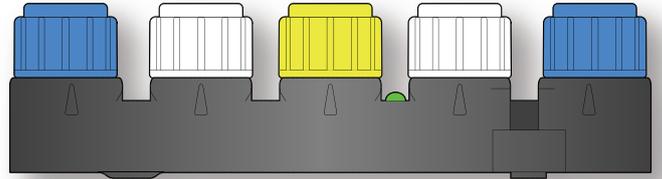


# NMEA 0183 to SeaTalk<sup>ng</sup><sup>®</sup> converter



## Installation instructions

### English

Date: 06-2015

Document number: 87256-1-EN

© 2015 Raymarine UK Limited



## **Trademark and patents notice**

**Raymarine, Tacktick, Clear Pulse, Truzoom, HSB, SeaTalk, SeaTalk<sup>hs</sup>, SeaTalk<sup>ng</sup>, Micronet, Raytech, Gear Up, Marine Shield, Seahawk, Autohelm, Automagic, and Visionality** are registered or claimed trademarks of Raymarine Belgium.

**FLIR, DownVision, SideVision, Dragonfly, Instalert, Infrared Everywhere, and The World's Sixth Sense** are registered or claimed trademarks of FLIR Systems, Inc.

All other trademarks, trade names, or company names referenced herein are used for identification only and are the property of their respective owners.

This product is protected by patents, design patents, patents pending, or design patents pending.

## **Fair Use Statement**

You may print no more than three copies of this manual for your own use. You may not make any further copies or distribute or use the manual in any other way including without limitation exploiting the manual commercially or giving or selling copies to third parties.

## **Software updates**

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

## **Product handbooks**

The latest versions of all English and translated handbooks are available to download in PDF format from the website [www.raymarine.com](http://www.raymarine.com).

Please check the website to ensure you have the latest handbooks.

**Copyright ©2015 Raymarine UK Ltd. All rights reserved.**



# Contents

<b>Chapter 1 Important information.....</b>	<b>7</b>
Certified Installation .....	7
Water ingress .....	7
Disclaimer .....	7
EMC installation guidelines .....	7
Suppression ferrites .....	8
Connections to other equipment .....	8
Declaration of conformity.....	8
Product disposal.....	8
Warranty registration.....	8
IMO and SOLAS.....	8
Technical accuracy .....	8
<b>Chapter 2 Document and product information.....</b>	<b>9</b>
2.1 Document information .....	10
2.2 Product overview .....	10
<b>Chapter 3 Planning the installation .....</b>	<b>11</b>
3.1 Installation checklist .....	12
3.2 Parts supplied.....	12
3.3 Software updates .....	13
3.4 Tools required .....	13
3.5 Warnings and cautions .....	14
3.6 General location requirements .....	14
3.7 Product dimensions.....	15
<b>Chapter 4 Cables and connections.....</b>	<b>17</b>
4.1 General cabling guidance .....	18
4.2 Connections overview .....	18
4.3 Power connection .....	19
4.4 VHF radio connection (NMEA 0183).....	21
<b>Chapter 5 Mounting.....</b>	<b>23</b>
5.1 Mounting the unit .....	24
<b>Chapter 6 System checks and troubleshooting .....</b>	<b>25</b>
6.1 System checks.....	26
6.2 Troubleshooting .....	27
<b>Chapter 7 Maintenance .....</b>	<b>29</b>
7.1 Routine checks .....	30
7.2 Unit cleaning instructions .....	30
<b>Chapter 8 Technical support .....</b>	<b>31</b>
8.1 Raymarine product support and servicing .....	32
8.2 Viewing product information .....	33
<b>Chapter 9 Technical specification.....</b>	<b>35</b>
9.1 Technical specification.....	36
<b>Chapter 10 Spares and accessories .....</b>	<b>37</b>
10.1 SeaTalk <sup>ng</sup> cables and accessories .....	38
<b>Appendix A NMEA 0183 PGNs .....</b>	<b>39</b>



# Chapter 1: Important information

## Certified Installation

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: 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.



### Warning: Potential ignition source

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



### Warning: Product grounding

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



### Warning: Positive ground systems

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



### Warning: Power supply voltage

Connecting this product to a voltage supply greater than the specified maximum rating may cause permanent damage to the unit. Refer to the *Technical specification* section for voltage rating.



### Warning: Switch off power supply

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

### Caution: Power supply protection

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

### Caution: 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.

## Water ingress

### Water ingress disclaimer

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

## Disclaimer

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

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

## 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 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 7 ft (2 m).
  - More than 2 m (7 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 Raymarine equipment is to be connected to other equipment using a cable not supplied by Raymarine, a suppression ferrite **MUST** always be attached to the cable near the Raymarine unit.

## Declaration of conformity

Raymarine UK Ltd. declares that this product is compliant with the essential requirements of EMC directive 2004/108/EC.

The original Declaration of Conformity certificate may be viewed on the relevant product page at [www.raymarine.com](http://www.raymarine.com).

## 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.

## Warranty registration

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

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

## IMO and SOLAS

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

## Technical accuracy

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

## Chapter 2: Document and product information

### Chapter contents

- [2.1 Document information on page 10](#)
- [2.2 Product overview on page 10](#)

## 2.1 Document information

This document contains important information related to the installation of your Raymarine product.

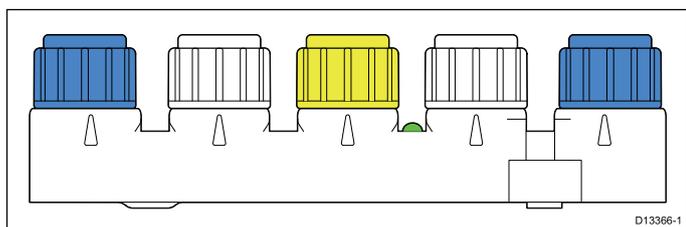
The document includes information to help you:

- plan your installation and ensure you have all the necessary equipment;
- install and connect your product as part of a wider system of connected marine electronics;
- troubleshoot problems and obtain technical support if required.

This and other Raymarine product documents are available to download in PDF format from [www.raymarine.com](http://www.raymarine.com).

### Applicable products

This document is applicable to the following products:



Part number	Name	Description
E70196	<b>NMEA0183–SeaTalk<sup>ng</sup>® converter</b>	Enables connection of a VHF NMEA0183 radio to the <b>SeaTalk<sup>ng</sup>®</b> bus

### Document illustrations

Your product 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.

### Product documentation

The following documentation is applicable to your product:

Description	Part number
<b>NMEA0183 – SeaTalk<sup>ng</sup>® converter installation instructions</b> Installation of a NMEA0183 – SeaTalk <sup>ng</sup> converter and connection to a wider system of marine electronics.	87256
<b>SeaTalk<sup>ng</sup> Reference manual</b> Details the planning and operation of systems based on the SeaTalk <sup>ng</sup> network.	81300
<b>LightHouse™ MFD operation instructions</b> Details the operation of the Data application and autopilot integration for <b>LightHouse™</b> powered <b>MFDs</b> .	81360

## 2.2 Product overview

### NMEA 0183 converter kit — overview

The NMEA 0183 to SeaTalk<sup>ng</sup> converter kit (E70196) enables you to connect a NMEA 0183 device to a SeaTalk<sup>ng</sup> bus.

A typical use for the converter is for the connection of a SeaTalk<sup>ng</sup> GPS receiver (e.g. the RS130) or multifunction display (e.g. a65 / a67) to a VHF radio, for outputting GPS position data to the VHF radio.

**Note:** The converter supports only uni-directional (one-way) communication from the SeaTalk<sup>ng</sup> bus to the NMEA device. For example, it only supports the **output** of GPS position data from a multifunction display or GPS receiver to the VHF radio. The converter does NOT allow bi-directional (two-way) NMEA 0183 communications.

### NMEA 0183

The NMEA 0183 Data Interface Standard was developed by the National Marine Electronics Association of America. It is an international standard to enable equipment from many different manufacturers to be connected together and share information.

The NMEA 0183 standard carries similar information to SeaTalk. However it has the important difference that one cable will only carry information in one direction. For this reason NMEA 0183 is generally used to connect a data receiver and a transmitter together, e.g. a compass sensor transmitting heading to a radar display. This information is passed in 'sentences', each of which has a three letter sentence identifier. It is therefore important when checking compatibility between items that the same sentence identifiers are used some examples of which are:

- VTG - carries Course and Speed Over Ground data.
- GLL - carries latitude and longitude.
- DBT - carries water depth.
- MWV - carries relative wind angle and wind speed data.

### Seataalk<sup>ng</sup>

SeaTalk<sup>ng</sup> (Next Generation) is an enhanced protocol for connection of compatible marine instruments and equipment. It replaces the older SeaTalk and SeaTalk<sup>2</sup> protocols.

SeaTalk<sup>ng</sup> utilizes a single backbone to which compatible instruments connect using a spur. Data and power are carried within the backbone. Devices that have a low draw can be powered from the network, although high current equipment will need to have a separate power connection.

SeaTalk<sup>ng</sup> is a proprietary extension to NMEA 2000 and the proven CAN bus technology. Compatible NMEA 2000 and SeaTalk / SeaTalk<sup>2</sup> devices can also be connected using the appropriate interfaces or adaptor cables as required.

# Chapter 3: Planning the installation

## Chapter contents

- [3.1 Installation checklist on page 12](#)
- [3.2 Parts supplied on page 12](#)
- [3.3 Software updates on page 13](#)
- [3.4 Tools required on page 13](#)
- [3.5 Warnings and cautions on page 14](#)
- [3.6 General location requirements on page 14](#)
- [3.7 Product dimensions on page 15](#)

### 3.1 Installation checklist

Installation includes the following activities:

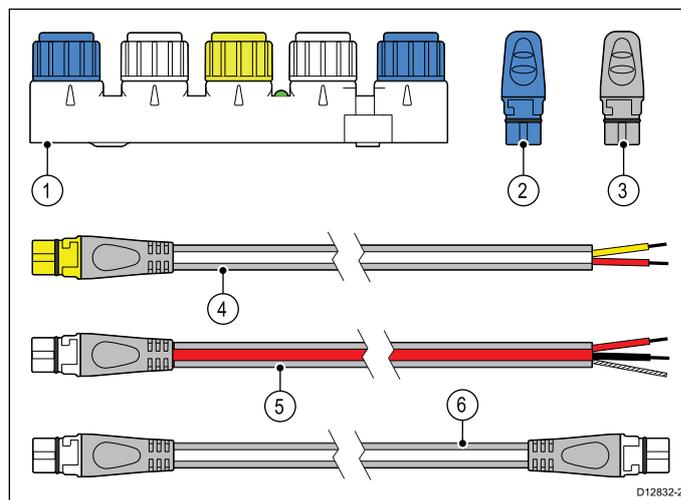
Installation Task	
1	Plan your system.
2	Obtain all required equipment and tools.
3	Site all equipment.
4	Route all cables.
5	Drill cable and mounting holes.
6	Make all connections into equipment.
7	Secure all equipment in place.
8	Power on and test the system.

### Schematic diagram

A schematic diagram is an essential part of planning any installation. It is also useful for any future additions or maintenance of the system. The diagram should include:

- Location of all components.
- Connectors, cable types, routes and lengths.

### 3.2 Parts supplied



Item	Description	Length
1	<b>NMEA0183-SeaTalkng converter</b>	N/A
2	<b>SeaTalkng backbone terminator (x2)</b>	N/A
3	<b>SeaTalkng blanking plugs (x2)</b>	N/A
4	<b>SeaTalkng—NMEA0183 bare wires cable.</b> (This cable connects the VHF radio to the converter.)	400 mm (15 in)
5	<b>SeaTalkng power cable</b>	1 m (3.3 ft)
6	<b>SeaTalkng spur cable</b>	1 m (3.3 ft)

**Note:** Fit the blanking plugs supplied into any unused **SeaTalkng** connection.

### 3.3 Software updates

The software running on the product can be updated.

- Raymarine periodically releases software updates to improve product performance and add new features.
- You can update the software for your product using a connected and compatible multifunction display.
- Refer to [www.raymarine.com/software/](http://www.raymarine.com/software/) for the latest software updates and the software update procedure for your product.
- If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine technical support.

**Caution: Downloading software updates**

The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.

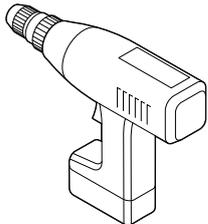
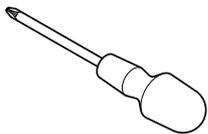
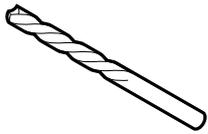
Ensure that the unit has a reliable power supply and that the update process is not interrupted.

Damage caused by incomplete updates are not covered by Raymarine warranty.

By downloading the software update package, you agree to these terms.

### 3.4 Tools required

Product installation requires the following tools:

Item	Description	Quantity
	Power drill	1
	Pozidrive screwdriver	1
	Drill bit of appropriate size*	1

**Note:** \* The appropriate drill bit size is dependent on the thickness and material of the mounting surface.

## 3.5 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.

## 3.6 General location requirements

Important considerations when choosing a suitable location for your product.

This product is suitable for mounting below decks.

The product should be mounted where it will be:

- protected from physical damage and excessive vibration.
- well ventilated and away from heat sources.

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

- **Access** — there must be sufficient space to enable cable connections to the product, avoiding tight bends in the cable.
- **Diagnostics** — the product must be mounted in a location where the diagnostics LED is easily visible.

**Note:** Not all products include a diagnostics LED. Refer to the [Chapter 6 System checks and troubleshooting](#) for more information.

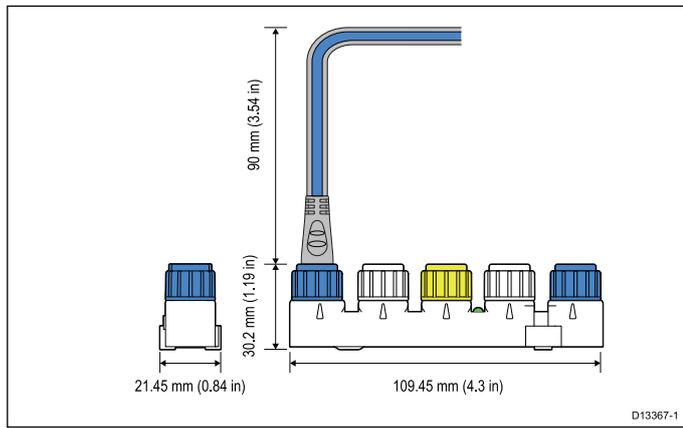
- **Electrical interference** — the product should be mounted far enough away from any equipment that may cause interference such as motors, generators and radio transmitters / receivers.
- **Magnetic compass** — refer to the *Compass safe distance* section in this document for advice on maintaining a suitable distance between this product and any compasses on your vessel.
- **Power** — to keep cable runs to a minimum, the product must be located as close as possible to the vessel's dc power supply.
- **Mounting surface** — ensure the product is adequately supported on a secure surface. Refer to the weight information provided in the *Technical specification* for this product and ensure that the intended mounting surface is suitable for bearing the product weight. Do NOT mount units or cut holes in places which may damage the structure of the vessel.

### Compass safe distance

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

When choosing a suitable location for the product you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3 ft) in all directions. However for some smaller vessels it may not be possible to locate the product this far away from a compass. In this situation, when choosing the installation location for your product, ensure that the compass is not affected by the product when it is in a powered state.

### 3.7 Product dimensions





## Chapter 4: Cables and connections

### Chapter contents

- [4.1 General cabling guidance on page 18](#)
- [4.2 Connections overview on page 18](#)
- [4.3 Power connection on page 19](#)
- [4.4 VHF radio connection \(NMEA 0183\) on page 21](#)

## 4.1 General cabling guidance

### Cable types and length

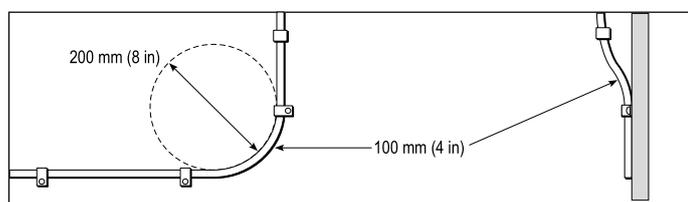
It is important to use cables of the appropriate type and length

- Unless otherwise stated use only standard cables of the correct type, supplied by Raymarine.
- Ensure that any non-Raymarine cables are of the correct quality and gauge. For example, longer power cable runs may require larger wire gauges to minimize voltage drop along the run.

### Routing cables

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

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter of 200 mm (8 in) / minimum bend radius of 100 mm (4 in).



- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through.
- Do NOT run cables near to engines or fluorescent lights.

Always route data cables as far away as possible from:

- other equipment and cables,
- high current carrying ac and dc power lines,
- antennae.

### Strain relief

Ensure adequate strain relief is provided. Protect connectors from strain and ensure they will not pull out under extreme sea conditions.

### Cable shielding

Ensure that all data cables are properly shielded that the cable shielding is intact (e.g. hasn't been scraped off by being squeezed through a tight area).

## 4.2 Connections overview

Use the following information to help you identify the connections on your product.

Connector	Color	Connector	Connects to:	Suitable cables
	Blue	SeaTalk <sup>ng</sup> backbone	SeaTalk <sup>ng</sup> backbone	SeaTalk <sup>ng</sup> backbone cables
	White	SeaTalk <sup>ng</sup> spur	SeaTalk <sup>ng</sup> devices or 12 V dc power supply	SeaTalk <sup>ng</sup> spur cables or SeaTalk <sup>ng</sup> power cable
	Yellow	NMEA 0183 spur	NMEA 0183 VHF radio	SeaTalk <sup>ng</sup> -NMEA 0183 bare wire cable

Refer to [Chapter 10 Spares and accessories](#).

### Making connections

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 to the unit has been installed in accordance with the installation instructions supplied with that device.
3. Ensuring correct orientation, push the cable connector fully onto the corresponding connector on the unit.
4. Turn the locking collar clockwise to secure the cable.

### 4.3 Power connection

Power is supplied to the product over the SeaTalk<sup>ng</sup> network.

A SeaTalk<sup>ng</sup> system requires one 12 V dc supply, connected to the SeaTalk<sup>ng</sup> backbone. This can be provided:

- By a battery via the distribution panel, or
- From a Raymarine course computer, via a SeaTalk or a SeaTalk<sup>ng</sup> system.

#### 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
5 A	3 A (if only connecting one device)

**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 a fitted in-line fuse, if not then you must add an in-line fuse / breaker to the positive wire of your products power connection.

#### Power distribution

Recommendations and best practice.

- The product is supplied with a power cable. 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.

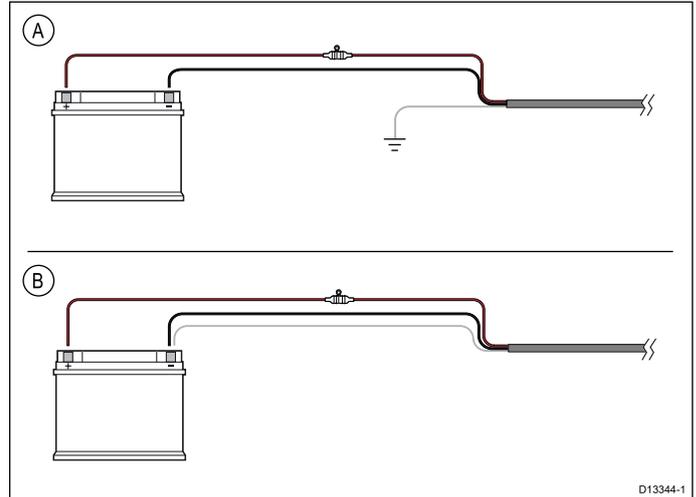
**Note:** The information provided below is for guidance only, to help protect your product. It covers common vessel power arrangements, but does NOT cover every scenario. If you are unsure how to provide the correct level of protection, please consult an authorized Raymarine dealer or a suitably qualified professional marine electrician.

#### Implementation — direct connection to battery

- 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

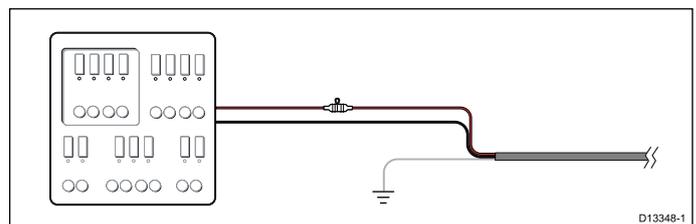
case, only the power cable's red and black wires need to be connected.

- If the supplied power cable is NOT fitted with an 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.



A	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.
B	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.

#### Implementation — connection to distribution panel



- Alternatively, the supplied power cable may be 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<sup>2</sup>) 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.

- In all cases, observe the recommended breaker / 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.

**Important:** Be aware that the suitable fuse rating for the thermal breaker or fuse is dependent on the number of devices you are connecting.

## Grounding

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

## More information

Raymarine recommends 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

## Power cable extension

The product is supplied with a power cable, which can be extended if required.

- 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.
- Raymarine recommends a **minimum** wire gauge of 18AWG (0.82 mm<sup>2</sup>) for any length of cable extension.
- For all lengths of extension to the power cable, ensure there is a continuous **minimum** voltage at the product's power connector of 10.8 V with a fully flat battery at 11 V.

**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.

## Grounding — Dedicated drain wire

The power cable supplied with this product includes a dedicated shield (drain) wire for connection to a vessel's RF ground point.

It is important that an effective RF ground is connected to the system. A single ground point should be used for all equipment. The unit can be grounded by connecting the shield (drain) wire of the power cable to the vessel's RF ground point. On vessels without an RF ground system the shield (drain) wire should be connected directly to the negative battery terminal.

The dc power system should be either:

- Negative grounded, with the negative battery terminal connected to the vessel's ground.
- Floating, with neither battery terminal connected to the vessel's ground



### 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

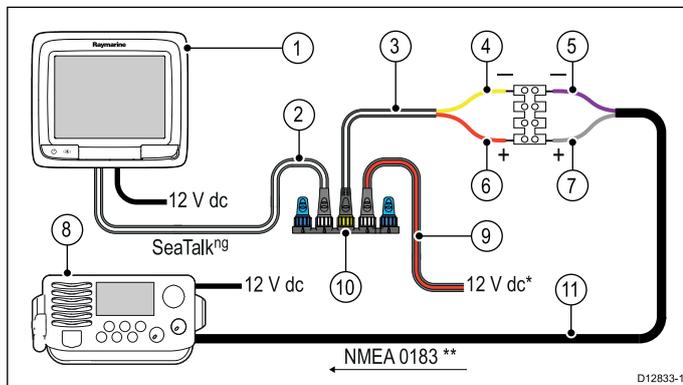
Do not connect this unit to a system which has positive grounding.

## 4.4 VHF radio connection (NMEA 0183)

You can connect a **SeaTalk<sup>ng</sup>** MFD or GNSS receiver to an Isolated **NMEA 0183** VHF radio using the converter.

### Connections

**NMEA 0183** connections to the converter are made using the **SeaTalk<sup>ng</sup>** to **NMEA 0183** bare wires spur cable, a terminal block, and the **NMEA 0183** cable supplied with the VHF radio.



1. **SeaTalk<sup>ng</sup>** MFD (alternatively, a **SeaTalk<sup>ng</sup>** GNSS receiver may be used as the source of GPS data for the VHF radio.)
2. **SeaTalk<sup>ng</sup>** spur
3. **SeaTalk<sup>ng</sup>** to **NMEA 0183** bare wires spur cable
4. Converter **NMEA 0183** negative connection (yellow wire)
5. **NMEA 0183** device **input** negative connection (purple wire)
6. Converter **NMEA 0183** positive connection (red wire)
7. **NMEA 0183** device **input** positive connection (grey wire)
8. Isolated **NMEA 0183** VHF radio
9. **SeaTalk<sup>ng</sup>** power cable
10. Converter
11. **NMEA 0183** connection (Use cable supplied with Isolated VHF radio.)

**Note:** \* If the converter is connected to a powered **SeaTalk<sup>ng</sup>** backbone, a dedicated power connection to the converter as shown in the illustration above is NOT required.

**Note:** \*\* The connection at the VHF radio must be to the Isolated **NMEA 0183** input only. It is a uni-directional (one-way) connection only.



# Chapter 5: Mounting

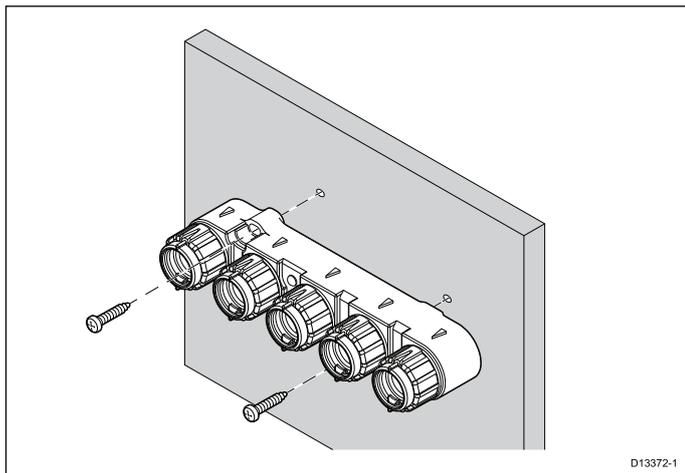
## Chapter contents

- [5.1 Mounting the unit on page 24](#)

## 5.1 Mounting the unit

Before mounting the unit ensure that you have:

- Identified the routes that the cables will take.



1. Switch off the vessel's power supply.
2. Check the selected location for the unit, a clear, flat area is required, which is safe to have screws fitted to.
3. Position the converter against the selected location and mark the surface through the converter's mounting holes.
4. Using an appropriate size drill bit, drill 2 holes at the marked locations.
5. Position the converter so that the mounting holes of the unit line up with the drilled holes in the mounting surface.
6. Use self tapping screws of a suitable size to secure the converter to the mounting surface.

Do NOT overtighten the fixings.

7. Connect the **SeaTalk**<sup>ng</sup> backbone and spur cables.
8. Connect the **SeaTalk** spur cable to the **SeaTalk** spur connector.
9. Connect the supplied blank plugs to any unused connectors.
10. Switch the vessel's power supply back on and check system.

# Chapter 6: System checks and troubleshooting

## Chapter contents

- [6.1 System checks on page 26](#)
- [6.2 Troubleshooting on page 27](#)

## 6.1 System checks

After connection of the SeaTalk - SeaTalk<sup>ng</sup> converter it is advisable to perform checks on the data shared around the system.

Typical checks should include:

- **Check your GPS position.** At a known location check that the GPS position is accurately shown on all displays and appropriate instruments.
- **Calibrate wind, speed, depth etc.** Ensure that instrument data is accurate and is available at all appropriate displays and instruments.
- **LifeTag MOB functional test.** Check that the LifeTag system generates the appropriate warnings / alarms at all appropriate displays and instruments.
- **Autopilot test.** Check that the autopilot operates as expected and that heading information is available at all appropriate displays and instruments.

All checks should be performed in a safe and familiar environment and in accordance with the instructions supplied with each product.

## 6.2 Troubleshooting

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

All Raymarine products are, prior to packing and shipping, subjected to comprehensive test and quality assurance programs. However, if you experience problems with the operation of your product this section will help you to diagnose and correct problems in order to restore normal operation.

If after referring to this section you are still having problems with your unit, please contact Raymarine Technical Support for further advice.

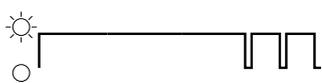
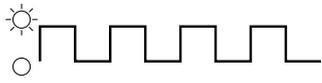
## System data troubleshooting

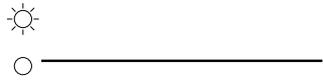
Aspects of the installation can cause problems with the data shared between connected equipment. Such problems, their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Instrument, engine or other system data is unavailable at all displays.	Data is not being received at the display.	Check the data bus (e.g. <b>SeaTalk<sup>ng</sup></b> ) wiring and connections.
		Check the overall integrity of the data bus (e.g. <b>SeaTalk<sup>ng</sup></b> ) wiring.
		If available refer to the reference guide for the data bus (e.g. <b>SeaTalk<sup>ng</sup></b> reference manual).
	Data source (e.g. instrument display or engine interface) is not operating.	Check the source of the missing data (e.g. instrument display or engine interface).
		Check the power to the <b>SeaTalk</b> bus.
		Refer to the manufacturer's handbook for the equipment in question.
Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.	
Instrument or other system data is missing from some but not all displays.	Network problem.	Check that all required equipment is connected to the network.
		Check the status of the Raymarine network Switch.
		Check that <b>SeaTalk<sup>hs</sup></b> / <b>RayNet</b> cables are free from damage.
	Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.
Position data is not displayed on VHF radio	VHF radio <b>NMEA 0183</b> input not isolated / incorrect polarity	<ul style="list-style-type: none"> <li>Check that the radio has an Isolated <b>NMEA 0183</b> input.</li> <li>Check polarity of <b>NMEA 0183</b> wires.</li> </ul>

## LED indications

The LED indicates SeaTalk<sup>ng</sup> and NMEA 0183 connection status.

LED state (8 Second cycle)	SeaTalk <sup>ng</sup> connection status	NMEA 0183 connection status
	Healthy	Healthy
	Not connected / fault	Not connected / fault
	Healthy	No valid GPS data available, NMEA 0183 data cannot be provided.
	Connected but not receiving data	No data available, NMEA 0183 data cannot be provided.

LED state (8 Second cycle)	SeaTalk <sup>ng</sup> connection status	NMEA 0183 connection status
	High voltage (power supply too high)	
	Low voltage / Converter not operational	

# Chapter 7: Maintenance

## Chapter contents

- [7.1 Routine checks on page 30](#)
- [7.2 Unit cleaning instructions on page 30](#)

## 7.1 Routine checks

The following periodic checks should be made:

- Examine cables for signs of damage, such as chafing, cuts or nicks.
- Check that the cable connectors are firmly attached and that their locking mechanisms are properly engaged.

**Note:** Cable checks should be carried out with the power supply switched off.

## 7.2 Unit cleaning instructions

The unit does not require regular cleaning. However, if you find it necessary to clean the unit, please follow the steps below:

1. Ensure power is switched off.
2. Wipe unit clean with a damp cloth.
3. If necessary, use a mild detergent solution to remove grease marks.

## Chapter 8: Technical support

### Chapter contents

- [8.1 Raymarine product support and servicing on page 32](#)
- [8.2 Viewing product information on page 33](#)

## 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 the menus within your product.

### Servicing and warranty

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

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

Region	Tele- phone	E-mail
United Kingdom (UK) and EMEA	+44 (0)1329 246 932	<a href="mailto:emea.service@raymarine.com">emea.service@raymarine.com</a>
United States (US)	+1 (603) 324 7900	<a href="mailto:rm-usrepair@flir.com">rm-usrepair@flir.com</a>

Region	Tele- phone	E-mail
Asia Pacific, including Australia and New Zealand	+61 2 8977 0300	<a href="mailto:aus.support@raymarine.com">aus.support@raymarine.com</a>
France	+33 (0)1 46 49 72 30	<a href="mailto:support.fr@raymarine.com">support.fr@raymarine.com</a>
Germany	+49 (0)40 237 808 0	<a href="mailto:support.de@raymarine.com">support.de@raymarine.com</a>
Italy	+39 02 9945 1001	<a href="mailto:support.it@raymarine.com">support.it@raymarine.com</a>
Spain	+34 96 2965 102	<a href="mailto:info@azimut.es">info@azimut.es</a>
Netherlands	+31 (0)26 3614 905	<a href="mailto:support.nl@raymarine.com">support.nl@raymarine.com</a>
Sweden	+46 (0)317 633 670	<a href="mailto:support.se@raymarine.com">support.se@raymarine.com</a>
Finland	+358 (0)207 619 937	<a href="mailto:support.fi@raymarine.com">support.fi@raymarine.com</a>
Norway	+47 692 64 600	<a href="mailto:support.no@raymarine.com">support.no@raymarine.com</a>
Denmark	+45 437 164 64	<a href="mailto:support.dk@raymarine.com">support.dk@raymarine.com</a>

### Web support

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

- **Manuals and Documents** — <http://www.raymarine.co.uk/display/?id=10125>
- **FAQ / Knowledgebase** — <http://www.raymarine.co.uk/knowledgebase/>
- **Technical support forum** — <http://raymarine.ning.com/>
- **Software updates** — <http://www.raymarine.com/software>

### Telephone and e-mail support

Region	Tele- phone	E-mail
United Kingdom (UK)	+44 (0)1329 246 777	<a href="mailto:support.uk@raymarine.com">support.uk@raymarine.com</a>
United States (US)	+1 (603) 324 7900 (Toll-free: +800 539 5539)	<a href="mailto:support@raymarine.com">support@raymarine.com</a>

## 8.2 Viewing product information

You can view information about your unit from the **Diagnostics** menu on a compatible multifunction display. This option displays information such as product serial number and software version.

With the Homescreen displayed:

1. Select **Set-up**.
2. Select **Maintenance**.
3. Select **Diagnostics**.
4. Select the **Select Device** option.  
A list of connected devices is displayed.
5. Select the product for which you want to view information. Alternatively, select **Show All Data** to display information for all connected products.



# Chapter 9: Technical specification

## Chapter contents

- [9.1 Technical specification on page 36](#)

## 9.1 Technical specification

Nominal supply voltage	12 V dc
Operating voltage range	9 to 16 V dc
Current	<ul style="list-style-type: none"> <li>• 50 mA converter peak operating current</li> <li>• 950 mA total peak supply to SeaTalk / SeaTalk<sup>ng</sup> devices on spur connections.</li> </ul>
LEN (Refer to Seataalk <sup>ng</sup> reference manual for further information.)	LEN 1
Environmental	<b>Installation environment</b> <ul style="list-style-type: none"> <li>• Operating temperature: -10 °C to +50 °C (14 °F to 122 °F)</li> <li>• Storage temperature: -20 °C to +65 °C (-4 °F to 149 °F)</li> <li>• Relative humidity: max 95%</li> <li>• Water proof to IPX6</li> </ul>
Data connections.	<ul style="list-style-type: none"> <li>• SeaTalk<sup>ng</sup> backbone</li> <li>• 2 x SeaTalk<sup>ng</sup> spur</li> <li>• 1 x NMEA 0183 spur</li> </ul>
Conformance	<ul style="list-style-type: none"> <li>• Europe: 2004/108/EC</li> <li>• Australia and New Zealand: C-Tick, Compliance Level 2</li> </ul>

## Chapter 10: Spares and accessories

### Chapter contents

- [10.1 SeaTalk<sup>ng</sup> cables and accessories on page 38](#)

## 10.1 SeaTalk<sup>ng</sup> cables and accessories

SeaTalk<sup>ng</sup> cables and accessories for use with compatible products.

Description	Part No	Notes
SeaTalk <sup>ng</sup> starter kit	T70134	Includes: <ul style="list-style-type: none"> <li>• 1 x 5 Way connector (A06064)</li> <li>• 2 x Backbone terminator (A06031)</li> <li>• 1 x 3 m (9.8 ft) spur cable (A06040)</li> <li>• 1 x Power cable (A06049)</li> </ul>
SeaTalk <sup>ng</sup> Backbone Kit	A25062	Includes: <ul style="list-style-type: none"> <li>• 2 x 5 m (16.4 ft) Backbone cable (A06036)</li> <li>• 1 x 20 m (65.6 ft) Backbone cable (A06037)</li> <li>• 4 x T-piece (A06028)</li> <li>• 2 x Backbone terminator (A06031)</li> <li>• 1 x Power cable (A06049)</li> </ul>
SeaTalk <sup>ng</sup> 0.4 m (1.3 ft) spur	A06038	
SeaTalk <sup>ng</sup> 1 m (3.3 ft) spur	A06039	
SeaTalk <sup>ng</sup> 3 m (9.8 ft) spur	A06040	
SeaTalk <sup>ng</sup> 5 m (16.4 ft) spur	A06041	
SeaTalk <sup>ng</sup> 0.4 m (1.3 ft) elbow spur	A06042	
SeaTalk <sup>ng</sup> 0.4 m (1.3 ft) backbone	A06033	
SeaTalk <sup>ng</sup> 1 m (3.3 ft) backbone	A06034	
SeaTalk <sup>ng</sup> 3 m (9.8 ft) backbone	A06035	
SeaTalk <sup>ng</sup> 5 m (16.4 ft) backbone	A06036	
SeaTalk <sup>ng</sup> 9 m (29.5 ft) backbone	A06068	
SeaTalk <sup>ng</sup> 20 m (65.6 ft) backbone	A06037	
SeaTalk <sup>ng</sup> to bare ends 1 m (3.3 ft) spur	A06043	
SeaTalk <sup>ng</sup> to bare ends 3 m (9.8 ft) spur	A06044	

Description	Part No	Notes
SeaTalk <sup>ng</sup> Power cable	A06049	
SeaTalk <sup>ng</sup> Terminator	A06031	
SeaTalk <sup>ng</sup> T-piece	A06028	Provides 1 x spur connection
SeaTalk <sup>ng</sup> 5-way connector	A06064	Provides 3 x spur connections
SeaTalk <sup>ng</sup> backbone extender	A06030	
SeaTalk to SeaTalk <sup>ng</sup> converter kit	E22158	Allows the connection of SeaTalk devices to a SeaTalk <sup>ng</sup> system.
SeaTalk <sup>ng</sup> Inline terminator	A80001	Provides direct connection of a spur cable to the end of a backbone cable. No T-piece required.
SeaTalk <sup>ng</sup> Blanking plug	A06032	
ACU / SPX SeaTalk <sup>ng</sup> spur cable 0.3 m (1.0 ft)	R12112	Connects an SPX course computer or an ACU to a SeaTalk <sup>ng</sup> backbone.
SeaTalk (3 pin) to SeaTalk <sup>ng</sup> adaptor cable 0.4 m (1.3 ft)	A06047	
SeaTalk to SeaTalk <sup>ng</sup> spur 1 m (3.3 ft) spur	A22164	
SeaTalk2 (5 pin) to SeaTalk <sup>ng</sup> adaptor cable 0.4 m (1.3 ft)	A06048	
DeviceNet adaptor cable (Female)	A06045	Allows the connection of NMEA 2000 devices to a SeaTalk <sup>ng</sup> system.
DeviceNet adaptor cable (Male)	A06046	Allows the connection of NMEA 2000 devices to a SeaTalk <sup>ng</sup> system.
DeviceNet adaptor cable (Female) to bare ends.	E05026	Allows the connection of NMEA 2000 devices to a SeaTalk <sup>ng</sup> system.
DeviceNet adaptor cable (Male) to bare ends.	E05027	Allows the connection of NMEA 2000 devices to a SeaTalk <sup>ng</sup> system.

## Appendix A NMEA 0183 PGNs

The converter bridges the following NMEA PGNs from the SeaTalk<sup>ng</sup> bus to an NMEA device.

Message number	Message description	NMEA 0183 PGN	Notes
129025	Latitude and Longitude	GGA	If Latitude and Longitude is present on SeaTalk <sup>ng</sup> , GGA will transmit only the available data fields, for example, time and date.
129029	GPS statistics and Latitude and Longitude		
129033	Time and date		
129029	GPS statistics and Latitude and Longitude	RMC	If Latitude and Longitude is present on SeaTalk <sup>ng</sup> , RMC will transmit only the available data fields, for example, time and date.
129033	Time and date		
129026	COG / SOG		
127258	Variation		
65311	Variation		
129026	COG / SOG	VTG	If COG and / or SOG are present on SeaTalk <sup>ng</sup> , VTG will transmit only the available data fields, for example, variation.
127258	Variation		
65311	Variation		





**Raymarine**<sup>®</sup>  
BY  **FLIR**<sup>®</sup>