Raymarine®

YACHTSENSE LINK MOBILE MARINE ROUTER

Installation & operation instructions

English (en-US)
Date: 02-2022
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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.

Non-Controlled information

Important:

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Contents

Chapter 1: Important information

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: High voltage

This product contains high voltage. Adjustments require specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts or adjustments. The operator should never remove the cover or attempt to service the product.

Warning: Input and output channels

- The router's input and output channels enable creation of a simple digital monitoring / control system. As device connections are outside of Raymarine's control the company will not be held liable for damage or injury caused due to incorrect connections.
- Input and output device connections should only be carried out by a competent person familiar with vessel digital switching systems.
- The Router's output channels are rated at 200 mA and are only intended to be connected to devices via standard automotive relays.
- If in any doubt or for further advice please contact Raymarine Technical Support.

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.

Product modifications

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

RF exposure

To be protected against all verified adverse effects, the separation distance of at least 0.5 m (1.64 ft) must be maintained between the antenna of the radio having maximum 5.84 dBi antenna gain and all persons.

5 GHz Wi-Fi band

The band 5150 MHz to 5350 MHz for this device is restricted to indoor use only within all European Union countries.

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio / TV technician for help.

Innovation, Science and Economic Development Canada (ISED)

This device complies with License-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian ICES-003.

Innovation, Sciences et Développement économique Canada (Français)

Cet appareil est conforme aux normes d'exemption de licence RSS.

Son fonctionnement est soumis aux deux conditions suivantes:

1. cet appareil ne doit pas causer d'interférence, et
2. cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Declaration of Conformity

FLIR Belgium BVBA declares that the following radio equipment type product is in compliance with the Radio Equipment Directive 2014/53/EU:

- **YachtSense™ Link Marine Cloud Router** — E70640

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

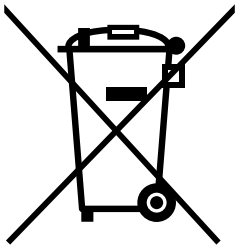
IMO and SOLAS

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.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

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



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

Warranty registration

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

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

Technical accuracy

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

Chapter 2: Document and product information

Chapter contents

2.1 Product documentation

The following documentation is applicable to your product:

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

- **81397** — YachtSense™ Link Marine Cloud Router Installation and operation instructions (This document)
- **87408** — YachtSense™ Link Marine Cloud Router Mounting Template

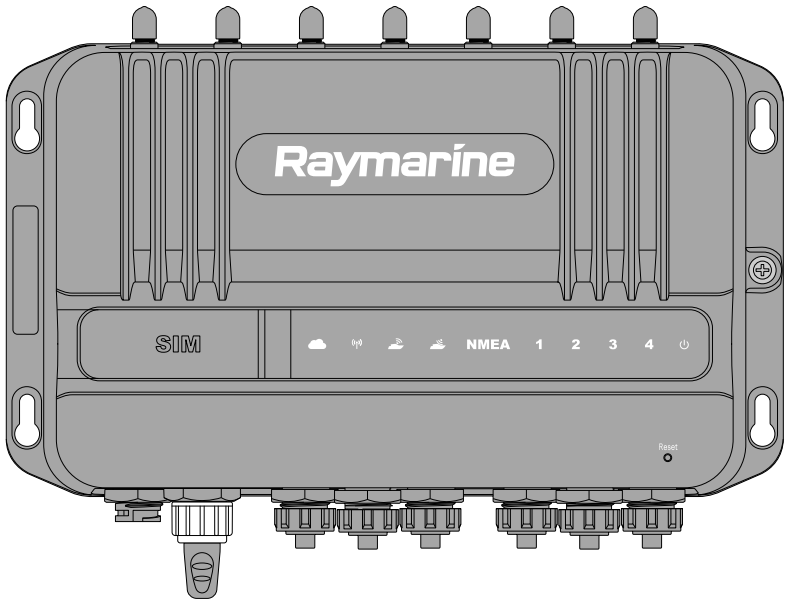
Document illustrations

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

All images are provided for illustration purposes only.

2.2 Product overview

The YachtSense™ Link Marine Cloud Router (part number E70640) is a 4G smart router that provides a Wi-Fi hotspot and/or Ethernet internet connection to other devices on your vessel, and also enables remote monitoring and control of compatible onboard systems from a wireless device using Wireless or cellular (2G/3G/4G) data networks.

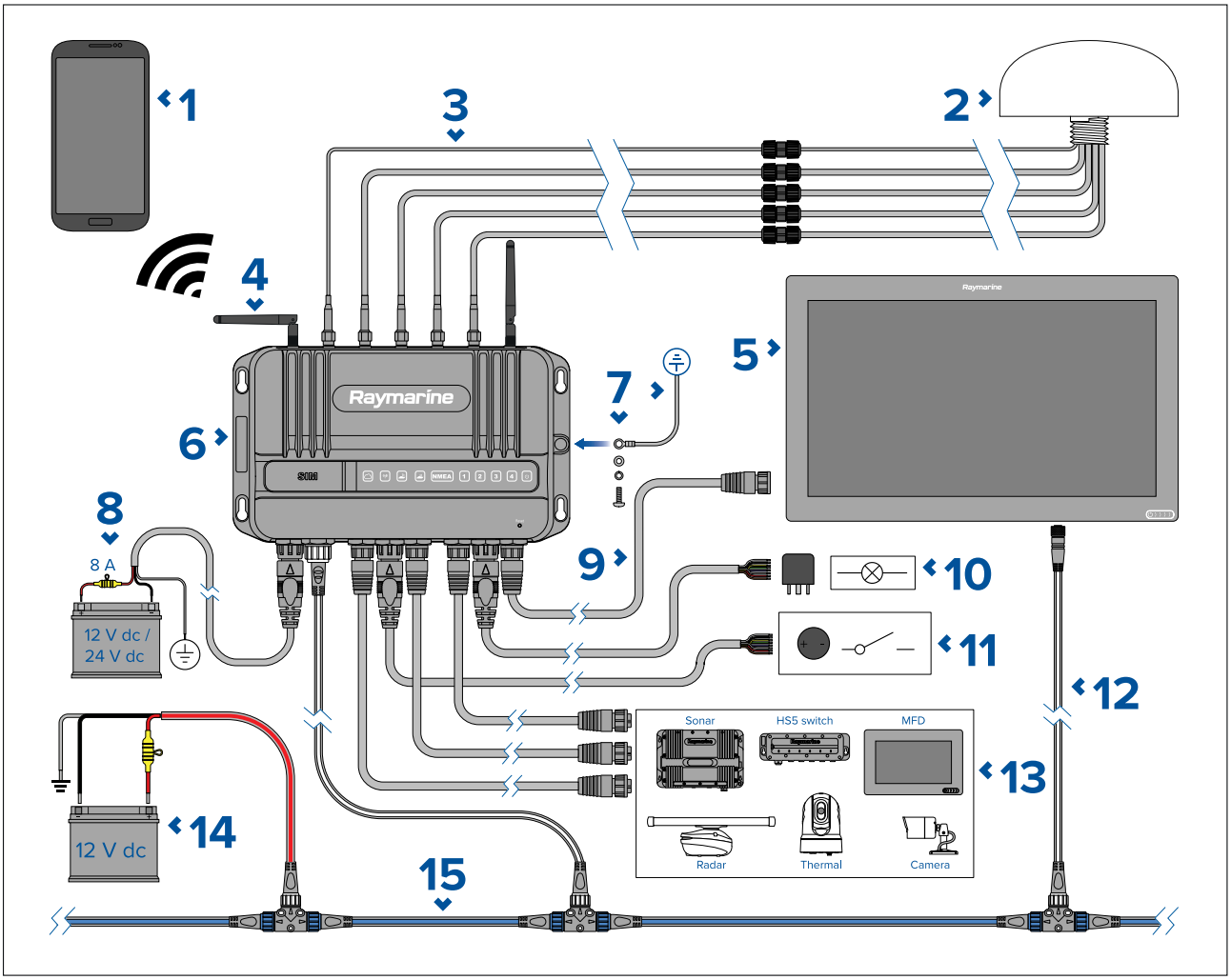


The YachtSense™ Link Marine Cloud Router includes the following features:

- Dual Micro-SIM card slots.
- Cellular antenna connections.
- Diversity antenna connections.
- Dual Wi-Fi network (DOCK WLAN) for off boat wireless connections.
- Dual Wi-Fi network (BOAT Wi-Fi) for onboard wireless connections.
- Built in GNSS (GPS) receiver (GLONASS and Beidou compatible).
- 4 digital input channels, for digital switching / device control.
- 4 digital output channels (rated at 200 mA), for digital switching / device control.
- 4 RayNet (SeaTalkhs®) network ports.
- SeaTalkng® / NMEA 2000 connection.
- Web browser user interface for configuration.

System diagram

The following diagram provides an overview of a typical system, including the available connections and the types of devices that can be connected to your router.

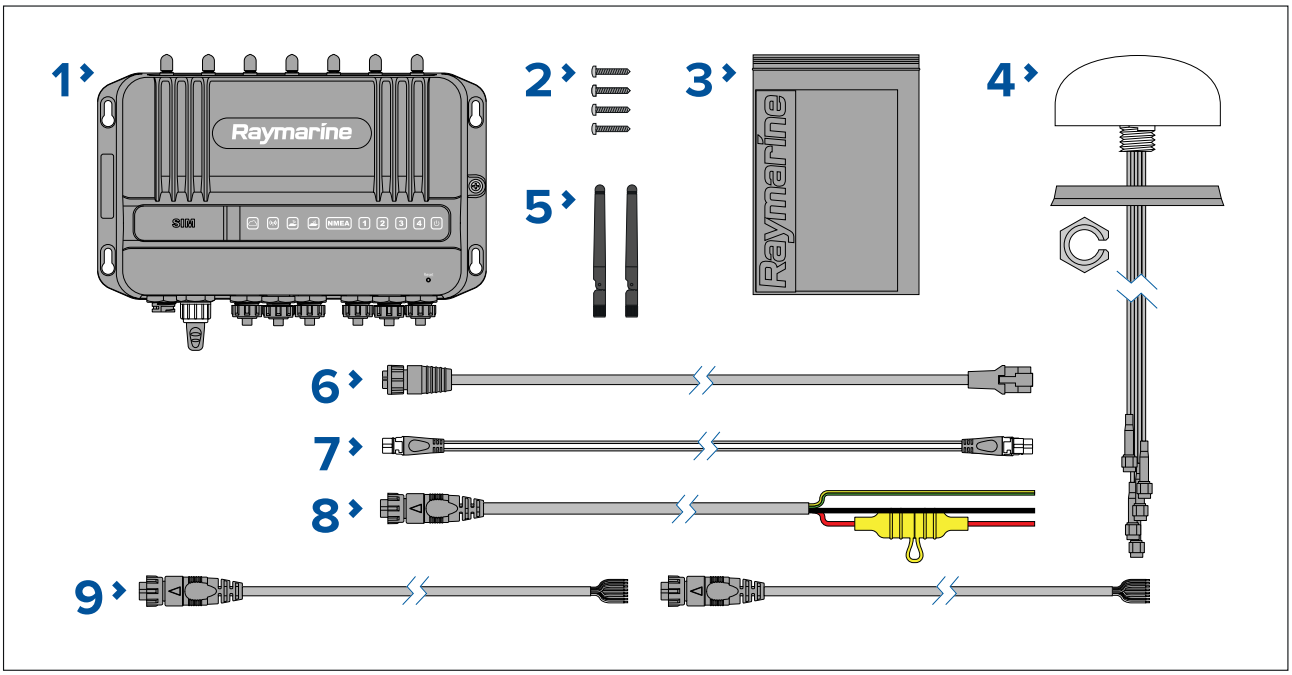


1. Mobile device (e.g.: smartphone)
2. 5 in 1 antenna providing GNSS/Wi-Fi/Cellular/Diversity connections (supplied)
3. Optional 5 in 1 antenna extension (A80701)
4. Boat Wi-Fi (antennas supplied)
5. Compatible MFD (e.g.: Axiom XL)
6. YachtSense™ Link Marine Cloud Router
7. Mandatory grounding connection
8. 12 V / 24 V dc router power supply
9. RayNet connection to MFD (direct or via HS5 network switch)
10. Router output connections (rated at 200 mA; for controlling devices via standard automotive relays)
11. Router input connections (control switches or monitor voltage etc.)
12. DeviceNet to SeaTalkng ® connection to MFD (via an adaptor cable, e.g.: A06075).
13. Other Raymarine products connected via RayNet (direct or via HS5 network switch)
14. 12 V dc SeaTalkng ® power supply (with 5 A fuse)
15. SeaTalkng ® backbone (requires its own 12 V power supply)

2.3 Parts supplied

The following parts are supplied in the box.

Unpack your product carefully to prevent damage or loss of parts. Check the box contents against the list below. Retain the packaging and documentation for future reference.



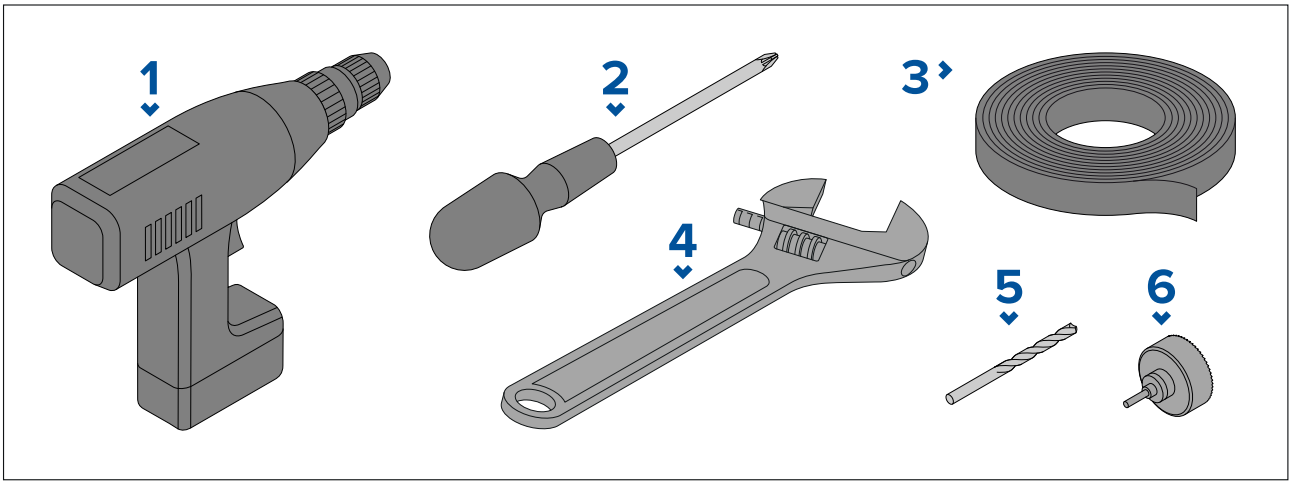
1. YachtSense™ Link Marine Cloud Router (supplied with grounding point fixings and protective caps fitted).
2. 4 x mounting fixings (PA 4 x 25 mm self tapping screws).
3. Documentation pack
4. 5-in-1 antenna (GNSS, Cellular, Diversity, DOCK WLAN) with 5 m (16.4 ft) cables and M20 nut and mounting gasket.
5. 2 x Dipole antenna (BOAT Wi-Fi).
6. RayNet to RJ45 cable 1 m (3.3 ft).
7. SeaTalkng ® spur cable 1 m (3.3 ft).
8. Power cable with 8 A fitted fuse 1.5 m (4.9 ft).
9. 2 x Input/Output (I/O) cables 0.5 m (1.64 ft).

Chapter 3: Installation

Chapter contents

3.1 Tools required

The following tools are required for installation.



1. Power drill
2. Pozi-drive screw driver
3. Masking / adhesive tape
4. Adjustable wrench / 30 mm wrench (Required for 5-in-1 antenna installation.)
5. Drill bit (suitable for pilot holes)
6. 23 mm (0.91 in) hole cutter (Required for 5-in-1 antenna installation.)

3.2 Selecting a location

Warnings and cautions

Important: Before proceeding, ensure that you have read and understood the warnings and cautions provided in the Chapter 1 **Important information** section of this document.

YachtSense™ Link location requirements

The installation location must take into account the following requirements:

This product is not suitable for installation in above decks locations, unless installed in a suitable protective enclosure. In this scenario, it's important to avoid using enclosure materials that will have a significant impact on the wireless signals, such as conductive materials like steel or carbon fibre, for example.

Wireless location requirements for optimum performance

All wireless devices in your system must be located in such a way that they can reliably receive and/or transmit wireless signals.

A number of factors can influence wireless performance. For example, physical obstacles and certain vessel structures and materials can all negatively impact wireless performance. Therefore, **it's important to check a product's wireless performance at the desired installation location before drilling any mounting holes**.

Vessel construction and materials

Wherever possible, mount products on surfaces constructed from GRP (e.g. fiberglass resin, or foam), or on dry wooden bulkheads.

Conductive materials in the signal path can have a significant impact on wireless signal performance. Reflective surfaces such as metal surfaces, some types of glass and even mirrors can drastically affect performance or even block the wireless signal. Installation locations that are in close proximity to these materials should be avoided. **Do NOT mount wireless products directly to conductive materials.** This includes any mounting surface or enclosure/pod.

Examples of conductive materials include, but are not limited to:

- carbon fibre, kevlar, or aramid (including sails made from these materials)
- aluminium
- steel

In installations with conductive materials, mount the wireless product using an accessory pole mount or deck mounting kit. A clearance of at least 10 cm (3.9 in) is required to minimize the ground effect from conductive materials. This applies to transmitters as well as displays. If moving the product fixes the problem, consider cutting an antenna clearance hole behind the unit (once the product position and mounting have been finalized).

Wireless performance can also be degraded in locations where the wireless signal passes through a bulkhead containing power cables.

Note:

Crew members (especially when wet) can also be obstructive to wireless signals, if their bodies pass through the signal area between wireless sensor and any associated displays.

Checking and optimizing signal strength

It may be necessary to experiment with the location of your wireless products to achieve optimal wireless performance and a clear signal path.

The distance between wireless products should always be kept to a minimum. Do not exceed the maximum stated range of your wireless product (maximum range will vary for each device).

Wireless performance degrades over distance, so products farther away will receive less network bandwidth. Products installed close to their maximum wireless range may experience slow connection speeds, signal dropouts, or not being able to connect at all.

For best results, the wireless product should have a clear, direct line-of-sight to the product it will be connected to. Any physical obstructions can degrade or even block the wireless signal.

Some wireless products feature a signal strength indicator to assist in the process of determining the location with the best wireless performance. Choose the location with the highest and most consistently strong direct signal reading, during a 5 minute monitoring period. Try alternative locations for the transmitter to maximise the signal strength to the displays; e.g. try locations below a hatch or skylight or near to a window. A small change in product position can result in a significant change in the signal strength.

Note:

Some wireless products (e.g. a Hull Transmitter) will not transmit data unless a transducer is connected. Also consider that an NMEA or SeaTalkng product (e.g. an interface) will not transmit data unless an appropriate data source is connected.

Interference and other equipment

Interference from other people's wireless devices can cause interference with your products. You can use a third-party wireless analyzer tool / smartphone app to assess the best wireless channel to use (e.g. a channel not in use or one used by the least number of devices).

Wireless products should be installed at least 1 m (3 ft) away from:

- Other wireless-enabled products
- Transmitting products that send wireless signals in the same frequency range
- Other electrical, electronic or electromagnetic equipment that may generate interference.

Software updates

It's also important to ensure all your wireless products are running the latest software versions, as improvements are made over time to wireless performance.

Mounting surface requirements

When selecting a mounting surface ensure:

- the product will be adequately supported on a secure, flat surface. Do NOT mount units or cut holes in places which may damage the structure of the vessel.
- sufficient space is available around the product.
- there is nothing behind the mounting surface that may be damaged when drilling.

Cable routing requirements

Ensure you have identified the route that all required cables will take and that sufficient space is available to allow connection of cables:

- Unless otherwise stated, a minimum cable bend radius of 100 mm (3.94 in) is required.
- Where necessary, cable supports should be used to prevent stress on connectors.

Electrical interference

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

Power supply

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

RF interference

Certain third-party external electrical equipment can cause Radio Frequency (RF) interference with GNSS (GPS), AIS or VHF devices, if the external equipment is not adequately insulated and emits excessive levels of electromagnetic interference (EMI).

Some common examples of such external equipment include LED lighting (e.g.: navigation lights, searchlights and floodlights, interior and exterior lights) and terrestrial TV tuners.

To minimize interference from such equipment:

- Keep it as far away from GNSS (GPS), AIS or VHF products and their antennas as possible.
- Ensure that any power cables for external equipment are not entangled with the power or data cables for these devices.
- Consider fitting one or more high frequency suppression ferrites to the EMI-emitting device. The ferrite(s) should be rated to be effective in the range 100 MHz to 2.5 GHz, and should be fitted to the power cable and any other cables exiting the EMI-emitting device, as close as possible to the position where the cable exits the device.

Compass safe distance

When choosing a suitable location for your product you should aim to maintain the maximum possible distance between the product and any installed compass. This distance should be at least 1 m (3 ft) in all directions. For smaller vessels it may not be possible to achieve this distance. In this situation ensure that the compass is not affected by the product when it is powered on.

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.

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.

Connections to other equipment

Requirement for ferrites on non-Raymarine cables.

If your product is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite MUST always be attached to the end of the cable nearest to the Raymarine product.

5-in-1 antenna location requirements

The supplied 5-in-1 antenna must be mounted in a location that provides a clear unobstructed view of the sky.

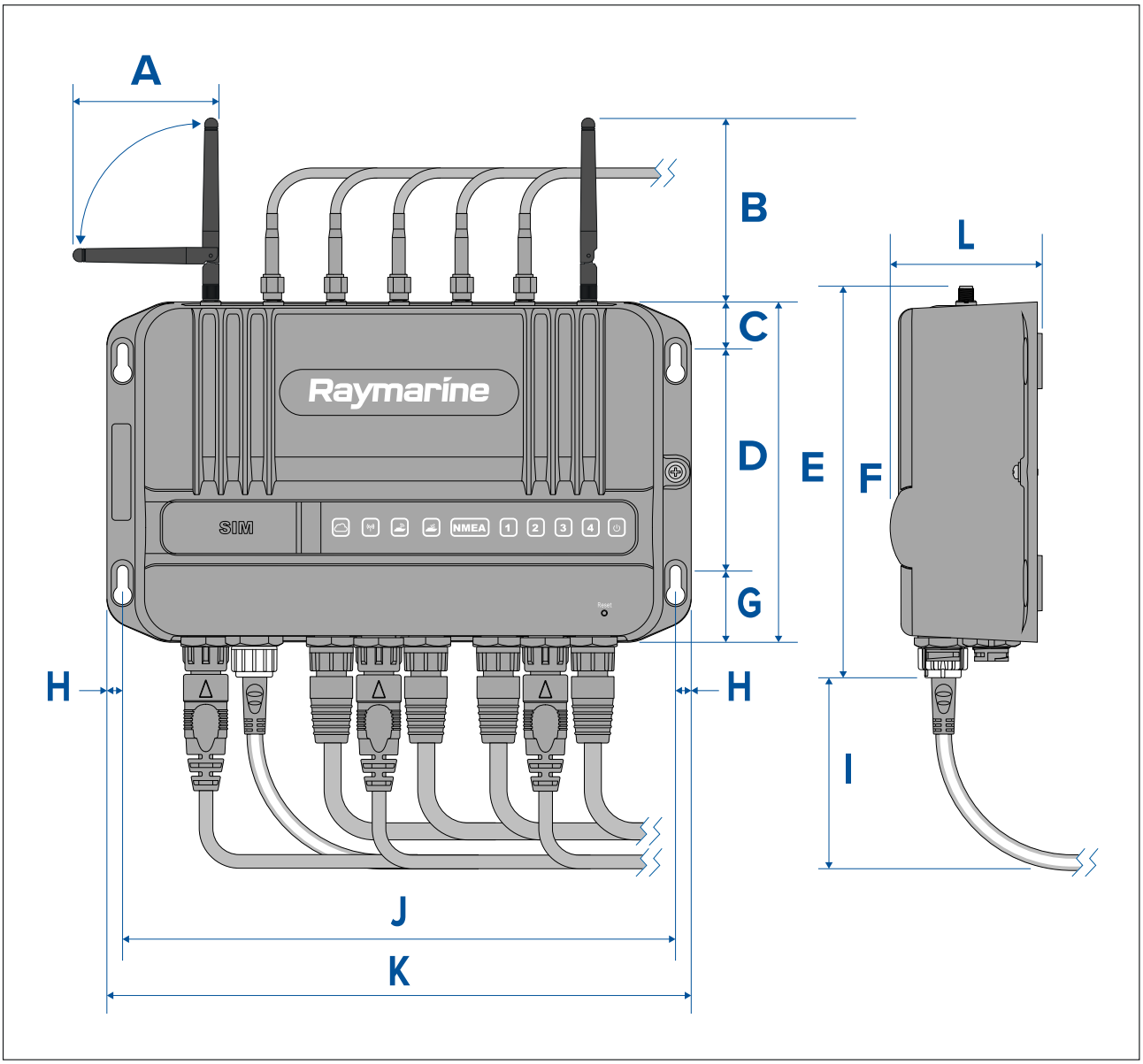
Ensure that the selected mounting location is:

- Open and clear of any obstructions (such as masts, search lights, or other structures) that could block line-of-sight to the sky.
- As low as possible, to keep the antenna as stable as possible. The more stable the antenna, the more effectively it will track satellites and provide stable data.
- As far as possible (at least 1 m (3 ft)) from other antennas and electronic equipment.

Do NOT mount the antenna:

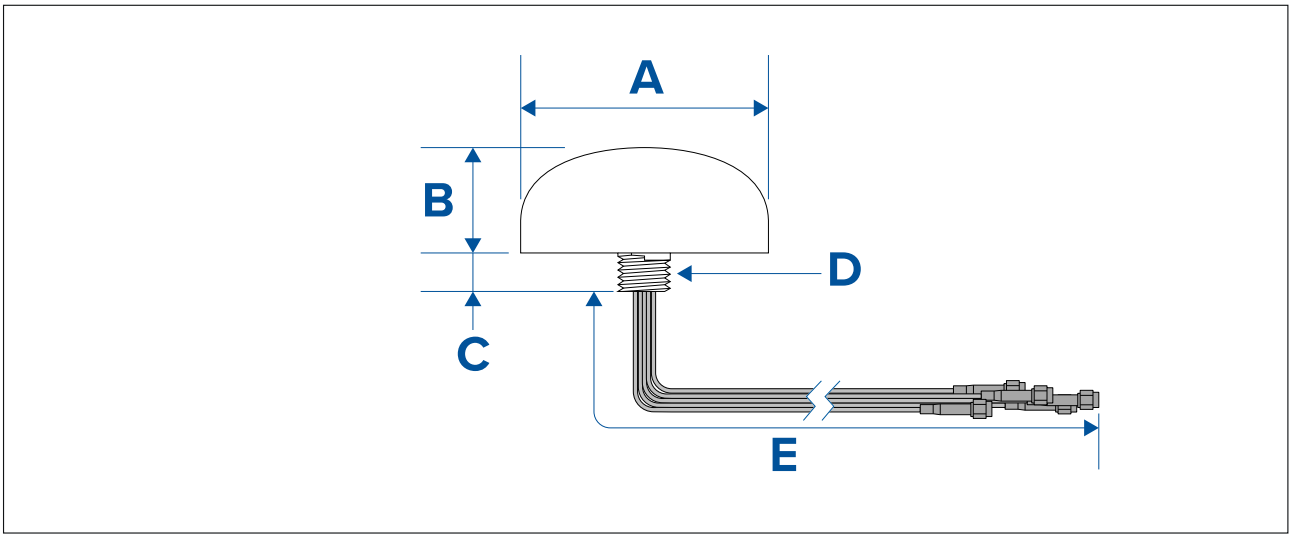
- In any area where it could be stepped on or tripped over.
- Up a mast. This will cause the antenna to swing and give significant errors in position data.
- In the direct path of a Radar beam.

3.3 YachtSense™ Link product dimensions



- **A** = 87.80 mm (3.46 in)
- **B** = 108.40 mm (4.27 in)
- **C** = 19.50 mm (0.78 in)
- **D** = 108.20 mm (4.26 in)
- **E** = 141.00 mm (5.55 in)
- **F** = 162.20 mm (6.39 in)
- **G** = 29.50 mm (1.16 in)
- **H** = 6.50 mm (0.26 in)
- **I** = 80.00 mm (3.15 in)
- **J** = 229.00 mm (9.02 in)
- **K** = 242.00 mm (9.53 in)
- **L** = 63.00 mm (2.48 in)

3.4 5-in-1 antenna dimensions



- **A** = Ø 102.90 mm (4.05 in)
- **B** = 43.50 mm (1.71 in)
- **C** = 16.00 mm (0.63 in)
- **D** = 7/8”-9 UNC thread
- **E** = 5 m (16.4 ft)

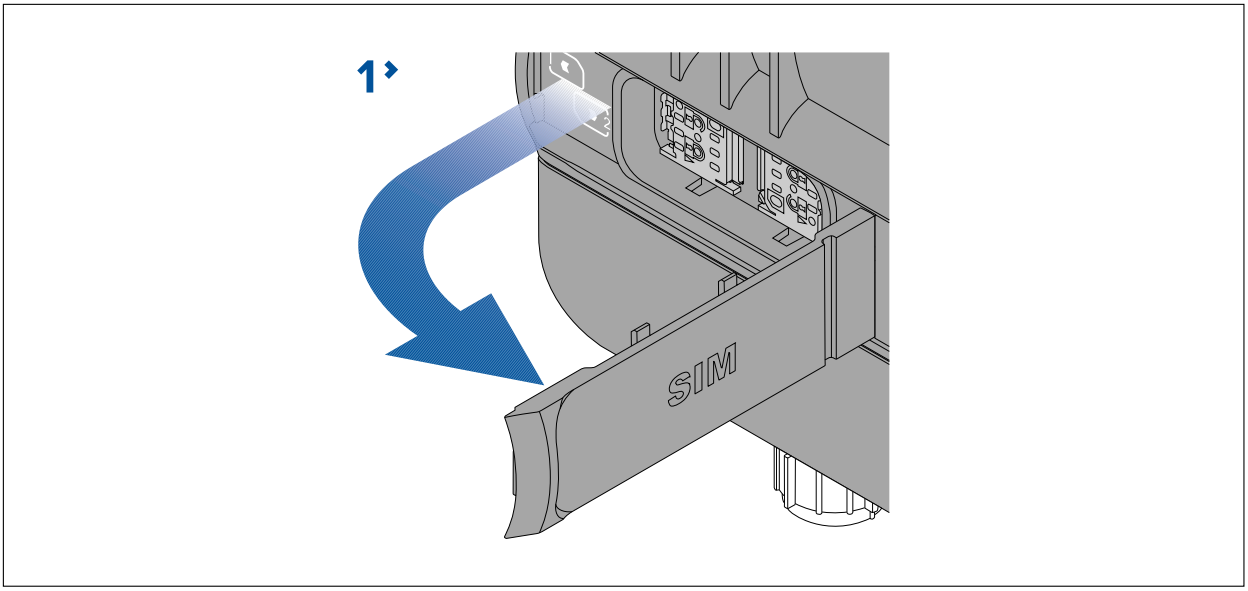
3.5 Inserting SIM cards

YachtSense™ Link has dual SIM card slots which accept Micro SIM cards (Nano SIMs can be used with a Nano to Micro SIM adaptor).

Important:

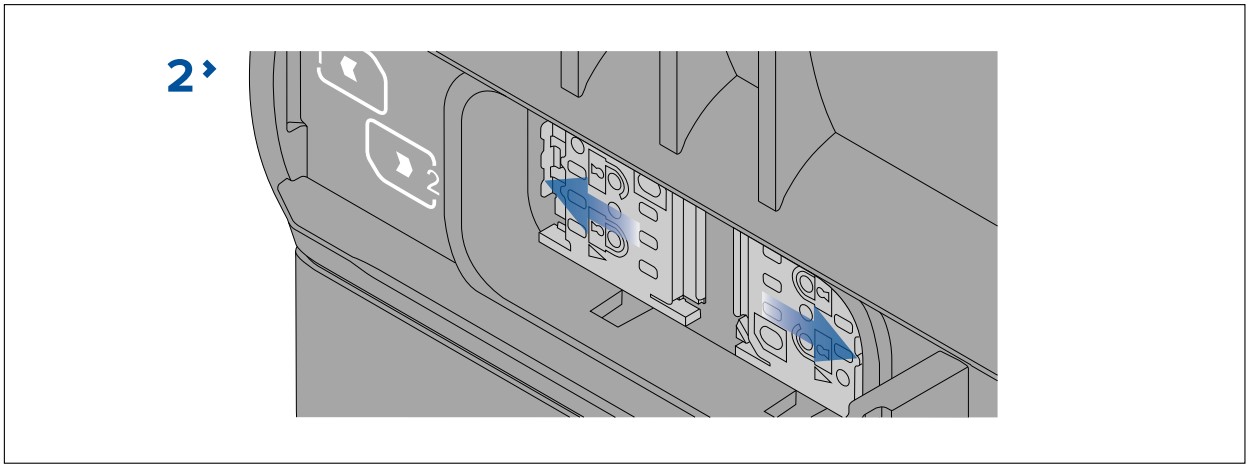
- A SIM card is not supplied with the YachtSense™ Link and will need to be purchased separately.
- If only using a single SIM card it should be inserted into SIM slot 1.
- Once SIM cards are inserted the router must be configured to allow use of mobile data. Refer to: **p.56 — Mobile data & SIM management**

1. Open the SIM card door.



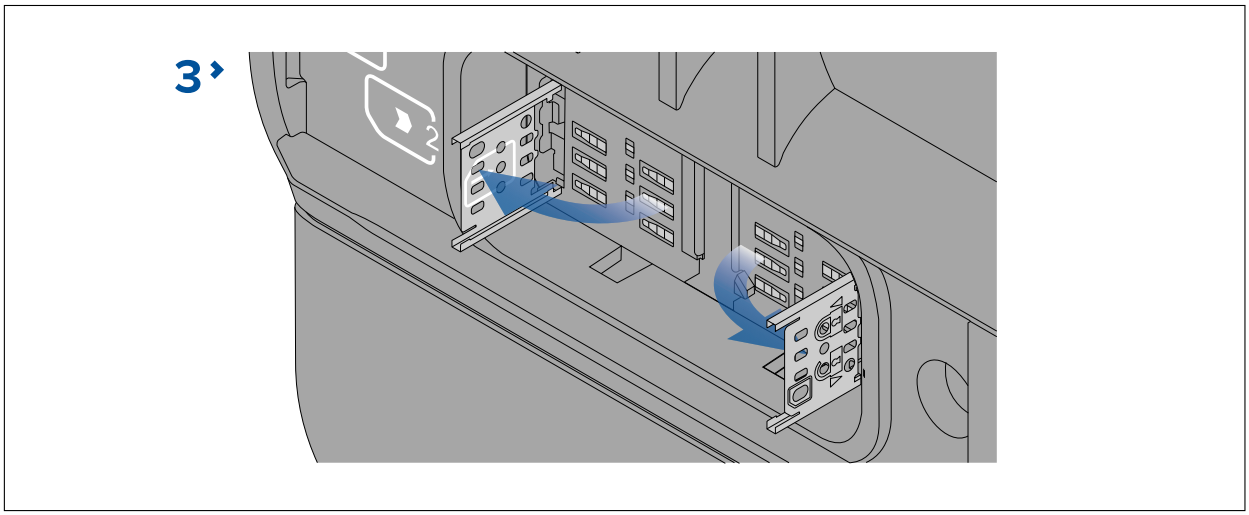
2. Slide the SIM card holder(s) into the unlocked position.

   SIM 1 slides to the left and SIM 2 slides to the right.

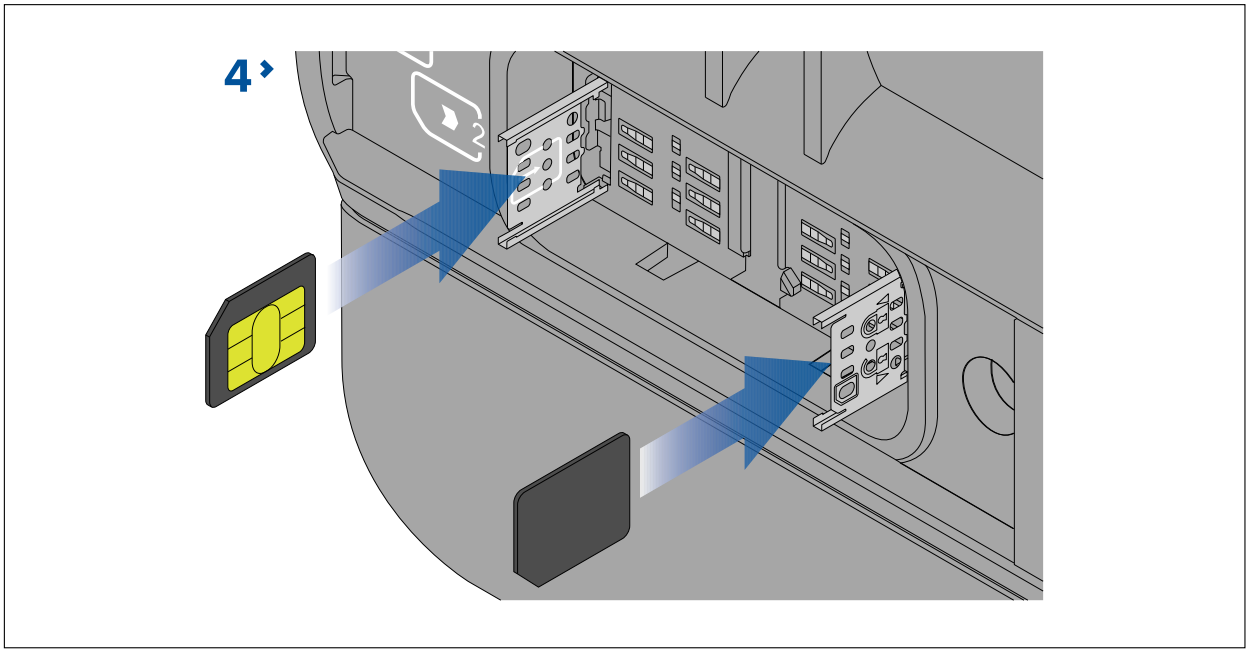


3. Open the SIM card holder(s).

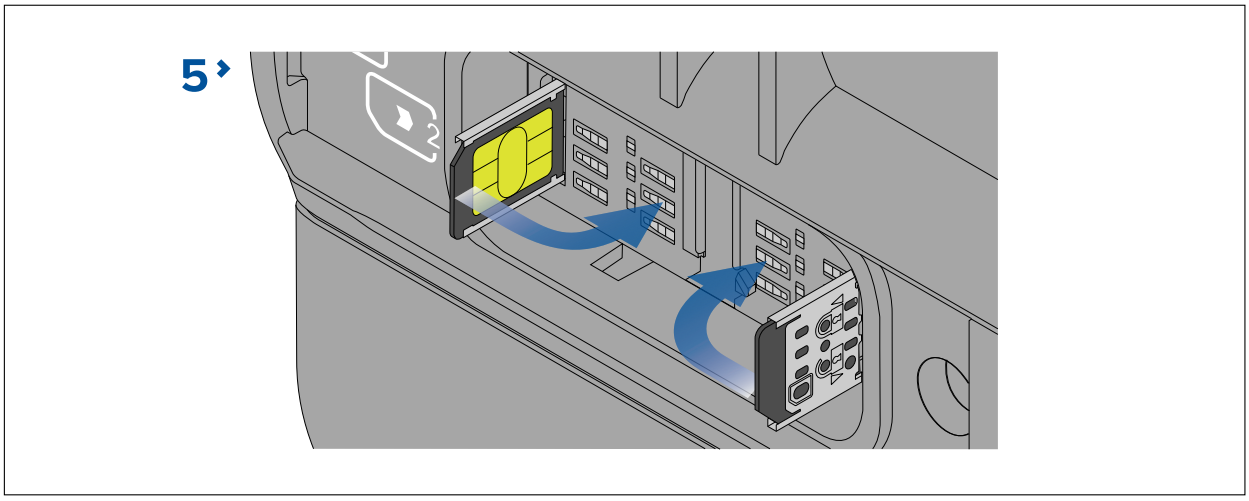
   SIM 1 is hinged on the left and SIM 2 is hinged on the right.



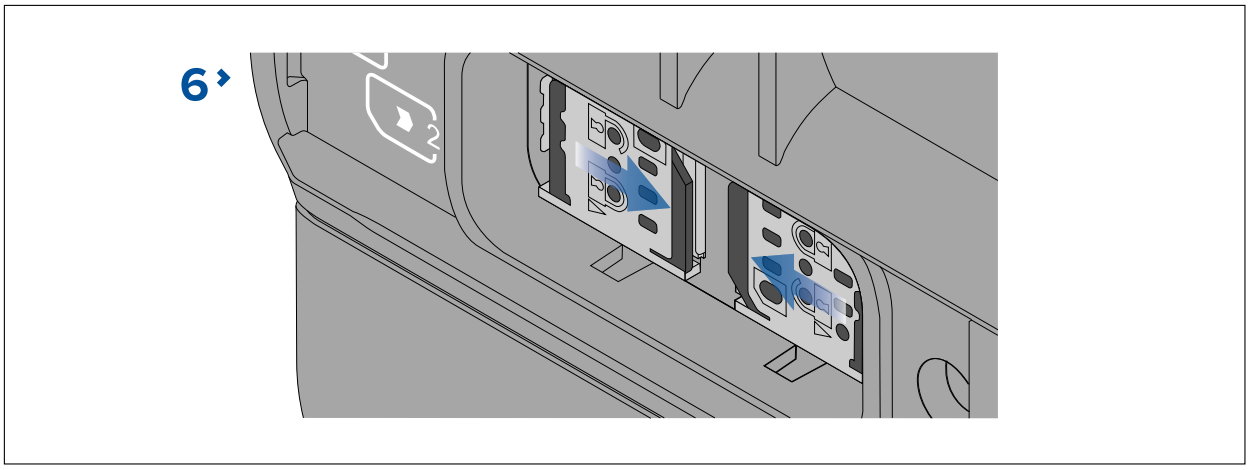
4. Ensuring correct orientation, insert your Micro SIM card(s) into the holders.



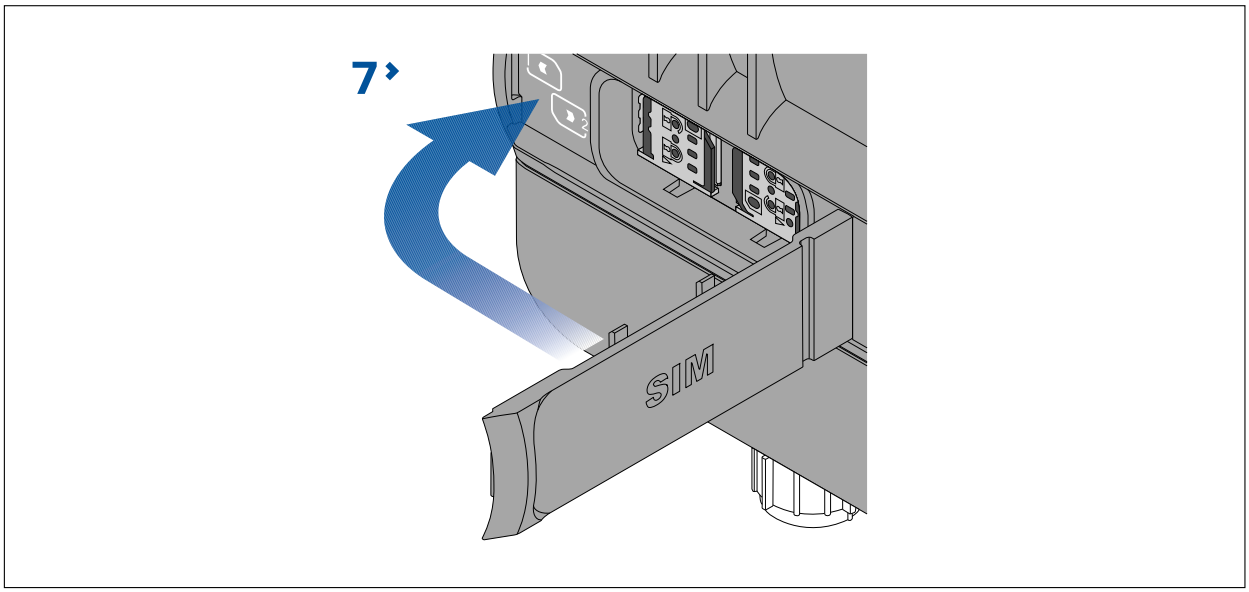
5. Close the SIM card holder(s).



6. Slide the SIM card holder(s) into the locked position.
   SIM 1 slides to the right and SIM 2 slides to the left.



7. Close the SIM card door, ensuring that it is correctly seated all the way around the edge.

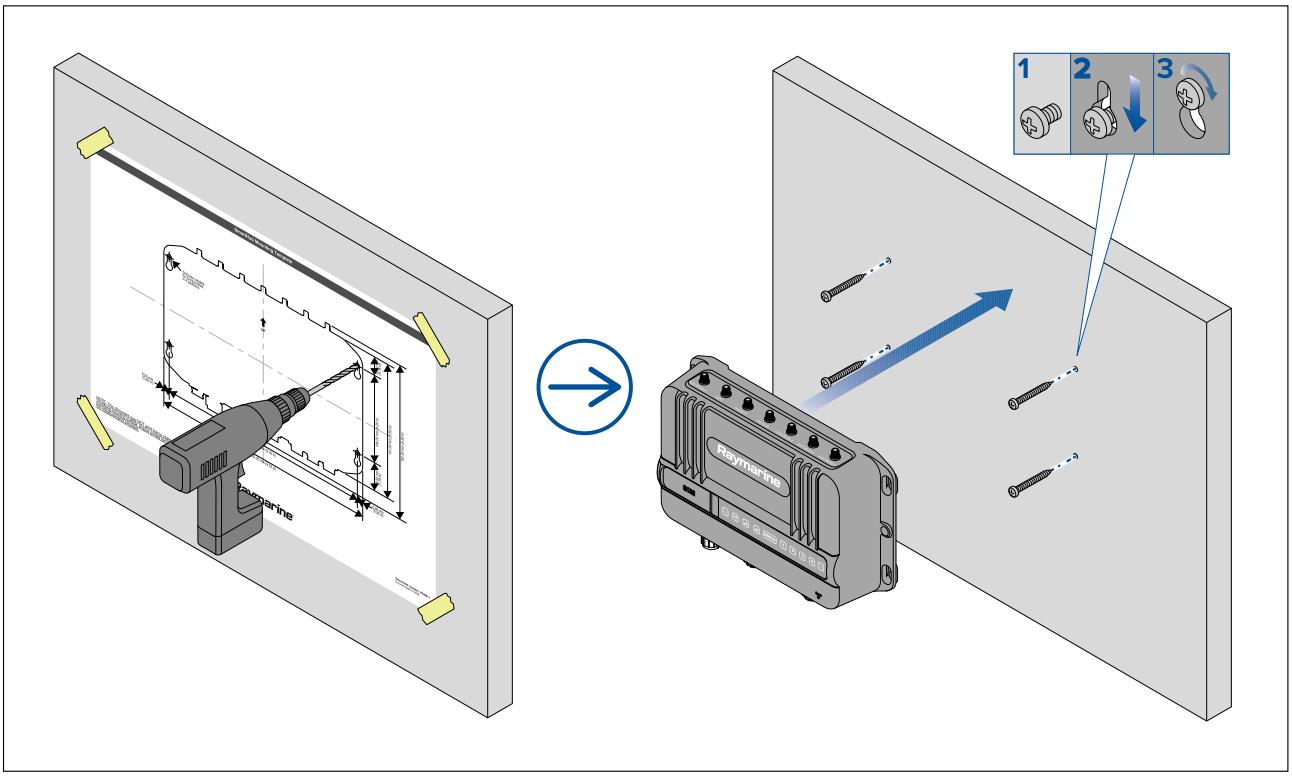


3.6 Mounting the YachtSense™ Link

Follow the instructions below to mount the YachtSense™ Link.
Before mounting the product ensure that you have:

- selected a suitable location, based on the location requirements found in this document.

- identified the relevant cable connections and the route that the cables will take.



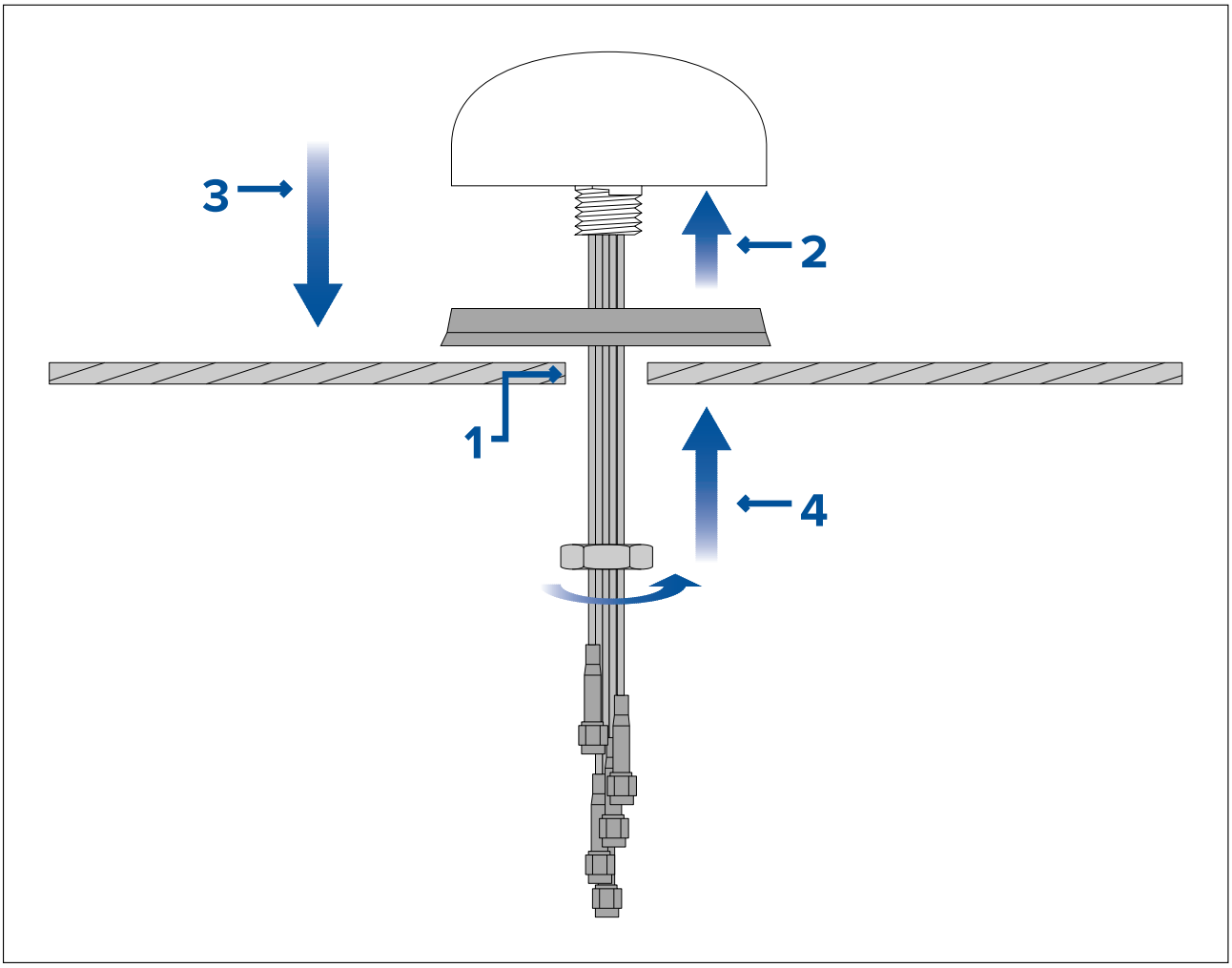
1. Fix the supplied mounting template to the chosen location using masking or self-adhesive tape.
2. Drill 4 holes as indicated on the template to accept the fixings.
3. Remove the mounting template.
4. Screw the fixings approximately half way into the holes in the mounting surface.
5. Place the unit over the fixings screws and push down to engage the keyhole slots.
6. Fully tighten the screws.

3.7 Mounting the 5-in-1 antenna

The supplied 5-in-1 antenna must be installed in a location which has a clear line of sight to the sky and where it will be away from structure and devices that could cause interference.

Important:

A thread extender kit is available that enables the antenna to be mounted on thicker mounting surfaces. If using the thread extender kit refer to the instructions supplied in the kit (document number 82425) for instructions on mounting the antenna as the thread extender kit requires a bigger mounting hole size and wrench for tightening the nut.



1. Drill a 23 mm (0.91 in) hole at the center of the desired mounting location to accept the antenna's thread and cables.
2. Feed the cables through the gasket and place on the underside of the antenna.
3. Feed the cables and thread through the hole in the mounting surface so that the gasket and antenna sit flush on the mounting surface.
4. Feed the cables through the split in the nut and secure the antenna by tightening the nut on the exposed thread.

   Tighten the split nut using a large adjustable wrench or a 30 mm wrench. The tightening torque should not exceed 1.47 N m / 1.08 lbf ft.

Chapter 4: Connections

Chapter contents

4.1 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).

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.

Warning: Positive ground systems

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

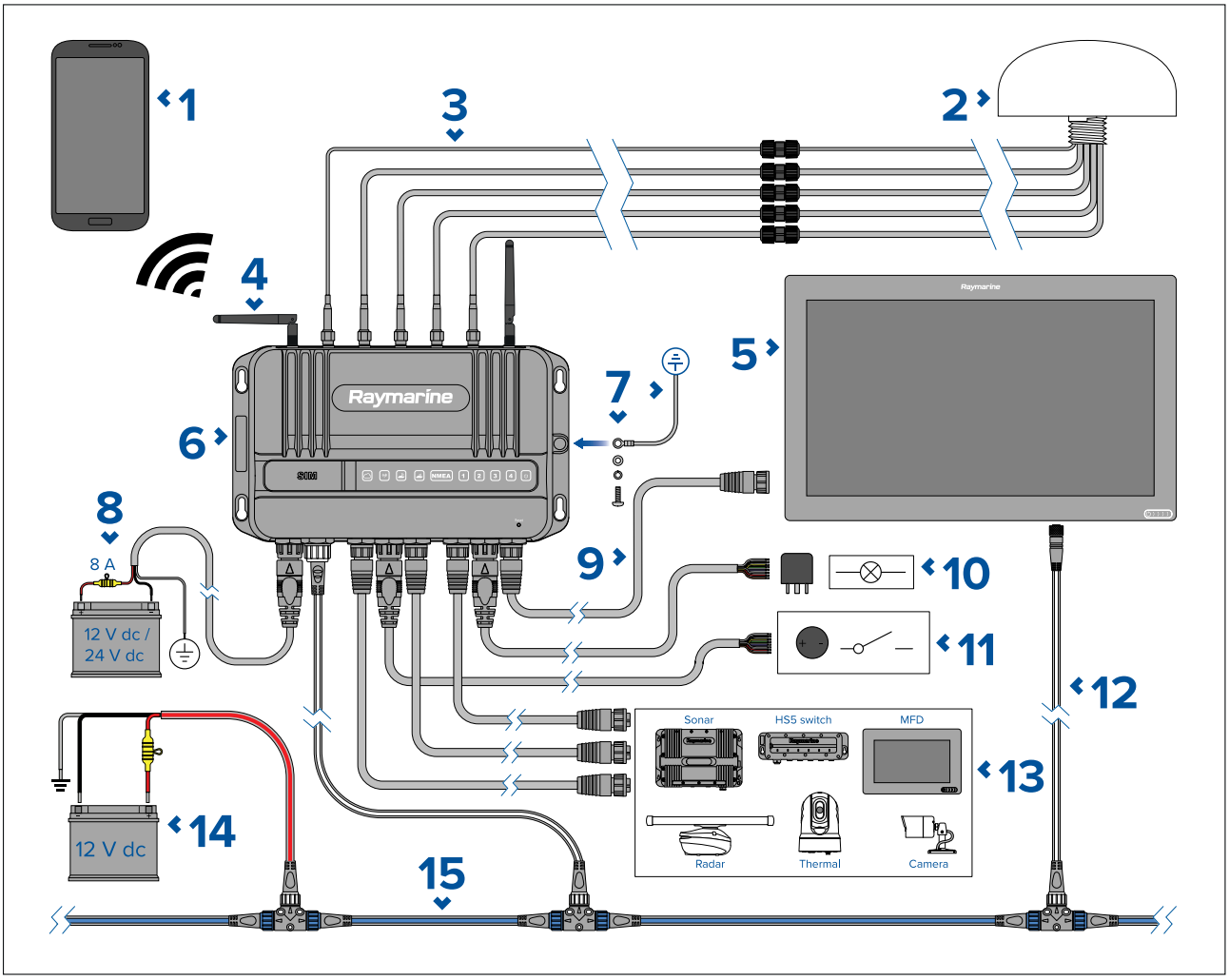
Connecting cables

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.

4.2 System diagram

The following diagram provides an overview of a typical system, including the available connections and the types of devices that can be connected to your router.



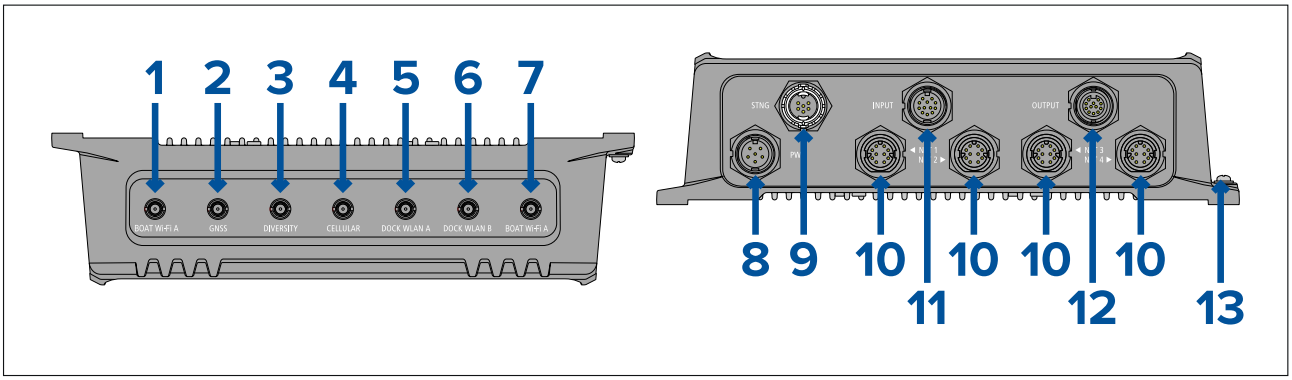
1. Mobile device (e.g.: smartphone)
2. 5 in 1 antenna providing GNSS/Wi-Fi/Cellular/Diversity connections (supplied)
3. Optional 5 in 1 antenna extension (A80701)
4. Boat Wi-Fi (antennas supplied)
5. Compatible MFD (e.g.: Axiom XL)
6. YachtSense™ Link Marine Cloud Router
7. Mandatory grounding connection
8. 12 V / 24 V dc router power supply
9. RayNet connection to MFD (direct or via HS5 network switch)
10. Router output connections (rated at 200 mA; for controlling devices via standard automotive relays)
11. Router input connections (control switches or monitor voltage etc.)
12. DeviceNet to SeaTalkng ® connection to MFD (via an adaptor cable, e.g.: A06075).
13. Other Raymarine products connected via RayNet (direct or via HS5 network switch)
14. 12 V dc SeaTalkng ® power supply (with 5 A fuse)
15. SeaTalkng ® backbone (requires its own 12 V power supply)

4.3 Connections overview

The YachtSense™ Link includes the following connections:

Note:

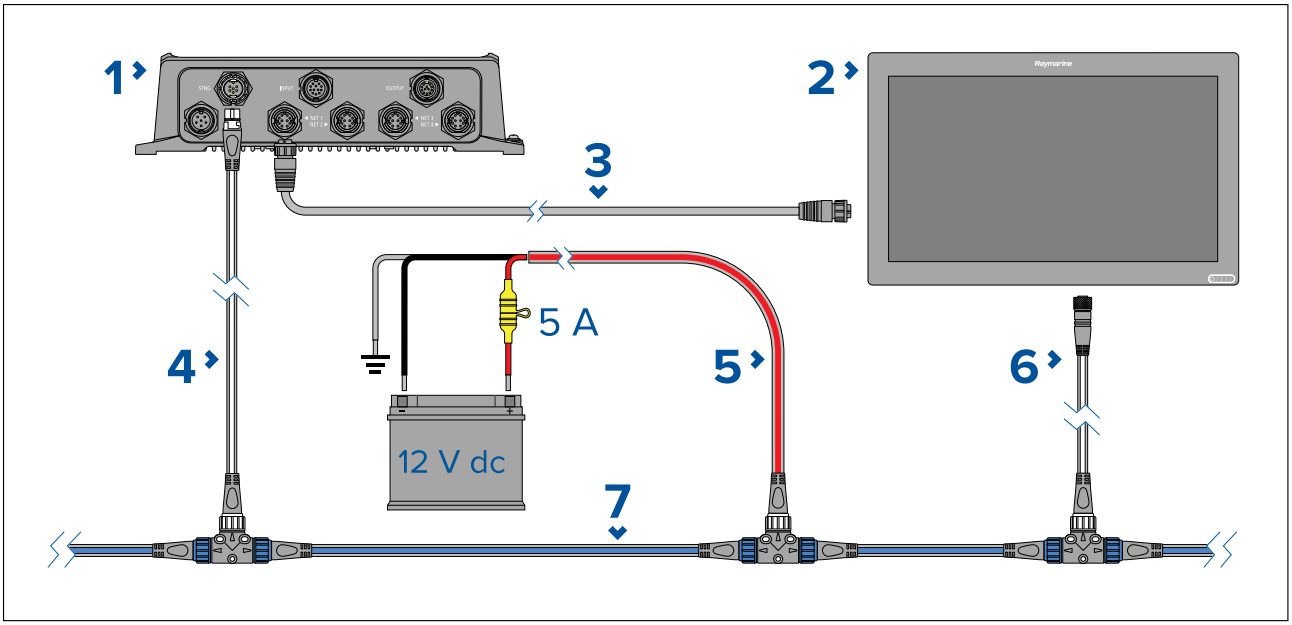
- The router is supplied with protective caps fitted to the antenna connections, RayNet connections, Input and Output connections, and the SeaTalkng ® connection.
- The protective caps should remain in place until connections are made. If a connection is not required then the protective cap should not be removed.



1. Boat Wi-Fi A (Internal boat Wi-Fi antenna connection)
2. GNSS (GPS/GLONASS antenna connection)
3. Diversity (Secondary cellular antenna connection)
4. Cellular (Primary cellular antenna connection)
5. Dock WLAN A (External dock Wi-Fi antenna connection)
6. Dock WLAN B (External dock Wi-Fi antenna connection)
7. Boat Wi-Fi B (Internal boat Wi-Fi antenna connection)
8. Power connection
9. SeaTalkng ® connection
10. RayNet connections
11. Input connections
12. Output connections
13. Dedicated grounding connection — this MUST be connected to a suitable grounding point; refer to: **p.37 — Grounding connection**

4.4 MFD connections

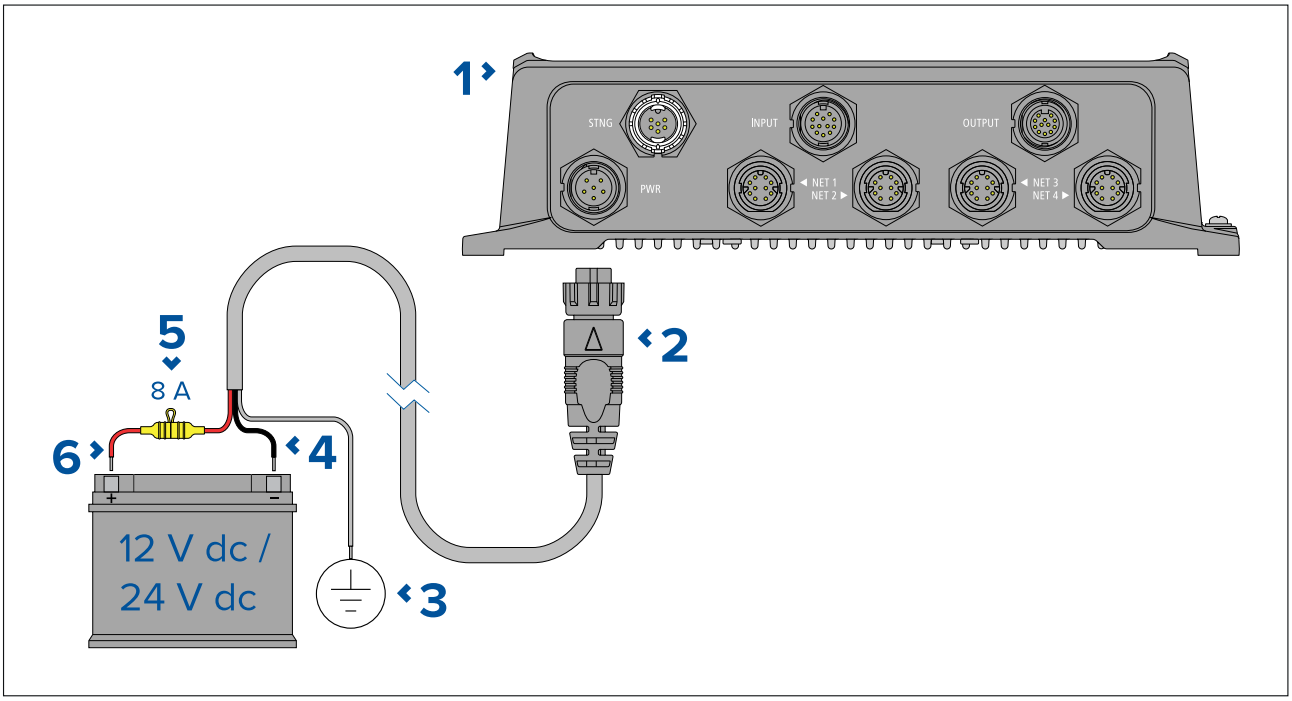
Raymarine MFDs require both a RayNet (SeaTalkhs ®) and SeaTalkng ® connection to the router.



1. YachtSense™ Link router
2. Axiom™ / Axiom™+ / Axiom™ Pro / Axiom™ XL MFD.
3. RayNet to RayNet (SeaTalkhs ®) network cable.
4. SeaTalkng ® spur cable.
5. SeaTalkng ® power cable (supplying 12 V dc power. 5 amp inline fuse is required).
6. SeaTalkng ® to DeviceNet spur cable.
7. SeaTalkng ® backbone.

4.5 Power connection

The supplied power cable must be connected to a 12 V dc or 24 V dc power supply, this can be achieved by connecting directly to a battery, or via the distribution panel.



1. YachtSense™ Link
2. Power cable (supplied)

3. Drain wire connects to vessel's RF ground point, if no ground point is available connect to the battery negative (-) terminal.
4. Negative wire connects to power supply negative (-) terminal.
5. Waterproof fuse holder with 8 A fuse must be fitted
6. Positive (Red) wire connects to power supply positive (+) terminal.

In-line fuse and thermal breaker ratings

The following in-line fuse and thermal breaker ratings apply to your product:

In-line fuse rating	Thermal breaker rating
8 A	8 A

Note:

- The suitable fuse rating for the thermal breaker is dependent on the number of devices you are connecting. If in doubt consult an authorized Raymarine dealer.
- Your product's power cable may have an in-line fuse fitted, if not then you must add an in-line fuse / breaker to the positive wire of your product's power connection.

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.

Power distribution

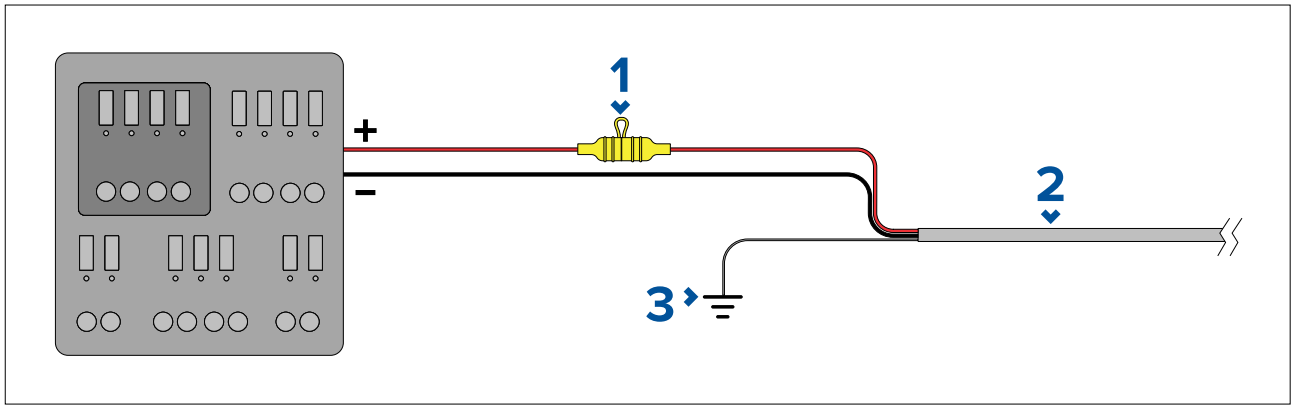
Recommendations and best practice.

- 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:

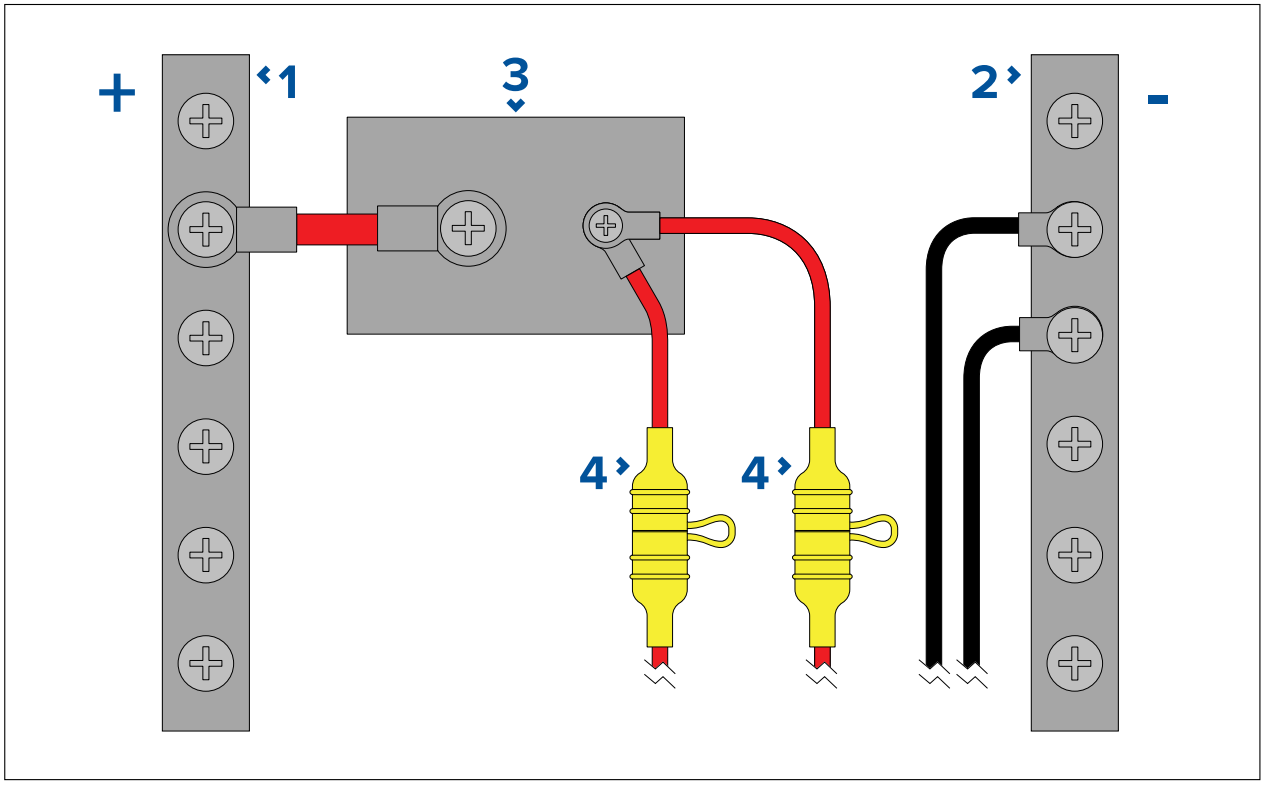
- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for 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)



1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *In-line 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 mm^2) 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 in-line fuses for each power circuit to provide the necessary protection.



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: *In-line fuse and thermal breaker ratings*.

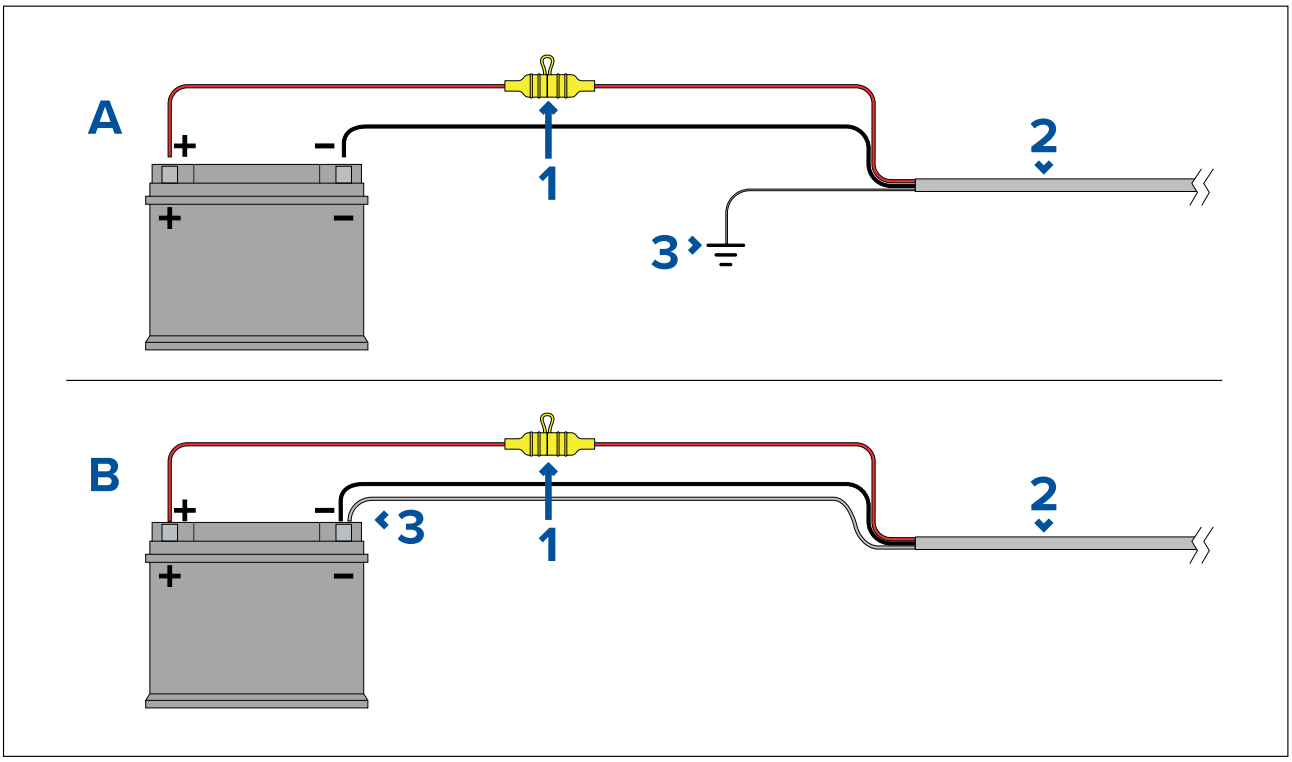
Important:

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.
- The power cable supplied with your product may NOT include a separate drain wire. If this is the case, only the power cable's red and black wires need to be connected.
- 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.



1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *In-line 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, if your product's power cable is supplied with a separate drain wire then it 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, if your product's power cable is supplied with a separate drain wire then it should be connected directly to the battery's negative terminal.

Power cable extension

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)	12 (3.31 mm^2)	16 (1.31 mm^2)
>32 (>100)	10 (5.26 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.)

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

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.

4.6 Grounding connection

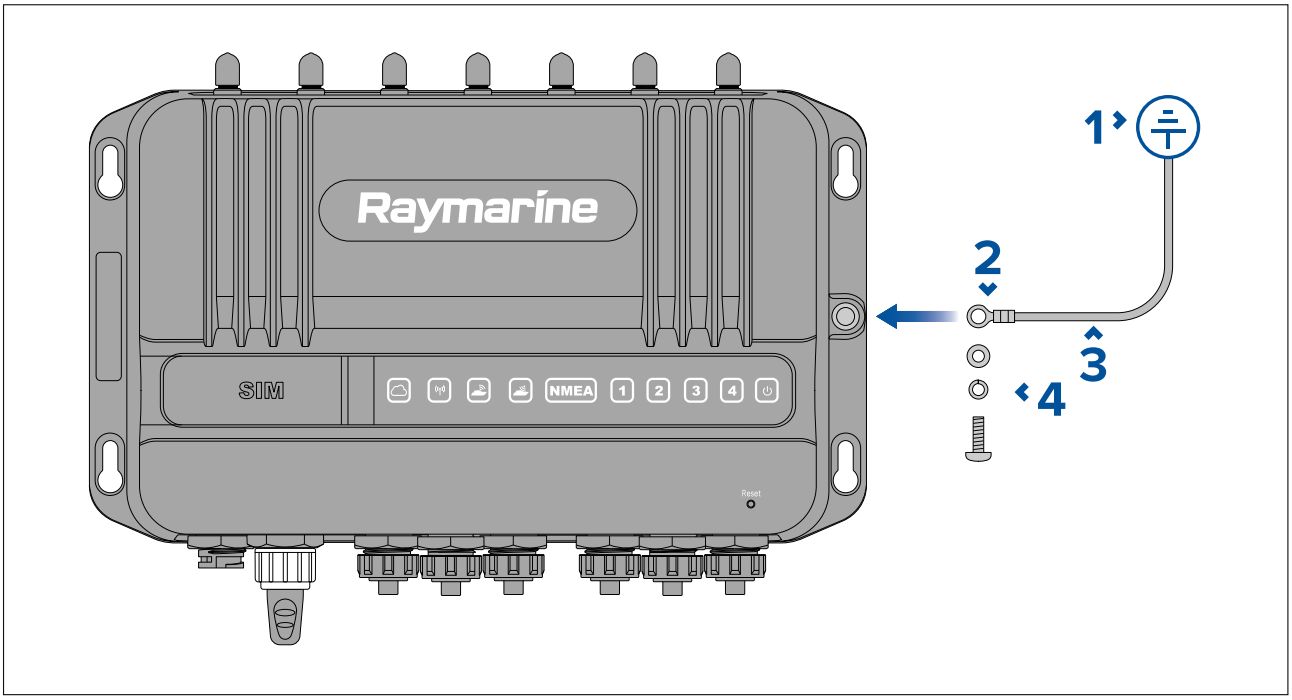
The YachtSense™ Link unit includes a dedicated grounding point, which MUST be connected as described below.

Important:

Connect the product's grounding point to your vessel's common RF ground. **On vessels without an RF ground system**, connect the product's grounding point directly to the vessel's negative battery terminal. This dedicated grounding point is NOT an optional connection.

The vessel's 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.



1. Vessel grounding point.
2. M3 size ring crimp (not supplied).
3. Grounding strap connected to vessel RF ground (not supplied).
4. Grounding screw and washers (supplied pre-fitted to the unit).

To connect the grounding point, an M3 ring crimp and suitable cable is required to create a grounding strap.

The grounding cable is connected to the product using the M3 screw and washers that are supplied pre-fitted to the product's grounding point.

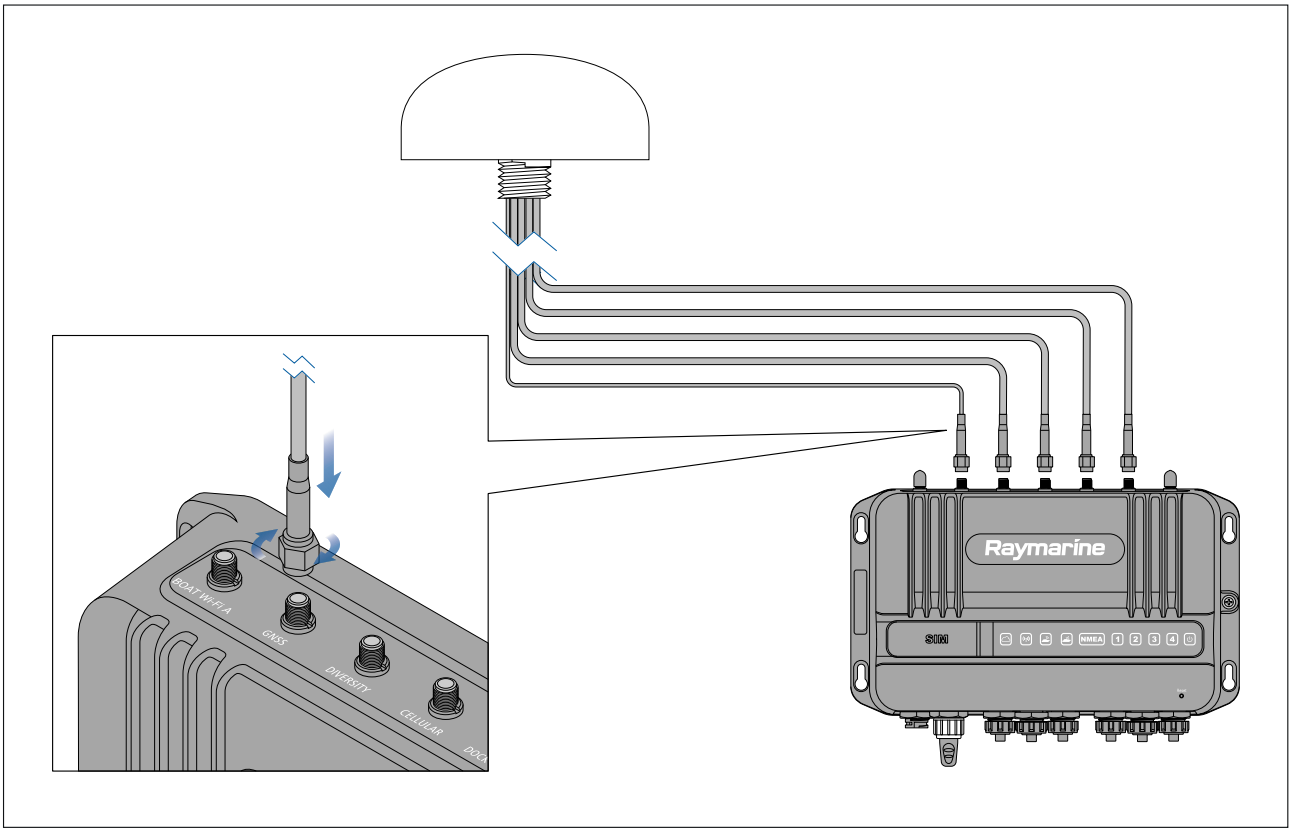
The preferred minimum requirement for the path to the vessel's ground (bonded or non-bonded) is via a flat tinned copper braid, with a 30 A rating or greater. If this is not possible, an equivalent stranded wire conductor may be used, rated as follows:

- for runs of <1 m (3 ft), use 6 mm2 (10 AWG) or greater.
- for runs of >1 m (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.

4.7 5-in-1 antenna connections

The supplied 5-in-1 antenna is connected to the antenna connections on the top of the YachtSense™ Link unit.

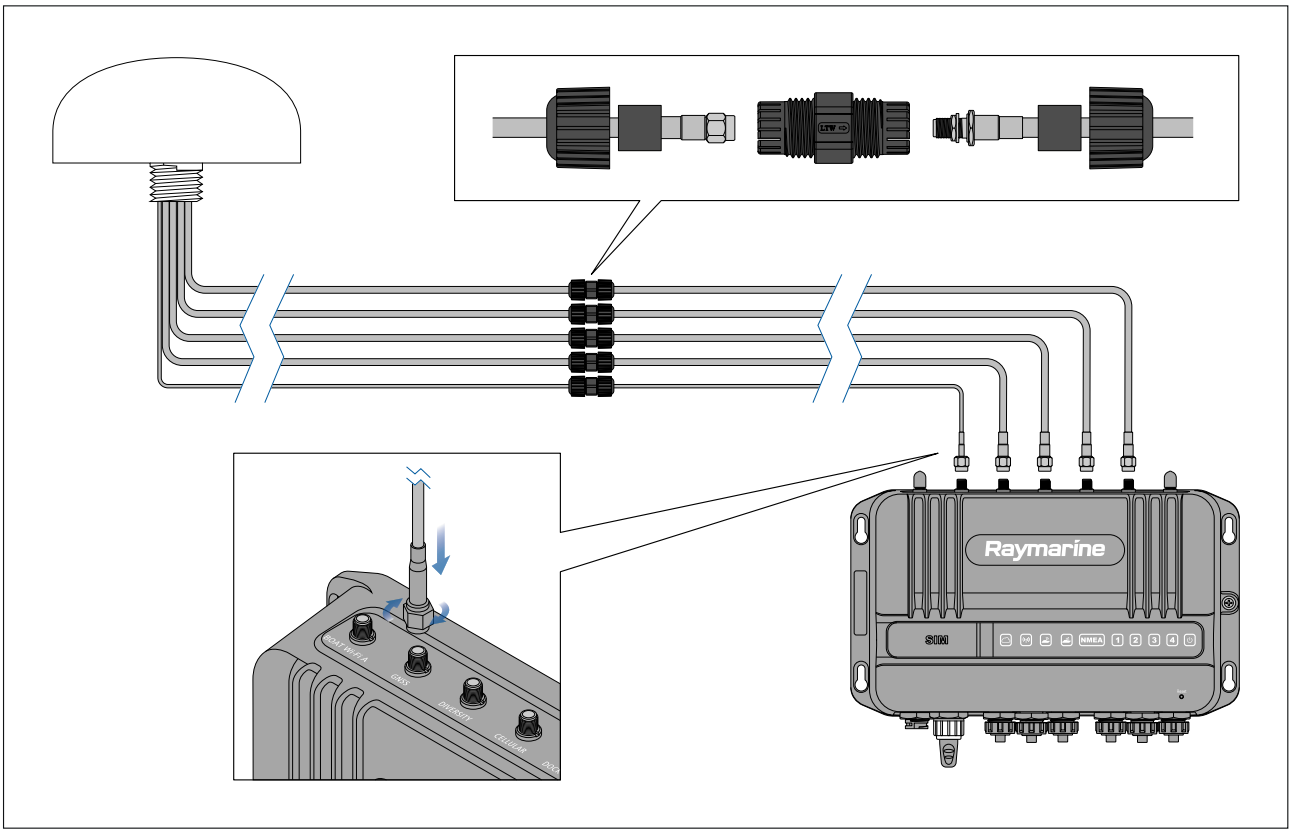


Connectors and cables are labelled appropriately. Connections are made by pushing the relevant cable connector over the relevant connector on the router and securing by turning the connector nut clockwise until tight.

The antenna's cable is 5 m (16.4 ft) in length. **This length can be extended if required using the optional 5 m (16.4 ft) extension cable (A80701), for a total cable length (including the antenna's supplied cable) of 10 m (32.8 ft).**

Antenna extension kit

The 5 m (16.4 ft) antenna cables on the supplied 5-in-1 antenna can be extended by 5 m (16.4 ft), using the antenna cable extension kit (A80701). Including the antenna extension cable kit, the total antenna cable length is 10 m 32.8 ft).



The extension kit consists of:

- 4 x extension cables for the **DOCK WLAN A**, **DOCK WLAN B**, **Cellular** and **Diversity** connections.
- 1 x extension cable for the **GNSS** (GPS) connection (the thinner cable).
- 5 x waterproof cable joiners.
- 2 x thicker sleeves for use with the waterproof cable joiner on the GNSS (GPS) cable.

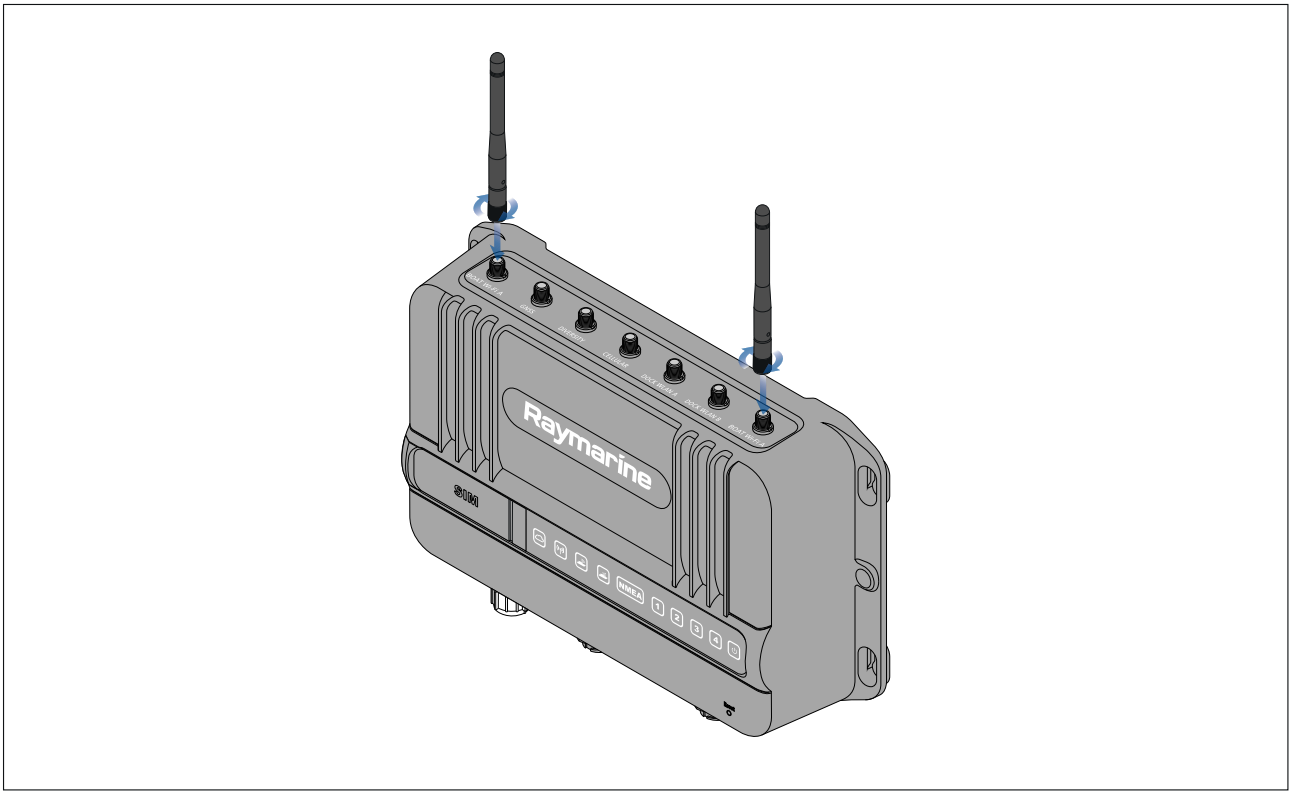
The supplied 5-in-1 antenna cable connectors are connected to the opposing connector on the relevant extension cable, the cable joiner is used over this connection to provide a watertight seal.

The opposite end of the extension cable is then connected to the relevant connection on the router.

Refer to the instruction sheet provided with the cable extension kit for details on how to assemble the waterproof cable joiners.

4.8 Boat Wi-Fi antenna connections

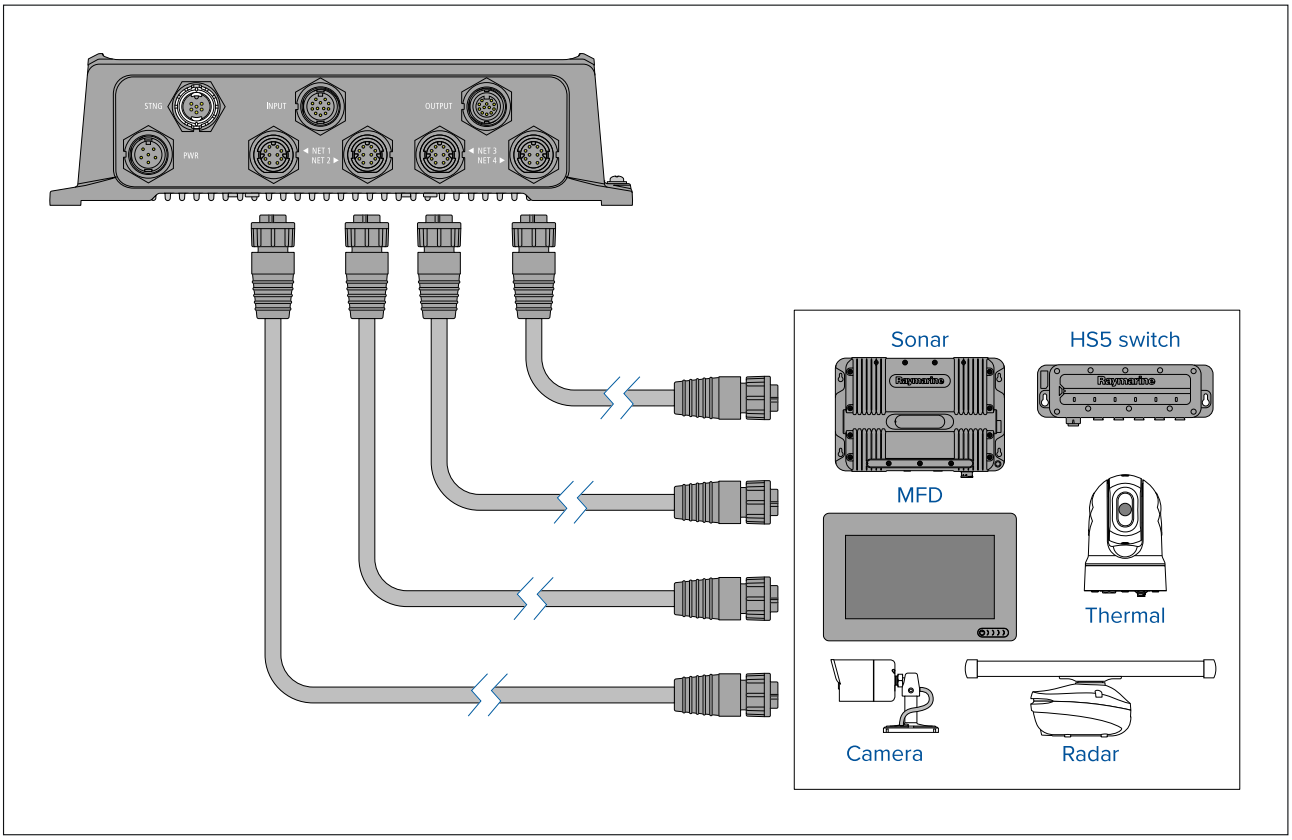
The supplied Wi-Fi antennas are connected to the **BOAT Wi-Fi** connections on the top of the YachtSense™ Link.



Connect the antennas by screwing them in clockwise until hand tight.

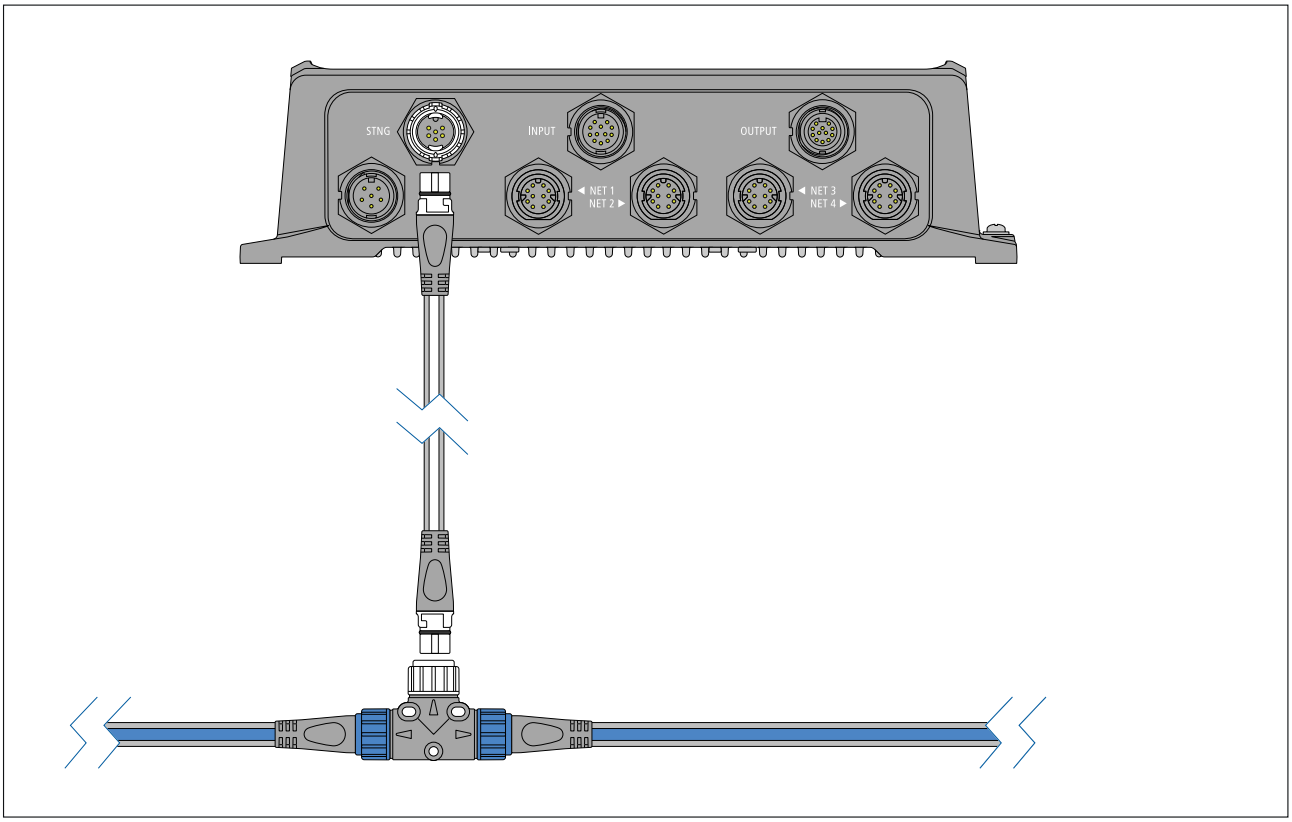
4.9 RayNet connections

Up to 4 RayNet devices can be connected to the YachtSense™ Link using the RayNet connections. RayNet networks can also be created or expanded by connecting the YachtSense™ Link to a network switch such as the HS5.



4.10 SeaTalkng connection

The router should be connected to SeaTalkng ® backbone using the supplied SeaTalkng ® spur cable. Connection to a SeaTalkng ® backbone enables compatible data to be received and transmitted by the router. The SeaTalkng ® connection also enables communications with Raymarine Axiom™ MFDs and Raymarine YachtSense™ Digital Control Systems.



Note:

The SeaTalkng ® backbone requires a dedicated 12 V dc power supply and is not supplied power from the router.

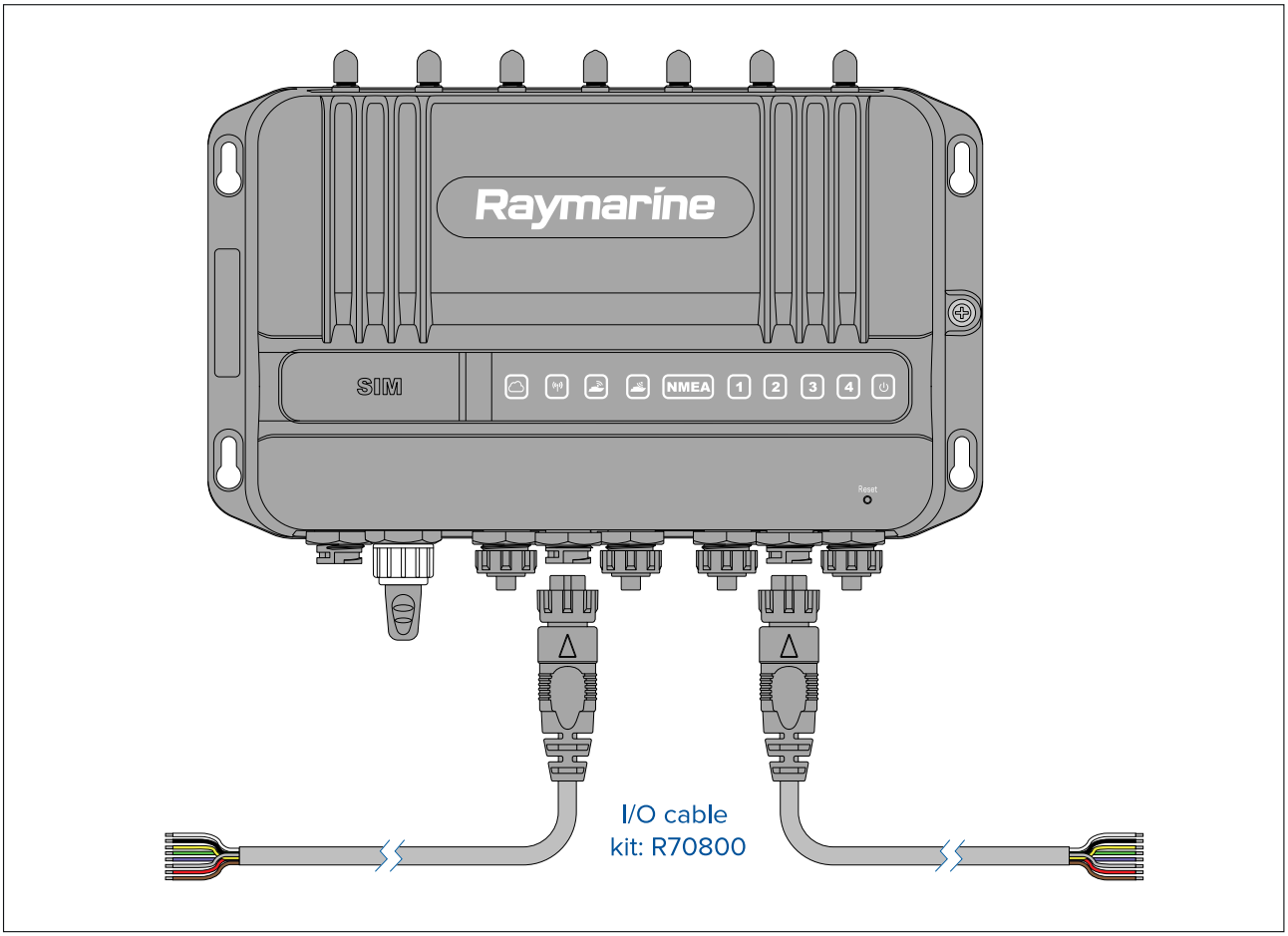
4.11 Input and output (I/O) connections

The router includes 4 digital input channels and 4 digital output channels. The supplied I/O cables (R70800) must be used to connect devices to the router's input and output connections.

Important:

- The negative power wire (0 V return) of the YachtSense™ Link's power cable must be connected to the same power supply negative as all connected input and output devices.
- Each load must have both positive and negative (supply and return) connections connected to the YachtSense Link I/O connections.

The digital inputs and outputs can be controlled from the YachtSense™ Link web interface.



Input cable signal wires

- White = Input 1 + (positive)
- Black = Input 1 - (negative)
- Yellow = Input 2 + (positive)
- Green = Input 2 - (negative)
- Purple = Input 3 + (positive)
- Gray = Input 3 - (negative)
- Red = Input 4 + (positive)
- Brown = Input 4 - (negative)

Output cable signal wires

- White = Output 1 Normally open terminal (N/O)
- Black = Output 1 Common terminal (COM)
- Yellow = Output 2 Normally open terminal (N/O)
- Green = Output 2 Common terminal (COM)
- Purple = Output 3 Normally open terminal (N/O)
- Gray = Output 3 Common terminal (COM)
- Red = Output 4 Normally open terminal (N/O)
- Brown = Output 4 Common terminal (COM)

Warning: Input and output channels

- The router's input and output channels enable creation of a simple digital monitoring / control system. As device connections are outside of Raymarine's control the company will not be held liable for damage or injury caused due to incorrect connections.
- Input and output device connections should only be carried out by a competent person familiar with vessel digital switching systems.
- The Router's output channels are rated at 200 mA and are only intended to be connected to devices via standard automotive relays.
- If in any doubt or for further advice please contact Raymarine Technical Support.

Input details

The input connection includes 4 configurable input channels.

The input channels can be configured as follows:

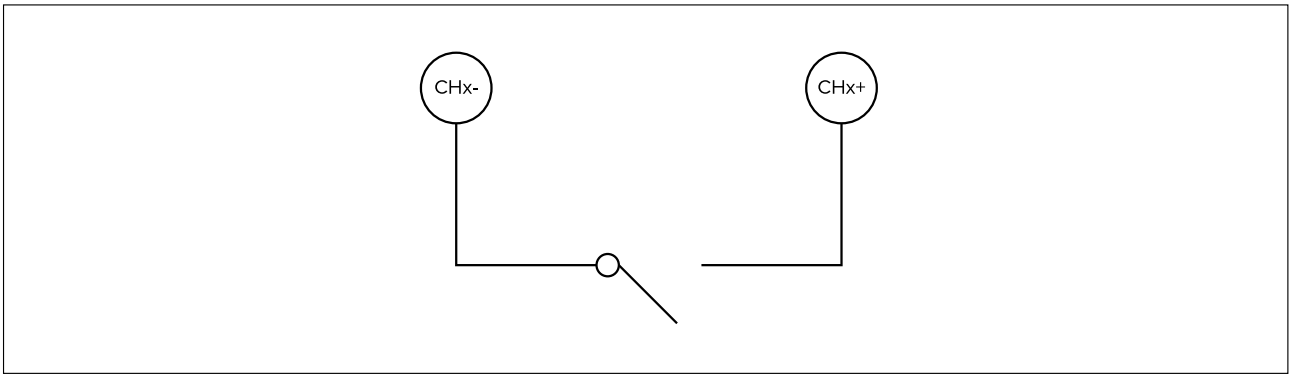
- Voltage measurement from 0 V dc to supply voltage.
- Connect switches between channel and minus or between channel and supply.
- Switches can close to negative or close to positive.
- A switch can be used to wake the router from low power mode. When power management options are configured accordingly. Refer to: **p.59 — Power management**

The input channels voltage characteristics are as follows:

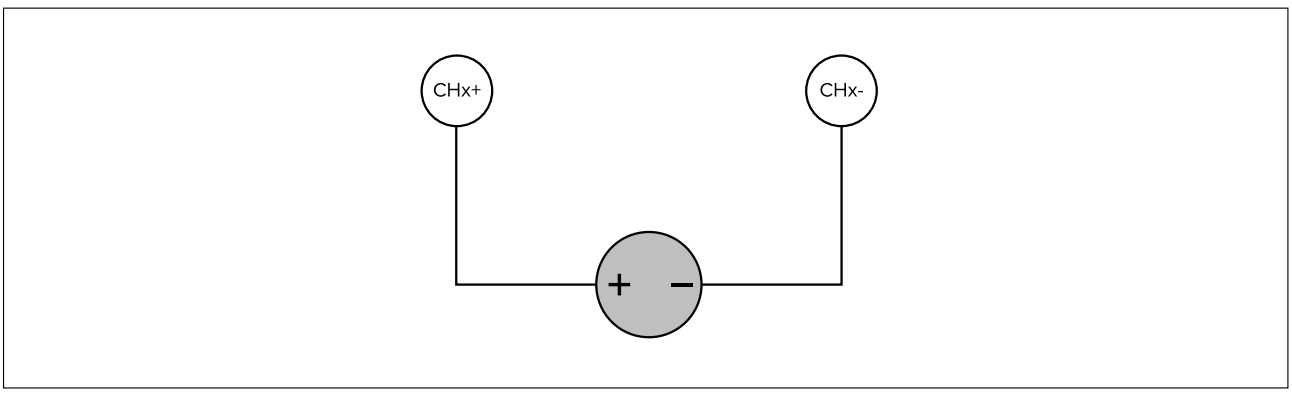
- Voltage protection up to 32 V dc (in case of inadvertent connections).
- Opto isolated when input driven from another device or supply,
- The input channel will automatically switch between low power (0 V dc to 8 V dc) and High power (8 V dc to supply voltage. The two thresholds are for the application of hysteresis.

Example connections

Example — Switch (Digital input)



Example — Voltage monitor (Digital input)



Output details

The output connection includes 4 configurable output channels. Output channels are intended to be connected to devices via an automotive relay. It is not intended that devices are connected directly to the output channels.

The router's output channels do NOT supply voltage to devices. The output channel's terminals (N/O and COM) are shorted together using internal relays within the router to complete a circuit.

The output channels can be configured as follows:

- Simple On/Off output switch.
- Pull-up to supply.
- Pull-down to 0 V.

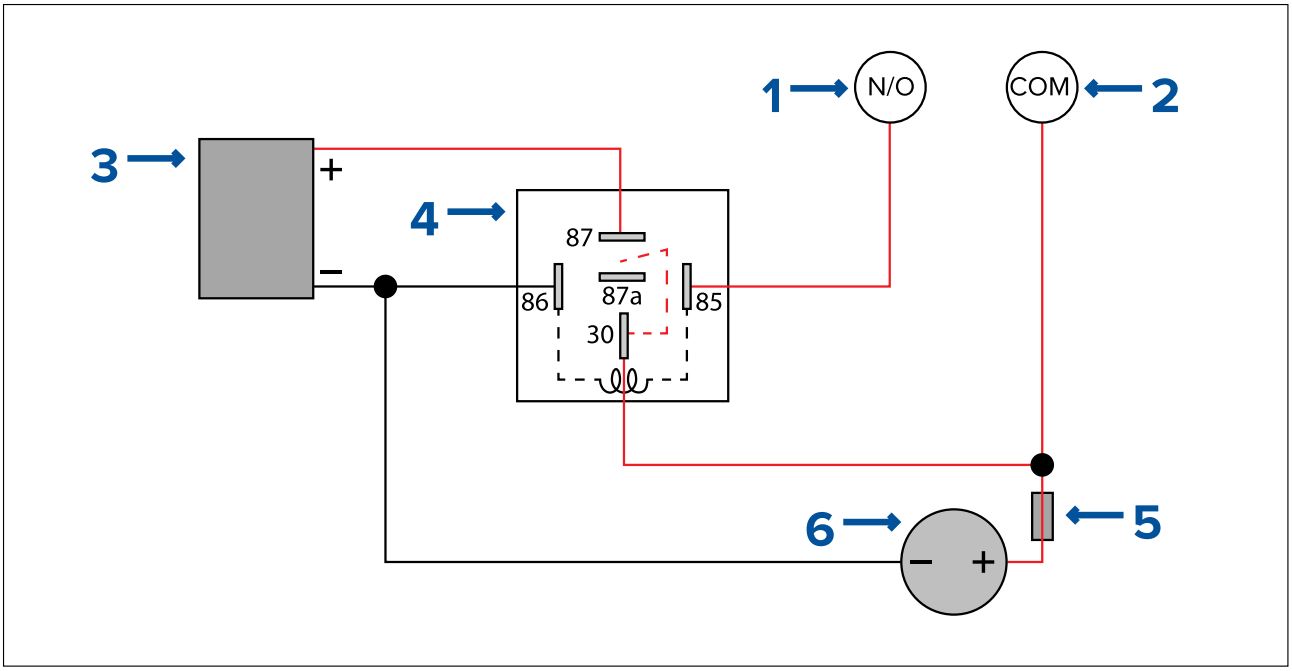
The output channels voltage characteristics are as follows:

- Maximum throughput per channel is 200 mA.
- Voltage protection up to 32 V dc (in case of inadvertent connections).
- Each output channel has a 200 mA internal thermal fuse.

The router's output channels (Channels 5 to 8) can be used to wake connected devices or systems that have a wake-on-power input feature. When the router is woken from low power mode the connected device will also be woken.

Refer to the Power management details: **p.59 — Power management**

Example automotive relay connection diagram



1. Router output channel Normally Open terminal (e.g.: Output 1 White wire)
2. Router output channel Common terminal (e.g.: Output 1 Black wire)
3. Device (e.g.: lighting)
4. Automotive 5 pin relay
   - **30** — High power feed
   - **85** — Relay coil feed (Trigger wire)
   - **86** — Relay coil ground
   - **87** — High power output (normally open contact)
   - **87a** — High power output (normally closed contact)
5. Fuse
6. Power supply

Chapter 5: Operations

Chapter contents

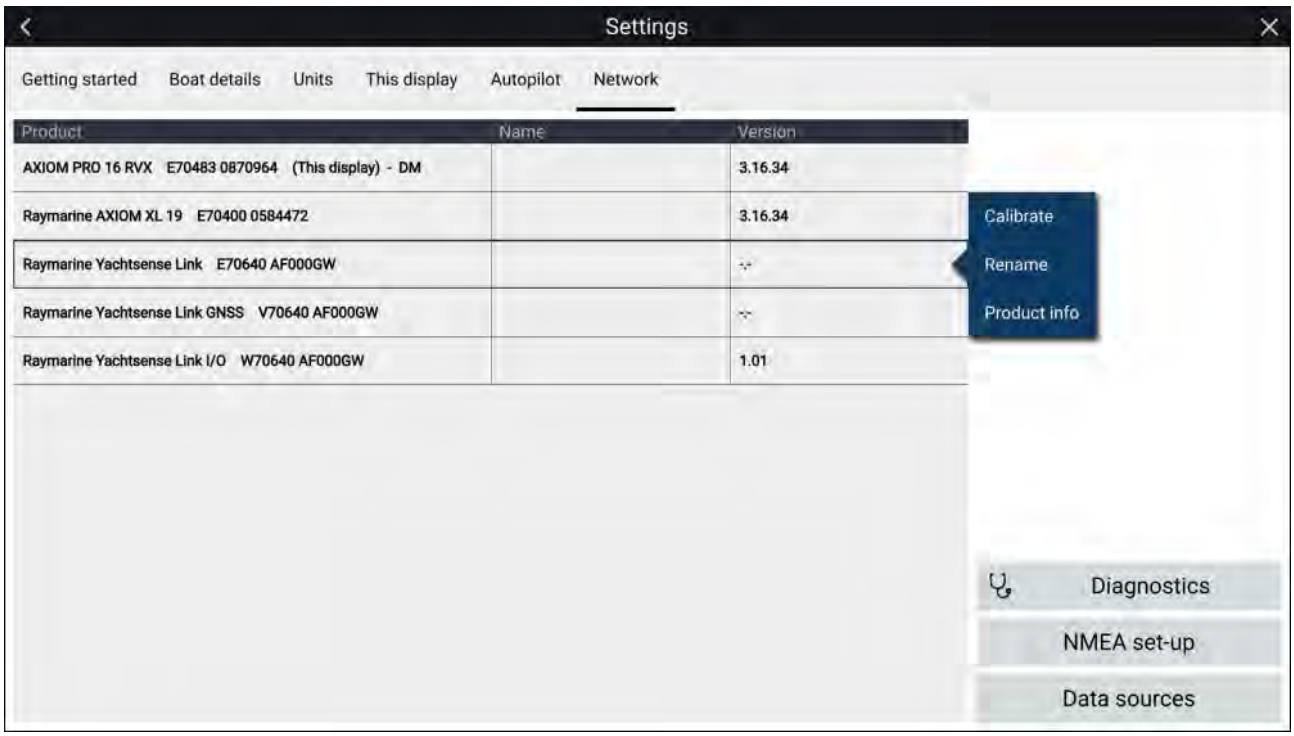
5.1 Getting started

Accessing the web interface from a Raymarine MFD

The router's settings are accessed using the built-in web interface. The web interface can be accessed using a wired connection to a Raymarine Axiom™ MFD.

Important:

Ensure that the MFD and router are connected over RayNet ethernet (SeaTalkhs ®), and that they are both connected to the same NMEA 2000 (SeaTalkng ® backbone).



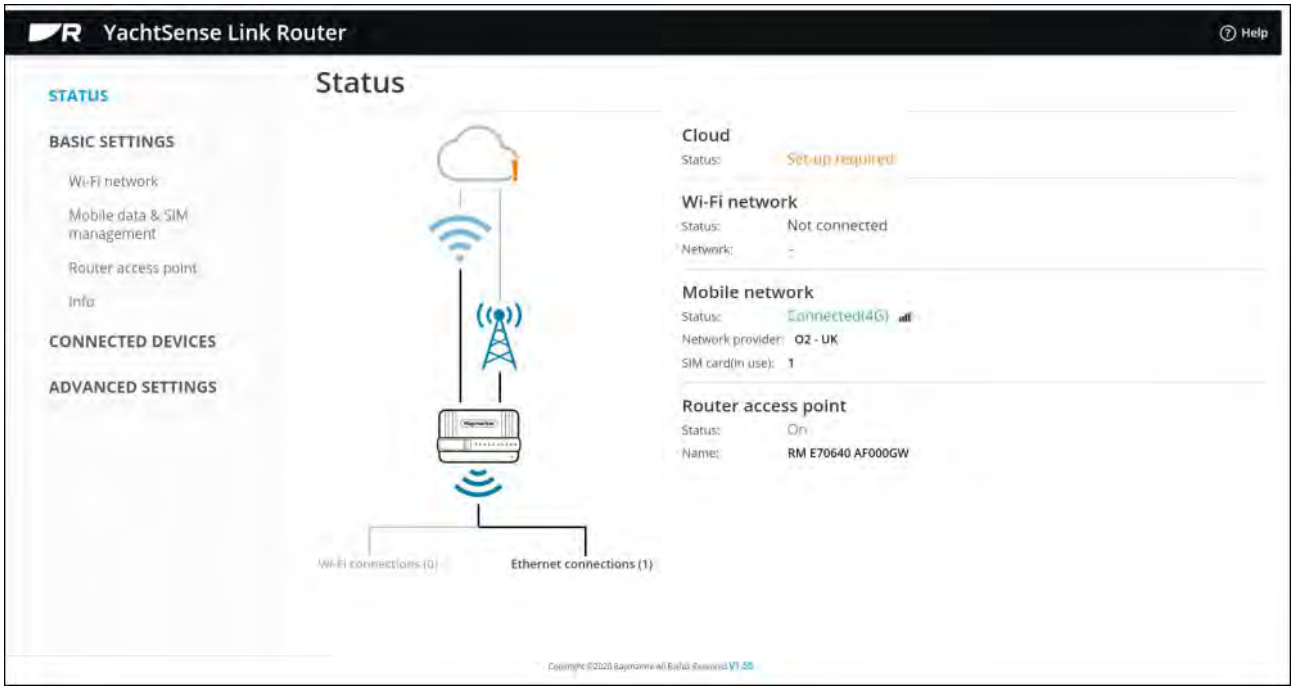
1. Ensure that the router and MFD are both powered on.
2. Open the MFD's **Network** settings tab: **Homescreen > Settings > Network**.
3. Select **Raymarine Yachtsense Link** from the list of network devices.

   The router will have 3 entries in the network devices list:

   - ***Raymarine Yachtsense Link*** *(Select this device)*
   - ***Raymarine Yachtsense Link GNSS***
   - ***Raymarine Yachtsense Link I/O***

4. Select **Calibrate**.

The status page is displayed:



Accessing the web interface using a wired connection

The router's settings are accessed using the built in web interface. The web interface can be accessed using a wired connection to a personal computer.

Important:

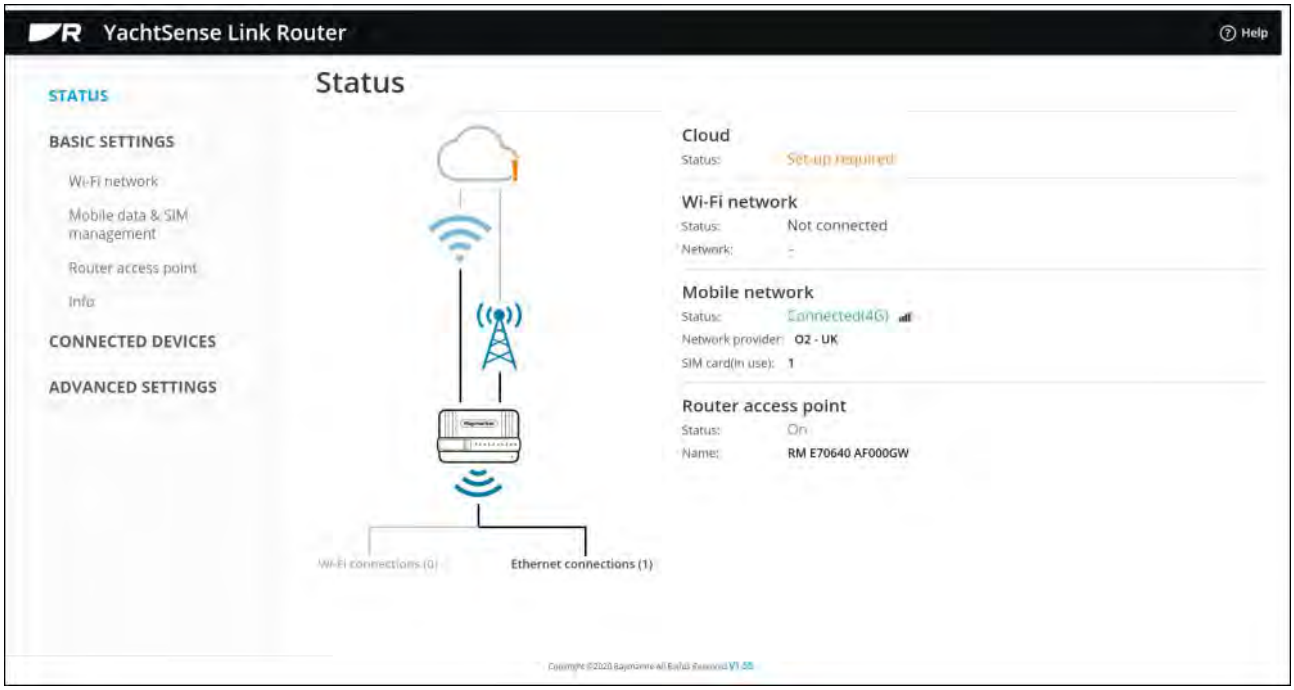
Ensure that your personal computer is configured to be assigned an IP address automatically.

1. Ensure the router has been supplied power following the power connection details. **p.33 — Power connection**
2. Connect the supplied RayNet to RJ45 cable to one of the router's network ports.
3. Connect the other end of the RayNet to RJ45 cable to a personal computer.
4. Turn on the router's power supply.
5. Wait for the router to boot up and for your personal computer's network connection to be established.
6. Enter '**http://yachtsense.raymarine.com**' into your web browser's address bar and press **Enter**/**Return**.

Important:

Supported browsers — The web interface can be accessed using the following supported browsers: Chrome, Firefox, Edge and Safari. Internet explorer (IE) is NOT supported.

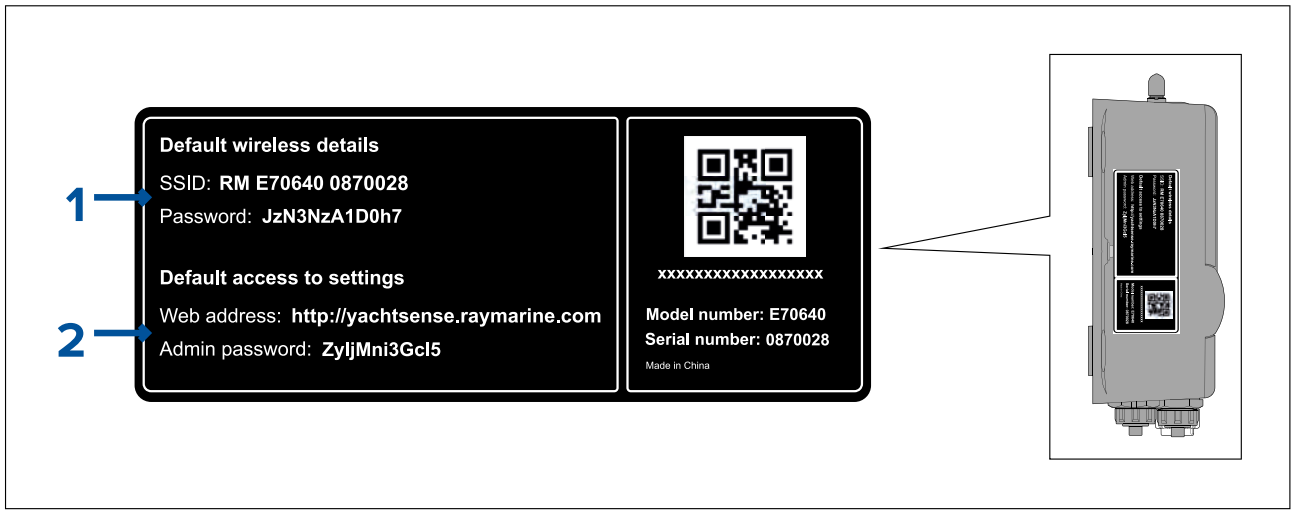
The status page will be displayed



Accessing the web interface using a Wi-Fi connection

The router's settings are accessed using the built in web interface. The web interface can be accessed using a wireless connection to a mobile device or personal computer.

Example credentials label



Note:

The details in the illustration above are an example only and do not reflect the actual credentials for your router.

1. **Default wireless details** — Wi-Fi credentials used for connecting mobile devices to the router's Wi-Fi network.
2. **Default access to settings** — Log in details for the router's settings web interface.

To access the web interface using a Wi-Fi connection follow the steps below:

1. Ensure the router has been supplied power following the power connection details. **p.33 — Power connection**
2. Turn on the router's power supply.
3. Wait for the router to complete its boot up sequence.
4. Connect your mobile device to the router's Wi-Fi network using the SSID and password located on the Credentials label on the side of the router (See item 1 in the above illustration).
5. Open a web browser on your connected mobile device.

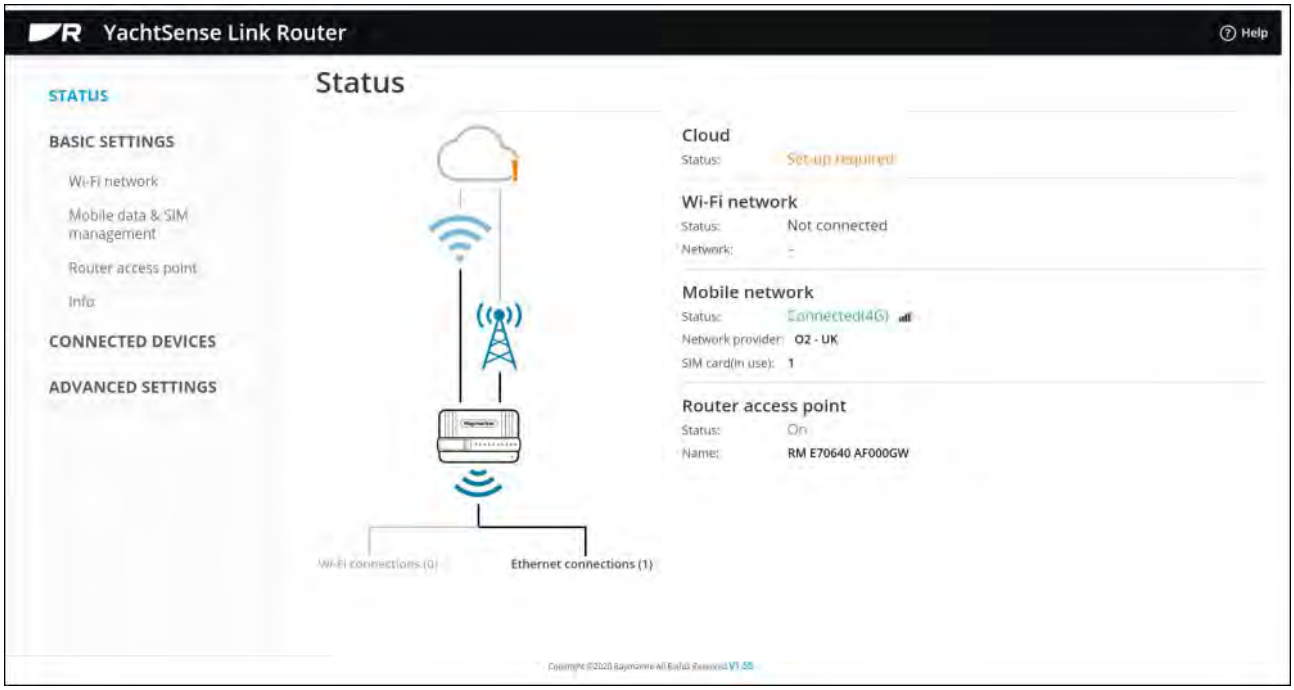
6. (1)Enter '**http://yachtsense.raymarine.com**' into your web browser's address bar and press **Enter**/**Return**.

Important:

Supported browsers — The web interface can be accessed using the following supported browsers: Chrome, Firefox, Edge and Safari. Internet explorer (IE) is NOT supported.

If problems are encountered using generic browsers on mobile devices try using one of the listed supported browsers instead.

The status page is displayed.



Note:

(1) By default mobile devices are configured to obtain an IP address automatically when they connect to a network. If your mobile device has been configured to use a static IP address then to access the router's web interface you will need to enter the Router's IP address into the browser's address bar instead.

Your mobile device's IP address must be in the same range as the router's IP address.

Your router's IP address can be found on an MFD's **Network** settings tab: **Homescreen** > **Settings** > **Network**. Then select **Raymarine Yachtsense Link** from the list of network devices, and select the Product Info option.

Accessing settings pages

From the router's status page you can access all of the routers settings. The first time you click a link you will be requested to log in to the router.

1. Click a link on the left hand side of the Status page.

   You can also select the Wi-Fi network, Mobile network and Router access point headings or icons to access the relevant settings page.

2. Enter the admin password (default password can be found on the credentials label located on the left side of the router).
3. Select **OK**.

The selected page will open.

Configuring mobile data

Follow the steps below to enable the router to use your SIM card(s) mobile data plan. If 2 SIM cards are installed, the steps below should be carried out for both SIMs.

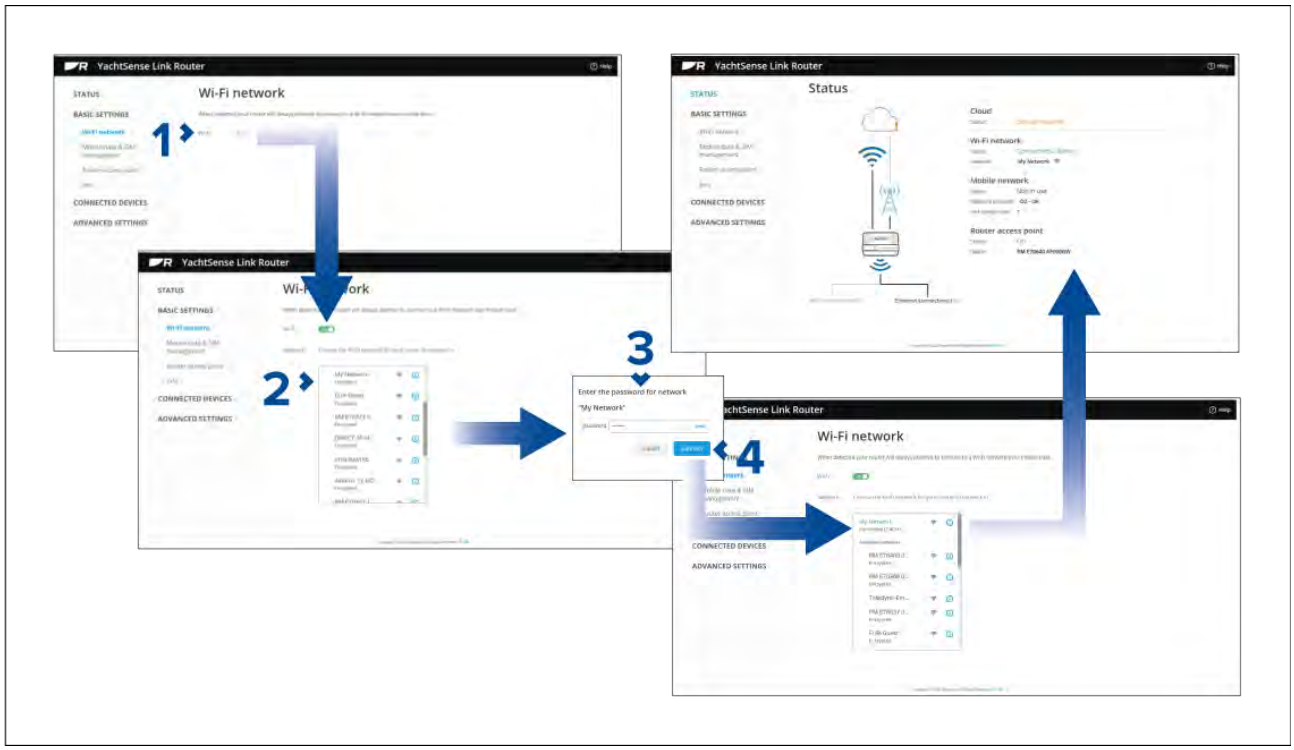
From the **Mobile data and SIM management** page: **Basic settings** > **Mobile data and SIM management** .

1. Select **SIM1** or **SIM2**.
2. To allow automatic switching between SIM card when there is no network coverage or when your data limit on one SIM card has been reached, tick the relevant tick box at the top of the page.
3. To allow mobile data to be used, tick the **Mobile data** tick box.
4. Select the date (day of the month) that your data allowance renews, using the **Router data usage cycle** drop down list.
5. To set up a notification when your SIM card gets close to its data limit, tick the **Set data warning** tick box and then enter a value in the **Data warning** field.
6. To set up a notification when your SIM card reaches its data limit, tick the **Set data limit** tick box and then enter a value in the **Data limit** field.
7. If the APN (Access Point Name) for your provider is not listed you will need to find out what the settings are from your network provider and modify an existing entry with the details.
8. To save all changes, select the **Save** button located at the top of the page.

Connecting to an available Wi-Fi network

Follow the steps below to connect to a Wi-Fi network.

From the **Wi-Fi network** page: **Basic settings** > **Wi-Fi network**.



1. Enable the **Wi-Fi** network using the toggle switch.
2. Select the Wi-Fi network you want to connect to from the list.

   *You can select the **Info** icon next to the Wi-Fi network to view information about the network.*

3. Enter the password for the network in the password field.
4. Select **Connect**.

Connecting to a Wi-Fi network manually

You can connect to a network that is not in the list but is in range, i.e.: a Wi-Fi network that is not broadcasting its SSID.

1. Select **Add network**.
2. Enter the Wi-Fi network name (SSID) in the **Network name** field.
3. Select the Security type from the **Security** drop down box.

4. Enter the networks password in the **Password** field.
5. Select **Connect**.

Forgetting a saved Wi-Fi network

When the router connects to a Wi-Fi network the details will automatically be saved so that the router can connect to it automatically when it is in range. If you do not wish to connect to this Wi-Fi network in future follow the steps below to 'forget' the network.

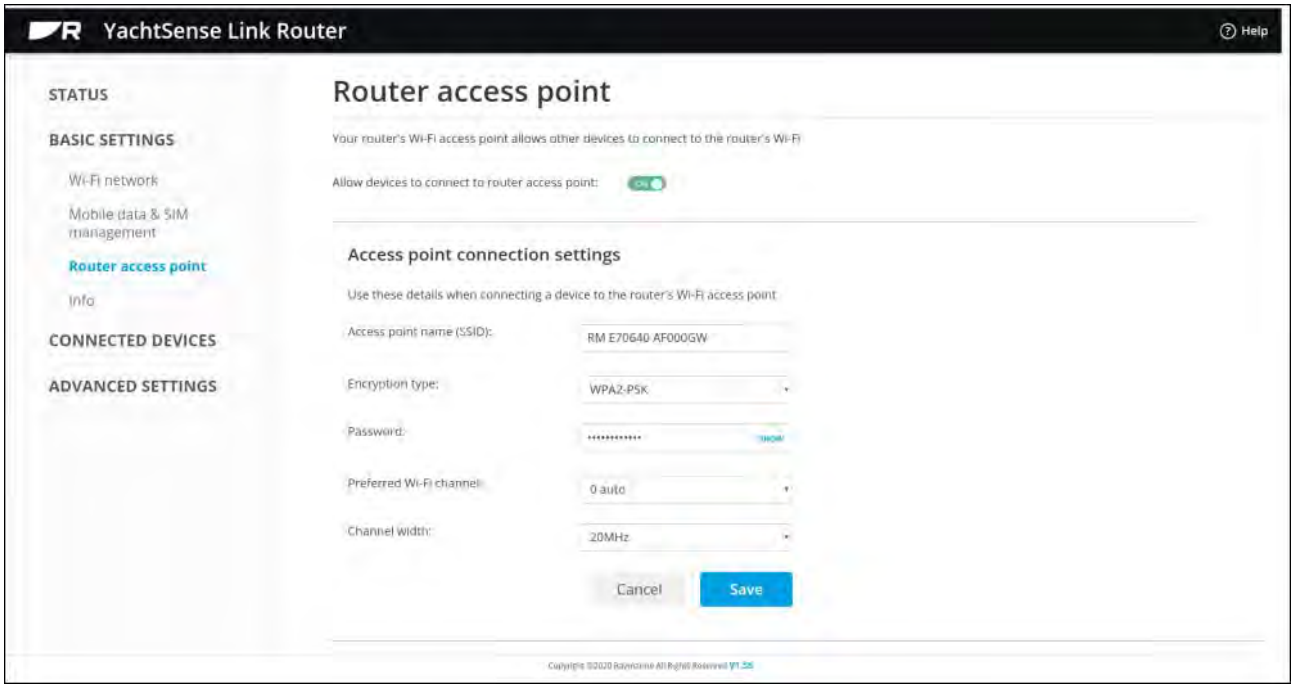
1. Select the **Info** icon next to the saved Wi-Fi network to display the network information.
2. Select **Forget network**.

Alternatively you can also turn off automatic network connection by disabling **Connect automatically** from the Info dialog.

Setting up the router's access point

Follow the steps below to set up the router's access point.

From the **Router access point** page: **Basic settings** > **Router access point**.



1. Enable the router's access point.
2. If required, change the router's default access point connection settings.

Important:

- The **Preferred Wi-Fi channel** and **Channel width** settings do not need to be changed unless you experience interference due to Wi-Fi congestion.
- Changing the **Encryption type** to **No encryption** is not recommended as anyone within range will be able to connect to the router.

3. Click **Save**.

Network security

Your network is only as secure as its most vulnerable component. Security vulnerabilities risk allowing unintentional access to your network and its connected wireless and wired devices.

To ensure that your network is secure, as a minimum you should:

- Regularly check for security updates for all your wireless and wired networked devices.
- For applicable devices, ensure you use a reputable antivirus program with the latest virus definitions.
- Always use the strongest encryption type for your router's access point settings.
- Use a strong router access point password (i.e. a longer password such as a memorable phrase).
- Change your password periodically.

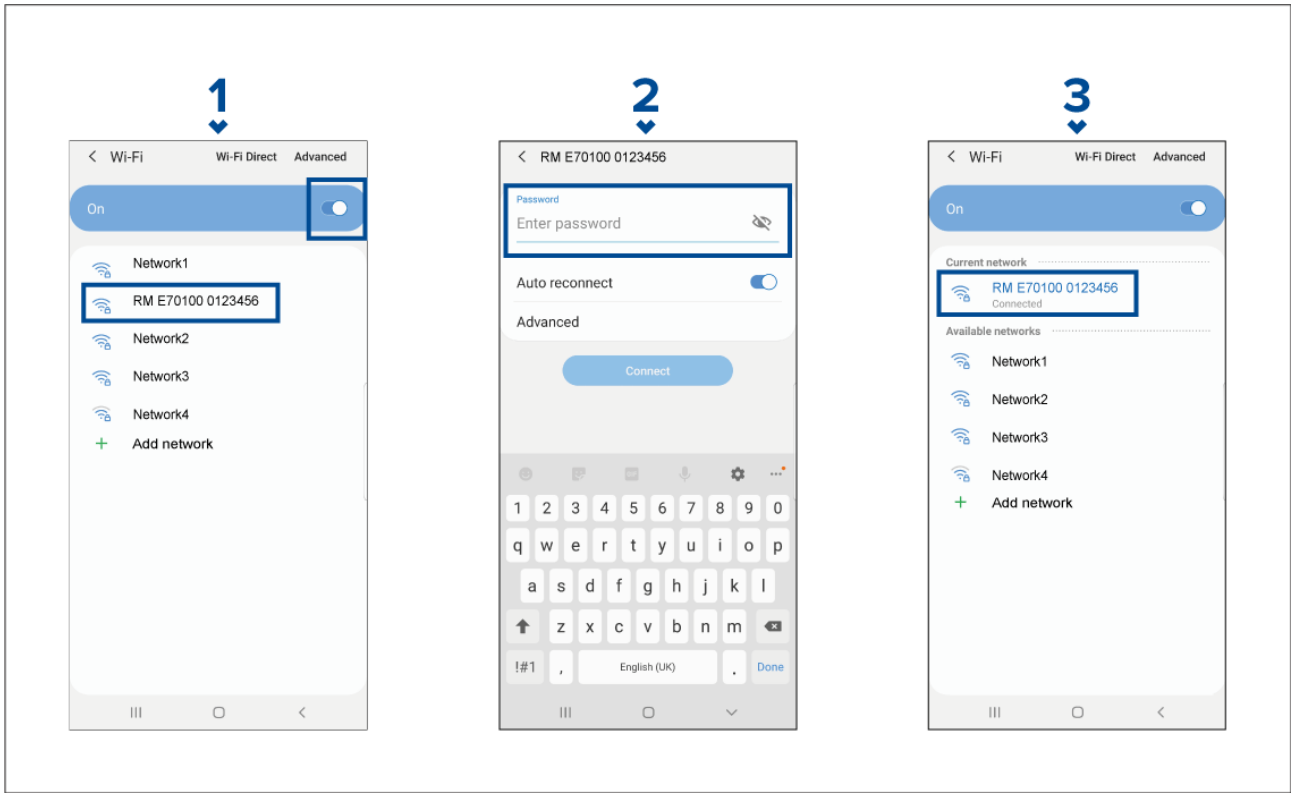
- Be cautious who you share your password with.
- If you need to write down your password, ensure it is kept in a secure place where it is not easily viewable.

Connecting an Android device to the router's access point

Android devices can be connected to the router's Wi-Fi access point.

Open your Android device's Wi-Fi settings from the top drop down menu or via the **Settings** icon.

Example Android Wi-Fi connection



Note:

Depending on device type, manufacturer and version of the Android operating system in use, screens and options may be different than in the example above.

1. Enable Wi-Fi by setting the toggle to on (blue) and select your router's SSID from the list of available networks.
2. Enter your router's Wi-Fi password and select **Connect**.

   The password is case sensitive.

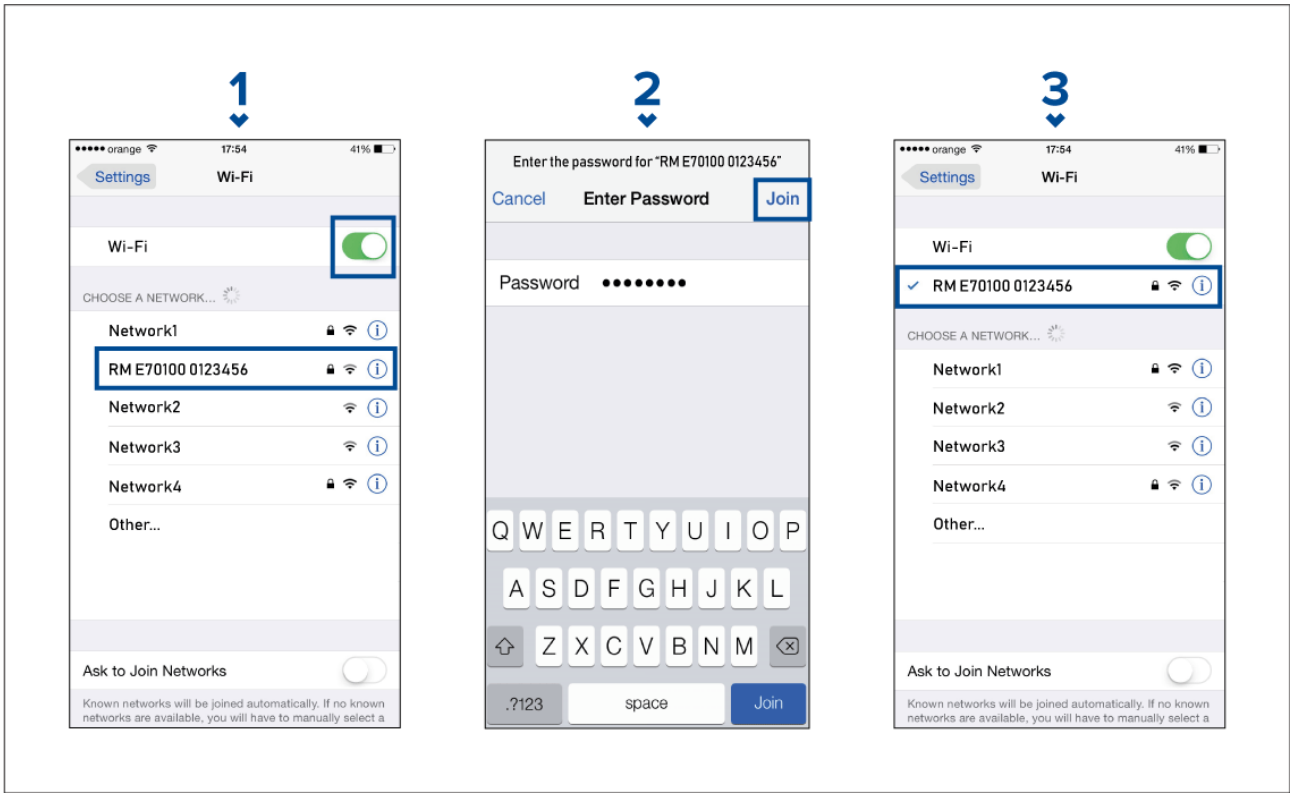
3. When your Android device is connected to your router's Wi-Fi it access point it will display connected under the router's SSID.

For troubleshooting advice refer to the Wi-Fi troubleshooting information on the Troubleshooting chapter **p.63 — Troubleshooting**

Connecting an iOS device to the router's Wi-Fi access point

iOS devices can be connected to the router's Wi-Fi access point.

Open your iOS device's Wi-Fi settings from the top drop down menu or via **Settings**.



Note:

Depending on device type, and iOS version in use, screens and options may be different than in the example above.

1. Enable Wi-Fi by setting the toggle to on (green) and select your router from the available networks.
2. Enter your router's Wi-Fi password and select **Join**.

   The password is case sensitive.

3. When your iOS device is connected to your router's Wi-Fi it access point it will display connected under the router's SSID.

For troubleshooting advice refer to the Wi-Fi troubleshooting information on the Troubleshooting chapter **p.63 — Troubleshooting**

5.2 Status page

Once you have logged in to the router's web interface the Status page is displayed.

The Status page provides information on the status the following router network connections:

- The **Cloud** section identifies the status of the router's connection to the Raymarine cloud service.
- The **Wi-Fi network** section shows the status of the DOCK WLAN connection (e.g.: connection to marina Wi-Fi), the name of the connected network and the signal strength.
- The **Mobile network** section shows the status of the Mobile network connection, your network provider and which SIM card in use.
- The **Router access point** section shows the connection status of the BOAT Wi-Fi connection and the access point's name (SSID).

The Status page also identifies the number of devices connected to the router's access point (BOAT Wi-Fi) and the wired network (devices connected to the router's 4 x RayNet ports).

Links are provided on the left side of the page to all the router's configuration / settings pages.

5.3 Basic settings

Wi-Fi network

The router can connect to available Wi-Fi access points to provide internet access to the router and its connected devices. The Wi-Fi network page allows you to connect to a Wi-Fi access point such as the Wi-Fi provided by your marina. When connected to a Wi-Fi connection that has an internet connection The router will provide internet access to Wi-Fi and RayNet connected devices.

Note:

The router will connect automatically to saved Wi-Fi networks when they are in range. When available the Wi-Fi network connection will be used instead of the cellular connection.

From the Wi-Fi page you can:

- Use the toggle switch to enable and disable the Wi-Fi network.
- Select the info icon next to available Wi-Fi networks to view network details.
- Connect to an available Wi-Fi network.
- Connect to a Wi-Fi network that is in range but not listed (i.e.: hidden).
- Forget a saved Wi-Fi network.

Mobile data & SIM management

The router can use cellular networks to provide internet access to the router and its connected devices. The Mobile data page provides access to settings related to the router's cellular connection, dual SIM management options and mobile data usage statistics. When the cellular connection is active and data is available the router will provide internet access to Wi-Fi and RayNet connected devices.

When using dual SIM cards, you can enable automatic switching between SIMs when there is no network coverage or when data limit has been reached. Use the Tick box at the top of the page to enable ISM switching.

Primary SIM: — when using dual SIM cards, the Primary SIM option determines which SIM card the router will try to use first when powered up.

Note:

The primary SIM will only be used if:

- Mobile data is enabled
- The SIM has network coverage
- The SIM has remaining data for the current period.

If the conditions above are not met then the second SIM card will be used.

From the Mobile data & SIM management page you can select **SIM1** or **SIM2** to view details and settings for each SIM card.

The following details and settings are available:

- **Mobile data:** — switches mobile data on and off, when switched on the router can access the internet using your SIM card's data allowance.
- **Data roaming:** — switches data roaming on and off. Data roaming allows you to use your data allowance when outside of your home country. Using data roaming may incur additional fees from your network provider.
- **Data usage graph**— view data usage statistics.
- **Router data usage cycle** — set the date at which your data allowance renews each month.
- **Data warning and limit** — set data warning and limit so that you do not exceed your data allowance. You will be notified by the Raymarine app when the specified data warning and data limit for the month has been reached.
  - **Set data warning** — Enables and disables the data warning notification.

  - **Data warning** — Specifies the data warning notification value. The data warning should be set to a value under your data limit so that you receive a warning notification when you are running out of mobile data for the month (data usage cycle).
  - **Set data limit** — Enables and disables the data limit notification.
  - **Data limit** — Specifies the data limit notification value. The data limit should be set close to your monthly allowance so that you are notified when to stop using mobile data allowance for the selected SIM card.

Note: There may be differences between how the router and your network provider measure usage and so it is recommended that data limit is set lower than your actual data limit.

- **Mobile network** — The mobile network section provides details and settings for your SIM card network provider's Access Point Name (APN). The APN settings are used to connect to your network provider and the internet.
  - **Network provider** — The name of your SIM card / network provider is displayed.
  - **SIM IMSI** — Your SIM card unique International Mobile Subscriber Identity number is displayed.
  - **Preferred network mode** — If required you can change your preferred network, the available options are: **3G/4G/Auto**, **4G only** or **3G only**.
  - **Access Point Name** — A list of Access Point Names (APNs) applicable to your SIM provider will be displayed.

Note: If the APN you require is not listed you can modify an existing APN by selecting the edit icon on the right.

  - **Reset APN settings** — Reverts the APN settings to default values.
- **SIM info** — View SIM card details.
- **Lock SIM** — Lock the SIM card or change the pin for the SIM card.

Router access point

Wi-Fi enabled devices can connect to the router's access point and connect to the internet using the router's Wi-Fi network connection and / or cellular network connections. The router access point page provides access to the router's access point settings.

The router's access point can be enabled and disabled using the toggle switch at the top of the page.

When enabled the following router access point settings can be configured:

- **Access point name (SSID)** — This is the name of the network that you should connect your mobile devices to.
- **Password** — This is the password that needs to be entered when connecting your mobile device(s).
- **Preferred Wi-Fi channel** — Allows you to select your preferred Wi—Fi channel. Interference can occur in areas were many Wi—Fi networks are using the same channel, moving to a less used channel should eliminate this interference.
- **Channel width** — Allows you to switch between single channel (20 MHz) 144 Mb and Dual channel (40 MHz) 300 Mb channel width. Dual channel provides faster speed, however in areas where there is wireless channel congestion a single channel may reduce interference.
- **Encryption type** — Allows selection of the type of encryption used, WPA2–PSA is the default and recommended encryption type.

Note: Changing the **Encryption type** to **No encryption** is not recommended as anyone within range will be able to connect to the router.

If you change any of the default settings then select **Save** at the top of the page to save the changes.

Info

The following technical information about your router can be found on the Info page:

- Model name
- Model number
- Serial number

- IMEI
- Voltage
- Current draw
- Temperature
- Operating hours
- Ethernet MAC addresses
- Wi-Fi MAC addresses
- Software version
  - Application version
  - Platform version
  - Product bundle version

The **Mobile network** section provides details and signal strength, power, and quality indicators for the mobile network currently in use.

A QR code is available at the bottom of the Info page that can be used for onboarding to the Raymarine cloud service.

For troubleshooting purposes you can also save any crash logs by selecting **Save crash logs**.

5.4 Connected devices page

The connected devices page ;provides a list of all devices connected to the router using ethernet or wireless connections.

The details include:

- Device name
- MAC address
- IP address
- Connection type

5.5 Advanced settings

Ethernet configuration

The ethernet configuration page provides advanced settings for the RayNet (SeaTalkhs ®) wired network.

Important:

IP configuration is for advanced users and should not be changed, unless for a specific reason. Disabling automatic configuration will affect compatibility with Raymarine MFDs.

The **Configure IP** options are:

- Automatically (DHCP on) — This is the recommended setting which allows IP addresses to be automatically assigned to connected devices by the router using IP addresses within the range specified in the DHCP server.
- Manually (DHCP on) — This setting allows you to manually configure the router's LAN IP address, subnet mask and default gateway and allows connecting devices to be automatically assigned an IP address within the range you specify in the DHCP server.
- Manually (DHCP off) — This settings allows you to manually configure the router's LAN IP Address, subnet mask and default gateway but does not assign IP addresses to connected devices.

Note: With DHCP switched off each device will have to be manually assigned an IP address in the same range as your router's IP address.

Wi-Fi configuration

The Wi-Fi configuration page provides advanced settings for the router's Wi-Fi access point.

The router's Wi-Fi IP address, subnet mask and default gateway can be configured and the IP address range used for the Wi-Fi DHCP server can be set.

GNSS

The GNSS page provides settings and information for the router's internal GNSS receiver.

The following settings and information is available:

- **GNSS fix status** — provides position fix status.
- **Internal GNSS** — enables and disables the internal GNSS receiver.
- **Restart GNSS** — reboots the internal GNSS receiver.
- **GNSS Constellations** — enables use of a second GNSS constellation. Either GLONASS (Russian), Galileo (European) or Beidou (Chinese) GNSS can be used in addition to the GPS (US) constellation)
- **Differential positioning** — enables use of differential positioning satellites which enhances your position fix.
- **Differential positioning systems** — Allows selection of specific localized Satellite Based Augmentation Systems (SBAS).
- Satellites in use — Provides details of the positioning satellites currently being tracked.

Inputs and outputs

Settings and status pages are available for the management of devices connected to the router's inputs & outputs connections.

The following pages are available

- **Channel monitoring and control** — view channel input and output details:
  - For input channels (channels 1 to 4) the channel number, name and voltage is displayed.
  - For output channels (channels 5 to 8) the channel number, name is displayed and a toggle switch to turn the channel on and off is available.
- **Channels configuration**— configure input and output channel:
  - For input channels (channels 1 to 4) the channel name and input type can be configured. The input type can be configured as either: Analog, Digital positive or Digital negative.
  - For output channels (channels 5 to 8) the channel name can be configured.
- **Alert notifications** — this page allows configuration of low voltage alert notifications. A product low voltage warning can be set which triggers when the voltage available to the router drops below a specified value. Low voltage warnings can also be configured for each input channel (Channels 1 to 4).

Note: Each input channel warning must be configured with a unique Alert ID with a value between 1,000 and 65,000.

Power management

The router includes power management options to help reduce power consumption whilst maintaining the ability to connect to the router remotely.

With **Always on** selected the router is fully powered.

With **Low power mode** selected the router is placed into a low power state. In Low power mode, Wi-Fi connections are disabled.

In low power mode the router can be woken by:

- a remote device connected to the Raymarine cloud service, via the Raymarine app.
- an alert notification, configured in the **Alert notifications** page.
- a Wake on LAN (WOL) signal from a device connected to the router's RayNet (SeaTalkhs ®) network ports when **LAN signal** is selected under **Also wake on**.
- a device such as a switch, connected to one of the router's input channels, when the relevant input channel is selected under **Also wake on**.

Note:

When power cycled, the router will also revert to **Always on** mode.

The input channels (Channels 1 to 4) can also be used to place the router into low power mode.

The router's output channels (Channels 5 to 8) can be used to wake connected devices or systems that have a wake-on-power input feature. Place a tick in the relevant output channel to wake the connected device when the router is woken from lower power mode.

Important:

To keep changes made to the Power management options, click **Save**.

Performing a router software upgrade

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

Note:

The upgrade should be performed from a wired network device such as a personal computer or Raymarine MFD. It is not recommended to perform the upgrade process from a device connected using Wi-Fi.

To upgrade the software on your router follow the steps below:

1. Check your router's current software version (You can check what software version your router has be checking the Info page located under Basic settings of the router's web interface).
2. If available, Download updated software from the Raymarine website: www.raymarine.com/software.
3. Access the router's web interface:
   - From a Raymarine MFD refer to: **p.48 — Accessing the web interface from a Raymarine MFD**
   - From a personal computer refer to: **p.49 — Accessing the web interface using a wired connection**
4. Open the router's **Software upgrade** page located under **Advanced settings**.
5. If requested enter the router's admin password. and select **–––OK**.
6. Click **Browse file to upload**.
7. Locate and select the downloaded file.

   The file will upload to the router.

8. Click **Upgrade**.

   The router will now be upgraded. The upgrade process can take some time, do NOT disconnect the device you are upgrading from until the process is complete.

Once the process is complete the router will reboot.

Restart & factory reset

If you encounter problems with your router it can be restarted or reset to its factory default settings from the Restart & factory reset page.

- **Restart router** — reboots the router.
- **Reset to factory defaults** — removes all changes made to the routers settings and resets it to the factory default settings.

Note: The router can also be reset to factory default settings using the reset button located on the front of the router. Refer to: **p.69 — Performing a hard reset**

Performing a factory reset to restore default settings

This function is useful if you need to reset the router to its factory default settings, but also want to re-connect it to the same Raymarine cloud account.

1. Access the router's web interface:

2. Select **Restart & factory reset** from the **Advanced settings** menu.
3. Select **Reset to factory defaults**.
4. Select **Reset**.

Note:

If your router was connected (onboarded) to your Raymarine cloud account, then the next time you open your Raymarine app the router will be automatically added back to your account.

Performing a factory reset prior to product disposal or change of ownership

In the event that you need to dispose of your router or sell it, and your router has been connected (onboarded) to your Raymarine cloud account, it must first be disconnected (unboarded) from your account and then restored to its factory default settings.

Note:

If your router is not connected to your Raymarine cloud account then steps 1 to 4 below are not necessary.

1. Open the Raymarine app on your mobile device and log in if required.
2. Select your YachtSense Link router from the **Select device** option.
3. Select **Remove device**.
4. Select **OK** to confirm the device removal.
   A confirmation e-mail will be sent to the e-mail address registered with your cloud account, and the router will no longer be linked to your account.
5. Access the router's web interface:
6. Select **Restart & factory reset** from the **Advanced settings** menu.
7. Select **Reset to factory defaults**.
8. Select **Reset**.

All personal details, passwords and cloud account details have now been removed, and the router has been reset to its factory default settings.

Changing the admin password

The default password used to access the router's web interface can be changed.

Important:

Ensure that you make a note of the new password. If you forget the new password you will not be able to log in to the router's web interface.

To change the password follow the steps below

1. Enter the current password in the **Current password:** field.
2. Enter your new password in the **Create new password:** field.
3. Re-enter the new password in the **Confirm new password:** field.
4. Click **Change password**.

Note:

If you can no longer access the router's web interface you can perform a network settings reset. Refer to: **p.68 — Password reset (forgotten password)**

5.6 Help

Selecting the Help icon in the top right of the web interface will provide access to the router's help pages and online documentation for your router.

Chapter 6: Troubleshooting

Chapter contents

6.1 Troubleshooting

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

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

6.2 Power up troubleshooting

Before troubleshooting problems with your power connection, ensure that you have followed the power connection guidance provided in the product's installation instructions and performed a power cycle/reboot of the device. The troubleshooting information below can be used if you are experiencing problems with powering up your router.

Blown fuse / tripped breaker

1. Check the fuse, located inline with the power cable. Ensure that it has the correct rating (refer to *Connections* chapter), as an under-rated fuse can affect the power supplied to the product. If the fuse has blown, replace with a new fuse.
2. Check the condition of relevant / additional fuses and breakers and connections; replace if necessary.
3. If fuse keeps blowing, check for cable damage, broken connector pins or incorrect wiring.

Poor / damaged / insecure power supply cable / connections

1. Check that the power cable connector is fully inserted into the unit and locked in position.
2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary.
3. With the unit turned on, try flexing the power cable near to the connector to see if this causes the unit to re-boot/lose power; replace if necessary.
4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion; replace if necessary.

Incorrect power connection

The power supply may be wired incorrectly, ensure the installation instructions have been followed.

Power source insufficient

Check that your power supply (battery or distribution panel) is providing a minimum of 10.8 V to each component in the system.

6.3 Wi-Fi troubleshooting

Before troubleshooting problems with your Wi-Fi connection, ensure that you have followed the Wi-Fi location requirements guidance provided in the relevant installation instructions and performed a power cycle/reboot of the devices you are experiencing problems with. The troubleshooting information below can be used if you are experiencing problems connecting your router to an external Wi-Fi network (Dock WLAN) such as the Wi-Fi provided at a marina or if you are experiencing problems connecting mobile devices to the router's Wi-Fi access point Boat Wi-Fi).

Cannot find network

If you cannot find the Wi-Fi network, it could be for one of the following reasons:

- **Wi-Fi is disabled** — Enable the Wi-Fi connection on the device you are trying to connect to the network.
- **Router not broadcasting** — Ensure that the router you are trying to connect to is broadcasting its SSID. If you have no control over the router's settings or do not want the router to broadcast its SSID then you will need to connect to the router manually by entering it SSID and password.

- **Router is out of range** — Wi-Fi performance degrades over distance so devices farther away will receive less network bandwidth. Devices close to their maximum Wi-Fi range will experience slow connection speeds, signal dropouts or not being able to connect at all. Move the device closer to the router and try to connect.
- **Signal blocked or degraded** — Bulkheads, decks and other heavy structure can degrade and even block the Wi-Fi signal. Depending on the thickness and material used it may not always be possible to pass a Wi-Fi signal through certain structures. If possible, remove the obstruction, or try moving the device so that the obstruction is no longer present.

Cannot connect to the network

If the network is available but you cannot connect to it check the following:

- **Incorrect network credentials** — Ensure you are entering the password correctly. Network passwords are case sensitive.
- **Wrong network** — Ensure you are selecting the correct network.
- **Router is out of range** — Wi-Fi performance degrades over distance so devices farther away will receive less network bandwidth. Devices close to their maximum Wi-Fi range will experience slow connection speeds, signal drop outs or not being able to connect at all. Move the device closer to the router and try to connect.
- **Signal blocked or degraded** — Bulkheads, decks and other heavy structure can degrade and even block the Wi-Fi signal. Depending on the thickness and material used it may not always be possible to pass a Wi-Fi signal through certain structures. If possible, remove the obstruction, or try moving the device so that the obstruction is no longer present.
- **Wi-Fi channel congestion** — In areas where there are a high number of Wi-Fi networks Wi-Fi channels can become congested making it difficult to connect or maintain a network connection. Try changing the Wi-Fi channel used by the router you are trying to connect to. You can use a free Wi-Fi analyzer app on a smart device to help you choose a less congested Wi-Fi channel.
- **Interference (2.4 GHz frequency)** — Interference can be caused by other devices that use the 2.4GHz frequency See list below of some common devices that use the 2.4GHz frequency:
  - Bluetooth devices
  - Microwave ovens
  - Fluorescent lighting
  - Cordless phones / baby monitors
  - Motion sensors

  Temporarily switch off devices in turn until you have identified the device causing the interference, then remove or reposition the offending device(s).
- **Interference (electrical and electronic devices)** — Interference caused by electrical and electronic devices or equipment and their associated cabling could generate an electromagnetic field which may interfere with the Wi-Fi signal. Temporarily switch off devices in turn until you have identified the device causing the interference, then remove or reposition the offending device(s).

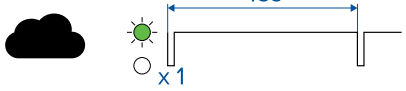
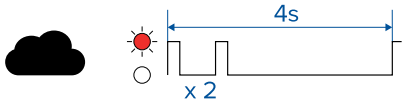
Slow connection / frequent connection dropouts

If you experience slow connection speeds or a connection that regularly drops out, work through the ‘Cannot find network’ and ‘Cannot connect to the network’ troubleshooting above.

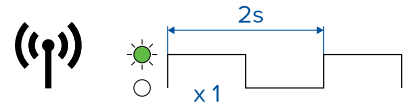
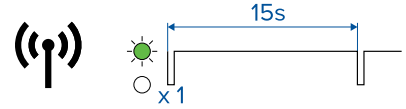
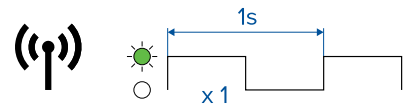
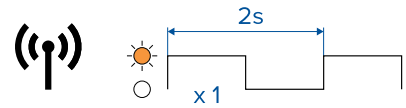
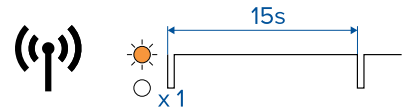
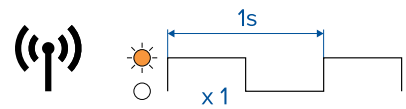
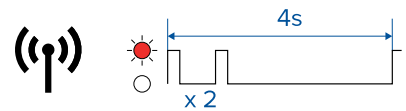
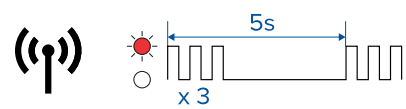
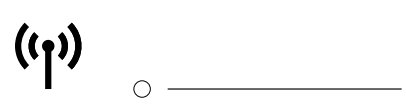
6.4 LED diagnostics

The LEDs on the front of the router provide basic status information for the relevant network/connection.

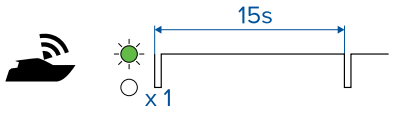
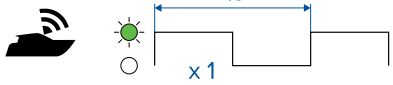
Cloud LED

	(Green) Connected to cloud service.
	(Red) Connection error / server not found.

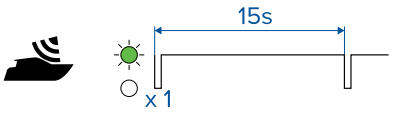
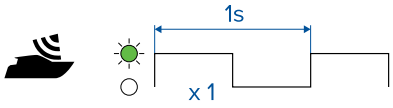
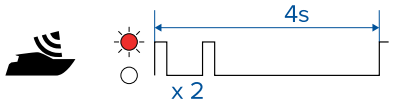
2G/3G/4G (Cellular / Diversity) LED

	(Green) Connecting to 4G.
	(Green) Connected to 4G.
	(Green) Connected to 4G and transmitting data.
	(Amber) Connecting to 2G/3G.
	(Amber) Connected to 2G/3G.
	(Amber) Connected to 2G/3G and transmitting data.
	(Red) Not connected / no signal.
	(Red) No SIM card detected.
	(Off) Mobile data (Cellular) switched off.

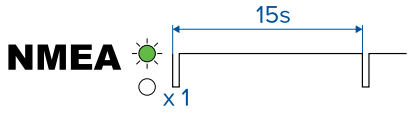
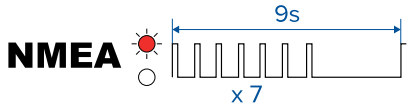
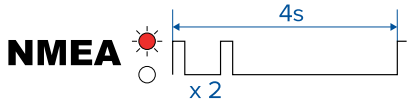
Boat Wi-Fi LED

	(Green) Device(s) connected to router access point.
	(Green) Device(s) connected to router access point and transferring data.
	(Off) router access point switched off.

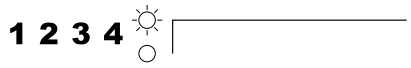
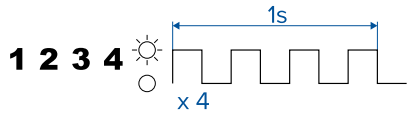
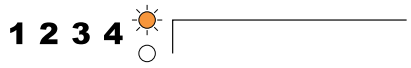
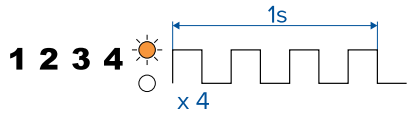
Dock WLAN LED

	(Green) Connected to Wi-Fi.
	(Green) Connected to Wi-Fi and transferring data.
	(Red) Unable to connect to Wi-Fi / No signal.
	(Off) Wi-Fi switched off.

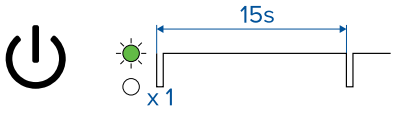
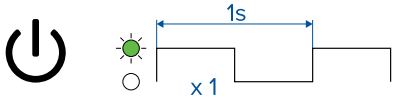
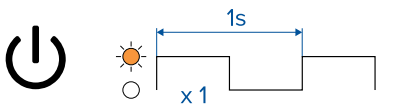
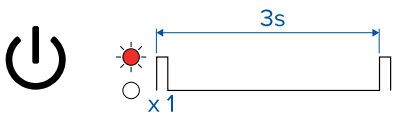
NMEA LED

	(Green) NMEA connected / OK.
	(Red) NMEA connected no data.
	(Red) NMEA not connected.

SaeTalkhs network (1 / 2 / 3 / 4) LEDs

	(White) Port connected 1,000 Mbits/s.
	(White) Transferring data 1,000 Mbits/s.
	(Amber) Port connected 10/100 Mbits/s.
	(Amber) Transferring data 10/100 Mbits/s.

Power LED

	(Green) Powered up / Ok.
	(Green) GNSS (GPS) no fix / Initializing.
	(Amber) Software update in progress.
	(Red) Fault.

6.5 Password reset (forgotten password)

The default password that is required to access the router's settings can be changed. It is important that when changing the password you make a note of it somewhere in case you forgot the password.

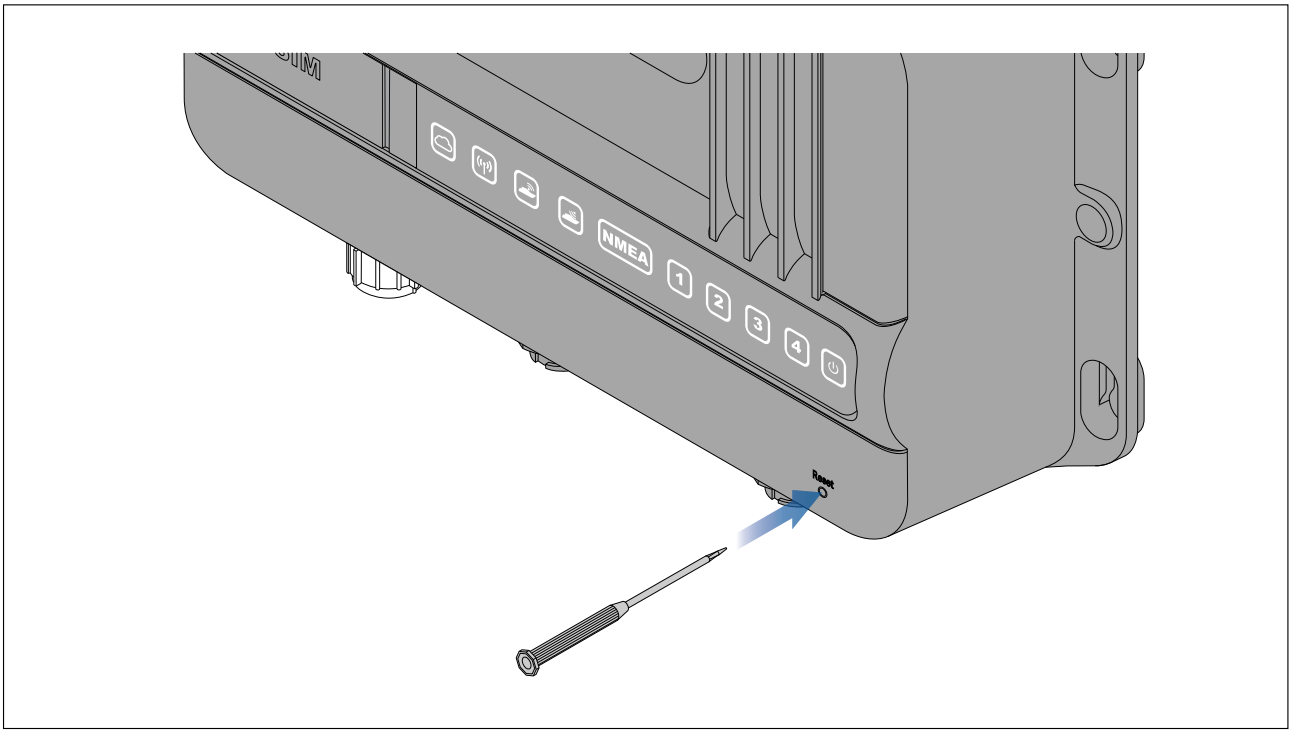
If the default password is changed and you have forgotten the new password you can perform a networking reset. Performing a networking reset will revert the router's Wi-Fi and ethernet settings and the admin password to its default settings The default password is printed on the credentials label located on the left side of the router.

6.6 Performing a network settings reset

If you have lost or can no longer remember the router's admin password you can perform a networking reset following the steps below.

Note:

Performing a networking reset will revert all customized Wi-Fi and ethernet settings and the admin password to their factory default settings. All other settings will remain unchanged.



With the router powered on:

1. Insert a paper clip or a small screwdriver into the hard reset hole located on the bottom right of the router.
2. Press in and hold for approximately 2 seconds until the first 5 LEDs turn off and then blink green once simultaneously.
3. Remove the paperclip / screwdriver.

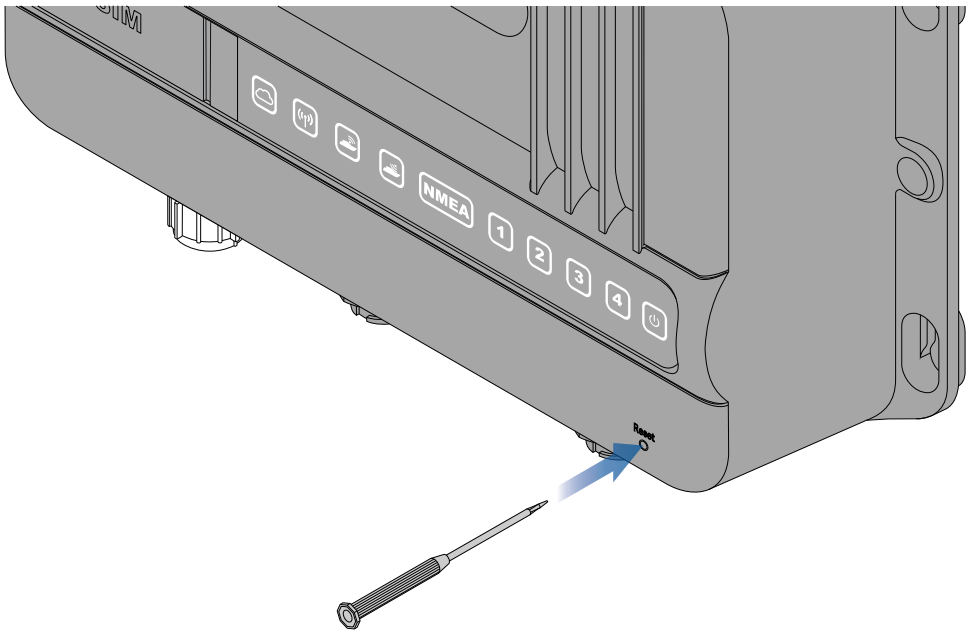
During the reset process the first 5 LEDs will turn solid amber. Once the Power LED turn solid green the networking reset is complete.

6.7 Performing a hard reset

If the router's web user interface becomes inaccessible then you can perform a hard reset of the router following the steps below.

Note:

- Performing a factory reset will remove all customized settings and reset the router to its factory default settings.
- Before performing a hard reset try power cycling the router to see if that fixes the problem.



With the router powered on:

1. Insert a paper clip or a small screwdriver into the hard reset hole located on the bottom right of the router.
2. Press in and hold for approximately 7 seconds until the first 5 LEDs turn off and then blink green once simultaneously.
3. Remove the paperclip / screwdriver.

During the reset process the first 5 LEDs will turn solid amber. Once the Power LED turn solid green the router will be reset to its factory default settings and ready to use.

Chapter 7: Maintenance

Chapter contents

7.1 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.

Warning: High voltage

This product contains high voltage. Adjustments require specialized service procedures and tools only available to qualified service technicians. There are no user serviceable parts or adjustments. The operator should never remove the cover or attempt to service the product.

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.

7.2 Product cleaning

Best cleaning practices.

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.

Chapter 8: Technical support

Chapter contents

8.1 Raymarine product support and servicing

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

Product information

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

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

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

Servicing and warranty

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

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

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

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

United States (US):

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

Web support

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

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

Worldwide support

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

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

United States (US):

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

Australia and New Zealand (Raymarine subsidiary):

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

France (Raymarine subsidiary):

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

Germany (Raymarine subsidiary):

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

Italy (Raymarine subsidiary):

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

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es

- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

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

Sweden (Raymarine subsidiary):

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

Finland (Raymarine subsidiary):

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

Norway (Raymarine subsidiary):

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

Denmark (Raymarine subsidiary):

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

Russia (Authorized Raymarine distributor):

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

8.2 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:

- YouTube

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 9: Technical specification

Chapter contents

9.1 YachtSense Link technical specification

Power specification

Nominal supply voltage:	12 / 24 V dc
Operating voltage range:	8 V dc to 32 V dc

Environmental specification

Operating temperature range:	-25°C (-13°F) to + 55°C (131°F)
Storage temperature range:	-30°C (–22°F) to + 70°C (158°F)
Humidity:	up to 93% @ 40°C (104°F)
Water ingress protection:	IPx6 and IPx7

Physical specification

Dimensions:	• Width: 242.00 mm (9.53 in) • Height: 162.20 mm (6.39 in) • Depth: 63.00 mm (2.48 in)
Weight:	1.03 Kg (2.26 lb)

Wireless networks specification

BOAT Wi-Fi:	Wi-Fi access point mode frequencies: • 2.4 GHz:(2412 MHz to 2472 MHz / 2422 MHz to 2462 MHz): 13.28 dBm
DOCK WLAN:	Wi-Fi station mode frequencies: • 2.4 GHz:(2412 MHz to 2472 MHz / 2422 MHz to 2462 MHz): 14.79 dBm • 5 GHz (5150 MHz to 5350 MHz / 5470 MHz to 5725 MHz): 14.94 dBm • 5.8 GHz (5725 MHz to 5875 MHz): 13.74 dBm
Cellular / Diversity:	2G/3G/4G frequencies: • LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18 /B19/B20/B25/B26/B28 • LTE-TDD: B38/B39/B40/B41 • WCDMA: B1/B2/B4/B5/B6/B8/B19 • GSM: B2/B3/B5/B8
LTE category:	4
Maximum download speed:	*150 Mbps
Maximum upload speed:	*50 Mbps

*Actual performance will vary and usually be less than the stated maximums.

Chapter 10: Spares and accessories

Chapter contents

10.1 Spares and Accessories

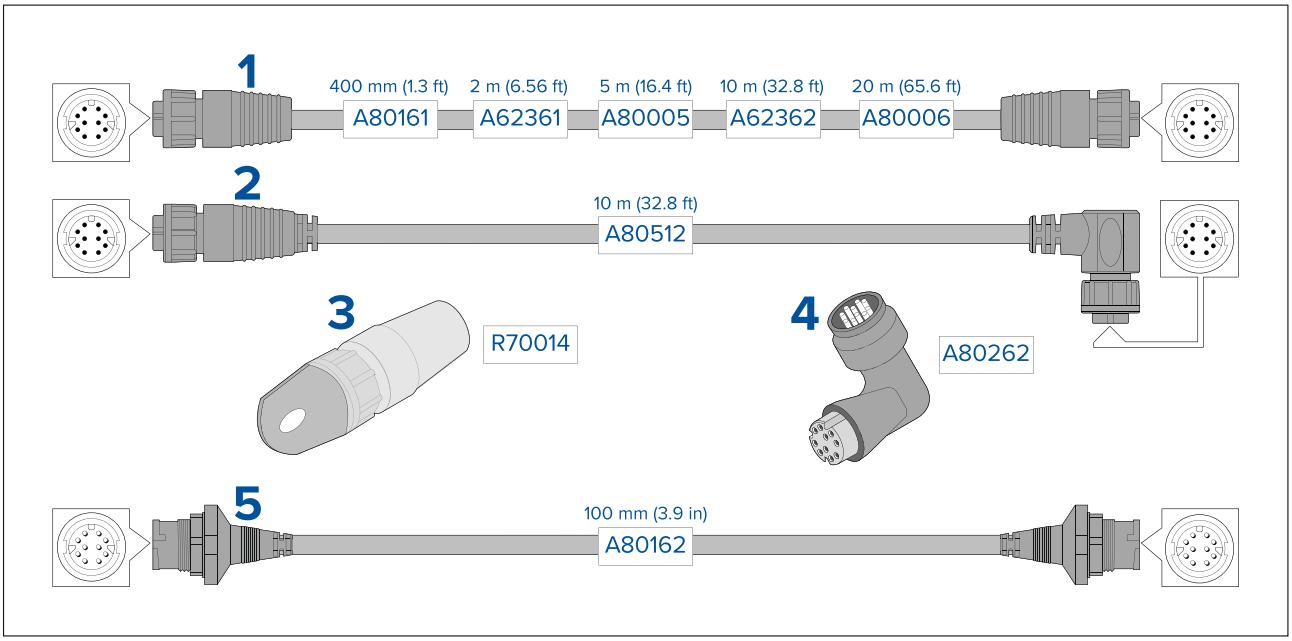
Accessories

- **R70800** — YachtSense Link I/O cable kit.
- **A80701** — 5-in-1 antenna extension cable 5 m (16.4 ft).
- **A70718** — 5-in-1 antenna thread extender kit.

Spares

- **R70835** — YachtSense Link router only.
- **R70836** — Replacement Wi-Fi antenna pair.
- **R70799** — YachtSense Link power cable 1.5 m (4.9 ft) with 8 A fitted fuse.
- **R70837** — replacement 5-in-1 antenna.
- **R70870** — 5-in-1 antenna replacement gasket and nut.
- **A62360** — RayNet to RJ45 cable 1 m (3.3 ft).

10.2 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.

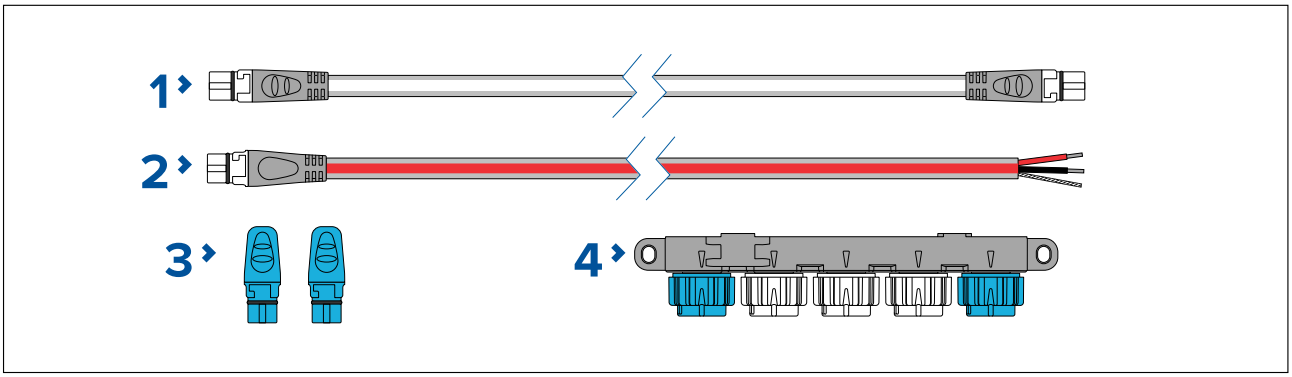
10.3 SeaTalkng ® cables and accessories

SeaTalkng ® cables and accessories for use with compatible products.

SeaTalkng ® kits

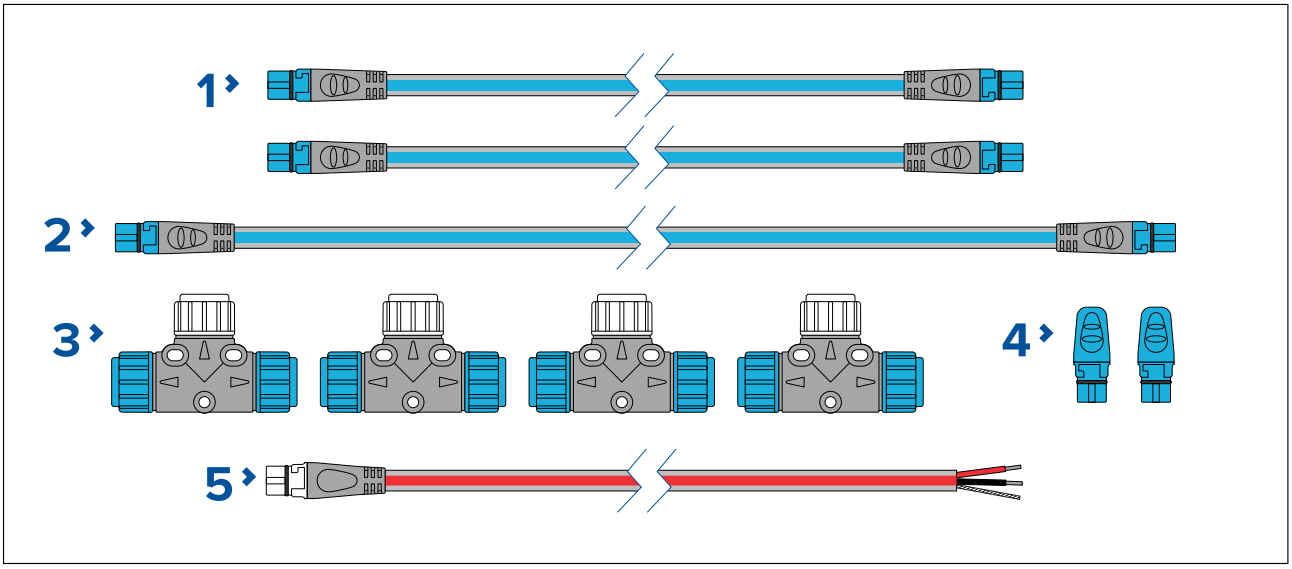
SeaTalkng kits enable you to create a simple SeaTalkng backbone.

Starter kit (T70134) consists of:



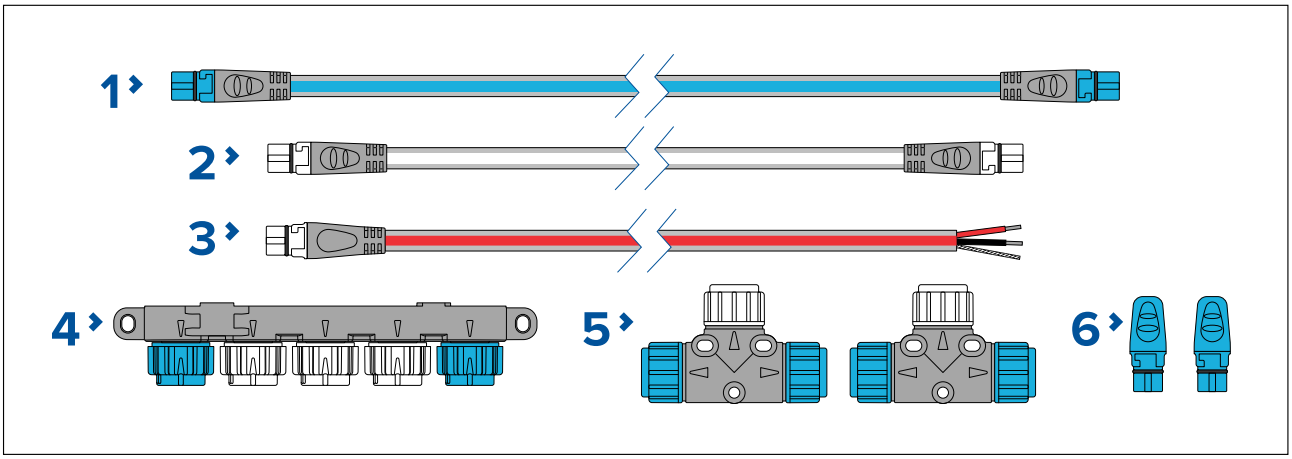
1. 1 x 3 m (9.8 ft) Spur cable (**A06040**). Used to connect device to the SeaTalkng backbone.
2. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.
3. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.
4. 1 x 5-Way connector (**A06064**). Each connector block allows connection of up to 3 SeaTalkng devices. Multiple connector blocks can be 'daisy chained' together.

Backbone kit (A25062) consists of:



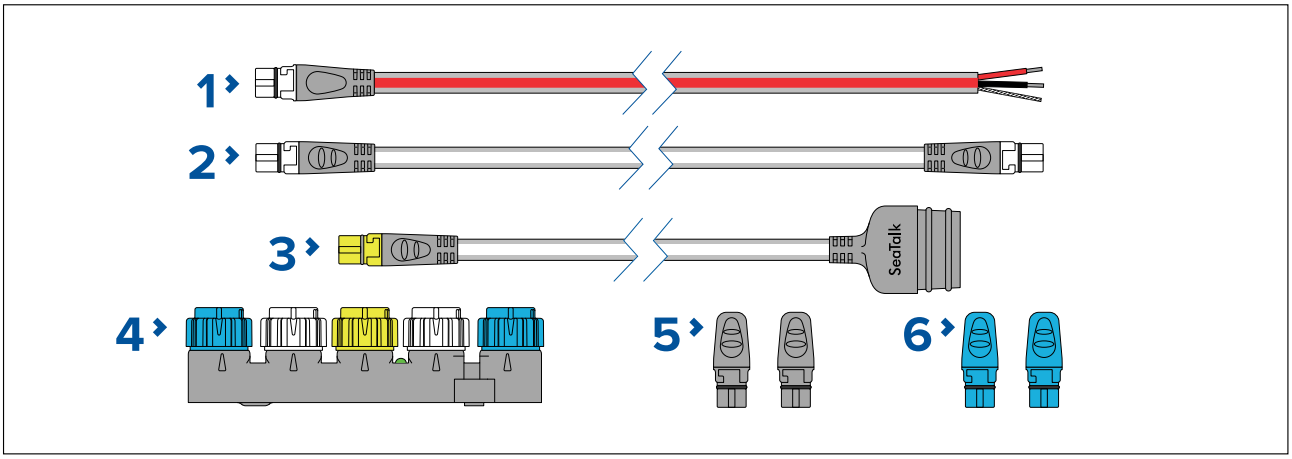
1. 2 x 5 m (16.4 ft) Backbone cables (**A06036**). Used to create and extend the SeaTalkng backbone.
2. 1 x 20 m (65.6 ft) Backbone cable (**A06037**). Used to create and extend the SeaTalkng backbone.
3. 4 x T-piece (**A06028**). Each T-piece allows connection of one SeaTalkng device. Multiple T-pieces can be 'daisy chained' together.
4. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.
5. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.

Evolution autopilot cable kit (R70160) consists of:



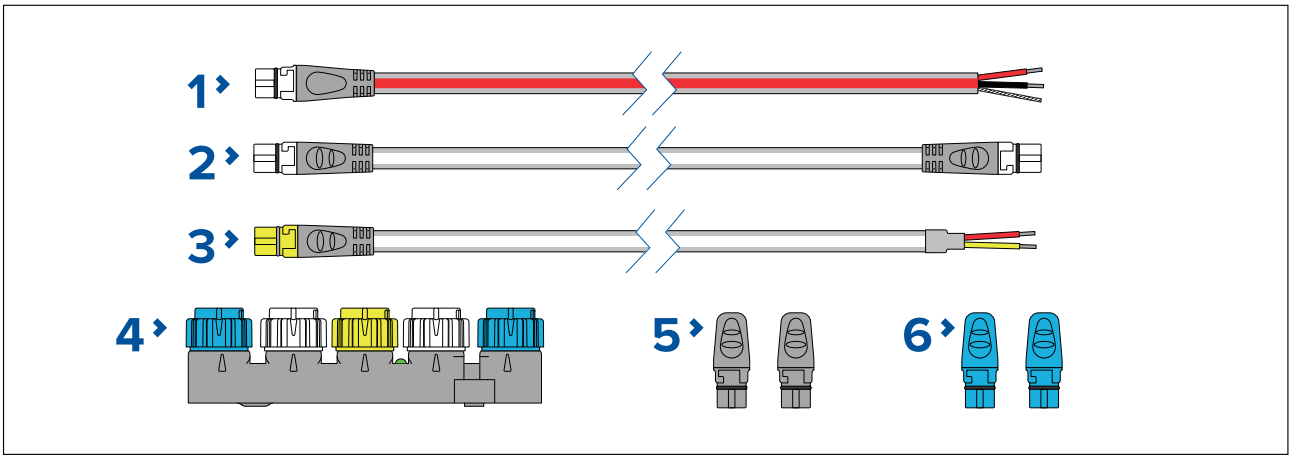
1. 1 x 5 m (16.4 ft) Backbone cable (**A06036**). Used to create and extend the SeaTalkng backbone.
2. 1 x 1 m (3.3 ft) Spur cable (**A06040**). Used to connect device to the SeaTalkng backbone.
3. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.
4. 1 x 5-Way connector (**A06064**). Each connector block allows connection of up to 3 SeaTalkng devices. Multiple connector blocks can be 'daisy chained' together.
5. 2 x T-pieces (**A06028**). Each T-piece allows connection of one SeaTalkng device. Multiple T-pieces can be 'daisy chained' together.
6. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.

SeaTalk to SeaTalkng converter kit (E22158) consists of:



1. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.
2. 1 x 1 m (3.3 ft) Spur cable (**A06039**). Used to connect a device to the SeaTalkng backbone.
3. 1 x 0.4 m (1.3 ft) SeaTalk (3 pin) to SeaTalkng adapter cable (**A22164**). Used to connect SeaTalk devices to the SeaTalkng backbone via the SeaTalk to SeaTalkng converter.
4. 1 x SeaTalk to SeaTalkng converter (**E22158**). Each converter allows connection of one SeaTalk device and up to 2 SeaTalkng devices.
5. 2 x Spur blanking plugs (**A06032**). Used to cover unused spur connections in 5–way blocks, T-piece connectors and SeaTalk to SeaTalkng converter.
6. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.

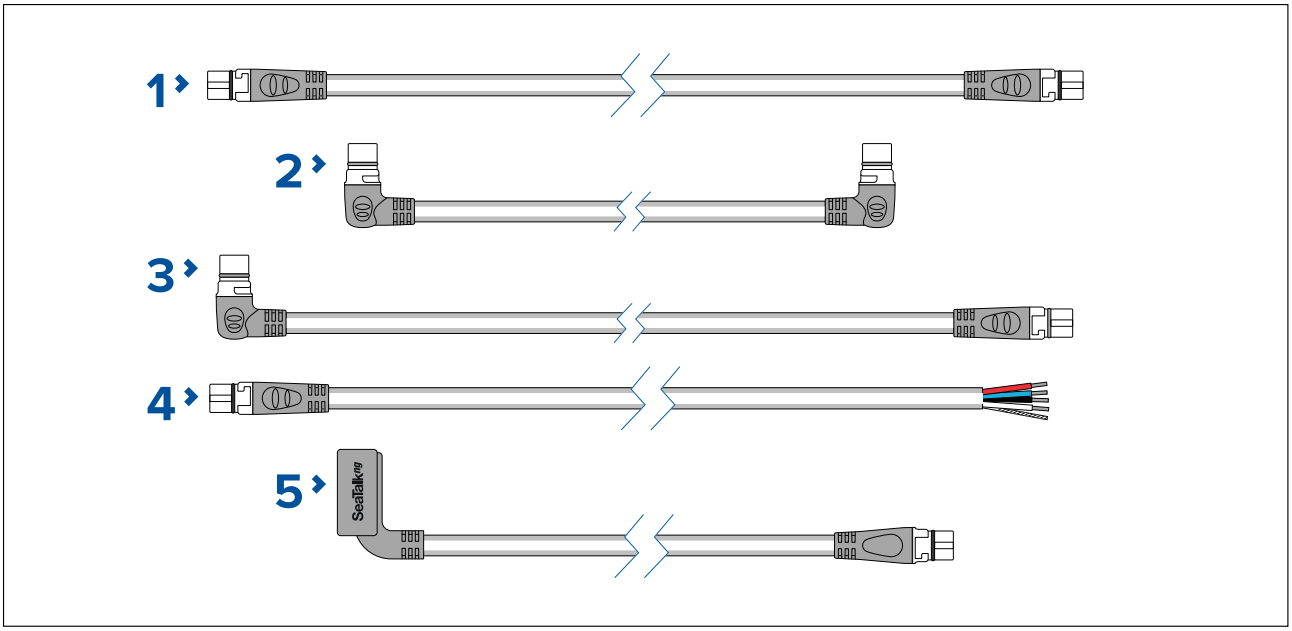
NMEA 0183 VHF 2 wire to SeaTalkng converter kit (E70196) consists of:



1. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.
2. 1 x 1 m (3.3 ft) Spur cable (**A06039**). Used to connect a device to the SeaTalkng backbone.
3. 1 x 1 m (3.3 ft) NMEA 0183 VHF stripped-end (2 wire) to SeaTalkng adapter cable (**A06071**). Used to connect an NMEA 0183 VHF radio to the SeaTalkng backbone via the NMEA 0183 VHF to SeaTalkng converter.
4. 1 x SeaTalk to SeaTalkng converter (**E22158**). Each converter allows connection of 1 SeaTalk device and up to 2 SeaTalkng devices.
5. 2 x Spur blanking plugs (**A06032**). Used to cover unused spur connections in 5-way blocks, T-piece connectors and SeaTalk to SeaTalkng converter.
6. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.

SeaTalkng® spur cables

SeaTalkng spur cables are required to connect devices to the SeaTalkng backbone.

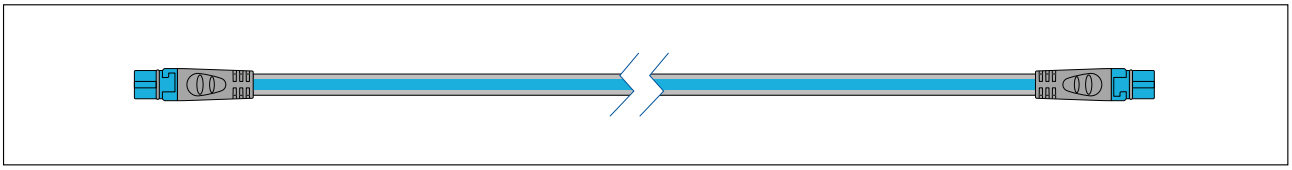


1. SeaTalkng spur cables:
   - 0.4 m (1.3 ft) Spur cable (**A06038**).
   - 1 m (3.3 ft) Spur cable (**A06039**).
   - 3 m (9.8 ft) Spur cable (**A06040**).
   - 5 m (16.4 ft) Spur cable (**A06041**).
2. 0.4 m (1.3 ft) Elbow (right angled) to elbow spur cable (**A06042**). Used in confined spaces where a straight spur cable will not fit.
3. 1 m (3.3 ft) Elbow (right angled) to straight spur cable (**A06081**). Used in confined spaces where a straight spur cable will not fit.

4. SeaTalkng to stripped-end spur cables (Connects compatible product that do not have a SeaTalkng connector such as transducer pods):
   - 1 m (3.3 ft) SeaTalkng to stripped-end spur cable — **A06043**
   - 3 m (9.8 ft) SeaTalkng to stripped-end spur cable — **A06044**
5. 0.3 m (1.0 ft) ACU / SPX autopilot to SeaTalkng spur cable (**R12112**). Connects the course computer to the SeaTalkng backbone. This connection can also be used to provide 12 V dc power to the SeaTalkng backbone.

SeaTalkng® backbone cables

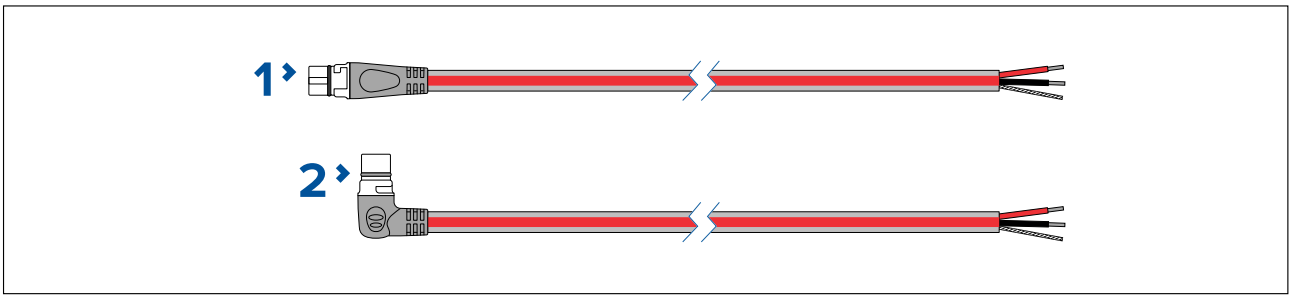
SeaTalkng backbone cables are used to create or extend a SeaTalkng backbone.



- 0.4 m (1.3 ft) Backbone cable (**A06033**).
- 1 m (3.3 ft) Backbone cable (**A06034**).
- 3 m (9.8 ft) Backbone cable (**A06035**).
- 5 m (16.4 ft) Backbone cable (**A06036**).
- 9 m (29.5 ft) Backbone cable (**A06068**).
- 20 m (65.6 ft) Backbone cable (**A06037**).

SeaTalkng® power cables

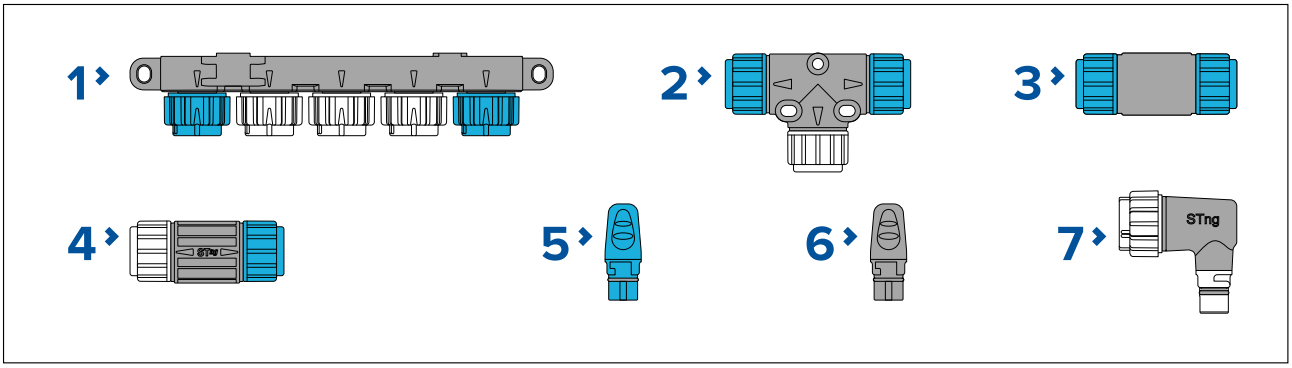
SeaTalkng power cables are used to provide the SeaTalkng backbone with a single 12 V dc power source. The power connection must include a 5 amp inline fuse (not supplied).



1. 2 m (6.6 ft) Power cable (straight) (**A06049**).
2. 2 m (6.6 ft) Elbow (right angled) power cable (**A06070**).

SeaTalkng® connectors

SeaTalkng connectors are used to connect SeaTalkng devices to the SeaTalkng backbone and to create and extend the backbone.

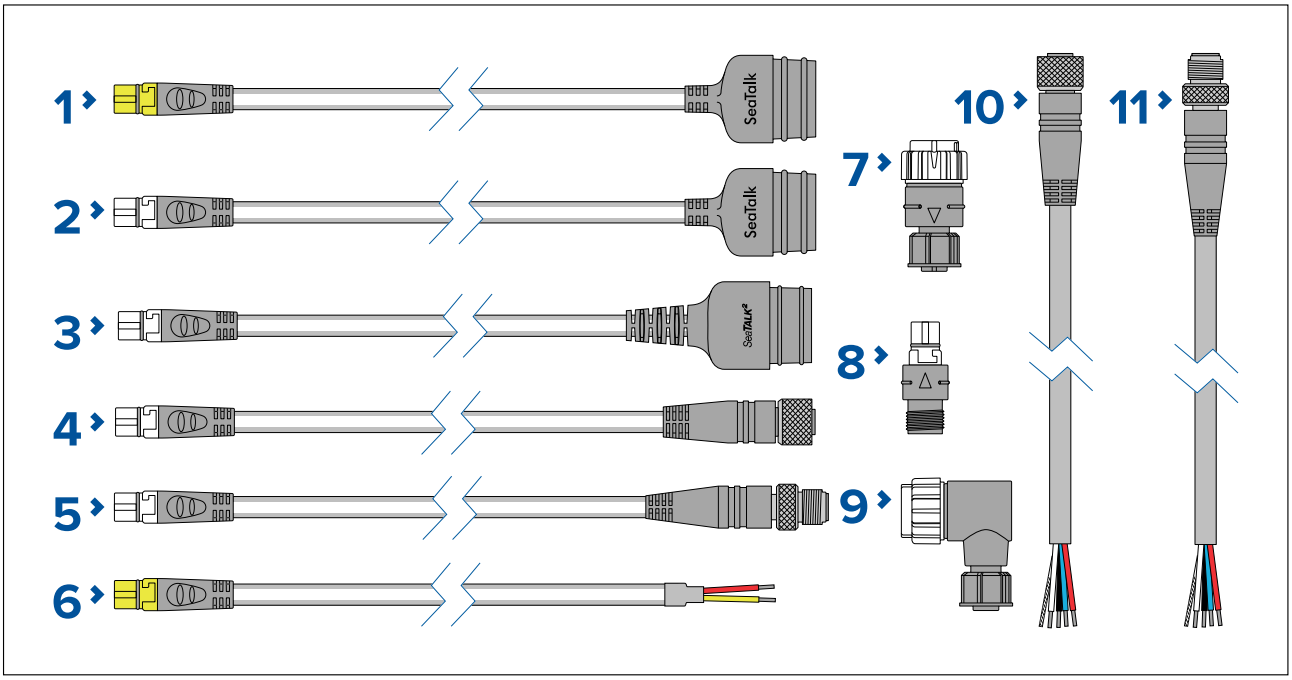


1. 5-Way connector (**A06064**). Each connector block allows connection of up to 3 SeaTalkng devices. Multiple connector blocks can be 'daisy chained' together.
2. T-piece (**A06028**). Each T-piece allows connection of one SeaTalkng device. Multiple T-pieces can be 'daisy chained' together.
3. Backbone extender (**A06030**). Used to connect 2 backbone cables together.
4. Inline terminator (**A80001**). Used to connect a spur cable and SeaTalkng device at the end of a backbone instead of a backbone terminator.

5. Backbone terminator (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.
6. Spur blanking plugs (**A06032**). Used to cover unused spur connections in 5–way blocks, T-piece connectors, or the SeaTalk to SeaTalkng converter.
7. Spur connector right angled elbow (**A06077**). Used in confined spaces where a straight spur cable will not fit.

SeaTalkng® adaptors and adaptor cables

SeaTalkng adaptor cables are used to connect devices designed for different CAN bus backbones (e.g.: SeaTalk or DeviceNet) to the SeaTalkng backbone.



1. 1 m (3.3 ft) SeaTalk (3 pin) to SeaTalkng converter cable (**A22164 / A06073**). Can be used to connect a SeaTalk device to a SeaTalkng backbone via the SeaTalk to SeaTalkng converter, or to connect a SeaTalkng product directly to a SeaTalk network.
2. 0.4 m (1.3 ft) SeaTalk (3 pin) to SeaTalkng adaptor cable (**A06047**). Can be used to connect a SeaTalk device to a SeaTalkng backbone via the SeaTalk to SeaTalkng converter, or to connect a SeaTalkng product directly to a SeaTalk network.
3. 0.4 m (1.3 ft) SeaTalk2 (5 pin) to SeaTalkng adaptor cable (**A06048**). Used to connect SeaTalk2 devices or networks to a SeaTalkng backbone.
4. SeaTalkng to DeviceNet (female) adaptor cables connect NMEA 2000 devices that use a DeviceNet connector to the SeaTalkng backbone, or connects SeaTalkng devices to an NMEA 2000 network. The following cables are available:
   - 0.4 m (1.3 ft) SeaTalkng to DeviceNet (female) adaptor cable (**A06045**).
   - 1 m (3.3 ft) SeaTalkng to DeviceNet (female) adaptor cable (**A06075**).
5. SeaTalkng to DeviceNet (male) adaptor cables. Connect NMEA 2000 devices that use a DeviceNet connector to the SeaTalkng backbone, or connect SeaTalkng devices to an NMEA 2000 network. The following cables are available:
   - 0.1 m (0.33 ft) SeaTalkng to DeviceNet (male) adaptor cable (**A06078**).
   - 0.4 m (1.3 ft) SeaTalkng to DeviceNet (male) adaptor cable (**A06074**).
   - 1 m (3.3 ft) SeaTalkng to DeviceNet (male) adaptor cable (**A06076**).
   - 1.5 m (4.92 ft) SeaTalkng to DeviceNet (male) adaptor cable (**A06046**).
6. 1 m (3.3 ft) NMEA 0183 VHF stripped-end (2 wire) to SeaTalkng adapter cable (**A06071**). Used to connect an NMEA 0183 VHF radio to the SeaTalkng backbone via the NMEA 0183 VHF to SeaTalkng converter.
7. SeaTalkng (male) to DeviceNet (female) adaptor (**A06082**).
8. SeaTalkng (female) to DeviceNet (male) adaptor (**A06083**).
9. SeaTalkng (male) to DeviceNet (female) elbow (right angled) adaptor (**A06084**).

10. (0.4 m (1.3 ft) DeviceNet (female) to stripped-end adaptor cable (**E05026**).
11. (0.4 m (1.3 ft) DeviceNet (male) to stripped-end adaptor cable (**E05027**).

Appendix A NMEA 2000 PGN support

Administration PGNs

- **59392** — ISO Acknowledge (Receive / Transmit)
- **59904** — ISO Request (Receive / Transmit)
- **60160** — ISO Transport protocol, data transfer (Receive)
- **60416** — ISO Transport protocol, connection management — BAM group function (Receive)
- **60928** — Address claim (Receive / Transmit)
- **65240** — ISO Commanded address (Receive)
- **126208** — Request group message (Receive)
- **126208** — Command group message (Receive)
- **126208** — Acknowledge group message (Transmit)
- **126464** — PGN transmit and receive list (Transmit)
- **126993** — Heartbeat (Transmit)
- **126996** — Product information (Transmit)
- **126998** — Configuration information (Transmit)

Data PGNs

- **126983** — Alert (Transmit)
- **126985** — Alert configuration (Transmit)
- **126986** — Alert configuration (Transmit)
- **126992** — System time (Transmit)
- **127250** — Vessel heading (Receive)
- **127251** — Rate of Turn (Receive)
- **127257** — Attitude (Receive)
- **127488** — Engine parameters, rapid update (Receive)
- **127489** — Engine parameters, dynamic (Receive)
- **127493** — Transmission parameters, dynamic (Receive)
- **127496** — Trip fuel consumption, vessel (Receive)
- **127497** — Trip fuel consumption, engine (Receive)
- **127498** — Engine parameters, static (Receive)
- **127501** — Binary status report (Receive)
- **127502** — Switch bank control (Receive/Transmit)
- **127503** — AC input status DEPRECATED (Receive)
- **127504** — AC output status DEPRECATED (Receive)
- **127505** — Fluid level (Receive)
- **127506** — DC detailed status (Receive)
- **127507** — Charger status DEPRECATED (Receive)
- **127508** — Battery status (Receive)
- **127509** — Inverter status DEPRECATED (Receive)
- **128259** — Speed (Receive)
- **128267** — Water depth (Receive)
- **129025** — Position, rapid update (Transmit)
- **129026** — COG & SOG, rapid update (Receive/Transmit)
- **129029** — GNSS position data (Receive/Transmit)
- **129033** — Local time offset (Receive/Transmit)
- **129044** — Datum (Transmit)
- **129539** — GNSS DOPs (Transmit)
- **129540** — GNSS Sats in view (Transmit)
- **129542** — GNSS Pseudorange noise statistics (Transmit)

- **129547** — GNSS Pseudorange error statistics (Transmit)
- **130306** — Wind data (Receive)
- **130310** — Environmental parameters DEPRECATED (Receive)
- **130311** — Environmental parameters DEPRECATED (Receive)
- **130312** — Temperature DEPRECATED (Receive)
- **130313** — Humidity (Receive)
- **130314** — Actual pressure (Receive)
- **130576** — Trim ab status (Receive)

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