source (mode) icon from the app **Menu**.

The currently selected zone will switch to the selected audio source. Depending on your entertainment system all zones will change and play the same audio source, or you may be able to play a different source on each zone. Check the instructions provided with your system for details.

### Muting and unmuting

1. To mute the audio for all zones on all connected systems, select **Mute All**, located above the zones on the top left of the screen.

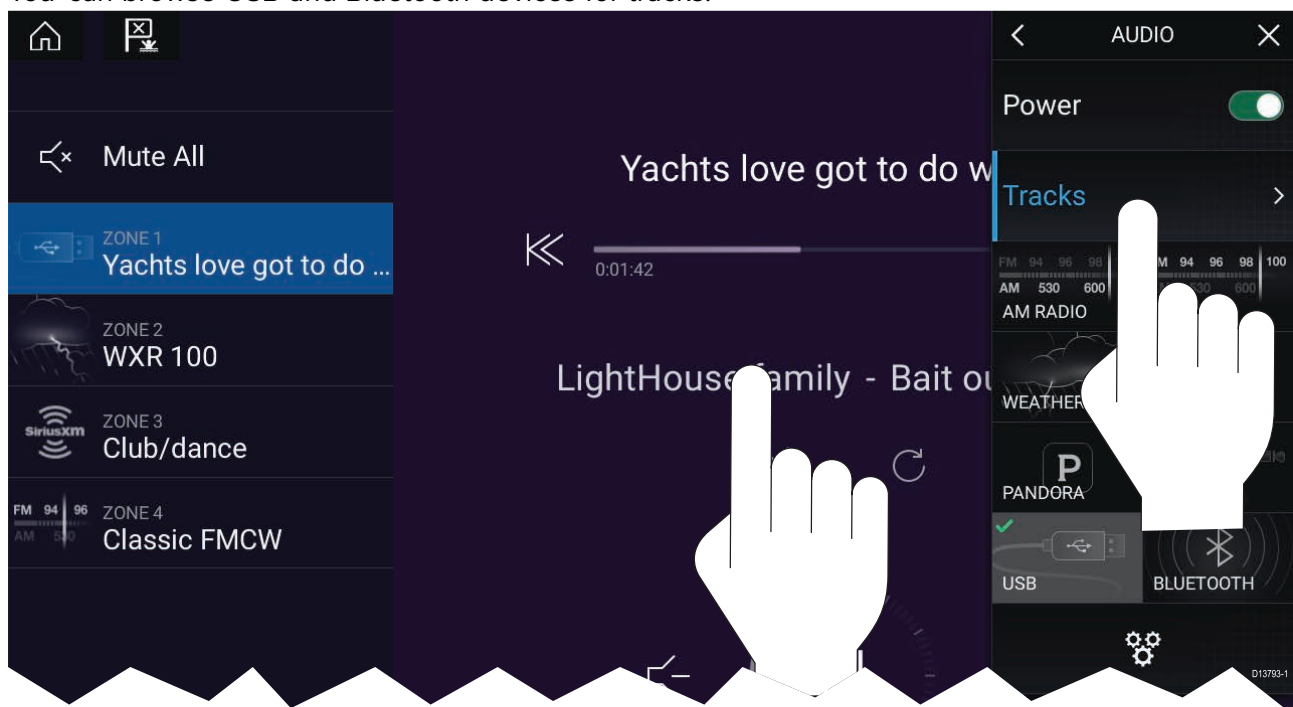
*When multiple systems are connected selecting **Mute all** will mute all zones on all connected entertainment systems.*

2. To Unmute a device select a zone for that device and then select **Unmute**.

*Selecting **Unmute** will unmute all the zones for the selected entertainment system.*

### Browsing for tracks

You can browse USB and Bluetooth devices for tracks.



With the relevant USB or Bluetooth device selected as the audio source:

1. Select **Tracks** from the Menu.  
The file browser is displayed.



2. Alternatively, you can select the current track's details to open the file browser.
3. Browse to the file you want to play.

*Wait for the file list to finish loading before selecting a track.*

4. Select the track you want to play.

## Browsing for stations/channels

You can browse available Radio stations/channels.

With the relevant Radio device selected as the audio source:

1. Select **Stations** or **Channels** from the Menu.  
The station or channel browser is displayed.
2. Browse to and select the station or channel you want to listen to.

## Saving presets

Up to 4 presets can be saved for each Radio audio source (i.e.: AM Radio, FM Radio, Weather, SiriusXM and Pandora).

1. Whilst listening to the station you want to save, press and hold the relevant Preset button for approximately 3 seconds.

## Powering off entertainment systems

Connected entertainment systems can be powered off using the Audio app.


With the Audio app displayed and the entertainment system powered on:

1. Select the **Power** icon located on the bottom left of the screen.  
If only 1 entertainment system is connected then the entertainment system will power off. If more than 1 entertainment system is connected then pop-over options are displayed allowing you to choose the entertainment system to turn off, or you can select **Power down all** to power off all connected systems.

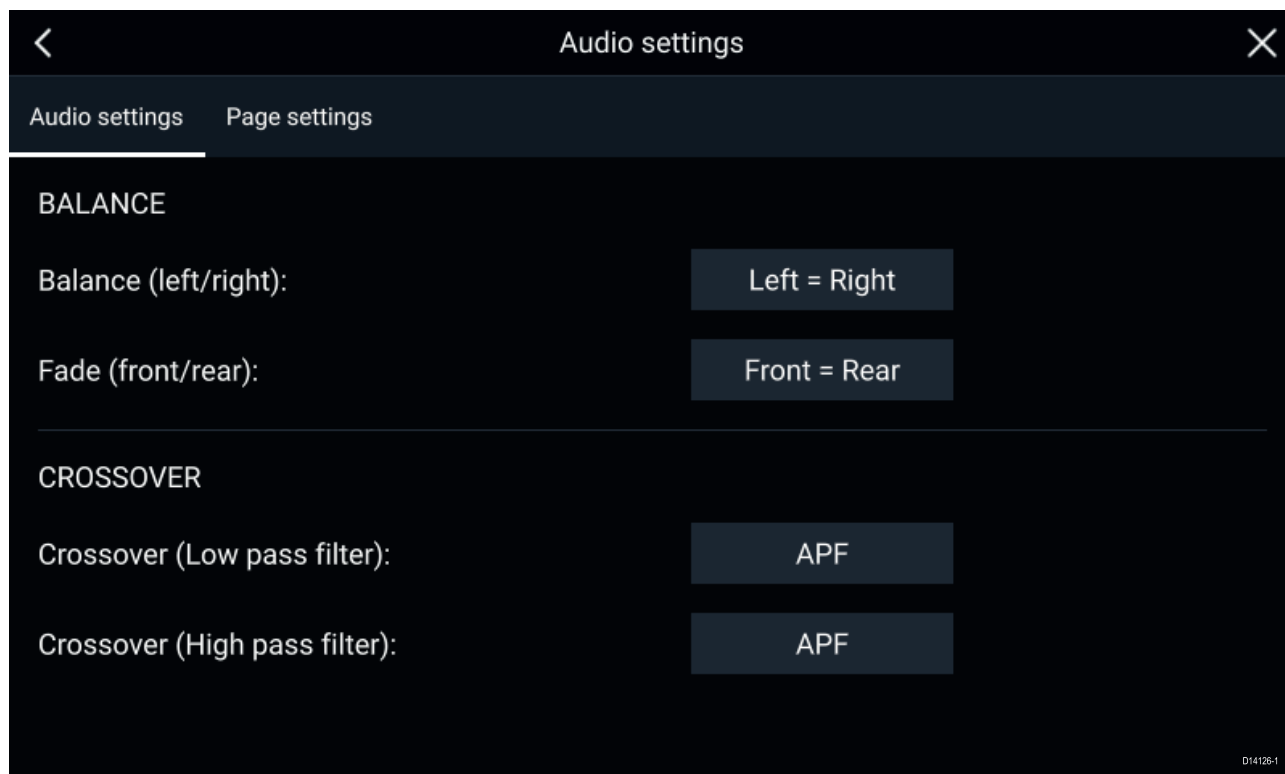
### Tip

Refer to the instructions provided with your entertainment system for details on naming your device. This aids device identification when multiple systems are connected.

## 15.4 Audio app menu options

Menu item	Description	Options
<b>Tracks</b>	Enables you to browse for tracks on USB/Bluetooth devices connected to your Entertainment system	<ul style="list-style-type: none"> <li>• Folder</li> <li>• Play Queue</li> </ul>
<b>Channels</b>	Provides a list of available SiriusXM channels	Channel list
<b>Stations</b>	Provides a list of available Pandora stations	Station list
<b>Audio sources</b>	Enables you to select an audio source connected to your Entertainment system	<ul style="list-style-type: none"> <li>• AM Radio</li> <li>• FM Radio</li> <li>• Weather</li> <li>• Sirius XM</li> <li>• Pandora</li> <li>• Auxiliary</li> <li>• USB</li> <li>• Bluetooth</li> <li>• Airplay</li> <li>• S/PDIF</li> </ul>
<b>Power</b>	Enables you to Power your Entertainment system on and off	<ul style="list-style-type: none"> <li>• On</li> <li>• Off</li> </ul>
	Displays the Settings page	<ul style="list-style-type: none"> <li>• Audio setting</li> <li>• Page settings</li> </ul>

### Audio app settings menu



## Audio settings tab

Menu item	Description	Options
<b>Balance</b>	Allows you to control the left / right speaker balance of your entertainment system speakers.	<ul style="list-style-type: none"> <li>• L = Left speakers up to 100%</li> <li>• Left = Right (Balance centered)</li> <li>• R = Right speakers up to 100%</li> </ul>
<b>Fade</b>	Allows you to control the front / back speaker fade of your entertainment system speakers. <div> <b>Note:</b>            Only available on Rockford Fosgate entertainment systems.         </div>	<ul style="list-style-type: none"> <li>• F = Front speakers up to 100%</li> <li>• Front = Back (Fade centered)</li> <li>• R = Rear speakers up to 100%</li> </ul>
<b>Crossover (Low pass filter):</b>	Allows you to select the crossover frequency.	<ul style="list-style-type: none"> <li>• 60 Hz</li> <li>• 80 Hz</li> <li>• 120 Hz</li> <li>• APF</li> </ul>
<b>Crossover (High pass filter):</b>	Allows you to select the crossover frequency.	<ul style="list-style-type: none"> <li>• 60 Hz</li> <li>• 80 Hz</li> <li>• 120 Hz</li> <li>• APF</li> </ul>

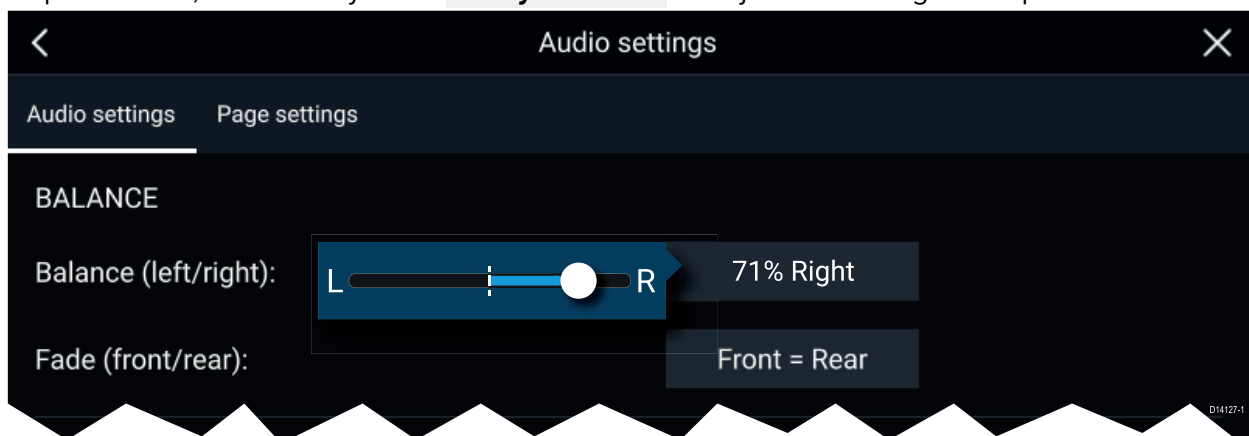
## Page settings tab

Settings	Description
<b>Data Overlays</b>	Enables configuration of Data overlays
<b>Edit split ratio</b>	Enables you to customize the position of the partitions in splitscreen app pages.

## Adjusting balance and fade controls

From the **Audio settings** menu: **Menu > Audio settings**

1. Select the **Balance** setting field or the **Fade** setting field.  
The Adjustment slider control is displayed.
2. Place your finger on the White marker and then slide it left or right to adjust the setting the required value, alternatively use a **Rotary controller** to adjust the setting the required value.



### Note:

Fade controls are only available on Rockford Fosgate entertainment systems.



## Chapter 16: UAV (Unmanned Aerial Vehicle) app

### Chapter contents

- 16.1 UAV disclaimer on page 250
- 16.2 UAV app overview on page 251
- 16.3 UAV pre-requisites on page 254
- 16.4 UAV precautions on page 256
- 16.5 Getting started on page 257
- 16.6 UAV app page on page 258
- 16.7 Opening the UAV app on page 259
- 16.8 Launching the UAV on page 261
- 16.9 Controlling the UAV in flight on page 262
- 16.10 Retrieving your UAV on page 263
- 16.11 Disconnect UAV remote controller from MFD on page 264
- 16.12 Fish on / Circle me mode on page 265
- 16.13 UAV Chart integration on page 266
- 16.14 UAV Emergency procedures on page 268

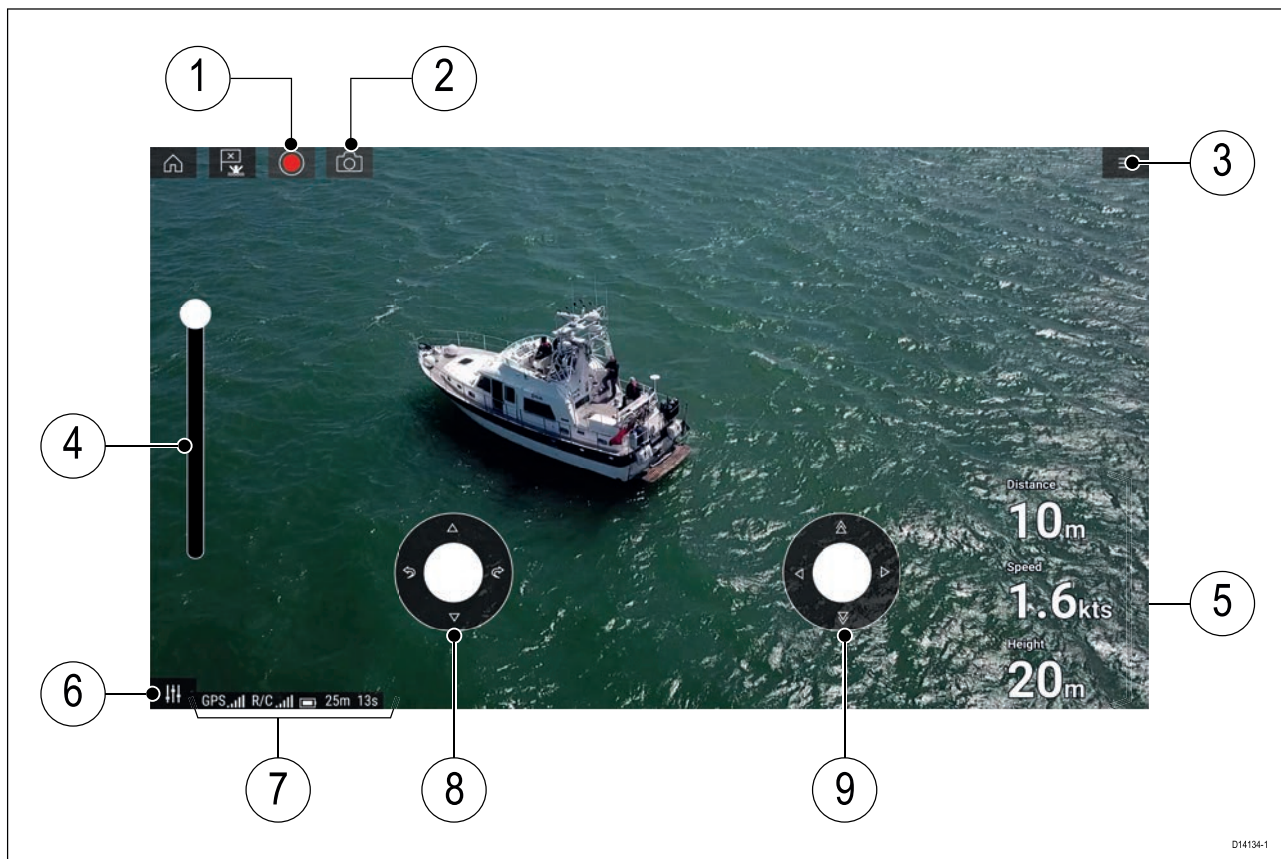
## 16.1 UAV disclaimer

The UAV app allows the FLIR multifunction display (“MFD”) to serve as an auxiliary controller for approved unmanned aerial vehicle (UAV) models. You are responsible for your own conduct while using the UAV and for any consequences thereof. You must use the UAV in accordance with all applicable legal regulations and safety recommendations of the UAV manufacturer. The primary controller should be readily accessible at all times while using the MFD as an auxiliary controller. FLIR accepts no liability for any damage, loss or injury caused by the UAV, whether caused by the use of the MFD or any other FLIR product. Particular attention must be paid to landing the UAV which must be done by the primary controller and not the MFD. By selecting continue, you confirm that you understand and accept these conditions.

## 16.2 UAV app overview

Axiom (Axiom™, Axiom™ Pro and Axiom™ XL) MFDs include the UAV (Unmanned Aerial Vehicle) app, which enables you to control a DJI Mavic Pro or Mavic Pro Platinum UAV using your MFD. The UAV app provides auxiliary remote controls, settings, video display and flight data for your connected UAV.

UAVs and MFDs have a one-to-one relationship, meaning that you can only control a UAV from the MFD that it is physically connected to. On an MFD network, each MFD can be connected to a different UAV, if required.



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1	<b>Record</b> Start recording your UAV's video feed to a memory card inserted into the UAV's memory card slot. While recording, the Record icon is replaced with a Stop icon and a time counter is displayed.
2	<b>Take photo</b> Take a screenshot of what is currently displayed in the UAV's video feed. The image is saved to a memory card inserted into the UAV's memory card slot.
3	<b>Menu</b> Opens the UAV app menu.
4	<b>Gimbal pitch control</b> Adjusts the pitch of the UAV's camera gimbal, from pointing forwards (control at top of slider) to pointing straight down (control at bottom of slider).
5	<b>Flight data</b> Distance, Speed and Height data is displayed onscreen. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <b>Note:</b>  Displayed Flight data is specific to the UAV app and cannot be edited. </div>
6	<b>Controls</b> Provides access to the onscreen virtual joystick controls.

7	<b>Status area</b> The status area provides the: <ul style="list-style-type: none"> <li>• signal strength of the UAV's GNSS (GPS) position fix.</li> <li>• signal strength from remote controller to UAV.</li> <li>• battery charge state.</li> <li>• flight time remaining.</li> <li>• identification of restricted no fly zones.</li> </ul>
8	<b>Virtual joystick</b> Provides <b>Up</b> , <b>Down</b> , <b>Turn left</b> and <b>Turn right</b> controls.
9	<b>Virtual joystick</b> Provides <b>Forward</b> , <b>Backward</b> , <b>Move left</b> and <b>Move right</b> controls.

**Note:**

- The UAV app is not available on eS Series and gS Series MFDs.
- On an Axiom XL MFD the UAV connects to the same connection as a remote card reader. Therefore, on a standalone Axiom XL MFD installation, electronic cartography, via a chart card, will NOT be available at the same time as a connection to your UAV. Only pre-loaded world basemaps will be available in the Chart application.

## Compatible UAVs

Currently the UAVs listed below are supported:

- Mavic Pro by DJI
- Mavic Pro Platinum by DJI

Connection to any other UAV is not approved and is performed at your own risk.

## UAV sport mode

When your UAV is in Sport mode (S-Mode), control via your MFD is limited.

In Sport mode the following MFD controls are disabled **virtual joystick**, **Gimbal pitch control**, **Take off**, **Return to boat** and **Fish on / Circle me**.

## UAV app settings menu

You should check and configure the settings listed in the Advanced settings menu before attempting to operate your UAV.

### Advanced

Settings	Description
<b>Initial height after take-off:</b>	Specifies the height at which the UAV will hover once it has taken off.
<b>Minimum safe height during UAV goto:</b>	Specifies the minimum safe height of the UAV when performing a Goto.
<b>Action if remote control signal is lost:</b>	If your UAV loses connection to the remote controller then you can select whether your UAV <b>Hovers</b> in its current location or performs a <b>Return to boat</b> .
<b>Minimum height:</b>	Specifies the minimum height of the UAV when performing a Return to boat.
<b>Return distance:</b>	Specifies the distance from your vessel the UAV will reach when performing a Return to boat.
<b>Height:</b>	Specifies the initial height of the UAV when performing a Fish on / Circle me.
<b>Distance:</b>	Specifies the initial distance from your vessel when performing a Fish on / Circle me.



## Page settings

Settings	Description
Data Overlays	Enables configuration of Data overlays
Edit split ratio	Enables you to customize the position of the partitions in splitscreen app pages.

Data overlays in the UAV app are separate from the Flight data information.

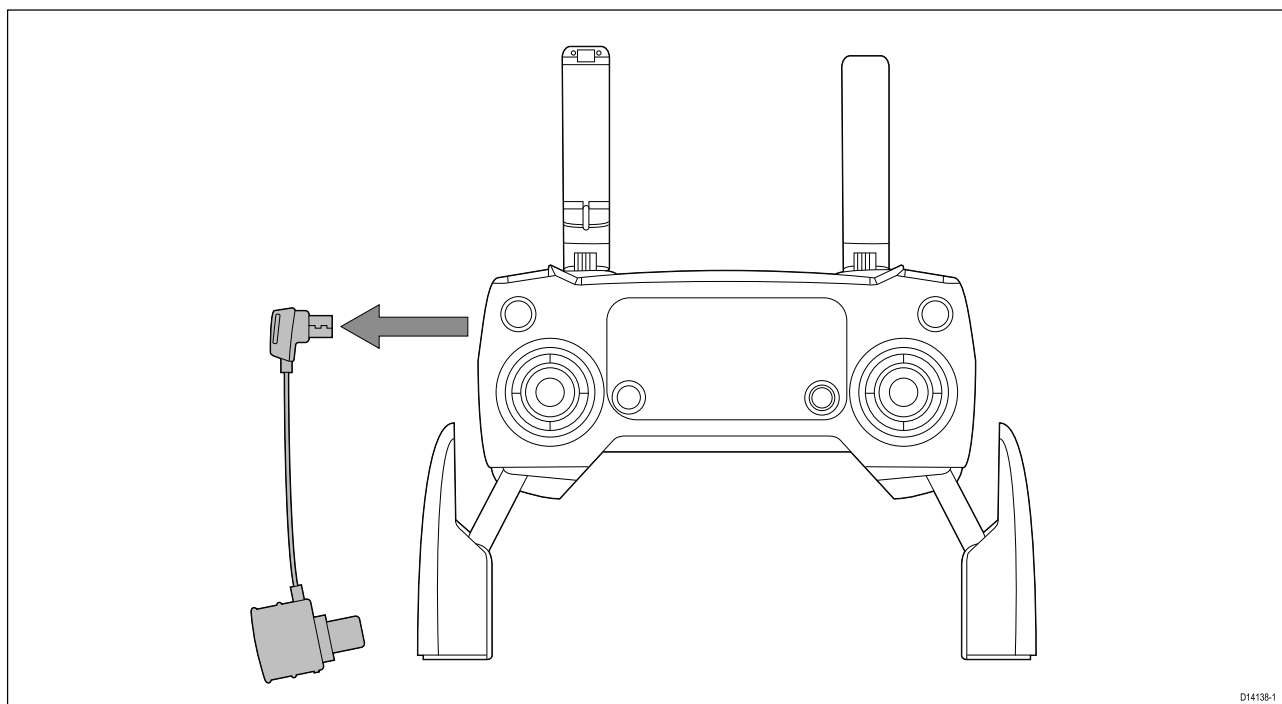
## 16.3 UAV pre-requisites

Before you can use the MFD's UAV app with your UAV you must have:

- set up your UAV in accordance with the instructions provided with the device.
- registered your UAV using the applicable DJI app (e.g.: **DJI GO 4**) on your mobile device.
- gained experience of launching, flying and retrieving your UAV.
- removed the RC cable from the side of your UAV's remote controller.
- ensured the remote controller is not in Sport mode.
- Created a UAV app page icon on the MFD's Homescreen.

### Removing the RC cable

The RC cable used for connecting the UAV's primary controller to a mobile device must be removed, before connecting the controller to your MFD.

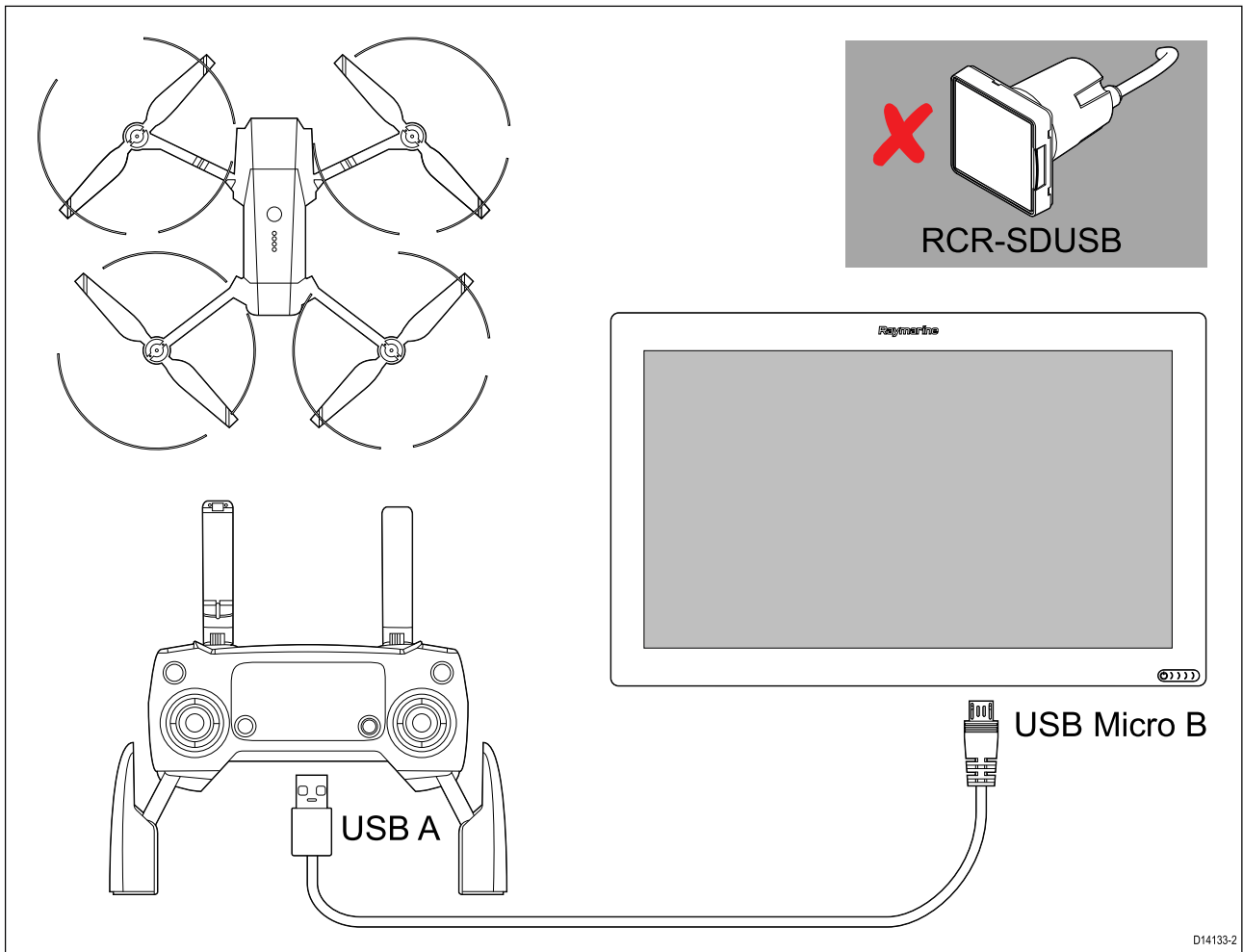


### UAV controller connection

Your MFD's Accessory connection must be connected directly to your UAV's primary remote controller using a USB "Micro B" to USB "A" cable.

**Note:**

The UAV can NOT be connected to your MFD while a card reader (such as the RCR-SDUSB) is connected.



**Important:**

Ensure that the USB connection to your MFD is secure and protected against water ingress.

## 16.4 UAV precautions

Operating your UAV over water and launching and retrieving your UAV on a vessel can be a significantly different experience than when on land.

The following precautions should be followed:

- You will need to be an experienced, competent pilot as launching and retrieving the UAV on a vessel is more difficult due to confined space and vessel movement / drift.
- Only launch your UAV in calm wind and tide conditions. When attempting to launch or retrieve your UAV your vessel should be travelling at less than 1 knot and your captain should be ready at the helm to back down or maneuver the vessel to avoid accidental collisions
- Maintain awareness of your UAV's battery status, remaining flight time, distance from your vessel and Wind and Tide conditions. A UAV flying against the wind will consume battery power more rapidly than when flying downwind or in calm conditions. Always budget sufficient power reserves to ensure the safe return and retrieval of your UAV.
- Maintain a permanent watch of your UAV while in flight. The UAV pilot or competent observer must maintain awareness of surrounding air and marine traffic while the UAV is in flight. The pilot must remain ready to take control of the UAV and manually fly it to avoid interfering with other vessels or aircraft.
- While your UAV's controller is connected to your MFD it should be positioned so that it maintains line of sight with your airborne UAV. If the controller is not hand held then it must be secured to prevent it becoming disconnected from your MFD and to prevent unintentional button presses.

### No-fly zones

It is illegal to fly your UAV in no-fly zones. No fly zones include:

- Airports
- Airfields
- Country borders
- Sensitive institutions

The Remote controller and the MFD will alert you that there is a no-fly zone. Your UAV will not enter the restricted airspace covered by a no-fly zone. You will also be unable to launch your UAV in restricted airspace. Please refer to the DJI app or the DJI website for more information on no-fly zones and their locations.

## 16.5 Getting started

Initial steps to get up and running with your UAV.

1. Using a **USB A to USB Micro B** cable, connect the Micro B end of the cable to the Accessory connection on the rear of your MFD.
2. Power on the MFD.
3. Obtain a GNSS (GPS) position fix on the MFD.
4. Open the UAV app.
5. Connect the MFD to the internet. (An internet connection is only required the first time you open the UAV app, after a Factory reset, or after an MFD software update).

*Ensure that an internet connection is available on your MFD at the point of registration. If your vessel is likely to be out-of-range of cellular or satellite internet service at registration time, you will need to register the UAV before heading out on the water.*

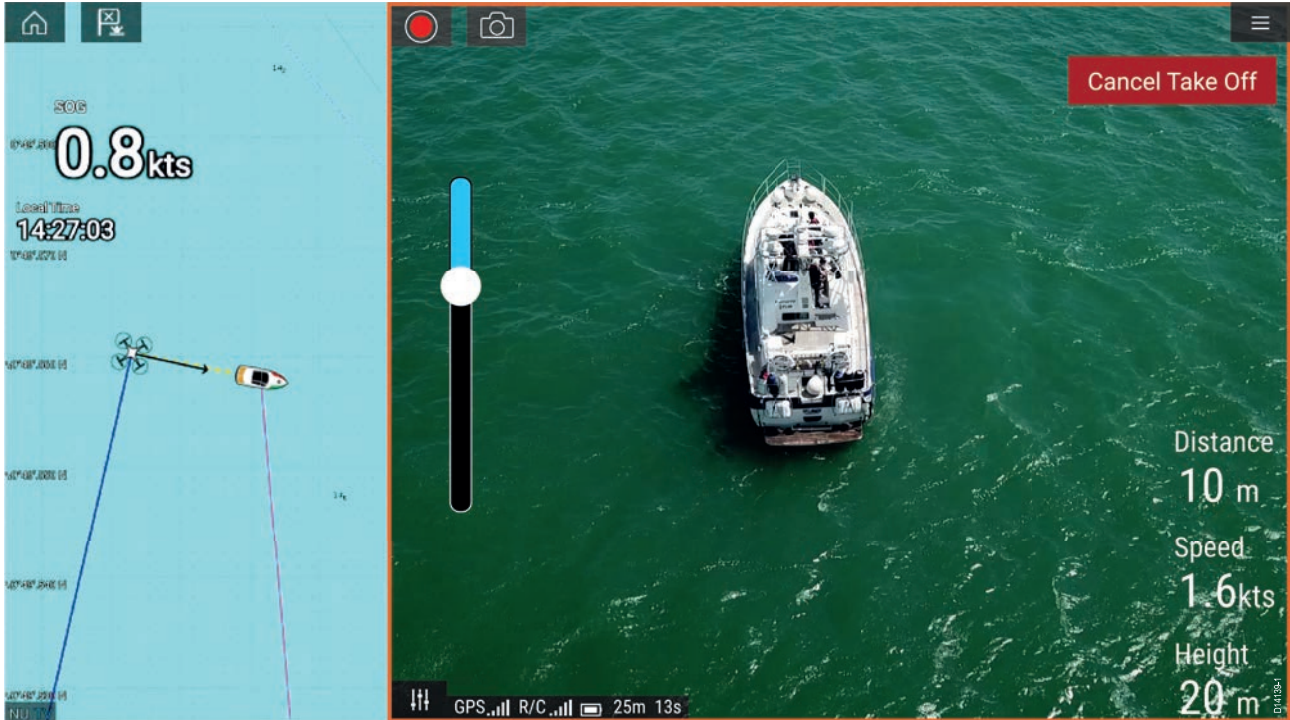
6. Wait for successful registration.
7. Power on the UAV's remote controller.
8. Power on the UAV.
9. Wait for the UAV to obtain a GNSS (GPS) position fix and for the "Ready to go" message to be displayed on the remote controller's screen.
10. Connect the USB A end of the USB cable to the relevant connection on the UAV's remote controller.

## 16.6 UAV app page

The UAV app is not displayed on the Homescreen by default. To open the UAV app you must first create a UAV app page icon on your MFD's Homescreen.

UAV control features are integrated with the Chart app; when creating a UAV app page it is recommended that you create a splitscreen Chart / UAV app page.

Follow the instructions detailed in the [5.4 Creating / Customizing an app page](#) section for information on creating an app page. Chart / UAV splitscreen app pages will be set to a 30/70 page split by default.



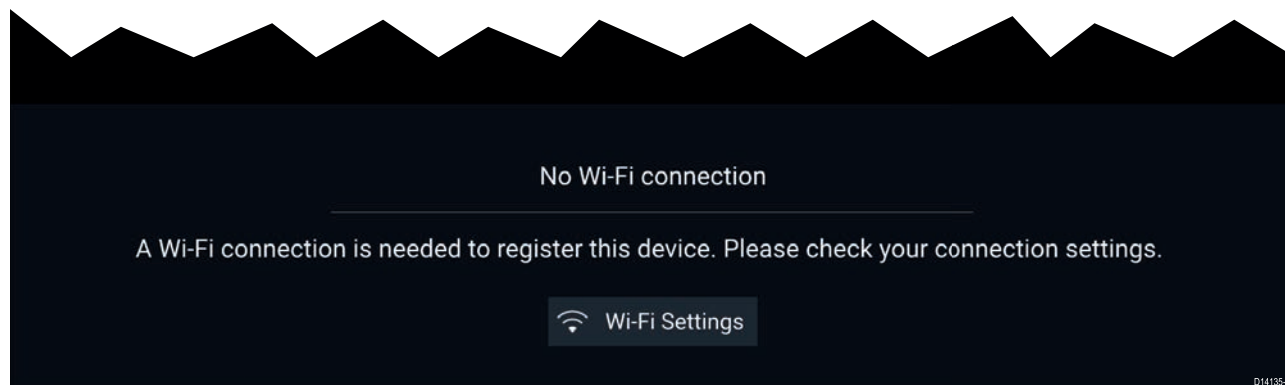
## 16.7 Opening the UAV app

The UAV app is opened from the Homescreen by selecting an app page icon that includes the UAV app.

The first time you open the UAV app and after each power cycle, a disclaimer is displayed. By selecting **Continue** you are agreeing to the terms of this disclaimer.

The UAV app will then open in 1 of 3 states:

### No Wi-Fi connection

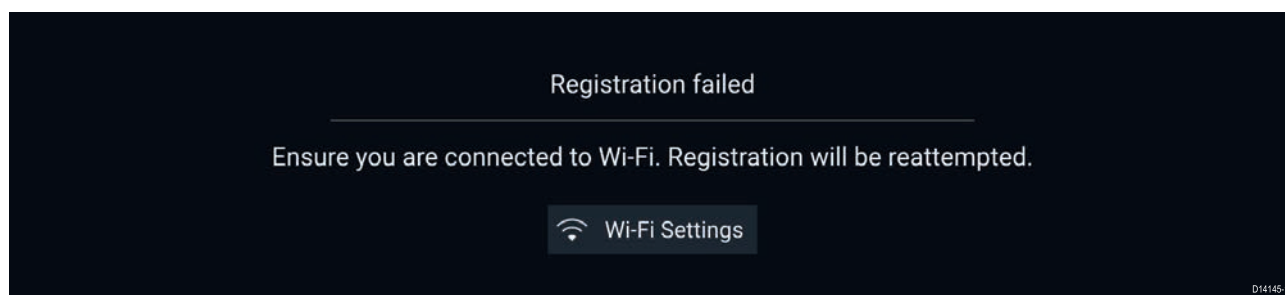


The first time you open the UAV app, after an MFD factory reset, or after you have updated your MFD's software, the UAV app must be registered using an internet connection on your MFD. Select **Wi-Fi Settings** to create an internet connection.



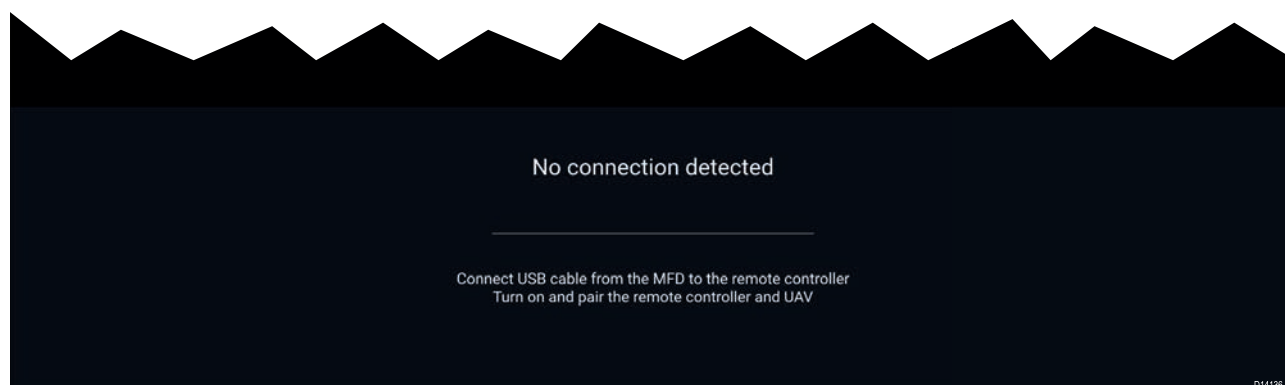
When registration is complete, if desired you can turn off your Wi-Fi connection by selecting **Wi-Fi Settings** and turning off your MFD's Wi-Fi. Selecting **OK** will close the info box keeping your Wi-Fi connection turned on.

### Registration failed



The registration failed notification is displayed if the DJI servers cannot be reached. Registration will be re-attempted automatically. If the failure persists, check your Wi-Fi and internet or try again later.

### No connection detected



After successful registration, the 'No connection detected' notification is displayed. Connect the USB A end of your USB cable to the UAV's primary controller. Once a successful connection is established, the notification will be closed.

### UAV app

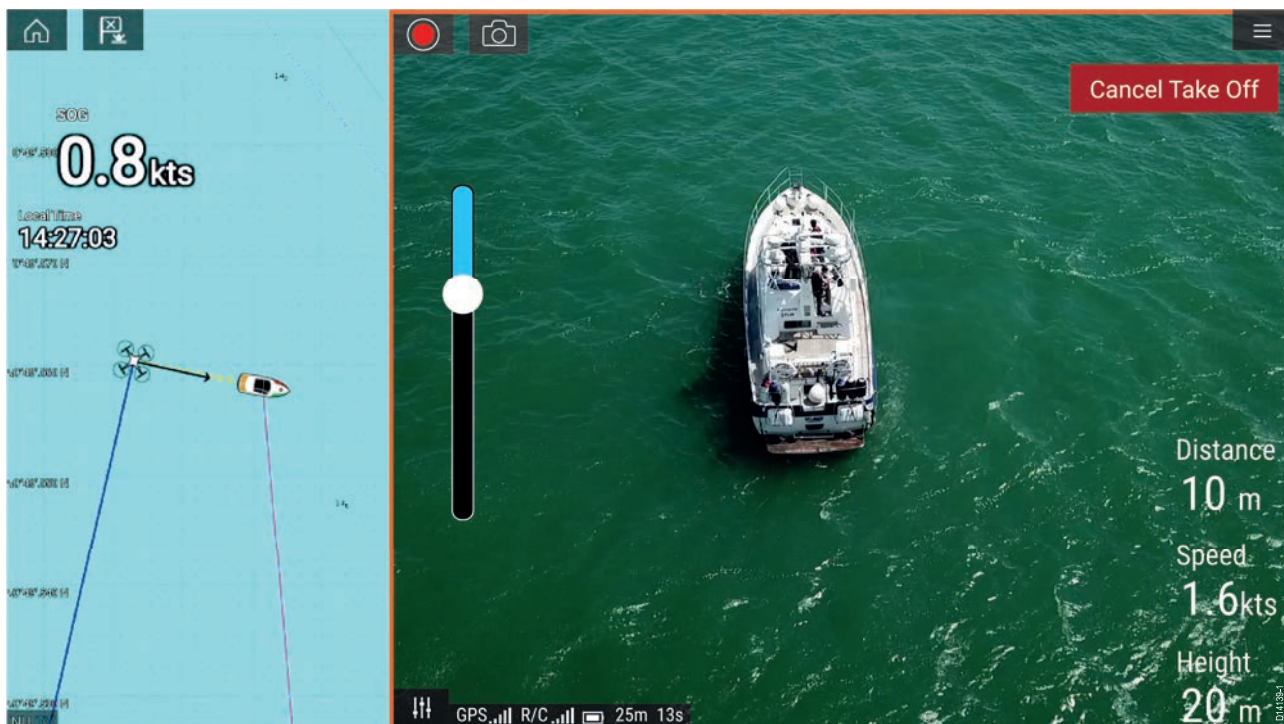


Once your UAV is correctly set up and connected to your MFD and your MFD's UAV app is registered successfully, the UAV's video feed is displayed and the app is ready to be used as an auxiliary controller for your UAV.



## 16.8 Launching the UAV

When it is safe to do so you can use the UAV app to launch your UAV.



Prior to launch ensure that all necessary precautions have been taken to ensure no loss, damage or injury can occur.

1. Ensure your UAV is correctly connected and configured.
2. Ensure you have set an **Initial height after take-off:** in the appropriate Advanced settings menu:  
**Menu > Settings > Advanced > Initial height after take-off:**

*Height needs to be sufficient so that your UAV will not collide with your vessel's sails, masts, rigging etc. or any other structure.*

3. Place your UAV in an open space with sufficient room to launch unobstructed, taking into consideration the effects of wind direction and speed, tide direction and speed and the drift of your own vessel.
4. Select **Take off** from the UAV menu.
5. Select **Yes** to confirm take off.

*The UAV will take off and lift to the height specified in step 2 above and hover.*

The Take off can be cancelled at anytime by selecting the Red **Cancel Take Off** button. When **Cancel Take Off** is selected the UAV will stop and hover in its current position. If required, you can then use manual control to retrieve your UAV.

## 16.9 Controlling the UAV in flight

When in flight you can control the UAV using the onscreen virtual joysticks.

1. Select the **Controls** icon to display the **Virtual joysticks**.
2. The Virtual joysticks include controls for: **Up**, **Down**, **Turn left**, **Turn right**, **Forwards**, **Backwards**, **Move left** and **Move right**.
3. Use the **Gimbal pitch control** to move the UAV's camera to the required position.
4. If desired, use the **Record** and **Take photo** icons to record footage of your flight.

**Note:**

The Virtual joysticks take priority over your UAV's remote controller's joysticks, To use the remote controller's joysticks hide the Virtual joysticks by selecting the **Controls** icon.

## 16.10 Retrieving your UAV

To retrieve your UAV follow the instructions below:

1. Ensure that the **Minimum height** and **Return distance** settings are adequate for current conditions (Minimum height and Return distance can be adjusted from the Advanced settings menu: **Menu > Settings > Advanced**).
2. When you are ready to retrieve your UAV select the **Return to boat** option from the UAV app menu: **Menu > Return to boat**.

*The UAV will return to your vessel's location within the specified Return distance and Minimum height, based on your MFD's current GNSS (GPS) position.*

3. Once your UAV has reached the Return to boat position use the UAV's remote controller to manually retrieve your UAV safely.

**Note:**

The Return home manoeuvre can be cancelled at any time by selecting the Red, onscreen **Cancel return to boat** option. Once selected the UAV will stop and hover in its current position.

## **16.11 Disconnect UAV remote controller from MFD**

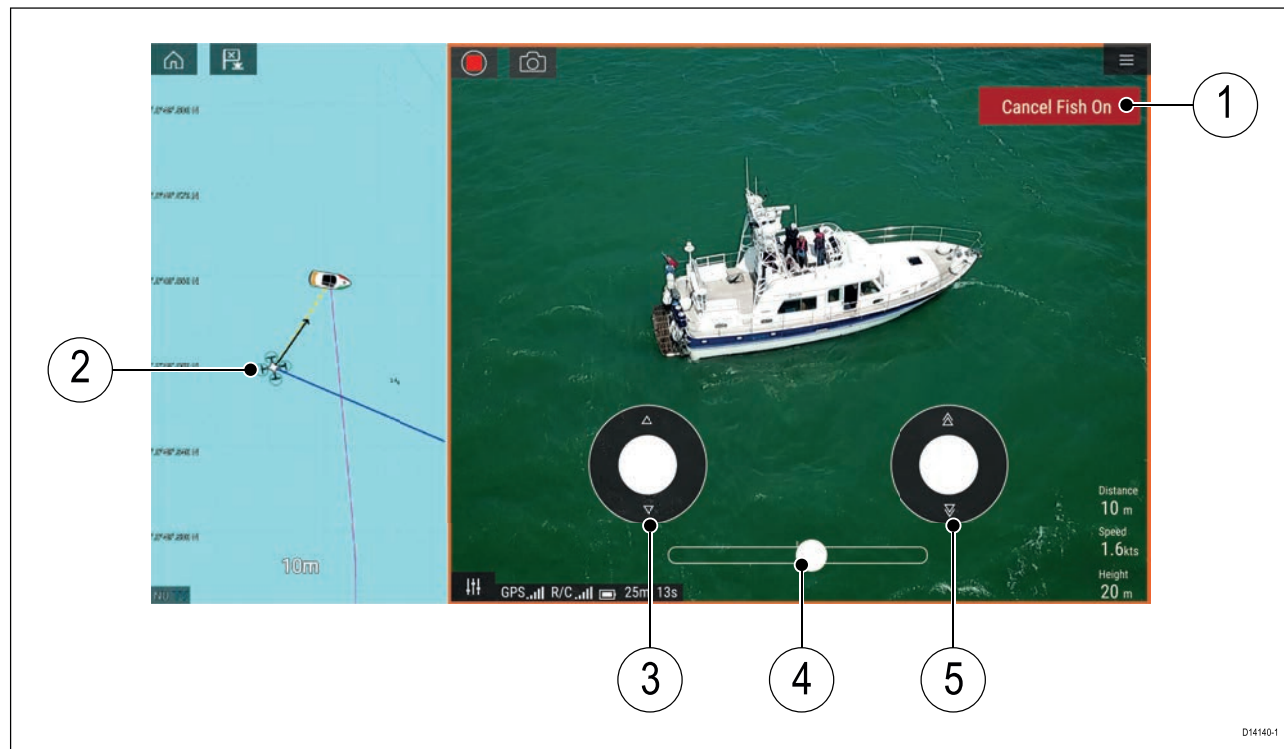
When you have finished using the UAV app it is recommended that you disconnect the USB cable from the UAV's remote controller.

Before performing a MFD Factory reset, or software update, ensure that your UAV's remote controller is either powered off or disconnected from your MFD.

## 16.12 Fish on / Circle me mode

When Fish on / Circle me mode is activated your UAV will launch and circle your vessel, maintaining its camera's view on your vessel and recording the camera's video feed. Fish on / Circle me mode can also be initiated when your UAV is already in flight.

When your UAV is in Fish on / Circle me mode you should ensure your vessel speed does not exceed 10 knots or the UAV may not be able to keep up with your vessel. If your UAV cannot keep up slow your vessel speed.



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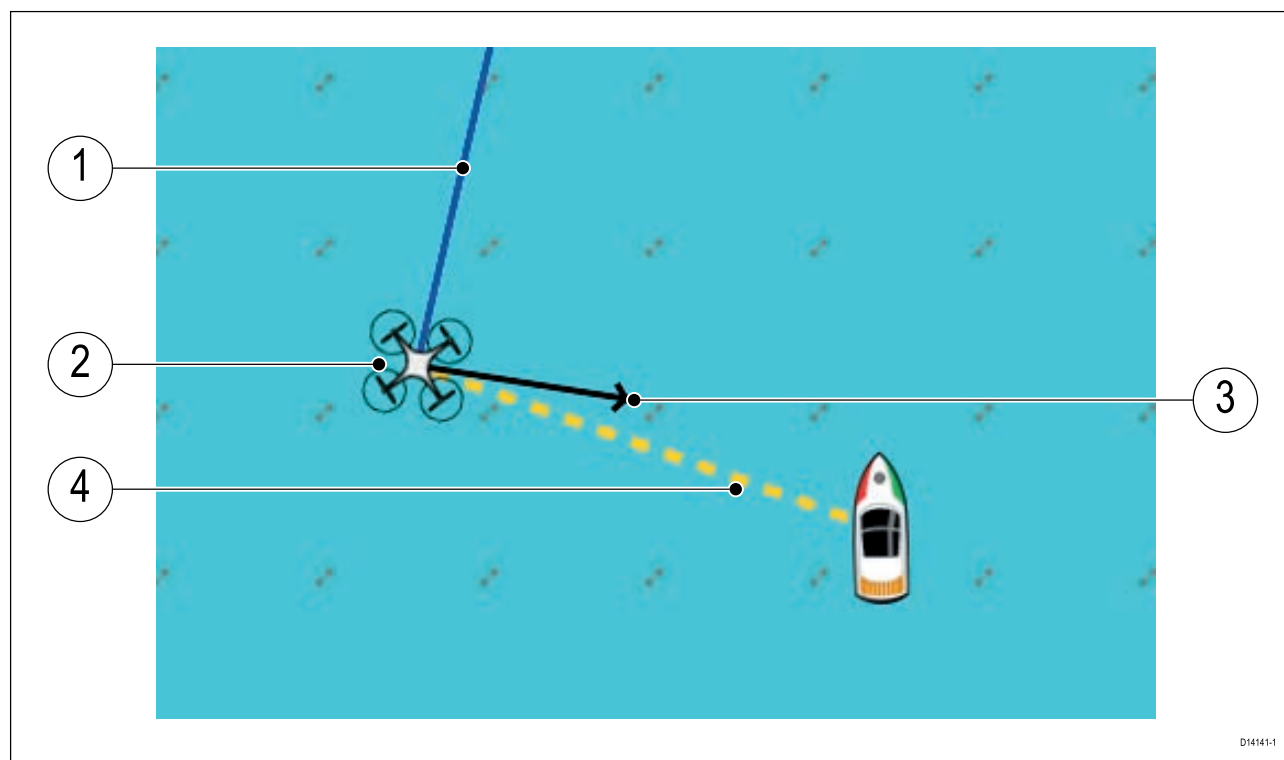
1	<b>Cancel Fish On / Cancel Circle me</b> Selecting <b>Cancel Fish On / Cancel Circle me</b> will stop Fish On / Circle me mode and the UAV will hover in its current location. If required you can manually stop recording by selecting the <b>Stop</b> icon.
2	<b>UAV icon</b> The UAV icon can be displayed in the Chart app. The icon includes a camera heading graphic, a Course Over Ground (COG) vector and a line linking your vessel icon to your UAV icon.
3	<b>Virtual joystick</b> In Fish On / Circle me mode the left virtual joystick provides <b>Up</b> and <b>Down</b> controls to adjust the UAV's distance from your vessel.
4	<b>Rotation</b> The Rotation slider control is used to adjust the UAV's direction of rotation and rotation speed. With the control on the slider center line the UAV will maintain position in relation to your vessel. Moving the slider right of the slider center line rotates the UAV counter-clockwise and moving the slider control to the left of the center line rotates the UAV clockwise. The farther left or right the slider control is set the faster the rotation speed will be.
5	<b>Virtual joystick</b> In Fish On / Circle me mode the right virtual joystick provides <b>Forward</b> and <b>Backwards</b> controls to adjust the UAV's height from your vessel.

### Note:

During your initial MFD configuration the boating **Activity** you selected will determine whether the function is labelled **Fish on** or **Circle me**. If Fishing (freshwater), Fishing (saltwater) or Retail/demonstration is selected then the function is labelled **Fish on**, otherwise the function is labelled **Circle me**.

## 16.13 UAV Chart integration

When a compatible UAV with a GNSS (GPS) position fix is connected to your MFD, a UAV icon representing the position of the UAV is displayed in the Chart app.



1	<b>UAV COG</b> The direction of the Blue line indicates the UAV's current Course Over Ground (COG). The length of the line indicates the UAV's predicted position when the specified vector Reference period has passed. The Vector Reference period can be adjusted from the vessel icon's context menu.
2	<b>UAV Icon</b> Displayed when the <b>UAV</b> option is enabled in the Chart app settings, and your UAV has a GNSS (GPS) position fix.
3	<b>Camera heading</b> The Black Camera heading arrow is fixed to provide an indication of the direction the UAV's camera is pointing towards.
4	<b>Line to vessel</b> The Yellow dotted line represents the angle of the UAV's position relative to your vessel.

### Showing or hiding the UAV icon

The UAV icon is displayed by default in the Chart app. The icon can be hidden if required.

From the Chart app menu:

1. Select **Settings**.
2. Select the **Layers** tab.
3. Select the **UAV** toggle switch.

Selecting the UAV toggle switch will make the UAV icon visible (on) or invisible (off).

### Performing a UAV Goto

When your UAV is in flight you can select a location or object in the Chart app and perform a **UAV Goto** (your UAV will fly to the selected location or object and hover).

1. Select a location or object in the Chart app.  
The Chart context menu is displayed.
2. Select **More**.

3. Select **UAV Goto**.

A UAV waypoint marker is placed to signify the UAV's destination and the UAV will fly to that location.

You can stop a UAV Goto at anytime by selecting the Red **Cancel UAV Goto** that is displayed onscreen in the UAV app, when a UAV Goto is active. Cancelling a UAV Goto will stop the Goto action and the UAV will hover in its current location.

A UAV Goto can be cancelled at any time by selecting **Stop UAV Goto** from the Chart context menu.

## 16.14 UAV Emergency procedures

The guidance below is intended to provide details of steps taken automatically by your UAV, and any manual intervention that may be required in certain situations.

### Controller signal to UAV lost

In the event that your UAV loses its connection to the primary controller, the UAV will perform 1 of 2 actions, depending on your selection in the **Advanced** setting menu: **Menu > Settings > Advanced > Action if remote control signal lost:**

- **Hover** — The UAV will stop and hover in its current location. You should maneuver your vessel towards your UAV's position and attempt to re-establish control. When control is re-established it is recommended that you retrieve the UAV and inspect it immediately.
- **Return to boat** — The UAV will perform a Return to boat maneuver and hover at the **Return distance** and **Minimum height** specified in the Return to boat settings:
  - **Menu > Settings > Advanced > Minimum height**
  - **Menu > Settings > Advanced > Return distance**

If connection between the Remote controller and UAV is not re-established, your UAV will attempt to land.

### Low battery warnings

Ensure while flying your UAV that you remain aware of the remaining flight time and distance from your vessel at all times. You must return your UAV to your vessel and safely retrieve it before a low battery warning occurs. The UAV app will mirror the UAV's primary controller battery state warnings.

- **Normal low battery level warning** — when the UAV reaches normal low battery level, in addition to the remote controller's audible and visual warnings a warning is also displayed on your MFD. You should immediately return the UAV to your vessel and retrieve.
- **Critical low battery warning** — when the UAV reaches critical low battery level, your UAV will automatically perform a **Return to boat** maneuver and attempt to land. It is not recommended that you allow your UAV to reach critical low battery while in flight, as it could result in damage or loss of your UAV.

### Assuming manual control

The UAV pilot has the ability to take manual control of the UAV at any time. Manual control may be required for normal in-flight maneuvering or positioning, or in emergency situations. The methods of assuming manual control are as follows:

- Virtual joysticks will need to be hidden, using the **Controls** icon before control is returned to the Remote controller.
- Enabling Sport mode on the UAV's Remote controller at any time will override MFD controls. Fly with caution, as flight characteristics change in Sport mode.
- In an emergency, unplugging the USB cable from the Remote controller will override the MFD controls and immediately restore manual control to the Remote controller.



## Chapter 17: LightHouse apps

### Chapter contents

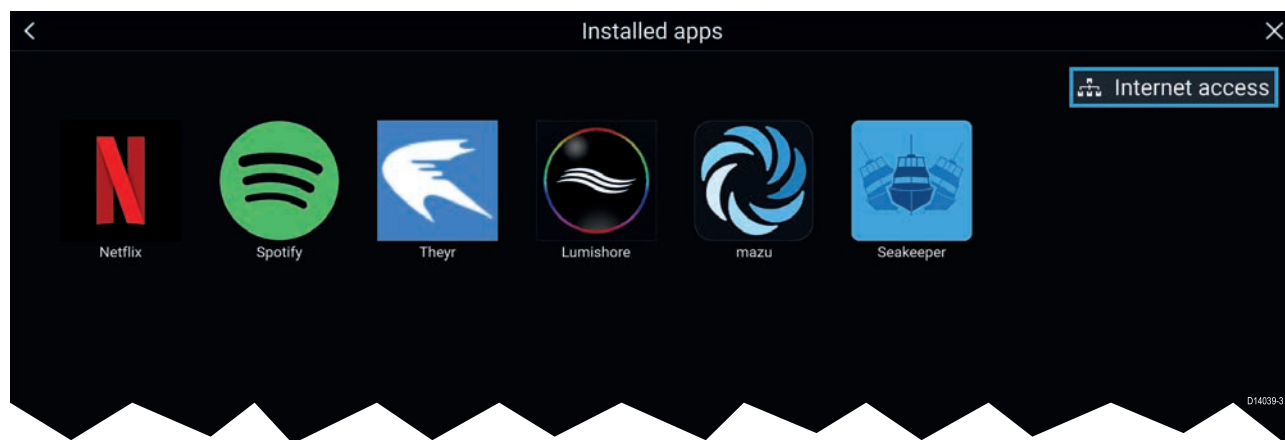
- [17.1 LightHouse app launcher on page 270](#)
- [17.2 LightHouse app requirements on page 271](#)
- [17.3 Internet connection on page 272](#)
- [17.4 Bluetooth speaker set up on page 273](#)

## 17.1 LightHouse app launcher

The app launcher provides a range of approved third-party apps on your MFD.

**Important:** The LightHouse app launcher and its associated third-party apps are not available on eS Series and gS Series MFDs.

Select **Apps** from the Homescreen to open the app launcher page.



Selecting an app icon will launch the app. Selecting the Wi-Fi connection status button, located on the top right of the screen, will open the Wi-Fi connection settings to enable you to connect to the internet over Wi-Fi.

Apps may run in the background, enabling you to use your MFD as usual whilst, for instance, listening to music.

MFD alarms will be displayed and sounded as normal whilst using LightHouse apps. When paired with a Bluetooth speaker, alarms will also be sounded through the speaker.

Bluetooth speaker volume can be controlled from the Shortcuts page or from the Status bar area on the Homescreen.

**Note:**

- Some app features or access to the apps may require your MFD to have an internet connection.
- If you use a wireless connection to a Quantum Radar, the Radar should be put in Standby before connecting your MFD to the internet.
- Some apps may also require an audio output. You can pair a Bluetooth speaker with your MFD to enable audio output.
- Please refer to the app developer for in-app assistance and troubleshooting.

### LightHouse apps

LightHouse™ apps are apps that have been developed by third parties and approved for use on the LightHouse™ 3 operating system.

**Note:**

Raymarine does not warrant that LightHouse™ apps are error-free or offer support for in app problems or troubleshooting,

Raymarine will not be held liable for damages or injuries caused by improper or inappropriate use of these apps.









**Warning: Maintain a permanent watch**

Do NOT navigate whilst distracted by entertainment apps. Failure to maintain a permanent watch puts yourself, your vessel and others at serious risk of harm.

## 17.2 LightHouse app requirements

Below is a list of the available LightHouse apps and details for each.

	<p><b>Netflix</b></p> <ul style="list-style-type: none"> <li>• Requires internet connection.</li> <li>• Log in using your existing subscription or join free for a month directly from the app.</li> <li>• Refer to Netflix (<a href="http://www.netflix.com">www.netflix.com</a>) for details.</li> </ul>
	<p><b>Spotify</b></p> <ul style="list-style-type: none"> <li>• Requires internet connection.</li> <li>• Log in using your existing subscription or join free directly from the app.</li> <li>• Refer to Spotify (<a href="http://www.spotify.com">www.spotify.com</a>) for details.</li> </ul>
	<p><b>Theyr</b></p> <ul style="list-style-type: none"> <li>• Requires internet connection to download weather data directly to your MFD. Weather data can also be downloaded and placed on external storage for viewing at a later time (when your MFD has no internet connection available).</li> <li>• Log in using your existing Theyr subscription or register for free account directly from the app.</li> </ul> <div data-bbox="424 981 1383 1059" style="border: 1px solid black; padding: 5px;"> <p><b>Note:</b> It is not currently possible to log in to the app using an existing Raymarine LightHouse 2 subscription to Theyr weather.</p> </div> <ul style="list-style-type: none"> <li>• Refer to Theyr (<a href="http://www.theyr.com">www.theyr.com</a>) for details.</li> </ul>
	<p><b>Lumishore</b></p> <ul style="list-style-type: none"> <li>• Requires compatible Lumishore hardware to be powered on and connected to the same network as your MFD.</li> <li>• Refer to Lumishore (<a href="http://www.lumishore.com">www.lumishore.com</a>) for details.</li> </ul>
	<p><b>Mazu</b></p> <ul style="list-style-type: none"> <li>• Requires compatible Mazu-marine hardware to be powered on and connected to the same network as your MFD.</li> <li>• Refer to Mazu (<a href="http://www.mazu-marine.com">www.mazu-marine.com</a>) for details.</li> </ul>
	<p><b>Seakeeper</b></p> <ul style="list-style-type: none"> <li>• Requires compatible Seakeeper hardware to be powered on and connected to the same network as your MFD.</li> <li>• Refer to Seakeeper (<a href="http://www.seakeeper.com">www.seakeeper.com</a>) for details.</li> </ul>

## 17.3 Internet connection

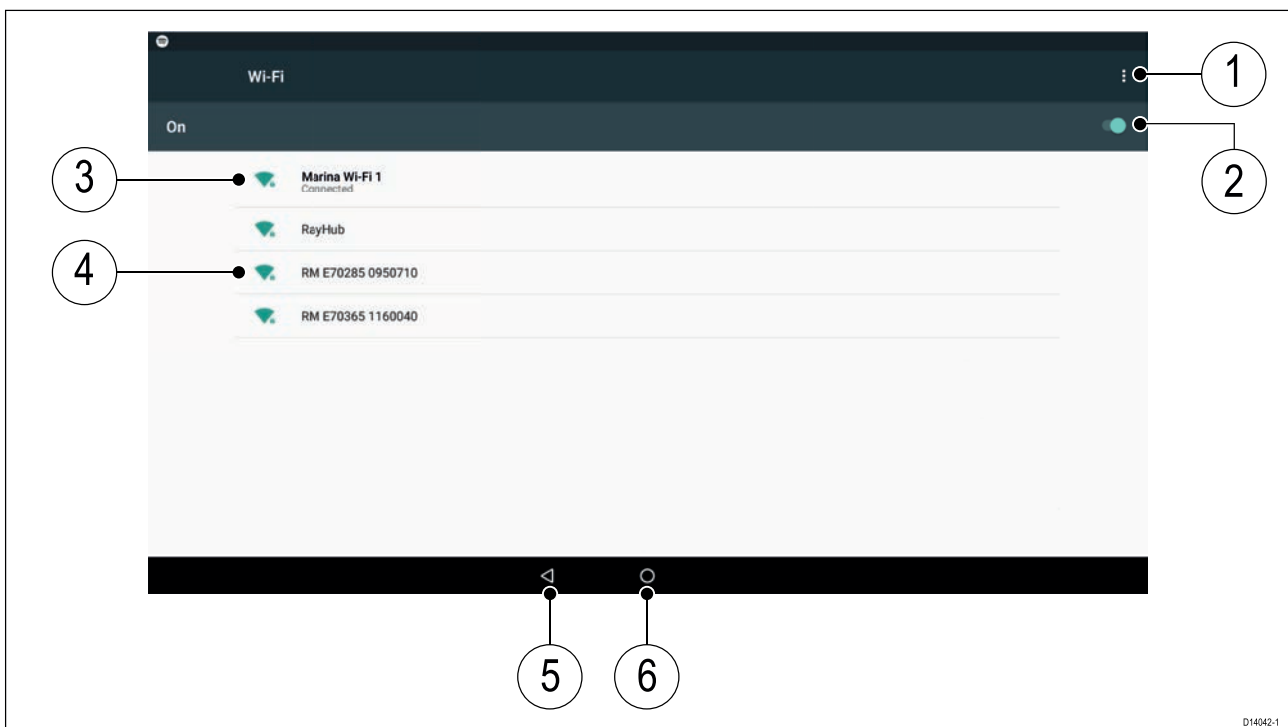
### Connecting to the internet

From the Homescreen:

1. Select **Apps**.  
The app launcher is displayed.
2. Select the Wi-Fi connection status button, located on the top right of the app launcher page.  
The Wi-Fi settings page is displayed and will scan for available networks.
3. Select the relevant connection.
4. Enter the password for the network and select **Connect**.  
Your MFD will now connect to the chosen network.
5. Select the **Back** triangle symbol or the **Home** Circle symbol at the bottom of the screen.

You can now use LightHouse™ apps that require an internet connection.

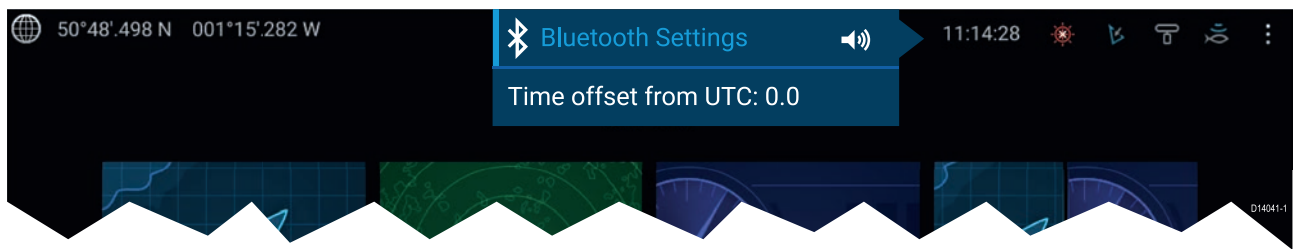
### Wi-Fi settings



1. Wi-Fi options — Provides the following options:
  - Add network — Manually add a network.
  - Saved networks — View a list of all saved networks.
  - Refresh — Rescan available networks.
  - Advanced — View advanced network settings.
2. Enable/Disable Wi-Fi.
3. Connected access point.
4. Available access points.
5. Back button.
6. Home button

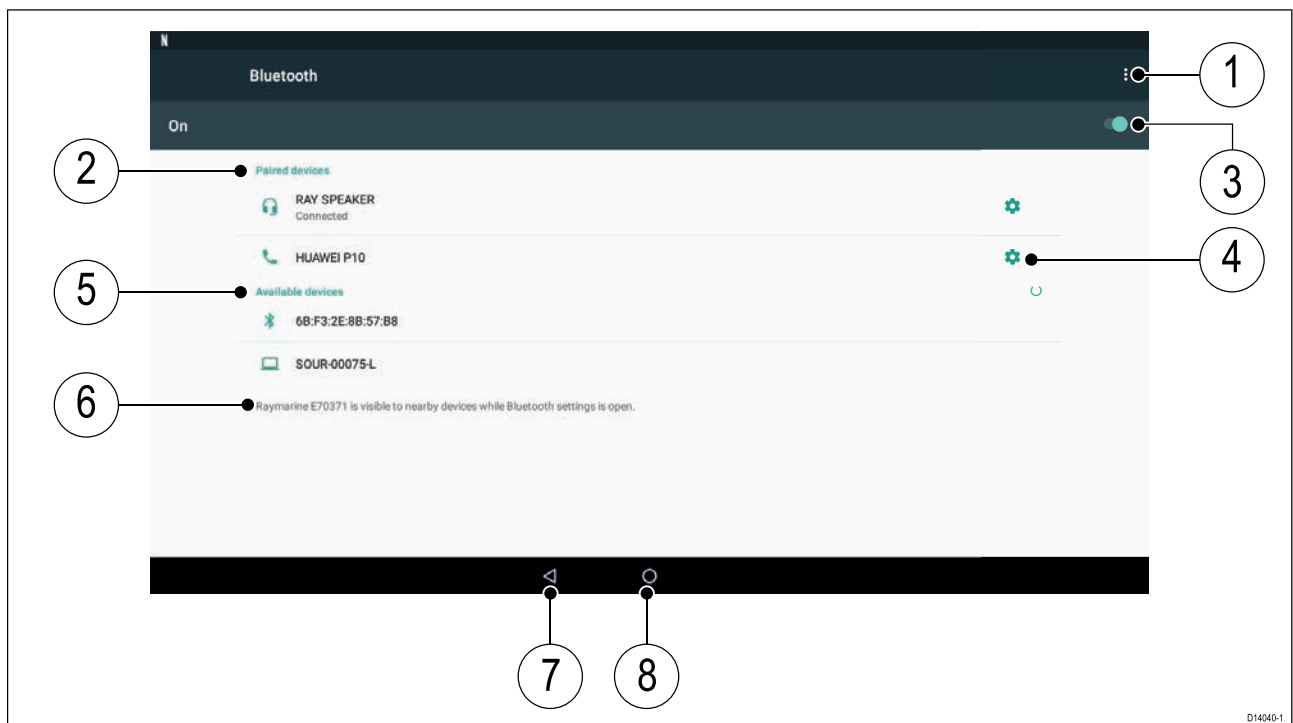
## 17.4 Bluetooth speaker set up

### Enabling and disabling Bluetooth



1. Select the Status bar area located in the top right of the screen.
  2. Select **Bluetooth Settings**.
  3. Select the Toggle switch on the right of the Bluetooth settings page to enable Bluetooth.
- Alternatively the Bluetooth settings page can be accessed from the This display settings tab:  
**Homescreen > Settings > This display > Bluetooth > Bluetooth settings.**

### Bluetooth Settings



1. Bluetooth options — Provides the following options:
  - Refresh — Selecting refreshes the list of available devices.
  - Rename this device — Allows you to rename the Bluetooth name your MFD uses.
  - Show file received — Not used as your MFD cannot receive files over Bluetooth.
2. Paired devices — List of devices paired with your ~MFD.
3. Enable/Disable Bluetooth.
4. Paired device settings — Allows you to rename the paired device or forget the device.
5. Available devices — List of available Bluetooth devices.
6. MFD Bluetooth name.
7. Back button.
8. Home button.

### Pairing a Bluetooth speaker

Before attempting to pair with a Bluetooth speaker, ensure that the speaker is switched on and discoverable.

With your MFD's Bluetooth enabled:

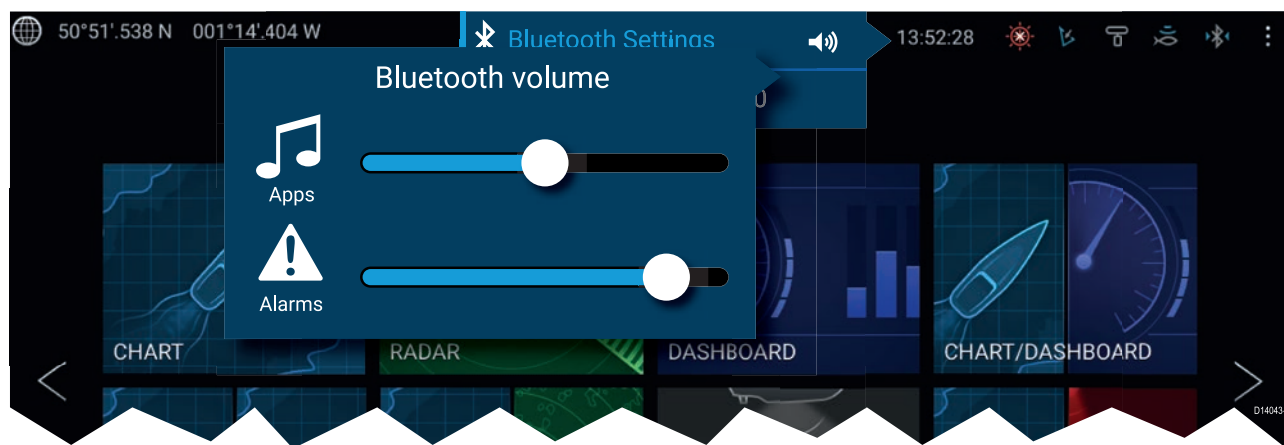
1. From the Bluetooth settings page, select the relevant device from the **Available devices** list.
2. If requested, confirm the bluetooth pairing code.

If pairing is successful the speaker will appear in the **Paired devices** list and display the **Connected** message.

## Bluetooth volume control

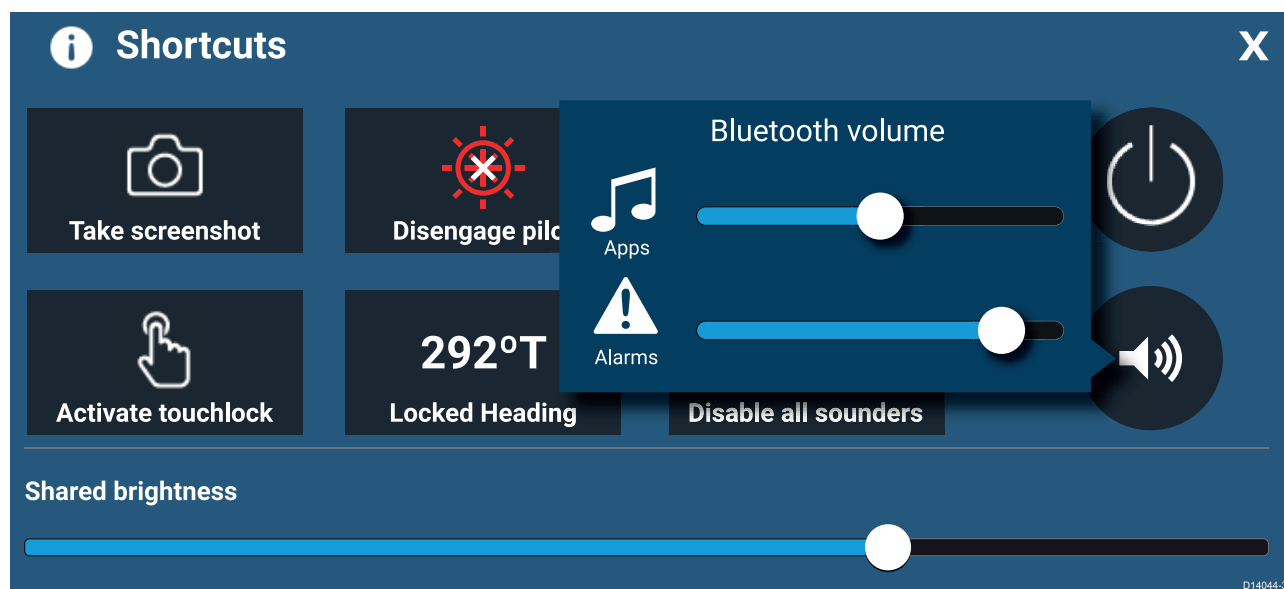
When your MFD is connected to a Bluetooth speaker, controls will be available to adjust speaker volume.

### Homescreen



From the Homescreen select the Status area and then select the Speaker symbol to display the Bluetooth volume control for LightHouse™ app and MFD alarms.

### Shortcuts page



Press or swipe the **Power** button to display the Shortcuts page and then select the speaker symbol to display the Bluetooth volume control for LightHouse™ apps and MFD alarms.

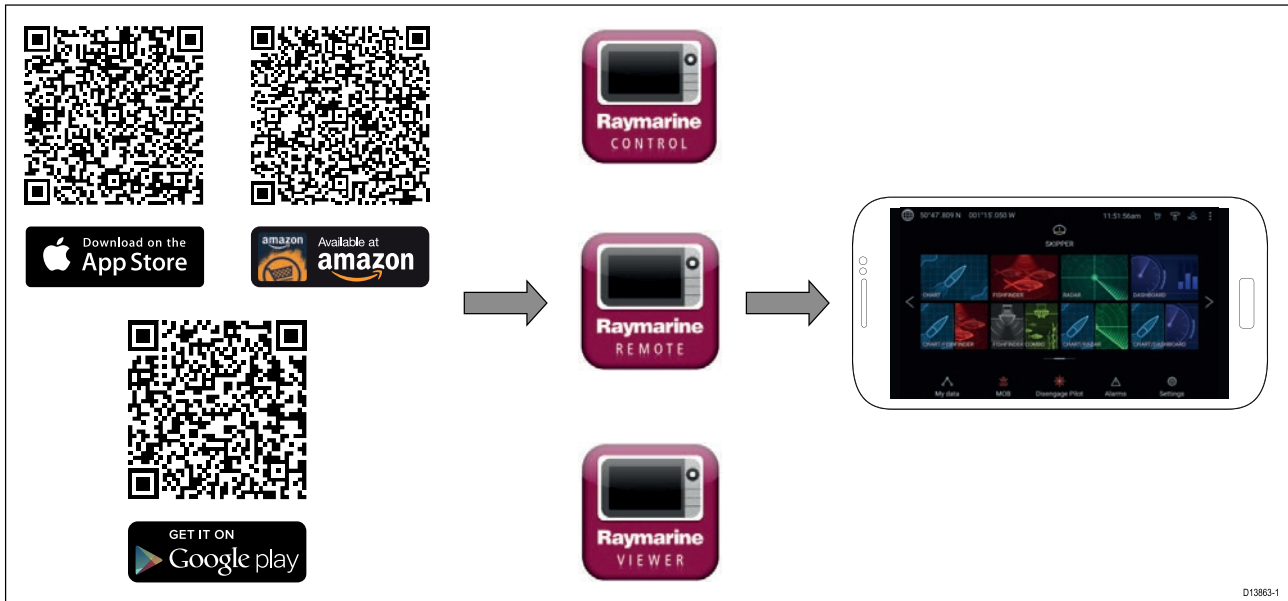
## Chapter 18: Mobile app support

### Chapter contents

- [18.1 Raymarine mobile apps on page 276](#)
- [18.2 Connecting a mobile device to your MFD on page 277](#)
- [18.3 Controlling your MFD using RayControl on page 278](#)
- [18.4 Controlling your MFD using RayRemote on page 279](#)
- [18.5 Viewing your MFD screen using RayView on page 280](#)
- [18.6 Navionics plotter sync on page 281](#)

## 18.1 Raymarine mobile apps

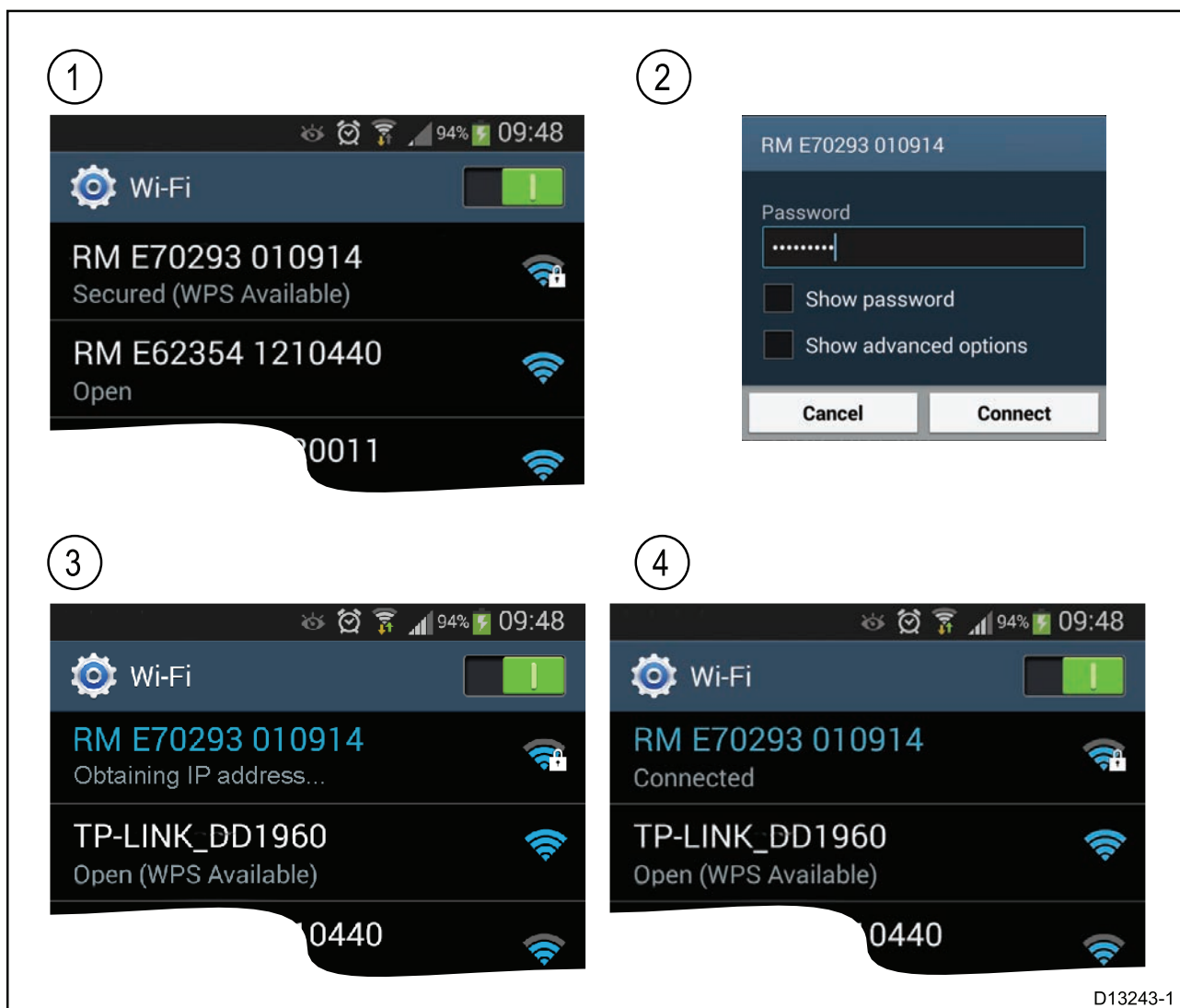
Please check the relevant app store for Raymarine mobile apps.



**Note:** When updating your MFD software ensure that you check for updates to your mobile apps.



## 18.2 Connecting a mobile device to your MFD



1. Open the Wi-Fi settings on your mobile device and select your product's Wi-Fi Name / SSID from the list of available networks.

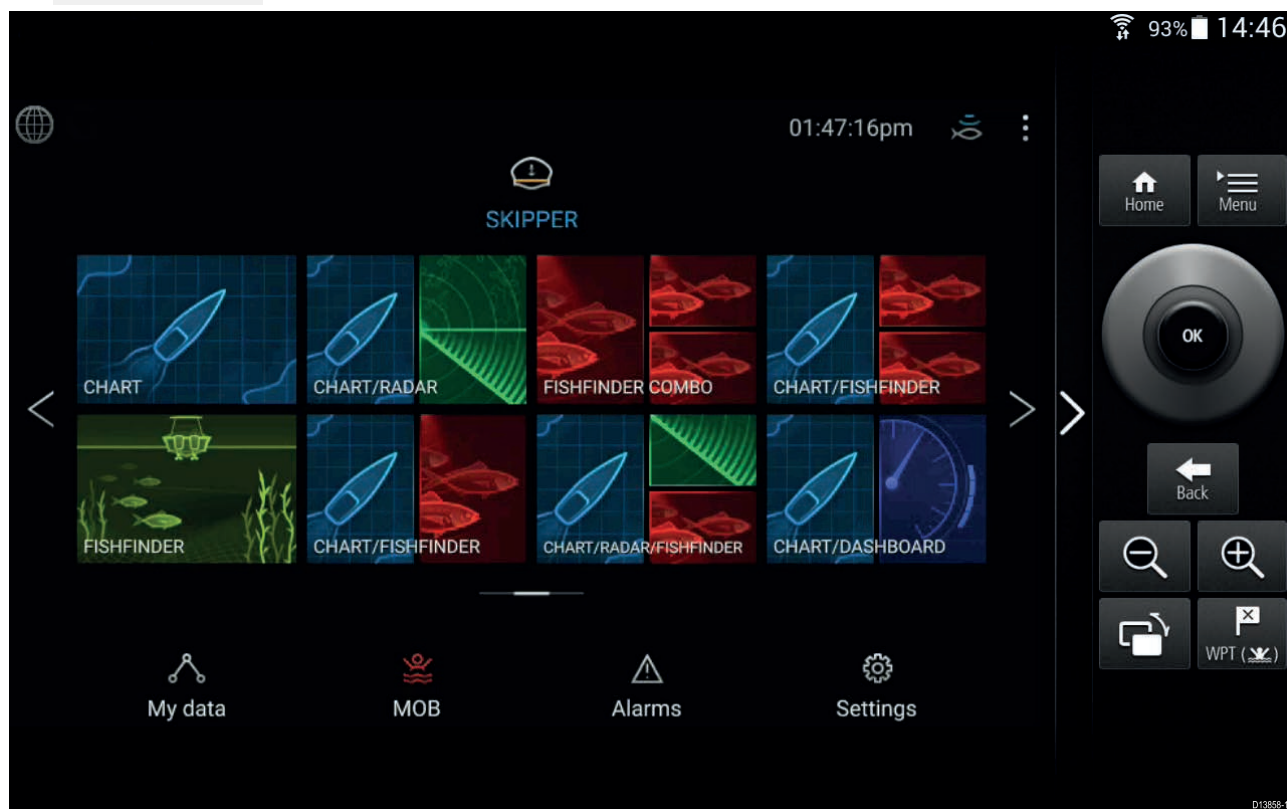
*You can establish your MFD's SSID and Passphrase by selecting **Configure** from the **This display** tab of the **Settings** menu: **Homescreen** > **Settings** > **This display** > **Configure**.*

2. Enter your product's Wi-Fi Passphrase and select **Connect**.
3. Your mobile device will now connect to your MFD.
4. The network status will change to **Connected**.

## 18.3 Controlling your MFD using RayControl

The RayControl app allows you to remotely view and control your MFD from your mobile device.

1. Download and install RayControl from your app store.
2. Ensure your mobile device is connected to your MFD's Wi-Fi.
3. Open the RayControl app.
4. Control your MFD using your mobile device's touchscreen in the same way you would interact with the MFD's touchscreen.
5. You can also use a representation of an Axiom Pro's or RMK remote's physical buttons by sliding the controls sidebar out from the right of the screen or on smaller devices selecting **Remote Control**.



## 18.4 Controlling your MFD using RayRemote

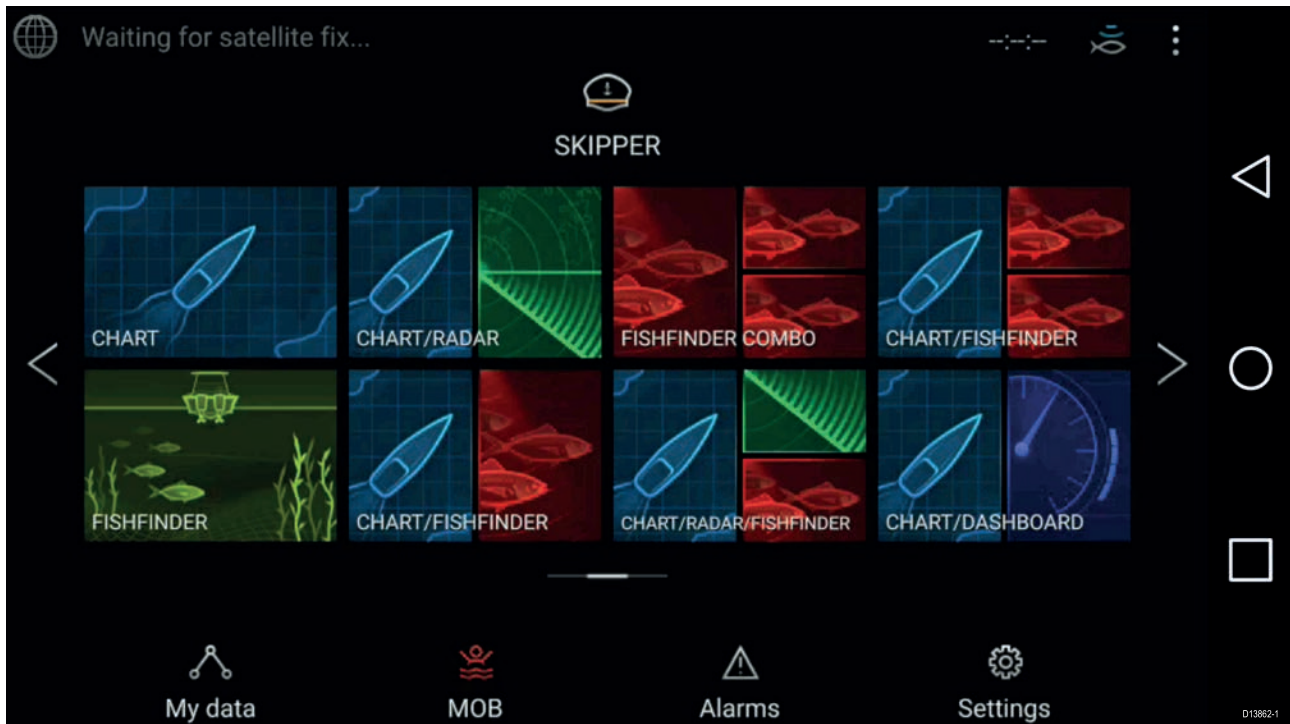
The RayRemote app allows you to remotely control your MFD from your mobile device.



1. Download and install RayRemote from your app store.
2. Ensure your mobile device is connected to your MFD's Wi-Fi.
3. Open the RayRemote app.
4. Control your MFD on your mobile device using the on-screen equivalents of the physical buttons found on the Axiom Pro MFD or RMK remote keypad.

## 18.5 Viewing your MFD screen using RayView

The RayView app allows you to remotely view your MFD from your mobile device.



1. Download and install RayView from your app store.
2. Ensure your mobile device is connected to your MFD's Wi-Fi.
3. Open the RayView app.
4. Your mobile device's screen will now mirror your MFD's screen.

## 18.6 Navionics plotter sync

You can use the Navionics boating mobile app to:

- transfer waypoints and routes between your MFD and mobile device.
- update, activate and renew your Navionics cartography



# Chapter 19: Troubleshooting

## Chapter contents

- [19.1 Troubleshooting on page 284](#)
- [19.2 Diagnostic product information on page 285](#)
- [19.3 Power up troubleshooting on page 286](#)
- [19.4 Radar troubleshooting on page 288](#)
- [19.5 GNSS \(GPS\) troubleshooting on page 289](#)
- [19.6 Sonar troubleshooting on page 290](#)
- [19.7 Camera troubleshooting on page 293](#)
- [19.8 Augmented Reality \(AR\) Troubleshooting on page 295](#)
- [19.9 Wi-Fi troubleshooting on page 296](#)
- [19.10 Wireless display troubleshooting on page 299](#)
- [19.11 Data troubleshooting on page 300](#)
- [19.12 Touchscreen troubleshooting on page 301](#)

## 19.1 Troubleshooting

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

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

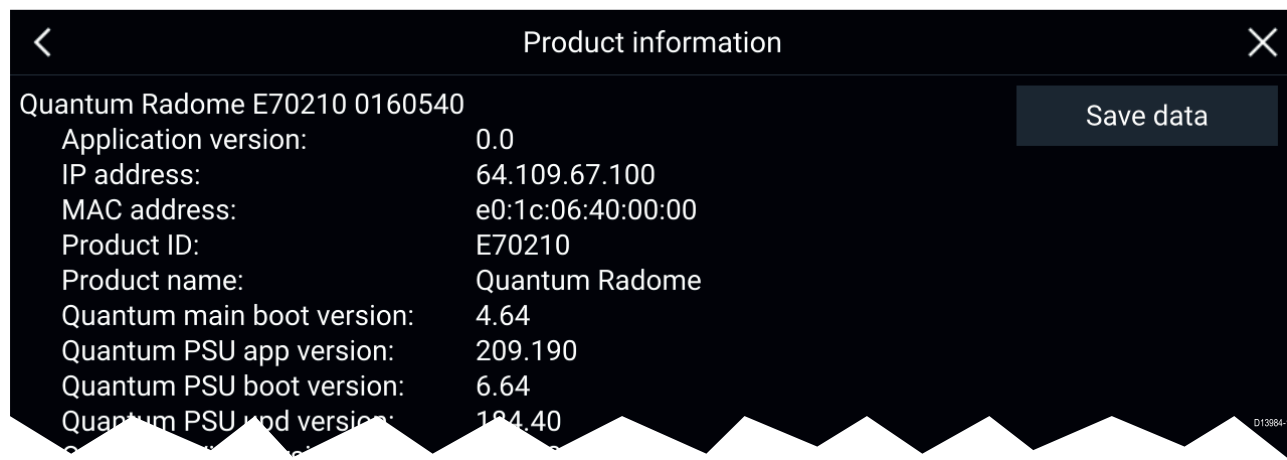
If after referring to this section you are still having problems with your product, please refer to the Technical support section of this manual for useful links and Raymarine Product Support contact details.



## 19.2 Diagnostic product information

Diagnostic product information can be viewed from your MFD, for products networked using SeaTalkhs® and SeaTalkng® / NMEA 2000.

To view diagnostic product information, select **View all product info** from the **Diagnostics** pop over menu: **Homescreen > Settings > Network > Diagnostics > View all product info**.



### Saving product information

Diagnostic product information can be saved to MicroSD card for off boat records.

With the Diagnostics product information page displayed:

1. Select **Save data**.
2. Select the storage device you want to save the data to.
3. Enter a filename.
4. Select **Save**.
5. Select **OK**.

A JSON (JavaScript Object Notation) file will be saved, using your chosen filename, to the selected storage device.

You may view the file using a compatible PC application (e.g.: Microsoft Word).

## 19.3 Power up troubleshooting

### Product does not turn on or keeps turning off

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

### Product will not start up (restart loop)

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



### Warning: Factory reset warning

Performing a factory reset will restore all system and app settings to factory defaults and erase all user data (such as waypoints, routes, tracks, camera recordings and photos).

### Performing a power on reset — Axiom™

1. Within 60 seconds of powering on your MFD, swipe your finger from right to left (opposite direction to powering on) across the **Power** button swipe area 5 times.  
Recovery options are displayed.
2. Swipe your finger from right to left twice to highlight **Wipe data/factory reset**.
3. Swipe your finger from left to right once to accept.
4. Swipe your finger from right to left once to highlight **Yes**.
5. Swipe your finger from left to right once to restore your MFD to factory default settings.

6. When **Data wipe complete** is displayed, swipe your finger from left to right to reboot your MFD.

## Performing a power on reset - Axiom Pro

1. Within 60 seconds of powering on your MFD, press and hold the **Back** and **Switch active** buttons until the screen goes black and the Raymarine logo appears.  
The MFD will boot into Recovery mode.
2. Use the directional controls to highlight **Wipe data/factory reset**.
3. Press **Ok**.
4. Select **Yes** to restore your MFD to factory default settings.
5. When 'Data wipe complete' is displayed, select **Reboot system** now.

## Performing a Power on Reset - eS and gS Series MFDs

1. Power the MFD off.
  2. Power the MFD back on.
  3. When the Raymarine logo appears press and hold the **Power** button, until the Initialization screen is displayed.
  4. Press the Waypoint button to restore your MFD to factory default settings.
- The MFD will reboot when complete.

## 19.4 Radar troubleshooting

### No connection can be made to the scanner

Possible Causes	Possible Solution
Radar powered down	<ul style="list-style-type: none"> <li>If the scanner product has shut down, power it up by opening the Radar app and selecting the <b>Power</b> icon.</li> <li>A Quantum Radar will shut down after 30 minutes if neither a wired (RayNet) , nor a wireless (Wi-Fi) connection can be made to a MFD.</li> </ul>
Radar not transmitting	<ul style="list-style-type: none"> <li>Select <b>Transmit</b> for the relevant Radar scanner from the Radar app.</li> </ul>
Missing or incorrect Wi-Fi credentials	<ul style="list-style-type: none"> <li>If using a wireless (Wi-Fi) connection, check that you have entered the correct SSID and passcode for your Radar. Both the SSID and passcode are provided on the Radar scanner's packaging, and are also shown on the serial number label on the underside of the product.</li> </ul>
Damaged or disconnected Power cable / RayNet cable	<ol style="list-style-type: none"> <li>1. Check that the cable connectors are fully inserted and locked in position.</li> <li>2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary.</li> <li>3. With the product turned on, try flexing the cable near to the display connector to see if this causes the product to re-boot/loose power, replace if necessary.</li> <li>4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary.</li> <li>5. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the product to reset/turn off), replace if necessary.</li> <li>6. Check condition of relevant breakers and fuses, replace if necessary. If the breaker keeps tripping or fuses keep blowing, contact a Raymarine authorized dealer for assistance.</li> </ol>
Open Array power in Off position	<ul style="list-style-type: none"> <li>Ensure Open Array power switch is in the On position.</li> </ul>
Software mismatch between equipment may prevent communication	<ul style="list-style-type: none"> <li>Ensure all Raymarine products contain the latest available software, check the Raymarine website: <a href="http://www.raymarine.com/software">www.raymarine.com/software</a> for software compatibility.</li> </ul>

### Poor image quality

Possible Causes	Possible Solution
High network bandwidth usage may interfere with a Quantum Radar connected wirelessly	<ul style="list-style-type: none"> <li>Disconnect Wireless display and close the Wireless display page.</li> <li>Disconnect other devices connected wirelessly.</li> </ul>

### Displayed bearing is different to the true bearing

Possible Causes	Possible Solution
Bearing alignment adjustment required	<ul style="list-style-type: none"> <li>Carry out the Bearing Alignment procedure.</li> </ul>

### Radar will not initialize (Voltage control module (VCM) stuck in "sleep mode")

Possible Causes	Possible Solution
Intermittent or poor power connection	Check power connection at VCM. (Voltage at input = 12 / 24 V, Voltage at output = 40 V)

## 19.5 GNSS (GPS) troubleshooting

### No fix displayed

Possible causes	Possible solutions
Geographic location or prevailing conditions preventing satellite fix.	Check to see if a fix is obtained in better conditions or another geographic location.
GNSS (GPS) connection fault.	Ensure that external GNSS (GPS) connections and cabling are correct and fault free.
External GNSS (GPS) receiver in poor location e.g.: <ul style="list-style-type: none"><li>• Below decks.</li><li>• Close proximity to transmitting equipment, such as a VHF radio.</li></ul>	Ensure GNSS (GPS) receiver has a clear view of the sky.
GNSS (GPS) installation problem.	Refer to the installation instructions supplied with your product.

**Note:** A GNSS (GPS) Status screen is accessible from the display. This provides satellite signal strength and other relevant information.

## 19.6 Sonar troubleshooting

### Scrolling image is not being displayed

Possible causes	Possible solutions
Sonar disabled	Enable <b>Ping</b> from the Sonar app's sounder tab: <b>Menu &gt; Settings &gt; Sounder &gt; Ping</b> .
Incorrect transducer selected	Check that the correct transducer is selected in the Sonar app's Transducer tab: <b>Menu &gt; Settings &gt; Transducer &gt; Ping</b> .
Damaged cables	<ol style="list-style-type: none"> <li>1. Check that the transducer cable connector is fully inserted and locked in position.</li> <li>2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary.</li> <li>3. With the unit turned on, try flexing the cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary.</li> <li>4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary.</li> <li>5. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.</li> </ol>
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer. After cleaning or replacement coat the transducer using a water-based anti-fouling paint.
Wrong transducer fitted	Check product and transducer documentation and ensure that the transducer is compatible with your system.
External sonar module: SeaTalkhs / RayNet network problem.	<ul style="list-style-type: none"> <li>• Check that the unit is correctly connected to the MFD or network switch. Check all connections ensuring connections are secure, clean and free from corrosion, replace if necessary.</li> </ul>
External sonar module: Software mismatch between equipment may prevent communication.	Ensure all Raymarine products contain the latest available software, check the Raymarine website: <a href="http://www.raymarine.com/software">www.raymarine.com/software</a> for software compatibility.

### No depth reading / lost bottom lock

Possible causes	Possible solutions
Transducer location	Check that the transducer has been installed in accordance with the instructions provided with the transducer.
Transducer angle	If the transducer angle is too great the beam can miss the bottom, adjust transducer angle and recheck.
Transducer kicked-up	If the transducer has a kick-up mechanism, check that it has not kicked up due to hitting an object.
Power source insufficient	With the product under load, using a multi-meter, check the power supply voltage as close to the unit as possible to establish actual voltage when the current is flowing. (Check your product's Technical specification for power supply requirements.)
Damaged or fouled transducer	Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer. After cleaning or replacement coat the transducer using a water-based anti-fouling paint.

Possible causes	Possible solutions
Damaged cables	<ol style="list-style-type: none"> <li>1. Check the unit's connector for broken or bent pins.</li> <li>2. Check that the cable connector is fully inserted into the unit and that the locking collar is in the locked position.</li> <li>3. Check the cable and connectors for signs of damage or corrosion, replace if necessary.</li> <li>4. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary.</li> <li>5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary.</li> <li>6. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.</li> </ol>
Vessel speed too high	Slow vessel speed and recheck.
Bottom too shallow or too deep	The bottom depth may be outside of the transducers depth range, move vessel to shallower or deeper waters as relevant and recheck.

#### Poor / problematic image

Possible causes	Possible solutions
Targets will appear differently if your vessel is stationary (e.g.: fish will appear on the display as straight lines).	Increase vessel speed.
Scrolling paused or speed set too low	Unpause or increase sonar scrolling speed.
Sensitivity settings may be inappropriate for present conditions.	Check and adjust sensitivity settings or perform a Sonar reset.
Damaged cables	<ol style="list-style-type: none"> <li>1. Check the unit's connector for broken or bent pins.</li> <li>2. Check that the cable connector is fully inserted into the unit and that the locking collar is in the locked position.</li> <li>3. Check the cable and connectors for signs of damage or corrosion, replace if necessary.</li> <li>4. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary.</li> <li>5. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary.</li> <li>6. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc (this can cause the Fishfinder applications to stop scrolling or the unit to reset/turn off), replace if necessary.</li> </ol>

Possible causes	Possible solutions
Transducer location	<ul style="list-style-type: none"> <li>Check that the transducer has been installed in accordance with the instructions provided with the transducer.</li> <li>If a transom mount transducer is mounted too high on the transom it may be lifting out of the water, check that the transducer face is fully submerged when planing and turning.</li> </ul>
Transducer kicked-up	If the transducer has a kick-up mechanism, check that it has not kicked up due to hitting an object.
Damaged or fouled transducer	<p>Check transducer condition, ensuring it is not damaged and is free from debris/fouling. If necessary, clean or replace your transducer.</p> <p>After cleaning or replacement coat the transducer using a water-based anti-fouling paint.</p>
Damaged transducer cable	Check that the transducer cable and connection is free from damage and that the connections are secure and free from corrosion.
Turbulence around the transducer at higher speeds may affect transducer performance	Slow vessel speed and recheck.
Interference from another transducer	<ol style="list-style-type: none"> <li>1. Turn off the transducer causing the interference.</li> <li>2. Reposition the transducers so they are farther apart.</li> </ol>
Unit power supply fault	Check the voltage from the power supply, if this is too low it can affect the transmitting power of the unit.



## 19.7 Camera troubleshooting

### Video not displayed

Possible causes	Possible solutions
Incorrect power up sequence	Your MFD needs to be powered up before your camera to enable the MFD to provide the camera with a valid IP address.
Camera not compatible.	Ensure the camera feed and network settings are compatible: <ul style="list-style-type: none"><li>• Camera feed should be set to 720p max.</li><li>• Network should be set to obtain network address automatically (DHCP).</li><li>• Anonymous login should be enabled.</li></ul>
Too many IP feeds on network.	Displaying multiple feeds on multiple MFDs simultaneously may cause some feeds to not be displayed. Try viewing less feeds.
Problem with the camera connections.	<ol style="list-style-type: none"><li>1. Check the unit's connector for broken or bent pins.</li><li>2. Check that the cable connector is fully inserted into the unit and that the locking collar is in the locked position.</li><li>3. Check the cable and connectors for signs of damage or corrosion, replace if necessary.</li><li>4. With the unit turned on, try flexing the power cable to see if this causes the unit to re-boot/loose power, replace if necessary.</li></ol>
Problem with power supply to the camera or thermal camera's JCU (if used as the primary controller)	<ul style="list-style-type: none"><li>• Check the power connections to the camera, JCU, and PoE injector (if used).</li><li>• Ensure that the power switch / breaker is on.</li><li>• Check the fuse / breaker state.</li></ul>
Camera is in Standby mode.	Use the camera controls (either the Camera app or a Thermal camera's JCU) to "wake" the camera from standby.

### PTZ cameras — Erratic or unresponsive controls

Possible causes	Possible solutions
Network problem.	<ul style="list-style-type: none"><li>• Check that the controller and camera are correctly connected to the network.</li><li>• If used, check the status of the network switch.</li><li>• Check that RayNet cables are free from damage.</li></ul>
Control conflict, e.g. caused by multiple users at different stations.	Ensure that no other controllers are in use at the same time.
Problem with the controller.	<ul style="list-style-type: none"><li>• Check power / network cabling to the controller and PoE injector, if used.</li><li>• Check other controllers, if available.</li></ul>

### Cannot switch between camera feeds

Possible causes	Possible solutions
Camera is not a dual payload model.	Only "dual payload" (dual lens) cameras support feed switching.

### Noisy image

Possible causes	Possible solutions
Poor quality or faulty cabling.	<ul style="list-style-type: none"><li>• Ensure cable runs are no longer than they need to be.</li><li>• Use only high quality shielded cable suitable for the marine environment.</li></ul>
Cable is picking up electromagnetic interference (EMI) from another device.	<ul style="list-style-type: none"><li>• Ensure you are using a high quality shielded cable.</li><li>• Ensure proper cable separation, for example do not run data and power cables in close proximity with each other.</li><li>• In certain conditions it may be necessary to fit suppression ferrites to cabling to eliminate interference.</li></ul>

### Image too dark or too light

Possible causes	Possible solutions
Brightness set too low.	Check MFD brightness and adjust if necessary.
The contrast and / or brightness settings in the Camera app are set too low.	Check Camera brightness and contrast, adjust if necessary.
The Scene Mode is not appropriate for the current conditions.	When viewing a thermal camera feed, a particular environment may benefit from using a different Scene Mode setting. For example, a very cold background (such as the sky) could cause the camera to use a wider temperature range than appropriate. Adjust the Scene as appropriate.

### Image freezes momentarily

Possible causes	Possible solutions
FFC (Flat Field Correction).	A Thermal camera's image will pause momentarily on a periodic basis during the Flat Field Correction (FFC) cycle. Just prior to the FFC, a small green square may appear in the upper left corner of the screen.

### Image is inverted (upside down or mirror image)

Possible causes	Possible solutions
Vertical or Horizontal flip control incorrectly set	Check the image flip controls to ensure they are set correctly for your installation.

## 19.8 Augmented Reality (AR) Troubleshooting

### AR options not available in Video app

Possible causes	Possible solutions
Wrong camera selected.	Ensure that the correct AR-compatible camera has been selected in the Video app menu.
Compatible camera not detected.	<ol style="list-style-type: none"> <li>1. Ensure your camera is AR compatible.</li> <li>2. Ensure your camera is correctly installed and networked to your MFD.</li> </ol>
AR200 not detected.	<ol style="list-style-type: none"> <li>1. Ensure your AR200 is correctly installed and on the same network as the MFD from which you are using the AR features.</li> </ol>
Incorrect LightHouse™ 3 software version.	Ensure that your MFD is running LightHouse™ 3 version 3.7 or above.
AR options turned off.	<p>The Compass bar, AIS, Waypoint and Chart object flags can be enabled and disabled from the <b>ClearCruise</b> settings page (<b>Video app &gt; Menu &gt; Settings &gt; ClearCruise</b>). Ensure relevant options are enabled.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Note:</b></p> <p>For AIS flags to be displayed, compatible AIS hardware must be operational and connected to the same network as your MFD.</p> </div>

### AR flags do not appear directly above on-screen target

Possible causes	Possible solutions
AIS update rate	Depending on the classification of the target's AIS hardware, transmitted position updates may be sent up to 3 minutes apart and therefore the flag may appear up to 3 minutes behind the actual onscreen target.
Camera Field of View (FOV) set incorrectly.	Ensure that the FOV setting reflects your camera's horizontal FOV. Check your camera's documentation for FOV specifications.
AR200 interference	If your AR200 is installed in a location which includes a source of magnetic interference large enough to affect AR flag placement, you may need to re-install the AR200 in a different location.
Deviation too high	<ol style="list-style-type: none"> <li>1. Reset the AR200 calibration by selecting <b>Reset</b> from the AR200 calibration page: <b>Homescreen &gt; Settings &gt; Network &gt; Data sources &gt; Heading &gt; Raymarine AR200 Attitude &gt; Calibrate</b>.</li> <li>2. If the problem persists, you may need to move your AR200 to a location with less magnetic interference.</li> </ol>

## 19.9 Wi-Fi troubleshooting

Before troubleshooting problems with your Wi-Fi connection, ensure that you have followed the Wi-Fi location requirements guidance provided in the relevant installation instructions and performed a power cycle/reboot of the devices you are experiencing problems with.

### Cannot find network

Possible cause	Possible solutions
Wi-Fi not currently enabled on devices.	Ensure Wi-Fi is enabled on both Wi-Fi devices and rescan available networks.
Some devices may automatically turn off Wi-Fi when not in use to save power.	Power cycle / reboot devices and rescan available networks.
Device not broadcasting.	<ol style="list-style-type: none"><li>1. Try to enable broadcasting of the device's network using the Wi-Fi settings on the device you are trying to connect to.</li><li>2. You may still be able to connect to the device, when it is not broadcasting, by manually entering the device's Wi-Fi Name / SSID and passphrase in the connection settings of the device you are trying to connect.</li></ol>
Devices out of range or signal being blocked.	Move devices closer together or, if possible remove the obstructions and then rescan available network.

### Cannot connect to network

Possible cause	Possible solutions
Some devices may automatically turn off Wi-Fi when not in use to save power.	Power cycle/reboot devices and retry the connection.
Trying to connect to the wrong Wi-Fi network	Ensure you are trying to connect to the correct Wi-Fi network, the Wi-Fi network's name can be found in the Wi-Fi settings on the broadcasting device (the device that you are trying to connect to).
Incorrect network credentials	Ensure you are using the correct passphrase, the Wi-Fi network's passphrase can be found in the Wi-Fi settings on the broadcasting device (the device that you are trying to connect to).
Bulkheads, decks and other heavy structure can degrade and even block the Wi-Fi signal. Depending on the thickness and material used it may not always be possible to pass a Wi-Fi signal through certain structures	<ol style="list-style-type: none"><li>1. Try repositioning the devices so the structure is removed from the direct line of sight between the devices, or</li><li>2. If possible use a wired connection instead.</li></ol>
Interference being caused by other Wi-Fi enabled or older Bluetooth enabled devices (Bluetooth and Wi-Fi both operate in the 2.4 GHz frequency range, some older bluetooth devices may interfere with Wi-Fi signals.)	<ol style="list-style-type: none"><li>1. Change the Wi-Fi Channel of the device you are trying to connect to and retry the connection. You can use free Wi-Fi analyzer apps on your smart device to help you choose a better channel (channel with least traffic).</li><li>2. Temporarily disable each wireless device in turn until you have identified the device causing the interference.</li></ol>

Possible cause	Possible solutions
Interference caused by other devices that use the 2.4GHz frequency See list below of some common devices that use the 2.4GHz frequency: <ul style="list-style-type: none"> <li>• Microwave ovens</li> <li>• Fluorescent lighting</li> <li>• Cordless phones / baby monitors</li> <li>• Motion sensors</li> </ul>	Temporarily switch off each device in turn until you have identified the device causing the interference, then remove or reposition the offending device(s).
Interference caused by electrical and electronic devices and associated cabling could generate an electromagnetic field which may interfere with the Wi-Fi signal.	Temporarily switch off each item in turn until you have identified the device causing the interference, then remove or reposition the offending device(s).

### Connection extremely slow and or keeps dropping out

Possible cause	Possible solutions
Wi-Fi performance degrades over distance so products farther away will receive less network bandwidth. Products installed close to their maximum Wi-Fi range will experience slow connection speeds, signal drop outs or not being able to connect at all.	<ul style="list-style-type: none"> <li>• Move devices closer together.</li> <li>• For fixed installations such as a Quantum Radar, enable the Wi-Fi connection on an MFD installed closer to the device.</li> </ul>
Interference being caused by other Wi-Fi enabled or older Bluetooth enabled devices (Bluetooth and Wi-Fi both operate in the 2.4 GHz frequency range, some older bluetooth devices may interfere with Wi-Fi signals.)	<ol style="list-style-type: none"> <li>1. Change the Wi-Fi Channel of the device you are trying to connect to and retry the connection. You can use free Wi-Fi analyzer apps on your smart device to help you choose a better channel (channel with least traffic).</li> <li>2. Temporarily switch off each device in turn until you have identified the device causing the interference, then remove or reposition the offending device(s).</li> </ol>
Interference from devices on other vessels. When in close proximity to other vessels, for example, when moored up in a marina, many other Wi-Fi signals may be present.	<ol style="list-style-type: none"> <li>1. Change the Wi-Fi Channel of the device you are trying to connect to and retry the connection. You can use free Wi-Fi analyzer apps on your smart device to help you choose a better channel (channel with least traffic).</li> <li>2. If possible, move your vessel to a location with less Wi-Fi traffic.</li> </ol>

### Network connection established but no data

Possible cause	Possible solutions
Connected to the wrong network.	Ensure that your devices is connected to the correct network.
Device software incompatibility	Ensure both devices are running the latest available software.
It may be possible that the device has become defective	<ol style="list-style-type: none"> <li>1. Try updating software to a later version, or</li> <li>2. try reinstalling the software.</li> <li>3. Obtain new replacement device.</li> </ol>

**Mobile application running slowly or not at all**

Possible cause	Possible solutions
Raymarine app not installed	Install mobile app from relevant app store.
Raymarine app version not compatible with MFD software	Ensure mobile app and MFD software are latest available versions.
Mobile apps not enabled on MFD	Enable “Viewing only” or “Remote Control” as required in the Mobile Apps setting on your MFD.

## 19.10 Wireless display troubleshooting

### Cannot connect to wireless display

Possible cause	Possible solutions
Some Miracast compatible but non certified devices may not be able to connect with Wi-Fi Sharing enabled.	Disable Wi-Fi Sharing on your MFD and retry connection.
WiFi Sharing has been enabled or disabled since the wireless display was first connected.	Try power cycling devices and trying again. Depending on dongle used a factory reset may be required to establish a connection.
Missed confirmation on wireless display	Restart connection procedure and ensure you check the wireless display for confirmation dialogs.
Wireless display too far away	Try moving the wireless display closer to the MFD and retry connection.
Chromecast devices are not supported.	Purchase a Miracast compatible device.

### Poor performance

Possible cause	Possible solutions
High video processing demand.	The Camera app, Raymarine mobile app connections can interfere with the wireless display performance as they use shared video processing resource. Try switching off video feeds and/or mobile app connections.
Wireless display too far away	Try moving the wireless display closer to the MFD and retry connection.

### Wireless display disconnects

Possible cause	Possible solutions
Changing the Wi-Fi Sharing option on your MFD will cause the wireless display to disconnect.	Do not change Wi-Fi sharing options whilst connected to a wireless display. Wireless display may require factory reset to re-establish connection.
Quantum wireless pairing process will cause wireless display to disconnect.	Do not pair with a Quantum Radar whilst wireless display connection is active.
Wireless display too far away	Try moving the wireless display closer to the MFD and retry connection.

## 19.11 Data troubleshooting

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

Possible causes	Possible solutions
Data is not being received at the display(s).	<ul style="list-style-type: none"><li>• Check transmitted data is compatible with your display. Refer to MFD supported PGN list.</li><li>• Check the data bus (e.g. <b>SeaTalk<sup>ng</sup></b>) wiring and connections.</li></ul>
Data source (e.g. instrument display or engine interface) is not operating.	<ul style="list-style-type: none"><li>• Check the source of the missing data (e.g. instrument display or engine interface).</li><li>• Check power to the data bus.</li></ul>
Software mismatch between equipment may prevent communication.	<ul style="list-style-type: none"><li>• Check the Raymarine website and ensure all your Raymarine products have the latest software.</li></ul>

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

Possible causes	Possible solutions
Network connection problem.	<ul style="list-style-type: none"><li>• Check that all required equipment is connected to the same network.</li><li>• Check correct operation of network switch, if used.</li><li>• Check network cabling is correct and free from damage.</li></ul>
Software mismatch between equipment may prevent communication.	Check all MFDs are using the same version of software.



## 19.12 Touchscreen troubleshooting

Touchscreen does not operate as expected.

Possible causes	Possible solutions
Touch lock is enabled.	Disable TouchLock, using the power button..
Screen is not being operated with bare fingers, for example gloves are being worn.	Bare fingers must make contact with the screen for correct operation. Alternatively you may use conductive gloves.
Saltwater deposits on the screen.	Carefully clean and dry the screen with a damp non-abrasive cloth.



## Chapter 20: Technical support

### Chapter contents

- [20.1 Raymarine product support and servicing on page 304](#)
- [20.2 Learning resources on page 306](#)

## 20.1 Raymarine product support and servicing

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

### Product information

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

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

You can obtain this product information using the menus within your product.

### Servicing and warranty

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

Don't forget to visit the Raymarine website to register your product for extended warranty benefits:

<http://www.raymarine.co.uk/display/?id=788>.

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:emea.service@raymarine.com">emea.service@raymarine.com</a></li><li>• Tel: +44 (0)1329 246 932</li></ul>
United States (US)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:rm-usrepair@flir.com">rm-usrepair@flir.com</a></li><li>• Tel: +1 (603) 324 7900</li></ul>

### Web support

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

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

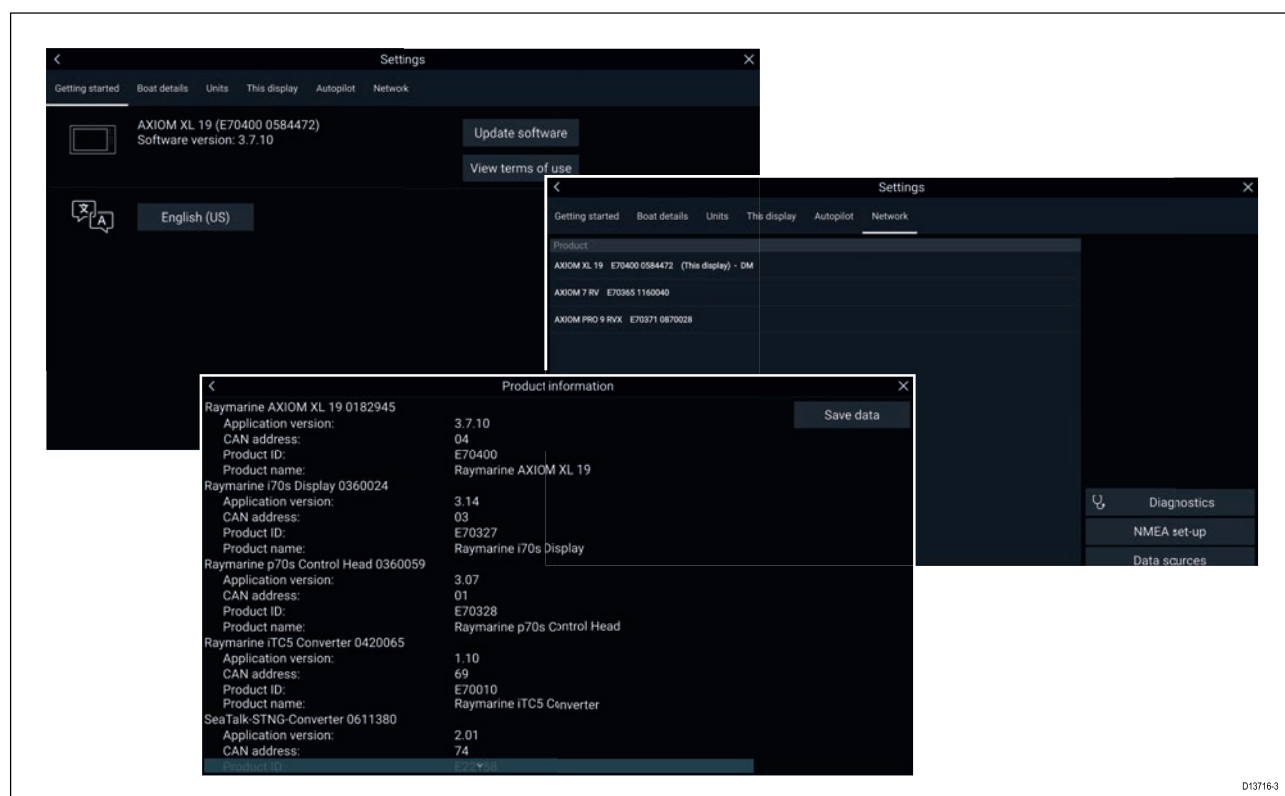
### Worldwide support

Region	Contact
United Kingdom (UK), EMEA, and Asia Pacific	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support.uk@raymarine.com">support.uk@raymarine.com</a></li><li>• Tel: +44 (0)1329 246 777</li></ul>
United States (US)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support@raymarine.com">support@raymarine.com</a></li><li>• Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)</li></ul>
Australia and New Zealand (Raymarine subsidiary)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:aus.support@raymarine.com">aus.support@raymarine.com</a></li><li>• Tel: +61 2 8977 0300</li></ul>
France (Raymarine subsidiary)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support.fr@raymarine.com">support.fr@raymarine.com</a></li><li>• Tel: +33 (0)1 46 49 72 30</li></ul>
Germany (Raymarine subsidiary)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support.de@raymarine.com">support.de@raymarine.com</a></li><li>• Tel: +49 (0)40 237 808 0</li></ul>
Italy (Raymarine subsidiary)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support.it@raymarine.com">support.it@raymarine.com</a></li><li>• Tel: +39 02 9945 1001</li></ul>
Spain (Authorized Raymarine distributor)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:sat@azimut.es">sat@azimut.es</a></li><li>• Tel: +34 96 2965 102</li></ul>
Netherlands (Raymarine subsidiary)	<ul style="list-style-type: none"><li>• E-Mail: <a href="mailto:support.nl@raymarine.com">support.nl@raymarine.com</a></li><li>• Tel: +31 (0)26 3614 905</li></ul>

Region	Contact
Sweden (Raymarine subsidiary)	<ul style="list-style-type: none"> <li>E-Mail: <a href="mailto:support.se@raymarine.com">support.se@raymarine.com</a></li> <li>Tel: +46 (0)317 633 670</li> </ul>
Finland (Raymarine subsidiary)	<ul style="list-style-type: none"> <li>E-Mail: <a href="mailto:support.fi@raymarine.com">support.fi@raymarine.com</a></li> <li>Tel: +358 (0)207 619 937</li> </ul>
Norway (Raymarine subsidiary)	<ul style="list-style-type: none"> <li>E-Mail: <a href="mailto:support.no@raymarine.com">support.no@raymarine.com</a></li> <li>Tel: +47 692 64 600</li> </ul>
Denmark (Raymarine subsidiary)	<ul style="list-style-type: none"> <li>E-Mail: <a href="mailto:support.dk@raymarine.com">support.dk@raymarine.com</a></li> <li>Tel: +45 437 164 64</li> </ul>
Russia (Authorized Raymarine distributor)	<ul style="list-style-type: none"> <li>E-Mail: <a href="mailto:info@mikstmarine.ru">info@mikstmarine.ru</a></li> <li>Tel: +7 495 788 0508</li> </ul>

## Viewing product information (LightHouse™ 3)

Use the **Settings** menu to view hardware and software information about your MFD, and connected products.





1. Select **Settings**, from the Homescreen.  
The **Getting started** tab contains hardware and software information for your MFD.
2. You can view further information about your MFD, or view information about products networked using SeaTalkhs® and SeaTalkng® / NMEA 2000, by selecting the **Network** tab, then:
  - i. to display detailed software information and your MFD's network IP address, select your MFD from the list.
  - ii. to display detailed diagnostics information for all products, select **Product info** from the **Diagnostics** pop over menu.

## 20.2 Learning resources

Raymarine has produced a range of learning resources to help you get the most out of your products.

### Video tutorials

 <b>YouTube</b>	<p>Raymarine official channel on YouTube:</p> <ul style="list-style-type: none"><li>• <a href="http://www.youtube.com/user/RaymarineInc">http://www.youtube.com/user/RaymarineInc</a></li></ul> <p>LightHouse™ 3 tips and tricks:</p> <ul style="list-style-type: none"><li>• <a href="http://www.raymarine.com/multifunction-displays/light-house3/tips-and-tricks">http://www.raymarine.com/multifunction-displays/light-house3/tips-and-tricks</a></li></ul>
	<p>Video Gallery:</p> <ul style="list-style-type: none"><li>• <a href="http://www.raymarine.co.uk/view/?id=2679">http://www.raymarine.co.uk/view/?id=2679</a></li></ul>

#### Note:

- Viewing the videos requires a device with an Internet connection.
- Some videos are only available in English.

### Training courses

Raymarine regularly runs a range of in-depth training courses to help you make the most of your products. Visit the Training section of the Raymarine website for more information:

- <http://www.raymarine.co.uk/view/?id=2372>

### FAQs and Knowledge Base

Raymarine has produced an extensive set of FAQs and a Knowledge Base to help you find more information and troubleshoot any issues.

- <http://www.raymarine.co.uk/knowledgebase/>

### Technical support forum

You can use the Technical support forum to ask a technical question about a Raymarine product or to find out how other customers are using their Raymarine equipment. The resource is regularly updated with contributions from Raymarine customers and staff:

- <http://forum.raymarine.com>

## Appendix A NMEA 0183 sentence support

Sentence	Description	Transmit	Receive
APB	Heading / Track controller pilot sentence "B"	•	•
BWC	Bearing & distance to waypoint — great circle	•	•
BWR	Bearing & distance to waypoint — rhumb line	•	•
DBT	Depth below transducer	•	•
DPT	Depth	•	•
GGA	GNSS (GPS) fix data	•	•
GLL	Geographic position lat/long	•	•
GSA	GNSS (GPS) DOP & active satellites	•	•
GSV	GNSS (GPS) satellites in view	•	•
MTW	Water temperature	•	•
MWV	Wind speed & angle	•	•
RMA	Recommended minimum specific Loran C data	•	•
RMB	Recommended minimum navigation information	•	•
RMC	Recommended minimum specific GNSS (GPS) data	•	•
RSD	Radar system data	•	•
TTM	Tracked target message	•	•
VHW	Water speed and heading	•	•
VLW	Dual ground/water distance	•	•
VTG	COG (Course Over Ground) & ground speed	•	•
ZDA	Time & date	•	•

## Appendix B NMEA 2000 PGN support

PGN	Description	Transmit	Receive
59392	ISO Acknowledgment	•	•
59904	ISO Request	•	•
60928	ISO Address Claim	•	•
126208	NMEA - Request group function	•	•
126464	Receive/Transmit PGN's group function	•	•
126992	System Time	•	•
126996	Product Information	•	•
127237	Heading/Track Control		•
127245	Rudder		•
127250	Vessel Heading	•	•
127488	Engine Parameters, Rapid Update		•
127489	Engine Parameters, Dynamic		•
127493	Transmission Parameters, Dynamic		•
127496	Trip Parameters, Vessel		•
127497	Trip Parameters, Engine		•
127498	Engine Parameters, Static		•
127505	Fluid Level		•
127506	DC Charge Status		•
128259	Speed	•	•
128267	Water Depth	•	•
128275	Distance Log	•	•
129025	Position, Rapid Update	•	•
129026	COG & SOG, Rapid Update	•	•
129029	GNSS Position Data	•	•
129033	Time & Date	•	•
129038	AIS Class A Position Report		•
129039	AIS Class B Position Report		•
129040	AIS Class B Extended Position Report		•
129041	AIS Aids to Navigation (AtoN) Report		•
129044	Datum	•	•
129283	Cross Track Error	•	•
129284	Navigation Data	•	•
129291	Set & Drift, Rapid Update	•	•
129301	Time to/from Mark		•
129539	GNSS DOPs		•
129540	GNSS Sats in View	•	•
129545	GNSS RAIM Output		•
129550	GNSS Differential Correction Receiver Interface		•
129551	GNSS Differential Correction Receiver Signal		•
129793	AIS UTC and Date Report		•
129794	AIS Class A Static and Voyage Related Data		•



PGN	Description	Transmit	Receive
129801	AIS Addressed Safety Related Message		•
129802	AIS Safety Related Broadcast Message		•
129808	DSC call information		•
129809	AIS Class B "CS" Static Report, Part A		•
129810	AIS Class B		•
130306	Wind Data	•	•
130310	Environmental Parameters	•	•
130311	Environmental Parameters		•
130576	Small Craft Status		•
130577	Direction Data	•	•
130578	Vessel Speed Components		•

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.

## Appendix C Document change history

Document revision	Date	Software version	Changes
81370-9	09-2018	LH3.7	<ul style="list-style-type: none"> <li>Added new ClearCruise™ chapter which documents Object Detection and Augmented Reality.</li> <li>Added details of new <b>Display estimated range</b> setting for ClearCruise™ Object detection in Video app.</li> <li>Updated Video app settings menu section with new ClearCruise™ options.</li> <li>Added details of new Seakeeper and Mazu LightHouse™ apps.</li> <li>Expanded My data details to include MFD settings import and export (backup).</li> <li>Added new tasks for Saving user data, saving MFD settings, restoring user data and restoring MFD settings.</li> <li>Added custom “Digital switching” pages export feature to Dashboard app.</li> <li>Added AR200 to hardware compatibility table.</li> <li>Moved Axiom XL compatibility from LightHouse V3.5 to V3.7.</li> </ul>
81370-881370-7	07-2018	LH3.6	<ul style="list-style-type: none"> <li>Updated software revision and new features section to reflect V3.6.</li> <li>Added description of each available MFD app to Homescreen section.</li> <li>Added new UAV app chapter.</li> <li>Added UAV chart integration details to Chart app chapter.</li> <li>Updated hardware compatibility list to include Mavic Pro and Mavic Pro Platinum UAVs.</li> </ul>
81370-6	06-2018	LH3.5	<ul style="list-style-type: none"> <li>Updated software revision and new features section to reflect V3.5.</li> <li>Added support for MFD alarms via Bluetooth speaker.</li> <li>Updated list of compatible entertainment systems in Audio app chapter to include new Fusion units and SR150, also added new column to list supported network connections.</li> <li>Updated Audio app chapter settings menu options to include Balance and Fade.</li> <li>Updated Audio app chapter details to allow for multiple systems to be connected and controlled.</li> <li>Added PDF viewer details.</li> <li>Updated demo profiles section to detail the new demo movie option.</li> <li>Updated NMEA 2000 PGN list to include 127506 and 129808.</li> <li>Updated compatible MFDs to include Axiom XL</li> <li>Updated product documentation to include Axiom XL installation instructions.</li> <li>Added new details for using SonarChart Live to Chart app chapter.</li> <li>Updated LH2 Vs LH3 feature gap on eS and gS Series.</li> <li>Added LH3 version Vs supported hardware list to appendix.</li> <li>Updated Radar chapter to include Magnum open array details.</li> <li>Added new details/requirements for LH apps.</li> </ul>

Document revision	Date	Software version	Changes
81370-5	02-2018	LH3.4	<ul style="list-style-type: none"> <li>• Added LightHouse 2 to LightHouse 3 upgrade procedure to applicable documents.</li> <li>• Updated software revision to V3.4.</li> <li>• Updated New features section to reflect V3.4 new features.</li> <li>• Change chapter title for 'General app settings' to 'General information'.</li> <li>• Added new definition of MFD app and LightHouse app to General info chapter.</li> <li>• Updated shortcuts page details to include Bluetooth speaker volume control.</li> <li>• Added new Bluetooth volume control instructions.</li> <li>• Added new Bluetooth speaker pairing procedure.</li> <li>• Updated Homescreen screenshots to reflect LH3.4 UI throughout the manual.</li> <li>• Updated Homescreen overview to include details of Apps icon.</li> <li>• Updated status area details to include Bluetooth volume controls and Disengage autopilot icon.</li> <li>• Added Bluetooth and Disengage autopilot icons to Status area table.</li> <li>• Removed Wi-Fi symbols from status area icons table and grouped icons in separate tables.</li> <li>• Updated trip log details to include new combined Fuel/trip manager details and settings.</li> <li>• Alarms section re-written to include examples of Blue, Orange and Red notifications.</li> <li>• Added Alarm history and Alarm indicators to Alarms section.</li> <li>• Added Digital switching alarm details and example screenshot.</li> <li>• Added Shared brightness details.</li> <li>• Added procedure for customizing the splashscreen.</li> <li>• Added new LightHouse apps chapter, including Wi-Fi and Bluetooth connection and settings..</li> <li>• Updated Disengaging autopilot details to include Status area location of autopilot icon.</li> <li>• Added new Tides mode details.</li> <li>• Added new Find nearest feature details.</li> <li>• Added new 'Other' vessel AIS icon and Changed current 'Other' icon to 'Commercial'.</li> <li>• Updated Radar chapter to include Quantum 2 support.</li> <li>• Added Doppler Radar feature.</li> <li>• Updated Fuel related data items available in Dashboard app.</li> <li>• Updated Camera app overview to include details of creating unique app instances on different displays.</li> <li>• Renamed 'Camera app' now 'Video app'.</li> </ul>

Document revision	Date	Software version	Changes
81370-4	11-2017	LH3.3	<ul style="list-style-type: none"> <li>• Updated New features list to reflect LH3.3.</li> <li>• Added RV transducer calibration details.</li> <li>• Added MFD controls information for eS Series and gS Series.</li> <li>• Added new LH3 compatible MFDs table.</li> <li>• Updated Radar target tracking to include AIS targets.</li> <li>• Updated Radar target settings information to include independent Reference mode for targets, and new Trails settings.</li> <li>• Added new Weather mode chapter.</li> <li>• Updated User interface languages table.</li> <li>• Added lists of data items available in Dashboard app and for data overlays and sidebars.</li> <li>• Added Navionics plotter sync details to Mobile app chapter.</li> <li>• Added diagnostic product information details to troubleshooting chapter.</li> <li>• Added LH2 to LH3 upgrade procedure to Appendix.</li> <li>• Updated RV Depth and intensity setting details.</li> <li>• Updated shortcuts page information to include new Disable all sounders option.</li> </ul>
81370-3	09-2017	LH3.2	<ul style="list-style-type: none"> <li>• Updated software revision to reflect LH3.2.</li> <li>• Updated New features section to reflect LH3.2.</li> <li>• Added User programmable button details for Axiom Pro MFDs.</li> <li>• Updated Software updates section to reflect updating SeaTalkng products.</li> <li>• Added wireless display information, connection details and troubleshooting.</li> <li>• Added NMEA0183 setting for Axiom Pro MFDs.</li> <li>• Added Autorouting related information and procedures.</li> <li>• Updated Chart selection information to include C-MAP cartography.</li> <li>• Added AIS symbols tables.</li> <li>• Updated Chart settings tables to include C-MAP specific and Enhanced Navionics cartography features support.</li> <li>• Added Sailing and Navigation dial overview to Dashboard chapter.</li> <li>• Updated Camera app overview to include analog feeds via an Axiom Pro.</li> <li>• Updated Audio app compatible entertainment systems to include compatible Rockford Fosgate and Fusion units.</li> <li>• Updated Radar troubleshooting to include high network bandwidth.</li> <li>• Added NMEA0183 supported sentences table.</li> </ul>

Document revision	Date	Software version	Changes
81370-2	07-2017	LH3.1	<ul style="list-style-type: none"> <li>• Updated software revision to reflect LH3.1.</li> <li>• Added controls details for Axiom and Axiom Pro</li> <li>• Added powering on and off details for Axiom Pro.</li> <li>• Removed Data source type table from Data sources.</li> <li>• Re-ordered Data source and MDS paragraphs.</li> <li>• Moved Factory reset procedure to para 3.3.</li> <li>• Added Pilot controls to shortcuts page.</li> <li>• Re-ordered memory card paragraphs and added details for Axiom Pro.</li> <li>• Added details for software updating networked MFDs.</li> <li>• Removed restriction of RMK pilot button in LH3 and added new step for repeating pairing process on each MFD.</li> <li>• Updated Homescreen overview to include Disengage pilot icon.</li> <li>• Added Wi-Fi sharing and Mobile app details to This display setting tab.</li> <li>• Added new Autopilot tab to Settings menu.</li> <li>• Added table of available UI languages.</li> <li>• Removed device disconnection details from External devices options.</li> <li>• Added new Autopilot control chapter.</li> <li>• Added details for switching between Sidebars.</li> <li>• Added camera tracking (Point camera here and Track with camera controls to Chart and Radar chapters.</li> <li>• Added details for placing waypoints in RV channels.</li> <li>• Added details of Sonar scroll back.</li> <li>• Added details of sensitivity adjustments effecting sonar scroll back.</li> <li>• Added View mode in RV channel settings to switch between scrolling and GPS tracking modes.</li> <li>• Added details of AHRS stabilization control in Sounder tab settings.</li> <li>• Added new Mobile app support chapter.</li> <li>• Added document change history to appendix.</li> </ul>
81370-1	04-2017	LH3.0	First release.

## Appendix D Hardware compatibility

The table below identifies the LightHouse™ 3 software version required to support the listed hardware.

Software version	Hardware
LH3.7	<ul style="list-style-type: none"><li>• AR200 Augmented Reality Sensor</li><li>• Axiom XL</li></ul>
LH3.6	<ul style="list-style-type: none"><li>• DJI Mavic Pro UAV</li><li>• DJI Mavic Pro Platinum UAV</li></ul>
LH3.5	<ul style="list-style-type: none"><li>• Fusion 770 and SRX400</li><li>• SR150 Sirius XM receiver (audio)</li></ul>
LH3.4	<ul style="list-style-type: none"><li>• Magnum Radar</li><li>• RVX1000 sonar module</li><li>• Bluetooth speaker</li><li>• Axiom XL 16</li></ul>
LH3.3	<ul style="list-style-type: none"><li>• SR150 Sirius XM receiver (weather only)</li><li>• eS Series (upgraded to LH3)</li><li>• gS Series (upgraded to LH3)</li></ul>
LH3.2	<ul style="list-style-type: none"><li>• Axiom Pro</li><li>• Fusion entertainment systems (NMEA 2000 only)</li></ul>
LH3.1	<ul style="list-style-type: none"><li>• Evolution autopilots</li><li>• RMK-10</li></ul>
LH3.0	<ul style="list-style-type: none"><li>• Axiom</li></ul>

## Appendix E LightHouse 3 on eS and gS Series

eS Series and gS Series MFDs running the LightHouse™ 2 operating system can be upgraded to run the new LightHouse™ 3 operating system version 3.3 or greater.



To ensure upgrading is the correct option for you, please ensure you fully understand and accept the differences between the 2 operating systems, before upgrading.

### Upgrade considerations

Before you perform the upgrade, the following considerations need to be taken into account:

#### Digital switching

Upgrading to LightHouse™ 3 will erase all Digital switching files loaded on your MFD. Once erased, these files will be unrecoverable, potentially rendering the Digital switching system unusable.

Digital switching solutions must be converted, before performing the upgrade to LightHouse™ 3. Contact Raymarine Technical Support, who will guide you through the process and perform the necessary file conversion.

#### Autopilots

Legacy SeaTalk® and SPX autopilots cannot be controlled by MFDs running LightHouse™ 3. A Pilot control head will be required to control legacy autopilot systems.

#### MFD networking

- LightHouse™ 2 MFDs cannot be connected to the same network as LightHouse™ 3 MFDs.
- a Series, c Series and e Series MFDs cannot be upgraded to LightHouse™ 3 and cannot be connected to the same network as MFDs running LightHouse™ 3.
- If you have a mixed MFD network all a Series, c Series and e Series MFDs must be permanently disconnected, before upgrading eS Series and gS Series MFDs to LightHouse™ 3.
- In a mixed Axiom™ / eS Series / gS Series MFD network, it is recommended that an Axiom™ MFD is selected as the Datamaster. Where this is not desirable, due to your electronics wiring layout, you may notice a difference in system performance when an eS Series or gS Series MFD is set as Datamaster.

#### MFD performance

LightHouse™ 3 was developed for use with the latest processing technology, utilized by Axiom™ MFDs. Performance of eS Series and gS Series MFDs upgraded to use LightHouse™ 3 will be limited to the processing power available to the MFD.

## Unsupported features

The following features are only supported by Axiom variant MFDs and will not be available on an eS Series or gS Series MFD upgraded to run LightHouse™ 3.

- Checking online for software updates.
- The Wireless (Miracast) display.
- LightHouse apps.
- Customizable splashscreen.
- Bluetooth audio output.
- UAV integration
- ClearCruise™ Augmented Reality

## Compatible MFDs

The MFDs listed below can be upgraded to run Raymarine's new LightHouse™ 3 operating system.

### eS Series MFDs

eS75 (E70263)	eS77 (E70264)
eS78 (E70265)	eS97 (E70274)
eS98 (E70275)	eS127 (E70275)
eS128 (E70285)	

### gS Series MFDs

gS95 (E70124)	gS95 INV (E70183)
gS125 (E70125)	gS125 INV (E70184)
gS165 (E70126)	gS165 INV (E70185)
gS195 (E70213)	

## Feature differences

The table below shows the differences between LightHouse™ 2 R19 and LightHouse™ 3 version 3.3 (LH3.3) and above, running on an **eS Series** or **gS Series** MFD. If in any doubt, contact Raymarine Technical Support for advice.

### Navigation

Feature	LightHouse™ 2	LightHouse™ 3
3D chart mode	Yes	No
Number of Boat icons	2 – changes automatically with boat type selection.	12 – independent selection.
Boat icon context menu	No	Yes
Chart measurement ruler	Yes	No
Chart synchronization — split screen pages	Yes	No
Enhanced AIS symbols	No	Yes
Find nearest (info)	Yes	LH3.4
Fuel manager	Yes	LH3.4
GRIB weather viewer	Yes	No
Nearby objects (selection)	No	Yes
Race sailing features	Yes	No
SAR (Search And Rescue) patterns	Yes	No
Target interception	Yes	No
Tide and Current graphs	Yes	LH3.4
Waypoint capacity	3,000	10,000
Waypoint search area box	Yes	No



## Data and controls

Feature	LightHouse™ 2	LightHouse™ 3
Alarm history	Yes	LH3.4
Databars	Top Databar	Sidebar
Available data items	117	LH3.4 = 134 LH3.5 = 137
Dashboard — more available page layouts	10	7
Dashboard — each app instance unique	No	Yes
Digital switching alarm settings	Yes	LH3.4
Light color theme	Yes	No
Shared brightness	Yes	LH3.4

## Sonar

Feature	LightHouse™ 2	LightHouse™ 3
Channel specific Homescreen sonar icons	No	Yes
Number of DownVision and SideVision color palettes	4	10
Fish alarm	Yes	No
Historical sensitivity	No	Yes
Range/zoom controls	Standard	Enhanced
* RealVision™ 3D	No	Yes
SideVision — Auto range	No	Yes
Scrollback (sonar history)	No	Yes
Disable all Sonar from Shortcuts page	No	Yes
VRM (Variable Range Marker)	Yes	No

### Note:

\* Available when networked to a RV variant Axiom™ or Axiom™ Pro MFD.

## Radar

Feature	LightHouse™ 2	LightHouse™ 3
Bearing ring	Standard	Enhanced
Place waypoints in Radar app	Yes	No
Radar overlay color options	No	Yes
True/Relative vector button	No	Yes
Doppler Radar support	No	LH3.4

## Camera / Thermal

Feature	LightHouse™ 2	LightHouse™ 3
Align Thermal camera to mobile device	Yes	No
ClearCruise™ Object detection	No	Yes
Single app for both Thermal and daylight cameras	No	Yes
Unique Camera app instances	No	Yes
Camera cycling	Yes	No

## Entertainment

Feature	LightHouse™ 2	LightHouse™ 3
Bluetooth audio control	Yes	No
Bluetooth — RCU-3 connection	Yes	No
Document (pdf) viewer	Yes	LH3.5
SiriusXM audio	Yes	LH3.5
Video player (demo movie)	Yes	LH3.5

## General

Feature	LightHouse™ 2	LightHouse™ 3
Active alarm indication	No	LH3.4
Alarm Clock / Timer	Yes	No
MFD app modes	No	Yes
Custom splash screens	Yes	No
Number of Data overlays	2	4
Data overlays movable	No	Yes
Homescreen — Lat/Lon display	No	Yes
Homescreen — Move pages	Yes	No
Homescreen — Time info	No	Yes
Homescreen customization — drag and drop app pages	Yes	No
Menus — close when tapping away from menu	No	Yes
NMEA Logging	Yes	No
LiveView (in menu app display)	No	Yes
Sidebar	No	Yes
Simulated — Demo profiles	No	Yes
Simulator — Move boat here	No	Yes
Splitscreen app page — pane size adjustment	No	Yes
Transducer calibration	Yes	No
User profiles	No	Yes

## Engine integration

Feature	LightHouse™ 2	LightHouse™ 3
Honda ECO mode	Yes	LH3.4
Trim tab calibration	Yes	No

## Performing the LightHouse™ 3 upgrade

Performing the upgrade procedure will upgrade all eS Series and gS Series MFDs on the network.

Pre-requisites:

- Your eS or gS Series MFD must be running LightHouse™ 2 Release 15 or greater to perform the upgrade. Prior releases of LightHouse™ 2 will not recognise the software upgrade file.
  - You should back up your user data and any media files before performing the upgrade.
1. Disconnect and remove any a Series, c Series or e Series MFDs from your network.
  2. Download the LightHouse™ 3 upgrade file from the Raymarine® website:
    - i. Go to [www.raymarine.com/software](http://www.raymarine.com/software).
    - ii. Click **MFD software**.
    - iii. Click **eS & gS Series Models Only**.
    - iv. Follow the instructions to download the upgrade file.
  3. Perform a User data backup following the [Saving all user data to a memory card](#) procedure.

4. If you have any media files saved on your MFD that you want to keep, these should also be copied to a MicroSD card following the [Copying media files](#) procedure.
5. Copy the downloaded upgrade file to the root directory of your MicroSD card, ensuring that no other software update files are present on the card.
6. Insert the MicroSD card into a card reader slot on your MFD.
7. Perform the software update procedure:
  - i. Select **Check Card for Updates** from the Maintenance menu: (**Homescreen > Set-up > Maintenance > Check Card for Updates**).
  - ii. Select **OK**.
  - iii. Select the check box for each MFD that you want to upgrade.



*When upgrading from LightHouse™ 2 to LightHouse™ 3 the Available software version column will remain blank and 'Re-install' is displayed. Select and hold on the Available column to confirm the version number of the software upgrade you are about to install and then select **Install**.*

- iv. Select **Install now**.

The software upgrade procedure will commence. Please be patient and do not power off the MFD whilst the upgrade is in progress. During the upgrade process the MFD will re-boot. When complete your MFD will boot up with the new LightHouse™ 3 operating system.

8. Perform a Factory reset following the [Performing a settings or factory reset](#) procedure.
9. If applicable, update any Axiom™ MFDs so that the software version matches your upgraded eS or gS Series MFD.
10. If applicable, add any Axiom MFDs to your system or, add your upgraded eS or gS MFD to a system already containing Axiom™ MFDs.
11. If requested, select a Datamaster MFD and / or complete the Startup wizard.

*In a mixed MFD network it is recommended that an Axiom™ MFD is selected as the Datamaster.*

12. If applicable, restore your user data following the [Import user data](#) procedure.
13. Familiarise yourself with the new LightHouse™ 3 operating system by reviewing the LightHouse™ 3 operation instructions available from the website.

## Saving all user data to a memory card

You can save all user data to one archive file.



With the Homescreeen displayed:

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

The onscreen keyboard is displayed.

6. Using the keyboard, enter the filename you want to save the file as.
7. Select **SAVE**.

The select external storage dialog is displayed.

8. Select **SD1** (single or top card reader slot) or **SD2** (bottom card reader slot).  
A confirmation dialog is displayed.
9. Select **OK**.

## Copying media files

Recorded video and images, that are stored on your MFDs internal memory, can be copied to MicroSD card.

With a MicroSD card inserted into a card reader slot of your MFD:

From the **Homescreeen**:

1. Select **My Files** from the **My Data** menu: (**Homescreeen** > **My Data** > **My Files**).
2. Navigate to the required file by selecting folders to see its contents.
3. Highlight the file that you want to copy.
4. Select **Copy** from the File options.

*If you have more than 1 MicroSD card inserted, you will need to select which card to save the file to by selecting **SD1** or **SD2**.*

5. Select **Yes**.

The file will now copy to your MicroSD card.

6. Once the file has copied, select **OK** from the confirmation dialogue.
7. Repeat steps 2 to 5 above for each file that you want to copy.

## Performing a settings or factory reset

Performing a **Factory reset** will erase ALL user data and reset the MFD's settings to Factory default values. Performing a **Settings reset** will restore your MFD's settings to factory defaults, whilst retaining user data.

1. Select **Settings reset**, from the **This display** tab: **Homescreen > Settings > This display > Settings reset** to perform a settings reset.
2. Select **Factory reset**, from the **This display** tab: **Homescreen > Settings > This display > Factory reset** to perform a factory reset.

## Importing user data

You can import user data (i.e.: Waypoints, Routes and Tracks) to your MFD.

1. Insert the MicroSD card that contains your user data files into a card reader slot on your MFD or connected card reader.
2. Select **Import from card** from the Import/export page: (**Homescreen > My data > Import/export > Import from card**).
3. Select the relevant SD card slot from the file browser and then navigate to your User data file (.gpx).
4. Select the relevant GPX file.  
Your user data has now been imported.
5. Select **OK**.



# Index

3rd party apps	
LightHouse apps.....	270

## A

Activate Touchlock .....	41
ActiveCaptain .....	128
Adjust Locked heading.....	41
Advance waypoint.....	87
Aerial layer .....	127
AIS	
Enhanced symbols.....	113, 181
Enhanced symbols (targets).....	112, 181
Silent mode.....	57, 113, 181
Target list.....	179
Target status.....	113, 181
Target symbols .....	113, 180
Target tracking.....	179
AIS layer .....	127
AIS, Buddy.....	228
AIS, buddy list.....	110
AIS, target list .....	110
AIS, Target tracking .....	110
Alarm manager .....	67
Alarms .....	67
Acknowledgement.....	71
Active.....	67
AIS safety messages.....	70
Anchor drift.....	70
AX8 camera.....	71
Cross track error (XTE).....	70
Dangerous .....	67
Dangerous AIS targets.....	69
Dangerous Radar targets.....	69
Deep water arrival .....	71
Digital switching.....	71–72
DSC.....	70
Engine.....	71
External speaker .....	71
Fishing range .....	71
Guard zone 1.....	70
Guard zone 2 .....	70
History.....	68
Lost Radar targets.....	69
Low fuel .....	70
MOB data type.....	70
Off track .....	70
Settings.....	69
Shallow water arrival.....	71
Warning .....	67
Water temperature.....	71
Waypoint arrival .....	70
Animated weather .....	136
App launcher .....	270
App pages	
Creating .....	54
Customizing .....	54
Applications.....	52
Apps .....	52
LightHouse .....	22
MFD .....	22
AR200 .....	234

Calibration.....	234
Audio app.....	244
app controls.....	239
Balance .....	246
Crossover .....	246
Fade.....	246
Menu options.....	246
Opening.....	242
Player controls .....	239
Settings.....	246
Source .....	244
Zones.....	244
Audio controls .....	239
Augmented Reality .....	220
AIS targets .....	230
AR200 setup.....	223
Camera installation and setup .....	221
Cartography source .....	230
ClearCruise settings .....	230
Compass bar.....	229–230
Flags .....	227
Goto flag .....	229
Range limit.....	230–231
Roll correction.....	232
Troubleshooting .....	295
Waypoints .....	230
Augmented Reality, camera FOV .....	221
Augmented Reality, Overview.....	226
Auto acquisition	
Data source requirements .....	182
Auto turn.....	90
Automatic linearization .....	235
Autopilot	
Adjust locked heading.....	41
Advanced settings .....	89
Control .....	84
Debug .....	89–90
Disengage .....	85–87
Engage or Disengage .....	41
Engaging.....	84
Pop-ups.....	88
Reset.....	89
Shortcuts.....	42
Sidebar .....	86
Standby.....	85
Status.....	86

## B

Back up	
Settings.....	63
User data .....	63
Backup	
MFD settings.....	64
Routes .....	64
Tracks .....	64
Waypoints .....	64
Barbs .....	145
Battery .....	202
Battery data .....	202
Battery selection.....	76
Bearing mode .....	208
Bird mode .....	176
Bluetooth	

Audio .....	48, 273
Connection .....	273
Disabling .....	273
Enabling .....	273
pairing speaker .....	48, 273
Settings .....	273
Speaker volume .....	42, 274
Volume .....	41, 270
Boat data .....	202
Boat details .....	75
Boat Icon .....	75
Boat name .....	75
Brightness .....	41–42
Shared .....	77
Buddy, add to list from AR flag .....	228
Buoy mode .....	176

## C

Calibration .....	234
Linearization .....	234
RealVision™ 3D .....	39
Calibration lock .....	89
Calibration, reset .....	235
Camera	
Tracking .....	108, 167
Cartography .....	127
Chart	
Boat position .....	129
ClearCruise .....	125
Contours .....	128
Controls .....	103
Current animation .....	115
Current graph .....	118
Current station .....	117
Detailed mode .....	105
Field of View (FOV) .....	125
Find nearest .....	120
Fishing mode .....	105
Layers .....	107, 127
Motion mode .....	129
Orientation .....	129
Radar settings .....	112
Search for objects .....	120
Simple mode .....	105
Tide animation .....	115
Tide bar .....	116
Tide graph .....	116
Tide station .....	116
Tides mode .....	105, 115
Weather mode .....	105
Chart detail .....	127
Chart,	
Modes .....	105
Cities layer .....	140
ClearCruise	
Augmented Reality (AR) .....	220
Object detection .....	220, 225
ClearCruise, Object detection .....	224
Coastal mode .....	176
COG/SOG filter .....	59
Color gain .....	160
Community edits .....	127
Compass	

Alignment .....	89
Linearization .....	234–235
Lock .....	89
Offset .....	89
Restart .....	89
Compass lock .....	235–236
Compass offset .....	235
Compatible entertainment systems .....	238–239
Connecting	
Mobile device .....	277
RayControl .....	278
RayRemote .....	279
RayView .....	280
Connection	
NMEA 0183 .....	80
Connections	
Bluetooth .....	273
Internet .....	272
Wi-Fi .....	272
Contact details .....	304
Controls	
Chart .....	103
Dashboard .....	200
Radar .....	166
Sonar .....	150
Video app .....	211
CPA .....	189
Cross track error .....	109
Cruise speed .....	89
Current reading .....	235

## D

Dangerous targets .....	111
Dashboard	
Controls .....	200
Data .....	202
Boat .....	202
Depth .....	202
Distance .....	202
Engine .....	203
Environmental .....	204
Fuel .....	203
GNSS (GPS) .....	204
Heading .....	204
Navigation .....	205
Speed .....	205
Time .....	205
Wind .....	206
Data import and export .....	61
Data items	
Data overlays .....	24
Sidebar .....	24
Data master .....	76
Designation .....	77
Multiple .....	36
Selection .....	36
Data overlays .....	24
Data sources	
Selection .....	38
Demo	
Movie .....	56
Profiles .....	56
Demo movie	



format.....	56
Depth data.....	202
Depth offset.....	39
Deviation .....	235
Diagnostics.....	305
Product info .....	285
Digital switching	
Exporting pages.....	207
Importing pages.....	207
Disable all Sounders.....	41
Distance data .....	202
Dockside wizard .....	89
Document history .....	310
Documentation.....	18
Doppler	
Data source requirements .....	193
Overview.....	192
Drive polarity .....	90
Drive type .....	89
Dual range.....	112

## E

Easy View .....	127
Engage / Disengage autopilot.....	41
Engine connection wizard .....	76
Engine data .....	203
Engine identification wizard .....	38
Engine selection .....	75
Environment data .....	204
eS Series .....	318
Export	
Routes.....	64
Settings.....	63
Tracks .....	64
User data .....	63
Waypoints .....	64
External storage	
Inserting .....	46
Removal .....	46

## F

Factory reset .....	286–287
FAQs.....	306
File browser.....	63
First power up .....	36
Fishing range.....	129
Follow .....	109
FOV layer .....	127
Fuel data.....	203
Fuel manager .....	61
Set-up .....	62
Fuel tank selection .....	76
Fusion.....	239

## G

GNSS (GPS) .....	59
GNSS (GPS) data .....	204
GNSS (GPS) Settings .....	59
GNSS/GPS troubleshooting.....	289
Goto waypoint .....	109
GPS.....	59

gpx.....	63
gS Series .....	318
Guard zone alarms .....	191
Gybe .....	90

## H

Harbor mode .....	176
Hard over time.....	90
Heading data.....	204
High res bathy .....	127
Homescreen.....	51

## I

Import	
Settings.....	63
User data .....	63
Import/export.....	61
Initial setup .....	36
Internal GNSS (GPS) .....	59
Internet connection .....	272
IP address.....	305

## K

Knowledge base.....	306
---------------------	-----

## L

Languages.....	75
Selection .....	75
LightHouse 3	
Compatible MFDs .....	18, 314
LightHouse™ 3	
Tips and Tricks .....	306
LightHouse 3 upgrade.....	318
LightHouse apps .....	270
Background app .....	270
Lumishore .....	271
Netflix.....	271
Requirements .....	271
Spotify.....	271
Theyr.....	271
Limitations on Use .....	50
Limitations on Use (LoU).....	50
Linearization .....	234–235
Locked heading.....	84, 86
Lumishore.....	271

## M

Magnetic deviation .....	234
magnetic interference .....	234
Man Overboard (MOB) .....	73
MARPA	
Data source requirements .....	182
Media files .....	61
Memory cards, compatibility.....	44
Menus	
Settings.....	27, 74
Types .....	25
MFD	

Buttons.....	30
Controls .....	30
MFD alarms .....	270
MFD settings	
Import.....	64
Restore .....	64
MicroSD	
Adaptor.....	44
Inserting.....	45
Removal.....	45
Miracast.....	81
Mobile apps.....	276
Motor phasing .....	90
Multiple data sources (MDS).....	37
Mute .....	244
My data.....	61

## N

N2K PGNs.....	308
Navigation data .....	205
Navigation mode .....	84, 87
Navionics plotter sync .....	281
Netflix .....	271
New features .....	19
NMEA 0183	
Baud rate .....	80
Notifications.....	67

## O

Object detection.....	224
ClearCruise settings .....	225
Offshore mode .....	176

## P

Pairing	
Quantum radar.....	48
RMK keypad.....	48
PDF.....	63
PDF viewer .....	65
Find.....	66
Search.....	66
PGN support.....	308
Pilot icon.....	84
Pilot sidebar.....	84
Point camera here .....	108, 167
Position.....	59
Power off .....	41
Power steering .....	90
Power troubleshooting .....	286
Powering off .....	33–34, 173
Powering on .....	33–34
Primary MFD.....	76
Product information.....	305
Product support.....	304

## R

Radar	
Antenna size selection.....	175
Bearing alignment.....	175
Color Gain.....	194

Comparison .....	169
Compatible scanners.....	171
Controls .....	166
Dual range .....	174
Features.....	169
Gain .....	194
MARPA.....	184
Modes.....	176
Rain.....	194
Range and Bearing .....	177
Sea.....	194
Selecting a scanner .....	174
Sensitivity controls.....	194
Settings.....	195
Stop transmitting.....	41
Target settings.....	186
Timed transmit .....	175
Radar Doppler	
Color palettes .....	192
Mode.....	192
Radar layer .....	127
Radar target	
Automatic acquisition .....	184–185
Cancel target .....	189
Cancel targets.....	186
Clear trails.....	188
Context menu .....	189
History.....	187
Information.....	189
List .....	185
Manual acquisition.....	184
Reference mode .....	186, 188
Relative mode.....	186
Shown CPA .....	189
Symbols .....	183
Tracking .....	182
Trails (Wakes).....	188
True mode .....	186
Vectors .....	187
Radar troubleshooting.....	288
Radar without heading .....	112
Radar, target list .....	110
Range ring layer .....	127
RayControl.....	276, 278
RayRemote .....	276, 279
RayView.....	276, 280
RealVision 3D	
Controls .....	151
Waypoints .....	157
Receiver status.....	135
Recovery mode .....	286–287
Rockford Fosgate .....	239
Route .....	95
Capacity.....	95
Creation .....	95
Follow .....	109
Importing.....	96
List .....	61, 97
Rudder	
Damping .....	90
Limit .....	90
Offset.....	90
Reverse reference .....	90
Rudder bar.....	86

## S

Safe depth, minimum.....	75
Safe distance.....	112
Safe height, minimum.....	75
Safe width, minimum.....	75
Save settings.....	64
Saving	
Product information.....	285
SBAS.....	59
Screen mirroring.....	81
Screen resolutions.....	79
Screenshot.....	41
Sea surface temperature.....	143
Service Center.....	304
Settings menu.....	74
Shared brightness.....	77
Shortcuts menu.....	41
Sidebar.....	23
Pinning.....	23
Selection.....	23, 86
Simulator, <i>See</i> Demo	
Sirius XM.....	238
SiriusXM weather.....	134
Slew to Cue.....	108, 167
Software	
Compatible MFDs.....	18, 314
Software updates.....	47
Software version.....	18
Sonar	
App overview.....	150
Auto range.....	151
Channel selection.....	153
Channels.....	156
Controls.....	150
Disable all sounders.....	41
Gain.....	160
History.....	159
Intensity.....	160
No source.....	154
No transducer.....	154
Noise filter.....	160
Range.....	151
Scroll back.....	159
Sensitivity controls.....	160
Surface filter.....	160
TVG (Time Varied Gain).....	160
Waypoints.....	157
Zoom mode.....	151
Sonar logs.....	128
SonarChart Live.....	122, 128
Enabling.....	122
Tide correction.....	122
Speed data.....	205
Speed input.....	89
Splashscreen customization.....	79
Splashscreen reset.....	79
Splashscreen resolution.....	79
Sports fishing.....	127
Spotify.....	271
Startup wizard.....	36
Status area.....	57
Status area icons.....	57
Steer to Hdg.....	86–87

Steer to Nav.....	86
Stop Radar transmitting.....	41
Storm cast.....	142
Storm tracks.....	142
Support forum.....	306
Surface observation stations layer.....	140
Surface pressure	
Animated.....	137
Switching off.....	33–34
Switching on.....	33–34
System Datum.....	208

## T

Take Screenshot.....	41
Target tracking.....	110
Technical support.....	304, 306
Thermal camera	
Tracking.....	108, 167
Theyr.....	271
Third-party apps.....	270
Tides layer.....	127
Tides mode	
Animation controls.....	115
Animation interval.....	130
Displaying graphs.....	119
Time data.....	205
Time/Date format.....	76, 207
Touchlock.....	41
Track with camera.....	108, 168
Tracking	
Thermal Camera.....	108, 167
Tracks.....	99
Capacity.....	99
Creation.....	99
Customize.....	100
Interval.....	100
List.....	61, 100
Trails clearing.....	188
Trails reset.....	188
Training courses.....	306
Transducer	
Configuration.....	39
Selection.....	39
Setup.....	39
Temperature calibration.....	39
Temperature settings.....	39
Trip	
Counter.....	61
Reset.....	61
Trip logs.....	61
Troubleshooting.....	284
Augmented Reality.....	295
Tutorials.....	18

## U

UAV	
App.....	260
App overview.....	251
Assuming control.....	268
Chart icon.....	123, 266
Chart integration.....	123, 266
Circle me.....	265

Compatible devices .....	252	Watchbox alerts.....	146
Connection .....	254	Wave direction .....	
Controller RC Cable .....	254	Animated .....	137
Controller signal lost.....	268	Wave height .....	
Controls .....	262	Animated .....	136
Critical battery.....	268	Wave period .....	
Disclaimer .....	250	Animated .....	136
Disconnect.....	264	Waypoint .....	92
Emergency procedures .....	268	capacity.....	92
Fish on .....	265	Goto .....	109
Flight.....	262	List .....	61
Flight data .....	251	Placement .....	157
Getting started .....	257	Waypoint, place from AR flag .....	229
Goto .....	123, 266	Weather data date.....	135
Icon .....	123, 266	Weather layers .....	134
launching .....	261	Weather mode.....	134, 176
Low battery .....	268	Weather Radar .....	
Manual control .....	268	Animated .....	136
No connection .....	259	Weather Radar layer.....	127
No-fly zone.....	256	Wi-Fi .....	
pre-requisites.....	254	Settings.....	272
Precautions .....	256	Wind .....	
Record .....	251	Data type .....	90
Registration failed .....	259	Shift.....	90
Restricted airspace .....	256	Wind arrows.....	145
Retrieval .....	263	Wind data .....	206
Set up sequence.....	257	Wind direction .....	145
Settings.....	252	Animated .....	136
Splitscreen page.....	258	Wind fields.....	142
Sport mode .....	252	Wind Radii .....	142
Status area.....	252	Wind speed .....	145
Take off.....	261	Wireless display.....	81
Take photo.....	251		
vectors .....	123, 266		
Virtual joysticks .....	251		
Uni-controller .....			
Functions .....	32		
Units .....	76, 207		
Unmute.....	244		
Unpairing .....			
RMK keypad.....	48		
Upgrading, software .....	47		
User data .....	61		
Import.....	64		
Restore .....	64		
Back up .....	63		
User programmable button (UPB) .....	40		

## V

Variation .....	208
Vessel hull type .....	89
Video .....	210
Feed selection .....	214
Renaming feeds.....	211
Video app .....	
Controls .....	211
Video app pages .....	210
Video Gallery.....	306
Video, viewing multiple inputs.....	210

## W

Warranty .....	304
----------------	-----

## X

XTE,	
Restart.....	109





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