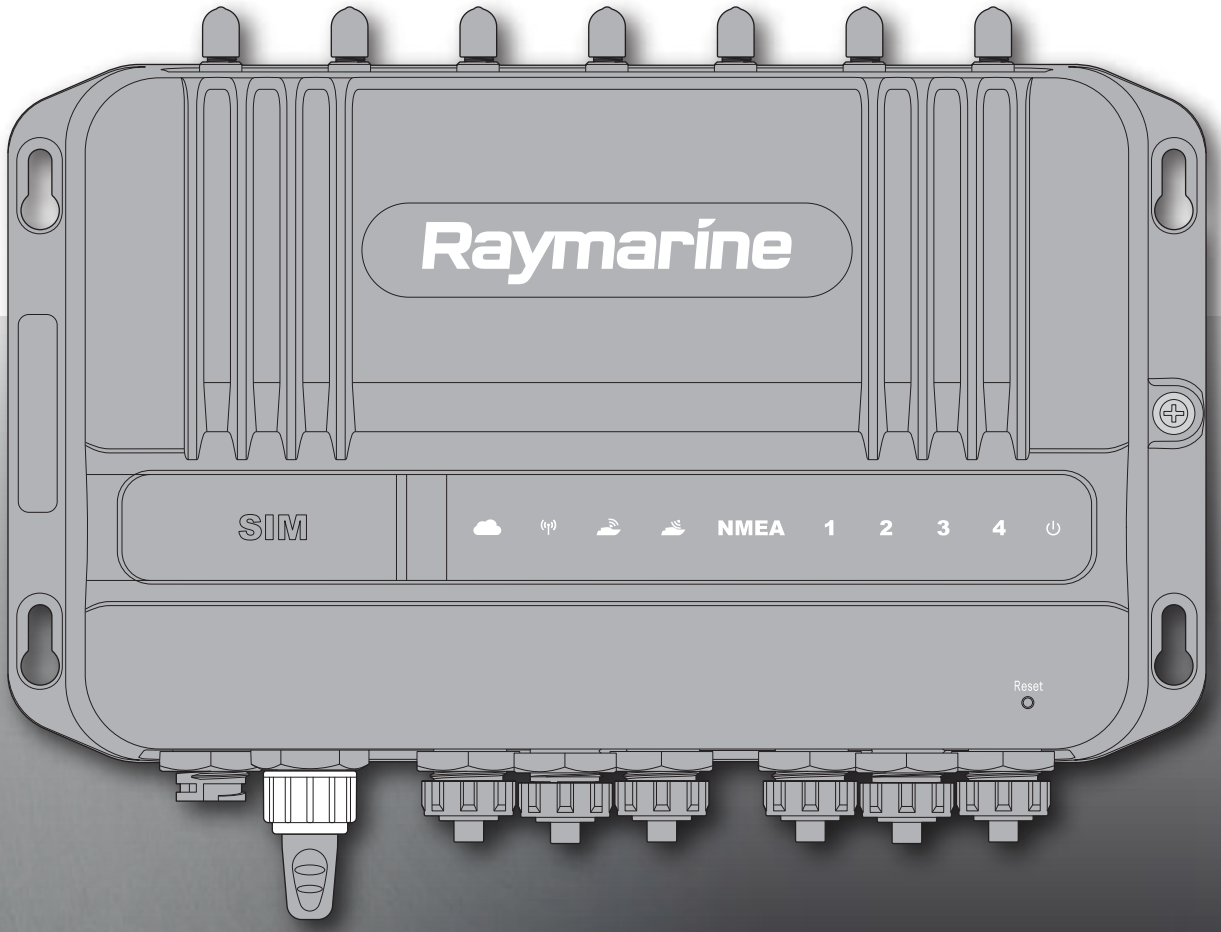
Raymarine®




# YACHTSENSE™ LINK

## Installation and operation instructions

English (en-US)
Date: 01-2021
Document number: 81397-2

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### Software updates

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

### Product documentation

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

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**English (en-US)**
Document number: 81397 (Rev 2)
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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 recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.

### 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.

## 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.

## RF exposure

This equipment complies with FCC / ISED RF exposure limits for general population / uncontrolled exposure. The antenna is mounted behind the front facia of the display. This equipment should be installed and operated with a minimum distance of 50 cm between the device and the body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter, except in accordance with FCC multi-transmitter product procedures.

## 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.

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

## 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)

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

## Japanese approvals

In the frequency band used for this device, campus radio stations (radios stations that require a license) and specified low power radio stations (radio stations that do not require license) for mobile identification and amateur radio stations (radio stations that require license) used in industries such as microwave ovens, scientific, medical equipment devices and production line of other factories are also being operated.

1. Before using this device, please make sure that campus radio stations and specified low power radio stations for mobile identification and amateur radio stations are not being operated nearby.
2. In case there is any case of harmful interference to campus radio stations for mobile identification caused by this device, please immediately change the frequency used or stop the transmission of radio waves and then consult about the measures to avoid interference (for example, the installation of partitions) through the contact information below.
3. Besides, when in trouble, such as when there is any case of harmful interference to specified low power radio stations for mobile identification or amateur radio stations caused by this device, please consult through the following contact information.

Contact information: Please contact your local authorized Raymarine dealer.

## MSIP Warning Statement for Radio Devices (Korea only)

- 제작자 및 설치자는 해당 무선설비가 전파혼신 가능성이 있으므로 안전 인명과 관련된
- 서비스는 할 수 없음을 사용자 설명서 등을 통하여 운용자 및 사용자에게 충분히 알릴 것
- 법에 의해 전 방향 전파 발사 및 동일한 정보를 동시에 여러 곳으로 송신하는 점-대-다지점 서비스에의 사용은 금지되어 있습니다.

## 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 – 4G Smart Router** — E70640

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

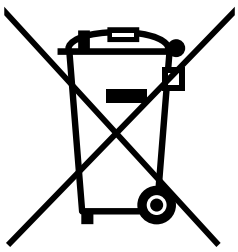
## IMO and SOLAS

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

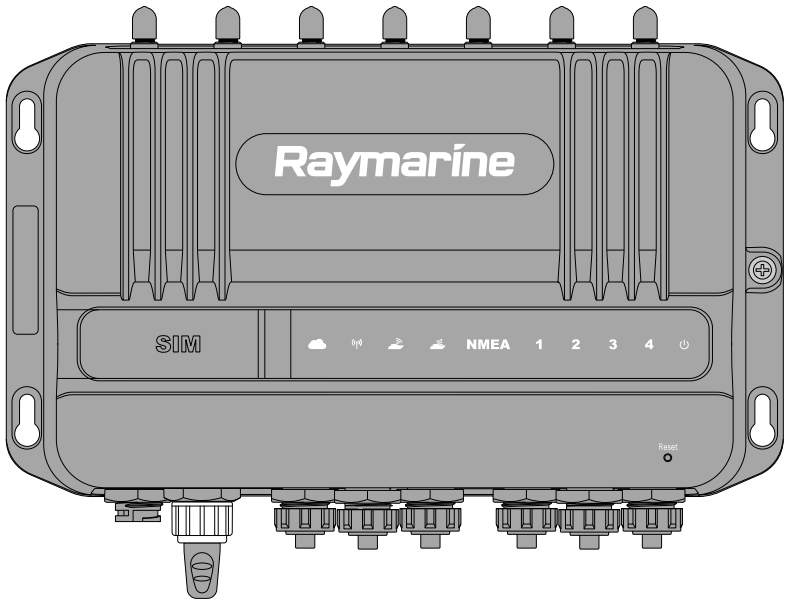
### Document illustrations

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 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.



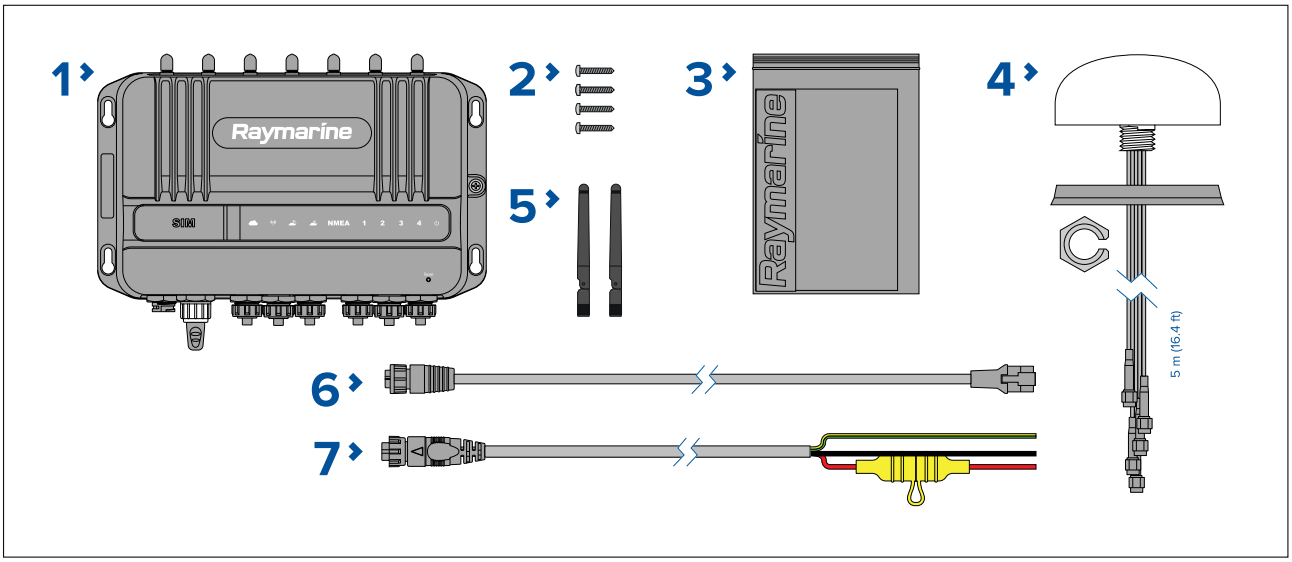

The YachtSense™ Link Marine Cloud Router includes the following features:

- Dual SIM card slots
- Cellular antenna connections
- Diversity antenna connections
- Dual wireless network (WLAN) for off boat connections
- Dual wireless network (WLAN) for onboard connections
- Built in GNSS (GPS) receiver (GLONASS and Beidou compatible)
- 4 Channel digital inputs, for digital switching / device control
- 4 Channel digital outputs, for digital switching / device control
- 4 RayNet SeaTalkhs ® network ports
- SeaTalkng ® / NMEA 2000 connection
- Web browser user interface for configuration.

## 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. External antenna (Smart antenna:GNSS, Cellular, Diversity, Dock WLAN) with 5 m (16.4 ft) cables
5. 2 x External antenna (Dipole antenna: Internal boat WLAN)
6. RayNet to RJ45 cable 1 m (3.3 ft)
7. Power cable 1.5 m (4.9 ft) with 8 A fitted fuse

**Note:**

The Router is supplied with protective caps fitted to the antenna connections, RayNet connections, Input and output connections and the SeaTalkng ® connection.

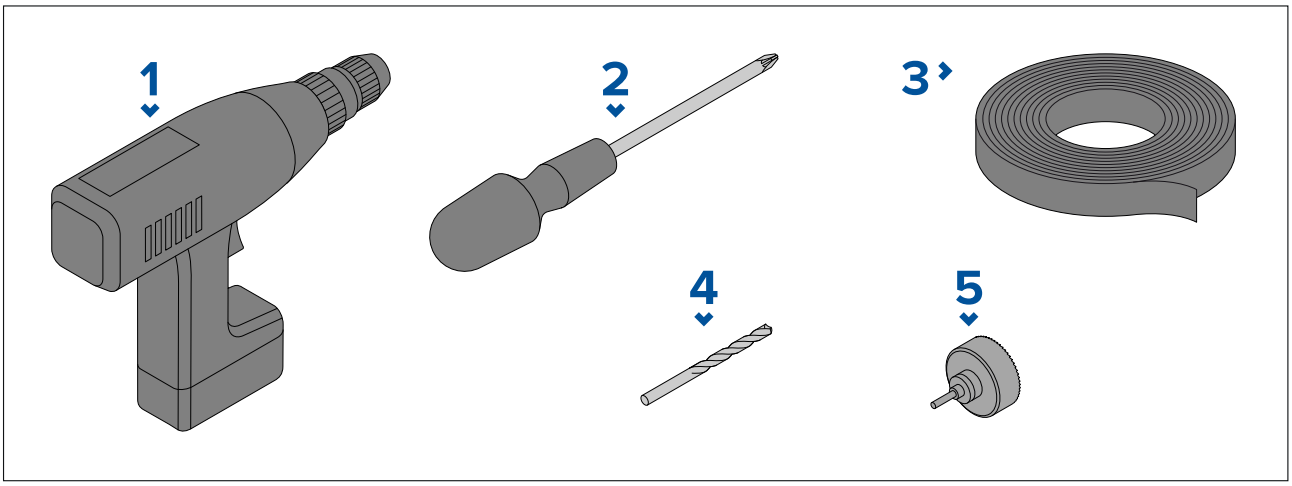
The protective caps should remain in place until connections are made. If a connection is not required then the protective cap should not be removed.

# 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. Drill bit (suitable for pilot holes)
5. 23 mm (0.91 in) hole cutter (Required for smart 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:

The YachtSense™ Link – 4G Smart Router is protected against water ingress to IPx6 and IPx7 and is therefor suitable for mounting above or below decks.

#### Wireless location requirements

A number of factors can influence wireless performance. It is important to ensure you test the connection performance at the desired location before installing wireless-enabled products.

#### Distance

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.

#### Line of sight

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.

The construction of your vessel can also have an impact on wireless performance. For example, metal structural bulkheads and roofing will reduce — and in certain situations — block the wireless signal.

If the wireless signal passes through a bulkhead containing power cables this can also degrade wireless performance.

Reflective surfaces such as metal surfaces, some types of glass and even mirrors can drastically affect performance or even block the wireless signal.

### Interference and other equipment

Wireless products should be installed at least 1m (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.

Interference from other people's wireless devices can also 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).

### 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.

## Smart antenna location requirements

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

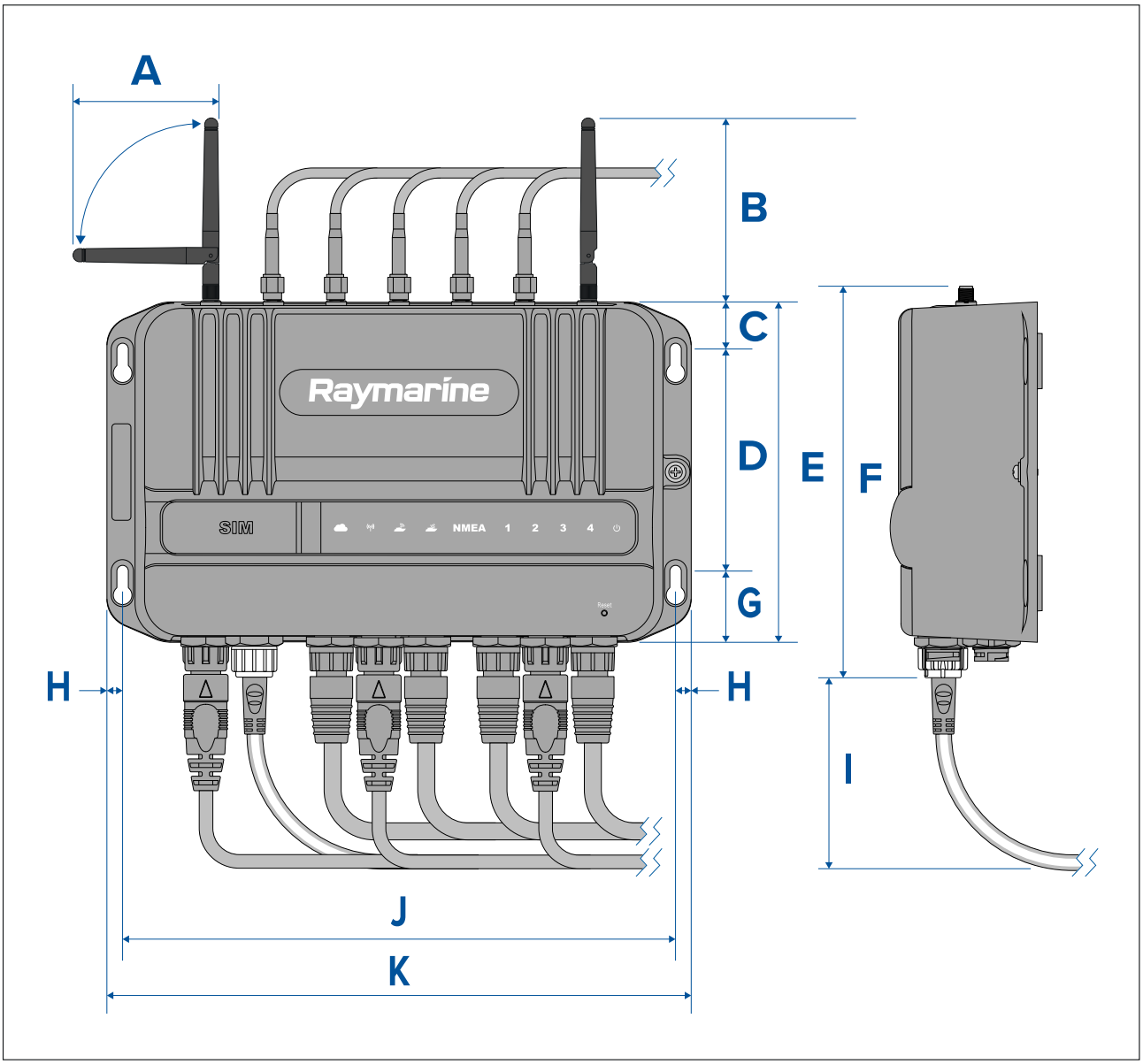
Ensure that the selected mounting location is:

- 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:

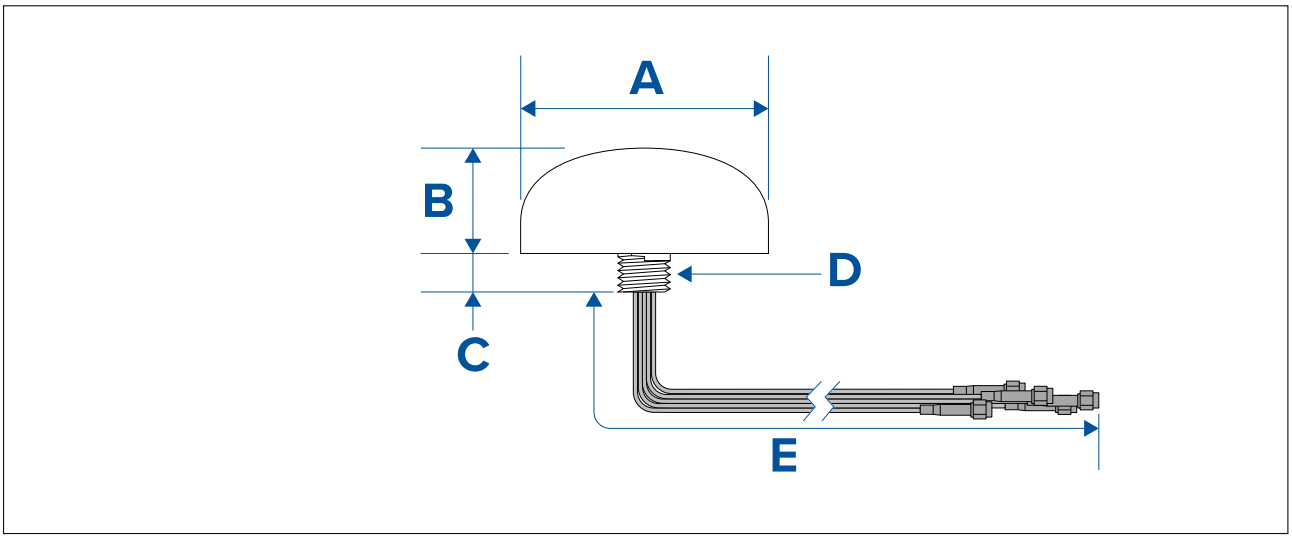
- In any area where it could be stepped on or tripped over.
- Up a mast. This will cause the antenna to swing and give significant errors in position data.
- In the direct path of a Radar beam.

# 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)

## 3.4 Smart antenna dimensions



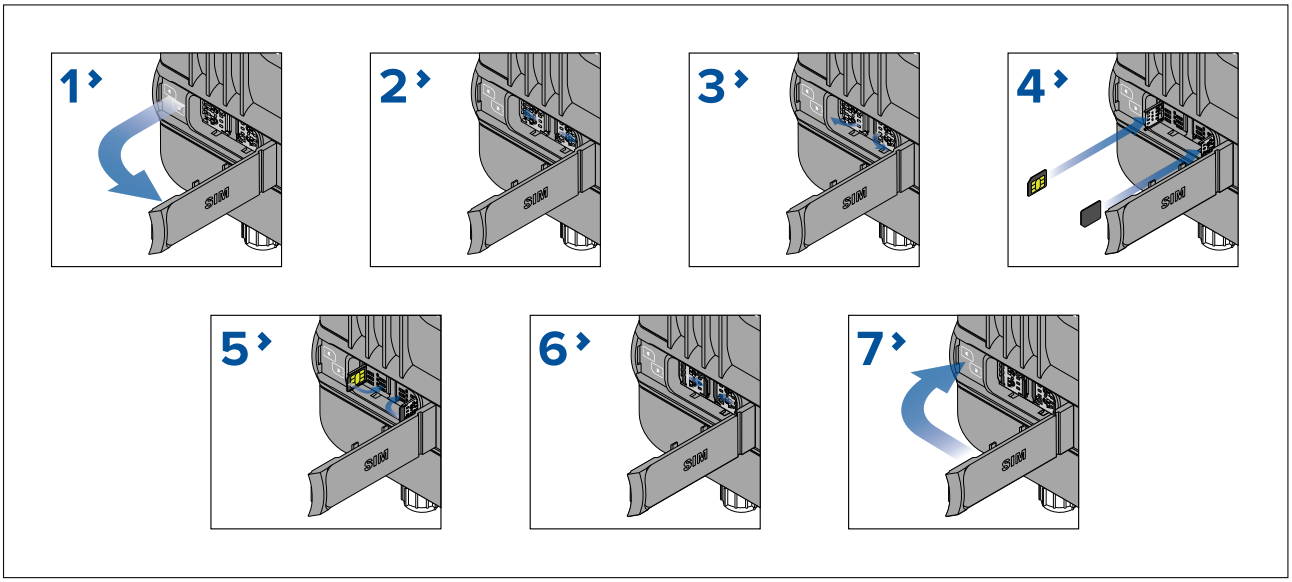

- **A** = Ø 102.90 mm (4.05 in)
- **B** = 43.50 mm (1.71 in)
- **C** = 16.00 mm (0.63 in)
- **D** = 7/8”-9 UNC thread
- **E** = 5 m (16.4 ft)

## 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).

**Note:**

The SIM card is not supplied with the YachtSense™ Link.




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.*

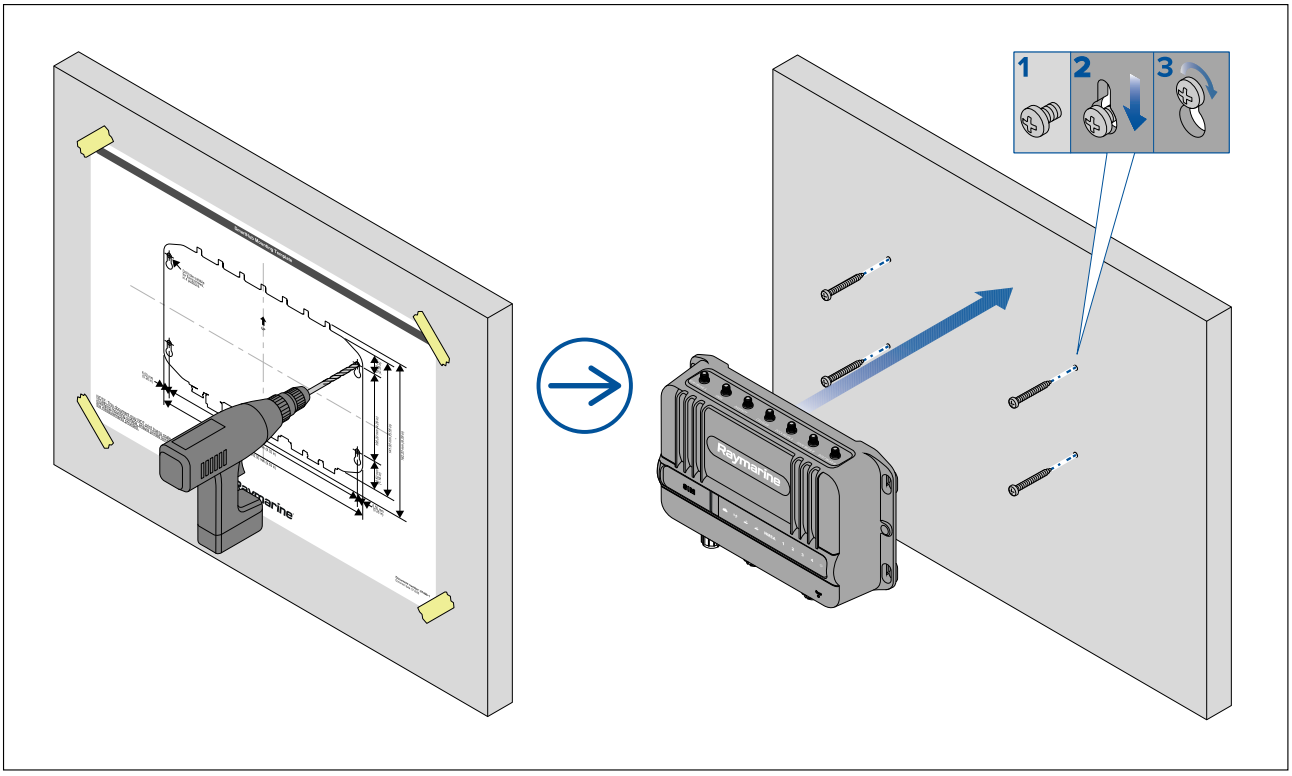
7. Close the SIM card door, ensuring that it is correctly seated.

## 3.6 Mounting the YachtSense™ Link

Follow the instructions below to mount the YachtSense™ Link.

Before mounting the product ensure that you have:

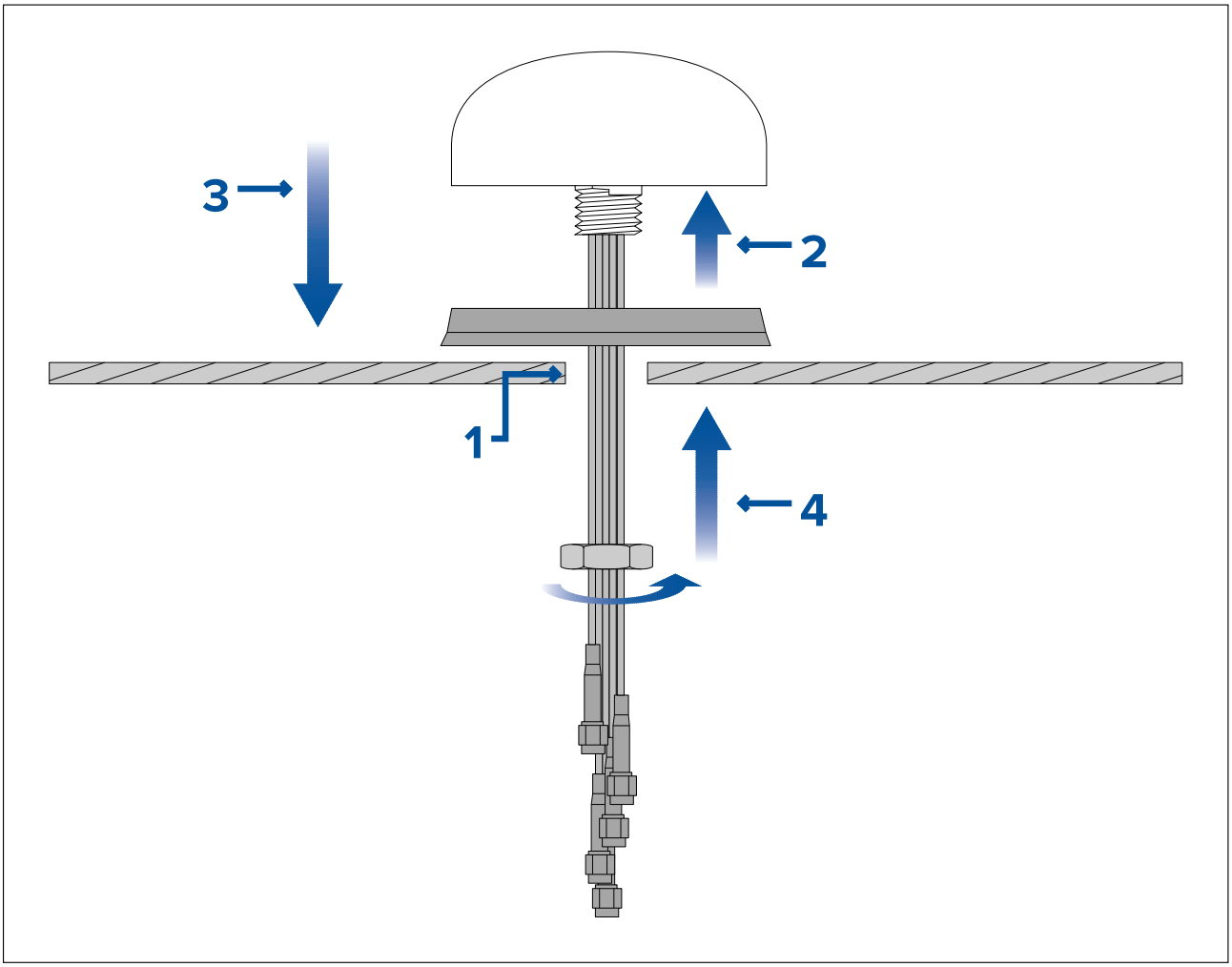
- selected a suitable location, based on the location requirements found in this document.
- identified the relevant cable connections and the route that the cables will take.




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 smart antenna

The supplied smart 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.




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 cable and thread through the gasket.
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 nut and secure the antenna by tightening the nut on the exposed antenna thread.

# 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.

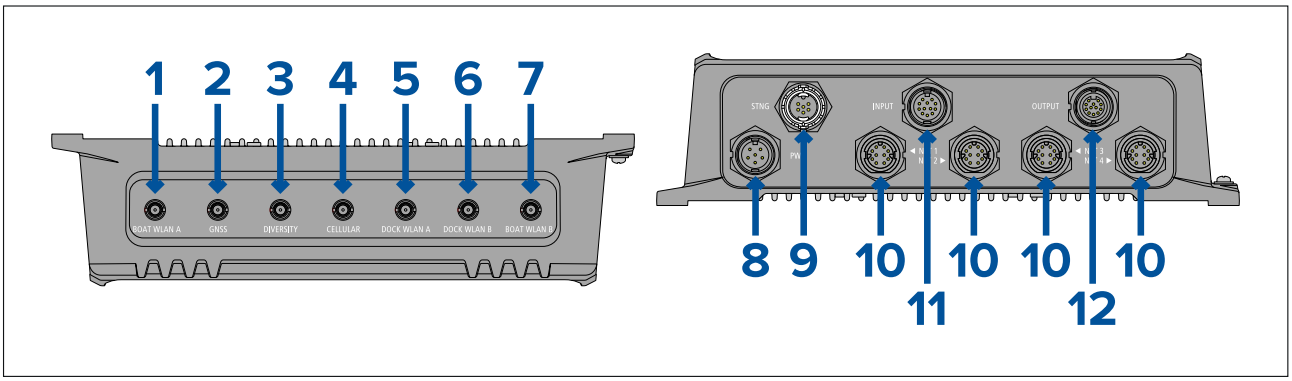
### Connecting cables

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 Connections overview

The YachtSense™ Link includes the following connections:

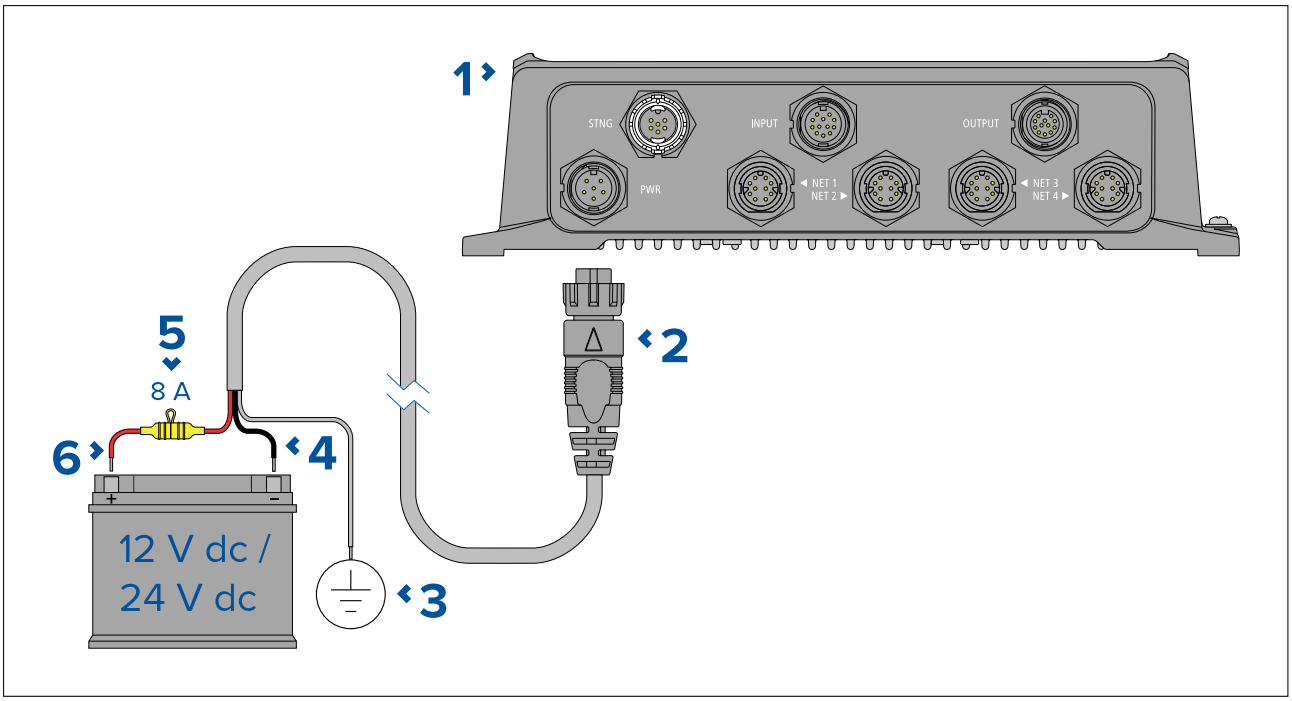



1. Boat WLAN A (Internal boat Wi-Fi antenna connection)
2. GNSS (GPS/GLONASS antenna connection)
3. Diversity (Secondary cellular antenna connection)
4. Cellular (Primary cellular antenna connection)
5. Dock WLAN A (External dock Wi-Fi antenna connection)
6. Dock WLAN B (External dock Wi-Fi antenna connection)
7. Boat WLAN B (Internal boat Wi-Fi antenna connection)

8. Power connection
9. SeaTalkng ® connection
10. RayNet connections
11. Input connections
12. Output connections

## 4.3 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. Ground wire connects to 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

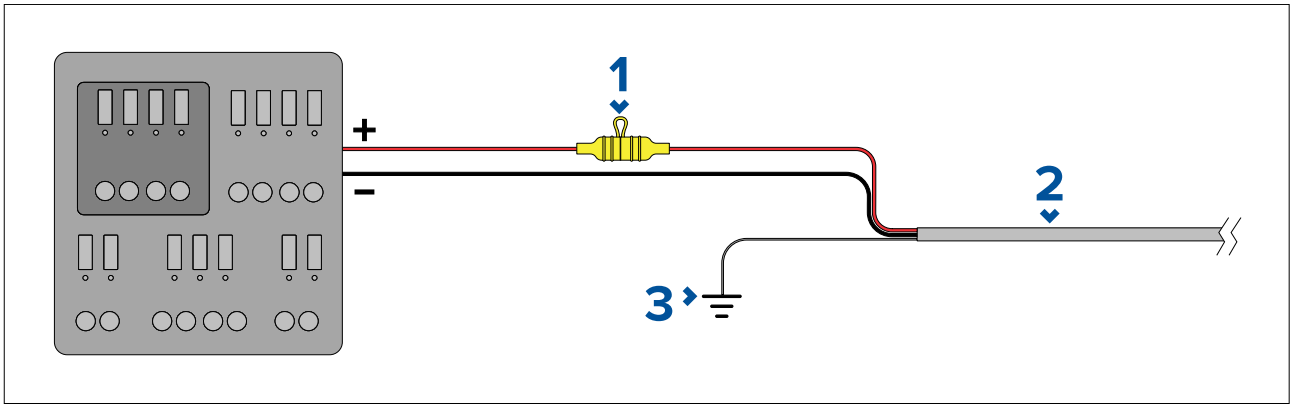
Recommendations and best practice.

- 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:**

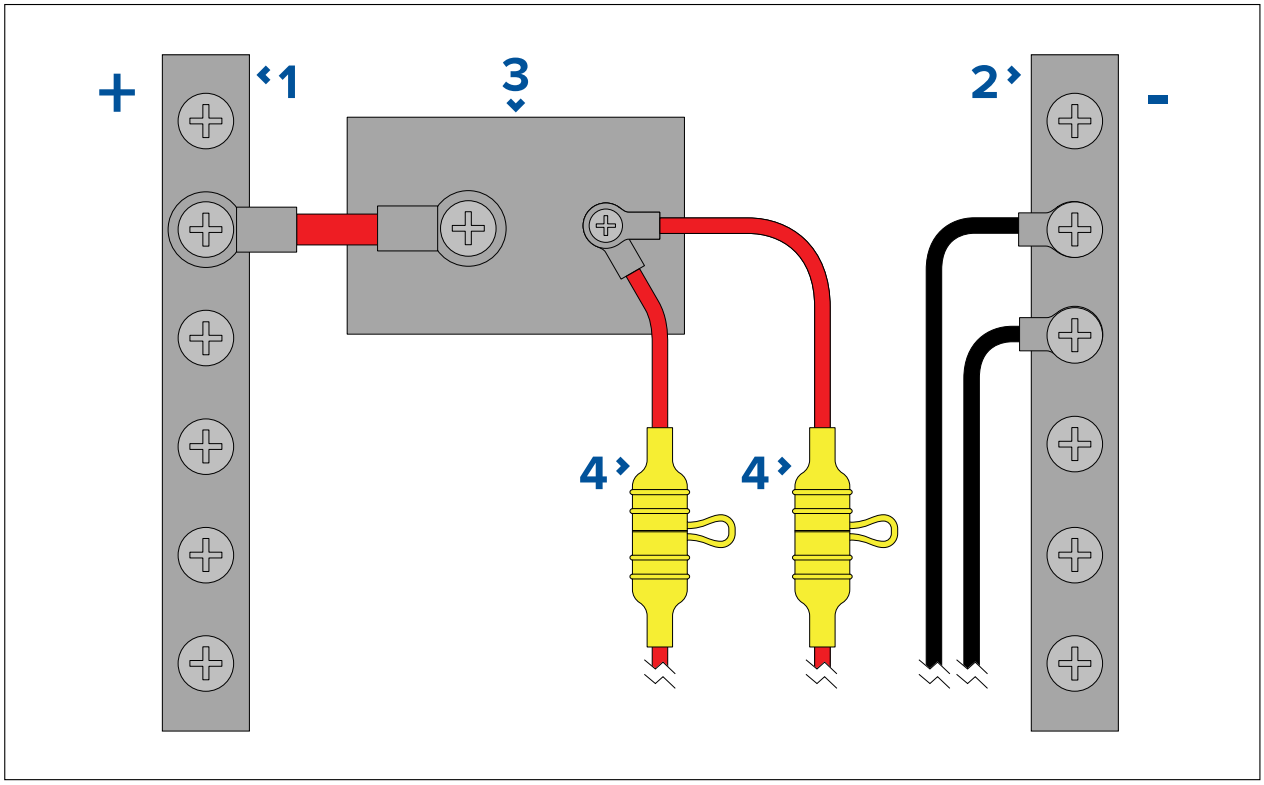
- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for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



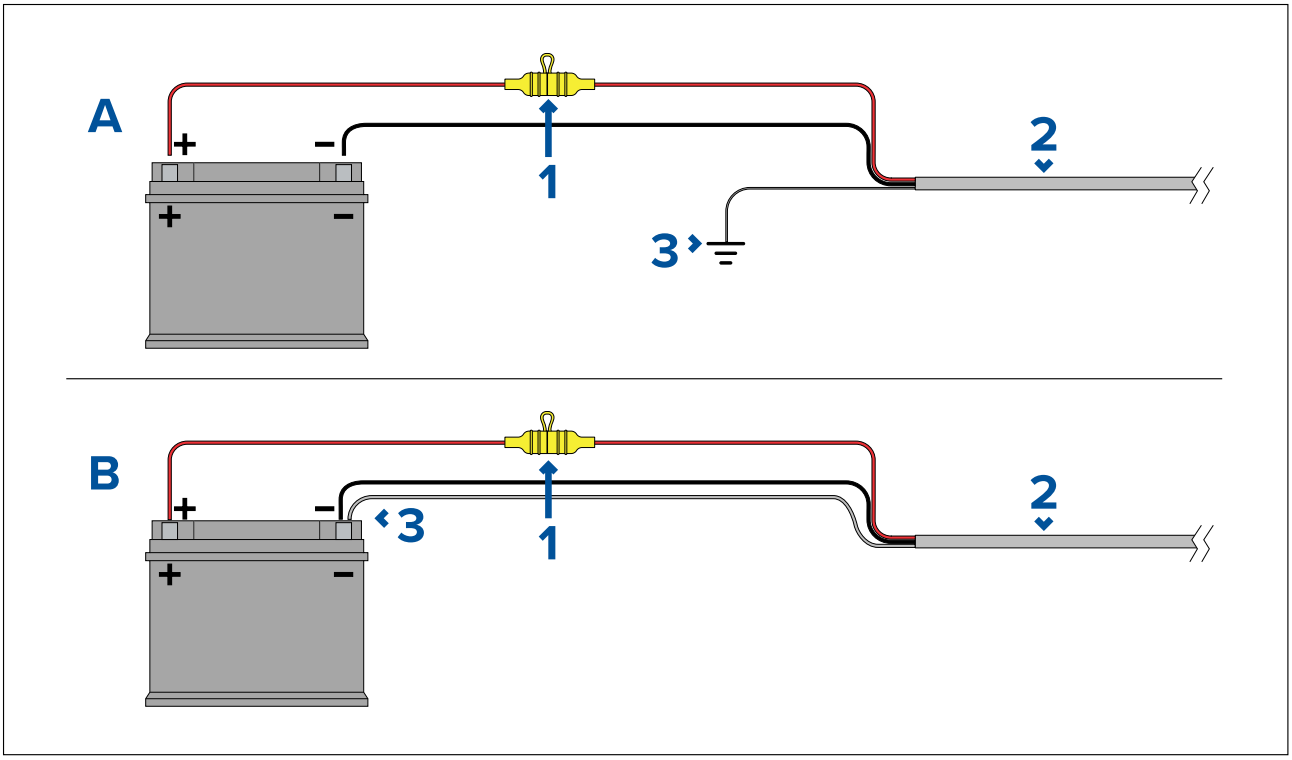

| | |
|---|---|
| 1 | Positive (+) bar |
| 2 | Negative (-) bar |
| 3 | Circuit breaker |
| 4 | Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *In-line fuse and thermal breaker ratings*. |

**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.

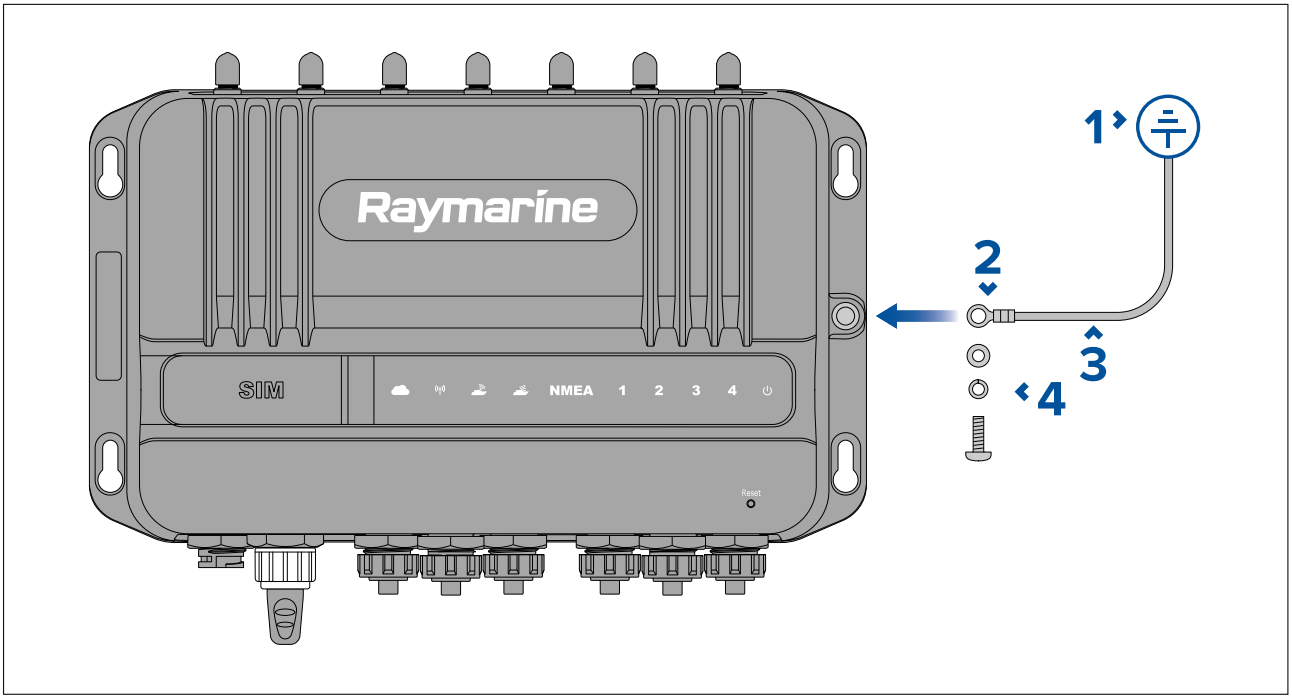
### Warning: Positive ground systems

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

## 4.4 Grounding connection

YachtSense™ Link includes a dedicated grounding point that must be connected to the vessel's RF ground.

The Grounding point must be connected to your vessel's RF ground; this is NOT an optional connection. Do NOT connect to any point that is connected to your vessel's 0 V Negative battery terminal.




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 fitted)

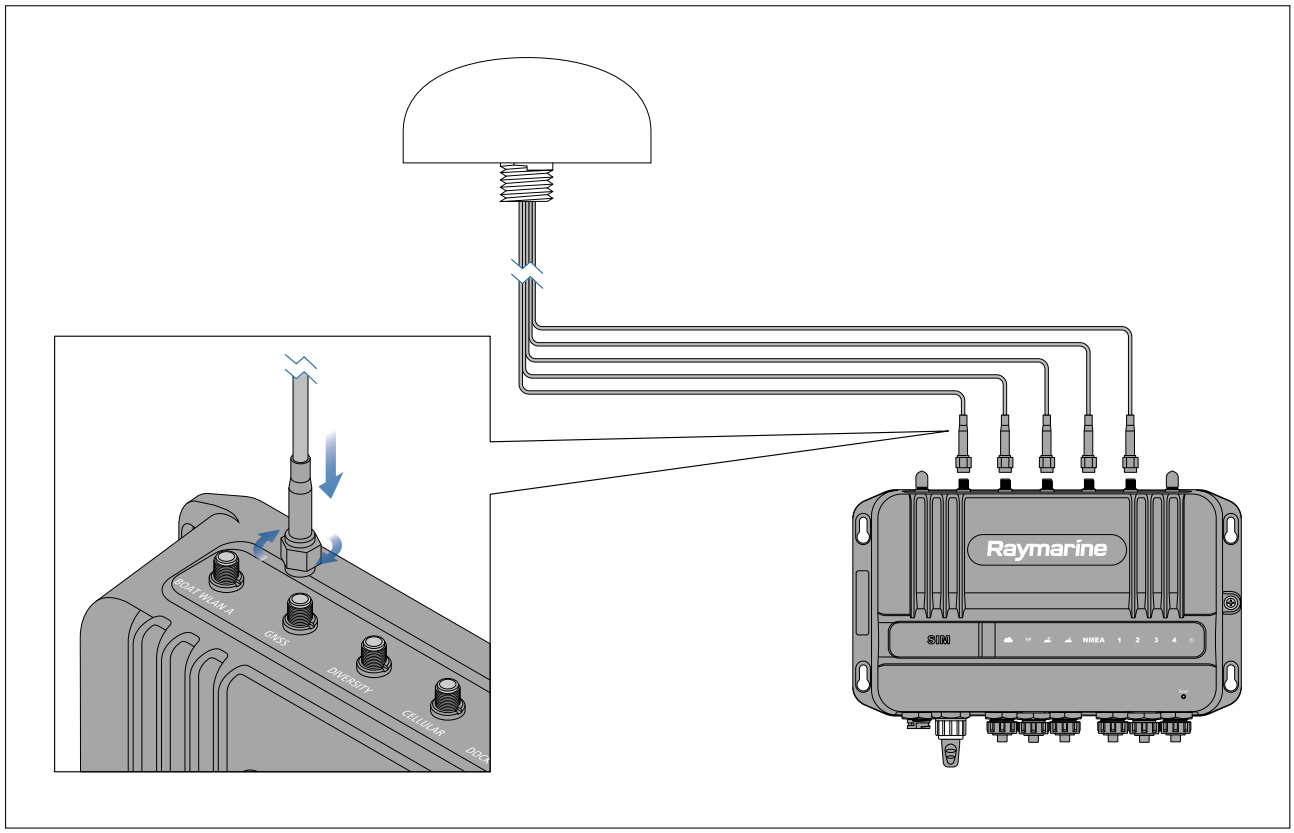
**Note:**

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

The grounding cable is connected using the M3 screw and washers that are supplied fitted to the grounding point.

## 4.5 Smart antenna connections

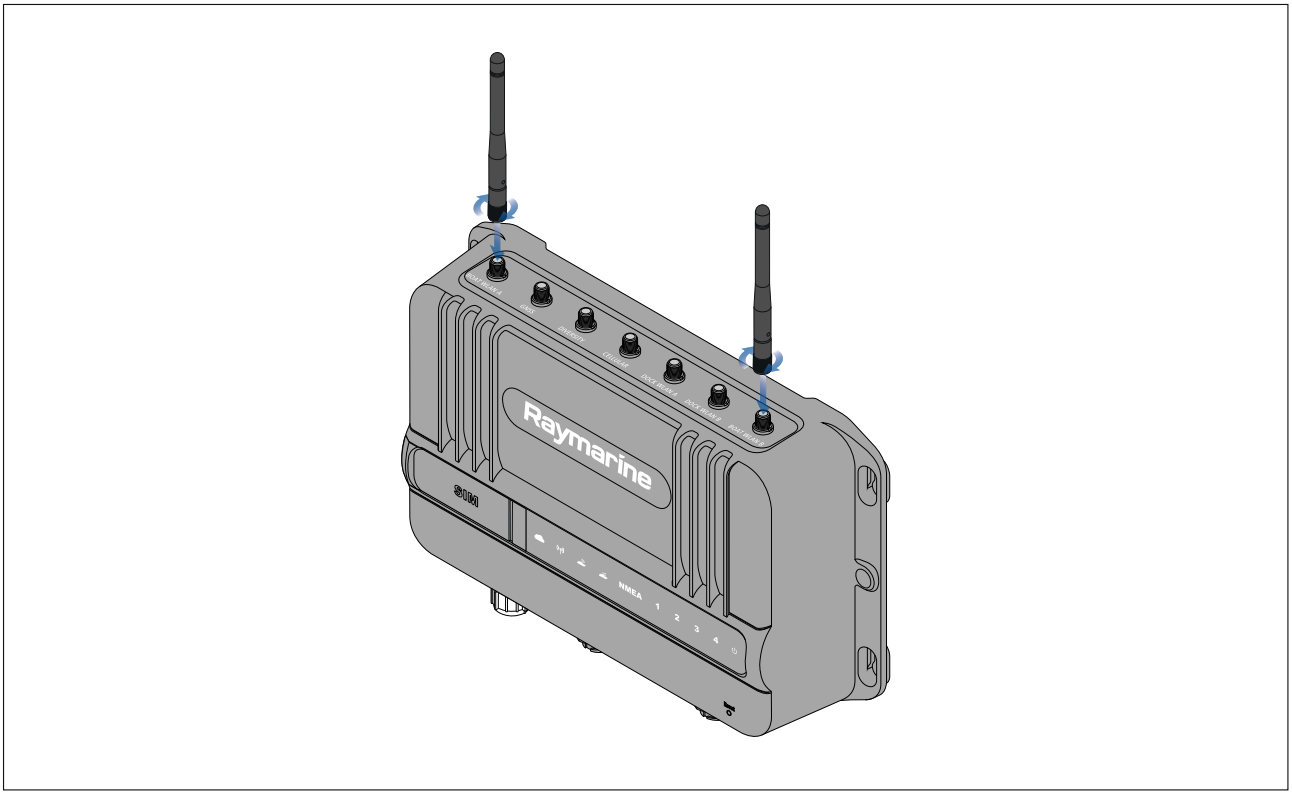
The supplied smart antenna is connected to the antenna connections on the top of the YachtSense™ Link.




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.

## 4.6 Boat Wi-Fi antenna connections

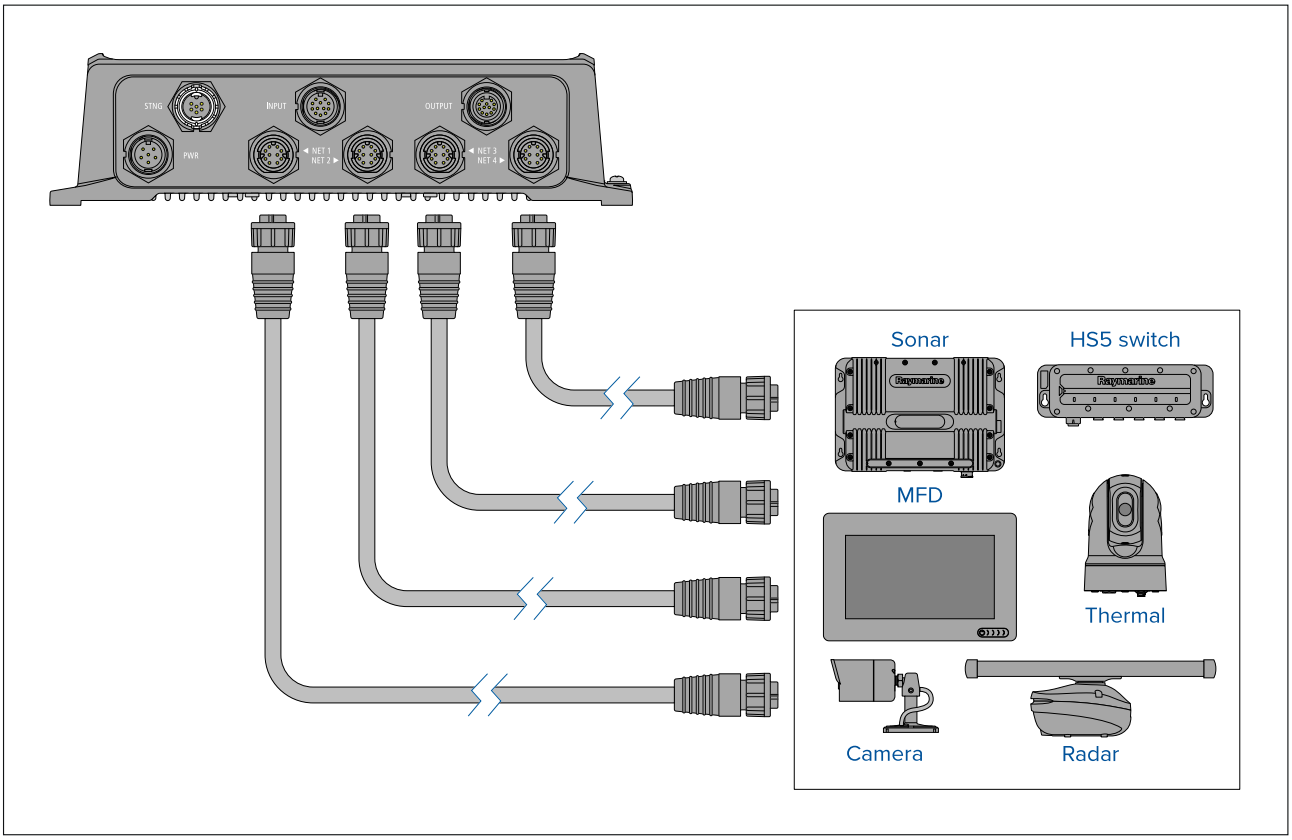
The supplied Wi-Fi antennas are connected to the **BOAT WLAN** connections on the top of the YachtSense™ Link.




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

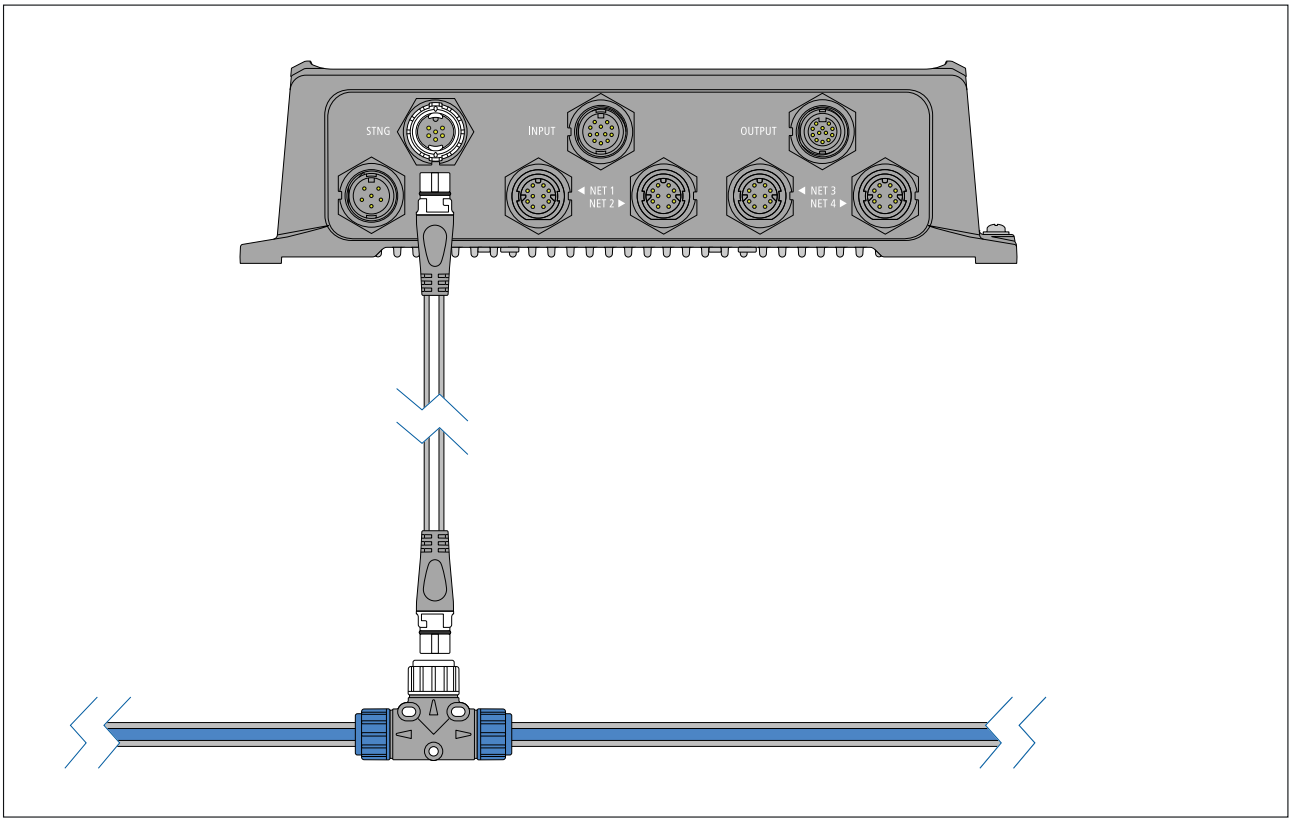
## 4.7 RayNet connections

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.



## 4.8 SeaTalkng  connection

The YachtSense™ Link cam be connected to SeaTalkng ® network using the SeaTalkng ® connections. Connection to SeaTalkng ® networks enables compatible data to be received and transmitted by the YachtSense™ Link. The SeaTalkng ® connection also enables communications with YachtSense™ Digital Control Systems.




**Note:**

SeaTalkng  networks require a dedicated 12 V dc power supply and are not supplied power via the YachtSense™ Link SeaTalkng  connection.

## 4.9 Input and output (I/O) connections

The YachtSense™ Link includes 4 digital input and 4 digital output channels.

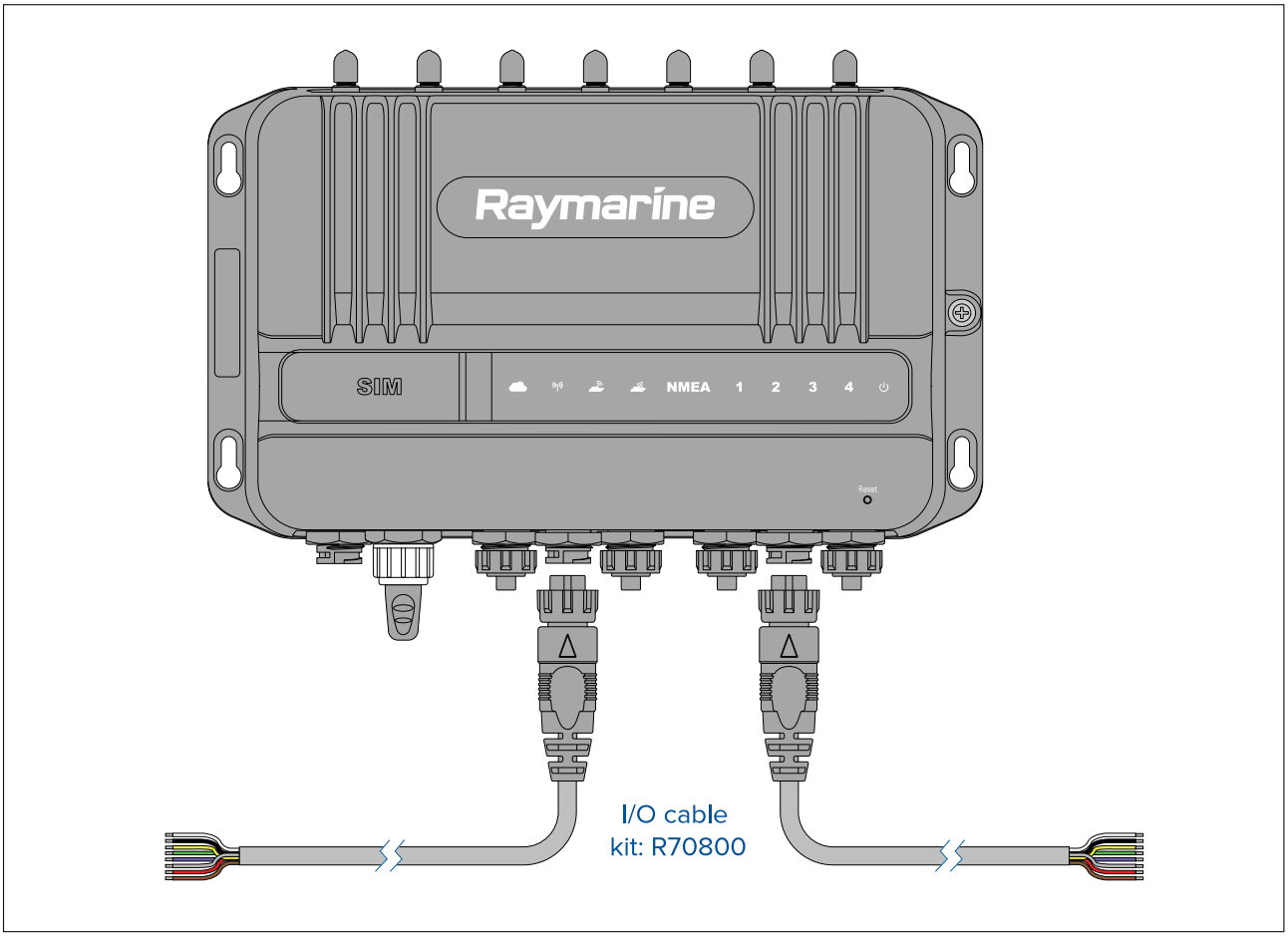
**Important:**

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

**Note:**

I/O cable kit: R70800 is required to enable connection of digital input and output devices.

The digital input sand outputs can be controlled from the YachtSense™ Link web interface.




**Input cable signal wires**

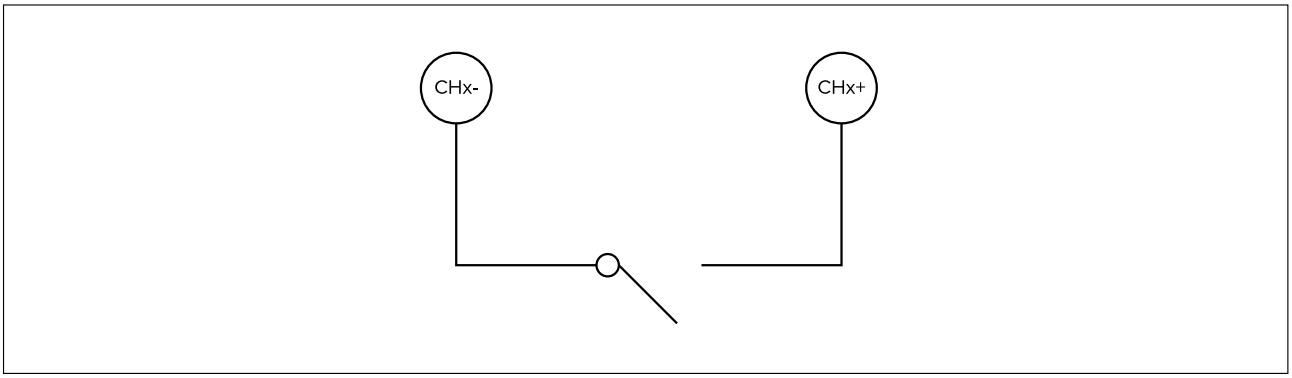
- White = Input 1 +
- Black = Input 1 -
- Yellow = Input 2+
- Green = Input 2-
- Purple = Input 3+
- Gray = Input 3-
- Red = Input 4 +
- Brown = Input 4-

**Output cable signal wires**

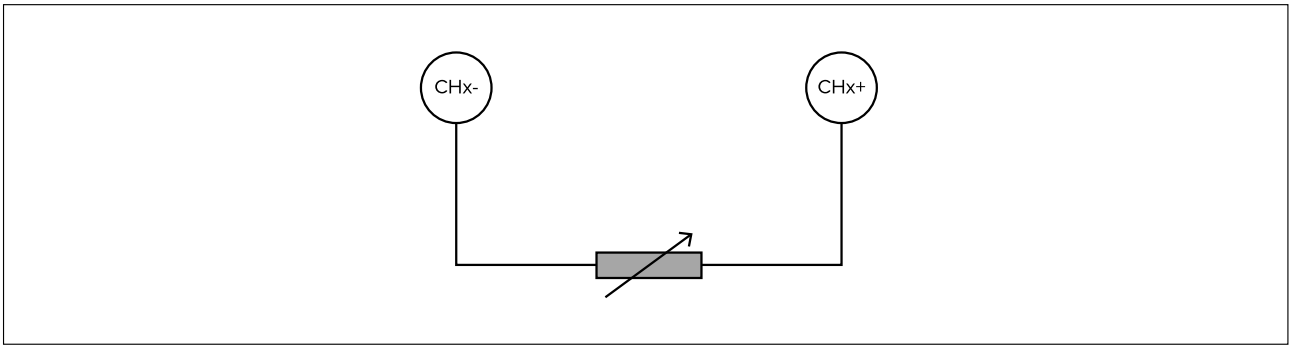
- White = Output 1 No terminal
- Black = Output 1 Common terminal
- Yellow = Output 2 No terminal
- Green = Output 2 Common terminal
- Purple = Output 3 No terminal
- Gray = Output 3 Common terminal
- Red = Output 4 No terminal
- Brown = Output 4 Common terminal

## Example connections

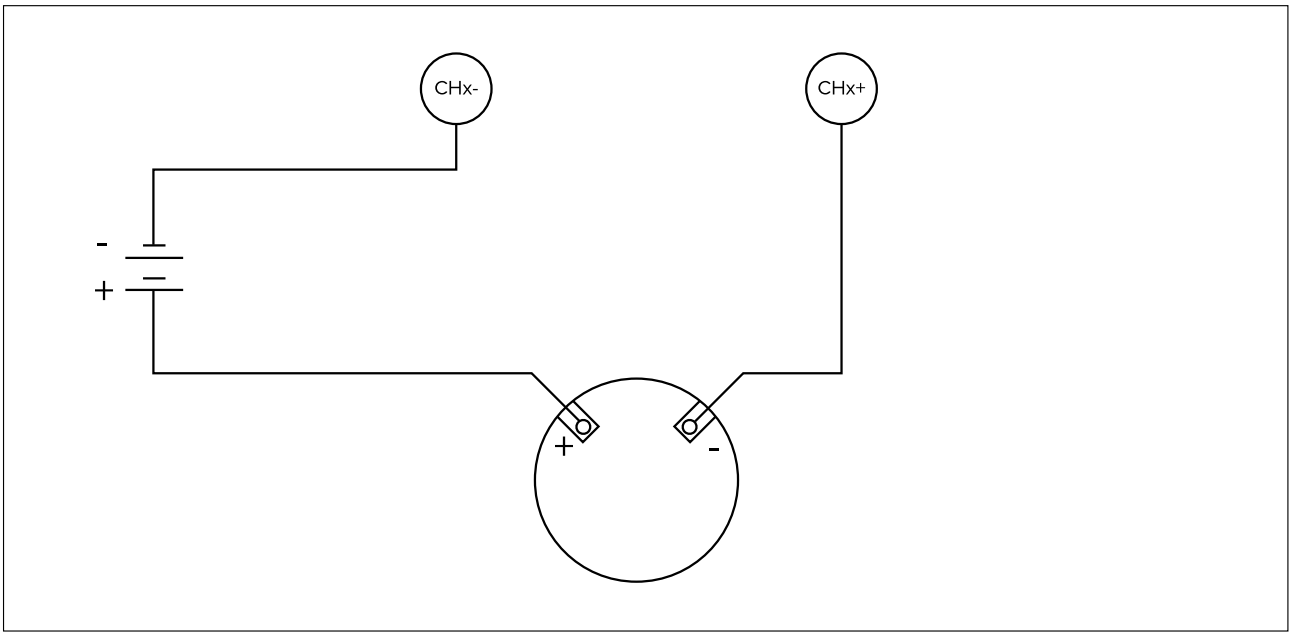
### Example — Switch (Digital input)



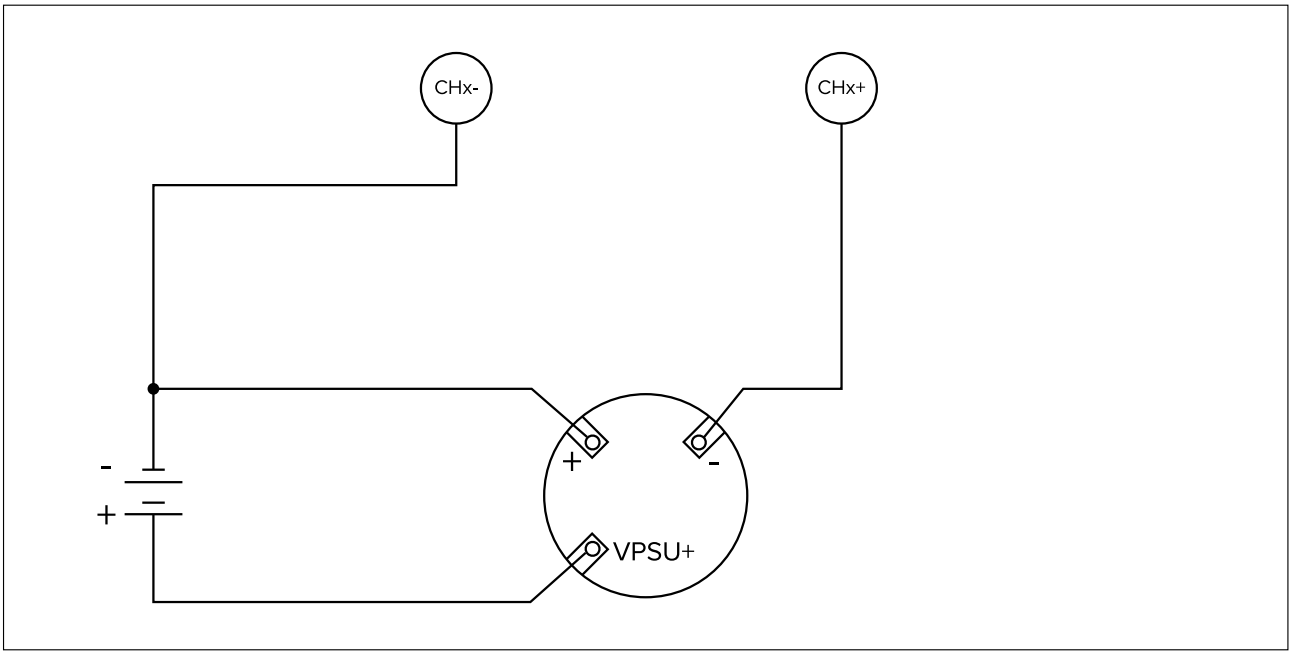

### Example — Resistive sensor (Analog input )



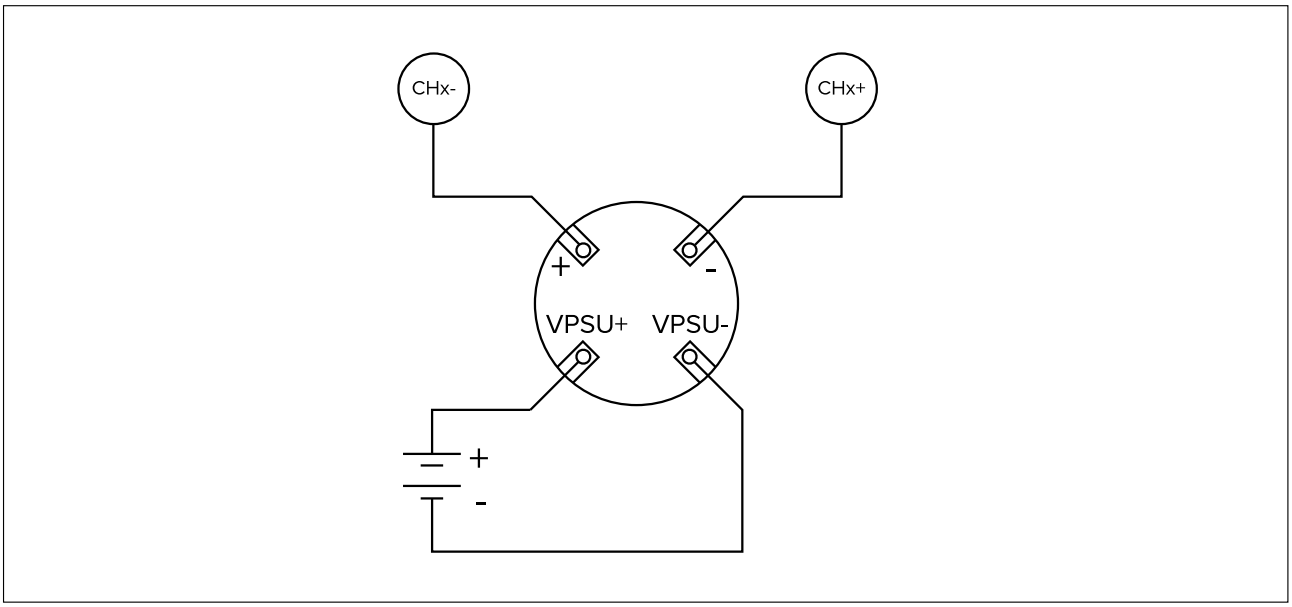

### Example — 2 wire 4–20 mA sensors



**Example — 3-wire 4–20 mA sensors**




**Example — 4 wire 4–20 mA sensors**



# Chapter 5: Operations

## Chapter contents

# 5.1 Getting started

## 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 or wireless connection.

**Important:**

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

To access the web interface using a wired connection follow the steps below:

1. Ensure the Router has been supplied power following the supplied power connection details. **p.25 — 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 the Router's default IP address into your web browser's address bar and press **Enter**/**Return**..

   *The default IP address assigned to the Router is 198.18.248.1.*

7. Enter the username (default username is 'admin').
8. Enter the password (default password can be found on the product label located on the left side of the Router).
9. Click **login**.

The Home page is displayed.

# 5.2 Home page

Once you have logged in to the Router's web interface the Home page is displayed.

The home page provides information on the status of your Router's network connections.

- The **Cloud** status identifies when the Router has an active connection to the Raymarine cloud service.
- The **WLAN** section shows the status of the external wireless network connection (e.g.: connection to marina WLAN) and the name of the network.
- The **Mobile network** section provides connection details and information of the cellular connection for the active SIM card, including:
  - **Status** — Shows the connection status for the cellular connection.
  - **IMSI** — IMSI (International Mobile Subscriber Identity) number, technically known as ICCID (Integrated Circuit Card Identifier) is your SIM card's unique identification number
  - **PLMN** — PLMN.(Public Land Mobile Network) number is a unique code that identifies your cellular operator and their country.
  - **CSQ** — CSQ (Cell Signal Quality) number is a signal quality indicator.
- **Router access point** — provides status and name of the router's access point (i.e.: internal boat WLAN network).

The Home page also identifies the number of devices connected to the Router's access point (internal WLAN) and wired network (devices connected to the Router's 4 x RayNet ports).

# 5.3 Set-up wizard page

The set-up wizard page guides you through the necessary settings to set up your wireless network connections.

The first page allows you to connected to a wireless network, such as the WLAN provided by marinas which enables the router and devices connected to it to connected to the internet.

The second page allows you to configure the router's access point name and password to enable your wireless devices, such as smart phones and tablets to connect to the router.

## 5.4 Basic settings

The basic settings provides access to settings for WLAN, Mobile data (Cellular) and the Router's wireless access point. The Basic settings option also provides access to product information.

Selecting the headings under Basic settings will take you to the relevant settings page.

- **Wireless network** — Thew Wireless network page allows you to:
  - Switch the Router's external WLAN on and off using the **Wireless:** toggle switch.
  - Connect to an available wireless network, such as the WLAN provided by marinas which enables the router and devices connected to it to connected to the internet. You can also connect to a network manually by selecting **Add network** and entering the networks connection details.
- **Mobile data** — The Mobile data page provides access to settings related to the cellular connection, SIM management and mobile data usage statistics.
  - **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.
  - **Advanced > Data usage** — Allows you to view data usage statistics and set data limits for your mobile data.
  - **Advanced > SIM management** — Allows you to select which SIM card is in use and to assign rules for automatically switching between SIM cards.
  - **SIM1 / SIM2** — By selecting SIM1 or SIM2 you can view details for your SIM card(s) and allows you to set up SIM locks.
- **Access point** — The Access point page allows you to:
  - Switch the Router's internal WLAN on and off.
  - Set up the access point's connection settings so that your wireless devices can connect to the router and use its internet connection. Access point Settings:
    - **Access point name** — This is the name of the network that you should connect your mobile devices too.
    - **Password** — This is the password that needs to be entered when connecting your mobile device(s).
    - **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.
    - **Preferred WLAN channel** — Allows you to select your preferred WLAN channel. Interference can occur in areas were many WLAN networks are using the same channel, moving to a less used channel should eliminate this interference.
    - **Encryption type** — Allows selection of the type of encryption used, WPA2–PSA is the default and recommended encryption type.

**Note:** If the encryption type is changed to **No encryption** anyone within range will be able to connect to the router.

- **Info** — The Info page provides Router hardware and software information including:
  - Model
  - Software version
  - Serial number
  - IMEI number
  - Voltage and current draw
  - Temperature
  - Operating hours
  - MAC addresses

## 5.5 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

## 5.6 Advanced settings

- **LAN configuration** — Provides settings for the wired (RayNet) network:
  - **Configure IP** — Allows you to decide how LAN network IP addresses are assigned.

**Note:** For correct operation with Raymarine MFDs ensure that Configure IP is set to Automatic (DHCP on).

    - 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.

- **WLAN configuration** — Provides settings for the wireless (WLAN) network:
  - Manually — This setting allows you to manually configure the Router's WLAN IP address, subnet mask and default gateway and specify the IP address range available.
  - Automatically — This is the recommended setting which allows IP addresses to be automatically assigned to wireless devices connecting to the Router.
- **GNSS** — Provides settings related to the Router's internal GNSS (GPS) receiver.
  - **GNSS fix status** — Provides position fix status.
  - **Internal GNSS** — Enables the internal receiver to be switched on and off.
  - **Restart GNSS** — Reboots the internal GNSS receiver.
  - **GNSS Constellations** — enable use of GLONASS and Beidou GNSS constellation (in addition to the GPS constellations.
  - **Differential positioning** — Enable use of differential positioning satellites which enhances your position fix.
  - **Differential positioning systems** — Allows selection specific of differential systems.
  - Satellites in use — Provides details of the satellites being used for positioning.
- **Inputs & Outputs** — Allows management of devices connected to the Router's input and output connections.
  - **Channels monitoring** — This page provides monitoring details of connected input and output devices.
  - **Channels configuration**— This page allows configuration of connected input and output devices.
  - **Alert notifications** — This page allows configuration of alert notifications of connected input and output devices.
- **Software upgrade** — Upload and install new Router software.
- **Restart & factory reset** — Reboot Router or perform a factory reset.

- **Admin password** — Change the password required to access the Router's web pages.

## 5.7 Help

Provides access to the help pages and online user manual.

# Chapter 6: Troubleshooting

## Chapter contents

## 6.1 Troubleshooting

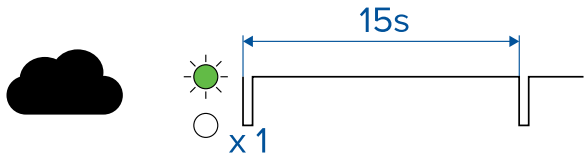
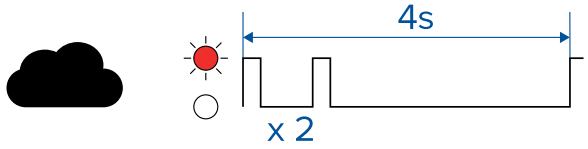
The troubleshooting information provides possible causes and corrective action required for common problems associated with installation and operation of your product.

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 in order to restore normal operation.

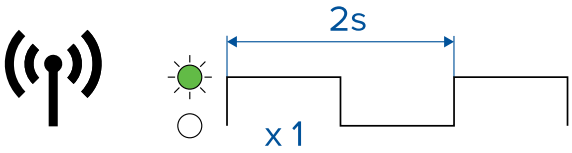
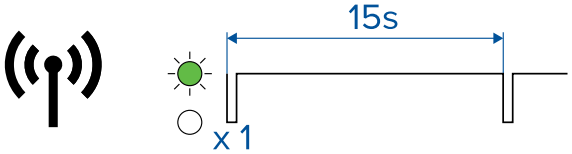
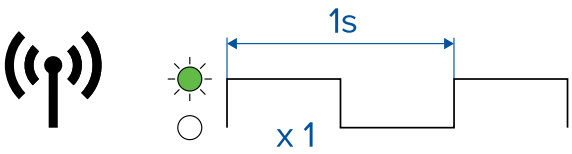
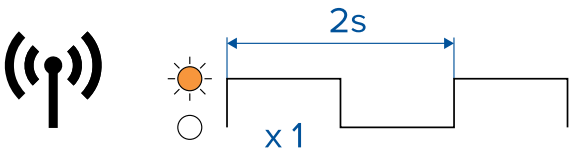
If after referring to this section you are still having problems with your product, please refer to the Technical support section of this manual for useful links and Raymarine Product Support contact details.

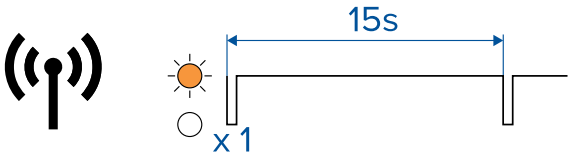
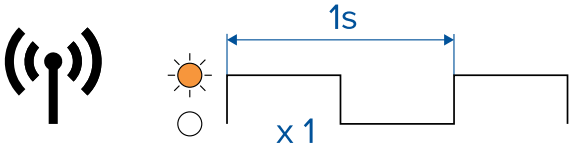
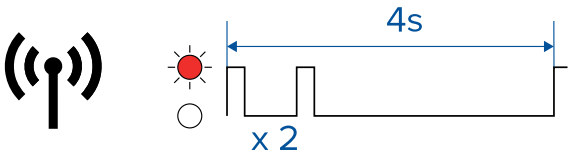
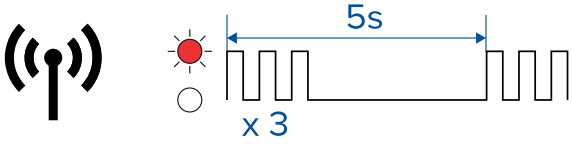
## 6.2 LED diagnostics

**Cloud LED diagnostics**

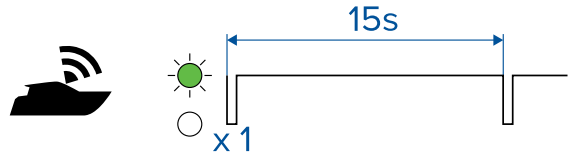
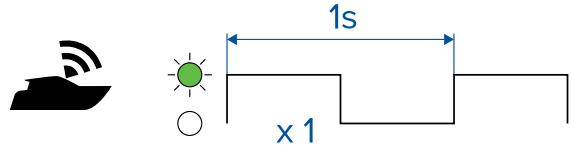
| | |
|---|---|
|  | (Green) Connected to cloud service. |
|  | (Red) Connection error / server not found. |

**2G/3G/4G (Cellular) LED diagnostics**

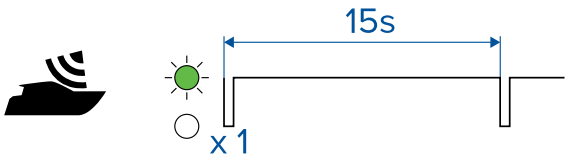
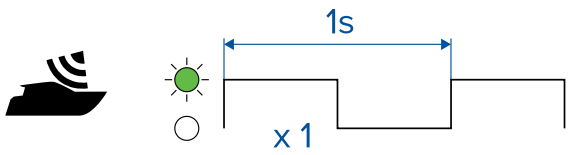
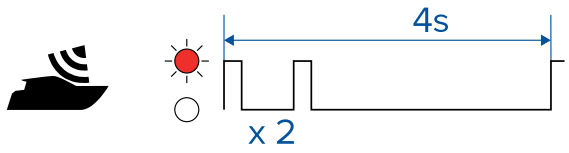
| | |
|---|---|
|  | (Green) Connecting to 4G. |
|  | (Green) Connected to 4G. |
|  | (Green) Connected to 4G and transmitting data. |
|  | (Amber) Connecting to 2G/3G. |

| | |
|---|---|
|  | (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. |

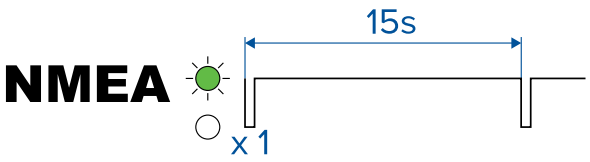
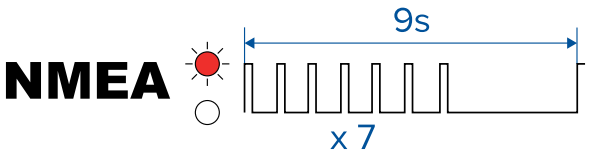
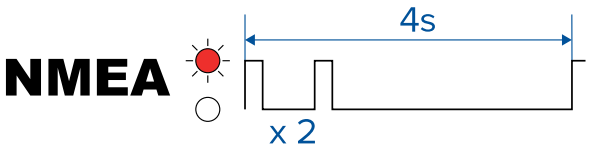
**Boat WLAN LED diagnostics**

| | |
|---|---|
|  | (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. |

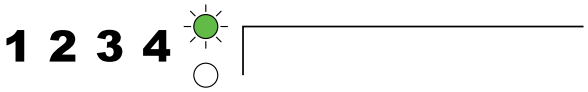
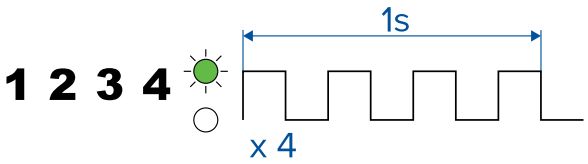
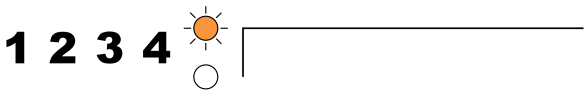
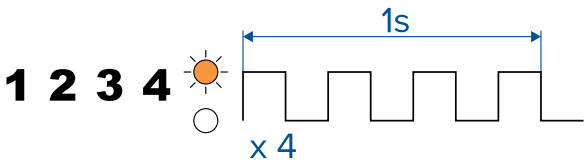
### Dock WLAN LED diagnostics

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

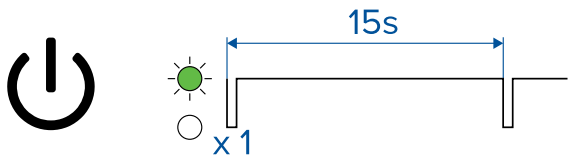
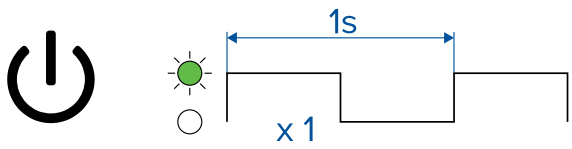
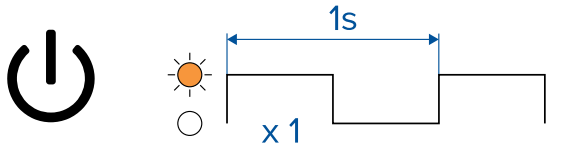
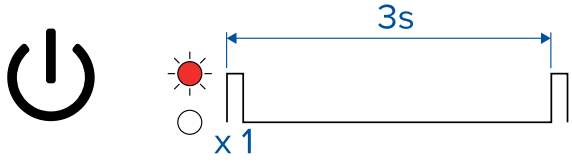
### NMEA 2000 / SeaTalkng LED diagnostics

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

**SaeTalkhs LED diagnostics**

| | |
|---|---|
|  | (Green) Port connected 1,000 Mbits |
|  | (Green) Port connected 1,000 Mbits transferring data. |
|  | (Amber) Port connected 10/100 Mbits |
|  | (Amber) Port connected 10/100 Mbits transferring data. |

**Power LED diagnostics**

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

# 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

**LightHouse™ 3 tips and tricks:**

- Raymarine website

**Video Gallery:**

- Raymarine website

**Note:**

- Viewing the videos requires a device with an Internet connection.
- Some videos are only available in English.

### Training courses

Raymarine regularly runs a range of in-depth training courses to help you make the most of your products. Visit the Training section of the Raymarine website for more information:

- http://www.raymarine.co.uk/view/?id=2372

### Technical support forum

You can use the Technical support forum to ask a technical question about a Raymarine product or to find out how other customers are using their Raymarine equipment. The resource is regularly updated with contributions from Raymarine customers and staff:

- http://forum.raymarine.com

# 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 |

## Wireless networks specification

| | |
|---|---|
| Dock WLAN: | WLAN frequencies:<br>• 2.4 GHz: 802.11b/g/n<br>• 5 GHz: 802.11a/n/ac<br>• 802.11n: 20/40 MHz, 2x2 MIMO, MCS0 to MCS15<br>• 802.11ac: 20/40/80 MHz, 2x2 MIMO, MCS0 to MCS9 |
| Boat WLAN: | WLAN frequencies:<br>• 2.4GHz: 802.11b/g/n<br>• 802.11n: 20/40 MHz, 2x2 MIMO, MCS0 to MCS15 |
| Cellular: | 2G/3G/4G frequencies:<br>• LTE-FDD: B1/B2/B3/B4/B5/B7/B8/B12/B13/B18/B19/B20/B25/B26/B28<br>• LTE-TDD: B38/B39/B40/B41<br>• WCDMA: B1/B2/B4/B5/B6/B8/B19<br>• GSM: B2/B3/B5/B8 |

# Chapter 10: Spares and accessories

## Chapter contents

## 10.1 Spares and Accessories

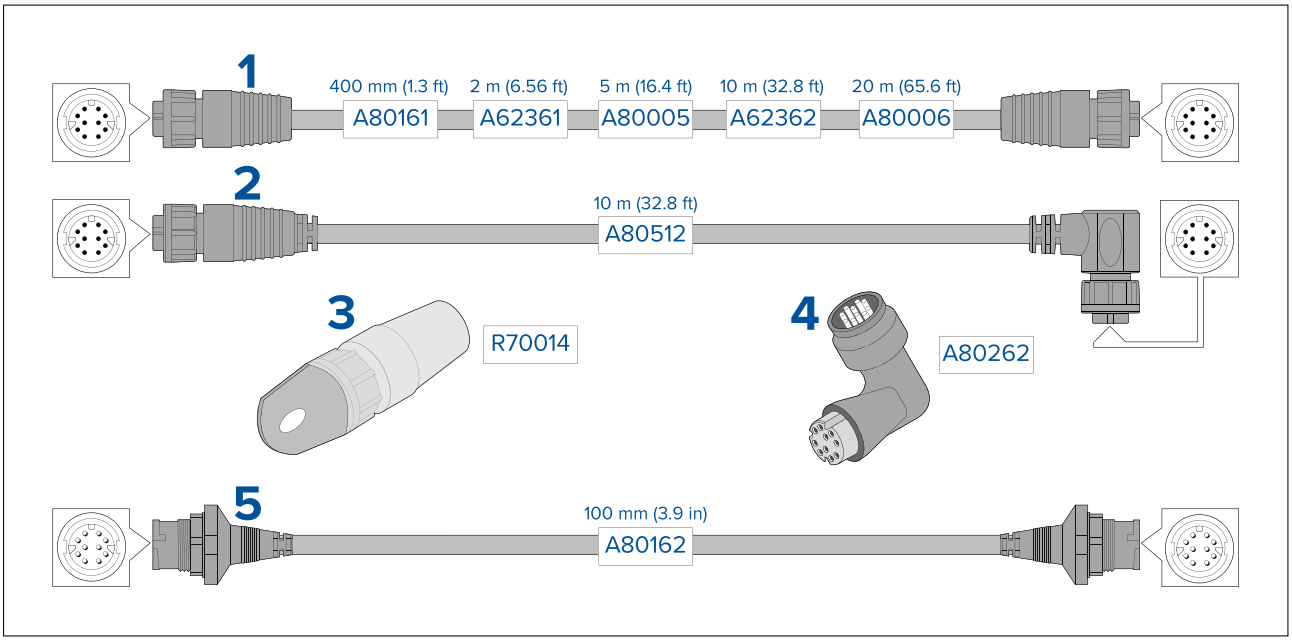
**Accessories**

| | |
|---|---|
| R70800 | YachtSense Link I/O cable kit |

**Spares**

| | |
|---|---|
| R70799 | YachtSense Link power cable 1.5 m (4.9 ft) with 8 A fitted fuse |
| R70837 | Smart antenna |
| 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**
  - 1 x 5 Way connector (**A06064**)
  - 2 x Backbone terminator (**A06031**)
  - 1 x 3 m (9.8 ft) spur cable (**A06040**)
  - 1 x Power cable (**A06049**)
- **Backbone Kit — A25062**
  - 2 x 5 m (16.4 ft) Backbone cable (**A06036**)
  - 1 x 20 m (65.6 ft) Backbone cable (**A06037**)
  - 4 x T-piece (**A06028**)
  - 2 x Backbone terminator (**A06031**)
  - 1 x Power cable (**A06049**)
- **SeaTalk  to SeaTalkng ® converter kit — E22158**
  - SeaTalk  to SeaTalkng ® converter.
  - 1 x Power cable (**A06049**)
  - 2 x Backbone terminator (**A06031**)
  - 2 x Spur blanking plug (**A06032**)
  - 1 x 3 m (9.8 ft) spur cable (**A06040**)
  - SeaTalk  to SeaTalkng ® spur cable 1 m (3.3 ft) (**A22164**)

### SeaTalkng  spur cables and connectors

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

**Cables:**

- Spur cable 0.4 m (1.3 ft) — **A06038**
- Spur cable 1 m (3.3 ft) — **A06039**
- Spur cable 3 m (9.8 ft) — **A06040**
- Spur cable 5 m (16.4 ft) — **A06041**
- Elbow spur cable 0.4 m (1.3 ft) — **A06042**
- SeaTalkng ® to bare wire spur cable 1 m (3.3 ft) — **A06043**
- SeaTalkng ® to bare wire spur cable 3 m (9.8 ft) — **A06044**
- ACU / SPX SeaTalkng ® spur cable 0.3 m (1.0 ft) — **R12112**

**Connectors**

- Right angled (90°) spur connector — **A06077**

### SeaTalkng  backbone cables and connectors

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

**Cables:**

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

**Connectors:**

- Terminator  — **A06031**
- T-piece (1 x spur connection) — **A06028**

- 5–way connector block (3 x spur connections) — **A06064**
- Backbone extender — **A06030**
- Spur blanking plug — **A06032**
- Inline terminator — **A80001** — Provides direct connection of a spur cable to the end of a backbone cable. No T-piece required.

## SeaTalkng power cables

SeaTalkng power cables are used to provide the backbone and connected devices with power.

- SeaTalkng Power cable 1 m (3.3 ft) — **A06049**

## DeviceNet power cables

DeviceNet power cables are used to provide the backbone and connected devices with power.

- DeviceNet Power cable 2 m (6.6 ft) — **A80692**

## SeaTalk to SeaTalkng adaptor cables

SeaTalk to SeaTalkng adaptor cables enable connection of older SeaTalk product to the SeaTalkng backbone, alternatively they can be used to connect SeaTalkng product to older SeaTalk networks.

- SeaTalk (3 pin) to SeaTalkng ® adaptor cable 0.4 m (1.3 ft) — **A06047**
- SeaTalk to SeaTalkng ® spur cable 1 m (3.3 ft) — **A22164**
- SeaTalk2 (5 pin) to SeaTalkng ® adaptor cable 0.4 m (1.3 ft) — **A06048**

## DeviceNet to SeaTalkng adaptor cables

DeviceNet to SeaTalkng adaptor cables enable connection of products that use the NMEA 2000 DeviceNet connector to the SeaTalkng backbone, alternatively they can be used to connect a SeaTalkng product to an NMEA 2000 DeviceNet backbone.

- SeaTalkng ® to DeviceNet (Female) adaptor cable 0.4 m (1.3 ft) — **A06045**
- SeaTalkng ® to DeviceNet (Male) adaptor cable 0.4 m (1.3 ft) — **A80674**
- SeaTalkng ® to DeviceNet (Female) adaptor cable 1 m (3.3 ft) — **A06075**
- SeaTalkng ® to DeviceNet (Male) adaptor cable 1.5 m (4.92 ft) — **A06046**
- SeaTalkng ® to DeviceNet (Male) adaptor cable 1 m (3.3 ft) — **A06076**
- SeaTalkng ® to DeviceNet (Male) adaptor cable 0.1 m (0.33 ft) — **A06078**
- SeaTalkng ® to DeviceNet (Female) right-angled adaptor (this is an adaptor plug only; not a cable) — **A06084**
- DeviceNet (Female) to bare wires adaptor cable (0.4 m (1.3 ft) — **E05026**
- DeviceNet (Male) to bare wires adaptor cable (0.4 m (1.3 ft) — **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**

- **126992** — System time (Receive)
- **127250** — Vessel heading (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)
- **127501** — Binary status report (Receive/Transmit)
- **127502** — Switch bank control (Receive/Transmit)
- **127503** — AC input status DEPRECATED (Receive)
- **127504** — AC output status DEPRECATED (Receive)
- **127505** — Fluid level (Receive/Transmit)
- **127506** — DC detailed status (Receive)
- **127507** — Charger status DEPRECATED (Receive)
- **127508** — Battery status (Receive)
- **127509** — Inverter status DEPRECATED (Receive)
- **128267** — Water depth (Receive)
- **129029** — GNSS position data (Receive)
- **129033** — Local time offset (Receive)
- **129044** — Datum (Receive)
- **130306** — Wind data (Receive)
- **130310** — Environmental parameters DEPRECATED (Receive)
- **130311** — Environmental parameters DEPRECATED (Receive)
- **130312** — Temperature DEPRECATED (Receive/Transmit)
- **130313** — Humidity (Receive)
- **130314** — Actual pressure (Receive)
- **130576** — Trim ab status (Receive)

# Index

## M



## N



## P



## R



## S



## T



## V



## W

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