

i60 Instrument

INSTALLATION & OPERATION INSTRUCTIONS

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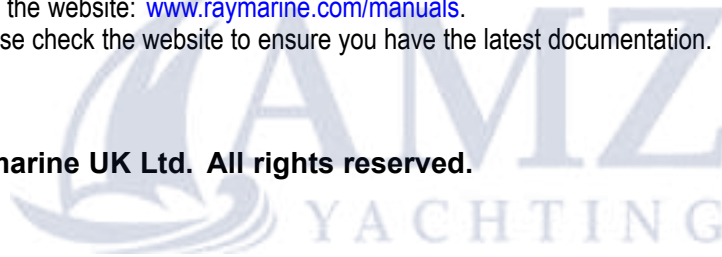
Check the Raymarine website for the latest software releases for your product.
www.raymarine.com/software

Product documentation



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Chapter 1: Important information

Certified Installation

Raymarine recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine dealer for further details, and refer to the separate warranty document packed with your product.



Warning: Product installation and operation

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- 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: Positive ground systems

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

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.



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: High voltage

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

Caution: Transducer cable

- Do NOT use the transducer cable to lift or suspend the transducer; always support the transducer body directly during installation.
- Do NOT cut, shorten, or splice the transducer cable.
- Do NOT remove the connector.

If the cable is cut, it cannot be repaired. Cutting the cable will also void the warranty.

Caution: Service and maintenance

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

Water ingress

Water ingress disclaimer

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

Disclaimer

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

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

EMC installation guidelines

Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations, to minimize electromagnetic interference

between equipment and minimize the effect such interference could have on the performance of your system

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

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

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

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

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

Suppression ferrites

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

Connections to other equipment

Requirement for ferrites on non-Raymarine cables

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

Caution: Sun covers

- If your product is supplied with a sun cover, to protect against the damaging effects of ultraviolet (UV) light, always fit the sun cover when the product is not in use.
- Sun covers must be removed when travelling at high speed, whether in water or when the vessel is being towed.

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: Condensation

Certain atmospheric conditions may cause a small amount of condensation to form on the unit's window. This will not damage the unit and will clear after the unit has been switched on for a short period.

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.

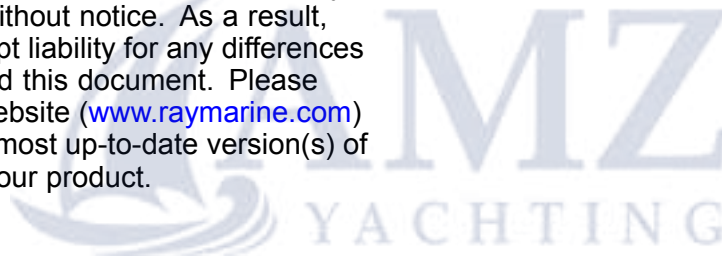
It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

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: Handbook information

Chapter contents

- [2.1 Document information on page 12](#)
- [2.2 Parts supplied on page 13](#)
- [2.3 i60 Product overview on page 13](#)



2.1 Document information

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

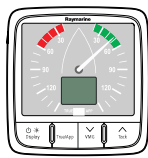

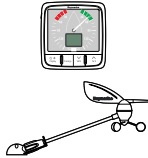
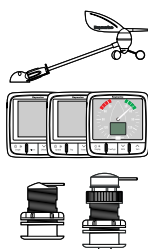
The document includes information to help you:

- 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:

Item	Model	Part number	Hardware
	i60 Wind	E70061	i60 Wind SeaTalk ^{ng} instrument display
	i60 Close Hauled Wind	E70062	i60 Close Hauled Wind SeaTalk ^{ng} instrument display (repeater)
	i60 Wind system pack	E70150	<ul style="list-style-type: none"> • i60 Wind SeaTalk^{ng} instrument display • Short arm wind vane transducer
	i50 & i60 Depth, Speed & Wind system pack	E70153	<ul style="list-style-type: none"> • i50 Depth SeaTalk^{ng} instrument display • P319 Thru-hull Depth transducer • i50 Speed SeaTalk^{ng} instrument display • P120 Thru-hull Speed and Temp transducer • i60 Wind SeaTalk^{ng} instrument display • Short arm wind vane transducer

Document illustrations

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

All images are provided for illustration purposes only.

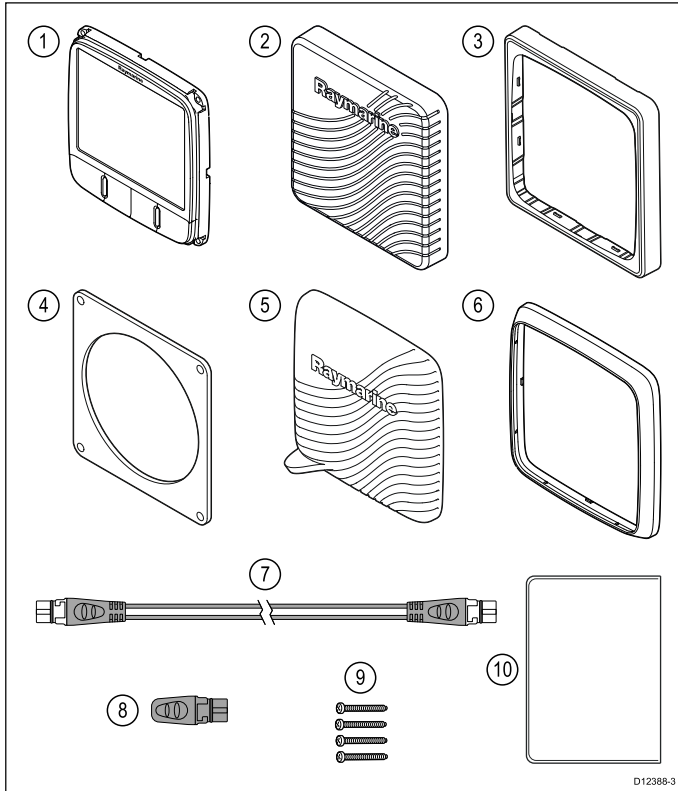
Product documentation

The following handbooks are applicable to your product:

Handbooks

Description	Part number
i60 Installation and operation instructions Installation and operation instructions for the i60 instrument display	81342 / 88010
i60 Mounting template Surface mounting template for the i60 instrument display	87130
Rotavecta Installation instructions Installation instructions for the Rotavecta wind transducer	87221 / 88036
Short & long arm wind vane Installation instructions Installation instructions for the short and long arm wind vane transducers	87220 / 88035

2.2 Parts supplied

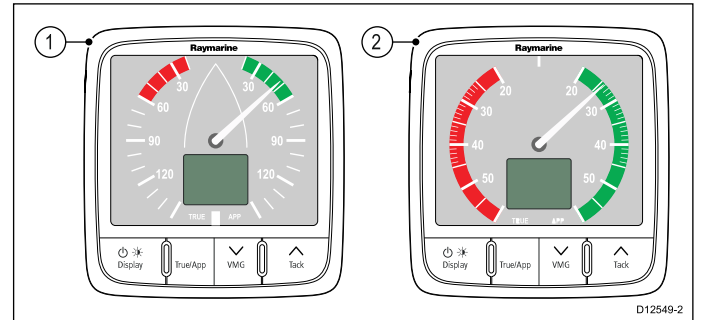


1	Instrument display
2	Suncover (to match i70s, p70s, p70Rs, eS Series)
3	Front bezel (to match i70s, p70s, p70Rs, eS Series)
4	Gasket
5	Suncover (to match a, c, e Series)
6	Front bezel (to match a, c, e Series)
7	SeaTalk ^{ng} spur cable
8	SeaTalk ^{ng} blanking plug
9	4 x fixing screws
10	Documentation

2.3 i60 Product overview

The i60 range of SeaTalk^{ng} instrument displays can be connected directly to the compatible wind transducers. The data can be transmitted on the SeaTalk^{ng} network to other compatible displays.

Raymarine's i60 instrument range consists of the following variants:



- i60 Wind** — The i60 Wind instrument provides a 360° wind direction scale and can be used as a stand alone unit or as part of a SeaTalk or SeaTalk^{ng} network.
- i60 Close Hauled (CH) Wind** — The i60 Close hauled wind instrument is a repeater display which provides an expanded indication from 20° to +60° about the bow and stern of the vessel. The i60 Close hauled repeats wind data available on the SeaTalk or SeaTalk^{ng} network.

The i60 instrument display range offers the following features:

- Integrates with Raymarine autopilots and navigation equipment on the SeaTalk^{ng} network
- Analogue and digital display read outs.
- Surface mountable
- Provides good visibility in all lighting conditions
- Low power consumption



Chapter 3: Planning the installation

Chapter contents

- 3.1 Installation checklist on page 16
- 3.2 Compatible transducers on page 16
- 3.3 System protocols on page 17
- 3.4 Tools required on page 17
- 3.5 Selecting a display location on page 18
- 3.6 Product dimensions on page 19
- 3.7 Wind vane transducer / rotavecta location requirements on page 19



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 Compatible transducers

Instrument Wind Vane transducer

The wind vane transducers listed below are compatible with the following instrument displays:


- **i60** Wind
- **i70 / i70s** via **iTC-5** converter

Part number	Image	Housing	Mounting
E22078		Short arm wind vane	Surface mount
E22079		Long arm wind vane	Surface mount

Instrument Rotavecta transducer

The wind transducers listed below are compatible with the following instrument displays:

- **i40** Wind
- **i60** Wind
- **i70 / i70s** via **iTC-5** converter

Part number	Image	Housing	Mounting
Z195		Rotavecta transducer	Surface mount

3.3 System protocols

Your product can be connected to various products and systems to share information and so improve the functionality of the overall system.

These connections may be made using a number of different protocols. Fast and accurate data collection and transfer is achieved by using a combination of the following data protocols:

- **SeaTalkng®**
- **NMEA 2000**
- **SeaTalk**

Note: You may find that your system does not use all of the connection types or instrumentation described in this section.

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.

NMEA 2000

NMEA 2000 offers significant improvements over **NMEA 0183**, most notably in speed and connectivity. Up to 50 units can simultaneously transmit and receive on a single physical bus at any one time, with each node being physically addressable. The standard was specifically intended to allow for a whole network of marine electronics from any manufacturer to communicate on a common bus via standardized message types and formats.

SeaTalk

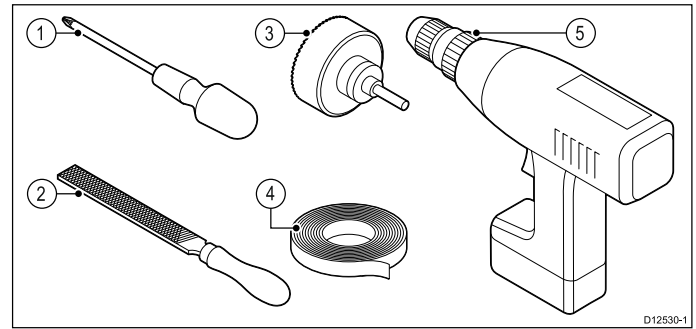
SeaTalk is a protocol which enables compatible instruments to connect to each other and share data.

The **SeaTalk** cable system is used to connect compatible instruments and equipment. The cable carries power and data and enables connection without the need for a central processor.

Additional instruments and functions can be added to a **SeaTalk** system, simply by plugging them into the network. **SeaTalk** equipment can also communicate with other non-SeaTalk equipment via the **NMEA 0183** standard, provided a suitable interface is used.

3.4 Tools required

Tools required for installation



1	Pozi-drive screwdriver
2	File
3	92 mm (3.62 in) hole cutter
4	Adhesive tape
5	Power drill

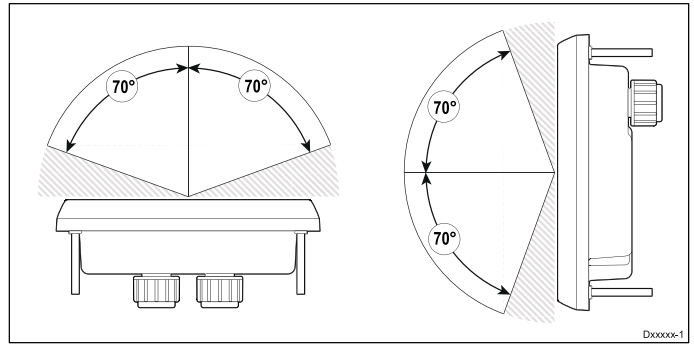
3.5 Selecting a display location



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).

Viewing angle



General location requirements

When selecting a location for the unit it is important to consider a number of factors.

Ventilation requirements

To provide adequate airflow:

- Ensure that equipment is mounted in a compartment of suitable size.
- Ensure that ventilation holes are not obstructed.
- Ensure adequate separation of equipment.

Mounting surface requirements

Ensure units are adequately supported on a secure surface. Do NOT mount units or cut holes in places which may damage the structure of the vessel.

Cable routing requirements

Ensure the unit is mounted in a location which allows proper routing and connection of cables:

- Minimum cable bend radius of 100 mm (3.94 in) is required unless otherwise stated.
- Use cable supports to prevent stress on connectors.

Electrical interference

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

Magnetic compass

When choosing a suitable location you should aim to maintain the maximum possible distance between the unit and any compasses.

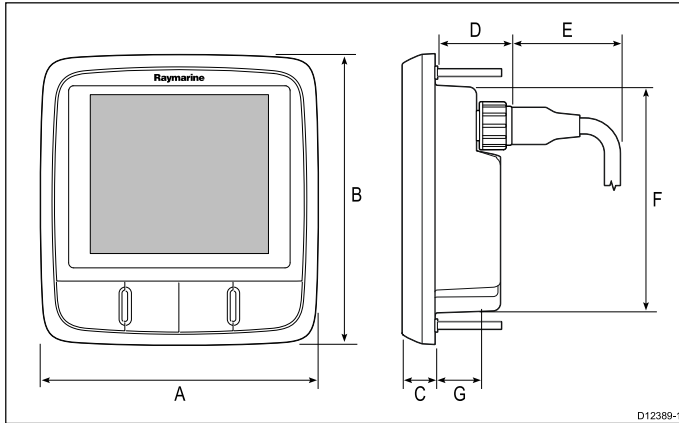
To prevent potential interference with the vessel's magnetic compasses, ensure that a minimum distance of 230 mm (9 in) between the unit and any installed compasses is maintained.

Viewing angle considerations

As display contrast and color are affected by the viewing angle, It is recommended that you temporarily power up the display, prior to installation, to enable you to best judge which location provides the optimum viewing angle.

Refer to [Chapter 13 Technical specification](#) for viewing angles for your product.

3.6 Product dimensions



A	110 mm (4.22")
B	115 mm (4.52")
C	14 mm (0.55")
D	30 mm (1.18")
E	35 mm (1.38")
F	90 mm (3.54")
G	17 mm (0.67")

3.7 Wind vane transducer / rotavecta location requirements

When selecting a location for your wind transducer it is important to consider a number of factors.

The transducer's location must:

- Allow reasonable access for installation and servicing.
- Be as high as possible and away from any equipment which may shield the transducer or otherwise disturb the air flow.
- Provide a horizontal mounting surface. If a surface (e.g. mast top) is otherwise suitable but not horizontal, make up a suitable wedged packing piece to provide the necessary horizontal surface.
- There must also be a viable route for the transducer cable to be routed to the product it is to be connected to (i.e. display or converter).

Wind vane transducer and rotavecta mounting

Ensure that the wind transducer or rotavecta is installed in accordance with the instructions supplied with the unit.





Chapter 4: Cables and connections

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- 4.1 General cabling guidance on page 22
- 4.2 Connections overview on page 22
- 4.3 Direct Power Connection on page 23
- 4.4 SeaTalkng® power supply on page 23
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- 4.8 SeaTalk connection on page 28
- 4.9 NMEA 2000 network connection on page 28



4.1 General cabling guidance

Cable types and length

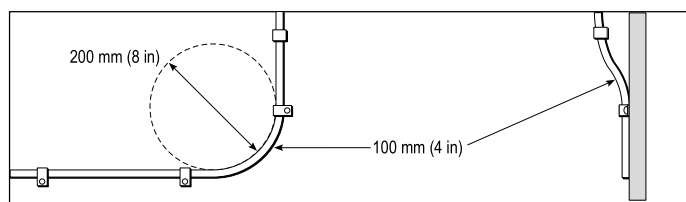
It is important to use cables of the appropriate type and length

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

Routing cables

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

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



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

Always route data cables as far away as possible from:

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

Strain relief


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

Cable shielding

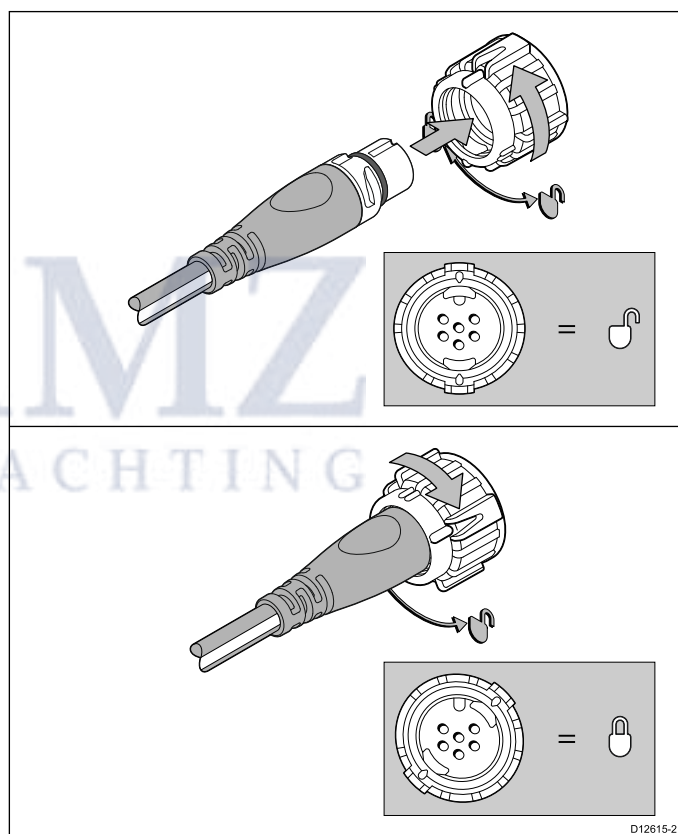
Ensure that all data cables are properly shielded that the cable shielding is intact (e.g. hasn't been scraped off by being squeezed through a tight area).

4.2 Connections overview

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

Connector	Qty	Connects to:	Suitable cables
	2	<ol style="list-style-type: none"> 1. SeaTalkng® backbone 2. NMEA 2000 backbone 3. SeaTalk backbone 4. SeaTalkng® device 	<ol style="list-style-type: none"> 1. SeaTalkng® spur cables 2. SeaTalkng® to DeviceNet adaptor cable (A06045) 3. SeaTalk to SeaTalkng® adaptor cable (A06073)

Connecting SeaTalkng® cables



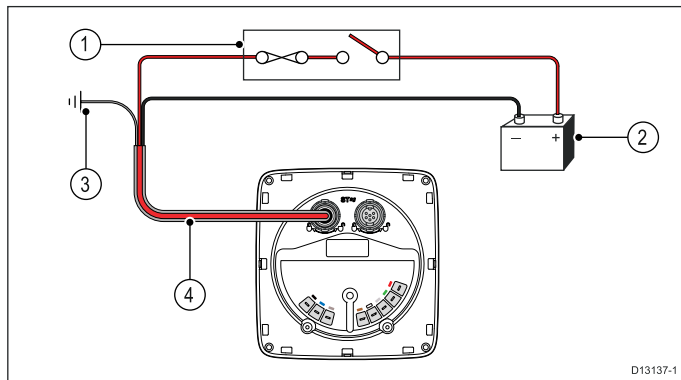
1. Rotate the locking collar on the unit to the unlocked position.
2. Ensure the cable's connector is correctly oriented.
3. Fully insert the cable connector.
4. Rotate locking collar clockwise (2 clicks) until it is in the locked position.

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 Direct Power Connection



1	3 A circuit breaker or fuse
2	12 V dc vessel power supply
3	Vessel's RF ground
4	SeaTalk ^{ng} power cable (A06049, available separately)

4.4 SeaTalkng® power supply

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

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

- 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, ACU-150 or SPX-5 products cannot be used to power the SeaTalkng® backbone.

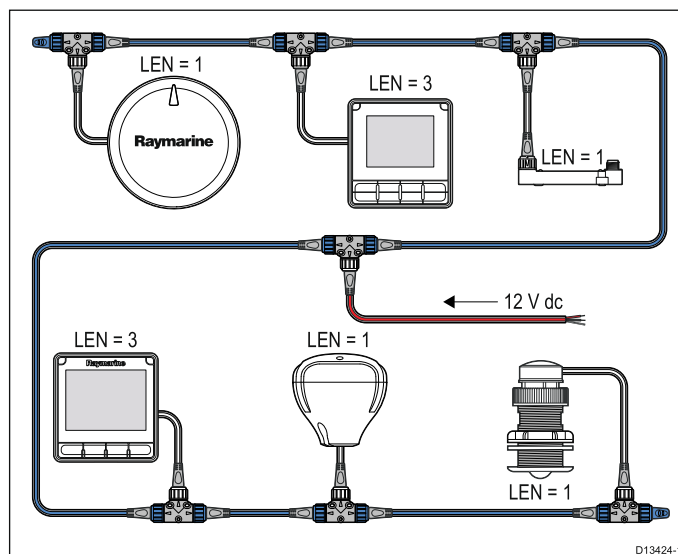
SeaTalkng® power connection point

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:

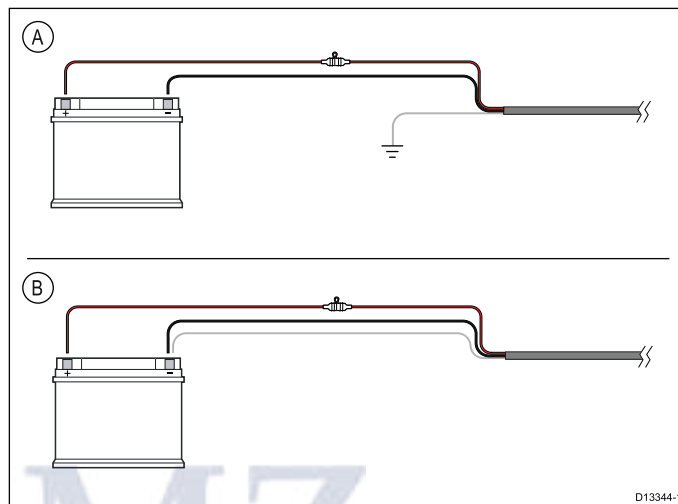
When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system.

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.

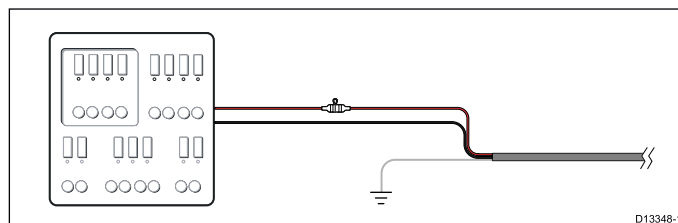
Implementation — direct connection to battery

- 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 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.

- 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.



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.

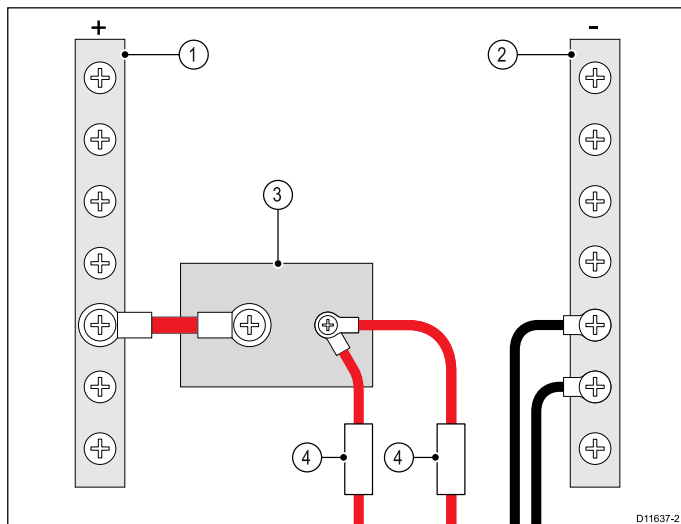
More information

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.



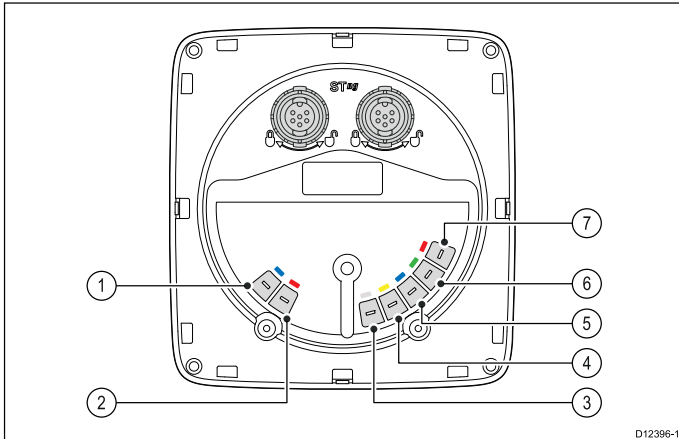
1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Fuse

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.

4.5 Transducer connections

Transducer connections only apply to the i60 Wind instrument, the i60 Close hauled wind does not include transducer connections as it is a repeater display.

i60 transducer connections

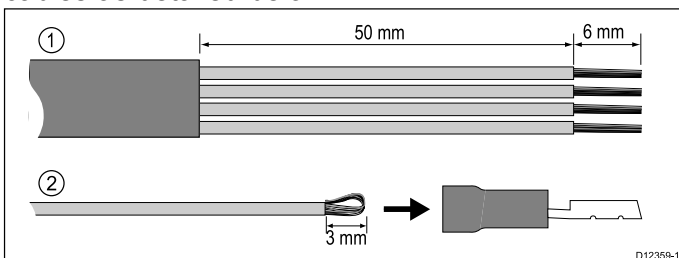


1	Blue	Rotor + (Rotavecta)
2	Red	Rotor - (Rotavecta)
3	Grey	Wind 0 V (Shield)
4	Yellow	Anemometer (signal)
5	Blue	Cosine wind direction
6	Green	Sine wind direction
7	Red	Wind V+

Note: Connectors 1 and 2 are rotavecta connections, connectors 3 to 7 are for wind transducers.

Making transducer connections

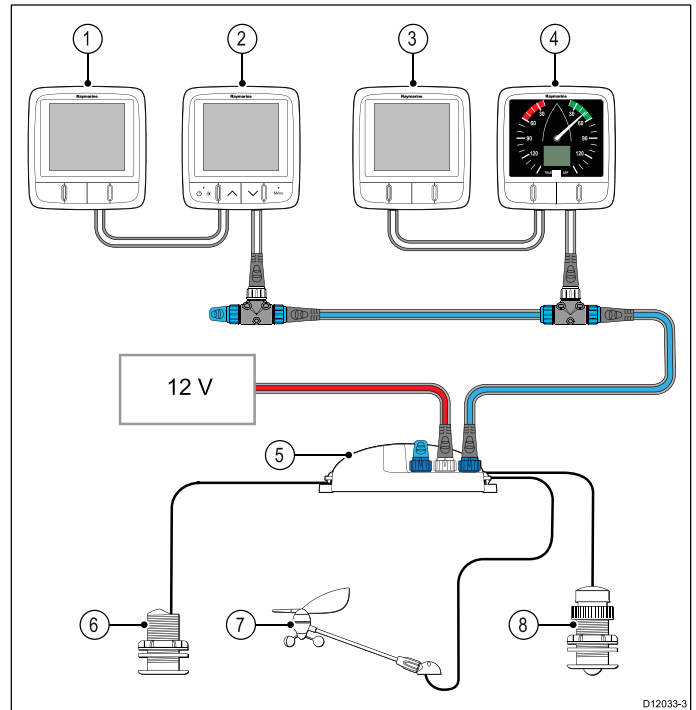
Although the transducer cable is fitted with spade connectors for direct connection to the rear of the unit, it may be necessary to remove these to facilitate installation, e.g. if the cable has to be routed through narrow apertures. 1/8th spade terminals will be required (not supplied), to replace those removed. When fitting the new spade connectors, prepare the cables as detailed below:



1. Prepare the cable as shown in 1 above.
2. Fold back the wire strands and insert into the new spade connector as shown in 2 above.
3. Ensure the wire strands do not extend beyond the rear of the spade connector insulation.
4. Crimp the connector to the wire.

4.6 iTC-5 connection

Transducers can be connected to a SeaTalk^{ng} network using Raymarine's Instrument transducer converter (iTC-5) and an i70 instrument, the data can then be repeated on an i50 / i60 unit.



1	i50 Depth (Repeater)
2	i70 Instrument (Master)
3	i50 Speed (Repeater)
4	i60 Wind (Repeater)
5	iTC-5
6	Depth transducer
7	Wind vane transducer
8	Speed transducer

Note: Transducers connected to the iTC-5 must be calibrated using an i70 (master) unit. Transducers connected to the iTC-5 cannot be calibrated using an i50 / i60.

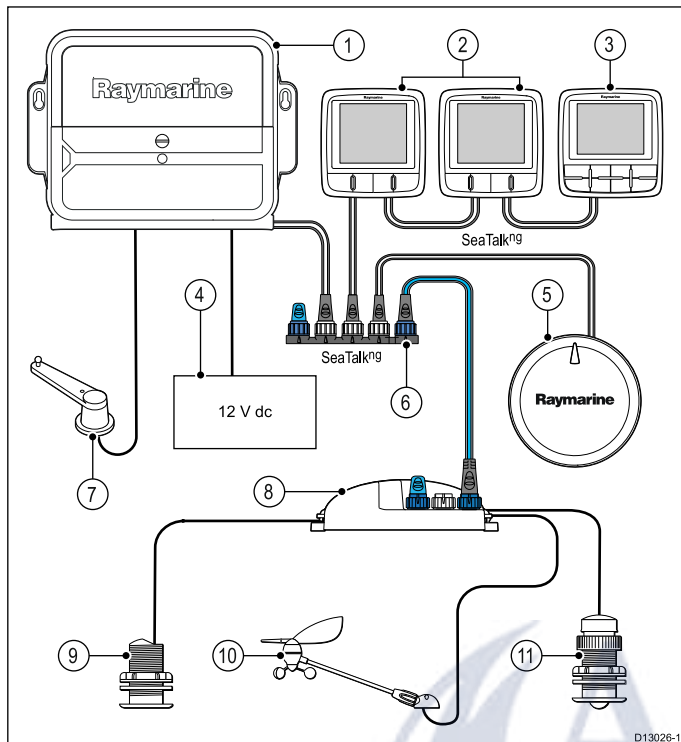
Making iTC-5 transducer connections

For instructions on connecting transducers to your iTC-5 refer to the iTC-5 handbook.

4.7 SeaTalk^{ng} connection

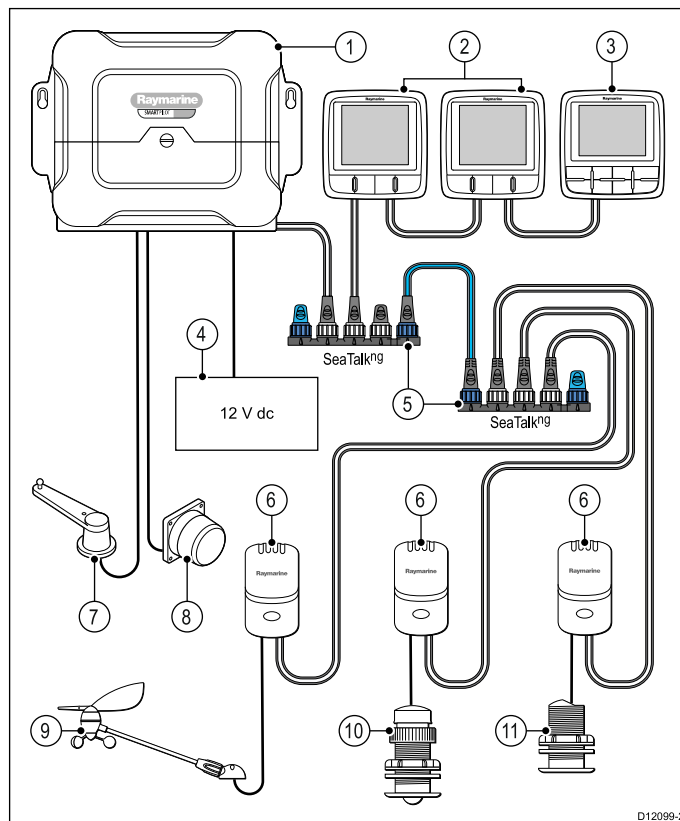
Note: In the example below, if an **ACU-100** was used, the SeaTalk^{ng} network would require a dedicated 12 V dc power supply because the **ACU-100** does not supply power to the SeaTalk^{ng} network.

Example: SeaTalk^{ng} Evolution system with iTC-5



1	ACU unit
2	2 x Instruments
3	Pilot controller
4	Vessel's 12 V dc power supply
5	EV unit
6	SeaTalk ^{ng} 5-way connector
7	Rudder reference transducer
8	iTC-5 converter
9	Depth transducer
10	Wind transducer
11	Speed transducer

Example: SeaTalk^{ng} SPX system with transducer pods

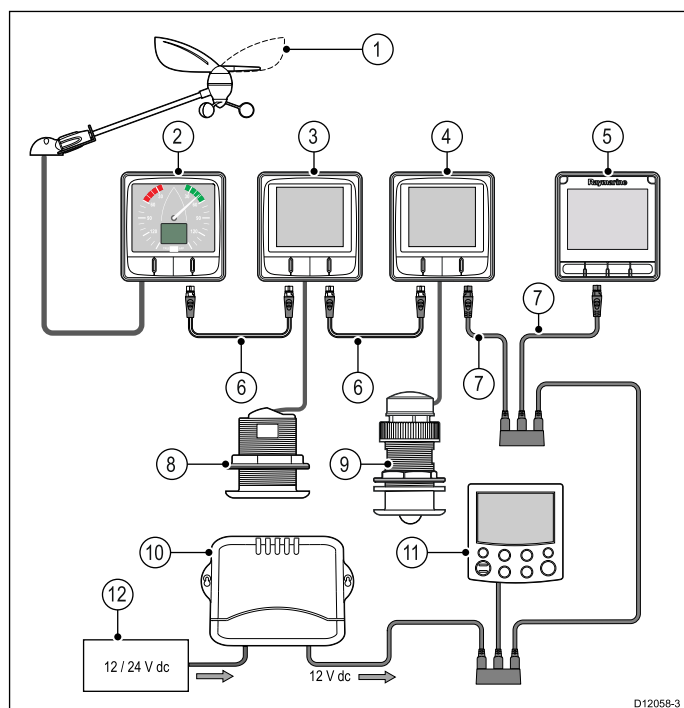


Item	Description
1	SPX (supplying 12V to SeaTalk ^{ng} network.)
2	2 x Instruments
3	p70 / p70R Pilot controller
4	Vessel's 12 V dc power supply
5	SeaTalk ^{ng} 5-way connectors with terminators
6	Transducer pods
7	Rudder reference transducer
8	Fluxgate compass
9	Wind transducer
10	Speed transducer
11	Depth transducer

4.8 SeaTalk connection

Connections to an existing **SeaTalk** system must be made using a **SeaTalk** to **SeaTalk^{ng}** adaptor cable.

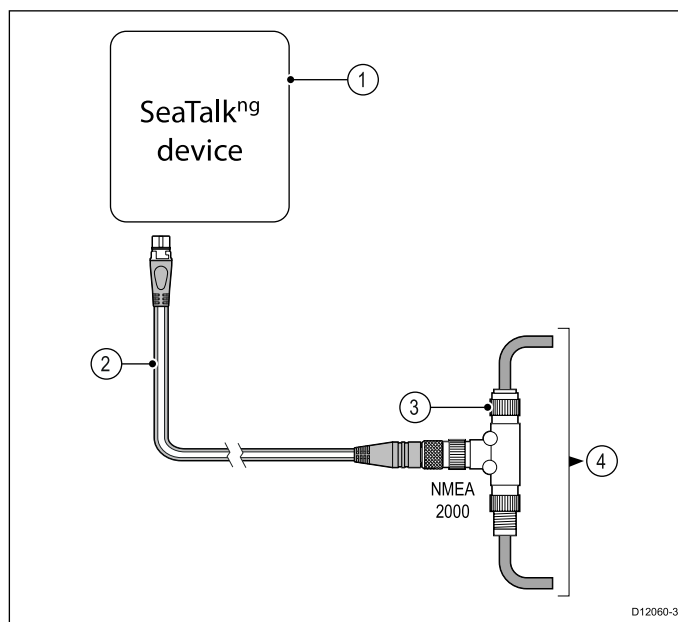
Basic SeaTalk system example



1	Wind vane transducer
2	i60 Wind (SeaTalk^{ng} Wind instrument)
3	i50 Depth (SeaTalk^{ng} Depth instrument)
4	i50 Speed (SeaTalk^{ng} Speed instrument)
5	i70s (SeaTalk^{ng} Multifunctional instrument display)
6	SeaTalk^{ng} spur cables
7	SeaTalk to SeaTalk^{ng} adaptor cables
8	Speed transducer
9	Depth transducer
10	SeaTalk Course computer (providing 12 V dc power to SeaTalk network.)
11	ST6002 (SeaTalk pilot controller)
12	12 / 24 V dc power supply

4.9 NMEA 2000 network connection

Your **SeaTalk^{ng}** device can be connected to a **DeviceNet** / **NMEA 2000** network.



1. **SeaTalk^{ng}** device
2. **SeaTalk^{ng}** to **DeviceNet** adaptor cable (A06045)
3. **DeviceNet** T-piece
4. **NMEA 2000** backbone

SeaTalk power protection

The power supply must be protected by a 5 A fuse or a circuit breaker providing equivalent protection.

Raymarine recommends that the power is connected to a SeaTalk system in such a way that the current drawn on each side of the power connection point is equal.

Chapter 5: Mounting

Chapter contents

- 5.1 Mounting on page 30
- 5.2 Front bezel on page 31



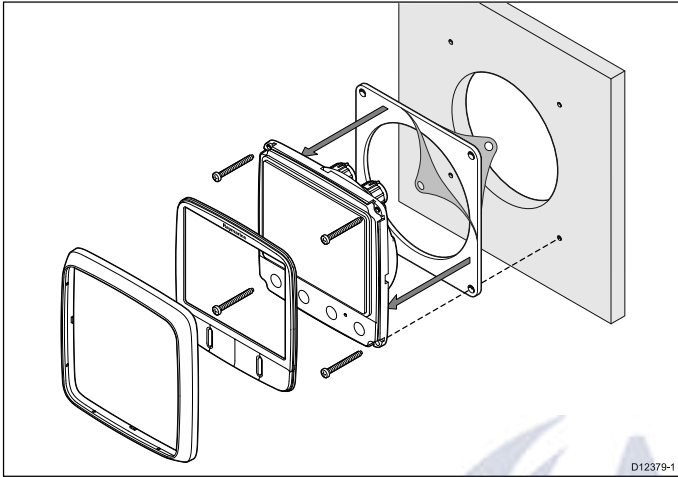
5.1 Mounting

Pre-mounting check

The product is designed to be surface mounted. Before mounting the unit, ensure you have:

- Selected a suitable location.
- Identified the cable connections and route that the cables will take.
- Detached the front bezel.
- Remove the keypad mat.

Mounting diagram



Mounting instructions

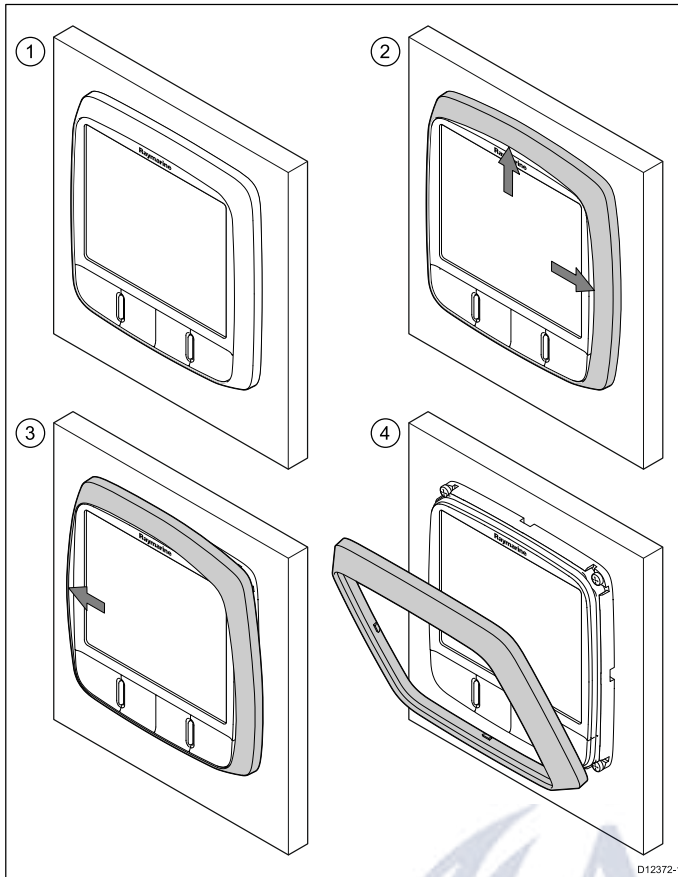
1. Check the selected location for the unit, a clear, flat area with suitable clearance behind the panel is required.
2. Fix the mounting template supplied with the product, to the selected location, using masking or self adhesive tape.
3. If possible use an appropriate size hole cutter and cut out the centre hole cut out area as indicated on the mounting template, or
4. Using a suitable drill bit, make pilot holes in each corner of the cut out area and using a jigsaw cut along the inside edge of the cut out line.
5. Ensure that the unit fits into the removed area and then file around the cut edge until smooth.
6. Drill any required holes as indicated on the mounting template for the mounting fixings.
7. Peel the backing off of the supplied gasket and place the adhesive side of the gasket onto the display unit and press firmly onto the flange.
8. Connect the relevant cables to the unit.
9. Slide the unit into place and secure using the fixings provided.
10. Fit keypad mat and front bezel.

Note: The supplied gasket provides a seal between the unit and a suitably flat and stiff mounting surface or binnacle. The gasket should be used in all installations. It may also be necessary to use a marine-grade sealant if the mounting surface or binnacle is not entirely flat and stiff or has a rough surface finish.

Note: Drill, tap size and tightening torques are dependant upon the material type and thickness of the mounting surface.

5.2 Front bezel

Removing the front bezel



Note: Use care when removing the bezel. Do not use any tools to lever the bezel, doing so may cause damage.

1. Using your fingers pull the bezel away from the unit at the top and side, as shown in 2.
The bezel will start to come away from the unit at the top and side.
2. Now pull the bezel away from the unit on the opposite side, as shown in 3.
The bezel will now come free from the unit, as shown in 4.



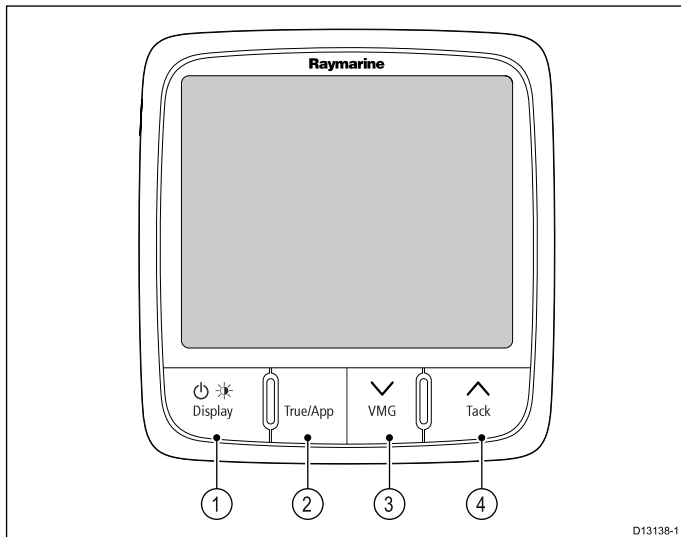
Chapter 6: Getting started

Chapter contents

- [6.1 Controls on page 34](#)
- [6.2 Power on page 34](#)
- [6.3 Data master on page 35](#)



6.1 Controls



1	Display / Power — Select to access Depth information on the digital display, adjust backlight, adjust contrast and power the display On and Off
2	True / App — Switch between true and apparent wind direction
3	VMG / Down — Display Velocity made good. Use to move down through menu options or to decrease numeric values
4	Tack / Up — Tack heading. Use to move up through menu options or to increase numeric values

6.2 Power

Powering on the unit

The unit will automatically turn on with the system, unless it has previously been powered off using the **Power** button.

With the unit powered off:

1. Press and hold the **Power** button until the screen turns on (approximately 2 seconds).

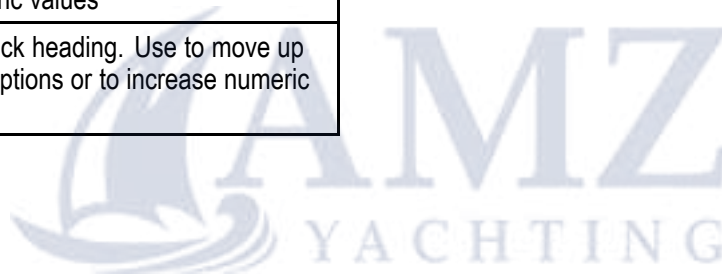
Powering off the unit

1. Press and hold the **Power** button until the count down timer reaches zero and the screen turns off.

Note: When powered off, the unit may still draw a small amount of power from the battery, if this is a concern unplug the power supply or switch off at the breaker.

Calibration alert

If the **CAL** legend on the digital display flashes for the first 30 seconds after power up, refer to the *Calibration* section to calibrate your unit.



6.3 Data master

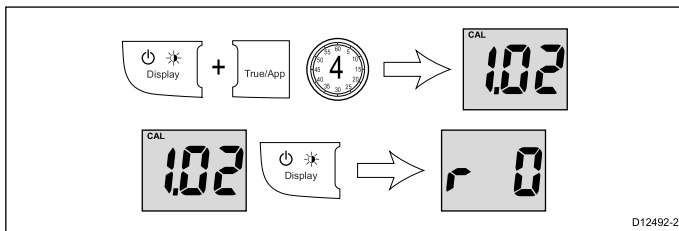
Where a system contains more than one unit capable of displaying a data type, the unit physically connected to the transducer must be set as the data master and any other units set as a repeater.

Checking the software version and instrument status

You can check the instrument display's software version and status by following the steps below.

Note: The i60 CH Wind instrument is a repeater display. You cannot check or change the instrument status of an i60 CH Wind display

From the software version page:



During normal operation:

1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 4 seconds, until the Software Version page is displayed.
2. Press the **Display** button to show the Instrument Status page.
The instrument status is displayed (r 0 = master and r 1 = repeater).

Note: The Software Version and Instrument Status pages are temporary pages and will time-out automatically after 8 seconds of inactivity.



Chapter 7: Calibration

Chapter contents

- [7.1 Calibration on page 38](#)
- [7.2 User calibration on page 38](#)
- [7.3 Intermediate calibration on page 39](#)
- [7.4 Dealer calibration on page 40](#)



7.1 Calibration

Before first use the unit must be calibrated to ensure optimum performance.

The calibration settings are grouped into 3 categories: **User Calibration**, **Intermediate Calibration** and **Dealer Calibration**.

Access to the User Calibration menu can be locked from the Dealer Calibration menu.

7.2 User calibration

The i60 CH instrument display is a repeater display and as such does not require calibration, the steps below apply to the calibration of the i60 Wind instrument only.

User calibration options include:

- Wind angle offset — Assigns an offset to the wind angle readings.
- Units for Wind speed readings — Assigns the unit of measure used for wind speed related readings

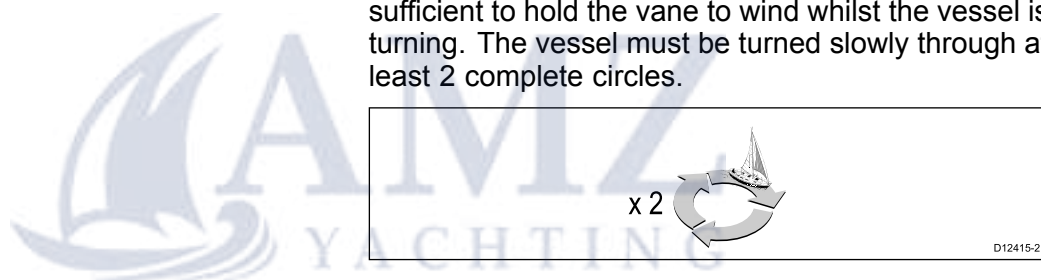
Automatic Linearization

The wind transducer can linearize itself automatically under certain conditions.

For Automatic Linearization to be performed **CAL** must be flashing on the digital display. **CAL** is displayed for approximately 30 seconds after power on under the following conditions:

- At first power on, after installation
- At power on, after a factory reset.

To perform the automatic linearization the vessel will need to be underway, with sufficient space to turn in large circles unhindered. The wind speed must be sufficient to hold the vane to wind whilst the vessel is turning. The vessel must be turned slowly through at least 2 complete circles.

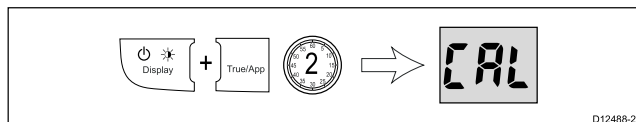


This procedure automatically linearizes the wind vane. A successful linearization is indicated by the digital display flashing and a buzzer sounding three beeps

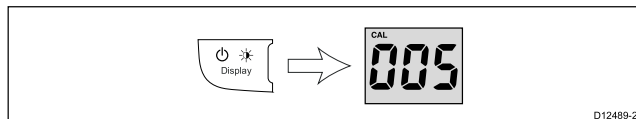
Aligning the wind transducer

During normal operation:

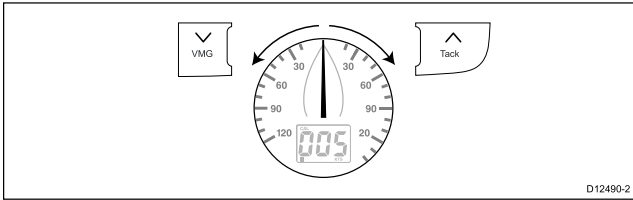
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds, until the User Calibration page is displayed.



2. Press the **Display** button until the **Wind Angle Offset** page is displayed (1 press from the **User Calibration** page).



- Sail your vessel directly into the wind and adjust the analog pointer to zero, using the **VMG** and **Tack** buttons.



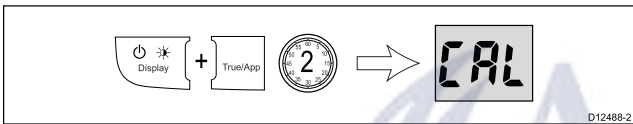
The VMG button will decrease the current value and the Tack button will increase the current value. As you do this, the wind angle offset shows the amount of correction you have applied.

- To exit the User Calibration Menu at any time press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds.

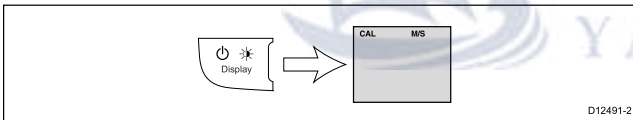
Selecting the unit of measure for wind speed readings

During normal operation:

- Press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds, until the User Calibration page is displayed.



- Press the **Display** button until the **Wind Speed Units** page is displayed (2 presses from the **User Calibration** page).



- Use the **VMG** or **Tack** buttons to select the required unit of measure for wind speed readings. The available units of measure for wind speed are:

- KTS (default) — Knots
- M/S — Meters per second

- To exit the **User Calibration** pages at any time press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds.

7.3 Intermediate calibration

Intermediate calibration allows you to:

- Check instrument software version
- * Check the instrument status (either master or repeater)

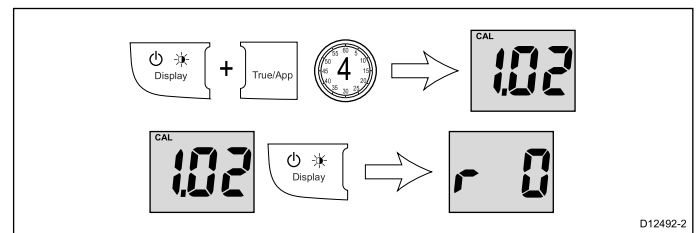
Note: * Not available on i60 CH Wind.

Checking the software version and instrument status

You can check the instrument display's software version and status by following the steps below.

Note: The i60 CH Wind instrument is a repeater display. You cannot check or change the instrument status of an i60 CH Wind display

From the software version page:



During normal operation:

- Press and hold the **Display** and **True / App** buttons at the same time for approximately 4 seconds, until the Software Version page is displayed.
- Press the **Display** button to show the Instrument Status page.

The instrument status is displayed (r 0 = master and r 1 = repeater).

Note: The Software Version and Instrument Status pages are temporary pages and will time-out automatically after 8 seconds of inactivity.

7.4 Dealer calibration

The dealer calibration procedures include:

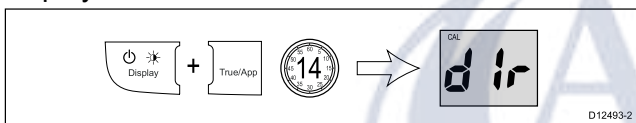
- User calibration menu access On (default) and Off.
- Display Response for wind angle readings — Dictates the rate at which the instrument display responds to changes in wind angle data.
- Display Response for wind speed readings — Dictates the rate at which the instrument display responds to changes in wind speed data.
- Display Response for VMG readings — Dictates the rate at which the instrument display responds to changes in VMG data.
- * Boat show mode On and Off (default) (Boat show mode is only available on displays set as repeaters).
- Reset to factory defaults.

Note: Not available on the i60 CH wind instrument.

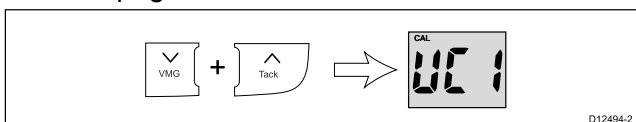
Setting access to the User Calibration Menu - i60

During normal operation:

1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



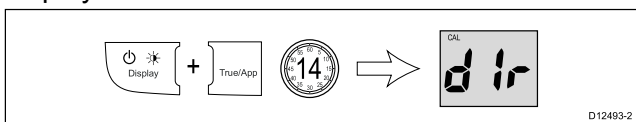
3. Use the **VMG** or **Tack** buttons to switch access to the **User Calibration Menu On and Off**.
 - UC1 (default) — User Calibration menu enabled
 - UC0 — User Calibration menu disabled

Note: To exit the Dealer Calibration pages at any time, press and hold the **Display** and **True/App** buttons at the same time for approximately 2 seconds.

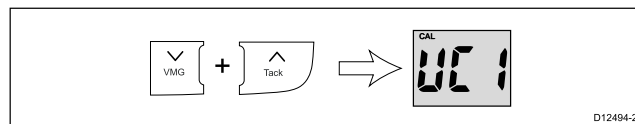
Setting the response delay for Wind Angle readings

During normal operation:

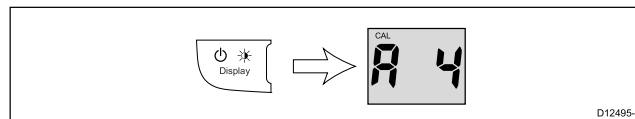
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **Wind Angle Response** page is displayed (1 press from the **User Calibration Access Menu** page).



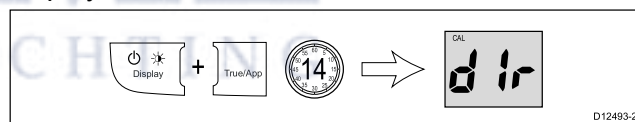
4. Use the **VMG** and **Tack** buttons to set the required level for Wind Angle Response. The default level is 12. The levels available are 1 to 15 with level 1 being the slowest update rate and level 15 the quickest.

Note: To exit the Dealer Calibration pages at any time, press and hold the **Display** and **True/App** buttons at the same time for approximately 2 seconds.

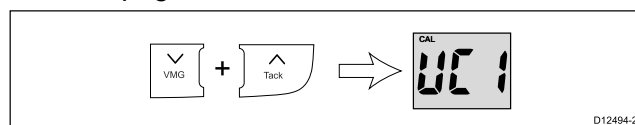
Setting the response delay for Wind Speed readings

During normal operation:

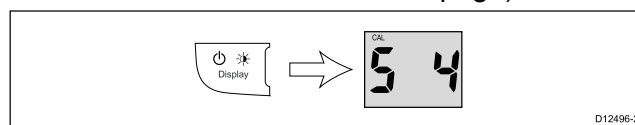
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **Wind Speed Response** page is displayed (2 presses from the **User Calibration Access Menu** page).



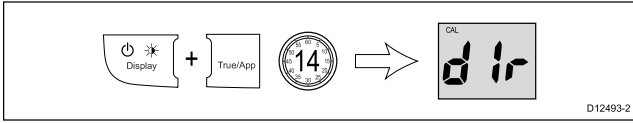
4. Use the **VMG** and **Tack** buttons to set the required level for Wind Speed Response. The default level is 12. The levels available are 1 to 15 with level 1 being the slowest update rate and level 15 the quickest.

Note: To exit the Dealer Calibration pages at any time, press and hold the **Display** and **True/App** buttons at the same time for approximately 2 seconds.

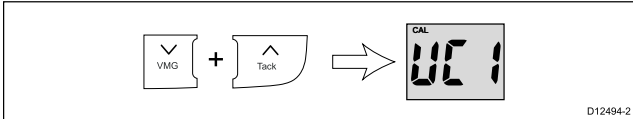
Setting the response delay for VMG readings

During normal operation:

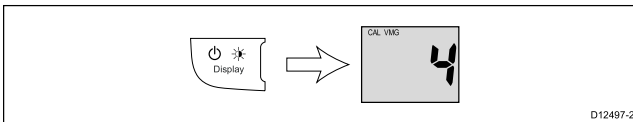
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **VMG Response** page is displayed (3 presses from **User Calibration Menu Access** page).



4. Use the **VMG** or **Tack** buttons to set the required level for VMG response.

The default level is 12. The levels available are 1 to 15 with level 1 being the slowest update rate and level 15 the quickest.

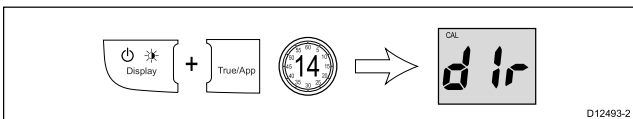
Note: To exit the Dealer Calibration pages at any time, press and hold the **Display** and **True/App** buttons at the same time for approximately 2 seconds.

Setting the wind speed Calibration Factor

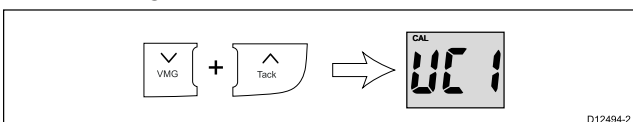
If you find that your wind speed readings deviate from a referenced wind speed source then a Calibration Factor can be applied to reduce the deviation.

During normal operation:

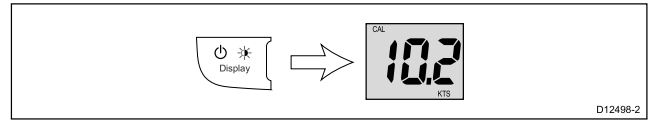
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **Current Wind Speed** page is displayed (4 presses from the **User Calibration Menu Access** page).



4. Use the **VMG** and **Tack** buttons to adjust the Calibration Factor to the desired value.

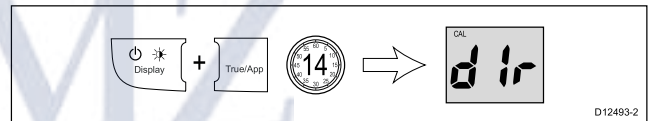
*When the **VMG** and **TACK** buttons are not being pressed the screen will revert back to **Current Wind Speed** page to enable you to see what change the Calibration Factor has on the display's Wind Speed reading.*

Note: To exit the dealer calibration pages at any time press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds.

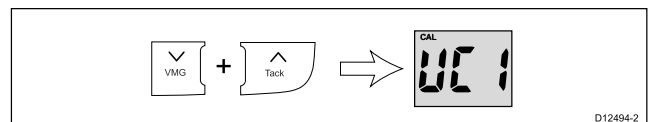
Enabling and disabling Boat Show Mode - i60

During normal operation:

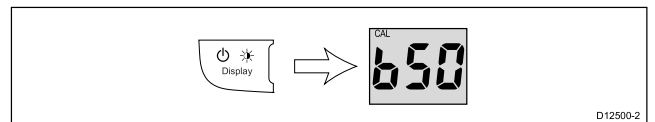
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **Boat Show Mode** page is displayed (5 presses from the **User Calibration Menu Access** page).



4. Use the **VMG** or **Tack** buttons to switch the Boat Show Mode On and Off (default).

Selecting On will put the display into boat show mode.

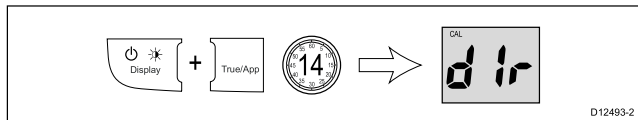
Note: Boat show mode is only suitable for demonstration purposes and should NOT be used whilst your vessel is in use.

Note: To exit the dealer calibration pages at any time press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds.

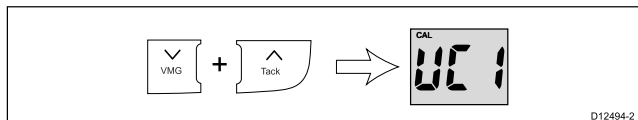
Resetting the display to factory defaults - i60

During normal operation:

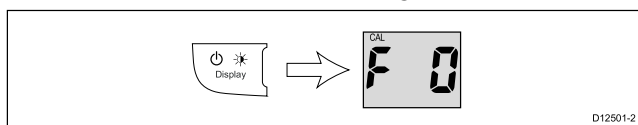
1. Press and hold the **Display** and **True / App** buttons at the same time for approximately 14 seconds, until the **Dealer Calibration** page is displayed.



2. Press the **VMG** and **Tack** buttons at the same time to display the **User Calibration Menu Access** page.



3. Press the **Display** button until the **Factory Reset** page is displayed (5 presses from the **User Calibration Menu Access** page).



4. To reset the display to factory default settings:
 - i. Use the **VMG** or **Tack** buttons to change the reset option to F 1 (default).
 - ii. Press the **Display** button to reset your display to factory default settings.

Note: To exit the dealer calibration pages at any time press and hold the **Display** and **True / App** buttons at the same time for approximately 2 seconds.

Chapter 8: Using your display

Chapter contents

- 8.1 Pages on page 44
- 8.2 i60 Wind operation on page 44
- 8.3 Illumination on page 46



8.1 Pages

The pages available depend on the display variant and are shown in the table below:

i60 Wind	i60 Close hauled wind
Wind speed	Wind speed
*Beaufort wind speed	*Maximum wind speed
*Maximum wind speed	VMG
*Maximum true wind speed alarm	Tack
*Low true wind speed alarm	
*High apparent wind angle alarm	
*Low apparent wind angle alarm	
VMG	
Tack	

Note: *These pages are temporary pages and will time-out to the previous permanent page after 8 seconds of inactivity.

Changing pages

During normal operation:

1. Press either the **Display** button to cycle through the wind pages.
2. Press the **VMG** button to display VMG information.
3. Press the **Tack** button to display tack information.

8.2 i60 Wind operation

When connected to a relevant rotavecta or wind vane transducer the i60 provides:

- True and apparent wind direction and speed. Wind speed is displayed either in knots, meters per second or as Beaufort scale values.
- Velocity made good (VMG) information, when vessel speed information is available on the network.
- Tack angle, when heading information is available on the network.
- Maximum wind speed.
- High and low true wind speed alarms.
- High and low apparent wind angle alarms.

Note: Alarms are only available on the i60 Wind instrument, when set as a master unit. No alarms are available on the i60 Close hauled wind instrument.

i60 display information

The i60 instrument's display consists of an analogue pointer and digital display.

Analogue display

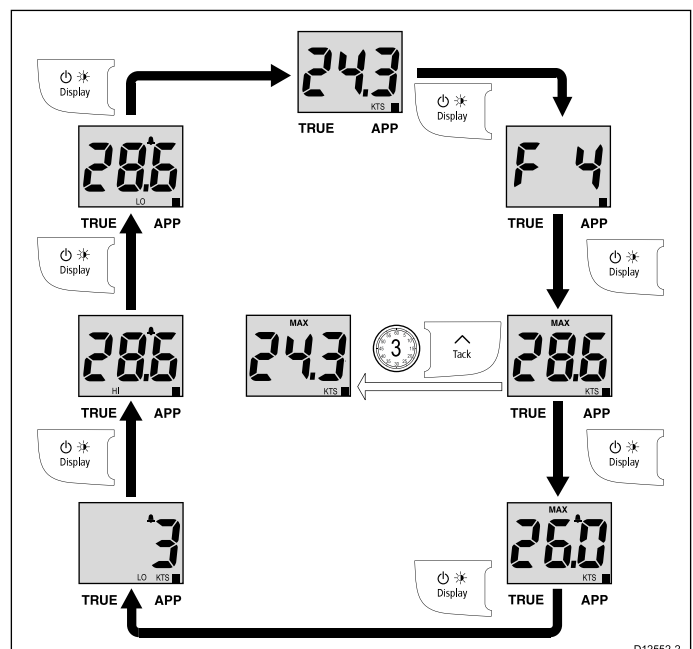
The analogue display pointer shows either true or apparent wind direction (Depending on setting).

Digital display

The digital display LCD shows the following wind information.

- Beaufort wind speed
- True / apparent wind speed
- Velocity made good (VMG)
- Tack heading
- Maximum wind speed
- Wind alarm data

Using the display button

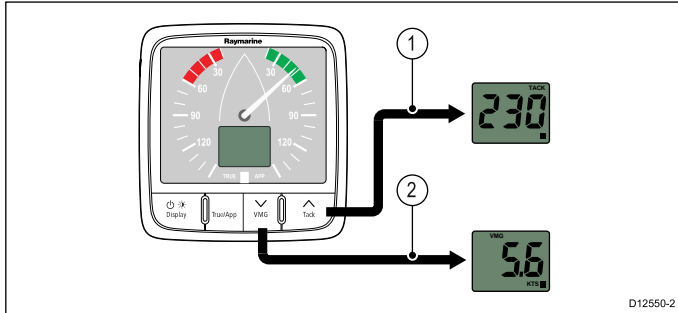


During normal operation:

1. Use the **Display** button to cycle through the available pages.
2. Press and hold the **Tack** button for 3 seconds to reset the maximum wind speed to the current wind speed values.

Note: All pages except for the **Current wind speed** page are temporary and will time-out after 8 seconds.

Using Tack and VMG buttons



During normal operation:

1. Press the **VMG** button to show the **VMG** page on the digital display.

Note: **VMG** information is only available when vessel speed information is available.

2. Press the **Tack** button to show the **Tack** page on the digital display.

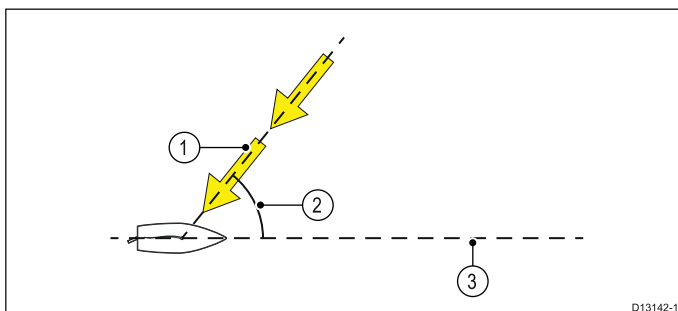
Note: **Tack** information is only available when vessel heading and speed information is available.

True and Apparent wind

Wind angle, direction and speed are reported as either 'True' or 'Apparent' wind measurements.

- **True wind** — True wind measurements assume the vessel is motionless in the water. True wind readings are calculated using Apparent Wind and STW values.
- **Apparent wind** — Apparent wind is the wind felt on deck when the vessel is in motion which is affected by vessel angle and speed.

With the vessel tied along side, True and Apparent wind readings should be identical.



1. Wind direction (specified using compass points)**True Wind Direction (TWD)** — The compass direction that wind would appear to be blowing across the vessel if it was not making

any way.**Apparent Wind Direction (AWD)** — The compass direction that wind would appear to be blowing across the vessel when it is making way.

2. Wind angle (specified in degrees)**True Wind Angle (TWA)** — The angle between the TWD and the center line of the vessel.**Apparent Wind Angle (AWA)** — The angle between the AWD and the center line of the vessel.
3. Wind speed (specified in the chosen speed units)**True Wind Speed (TWS)** — The speed that the wind would appear to be blowing across the vessel if it was not making any way.**Apparent Wind Speed (AWS)** — The speed that the wind would appear to be blowing across the vessel when it is making way.

Note: True Wind readings require Speed Through Water (STW) data to be available.

Switching between true and apparent wind information

You can switch the unit between displaying True or Apparent wind information.



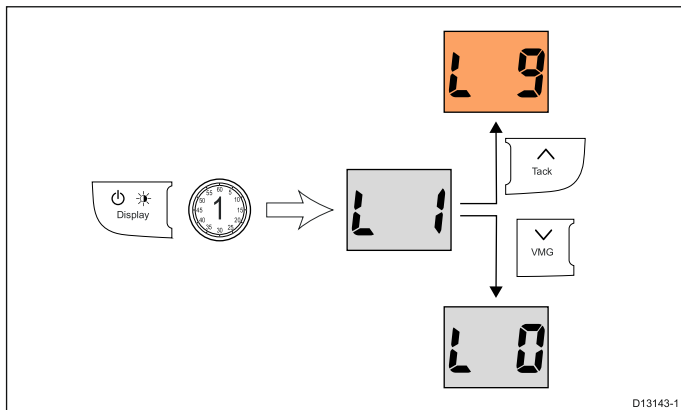
During normal operation:

1. Press the **True / App** button to switch between true or apparent wind information.
 - In **True** mode the indicator shown in 1 above will be displayed.
 - In **Apparent** mode the indicator shown in 2 above will be displayed.

8.3 Illumination

Adjusting the backlight level

The backlighting can be adjusted using the power button.



During normal operation:

1. Press and hold the **Display** button for approximately 1 second until the backlight page is displayed.
L and the current illumination level is displayed.
2. Use the **VMG** button to decrease the illumination level.
3. Use the **Tack** button to increase the illumination level.

The illumination level can be adjusted from 0 (default) (Off) to 9 (Max)

Note: The backlight page will time-out after 8 seconds of inactivity.

Adjusting the contrast — i60

The contrast level can be accessed using the Speed button.

During normal operation:

1. Press and hold the **Display** button for approximately 4 seconds to display the Contrast page.

C is displayed on-screen and the current contrast level.

2. Use the **Display** button to cycle through the available contrast levels.

The contrast level can be adjusted from level 0 (default) to 3.

Note: The contrast page will time-out after 8 seconds of inactivity.

Group illumination

Group illumination is used to synchronizes and control the backlighting level of multiple units assigned to the same group.

The unit can participate in shared illumination via a SeaTalk network or group illumination via a SeaTalk^{ng} network.

When connected on a SeaTalk network all compatible units will share their backlight level (when 1 unit's backlighting level is adjusted all other units backlight level will also change).

When connected on a SeaTalk^{ng} network the unit can participate in group illumination and be assigned to a group of units which will share their backlighting levels. Available groups are as follows:

- OFF (default) — Group illumination is switched off
- HL1 — Helm 1
- HL2 — Helm 2
- CPt — Cockpit
- FLY — Flybridge
- NST — Mast
- GP1 to GP5 — User defined groups

When assigned to a group, when the backlighting of 1 unit is adjusted the backlighting level of all units assigned to the same group will also change.

Assigning the unit to a group

To assign the unit as part of a group so that it can participate in group illumination follow the steps below.

During normal operation:

1. Press and hold the **Display** and **True / App** buttons a the same time for approximately 6 seconds, until the Group Illumination page is displayed.

GrP is displayed on-screen

Note: The Group Illumination page is a temporary page and will time-out to the previous page after 8 seconds.

2. Press the **Display** button to display the current group illumination setting.
3. Press the **VMG** and **Tack** buttons at the same time to change the current setting.
The current group setting will flash.
4. Use the **Tack** button to cycle upwards through the list of available groups.
5. Use the **VMG** button to cycle back down through the list.
6. Press the **VMG** and **Tack** buttons at the same time to assign the display to the selected group.
The group setting will stop flashing.
7. Press and hold the **Display** and **True / App** buttons a the same time for approximately 2 seconds to return to normal operation.

Chapter 9: Alarms

Chapter contents

- [9.1 Alarms on page 48](#)



9.1 Alarms

Alarms alert you to a situation or hazard requiring your attention.

You can set up alarms to alert you to certain conditions.

Alarms are raised by system functions, and also external equipment connected to your display.

When an alarm event occurs an audible and visual alarm is activated which indicates the alarm state.

Alarm thresholds can be configured from the relevant alarm page / menu.

Instrument alarms

Alarms available on the i60 Wind are listed below.

- High true wind speed
- Low true wind speed
- High apparent wind angle
- Low apparent wind angle

Note: Alarms are not available on the i60 Close Hauled wind.

Alarm indications

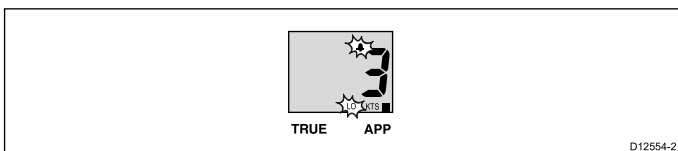
An alarm event is indicated by both audible and visual warnings.

High true wind speed alarm



The **High true wind speed alarm** sounds when the true wind speed is equal to or more than the **High true wind speed threshold**. The alarm sounds until silenced manually.

Low true wind speed alarm



The **Low true wind speed alarm** sounds when the true wind speed is equal to or less than the **Low true wind speed threshold**. The alarm sounds until silenced manually.

High apparent wind angle alarm



The **High apparent wind angle alarm** sounds when the apparent wind angle equal to or more than the **High apparent wind angle threshold**. The alarm sounds until silenced manually.

Low apparent wind angle alarm



The **Low apparent wind angle alarm** sounds when the apparent wind angle is equal to or less than the **Low apparent wind angle threshold**. The alarm sounds until silenced manually.

Silencing alarms

1. Press any button to silence an active alarm.

Enabling / Disabling alarms

Alarms can be enabled or disabled at any time.

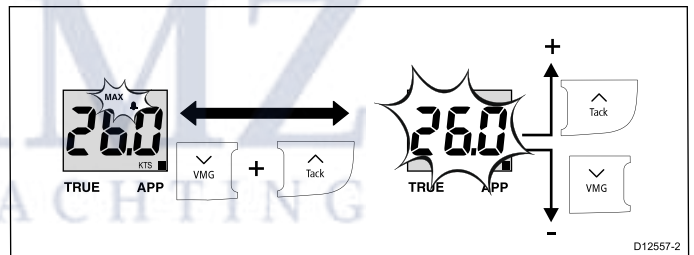
With the relevant alarm page displayed:

1. Press and hold the **Tack** button for 1 second to switch the alarm on or off.

When the alarm is on the alarm threshold is displayed.

Setting alarm thresholds

You can adjust the threshold at which alarms are triggered by following the steps below.



With the relevant alarm page displayed:

1. Press the **VMG** and **Tack** buttons at the same time to enter adjust mode.
The current threshold will start to flash.
2. Use the **Tack** button to increase the alarm threshold.
3. Use the **VMG** button to decrease the alarm threshold.
4. Press the **VMG** and **Tack** buttons at the same time to save the new alarm threshold and exit adjust mode.

Note: The illustration above is an example depicting setting the Maximum true wind speed alarm threshold.

Chapter 10: Maintaining your display

Chapter contents

- 10.1 Service and maintenance on page 50
- 10.2 Condensation on page 50
- 10.3 Routine equipment checks on page 51
- 10.4 Product cleaning on page 51
- 10.5 Cleaning the display case on page 52
- 10.6 Cleaning the display screen on page 52



10.1 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.

10.2 Condensation

Certain atmospheric conditions may cause a small amount of condensation to form on the unit's window. This will not damage the unit and will clear after the unit has been switched on for a short period.



10.3 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.

10.4 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.



10.5 Cleaning the display case

The display unit is a sealed unit and does not require regular cleaning. If it is necessary to clean the unit, follow this basic procedure:

1. Switch off the power to the display.
2. Wipe the display with a clean, soft cloth (a microfibre cloth is ideal).
3. If necessary, use a mild detergent to remove grease marks.

Note: Do NOT use solvents or detergents on the screen itself.

Note: In certain conditions, condensation may appear inside the display screen. This will not harm the unit, and can be cleared by powering on the display for a short time.

10.6 Cleaning the display screen

A coating is applied to the display screen. This makes it water repellent, and prevents glare. To avoid damaging this coating, follow this procedure:

1. Switch off the power to the display.
2. Rinse the screen with fresh water to remove all dirt particles and salt deposits.
3. Allow the screen to dry naturally.
4. If any smears remain, very gently wipe the screen with a clean microfibre cleaning cloth (available from an opticians).



Chapter 11: Troubleshooting

Chapter contents

- 11.1 Troubleshooting on page 54
- 11.2 Instrument troubleshooting on page 55
- 11.3 Power up troubleshooting on page 56
- 11.4 Miscellaneous troubleshooting on page 57



11.1 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.



11.2 Instrument troubleshooting

Fault	Cause	Action
Blank display.	No power supply.	<ul style="list-style-type: none"> • Check fuse / circuit breaker. • Check power supply. • Check SeaTalk / SeaTalk^{ng} cabling and connector security.
SeaTalk / SeaTalk ^{ng} information not being transferred between instruments.	SeaTalk / SeaTalk ^{ng} cabling or connector fault.	<ul style="list-style-type: none"> • Check security of SeaTalk / SeaTalk^{ng} connections between units. • Check condition of SeaTalk / SeaTalk^{ng} cables. • Isolate faulty unit by disconnecting units one by one.
A group of SeaTalk / SeaTalk ^{ng} units not working.	SeaTalk / SeaTalk ^{ng} cabling or connector fault.	<ul style="list-style-type: none"> • Check the security of SeaTalk / SeaTalk^{ng} connectors between functioning and non-functioning units. • Check the condition of SeaTalk / SeaTalk^{ng} cable between functioning and non-functioning units.



11.3 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 condition of relevant fuses and breakers and connections, replace if necessary (Refer to the <i>Technical Specification</i> section of your product's installation instructions for fuse ratings.) 2. 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 unit and locked in position. 2. Check the power supply cable and connectors for signs of damage or corrosion, replace if necessary. 3. With the unit turned on, try flexing the power cable near to the display connector to see if this causes the unit to re-boot/loose power, replace if necessary. 4. Check the vessel's battery voltage, the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion, replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors/fuses etc, replace if necessary.
Incorrect power connection	The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient	With the product under load, using a multi-meter, check the power supply voltage as close to the unit as possible to establish actual voltage when the current is flowing. (Refer to the <i>Technical Specification</i> section of your product's installation instructions for power supply requirements.)

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	<ol style="list-style-type: none"> 1. In the unlikely event that the products software has become corrupted please try re-flashing the latest software from the Raymarine website. 2. On display products, as a last resort, you can try to perform a 'Power on Reset', however this will delete all settings/presets and user data (such as waypoints and tracks) and revert the unit back to factory defaults.

11.4 Miscellaneous troubleshooting

Miscellaneous problems and their possible causes and solutions are described here.

Problem	Possible causes	Possible solutions
Display behaves erratically: <ul style="list-style-type: none"> • Frequent unexpected resets. • System crashes or other erratic behavior. 	Intermittent problem with power to the display.	Check relevant fuses and breakers.
		Check that the power supply cable is sound and that all connections are tight and free from corrosion.
		Check that the power source is of the correct voltage and sufficient current.
	Software mismatch on system (upgrade required).	Go to www.raymarine.com and click on support for the latest software downloads.
Corrupt data / other unknown issue.	Perform a factory reset.	Important: This will result in the loss of any settings and data (such as waypoints) stored on the product. Save any important data to a memory card before resetting.





Chapter 12: Technical support

Chapter contents

- 12.1 Raymarine product support and servicing on page 60
- 12.2 Checking the software version on page 61



12.1 Raymarine product support and servicing

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

Product information

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

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

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

Servicing and warranty

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

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

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

Region	Tele- phone	E-mail
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)
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)

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	Tele- phone	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

12.2 Checking the software version

Follow the steps below to identify the software version of your unit.

During normal operation:

1. Press and hold the **Display (Power)** and **True / App** buttons simultaneously for 4 seconds.

The software version will be displayed on the screen.





Chapter 13: Technical specification

Chapter contents

- [13.1 Technical specification on page 64](#)



13.1 Technical specification

Nominal supply voltage	12 V dc
Operating voltage range	10 V dc to 16 V dc
Power consumption	<ul style="list-style-type: none">• < 1 W Typical (Display only)• 2.4 W Maximum (Transducer connected)
Current	<ul style="list-style-type: none">• 45 to 65 mA Typical (Display only)• 200 mA Maximum (Transducer connected)
LEN (Refer to SeaTalk ^{ng} reference manual for further information.)	4
Environmental	Operating temperature: -20°C to +55°C Storage temperature: -30°C to +70°C Relative humidity: 93% Water proofing: IPX6
Connections	<ul style="list-style-type: none">• 2 x SeaTalk^{ng} connections (compliant with SeaTalk)• Transducer connections
Conformance	Europe 2004/108/EC



Chapter 14: Spares and accessories

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- 14.1 Spares and Accessories on page 66
- 14.2 SeaTalk^{ng}® cables and accessories on page 66
- 14.3 SeaTalk^{ng} cable kits on page 68



14.1 Spares and Accessories

Spares

Description	Part number
i50 / i60 / i70 front bezel	R22168
i50 / i60 / i70 Sun cover	R22169
i60 Keypad	R70133

Accessories

Description	Part number
i50 / i60 / i70 Front bezel Black (eS style)	A80355
i50 / i60 / i70 Front bezel Gunmetal (eS style)	A80356
i50 / i60 / i70 Suncover (for eS style bezel)	A80357

14.2 SeaTalk^{ng}® cables and accessories

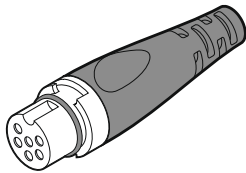

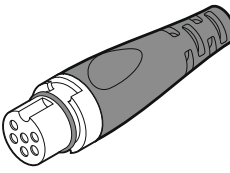
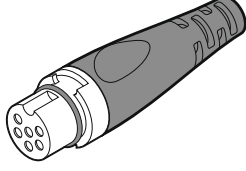
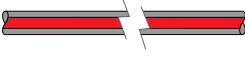
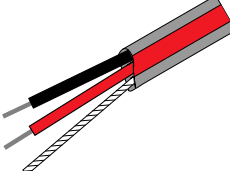
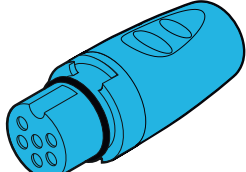
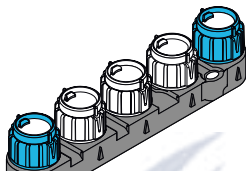
SeaTalk^{ng} cables and accessories for use with compatible products.

Part No	Description	Notes
T70134	SeaTalk ^{ng} starter kit	Includes: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	

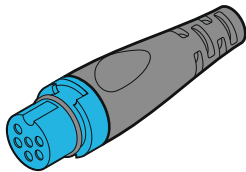

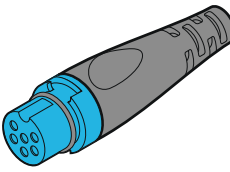
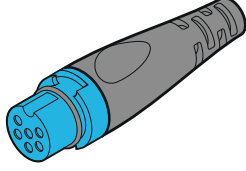

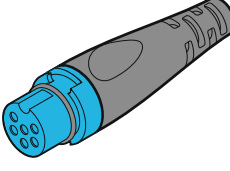
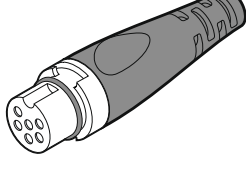

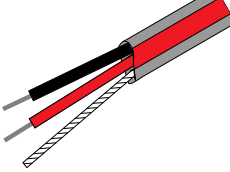
Part No	Description	Notes
A06043	SeaTalk ^{ng} to bare ends 1 m (3.3 ft) spur	
A06044	SeaTalk ^{ng} to bare ends 3 m (9.8 ft) spur	
A06049	SeaTalk ^{ng} Power cable	
A06031	SeaTalk ^{ng} Terminator	
A06028	SeaTalk ^{ng} T-piece	Provides 1 x spur connection
A06064	SeaTalk ^{ng} 5-way connector	Provides 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.
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.

14.3 SeaTalk^{ng} cable kits

SeaTalk^{ng} starter kit (T70134)

Parts included	Quantity	Connector A	Cable	Connector B	Length
Spur cable (A06040)	1				3 m (9.8 ft)
Power cable (A06049)	1				1 m (3.3 ft)
Backbone terminator (A06031)	2		N/A	N/A	N/A
5-way connector (A06064). Each connector block allows the connection of up to 3 compatible devices. When correctly terminated, a connector block forms a complete backbone. Multiple connector blocks can be daisy-chained together.	1		N/A	N/A	N/A

SeaTalk^{ng} Backbone kit (A25062)

Parts included	Quantity	Connector A	Cable	Connector B	Length
Backbone cable ((A06036))	2				5 m (16.4 ft)
Backbone cable ((A06037))	1				20 m (65.6 ft)
Power cable (A06049)	1				1 m (3.3 ft)

Parts included	Quantity	Connector A	Cable	Connector B	Length
T-piece (A06028)	4		N/A	N/A	N/A
Backbone terminator (A06031)	2		N/A	N/A	N/A

SeaTalk^{ng} Evolution cable kit (R70160)

Parts included	Quantity	Connector A	Cable	Connector B	Length
Backbone cable (A06036)	2				5 m (16.4 ft)
Power cable (A06049)	1				1 m (3.3 ft)
Spur cable (A06040)	1				1 m (3.3 ft)
ACU / SPX power cable (R12112) (for powering the SeaTalk ^{ng} backbone from the autopilot system.	1				0.3 m (1.0 ft)
5-way connector (A06064). Each connector block allows the connection of up to 3 compatible devices. When correctly terminated, a connector block forms a complete backbone. Multiple connector blocks can be daisy-chained together.	1		N/A	N/A	N/A

Parts included	Quantity	Connector A	Cable	Connector B	Length
T-piece (A06028)	2		N/A	N/A	N/A
Backbone terminator (A06031)	2		N/A	N/A	N/A

SeaTalk^{ng} converter kit (E22158)

Parts included	Quantity	Connector A	Cable	Connector B	Length
Power cable (A06049)	1				1 m (3.3 ft)
Backbone terminator (A06031)	2		N/A	N/A	N/A
Blanking plug (A06032)			N/A	N/A	N/A
SeaTalk (3 pin) adapter cable (A06047)	1				0.4 m (1.3 ft)
SeaTalk to SeaTalk ^{ng} converter (E22158). Enables the connection of SeaTalk devices to a SeaTalk ^{ng} system.	1		N/A	N/A	N/A

Appendix A NMEA 2000 sentences

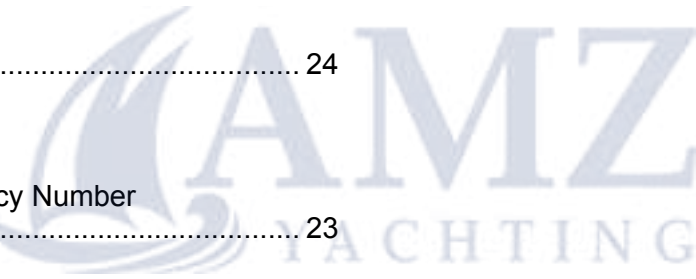
The i60 instrument range supports the following NMEA 2000 Parameter Group Number (PGN) sentences.

PG name	PGN	i60 Wind Transmit	i60 Wind Receive
ISO Acknowledgement	59392	•	
ISO Request	59904		•
ISO Address claim	60928	•	•
ISO Commanded address	65240		•
NMEA Request group function	126208		•
NMEA Command group function	126208		•
NMEA Acknowledge group function	126208	•	
PGN list — Transmit PGN's group function	126464	•	
PGN list — Received PGN's groupfunction	126464	•	
Product information	126996	•	•
Heading / Tack	127237		•
Vessel heading	127250		•
Magnetic variation	127258		•
Speed	128259		•
COG & SOG rapid update	129026		•
GNSS Position data	129029		•
Wind data	130306	•	•



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