ALPHA

Touchscreen Performance Display

INSTALLATION INSTRUCTIONS

English (en-US)
Date: 09-2023
Document number: 87457 (Rev 1)

Raymarine®

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Software updates

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

Product documentation

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

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CONTENTS

CHAPTER 1: IMPORTANT INFORMATION

Safety warnings

Warning: Product installation and operation

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- Raymarine highly recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Register your warranty on the Raymarine website: www.raymarine.com/warranty

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).

Warning: Switch off power supply

Ensure the vessel's power supply is switched OFF before starting to install this product. Do NOT connect or disconnect equipment with the power switched on, unless instructed in this document.

Product warnings

Warning: Product grounding

Before applying power to this product, ensure it has been correctly grounded, in accordance with the instructions provided.

Warning: Positive ground systems

Do not connect this unit to a system which has positive grounding.

Warning: Power supply voltage

Connecting this product to a voltage supply greater than the specified maximum rating may cause permanent damage to the unit. Refer to the product's information label for the correct voltage.

Warning: Collision avoidance

In order to avoid potential physical damage to the unit, ensure that the environment surrounding the unit is clear from potential objects that may cause collisions.

Caution: Power supply protection

When installing this product ensure the power source is adequately protected by means of a suitably-rated fuse or thermal circuit breaker.

Caution: Sun covers

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

Regulatory notices

TFT Displays

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

Water ingress

Water ingress disclaimer

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

Disclaimer

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

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

Third-party hardware, such as converters, adapters, routers, switches, Access Points etc., provided by third parties, may be made available directly to you by other companies or individuals under separate terms and conditions, including separate fees and charges. Raymarine UK Limited or its affiliates have not tested or screened the third-party hardware.

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Declaration of conformity

Raymarine® UK Ltd declares that the following products are in compliance with the EMC Directive 2014/30/EU:

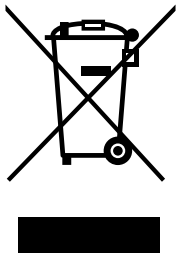
- Alpha 7 performance display, part number: E70649
- Alpha 9 performance display, part number: E70650

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

Product disposal

Dispose of this product in accordance with the WEEE Directive.

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



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

Warranty registration

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

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

IMO and SOLAS

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

Technical accuracy

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

CHAPTER 2: DOCUMENT INFORMATION

CHAPTER CONTENTS

2.1 Applicable products

This document is applicable to the following products:

- Alpha 7 performance display, part number: E70649
- Alpha 9 performance display, part number: E70650

2.2 Multifunction display (MFD) requirement

The Alpha Series performance display is not a standalone product. It MUST be connected to a Raymarine® **Axiom Series** or **Axiom 2 Series** Multifunction display (MFD) / chartplotter. All displays must be running the latest available software versions.

The Alpha Series is compatible with the following Raymarine® Multifunction displays / chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro, Axiom 2 XL	LightHouse 4, v4.5 or later
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	LightHouse 4, v4.5 or later

Note:

For latest software, visit: www.raymarine.com/software

2.3 Product documentation

The following documentation is applicable to your product:

Applicable documents

Documentation number	Description
87457	Alpha Series Performance Display Installation Instructions (this document)
81415	Alpha Series Performance Display Operation Instructions
87427	Alpha 7 Performance Display Mounting Template
87428	Alpha 9 Performance Display Mounting Template
88130	Alpha Series Performance Display Mast Bracket Accessory Sheet

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

Operation instructions

For operation instructions, please refer to the “Alpha Series Performance Display Operation Instructions” documentation.

Description	QR code
The Alpha Series Performance Display Operation Instructions (81415) can be downloaded from the Raymarine® website: www.raymarine.com/manuals. Please check the website to ensure you have the latest documentation.	

2.4 Document illustrations

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

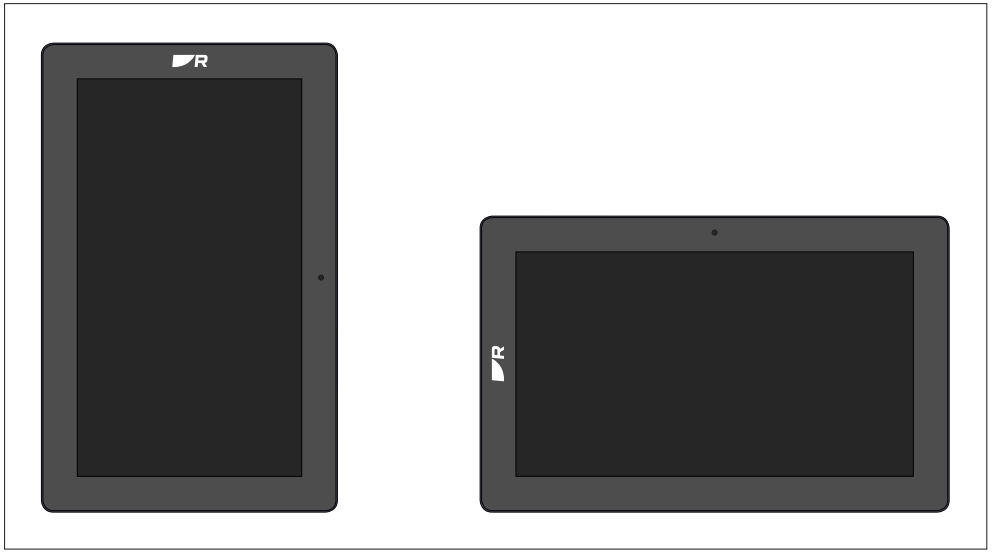
All images are provided for illustration purposes only.

CHAPTER 3: PRODUCT AND SYSTEM OVERVIEW

CHAPTER CONTENTS

3.1 Product overview

Alpha is a high brightness and high contrast sunlight-viewable touchscreen performance display, optimized for sailing applications. Available in 2 different screen sizes, the Alpha Series displays can be mounted in portrait or landscape configurations, and in conjunction with Raymarine® Axiom™ multifunction displays / chartplotters and compatible sensors, show key environmental, navigational and vessel data in a fully-customizable format. With the ability to be daisy-chained in groups of up to 4 displays for simplified mast and deck cabling, Alpha displays are ideal for providing vital performance data at the optimum locations on your vessel.



The performance display has the following key features:

- 7 ” (*Alpha 7 performance display*) (E70649) or 9 ” (*Alpha 9 performance display*) (E70650) polarized sunglasses-friendly high brightness and high contrast anti-glare IPS display, with wide viewing angles and accurate touch controls.
- Hydrotough™ display technology with nano-coated, impact-resistant glass repels water, oil, and smudges.
- Ambient light sensor for automatic display brightness adjustment.
- Maximum installation flexibility with flush, surface, or mast mounting options in portrait or landscape orientation. Single or dual display mast brackets available as optional accessories.
- Retro-fit mounting option — fits the mounting hole of an existing Raymarine® instrument, such as ST60, ST60+, i50, i60, i70, or i70s.
- Simplified cabling — a robust single waterproof cable carries both power and data (available separately, in a range of lengths).
- Up to 4 Alpha displays can be connected together in a “daisy chain”, for expanded systems.
- Fully customizable data pages and widgets for the following categories: *Battery*, *Boat*, *Depth*, *Distance*, *Engine*, *Environment*, *Fuel*, *GPS*, *Generators*, *Heading*, *Inside environments*, *Navigation*, *Pilot*, *Speed*, *Time*, *Water tanks* and *Wind*.
- Lockable touchscreen display, with remotely-controllable brightness and data page selection via a connected (and required) Raymarine® Axiom™ multifunction display / chartplotter.
- Waterproof to IPx6 and IPx7 (suitable for above or below decks installation).
- 12 / 24 V dc operation.
- Low power consumption:
  - (Alpha 7 performance display) — 10.10 W (maximum) @ 12 V dc / 12.34 W (maximum) @ 24 V dc
  - (Alpha 9 performance display) — 12.27 W (maximum) @ 12 V dc / 12.51 W (maximum) @ 24 V dc

3.2 Multifunction display (MFD) requirement

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The Alpha Series is compatible with the following Raymarine® Multifunction displays / chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro, Axiom 2 XL	LightHouse 4, v4.5 or later
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	LightHouse 4, v4.5 or later

Note:

For latest software, visit: www.raymarine.com/software

3.3 Required additional components

This product forms part of a system of electronics and requires the following additional components in order to function.

Compatible multifunction display

For information on the multifunction displays / chartplotters which are compatible with your product, refer to:
p.14 — Multifunction display (MFD) requirement

Network and power cables

For information on the separately available network and power cables that are required to operate your product, refer to:

- **p.18 — Cable requirement**
- **p.18 — Network connections**

Cable extensions

Some installations may also require extensions to network or power cables. For information on cable extensions, refer to:

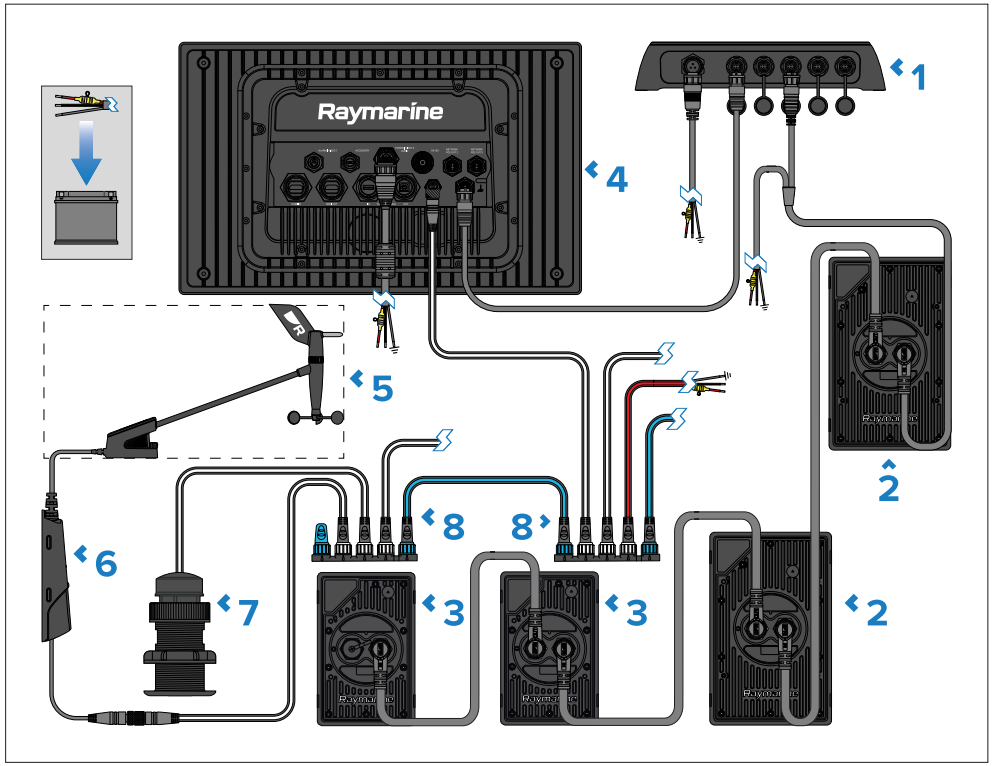
- **p.37 — Network connections**
- **p.40 — Power connections**

3.4 System overview (example only)

The following illustrations provide an overview of different products which can be connected to and used in conjunction with the performance display.

Note:

- The system configuration shown is intended as an example only and may differ from your planned installation.
- Power connections are not shown in this illustration. For power connection information, refer to the following section:
  p.40 — Power connections



1. RNS-5 Network switch.
2. Alpha 9 performance display.
3. Alpha 7 performance display.

4. Axiom 2 XL multifunction display.
5. RSW-Wired Smart Wind transducer.
6. NMEA 2000 gateway (supplied with RSW-Wired wind transducer).
7. DST810 Thru-Hull transducer.
8. SeaTalkng ® 5–way connector (A06064).

3.5 Software updates

The software running on the product can be updated.

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

Important:

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

Caution: Installing software updates

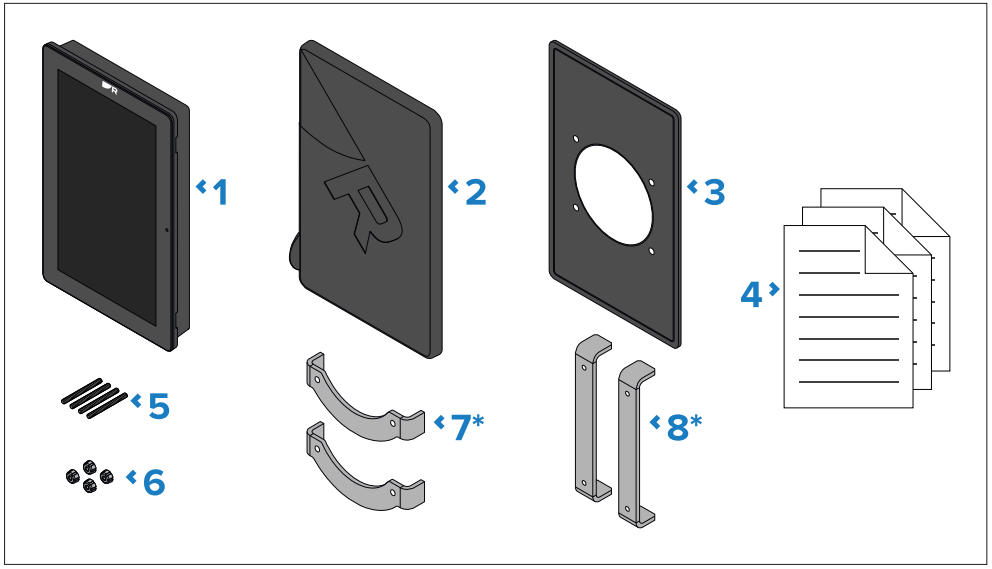
- The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.
- Ensure that the unit has a reliable power supply and that the update process is not interrupted.
- Damage caused by an incomplete update is not covered by Raymarine warranty.
- By downloading the software update package, you agree to these terms.

CHAPTER 4: PARTS SUPPLIED

CHAPTER CONTENTS

4.1 Parts supplied

The following parts are supplied with your product:

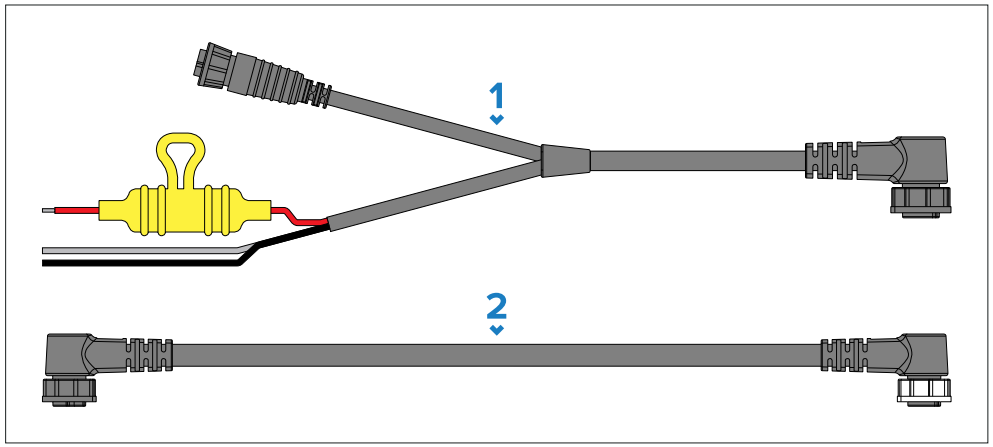


1. Alpha Series performance display.
2. Suncover.
3. Waterproof gasket.
4. Documentation pack.
5. 4 x Threaded studs, M4 x 40 mm.
6. 4 x Thumb nuts.
7. * Supplied with Alpha 7 only — 2 x mounting brackets.
8. * Supplied with Alpha 9 only — 2 x mounting brackets.

4.2 Power cable requirement

Your performance display requires a separately available combined RayNet and power cable in order to function, which is **NOT supplied** with the product.

Depending on your system configuration, either one or both of the following cables will be required:



1. 8–pin right angled power to RayNet and bare end power wires cable, available separately — used to supply power to the performance display directly from a 12 V or 24 V power source.
2. 8–pin right angled daisy chain cable, available separately — used to supply power and data to additional performance displays connected (or “daisy-chained”) in a series.

4.3 Inline fuse and thermal breaker ratings

The performance display's power cable is fitted with a waterproof fuse holder and an 8 A inline fuse which is appropriate for up to 3 additional daisy-chain connections. In the instance where the supplied inline fuse needs to be replaced, or, when installing a thermal breaker, the following inline fuse and thermal breaker ratings will apply to your product:

Important:

The suitable fuse rating for an inline fuse and thermal breaker is dependent on the number of devices you are connecting. When connecting multiple Alpha displays in a series (up to 4 maximum), ensure that **the fuse rating is appropriate for the total power consumption of all daisy-chained Alpha displays in your system**.

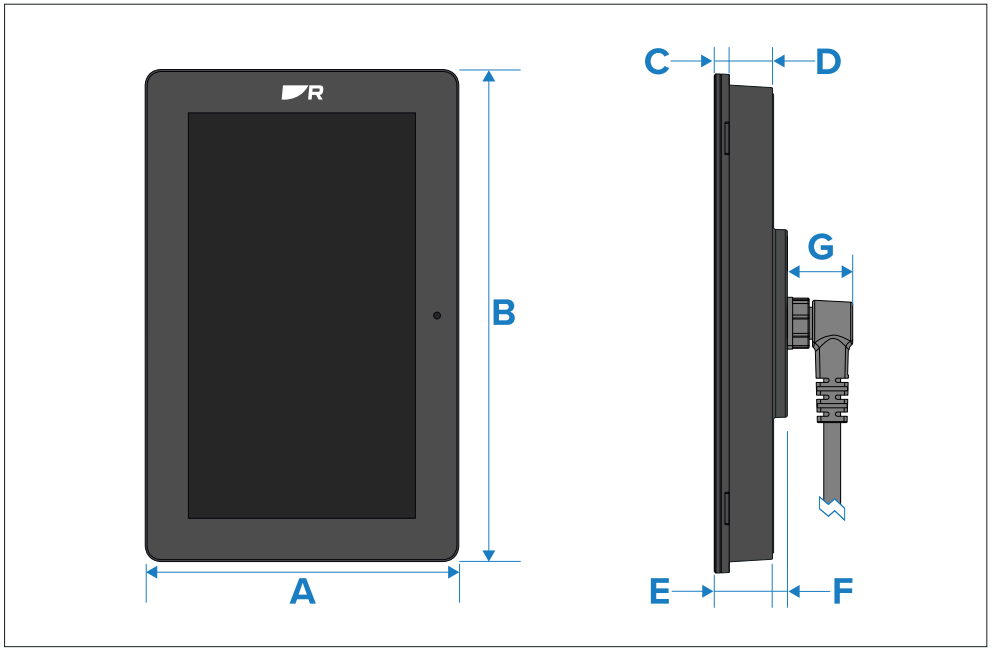
The ratings listed below are applicable when replacing the power cable's supplied 8 A inline fuse. If in doubt consult an authorized Raymarine® dealer.

Number of displays in a series	Inline fuse rating	Thermal breaker rating
1	2 A	2 A
2	4 A	4 A
3	6 A	6 A
4	8 A	8 A

CHAPTER 5: PRODUCT DIMENSIONS

CHAPTER CONTENTS

5.1 Product dimensions



Alpha 7	Alpha 9
A) 120.1 mm (4.72 in)	**A)** 148.9 mm (5.86 in)
B) 188.4 mm (7.42 in)	**B)** 253.9 mm (9.29 in)
C) 7 mm (0.28 in)	**C)** 7 mm (0.28 in)
D) 18 mm (0.71 in)	**D)** 20.5 mm (0.81 in)
E) 25 mm (0.98 in)	**E)** 27.5 mm (1.06 in)
F) 7 mm (0.28 in)	**F)** 7 mm (0.28 in)
G) 30.9 mm (1.22 in)	**G)** 30.9 mm (1.22 in)

CHAPTER 6: LOCATION REQUIREMENTS

CHAPTER CONTENTS

6.1 Warnings and cautions

Important:

Before proceeding, ensure that you have read and understood the warnings and cautions provided in the following section of this document:
p.8 — Important information

6.2 General location requirements

Below are important requirements that need to be considered when choosing a suitable location to install your product.

The product is suitable for mounting above or below decks.

The product should be mounted in a location where it will be:

- Protected from physical damage and excessive vibration.
- Well ventilated and away from heat sources.
- Away from any potential ignition source such as an engine room, near fuel tanks or a gas locker.
- Easily accessible for operations.

When choosing a location for the product, consider the following to ensure reliable and trouble-free operation:

- Access — there must be sufficient space to enable cable connections and to avoid tight cable bends.
- Electrical interference — the product should be mounted far enough away from any equipment that may cause interference such as engines, motors, generators, radio transmitters / receivers and cables carrying high power.
- Magnetic compass — refer to the *Compass safe distance* section in this document for advice on maintaining a suitable distance between this product and any compasses on your vessel.
- Mounting surface — ensure the product is adequately supported on a secure surface. Refer to the weight information provided in the *Technical specification* for this product and ensure that the intended mounting surface is suitable for bearing the product weight. Do NOT mount units or cut holes in places which may damage the structure of the vessel.

6.3 Compass safe distance

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

When choosing a suitable location for the product you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3.3 ft) in all directions. However for some smaller vessels it may not be possible to locate the product this far away from a compass. In this situation, when choosing the installation location for your product, ensure that the compass is not affected by the product when it is in a powered state.

6.4 Viewing angle considerations

As display contrast and color are affected by the viewing angle, It is recommended that you temporarily power up the display, prior to installation, to enable you to best judge which location provides the optimum viewing angle.

For viewing angles for your product refer to the *Technical specification*.

6.5 EMC installation guidelines

Raymarine® equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations, to minimize electromagnetic interference between equipment and minimize the effect such interference could have on the performance of your system.

Correct installation is required to ensure that EMC performance is not compromised.

Note:

In areas of extreme EMC interference, some slight interference may be noticed on the product. Where this occurs the product and the source of the interference should be separated by a greater distance.

For **optimum** EMC performance we recommend that wherever possible:

- Raymarine® equipment and cables connected to it are:

  - At least 1 m (3.3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (6.6 ft).
  - More than 2 m (6.6 ft) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The product is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine® specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

Note:

Where constraints on the installation prevent any of the above recommendations, always ensure the maximum possible separation between different items of electrical equipment, to provide the best conditions for EMC performance throughout the installation.

6.6 Suppression ferrites

- Raymarine® cables may be pre-fitted or supplied with suppression ferrites. These are important for correct EMC performance. If ferrites are supplied separately to the cables (i.e. not pre-fitted), you must fit the supplied ferrites, using the supplied instructions.
- If a ferrite has to be removed for any purpose (e.g. installation or maintenance), it must be replaced in the original position before the product is used.
- Use only ferrites of the correct type, supplied by Raymarine® or its authorized dealers.
- Where an installation requires multiple ferrites to be added to a cable, additional cable clips should be used to prevent stress on the connectors due to the extra weight of the cable.

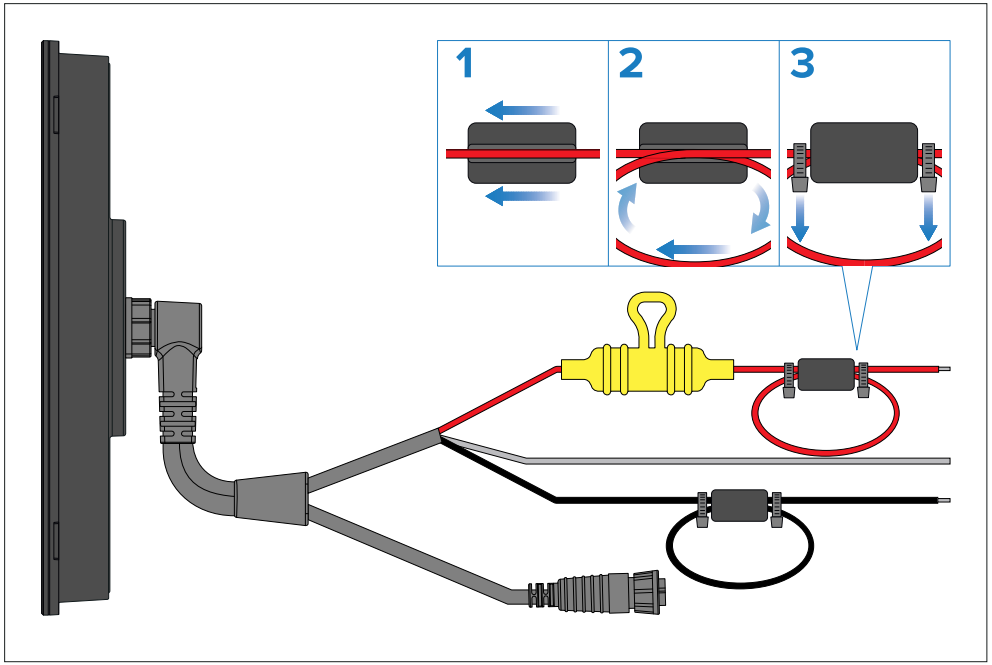
6.7 Suppression ferrite installation requirement

Raymarine® equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations for use in the recreational marine environment.

To ensure EMC Compliance, **the specified products must be fitted with the supplied cable ferrite(s)**, according to the instructions provided.

6.8 Suppression ferrite installation procedure

Follow the steps listed below to fit the supplied suppression ferrites to **both** your 8-pin power cable's red (positive) **and** black (negative) wires.



1. Feed the suppression ferrite approximately halfway down the length of the red (positive) power cable wire.
2. Wrap the red (positive) power cable wire around the outside of the suppression ferrite, and then feed the wire back through the ferrite so that a loop is formed (as shown in the above illustration).
3. Secure the suppression ferrite in place using cable ties (not supplied), directly at both ends.

4. Cut off any excess from the cable ties.

Repeat steps 1–4 for the power cable's black (negative) wire.

6.9 Connections to other equipment

Requirement for ferrites on non-Raymarine cables:

If your Raymarine® equipment is to be connected to other equipment using a cable not supplied by Raymarine®, a suppression ferrite MUST always be attached to the cable near the Raymarine® unit.

For more information, refer to your third-party cable manufacturer.

CHAPTER 7: CABLES AND CONNECTIONS — GENERAL INFORMATION

CHAPTER CONTENTS

7.1 General cabling guidance

Cable types and length

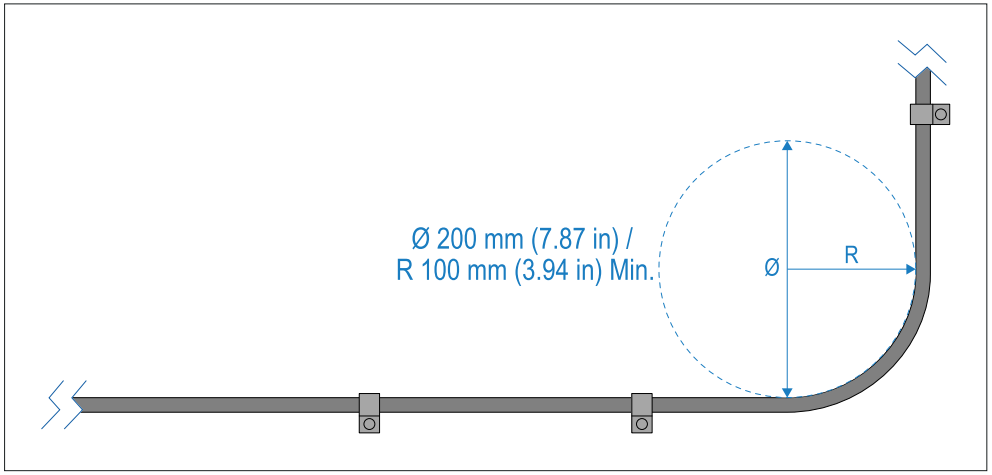
It is important to use cables of the appropriate type and length.

- Unless otherwise stated only use cables supplied by Raymarine.
- Where it is necessary to use non-Raymarine cables, ensure that they are of correct quality and gauge for their intended purpose. (e.g.: longer power cable runs may require larger wire gauges to minimize voltage drop along the run).

Cable routing

Cables must be routed correctly, to maximize performance and prolong cable life.

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter (Ø) of 200 mm (7.87 in) / minimum bend radius (R) of 100 mm (3.94 in).



- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
- Secure cables in place using cable clips or cable ties. Coil any excess cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through.
- Do NOT run cables near to engines or fluorescent lights.
- Always route data cables as far away as possible from:
  - Other equipment and cables.
  - High current carrying AC and DC power lines.
  - Antennas.

Strain relief

Use adequate strain relief for cabling to ensure that connectors are protected from strain and will not pull out under extreme sea conditions.

Cable shielding

Ensure that cable shielding is not damaged during installation and that all cables are properly shielded.

Suppression ferrites

- Raymarine® cables may be pre-fitted or supplied with suppression ferrites. These are important for correct EMC performance. If ferrites are supplied separately to the cables (i.e. not pre-fitted), you must fit the supplied ferrites, using the supplied instructions.
- If a ferrite has to be removed for any purpose (e.g. installation or maintenance), it must be replaced in the original position before the product is used.
- Use only ferrites of the correct type, supplied by Raymarine® or its authorized dealers.
- Where an installation requires multiple ferrites to be added to a cable, additional cable clips should be used to prevent stress on the connectors due to the extra weight of the cable.

Connecting cables

Follow the steps below to connect the cable(s) to your product.

1. Ensure that the vessel's power supply is switched off.
2. Ensure that the device being connected has been installed in accordance with the installation instructions supplied with that device.
3. Ensuring correct orientation, push cable connectors fully onto the corresponding connectors.

4. Engage any locking mechanism to ensure a secure connection (e.g.: turn locking collars clockwise until tight, or in the locked position).
5. Ensure any bare ended wire connections are suitably insulated to prevent shorting and corrosion due to water ingress.

Bare end wire connections

You must ensure that any bare end wires are adequately protected from short circuit and water ingress.

Bare ended wire connections

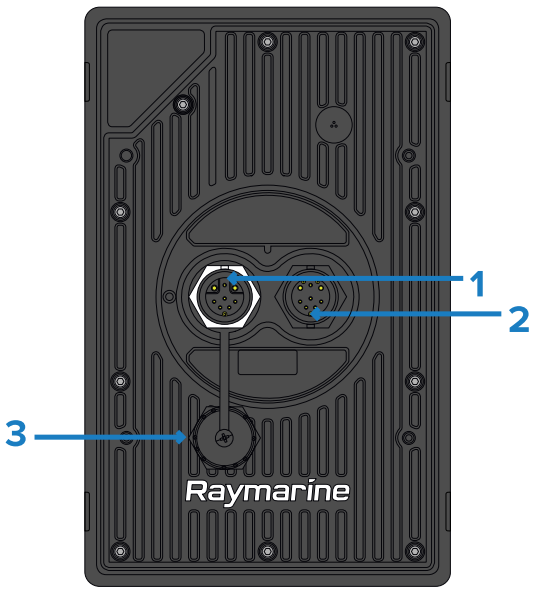
It is recommended that bare ended wire connections are made by soldering or using crimp connectors and then protected by wrapping the connection in insulation tape.

Unused bare ended wires

Any unused bare ended wires should be folded back and wrapped in insulation tape.

Warning: Positive ground systems

Do not connect this unit to a system which has positive grounding.



1. Daisy-chain connector (*Port 1 — white*).
2. Power / RayNet (Ethernet) connector (*Port 2 — black*).
3. Protective cap — only remove if daisy-chaining Alpha Series displays.

7.2 Connections overview

The Alpha Series performance display includes the following connections:

Note:

The performance display is supplied with a protective cap fitted to the Daisy-chain connection port.

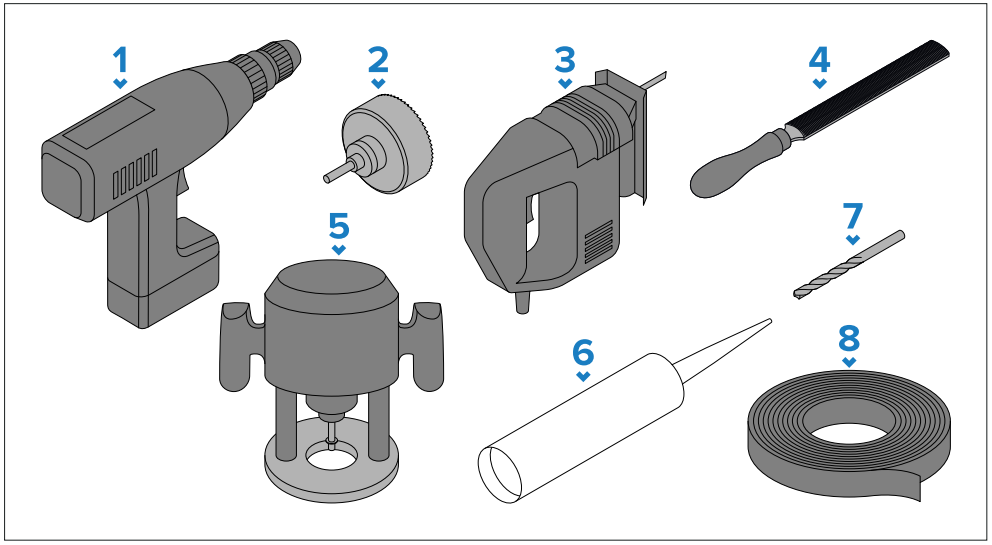
The protective cap should remain in place until connections are made. If a connection is not required then the protective cap should not be removed.

CHAPTER 8: MOUNTING

CHAPTER CONTENTS

8.1 Tools required

The following tools are required for installation:



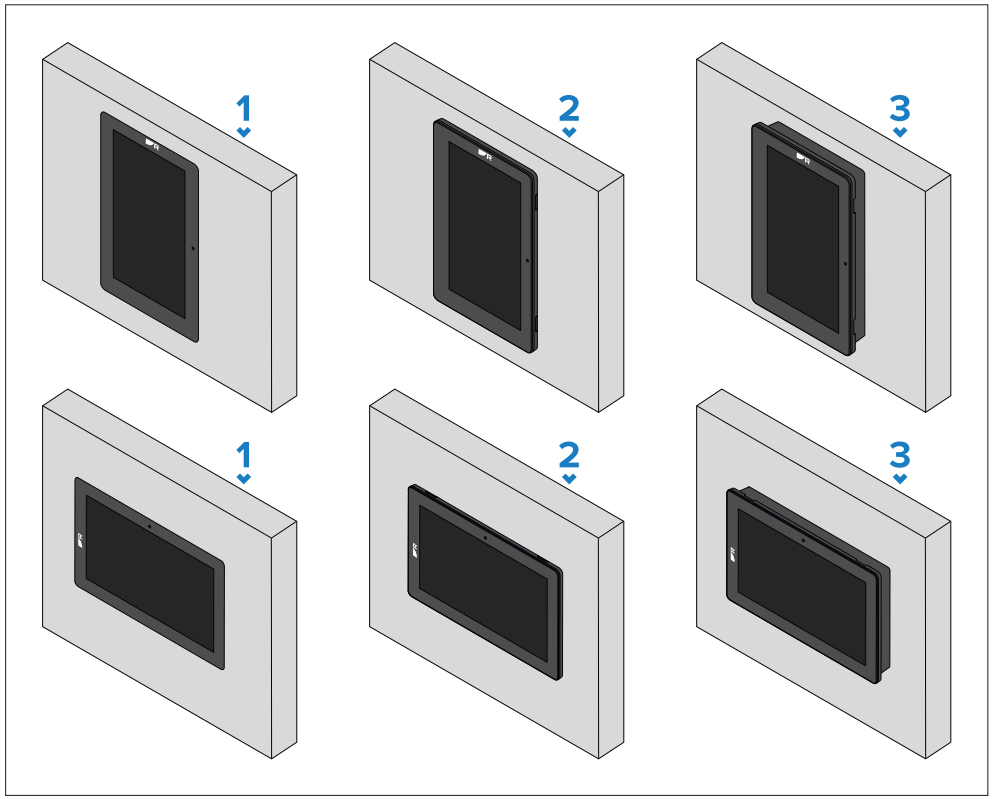
1. Power drill.
2. Hole cutter an appropriate size for the 8.00 mm (0.31 in) surface and flush mount corner diameter cutout line / the 90.94 mm (3.58 in) instrument mount center diameter cutout line.
3. Jigsaw.
4. Half round file (or sandpaper).
5. * Hand router with a router bit an appropriate size for the 11.50 mm (0.45 in) corner diameter required for the flush mount rebate.
6. Marine grade sealant.
7. Drill bit.
8. Masking / self adhesive tape.

Note:

* Items are only required when flush mounting the display.

8.2 Mounting options

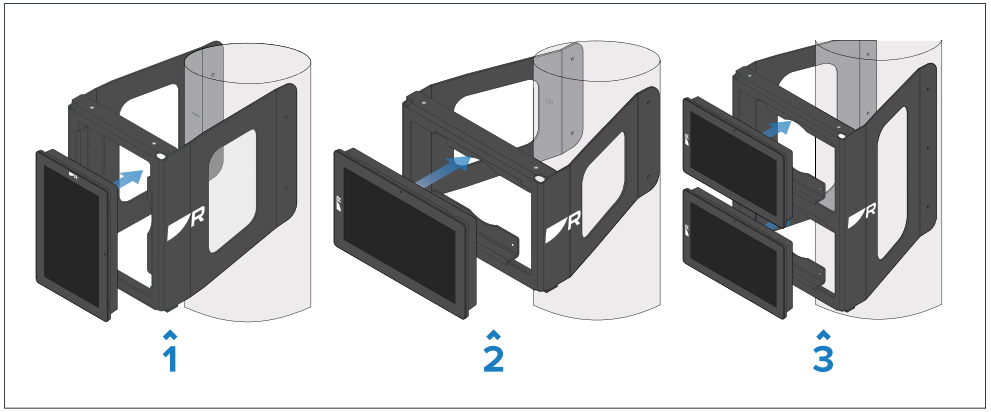
The performance display can be mounted flush with the mounting surface (flush mount), with the glass protruding from the mounting surface (surface mount), or with the instrument's body protruding from the mounting surface (retrofit / offset mount).



1. Portrait or landscape flush mount.
2. Portrait or landscape surface mount.
3. Portrait or landscape retrofit / offset mount — this is typically used when replacing an existing Raymarine® instrument, such as ST60, ST60+, i50, i60, i70, i70s.

Accessory mounting options

The performance display can also be mounted to a mast using one of the separately available mast bracket accessories.



1. Single portrait mast bracket.
2. Single landscape mast bracket.
3. Dual landscape mast bracket.

Each accessory bracket is supplied with installation instructions. For a list of mast bracket accessory part numbers, refer to:
p.63 — Spares and accessories

Bracket mast size compatibility

Before obtaining and attempting to install an Alpha display mast bracket, ensure that the diameter of your mast does not exceed the minimum and maximum mast bracket tolerances specified below.

Important:

- Depending on the diameter of your mast, one or more of the following accessory mast brackets may not be appropriate for the size of your mast.
- Exceeding the specified mast bracket tolerances may cause damage to the bracket and any attached products.

Single mast bracket tolerances (portrait):

Display variant	Minimum and maximum mast tolerances
Alpha 7:	90 mm (3.54 in) min — 150 mm (5.91 in) max
Alpha 9:	120 mm (4.72 in) min — 210 mm (8.27 in) max

Single mast bracket tolerances (landscape):

Display variant	Minimum and maximum mast tolerances
Alpha 7:	90 mm (3.54 in) min — 150 mm (5.91 in) max
Alpha 9:	120 mm (4.72 in) min — 210 mm (8.27 in) max

Dual mast bracket tolerances (landscape):

Display variant	Minimum and maximum mast tolerances
Alpha 7:	90 mm (3.54 in) min — 150 mm (5.91 in) max
Alpha 9:	120 mm (4.72 in) min — 210 mm (8.27 in) max

8.3 Horizon level mounting

It is recommended that you mount the performance display level with the horizon for the *[SailPoint]* and *[3D compass]* widgets to line up with the display screen when the boat is stationary.

Note:

Other widgets will not be affected by the performance display's level.

For more information on the performance display's *[SailPoint]* and *[3D compass]* widgets, refer to the Alpha Series Performance Display Operation Instructions (81415).

8.4 Rear mount requirements

Access to the rear of the display and mounting surface is required in order to install the display.

Ensure there is sufficient access and space behind the mounting surface to attach and tighten the fixings and also to connect the cables.

8.5 Preparing the mounting surface — surface mounting

Surface mounting requires one cutout hole. When the performance display is surface mounted, the glass/bezel will protrude from the mounting surface.

Note:

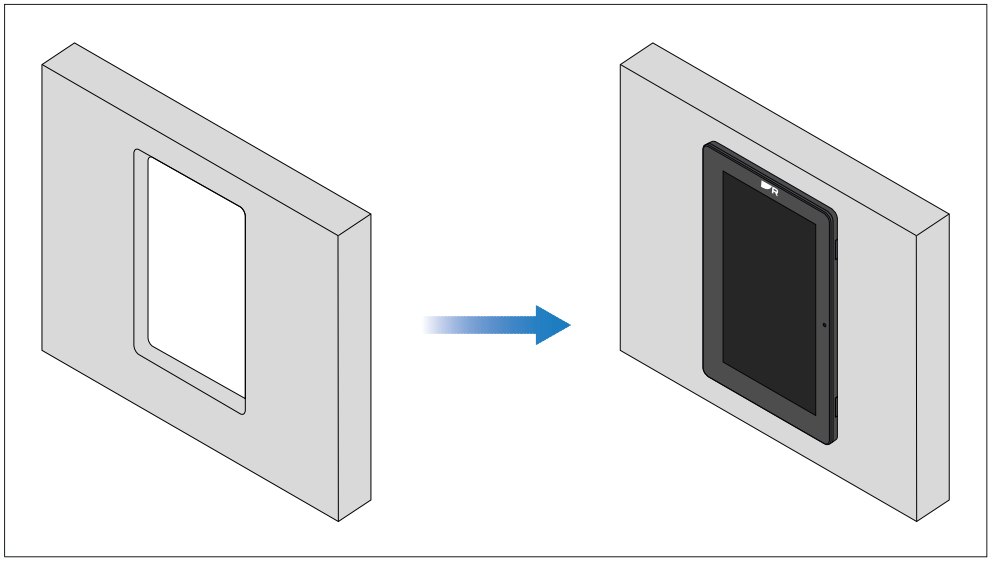
The following procedure is for preparing the mounting surface for surface mount installations. For flush or retrofit / offset mounting details, refer to:

- **p.32 — Preparing the mounting surface — flush mounting**
- **p.33 — Preparing the mounting surface — retrofit / offset mounting**

Important:

Before preparing the mounting surface ensure that:

- Your selected location meets the location requirements. For details refer to: **p.22 — Location requirements**
- You have identified cable connections and the route that the cables will take.



1. Mark the cutout line identified on the supplied mounting template on the mounting surface.
2. Use a drill and an appropriate size drill bit or hole cutter to cut out the corners of the cutout line. The corner diameter for the instruments is 8.00 mm (0.31 in).
3. Use a jigsaw or similar cutting tool to cut out the remainder of the cutout area.
4. Use a half round file and/or sandpaper to smooth and rough edges or burs on the cutout hole.

8.6 Preparing the mounting surface — flush mounting

Flush mounting requires the same cutout hole as surface mounting and an additional rebate around the edge of the cutout area. When the performance display is flush mounted, the glass will be flush with the mounting surface.

Note:

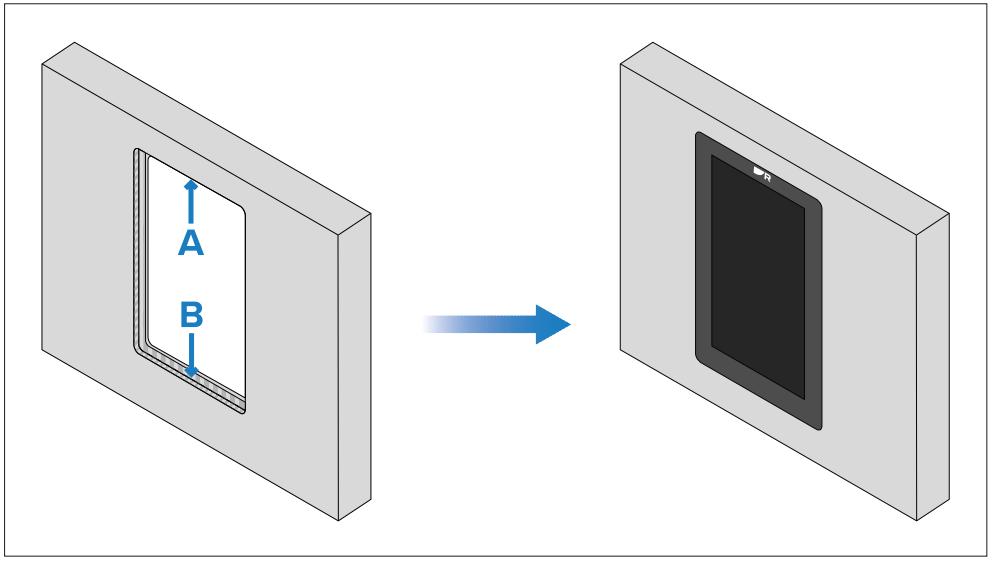
The following procedure is for preparing the mounting surface for flush mount installations. For surface or retrofit / offset mounting details, refer to:

- **p.32 — Preparing the mounting surface — surface mounting**
- **p.33 — Preparing the mounting surface — retrofit / offset mounting**

Important:

Before preparing the mounting surface ensure that:

- Your selected location meets the location requirements. For details refer to: **p.22 — Location requirements**
- You have identified cable connections and the route that the cables will take.



- **A** — Cutout (when flush mounting the cutout will be the same size as for surface mounting).
- **B** — Flush mounting requires an extra rebate to recess the display fully in the mounting surface.

Important:

When flush mounting, the fixings go through holes drilled in the rebated, and therefore thinnest, part of the mounting surface. **Before preparing the mounting surface, ensure that sufficient surface thickness will remain (once rebated) to take the weight of the display.** The final rebated area must be **at least** as thick as the display's bezel (7.00 mm (0.28 in)), in order to ensure that the display sits entirely flush with the mounting surface. Due to these requirements, not all mounting surface types and materials are suitable for flush mounting the display. *It is the installer's responsibility to ensure that the mounting surface is suitable for flush mounting.* **If the mounting surface is not suitable, the display must be surface or trunnion mounted instead.**

1. Mark the cutout line identified on the supplied mounting template on the mounting surface.
2. Mark the rebate for flush mount line identified on the supplied mounting template on the mounting surface.
3. Use a drill and an appropriate size drill bit or hole cutter to cut out the corners of the cutout line. The corner diameter for the instruments is 8.00 mm (0.31 in).
4. Use a jigsaw or similar cutting tool to cut out the remainder of the cutout area.
5. Use a router hand tool to recess the marked rebate area to a depth of 7.00 mm (0.28 in).
6. Carefully (and temporarily) fit the display to the cutout area, to check for a good fit. **Do not use any fixings at this time.** If the fit is very tight, it may be necessary to remove the display and file the edges of the cutout to achieve a better fit, using a half round file and/or sandpaper. Alternatively, if the fit is loose and there is a visible gap between the display's outer bezel and the cutout, this will need to be filled with marine-grade sealant or suitable packing material to fill the gap. *This should only be done once the display has been secured to the surface using the fixings, as described in the next mounting procedure*.
7. Use a half round file and/or sandpaper to smooth and rough edges or burs on the cut out hole.

8.7 Preparing the mounting surface — retrofit / offset mounting

Offset mounting requires one cutout hole. When the performance display is offset mounted the glass/bezel and case will protrude from the mounting surface.

Note:

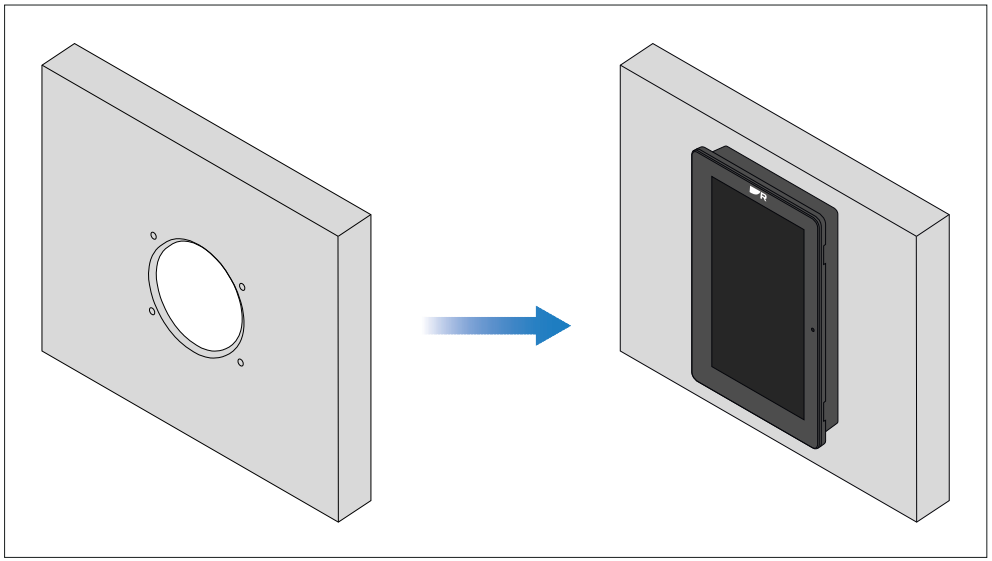
The following procedure is for preparing the mounting surface for surface mount installations. For flush or instrument mounting details, refer to:

- **p.32 — Preparing the mounting surface — surface mounting**
- **p.32 — Preparing the mounting surface — flush mounting**

Important:

Before preparing the mounting surface ensure that:

- Your selected location meets the location requirements. For details refer to: **p.22 — Location requirements**
- You have identified cable connections and the route that the cables will take.



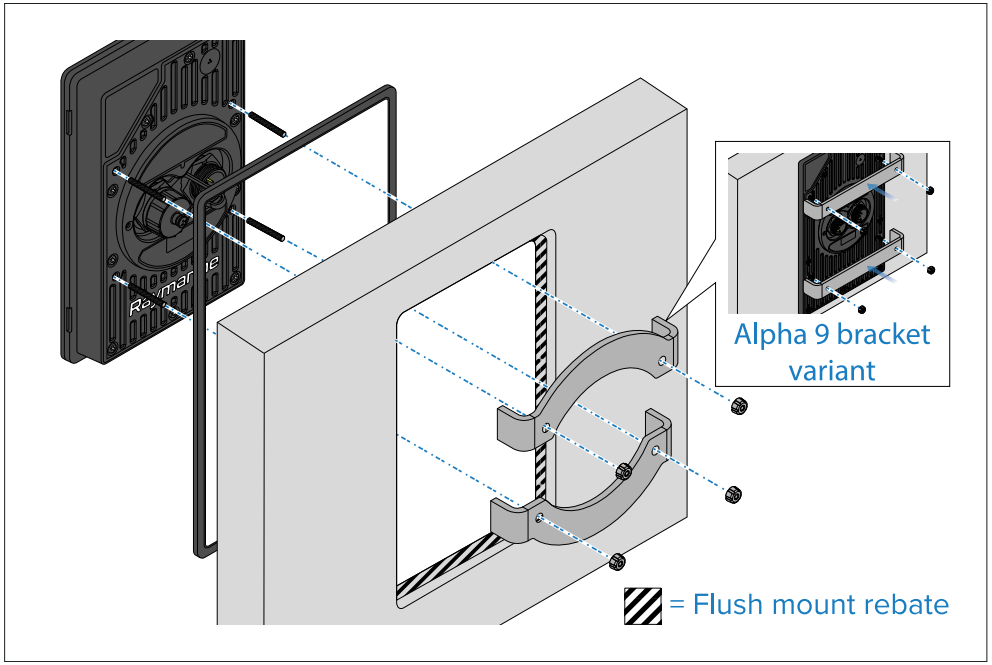
1. Mark the cutout line and drill hole locations identified on the supplied mounting template on the mounting surface.
2. Use a drill and an appropriate size drill bit to drill the holes required at the marked locations.
3. Use a drill and an appropriate size hole cutter to cut the cutout line. The instrument mount cut-out diameter is 90.94 mm (3.58 in).
4. Use a half round file and/or sandpaper to smooth and rough edges or burs on the cutout hole.

8.8 Surface and flush mounting

Follow the steps below to surface or flush mount the performance display.

Important:

In above-decks installations, marine-grade sealant should be used to seal the gap between the mounting surface and the performance display bezel.



1. Ensure you have followed the relevant instructions for preparing the mounting surface for performance display mounting.
2. Route the relevant cables behind the mounting surface cut-out.

   This may be difficult or not possible once the display has been mounted.

3. (Flush mount only) remove the waterproof gasket cutout as shown above, and fit the gasket onto the performance display.
4. Depending on your mounting method, place the performance display into the cutout / flush mount rebate.
5. Insert the supplied threaded studs into the performance display.
6. Place the supplied mounting brackets over the threaded studs.

7. Attach the supplied thumb nuts to the end of each stud.
8. Tighten the thumb nuts by hand until the brackets and display are secured firmly in position.

Warning: Marine-grade sealant

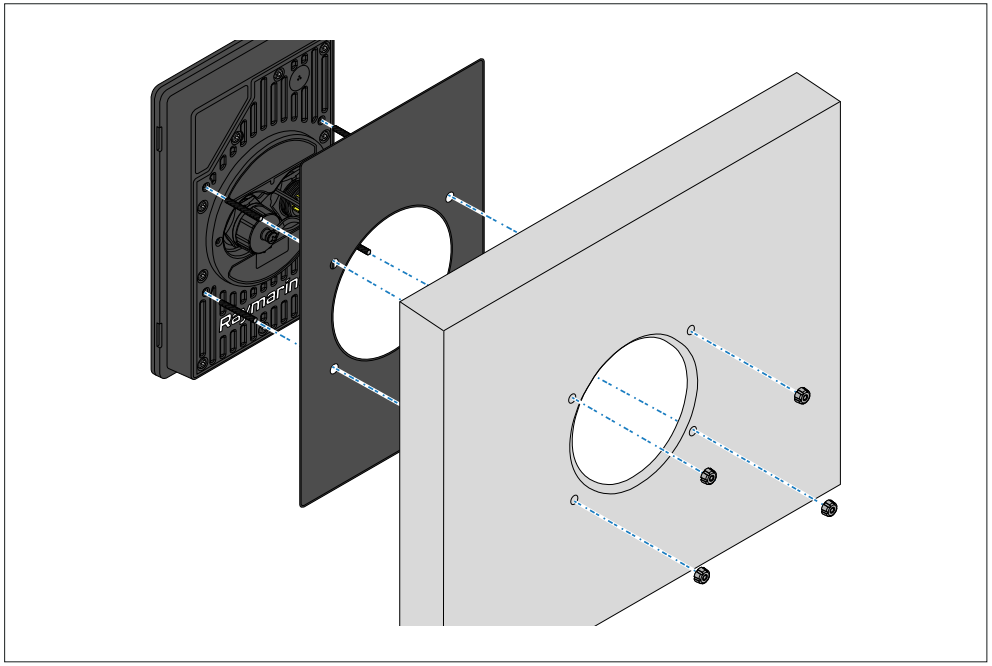
Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

8.9 Retrofit / offset mounting

The performance display can be retrofitted to the mounting position of an existing Raymarine® instrument, such as the ST60, ST60+, i50, i60, i70, i70s. In this mounting scenario, the performance display bezel protrudes from the mounting surface, with a 24 mm (0.9 in.) gap between the bezel and the mounting surface.

Important:

In above-decks installations, marine-grade sealant should be used to seal the gap between the mounting surface and the performance display bezel.



1. Ensure you have followed the relevant instructions for preparing the mounting surface for retrofit / offset mounting.
2. In the case of a retrofit, remove the existing instrument product, and any associated cables.
3. Route the relevant cables for the new performance display behind the mounting surface cutout.

   This may be difficult or not possible once the display has been mounted.

4. Insert the supplied threaded studs into the rear of the performance display.
5. Remove the waterproof gasket cutout as shown above, and fit the gasket over each threaded stud onto the performance display.
6. Place the threaded studs into the drilled holes on the rear of the performance display.
7. Attach the supplied thumb nuts to the end of each stud.
8. Tighten the thumb nuts by hand until the performance display is secured firmly in position.

Warning: Collision avoidance

In order to avoid potential physical damage to the unit, ensure that the environment surrounding the unit is clear from potential objects that may cause collisions.

Warning: Marine-grade sealant

Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

CHAPTER 9: NETWORK CONNECTIONS

CHAPTER CONTENTS

9.1 Network connections overview

The following section will provide two different network connection scenarios, one of which is required in order for the performance display to function:

- p.38 — Required compatible multifunction display connection
- p.38 — Multiple performance display connections

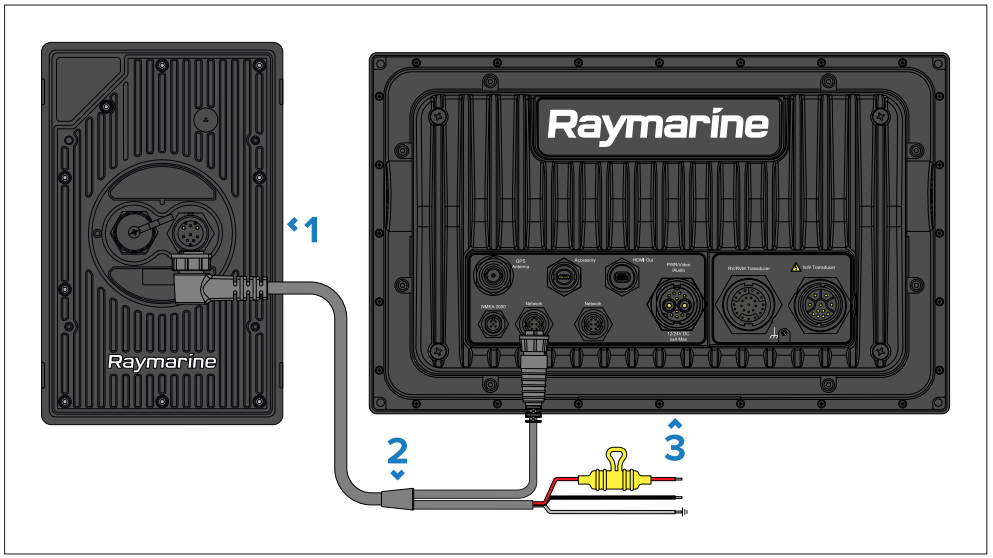
Note:

Power connections are not shown throughout each of the following illustrations. For appropriate power connection information, refer to the instructions which accompany each device.

Required MFD connection

In order to function, your performance display **must** be networked to a compatible multifunction display / chartplotter via a separately available 8-pin right-angled power to RayNet and bare end power wires cable.

Example: RayNet cable connection scenario



1. Alpha Series performance display.
2. 8-pin right-angled power to RayNet and bare end power wires cable, available separately.
3. Compatible Raymarine® multifunction display / chartplotter (Axiom 2 Pro illustrated).

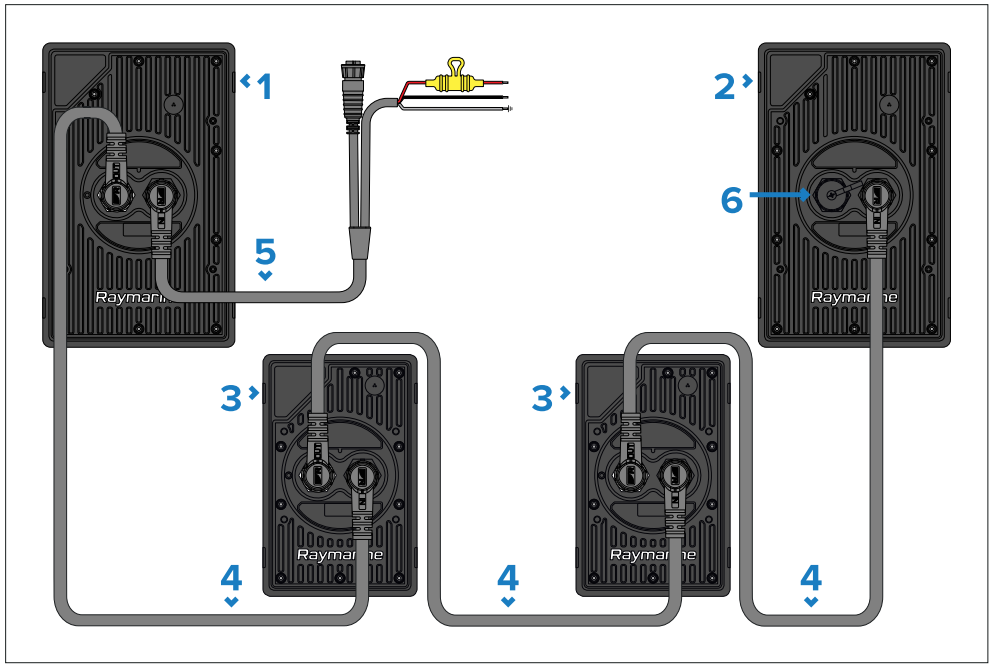
Note:

- For a list of compatible multifunction displays / chartplotters, refer to: p.14 — Multifunction display (MFD) requirement
- For information on the available cables and accessories, refer to the following section: p.63 — Spares and accessories

Multiple performance display connections

Multiple performance displays can be connected together (daisy-chained) for the purpose of an expanded system, via a separately available 8-pin right-angled daisy-chain accessory cable. A maximum of 4 performance displays can be daisy-chained in a series and a maximum of 10 performance displays can be connected per system.

Example: daisy-chain network connection scenario



Important:

When daisy-chaining instruments together, ensure that a suitably-rated fuse is installed before applying power. **The fuse rating must be appropriate for the total power consumption of all daisy-chained instruments in your system**. For more information, refer to:
p.42 — Inline fuse and thermal breaker ratings

1. Alpha 9 performance display — receiving power directly from a 12 V or 24 V power source via a separately available power and RayNet cable.
2. Alpha 9 performance display — receiving power from the previous instrument in series via a separately available daisy-chain cable.
3. Alpha 7 performance display — receiving power from the previous instrument in series via a separately available daisy-chain cable.
4. 8-pin right-angled daisy chain cable, available separately.
5. 8-pin right-angled power to RayNet and bare end power wires cable, available separately.
6. Protective cap — must be fitted when connector is not in use.

Note:

For information on the available cables and accessories, refer to the following section: **p.63 — Spares and accessories**

Network cable extensions

If you wish to extend the length of a network cable connected to your product, you can refer to the following section for further information:
p.63 — Spares and accessories

CHAPTER 10: POWER CONNECTIONS

CHAPTER CONTENTS

10.1 Power options

This product must be powered using ONE of the following methods.

1. **Directly powered** — via:
   - A direct connection to a vessel's power supply using a separately available 8-pin right-angled power to RayNet and bare end power wires cable.
   - Only one performance display should be directly powered in both single and expanded systems (up to 4 performance displays maximum in a series and up to 10 performance displays per system). For more information, refer to: **p.41 — Direct power connection**
2. **Daisy-chain powered** — via:
   - A connection to another performance display's daisy-chain connector using a separately available 8-pin right-angled daisy-chain accessory cable.
   - Each additional performance display should be powered via the use of a daisy-chain cable in an expanded system (up to 4 performance displays maximum in a series and up to 10 performance displays per system). For more information, refer to: **p.38 — Multiple instrument connections**

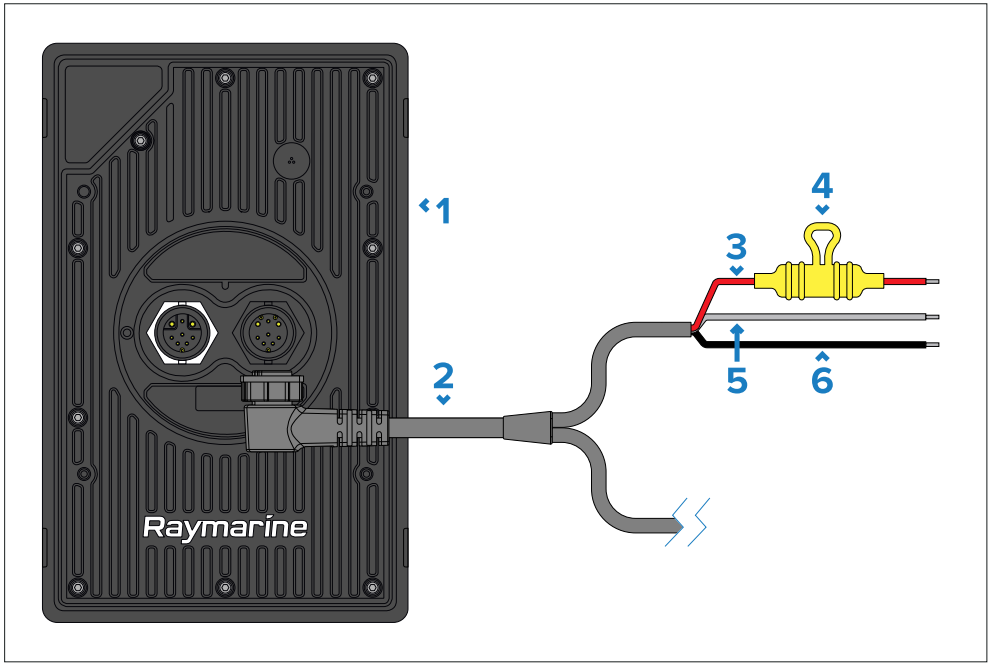
Note:

For information on the available cables and accessories, refer to the following section: **p.63 — Spares and accessories**

10.2 Direct power connection

The performance display can be powered directly from a 12 V or 24 V power source by using a separately available RayNet and bare end power wires accessory cable.

The separately available power and RayNet cables include bare stripped wires, which are suitable for direct connection to a 12 V or 24 V power supply:



1. Alpha Series performance display.
2. 8-pin right-angled power to RayNet and bare end power wires cable, available separately.
3. Red wire (positive) — connects to the power supply's positive terminal.
4. Waterproof fuse holder containing inline fuse (included with cable).
5. Gray wire (drain) — connects to the vessel RF ground (if available), or the negative battery terminal.
6. Black wire (negative) — connects to the power supply's negative terminal.

Note:

For information on available cables and accessories, refer to the following section: **p.63 — Spares and accessories**

10.3 Inline fuse and thermal breaker ratings

The performance display's power cable is fitted with a waterproof fuse holder and an 8 A inline fuse which is appropriate for up to 3 additional daisy-chain connections. In the instance where the supplied inline fuse needs to be replaced, or, when installing a thermal breaker, the following inline fuse and thermal breaker ratings will apply to your product:

Important:

The suitable fuse rating for an inline fuse and thermal breaker is dependent on the number of devices you are connecting. When connecting multiple Alpha displays in a series (up to 4 maximum), ensure that **the fuse rating is appropriate for the total power consumption of all daisy-chained Alpha displays in your system**.

The ratings listed below are applicable when replacing the power cable's supplied 8 A inline fuse. If in doubt consult an authorized Raymarine® dealer.

Number of displays in a series	Inline fuse rating	Thermal breaker rating
1	2 A	2 A
2	4 A	4 A
3	6 A	6 A
4	8 A	8 A

10.4 Power distribution

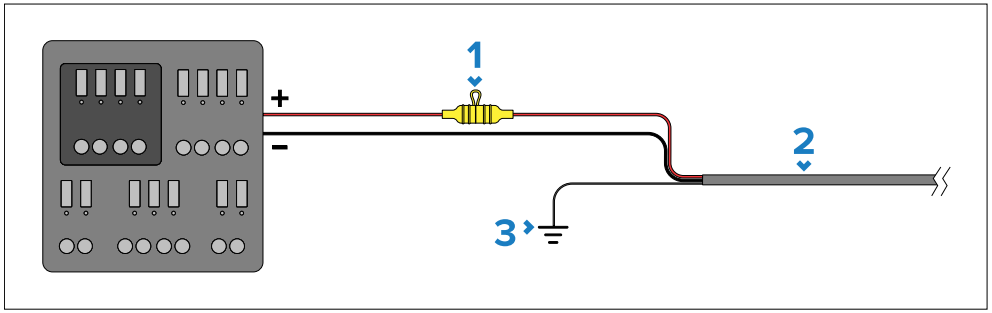
Recommendations and best practice for the power connection of products supplied with a drain wire as part of the supplied power cable.

- The product is supplied with a power cable, either as a separate item or a captive cable permanently attached to the product. Only use the power cable supplied with the product. Do NOT use a power cable designed for, or supplied with, a different product.
- Refer to the *Power connection* section for more information on how to identify the wires in your product's power cable, and where to connect them.
- See below for more information on implementation for some common power distribution scenarios:

Important:

- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for guidance only, to help protect your product. It covers common vessel power arrangements, but does NOT cover every scenario. If you are unsure how to provide the correct level of protection, please consult an authorized dealer or a suitably qualified professional marine electrician.

Implementation — connection to distribution panel (Recommended)

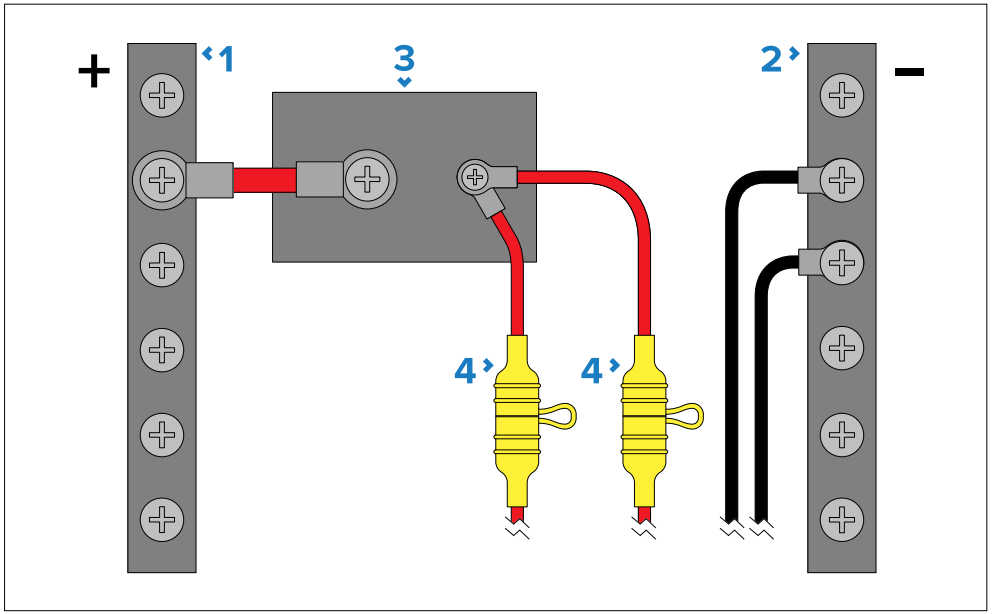


Item	Description
1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.
2	Product power cable.
3	Drain wire connection point.

- It is recommended that the supplied power cable is connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.
- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm²) cable.
- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is

not possible and more than 1 item of equipment shares a breaker, use individual inline fuses for each power circuit to provide the necessary protection.

- The power cable supplied with your product includes a drain wire, which must be connected to the vessel's common RF ground.

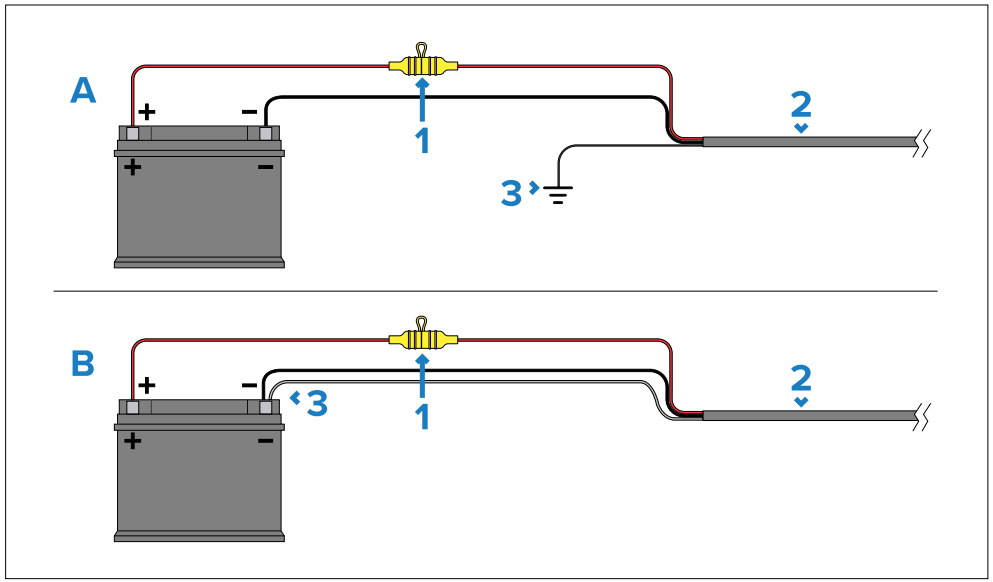


Item	Description
1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.

Important:

Observe the recommended fuse / breaker ratings provided in the product's documentation, however be aware that the suitable fuse / breaker rating is dependent on the number of devices being connected.

Implementation — direct connection to battery



- Where connection to a power distribution panel is not possible, the power cable supplied with your product may be connected directly to the vessel's battery, via a suitably rated fuse or breaker.
- If the power cable is NOT supplied with a fitted inline fuse, you MUST fit a suitably rated fuse or breaker between the red wire and the battery's positive terminal.
- Refer to the inline fuse ratings provided in the product's documentation.
- If you need to extend the length of the power cable supplied with your product, ensure you observe the dedicated *Power cable extensions* advice provided in the product's documentation.

Item	Description
1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.
2	Product power cable.
3	Drain wire connection point.

Battery connection scenario A:

Suitable for a vessel with a common RF ground point. In this scenario, the power cable's drain wire should be connected to the vessel's common ground point.

Battery connection scenario B:

Suitable for a vessel without a common grounding point. In this case, the power cable's drain wire should be connected directly to the battery's negative terminal.

Grounding

Ensure that you observe any additional grounding advice provided in the product's documentation.

More information

It is recommended that best practice is observed in all vessel electrical installations, as detailed in the following standards:

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

10.5 Power cable extension (12 / 24 V systems)

If you need to extend the length of the power cable supplied with your product, ensure you observe the following advice:

- The power cable for each unit in your system should be run as a separate, single length of 2-wire cable from the unit to the vessel's battery or distribution panel.
- Ensure that the extension cable is of a sufficient gauge for the supply voltage and the total load of the device and the length of the cable run. Refer to the following table for typical **minimum** power cable wire gauges:

Cable length in meters (feet)	Wire gauge in AWG (mm^2) for 12 V supply	Wire gauge in AWG (mm^2) for 24 V supply
<8 (<25)	16 (1.31 mm^2)	18 (0.82 mm^2)
16 (50)	14 (2.08 mm^2)	18 (0.82 mm^2)
24 (75)	14 (2.08 mm^2)	16 (1.31 mm^2)
>32 (>100)	14 (2.08 mm^2)	16 (1.31 mm^2)

Important:

Be aware that some products in your system (such as sonar modules) can create voltage peaks at certain times, which may impact the voltage available to other products during the peaks.

Important:

To ensure power cables (including any extension) are of a sufficient gauge, ensure that there is a continuous **minimum** voltage of **10.8 V dc** at the end of the cable where it enters the product's power connector, even with a fully flat battery at 11 V dc. (Do not assume that a flat battery is at 0 V dc. Due to the discharge profile and internal chemistry of batteries, the current drops much faster than the voltage. A "fully flat" battery still shows a positive voltage, even if it doesn't have enough current to power your device.)

10.6 Power cable drain wire connection

The power cable supplied with this product includes a dedicated drain wire for connection to a vessel's Radio Frequency (RF) ground point (if available), or the negative battery terminal.

The purpose of the drain wire is to drain excess voltage from the cable shield, giving it a path to safety. The drain wire protects the cable's inner signal conductors from electrical noise emitted by other cables and devices.

Although the drain wire is not intended to ground the product's internal circuits, it's important that the drain wire is connected to the vessel's common RF ground point, which should be used for all equipment in your system. If several items require grounding, the drain wires and dedicated ground connections (if available) of all equipment should first be connected to a single local point (e.g. within a distribution panel), and then this point connected via an appropriately-rated conductor to the vessel's RF common ground point.

An RF ground point is typically a circuit with a very low-impedance signal at Radio Frequency, connected to the sea via an electrode immersed in the sea, or bonded to the inner side of the hull in an area that is underwater.

On vessels without an RF ground system, the drain wires and dedicated ground connections (if available) of all equipment should be connected directly to the vessel's negative battery terminal.

The dc power system should be either:

- Negative grounded ("bonded"), with the negative battery terminal connected to the vessel's RF ground.
- Floating, with neither battery terminal connected to the vessel's ground.

The preferred minimum requirement for the path to ground (bonded or non-bonded) is via a flat tinned copper braid, with a 30 A rating or greater. If this is not possible, an equivalent stranded wire conductor may be used, rated as follows:

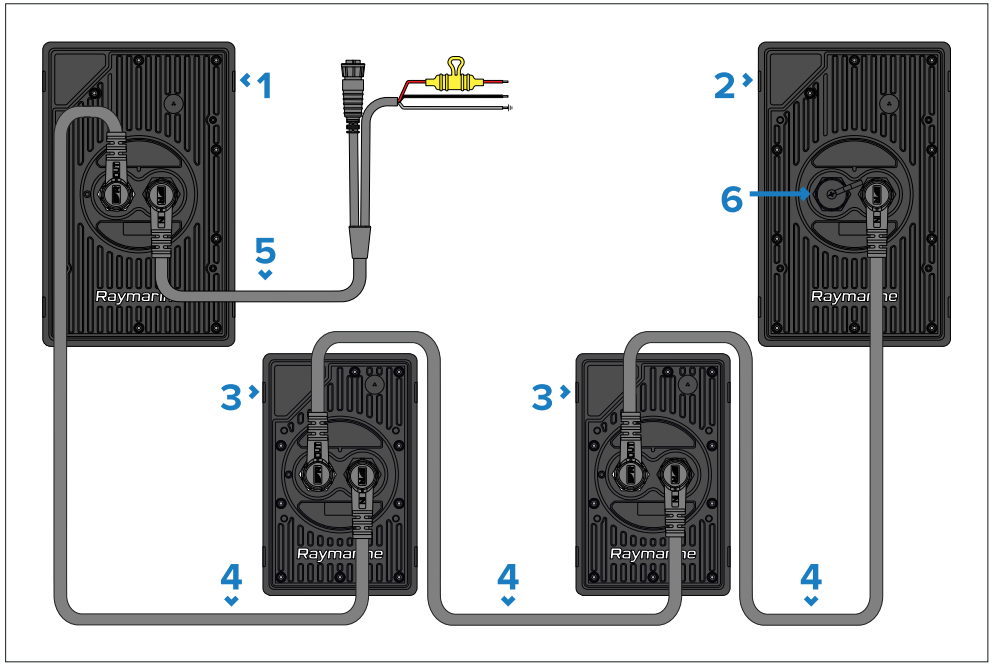
- for runs of <1 m (3.3 ft), use 6 mm2 (10 AWG) or greater.
- for runs of >1 m (3.3 ft), use 8 mm2 (8 AWG) or greater.

In any grounding system, always keep the length of connecting braid or wires as short as possible.

10.7 Multiple performance display connections

Multiple performance displays can be connected together (daisy-chained) for the purpose of an expanded system, via a separately available 8-pin right-angled daisy-chain accessory cable. A maximum of 4 performance displays can be daisy-chained in a series and a maximum of 10 performance displays can be connected per system.

Example: daisy-chain network connection scenario



Important:

When daisy-chaining instruments together, ensure that a suitably-rated fuse is installed before applying power. **The fuse rating must be appropriate for the total power consumption of all daisy-chained instruments in your system**. For more information, refer to:
p.42 — Inline fuse and thermal breaker ratings

1. Alpha 9 performance display — receiving power directly from a 12 V or 24 V power source via a separately available power and RayNet cable.
2. Alpha 9 performance display — receiving power from the previous instrument in series via a separately available daisy-chain cable.
3. Alpha 7 performance display — receiving power from the previous instrument in series via a separately available daisy-chain cable.
4. 8-pin right-angled daisy chain cable, available separately.
5. 8-pin right-angled power to RayNet and bare end power wires cable, available separately.
6. Protective cap — must be fitted when connector is not in use.

Note:

For information on the available cables and accessories, refer to the following section: **p.63 — Spares and accessories**

CHAPTER 11: SYSTEM CHECKS

CHAPTER CONTENTS

11.1 Initial power on test

Before attempting an initial power on test, ensure that you have correctly networked and powered the performance display in accordance with the instructions provided throughout the following sections:

- **p.37 — Network connections**
- **p.40 — Power connections**

Once the power cable has been connected and adequate power is being supplied, the performance display will begin to boot.

The performance display will remain on until power is no longer being supplied to the unit.

- If you are experiencing issues, ensure that you have read and followed the information listed above before referring to the troubleshooting advice found within the follow section: **p.51 — Troubleshooting**
- For comprehensive operation instruction information, refer to the documentation listed within the following section: **p.50 — Operation instructions**

CHAPTER 12: OPERATION

CHAPTER CONTENTS

12.1 Operation instructions

For operation instructions, please refer to the “Alpha Series Performance Display Operation Instructions” documentation.

Description	QR code
The Alpha Series Performance Display Operation Instructions (81415) can be downloaded from the Raymarine® website: www.raymarine.com/manuals. Please check the website to ensure you have the latest documentation.	

CHAPTER 13: TROUBLESHOOTING

CHAPTER CONTENTS

13.1 Troubleshooting

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

Before packing and shipping, all 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 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.

13.2 Power up troubleshooting

Product does not turn on or keeps turning off

Possible causes	Possible solutions
Blown fuse / tripped breaker	1. Check the condition of your relevant fuses, breakers and connections, and replace if necessary. Refer to the Alpha Series Performance Display Installation Instructions (87457) for information on the appropriate fuse ratings when connecting one or more performance displays in a series. 2. If the fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections	1. 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. 2. Check the daisy-chain / power cable and your power supply connection for signs of damage or corrosion, and replace if necessary. 3. Ensure that the daisy-chain / power cable connectors are correctly orientated, fully inserted and in the locked position. 4. With the unit turned on, try flexing the performance display's daisy-chain / power cable connectors to see if this causes the unit to restart or lose power. Replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary.
Incorrect power connection	1. The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient	1. Check that your power supply (battery or distribution panel) is providing a minimum of 10.8 V to each component in the system.

Product will not start up (restart loop)

Product causes	Possible solutions
Power supply and connection	1. See possible solutions from the table above, entitled 'Product does not turn on or keeps turning off'.
Software corruption	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Attempt a factory reset using the following instructions: **p.54 — Performing a factory reset**

13.3 System data troubleshooting

Transducer, instrument, engine or other system data is unavailable at all performance displays

Possible causes	Possible solutions
Data is not being received at the performance display.	1. Check the relevant product, network cabling and connections for signs of damage or corrosion, and replace if necessary.
Data source is not operating.	1. Check the source of the missing data (e.g. transducer or engine interface) for signs of damage or corrosion, and replace if necessary. 2. If possible, check that the data source is correctly powered and operational. 3. Refer to the instructions provided with the equipment to ensure it has been correctly installed.
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.

Transducer, instrument or other system data is missing from some but not all performance displays

Possible causes	Possible solutions
Connection problem.	1. Check the product's attached cable(s) and connections for signs of damage or corrosion, and replace if necessary.
Software corruption.	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Attempt a factory reset using the following instructions: **p.54 — Performing a factory reset**
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.

Incorrect data reported

Possible causes	Possible solutions
Transducer calibration error.	1. Switch off power supply to system and switch back on again. 2. Re-calibrate or re-configure data source following instructions provided with the relevant devices.

13.4 Miscellaneous troubleshooting

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

Display behaves erratically (frequent unexpected resets, system crashes and other erratic behavior)

Possible causes	Possible solutions
Intermittent problem with power to the performance display.	1. Check relevant fuses and breakers. 2. Check that the power supply cable is sound and that all connections are tight and free from corrosion. 3. Check that the power source is of the correct voltage and sufficient current.
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.
Corrupt data / other unknown issue.	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Check the data source for correct operation.

13.5 Performing a factory reset

If you are experiencing problems with the Alpha Series performance display which cannot be resolved using the troubleshooting advice provided, you may need to perform a *[Factory reset]*.

Note:

Restoring your performance display to factory default settings will cause all custom data pages to be deleted.

1. To *[Factory reset]* your device via the *[Settings]* menu:
   i. Navigate to: *[Data page view > Overlay menu > Settings > Factory reset]*.
   ii. Select *[Reset]*.
2. To *[Factory reset]* your device via the physical recovery button:
   i. Press the factory reset button on the rear of your unit (to the left of the daisy-chain connector) when applying power.

The performance display will now reset to factory default settings, all user data will be removed and the display will reboot to the startup wizard.

CHAPTER 14: MAINTENANCE

CHAPTER CONTENTS

14.1 Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized Raymarine dealers. Unauthorized repair may affect your warranty.

14.2 Routine equipment checks

It is recommended that you perform the following routine checks, on a regular basis, to ensure the correct and reliable operation of your equipment:

- Examine all cables for signs of damage or wear and tear.
- Check that all cables are securely connected.

Caution: Product cleaning

When cleaning products:

- Switch off power supply.
- Use a clean damp cloth to wipe clean.
- Do NOT use: abrasive, acidic, ammonia, solvent or other chemical based cleaning products.
- Do NOT use a jet wash.

14.3 Cleaning the display case

The performance display is a sealed unit and does not require regular cleaning. If it is necessary to clean the performance display, follow this basic procedure:

1. Switch off the power to the performance display.
2. Wipe the case with a clean, lint-free cloth.
3. If necessary, use a mild detergent to remove grease marks.

14.4 Cleaning the display screen

A coating is applied to the performance screen. This makes it water repellent, and prevents glare. To avoid damaging this coating, follow this procedure:

1. Switch off the power to the performance display.
2. Rinse the screen with fresh water to remove all dirt particles and salt deposits.
3. Allow the screen to dry naturally.
4. If any smears remain, very gently wipe the screen with a clean microfibre cleaning cloth.

14.5 Cleaning the sun cover

The supplied sun cover features an adhesive surface. In certain conditions unwanted contaminants may stick to this surface. To avoid damaging the monitor display, clean the sun cover regularly following this procedure:

1. Carefully remove the sun cover from the display.
2. Rinse the sun cover with fresh water to remove all dirt particles and salt deposits.
3. Allow the sun cover to dry naturally.

CHAPTER 15: TECHNICAL SUPPORT

CHAPTER CONTENTS

15.1 Raymarine product support and servicing

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

Product information

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

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

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

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: https://www.raymarine.com/en-us/support/product-registration

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

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

United States (US):

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

Web support

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

- **Manuals and Documents** — http://www.raymarine.com/manuals
- **Technical support forum** — https://raymarine.custhelp.com/app/home
- **Software updates** — http://www.raymarine.com/software

Worldwide support

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

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

United States (US):

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

Australia and New Zealand (Raymarine subsidiary):

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

France (Raymarine subsidiary):

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

Germany (Raymarine subsidiary):

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

Italy (Raymarine subsidiary):

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

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es
- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

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

Sweden (Raymarine subsidiary):

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

Finland (Raymarine subsidiary):

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

Norway (Raymarine subsidiary):

- E-Mail: support.no@raymarine.com

- Tel: +47 692 64 600

Denmark (Raymarine subsidiary):

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

Russia (Authorized Raymarine distributor):

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

15.2 Diagnostic product information

Diagnostic product information can be viewed and exported from a Raymarine® LightHouse multifunction display, for supported products networked using RayNet, RJ45, or SeaTalkng ® / NMEA 2000 cables.

Diagnostic product information includes technical data related to the connected product, such as serial numbers, network addresses, firmware version numbers, and so on. It is useful for 2 main purposes:

1. Sending detailed product information to the Raymarine® product support team, in the event of a problem or fault with your product. The information can be exported to a MicroSD card, and you can then copy the file for the purposes of emailing it to the product support team. For contact details, refer to: **p.57 — Technical support**
2. Maintaining detailed off-boat records. This is particularly useful for vessels that have multiple Raymarine® products installed.

To view or export diagnostic product information, access the *[Diagnostics]* menu. For instructions on how to access this menu, refer to the relevant operation instructions for your multifunction display.

15.3 Learning resources

Raymarine has produced a range of learning resources to help you get the most out of your products.

Video tutorials

Raymarine official channel on YouTube

- http://www.youtube.com/user/RaymarineInc

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

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:

- https://raymarine.custhelp.com/app/home

CHAPTER 16: TECHNICAL SPECIFICATION

CHAPTER CONTENTS

16.1 Physical specification

Specification	
Width:	• Alpha 7 display — 118.6 mm (4.67 in) • Alpha 9 display — 148.9 mm (5.86 in)
Height:	• Alpha 7 display — 188.4 mm (7.42 in) • Alpha 9 display — 235.9 mm (9.29 in)
Depth:	• Alpha 7 display — 32 mm (1.26 in) • Alpha 9 display — 34 mm (1.34 in)
Port separation distance:	5.71 mm (0.22 in)
Weight:	• Alpha 7 display — 0.72 kg (1.59 lbs) • Alpha 9 display — 1.18 kg (2.60 lbs)

16.2 Power specification

Specification	
Nominal supply voltage:	12 V / 24 V dc
Operating voltage range:	10.8 V to 32 V dc
Current:	• Alpha 7 display — 0.84 A (nominal) @ 12 V dc / 0.43 A (nominal) @ 24 V dc • Alpha 9 — 1.02 A (nominal) @ 12 V dc / 0.52 A (nominal) @ 24 V dc
Power consumption:	• Alpha 7 display — 10 W (maximum) • Alpha 9 display — 12 W (maximum)
Inline fuse rating:	8 A
Thermal breaker rating:	8 A

Important:

The suitable fuse rating for an inline fuse and thermal breaker is dependent on the number of devices you are connecting. When connecting multiple Alpha displays in a series (up to 4 maximum), ensure that **the fuse rating is appropriate for the total power consumption of all daisy-chained Alpha displays in your system**.

16.3 Network specification

Specification	
Data connections:	1 x Daisy-chain connector. 1 x Power / RayNet Ethernet connector.

16.4 Environmental specification

Specification	
Operating temperature range:	-25°C to +55°C (-13°F to +131°F)
Storage temperature range:	-30°C to +70°C (-22°F to +158°F)
Relative humidity:	93% Max.
Waterproof rating:	IPx6 and IPx7

16.5 Display specification

Specification	
Type:	• Alpha 7 display — 7” IPS TFT LCD • Alpha 9 display — 9” IPS TFT LCD
Brightness / Luminance:	1500 nits / 1500 cd/m^2
Viewing angles:	• Portrait — 85 + / 85 + • Landscape — 85 + / 85 +
Resolution:	• Alpha 7 display — 1024 (H) x 600 (V) • Alpha 9 display — 1280 (H) x 720 (V)
Aspect ratio:	• Alpha 7 display — 15.4 : 9 • Alpha 9 display — 16 : 9

Specification	
PPI (Pixels Per Inch):	• Alpha 7 display — 170 PPI • Alpha 9 display — 163 PPI
Color:	24-bit color (16.7 million colors)
Refresh rate:	60 Hz

16.6 Conformance specification

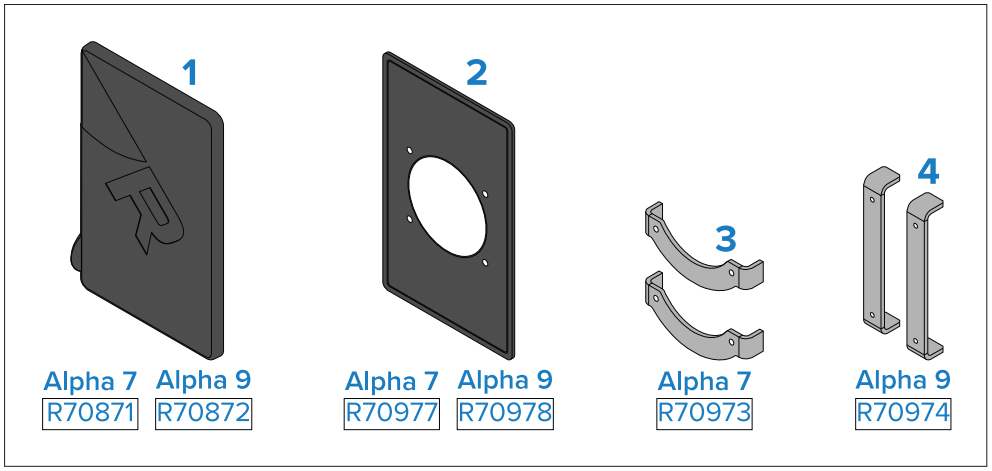
Specification	
Europe, Australia & New Zealand:	EN 60945:2002
Canada:	ICES-003
USA:	CFR47 Part 15
Japan / China:	IACS section E10
Product markings:	• UKCA • CE • Australian Tick • WEEE Directive • Industry Canada

CHAPTER 17: SPARES AND ACCESSORIES

CHAPTER CONTENTS

17.1 Spares

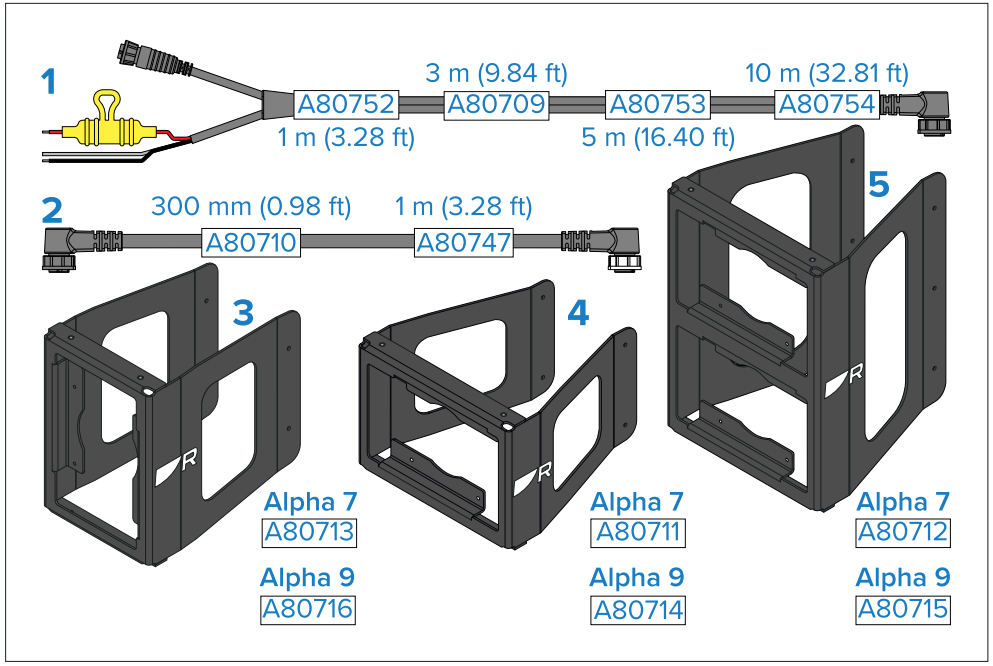
The following spares are available for your product:



1. Suncover.
2. Mounting gasket.
3. (Alpha 7 only) mounting bracket kit.
4. (Alpha 9 only) mounting bracket kit.

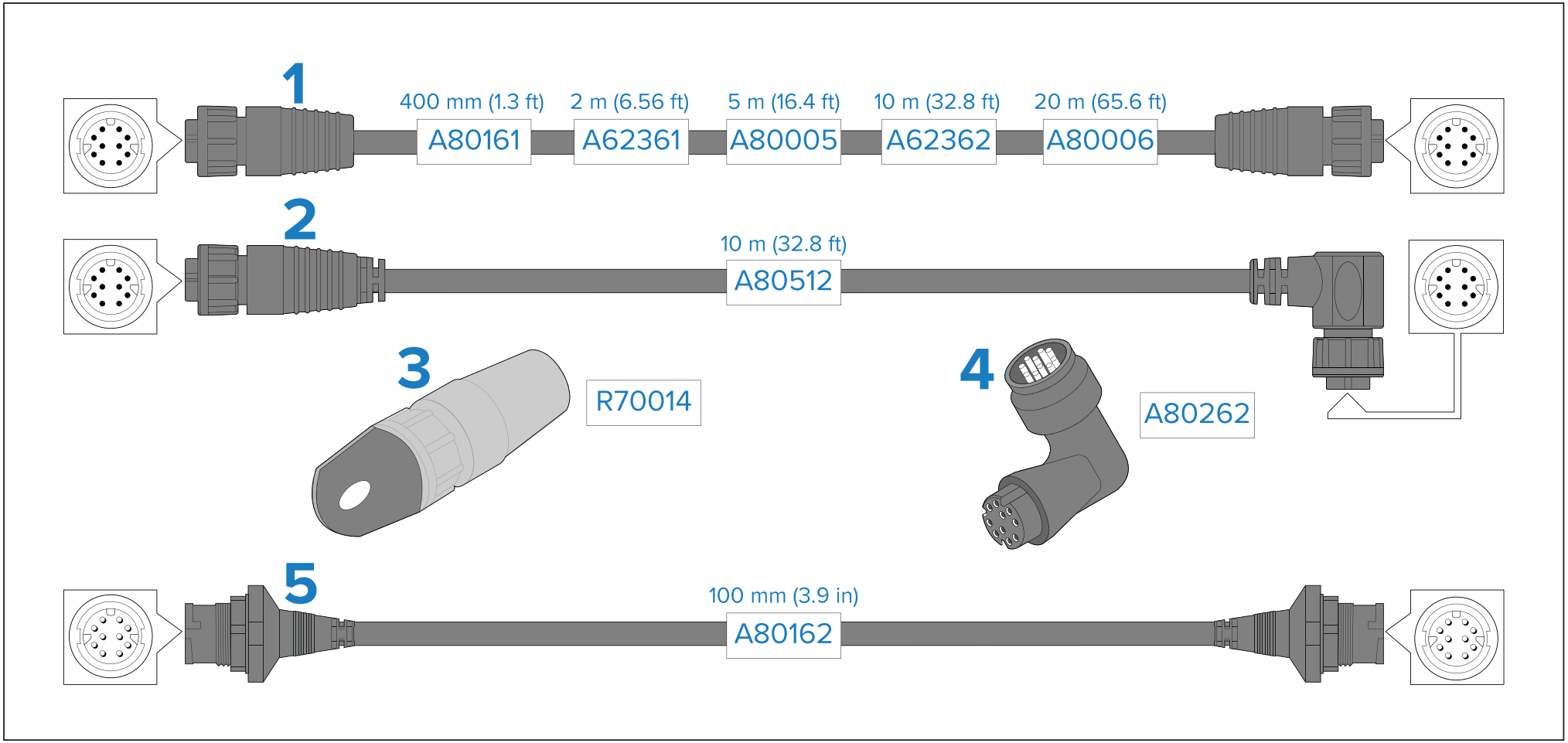
17.2 Accessories

The following accessories are available for your product:



1. 8-pin right-angled power to RayNet and bare end power wires cable.
2. 8-pin right-angled daisy chain cable.
3. Single portrait mast bracket.
4. Single landscape mast bracket.
5. Dual landscape mast bracket.

17.3 RayNet to RayNet cables and connectors



1. Standard RayNet connection cable with a RayNet (female) socket on both ends.
2. Right-angle RayNet connection cable with a straight RayNet (female) socket on one end, and a right-angle RayNet (female) socket on the other end. Suitable for connecting at 90° (right angle) to a device, for installations where space is limited.
3. RayNet cable puller (5 pack).
4. RayNet to RayNet right-angle coupler / adapter. Suitable for connecting RayNet cables at 90° (right angle) to devices, for installations where space is limited.
5. Adapter cable with a RayNet (male) plug on both ends. Suitable for joining (female) RayNet cables together for longer cable runs.

Index

N

O

P

R

S

T

U

W

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Raymarine®

ALPHA

Touchscreen Performance Display

OPERATION INSTRUCTIONS

English (en-US)
Date: 09-2023
Document number: 81415 (Rev 1)

Raymarine®

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English (en-US)
Document number: 81415 (Rev 1)
AA;49326;2023-09-18T16:03:44

CONTENTS

CHAPTER 1: IMPORTANT INFORMATION

Safety warnings

Warning: Maintain a permanent watch

Always maintain a permanent watch, this will allow you to respond to situations as they develop. Failure to maintain a permanent watch puts yourself, your vessel and others at serious risk of harm.

Warning: Day mode brightness warning

Switching from Night mode to Day mode instantly increases the display brightness to maximum which will impact the operator's night vision due to the relative brightness of Day mode in night time conditions.

Product warnings

Caution: Sun covers

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

Caution: Product cleaning

When cleaning products:

- Switch off power supply.
- Use a clean damp cloth to wipe clean.
- Do NOT use: abrasive, acidic, ammonia, solvent or other chemical based cleaning products.
- Do NOT use a jet wash.

Regulatory notices

TFT Displays

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

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.

Disclaimer

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

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

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Declaration of conformity

Raymarine® UK Ltd declares that the following products are in compliance with the EMC Directive 2014/30/EU:

- Alpha 7 performance display, part number: E70649
- Alpha 9 performance display, part number: E70650

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

Warranty registration

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

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

IMO and SOLAS

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

Technical accuracy

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

Publication copyright

CHAPTER 2: DOCUMENT INFORMATION

CHAPTER CONTENTS

2.1 Applicable products

This document is applicable to the following products:

- Alpha 7 performance display, part number: E70649
- Alpha 9 performance display, part number: E70650

2.2 Multifunction display (MFD) requirement

The Alpha Series performance display is not a standalone product. It MUST be connected to a Raymarine® **Axiom Series** or **Axiom 2 Series** Multifunction display (MFD) / chartplotter. All displays must be running the latest available software versions.

The Alpha Series is compatible with the following Raymarine® Multifunction displays / chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro, Axiom 2 XL	LightHouse 4, v4.5 or later
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	LightHouse 4, v4.5 or later

Note:

For latest software, visit: www.raymarine.com/software

2.3 Document conventions

The following conventions are used throughout this document:

Formatting of user interface menus and settings.

References to menus and setting options are formatted using square brackets [].

Examples:

- The *[Pages]* screen provides a horizontally-scrollable live view of the data pages that currently exist on your unit.
- You can also delete unwanted data pages using the available *[Delete]* option.

Procedures for navigating menu hierarchies.

Menu hierarchies are used in this document to provide a quick summary on how to access a particular function or menu option.

Examples:

- In order to add a new data page, navigate to: *[Data page view > Overlay menu > Pages > + Add page]*.
- In order to automatically lock your device, navigate to: *[Data page view > Overlay menu > Settings > Auto-lock]*

Commonly used terminology

The terminology listed below is commonly used throughout this document.

Examples:

- **Overlay menu** — The term ‘overlay menu’ refers to the menu that is displayed by swiping *[DOWN]* from the top of your screen when viewing a data page.
- **Data item** — The term ‘data item’ is used to denote a specific data parameter, which is transmitted to the performance display either directly from your Axiom multifunction display / chartplotter or from a compatible device that is connected to the same network.
- **Widget** — The term ‘widget’ is used to denote the graphical on-screen object displaying data values (e.g. as digits, gauge, graph, etc) and user interface options for each data item.
- **Data page** — The term ‘data page’ refers to the fullscreen page view which displays widgets, and also enables you to customize them.
- **Data category** — The term ‘data category’ refers to the groups which data items are sorted into.

2.4 Product documentation

The following documentation is applicable to your product:

Applicable documents

Documentation number	Description
87457	Alpha Series Performance Display Installation Instructions
81415	Alpha Series Performance Display Operation Instructions (this document)
87427	Alpha 7 Performance Display Mounting Template
87428	Alpha 9 Performance Display Mounting Template
88130	Alpha Series Performance Display Mast Bracket Accessory Sheet

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

2.5 Applicable software version

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

This document has been updated to reflect products running Alpha software version **1.0**.

Check the website for the latest software and user manuals:

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

2.6 Document illustrations

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

All images are provided for illustration purposes only.

CHAPTER 3: GETTING STARTED

CHAPTER CONTENTS

3.1 Multifunction display (MFD) requirement

The Alpha Series performance display is not a standalone product. It MUST be connected to a Raymarine® **Axiom Series** or **Axiom 2 Series** Multifunction display (MFD) / chartplotter. All displays must be running the latest available software versions.

The Alpha Series is compatible with the following Raymarine® Multifunction displays / chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro, Axiom 2 XL	LightHouse 4, v4.5 or later
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	LightHouse 4, v4.5 or later

Note:

For latest software, visit: www.raymarine.com/software

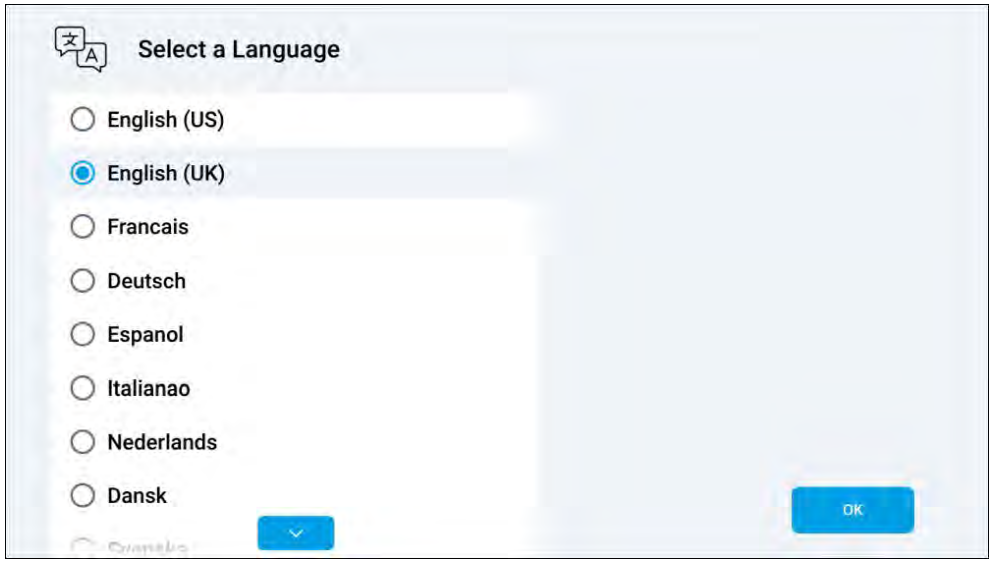
3.2 Powering on the unit

Once the power cable has been connected and adequate power is being supplied, the performance display will power on.

The performance display will remain on until power is no longer being supplied to the unit. If your display appears to be turned off, *[Power-save mode]* may be active. For more information, refer to:
p.17 — Enabling power-save mode

3.3 Language selection

If your performance display is being powered for the first time, or, if a factory reset has just occurred, a language selection screen will appear if no multifunction display / chartplotter is detected by your performance display:



In order to select a language:

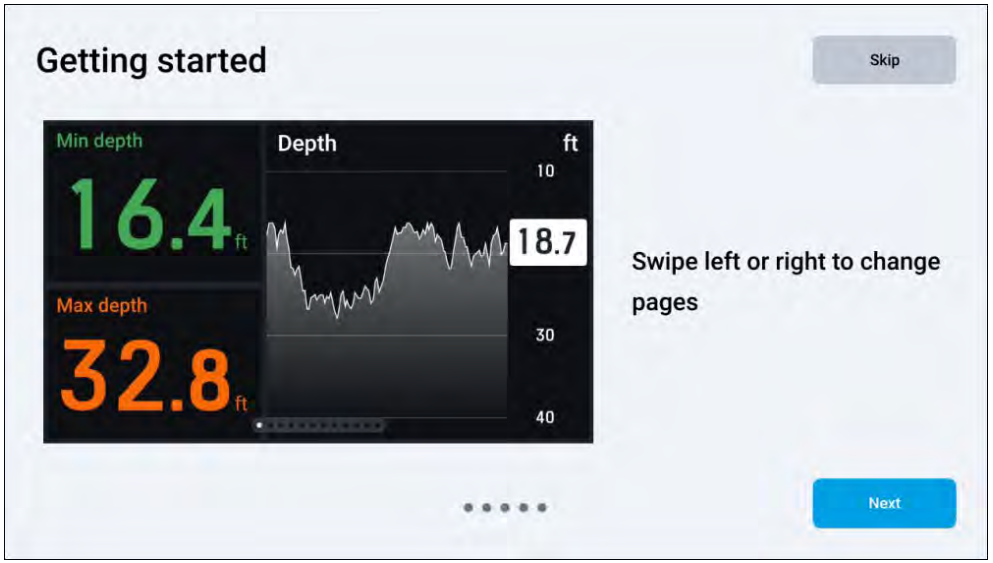
1. (If required) horizontally scroll up and down to find the language that you wish to use, tap the language to select it, and then select *[OK]* to continue.

Once *[OK]* has been selected, a series of tutorial pages will appear.

For a comprehensive list of languages that can be selected on the performance display, refer to: **p.61 — Language settings**

3.4 Tutorial pages

If your performance display is being powered for the first time, or, if a factory reset has just occurred, a series of tutorial pages will appear:



In order to complete the tutorial:

1. Proceed with the tutorial by selecting the *[Next]* button located at the bottom right of your screen until you reach the end.
    a. If you want to return to the previous step, select the *[Back]* button located at the bottom left of your screen.
    b. Optionally, you may skip the tutorial by selecting the *[Skip]* button now, or at any point once the tutorial has been started.
2. Select the *[Done]* button to finish the tutorial.

Once complete, a series of default data pages will be loaded.

3.5 Default data pages

The default data pages created on your performance display will reflect the boating activity type which has been selected on your connected multifunction display / chartplotter.

The following default data will be loaded for each of the following multifunction display / chartplotter activities:

Activity	Data pages
[Sailing]	• *[Zoomed wind (landscape only)]* • *[Wind gauge plus data]* • *[Race pre-start]* • *[SailPoint steering guidance]* • *[3D compass]* • *[Single engine]* • *[True wind graph]*
[General], *[Cruising]*, *[First responder]*	• *[3D compass]* • *[Basic navigation]* • *[Power navigation]* • *[Dual engine]*
[Fishing]	• *[Basic navigation]* • *[Multi-data (fish preset category)]* • *[Compass & data (fish preset category)]* • *[Power navigation]* • *[3D compass]* • *[Single engine]*

Note:

Default data pages can be further edited or removed to suit your preference. For more information, refer to the following sections:

- **p.22 — Deleting pages**
- **p.31 — Widget creation and customization**

Note:

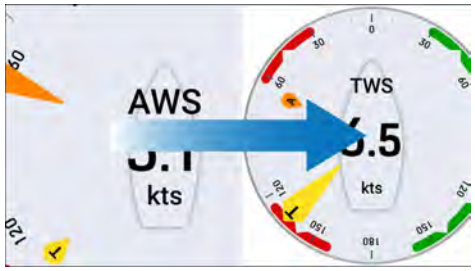
For more information on the default pages that are configured on your performance display, refer to the following section: **p.25 — Page presets**

3.6 Basic controls

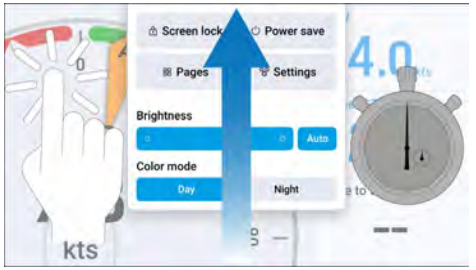
You can switch between data pages by either swiping to the left or right.

Data pages will loop if you reach either the start or end and continue to swipe left or right.

Once your last data page has been reached, swiping to the left or right again will cause the selected page to loop back to the start.

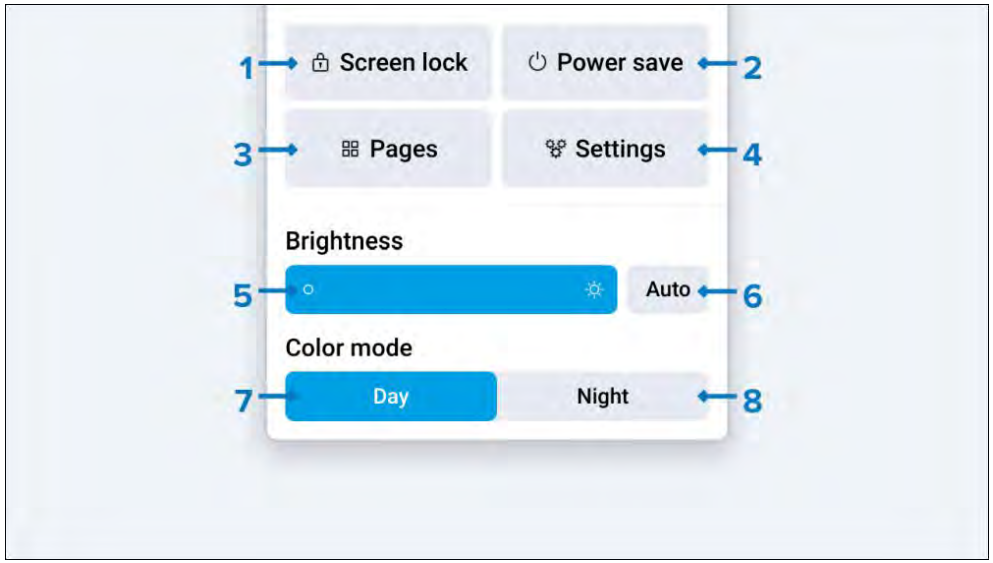
Swipe left (change page)	Swipe right (change page)
	

Each of the display's default pages, user preferences and settings can be customized by selecting one of the options available via the overlay menu, which appears when swiping downward from the top edge of your screen. The overlay menu and other pop-ups can be dismissed by either swiping upward from the bottom edge of your screen (overlay menu only), by tapping outside of the window, or by waiting for an automatic time-out to occur.

Swipe down (open overlay)	Swipe up / tap off / automatic time-out (dismiss overlay)
	

3.7 Overlay options

The following options are available via the *[Overlay menu]*:



1. *[Screen lock]*
2. *[Power save]*
3. *[Pages]*
4. *[Settings]*
5. *[Brightness bar]*

6. *[Auto brightness]*
7. *[Color mode (Day)]*
8. *[Color mode (Night)]*

Activating screen lock

The *[Screen lock]* setting may need to be activated in the unlikely event that erroneous touches are detected in severe weather conditions.

To enable the *[Screen lock]* setting:

1. Swipe down from the top edge of the screen when viewing a data page to display the *[Overlay menu]*.
2. Select *[Screen lock]*.
   Once locked, a *[Screen locked]* pop-up will appear.
3. When you wish to re-enable the touchscreen, swipe upward from the bottom of the screen to unlock the device.
   Once unlocked, a *[Screen unlocked]* pop-up will appear.

Activating power-save mode

The total amount of power consumed by the performance display can be reduced when it is not in use by activating the *[Power-save]* setting.

To enable *[Power-save]* mode:

1. Swipe down from the top edge of the screen when viewing a data page to display the *[Overlay menu]*.
2. Select *[Power save]*.
   While entering *[Power-save]* mode, a *[Power-save mode activated]* pop-up will appear.
3. After 2 seconds, your performance display will enter *[Power-save]* mode.

To exit *[Power-save]* mode, either tap the screen or attempt to remotely control the performance display via a connected multifunction display / chartplotter.

Note:

If your performance display is set to be part of a shared display group, the *[Power-save]* mode can be simultaneously activated for each compatible device which is assigned to the same group. For more information on how to configure your performance display's display group settings, refer to: **p.56 — Display group settings**

Managing pages

The performance display's data pages can be managed by using the *[Pages]* option, which can be found under: *[Data page view > Overlay menu > Pages]* or by using a pinching-in gesture on the touchscreen when viewing a data page.

For comprehensive page management and creation information, refer to the following section: **p.20 — Page management and creation**

Managing settings

The performance display's system settings can be configured by using the *[Settings]* option, which can be found under: *[Data page view > Overlay menu > Settings]*.

For comprehensive setting configuration information, refer to the following section: **p.55 — Settings**

Display orientation settings

Following a factory reset, your screen orientation will automatically change to *[Landscape]* or *[Portrait]*, based on your installation orientation.

Note:

Your performance display has a separate selection of pages that are available in each screen orientation (i.e. portrait or landscape):

- Any data pages which you have created will be specific to the screen orientation which they were created on.
- When switching between screen orientations, your previous setup will be saved in case you wish to revert back to your original orientation.

In order to change your screen orientation:

1. Navigate to: *[Data page view > Overlay menu > Settings > Display orientation]*.
2. Select between *[Landscape]* and *[Portrait]*.

Adjusting the display's brightness

The performance display's brightness level can be adjusted using the *[Brightness bar]* and *[Auto brightness]* settings.

The *[Brightness bar]* will allow you to manually adjust the performance display's brightness level.

The *[Auto brightness]* setting will automatically adjust the performance display's brightness level based on the surrounding ambient light level. When using the *[Auto brightness]* setting, adjusting the *[Brightness bar]* will add an offset value to the current brightness.

Note:

If your performance display is configured to be part of a shared display group, the *[Brightness bar]* and *[Auto brightness]* setting can be used to simultaneously adjust the brightness level of each compatible device assigned to the same group. For more information on how to configure your performance display's display group settings, refer to:
p.56 — Display group settings

In order to change the brightness:

1. When viewing a data page, swipe down from the top edge of the screen to display the *[Overlay menu]*.
2. Manually adjust the screen brightness via the *[Brightness bar]*, or select *[Auto]* to automatically adjust the performance display's brightness level based on the surrounding ambient light level.

Changing color modes

In addition to the default *[Color mode (Day)]* configuration, the performance display can also be configured for night time use via the available *[Color mode (Night)]* setting.

Important:

If you are using the *[Color mode (Night)]* setting at night, be aware that your vision may be compromised when reverting back to either the *[Color mode (Day)]* setting or a display screen with a higher level of brightness.

Note:

The *[Color mode (Day)]* and *[Color mode (Night)]* settings are applied globally to all compatible devices in the system, and will therefore automatically synchronize with any networked multifunction displays / chartplotters and daisy-chained performance displays.

In order to change between color modes:

1. When viewing a data page, swipe down from the top edge of the screen to display the *[Overlay menu]*.
2. Select between *[Color mode (Day)]* and *[Color mode (Night)]*.

Color mode (Day)	Color mode (Night)
	

[Color mode (Day)] — the default color mode, which uses standard light (default) or dark colors (intended for day use).

[Color mode (Night)] — the non-default color mode, which uses red text and icons on a darkened background screen (intended for night use).

Note:

For information on how to configure your *[Color mode (Day)]* color scheme, refer to the information found in the following section:
p.56 — Daytime color settings

3.8 Software updates

The software running on the product can be updated.

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

Important:

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

Caution: Installing software updates

- The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.
- Ensure that the unit has a reliable power supply and that the update process is not interrupted.
- Damage caused by an incomplete update is not covered by Raymarine warranty.
- By downloading the software update package, you agree to these terms.

CHAPTER 4: PAGE MANAGEMENT AND CREATION

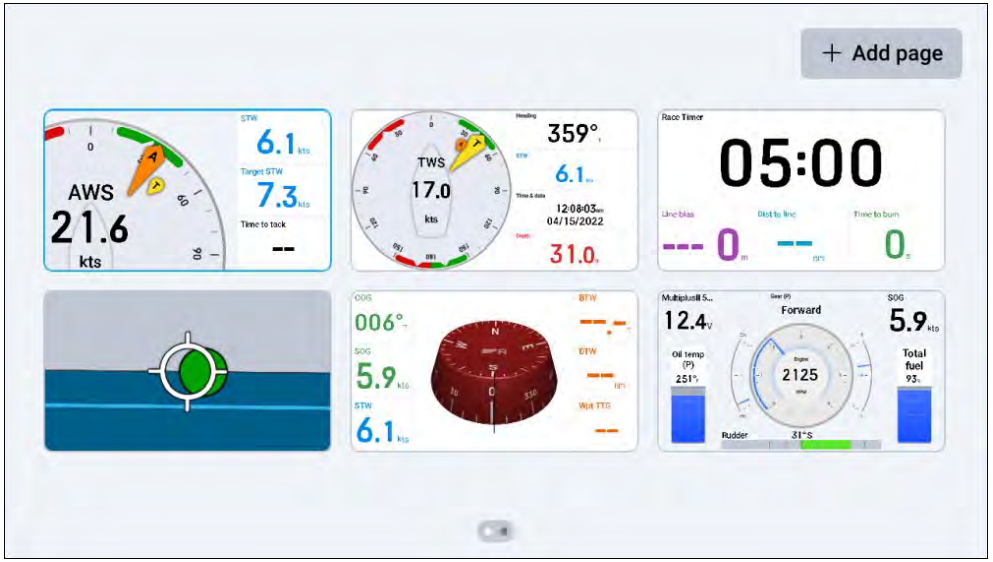
CHAPTER CONTENTS

4.1 Page management overview

The *[Pages]* screen provides a horizontally-scrollable live view of the currently configured data pages.

Data pages can be added, reordered, duplicated, deleted, selected and configured to auto-select via the *[Pages]* screen.

The *[Pages]* screen can be accessed via the *[Overlay menu]* or when you use a pinch-in gesture with the touchscreen, when viewing a data page.



Selecting a data page to view

The *[Pages]* shows an overview of all your data pages, allowing you to select the page that you wish to view.

In order to select and display a specific data page:

1. Navigate to: *[Data page view > Overlay menu > Pages]* or pinch-in when viewing a data page to display the *[Pages]* screen.
2. (If applicable) scroll left and right to find the data page that you wish to view.
3. Select the data page to view it.

Your chosen data page will be displayed onscreen.

Reordering data pages

You can use the *[Pages]* screen to change the order in which your data pages appear.

Note:

The data page layout shown on your *[Pages]* screen is ordered from the top left to the top right, then from the bottom left to the bottom right.

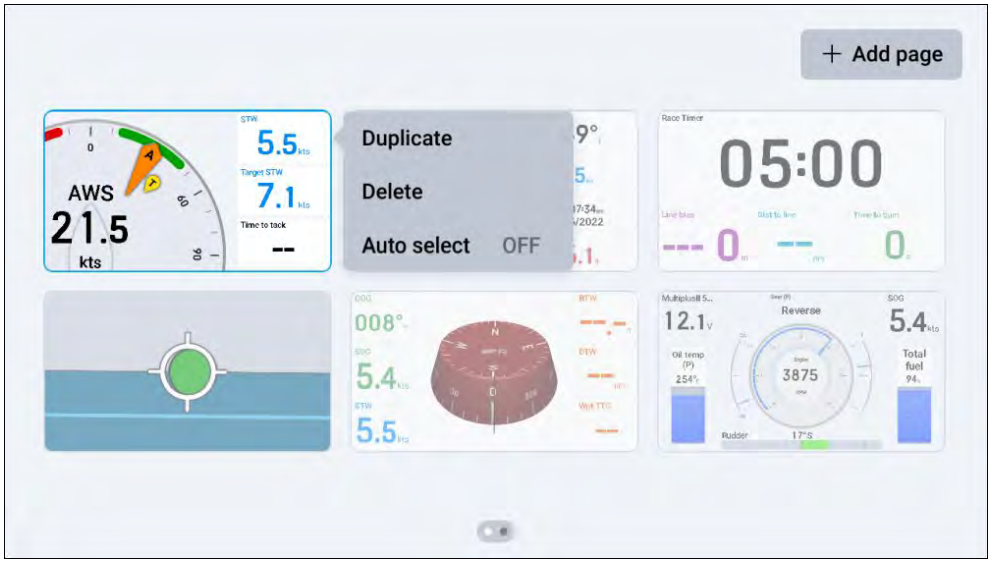
To reorder your data pages:

1. Navigate to: *[Data page view > Overlay menu > Pages]* to display the *[Pages]* screen, or use a pinch-in gesture when viewing a data page.
2. (If applicable) scroll left and right to find the data page that you wish to move in your page sequence.
3. Tap and hold the data page that you wish to move, until it is highlighted.
4. (If applicable) to scroll between pages, drag the data page to the left or right edge of your screen.
5. Drag and drop the data page to your chosen location.

Repeat steps 1–5 if you wish to change the order of multiple data pages.

4.2 Page options

When viewing the *[Pages]* screen, you can tap and hold on a data page to display additional *[Page options]*.



The following options are available:

1. *[Duplicate]*.
2. *[Delete]*.
3. *[Auto-select]*.

Duplicating data pages

You can make a copy of an existing page by using the *[Duplicate]* option.

To *[Duplicate]* a data page:

1. Navigate to: *[Data page view > Overlay menu > Pages]* to display the *[Pages]* screen, or use a pinch-in gesture when viewing a data page.
2. (If applicable) scroll left and right to find the data page that you wish to duplicate.
3. Tap and hold on your data page, until it is highlighted.
4. Once highlighted, release your data page to display the *[Page options]* menu.
5. Select *[Duplicate]* to duplicate your highlighted data page.

Your duplicated data page will appear next to the original data page.

Deleting pages

You can also delete unwanted data pages using the *[Delete]* option.

To *[Delete]* a data page:

1. Navigate to: *[Data page view > Overlay menu > Pages]* to display the *[Pages]* screen, or use a pinch-in gesture when viewing a data page.
2. (If applicable) scroll left and right to find the data page that you wish to delete.
3. Tap and hold on your data page, until it is highlighted.
4. Once highlighted, release your data page to display the *[Page options]* menu.
5. Select *[Delete]* to delete your highlighted data page.

   A confirmation pop-up will appear:

   - Select *[Yes]* to confirm your choice.
   - Select *[No]* to return to the *[Pages]* screen.

Once confirmed, your selected data page will be deleted.

Auto-selecting pages

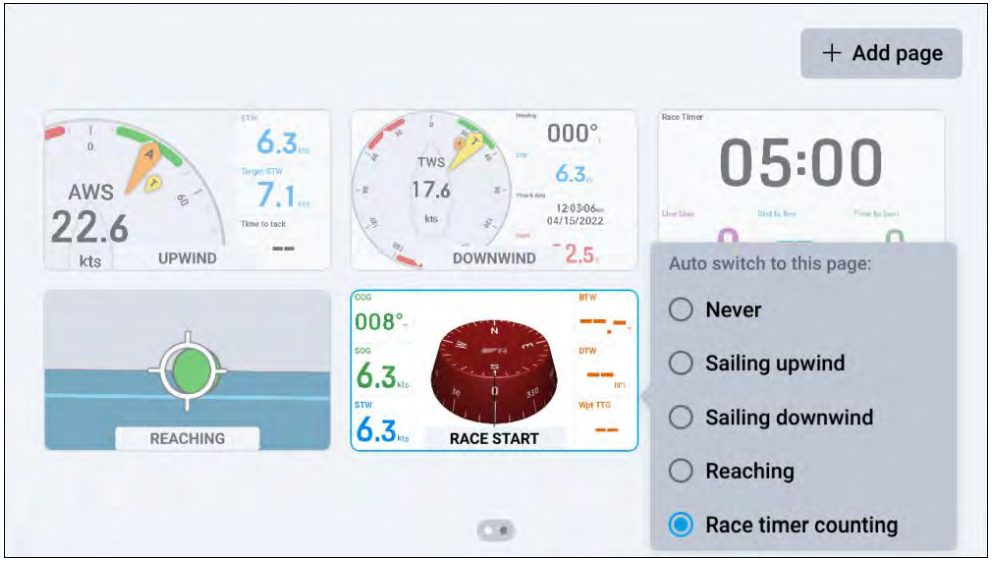
You can configure your data pages to be automatically selected once one of the following conditions has been met:

- Never (default).
- Sailing upwind.
- Sailing downwind.
- Reaching.
- Race timer counting.

To *[Auto select]* your data page(s):

1. Navigate to: *[Data page view > Overlay menu > Pages]* to display the *[Pages]* screen, or use a pinch-in gesture when viewing a data page.
2. (If applicable) scroll left and right to find the data page that you wish to configure.
3. Tap and hold on your data page, until it is highlighted.
4. Once highlighted, release your data page to display the *[Page options]* menu.
5. Select *[Auto select]*.
6. Select one of the conditions that has to be met in order for your data page to automatically appear onscreen:

Once selected, a blue circle indicator will appear to the left of your chosen condition, and a label will be shown at the bottom of your data page on the *[Pages]* screen.



Note:

Each *[Auto select]* condition can only be assigned to one data page at a time. If you are duplicating a page which has been assigned an *[Auto select]* condition, the condition will not be copied across to the duplicated page.

4.3 Page creation

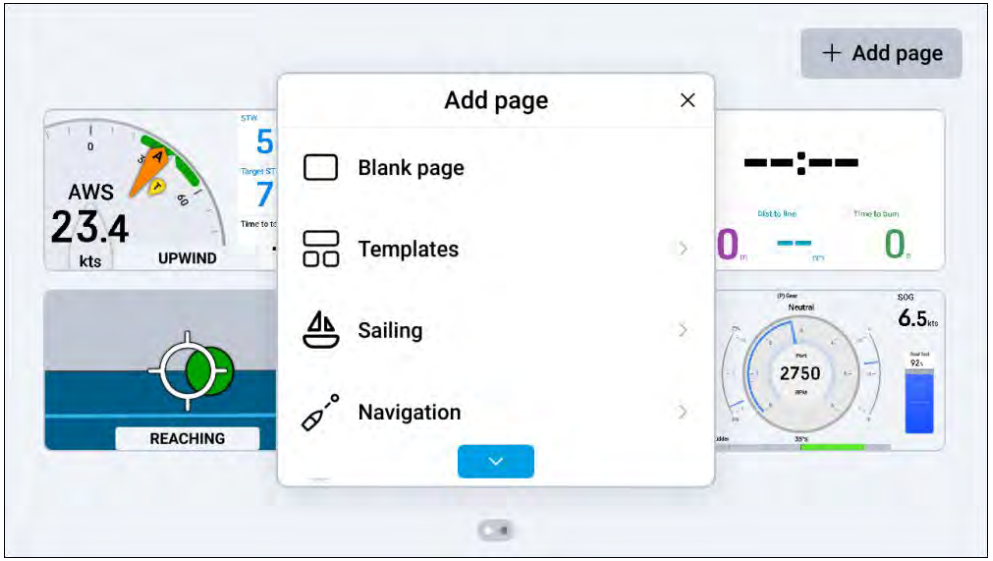
When viewing the *[Pages]* screen, you can select the *[+ Add page]* button located at the top right corner of your screen to display additional page creation options.

Creating new pages

The *[+ Add page]* option allows you to create new data pages based upon a series of page presets which can be further customized to suit your preference.

Note:

A maximum of 18 data pages can exist at any one time on a performance display. If your performance display already contains 18 data pages, the *[+ Add page]* option will be disabled.



The following page preset options are available:

- *[Blank page]* — A blank data page which is not populated with any widgets.
- *[Templates]* — A range of selectable preset data pages which are populated with blank widget cells that vary in number, shape and size.
- *[Navigation]* — A range of selectable preset data pages which are populated with navigation related widgets.
- *[Sailing]* — A range of selectable preset data pages which are populated with sailing related widgets.

Note:

In order for the *[Sailing]* page preset option to appear, your boat activity must be set to either *[General]* or *[Sailing]* during your connected MFD's initial startup wizard.

- *[Fishing]* — A range of selectable preset data pages which are populated with fishing related widgets.

Note:

In order for the *[Fishing]* page preset option to appear, your boat activity must be set to either *[General]*, *[Saltwater fishing]* or *[Freshwater fishing]* during your connected MFD's initial startup wizard.

- *[Engines]* — A range of selectable preset data pages which are populated with engine related widgets.

In order to add a new data page:

1. Navigate to: *[Data page view > Overlay menu > Pages > + Add page]*.
2. (If applicable) vertically scroll up and down to find your chosen preset.
3. Select the page preset that you wish to create.
   i. (If applicable) select a sub-page preset.

Your chosen preset will now be created as a new data page.

For further information on each of the page presets that are available, refer to the following section: **p.25 — Page presets**

CHAPTER 5: PAGE PRESETS

CHAPTER CONTENTS

5.1 Page presets overview

The following section will provide a summary for each of the page preset options that are available, the typical use cases for each preset and the widgets that are supplied with each preset.

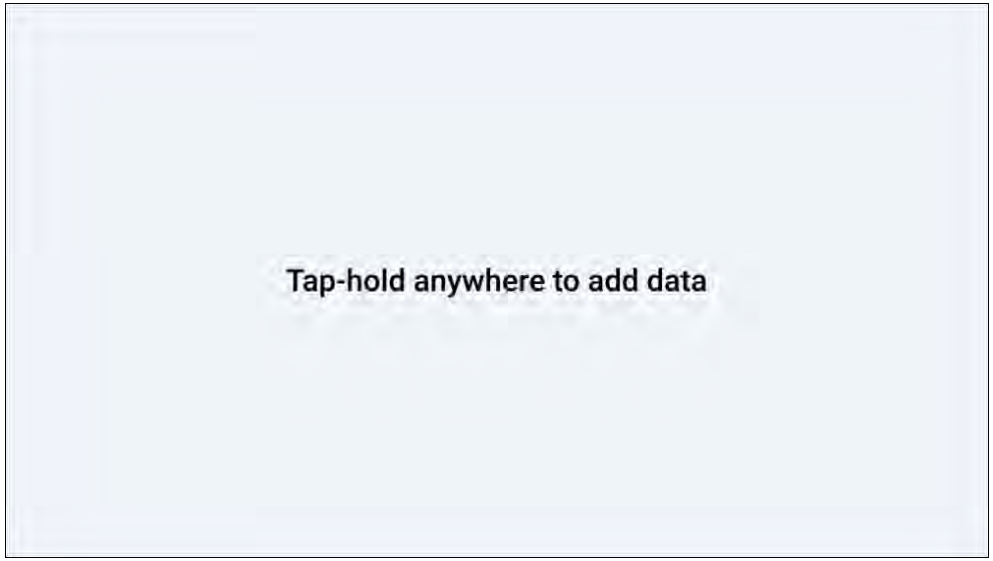
- **p.26 — Blank page preset**
- **p.27 — Template page presets**
- **p.29 — Navigation page presets**
- **p.28 — Sailing page presets**
- **p.29 — Fishing page presets**
- **p.30 — Engine page presets**

Note:

- For information on how to create pages, refer to the following section: **p.23 — Creating new pages**
- For information on how to add a widget, refer to the following section: **p.32 — Adding widgets**

5.2 Blank page preset

The *[Blank page]* preset is not populated with any widgets and can be fully customized to suit your preference.

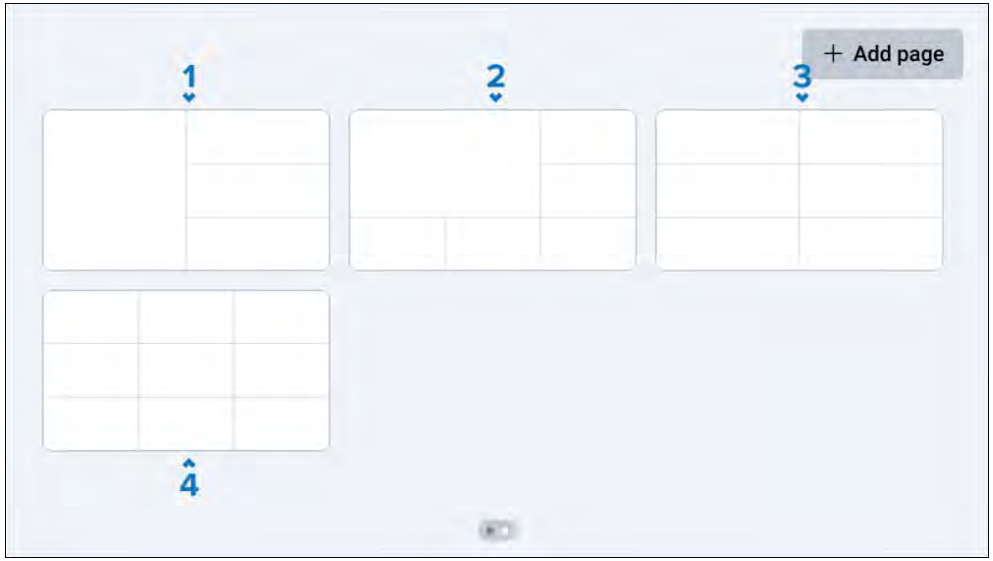


5.3 Template page presets

The *[Template]* page presets are populated with template cells which you can populate with data widgets. This enables you to quickly create a customized data page without having to manually resize and align each of your widgets.

The following *[Template]* preset pages are available:

1. *[Fullscreen]*.
2. *[Vertical split]*.
3. *[Horizontal split]*.
4. *[Horizontal and double-split]*.
5. *[Vertical and double-split]*.
6. *[Quad-split]*.



1. *[Vertical and tri-split]*.
2. *[Corner-split]*.
3. *[2 x 3 split]*.
4. *[3 x 3 split]*.

Once a *[Template]* page preset has been created, you can tap an individual cell to display additional *[Add data]* and *[Delete cell]* options.

Note:

If a widget cannot fit within the defined space that you have chosen, a *[Can not add widget]* pop-up will appear.

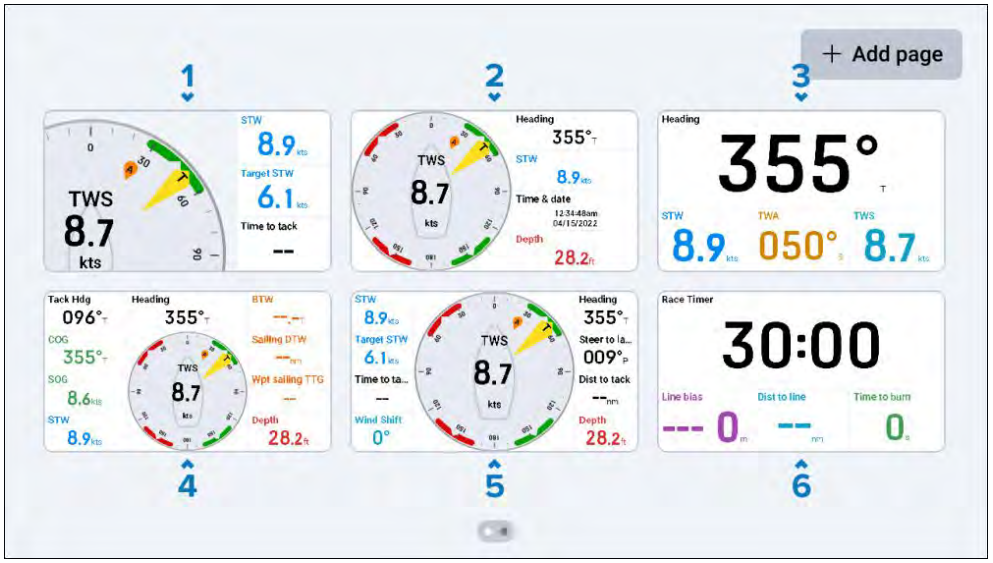
5.4 Sailing page presets

The *[Sailing]* page presets are populated with widgets that combine to provide assistance when sailing.

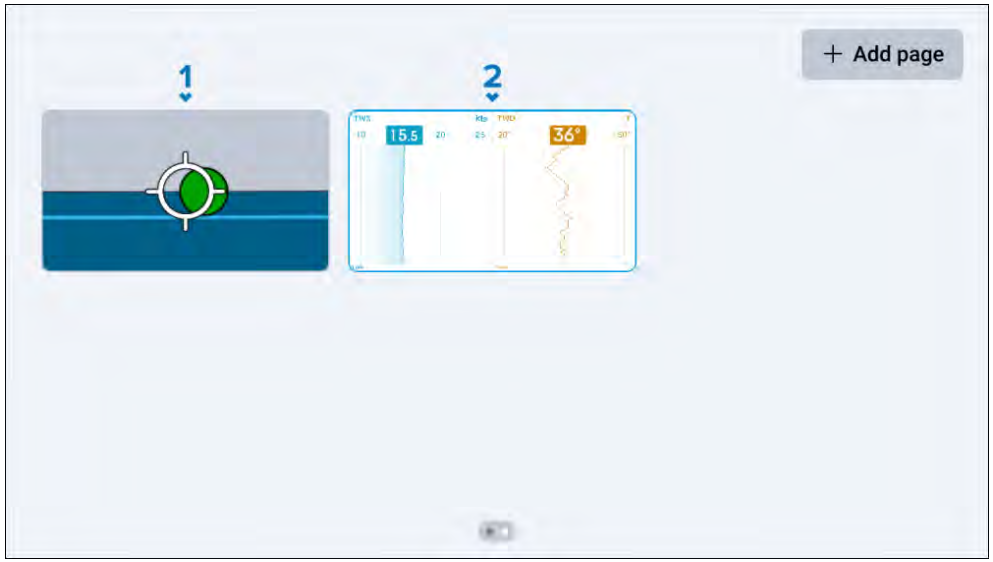
Note:

In order for the *[Sailing]* page preset option to appear, your boat activity must be set to either *[General]* or *[Sailing]* during your connected MFD's initial startup wizard.

The following *[Sailing]* page presets are available:



1. *[Zoomed wind gauge (landscape only)]* — Includes 3 sailing orientated widgets and a zoomed variant of the *[Wind performance gauge]* widget which moves to focus on the current wind angle in one of five positions (upwind port, upwind starboard, reaching port, reaching starboard and downwind). The zoomed *[Wind performance gauge]* variant can be tap-held to change between *[Apparent Wind]* and *[True Wind]*. The zoomed *[Wind performance gauge]* variant widget cannot be edited or deleted. This preset page is only available when your performance display's *[Display orientation]* is set to *[Landscape]*.
2. *[Wind gauge plus data]* — Includes 4 sailing orientated widgets and an enlarged *[Wind performance gauge]* widget.
3. *[Heading plus data]* — Includes 3 sailing orientated widgets and an enlarged *[Heading]* digits widget.
4. *[Sailing navigation]* — Includes 9 sailing orientated widgets and a centred *[Wind performance gauge]* widget.
5. *[Performance sailing]* — Includes 8 sailing orientated widgets and a center enlarged *[Wind performance gauge]* widget.
6. *[Race pre-start]* — Includes 3 sailing race start-line orientated widgets and an enlarged *[Race timer]* digits widget.

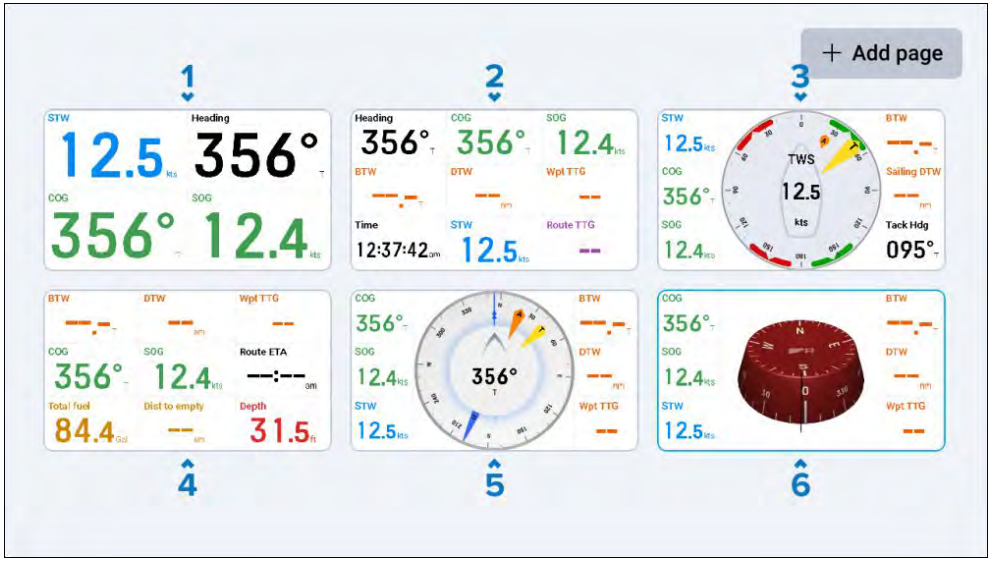


1. *[SailPoint steering guidance]* — Includes 4 sailing orientated widgets (*[Display orientation (portrait)]* only) and a center enlarged *[SailPoint]* widget.
2. *[True wind graph]* — Includes an enlarged view of the *[TWS (True Wind Speed)]* graph widget and the *[TWD (True Wind Direction)]* graph widget (*[Display orientation (portrait)]* only).

5.5 Navigation page presets

The *[Navigation]* page presets are populated with widgets that combine to provide assistance when navigating your boat.

The following *[Navigation]* preset pages are available:



1. *[Basic navigation]* — Includes 4 navigation orientated widgets which combine to provide a basic level of navigational assistance.
2. *[Advanced navigation]* — Includes 9 navigation orientated widgets which combine to provide an advanced level of navigational assistance.
3. *[Wind navigation]* — Includes 6 navigation orientated widgets and a center enlarged *[Wind performance gauge]* widget.
4. *[Power navigation]* — Includes 9 fuel and navigation orientated widgets.
5. *[Compass & data]* — Includes 6 navigation orientated widgets and a center enlarged *[Standard compass]* widget.
6. *[3D compass]* — Includes 6 navigation orientated widgets and a center enlarged *[3D compass]* widget.

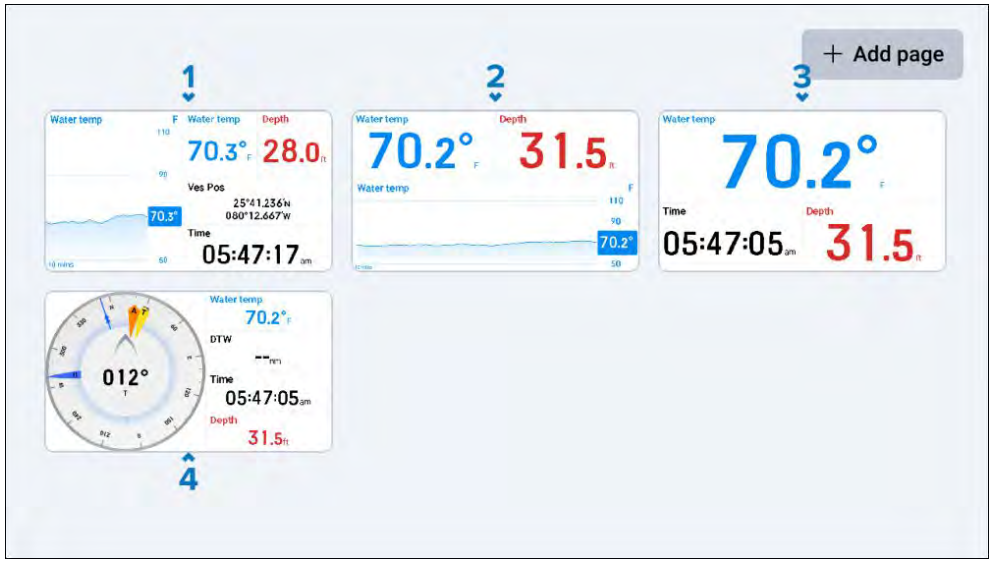
5.6 Fishing page presets

The *[Fishing]* page presets are populated with widgets that combine to provide assistance when fishing.

Note:

In order for the *[Fishing]* page preset option to appear, your boat activity must be set to either *[General]*, *[Saltwater fishing]* or *[Freshwater fishing]* during your connected MFD's initial startup wizard.

The following *[Fishing]* page presets are available:



1. *[Multi-data]* — Includes 4 fishing orientated widgets and an enlarged *[Water temp]* graph widget.
2. *[Water temperature graph & depth]* — Includes 3 fishing orientated widgets and an enlarged *[Water temp]* graph widget.
3. *[Water temperature, time & depth]* — Includes 3 fishing orientated widgets and an enlarged *[Water temp]* digits widget.
4. *[Compass & data]* — Includes 4 fishing orientated widgets and an enlarged *[Standard compass]* widget.

5.7 Engine page presets

The *[Engine]* page presets are populated with widgets that combine to provide information related to your vessel's engine status.

The following *[Engine]* preset pages are available:

1. *[Single engine]* — Includes 6 engine orientated widgets and a center enlarged *[Engine combo gauge]* widget.
2. *[Dual engine]* — Includes 10 engine orientated widgets and two center enlarged *[Engine combo gauge]* widgets.

CHAPTER 6: WIDGET CREATION AND CUSTOMIZATION

CHAPTER CONTENTS

6.1 Adding widgets

Depending on the space available, you may be able to add one or more widgets to your page.

Note:

For information on how to create a new data page, refer to the following section: **p.23 — Page creation**

Note:

Before adding a widget to your page, ensure that there is sufficient space available. If a widget cannot fit into the defined space that you have selected then it will be greyed out.

In order to add a widget:

1. Either:
   - Tap-hold in the space available and select *[Add data]* when prompted.
   - Or if you are viewing a *[Data combo]* page, tap one of the *[Data combo]* widget templates that are available onscreen and select *[Add data]*.

   A *[Select data category]* menu will appear.
2. Then, either:
   - Select the *[Search bar]* located at the top of the *[Select data category]* menu in order to directly search for a specific data item. Once pressed, an onscreen keyboard will appear.
     - Enter the name of the data item that you wish to create a widget for and select from the list of results available.
     - Select the type of widget that you wish to create.
   - Or, browse the *[Select data category]* menu and select a category to view the full range of related data items that are available.
     - (If required) select the battery, engine, fuel tank, generator or water tank that you wish to create a widget for.
     - Browse the data item list and select the type of data that you wish to create a widget for.
     - Select the type of widget that you wish to create.

Your widget will now appear onscreen in the space that you previously selected.

Note: If two or more data items exist with the same name but they apply to different data categories (e.g. the *[Oil temperature]* data item name is found within both the *[Engine]* and *[Generator]* data categories), then the applicable data category will also appear alongside each name instance.

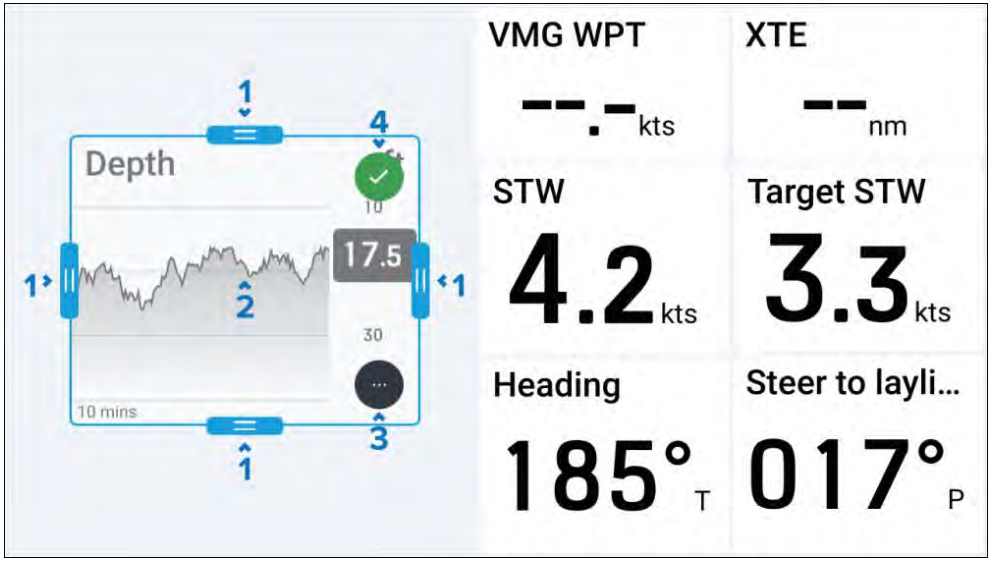
Note:

- The unit of measurement shown on each widget is dependent on the *[Units]* settings that have been configured on your connected multifunction display / chartplotter. For more information, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).
- For information on which data items and widgets are available, refer to the following section: **p.41 — Data item and widget overview**

6.2 Widget customization

Each of your widgets can be independently moved and resized to suit your preference.

The following customization options will appear when tap-holding one of your widgets.



1. *[Scale handle]* — Tap, hold and drag inward or outward to either increase or decrease the size of your widget in the direction of the handle which you have selected.
2. *[Move widget]* — Tap and hold inside your widget, then drag the widget to a new location.
3. *[More options]* — Tap to show more options related to the widget type that you have selected. For more information on each of the widget type options available, refer to the information found within the following section: **p.33 — Widget types overview**
4. *[Accept]* — Tap to confirm your changes.

Note:

- If the selected widget is scaled within close proximity to another widget, it will automatically snap into alignment.
- Information inside of your widget will automatically scale to match any dimension changes.

6.3 Widget types overview

The following section will outline which types of widgets are available on your performance display:

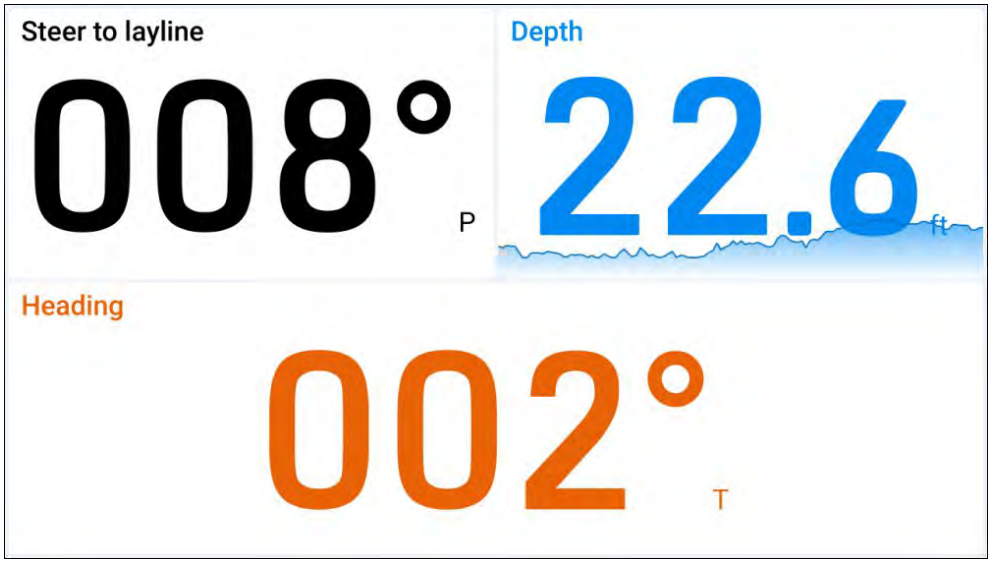
Note:

For information on which widgets are supported for each of the data items available, refer to the following section: **p.41 — Data item and widget overview**

Digital data widgets

The *[Digits]* widget option provides a clear, and easy to understand numerical view of the data item that you have selected, which can be further customized to suit your preference.

Example: Digit widgets



Digit widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Text colour]* — opens a menu with selectable color palettes, which can be used to change the selected widget's color. The same color can be applied to other versions of the same data item widget type by using the *[Apply to all widget data]* tick box located underneath the color palettes.
- *[Text title]* — opens a menu with selectable widget title size options, which can be used to change the selected widget's title size between: *[Large]*, *[Medium]* and *[Small]*.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).
- *[Show mini-graph (toggle)]* —displays a miniature graph at the bottom of the selected widget, which shows the value's trend over time on select data items.

Note:

A maximum of 10 *[Show mini-graph]* options can be toggled *[On]* per performance display.

- *[Mini-graph scale]* — changes the *[Mini-graph]* time scale for the selected widget between: *[1 min]*, *[10 mins]*, *[1 hour]*, *[12 hours]*, *[24 hours]*.

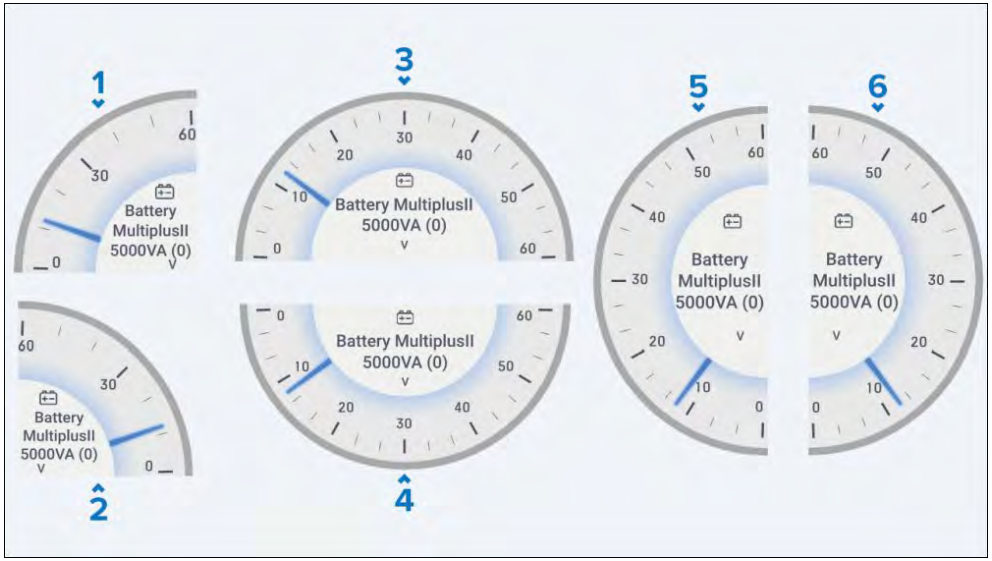
Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Gauge widgets

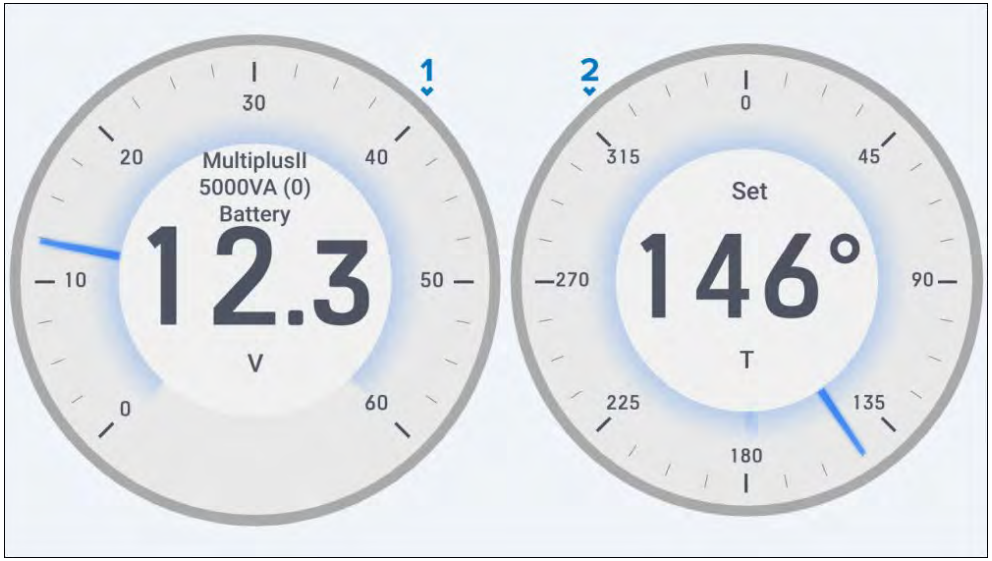
The *[Gauge]* widget options provide a selection of graphical 90° (left / right), 180° (up / down / left / right), 270° and 360° data item indicator views, which can be further moved and resized to suit your preference.

Example: Gauge widgets 1



1. *[90° Gauge left]*
2. *[90° Gauge right]*
3. *[180° Gauge up]*
4. *[180° Gauge down]*
5. *[180° Gauge left]*
6. *[180° Gauge right]*

Example: Gauge widgets 2



1. *[270° Gauge]*
2. *[360° Gauge]*

Gauge widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Graph widgets

The *[Graph (horizontal)]* and *[Graph (vertical)]* widget options provide two graphical views which automatically update to show the changing values and trends over time for the widget that you have selected. Both the *[Graph (horizontal)]* and *[Graph (vertical]* widgets can be further customized to suit your preference.

Example: Graph widgets (horizontal and vertical)

Graph widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Graph colour]* — opens a menu with selectable color palettes, which can be used to change the selected widget's color. The same color can be applied to duplicate versions of the same widget, by using the *[Apply to all widget graphs]* tick box located underneath the color palettes.
- *[Time scale]* — changes the selected widget's time scale between: *[1 min]*, *[10 mins]*, *[1 hour]*, *[12 hours]*, *[24 hours]*.
- *[Text title]* — opens a menu with widget title size options, which can be used to change the selected widget's title size between: *[Large]*, *[Medium]* and *[Small]*.

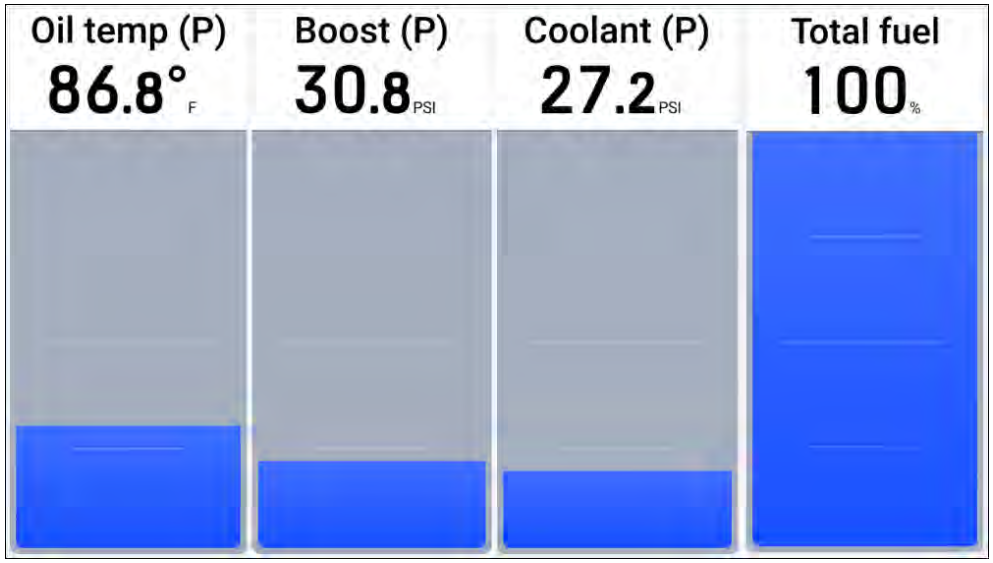
Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Level widgets

The *[Level]* widget option provides a vertical bar indicator which raises or lowers to reflect the live state of the data item that you have selected. The *[Level]* widget can be further moved and resized to suit your preference.

Example: Level widgets



Level widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.

- *[Delete]* — deletes the selected widget.

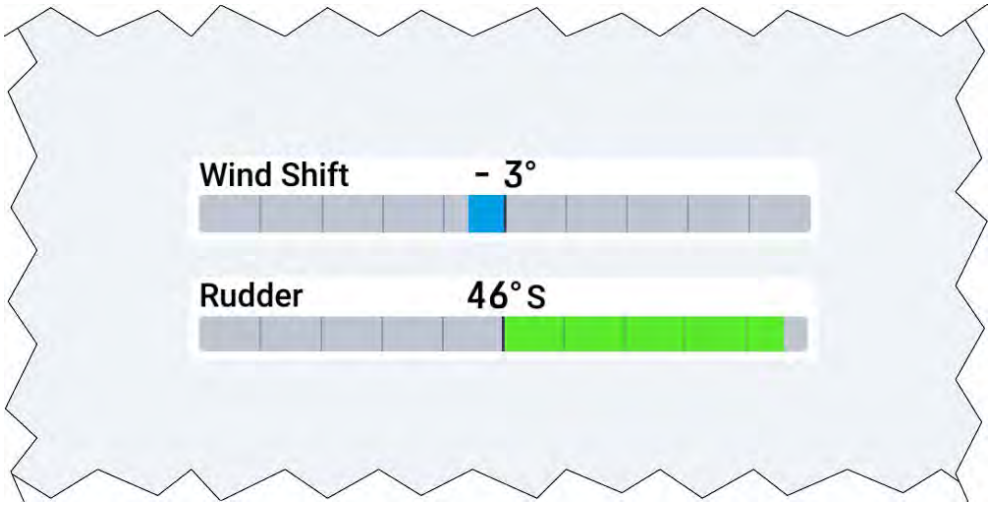
Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Bar widget

The *[Bar]* widget option provides a horizontal bar indicator which moves left (port) or right (starboard) to reflect the live state of the data item that you have selected. The *[Bar]* widget can be further moved and resized to suit your preference.

Example: Bar widgets



Bar widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Engine combo gauge

The *[Engine combo gauge]* widget combines a dynamic graphical RPM 270° gauge with oil pressure, engine temperature and other status indicators.

Example: Engine combo gauge

1. **Oil pressure indicator** — Current engine oil pressure indication.
2. **RPM indicator** — Graphical representation of engine RPM.
3. **Engine name** — As defined on multifunction display / chartplotter.
4. **RPM** — Digital RPM value.
5. **Maintenance indicator** — Illuminates when engine maintenance is required.
6. **Engine check** — Illuminates when an engine fault is detected.
7. **Coolant temperature** — Current engine coolant temperature indication.

Engine combo gauge widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).

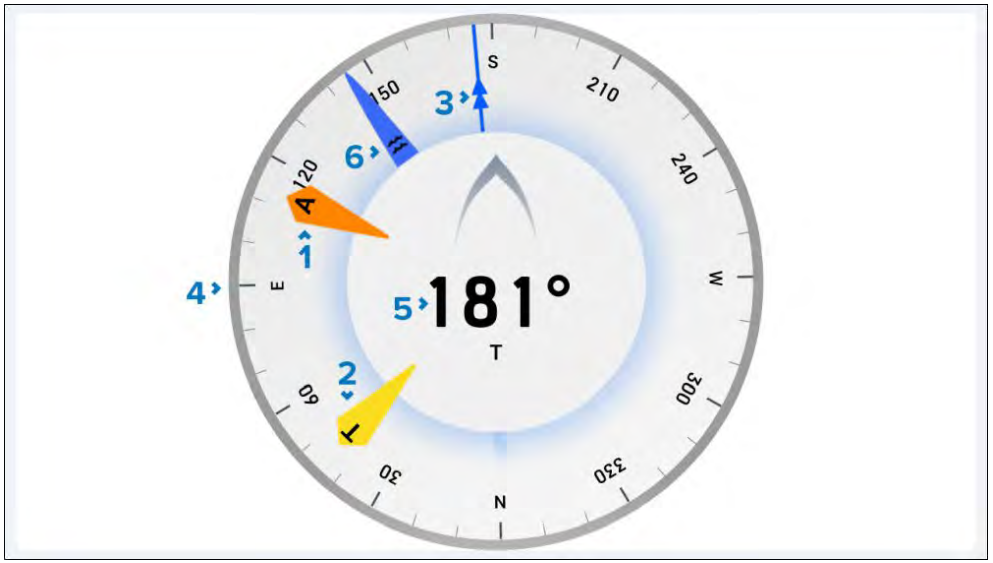
Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Standard compass

The *[Standard compass]* widget combines a dynamic graphical vessel heading gauge with tide direction, AWD, TWD and COG indicators.

Example: Standard compass



1. **AWD indicator** — Apparent Wind Direction.
2. **TWD indicator** — True Wind Direction.
3. **COG indicator** — Course Over Ground.
4. **Compass dial** — The compass dial will rotate to provide indication of heading.
5. **Heading** — Vessel heading.
6. **Tide indicator** — Tide direction.

Standard compass widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

3D compass widget

The *[3D compass]* widget option provides a digital view of a wet compass which responds dynamically to your boat's magnetic heading and movement. The *[3D compass]* widget can be further customized to suit your preference.

Note:

A maximum of 2 *[3D compass]* widgets can be created per performance display. If a third *[3D compass]* widget is created, a *[Can not add widget]* pop-up will appear.

Example: 3D compass widget

3D compass widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Compass colour]* — opens a menu with selectable color palettes, which can be used to change the selected widget's color between red, blue or black / white depending on your performance display's *[Daytime colour]* settings. For more *[Daytime colour]* setting information, refer to the following section: **p.56 — Daytime color settings**
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

Wind performance gauge

The *[Wind performance gauge]* widget shows both measured and target wind angles, with a central wind speed value.

Note:

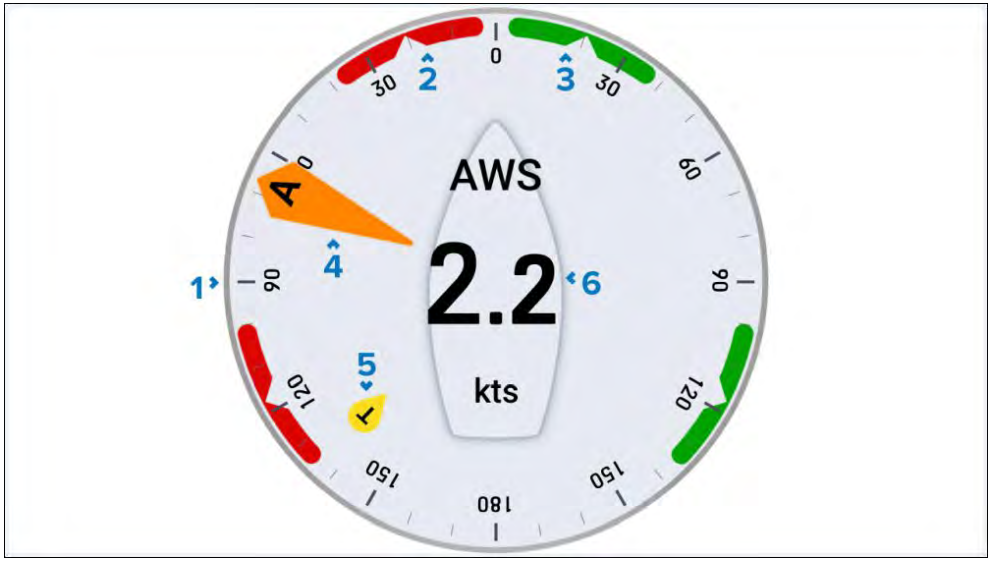
Target wind angles shown on the *[Wind performance gauge]* widget are taken from your multifunction display's *[Sail performance]* setting. The *[Sail performance]* setting can be configured from the *[Boat details]* menu: *[Homescreen > Boat details > Sail performance]*. For more information on the *[Polar]* and *[Fixed angles]* options available, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

Note:

This widget is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

The *[Wind performance gauge]* widget can be tapped and selected to display additional *[Apparent Wind]* and *[True Wind]* view options. For a full list of widget functions that are available, refer to: **p.51 — Widget functions**

Example: Wind performance gauge (AWS view)



1. **Angle dial** — The angle dial remains fixed and the indicators move around the dial to indicate changes to direction / angle.
2. **Port wind angle target** — Align the larger wind indicator (AWA or TWA) with the notch to optimize Velocity Made Good (VMG) when sailing upwind (currently shown) or downwind on port tack.
3. **Starboard wind angle target** — Align the larger wind indicator (AWA or TWA) with the notch to optimize Velocty Made Good (VMG) when sailing upwind or downwind on starboard tack.
4. **AWA indicator** — Apparent Wind Angle.
5. **TWA indicator** — True Wind Angle.
6. **Apparent wind speed** / **True wind speed** — Changes based upon widget function selected.

Wind performance gauge widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.
- *[Show background]* — toggles the selected widget's background either *[On]* (to display a shaded background) or *[Off]* (to display no shaded background).
- *[Wind]* — changes the selected widget's view between *[Apparent Wind]* and *[True Wind]*.

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

SailPoint

The *[SailPoint]* widget includes steering markers and a crosshair, which provide a visual reference of the best target wind angle, to assist you in achieving your vessel's maximum upwind or downwind Velocity Made Good (VMG) / waypoint Course-to-Steer (CTS). SailPoint also includes a dynamic polar speed indicator which moves up or down to show the percentage polar performance versus the target polar vessel speed for the current wind speed and angle.

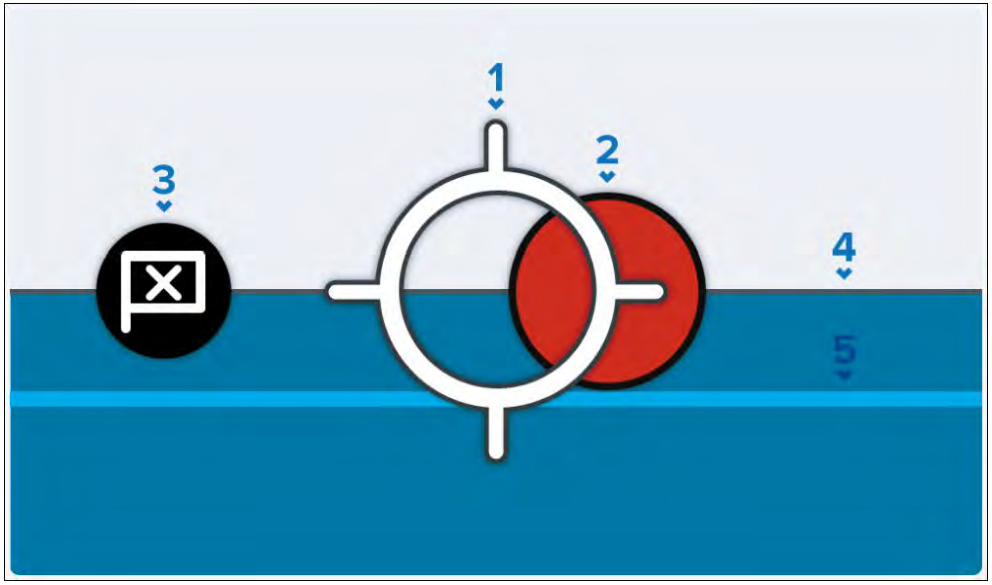
Note:

This widget is only available when the boating activity is set to *[Sailing]*, when completing the initial startup wizard for your connected multifunction display / chartplotter.

Note:

The widget is set to self-correct and counteract the performance display's tilt angle. All screen objects referenced below will rotate around the center of the crosshair, so that each element remains horizontally level with the ground.

Example: SailPoint widget



1. **Heading crosshair** — Your boat's heading is represented by a central crosshair. When a marker is within the crosshair, the boat is considered to be on target to achieve the best upwind and downwind Velocity Made Good (VMG) / waypoint Course-to-Steer (CTS), according to your multifunction display / chartplotter's *[Fixed Angles]* / *[Polar]* layline configuration. For more information, refer to the "*Chart app – racing mode*" chapter in the LightHouse™ 4 Advanced Operation Instructions (**81406**).
2. **Steering marker** — Indicates the optimum port (red marker is illustrated) or starboard (green marker) tack steering angle (upwind and downwind).
3. **Waypoint marker** — Indicates the optimum waypoint Course-to-Steer (CTS).
4. **Target speed** — Target polar boat speed for the current wind speed and angle.
5. **Polar performance** — Current polar boat performance.

SailPoint widget options

You can tap-hold a widget and select *[...]* to display additional widget options which are specific to the selected widget type.

The following widget options are available:

- *[Edit data]* — replaces the selected widget with another chosen from the *[Select data category]* sub-menus. The new widget will adopt the same position and dimensions as the previous widget.
- *[Delete]* — deletes the selected widget.

Note:

For more information on how to edit your widgets, refer to the following section: **p.32 — Widget customization**

6.4 Data item and widget overview

Network data shared from your connected multifunction display / chartplotter can be shown as different customizable widgets on your performance display.

When adding data to your performance display, each data item (and corresponding widget type available) is organized into a data category.

The following section will outline every data item and customizable widget type that is available under each data category.

- **p.42 — Battery data**
- **p.42 — Boat data**
- **p.42 — Depth data**
- **p.42 — Distance data**
- **p.43 — Engine data**
- **p.44 — Environment data**
- **p.44 — Fuel data**
- **p.45 — GPS data**
- **p.45 — Generator data**
- **p.46 — Heading data**
- **p.47 — Inside environment data**
- **p.47 — Navigation data**
- **p.48 — Pilot data**
- **p.48 — Speed data**
- **p.49 — Time data**
- **p.49 — Water tank data**
- **p.50 — Wind data**

Battery data

The *[Battery]* data category includes items related to your battery status.

The number of batteries that are detected by your performance display is determined by the number of batteries specified under your multifunction display / chartplotter's *[Boat details]* settings menu: *[Homescreen > Settings > Boat details > Num of engines]*. For more information on how to configure your multifunction display / chartplotter's *[Boat details]* settings menu, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

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

Data items	Widget types available
• *[Battery voltage]* • *[Battery current]* • *[State of charge]* • *[Battery temperature]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
[Time till zero charge]	*[Digits]*

Boat data

In order for boat data to be displayed on your performance display, a compatible sensor must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[Rudder angle]	• *[Digits]* • *[180° gauge (up / down)]* • *[Rudder bar]*
• *[Rate of turn]* • *[Roll]*	• *[Digits]* • *[180° gauge (up / down)]*
[Pitch]	• *[Digits]* • *[180° gauge (left / right)]*
• *[Mast rotation]* (1) • *[Trim tabs]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

Depth data

In order for depth data to be displayed on your performance display, a compatible sonar transducer must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[Depth]	• *[Digits]* • *[Graph (horizontal)]* • *[Graph (vertical)]*
• *[Min depth]* • *[Max depth]*	*[Digits]*

Distance data

In order for distance data to be displayed on your performance display, a compatible speed transducer and / or GNSS receiver must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
• *[Log]* • *[Trip]* • *[Ground log]* • *[Trip (day)]* • *[Trip (month)]* • *[Trip (season)]* • *[Distance to tack]* (1) • *[Trip (manual)]* • *[Distance to start line]* (1) • *[Line bias]* (1) • *[Distance to empty]* • *[DMG (Distance made good)]* • *[DTW (Distance to waypoint)]* • *[Sailing DTW]* • *[XTE (Cross track error)]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

Engine data

In order for engine data to be displayed on your performance display, an engine management system must be connected to your multifunction display / chartplotter network. Depending on your engine manufacturer, a compatible engine interface or gateway may be required.

The number of engines that are detected by your performance display is determined by the number of engines specified under your multifunction display / chartplotter's *[Boat details]* settings menu: *[Homescreen > Settings > Boat details > Num of engines]*. For more information on how to configure your multifunction display / chartplotter's *[Boat details]* settings menu, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

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

Data items	Widget types available
—	*[Engine combo gauge]*
[Alternator]	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]*
• *[Boost pressure]* • *[Coolant pressure]* • *[Coolant temperature]* • *[Engine RPM]* • *[Oil pressure]* • *[Oil temperature]* • *[Transmission oil pressure]* • *[Fuel flow]* • *[Fuel flow (instantaneous)]* • *[Fuel flow (average)]* • *[Fuel pressure]* • *[Transmission oil temperature]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
[Engine load]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]*

Data items	Widget types available
[Tilt position]	• *[Digits]* • *[Level]*
• *[Engine trip]* • *[Engine hours]* • *[Gear]*	*[Digits]*

Environment data

In order for environment data to be displayed on your performance display, a compatible sensor and / or transducer must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
• *[Air temperature]* • *[Barometric pressure]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
[Water temperature]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
[Drift]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
• *[Set]* • *[Set & drift]*	• *[Digits]* • *[360° gauge]*
• *[Max air temp]* • *[Min air temp]* • *[Dew point]* • *[Humidity]* • *[Sunset / sunrise]* • *[Max water temp]* • *[Min water temp]* • *[Wind chill apparent]* • *[Wind chill true]*	*[Digits]*

Fuel data

The *[Fuel]* data category includes items related to your fuel economy.

Values for the data items listed below are provided by your multifunction display / chartplotter's *[Fuel / trip]* manager: *[My data > Fuel/Trip > Fuel set-up > Fuel manager]* and *[Tank settings]* menu: *[Settings > Boat details > Configure tanks > Tank settings]*. For more information on how to enable and configure your multifunction display / chartplotter's *[Fuel / trip]* manager and *[Tank settings]*, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

The following data items are available in the *[Fuel (tank)]* data sub-categories:

Data items	Widget types available
• *[Fuel level (%)]* • *[Fuel level (vol)]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

The following data items are available in the *[All tanks]* data sub-categories:

Data items	Widget types available
• *[Total fuel (vol)]* • *[Total fuel (%)]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
• *[Fuel remaining (estimated)]* • *[Fuel flow rate (total)]* • *[Engine economy total]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]*
• *[Distance to empty]* • *[Time to empty]* • *[Fuel used (trip)]* • *[Fuel used (season)]*	*[Digits]*

GPS data

The *[GPS]* data category contains data items related to the GNSS receiver that is in use by your multifunction display / chartplotter.

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

Data items	Widget types available
[SOG (Speed Over Ground)]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
[COG (Course Over Ground)]	• *[Digits]* • *[Graph (horizontal)]* • *[Graph (vertical)]*
• *[Vessel position]* • *[Max SOG]* • *[Average SOG]* • *[Loran position]*	*[Digits]*

Generator data

In order for generator data to be displayed on your performance display, a generator transmitting supported NMEA 2000 PGNs must be connected to and detected by your multifunction display / chartplotter.

Values for the data items listed below are provided within your multifunction display / chartplotter's *[Generator settings]* menu: *[Settings > Boat details > Configure Generators > Generator settings]*. For more information on how to configure your multifunction display / chartplotter's *[Generator settings]*, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

The following data items are available in the *[Generator 1]* and *[Generator 2]* data sub-categories:

Data items	Widget types available
[RPM]	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
• *[Voltage]* • *[Current]* • *[Phase A Current]* • *[Phase A Neutral Voltage]* • *[Phase A Line Voltage]* • *[Phase B Current]* • *[Phase B Line Voltage]* • *[Phase B Neutral Voltage]* • *[Phase C Current]* • *[Phase C Power]* • *[Phase C Line Voltage]* • *[Phase C Neutral Voltage]* • *[Exhaust Gas Temperature]* • *[Battery Voltage]* • *[Oil Pressure]* • *[Oil Temperature]* • *[Coolant Temperature]* • *[Fuel Flow]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

Data items	Widget types available
[Load]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]*
• *[Generator Status]* • *[Total Hours]* • *[Phase A Power]* • *[Phase A Frequency]* • *[Phase B Power]* • *[Phase B Frequency]* • *[Phase C Frequency]* • *[Generator Oil Status]*	*[Digits]*

Heading data

In order for heading data to be displayed on your performance display, a compatible sensor providing vessel heading data must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[Heading]	• *[Digits]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Graph (vertical)]*
[Compass]	• *[Standard compass]* • *[3D compass]*
• *[Tack heading]* • *[Steer to layline]* • *[Locked heading]* • *[Heading error]*	*[Digits]*

Inside environment data

In order for inside environment data to be displayed on your performance display, a compatible sensor must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
• *[Inside humidity]*	*[Digits]*
• *[Inside temperature]*	

Navigation data

In order for navigation data to be displayed on your performance display, a compatible sensor providing position data must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[VMG to waypoint]	• *[Digits]* • *[270° gauge]* • *[Level]*
[Compass]	• *[Standard compass]* • *[3D compass]*
• *[Active waypoint]* • *[Next waypoint]* • *[Waypoint info]* • *[BTW (Bearing to waypoint)]* • *[BOTW (Bearing Origin to Waypoint)]* • *[Course to steer]* • *[NTL (Next Track Leg)]* • *[CMG (Course Made Good)]* • *[DMG (Distance Made Good)]* • *[DTW (Distance To Waypoint)]* • *[Sailing DTW]* (1) • *[Steer to layline]* • *[Time to tack]* • *[Route ETA]* • *[Waypoint ETA]* • *[Target position]* • *[Loran target position]* • *[Route TTG (Time To Go)]* • *[Waypoint TTG]* • *[Waypoint sailing TTG]* • *[XTE (Cross track error)]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

Pilot data

In order for pilot data to be displayed on your performance display, a compatible rudder reference transducer must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[Rudder angle]	• *[Digits]* • *[180° gauge]* • *[Rudder bar]*

Speed data

In order for speed data to be displayed on your performance display, a compatible speed transducer must be connected to your multifunction display / chartplotter network.

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

Data items	Widget types available
[SOG (Speed Over Ground)]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
[STW (Speed Through Water / Boat Speed)]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]*
[Drift]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
• *[VMG to windward]* • *[VMG to waypoint]*	• *[Digits]* • *[270° gauge]* • *[Level]*
• *[Max STW]* • *[Average STW]*	• *[Digits]* • *[180° gauge (up / down / left / right)]*
• *[Target STW]* (1) • *[Polar performance]* (1) • *[Max SOG]* • *[Average SOG]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

Time data

In order for time data to be displayed on your performance display, a compatible device providing time data must be connected to your multifunction display network /chartplotter.

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

Data items	Widget types available
• *[Race timer]* (1) • *[Time to burn]* (1) • *[Time to tack]* (1) • *[Route ETA]* • *[Waypoint ETA]* • *[Route TTG]* • *[Waypoint TTG]* • *[Sailing Wpt TTG]* (1) • *[Time]* • *[Date]* • *[Time & date]* • *[UTC time]* • *[UTC date]* • *[Sunrise time]* • *[Sunset time]* • *[Sunset / sunrise]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

Water tank data

[Water tank] data shows the fill percentage for each detected water tank.

Values for the data items listed below are provided by your multifunction display / chartplotter's *[Tank settings]* menu: *[Settings > Boat details > Configure tanks > Tank settings]*. For more information on how to configure your multifunction display / chartplotter's *[Tank settings]*, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

The following data items are available for the *[Fresh water]* data sub-categories:

Data items	Widget types available
• *[Fresh water (%)]* • *[Fresh water (vol)]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

The following data items are available for the *[Grey water]* data sub-categories:

Data items	Widget types available
[Grey water (%)]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

The following data items are available for the *[Black water]* data sub-categories:

Data items	Widget types available
• *[Black water (%)]* • *[Black water (vol)]*	• *[Digits]* • *[90° gauge (left / right)]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

The following data items are available for the *[Live well]* data sub-categories:

Data items	Widget types available
• *[Live well (%)]* • *[Live well (vol)]*	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*

Wind data

In order for wind data to be displayed on your performance display, a compatible wind transducer must be connected to your multifunction display / chartplotter network.

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

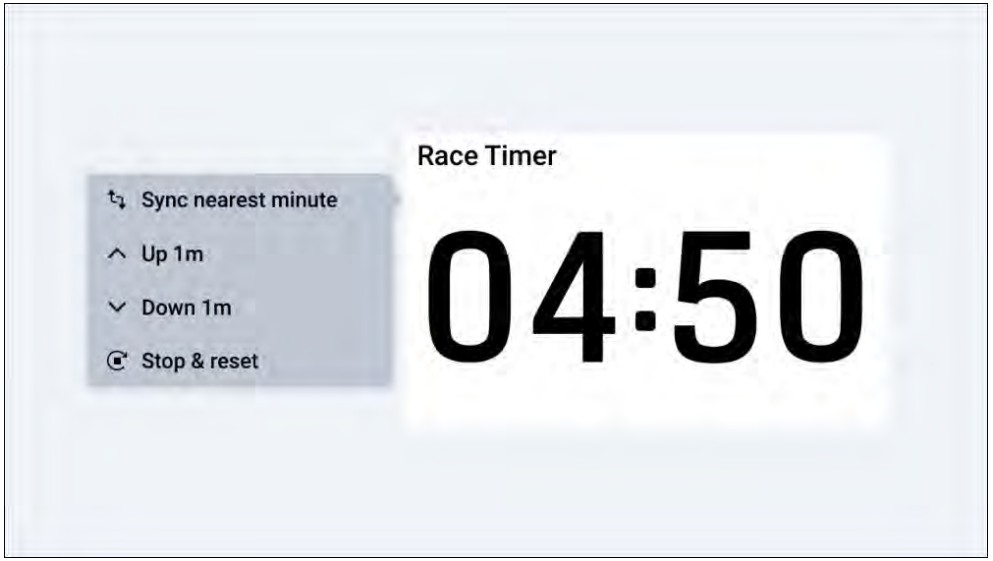
Data items	Widget types available
—	• *[Wind performance gauge]* **(1)** • *[SailPoint]* **(1)**
• *[AWS (Apparent Wind Speed)]* • *[TWS (True Wind Speed)]*	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]* • *[Level]*
• *[AWA (Apparent Wind Angle)]* • *[TWD (True Wind Direction)]* • *[TWA (True Wind Angle)]* • *[GWD (Ground Wind Direction)]*	• *[Digits]* • *[360° gauge]* • *[Graph (horizontal)]* • *[Graph (vertical)]*
[GWS (Ground Wind Speed)]	• *[Digits]* • *[180° gauge (up / down / left / right)]* • *[270° gauge]* • *[Level]*
[Wind shift]	• *[Digits]* • *[180° gauge (up / down)]* • *[Wind shift bar]*
• *[Max AWA]* • *[Min AWA]* • *[Max AWS]* • *[Min AWS]* • *[Max TWA]* • *[Min TWA]* • *[Max TWS]* • *[Min TWS]* • *[Beaufort]* • *[Cardinal]*	*[Digits]*

Note:

(1) This data item is only available when the boating activity is set to *[Sailing]* during your connected multifunction display / chartplotter's initial startup wizard.

6.5 Widget functions

In addition to the customizable widget options available, the following data items and corresponding widgets listed below can be tapped to display separate functions which are specific to that widget.



Available functions for the *[Min (...) / Max (...) / Average (...) / Trip (...)]* related data items:

- *[Reset (...)]* — resets the value shown on both your multifunction display / chartplotter and performance display.

Available functions for the *[Race timer]* data item:

- *[Start]* — starts a race timer on both your performance display and multifunction display / chartplotter. Once started, a beep will sound every minute, on the minute mark. When 30 seconds are remaining on the timer, 3 beeps will sound. When 10 seconds are remaining on the timer, 2 alternating beeps will sound every second until the timer reaches zero. The default race timer duration can be changed from your connected multifunction display / chartplotter. For more information, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).
- *[Sync nearest minute]* — synchronizes the race timer to the closest minute. This function is available once *[Start]* has been selected.
- *[Up 1m]* — increase the time remaining on the race timer by one minute. This function is available once *[Start]* has been selected.
- *[Down 1m]* — decreases the time remaining on the race timer by one minute. This function is available once *[Start]* has been selected.
- *[Stop & reset]* — stops and resets the race timer. Once stopped, a beep will sound. This function is available once *[Start]* has been selected.

CHAPTER 7: OPERATION VIA RAYMARINE® MULTIFUNCTION DISPLAY

CHAPTER CONTENTS

7.1 Multifunction display (MFD) requirement

The Alpha Series performance display is not a standalone product. It MUST be connected to a Raymarine® **Axiom Series** or **Axiom 2 Series** Multifunction display (MFD) / chartplotter. All displays must be running the latest available software versions.

The Alpha Series is compatible with the following Raymarine® Multifunction displays / chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro, Axiom 2 XL	LightHouse 4, v4.5 or later
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	LightHouse 4, v4.5 or later

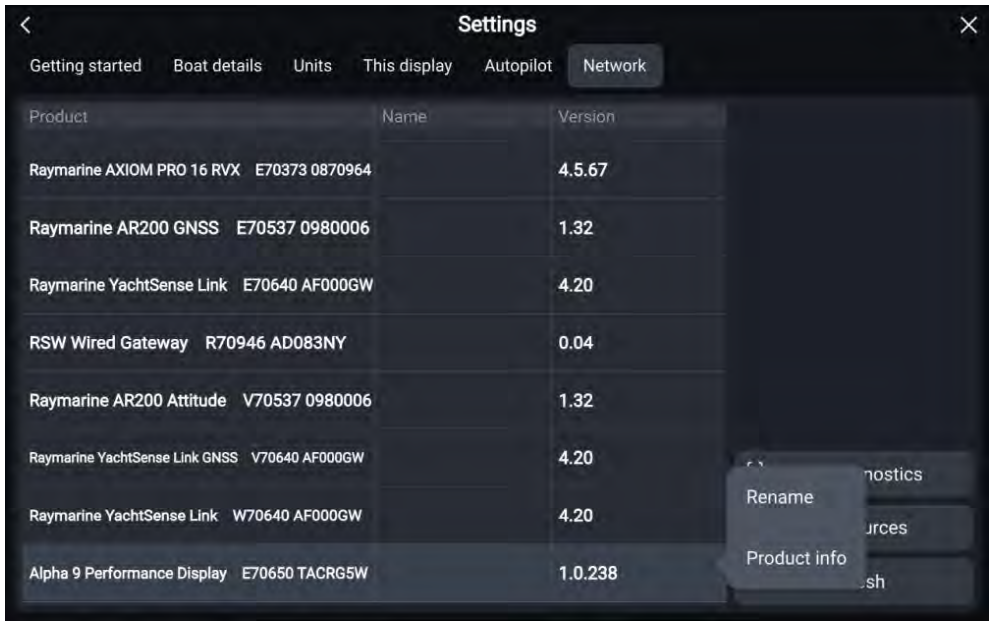
Note:

For latest software, visit: www.raymarine.com/software

7.2 Alpha Series network operations (LightHouse™ 4 MFD)

Some functions can be invoked remotely when using a Raymarine® LightHouse™ 4 (version 4.5 or later) multifunction display / chartplotter which is connected to the same network as your Alpha performance display(s). These functions are split between either the multifunction display / chartplotter's *[Network]* page (for configuration-based options) and *[Sidebar]* menu (for features often required whilst sailing).

The following configuration related functions can be invoked from theLightHouse™ 4 *[Network]* page: *[Homescreen > Settings > Network]*

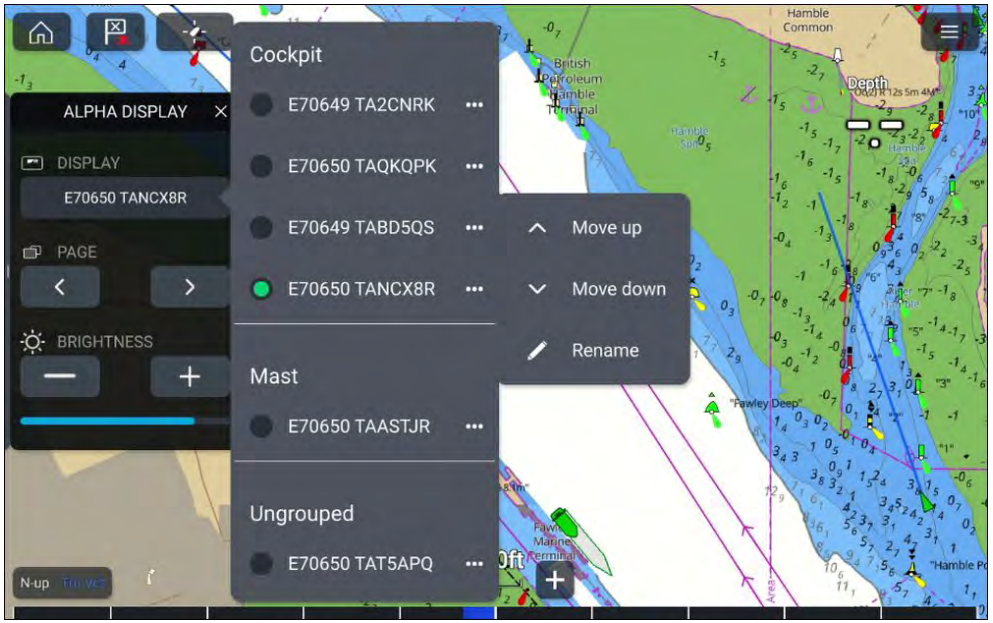


- *[Rename]* — Renames the selected performance display. If no *[Name]* has been set, the unit model and serial number will appear instead if the unit is selected on your multifunction display / chartplotter's *[Network]* tab.
- *[Product information]* — Displays a series of product information related to the selected performance display.

7.3 Alpha Series sidebar operations (LightHouse™ 4 MFD)

Some Alpha display functions can be invoked remotely when using a Raymarine® LightHouse™ 4 (version 4.5 or later) multifunction display / chartplotter connected to the same network as your Alpha display(s). These functions are split between either the multifunction display / chartplotter's *[Network]* page (for configuration-based options) and *[Sidebar]* menu (for features often required whilst sailing).

When viewing an application on your multifunction display / chartplotter, you can swipe from the left edge of the screen to display the *[Sidebar]* menu. From there, select *[Alpha display]* in order to invoke the following functions remotely:



Note:

The *[Display]* option and its available sub-options are only available if more than one Alpha Series display is networked to the same system as your multifunction display / chartplotter.

- *[Display]* — Indicates the current performance display that is being operated via the *[Sidebar]* menu. A different performance display can be operated by selecting the *[Display]* option and choosing a different display from the list shown. Each Alpha Series display is sorted according to the display group that it has been assigned to.
  - *[...]* — Opens a menu with additional options:
    - *[Rename]* — Displays an onscreen keyboard which can be used to edit the selected Alpha display's name.
    - *[Move up]* —Moves the selected Alpha display up within the list by one position, if multiple Alpha displays are available. This option is disabled if your Alpha display has reached the top of the display group that it has been assigned to.
    - *[Move down]* — Moves the selected Alpha display down within the list by one position, if multiple Alpha displays are available. This option is disabled if your Alpha display has reached the bottom of the display group that it has been assigned to.
- *[Page]* — Switches between the selected Alpha display's data pages. Data pages can be cycled through either using the *[<]* left option or *[>]* right option.
- *[Brightness]* — Increases or decreases the selected Alpha display's screen brightness. Brightness can be changed using the *[+]* increase option or *[–]* decrease option. The current screen brightness is indicated by the *[Brightness bar]* below the *[+]* and *[–]* options.

CHAPTER 8: SETTINGS

CHAPTER CONTENTS

8.1 Settings overview

You can access the following advanced performance display settings and product information via the *[Settings]* menu: *[Data page view > Overlay menu > Settings]*

1. *[Auto-lock]*.
2. *[Daytime colors]*.
3. *[Display group]*.
4. *[Display orientation]*.
5. *[Standby Image]*.
6. *[Alarms]*.
7. *[Factory reset]*.
8. *[About this device]*.

8.2 Auto-lock settings

You can configure your performance display to activate *[Screen lock]* automatically after 10 seconds of touchscreen inactivity.

In order to automatically lock your device:

1. Navigate to *[Data page view > Overlay menu > Settings > Auto-lock]*.
2. Select *[Automatically lock the screen after 10 seconds]*.

Note:

For more *[Screen lock]* information, refer to the following section:
p.17 — Activating screen lock

8.3 Daytime color settings

By default, your performance display is set to show a *[Light]* color scheme when the *[Color mode (Day)]* setting is in use. Alternatively, this color scheme can be changed to a *[Dark]* mode depending on your preference.

In order to configure your daytime color scheme:

1. Navigate to *[Data page view > Overlay menu > Settings > Daytime colours]*.
2. Select between *[Light]* (default) and *[Dark]*.

Light mode (default)	Dark mode
	

8.4 Display group settings

You can synchronize the *[Brightness]*, *[Screen lock]* and *[Power-save mode]* settings between your performance display and other compatible devices on your network that are assigned to the same display group.

The settings listed below can be synchronized between a Alpha Series performance display and each of the following compatible devices:

Setting	Compatible devices
[Brightness]	• Alpha Series performance display(s) • Compatible multifunction display(s) / chartplotter(s)
[Screen lock]	• Alpha Series performance display(s)
[Power-save mode]	• Alpha Series performance display(s)

Note:

For more information on which multifunction displays / chartplotters are compatible with your performance display, refer to the information found within the “Alpha Series Performance Display Installation Instructions” (**87457**).

Assigning a display group and synchronizing settings

By default your performance display is not assigned to a display group.

Note:

- Before attempting to synchronize your device, ensure that all units are powered and operational.
- For information on how to assign and unassign a display group on your multifunction display / chartplotter, refer to the latest LightHouse™ 4 Advanced Operation Instructions (**81406**).

In order to assign a display group:

1. Navigate to: *[Data page view > Overlay menu > Settings > Display group]*.
2. Select *[Group]*.
3. Select the display group that you want to assign your performance display to.

   The following groups are available:

   - *[None (default)]*
   - *[Helm 1]*
   - *[Helm 2]*
   - *[Cockpit]*
   - *[Flybridge]*
   - *[Mast]*
   - *[Group 1–5]*
4. Once a display group has been assigned, select the setting(s) that you want to synchronize between your performance display and any other compatible devices that you have assigned to the same display group.

Note:

For information on which devices are compatible with the *[Brightness]*, *[Screen lock]* and *[Power-save mode]* settings, refer to the following section: **p.56 — Display group settings**

5. Select *[Sync]*.
6. Once your devices have finished synchronizing, a *[Group (setting name) enabled]* pop-up will appear at the top of your screen.

After the synchronization process has complete, adjustments to your *[Brightness]*, *[Screen lock]* and / or *[Power-save mode]* settings will be applied to each supported device that is assigned to the same display group.

Unsynchronizing display group settings

In order to unsynchronize your *[Brightness]*, *[Screen lock]* and *[Power-save mode]* settings:

1. Navigate to: *[Data page view > Overlay menu > Settings > Display group]*.
2. Toggle off the setting that you wish to unsynchronize.

8.5 Display orientation settings

Following a factory reset, your screen orientation will automatically change to *[Landscape]* or *[Portrait]*, based on your installation orientation.

Note:

Your performance display has a separate selection of pages that are available in each screen orientation (i.e. portrait or landscape):

- Any data pages which you have created will be specific to the screen orientation which they were created on.
- When switching between screen orientations, your previous setup will be saved in case you wish to revert back to your original orientation.

In order to change your screen orientation:

1. Navigate to: *[Data page view > Overlay menu > Settings > Display orientation]*.
2. Select between *[Landscape]* and *[Portrait]*.

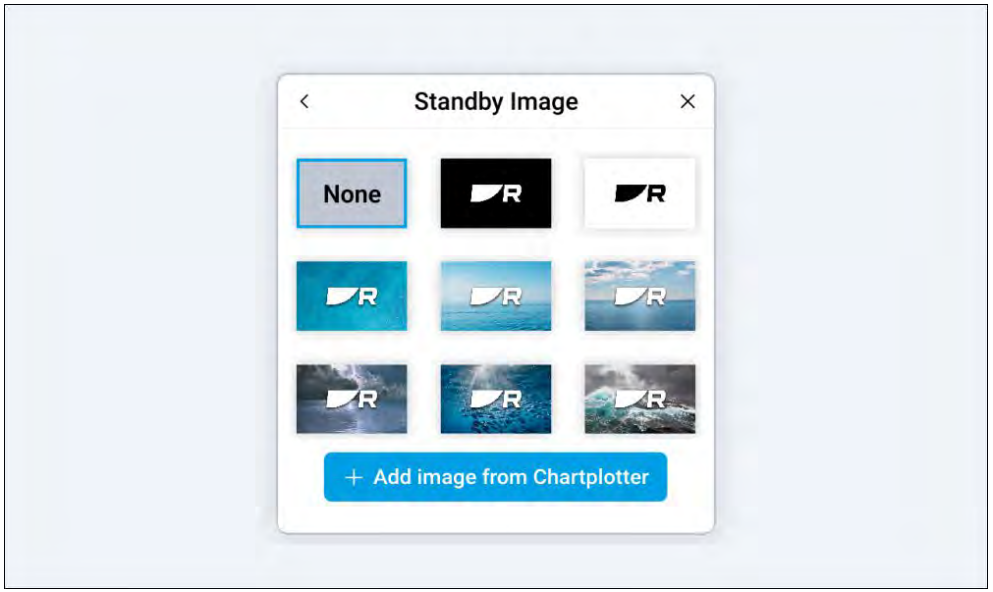
8.6 Standby image settings

You can set a preset standby image or a custom standby image to display on the performance display's screen once your boat has entered a stationary position.

Note:

The boat is considered to be stationary once both your GPS position and heading have remained unchanged for a 5 minute duration.

The following preset images are available:



Alternatively, you can add and set a custom standby image from a compatible multifunction display / chartplotter that is connected to the same network as your performance display.

Before attempting to add a custom standby image, an image file must first be copied to a MicroSD card using an external device (such as a PC or tablet) and then inserted into the MicroSD card slot on your multifunction display / chartplotter.

Your custom image must meet the following requirements:

Note:

- Custom images must be in the .png format.
- You cannot use copyrighted images without permission from the copyright owner.
- For optimum image quality, the resolution of the image should match the resolution of your performance display.

Custom images are unique to each performance display and will need to be configured individually.

Performing a factory reset will remove any custom images that have been uploaded to the performance display.

Refer to the following table for a full list of screen resolutions:

Display variant	Screen resolution / DPI
Alpha 7 performance display	• Screen resolution: 1024 (H) x 600 (V) • DPI : 170
Alpha 9 performance display	• Screen resolution: 1280 (H) x 720 (V) • DPI : 163

Selecting a preset standby image

In order to set a preset standby image:

1. Navigate to: *[Data page view > Overlay menu > Settings > Standby Image]*.
2. Select the standby image that you wish to display. Once selected, a blue highlight will appear to indicate that your selections has been confirmed.

Once your boat has entered a stationary position, your selected image will appear.

Adding and selecting a custom standby image

In order to set a custom standby image:

1. Navigate to: *[Data page view > Overlay menu > Settings > Standby Image]*.
2. Select the *[Add image from MFD]* blue plus icon.
3. Navigate the file browser and select the multifunction display / chartplotter and MicroSD card where your image is saved.

4. Select the image that you want to assign as your standby image.
5. Select the *[Done]* button, which is located at the top right corner of your screen.

   Your performance display will now return to the *[Standby Image]* screen.
6. Select the standby image that you wish to display. Once selected, a blue highlight will appear to indicate that your selections has been confirmed.

Once your boat has entered a stationary position, your selected image will appear.

Removing and deleting a standby image

In order to either remove or delete a standby image:

1. Navigate to: *[Data page view > Overlay menu > Settings > Standby Image]*.
2. To remove your currently selected standby image:
   i. Select *[None]*.
   ii. Select *[Done]* at the bottom edge of your screen to confirm your selection.
3. Or, to permanently delete a preexisting image:
   i. Tap and hold a preexisting image for additional options.
   ii. Select *[Delete]*.
   iii. Select *[Yes]* to confirm your selection.

8.7 Alarm settings

Alarms are used to alert you to a danger, a hazard or a situation requiring your attention. Your performance display is capable of acting as a repeater for alarms raised by the multifunction display / chartplotter on your system. Once an alarm is triggered, the audio buzzer built into your performance display will sound.

In order for an alarm to be raised, it must be separately enabled on both your multifunction display / chartplotter and your performance display.

Alarms can be enabled or disabled on your multifunction display / chartplotter via the *[Alarms]* page: *[Homescreen > Alarms > Settings]*.

For more information on how to acknowledge alarms, the functionality of each alarm and how to further configure your multifunction display / chartplotter's alarm settings, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

The following alarms can be toggled either on or off for the performance display:

Category	Alarm(s)
[AIS]	• *[AIS connection lost]* • *[Dangerous AIS target]* • *[Lost AIS target]* • *[AIS safety messages]* • *[AIS hardware alarm]*
[Anchor]	• *[Anchor drift]* • *[Deep anchor]* • *[Shallow anchor]*
[Battery]	A toggle is available for each battery that is detected by your performance display. For more information, refer to: **p.42 — Battery data** • *[(Battery name) — battery (number)]*
[DSC alarms]	*[DSC alarms]*
[Depth]	• *[Deep water]* • *[Shallow depth]* • *[Fishing zone arrival]*
[Engine alarms]	*[Engine alarms]*
[Generator alarms]	*[Generator alarms]*
[Low fuel remaining]	*[Low fuel remaining]*
[Man overboard (MOB)]	*[Man overboard (MOB)]*

Note:

The *[Man overboard (MOB)]* alarm is enabled by default.

Category	Alarm(s)
[Navigation]	• *[Waypoint arrival]* • *[Position lost]* • *[Off track]* • *[Interception arrival]* • *[Position drift]*
[Pilot alarms]	*[Pilot alarms]*
[Radar]	• *[Dangerous Radar target]* • *[Lost Radar target]* • *[Guard zone 1]* • *[Guard zone 2]*
[Speed]	• *[Boat speed high]* • *[Boat speed low]*
[Temperature]	• *[Water temperature high]* • *[Water temperature low]* If an AX8 camera is connected to the same system as your performance display, an additional temperature toggle will be available. • *[AX8 camera temperature]*
[Wind]	• *[AWS high]* • *[AWS low]* • *[AWA high]* • *[AWA low]* • *[TWS high]* • *[TWS low]* • *[TWA high]* • *[TWA low]*

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 menu so that, if required, you can change the alarm threshold.

8.8 Performing a factory reset

If you are experiencing problems with the Alpha Series performance display which cannot be resolved using the troubleshooting advice provided, you may need to perform a *[Factory reset]*.

Note:

Restoring your performance display to factory default settings will cause all custom data pages to be deleted.

1. To *[Factory reset]* your device via the *[Settings]* menu:
   i. Navigate to: *[Data page view > Overlay menu > Settings > Factory reset]*.
   ii. Select *[Reset]*.
2. To *[Factory reset]* your device via the physical recovery button:
   i. Press the factory reset button on the rear of your unit (to the left of the daisy-chain connector) when applying power.

The performance display will now reset to factory default settings, all user data will be removed and the display will reboot to the startup wizard.

8.9 About this device

If you are experiencing issues with your device, the following product information may help to diagnose your problem.

Product information:

Item	Description
[Product description]	Provides a description of the product's name.
[Product code / ID]	Provides the product's part number.
[Product serial number]	Provides the product's serial number.
[Software version number]	Provides the software version number that the product is currently running.
[Software component versions]	Provides the software component version application and platform numbers that the product is currently running.

Operating conditions:

Item	Description
[Up time since powering on]	Provides a value for the total amount of time that the product has been running for during the current session.
[Total operating hours]	Provides a value for the total amount of time that the product has been in operation for.
[Operating voltage]	Provides a value for the product's operating voltage.
[Operating current]	Provides a value for the product's operating current.
[Operating temperature]	Provides a value for the product's operating temperature.

System Installation / Configuration:

Item	Description
[Devices attached]	Provides the product ID and serial number(s) of other device(s) that are currently connected to the product.
[Network port 1]	
[Network port 2]	
[IP Address]	Provides the product's IP address.

8.10 Language settings

By default, the language displayed on your performance display is defined by the user interface language option selected on your multifunction display / chartplotter. The *[Select language]* menu can be accessed from the LightHouse™ 4 Homescreen: *[Homescreen > Settings > Getting started > Select language]*.

For more information on the multifunction display / chartplotter language options available, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

In the instance that you do not have a multifunction display / chartplotter connected to your performance display, and, if your system has not previously been setup with a multifunction display / chartplotter, you can choose which language you want the performance display's user interface to use during the unit's startup wizard.

The following startup wizard language options are available:

Available languages	
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)
Estonian (et-EE)	Finnish (fi-FI)
French (fr-FR)	German (de-DE)

Available languages	
Greek (el-GR)	Hebrew (he-IL)
Hungarian (he-IL)	Icelandic (is-IS)
Indonesian (Bahasa) (id-ID)	Italian (it-IT)
Japanese (ja-JP)	Korean (ko-KR)
Latvian (lv-LV)	Lithuanian (lt-LT)
Malay (ms-MY ZSM)	Norwegian (nb-NO)
Polish (pl-PL)	Portuguese (Brazilian) (pt-BR)
Russian (ru-RU)	Slovenian (sl-SL)
Spanish (es-ES)	Swedish (sv-SE)
Thai (th-TH)	Turkish (tr-TR)
Vietnamese (vi-VN)	

8.11 Units of measurement settings

The units of measurement displayed on your performance display is defined by the *[Units]* options selected on your multifunction display / chartplotter. The *[Units]* menu can be accessed from the LightHouse™ 4 Homescreen: *[Homescreen > Settings > Units]* or from the Dashboard app: *[Menu > Settings > Units]*.

For more information on the unit options available, refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

CHAPTER 9: TROUBLESHOOTING

CHAPTER CONTENTS

9.1 Troubleshooting

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

Before packing and shipping, all 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 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.

9.2 Power up troubleshooting

Product does not turn on or keeps turning off

Possible causes	Possible solutions
Blown fuse / tripped breaker	1. Check the condition of your relevant fuses, breakers and connections, and replace if necessary. Refer to the Alpha Series Performance Display Installation Instructions (87457) for information on the appropriate fuse ratings when connecting one or more performance displays in a series. 2. If the fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections	1. 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. 2. Check the daisy-chain / power cable and your power supply connection for signs of damage or corrosion, and replace if necessary. 3. Ensure that the daisy-chain / power cable connectors are correctly orientated, fully inserted and in the locked position. 4. With the unit turned on, try flexing the performance display's daisy-chain / power cable connectors to see if this causes the unit to restart or lose power. Replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary.
Incorrect power connection	1. The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient	1. Check that your power supply (battery or distribution panel) is providing a minimum of 10.8 V to each component in the system.

Product will not start up (restart loop)

Product causes	Possible solutions
Power supply and connection	1. See possible solutions from the table above, entitled 'Product does not turn on or keeps turning off'.
Software corruption	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Attempt a factory reset using the following instructions: **p.66 — Performing a factory reset**

9.3 System data troubleshooting

Transducer, instrument, engine or other system data is unavailable at all performance displays

Possible causes	Possible solutions
Data is not being received at the performance display.	1. Check the relevant product, network cabling and connections for signs of damage or corrosion, and replace if necessary.
Data source is not operating.	1. Check the source of the missing data (e.g. transducer or engine interface) for signs of damage or corrosion, and replace if necessary. 2. If possible, check that the data source is correctly powered and operational. 3. Refer to the instructions provided with the equipment to ensure it has been correctly installed.
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.

Transducer, instrument or other system data is missing from some but not all performance displays

Possible causes	Possible solutions
Connection problem.	1. Check the product's attached cable(s) and connections for signs of damage or corrosion, and replace if necessary.
Software corruption.	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Attempt a factory reset using the following instructions: **p.66 — Performing a factory reset**
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.

Incorrect data reported

Possible causes	Possible solutions
Transducer calibration error.	1. Switch off power supply to system and switch back on again. 2. Re-calibrate or re-configure data source following instructions provided with the relevant devices.

9.4 Miscellaneous troubleshooting

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

Display behaves erratically (frequent unexpected resets, system crashes and other erratic behavior)

Possible causes	Possible solutions
Intermittent problem with power to the performance display.	1. Check relevant fuses and breakers. 2. Check that the power supply cable is sound and that all connections are tight and free from corrosion. 3. Check that the power source is of the correct voltage and sufficient current.
Software mismatch between equipment may prevent communication.	1. Ensure all products have the latest software installed.
Corrupt data / other unknown issue.	1. In the unlikely event that the product's software has become corrupted, try downloading and installing the latest software from the Raymarine® website. Refer to your multifunction display / chartplotter's operation instructions for details on updating software for connected devices. 2. Check the data source for correct operation.

9.5 Performing a factory reset

If you are experiencing problems with the Alpha Series performance display which cannot be resolved using the troubleshooting advice provided, you may need to perform a *[Factory reset]*.

Note:

Restoring your performance display to factory default settings will cause all custom data pages to be deleted.

1. To *[Factory reset]* your device via the *[Settings]* menu:
   i. Navigate to: *[Data page view > Overlay menu > Settings > Factory reset]*.
   ii. Select *[Reset]*.
2. To *[Factory reset]* your device via the physical recovery button:
   i. Press the factory reset button on the rear of your unit (to the left of the daisy-chain connector) when applying power.

The performance display will now reset to factory default settings, all user data will be removed and the display will reboot to the startup wizard.

CHAPTER 10: TECHNICAL SUPPORT

CHAPTER CONTENTS

10.1 Raymarine product support and servicing

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

Product information

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

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

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

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: https://www.raymarine.com/en-us/support/product-registration

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

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

United States (US):

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

Web support

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

- **Manuals and Documents** — http://www.raymarine.com/manuals
- **Technical support forum** — https://raymarine.custhelp.com/app/home
- **Software updates** — http://www.raymarine.com/software

Worldwide support

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

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

United States (US):

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

Australia and New Zealand (Raymarine subsidiary):

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

France (Raymarine subsidiary):

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

Germany (Raymarine subsidiary):

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

Italy (Raymarine subsidiary):

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

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es
- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

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

Sweden (Raymarine subsidiary):

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

Finland (Raymarine subsidiary):

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

Norway (Raymarine subsidiary):

- E-Mail: support.no@raymarine.com

- Tel: +47 692 64 600

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

Russia (Authorized Raymarine distributor):

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

10.2 Diagnostic product information

Diagnostic product information can be viewed and exported from a Raymarine® LightHouse multifunction display, for supported products networked using RayNet, RJ45, or SeaTalkng ® / NMEA 2000 cables.

Diagnostic product information includes technical data related to the connected product, such as serial numbers, network addresses, firmware version numbers, and so on. It is useful for 2 main purposes:

1. Sending detailed product information to the Raymarine® product support team, in the event of a problem or fault with your product. The information can be exported to a MicroSD card, and you can then copy the file for the purposes of emailing it to the product support team. For contact details, refer to: **p.67 — Technical support**
2. Maintaining detailed off-boat records. This is particularly useful for vessels that have multiple Raymarine® products installed.

To view or export diagnostic product information, access the *[Diagnostics]* menu. For instructions on how to access this menu, refer to the relevant operation instructions for your multifunction display.

10.3 Learning resources

Raymarine has produced a range of learning resources to help you get the most out of your products.

Video tutorials

Raymarine official channel on YouTube

- http://www.youtube.com/user/RaymarineInc

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

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:

- https://raymarine.custhelp.com/app/home

Appendix A Sailing glossary

Below is a list of common terms and abbreviations used in sailing.

Term	Meaning
Apparent Wind	The wind flow observed when in motion. Apparent wind is different from True wind in that it takes into account your own movement, i.e.: speed and direction of travel. Apparent wind is the raw data that is reported by wind transducers, which can then be used in conjunction with other data sources to calculate True wind. Supported data: • NMEA 2000: PGN 130306 • NMEA 0183: MWV
Apparent Wind Angle (AWA)	The wind angle observed when in motion. AWA is a combination of the true angle of the wind and the angle that is felt due to direction and speed of travel.
Apparent Wind Speed (AWS)	The wind speed observed when in motion. AWS is a combination of the true speed of the wind and the speed you are travelling.
Distance to Tack	The travel distance remaining until you need to tack.
Distance to Line	Distance remaining to the closest point along the race start line.
Downwind	Moving in the direction that the wind is blowing..
Ground Wind Direction (GWD)	The direction of the wind relative to north, as observed on land. This is the actual direction the wind is blowing. In addition to AWA, COG from a GNSS receiver is also required to calculate GWD.
Ground Wind Speed (GWS)	The wind speed observed when stationary, as observed on land. GWS is the actual speed the wind is blowing over land. In addition to AWS, SOG from a GNSS receiver is also required to calculate GWS.
Header	A wind shift which causes your boat to turn more downwind.
Laylines	Vector lines showing the course the boat will take when sailing at the optimum angle to the wind, on either tack.
Leeway	The difference in angle between desired heading and actual course, caused by sideways movement of a sailing boat due to the wind.
Lift	A wind shift which allows your boat to turn upwind and closer to your destination.
Line bias	The distance advantage conferred by crossing the start line at the favored end. of the race start line.
Polar table	A performance profile for a boat, showing the boat speed achievable at varying angles to the wind, with varying wind speed. In sailing, the Velocity Made Good (VMG) principle demonstrates that travelling in a straight line is not always the quickest route, and polars enable you to optimize your vessel's performance to its best advantage, by improving the accuracy of laylines to display how far you need to sail on a current tack to reach a target waypoint after tacking, and taking wind conditions into consideration.
RSW (Raymarine Smart Wind)	The Raymarine Smart Wind transducer series. The RSW series of transducers include a built-in attitude sensor which is used to provide more accurate readings than standard wind transducers.
Sail plan	Sail configuration recommendations based on wind conditions.
Sailing upwind	Sailing as close as possible to the wind direction.
Tack	A course change made by a sailing vessel, b y turning its heading into and through the wind.
Tacking	The zig-zag manoeuvre a sailing vessel makes when travelling upwind.

Term	Meaning
Time To Burn (TTB)	The time remaining during race start countdown before the boat needs to start moving towards the start line at full speed.
Time to Tack	Time to tack is the duration left until you need to tack.
True Wind	The actual wind flow; it is the wind flow you feel, on the water, when stationary. True wind is calculated from Apparent wind data from a wind transducer and STW (Speed Through Water) from a speed transducer.
True Wind Angle (TWA)	The angle of the wind over water, relative to boat's bow, observed when stationary.
True Wind Direction (TWD)	The direction of the wind relative to north. This is the actual direction the wind is blowing. In addition to STW, Heading is also required to calculate TWD.
True Wind Speed (TWS)	The wind speed observed when stationary, on the water. TWS is the actual speed the wind is blowing over water.
Upwind	Moving in the opposite direction from which the wind is blowing.
Velocity Made Good (VMG)	Sailing term related to the component of a sail vessel's velocity vector that is in the direction of true wind.
Wind shift	The amount of variation in True Wind Direction (TWD) over time.

Index

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