CP370 / CP470

Installation instructions

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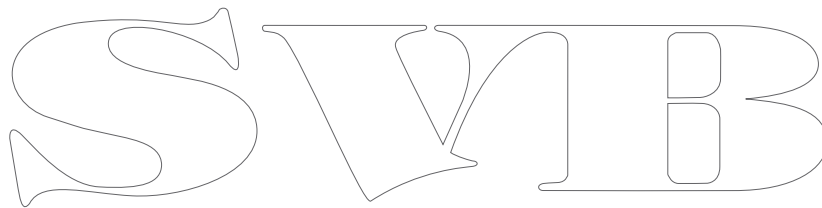
Software updates

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

Product handbooks

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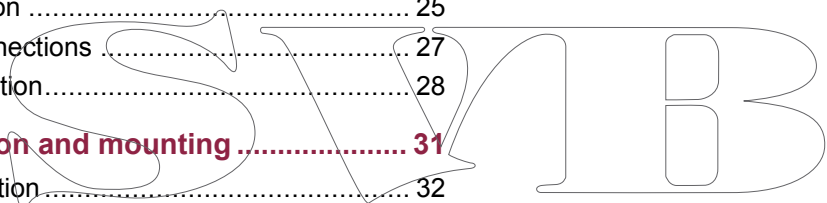Please check the website to ensure you have the latest handbooks.

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Contents

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Chapter 1: Important information

Safety notices

Certified Installation

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

Warning: Product installation and operation

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

Warning: Potential ignition source

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

Warning: 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.

Warning: Product grounding

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

Warning: Positive ground systems

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

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: Sonar operation

- NEVER operate the sonar with the vessel out of the water.

- NEVER touch the transducer face when the sonar is powered on.

- SWITCH OFF the sonar if divers are likely to be within 7.6 m (25 ft) of the transducer.

Warning: Transducer cables

Do not remove the transducer cable whilst the product is powered on, doing so can cause sparks. If the transducer cable is accidently removed whilst the product is powered on, switch the product's power off, replace the cable and then switch the power back on.

Caution: Power supply protection

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

Caution: Do not cut transducer cables

- Cutting the transducer cable severely reduces sonar performance. If the cable is cut, it must be replaced, it cannot be repaired.

- Cutting the transducer cable will void the warranty and invalidate the European CE mark.

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.

General Information

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.

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 fitted with suppression ferrites. These are important for correct EMC performance. 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 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.

Water ingress

Water ingress disclaimer

Although the waterproof rating capacity of this product meets the IPX6 standard, 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.

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. Whilst the WEEE Directive does not apply to some Raymarine products, we support its policy and ask you to be aware of how to dispose of this product.

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.

Warranty registration

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

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

IMO and SOLAS

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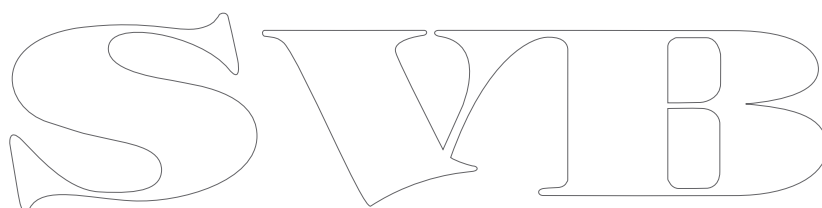
Technical accuracy

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

Chapter 2: Document and product information

Chapter contents

2.1 Handbook information

This handbook contains important information related to the installation of your Raymarine sonar module.

This handbook contains important information to help you:

- plan you installation and ensure you have all the necessary equipment;

- install and connect the sonar module 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.

Related products

This document applies to the following products:

Part number	Name	Description
E70297	CP370	**ClearPulse™** sonar module
E70298	CP470	**ClearPulse™** CHIRP broadband sonar module.

Note: Your multifunction display's Fishfinder application menu options and settings will differ depending on the type of sonar module in use.

Handbooks

The following documentation is applicable to your product:

|	
CP370 and CP470 Installation instructions Installation of a CP370 \ CP470 unit and connection to a wider system of marine electronics.	87239-1 / 88046
CP370 and CP470 Mounting template Mounting diagram for surface mounting a CP370 / CP470	87240
New a Series, c Series, e Series Installation and operation instructions Details the operation of the Fishfinder application for New a Series, c Series, e Series multifunction displays	81337
gS Series Installation and operation instructions Details the operation of the Fishfinder application for gS Series multifunction displays	81344

Further information

For detailed operating instructions, refer to the handbook that accompanies your multifunction display.

Transducer installation instructions

This document includes installation instructions for the sonar module only. For installation instructions for a connected transducer, please refer to the documentation that accompanies the transducer.
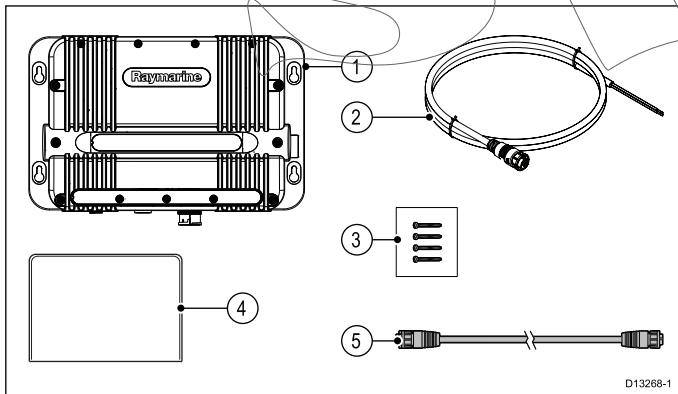
2.2 Product overview

CP370 — Parts supplied
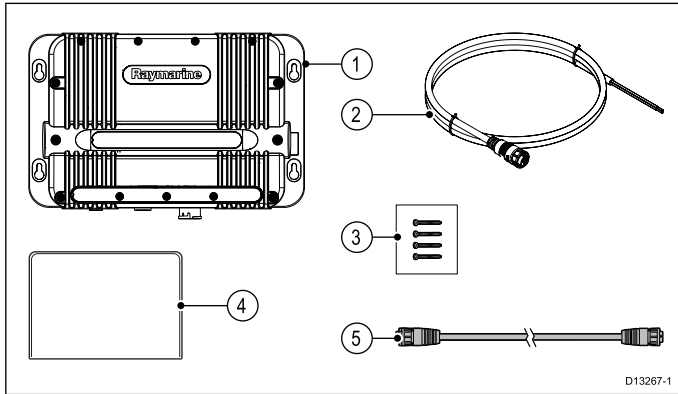
Item	Description	Quantity
1	Sonar module	1
2	1.5 m (5 ft) power cable	1
3	No.8 fixing screws	4
4	Documentation pack	1
5	2 m (6.56 ft) RayNet (Female) to RayNet (Female) network cable	1

CP470 — Parts supplied

Item	Description	Quantity
1	Sonar module	1
2	1.5 m (5 ft) power cable	1
3	No.8 fixing screws	4
4	Documentation pack	1
5	2 m (6.56 ft) RayNet (Female) to RayNet (Female) network cable	1

CP370 product overview

The CP370 is a **ClearPulse™** traditional sonar module. In conjunction with a compatible multifunction display, the CP370 provides a detailed view of the water beneath your vessel including the bottom, enabling you to identify fish and other objects.
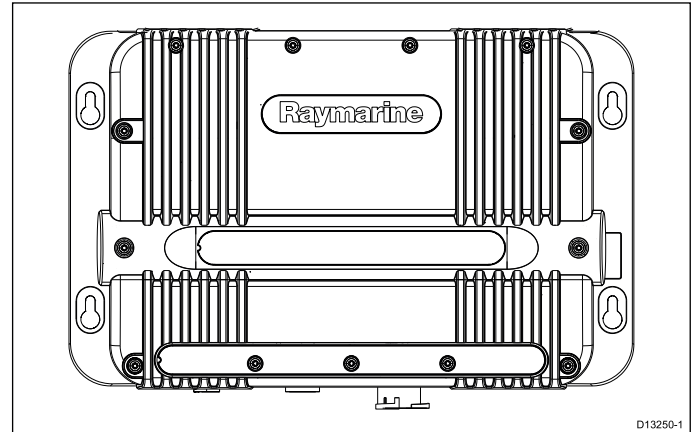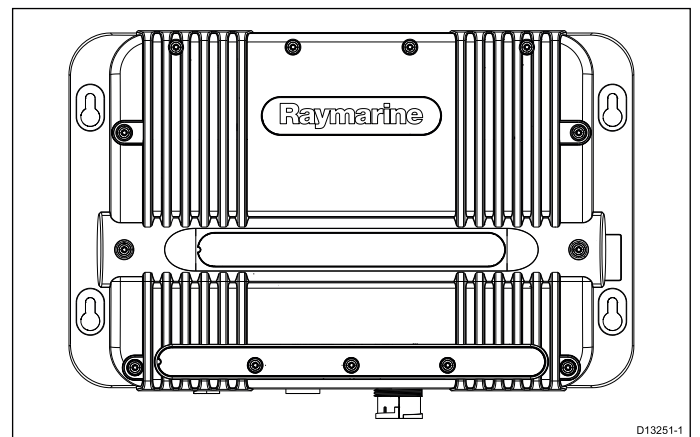

The CP370 has the following features:

- Single channel **ClearPulse™** sonar (conical beam).
- Up to 5,000 ft depth range.
- Water temperature and speed sensing.
- Support for transom, through-hull and in-hull transducers.
- 12 V or 24 V dc operation.
- Waterproof to IPX6.
- Robust and waterproof high-speed network connection.

CP470 product overview

The CP470 is a **ClearPulse™** CHIRP broadband sonar module. In conjunction with a compatible multifunction display, the CP470 provides a detailed view of the water beneath your vessel including the bottom, enabling you to identify fish and other objects.


The CP470 has the following features:

- Dual channel **ClearPulse™** CHIRP broadband sonar (conical beam).
- Up to 10,000 ft depth range.
- Water temperature and speed sensing.
- Support for transom, through-hull and in-hull transducers.

- 12 V or 24 V dc operation.
- Waterproof to IPX6.
- Robust and waterproof high-speed network connection.

## 2.3 Sonar technology

Traditional sonar technology

Traditional sonar uses a single carrier frequency or carrier wave for the sonar ping. The sonar works by measuring the time it takes the ping echo to return to the transducer to determine target depth.
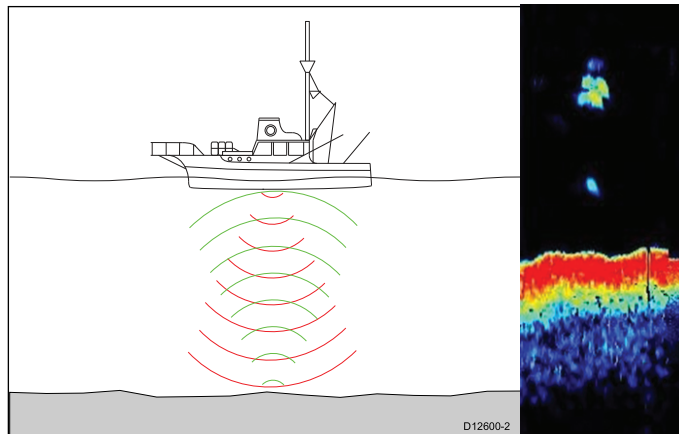
CHIRP technology

CHIRP sonars use a swept frequency 'CHIRP' signal which can distinguish between multiple close targets, this enables the sonar to display multiple targets instead of large combined targets that you would see when using traditional non-CHIRP sonar.

Benefits of CHIRP include improvements to target resolution, bottom detection even through bait balls and thermoclines and detection sensitivity.
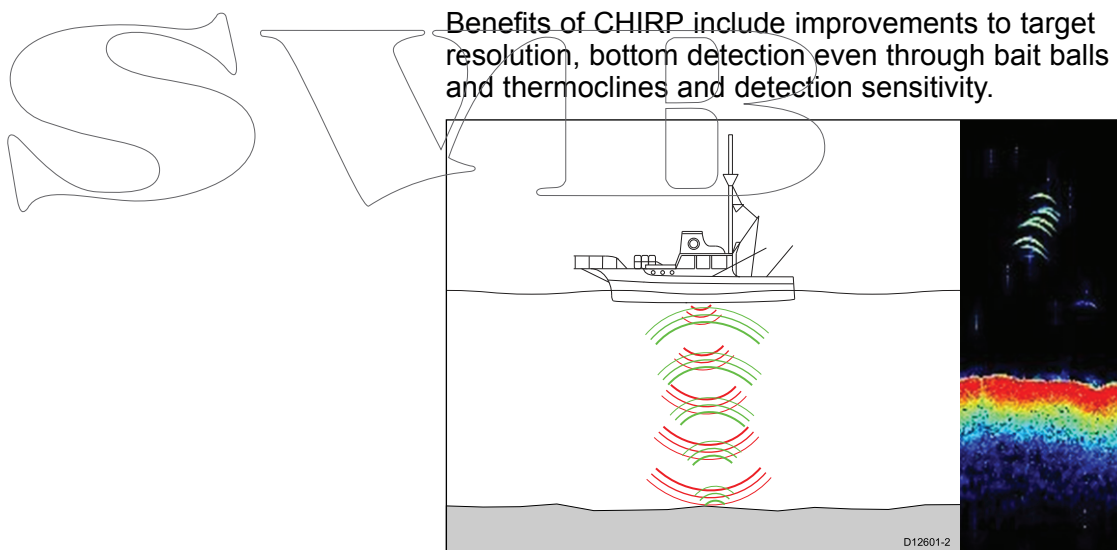
2.4 Raymarine sonar modules

The table below lists Raymarine's current range of sonar modules.

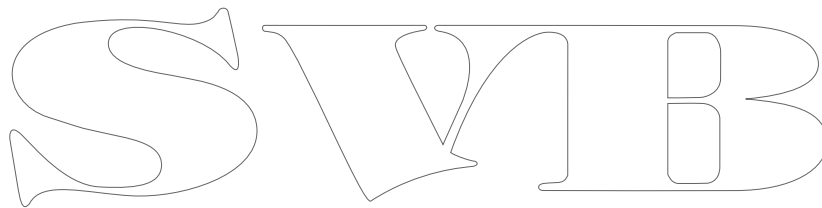|	
CP100	DownVision™ CHIRP sonar
CP200	SideVision™ CHIRP sonar
CP370	**ClearPulse™** traditional sonar
CP470	**ClearPulse™** CHIRP broadband sonar
Dragonfly (internal sonar)	DownVision™ CHIRP sonar
a68 / a78 MFD (internal sonar)	DownVision™ CHIRP sonar
a67 / a67 Wi-Fi / a77 / a77 Wi-Fi MFD (internal sonar)	**ClearPulse™** traditional sonar
c97 / c127 MFD (internal sonar)	**ClearPulse™** traditional sonar
e7D / e97 / e127 MFD (internal sonar)	**ClearPulse™** traditional sonar
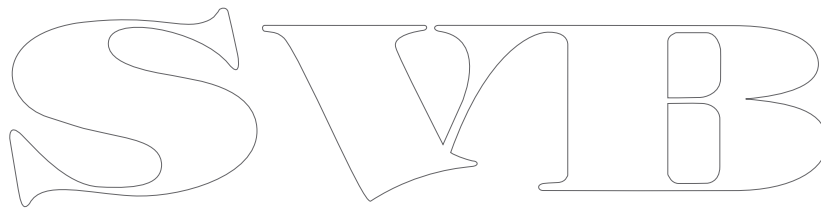
Chapter 3: Planning the installation

Chapter contents

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 Required additional components

This product forms part of a system of electronics and requires the following additional components for full operation.
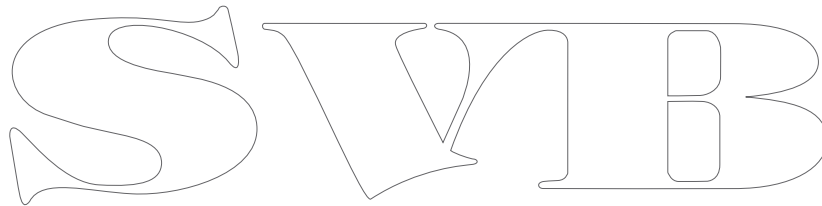
- CP370: For a list of compatible traditional transducers refer to 3.4 CP370 compatible transducers.
- CP470: For a list of compatible CHIRP broadband transducers refer to 3.5 CP470 compatible CHIRP broadband transducers.

  For a list of transducer cables refer to 10.1 Spares and accessories.
- Compatible Raymarine multifunction display. Refer to 3.3 Compatible multifunction displays for a list of compatible products.
- Data cables. Refer to Chapter 4 Cables and connections for suitable cables. Some installations may also require extensions to data, power or transducer cables. Refer to the Chapter 4 Cables and connections and Chapter 10 Spares and accessories sections for more information.
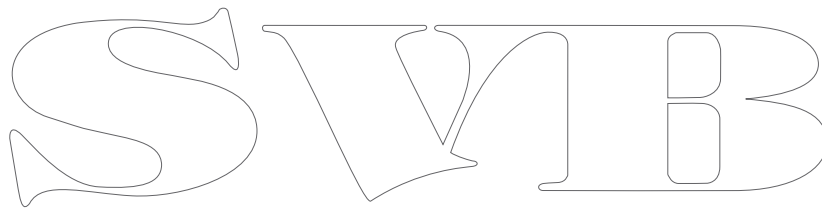
3.3 Compatible multifunction displays

The following Raymarine multifunction displays are compatible with your sonar module.

Multifunction display	CP370	CP470
gS Series	●	●
New e Series	●	●
New c Series	●	●
New a Series	●	●
E-Series Widescreen	●	Not compatible
C-Series Widescreen	●	Not compatible
G-Series	●	Not compatible
E Classic	●	Not compatible
C Classic	Not compatible	Not compatible

3.4 CP370 compatible transducers

The following transducers can be used with CP370 sonar modules:

> **Important:** To ensure EMC Compliance, transducers marked in the table below with a * symbol are NOT certified to be used with the CP370 in the following regions:
>
> • Australia;
>
> • New Zealand;
>
> • any member state of the European Economic Area (EEA);
>
> • European Free Trade Association countries Iceland, Liechtenstein, Norway, and Switzerland;
>
> • any country that requires EMC Directive Compliance.
>
> If in doubt, please contact your local dealer or Raymarine technical support.

Part number	Description	Features	Frequency (kHz)	Rated Power
E66054*	P66, Plastic, Transom mount	D/S/T	50 / 200	600 W*
E66019	ST69, Plastic, Transom mount	S/T	-	-
E66084	TM258, Plastic, Transom mount	D/T	50 / 200	1000 W
E66008*	P79, Plastic, In-hull	D	50 / 200	600 W*
A66089	M260, Plastic, In-hull	D	50 / 200	1000 W
E66076	R199, Plastic, In-hull	D	50 / 200	2000 W
A66091*	B744V, Bronze, Through-hull	D/S/T	50 / 200	600 W*
A66092*	B744VL, Bronze, Through-hull	D/S/T	50 / 200	600 W*
E66013*	P319, Plastic, Through-hull	D	50 / 200	600 W*
E66014*	B117, Bronze, Through-hull	D	50 / 200	600 W*
E66082	B258, Bronze, Though-hull	D/T	50 / 200	1000 W
A102121	SS270, Wide angle, Stainless steel, Through-hull	D/T	50 / 200	1000 W
E66079	B260, Bronze, Through-hull	D/T	50 / 200	1000 W
E66075	R99, Plastic, Through-hull	D/T	50 / 200	2000 W
E66071	P120–ST800, Plastic, Through-hull	S/T	-	-
E66072	B120–ST800, Bronze, Through-hull	S/T	-	-
E66077*	P319, Plastic, Through-hull	D/T	50 / 200	600 W*
E66085*	B60–20˚, Bronze, Tilted element, Through-hull	D/T	50 / 200	600 W*
E66086*	B60–12˚, Bronze, Tilted element, Through-hull	D/T	50 / 200	600 W*
A102137	B164–0˚, Bronze, Tilted element, Through-hull	D/T	50 / 200	1000 W
A102112	B164–12˚, Bronze, Tilted element, Through-hull	D/T	50 / 200	1000 W
A102113	B164–20˚, Bronze, Tilted element, Through-hull	D/T	50 / 200	1000 W

• D = Depth

• S = Speed

• T = Temperature

3.5 CP470 compatible CHIRP broadband transducers

The following transducers can be used with Raymarine CP470 sonar modules:

Part number	Description	Features	Frequency (kHz)	Rated Power
A80012	M265LH, Plastic Urethane, In-hull, dual element, CHIRP	D	• Low = 40 to 75 kHz • High = 130 to 210 kHz	1 kW
A80038	M265LM, Plastic Urethane, In-hull, dual element, CHIRP	D	• Low = 40 to 75 kHz • Medium = 80 to 130 kHz	1 kW
A80133	R111LH, Urethane housing, In-hull, dual element, CHIRP	D	• Low = 38 to 75 kHz • High = 130 to 210 kHz	2 kW
A80134	R111LM, Urethane housing, In-hull, dual element, CHIRP	D	• Low = 38 to 75 kHz • Medium = 85 to 135 kHz	2 kW
A80212	R599LH, Epoxy housing, In-hull, dual element, CHIRP	D	• Low = 28 to 60 kHz • High = 130 to 210 kHz	2 to 3 kW
A80213	R599LM, Epoxy housing, In-hull, dual element, CHIRP	D	• Low = 38 to 75 kHz • Medium = 80 to 130 kHz	2 to 3 kW
A80013	TM265LH, Urethane housing, stainless steel bracket, dual element, Transom mount, CHIRP	D/T	• Low = 42 to 65 kHz • High = 130 to 210 kHz	1 kW
A80041	TM265LM, Urethane housing, stainless steel bracket, dual element, Transom mount, CHIRP	D/T	• Low = 42 to 65 kHz • Medium = 85 to 135 kHz	1 kW
A80016	*B75, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• Low = 40 to 75 kHz	600 W
A80033	*B75, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• Low = 40 to 75 kHz	600 W
A80017	*B75M, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• Medium = 80 to 130 kHz	600 W
A80034	*B75M, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• Medium = 80 to 130 kHz	600 W
A80036	*B75M, Bronze, Through-hull, 20˚ Tilted element, CHIRP	D/T	• Medium = 80 to 130 kHz	600 W
A80018	*B75H, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	600 W
A80035	*B75H, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	600 W
A80037	*B75H, Bronze, Through-hull, 20˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	600 W
A80042	*B175L, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• Low = 40 to 60 kHz	1 kW
A80045	*B175L, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• Low = 40 to 60 kHz	1 kW
A80048	*B175L, Bronze, Through-hull, 20˚ Tilted element, CHIRP	D/T	• Low = 40 to 60 kHz	1 kW

| Part number	Description	Features	Frequency (kHz)	Rated Power
A80043	*B175M, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• Medium = 85 to 135 kHz	1 kW
A80046	*B175M, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• Medium = 85 to 135 kHz	1 kW
A80049	*B175M, Bronze, Through-hull, 20˚ Tilted element, CHIRP	D/T	• Medium = 85 to 135 kHz	1 kW
A80044	*B175H, Bronze, Through-hull, 0˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	1 kW
A80047	*B175H, Bronze, Through-hull, 12˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	1 kW
A80050	*B175H, Bronze, Through-hull, 20˚ Tilted element, CHIRP	D/T	• High = 130 to 210 kHz	1 kW
A80014	B765LH, Bronze, Through-hull, dual element, CHIRP	D/T	• Low = 40 to 75 kHz • High = 130 to 210 kHz	600 W
A80015	B765LM, Bronze, Through-hull, dual element, CHIRP	D/T	• Low = 40 to 75 kHz • Medium = 80 to 130 kHz	600 W
A80010	B265LH, Urethane housing, Through-hull, dual element, CHIRP	D/T	• Low = 42 to 65 kHz • High = 130 to 210 kHz	1 kW
A80011	B265LM, Urethane housing, Through-hull, dual element, CHIRP	D/T	• Low = 42 to 65 kHz • Medium = 85 to 135 kHz	1 kW
A80039	R109LH, Epoxy housing, Through-hull, dual element, CHIRP	D/T	• Low = 38t o 75 kHz • High = 130 to 210 kHz	2 kW
A80040	R109LM, Epoxy housing, Through-hull, dual element, CHIRP	D/T	• Low = 48 to 75 kHz • Medium = 80 to 130 kHz	2 kW
A80210	B509LH, Epoxy housing, Through-hull, dual element, CHIRP	D/T	• Low = 28 to 60 kHz • High = 130 to 210 kHz	2 to 3 kW
A80211	B509LM, Epoxy housing, Through-hull, dual element, CHIRP	D/T	• Low = 28 to 60 kHz • Medium = 80 to 130 kHz	2 to 3 kW

• D = Depth

• S = Speed

• T = Temperature

Note: *Transducers only available in pairs.

3.6 System examples

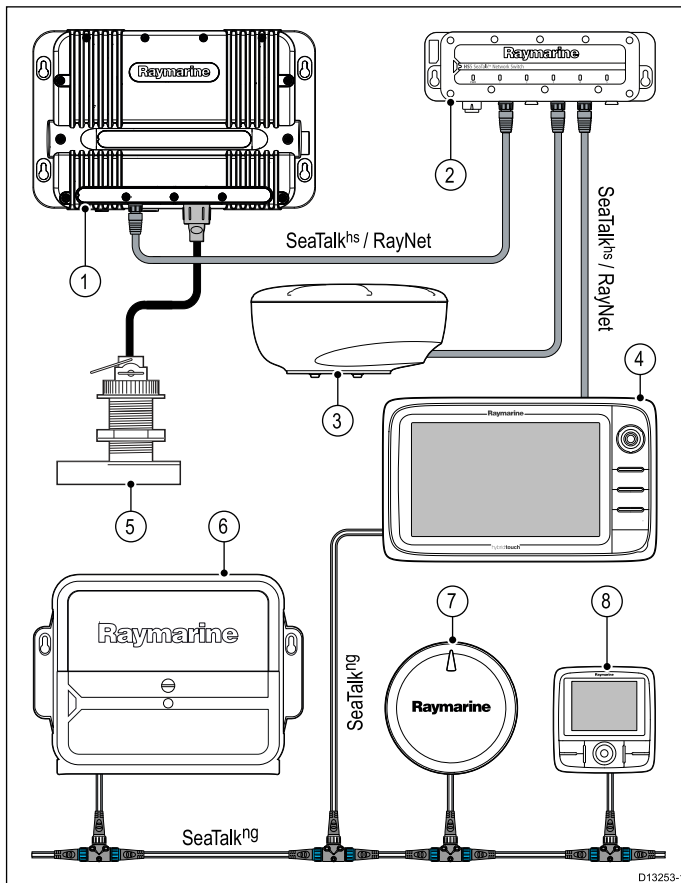The system examples below apply to your sonar module.

Example: Basic system

D13252-1
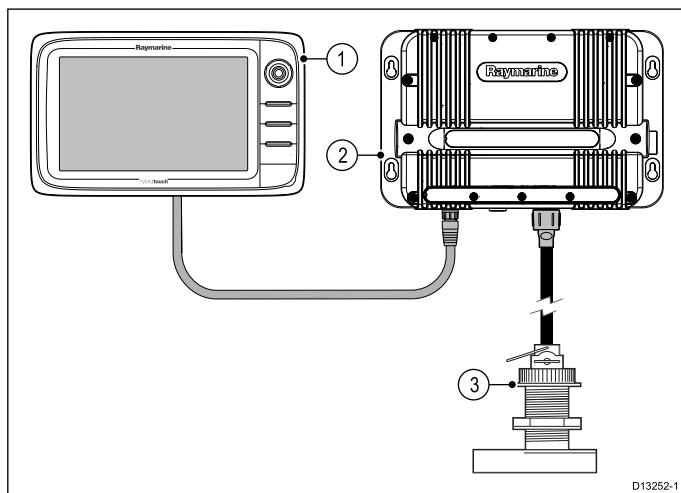
Item	Description
1	Compatible Raymarine multifunction display
2	Sonar module
3	Transducer

Example: Extended system

D13253-1

Item	Description
1	Sonar module
2	Raymarine network switch
3	Digital radome
4	Compatible Raymarine multifunction display
5	Transducer
6	Actuator Control Unit (ACU)
7	EV unit
8	SeaTalk^ng^ Pilot controller

Note: For detailed information on sonar module connections refer to Chapter 4 Cables and connections.
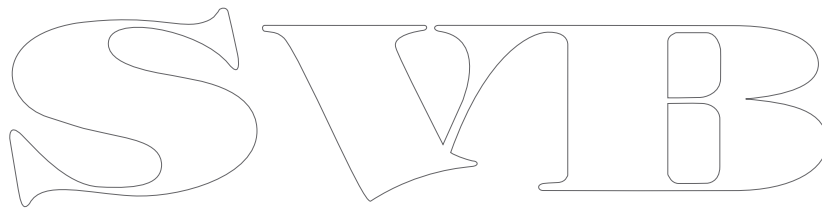
3.7 Tools

Installation of the unit requires the following tools:

D12228-3
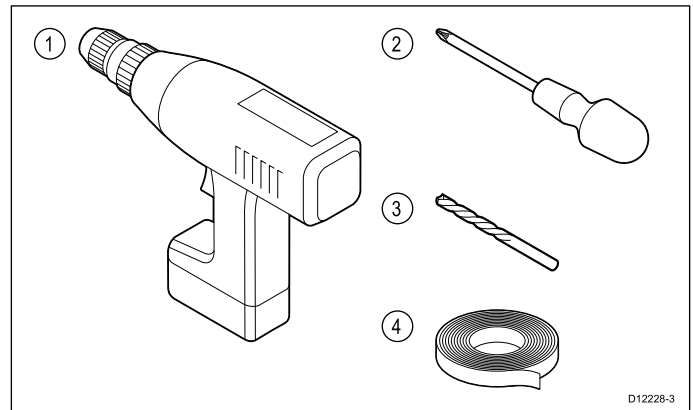
Item	Description
1	Drill
2	Pozidrive screwdriver
3	Drill bit of appropriate size*
4	Adhesive tape

Note: *Drill bit size is dependent on the thickness and type of material that the unit is to be mounted on.

Chapter 4: Cables and connections

Chapter contents

4.1 General cabling guidance

Cable types and length

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

- Unless otherwise stated 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).
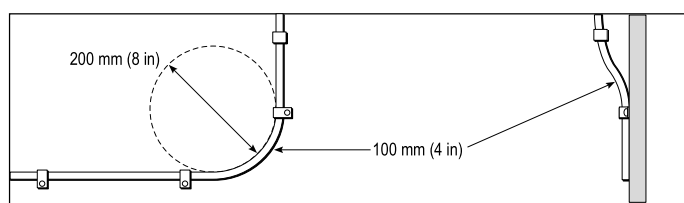
- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.

- 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.

Circuit isolation

Appropriate circuit isolation is required for installations using both AC and DC current:

- Always use isolating transformers or a separate power-inverter to run PC's, processors, displays and other sensitive electronic instruments or devices.

- Always use an isolating transformer with Weather FAX audio cables.

- Always use an isolated power supply when using a 3rd party audio amplifier.

- Always use an RS232/NMEA converter with optical isolation on the signal lines.

- Always make sure that PC's or other sensitive electronic devices have a dedicated power circuit.
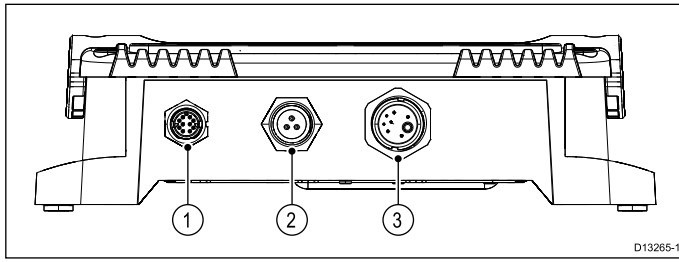
Cable shielding

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).
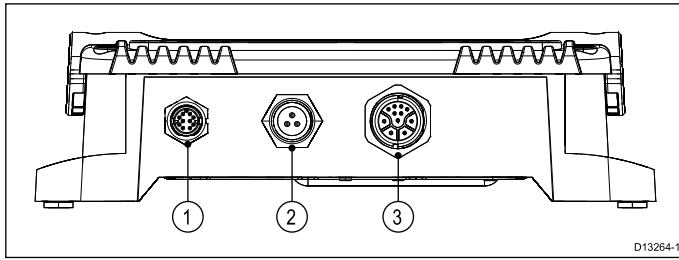
4.2 Connections overview

Cable connectors for your sonar module are shown below:

CP370 sonar module

D13265-1

CP470 sonar module

D13264-1

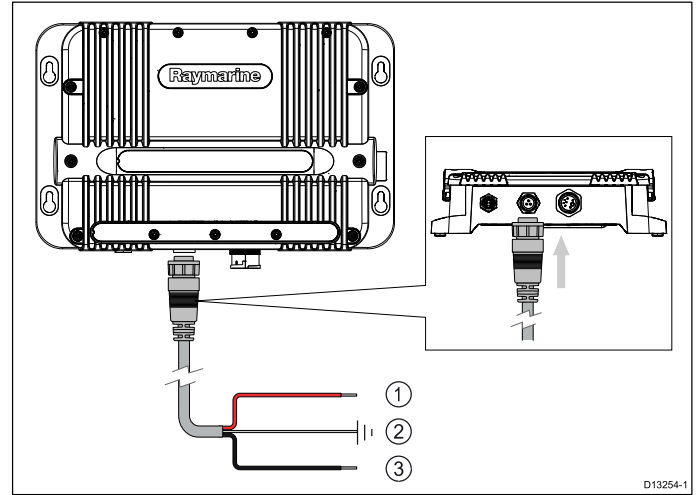| Item	Description
1	Network connection
2	Power connection
3	Transducer connection

Making connections

Follow the steps below to connect the cable(s) to your product.

1. Ensure that the vessel's power supply is switched off.
2. Ensure that the device being connected to the unit has been installed in accordance with the installation instructions supplied with that device.
3. Ensuring correct orientation, push the cable connector fully onto the corresponding connector on the unit.
4. Turn the locking collar clockwise to secure the cable.

4.3 Power connection

Always use the power cable provided with your product.

D13254-1

Item	Description
1	RED positive wire
2	Ground
3	BLACK negative wire

D13255-1
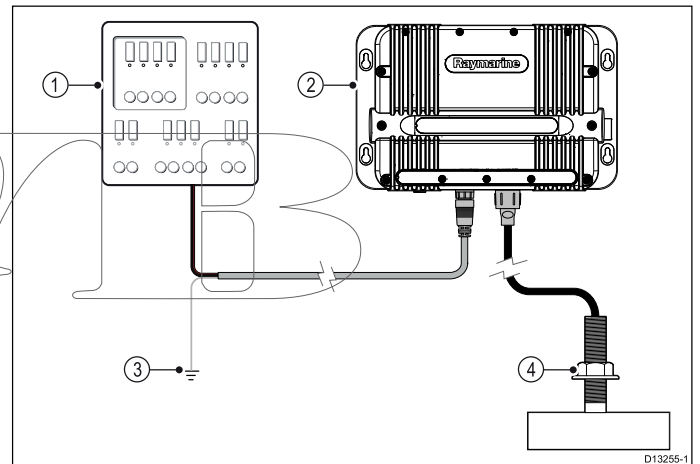
Item	Description
1	Power supply
2	Sonar module
3	Vessel's RF ground
4	Transducer

The unit is intended for use on dc 'negative' or 'floating' ground power systems rated from 10.2V to 32V.

Raymarine recommends that all power connections are made via a distribution panel. All equipment must be either:

- powered from a circuit breaker or switch, with 5A circuit protection, or
- powered from a 5A slow blow in-line fuse connected to the RED positive wire of the power cable.

The unit does not have a power switch. The unit is powered when the power cable is attached to the vessel's power supply.

Note: The unit should be mounted so that the power cable can be easily removed if necessary. If the unit is placed in a difficult to reach location, Raymarine recommends installing an on/off switch on the power connection at a point that is easily accessible.

Power cable extension

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

• The power cable for each unit in your system should be run as a separate, single length of 2-wire cable from the unit to the vessel's battery or distribution panel.

• Raymarine recommends a **minimum** wire gauge of 18AWG (0.82 mm2) for any length of cable extension.

• Regardless of the length of the cable extension, any cable used should be capable of achieving a **minimum** voltage at the unit of 10.8 V with a fully flat battery at 11 V.

Breakers, fuses and circuit protection

It is recommended that you fit a thermal breaker or fuse at the distribution panel.

Thermal breaker rating
5 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.

Sharing a breaker

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

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

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

⚠ **Warning: Product grounding**

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

Grounding — Dedicated drain wire

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

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

The dc power system should be either:

• Negative grounded, with the negative battery terminal connected to the vessel's ground.

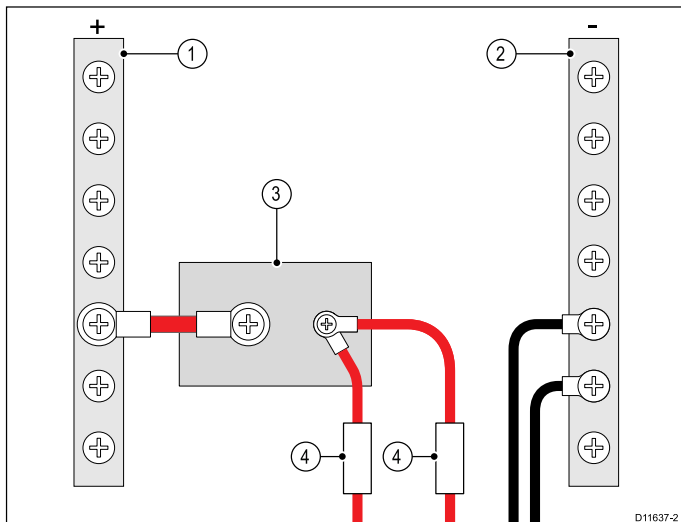• Floating, with neither battery terminal connected to the vessel's ground

⚡ **Warning: Positive ground systems**

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

4.4 Transducer connections

⚡ **Warning: Transducer cables**

Do not remove the transducer cable whilst the product is powered on, doing so can cause sparks. If the transducer cable is accidently removed whilst the product is powered on, switch the product's power off, replace the cable and then switch the power back on.

**Caution: Do not cut transducer cables**

• Cutting the transducer cable severely reduces sonar performance. If the cable is cut, it must be replaced, it cannot be repaired.

• Cutting the transducer cable will void the warranty and invalidate the European CE mark.

CP370 Transducer connections

The CP370 is a **ClearPulse™** traditional sonar module designed for use with traditional transducers.

Important: Transducers must be installed in accordance with the instructions provided with the transducer.

CP370 transducer connection

D13256-1
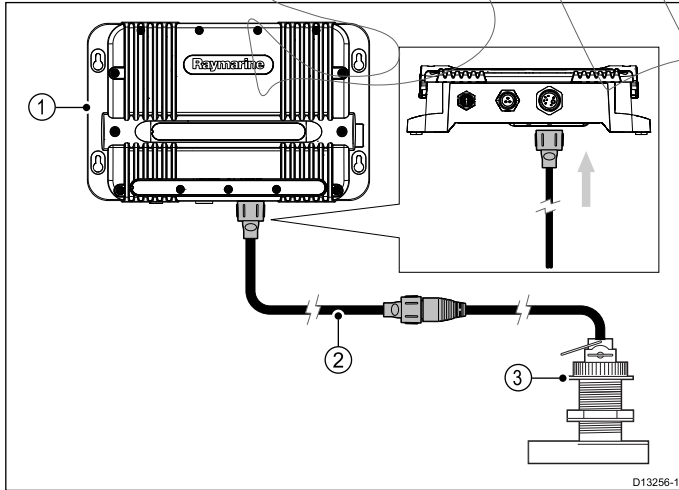
Item	Description
1	CP370.
2	Extension cable (optional)
3	Transducer

Dual transducer connections

You can use the optional "Dual transducer" Speed / Temperature Y-cable adaptor (E66022) to connect a combination of depth and speed / temperature transducers.

Note: Do NOT use this cable adaptor to connect more than one **depth** transducer.

D13257-1
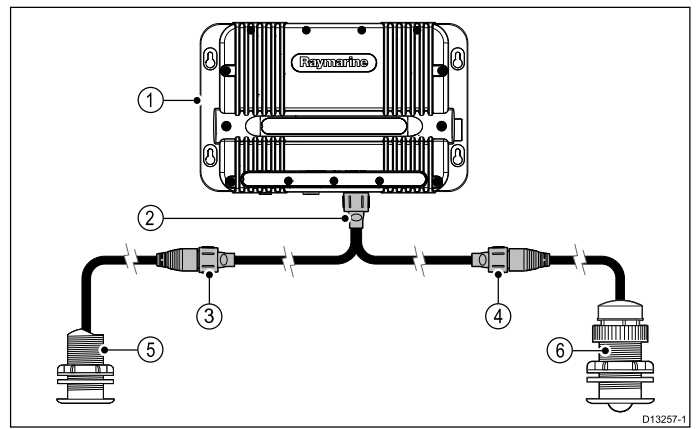
Item	Description
1	CP370
2	"Dual transducer" Speed / Temperature Y-cable adaptor (E66022)
3	Cable to transducer connection
4	Cable to transducer connection
5	Compatible depth transducer
6	Compatible speed / temperature transducer

For a list of compatible transducers refer to 3.4 Traditional transducers.

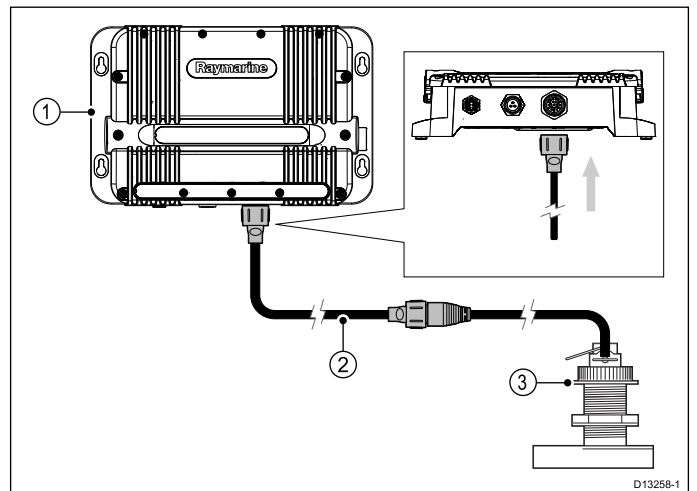For a list of transducer cables refer to 10.1 Spares and accessories.

CP470 Transducer connection

The CP470 is a CHIRP broadband sonar module designed for use with broadband transducers.

Important: Transducers must be installed in accordance with the instructions provided with the transducer.

Broadband transducer connection

D13258-1

Item	Description
1	CP470
2	Extension cable (optional)
3	Broadband transducer (dual element)

Dual broadband (single element) transducer connections
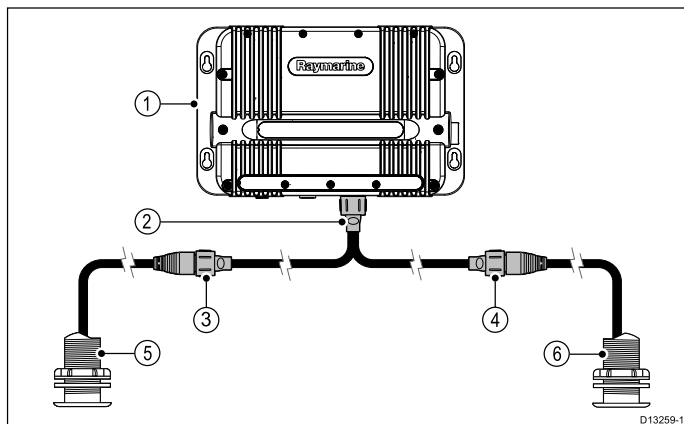
Item	Description
1	CP470
2	"Paired CHIRP transducer" Y-cable adaptor (A102146)
3	Channel B of combined cable
4	Channel A of combined cable
5	Broadband transducer (single element)
6	Broadband transducer (single element)

Transducer pair connections

Transducer Pair Frequencies	Cable Channel A	Cable Channel B
Low & High	Low frequency transducer	High frequency transducer
Low & Medium	Low frequency transducer	Medium frequency transducer
Medium & High	Medium frequency transducer	High frequency transducer

Note: When fitting transducer pairs ensure that channel A and channel B of the transducer cable are connected to the relevant transducer as shown in the table above.

For a list of compatible CHIRP transducers refer to 3.5 CHIRP transducers.

For a list of transducer cables refer to 10.1 Spares and accessories.

Transducer cable extension

For some installations it may be necessary to extend the transducer cable.

• Refer to Chapter 10 Spares and accessories for a list of suitable transducer extension cables.

• Raymarine recommends a maximum of one cable extension for any single transducer cable.

• For best performance, keep all cable lengths to a minimum.

4.5 Network connection

The unit must be connected to a compatible Raymarine multifunction display to enable echo sounder data to be viewed.

Multifunction display connection

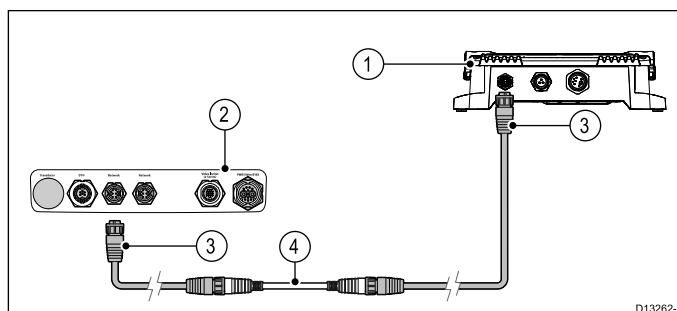Unit connected to a multifunction display using a RayNet cable.
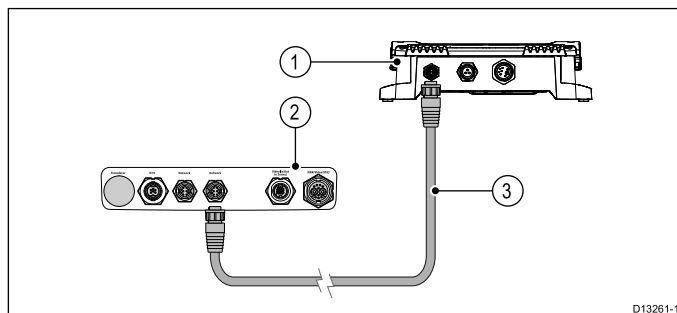
Note: The connection panel on your product may look slightly different to that shown, depending on variant. The network connection method remains the same for all products featuring RayNet connectors.

Item	Description
1	Sonar module.
2	Connector panel for compatible Raymarine multifunction display.
3	RayNet cable.

Multifunction display configuration (extended cables)

When the required length of a single network cable run is greater than 20 m (65.6 ft), a RayNet (male) to (male) adaptor cable should be used to connect RayNet cables together .
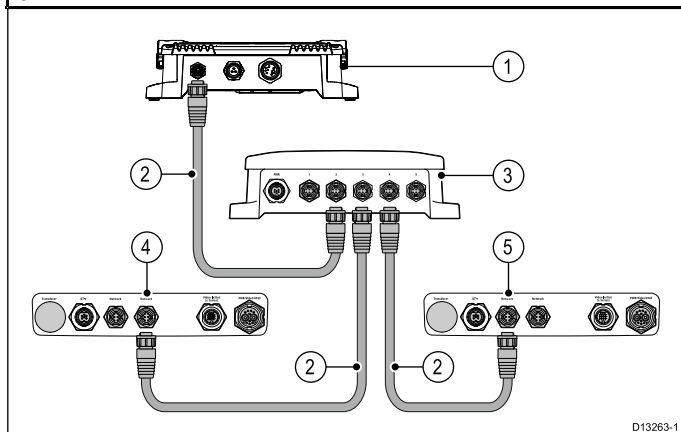

Note: The connection panel on your product may look slightly different to that shown, depending on variant. The network connection method remains the same for all products featuring RayNet connectors.

Item	Description
1	Sonar module.
2	Connector panel for compatible Raymarine multifunction display.
3	RayNet cables.
4	RayNet (Male) to (Male) adaptor cable.

Multiple multifunction display configuration

A Raymarine network switch can be used to connect the unit to more than 1 multifunction display.

> **Note:** Ensure network cables and connections are tight and secure using any cable ties provided with your network hardware.

D13263-1

> **Note:** The connection panel on your product may look slightly different to that shown, depending on variant. The network connection method remains the same for all products featuring RayNet connectors.

Item	Description
1	Sonar module.
2	RayNet cable.
3	RayNet network switch.
4	Connector panel for compatible Raymarine multifunction display.
5	Connector panel for additional compatible Raymarine multifunction display.

For details on available network hardware and cables refer to Chapter 10 Spares and accessories.

Chapter 5: Location and mounting

Chapter contents

5.1 Selecting a location

⚠️ **Warning: Potential ignition source**

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

General location requirements

Important considerations when choosing a suitable location for your product.

This product is suitable for mounting above or below decks.

The product should be mounted where it will be:

• protected from physical damage and excessive vibration.

• well ventilated and away from heat sources.

• away from any potential ignition source such as an engine room, near fuel tanks or a gas locker.

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

• **Access** — there must be sufficient space to enable cable connections to the product, avoiding tight bends in the cable.

• **Diagnostics** — the product must be mounted in a location where the diagnostics LED is easily visible.

Note: Not all products include a diagnostics LED. Refer to the Chapter 6 System checks and troubleshooting for more information.

• **Electrical interference** — the product should be mounted far enough away from any equipment that may cause interference such as motors, generators and radio transmitters / receivers.

• **Magnetic compass** — refer to the *Compass safe distance* section in this document for advice on maintaining a suitable distance between this product and any compasses on your vessel.

• **Power** — to keep cable runs to a minimum, the product must be located as close as possible to the vessel's dc power supply.

• **Mounting surface** — ensure the product is adequately supported on a secure surface. Refer to the weight information provided in the *Technical specification* for this product and ensure that the intended mounting surface is suitable for bearing the product weight. Do NOT mount units or cut holes in places which may damage the structure of the vessel.

Cable routing requirements

Consider the following before installing the system cables:

• You will need to attach power, transducer and network cables to the unit.

• All cables should be adequately secured, protected from physical damage, and protected from exposure to heat.

• Avoid sharp bends in cables.

• Use a watertight feed-through wherever a cable passes through an exposed bulkhead or deckhead.

• Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.

• Do NOT run cables through bilges or doorways, or close to moving or hot objects.

• Do NOT run cables near to engines or fluorescent lights.

Always route data cables as far away as possible from:

• other equipment and cables,

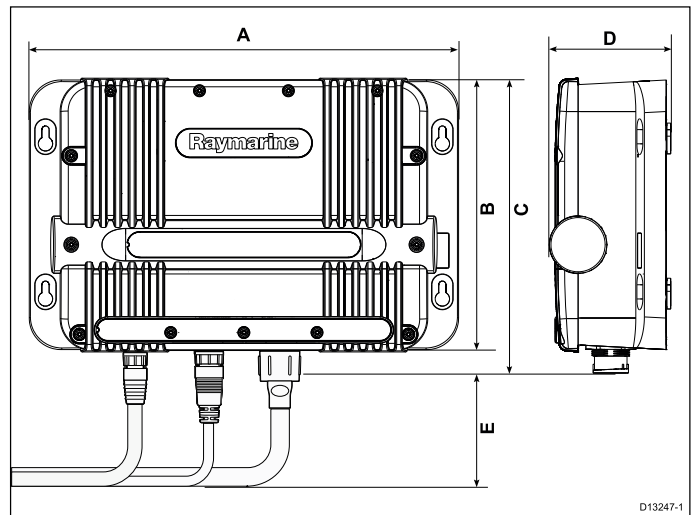• high current carrying ac and dc power lines,

• antennas.

5.2 Product dimensions — CP370
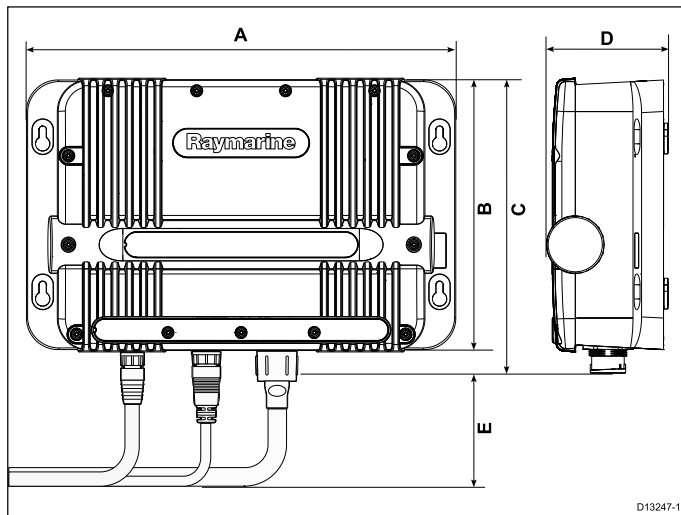
Item	Dimension
A	299.4 mm (11.79 in)
B	188.0 mm (7.4 in)
C	201.5 mm (7.9 in)
D	84.4 mm (3.3 in)
E	80.0 mm (3.1 in)

5.3 Product dimensions — CP470

Item	Dimension
A	299.4 mm (11.79 in)
B	188.0 mm (7.4 in)
C	205.6 mm (8.1 in)
D	84.4 mm (3.3 in)
E	80.0 mm (3.1 in)

5.4 Mounting

Mounting the unit

Having chosen a suitable location, install the unit as follows:

> **Note:** Raymarine recommends mounting the unit vertically.

> **Note:** Drill bit, tap size and tightening torque is dependent on the thickness and type of material the unit is to be mounted on.

1. Secure the mounting template in the required location using adhesive tape.
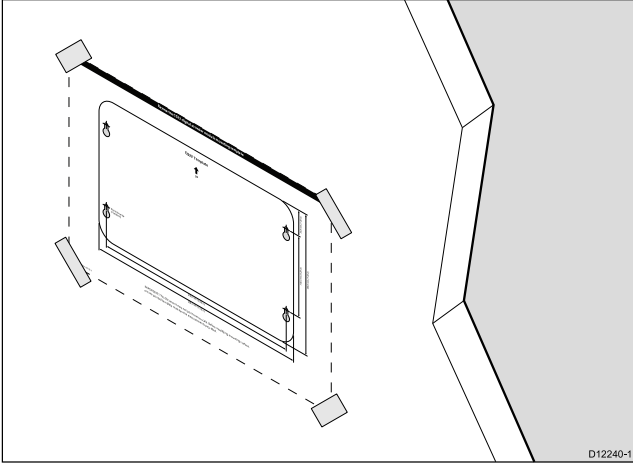
2. Drill 4 holes at the marked location on the template.
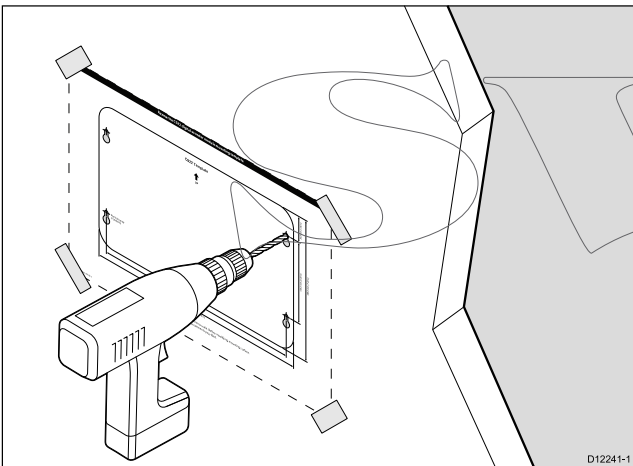
3. Remove the mounting template.
4. Screw in the supplied fixing screws about half way into the holes.
5. Place the unit onto the fixing screws.
6. Push the unit down to engage the key slots in the unit.
7. Tighten the screws

Chapter 6: System checks and troubleshooting

Chapter contents

6.1 Initial power on test

Once the unit has been correctly installed check that it is operating correctly.

After powering on, the unit will take approximately 50 seconds to bootup, from powering on through to normal operation LED status indicator should be GREEN. If the LED status indicator is not green then refer to the troubleshooting section of this handbook.

Open the Fishfinder application on your connected multifunction display and ensure that it is operating correctly.
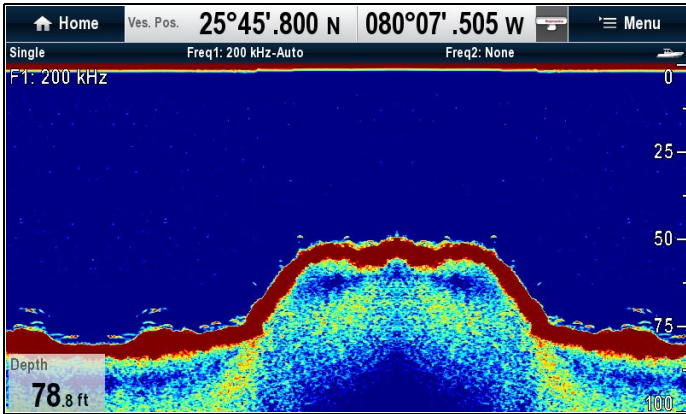
Further information

For detailed operating instructions, refer to the handbook that accompanies your multifunction display.

Multiple sonar operation

For systems with multiple sonar modules, only one sonar may operate at any one time.

Before attempting to use the fishfinder application on your multifunction display, use one of the methods described in this document to ensure that only one sonar module is active on your system.

Switching between internal and external sonar modules

If you want to switch your active sonar module between internal and external follow the steps below.

1. Power off the active sonar module.

   - Internal sonar module is turned off from the Fishfinder application menu: **Menu > Set-up > Sounder Set-up > Internal Sounder**.

   - External sonar modules should be turned off at the power supply.

2. Wait for the No Sounder Source Available message to be displayed in the Fishfinder application.

3. Power on the new sonar module.

Switching between multiple external sonar modules

If your system includes multiple external sonar modules you must complete the procedure detailed below to ensure only one sonar module is active at a time.

Note: If your multifunction display has an **internal** sonar module, complete the procedure detailed in Switching between internal and external sonar modules BEFORE attempting the following:

1. Power off ALL external sonar modules, either at the power supply or by disconnecting the power cable from the sonar module.

2. Wait for the No Sounder Source Available message to be displayed in the Fishfinder application.

3. Power on the external sonar module that you want to use.

6.2 Software updates

The software running on the product can be updated.

- Raymarine periodically releases software updates to improve product performance and add new features.

- You can update the software for your product using a connected and compatible multifunction display.

- Refer to www.raymarine.com/software/ for the latest software updates and the software update procedure for your product.

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

6.3 Troubleshooting

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

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

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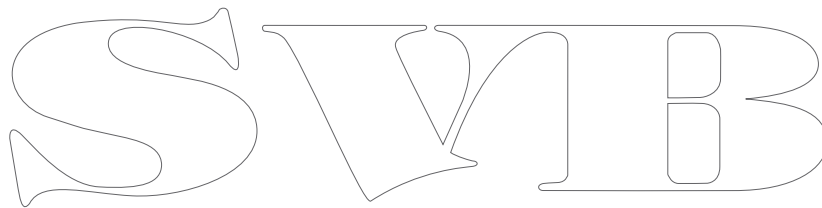
6.4 Sonar troubleshooting

Problems with the sonar and their possible causes and solutions are described here.

| Problem	Possible causes	Possible solutions
Sonar data not available on multifunction display.	Unit power supply fault.	Check the unit power supply and cables.
	Other unit fault.	Refer to the instructions supplied with the unit.
	SeaTalkhs / RayNet network problem.	Check that the unit is correctly connected to a Raymarine network SeaTalkhs switch or crossover coupler (as applicable).
		Check the status of the Raymarine network switch (if applicable).
		Check that SeaTalkhs/ RayNet cables are free from damage.
	Software mismatch between equipment may prevent communication.	Contact Raymarine technical support.
Problematic depth readings or sonar image.	Gain or Frequency settings may be inappropriate for present conditions.	Check the sonar presets, gain and frequency settings.
	Unit power supply fault	Check the voltage from the power supply, if this is too low it can affect the transmitting power of the unit.
	Unit cable fault.	Ensure that the power, transducer and all other cables to the unit are properly connected and free from damage.
	Transducer fault	Check that the transducer is mounted correctly and is clean.
		If you have a transom-mount transducer, check that the transducer hasn't kicked up due to hitting an object.
	Other unit fault.	Refer to the instructions supplied with the unit.
	Vessel stationary	Fish arches are not displayed if the vessel is stationary, fish will appear on the display as straight lines.
	High vessel speed	Turbulence around the transducer may be confusing the unit.
	Scroll speed set to zero	Adjust scroll speed
Incorrect speed reading	Paddle wheel fault	Check that the paddle wheel is clean.
	No speed offset set	Add speed offset.
	Incorrect calibration	Re-calibrate equipment

6.5 LED Diagnostics
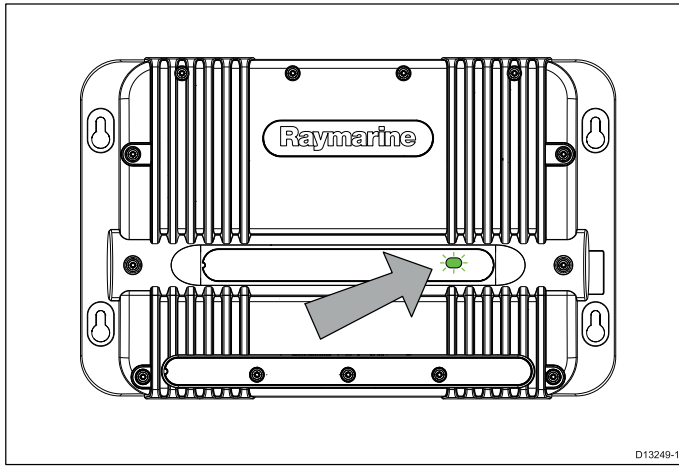
The LED on the front panel of the unit provides information on the status of the sonar module and notifies users of any problems within the unit. The LED blinks the following colors:

• **Green** — shows the unit is operating normally.

• **Amber** — warns of a problem in the unit.

• **Red** — shows that there is an error in the unit.

The number of times the LED blinks is a code which represents the errors or warnings as shown in the LED indication status table. If there are multiple warnings or errors, the codes are given in sequence with a 2 second pause between blink patterns.

LED indication status

LED color	LED code		Status	User action
🟢	☀ —————— ○		Solid Green	• None (normal power up takes <1 minute.)
🟢	☀ ⊓ ○		Green 1 blink	• None
🟠	☀ ⊓ ○		Amber 1 blink	Transducer disconnected	• Ensure transducer cable and connections are secure and free from damage. • Power cycle unit to recover transducer information. • If problem persists contact Raymarine technical support.
🟠	☀ ⊓⊓ ○		Amber 2 blinks	No network detected	• Ensure network is powered. • Ensure network cable and connections are secure and free from damage. • If problem persists contact Raymarine technical support.
🟠	☀ ⊓⊓⊓ ○		Amber 3 blinks	Unit overheating	• Ensure installation environment is within recommendations. • Unit will recover when temperature falls within specifications. • If problem persists contact Raymarine technical support.
🟠	☀ ⊓⊓⊓⊓ ○		Amber 4 blinks	*Transducer overheating	• Ensure installation environment is within recommendations. • Unit will recover when temperature falls within specifications. • If problem persists contact Raymarine technical support.
🟠	☀ ⊓⊓⊓⊓⊓ ○		Amber 5 blinks	Under voltage (<10.2V)	• Ensure power cable and connections are secure and free from damage. • Ensure power supply cabling is consistent with recommendations. • If problem persists contact Raymarine technical support.
🟠	☀ ⊓⊓⊓⊓⊓⊓ ○		Amber 6 blinks	Over voltage (>34.2V)	• Ensure power supply levels are consistent with recommendations. • If problem persists contact Raymarine technical support.
🔴	☀ ⊓ ○		Red 1 blink	General failure	• If combined with voltage warning, check power supply and cables. • Power cycle unit to recover. • If problem persists contact Raymarine technical support.
🔴	☀ ⊓⊓ ○		Red 2 blinks	Not Defined	• If problem persists contact Raymarine technical support.

LED color	LED code		Status	User action
🔴	☼ ○ ⊓⊔⊓⊔	Red 3 blinks	Ambient temperature too hot	• Ensure installation environment is within recommendations. • Unit will recover when temperature falls within specifications. • If problem persists contact Raymarine technical support.
🔴	☼ ○ ⊓⊔⊓⊔⊓	Red 4 blinks	Problems with internal database	• Power cycle unit to recover. • If problem persists contact Raymarine technical support.

Note: *Not applicable to CP370.

Note: During a software upgrade process the LED will be solid Red and change to solid Amber on successful completion. A power cycle will be necessary to install the changes.

Note: If any other LED sequence other than described above is seen and persists please contact Raymarine technical support.
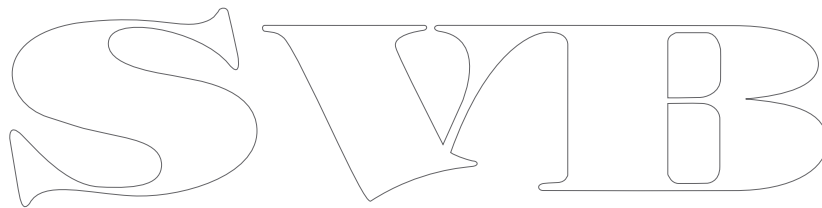
6.6 Resetting the sonar

The reset function restores the unit to its factory default values.

> **Note:** Performing a factory reset will clear speed and temperature calibration settings and the depth offset.

1. Using a compatible Raymarine multifunction display go to the Fishfinder application page.
2. Select **Menu** from the side menu.
3. Select **Set-up**.
4. Select **Sounder Set-up**.
5. Select **Sonar reset**.
6. Select **Yes** to confirm.

The unit will now be reset to factory default settings.

Chapter 7: Maintenance

Chapter contents

7.1 Routine checks

The following periodic checks should be made:

- Examine cables for signs of damage, such as chafing, cuts or nicks.

- Check that the cable connectors are firmly attached and that their locking mechanisms are properly engaged.

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

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.

7.2 Unit cleaning instructions

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

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

7.3 Transducer cleaning

Growth can collect on the bottom of the transducer, this can reduce performance. To prevent the build up of sea growth, coat the transducer with a thin layer of water based antifouling paint, available from your local marine dealer. Reapply paint every 6 months or at the beginning of each boating season. Certain smart transducers have restrictions on where antifouling paint is applied. Please consult your dealer.

> **Note:** Transducers with a temperature sensor may not work properly if painted.

> **Note:** Never use ketone based paint. Ketones can attack many plastics possibly damaging the sensor.

> **Note:** Never use spray paint on your transducer. Spraying incorporates tiny air bubbles, and a marine transducer cannot transmit properly through air.

Use a soft cloth and mild household detergent to clean the transducer. If the fouling is severe, remove the growth with a green scotch brite™ pad. Be careful to avoid scratching the transducers face.

If your transducer has a paddlewheel you can wet sand with fine grade wet/dry paper.

> **Note:** Harsh cleaning solvents such as acetone may damage the transducer.
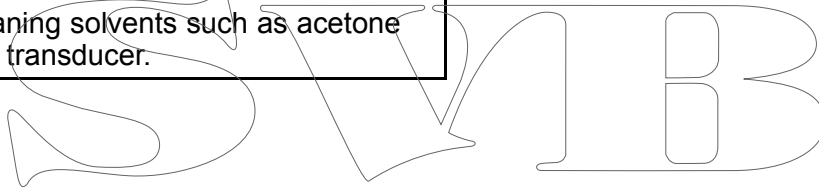
Chapter 8: Technical support

Chapter contents

8.1 Raymarine customer support

Raymarine provides a comprehensive customer support service. You can contact customer support through the Raymarine website, telephone and e-mail. If you are unable to resolve a problem, please use any of these facilities to obtain additional help.

Web support

Please visit the customer support area of our website at:

www.raymarine.com

This contains Frequently Asked Questions, servicing information, e-mail access to the Raymarine Technical Support Department and details of worldwide Raymarine agents.

Telephone and e-mail support

In the USA:

- **Tel:** +1 603 324 7900

- **Toll Free:** +1 800 539 5539

- **E-mail:** support@raymarine.com

In the UK, Europe, and the Middle East:

- **Tel:** +44 (0)13 2924 6777

- **E-mail:** ukproduct.support@raymarine.com

In Southeast Asia and Australia:

- **Tel:** +61 (0)29479 4800

- **E-mail:** aus.support@raymarine.com

Product information

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

- Product name.

- Product identity.

- Serial number.

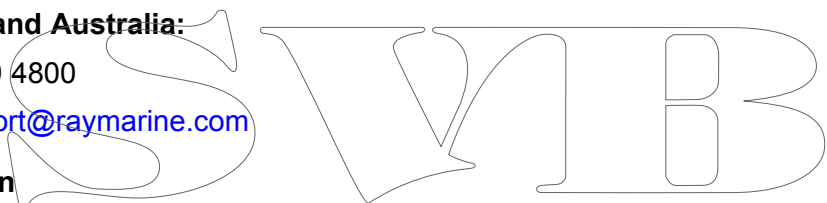- Software application version.

- System diagrams.

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

8.2 Viewing product information

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

With the Homescreen displayed:

1. Select **Set-up.**

2. Select **Maintenance**.

3. Select **Diagnostics**.

4. Select the **Select Device** option.

   A list of connected devices is displayed.

5. Select the product for which you want to view information. Alternatively, select **Show All Data** to display information for all connected products.

Chapter 9: Technical specification

Chapter contents

9.1 CP370

Physical specification

Dimensions	• **Width**: 299.4 mm (11.79 in). • **Height**: 204.9 mm (8.06 in). • **Height (including connectors)**: 284.9 mm (11.2 in). • **Depth**: 87.5 mm (3.45 in).
Weight	1.435 kg (3.16 lbs)

Power specification

Nominal supply voltage	12 V / 24 V dc
Operating voltage range	10.8 V to 31.2 V dc
Power consumption	30.6 W (Maximum)
Current	3 A RMS
Fuse / breakers	5 A

Environmental specification

Operating temperature	–10°C (14°F) to +55°C (131°F)
Storage temperature	–30°C (22°F) to +70°C (158°F)
Relative humidity	95%
Waterproof rating	IPX6

CP370 — Sonar specification

Channels	1
Frequency	50 kHz and 200 kHz
Power output	Up to 1 kW RMS (with suitable transducer)
Depth	0.9 m (3 ft) to 1524 m (5,000 ft) (In optimum conditions and depending on transducer connected)
Transducer	Transom-mount, in-hull, through-hull
Connections	• 1 x Power connection • 1 x network connection (RayNet connector) 10 / 100 Mb/s • 1 x Transducer connection

Conformance specification

Conformance	• EN 60945:2002 • EMC Directive 2004/108/EC • Australia and New Zealand: C-Tick, Compliance Level 2

9.2 CP470

Physical specification

Dimensions	• **Width**: 299.4 mm (11.79 in). • **Height**: 204.9 mm (8.06 in). • **Height (including connectors)**: 284.9 mm (11.2 in). • **Depth**: 87.5 mm (3.45 in).
Weight	1.539 kg (3.39 lbs)

Power specification

Nominal supply voltage	12 V / 24 V dc
Operating voltage range	10.8 V to 31.2 V dc
Power consumption	22 W Typical
Current	6 A Peak
Fuse / breakers	5 A

Environmental specification

Operating temperature	–20°C (–4°F) to +50°C (122°F)
Storage temperature	–30°C (22°F) to +70°C (158°F)
Relative humidity	95%
Waterproof rating	IPX6

CHIRP Sonar specification

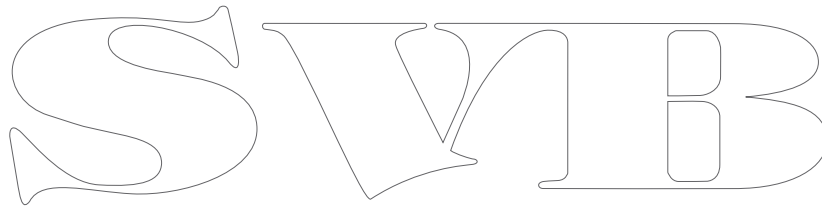| Frequency	25 kHz to 255 kHz
Pulse length	80 ms maximum
Maximum transmit rate	80 p/s
Power output	2 kW RMS (with suitable transducer)
Depth	0.6 m (2 ft) to 3048 m (10,000ft) (dependent on connected transducer)
Transducer	Transom-mount, in-hull, through-hull
Connections	• 1 x Power connection • 1 x Network connection (RayNet connector) 10 / 100 Mb/s • 1 x Transducer connection

Conformance specification

Conformance	• EN 60945:2002 • EMC Directive 2004/108/EC • Australia and New Zealand: C-Tick, Compliance Level 2

Chapter 10: Spares and accessories

Chapter contents

10.1 Spares and accessories

The following accessories and spare parts are available:

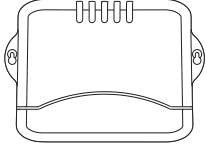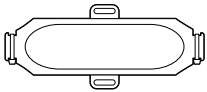| Item	CP370 Part number	CP470 Part number
1.5 m (5 ft) power cable	A80025	A80025
3 m (10 ft) transducer extension cable	E66074	A102148
5 m (16.4 ft) transducer extension cable	E66010	A102150
Dual transducer Speed / Temperature Y-cable adaptor	E66022	
Paired CHIRP transducer Y-cable adaptor		A102146

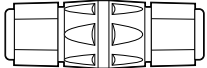## 10.2 Transducers

For a list of compatible transducers for the CP370 refer to 3.4 ClearPulse™ transducers.

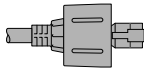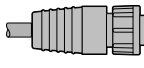For a list of compatible transducers for the CP470 refer to 3.5 CHIRP transducers.

10.3 Network hardware

Item	Part number	Notes
HS5 RayNet network switch	A80007	5–port switch for network connection of multiple devices featuring RayNet connectors. Equipment with RJ45 SeaTalk^{hs} connectors can also be connected using suitable adapter cables.
RJ45 SeaTalk^{hs} network switch	E55058	8–port switch for network connection of multiple SeaTalk^{hs} devices featuring RJ45 connectors.
RJ45 SeaTalk^{hs} crossover coupler	E55060	• Enables direct connection of RJ45 SeaTalk^{hs} devices to smaller systems where a switch is not required. • Enables the connection of RJ45 SeaTalk^{hs} devices to a HS5 RayNet network switch (in conjunction with suitable adapter cables). • Enables 2 RJ45 SeaTalk^{hs} cables to be connected together to extend the length of the cabling. Recommended for internal installations.
Ethernet RJ45 coupler	R32142	• Enables direct connection of RJ45 SeaTalk^{hs} devices to smaller systems where a switch is not required. • Enables the connection of RJ45 SeaTalk^{hs} devices to a HS5 RayNet network switch (in conjunction with suitable adapter cables). • Enables 2 RJ45 SeaTalk^{hs} cables to be connected together to extend the length of the cabling. Recommended for external installations.

10.4 Network cable connector types

There are 2 types of network cable connector — SeaTalk^{hs} and RayNet.

	SeaTalk^{hs} connector — used for connecting SeaTalk^{hs} devices to a Raymarine network switch via SeaTalk^{hs} cables.
	RayNet connector — used for connecting Raymarine network switches and SeaTalk^{hs} devices to the multifunction display via RayNet cables. Also required for connecting a crossover coupler if only one device is being connected to the display's Network connector.
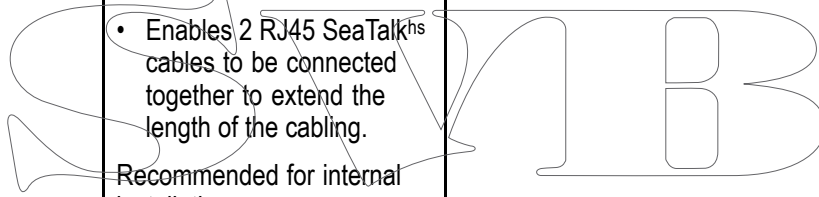
10.5 RayNet to RayNet cables and connectors

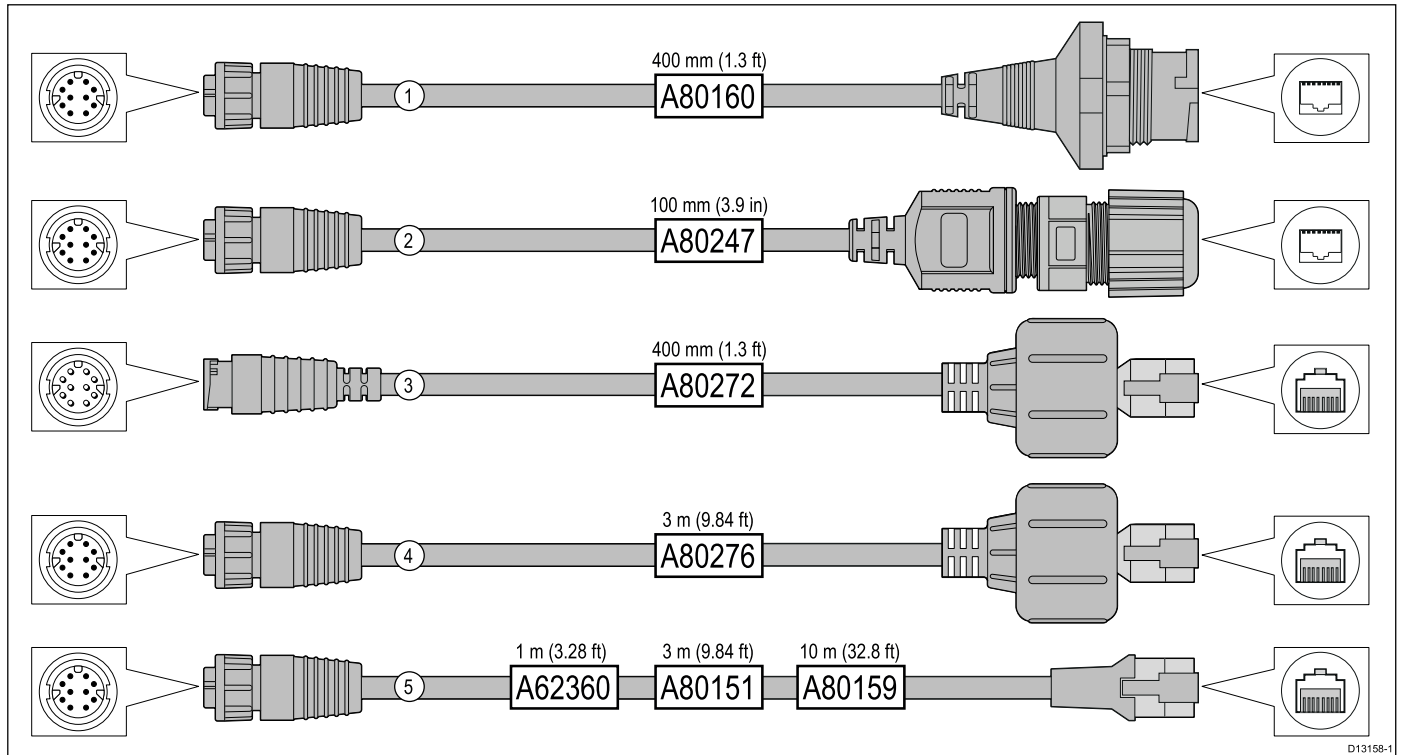|	Description	Typical use	Quantity
1	Standard **RayNet** connection cable with a **RayNet** (female) socket on both ends.	Suitable for connecting all **RayNet** equipment directly to **LightHouse** multifunction displays featuring a **RayNet** connector. Can also be used to connect **RayNet** equipment via a **RayNet** network switch (e.g. **HS5**).	1
2	**RayNet** cable puller (5 pack).	These "handles" securely attach to the twist-lock on **RayNet** cables, enabling you to pull the cables through conduits and other obstacles.	5
3	**RayNet** to **RayNet** right-angle coupler / adapter.	Suitable for connecting **RayNet** cables at 90° (right angle) to devices, for installations where space is limited. For example, use this adapter to connect a **RayNet** cable to a multifunction display when there is not enough space behind the display for the usual cable bend radius required by a standard RayNet cable. This adapter features a **RayNet** (female) socket at one end, and a **RayNet** (male) plug at the other end.	1
4	Adapter cable with a **RayNet** (male) plug on both ends.	Suitable for joining (female) **RayNet** cables together for longer cable runs.	1

10.6 RayNet to RJ45 adapter cables

	Description	Typical use	Quantity
1	Adapter cable with a **RayNet** (female) socket on one end, and a waterproof (female) socket on the other end accepting the following cables with an **RJ45 SeaTalkhs** waterproof **locking** (male) plug: • **A62245** (1.5 m). • **A62246** (15 m).	A typical use for this adapter cable is to connect a **DSM300** sonar module to a **LightHouse** MFD, using all-waterproof cable connections. This adapter cable will also accept the following **RJ45 SeaTalkhs** cables, although the **RJ45** plug that connects at the equipment end (e.g. **DSM300**) will NOT be waterproof: • **E55049** (1.5 m). • **E55050** (5 m). • **E55051** (10 m). • **A62135** (15 m). • **E55052** (20 m).	1
2	Adapter cable with a **RayNet** (female) socket on one end, and a waterproof (female) **RJ45** socket on the other end, along with a locking gland for a watertight fit.	Directly connect a Raymarine radar scanner with an **RJ45 SeaTalkhs** (male) cable to a **RayNet** network switch (e.g. **HS5**) or **LightHouse** MFD.	1
3	Adapter cable with a **RayNet** (male) plug on one end, and an **RJ45 SeaTalkhs** waterproof (male) plug on the other end.	Connect a legacy **G-Series GPM-400**, **C-Series** Widescreen or **E-Series** Widescreen MFD to a Raymarine radar scanner supplied with a **RayNet** power / data cable.	1
4	Adapter cable with a **RayNet** (female) socket on one end, and an **RJ45 SeaTalkhs** waterproof (male) plug on the other end.	Connect a legacy **G-Series GPM-400**, **C-Series** Widescreen or **E-Series** Widescreen MFD to a **RayNet** network switch (e.g. the **HS5**).	1
5	Adapter cable with a **RayNet** (female) socket on one end, and an **RJ45 SeaTalkhs** (female) socket on the other end.	Connect a **LightHouse** MFD to a legacy **SR6** switch / weather receiver or a legacy 8–port **SeaTalkhs** network switch. Another common use for the cable is in conjunction with a crossover coupler (**E55060** or **R32142**) to connect Raymarine products with an **RJ45** connection (e.g. radar scanner, thermal camera or **DSM300**) to a **LightHouse** MFD or **RayNet** network switch (e.g. the **HS5**).	1

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