

Raymarine®



AIS700

Installation instructions

English (en-US)

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

Product documentation



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Chapter 1: Important information



Warning: IMPORTANT — Configure before use

Before first use this product **must** be correctly configured using a personal computer and the ProAIS2 software, which can be downloaded from the Raymarine website: www.raymarine.com/software

- Failure to configure the product will prevent correct operation.
- Configuration **MUST** include programming the product with an MMSI number. In some regions (such as the United States), the MMSI **must** be programmed by a qualified dealer or installer.
- Incorrect / incomplete configuration can cause erroneous data and prevent your product from transmitting.
- If an MMSI number is not programmed the product will operate as an AIS receiver only and will **not** transmit AIS information for your vessel.



Warning: VHF antenna

Ensure that your VHF antenna meets the requirements of the VHF antenna specification, which are detailed in the following section of this document: [p.41 — VHF antenna requirements](#)

- Using an antenna optimized for only AIS frequencies may damage the product.
- Using an antenna optimized for only VHF frequencies may cause erroneous alarms.
- Using an old antenna with degraded performance will result in reduced AIS performance.
- New VHF antennas are sold with a fixed cable length. The cable length partly determines the antenna performance, and therefore cutting the cable of an antenna can affect its performance and result in a high VSWR ratio and limited reception.



Warning: GNSS (GPS) antenna

- To enable the AIS to function, the supplied GNSS (GPS) passive antenna **MUST** be installed and connected.
- Ensure that the installation location has a clear line of sight to the sky.



Warning: Grounding stud connection

Energy generated by Near-lightning strikes (NLS) and atmospheric static build-up can be conducted by the product, via the VHF antenna. To ensure that this energy is safely discharged, the grounding stud connection located on the product **MUST** be connected (via a suitable grounding strap) to the vessel battery's 0V negative terminal.

Failure to connect the grounding stud to the vessel battery's 0V negative terminal may cause permanent damage to the product and invalidate your product's warranty.

Product installation and operation

Ensure safe effective use of the product.

- 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: 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).

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.

RF safety notice

RF radiation statement

AIS **transceivers** generate and radiate radio frequency (RF) electromagnetic energy (EME).

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: FCC Warning (Part 15.21)

Changes or modifications to this equipment not expressly approved in writing by Raymarine Incorporated could violate compliance with FCC rules and 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)

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

Son fonctionnement est soumis aux deux conditions suivantes:

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

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

AIS licensing and MMSI

Prior to using this product for the first time, please check your national requirements for both operator and equipment licensing.

Licensing

In many countries, the licensing for the use of AIS equipment is included in the **Ship Station license** and **Operator's license** issued for VHF radios.

However, even if you already have a Ship Station license and Operator's license for a VHF radio, **some countries may require a separate license for AIS equipment use.**

Important:

It is your responsibility to determine whether a license is required in your area before operating this equipment.

MMSI

An MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel / station. **Before commencing installation ensure you have obtained an MMSI number for your vessel.** This is a mandatory requirement. If your vessel already has an MMSI number (used for a VHF DSC radio, for example), then the same MMSI number must be used to program your AIS equipment.

Important:

In some areas, a radio operator licence is required before an MMSI number will be issued. If an MMSI number is not entered, your product can only be used in Silent Mode and will operate as a receiver only.

In the United States of America (USA), the MMSI and Static Data must be entered only by a Raymarine® dealer or other appropriately qualified installer of marine communications equipment for marine vessels.

In the USA, the user is NOT authorized to do this.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

Important:

You can only enter a MMSI number once, if you enter the number incorrectly or need to change your MMSI number, the unit will require re-programming by an authorized Raymarine dealer.

For a list of issuing authorities for licences and MMSI numbers in each region, refer to:

[p.45 – Licensing and MMSI issuing authorities](#)

Declaration of conformity

FLIR Belgium BVBA declares that the radio equipment type AIS700 Class B transceiver, part number E70476, is in compliance with the Radio Equipment Directive 2014/53/EU.

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

Water ingress

Water ingress disclaimer

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

AIS disclaimer

All information presented by the AIS700 is advisory only, as there is a risk of incomplete and erroneous information. By placing this product into service you acknowledge this and assume complete responsibility for any associated risks, and accordingly release Raymarine and SRT Marine System plc from any and all claims arising from the use of the AIS service.

Disclaimer

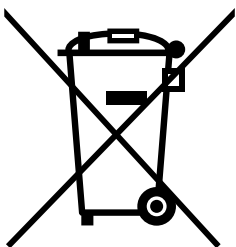
Raymarine does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine.

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

Product 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 information

Chapter contents

- [2.1 Product documentation on page 16](#)
- [2.2 Applicable products on page 16](#)
- [2.3 Document illustrations on page 16](#)

2.1 Product documentation

The following documentation is applicable to your product:

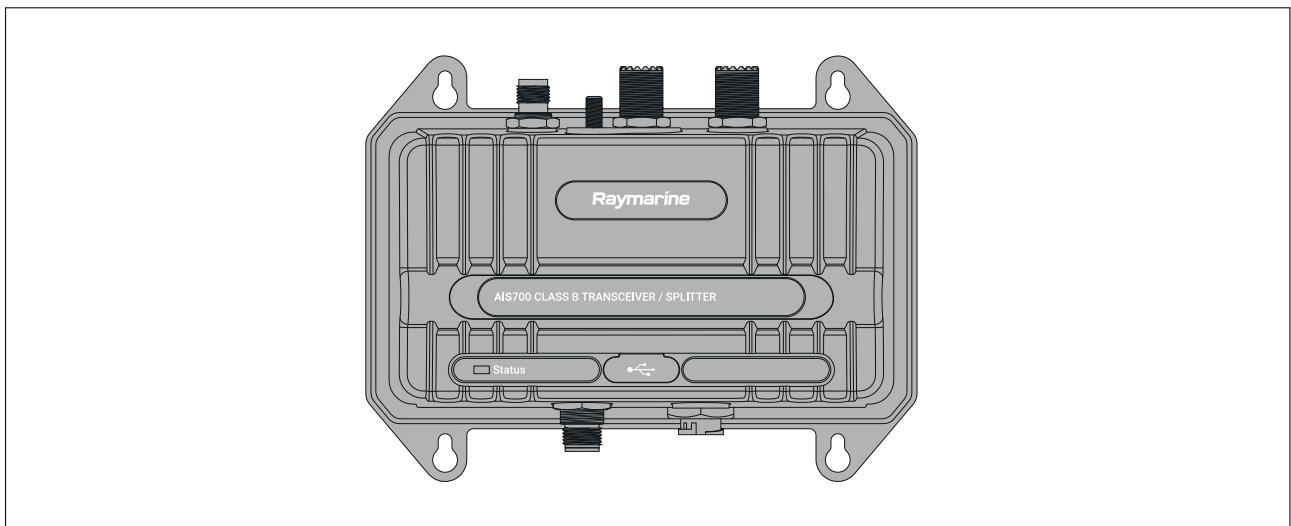
All documents are available to download as PDFs from www.raymarine.com/manuals

Documentation

Description	Part number
AIS700 Installation instructions (This document) Installation of an AIS700 and connection to a wider system of marine electronics.	87326
GNSS antenna Mounting template	87225
LightHouse 3 Operation instructions Operation instructions for LightHouse 3 MFDs, including AIS-related functions.	81370
LightHouse 2 Operation instructions Operation instructions for LightHouse 2 MFDs, including AIS-related functions.	81360

2.2 Applicable products

This document is applicable to the following products:



Part number	Description
E70476	The AIS700 is a Class B AIS transceiver with a built-in VHF splitter, used to display real-time information on local vessels, land based stations or aids to navigation that are equipped with either Class A or Class B AIS transceivers. For more information on AIS, refer to the Appendix.

2.3 Document illustrations

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

All images are provided for illustration purposes only.

Chapter 3: Product and system overview

Chapter contents

- [3.1 AIS overview on page 18](#)
- [3.2 Compatible Raymarine displays on page 18](#)
- [3.3 Compatible 3rd party displays on page 20](#)

3.1 AIS overview

Your AIS unit uses digital radio signals to exchange 'real-time' information between vessels, shore based stations, or aids to navigation (AToNs) on dedicated VHF frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data.

Although AIS augments your Radar app by operating in Radar blind spots and detecting smaller AIS-fitted vessels, it does not replace your Radar, as it relies on receiving transmitted AIS information and therefore cannot detect objects such as landmasses, navigational beacons or vessels not equipped with AIS.

Note:

NEVER assume that AIS is displaying information from all vessels in the area, because:

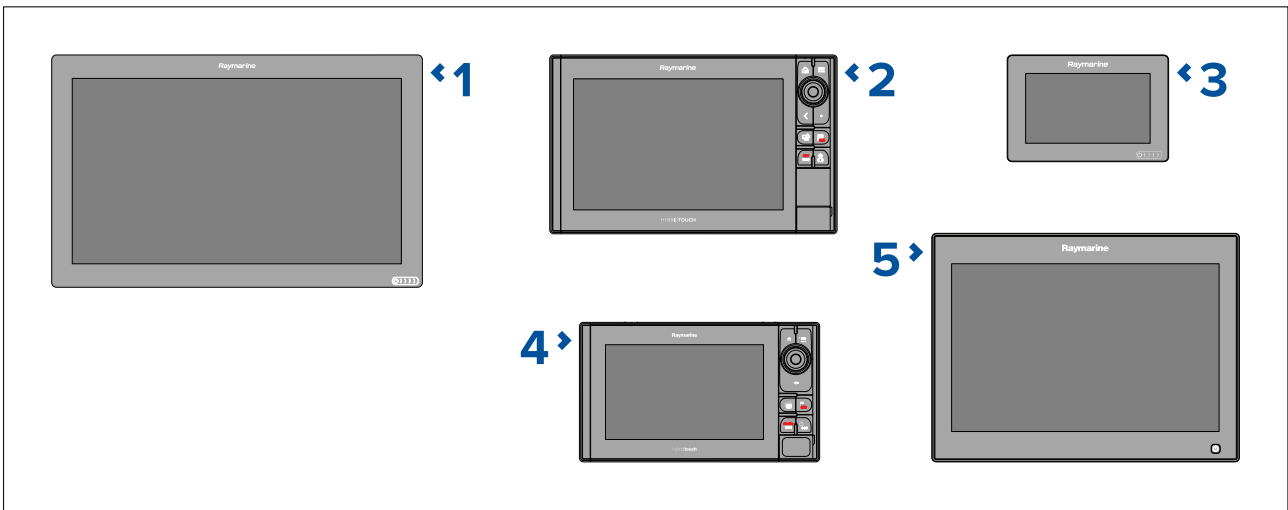
- Not all vessels are fitted with AIS
 - Although it is mandatory for larger commercial vessels to carry AIS, it is not mandatory to use it.
- AIS should be used only to augment Radar information, not substitute it.

3.2 Compatible Raymarine displays

The AIS receiver/transceiver is compatible with the MFDs shown below. displays can be connected using either a SeaTalkng® backbone or NMEA 0183 connection set to 38,400 baud rate. Where available it is recommended that the SeaTalkng® / NMEA 2000 connection is used.

Compatible LightHouse™ 3 MFDs

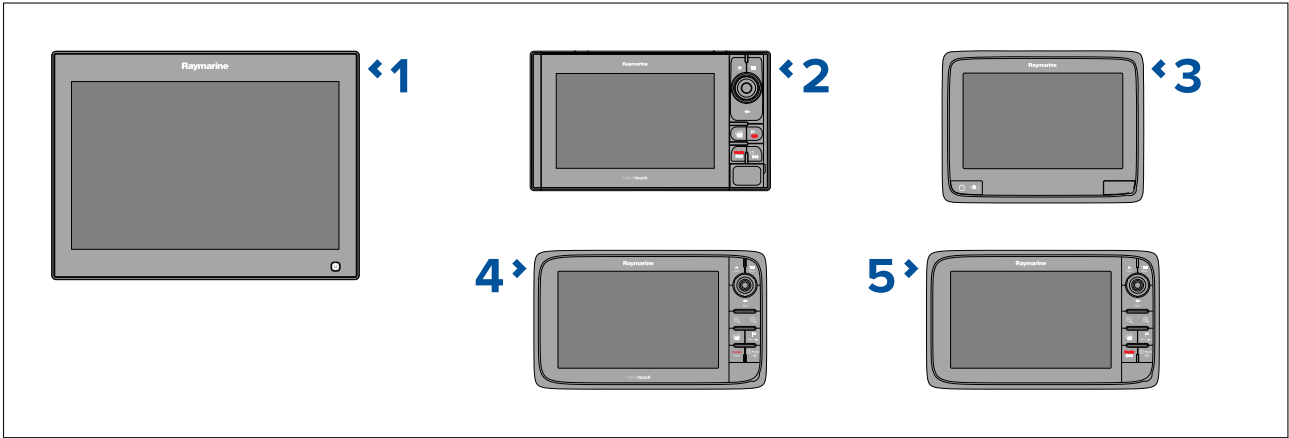
SeaTalkng® is the preferred method of connection to LightHouse™ 3 MFDs, however NMEA 0183 can be used as an alternate connection if required.



1	Axiom™ XL MFDs
2	Axiom™ Pro MFDs
3	Axiom™ / Axiom™+ MFDs
4	eS Series MFDs
5	gS Series MFDs

Compatible LightHouse™ 2 MFDs

SeaTalkng® is the preferred method of connection to LightHouse™ 2 MFDs, however NMEA 0183 can be used as an alternate connection if required.



1	gS Series MFDs
2	eS Series MFDs
3	aSeries MFDs
4	eSeries MFDs
5	cSeries MFDs

Compatible instrument displays

Compatible instrument displays can be connected to the same SeaTalkng® network.

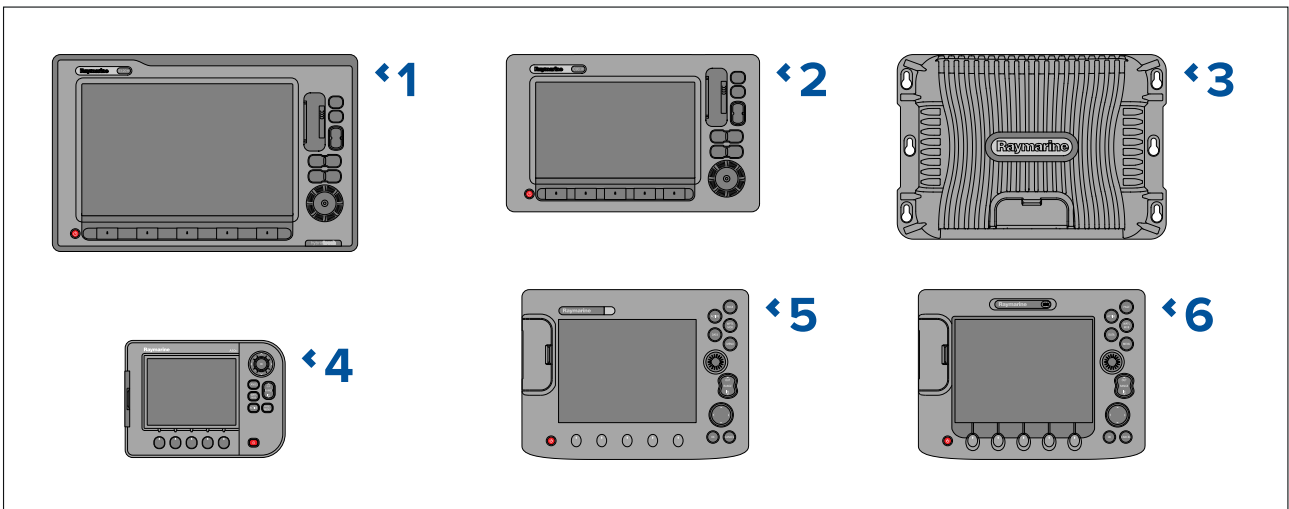


1	i70 Instrument display
2	i70s Instrument display

Compatible legacy MFDs

SeaTalkng® is the preferred method of connection for E-Series, C-Series, G-Series and A-Series MFDs, however NMEA 0183 can be used as an alternate connection if required.

E Series Classic and C Series Classic MFDs can only be connected using a NMEA 0183 connection.



1	E-Series Widescreen MFDs
2	C-Series Widescreen MFDs
3	G-Series systems

4	A-Series MFDs
5	C Series Classic MFDs (Connection via NMEA 0183 only)
6	E Series Classic MFDs (Connection via NMEA 0183 only)

3.3 Compatible 3rd party displays

The AIS receiver/transceiver can be connected to displays manufactured by 3rd parties.

3rd party displays can be connected using either a NMEA 2000 or a NMEA 0183 connection set to 38,400 baud rate. Where available it is recommended that a NMEA 2000 connection is used where possible.

Note:

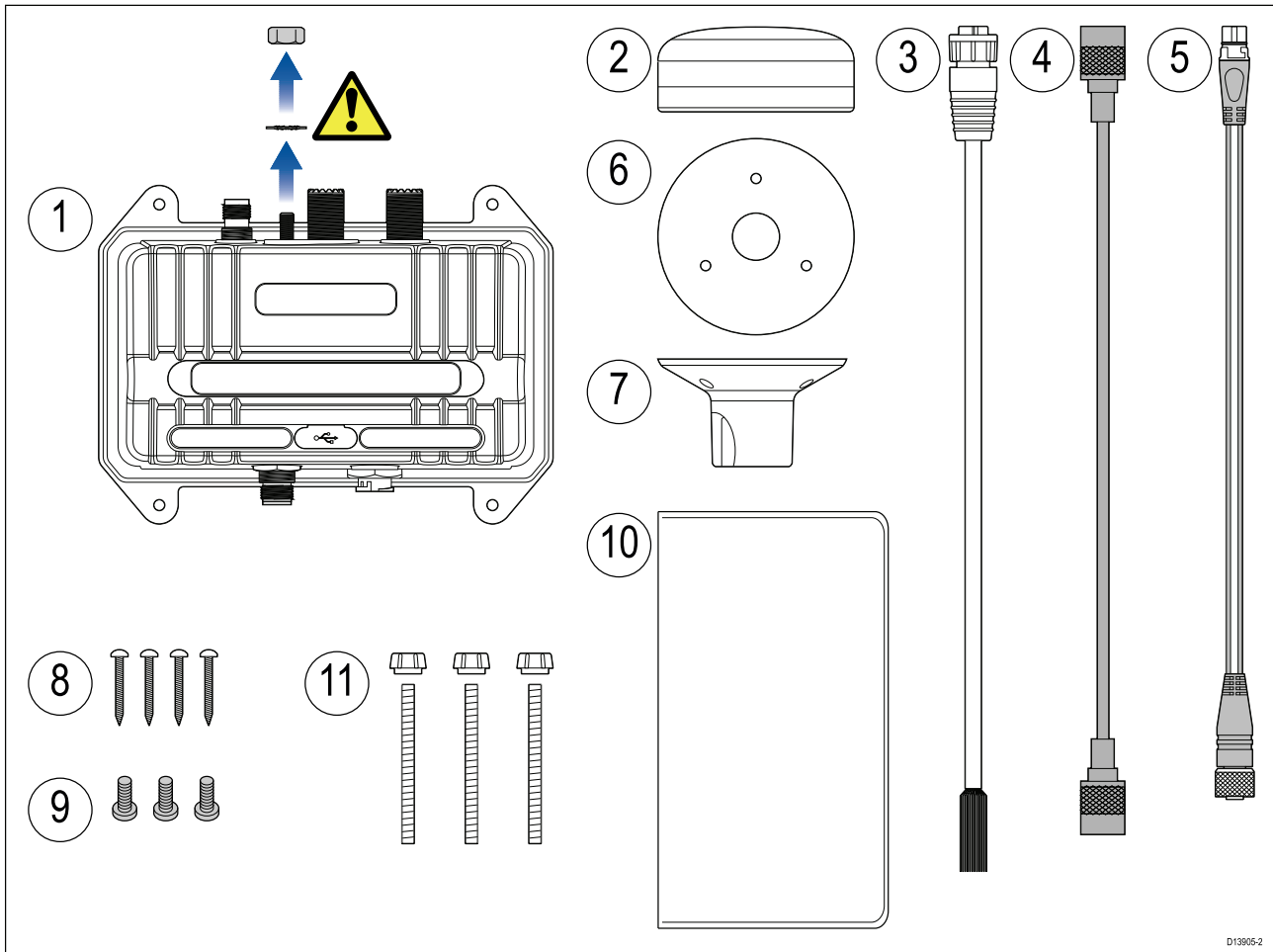
The data available to 3rd party displays will be limited to the NMEA 2000 PGNs and NMEA 1083 sentences that are supported by both the AIS receiver/transceiver and the 3rd party display.

Chapter 4: Parts supplied

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- [4.1 Parts supplied on page 22](#)

4.1 Parts supplied



1. AIS700 unit. For an explanation of the warning symbol shown, refer to the Important Note below.
2. GNSS antenna, with captive cable 10m (33 ft).
3. Power/data cable 2m (6.56 ft)
4. VHF Radio cable 1m (3.28 ft)
5. DeviceNet to SeaTalkng adaptor cable 1m (3.28 ft)
6. GNSS antenna gasket
7. GNSS antenna pole mount
8. AIS unit fixings (4 x No.8x19 self-tapping screws)
9. Screws for (optional) pole-mounting of the GNSS antenna
10. Documentation
11. Fixings for (optional) surface mounting of the GNSS antenna (3 x M3x40 stud and thumb nut)

Important:

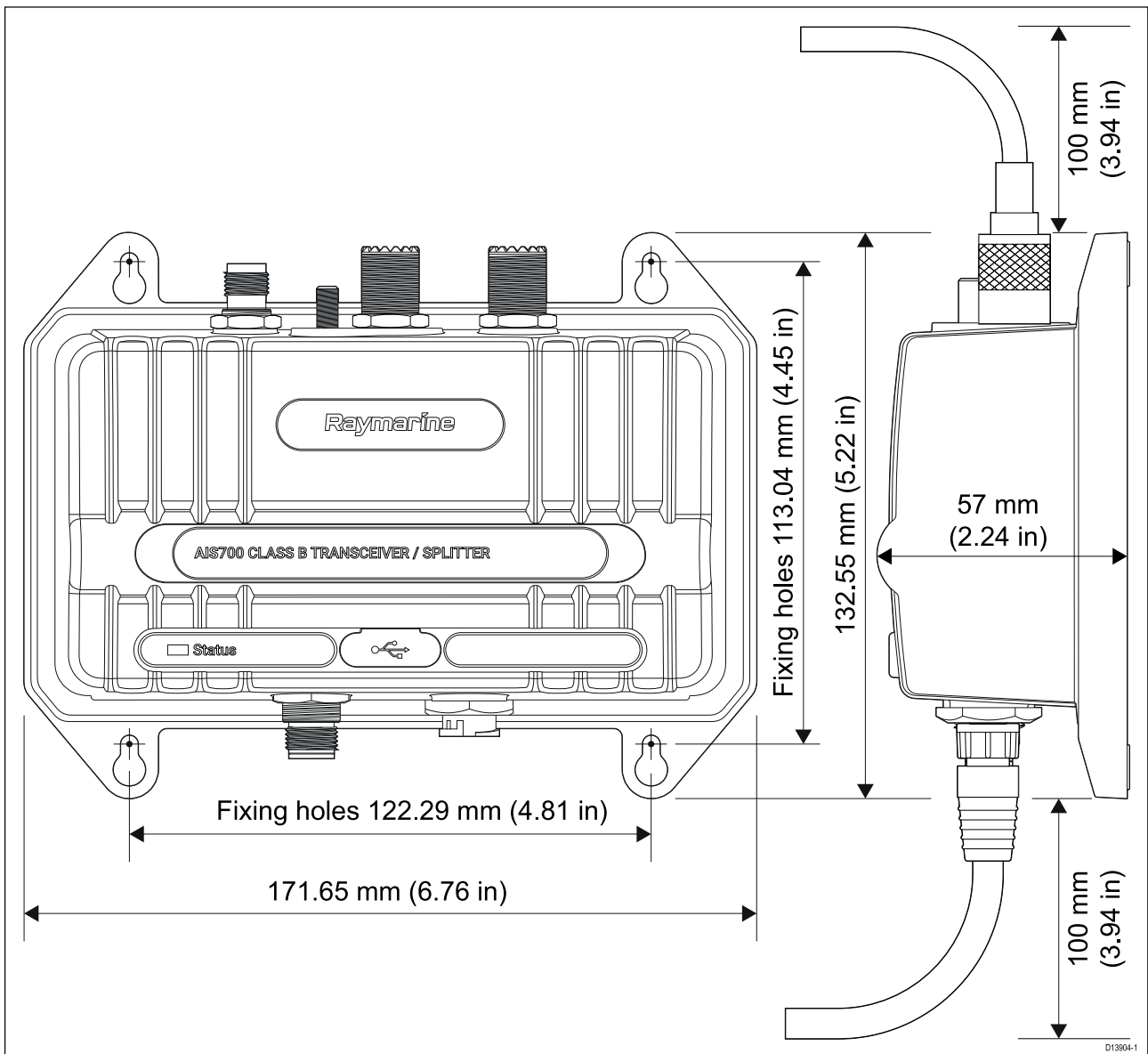
The AIS unit is supplied with a nut and washer pre-fitted to the unit's grounding lug. This dedicated grounding point **must** be connected via a suitable grounding strap (not supplied) to your vessel battery's 0V negative battery terminal. For more information, refer to the label attached to the unit's grounding lug, as well as the following section of the Connections chapter: [p.38 – Grounding](#)

Chapter 5: Product dimensions

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- [5.1 Product dimensions on page 24](#)

5.1 Product dimensions



Chapter 6: Location requirements

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- [6.1 Selecting a location on page 26](#)

6.1 Selecting a location



Warning: Potential ignition source

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

General location requirements

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

- **Water ingress** — The unit should be mounted below decks. Although the unit is waterproof, it is good practice to locate it in a protected area away from prolonged and direct exposure to rain and salt spray.
- **Ventilation** — To ensure adequate airflow:
 - Ensure that the unit is mounted in a compartment of suitable size.
 - Ensure that ventilation holes are not obstructed. Allow adequate separation of all equipment.
- **Electrical interference** — Select a location that is far enough away from devices that may cause interference, such as motors, generators and radio transmitters / receivers.
- **Power supply** — Select a location that is as close as possible to the vessel's DC power source. This will help to keep cable runs to a minimum.
- **Diagnostics** — The unit must be mounted in a location where any diagnostics LEDs are easily visible.
- **Mounting surface** — Ensure the unit is adequately supported on a secure surface. Do not mount units or cut holes in places which may damage the structure of the vessel.
- **Cabling** — Ensure the unit is mounted in a location which allows proper routing, support and connection of cables:
 - Minimum bend radius of 100 mm (3.94 in) unless otherwise stated.
 - Use cable clips to prevent stress on connectors.
 - If your installation requires multiple ferrites to be added to a cable then additional cable clips should be used to ensure the extra weight of the cable is supported.

GNSS antenna location requirements

The supplied GNSS antenna must be installed in accordance with the instructions provided. Do NOT connect any other GNSS antenna other than that supplied.

The GNSS antenna can be mounted either on a flat horizontal surface or on a suitable pole.

- If you intend to surface mount the antenna, ensure you have access to the underside of the mounting surface.
- If you intend to pole-mount the antenna, the pole needs to have a 1 inch 14 TPI thread.

Important:

The GNSS antenna must be mounted in a location that provides a good direct line-of-sight to the entire sky, around the horizon.

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 antennae 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.

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. 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 2 m (7 ft).
 - 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 power 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.
- Only Raymarine® specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation instructions.

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 ferrites.

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.

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.

Chapter 7: Installation

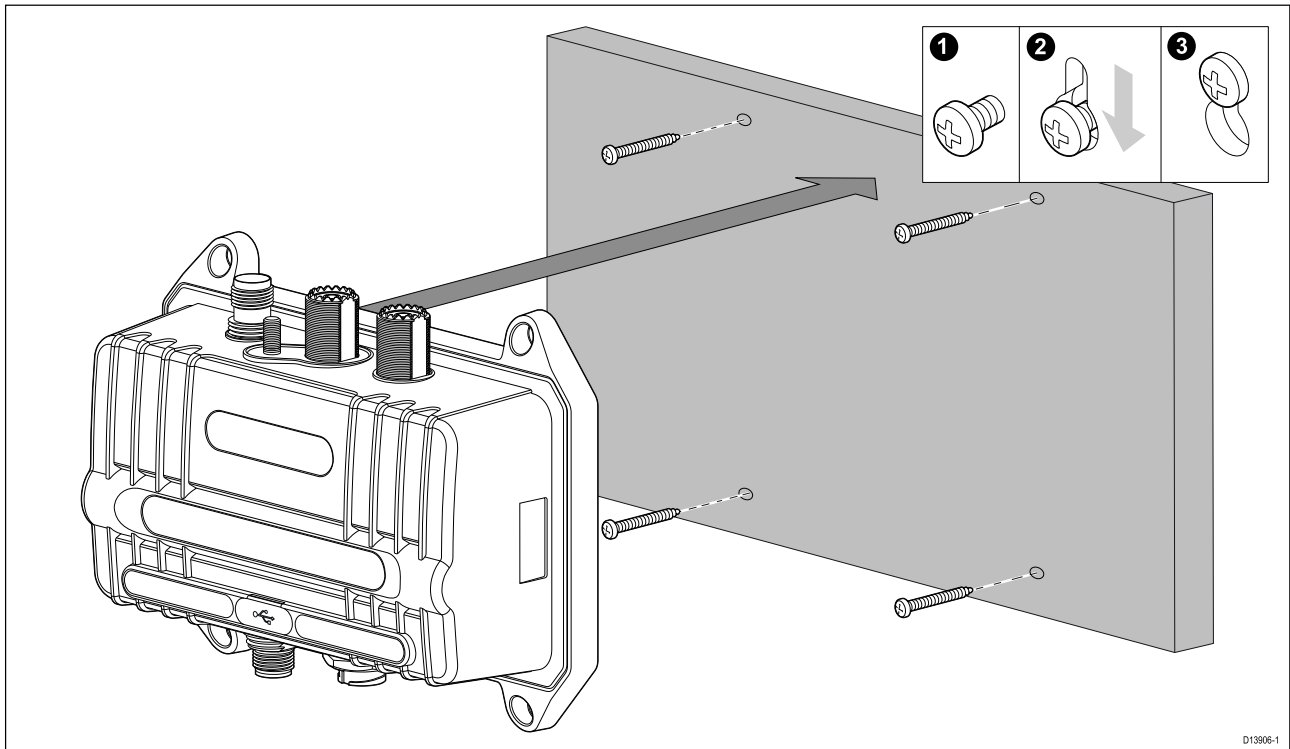
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- 7.1 Mounting the unit on page 30
- 7.2 Mounting the GNSS (GPS) antenna on page 30

7.1 Mounting the unit

Before mounting the unit, ensure that you have:

- selected a suitable location (a clear, flat surface is required).
- Identified the relevant cable connections and the route that the cable will take.



1. Using the unit as a guide, mark the location of the mounting holes on the mounting surface.
2. Drill holes for the mounting fixings using a drill with a suitable sized drill bit.
3. Screw the fixings approximately half way into the holes in the mounting surface.
4. Place the unit over the fixing screws and push down to lock into position.
5. Fully tighten the screws.
6. Connect the necessary cables.

7.2 Mounting the GNSS (GPS) antenna

To mount the antenna:

1. Select a suitable location for the antenna, as described in the *GNSS antenna location requirements* section.
2. **Mount your antenna according to the instructions provided in the following document: 88092 GA200 Installation instructions.** The document is supplied with the GNSS antenna, and is also available to download from the Raymarine website: www.raymarine.com/manuals

Important:

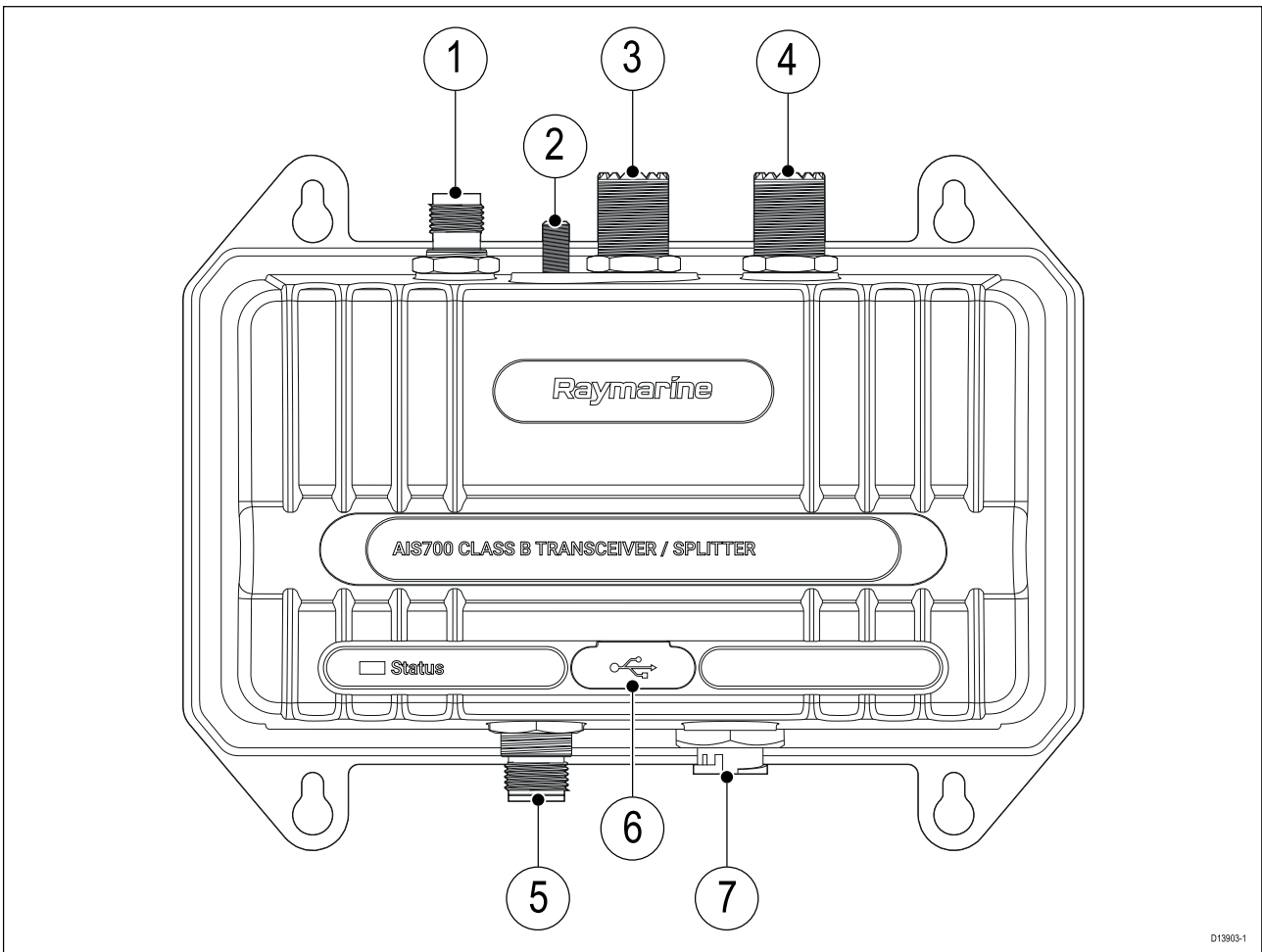
If you are replacing a GPS antenna supplied with an older AIS receiver or an AIS700 with an early (low) serial number, please be aware that the mounting diameter (cutout) of the GPS receiver has changed, from Ø44 mm to Ø60 mm.

Chapter 8: Connections

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- 8.1 Connections overview on page 32
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8.1 Connections overview



D13903-1

	Connection	Connects to:	Suitable cables:
1	GNSS connection	GNSS antenna	GNSS antenna's fitted cable
2	Grounding earth stud connection	Vessel battery's 0V negative battery terminal. Important: You must make this connection for safety reasons; it is not optional. Its purpose is to reduce potential damage caused by near lightning strikes and static build-up in the atmosphere.	Grounding strap (not supplied). For more information, refer to: p.38 – Grounding
3	To Antenna connection	VHF antenna	VHF antenna cable
4	To VHF connection	VHF Radio	The supplied VHF radio cable
5	NMEA 2000 / SeaTalkng connection	NMEA 2000 or SeaTalkng backbone.	The supplied DeviceNet to SeaTalkng adaptor cable or a DeviceNet spur cable
6	USB connection	Personal computer (PC)	Micro B USB cable
7	Power and data connection	<ul style="list-style-type: none"> 12/24 V dc power supply NMEA 0183 devices Silent mode switch 	The supplied Power/data cable

Data connections matrix

The following table details the types of data that can be exchanged using the various combinations of data connections (NMEA 0183 (Low / High baud rate), NMEA 2000 / SeaTalkng, and USB).

It is important to choose the right combination of connections in order to exchange the types of data you require.

As an example of how to use the table below, you can see that you can feed GNSS (GPS) data into the AIS700 via an NMEA 0183 port configured for low baud rate (4,800), and then output it along with AIS data to the other NMEA 0183 port configured for high baud rate (38,400).

When data is input on one NMEA 0183 port it is output on the other NMEA 0183 port; you cannot receive and send data on the same NMEA 0183 port.

INPUTS	OUTPUTS							
	NMEA 0183 (4,800)		NMEA 0183 (38,400)		NMEA 2000,* / SeaTalkng		USB	
	GNSS	AIS	GNSS	AIS	GNSS	AIS	GNSS	AIS
NMEA 0183 (4,800) GNSS	✗	✗	✓	✓	✗	✓	✗	✗
NMEA 0183 (38,400) GNSS	✓	✗	✗	✗	✗	✓	✗	✗
NMEA 2000 / SeaTalkng GNSS	✗	✗	✗	✓	✗	✓	✗	✓

Important:

To avoid potential data conflicts or loops, multiple network protocols should not be connected to the same device:

- Do NOT connect the AIS700 to an MFD using NMEA 0183 and SeaTalkng / NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a VHF Radio using NMEA 0183 and SeaTalkng / NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a PC using NMEA 0183 and USB connections at the same time.
- If you are connecting to an AIS-capable VHF Radio, you must first disable the VHF Radio's AIS function. Refer to your Radio's documentation for details on disabling the AIS function.

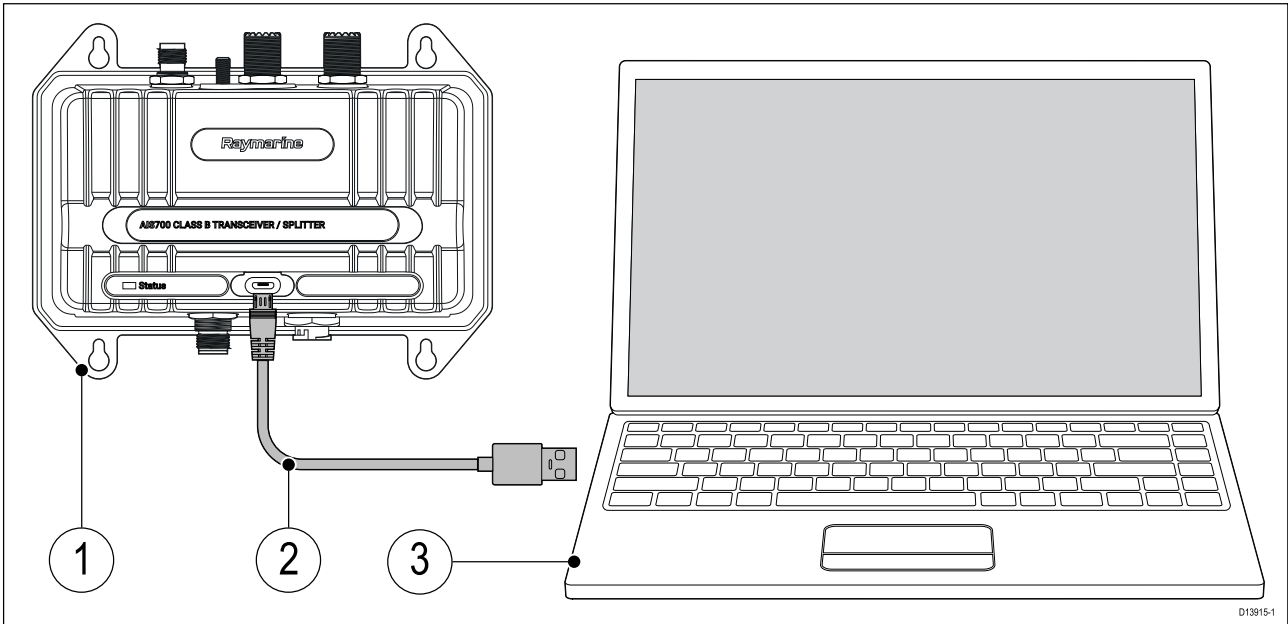
8.2 USB connection

Before using your product for the first time, you must configure it using the supplied proAIS2 software via a PC connected to the USB connection.

Important:

In the United States of America, it is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user or to otherwise input any inaccurate data in this device. The MMSI and Static Data must be entered only by a Raymarine dealer or other appropriately qualified installer of marine communications equipment on board vessels.

Ensure you check the regulations for your location to ensure you are allowed to configure MMSI data on your unit.



1. AIS unit
2. USB Micro-B to type A cable (not supplied)
3. PC (personal computer) running proAIS2

Note:

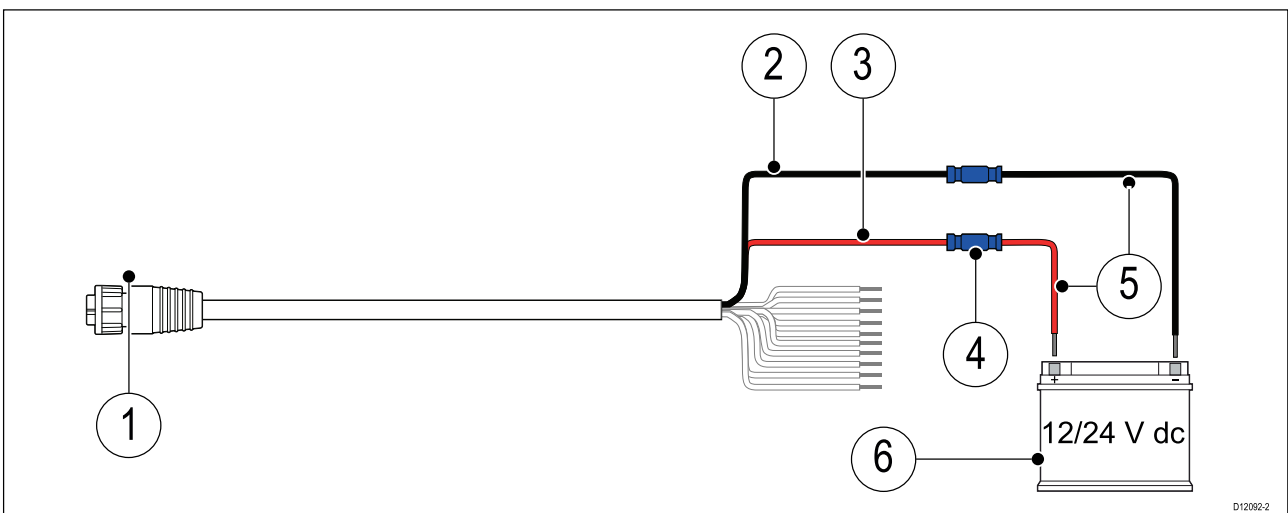
- The PC USB connection will provide power to the unit to enable configuration prior to installation.
- For details on configuring your unit, refer to: [Chapter 9 Set up and configuration](#)



Warning: USB device power

Do NOT connect any device to the product's USB connection that requires an external power source.

8.3 Power connection



1. Power/data cable (supplied)
2. Power supply – (Negative) Black wire
3. Power supply + (Positive) Red wire
4. Suitable waterproof connection (not supplied)
5. Power cable extension to vessel's circuit breaker/power source
6. Power source (12/24 V dc)

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
3 A	3 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.

Power distribution

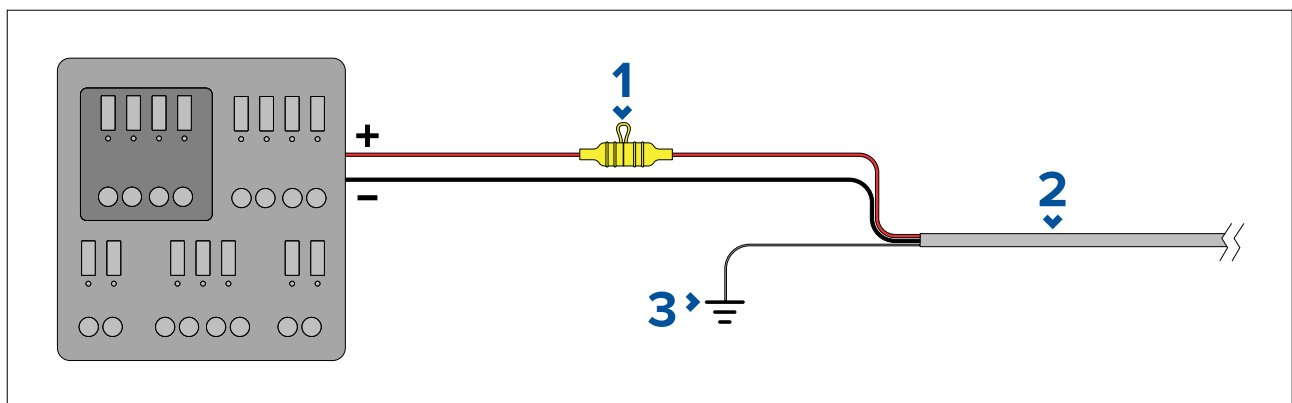
Recommendations and best practice.

- 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:

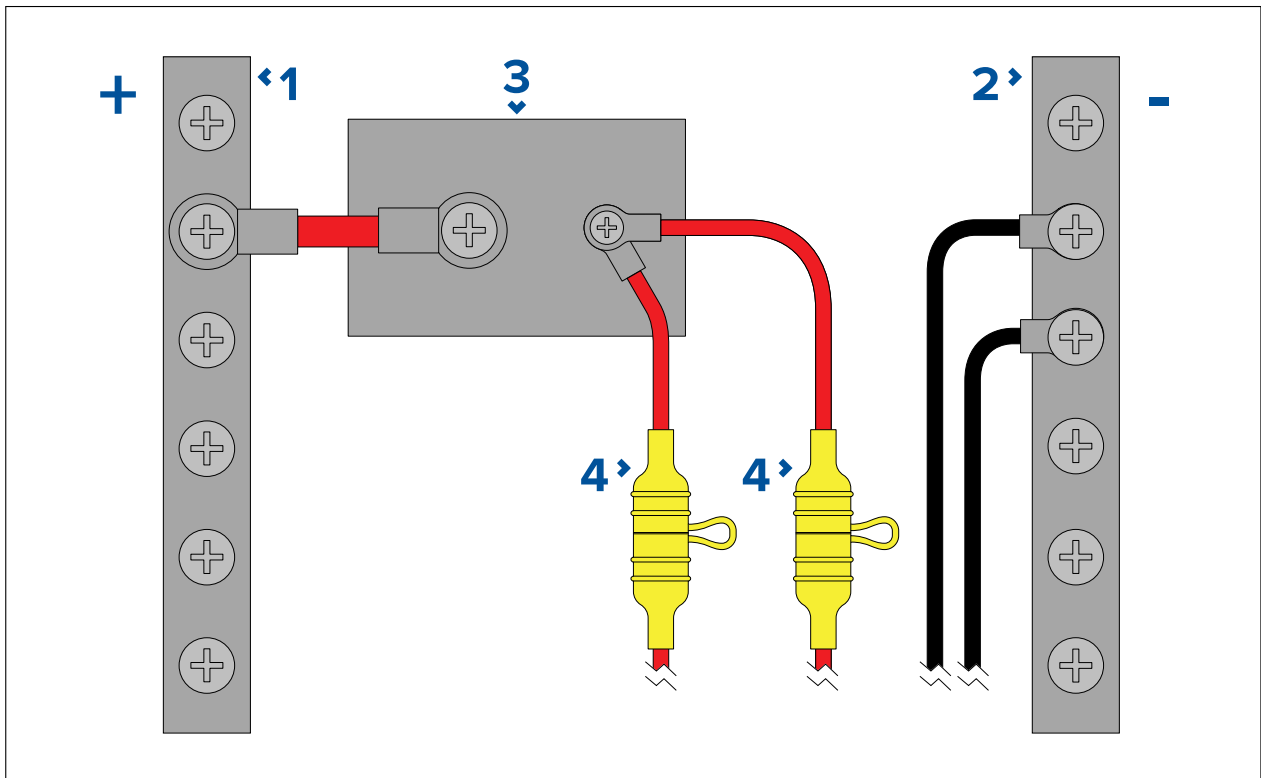
- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for 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: <i>In-line fuse and thermal breaker ratings</i> .
2	Product power cable.
3	Drain wire connection point.

- It is recommended that the supplied power cable is connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.
- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm²) cable.
- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is not possible and more than 1 item of equipment shares a breaker, use individual in-line fuses for each power circuit to provide the necessary protection.



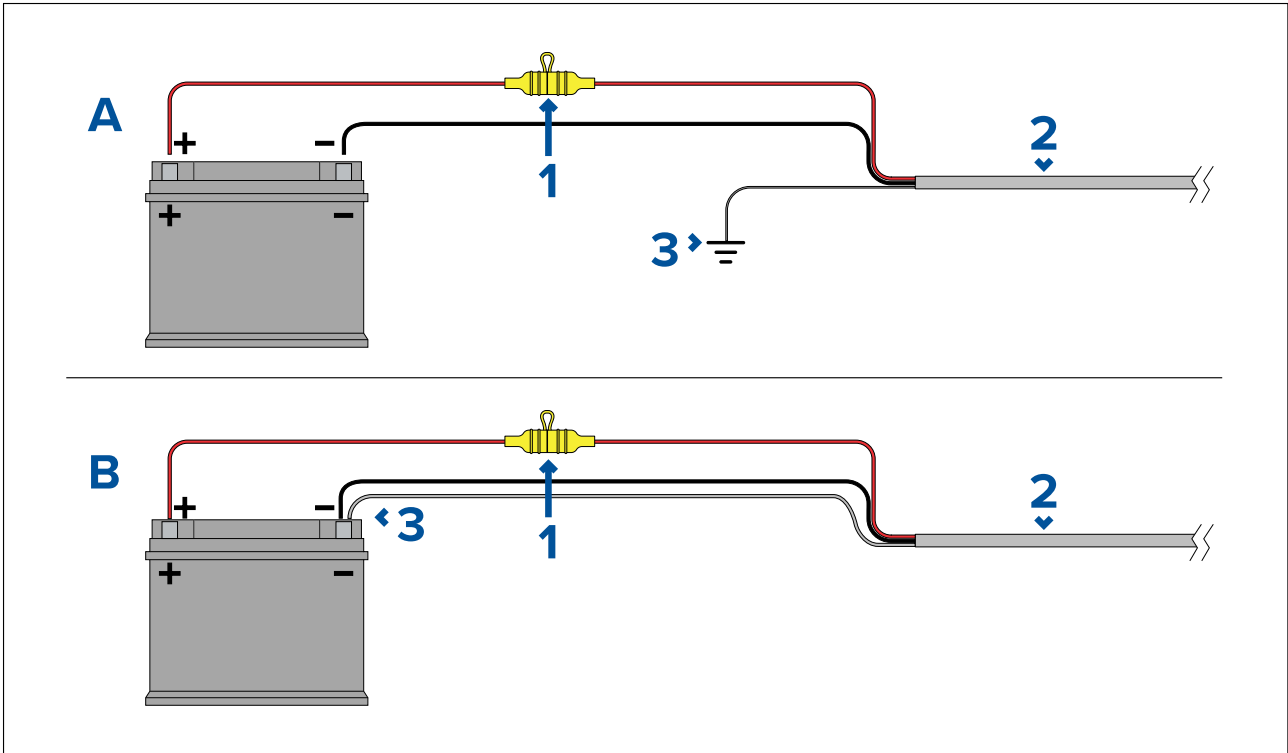
1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: <i>In-line fuse and thermal breaker ratings</i> .

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: <i>In-line fuse and thermal breaker ratings</i> .
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:

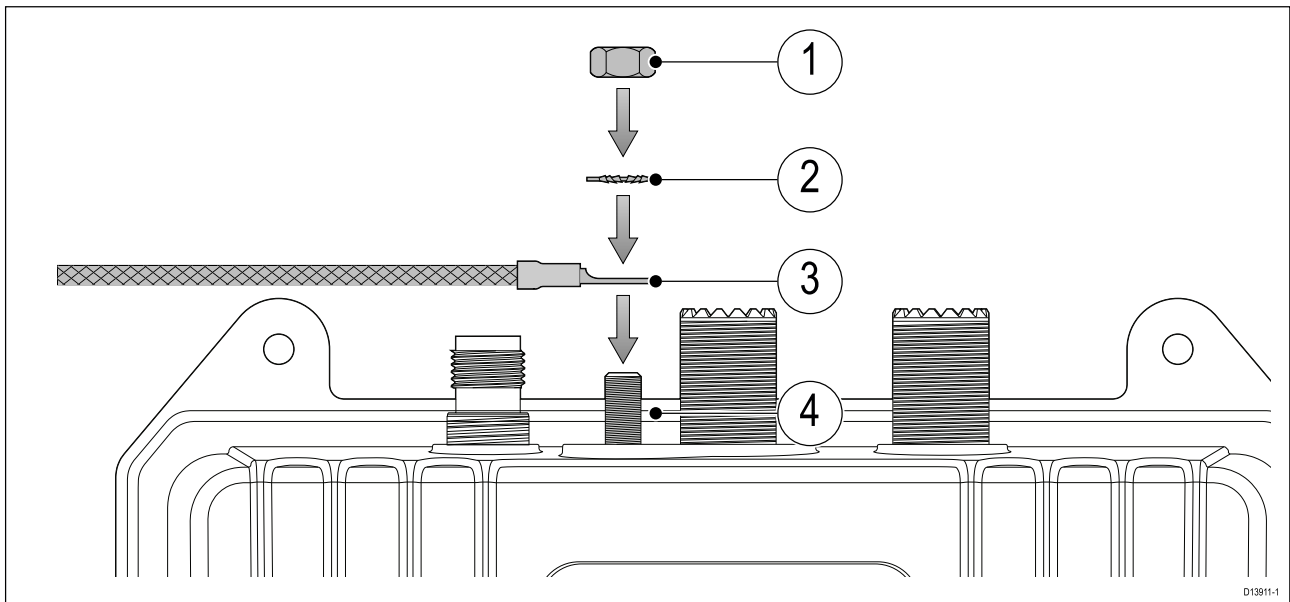
- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

Grounding

The AIS700 includes a dedicated grounding point to reduce potential damage caused by near lightning strikes and static build-up in the atmosphere.

The Grounding point must be connected to your vessel's 0V Negative battery terminal. This is NOT an optional connection.

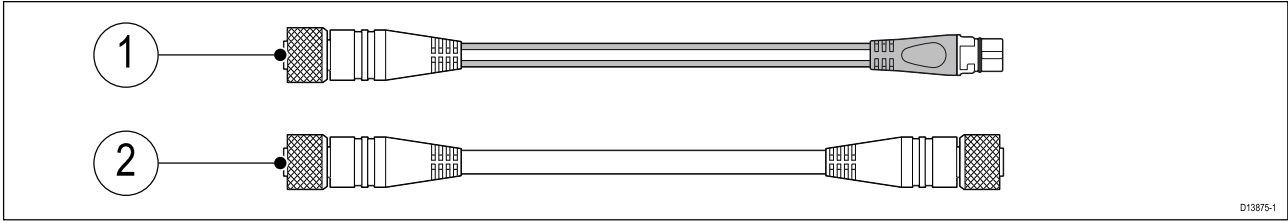
Note: If your vessel is constructed of an electrically conductive material such as steel, aluminium or carbon fibre, you **MUST** ensure that the VHF antenna's outer mount is insulated / isolated from the vessel structure.



1. M5 Nut (supplied)
2. M5 Shakeproof washer (supplied)
3. Grounding strap (not supplied), connected to vessel battery's 0V negative battery terminal.
4. Grounding stud

8.4 NMEA 2000 / SeaTalkng® connection

Your product can transmit data to devices connected on SeaTalkng® or NMEA 2000 CAN bus networks. Connection is established using the DeviceNet connector located on the bottom of the unit.



1. Use the supplied DeviceNet to SeaTalkng® adaptor cable to connect your product to an available spur connection on a SeaTalkng® backbone.
2. Alternatively you can connect your product to a NMEA 2000 backbone using a standard DeviceNet cable (not supplied).

Note:

1. The product must be connected to a correctly terminated backbone. You cannot connect your product directly to a MFD.
2. Refer to the instructions supplied with your SeaTalkng® / NMEA 2000 device for details on creating a backbone.

8.5 NMEA 0183 connection

The AIS700 can transmit and receive NMEA 0183 data, using the NMEA 0183 wires located on the power / data cable.

Note: Whilst it is possible to output both AIS and GNSS data, it is NOT recommended that you output GNSS data to external devices as this can cause data conflicts and / or performance issues. The ability to output GNSS data is intended for diagnostics purposes only.

The AIS700 includes 2 bidirectional NMEA 0183 ports. The baud rate for each port can be configured using the supplied proAIS2 software. Both ports can be multiplexed which enables any data provided to one port to be combined with AIS data and output on the other port.

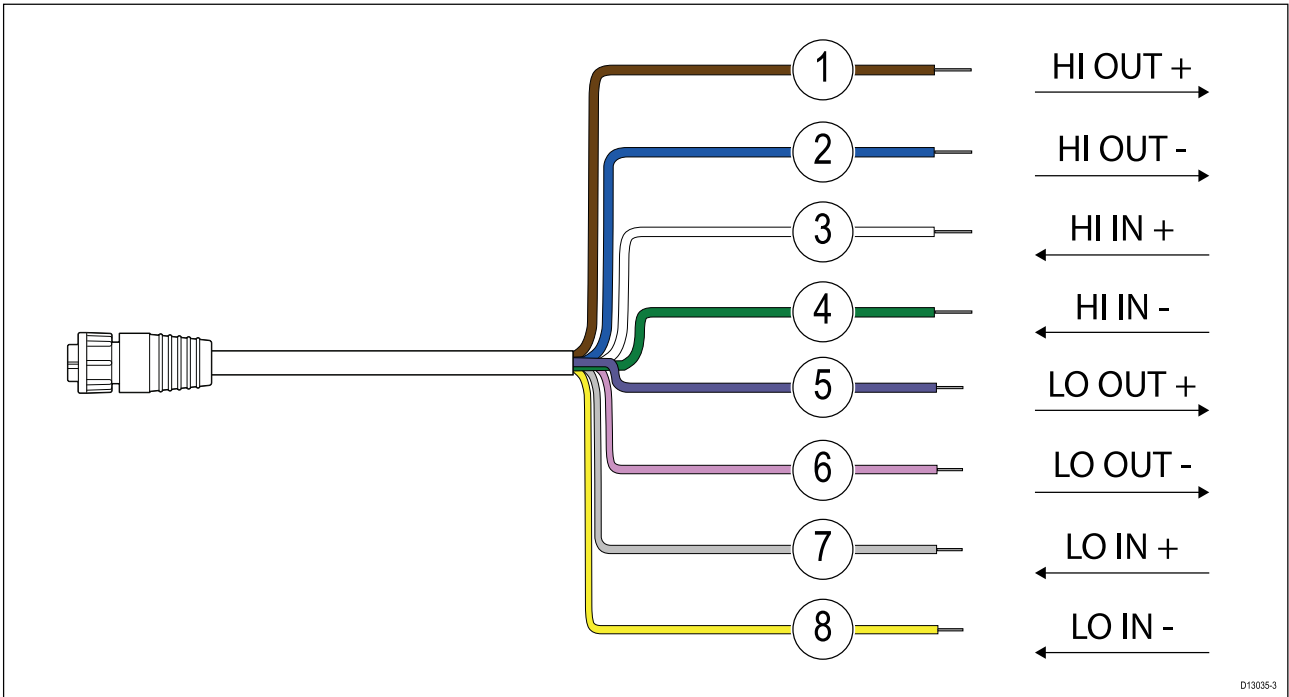
Typically port 1 is connected to an MFD and configured for 38,400 baud rate, the baud rate required for AIS data transfer. Port 2 is connected to a Heading sensor or other NMEA 0183 device and configured for 4,800 baud rate.

Important:

To avoid potential data conflicts or loops, multiple network protocols should not be connected to the same device:

- Do NOT connect the AIS700 to an MFD using NMEA 0183 and SeaTalkng / NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a VHF Radio using NMEA 0183 and SeaTalkng / NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a PC using NMEA 0183 and USB connections at the same time.
- If you are connecting to an AIS-capable VHF Radio, you must first disable the VHF Radio's AIS function. Refer to your Radio's documentation for details on disabling the AIS function.

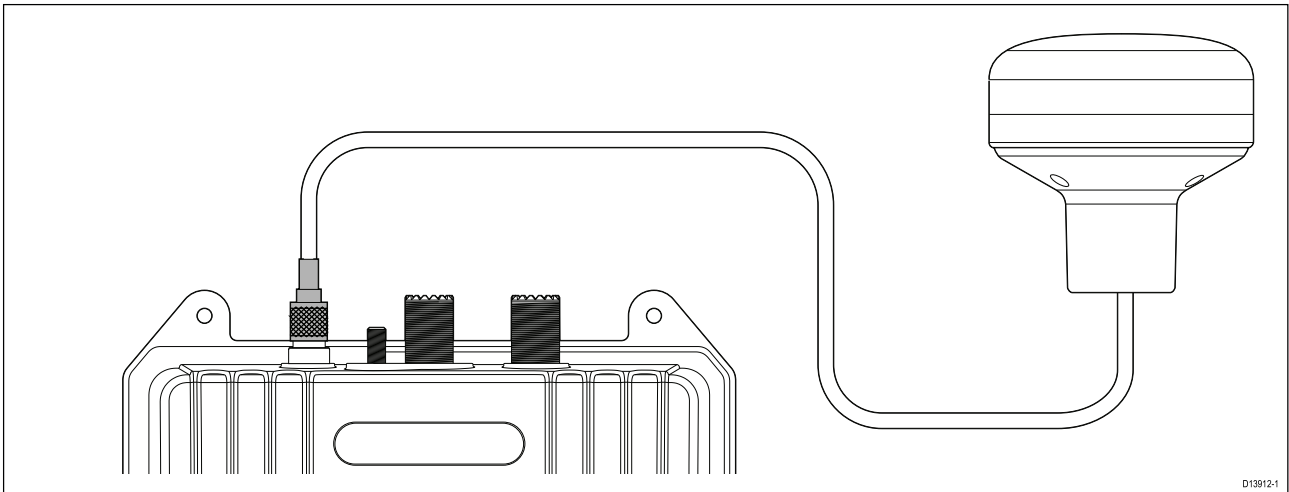
The NMEA 0183 connection wires on the power / data cable are identified below.



1	Brown (HI OUT +)	2	Blue (HI OUT -)
3	White (HI IN +)	4	Green (HI IN -)
5	Purple (LO OUT +)	6	Pink (LO OUT -)
7	Gray (LO IN +)	8	Yellow (LO IN -)

8.6 GPS (GNSS) antenna connection

Connect the supplied GNSS antenna to your AIS700 using the GNSS antenna connection. The antenna is fitted with a 10 m (33ft) cable for connecting to the AIS700.

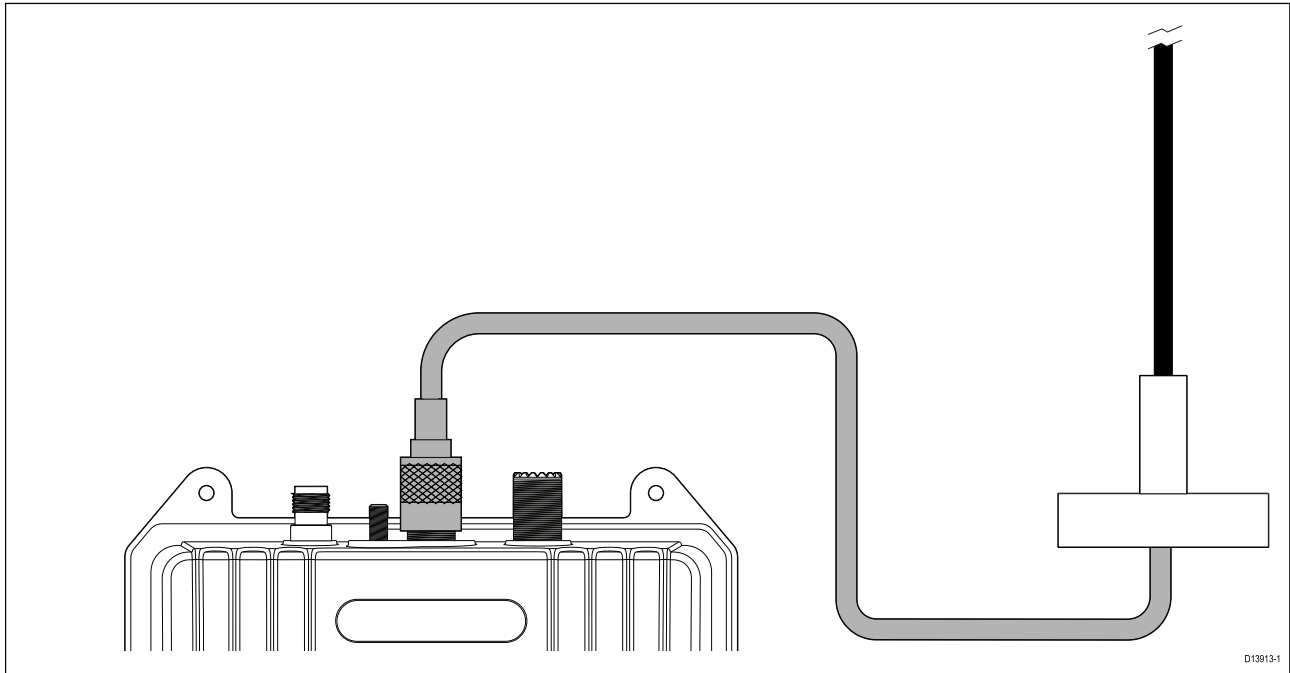


Note: Do NOT connect any other antenna than the one supplied with your AIS700.

If the antenna is not connected or connected incorrectly, your AIS700 will operate in Silent mode. In this mode, the AIS700 will not transmit but will still receive.

8.7 VHF antenna connection

Connect a VHF antenna (not supplied) to your AIS700 using the VHF antenna connection.



VHF antenna requirements

Important requirements related to the type and specification of the VHF antenna for your AIS unit.

To ensure optimum antenna performance, adhere to the following guidelines:

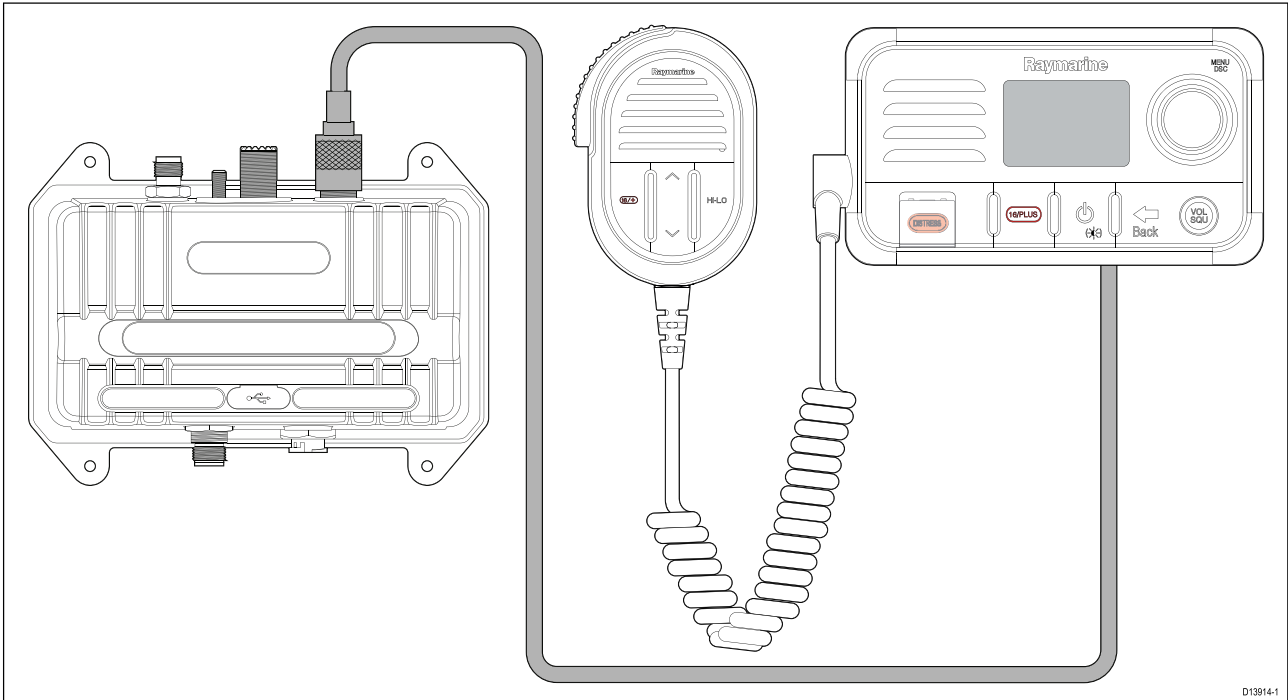
- The use of a **wideband** VHF antenna is highly recommended, rather than an AIS-only antenna.
- The AIS700 requires a wideband antenna to provide good performance for both the AIS transceiver and a connected VHF radio utilising the AIS700's integrated antenna splitter.
- Using a VHF antenna optimized for only AIS frequency operation may permanently damage the AIS700, as VHF radio transmissions are reflected back into the AIS700 due to the poor impedance match of the VHF antenna operating at VHF radio frequencies.
- Using a **non-wideband** VHF antenna optimized only for VHF radio frequencies may cause transmissions from the AIS transceiver to be reflected back into the AIS700, due to the poor impedance match of the antenna and AIS transceiver frequencies. Although this will not damage the AIS700 (because AIS class B transmissions are of substantially lower power than VHF transmissions), it could result in the AIS700 triggering a system VSWR alarm.
- New VHF antennas are sold with a fixed cable length. The cable length partly determines the antenna performance, and therefore cutting the cable of an antenna can affect its performance and result in a high VSWR ratio and limited reception.

Recommended specifications for a VHF antenna suitable for connecting to the AIS unit:

Frequency band	156.025 MHz to 162.025 MHz
VSWR (Voltage Standing Wave Ratio)	should not exceed 2:1, across the entire frequency range
Impedance	50 Ohm wideband
Gain	3dBi Max
Connector type	PL-259

8.8 VHF radio connection

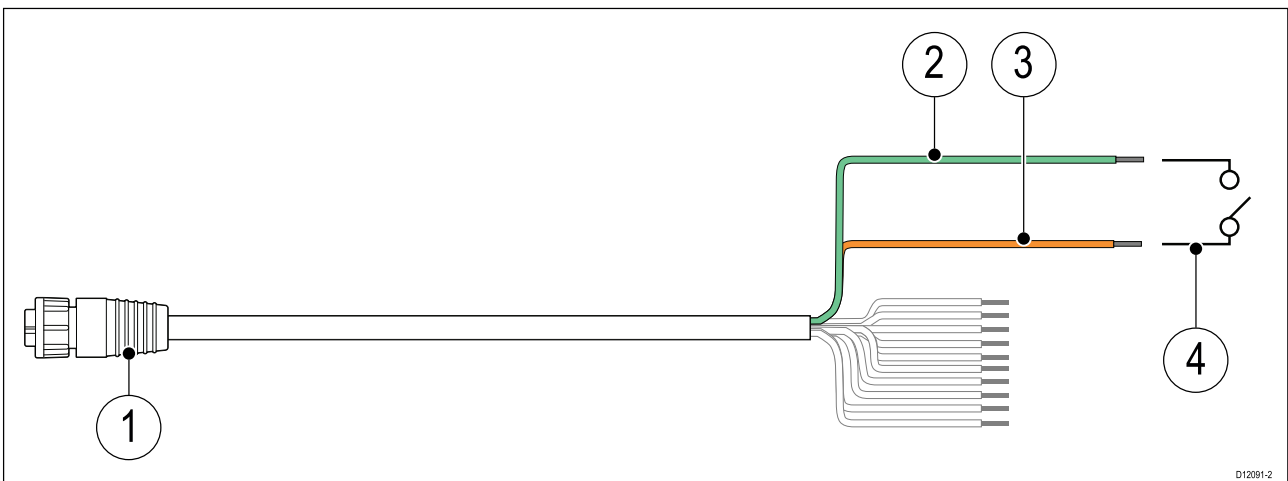
For systems that include a VHF DSC radio, you can share the VHF antenna by connecting your Radio's VHF antenna connection to the VHF Radio connection on your AIS700. Connect your VHF antenna to the AIS700's VHF antenna connection.



8.9 Silent mode switch connection

In Silent mode your AIS700 will stop transmitting position data and operate as a receiver only. Silent mode can be enabled using a connected MFD and by connecting a switch to the relevant wires on the Power/data cable. Please refer to your MFD's operation instructions for details on enabling silent mode.

Note: A silent mode switch will override an MFD's Silent mode setting.



1. Power/data cable (supplied)
2. Light Green wire
3. Orange wire
4. Switch (not supplied)

Crimp or solder the wire connections and ensure suitable insulation from water ingress.

Chapter 9: Set up and configuration

Chapter contents

- 9.1 IMPORTANT — Configure before use on page 44
- 9.2 AIS licensing and MMSI on page 44
- 9.3 Licensing and MMSI issuing authorities on page 45
- 9.4 Configuration on page 47
- 9.5 Software updates on page 49

9.1 IMPORTANT — Configure before use

Before first use this product **must** be correctly configured using a personal computer and the ProAIS2 software, which can be downloaded from the Raymarine website: www.raymarine.com/software

- Failure to configure the product will prevent correct operation.
- Configuration **MUST** include programming the product with an MMSI number. In some regions (such as the United States), the MMSI **must** be programmed by a qualified dealer or installer.
- Incorrect / incomplete configuration can cause erroneous data and prevent your product from transmitting.
- If an MMSI number is not programmed the product will operate as an AIS receiver only and will **not** transmit AIS information for your vessel.

9.2 AIS licensing and MMSI

Prior to using this product for the first time, please check your national requirements for both operator and equipment licensing.

Licensing

In many countries, the licensing for the use of AIS equipment is included in the **Ship Station license** and **Operator's license** issued for VHF radios.

However, even if you already have a Ship Station license and Operator's license for a VHF radio, **some countries may require a separate license for AIS equipment use.**

Important:

It is your responsibility to determine whether a license is required in your area before operating this equipment.

MMSI

An MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel / station. **Before commencing installation ensure you have obtained an MMSI number for your vessel.** This is a mandatory requirement. If your vessel already has an MMSI number (used for a VHF DSC radio, for example), then the same MMSI number must be used to program your AIS equipment.

Important:

In some areas, a radio operator licence is required before an MMSI number will be issued. If an MMSI number is not entered, your product can only be used in Silent Mode and will operate as a receiver only.

In the United States of America (USA), the MMSI and Static Data must be entered only by a Raymarine® dealer or other appropriately qualified installer of marine communications equipment for marine vessels.

In the USA, the user is NOT authorized to do this.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

Important:

You can only enter a MMSI number once, if you enter the number incorrectly or need to change your MMSI number, the unit will require re-programming by an authorized Raymarine dealer.

For a list of issuing authorities for licences and MMSI numbers in each region, refer to: [p.45 — Licensing and MMSI issuing authorities](#)

9.3 Licensing and MMSI issuing authorities

The following table lists the relevant issuing authority for licences and MMSI numbers in each region, along with a link to the relevant website. Many authorities allow you to apply for a license online.

Country	Code	Regulatory authority	Website
Argentina	AR	Ente Nacional de Comunicaciones	http://www.enacom.gob.ar
Australia	AU	Australian Communications and Media Authority	http://www.acma.gov.au/
Austria	AT	Austrian Regulatory Authority for Broadcasting and Telecommunications	http://www.rtr.at
Belgium	BE	Belgian Institute for Postal services and Telecommunications (BIPT)	http://www.bipt.be
Brazil	BR	Agencia Nacional de Telecomunicacoes	http://www.anatel.gov.br
Bulgaria	BG	Communications Regulation Commission	http://www.crc.bg
Canada	CA	Industry Canada	https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home
China	ZH	Ministry of Information Industry	http://www.mii.gov.cn
Costa Rica	CR	Superintendencia de Telecomunicaciones	http://sutel.go.cr
Croatia	HR	Croatian Post and Electronic Communications Agency	http://www.hakom.hr/default.aspx?id=7
Cyprus	CY	Office of Electronic Communications & Postal Regulation	http://www.ocecpr.org.cy/nqcontent.cfm?a_id=767&tt=ocecpr&l-ang=gr
Czech Republic	CZ	The Czech Telecommunication Office	http://www.ctu.eu/main.php?pageid=178
Denmark	DK	Danish Energy Agency	https://ens.dk/en
Estonia	EE	Estonian Competition Authority	http://www.konkurentsiamet.ee/?lang=en
Finland	FI	Finnish Communications Regulatory Authority	http://www.ficora.fi/en
France	FR	Autorité de Régulation des Communications Électroniques et des Postes	http://www.arcep.fr
Germany	DE	Bundesnetzagentur	http://www.bundesnetzagentur.de
Greece	EL	Hellenic Telecommunications and Post Commission	http://www.eett.gr/opencms/opencms/EETT_EN/index.html
Holland	NL	Autoriteit Consument & Markt	https://www.acm.nl/nl
Hong Kong	HK	Office of Communications Authority	http://www.ofca.gov.hk
Hungary	HU	National Media and Infocommunication Authority	http://www.nmhh.hu
Iceland	IS	Post and Telecom Administration	http://www.pfs.is/default.aspx?cat_id=101
Indonesia	ID	Indonesian Telecommunications Regulatory Authority	http://www.brti.or.id

Country	Code	Regulatory authority	Website
Ireland	IE	Commission for Communications Regulation	http://www.comreg.ie
Isle of Man	IM	Communications Commission	http://www.gov.im/government/boards/cc.xml
Italy	IT	Autorità per le Garanzie nelle Comunicazioni	http://www.agcom.it
Jamaica	JM	Spectrum Management Authority	http://www.sma.gov.jm
Japan	JP	Ministry of Internal Affairs and Communications	http://www.soumu.go.jp/english/index.html
Korea, South	KR	Korea Communications Commission	http://eng.kcc.go.kr
Lichtenstein	LI	Office for Communications	http://www.llv.li/amtstellen/llv-ak-english-page.htm
Lithuania	LT	Communications Regulatory Authority	http://www.rrt.lt/en/home.html
Luxembourg	LU	Institut luxembourgeois de régulation	http://www.ilr.public.lu
Latvia	LV	Elektronisko sakaru direkcija	https://www.vases.lv/lv/content/juras-sakaru-atlaujas
Malaysia	MY	Malaysian Communications and Multimedia Commission	http://www.mcmc.gov.my
Malta	MT	Malta Communications Authority	http://www.mca.org.mt
Mexico	MX	Instituto Federal de Telecomunicaciones	http://www.ift.org.mx
New Zealand	NZ	Commerce Commission of New Zealand	http://www.comcom.govt.nz
Norway	NO	Norwegian Communications Authority	http://www.nkom.no
Panama	PA	Autoridad Nacional de los Servicios Públicos	http://www.asep.gob.pa/default.asp
Poland	PL	Prezes Urzędu Komunikacji Elektronicznej	http://www.uke.gov.pl
Portugal	PT	Autoridade Nacional de Comunicações	https://www.anacom.pt
Romania	RO	National Authority for Management and Regulation in Communications of Romania	http://www.ancom.org.ro/en
Russia	RU	Ministry of Telecom and Mass Communications of the Russian Federation	https://minsvyaz.ru/en
Saudi Arabia	SA	Communications and Information Technology Commission (Saudi Arabia)	http://www.citc.gov.sa
Singapore	SG	Info-communications Media Development Authority of Singapore	https://www.imda.gov.sg
Slovenia	SI	Agency for communication networks and services of the Republic of Slovenia	http://www.akos-rs.si/akos-ang

Country	Code	Regulatory authority	Website
Slovakia	SK	Telecommunications Regulatory Authority of the Slovak Republic	http://www.teleoff.gov.sk/index.php?ID=9
South Africa	ZA	Independent Communications Authority of South Africa	http://www.icasa.org.za
Spain	ES	Comisión Nacional de los Mercados y la Competencia	https://www.cnmc.es/en
Sweden	SE	Swedish Post and Telecom Authority	http://www.pts.se
Switzerland	CH	Office fédéral de la communication	http://www.bakom.admin.ch/themen/frequenzen/00689/01563/index.html?lang=fr
Taiwan	TW	National Communications Commission	http://www.ncc.gov.tw/english/index.aspx
Thailand	TH	National Broadcasting and Telecommunications Commission	http://nbt.go.th/wps/portal/NTC/eng
Turkey	TR	Information And Communication Technologies Authority	http://eng.btk.gov.tr
United Arab Emirates	AE	Telecommunications Regulatory Authority	http://www.tra.ae
United Kingdom and Northern Ireland	UK(NI)	OFCOM	http://www.ofcom.org.uk
United States	US	FCC	https://www.fcc.gov/bureau-divisions/mobility-division/ship-radio-stations#block-menu-block-4

9.4 Configuration

The AIS700 should be configured prior to installation using a PC/laptop, USB Micro-B cable, and the supplied proAIS2 software.

The manner in which configuration is carried out depends on the legal requirements of your geographical location.

USA

In the USA, it is a legal requirement that the configuration is performed by a qualified dealer or installer.

You can use the supplied proAIS2 PC software, to check the vessel data programmed into your AIS700. If this information is incorrect please contact your Raymarine dealer.

Areas outside of USA

In areas outside of the USA, use the supplied proAIS2 PC software to configure your AIS700.

Note: If configuring after installation ensure any MFDs on the same network are switched off first, otherwise you will not be able to correctly configure your AIS700.

The following vessel-related static data should be configured:

- MMSI number
- Vessel name
- Vessel call sign
- Vessel dimensions including AIS GNSS (GPS) antenna location

- Vessel type

A valid 9 digit MMSI number must be entered. Invalid numbers will not be accepted. Only the *Vessel call sign* field is entirely optional.

Installing ProAIS2 software and USB drivers

Before using your AIS unit for the first time, you **must** configure the unit using the ProAIS software, via a PC, Mac or laptop connected by USB. This requires downloading and installing the ProAIS2 application and USB drivers, as described below:

1. Download the ProAIS2 software from the Raymarine website: www.raymarine.com/software
2. Double click on the *setup.exe* file to launch the installer.
3. Follow the on screen installation instructions, ensuring that the option to install USB drivers is selected when presented.
4. Once installed the AIS unit can be connected to the PC/laptop. The USB drivers will be installed automatically and the AIS unit will appear as a new COM port device.
5. Launch ProAIS2 by navigating to the ProAIS2 folder accessible from the Start menu or applications launcher of your PC/laptop.

Configuring using proAIS2

Important:

In the United States of America, it is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user or to otherwise input any inaccurate data in this device. The MMSI and Static Data must be entered only by a Raymarine dealer or other appropriately qualified installer of marine communications equipment on board vessels.

Ensure you check the regulations for your location to ensure you are allowed to configure MMSI data on your unit.

The screenshot shows the proAIS2 software interface. At the top, there's a menu bar (File, Options, Help) and a toolbar (Connect, Disconnect, Write Configuration). The main window is titled 'AIS Class B Transceiver (COM5)'. Below this, there are tabs for Configuration, GNSS Status, Other Vessels, Diagnostics, and Serial Data. The 'Configuration' tab is active, showing various settings:

- Vessel Details:** Ship's Name, Call Sign, MMSI Number, and Vessel Type (37 = Vessel - Pleasure craft).
- Configure Baud Rates:** NMEA1 Baud (38400) and NMEA2 Baud (4800).
- Output GNSS Sentences:** GBS - Satellite Fault Detection, GGA - Global Positioning System Fix Data, GLL - Latitude, Longitude, Time of Fix and Status, RMC - Recommended Minimum Data.
- Ship's Dimensions and GNSS Antenna Location:** A diagram of a vessel with a GNSS Antenna location marked and input fields for dimensions in meters.
- GNSS configuration:** GNSS Mode (GPS, GLONASS & Galileo).
- Long range broadcast:** Enable message 27.

Status: Ship's Name can not be blank

With the proAIS2 software open on your PC:

1. Select the AIS device from the drop down list at the top of the page.
2. Click **Connect**.
3. Enter your vessel's details, including MMSI in the relevant fields.
4. Select a **Vessel Type** appropriate for your vessel from the drop down list.
5. If required set the baud rate for your NMEA 0183 ports.
6. Ensure that the built-in GNSS receiver is not outputting sentences (i.e. ensure GBS, GGA, GLL and RMC boxes are not ticked).

The GNSS receiver built-in to the AIS700 is intended to provide GNSS data to the AIS unit only, outputting this data can cause data conflicts. The ability to output these sentences is intended for diagnostics purposes only.

7. Enter your vessel's dimensions and GNSS (GPS) antenna location in the relevant fields.
8. Ensure that the option selected in the **GNSS Mode** dropdown list reflects the range of GNSS (GPS) satellite systems that you need to use. If in doubt, keep the default option.
9. The Enable Message 27 option for the **Long range broadcast** setting is used for long range detection when outside the range of coastal receivers. Message 27 transmissions are on different channels to the standard AIS channels, and are primarily used for satellite reception. This option should only be selected if you are likely to be boating in a location that is outside the range of coastal receivers.
10. Click **Write Configuration** to save your configuration settings.
11. Click **Disconnect**.

9.5 Software updates

Raymarine periodically releases software updates for its products. These updates can provide new and enhanced features and also improve product performance and usability. You should ensure that you have the latest software for your products by regularly checking the website for new software. The software update process requires a compatible MFD powered by LightHouse™ 2 release 13 or greater, or LightHouse™ 3.

Check the Raymarine website regularly for software updates for your products:
www.raymarine.com/software.

The MFD used to perform the software update must be the designated Data master and be connected via SeaTalkng® / NMEA 2000 to the product being updated.

Please refer to Raymarine website for instructions on how to use your MFD to perform a software update: www.raymarine.com/software

If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine technical support.

Chapter 10: Maintenance

Chapter contents

- 10.1 Routine equipment checks on page 52
- 10.2 Product cleaning on page 52

10.1 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.

10.2 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 11: Troubleshooting

Chapter contents

- [11.1 Power up troubleshooting on page 54](#)
- [11.2 AIS data troubleshooting on page 54](#)
- [11.3 VSWR Alarm troubleshooting on page 56](#)
- [11.4 Data conflicts and data loops on page 56](#)
- [11.5 LED Status indicator on page 56](#)

11.1 Power up troubleshooting

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

Product does not turn on or keeps turning off

Possible causes	Possible solutions
Blown fuse / tripped breaker	<ol style="list-style-type: none"> 1. Check the condition of fitted fuses and breakers and connections, replace if necessary. 2. Ensure fitted fuse rating is correct (3 A) 3. If fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections	<ol style="list-style-type: none"> 1. Check that the power cable connector is fully inserted into the product and locked in position. 2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary. 3. With the product powered on, try flexing the power cable near to the product connector to see if this causes the product to re-boot/lose power, replace if necessary. 4. Check the product's power supply voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 5. With the product powered on and where applicable, transmitting, using a multi-meter, check for a voltage drop across all connectors /fuses etc, and replace if necessary.
Incorrect power connection	The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient	Check that your power supply (battery or distribution panel) is providing a minimum of 10.2 V to the product.

Product will not boot up (re-boot loop)

Possible causes	Possible solutions
Power supply and connection	See possible solutions from 'Products does not turn on or keeps turning off' above.
Software corruption	In the unlikely event that the product's software has become corrupted, please try re-flashing the product with the latest software from the Raymarine website: www.raymarine.com/software

11.2 AIS data troubleshooting

No AIS targets shown on the display

Possible causes	Possible solutions
Data / network problem	Review and carry out solutions in the <i>Missing, conflicting or erratic data</i> table below.
VHF antenna fault	Check the VHF antenna is properly connected and is not short circuiting to the vessel structure.
GNSS (GPS) antenna fault	Check the GNSS (GPS) antenna is properly connected and is installed in an appropriate location (e.g.: clear view of the sky).
AIS feature not enabled on display	Refer to the Operation instructions for your display to identify how to enable the AIS feature.

Possible causes	Possible solutions
MFD set to display Dangerous or Buddy targets only and none are in range of your vessel.	Refer to the Operation instructions for your display to identify how to enable the display of all AIS targets.
No AIS equipped vessels in range.	Wait for more vessels to be in your vicinity and check again (e.g.: in a marina).

Missing, conflicting or erratic data

Possible causes	Possible solutions
MMSI number and / or static data not configured.	Configure the product with an MMSI number and correct static data using the proAIS2 software and a PC. Refer to 9.4 Configuration for details.
AIS configuration, static data is not being saved.	Disconnect all connections then connect only the USB cable to a PC and retry configuration.
AIS hardware not detected by display	<ul style="list-style-type: none"> • Check all connections are secure and free from damage; replace if required. • When connected using NMEA 0183, ensure the port used to connect the product to your MFD is set to 38,400 baud rate. Also check that the port is configured to output AIS data (usually Port 1 outputs AIS data by default). • Ensure the MFD is connected to the same SeaTalkng® / NMEA 2000 network as your display, or that the MFD is connected directly to the relevant NMEA 0183 connections.
SeaTalkng® / NMEA 2000 and NMEA 0183 connected at the same time	Ensure only one connection is made, either SeaTalkng® / NMEA 2000 OR NMEA 0183.
Multiple AIS receivers/transceivers connected and operating	If your system includes more than one AIS receiver/transceiver, ensure that only one is powered on or transmitting.

VHF antenna requirements

Important requirements related to the type and specification of the VHF antenna for your AIS unit.

To ensure optimum antenna performance, adhere to the following guidelines:

- The use of a **wideband** VHF antenna is highly recommended, rather than an AIS-only antenna.
- The AIS700 requires a wideband antenna to provide good performance for both the AIS transceiver and a connected VHF radio utilising the AIS700's integrated antenna splitter.
- Using a VHF antenna optimized for only AIS frequency operation may permanently damage the AIS700, as VHF radio transmissions are reflected back into the AIS700 due to the poor impedance match of the VHF antenna operating at VHF radio frequencies.
- Using a **non-wideband** VHF antenna optimized only for VHF radio frequencies may cause transmissions from the AIS transceiver to be reflected back into the AIS700, due to the poor impedance match of the antenna and AIS transceiver frequencies. Although this will not damage the AIS700 (because AIS class B transmissions are of substantially lower power than VHF transmissions), it could result in the AIS700 triggering a system VSWR alarm.
- New VHF antennas are sold with a fixed cable length. The cable length partly determines the antenna performance, and therefore cutting the cable of an antenna can affect its performance and result in a high VSWR ratio and limited reception.

Recommended specifications for a VHF antenna suitable for connecting to the AIS unit:

Frequency band	156.025 MHz to 162.025 MHz
VSWR (Voltage Standing Wave Ratio)	should not exceed 2:1, across the entire frequency range
Impedance	50 Ohm wideband

Gain	3dBi Max
Connector type	PL-259

11.3 VSWR Alarm troubleshooting

If you experience regular VSWR alarms try the troubleshooting guidance below.

Possible causes	Possible solutions
Incorrect antenna in use.	Check that your antenna meets the required VHF antenna specification that can be found in the product documentation.
Antenna short or open circuit.	Check antenna for short or open circuit, repair or replace as necessary.
Product running an older version of software	Software version 1.09 included Improvements to Antenna fault detection (VSWR alarm).

11.4 Data conflicts and data loops




To avoid potential data conflicts and data loops, products should not be connected to the same device using more than one network protocol.


Important:

- Do NOT connect to an MFD or VHF radio using NMEA 0183 **and** SeaTalkng® / NMEA 2000 connections at the same time.
- Do NOT connect to a PC using NMEA 0183 **and** USB connections at the same time.
- If you are connecting to a VHF Radio that has built-in AIS, you **must** first disable the VHF Radio's AIS function, before connecting it to the AIS unit (or the same data network). Refer to your Radio's documentation for details on disabling the VHF Radio's AIS function.

11.5 LED Status indicator

The LED status indicator on the transceiver provides an indication of product status.

LED	Color	Status
	Green	Transceiver is powered up and operating normally.
	Amber	Transceiver is not transmitting. <ul style="list-style-type: none"> • Wait at least 30 minutes to check that a 'Quiet time' has not been requested by the local authority.
	Red	Transceiver fault / MMSI number not programmed. <ul style="list-style-type: none"> • Check MMSI number and static data has been correctly configured. • Check GNSS antenna is properly connected and has a clear unobstructed view of the sky. • Check the VHF antenna is properly connected and is not short circuiting to the vessel structure. • Check that power supply is at the correct voltage (12 V dc or 24 V dc).

LED	Color	Status
		<ul style="list-style-type: none"> Excessive difference between Heading from an input device, and COG.
	Blue	<p>Transceiver is running in silent mode (not transmitting). To disable silent mode:</p> <ul style="list-style-type: none"> Check the AIS Silent mode setting on your MFD. Check the position of the dedicated Silent mode switch, if fitted (the switch will override the MFD setting). Where no dedicated switch is fitted, check that the Light Green and Orange wires on the power/data cable are not shorting together.

Chapter 12: Technical support

Chapter contents

- 12.1 Product returns process on page 60
- 12.2 Raymarine product support and servicing on page 60
- 12.3 Learning resources on page 62

12.1 Product returns process

Many returned products are found to be not faulty. Before returning your product to Raymarine, please first conduct some basic troubleshooting to get up and running with your product. The Raymarine Product Support team is also available to take you step-by-step through any issues you might have.

1. Check all connections and power supply.
2. Ensure that the AIS unit has been programmed with an MMSI number.
3. Ensure that you have configured static data using the ProAIS2 software, which is available for download on the Raymarine website: www.raymarine.com/software
4. Connect the AIS receiver/transceiver to a PC and check the ProAIS2 diagnostics page for any faults.
5. Check that your display is compatible with your AIS receiver/transceiver.
6. Ensure that your display software is up to date. The latest software is available for download on the Raymarine website: www.raymarine.com/software
7. Ensure that the VHF and GNSS (GPS) antennas are operating correctly and installed in accordance with the instructions provided.
8. Ensure that the VHF antenna's specification meets the requirements detailed in the following section: [p.55 – VHF antenna requirements](#)
9. Check the LED status indicator against the diagnostics section of the product manual.
10. Read the product manual and troubleshooting information.
11. If the above actions do not resolve your problems, please call Raymarine Service and Support to obtain a Warranty Ref. No., see product return detail on the Raymarine website: www.raymarine.com/support

Note:

The above actions need to be completed prior to Raymarine accepting the unit back under warranty.

12.2 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

12.3 Learning resources

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

Video tutorials

Raymarine official channel on YouTube:

- [YouTube](#)

Training courses

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

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

Technical support forum

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

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

Chapter 13: Technical specification

Chapter contents

- [13.1 AIS700 technical specification on page 64](#)

13.1 AIS700 technical specification

Power specification

Supply voltage	12 V dc / 24 V dc
Operating voltage range	9.6 V dc to 31.2 V dc
Power consumption	Peak current: <ul style="list-style-type: none"> • 2.5A @ 12 V dc • 1.25A @ 24 V dc Typical power consumption: <ul style="list-style-type: none"> • 3 Watts
Fuse rating	3 A
LEN (Load Equivalency Number)	1

Environmental specification

Operating temperature range	-15°C to +55°C (+5°F to +131°F)
Storage temperature range	-20°C to +75°C (-4°F to 167°F)
Humidity	Up to 93% at 40°C
Waterproofing	IPx6, IPx7

AIS specification

Transmitter	x 1
Receiver	x 2
Operating frequency range	<ul style="list-style-type: none"> • Transmitting: 156.0MHz to 162.025 MHz • Receiving: 156.0MHz to 174.0 MHz
Channel spacing	25 KHz
AIS performance	5 W SOTDMA

GNSS receiver specification

Channels	72
Cold start acquisition	26s (nominal)
Position source	<ul style="list-style-type: none"> • GPS • GLONASS

External connections

VHF antenna connector type	SO-239 co-axial
VHF radio connector type	SO-239 co-axial
GNSS antenna connector type	50Ω TNC co-axial
SeaTalk ng® / NMEA 2000 connector type	5-way DeviceNet male
Power and NMEA 0183	12-way bare-ended wires
NMEA 0183 port 1 (MFD connection)	NMEA 0183 HS (IEC 61162–1) compliant, bi-directional, RS422 levels, 4 wire interface (differential signalling), configurable baud rate
NMEA 0183 port 2 (Instrument connection)	NMEA 0183 (IEC 61162–1) compliant, bi-directional, RS422 levels, 4 wire interface (differential signalling), configurable baud rate
Power	2-way bare-ended wires
Silent mode switch	2-way bare-ended wires

USB	Micro-B
Earth stud	Threaded stud (nut and washer supplied)

Chapter 14: Spares and accessories

Chapter contents

- [14.1 Spares and accessories on page 68](#)
- [14.2 SeaTalkng[®] cables and accessories on page 68](#)

14.1 Spares and accessories

The following spares are available:

Part number	Description
R62241	GNSS passive antenna with 10 m (32.8 ft) coaxial cable (for AIS transceivers only)
R32162	2 m (6.56 ft) Power/data cable

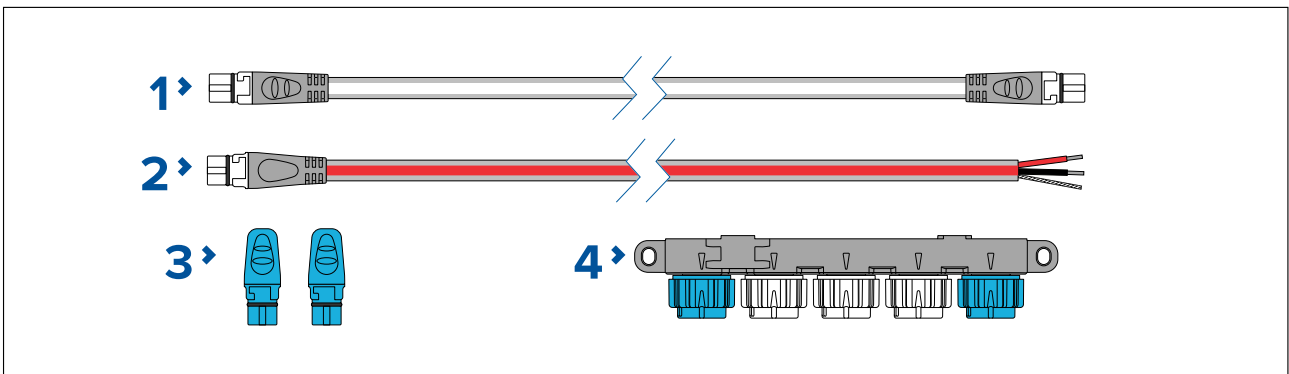
14.2 SeaTalkng[®] cables and accessories

SeaTalkng[®] cables and accessories for use with compatible products.

SeaTalkng[®] kits

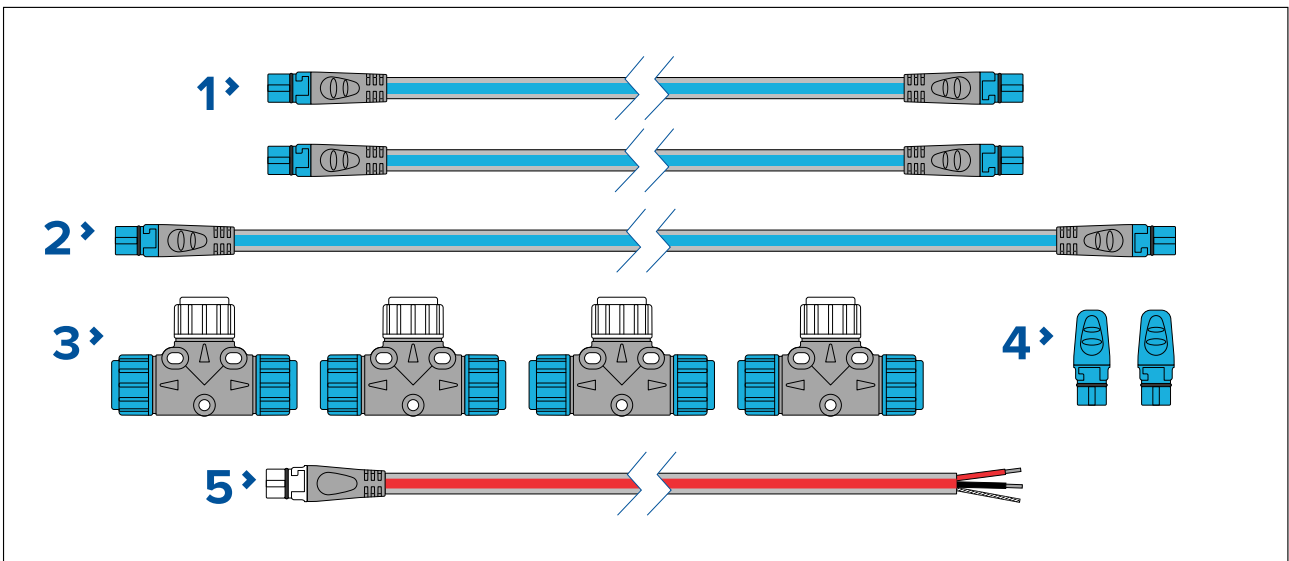
SeaTalkng kits enable you to create a simple SeaTalkng backbone.

Starter kit (T70134) consists of:



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

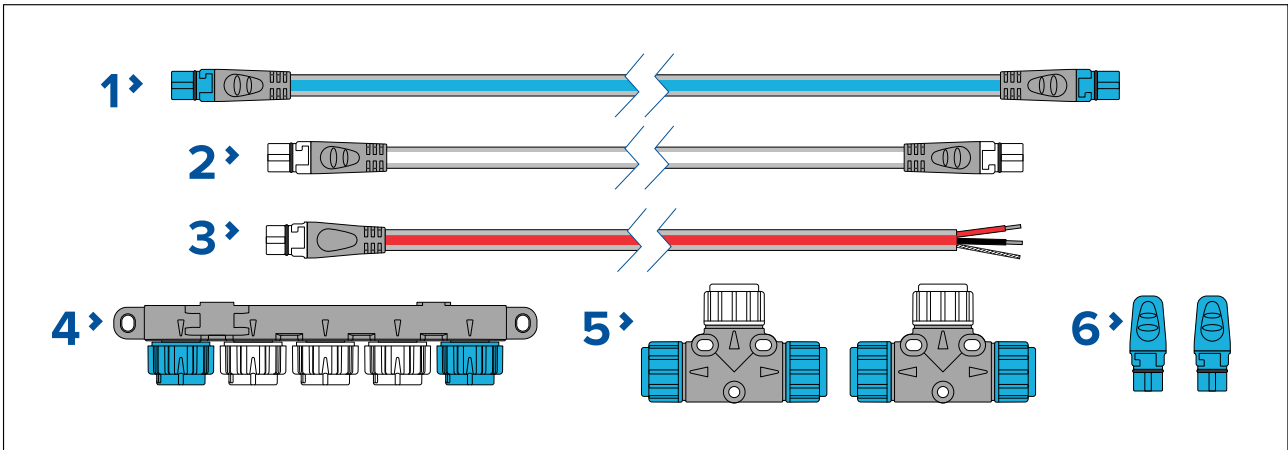
Backbone kit (A25062) consists of:



- 2 x 5 m (16.4 ft) Backbone cables (**A06036**). Used to create and extend the SeaTalkng backbone.
- 1 x 20 m (65.6 ft) Backbone cable (**A06037**). Used to create and extend the SeaTalkng backbone.
- 4 x T-piece (**A06028**). Each T-piece allows connection of one SeaTalkng device. Multiple T-pieces can be 'daisy chained' together.

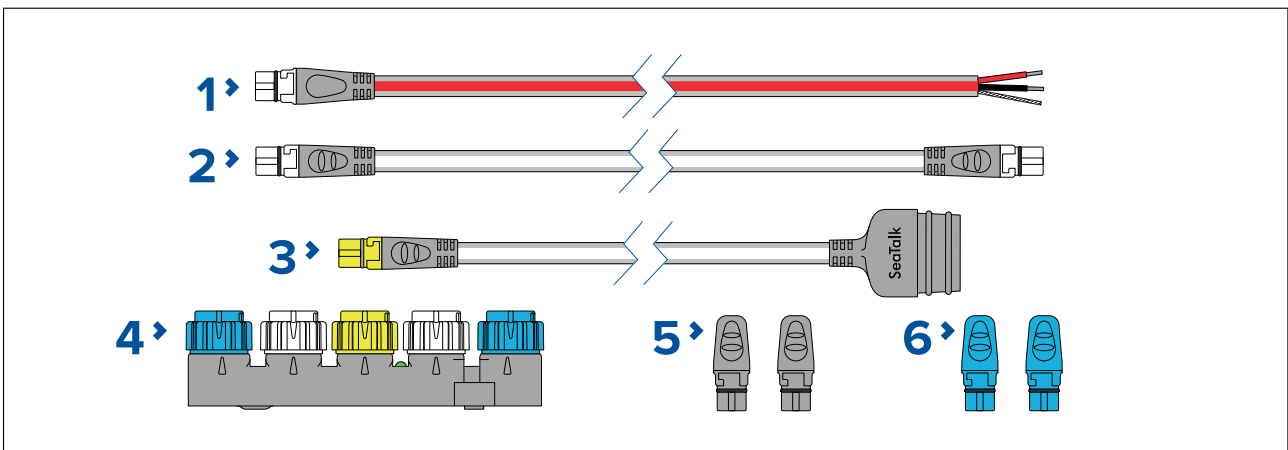
4. 2 x Backbone terminators (**A06031**). Terminators must be fitted to both ends of the SeaTalkng backbone.
5. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.

Evolution autopilot cable kit (R70160) consists of:



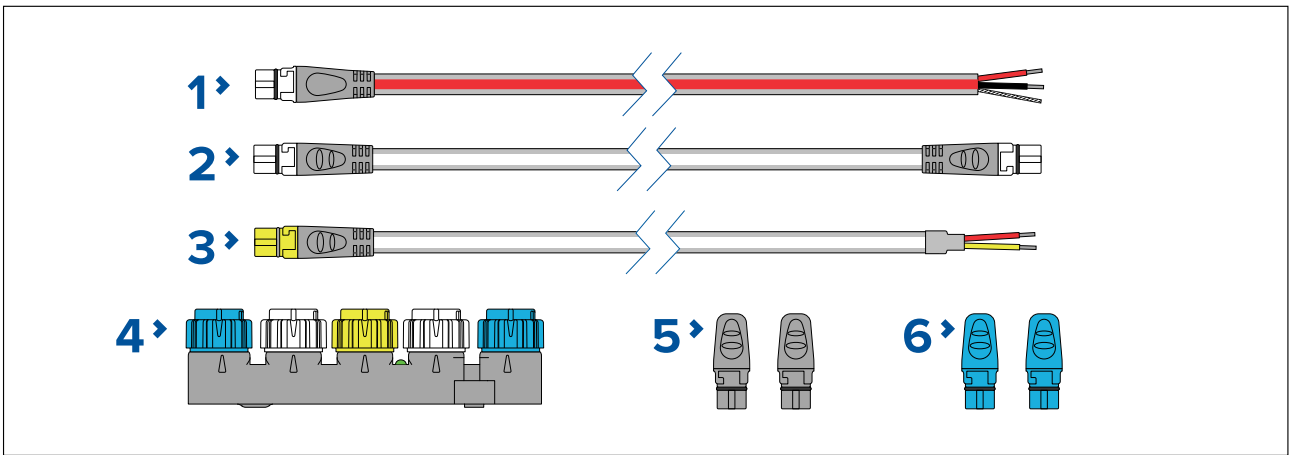
1. 1 x 5 m (16.4 ft) Backbone cable (**A06036**). Used to create and extend the SeaTalkng backbone.
2. 1 x 1 m (3.3 ft) Spur cable (**A06040**). Used to connect device to the SeaTalkng backbone.
3. 1 x 2 m (6.6 ft) Power cable (**A06049**). Used to provide 12 V dc power to the SeaTalkng backbone.
4.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

SeaTalk to SeaTalkng converter kit (E22158) consists of:



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

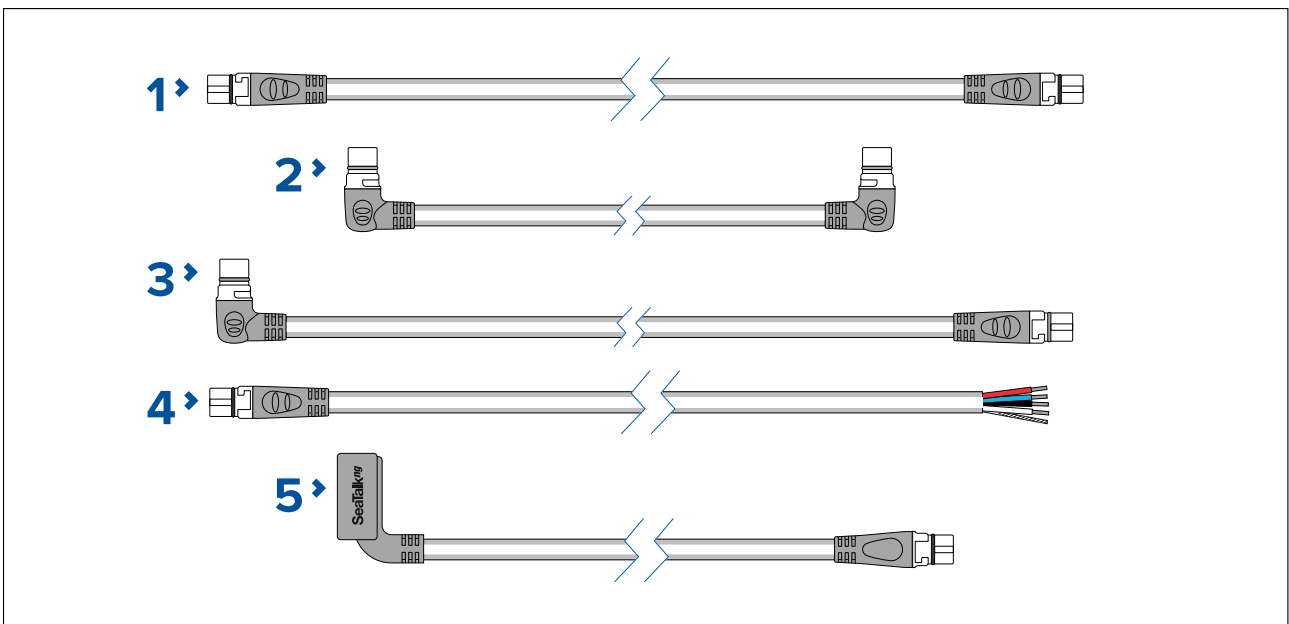
NMEA 0183 VHF 2 wire to SeaTalkng converter kit (E70196) consists of:



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

SeaTalkng[®] spur cables

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

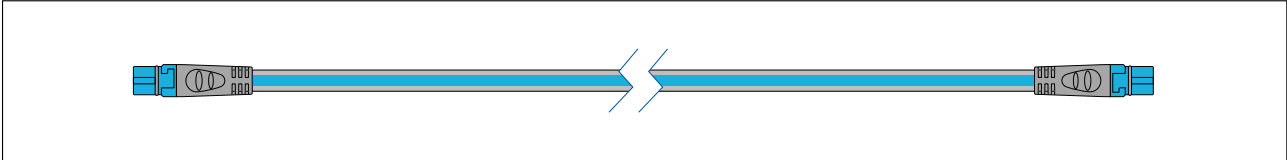


1. SeaTalkng spur cables:
 - 0.4 m (1.3 ft) Spur cable (**A06038**).
 - 1 m (3.3 ft) Spur cable (**A06039**).
 - 3 m (9.8 ft) Spur cable (**A06040**).
 - 5 m (16.4 ft) Spur cable (**A06041**).
2. 0.4 m (1.3 ft) Elbow (right angled) to elbow spur cable (**A06042**). Used in confined spaces where a straight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

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

SeaTalkng® backbone cables

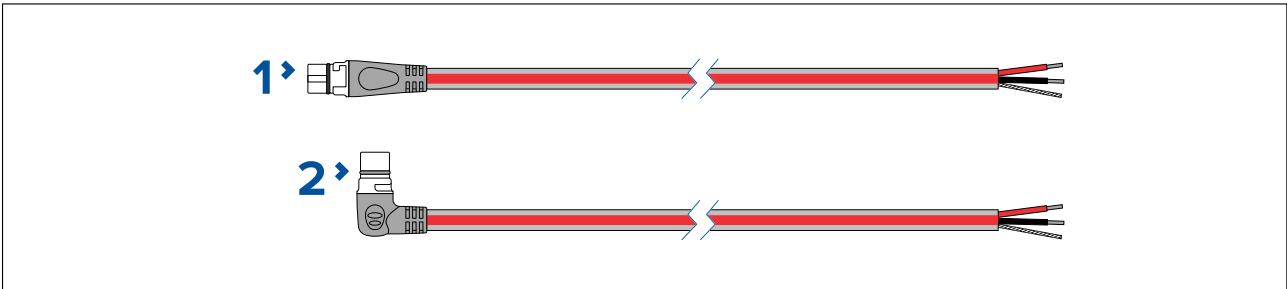
SeaTalkng backbone cables are used to create or extend a SeaTalkng backbone.



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

SeaTalkng® power cables

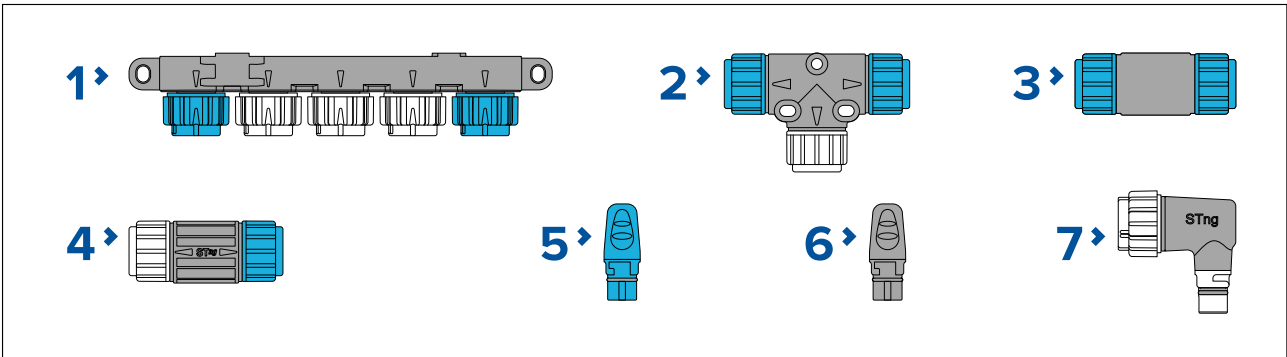
SeaTalkng power cables are used to provide the SeaTalkng backbone with a single 12 V dc power source. The power connection must include a 5 amp inline fuse (not supplied).



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

SeaTalkng® connectors

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

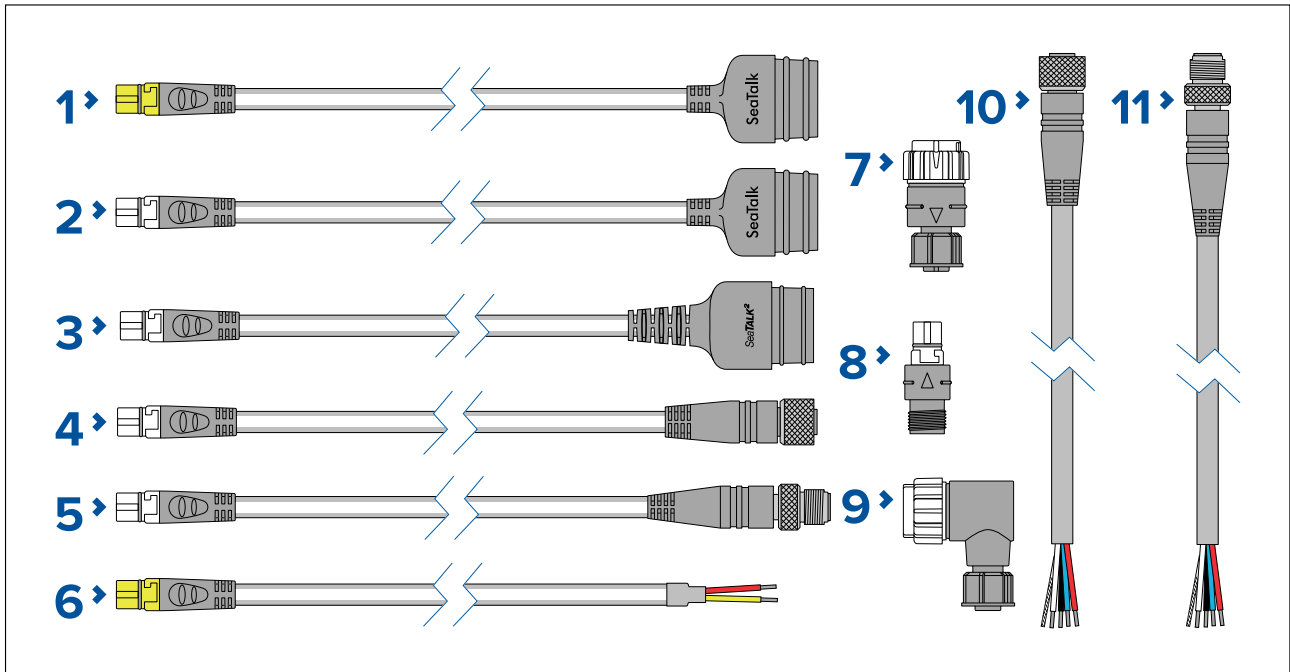


1. 5-Way connector (**A06064**). Each connector block allows connection of up to 3 SeaTalkng devices. Multiple connector blocks can be 'daisy chained' together.
2. T-piece (**A06028**). Each T-piece allows connection of one SeaTalkng device. Multiple T-pieces can be 'daisy chained' together.
3. Backbone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

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

SeaTalkng® adaptors and adaptor cables

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



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

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

Appendix A Licensing and MMSI issuing authorities

The following table lists the relevant issuing authority for licences and MMSI numbers in each region, along with a link to the relevant website. Many authorities allow you to apply for a license online.

Country	Code	Regulatory authority	Website
Argentina	AR	Ente Nacional de Comunicaciones	http://www.enacom.gob.ar
Australia	AU	Australian Communications and Media Authority	http://www.acma.gov.au/
Austria	AT	Austrian Regulatory Authority for Broadcasting and Telecommunications	http://www.rtr.at
Belgium	BE	Belgian Institute for Postal services and Telecommunications (BIPT)	http://www.bipt.be
Brazil	BR	Agencia Nacional de Telecomunicacoes	http://www.anatel.gov.br
Bulgaria	BG	Communications Regulation Commission	http://www.crc.bg
Canada	CA	Industry Canada	https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home
China	ZH	Ministry of Information Industry	http://www.mii.gov.cn
Costa Rica	CR	Superintendencia de Telecomunicaciones	http://sutel.go.cr
Croatia	HR	Croatian Post and Electronic Communications Agency	http://www.hakom.hr/default.aspx?id=7
Cyprus	CY	Office of Electronic Communications & Postal Regulation	http://www.ocecpr.org.cy/nqcontent.cfm?a_id=767&tt=ocecpr&lang=gr
Czech Republic	CZ	The Czech Telecommunication Office	http://www.ctu.eu/main.php?pageid=178
Denmark	DK	Danish Energy Agency	https://ens.dk/en
Estonia	EE	Estonian Competition Authority	http://www.konkurentsiamet.ee/?lang=en
Finland	FI	Finnish Communications Regulatory Authority	http://www.ficora.fi/en
France	FR	Autorité de Régulation des Communications Électroniques et des Postes	http://www.arcep.fr
Germany	DE	Bundesnetzagentur	http://www.bundesnetzagentur.de
Greece	EL	Hellenic Telecommunications and Post Commission	http://www.eett.gr/opencms/opencms/EETT_EN/index.html
Holland	NL	Autoriteit Consument & Markt	https://www.acm.nl/nl
Hong Kong	HK	Office of Communications Authority	http://www.ofca.gov.hk
Hungary	HU	National Media and Infocommunication Authority	http://www.nmhh.hu
Iceland	IS	Post and Telecom Administration	http://www.pfs.is/default.aspx?cat_id=101
Indonesia	ID	Indonesian Telecommunications Regulatory Authority	http://www.brti.or.id
Ireland	IE	Commission for Communications Regulation	http://www.comreg.ie
Isle of Man	IM	Communications Commission	http://www.gov.im/government/boards/cc.xml
Italy	IT	Autorità per le Garanzie nelle Comunicazioni	http://www.agcom.it

Country	Code	Regulatory authority	Website
Jamaica	JM	Spectrum Management Authority	http://www.sma.gov.jm
Japan	JP	Ministry of Internal Affairs and Communications	http://www.soumu.go.jp/english/index.html
Korea, South	KR	Korea Communications Commission	http://eng.kcc.go.kr
Lichtenstein	LI	Office for Communications	http://www.llv.li/amtsstellen/llv-ak-english-page.htm
Lithuania	LT	Communications Regulatory Authority	http://www.rtt.lt/en/home.html
Luxembourg	LU	Institut luxembourgeois de régulation	http://www.ilr.public.lu
Latvia	LV	Elektronisko sakaru direkcija	https://www.vases.lv/lv/content/juras-sakaru-atlaujas
Malaysia	MY	Malaysian Communications and Multimedia Commission	http://www.mcmc.gov.my
Malta	MT	Malta Communications Authority	http://www.mca.org.mt
Mexico	MX	Instituto Federal de Telecomunicaciones	http://www.ift.org.mx
New Zealand	NZ	Commerce Commission of New Zealand	http://www.comcom.govt.nz
Norway	NO	Norwegian Communications Authority	http://www.nkom.no
Panama	PA	Autoridad Nacional de los Servicios Públicos	http://www.asep.gob.pa/default.asp
Poland	PL	Prezes Urzędu Komunikacji Elektronicznej	http://www.uke.gov.pl
Portugal	PT	Autoridade Nacional de Comunicações	https://www.anacom.pt
Romania	RO	National Authority for Management and Regulation in Communications of Romania	http://www.ancom.org.ro/en
Russia	RU	Ministry of Telecom and Mass Communications of the Russian Federation	https://minsvyaz.ru/en
Saudi Arabia	SA	Communications and Information Technology Commission (Saudi Arabia)	http://www.citc.gov.sa
Singapore	SG	Info-communications Media Development Authority of Singapore	https://www.imda.gov.sg
Slovenia	SI	Agency for communication networks and services of the Republic of Slovenia	http://www.akos-rs.si/akos-ang
Slovakia	SK	Telecommunications Regulatory Authority of the Slovak Republic	http://www.teleoff.gov.sk/index.php?ID=9
South Africa	ZA	Independent Communications Authority of South Africa	http://www.icasa.org.za
Spain	ES	Comisión Nacional de los Mercados y la Competencia	https://www.cnmc.es/en
Sweden	SE	Swedish Post and Telecom Authority	http://www.pts.se
Switzerland	CH	Office fédéral de la communication	http://www.bakom.admin.ch/themen/frequenzen/00689/01563/index.html?lang=fr

Country	Code	Regulatory authority	Website
Taiwan	TW	National Communications Commission	http://www.ncc.gov.tw/english/index.aspx
Thailand	TH	National Broadcasting and Telecommunications Commission	http://nbt.go.th/wps/portal/NTC/eng
Turkey	TR	Information And Communication Technologies Authority	http://eng.btk.gov.tr
United Arab Emirates	AE	Telecommunications Regulatory Authority	http://www.tra.ae
United Kingdom and Northern Ireland	UK(NI)	OFCOM	http://www.ofcom.org.uk
United States	US	FCC	https://www.fcc.gov/bureau-divisions/mobility-division/ship-radio-stations#block-menu-block-4

Appendix B NMEA 0183 supported sentences

The AIS700 supports the following NMEA 0183 sentences

Sentence	Description	Transmit	Receive
ABK	ABM/BBM acknowledgement	•	
ABM	Addressed binary message		•
ACA	AIS channel management assignment	•	
ACS	AIS channel management information source	•	
AIQ	AIS query		•
ACK	Acknowledge alarm		•
BBM	Broadcast binary message		•
HDT	Heading true		•
RST	Equipment reset command	•	•
SSD	Ship static data		•
THS	True heading and status		•
TXT	Text	•	
VDM	AIS VHF data-link message	•	
VDO	AIS VHF data-link own-vessel report	•	
VSD	Voyage static data		•

Sentences output by query (AIQ)

Sentence	Description
ACA	AIS channel management assignment
SSD	Ship static data
TXT	Text
VER	Version
VSD	Voyage static data

Appendix C NMEA 2000 supported PGNs

The AIS700 supports the following PGNs.

PGN	Description	Transmit	Receive
59392	ISO Acknowledgement	•	•
59904	ISO Request	•	•
60928	ISO Address Claim	•	•
65240	ISO Commanded Address	•	•
126208	Request group function	•	•
126992	System time	•	
126993	Heartbeat	•	
126996	Product information	•	•
127250	Vessel heading		•
129025	Position, rapid update	•	
129026	COG & SOG, rapid update	•	
129029	GNSS position data	•	
129038	AIS Class A position report	•	
129039	AIS Class B position report	•	
129040	AIS Class B extended position report	•	
129041	AIS AToN report	•	
129793	AIS UTC and date report	•	
129794	AIS class A static and voyage related data	•	
129795	AIS addressed binary message	•	
129796	AIS Acknowledge	•	
129797	AIS binary broadcast message	•	
129798	AIS SAR aircraft position report	•	
129801	AIS addressed SRM	•	
129802	AIS safety broadcast binary message	•	
129809	AIS class B CS static data report part A	•	
129810	AIS class B CS static data report part B	•	

Appendix D AIS overview

Your AIS unit uses digital radio signals to exchange 'real-time' information between vessels, shore based stations, or aids to navigation (AToNs) on dedicated VHF frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data.

Although AIS augments your Radar app by operating in Radar blind spots and detecting smaller AIS-fitted vessels, it does not replace your Radar, as it relies on receiving transmitted AIS information and therefore cannot detect objects such as landmasses, navigational beacons or vessels not equipped with AIS.

Note:

NEVER assume that AIS is displaying information from all vessels in the area, because:

- Not all vessels are fitted with AIS
- Although it is mandatory for larger commercial vessels to carry AIS, it is not mandatory to use it.

AIS should be used only to augment Radar information, not substitute it.

AIS limitation

Never assume that your AIS is detecting all vessels in the area. Always exercise due prudence and do not use AIS as a substitute for sound navigational judgement.

Classes of AIS

Class A transceivers

Class A AIS transceivers transmit and receive AIS signals. AIS transceivers are currently mandatory on all commercial vessels exceeding 300 tons that travel internationally (SOLAS vessels).

The following information can be transmitted by a Class A AIS system:

- Static data (Includes information such as MMSI number, vessel name, vessel type, call sign, IMO number, length, beam and GNSS antenna location).
- Voyage related data (Includes information such as draft, cargo, destination, ETA and other relevant information).
- Dynamic data (Includes information such as time (UTC), ship's position, COG, SOG, heading, rate of turn and navigational status).
- Dynamic reports (Ship's speed and status).
- Messages (Alarms and safety messages).

Remember that not all vessels will transmit all of the information.

Class B transceivers

Class B AIS transceivers transmit and receive AIS signals, but use a reduced set of data compared to Class A (see *Data Summary*). A Class B AIS transceiver can be fitted on any vessel not fitted with a Class A transceiver, but is not mandatory aboard any vessel.

Data Summary

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
Ship's name	Yes	Yes	Yes
Type	Yes	Yes	Yes
Call sign	Yes	Yes	Yes
IMO number	Yes	No	Yes
Length and beam	Yes	Yes	Yes
Antenna location	Yes	Yes	Yes
Draft	Yes	No	Yes
Cargo Information	Yes	Yes	Yes
Destination	Yes	No	Yes
ETA	Yes	No	Yes
Time	Yes	Yes	Yes
Ship's position	Yes	Yes	Yes
COG	Yes	Yes	Yes

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
SOG	Yes	Yes	Yes
Gyro heading	Yes	Yes*	Yes
Rate of turn	Yes	No	Yes
Navigational status	Yes	No	Yes
Safety message	Yes	No	Yes

*Class B transceivers do not transmit a Gyro heading unless the transceiver is receiving an NMEA HDT sentence from an external source.

Data reporting intervals

AIS information is classed as either static or dynamic. Static information is broadcast, when data has been amended, or upon request, or by default, every 6 minutes.

The reporting rates for dynamic information depend on speed and course change, and are given in the following tables.

Note: The reporting rates shown here are for reference and may not be the rate at which information is actually received by your AIS transceiver. This is dependent on a number of factors, including but not limited to antenna height, gain and signal interference.

Class A systems

Ships Dynamic Conditions	Reporting rate	
	Not changing course	Changing course
At anchor or moored, moving less than 3 knots	3 Minutes	3 Minutes
At anchor or moored, moving greater than 3 knots	10 Seconds	10 Seconds
0-14 knots	10 Seconds	3 1/3 Seconds
14-23 knots	6 Seconds	2 Seconds
Faster than 23 knots	2 Seconds	2 Seconds

Class B systems

Ships Dynamic Conditions	Reporting rate (nominal)
SOTMDA – 0 to 2 knots	3 Minutes
SOTMDA – 2 to 14 knots	30 Seconds
SOTMDA – 14 to 23 knots	15 Seconds
SOTMDA – Greater than 23 knots	5 Seconds
CSTMDA – 0 to 2 knots	3 Minutes
CSTMDA – Greater than 2 knots	30 Seconds

Other AIS sources

Source	Reporting rate
Search and Rescue (SAR) aircraft	10 Seconds
Aids to navigation (AToN)	3 Minutes
AIS base station	10 Seconds or 3.33 Seconds, depending on operating parameters

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