Micro-Talk Gateway

INSTALLATION INSTRUCTIONS

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Software updates

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

Product documentation

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

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Chapter 1: Important information

Warning: Product installation and operation

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- Raymarine recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.

Warning: Potential ignition source

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

Warning: Switch off power supply

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

Warning: Power supply voltage

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

Caution: Power supply protection

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

Caution: Product cleaning

When cleaning products:

- Lightly rinse or flush with clean, cool fresh water.
- If your product has a display screen, do NOT wipe the screen with a dry cloth, as this could scratch the screen coating.
- Do NOT use: abrasive, acidic, ammonia, solvent of chemical based cleaning products.
- Do NOT use a jet wash.

Caution: Service and maintenance

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

Water ingress

Water ingress disclaimer

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

Disclaimer

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

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

Suppression ferrites

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

Connections to other equipment

Requirement for ferrites on non-Raymarine cables

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

Declaration of conformity

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

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

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment.

Warranty registration

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

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

IMO and SOLAS

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

Technical accuracy

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

Chapter 2: Document and product information

Chapter contents

- 2.1 Document information on page 14
- 2.2 Product overview on page 17
- 2.3 Networking restrictions on page 19

2.1 Document information

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

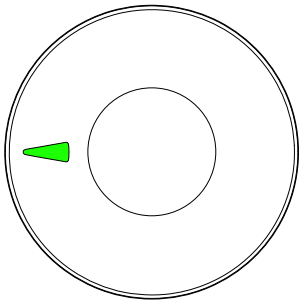
The document includes information to help you:

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

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

Applicable products

This document is applicable to the following products:

	Part number	Name	Description
	E70361	Micro-Talk	Micronet (Wireless) to SeaTalkng ® gateway

Special bundle and promotional products

From time to time, Raymarine may supply certain products as special “bundle”, “package”, or “promotional” variants.

These bundles typically include additional accessories such as cables, and usually have a Txxxxx part number. For these bundle variants, the provided parts supplied and part numbers may differ slightly from those stated in this document. However, the core supplied product and its features will remain the same as those described in this document. To ensure that you are using the correct documentation for your product, please:

- Refer to the product’s core model number, which can be found listed on the label on the rear or underside of your product, or accessed from any Raymarine multifunction display via the Diagnostics page. Ensure that the number matches one of those listed in the “Applicable products” section of your product documentation.
- Alternatively, contact the place of purchase and request the information. You may need to provide the product’s serial number, which can be found on the product packaging and also on the label on the rear or underside of the unit.

Related system packs

Your product is included in the following system bundles/packages:

Part number	Products Included	Description
T70338 / T70345	• Micro-Talk (E70361) • Wind vane (T120) • Wireless remote (T113–868 / T113–916)	Basic sailing starter kit
T70339 / T70346	• Micro-Talk (E70361) • Wind vane (T120) • Wireless remote (T113–868 / T113–916) • i60 Wind display (E70061) • SeaTalkng ® power cable (A06049) • SeaTalkng ® backbone cable (A06036) • SeaTalkng ® 5–way block (A06064)	Premium i60 sailing starter kit

Part number	Products Included	Description
	• SeaTalkng ® terminator (A06031) • SeaTalkng ® T-piece (A06028)	
T70340 / T70347	• Micro-Talk (E70361) • Wind vane (T120) • DST-800 triducer (A22111) • Wireless remote (T113–868 / T113–916) • i70s instrument display (E70327) • SeaTalkng ® power cable (A06049) • SeaTalkng ® backbone cable (A06036) • SeaTalkng ® 5–way block (A06064) • SeaTalkng ® terminator (A06031) • SeaTalkng ® T-piece (A06028)	Premium i70s sailing starter kit
T70341 / T70348	• Micro-Talk (E70361) • Wind vane (T120) • Evolution EV-1 sensor (E70096) • DST-800 triducer (A22111) • Wireless remote (T113–868 / T113–916) • i70s instrument display (E70327) • SeaTalkng ® power cable (A06049) • SeaTalkng ® backbone cable (A06036) • SeaTalkng ® 5–way block (A06064) • SeaTalkng ® terminator (A06031) • SeaTalkng ® T-piece (A06028)	Advanced sailing kit
T70342 / T70349	• Micro-Talk (E70361) • Vertical wind vane (T222) • Evolution EV-1 sensor (E70096) • DST-800 triducer (A22111) • Wireless remote (T113–868 / T113–916) • i70s instrument display (E70327) • SeaTalkng ® power cable (A06049) • SeaTalkng ® backbone cable (A06036) • SeaTalkng ® 5–way block (A06064) • SeaTalkng ® terminator (A06031) • SeaTalkng ® T-piece (A06028)	Pro sailing kit
T70344 / T70351	• Micro-Talk (E70361) • Wind vane (T120) • Evolution EV-1 sensor (E70096) • Wireless remote (T113–868 / T113–916) • SeaTalkng ® power cable (A06049) • SeaTalkng ® backbone cable (A06036) • SeaTalkng ® 5–way block (A06064)	Legacy SeaTalkng ® kit

Part number	Products Included	Description
	• SeaTalkng ® terminator (A06031) • SeaTalkng ® T-piece (A06028)	

Always refer to the Raymarine website: www.raymarine.com for the latest special bundle/package and promotional deals:

Product documentation

The following documentation is applicable to your product:

Description	Part number
Micro-Talk Installation instructions Installation of a Micro-Talk gateway and connection to a wider system of marine electronics.	87265
Micro-Talk mounting template Template for surface mounting the Micro-Talk gateway.	87266

Document illustrations

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

All images are provided for illustration purposes only.

Operation instructions

For detailed operation instructions for your product, refer to the documentation that accompanies your display.

User manuals Print Shop

Raymarine provides a Print Shop service, enabling you to purchase a high-quality, professionally-printed manual for your Raymarine product.

Printed manuals are ideal for keeping onboard your vessel, as a useful source of reference whenever you need assistance with your Raymarine product.

Visit http://www.raymarine.co.uk/view/?id=5175 to order a printed manual, delivered directly to your door.

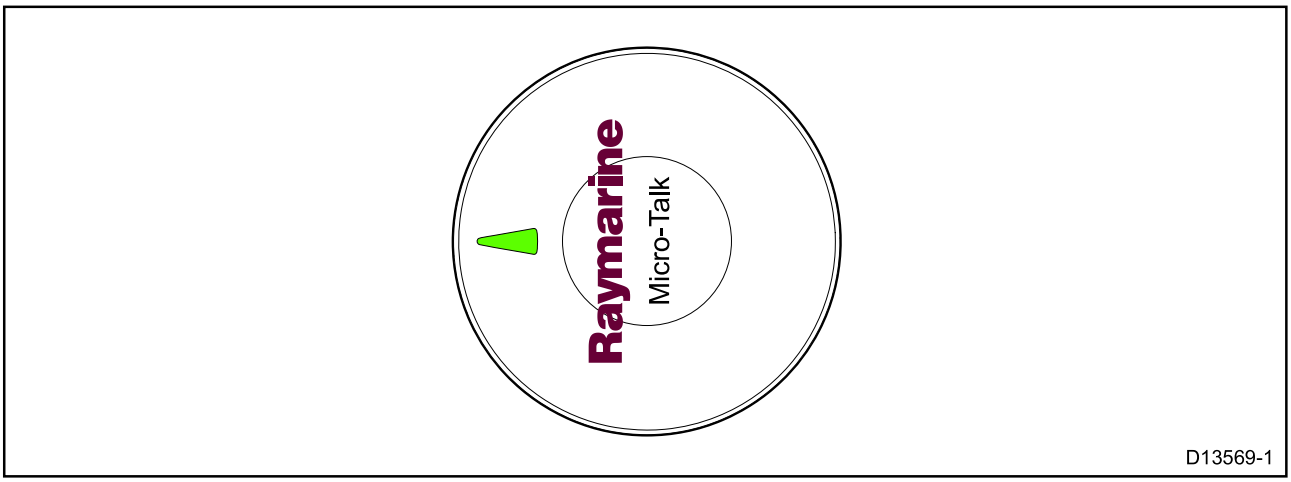
For further information about the Print Shop, please visit the Print Shop FAQ pages: http://www.raymarine.co.uk/view/?id=5751.

Note:

- Accepted methods of payment for printed manuals are credit cards and PayPal.
- Printed manuals can be shipped worldwide.
- Further manuals will be added to the Print Shop over the coming months for both new and legacy products.
- Raymarine user manuals are also available to download free-of-charge from the Raymarine website, in the popular PDF format. These PDF files can be viewed on a PC / laptop, tablet, smartphone, or on the latest generation of Raymarine multifunction displays.

2.2 Product overview

The Micro-Talk gateway bridges data between Micronet (wireless) and SeaTalkng ® networks. When used in conjunction with a SeaTalk ® to SeaTalkng ® converter the data can also be bridged on to the SeaTalk ® network or devices.



The Micro-Talk gateway has the following features:

- Bridges data from Micronet to SeaTalkng ®
- Bridges data from SeaTalkng ® to Micronet
- Pole, Rail or Surface or Bracket mountable using optional mounting kits
- NMEA 2000 compliant
- Low power consumption
- 12 V dc operation (24V protection)
- Waterproof to IPx6 and IPx7

The following data can be bridged by the Micro-Talk gateway:

Data	Micro-Talk to SeaTalkng ®	SeaTalkng ® to Micro-Talk
Wind	✓	✓
Mast rotation	✓	✗
Depth	✓ (1) or (2)	✓
Speed	✓ (1) or (2)	✓
Temperature	✓ (1) or (2)	✓
Heading	✓ (1) or (2)	✓
GPS	✗	✓
Time & Date	✗	✓
Navigation data	✗	✓

Note:

- (1) Requires T121 Wireless hull transmitter.
- (2) Requires T122 NMEA 0183 wireless interface.

Multiple data sources (MDS)

The Micro-Talk gateway is MDS compliant. If a data type is available on the Micronet network then the gateway will be selectable as a data source, for that data type, from SeaTalkng ® displays.

In installations where multiple sources of the same data type exist on the Micronet network, the data source that is used by the gateway and transmitted on to SeaTalkng ® will be the same data source that is displayed on Micronet displays.

In installations where the same data types exist on both networks then the MDS selected data source will be shown on displays on both networks.

If MDS is set to **Auto** then the gateway will be the preferred data source.

SeaTalkng ®

SeaTalkng ® (Next Generation) is an enhanced protocol for connection of compatible marine instruments and equipment. It replaces the older SeaTalk and SeaTalk2 protocols.

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

SeaTalkng ® is a proprietary extension to NMEA 2000 and the proven CAN bus technology. Compatible NMEA 2000 and SeaTalk and SeaTalk2 devices can also be connected using the appropriate interfaces or adaptor cables as required.

Micronet

Micronet is a proprietary wireless Radio Frequency (RF) network protocol compatible with Raymarine's wireless range of instrument displays and transducers.

Micronet can be used to connect up to 32 compatible devices together to create a wireless marine electronics network. Micronet products can operate on 1 of 2 frequencies depending on geographic location:

- 869.8 MHz for products operating in the UK, Europe or Africa
- 915.9 MHz for products operating in the USA, Canada, South America and Australia

Micronet products comply with the relevant ISM regulations and are exempt from licensing in each of these territories.

2.3 Networking restrictions

To ensure reliable system operation, certain restrictions must be adhered to when using the Micro-Talk gateway.

Wireless interface (NMEA 0183)

When the Micro-Talk gateway is used in a Micronet network that has a Wireless interface (T122) present, to prevent data looping, you must ensure that the Wireless interface's NMEA 0183 input/output connections are NOT connected to an MFD or an NMEA 0183 to SeaTalkng ® converter that is connected to the same network as the gateway.

Multiple Micro-Talk gateways

It is recommended that only 1 Micro-Talk gateway is used per SeaTalkng ® network. After powering up if a gateway detects another gateway it will shut itself down. It is recommended that only 1 Micro-Talk gateway is used per MicroNet network. Bridging multiple SeaTalkng ® networks using MicroNet is NOT recommended.

Chapter 3: Planning the installation

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- 3.1 Installation checklist on page 22
- 3.2 Parts supplied on page 23
- 3.3 Software updates on page 24
- 3.4 Tools required for installation on page 25
- 3.5 Warnings and cautions on page 26
- 3.6 Selecting a location on page 27
- 3.7 Product dimensions on page 29

3.1 Installation checklist

Installation includes the following activities:

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

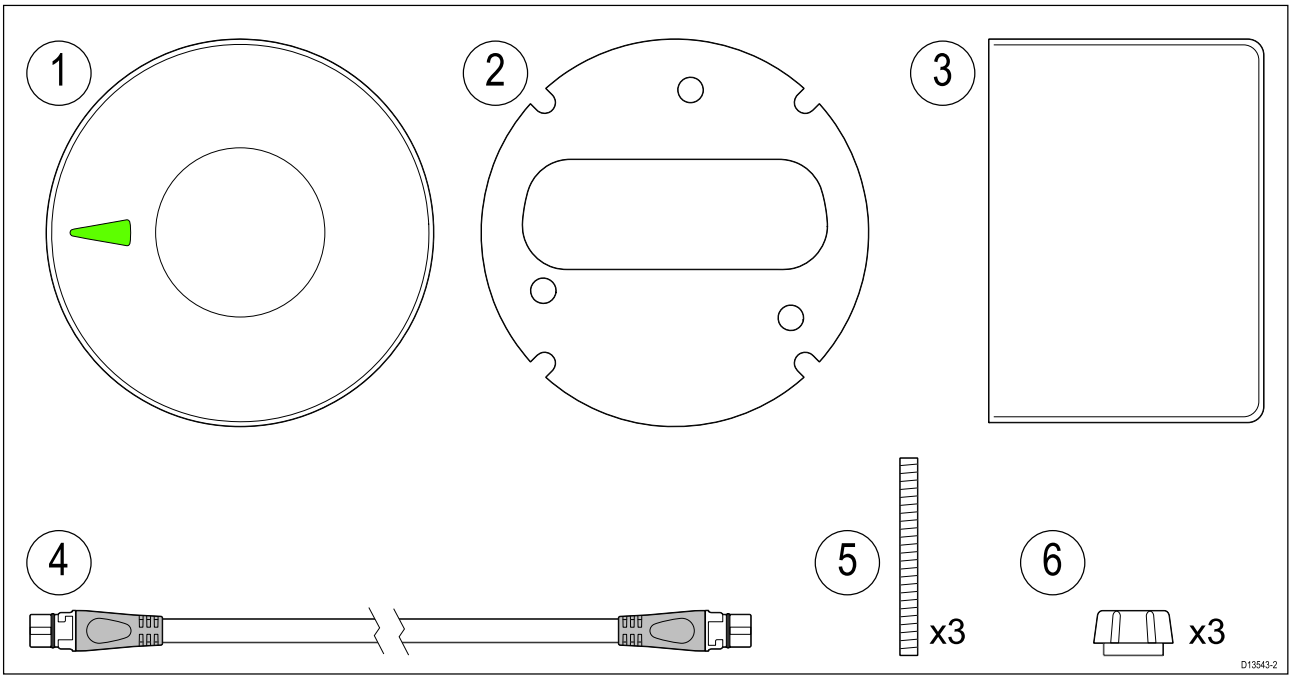
Schematic diagram

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

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

3.2 Parts supplied

The following parts are supplied with your product.



1. Unit
2. Mounting gasket
3. Documentation
4. 6 m (19.69 ft) SeaTalkng ® (White) cable
5. M4 x 40mm Threaded studs x 3 (used for surface mounting)
6. Finger nuts x 3 (used for surface mounting)

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

3.3 Software updates

The software running on the product can be updated.

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

Important:

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

Caution: Installing software updates

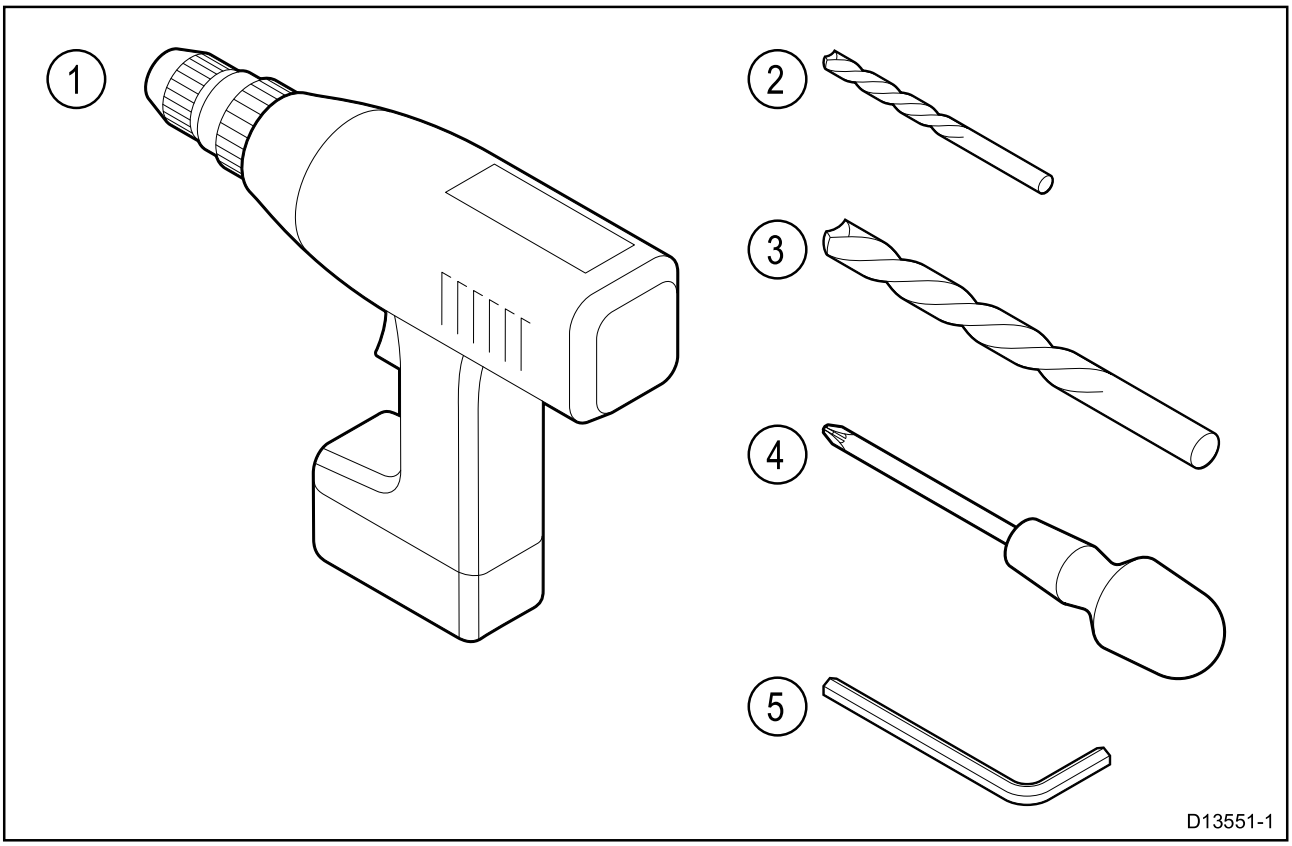
The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.

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

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

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

3.4 Tools required for installation



1	Power drill
2	4 mm (11/64) drill bit (for fixing studs)
3	22 mm (for cable hole when surface mounting)
4	Pozi-drive screwdriver (only required for Pole mount installations)
5	Size 4 (2.5 mm) Hex Key (only required for Pole mount installations)

3.5 Warnings and cautions

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

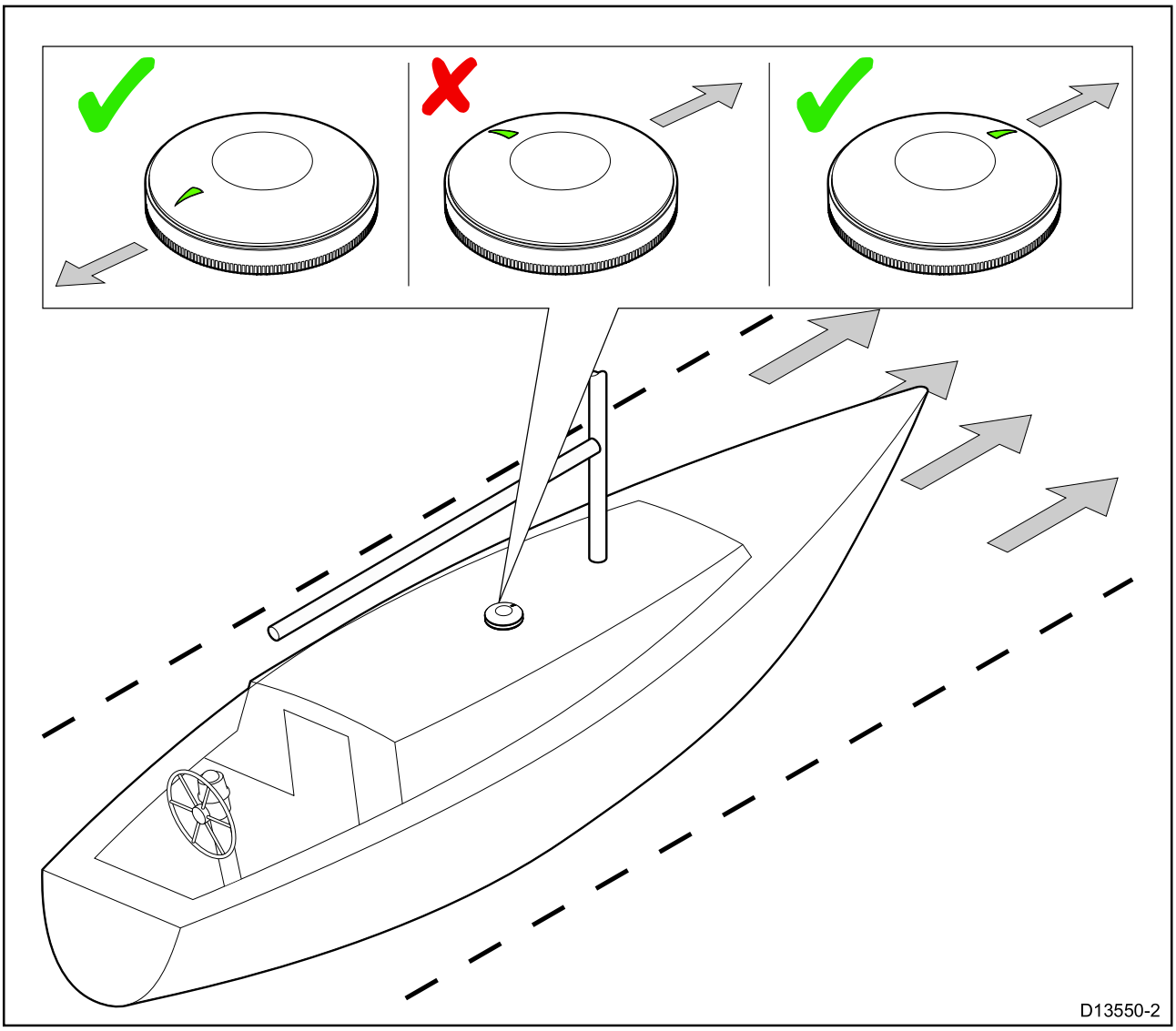
3.6 Selecting a location

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).

Micronet device location requirements

Your unit includes a wireless transceiver that utilizes the Micronet networking protocol. The product's wireless performance should be checked at the desired location before drilling any mounting holes.



For optimum performance, the product should be installed above decks, on a horizontal surface with the LED 'arrow' pointing towards the bow or the stern of the vessel.

When planning the installation location, also consider the following:

- The unit should have a clear line of sight to the Micronet products it will connect to. The range for unobstructed line of sight is up to 150 m (492 ft), if the line of sight is obstructed by a bulkhead or other objects this range can be drastically reduced.
- The unit should be mounted at least 1 m (3 ft) away from devices that may cause interference, such as a compass, motors, generators, VHF radio, and any other transmitters or receivers.
- Choose a location where the unit will be safe from physical damage and excessive vibration.
- Choose a location where no load or force maybe put on the unit.
- Mount away from any source of heat or potential flammable hazards, such as fuel vapor.
- The unit should be mounted in a location where the diagnostics LED is viewable.

Note: Do NOT mount on a Carbon, Steel or Aluminium surface, as this may cause interference of the wireless signal, in these circumstances, mount using the optional Pole mount or Deck mounting kit.

Compass safe distance

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

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

EMC installation guidelines

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

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

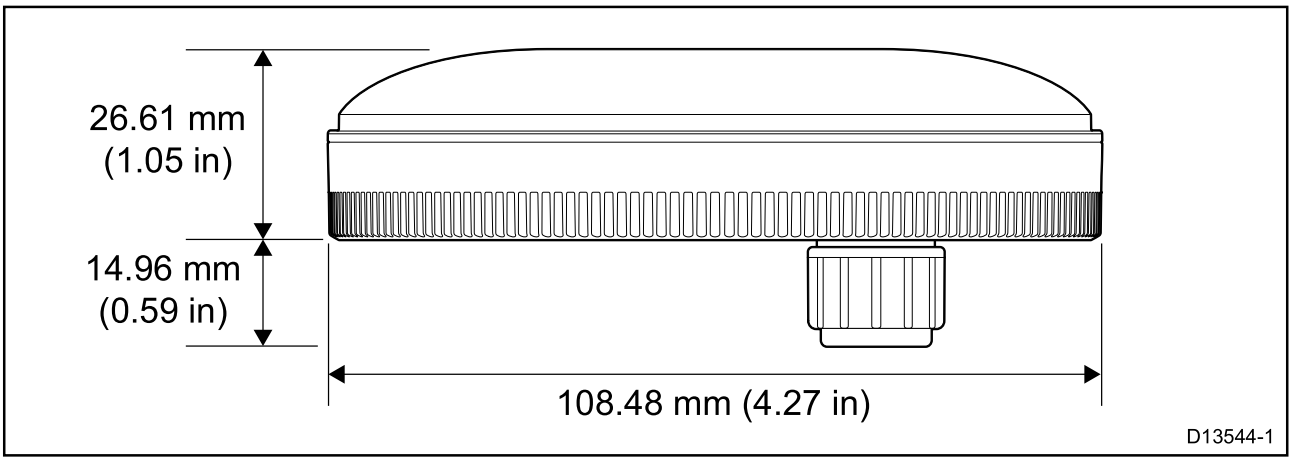
Note: In areas of extreme EMC interference, some slight interference may be noticed on the product.Where this occurs the product and the source of the interference should be separated by a greater distance.

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

- Raymarine equipment and cables connected to it are:
  - At least 1m (3ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7 ft (2 m).
  - More than 2m (7ft) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The product is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

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

3.7 Product dimensions



Chapter 4: Cables and connections

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- 4.3 SeaTalkng ® power supply on page 35
- 4.4 Network examples on page 40

4.1 General cabling guidance

Cable types and length

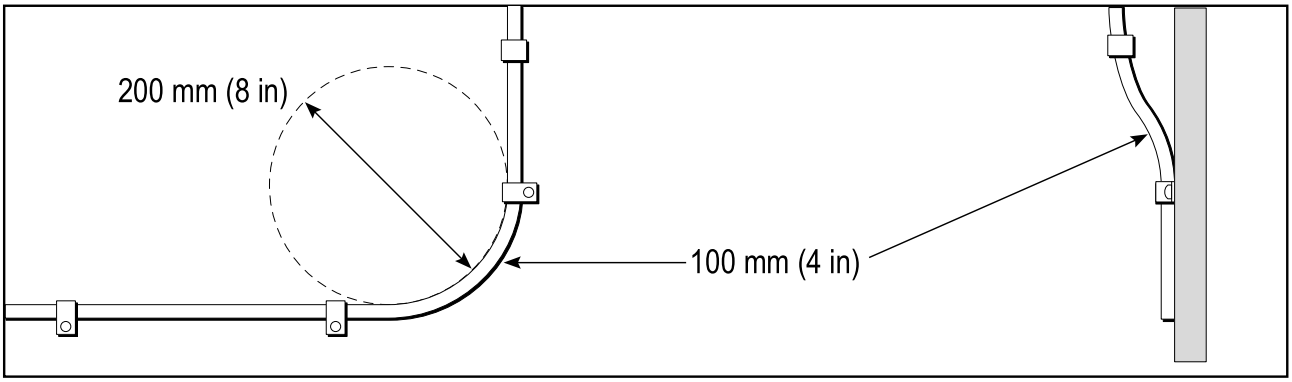
It is important to use cables of the appropriate type and length

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

Routing cables

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

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



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

Always route data cables as far away as possible from:

- other equipment and cables,
- high current carrying AC and DC power lines,
- antennae.

Strain relief

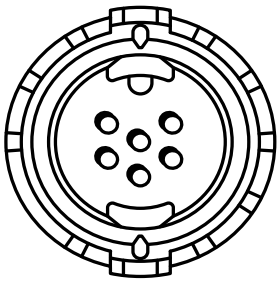
Ensure adequate strain relief is provided. Protect connectors from strain and ensure they will not pull out under extreme sea conditions.

Cable shielding

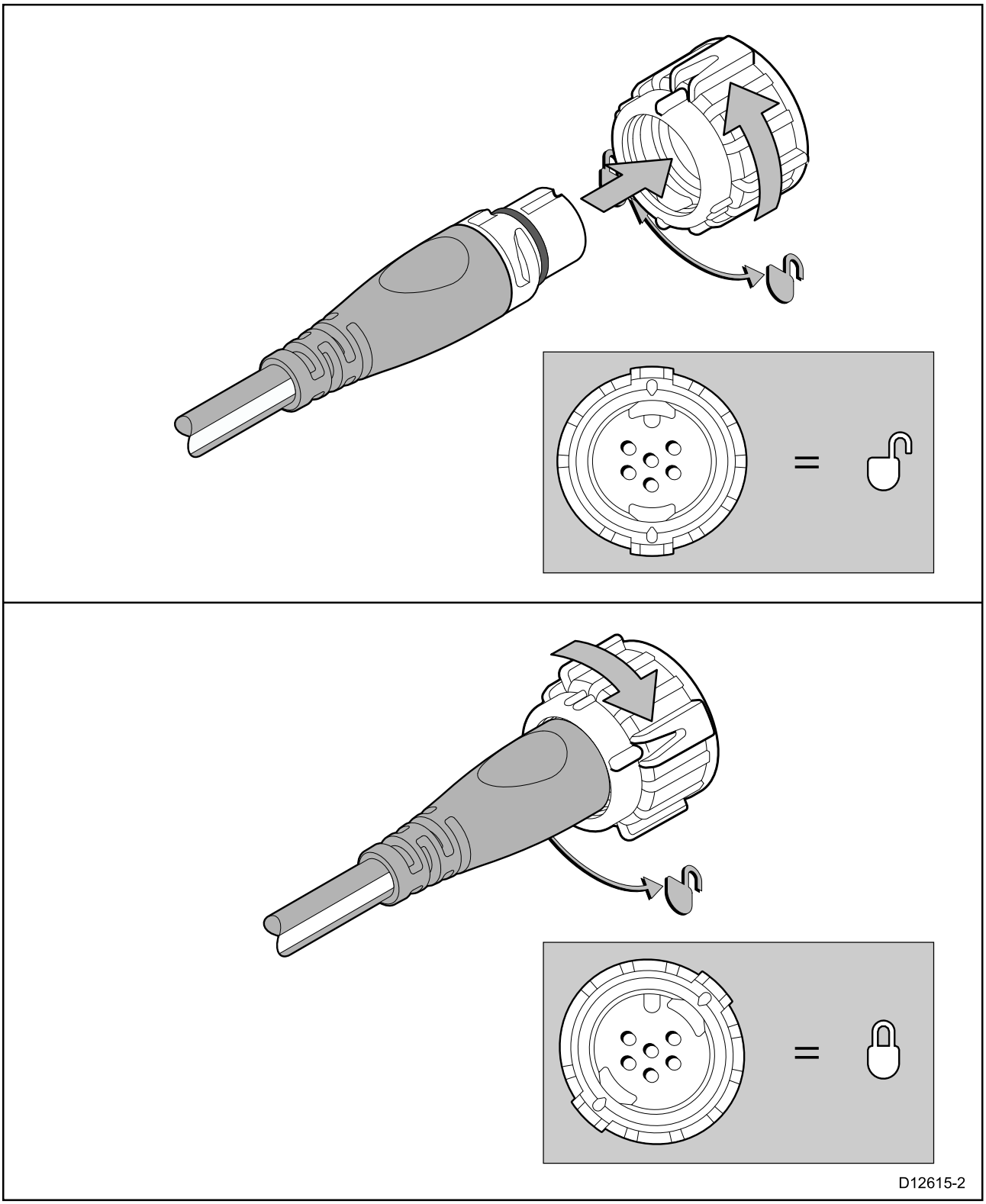
Ensure that all data cables are properly shielded that the cable shielding is intact (e.g. hasn't been scraped off by being squeezed through a tight area).

4.2 Connections overview

Your product includes the following connections.

Connection	Qty	Connects to:	Suitable cables
	1	1. SeaTalkng ® backbone 2. NMEA 2000 backbone	1. SeaTalkng ® spur cables 2. SeaTalkng ® to DeviceNet adaptor cable (A06045)
micronet	Can connect up to 32 Compatible Micronet (wireless) devices simultaneously.		

Connecting SeaTalkng® cables



1. Rotate the locking collar on the unit to the unlocked position.
2. Ensure the cable's connector is correctly oriented.
3. Fully insert the cable connector.
4. Rotate locking collar clockwise (2 clicks) until it is in the locked position.

SeaTalkng® product loading

The number of products that can be connected to a SeaTalkng® backbone depends on the power consumption of each product and the physical overall length of the backbone.

SeaTalkng® products have a Load Equivalency Number (LEN), which indicates the product's power consumption. The LEN for each product can be found in the product's Technical Specification.

4.3 SeaTalkng ® power supply

Power is supplied to the product over the SeaTalkng ® backbone.

A SeaTalkng ® backbone requires one 12 V dc power supply, connected to the SeaTalkng ® backbone. This can be provided by:

- a battery (1), via the distribution panel,
- an Autopilot Control Unit (ACU)(2),
- an SPX course computer (2),
- for 24 V vessels a 5 amp, regulated, continuous 24 V dc to 12 V dc converter is required.

Note:

- (1) The battery used for starting the vessel's engine(s) should NOT be used to power the SeaTalkng ® backbone as this can cause sudden voltage drops, when the engines are started.
- (2) The ACU-100 and SPX-5 cannot be used to power the SeaTalkng ® backbone.

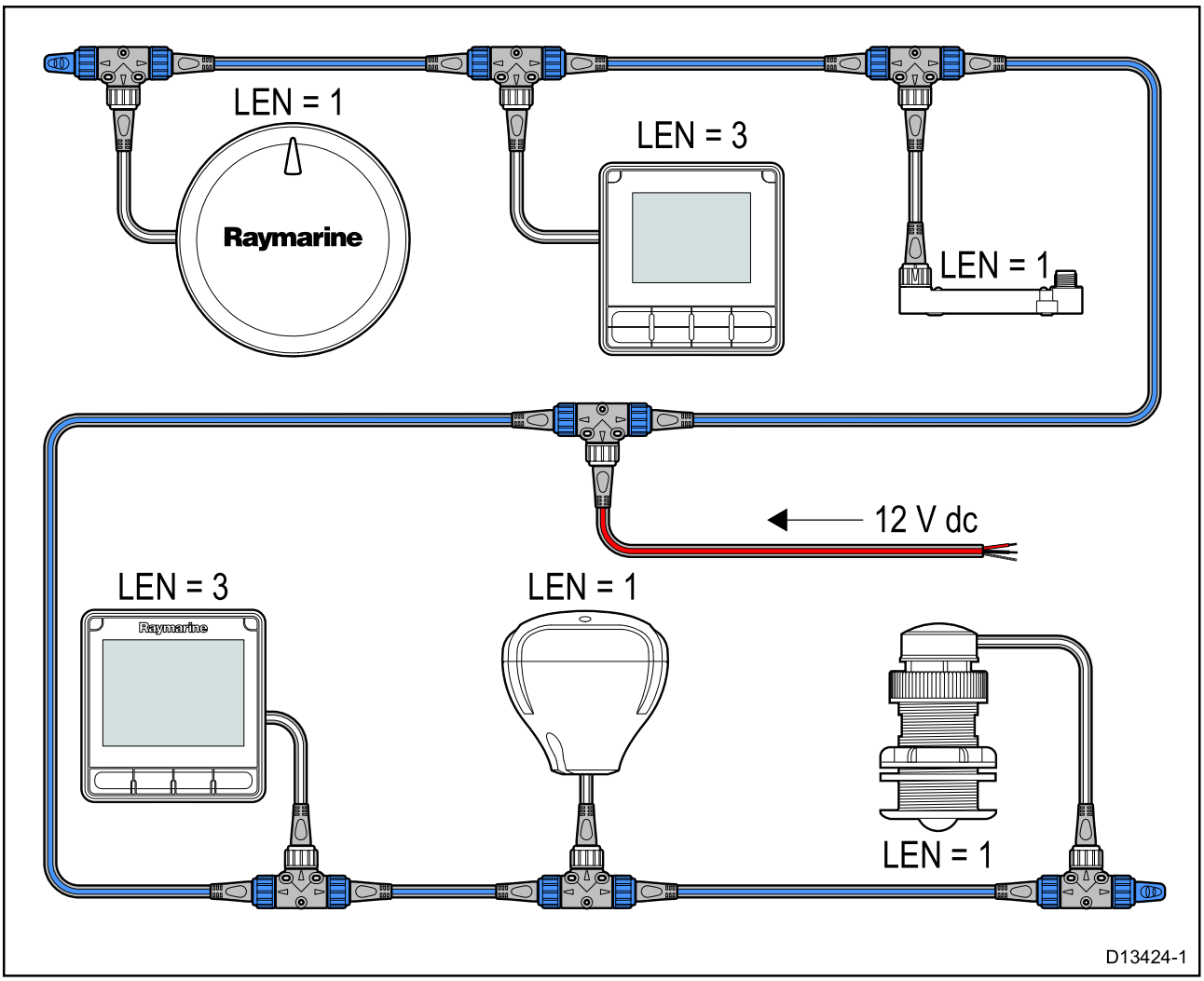
SeaTalkng ® power connection point

Small systems

If the backbone length is 60 m (197 ft) or less, the power connection point may be connected at any point in the backbone.

Large systems

If the backbone length is greater than 60 m (197 ft), the power connection point should be connected at a point that creates a balanced current draw from each side of the backbone. The Load Equivalency Number (LEN) is used to determine the power connection point for the system.



In the example above the system has an overall LEN of 10, so the optimum connection point would be to have 5 LEN either side of the connection point.

In-line fuse and thermal breaker ratings

The SeaTalkng ® network's power supply requires an in-line fuse or thermal breaker to be fitted.

In-line fuse rating	Thermal breaker rating
5 A	3 A (if only connecting one device)

Note:

The suitable fuse rating for the thermal breaker is dependent on the number of devices you are connecting. If in doubt consult an authorized Raymarine dealer.

SeaTalkng ® system loading

The maximum loading / LEN for a SeaTalkng ® system depends on the length of the backbone.

Loading type	Backbone length	Total LEN
Unbalanced	20 m (66 ft)	40
Unbalanced	40 m (131 ft)	20
Unbalanced	60 m (197 ft)	14
Balanced	60 m (197 ft) or less	100
Balanced	80 m (262 ft)	84
Balanced	100 m (328 ft)	60
Balanced	120 m (394 ft)	50
Balanced	140 m to 160 m (459 ft to 525 ft)	40
Balanced	180 m to 200 m (591 ft to 656 ft)	32

Power distribution — SeaTalkng ®

Recommendations and best practice.

- Only use approved SeaTalkng ® power cables. Do NOT use a power cable designed for, or supplied with, a different product.
- See below for more information on implementation for some common power distribution scenarios.

Important:

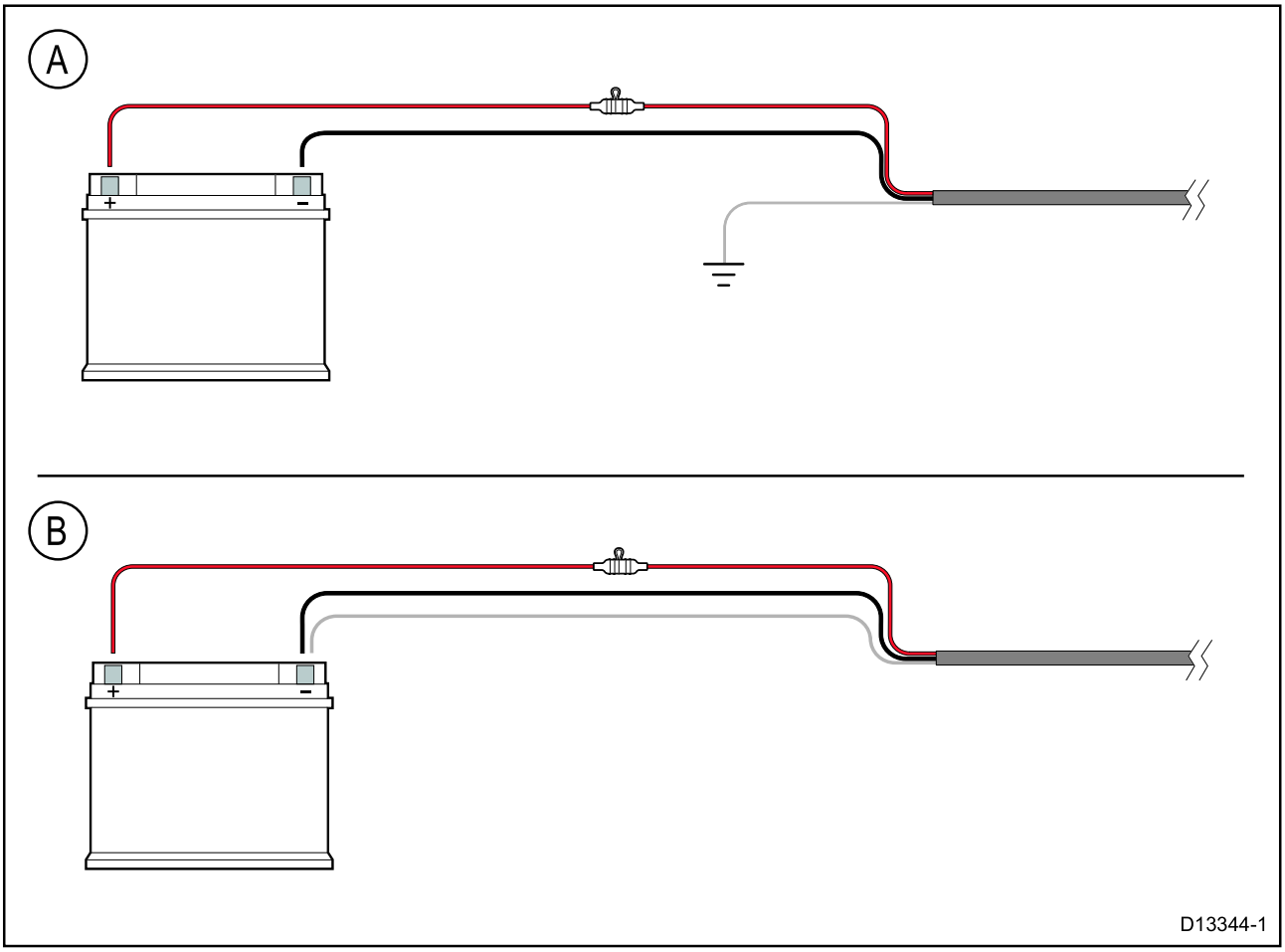
When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system.

Note:

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

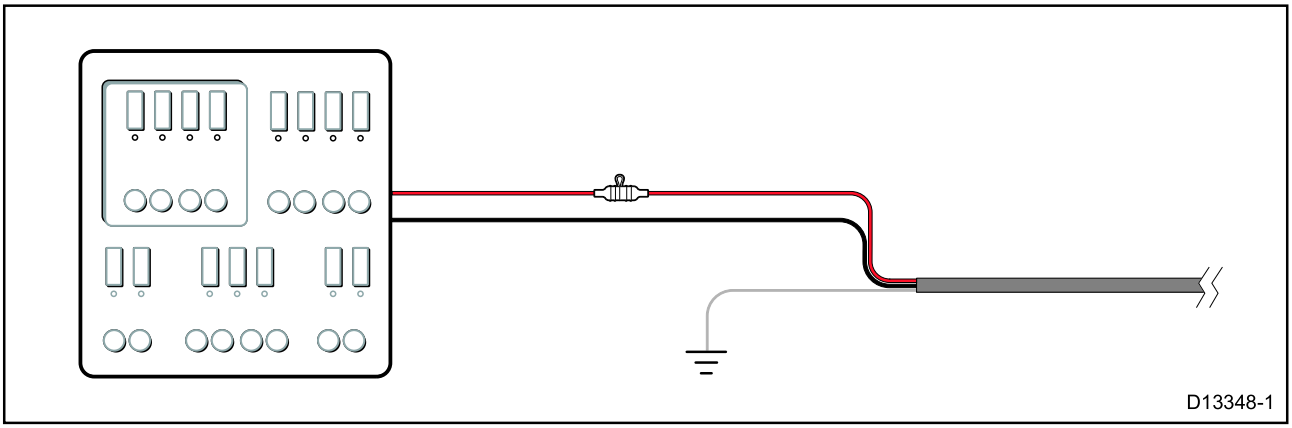
Implementation — direct connection to battery

- SeaTalkng ® power cables may be connected directly to the vessel's battery, via a suitably rated fuse or breaker.
- 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, ensure you use suitably rated cable and that sufficient power (12 V dc) is available at the SeaTalkng ® backbone's power connection.



A	Battery connection scenario A: suitable for a vessel with a common RF ground point. In this scenario, if your product's power cable is supplied with a separate drain wire then it should be connected to the vessel's common ground point.
B	Battery connection scenario B: suitable for a vessel without a common grounding point. In this case, if your product's power cable is supplied with a separate drain wire then it should be connected directly to the battery's negative terminal.

Implementation — connection to distribution panel



- Alternatively, the SeaTalkng ® power cable may be connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.
- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm^2) cable.
- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is not possible and more than 1 item of equipment shares a breaker, use individual in-line fuses for each power circuit to provide the necessary protection.
- In all cases, observe the recommended breaker / fuse ratings provided in the product's documentation.

- If you need to extend the length of the power cable, ensure you use suitably rated cable and that sufficient power (12 V dc) is available at the SeaTalkng ® backbone's power connection.

Important:

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

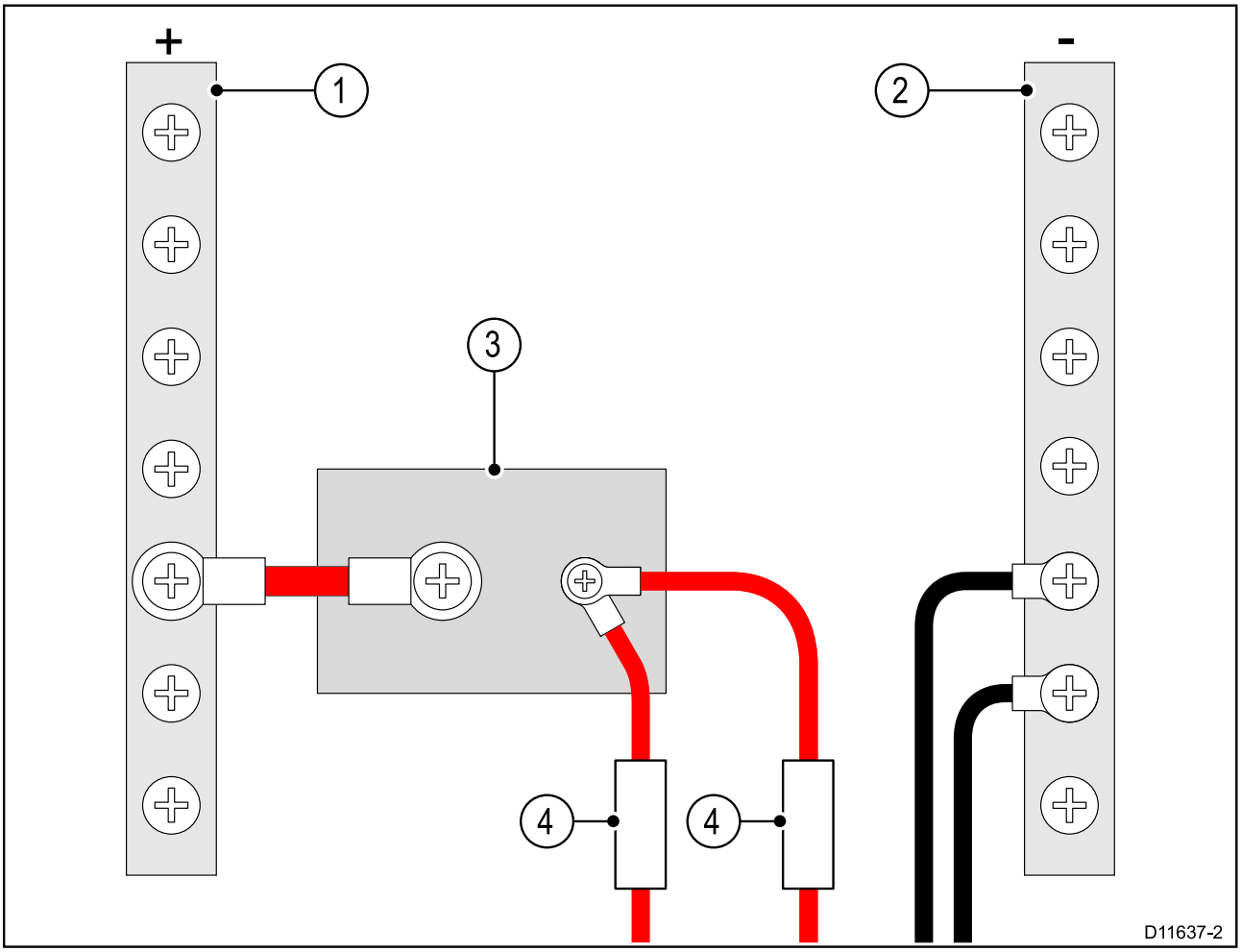
More information

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

Sharing a breaker

Where more than 1 piece of equipment shares a breaker you must provide protection for the individual circuits. E.g. by connecting an in-line fuse for each power circuit.



1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Fuse

Where possible, connect individual items of equipment to individual circuit breakers. Where this is not possible, use individual in-line fuses to provide the necessary protection.

Warning: Product grounding

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

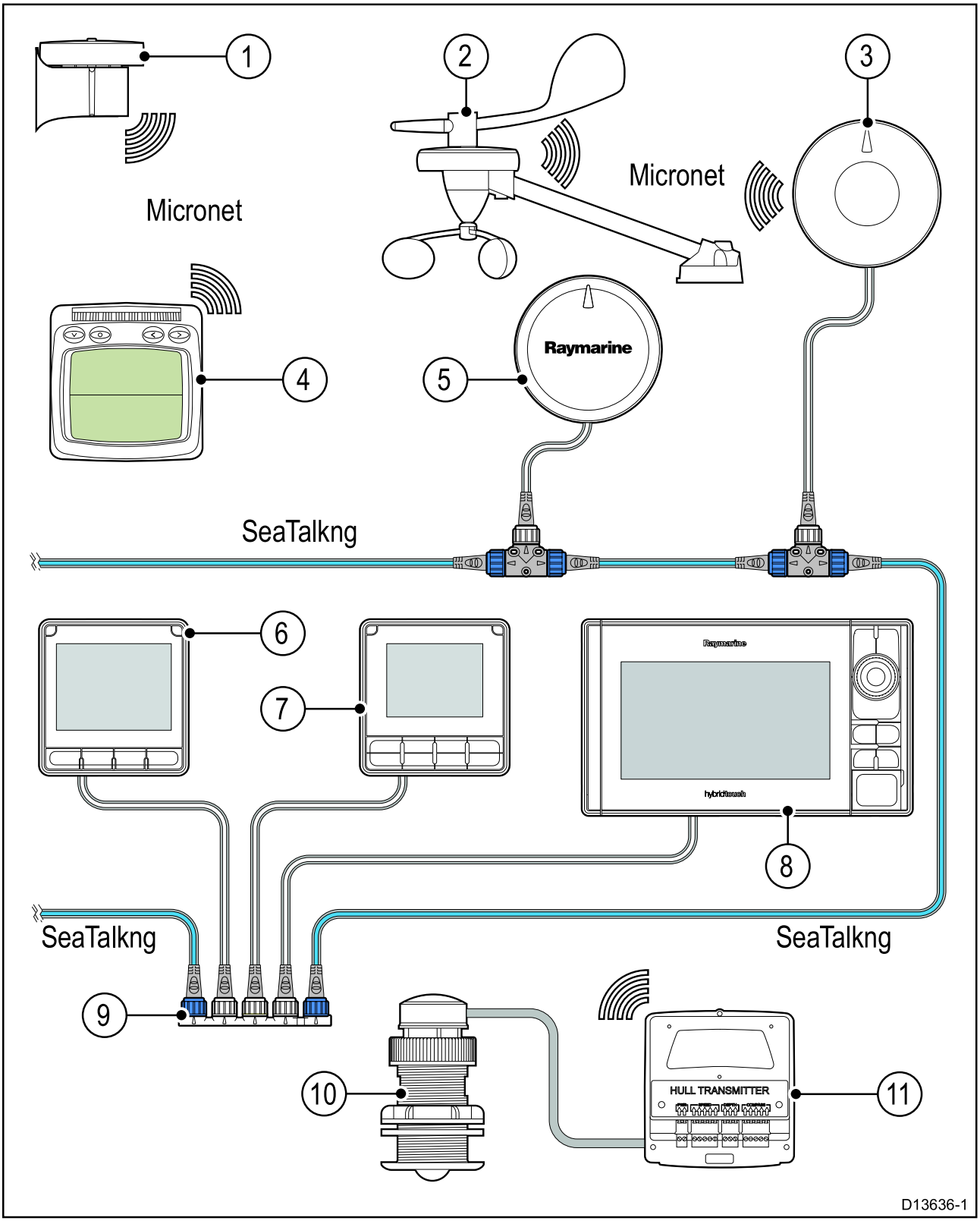
Warning: Positive ground systems

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

4.4 Network examples

The illustrations below are provided as examples only.

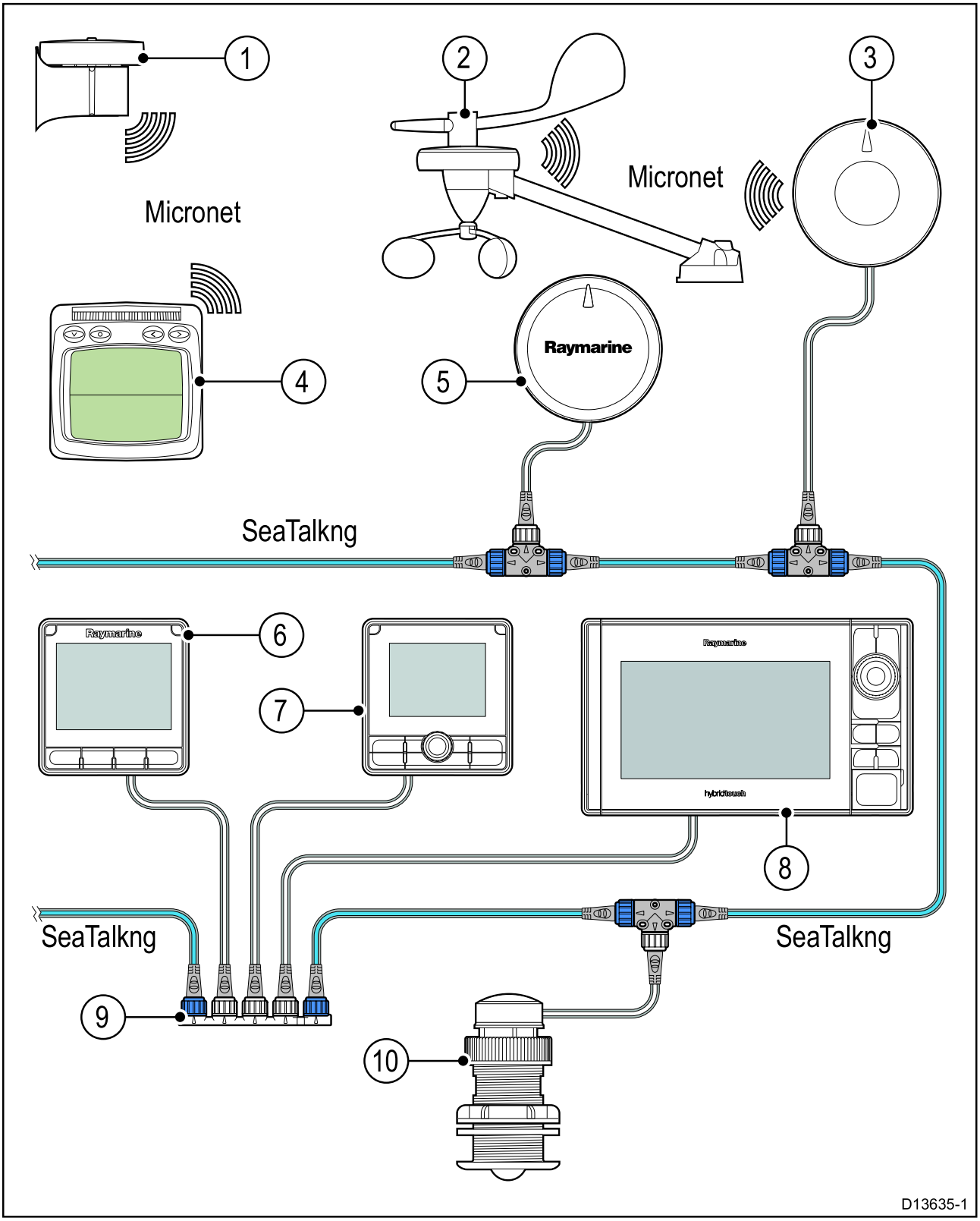
Example system with wireless hull transmitter



1. Mast rotation sensor
2. Micronet Wind transducer
3. Micro-Talk gateway
4. Wireless instrument
5. Heading source (e.g.: Evolution EV sensor)
6. SeaTalkng ® instrument

7. SeaTalkng ® Pilot Controller
8. SeaTalkng ® MFD
9. SeaTalkng ® 5–way block
10. DST transducer
11. Wireless hull transmitter

Example system with SeaTalkng ® DST transducer



1. Mast rotation sensor
2. Micronet Wind transducer
3. Micro-Talk gateway

4. Wireless instrument
5. Heading source (e.g.: Evolution EV sensor)
6. SeaTalkng ® instrument
7. SeaTalkng ® Pilot Controller
8. SeaTalkng ® MFD
9. SeaTalkng ® 5–way block
10. DST transducer

Chapter 5: Installation

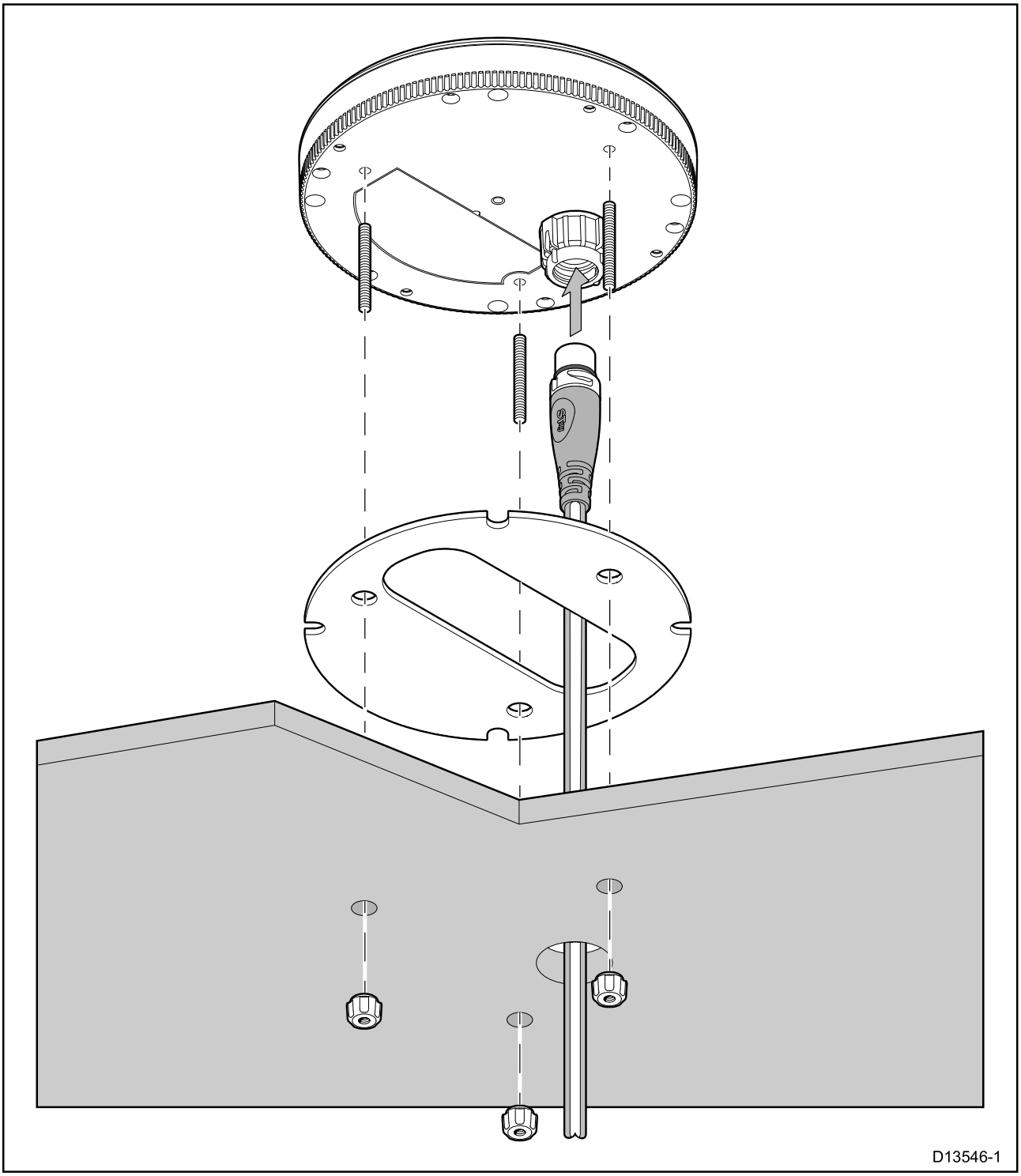
Chapter contents

- 5.1 Surface mounting on page 44
- 5.2 Pole or rail mounting on page 45
- 5.3 Surface mounting using the Deck mounting kit on page 46
- 5.4 Bracket mounting using the Deck mounting kit on page 48
- 5.5 Surface mounting using the Riser on page 50
- 5.6 Releasing the unit from the adaptor on page 52

5.1 Surface mounting

The unit can be mounted on a surface that is up to approximately 28 mm (1.10 in) thick using the fixings supplied with the unit. To mount on a thicker surface longer studs will be required.

Ensure that the chosen location meets the product's location requirements, see 3.6 **Selecting a location** for details.

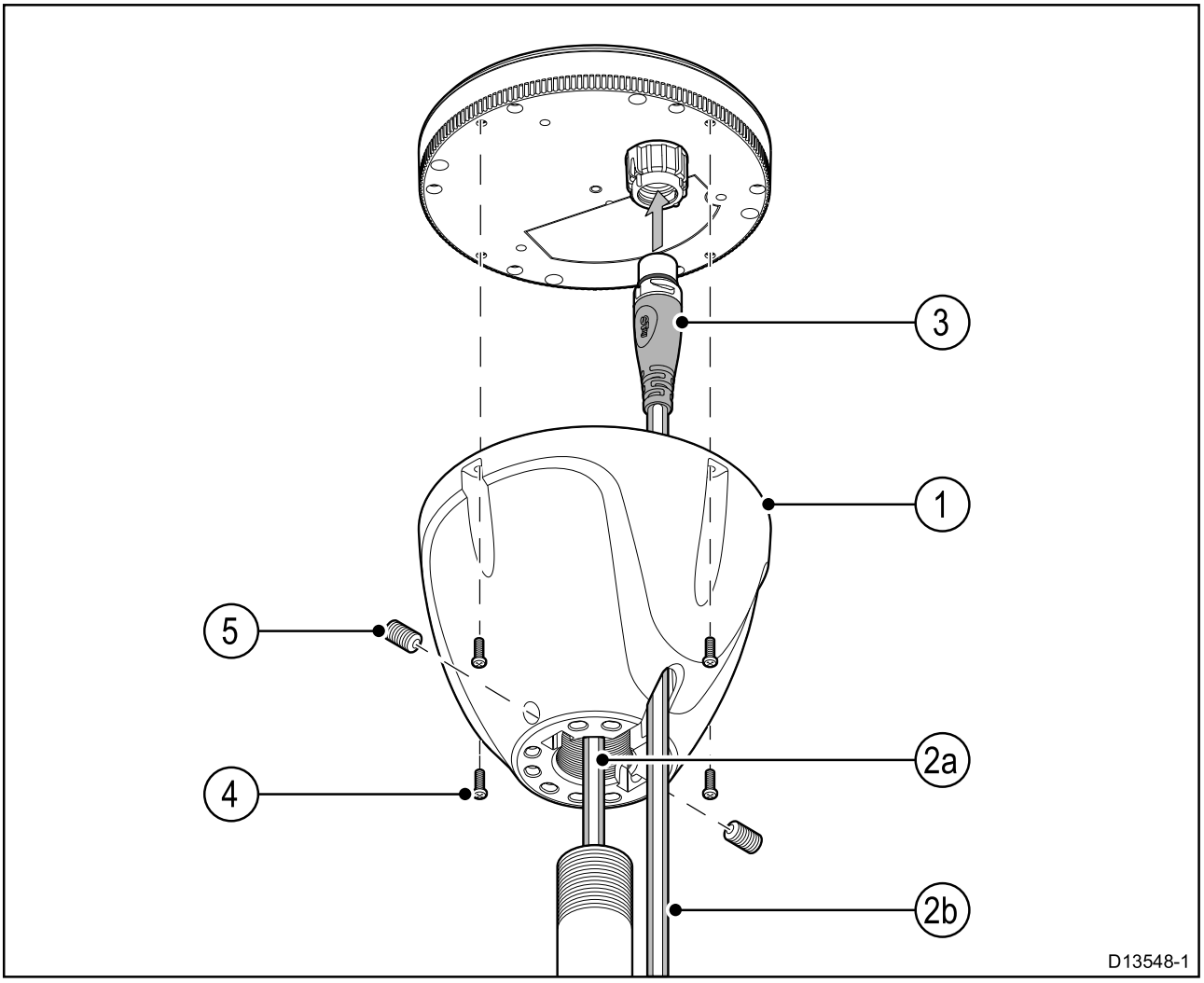


1. Affix the supplied mounting template to the mounting surface at the desired location.
2. Drill 3 x fixing holes and 1 x cable hole using drill bit sizes as indicated on the template.
3. Place the waterproof gasket into position on the underside of the unit.
4. Connect the cable to an available **SeaTalk ng** spur connection then connect the other end to the connector on the underside of the unit and secure using the locking collar.
5. Screw the threaded studs into the underside of the unit (these should be hand-tight only).
6. Position the unit so that the mounting studs pass through the holes in the mounting surface.
7. Secure the unit to the mounting surface using the thumb nuts. (these should be hand-tight only).

5.2 Pole or rail mounting

The Pole mount kit (A80370) can be used to mount your product on a pole or rail.

A pole or rail mount with a 1 inch 14 TPI thread is required.



1. Screw the Pole mount adaptor on to the pole.
2. Feed the cable through either:
   - a) the center of the Pole mount adaptor and pole, or
   - b) the cable exit hole.
3. Connect the cable to an available **SeaTalk ng** spur connection then connect the other end of the cable to the connector on the underside of the unit and secure using the locking collar.
4. Ensuring correct orientation, Secure the unit to the Pole mount adaptor using the fixings supplied with the adaptor.
5. Fix the unit's orientation by tightening the grub screws.

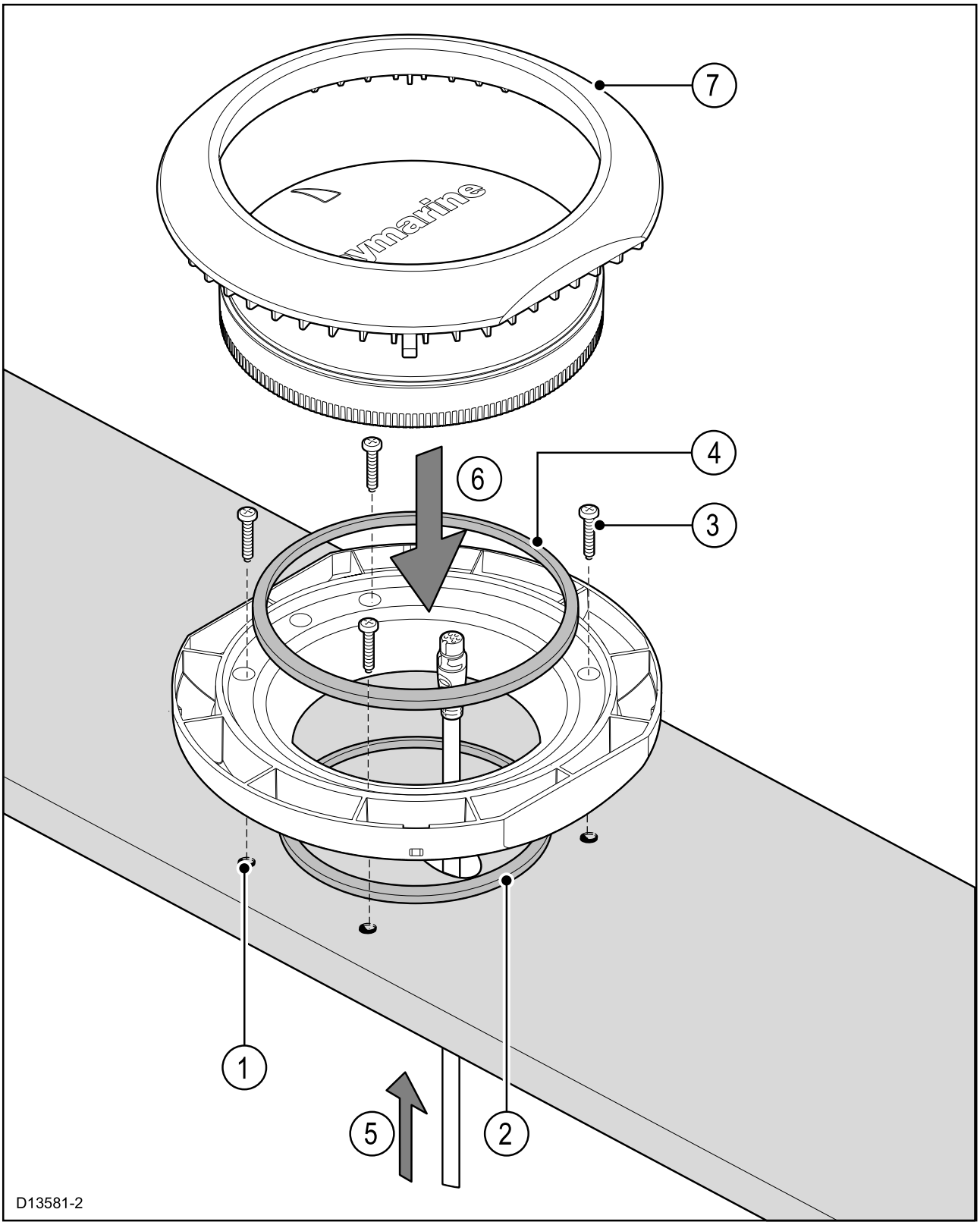
   The grub screws and their captive nuts are supplied fitted to the adaptor.

5.3 Surface mounting using the Deck mounting kit

The Deck mounting kit (A80437) can be used to surface mount your product.

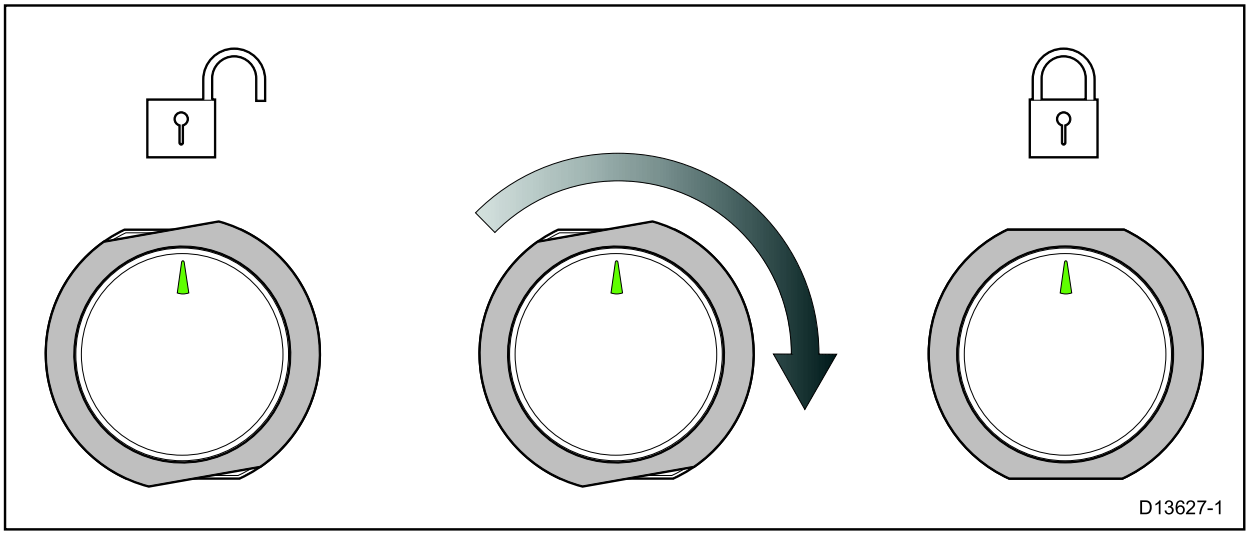
The Riser and Bracket pieces are not required for this installation.

Ensure that the chosen location meets the product's location requirements, see 3.6 **Selecting a location** for details.



1. Using the Mounting tray template (87170), drill 4 holes in the mounting surface, plus a 22 mm (7/8 in) hole for the SeaTalkng ® cable.
2. Place the small sealing ring in the groove located on the bottom of the mounting tray.
3. Secure the tray to the mounting surface using the 4 x fixings, supplied.
4. Place the large sealing ring into the groove on the upper side of the Mounting tray.

5. Pull the SeaTalkng ® cable through the mounting surface hole and the Mounting tray. Plug in the cable connector on the underside of the unit and secure by rotating the locking collar clockwise 2 clicks.
6. Insert the unit into the mounting tray, ensuring the tabs in the Mounting tray are slotted into the grooves around the edge of the unit.
7. Place the Mounting trim over the unit slightly offset, and then twist the Mounting trim clockwise until it locks into position.

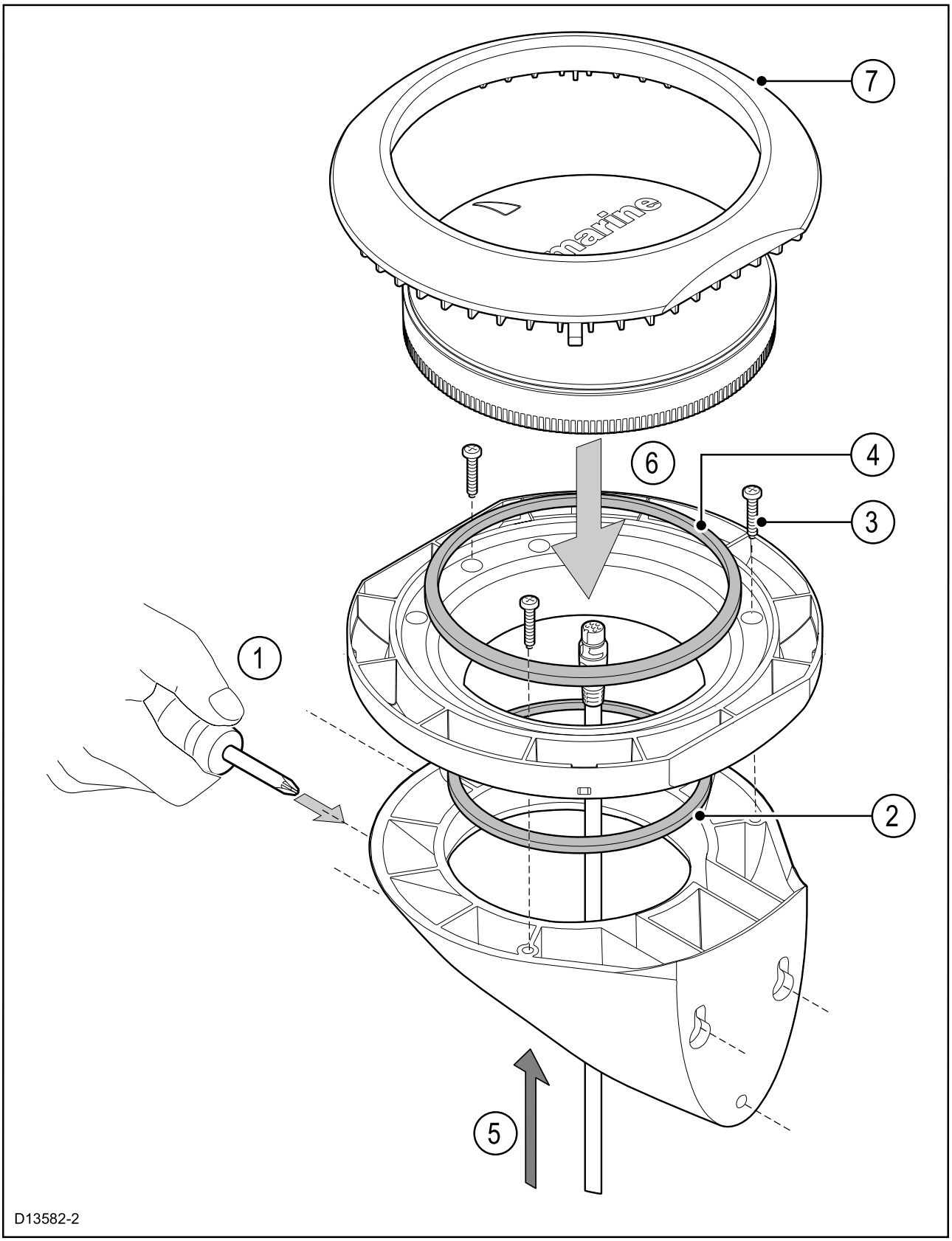


5.4 Bracket mounting using the Deck mounting kit

The Deck mounting kit (A80437) can be used to wall mount your product.

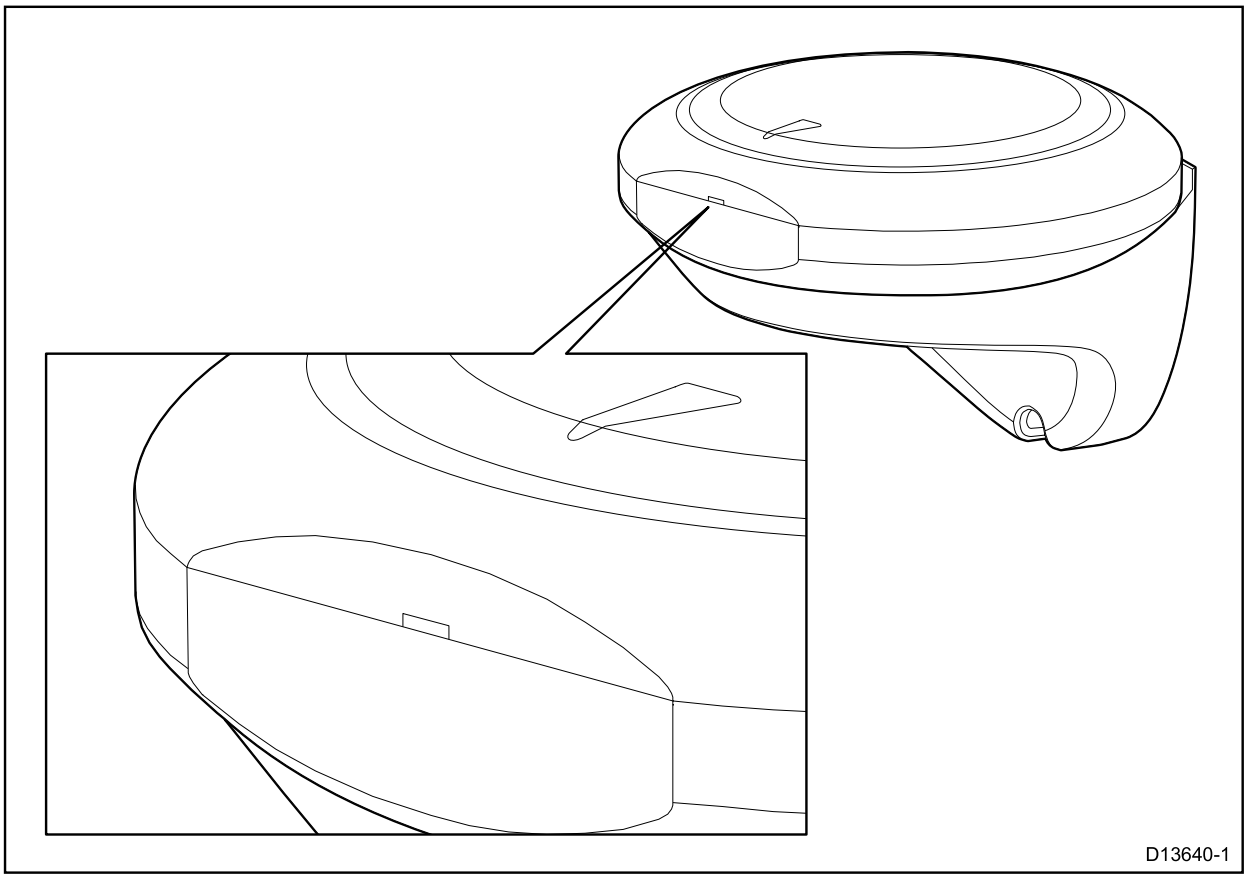
The Riser piece is not required for bracket mounting the product.

Ensure that the chosen location meets the product's location requirements, see 3.6 **Selecting a location** for details.

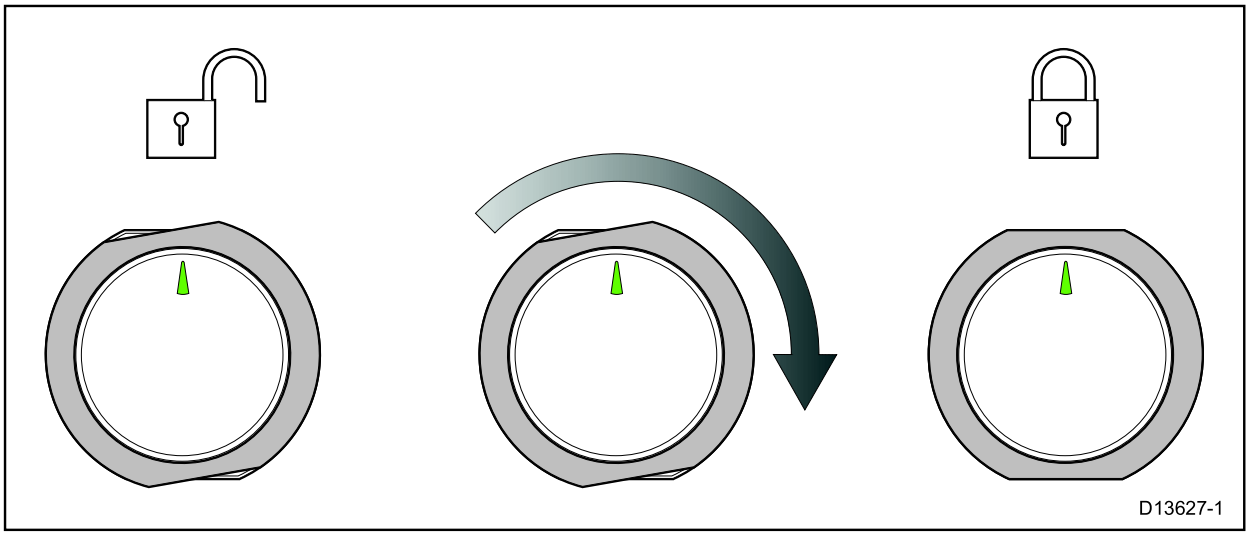


1. Use the Mounting bracket template (87170) to drill 3 pilot holes in the vertical mounting surface. Secure the mounting bracket to the surface using the supplied screws.
2. Place the small sealing ring in the groove located on the bottom of the Mounting tray.

3. Secure the tray to the bracket using 3 of the supplied screws, in the positions indicated in the illustration above.
4. Place the large sealing ring into the groove on the upper side of the Mounting tray.
5. Pull the SeaTalkng ® cable through the canter of the bracket and tray. Plug in the cable connector on the underside of the unit and secure by rotating the locking collar clockwise 2 clicks.
6. Insert the unit into the mounting tray, ensuring the tabs in the Mounting tray are slotted into the grooves around the edge of the unit.
7. Orientate the Mounting trim so that the release hole is accessible when mounted.



8. Place the Mounting trim over the unit slightly offset, and then twist the Mounting trim clockwise until it locks into position.

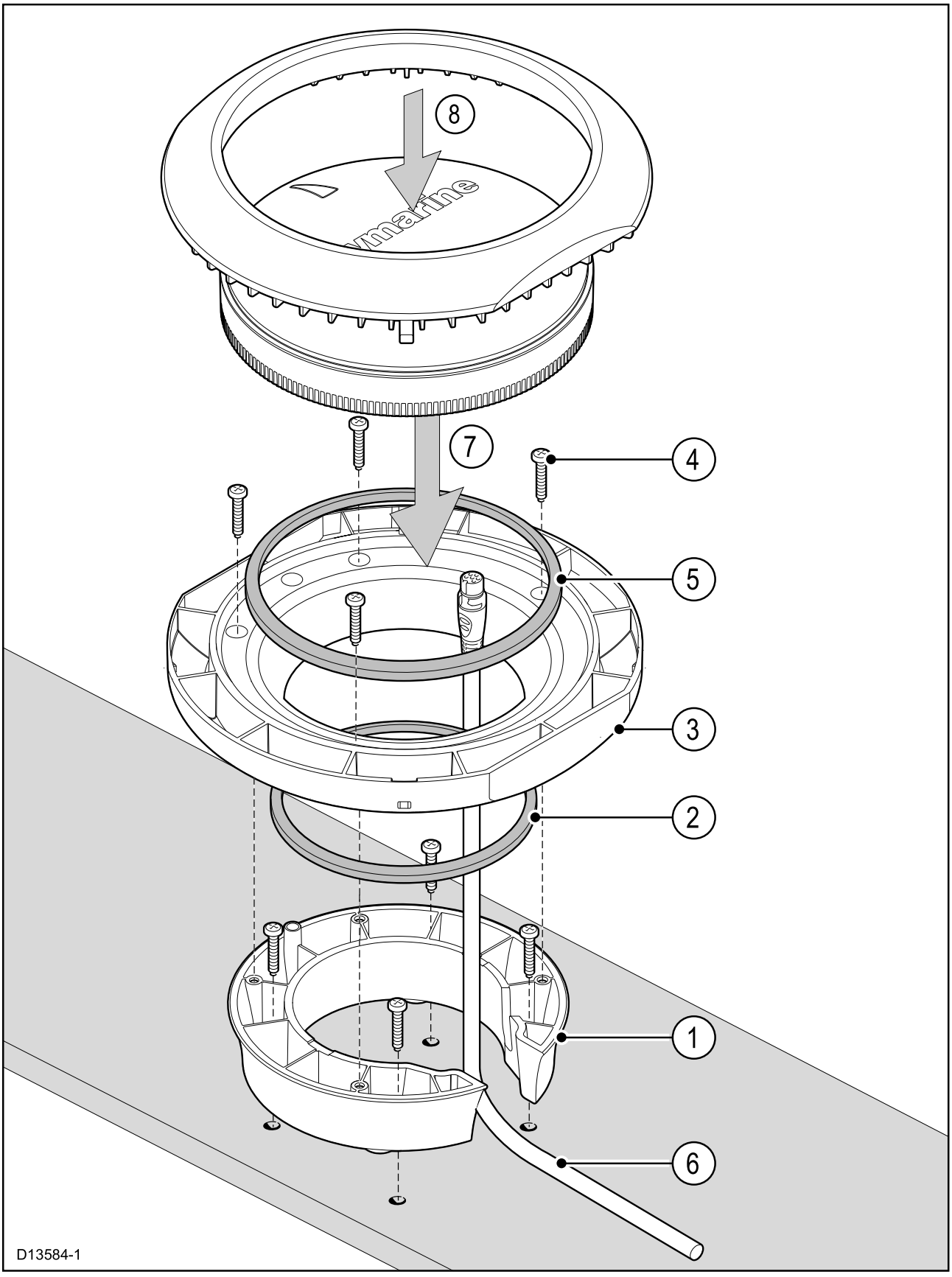


5.5 Surface mounting using the Riser

The Deck mounting kit (A80437) can be used to raise the product from the mounting surface.

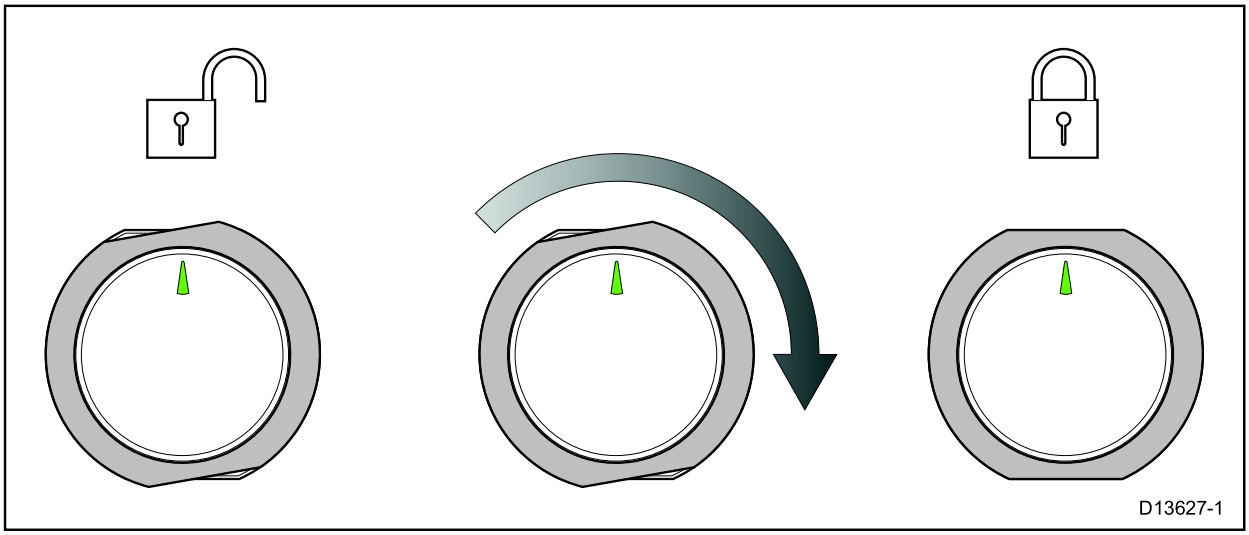
The Wall bracket is not required when using the Riser.

Ensure that the chosen location meets the product's location requirements, see 3.6 **Selecting a location** for details.



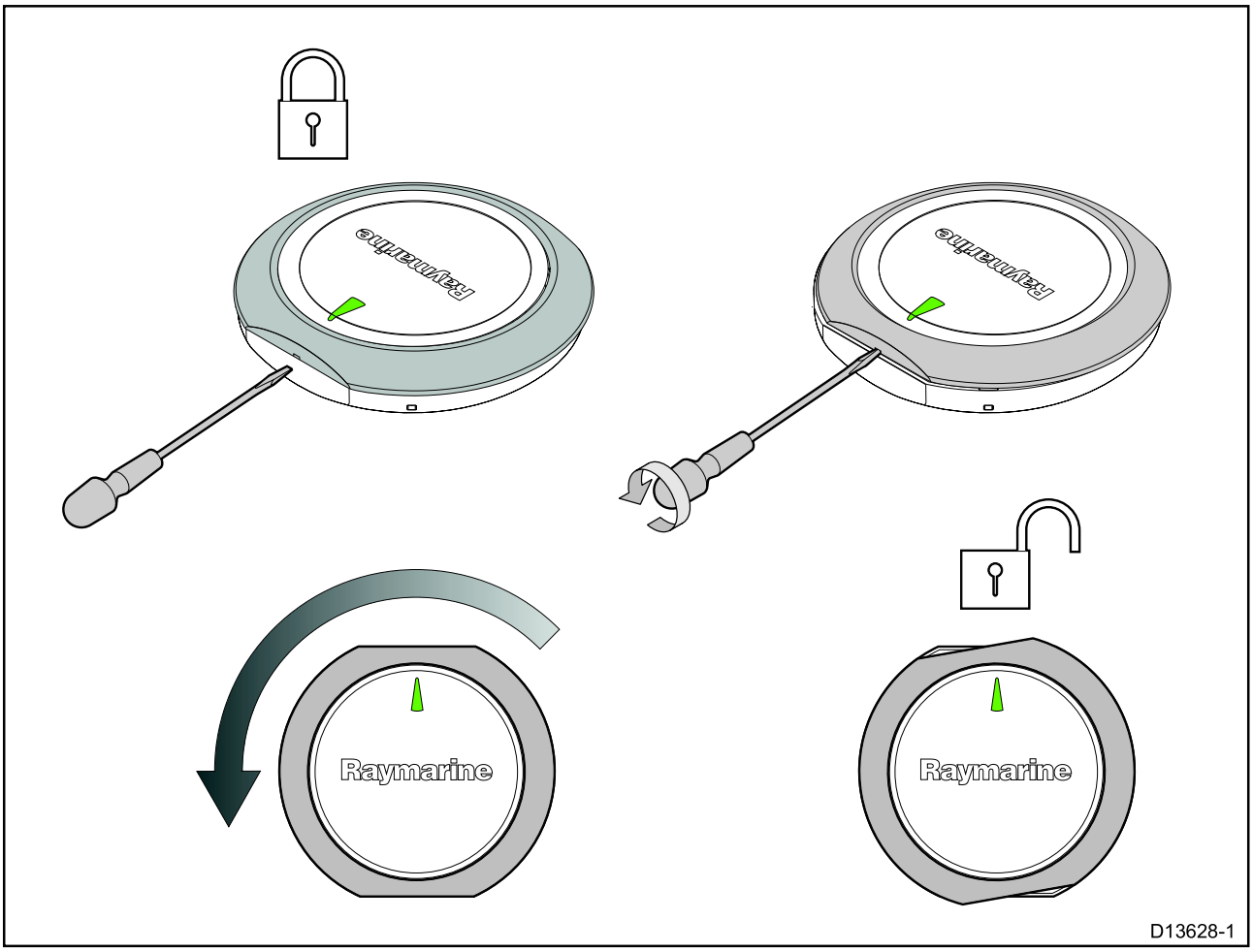
1. Use the supplied Deck mount riser template to drill 4 holes in the mounting surface. Secure the Riser to the mounting surface using 4x supplied fixings.

2. Place the small sealing ring in the groove located on the bottom of the mounting tray.
3. Position the Mounting tray on top of the Riser.
4. Secure the Mounting tray to the Riser using 3x supplied fixings.
5. Place the large sealing ring into the groove on the upper side of the Mounting tray.
6. Pull the SeaTalkng ® cable through the Riser and Mounting tray. Plug in the cable connector on the underside of the unit and secure by rotating the locking collar clockwise 2 clicks.
7. Insert the unit into the mounting tray, ensuring the tabs in the Mounting tray are slotted into the grooves around the edge of the unit.
8. Place the Mounting trim over the unit slightly offset, and then twist the Mounting trim clockwise until it locks into position.



5.6 Releasing the unit from the adaptor

Follow the steps below to release the unit from the Mounting adaptor.



1. Insert the flat of a small flat blade screw driver, or similar tool into the release hole located on the flat edge of the mounting adaptor and twist the screw driver 90°, so that there is a small gap between the Mounting trim and Mounting tray.

Important: To help prevent scratching the product, cover the tip of your screw driver with a small piece of insulation tape.

2. Twist the Mounting trim counter-clockwise approximately 10° and then lift away from the unit.

Chapter 6: System operation and setup

Chapter contents

- 6.1 Transducer calibration on page 54
- 6.2 Autonetworking on page 55
- 6.3 Powering the unit on and off on page 59
- 6.4 Data damping on page 60

6.1 Transducer calibration

The Micro-Talk gateway combines SeaTalkng ® and MicroNet networks together.

Prior to powering on the Micro-Talk gateway for the first time you must ensure that all transducers are calibrated. This is particularly important with the Mast rotation device, which must be linearized **after** and independently of your primary heading source. This means 2 linearizations are required, the first for the heading source and second for the Mast rotation device, which uses the linearized heading source as an input.

Please refer to the documentation that accompanied your products for calibration/linearization instructions.

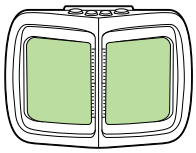
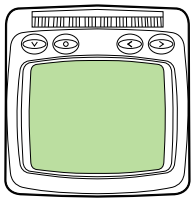
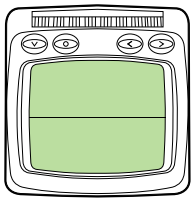
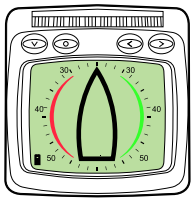
6.2 Autonetworking

Micronet wireless products are networked together using the **Autonetworking** procedure.

Autonetworking connects compatible wireless products, within range, to the same Micronet network.

Autonetworking — compatible Micronet displays

Autonetworking can be initiated using one of the compatible Micronet displays shown below.

Product	Description
	**T070** Race Master Display
	**T110** Multifunction wireless display
	**T111** Multifunction wireless dual display
	**T112** Multifunction wireless analogue display
	T113 Multifunction wireless remote display

Performing Autonetworking

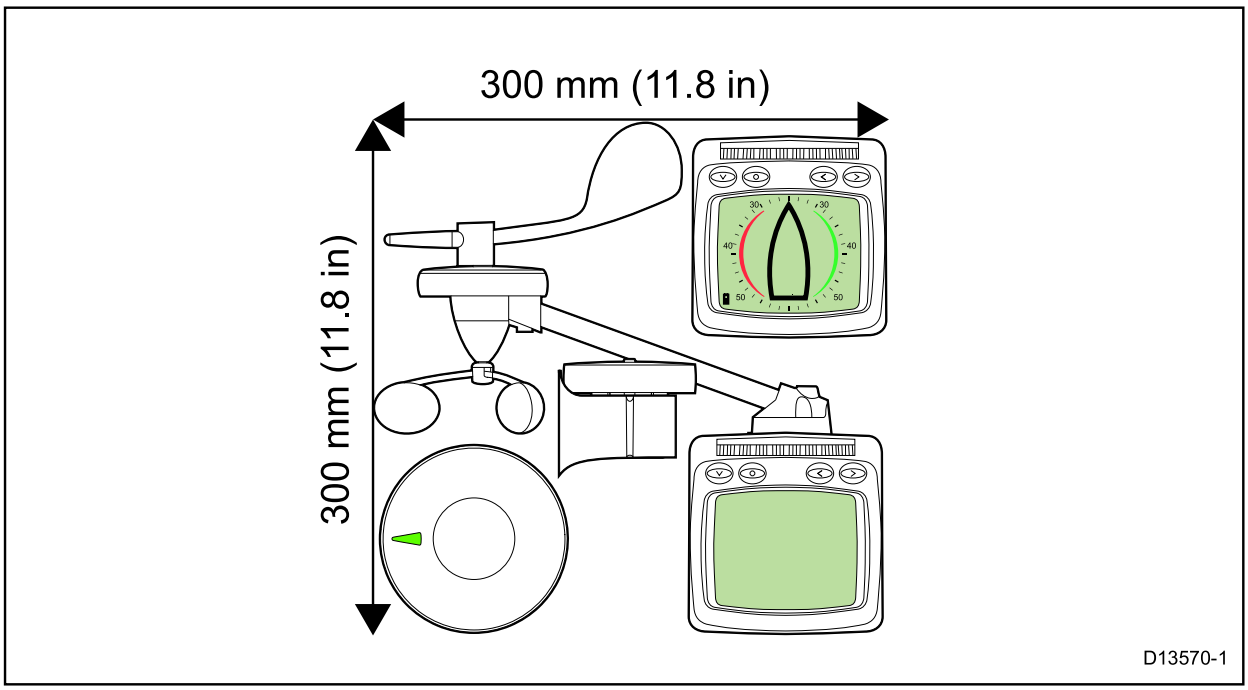
Follow the steps below to add new Micronet products to an existing system, or create a new system from multiple boxes.

Note:

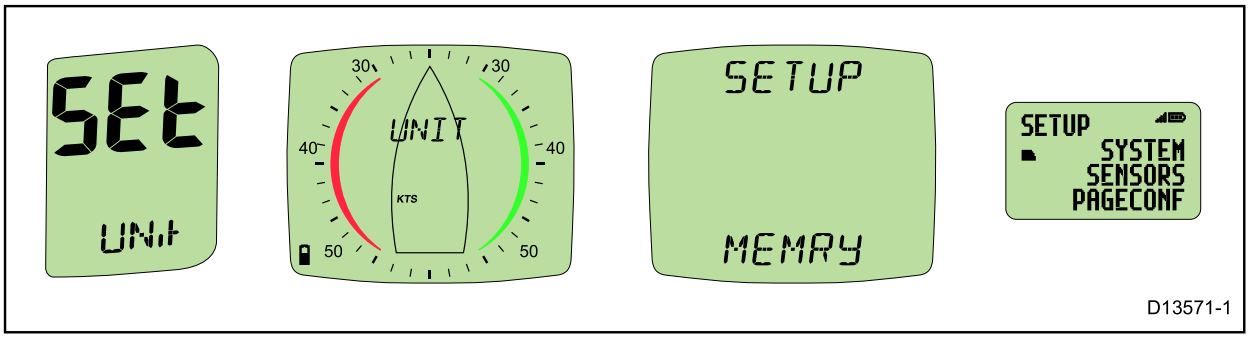
- Autonetworking should be performed before new products are mounted.
- The following procedure is NOT required when creating a new system with products that have been supplied in a single box.
- You will need to choose a display capable of initiating Autonetworking.
- If you have an existing system then a capable display from this system should be chosen.

1. Connect products that require an external power source to a 12 V dc power supply.
2. Place all **New** products within 300 mm (11.8 in) of the display you have chosen to perform Autonetworking.

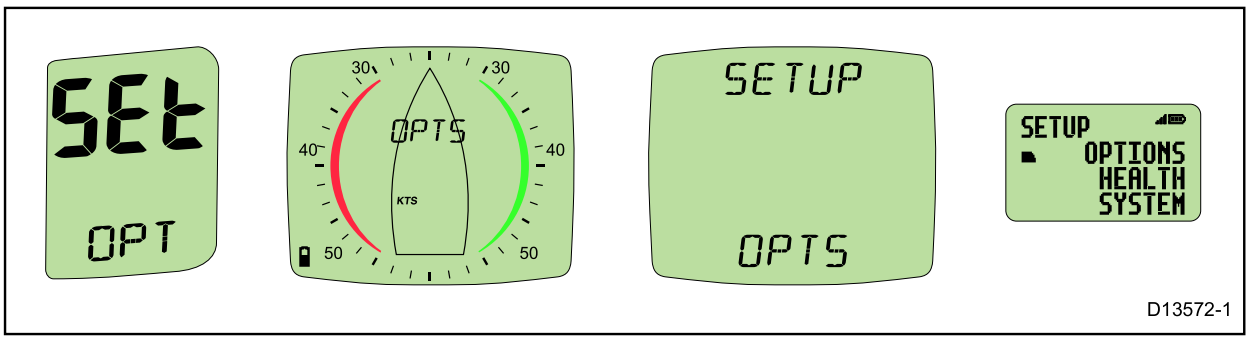
Existing networked products do not need to be included.



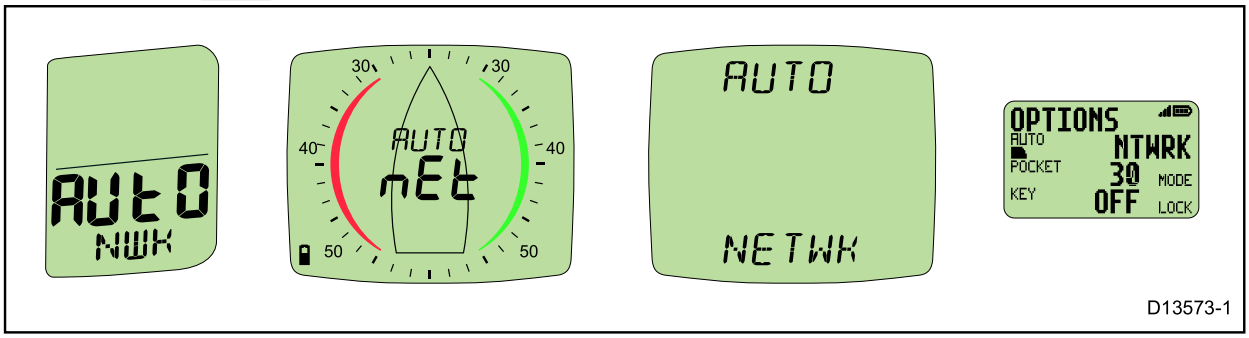
3. Ensure all products are powered off.
4. Power on the chosen display, by pressing and holding the **Down/Power** button for 2 seconds.
5. Ensure the chosen display is not showing a ‘Racer Timer’ or ‘Wind Shift’ page.
6. Press the **Set Up** button for 2 seconds to display the Setup menu.



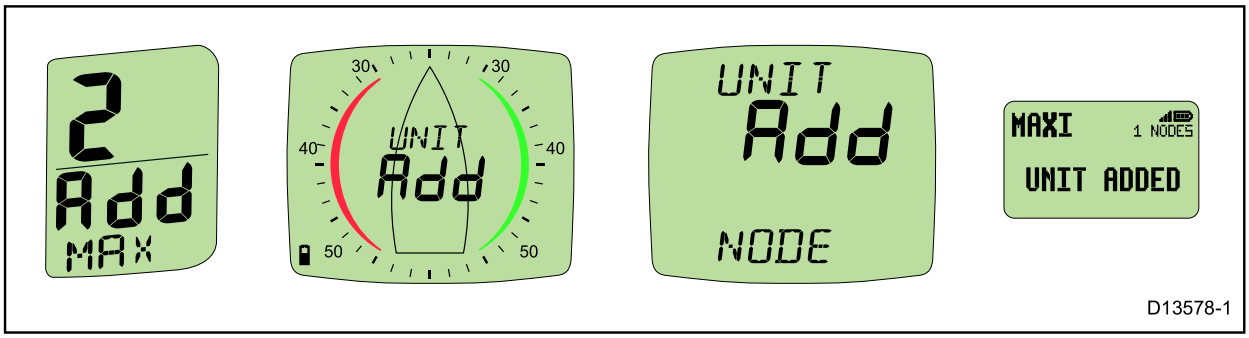
7. Press the **Down/Power** button until the Options page is displayed.



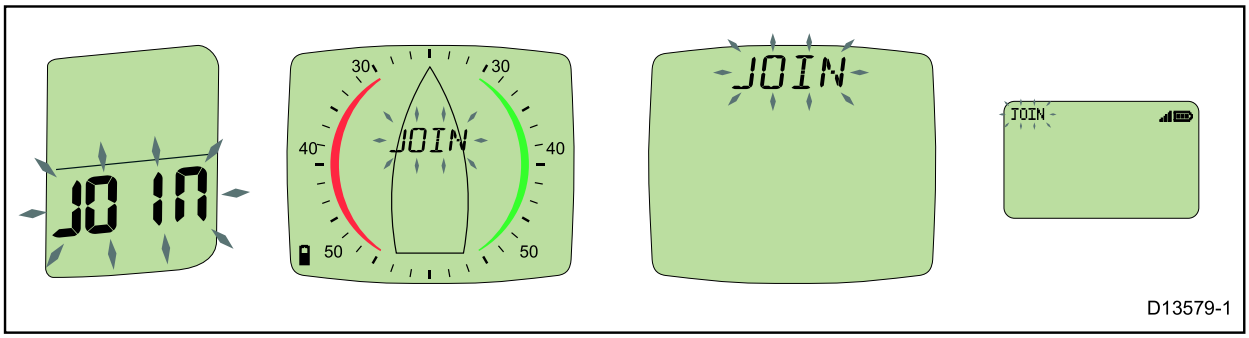
8. Press the **Right** button to display the Autonetworking page.



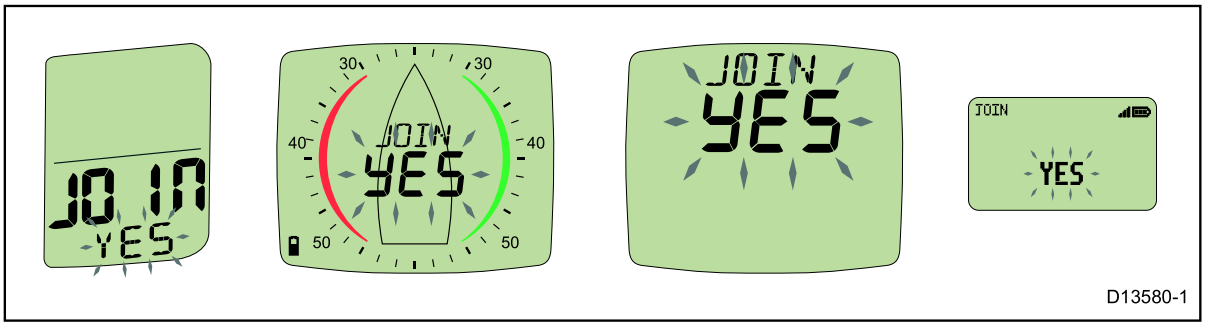
9. Press the **Set up** button to begin the Autonetworking procedure.
   A countdown will begin and the chosen display shows 'WAIT' and then 'JOIN' as devices join the network.



10. In the last 30 seconds of the countdown some displays may switch on and 'JOIN' will flash onscreen, to allow these displays to join the network follow the steps below:



    i. Press any button on a display that has 'JOIN' flashing onscreen.
    The Display will show 'JOIN YES'



    ii. Confirm by pressing any button on the same display.
    The display will show 'DONE'.

If confirmation is not completed within 25 seconds, 'FAIL' will be shown which means the display has not joined the network.

When the countdown is complete, the chosen display returns to the Autonetworking page. Press and hold the **Set up** button for 2 seconds to return to normal operation.

11. Test the system:
    i. Switch off the chosen display.

ii. Switch on the chosen display.

    If some units do not power up, check that all new units are within 300 mm (11.8 in) of the chosen display and if required, are connected to a power source.

12. Repeat the steps above until all units have joined the network.
13. If you are replacing older units, remove them from the vessel.
14. Ensure all units are working correctly before mounting them.

Product identification on Micronet

The Micro-Talk gateway is identified differently during the Autonetworking process than when checking the Health pages from a Micronet display.

During Autonetworking the gateway is identified as an NMEA 2000 device (i.e.: `2000`, `N2000`, or `N 2000`)

When checking the Health pages from a Micronet display the gateway is identified as Type 7 device (i.e: `TYP7`, `TYPE7` or `TYPE 7`.

6.3 Powering the unit on and off

Powering on

The Micro-Talk unit will automatically power on when power is applied to the SeaTalkng ® network that the unit is connected to.

Powering off

The Micro-Talk unit is powered off when the SeaTalkng ® network it is connected to is powered off.

6.4 Data damping

Data damping affects the responsiveness of display data to changes in the data received from connected transducers/sensors. A less responsive setting removes data fluctuations and provides a more stable reading. A more responsive setting results in a more dynamic update to changes to the data.

Response settings are available on both MicroNet and SeaTalkng ® networks to control data damping.

As the **Response** settings on each network are independent of each other, there is a risk that data can be double damped, once on MicroNet and then again on SeaTalkng ®. To minimize the effect of double damping, you should reduce the relevant **Response** setting on MicroNet displays and/or increase the **Display Response** setting on SeaTalkng ® displays.

Note: It is recommended that MicroNet **Response** settings are set to either Slow, Medium or Fast rather than Auto.

To determine whether you should make the damping changes on SeaTalkng ® or MicroNet, the user should consider the other products in their networks. For example:

- if an Autopilot is present on the SeaTalkng ® network and the wind data source is on the MicroNet network, then it is recommended that the **Response** setting for wind data is set to Fast, so that the Autopilot receives more dynamic data.
- if MicroNet displays are used as the primary method for displaying data, in order to avoid rapidly changing data values, it is recommended that you use a lower **Response** setting for data sources that originate on the MicroNet network.

Note:

Due to the effects of damping, there may be differences in the data shown on MicroNet displays to that shown on SeaTalkng ® displays. You can manually alter the **Response** settings on your displays individually for each data type (i.e. wind, depth, Speed and Heading) to provide data update rates that meet your requirements.

Chapter 7: Troubleshooting

Chapter contents

- 7.1 Troubleshooting on page 62
- 7.2 LED Diagnostics on page 63

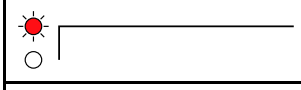
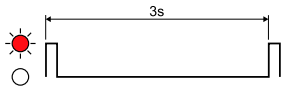
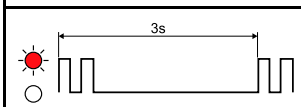
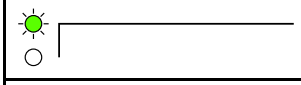
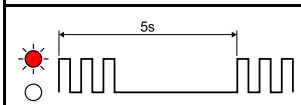
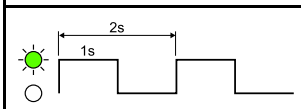
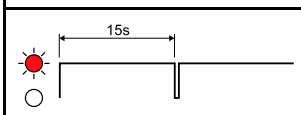
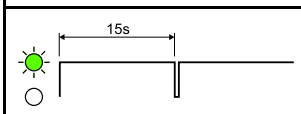
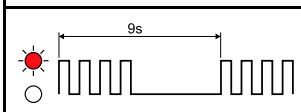
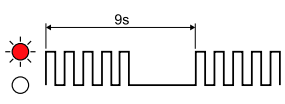
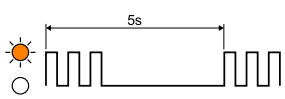
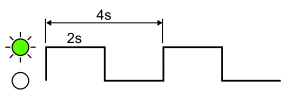
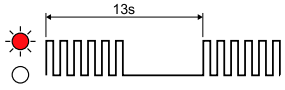
7.1 Troubleshooting

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

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

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

7.2 LED Diagnostics

LED Sequence	LED Color	Status	Action
	Red	Unit powering up	None
	Red	Power up failed	Power cycle unit
	Red	Multiple Micro-Talk gateways detected on SeaTalkng ®	Remove all but 1 Micro-Talk gateway from SeaTalkng ®
	Green	SeaTalkng ® powered up, Micronet powering up	None
	Red	Micronet connection failed	Power cycle the unit
	Green	Micronet joining network	None
	Red	Micronet searching for network	None
	Green	Normal operation	None
	Red	SeaTalkng ® connection lost, Micronet will revert to searching mode after 30 seconds	1. Power cycle unit 2. Check network connections
	Red	No data being received on SeaTalkng ®, Micronet will revert to searching mode after 30 seconds	1. Power cycle unit 2. Check network connections
	Amber	Device failed to commence software update process.	Power cycle unit and retry the update
	Green	Software update in progress	None
	Red	Software update failed	Power cycle unit and retry the update

Chapter 8: Maintenance

Chapter contents

- 8.1 Service and maintenance on page 66
- 8.2 Routine equipment checks on page 67
- 8.3 Product cleaning on page 68

8.1 Service and maintenance

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

8.2 Routine equipment checks

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

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

8.3 Product cleaning

Best cleaning practices.

When cleaning products:

- Lightly rinse or flush with clean, cool fresh water.
- If your product has a display screen, do NOT wipe the screen with a dry cloth, as this could scratch the screen coating.
- Do NOT use: abrasive, acidic, ammonia, solvent of chemical based cleaning products.
- Do NOT use a jet wash.

Chapter 9: Technical support

Chapter contents

- 9.1 Raymarine product support and servicing on page 70
- 9.2 Learning resources on page 72

9.1 Raymarine product support and servicing

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

Product information

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

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

You can obtain this product information using the menus within your product.

Servicing and warranty

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

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

Region	Telephone	E-mail
United Kingdom (UK), EMEA, and Asia Pacific	+44 (0)1329 246 932	emea.service@raymarine.com
United States (US)	+1 (603) 324 7900	rm-usrepair@flir.com

Web support

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

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

Telephone and e-mail support

Region	Telephone	E-mail
United Kingdom (UK), EMEA, and Asia Pacific	+44 (0)1329 246 777	support.uk@raymarine.com
United States (US)	+1 (603) 324 7900 (Toll-free: +800 539 5539)	support@raymarine.com
Australia and New Zealand	+61 2 8977 0300	aus.support@raymarine.com (Raymarine subsidiary)
France	+33 (0)1 46 49 72 30	support.fr@raymarine.com (Raymarine subsidiary)
Germany	+49 (0)40 237 808 0	support.de@raymarine.com (Raymarine subsidiary)
Italy	+39 02 9945 1001	support.it@raymarine.com (Raymarine subsidiary)
Spain	+34 96 2965 102	sat@azimut.es (Authorized Raymarine distributor)
Netherlands	+31 (0)26 3614 905	support.nl@raymarine.com (Raymarine subsidiary)
Sweden	+46 (0)317 633 670	support.se@raymarine.com (Raymarine subsidiary)
Finland	+358 (0)207 619 937	support.fi@raymarine.com (Raymarine subsidiary)

Region	Telephone	E-mail
Norway	+47 692 64 600	support.no@raymarine.com (Raymarine subsidiary)
Denmark	+45 437 164 64	support.dk@raymarine.com (Raymarine subsidiary)
Russia	+7 495 788 0508	info@mikstmarine.ru (Authorized Raymarine distributor)

Viewing product information

With your MFD Homescreen displayed:

1. Select **Set-up**.
2. Select **Maintenance**.
3. Select **Diagnostics**.
4. Select **Select Device**.
5. Select the relevant product from the list.

The Diagnostics page is displayed.

9.2 Learning resources

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

Video tutorials

	Raymarine official channel on YouTube: • http://www.youtube.com/user/RaymarineInc
	Video Gallery: • http://www.raymarine.co.uk/view/?id=2679
	Product Support videos: • http://www.raymarine.co.uk/view/?id=4952

Note:

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

Training courses

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

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

FAQs and Knowledge Base

Raymarine has produced an extensive set of FAQs and a Knowledge Base to help you find more information and troubleshoot any issues.

- http://www.raymarine.co.uk/knowledgebase/

Technical support forum

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

- http://forum.raymarine.com

Chapter 10: Technical specification

Chapter contents

- 10.1 Technical specification on page 74

10.1 Technical specification

Nominal supply voltage	12 V dc (Supplied by SeaTalkng ®)
Operating voltage range	9 V dc to 16 V dc (protected up to 32 V dc)
Power consumption	25 mA at nominal supply voltage
Operating frequency (MicroNet)	• 869.8 MHz for products operating in the UK, Europe or Africa • 915.9 MHz for products operating in the USA, Canada, South America and Australia
Environmental	**Installation environment** • Operating temperature: -20 ºC to +55 ºC (-4 ºF to 131 ºF) • Storage temperature: -30 ºC to +70 ºC (-22 ºF to 158 ºF) • Relative humidity: max 93% • Waterproof to IPx6 and IPx7
Supported connection protocols	• SeaTalkng ® / NMEA 2000 (via DeviceNet adaptor) • Micronet (wireless)
LEN (refer to SeaTalkng ® Reference manual for more information)	1

Chapter 11: Spares and accessories

Chapter contents

- 11.1 Accessories on page 76
- 11.2 SeaTalk ng® cabling components on page 77
- 11.3 SeaTalk ng® cables and accessories on page 78

11.1 Accessories

The following accessories are available:

Accessories

Item	Part number
Pole/rail mounting adaptor kit	A80370
6 m SeaTalkng white spur cable	A06072
Deck mounting (Clamshell/Riser) kit	A80437

11.2 SeaTalk ng® cabling components

SeaTalk ng cabling components and their purposes.

Connection / Cable	Notes
Backbone cable (various lengths)	The main cable carrying data. Spurs from the backbone are used to connect SeaTalk ng devices.
T-piece connector	Used to make junctions in the backbone to which devices can then be connected.
Terminator	Required at either end of the backbone.
Inline terminator	Used to connect a spur cable directly to the end of a backbone; useful for longer cable runs.
Spur cable	Used to connect devices to the backbone. Devices may be daisy chained or connected directly to the T-pieces.
SeaTalk ng 5–way connector	Used to branch, split, or make additional connections in SeaTalk or SeaTalk ng networks.
Blanking plug	Inserted into unused spur connector positions in a 5-way connector or T-piece.

11.3 SeaTalk ng® cables and accessories

SeaTalk ng cables and accessories for use with compatible products.

Part No	Description	Notes
T70134	SeaTalk ng starter kit	Includes: • 1 x 5 Way connector (A06064) • 2 x Backbone terminator (A06031) • 1 x 3 m (9.8 ft) spur cable (A06040) • 1 x Power cable (A06049)
A25062	SeaTalk ng Backbone Kit	Includes: • 2 x 5 m (16.4 ft) Backbone cable (A06036) • 1 x 20 m (65.6 ft) Backbone cable (A06037) • 4 x T-piece (A06028) • 2 x Backbone terminator (A06031) • 1 x Power cable (A06049)
A06038	SeaTalk ng 0.4 m (1.3 ft) spur	
A06039	SeaTalk ng 1 m (3.3 ft) spur	
A06040	SeaTalk ng 3 m (9.8 ft) spur	
A06041	SeaTalk ng 5 m (16.4 ft) spur	
A06042	SeaTalk ng 0.4 m (1.3 ft) elbow spur	
A06033	SeaTalk ng 0.4 m (1.3 ft) backbone	
A06034	SeaTalk ng 1 m (3.3 ft) backbone	
A06035	SeaTalk ng 3 m (9.8 ft) backbone	
A06036	SeaTalk ng 5 m (16.4 ft) backbone	
A06068	SeaTalk ng 9 m (29.5 ft) backbone	
A06037	SeaTalk ng 20 m (65.6 ft) backbone	
A06043	SeaTalk ng to bare ends 1 m (3.3 ft) spur	
A06044	SeaTalk ng to bare ends 3 m (9.8 ft) spur	
A06049	SeaTalk ng Power cable	
A06031	SeaTalk ng Terminator	
A06028	SeaTalk ng T-piece	Provides 1 x spur connection
A06064	SeaTalk ng 5–way connector	Provides 3 x spur connections
A06030	SeaTalk ng backbone extender	
E22158	SeaTalk to SeaTalk ng converter kit	Allows the connection of SeaTalk devices to a SeaTalk ng system.
A80001	SeaTalk ng Inline terminator	Provides direct connection of a spur cable to the end of a backbone cable. No T-piece required.

Part No	Description	Notes
A06032	SeaTalk ng Blanking plug	
R12112	ACU / SPX SeaTalk ng spur cable 0.3 m (1.0 ft)	Connects an SPX course computer or an ACU to a SeaTalk ng backbone.
A06047	SeaTalk (3 pin) to SeaTalk ng adaptor cable 0.4 m (1.3 ft)	
A22164	SeaTalk to SeaTalk ng spur 1 m (3.3 ft) spur	
A06048	SeaTalk2 (5 pin) to SeaTalk ng adaptor cable 0.4 m (1.3 ft)	
A06045	DeviceNet adaptor cable (Female)	Allows the connection of NMEA 2000 devices to a SeaTalk ng system.
A06046	DeviceNet adaptor cable (Male)	Allows the connection of NMEA 2000 devices to a SeaTalk ng system.
E05026	DeviceNet adaptor cable (Female) to bare ends.	Allows the connection of NMEA 2000 devices to a SeaTalk ng system.
E05027	DeviceNet adaptor cable (Male) to bare ends.	Allows the connection of NMEA 2000 devices to a SeaTalk ng system.

Appendix A NMEA 2000 PGN support

The unit supports the following NMEA 2000 PGNs.

PGN	Description	Receive (Rx)	Transmit (Tx)
59904	ISO Request	●	
59932	ISO Acknowledgement		●
60160	ISO Transport protocol, data transfer	●	
60416	ISO Transport protocol, connection management	●	●
60928	ISO Address claim	●	●
65240	ISO Commanded address	●	
126208	NMEA - Request group function	●	
126208	NMEA - Command group function	●	
126208	NMEA - Acknowledge group function		●
126464	Transmission PGN list		●
126464	Received PGN list		●
126992	System time	●	
126993	Heartbeat		●
126996	Product information		●
126998	Configuration information		●
127237	Heading / track control	●	●
127250	Vessel heading	●	●
127258	Magnetic variation	●	●
128259	Speed, water referenced	●	●
128267	Water depth	●	●
128275	Distance log	●	●
129025	Position, rapid update	●	
129026	COG & SOG rapid update	●	
129029	GNSS position data	●	
129033	Local time offset *(formerly Time and date)*	●	
129283	Cross track error	●	
128284	Navigation data	●	
130306	Wind data	●	●
130310	Environmental parameters	●	●
130316	Temperature, extended range	●	●
130577	Direction data	●	

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