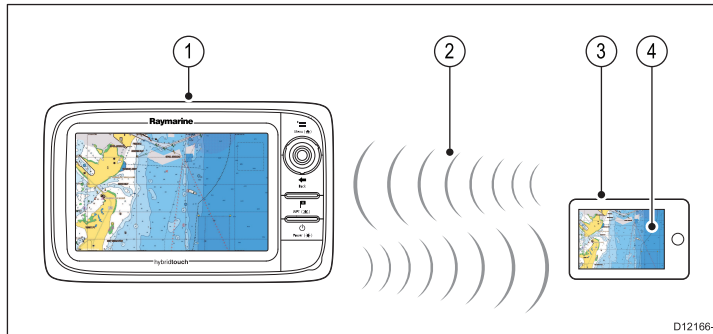


- Enable Device Streaming in the System Settings on the multifunction display.

## Navionics chartplotter sync connection

You can wirelessly synchronize waypoints and routes between the multifunction display and an iPhone or iPad.



1. Multifunction display.
2. WiFi connection.
3. Apple iPhone or iPad.
4. Navionics Marine app.

To use this feature you must first:

- Download and install the Navionics Marine app, available from the Apple App Store.
- Enable WiFi in the System Settings on the multifunction display.
- Enable WiFi on your iPhone or iPad.
- Select the Raymarine WiFi connection from the list of available WiFi networks on your iPhone or iPad.



## Chapter 4: Location and mounting

### Chapter contents

- 4.1 Selecting a location on page 66
- 4.2 Removing the rear bezel on page 68
- 4.3 Flush mounting on page 69
- 4.4 Attaching the rear bezel on page 70
- 4.5 Bracket (trunnion) mounting on page 70
- 4.6 Front bezel on page 72

## 4.1 Selecting a location



### Warning: Potential ignition source

This product is NOT approved for use in hazardous/flammable atmospheres. Do NOT install in a hazardous/flammable atmosphere (such as in an engine room or near fuel tanks).

### General location requirements

When selecting a location for your display it is important to consider a number of factors.

Key factors which can affect product performance are:

- **Ventilation**

To ensure adequate airflow:

- Ensure that equipment is mounted in a compartment of suitable size.
- Ensure that ventilation holes are not obstructed. Allow adequate separation of equipment.

Any specific requirements for each system component are provided later in this chapter.

- **Mounting surface**

Ensure equipment is adequately supported on a secure surface. Do not mount units or cut holes in places which may damage the structure of the vessel.

- **Cable entry**

Ensure the unit is mounted in a location which allows proper routing and connection of cables:

- Minimum bend radius of 100 mm (3.94 in) unless otherwise stated.
- Use cable supports to prevent stress on connectors.

- **Water ingress**

The display is suitable for mounting both above and below decks. It is waterproof to IPX6 standard. Although the unit is waterproof, it is good practice to locate it in a protected area away from prolonged and direct exposure to rain and salt spray.

- **Electrical interference**

Select a location that is far enough away from devices that may cause interference, such as motors, generators and radio transmitters / receivers.

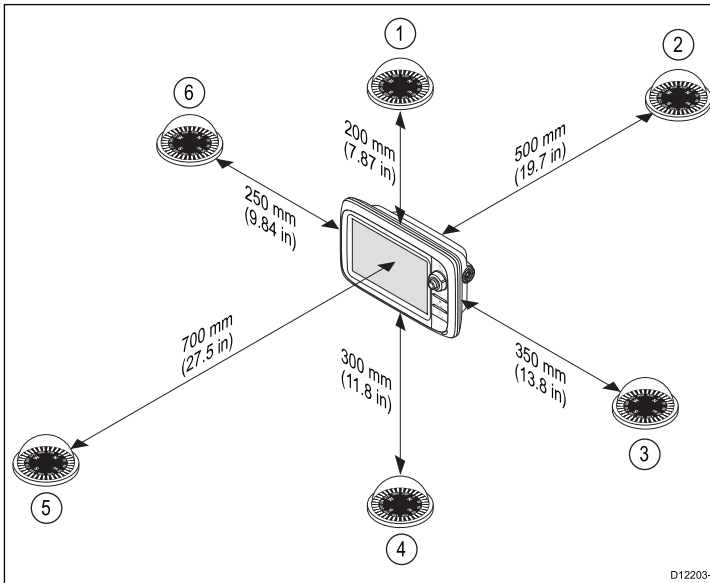
- **Power supply**

Select a location that is as close as possible to the vessel's DC power source. This will help to keep cable runs to a minimum.

### Compass safe distance

To prevent potential interference with the vessel's magnetic compasses, ensure an adequate distance is maintained from the display.

When choosing a suitable location for the multifunction display you should aim to maintain the maximum possible distance between the display and any compasses. Typically this distance should be at least 1 m (3 ft) in all directions. However for some smaller vessels it may not be possible to locate the display this far away from a compass. In this situation, the following figures provide the minimum safe distance that should be maintained between the display and any compasses.

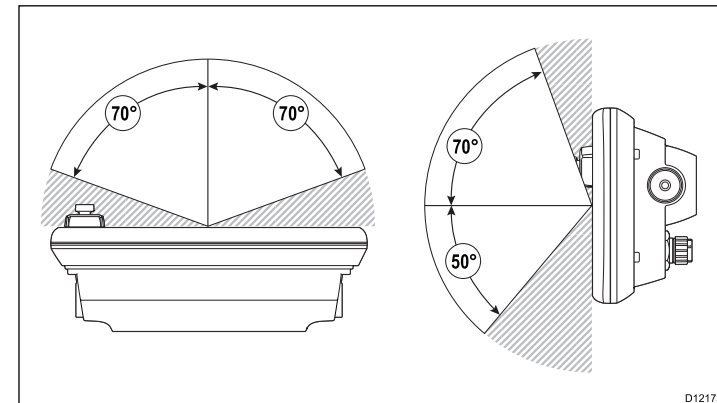


Item	Compass position in relation to display	Minimum safe distance from display
1	Top	200 mm (7.87 in.)
2	Rear	500 mm (19.7 in.)
3	Right-hand side	350 mm (13.8 in.)
4	Underside	300 mm (11.8 in.)
5	Front	700 mm (27.5 in.)
6	Left-hand side	250 mm (9.84 in.)

### Viewing angle considerations

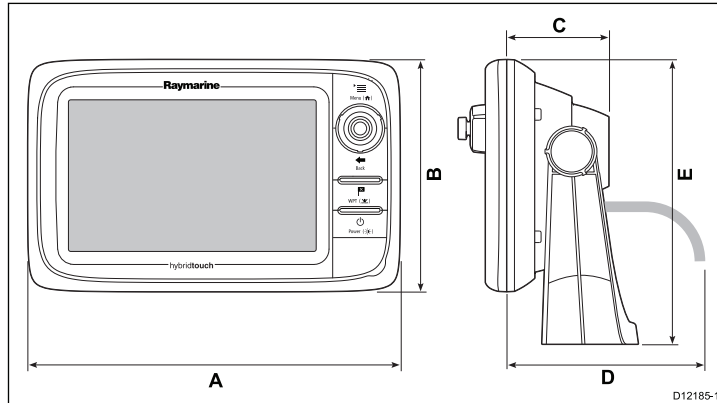
As display contrast, color and night mode performance are all affected by the viewing angle, Raymarine recommends you temporarily power up the display when planning the installation, to enable you to best judge which location gives the optimum viewing angle.

### Viewing angle



**Note:** The angles stated are for a contrast ratio of equal to or greater than 10.

## Product dimensions

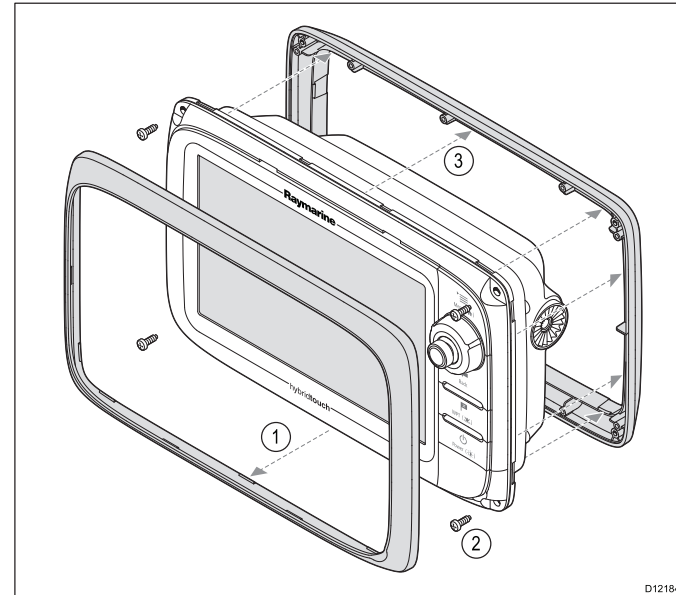


A	233 mm (9.17 in.)
B	145 mm (5.71 in.)
C	64 mm (2.52 in.)
D	150 mm (5.9 in.)
E	180 mm (7.09 in.)

## 4.2 Removing the rear bezel

You must remove the rear bezel before flush-mounting the display.

1. Remove the front bezel. Refer to the separate instructions provided for that procedure.

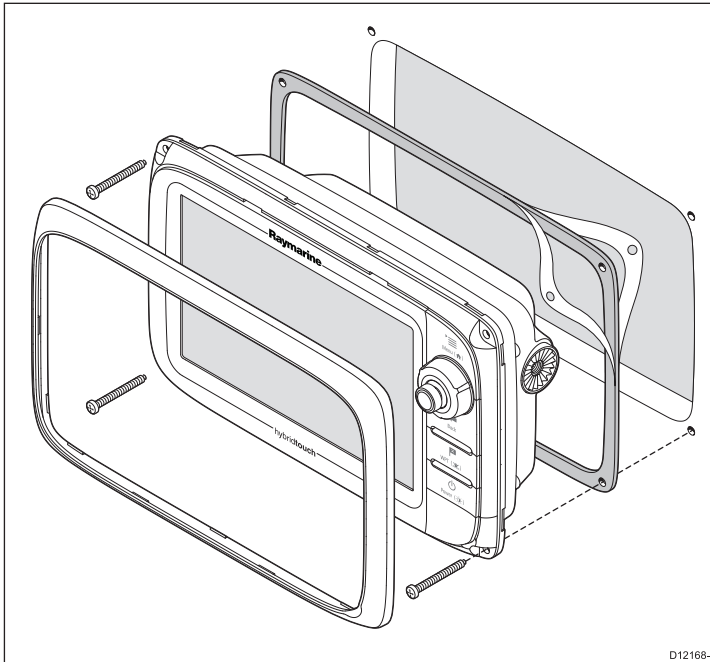


2. Remove the screws that secure the bezel to the display.
3. Carefully remove the bezel from the rear of the display, pulling the bezel gently along the:
  - i. Outer edges - work from the sides upwards and then along the top edge, ensuring that the clips are fully released from the display.
  - ii. Inner edges - ensure that the bezel is completely removed from the display.

## 4.3 Flush mounting

You can mount the display in a flush or panel mounting arrangement. Before mounting the unit, ensure that you have:

- Selected a suitable location.
- Identified the cable connections and route that the cables will take.
- Detached the front bezel.



1. Check the selected location for the unit. A clear, flat area with suitable clearance behind the panel is required.

2. Fix the appropriate cutting template supplied with the product, to the selected location, using masking or self-adhesive tape.
3. Using a suitable hole saw (the size is indicated on the template), make a hole in each corner of the cut-out area.
4. Using a suitable saw, cut along the inside edge of the cut-out line.
5. Ensure that the unit fits into the removed area and then file around the rough edge until smooth.
6. Drill 4 holes as indicated on the template to accept the securing screws.
7. Place the gasket onto the display unit and press firmly onto the flange.
8. Connect the power, data and other cables to the unit.
9. Slide the unit into place and secure using the provided screws.

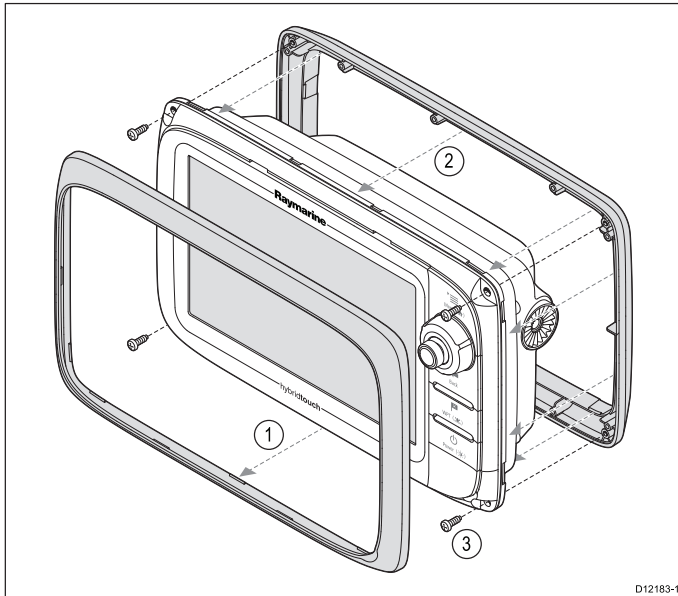
**Note:** The appropriate torque to use when drilling depends on the thickness of the mounting surface and the type of material.

**Note:** The supplied gasket provides a seal between the unit and a suitably flat and stiff mounting surface or binnacle. The gasket should be used in all installations. It may also be necessary to use a marine-grade sealant if the mounting surface or binnacle is not entirely flat and stiff or has a rough surface finish.

## 4.4 Attaching the rear bezel

The rear bezel must be fitted before mounting the unit on the supplied trunnion bracket.

1. Remove the front bezel. Refer to the separate instructions provided for that procedure.
2. Place the bezel over the rear of the display, ensuring that it is correctly aligned with the display. Apply firm but even pressure to the bezel along the:
  - i. Outer edges - work from the sides upwards and then along the top edge, to ensure that it clips securely into position.
  - ii. Inner edges - ensure that the bezel sits flat against the unit.



3. Use the supplied screws to secure the bezel to the display.

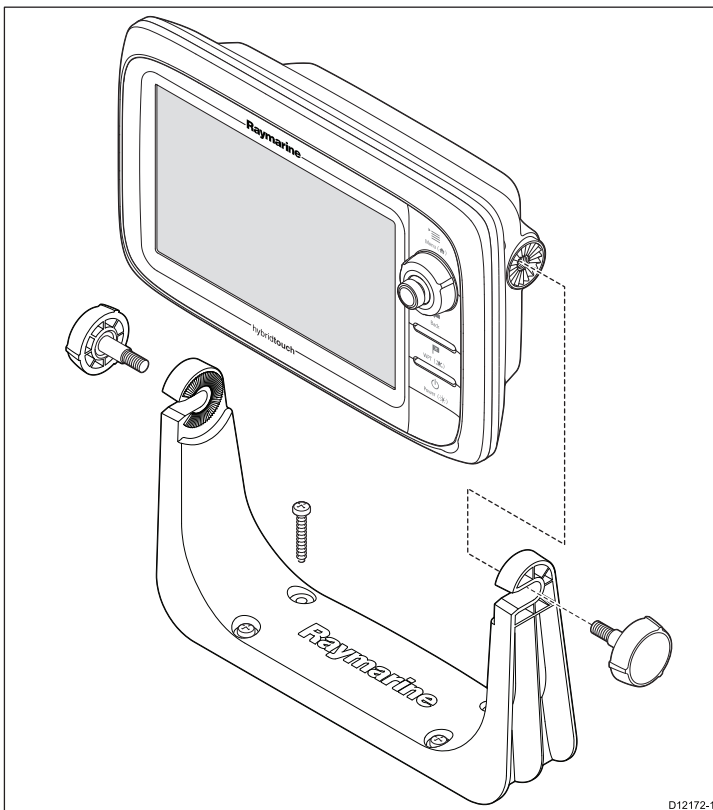
## 4.5 Bracket (trunnion) mounting

The display can be mounted on the supplied bracket.

Before mounting the unit ensure that you have:

- Selected a suitable location.
- Identified the cable connections and route that the cables will take.
- Attach the front bezel.





**Note:** The appropriate torque to use when drilling depends on the thickness of the mounting surface and the type of material.

1. Mark the location of the mounting bracket screw holes on the chosen mounting surface.
2. Drill holes for the screws using a suitable drill, ensuring there is nothing behind the surface that may be damaged.
3. Use the supplied screws to attach the mounting bracket securely.
4. Attach the display unit to the mounting bracket.

Location and mounting

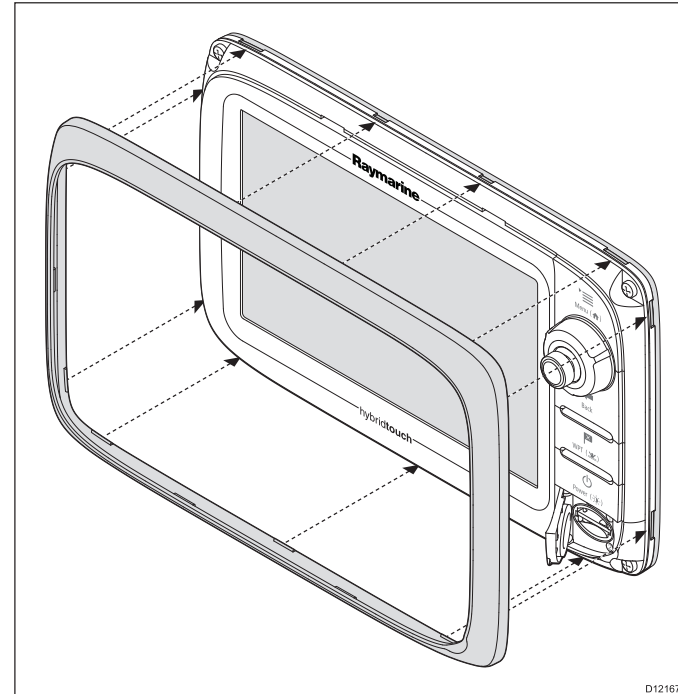
## 4.6 Front bezel

### Attaching the front bezel

The following procedure assumes that the unit has already been mounted in position.

1. Carefully lift one edge of the screen protection film, so that it is accessible for removing when unit installation is complete.
2. Ensure the memory card slot door is in the open position.
3. Orientate the bottom-right side of the bezel under the lip of the chart card door and place the bezel over the front of the display,

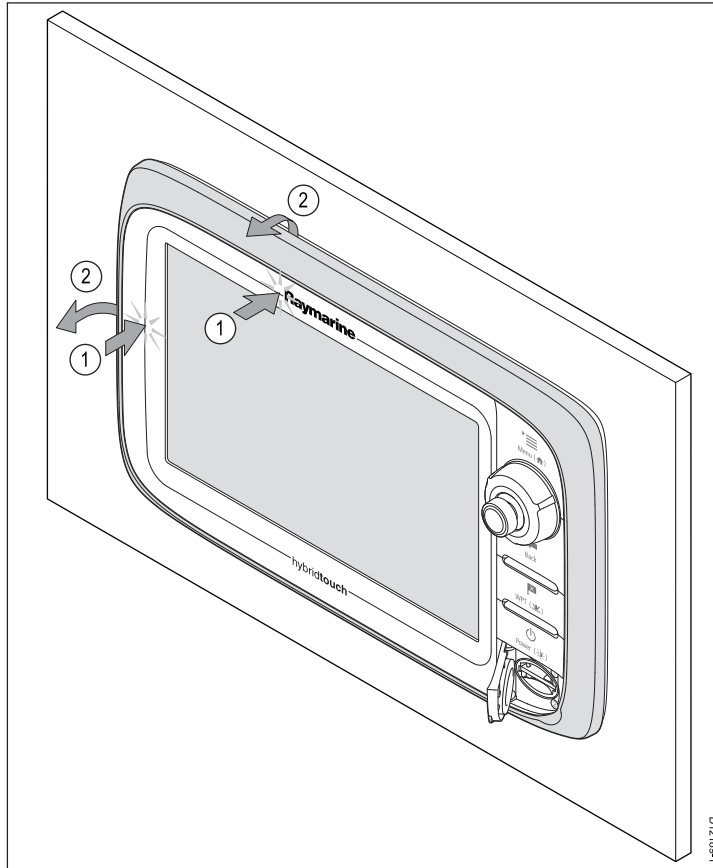
ensuring that the clips along the bottom edge of the bezel latch into position.



4. Ensure the bezel is correctly aligned with the display, as shown.
5. Apply firm but even pressure to the bezel along the:
  - i. Outer edges - work from the sides upwards and then along the top edge, to ensure that it clips securely into position.
  - ii. Inner edges - particularly along the chart card door edge, to ensure that the bezel sits flat.
6. Check that all control buttons are free to operate.

## Removing the front bezel

Before proceeding ensure the memory card slot door is open.



**Important:** Use care when removing the bezel. Do not use any tools to lever the bezel; doing so may cause damage.

1. Place both your thumbs on the upper left edge of the display, at the positions indicated in the diagram above.
2. Place your fingers underneath the bezel, at the positions indicated in the diagram above.
3. In a single firm motion, apply pressure to the outer edge of the display with your thumbs and pull the bezel towards you using your fingers.

The bezel should now come away from the display easily.



## Chapter 5: System checks

### Chapter contents

- 5.1 Initial power on test on page 76
- 5.2 Designating the data master on page 78
- 5.3 GPS check on page 78
- 5.4 Radar check on page 81
- 5.5 Sonar check on page 83
- 5.6 Thermal camera setup and checks on page 84
- 5.7 Enabling autopilot functions on page 86
- 5.8 Enabling AIS functions on page 86
- 5.9 Language selection on page 87

## 5.1 Initial power on test

### Touchscreen overview

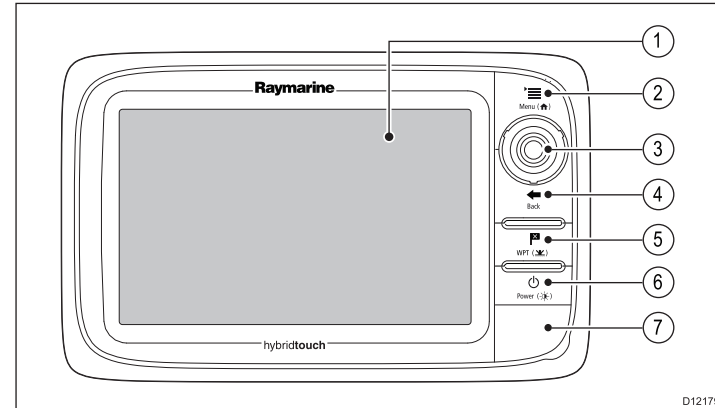
The touchscreen provides a quick way of performing many common functions.

Some of the functions you can operate with the touchscreen include:

- Accessing applications.
- Adding and editing applications pages.
- Placing and editing waypoints.
- Building routes.
- Panning the chart display.
- Placing and moving the cursor.

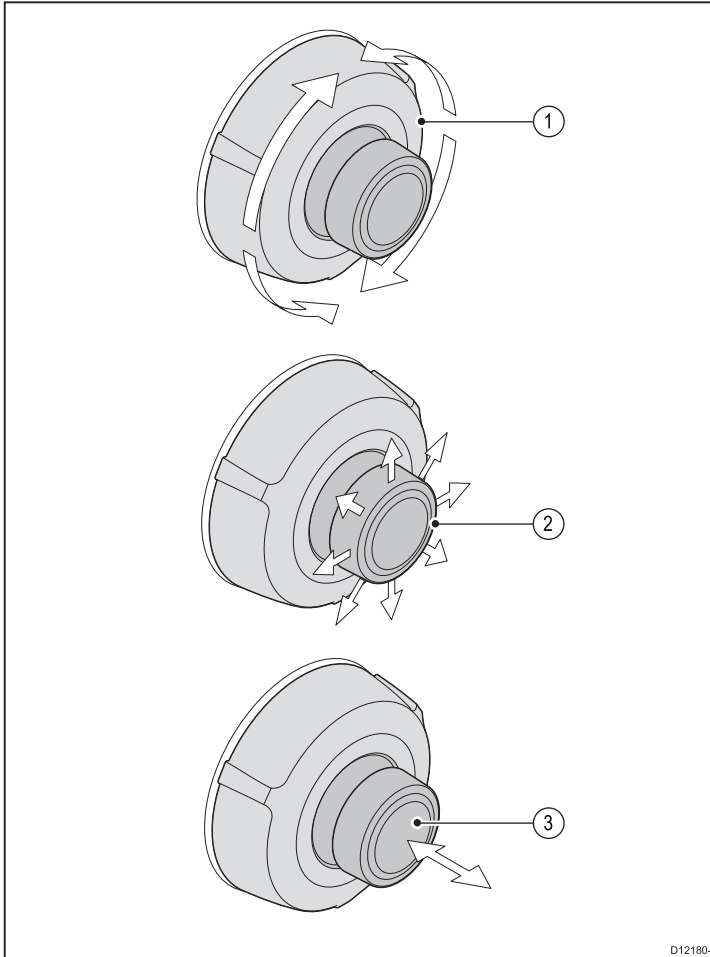
**Note:** Raymarine strongly recommends that you familiarize yourself with touch operations while your vessel is anchored or moored. You may find it helpful to use the simulator mode (accessible from **Homescreen > Set-up > System Settings**) in these situations.

### Controls



1. **Touchscreen** — you can touch the screen to operate many common functions, including all menu operations.
2. **Menu** — accesses menus. Press again to close menus.
3. **UniControl** — provides a joystick and rotary control and an OK button for using menus and applications.
4. **Back** — press to return to a previous menu or dialog level.
5. **WPTS / MOB** — press and release to access the waypoint options. Press again to place a waypoint. Press and hold to place a Man Overboard (MOB) marker at your current position.
6. **Power** — press once to switch the unit ON. Once powered on, press the Power button again to adjust the brightness, access the power controls for external devices, and access the autopilot controls. Press and hold to switch the unit OFF.
7. **Chart card slots** — open the card door to insert or remove MicroSD cards. There are 2 card slots (labelled 1 and 2), used for electronic charts and archiving waypoint, route and track data.

## UniControl



1. **Rotary** — use this to select menu items, move the on-screen cursor, and adjust the range in the chart and radar applications.
2. **Joystick** — use this to select menu items, and pan left and right in the chart and fishfinder applications.
3. **OK** button — push the end of the joystick to confirm a selection or entry.

### Powering the display on

1. Press and hold the **POWER** button until the Raymarine logo appears.
2. Press **OK** to acknowledge the disclaimer message.

## 5.2 Designating the data master

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

With the homescreen displayed:

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

## 5.3 GPS check

### GPS selection

You can use an internal or external GPS receiver.

- The multifunction display features an internal GPS receiver.
- You can also connect an external GPS receiver using SeaTalk<sup>ng</sup> or NMEA 0183.
- Use the System Settings menu to enable or disable the internal GPS receiver.

### Enabling or disabling the internal GPS

With the homescreen displayed:

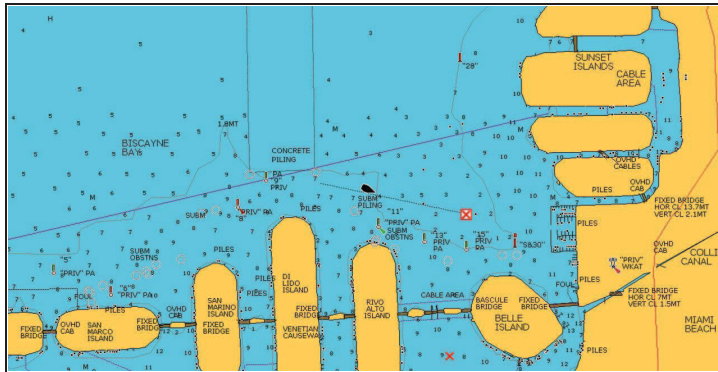
1. Select **Set-Up**.
2. Select **System Settings**.
3. Select **Internal GPS**.
4. Select the On or Off option as appropriate.

### Checking GPS operation

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

1. Select the Chart page.





2. Check the screen.

With the chart displayed, you should see:

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

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

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

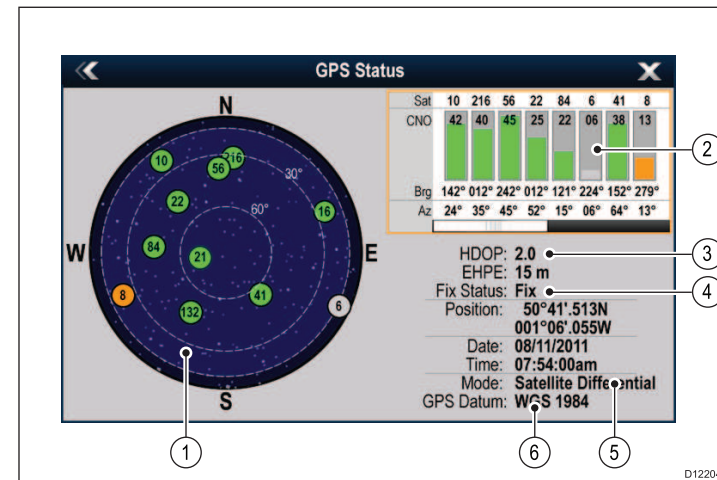
**Note:** A GPS Status screen is available within the Setup menu of Raymarine multifunction displays. This provides satellite signal strength and other relevant information.

## GPS setup

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

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

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



Item	Description
1	<b>Sky view</b> — a visual representation of the position of tracked satellites.
2	<p><b>Satellite status</b> — displays the signal strength and status of each satellite identified in the sky view diagram on the left of the screen. The colored bars have the following meanings:</p> <ul style="list-style-type: none"> <li>• Grey = searching for satellite.</li> <li>• Green = satellite in use.</li> <li>• Orange = tracking satellite.</li> </ul>
3	<p><b>Horizontal Dilution of Position (HDOP)</b> — a measure of GPS accuracy, calculated from a number of factors including satellite geometry, system errors in the data transmission and system errors in the GPS receiver. A higher figure signifies a greater positional error. A typical GPS receiver has an accuracy of between 5 and 15 m. As an example, assuming a GPS receiver error of 5 m, an HDOP of 2 would represent an error of approximately 15 m. Please remember that even a very low HDOP figure is NO guarantee that your GPS receiver is providing an accurate position. If in doubt, check the displayed vessel position in the chart application against your actual proximity to a known charted object.</p>
4	<b>Fix status</b> — indicates the actual mode the GPS receiver is reporting (No Fix, Fix, D Fix or SD Fix).
5	<b>Mode</b> — the mode currently selected by the GPS receiver.
6	<b>Datum</b> — The GPS receiver's datum setting affects the accuracy of the vessel position information displayed in the chart application. In order for your GPS receiver and multifunction display to correlate accurately with your paper charts, they must be using the same datum.

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

## 5.4 Radar check



### Warning: Radar scanner safety

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



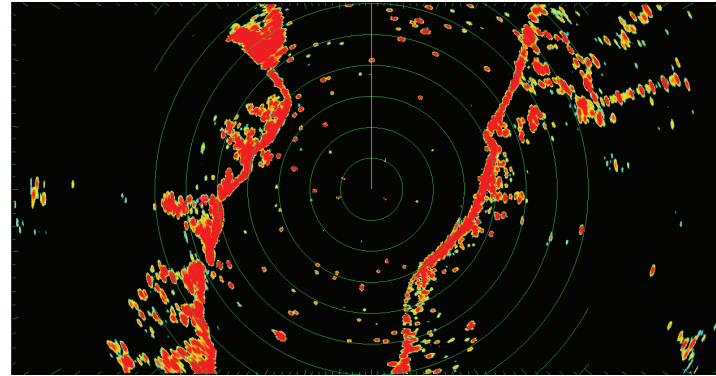
### Warning: Radar transmission safety

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

### Checking the radar

1. Select the Radar application.  
The Radar scanner will now initialize in standby mode. This process will take approximately 70 seconds.
2. Press the **MENU** button.
3. Select **Power** .
4. Select the On option.
5. Select **Radar**.
6. Select the Transmit option.  
The radar scanner should now be transmitting and receiving.
7. Check that the radar screen is operating correctly.

Typical HD digital radar screen



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

#### Points to check:

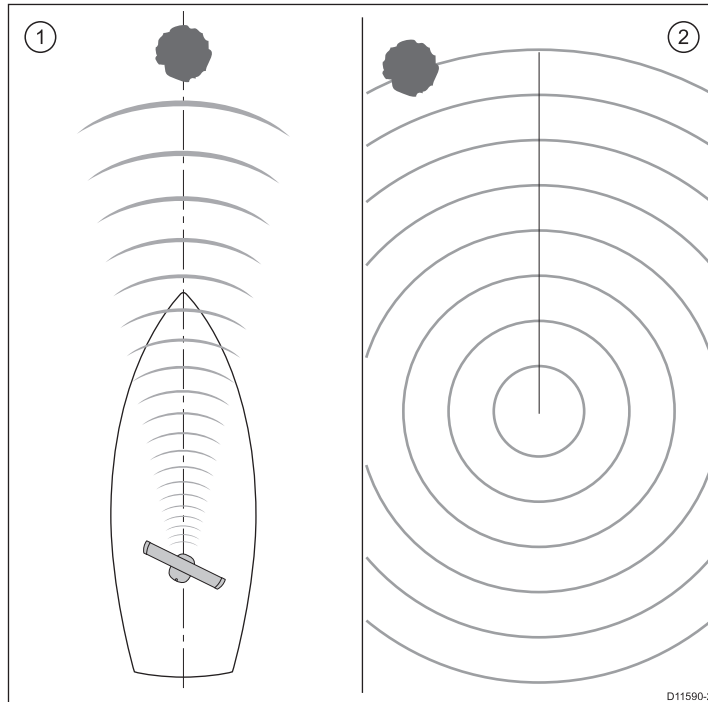
- Radar sweep with echo responses are shown on screen.
- Radar status icon rotating in top right hand corner.

### Check and adjust bearing alignment

#### Bearing alignment

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

### Example misaligned radar



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

### Checking the bearing alignment

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

### Adjusting the bearing alignment

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

With the radar application displayed:

1. Press the **MENU** button.
2. Select **Set-Up**.
3. Select **Advanced**.
4. Select **Bearing Alignment**.
5. Use the rotary control to place the selected target under the Ship's Heading Marker.
6. Press **OK** when complete.

## 5.5 Sonar check



### Warning: Sonar operation

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

### Sonar transducer and DSM selection

You must designate the sonar transducer and Digital Sounder Module (DSM) that you want to use.

#### Digital Sounder Module (DSM) selection

- “D” variant models are fitted with an internal sonar DSM.
- All models allow you to connect a compatible external DSM unit.
- If an external DSM unit is connected to a “D” variant model and a power supply the internal DSM is disabled.
- To use the internal DSM on “D” variant models that are also connected to an external DSM, disconnect the network cable from the external DSM unit and use the **Sounder Set-Up** menu in the fishfinder application to enable the internal DSM.

#### Transducer selection

- “D” variant models allow the direct connection of EITHER a Raymarine OR a Minn Kota sonar transducer.
- All models allow the connection of a Raymarine sonar transducer via a compatible external DSM unit.
- For all models use the **Transducer Set-Up** menu in the fishfinder application to specify the sonar transducer you want to use.

### Selecting the sonar DSM

Applicable only to multifunction displays with an internal DSM.

With the fishfinder application displayed:

1. Press the **Menu** button.
2. Select **Set-Up**.
3. Select **Sounder Set-Up**.
4. Select **Internal Sounder**.
5. Select the On option.

**Note:** The Internal Sounder menu item is disabled if an external DSM unit is connected to the multifunction display and a power supply. Disconnect the network cable from the external DSM unit to enable the display’s internal DSM option.

### Selecting the sonar transducer

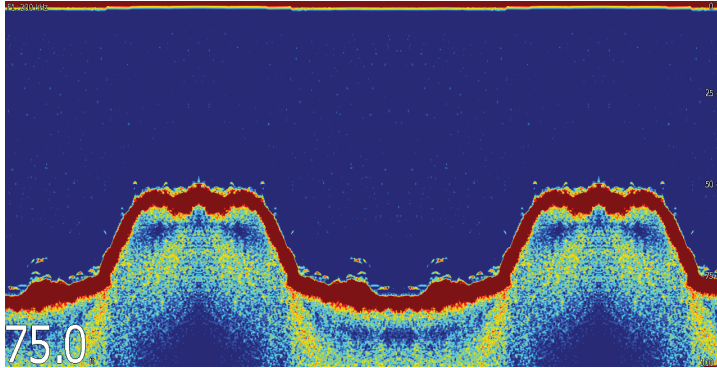
With the fishfinder application displayed:

1. Press the **Menu** button.
2. Select **Set-Up**.
3. Select **Transducer Set-Up**.
4. Select the **Select Transducer** menu item.
5. Select the transducer you want to use.

### Checking the sonar

Sonar checks are made using the fishfinder application.

1. Select the fishfinder page.



2. Check the fishfinder display.

With the fishfinder active you should see:

- Depth reading (indicates the transducer is working). The depth is shown in large white numbers at the bottom left of the screen.

## 5.6 Thermal camera setup and checks

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

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

### Set up the camera

You will need to:

- Adjust the image (aspect ratio, contrast, brightness, and so on).

### Check the camera

You will need to:

- Check the camera movement (pan, tilt, zoom).
- Check the camera "home" position is appropriate.

### Adjusting the thermal camera image

With the thermal camera application displayed:

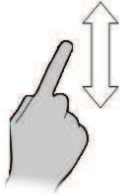

1. Select **Menu**.
2. Select **Adjust Contrast**.
3. Select the Contrast, Brightness, or Color option as appropriate.
4. Use the rotary control to adjust as required.

### Panning, tilting, and zooming the thermal image

There are 2 ways of controlling the thermal camera using the thermal camera application:

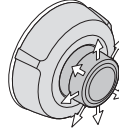
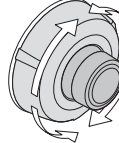
- Using the touchscreen and the UniControl's rotary control.
- Using the UniControl's joystick and rotary controls.

To pan and tilt the thermal camera using touch actions:

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

**Note:** You cannot zoom the image using the touchscreen. You must use the multifunction display's rotary control, or the thermal camera's optional Joystick Control Unit (JCU).

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

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

### Resetting the thermal camera to the home position

In the thermal camera application:

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

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

## 5.7 Enabling autopilot functions

With the homescreen displayed:

1. Select **Set-up**.
2. Select **System Settings**.
3. Select **Autopilot Control**.
4. Select the On or Off option as appropriate.
5. Use the **Back** button to return to the **System Settings** menu.
6. Select **Pilot Controls**.

If this menu option is disabled, no autopilot has been found. Check the physical connections, then repeat steps 1 to 6.

7. The Pilot Control dialog is displayed, indicating that pilot control is enabled and an autopilot is detected.

## 5.8 Enabling AIS functions

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

With the homescreen displayed:

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



## 5.9 Language selection

The system can operate in the following languages:

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

With the homescreen displayed:

1. Select **Customize**.
2. Select **Language**.
3. Select from the languages available.



## Chapter 6: Troubleshooting

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- 6.1 Troubleshooting on page 90
- 6.2 Power up troubleshooting on page 91
- 6.3 Radar troubleshooting on page 92
- 6.4 GPS troubleshooting on page 93
- 6.5 Sonar troubleshooting on page 94
- 6.6 Thermal camera troubleshooting on page 96
- 6.7 System data troubleshooting on page 99
- 6.8 Video troubleshooting on page 100
- 6.9 WiFi troubleshooting on page 101
- 6.10 Bluetooth troubleshooting on page 102
- 6.11 Touchscreen troubleshooting on page 103
- 6.12 Miscellaneous troubleshooting on page 104

## 6.1 Troubleshooting

The troubleshooting information provides possible causes and corrective action required for common problems associated with marine electronics installations.

All Raymarine products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programs. However, if you experience problems with the operation of 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 unit, please contact Raymarine Technical Support for further advice.

## 6.2 Power up troubleshooting

Problems at power up and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
The system (or part of it) does not start up.	Power supply problem.	Check relevant fuses and breakers.
		Check that the power supply cable is sound and that all connections are tight and free from corrosion.
		Check that the power source is of the correct voltage and sufficient current.

## 6.3 Radar troubleshooting

Problems with the radar and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
No Data or No scanner message	Radar scanner power supply	Check that the scanner power supply cable is sound and that all connections are tight and free from corrosion.
		Check relevant fuses and breakers.
		Check power source is of the correct voltage and sufficient current (using voltage booster if appropriate).
	SeaTalk <sup>hs</sup> network problem	Check that the Scanner is correctly connected to a SeaTalk <sup>hs</sup> switch or crossover coupler (as applicable).
		Check the status of the SeaTalk <sup>hs</sup> switch.
		Check that SeaTalk <sup>hs</sup> cables are free from damage.
Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.	
Switch at scanner pedestal in OFF position	Ensure scanner pedestal switch is in ON position.	
Radar will not initialize (Voltage control module (VCM) stuck in "sleep mode")	Intermittent or poor power connection	Check power connection at VCM. (Voltage at input = 12 / 24 V, Voltage at output = 40 V)
The bearing of a target on the radar screen is incorrect.	The radar bearing alignment requires correcting.	Check and adjust radar bearing alignment.

## 6.4 GPS troubleshooting

Problems with the GPS and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
"No Fix" GPS status icon is displayed.	Geographic location or prevailing conditions preventing satellite fix.	Check periodically to see if a fix is obtained in better conditions or another geographic location.
	GPS connection fault.	Ensure that external GPS connections and cabling are correct and fault free.
	External GPS antenna in poor position. For example: <ul style="list-style-type: none"> <li>• Below decks.</li> <li>• Close proximity to transmitting equipment such as VHF radio.</li> </ul>	Ensure GPS antenna has a clear view of the sky.
	GPS installation problem.	Refer to the installation instructions.
<p><b>Note:</b> A GPS Status screen is available within the Setup menu of Raymarine multifunction displays. This provides satellite signal strength and other relevant information.</p>		

## 6.5 Sonar troubleshooting

Problems with the sonar and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
No data source for the sounder.	Unit power supply fault.	Check the unit power supply and cables.
	Other unit fault.	Refer to the instructions supplied with the unit.
	SeaTalk <sup>hs</sup> / RayNet network problem.	Check that the unit is correctly connected to a Raymarine network switch or crossover coupler (as applicable).
		Check the status of the Raymarine network switch (if applicable).
		Check that SeaTalk <sup>hs</sup> / RayNet cables are free from damage.
Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.	
Problematic depth readings or sonar image.	Gain or Frequency settings may be inappropriate for present conditions.	Check the sounder presets, gain and frequency settings.
	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.
	Unit cable fault.	Ensure that the power, transducer and all other cables to the unit are properly connected and free from damage.
	Transducer fault	Check that the transducer is mounted correctly and is clean.
		Check the transducer is within 10° of vertical.
		If you have a transom-mount transducer, check that the transducer hasn't kicked up due to hitting an object.
	Other unit fault.	Refer to the instructions supplied with the unit.
Vessel stationary	Fish arches are not displayed if the vessel is stationary, fish will appear on the display as straight lines.	
High vessel speed	Turbulence around the transducer may be confusing the unit.	



<b>Problem</b>	<b>Possible causes</b>	<b>Possible solutions</b>
	Scroll speed set to zero	Adjust scroll speed
Incorrect speed reading	Paddle wheel fault	Check that the paddle wheel is clean.
	No speed offset set	Add speed offset.
	Incorrect calibration	Re-calibrate equipment

## 6.6 Thermal camera troubleshooting

Problems with the thermal camera and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Video not displayed.	Camera is in Standby mode.	The camera will not display video if it is in Standby mode. Use the camera controls (either the thermal camera application or JCU) to “wake” the camera from standby.
	Problem with the thermal camera video connections.	<ul style="list-style-type: none"> <li>• Check thermal camera video cables are sound and properly connected.</li> <li>• Ensure that the video is connected into video input 1 at the multifunction display or GVM.</li> <li>• Ensure that the correct video input is selected at the display.</li> </ul>
	Problem with power supply to the camera or JCU (if used as the primary controller)	<ul style="list-style-type: none"> <li>• Check the power connections to the camera and JCU / PoE injector (if used).</li> <li>• Ensure that the power switch / breaker is on.</li> <li>• Check the fuse / breaker state.</li> </ul>
Cannot control thermal camera from Raymarine display or keyboard.	Thermal camera application is not running.	Ensure the thermal camera application is running on the multifunction display (as oppose to the video application which does not have camera controls).

Problem	Possible causes	Possible solutions
Erratic or unresponsive controls.	SeaTalk <sup>hs</sup> problem.	Check that the controller and thermal camera are correctly connected to the SeaTalk <sup>hs</sup> network. (Note: This may be a direct connection or via a SeaTalk <sup>hs</sup> switch.)
		Check the status of the SeaTalk <sup>hs</sup> switch.
		Check that SeaTalk <sup>hs</sup> cables are free from damage.
	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.	Check power / SeaTalk <sup>hs</sup> cabling to the controller and PoE injector (PoE only used with optional Joystick Control Unit).	
	Check other controllers if available. If other controllers are operating this will eliminate the possibility of a more fundamental camera fault.	
Cannot switch between thermal and visible (VIS / IR) video image .	Camera is not a dual payload model.	Only "dual payload" (dual lens) thermal cameras support VIS / IR switching.
	VIS / IR cable not connected.	Ensure that the VIS / IR cable is connected from the camera to the Raymarine system. (The IR-only cable does not support switching).
Noisy image.	Poor quality or faulty video cable.	Ensure that the video cable is no longer than necessary. The longer the cable is (or the smaller the wire gauge / thickness), the more severe the losses become. Use only high quality shielded cable suitable for a marine environment.
	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> </ul>

Problem	Possible causes	Possible solutions
Image too dark or too light.	Display brightness is set too low.	Use the brightness controls at the display to adjust accordingly.
	The contrast or brightness settings in the thermal camera application are set too low.	Use the appropriate softkeys in the thermal camera application to adjust the contrast and brightness of the image.
	The Scene Mode is not appropriate for the current conditions.	A particular environment may benefit from 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. Use the <b>SCENE</b> button.
Image freezes momentarily.	FFC (Flat Field Correction).	The image will pause momentarily on a periodic basis during the Flat Field Correction (FFC) cycle. Just prior to the FFC, a small green square will appear in the upper left corner of the screen.
Image is inverted (upside down).	Camera "Ball down" setting is incorrect.	Ensure that the Ball down setting within the thermal camera system setup menu is set correctly.

## 6.7 System data troubleshooting

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

Problem	Possible causes	Possible solutions
Instrument, engine or other system data is unavailable at all displays.	Data is not being received at the display.	Check the data bus (e.g. SeaTalk <sup>ng</sup> ) wiring and connections.
		Check the overall integrity of the data bus (e.g. SeaTalk <sup>ng</sup> ) wiring.
		If available refer to the reference guide for the data bus. (e.g. SeaTalk <sup>ng</sup> reference manual)
	Data source (e.g. ST70 instrument or engine interface) is not operating.	Check the source of the missing data (e.g. ST70 instrument or engine interface).
		Check the power to the SeaTalk bus.
		Refer to the manufacturer's handbook for the equipment in question.
Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.	
Instrument or other system data is missing from some but not all displays.	SeaTalk <sup>hs</sup> network problem	Check that all required equipment is connected to the SeaTalk <sup>hs</sup> switch.
		Check the status of the SeaTalk <sup>hs</sup> Switch.
		Check that SeaTalk <sup>hs</sup> cables are free from damage.
	Software mismatch between equipment may prevent communication.	Contact Raymarine technical support

## 6.8 Video troubleshooting

Problems with the video inputs and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
No signal message on screen (video image not displayed)	Cable or connection fault	Check that the connections are sound and free from corrosion.

## 6.9 WiFi troubleshooting

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

Problem	Possible causes	Possible solutions
No wireless connection.	iPhone does not have a wireless connection established with the multifunction display.	Ensure that WiFi is enabled on the multifunction display ( <b>Homescreen: &gt; Set-Up &gt; System Settings &gt; Wireless Connections &gt; WiFi &gt; ON</b> ).
		Ensure that the "WiFi" option is enabled on the iPhone (available from the phone's Settings menu).
		Ensure that the Raymarine connection is selected as the WiFi network. If a passcode has been specified for the multifunction display's WiFi connection ensure that the same passcode is entered into the iPhone when prompted.
No video streaming to iPhone.	iPhone does not have "Raymarine Viewer" iPhone app installed and running.	Download the "Raymarine Viewer" iPhone app from the Apple App Store. Start the "Raymarine Viewer" app on the iPhone.
	"Display Streaming" is NOT enabled on the multifunction display.	Enable "Display Streaming" ( <b>Homescreen: &gt; Set-Up &gt; System Settings &gt; Wireless Connections &gt; Display Streaming &gt; ON</b> ).
No waypoint / routes synchronization with Navionic Marine app.	iPhone does not have "Navionics Marine" iPhone app installed and running.	Download the "Navionics Marine" iPhone app from the Apple App Store. Start the "Navionics Marine" app on the iPhone.
	Chart application is not running on the multifunction display.	Start the chart application on the multifunction display.
Weak or intermittent WiFi signal.	Interference from other wireless devices in the vicinity.	Multiple wireless devices running simultaneously (such as laptops, phones, and other wireless devices) can sometimes cause wireless signal conflicts. Temporarily disable each wireless device in turn until you have identified the device causing the interference.

## 6.10 Bluetooth troubleshooting

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

Problem	Possible causes	Possible solutions
No wireless connection.	iPhone does not have a Bluetooth connection established with the multifunction display.	Ensure that Bluetooth is enabled on the multifunction display ( <b>Homescreen: &gt; Set-Up &gt; System Settings &gt; Wireless Connections &gt; Bluetooth &gt; ON</b> ).
		Ensure that the "Bluetooth" option is enabled on the iPhone (available from the phone's Settings / General menu).
		Ensure that the Bluetooth device is paired with the multifunction display that you want to use it with. To do this: <b>Homescreen: &gt; Set-Up &gt; System Settings &gt; Wireless Connections &gt; New Bluetooth Connection</b> .
No media player control.	Media player device is not compatible with the Bluetooth AVRCP protocol (version 2.1 or higher).	Check the Bluetooth AVRCP compatibility with the device manufacturer. If the device is not Bluetooth AVRCP compatible then it is not suitable for wireless use with the multifunction display.
	"Audio Control" is NOT enabled on the multifunction display.	Enable "Audio Control" ( <b>Homescreen: &gt; Set-Up &gt; System Settings &gt; Wireless Connections &gt; Connections Manager &gt; Audio Control &gt; ON</b> ).
Weak or intermittent Bluetooth signal.	Interference from other wireless devices in the vicinity.	Multiple wireless devices running simultaneously (such as laptops, phones, and other wireless devices) can sometimes cause wireless signal conflicts. Temporarily disable each wireless device in turn until you have identified the device causing the interference.



## 6.11 Touchscreen troubleshooting

Problems with the touchscreen and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Touchscreen does not operate as expected	Touch lock is enabled	Use the Trackpad to turn off the touch lock on the home screen.
	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.
	Touchscreen requires calibration	Use the setup menus to calibrate the touchscreen.
	Saltwater deposits on the screen	Carefully clean and dry the screen in accordance with the instructions provided.

## 6.12 Miscellaneous troubleshooting

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

Problem	Possible causes	Possible solutions
Display behaves erratically: <ul style="list-style-type: none"> <li>• Frequent unexpected resets.</li> <li>• System crashes or other erratic behavior.</li> </ul>	Intermittent problem with power to the display.	Check relevant fuses and breakers.
		Check that the power supply cable is sound and that all connections are tight and free from corrosion.
		Check that the power source is of the correct voltage and sufficient current.
	Software mismatch on system (upgrade required).	Go to <a href="http://www.raymarine.com">www.raymarine.com</a> and click on support for the latest software downloads.
	Corrupt data / other unknown issue.	Perform a factory reset. <div style="border: 1px solid black; padding: 5px; margin-top: 5px;"> <p><b>Important:</b> This will result in the loss of any settings and data (such as waypoints) stored on the product. Save any important data to a memory card before resetting.</p> </div>

## Chapter 7: Technical support

### Chapter contents

- 7.1 Raymarine customer support on page 106
- 7.2 Third-party support on page 107

## 7.1 Raymarine customer support

Raymarine provides a comprehensive customer support service. You can contact customer support through the Raymarine website, telephone and email. If you are unable to resolve a problem, please use any of these facilities to obtain additional help.

### Web support

Please visit the customer support area of our website at:

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

This contains Frequently Asked Questions, servicing information, e-mail access to the Raymarine Technical Support Department and details of worldwide Raymarine agents.

### Telephone and email support

#### In the USA:

- **Tel:** +1 603 881 5200 extension 2444
- **Email:** [Raymarine@custhelp.com](mailto:Raymarine@custhelp.com)

#### In the UK, Europe, the Middle East, or Far East:

- **Tel:** +44 (0)23 9271 4713
- **Email:** [ukproduct.support@raymarine.com](mailto:ukproduct.support@raymarine.com)

### Product information

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

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

You can obtain this product information using the menus within your product.

## Viewing product information

With the homescreen displayed:

1. Select **Set-up**.
2. Select **Maintenance**.
3. Select **Diagnostics**.
4. Select **Select Device**.
5. Select the relevant product from the list.
6. Select **Show All Data**.

## 7.2 Third-party support

Contact and support details for third-party suppliers can be found on the appropriate websites.

### **Navionics**

[www.navionics.com](http://www.navionics.com)

### **Sirius**

[www.sirius.com](http://www.sirius.com)



## Chapter 8: Technical specification

### Chapter contents

- [8.1 Technical specification on page 110](#)

## 8.1 Technical specification

### Physical specification

<b>Dimensions</b>	<ul style="list-style-type: none"> <li>• Width: 233 mm (9.17 in.)</li> <li>• Height (NOT including bracket): 145 mm (5.71 in.)</li> <li>• Height (including bracket): 180 mm (7.09 in.)</li> <li>• Depth (NOT including cables): 64 mm (2.52 in.)</li> <li>• Depth (including cables): 150 mm (5.90 in.)</li> </ul>
<b>Weight (bare unit)</b>	<b>e7</b> <ul style="list-style-type: none"> <li>• 1.465 kg (3.23 lb.)</li> </ul> <b>e7D</b> <ul style="list-style-type: none"> <li>• 1.550 kg (3.42 lb.)</li> </ul>
<b>Weight (boxed unit)</b>	<b>e7</b> <ul style="list-style-type: none"> <li>• 2.385 kg (5.26 lb.)</li> </ul> <b>e7D</b> <ul style="list-style-type: none"> <li>• 2.423 kg (5.34 lb.)</li> </ul>

### Power specification

<b>Nominal supply voltage</b>	13.8 V dc
<b>Operating voltage range</b>	10.2 to 15.6 V dc

<b>Fuse / Breakers</b>	In-line fuse (fitted within power cable) <ul style="list-style-type: none"> <li>• 7 A. (Standard 20 mm glass fuse)</li> </ul>
<b>Power consumption (at full brightness)</b>	13.2 W
<b>LEN</b> (Refer to Seataalk <sup>®</sup> reference manual for further information).	1

### Environmental specification

<b>Operating temperature</b>	-25 °C to +55 °C (-13 °F to 131 °F)
<b>Storage temperature</b>	-30 °C to +70 °C (-22 °F to 158 °F)
<b>Relative humidity</b>	Maximum 75%
<b>Waterproof rating</b>	IPX6

### Display specification

<b>Size</b>	7 in.
<b>Type</b>	TFT backlit LED
<b>Color depth</b>	18-bit
<b>Resolution</b>	800 x 480 pixels (WVGA)
<b>Viewing angle</b>	<ul style="list-style-type: none"> <li>• Left / Right: 70 degrees</li> <li>• Top / Bottom: 70 / 50 degrees</li> </ul>



## Data connections

### Wired connections

<b>NMEA 0183</b>	2x NMEA 0183 ports: <ul style="list-style-type: none"> <li>NMEA port 1: Input and output, 4800 / 9600 / 38400 baud</li> <li>NMEA port 2: Input only, 4800 / 9600 / 38400 baud</li> </ul>
<b>Network (SeaTalk<sup>hs</sup>)</b>	1 x SeaTalk <sup>hs</sup> port. 100 Mbits/s. RayNet type connection
<b>SeaTalk<sup>ng</sup></b>	1 x SeaTalk <sup>ng</sup> connection

### Wireless connections

<b>WiFi</b>	802.11 b / g
<b>Bluetooth</b>	AVRCP 2.1+ EDR power class 1.5

### Internal GPS specification

<b>Channels</b>	48
<b>Hot start</b>	< 1 second
<b>Cold start</b>	35 seconds to 2.5 minutes
<b>Sensitivity</b>	163 dBm Tracking
<b>Satellite Based Aiding System (SBAS)</b>	WAAS + EGNOS
<b>Special features</b>	Active Jamming Reduction
<b>Operating frequency</b>	1575.42MHz
<b>Signal Acquisition</b>	Automatic

<b>Almanac Update</b>	Automatic
<b>Geodetic Datum</b>	WGS-84, alternatives available through Raymarine displays.
<b>Update Rate</b>	1 second
<b>Antenna</b>	Patch
<b>Accuracy</b>	<ul style="list-style-type: none"> <li>Without Signal Acquisition: &lt;= 15 metres 95% of the time</li> <li>With WAAS / EGNOS: &lt;= 5 metres 95% of the time</li> </ul>

### Internal DSM sounder specification (“D” variant models only)

<b>Operating frequencies</b>	50 / 83 / 200 KHz
<b>Transmit power</b>	Up to 600 W RMS, depending on transducer
<b>Depth range</b>	Up to 3000 ft, depending on transducer

### Video specification

<b>Signal type</b>	Composite
<b>Format</b>	PAL or NTSC
<b>Connector type</b>	BNC (female)

## Electronic chart specification

<b>Embedded electronic charts</b>	Navionics worldwide base map.
<b>Compatible chart cards</b>	<ul style="list-style-type: none"><li>• Navionics Ready to Navigate</li><li>• Navionics Silver</li><li>• Navionics Gold</li><li>• Navionics Gold+</li><li>• Navionics Platinum</li><li>• Navionics Platinum+</li><li>• Navionics Fish'N Chip</li><li>• Navionics Hotmaps</li></ul> <p>Refer to the Raymarine website (<a href="http://www.raymarine.com">www.raymarine.com</a>) for the latest list of supported chart cards.</p>

## Conformance specification

<b>Conformance</b>	<ul style="list-style-type: none"><li>• NMEA 2000 certification</li><li>• WiFi Alliance certification</li><li>• Bluetooth certification</li><li>• Europe: 1995/5/EC</li><li>• Australia and New Zealand: C-Tick, Compliance Level 2</li></ul>
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## Chapter 9: Options and accessories

### Chapter contents

- [9.1 Spares and accessories on page 114](#)

## 9.1 Spares and accessories

### Optional accessories

Item	Part number	Notes
1 m (3.28 ft) RayNet to SeaTalk <sup>hs</sup> (RJ45) cable	A62360	
2 m (6.56 ft) RayNet to RayNet cable	A62361	
10 m (32.8 ft) RayNet to RayNet cable	A62362	
P48 sonar transducer	A102140	Transom mount.
P58 sonar transducer	A102138	Transom mount.
1 m (3.28 ft) Minn Kota transducer adaptor cable	A62363	Only for direct connection to "D" variant multifunction displays.
0.5 m (1.64 ft) transducer adaptor cable	E66066	For connecting any 600 watt DSM-compatible sonar transducer directly to a "D" variant multifunction display.

### Spare parts

Item	Part number	Notes
Trunnion (bracket) mount kit	A62358	
Documentation pack	R62378	
Flush mount panel set	R62376	
Front bezel	R62377	

Item	Part number	Notes
1 m (3.28 ft) power and data cable	R62379	
Suncover	R62365	

### Service spares

Service spares are only available to service dealers.

Item	Part number	Notes
Front housing assembly	R62371	
GPS PCB assembly	R62373	
LCD / touchscreen assembly	R62372	
PCBA with sonar assembly	R62367	
Flexi kit	R62370	
Screw kit	R62369	
Dust cap kit	R62366	
Seal pack assembly (Internal)	R62375	
WiFi PCB assembly	R62374	
MicroSD card reader assembly	R62364	

## Appendix A NMEA 0183 sentences

The display supports the following NMEA 0183 sentences. These are applicable to NMEA 0183 and SeaTalk protocols.

### Transmit

APB	Autopilot b
BWC	Bearing and distance to waypoint
BWR	Bearing and distance to waypoint rhumb line
DBT	Depth below transducer
DPT	Depth
MTW	Water temperature
RMB	Recommended minimum navigation information
RSD	Radar system data
TTM	Tracked target message
VHW	Water speed and heading
VLW	Distance travelled through the water
GGA	Global positioning system fix data
GLL	Geographic position latitude longitude
GSA	GPS DOP and active satellites
GSV	GPS satellites in view
RMA	Recommended minimum specific loran c data

RMC	Recommended minimum specific GPS transit data
VTG	Course over ground and ground speed
ZDA	Time and date
MWV	Wind speed and angle
RTE	Routes sentence
WPL	Waypoint location sentence

### Receive

AAM	Waypoint arrival alarm sentence
DBT	Depth below transducer sentence
DPT	Depth sentence
DTM	Datum reference sentence
APB	Autopilot b sentence
BWC	Bearing and distance to waypoint sentence
BWR	Bearing and distance to waypoint rhumb line sentence
DSC	Digital selective calling information sentence
DSE	Distress sentence expansion
GGA	Global positioning system fix data sentence
	Geographic position loran c sentence GLC

GLL	Geographic position latitude longitude sentence
GSA	GPS DOP and active satellites sentence
GSV	GPS satellites in view sentence
HDG	Heading deviation and variation sentence
HDT	Heading true sentence
HDM	Heading magnetic sentence
MSK	MSK receiver interface sentence
MSS	MSK receive r signal status sentence
MTW	Water temperature sentence
WMV	Wind speed and angle sentence
RMA	Recommended minimum specific loran c data sentence
RMB	Recommended minimum navigation information sentence
RMC	Recommended minimum specific GPS transit data sentence
VHW	Water speed and heading sentence
VLW	Distance travelled through the water sentence
VTG	Course over ground and ground speed sentence
XTE	Cross track error measured sentence

ZDA	Time and date sentence
MDA	Meteorological composite sentence
GBS	GPS satellite fault detection data sentence
RTE	Routes sentence
WPL	Waypoint location sentence

## Appendix B NMEA 2000 sentences

The display supports the following NMEA 2000 sentences. These are applicable to NMEA 2000, SeaTalk<sup>ng</sup> and SeaTalk 2 protocols.

Message number	Message description	Transmit	Receive	Bridge
59392	ISO Acknowledgment	•	•	•
59904	ISO Request		•	
60928	ISO Address Claim	•	•	•
126208	NMEA - Acknowledge group function	•	•	•
126464	PGN List	•	•	•
126992	System time	•	•	•
126996	Product information	•	•	•
127237	Heading/Track Control		•	
127245	Rudder	•	•	•
127250	Vessel heading	•	•	•
127488	Engine parameters rapid update		•	
127489	Dynamic engine parameters		•	
127493	Dynamic transmission		•	
127498	Static engine parameters		•	
127505	Fluid level		•	
128259	Speed	•	•	•
128267	Water depth	•	•	•
128275	Distance log	•	•	•
129025	Position rapid update	•	•	•

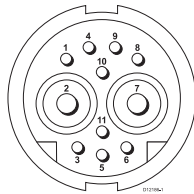
Message number	Message description	Transmit	Receive	Bridge
129026	COG SOG rapid update	•	•	•
129029	GNSS position data	•	•	•
129033	Time and date	•	•	•
129038	AIS Class A Position Report		•	
129039	AIS Class B Position Report		•	
129040	AIS Class B Extended Position Report		•	
129044	Datum	•	•	•
129283	Cross track error	•	•	•
129284	Navigation data	•	•	•
129291	Set and drift rapid update	•	•	•
129301	Time to or from mark		•	
129539	NMEA 2000 GNSS DOPs message		•	
129540	GNSS Sats in view	•	•	•
129545	NMEA 2000 GNSS RAIM output message		•	
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			•
129801	AIS Addressed Safety Related Message			•
129802	AIS Safety Related Broadcast Message			•
130306	Wind data	•	•	•



Message number	Message description	Transmit	Receive	Bridge
130310	Environmental parameters	•	•	•
130311	Environmental parameters message		•	
130576	Small craft status		•	
130577	Direction data	•	•	•
130578	Vessel speed components		•	

## Appendix C Connectors and pinouts

### Power, data, and video connector



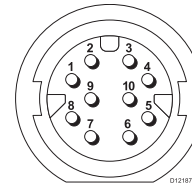
Item	Remarks
Identification	PWR / NMEA / Video
Connector type	11 pin twist-lock
Current source to network	No current sourced for external devices
Current sink from network	<ul style="list-style-type: none"> <li>• PSU: Main Power input.</li> <li>• NMEA: No power required for interface.</li> <li>• Video: No power required for interface.</li> </ul>

### Power, data and video cable cores and colors

Signal	Pin	AWG	Color
BATT+	2	16	Red
BATT-	7	16	Black
SCREEN	10	26	Black
NMEA1 TX+	8	26	Yellow
NMEA1 TX-	9	26	Brown

Signal	Pin	AWG	Color
NMEA1 RX+	1	26	White
NMEA1 RX-	4	26	Green
NMEA2 RX+	3	26	Orange / White
NMEA2 RX-	11	26	Orange / Green
VIDEO IN	6	RG179 coaxial	
VIDEO RTN	5	Screen	

### Network connector



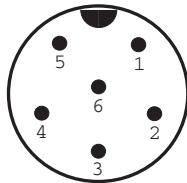
Item	Remarks
Identification	Network
Connector type	RJ45 (with suitable waterproofing)
Current source to network	No current sourced for external devices
Current sink from network	No power required for interface

Pin	Signal
1	Rx+
2	Rx-
3	Not connected

Pin	Signal
4	Not connected
5	Tx+
6	Tx-
7	Not connected
8	Not connected
9	Screen
10	Not connected

**Note:** Use only Raymarine RayNet cables when connecting SeaTalk<sup>hs</sup> devices.

#### SeaTalk<sup>ng</sup> connector



Item	Remarks
Identification	ST2/NMEA2000
Connector type	STNG
Current source to network	No current sourced for external devices
Current sink from network	<160mA (Interface drive only)

Pin	Signal
1	+12V
2	0V
3	Screen
4	CanH
5	CanL
6	SeaTalk (not connected)

**Note:** Use only Raymarine cables when connecting to SeaTalk<sup>ng</sup>





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