ST70 Instrument
Installation Guide

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Contents

Preface

Warnings and cautions

⚠ **WARNING: Product installation and operation**
This equipment must be installed, commissioned and operated in accordance with the Raymarine instructions provided. Failure to do so could result in personal injury, damage to your boat and/or poor product performance. Before you install the ST70 instrument, check that individual components are the correct voltage for your boat's supply.

⚠ **WARNING: Electrical safety**
Make sure you have switched off the power supply before you start installing this product.

⚠ **WARNING: Navigational safety**
Although we have designed this product to be accurate and reliable, many factors can affect its performance. Therefore, it should serve only as an aid to navigation and should never replace commonsense and navigational judgement. Always maintain a permanent watch so you can respond to situations as they develop.

Electromagnetic Compatibility (EMC) conformance

Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations for use in the recreational marine environment. Correct installation is required to ensure that EMC performance is not compromised.

Always check the installation before going to sea to make sure that it is not affected by radio transmissions, engine starting or other forms of interference.

To do this:

1. Turn on all transmitting equipment (radar, VHF radio, etc).
2. Check that all electronic systems are unaffected by interference from the transmitting equipment.

EMC installation guidelines

Raymarine equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations. This minimizes electromagnetic interference between equipment, which could otherwise affect the performance of your system.

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

For **optimum** EMC performance, we make the following recommendations:

- Place Raymarine equipment and cables at least 3 ft (1 m) from any equipment that transmits, or cables that carry, radio signals from VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 7 ft. (2 m).
- Place Raymarine equipment and cables more than 7 ft (2 m) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- Use a power source separate 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.
- Use Raymarine-specified cables.
- Do not cut or extend cables unless doing so is detailed in the installation manual.

Remember

Where constraints on the installation prevent any of the above recommendations:

- Always allow the maximum separation possible between different items of electrical equipment.

This will provide the best conditions for good EMC performance of the installation.

Suppression ferrites

Raymarine cables may be fitted with suppression ferrites. These are necessary for correct EMC performance. Any ferrite removed during installation must be replaced as soon as installation is complete.

Use only ferrites of the correct type, supplied by Raymarine authorized dealers.

Connections to other equipment

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

EMC Servicing and maintenance

- Undue noise and interference may be a symptom of an EMC-related problem. Please report any EMC-related problem to your nearest Raymarine dealer. We use such information to improve our quality standards.
- To minimize any EMC related problems and ensure the best possible performance form your Raymarine equipment, follow the guidelines given in the installation instructions.

Product documents

The following user documents are available to help you install and operate an ST70 instrument controller:

- ST70 Instrument Installation Guide (this document).
- ST70 Instrument Operating Guide.This is a detailed manual supplied with your ST70 instrument. It contains important commissioning instructions.
- SeaTalk^{ng} Reference Manual. This provides detailed information regarding SeaTalk^{ng} connectivity.

To the best of our knowledge, the information in the product documents was correct when they went to press. However, Raymarine cannot accept liability for any inaccuracies or omissions in product documents.

In addition, our policy of continuous product improvement may change specifications without notice. Therefore, Raymarine cannot accept liability for any differences between the product and the accompanying documents.

Product disposal

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

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

The crossed out wheelie bin symbol, illustrated above, and found on our products signifies that this product should not be disposed of in general waste or landfill.

Please contact your local dealer, national distributor or Raymarine Technical Services for information on product disposal.

Chapter 1:   Before you begin

The ST70 instrument must be installed correctly. For a safe and successful installation, we recommend a certified installation.

1.1   Installation overview

The key steps in the procedure are as follows:

Planning
1. Plan your system.
2. Decide where to locate the ST70 instrument.
3. Check parts.

Installing
1. Mount and connect the instrument.
2. Install the transducers.
3. Fix equipment in place.
4. Commission the instrument before use.

1.2   Certified installation

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

1.3   Getting assistance

Should you require further assistance with your installation, please refer to your dealer or visit the Raymarine web site: www.raymarine.com.
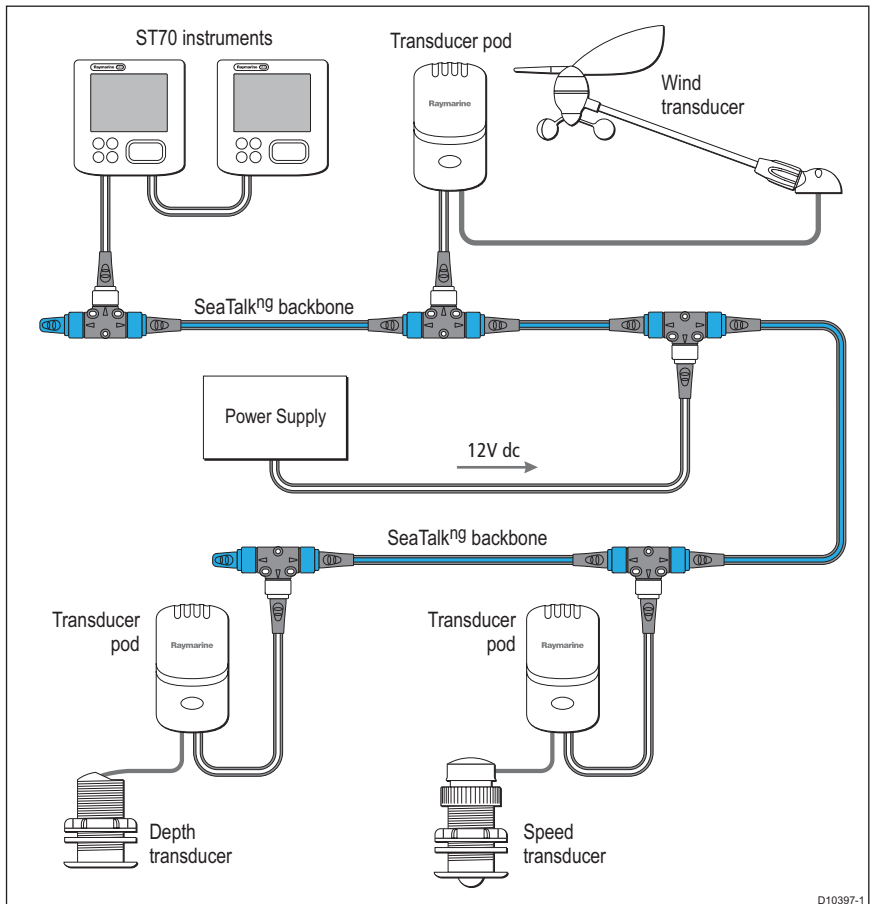
Chapter 2: Planning

2.1 System overviews

The ST70 instrument is connected to the boat's data system, which could be SeaTalk^{ng} or SeaTalk.

SeaTalk^{ng}

In a SeaTalk^{ng} system, instruments and transducer pods are connected to the SeaTalk^{ng} backbone using spur cables. For more detailed connectivity information, refer to the SeaTalk^{ng} System Installation Guide.

Note: *See page 7 for information about additional SeaTalk^{ng} cables and accessories, including the SeaTalk^{ng} backbone kit.*

SeaTalk

In a SeaTalk system, the ST70 instrument is connected to existing instruments using a SeaTalk^{ng} to SeaTalk adapter cable; wind, speed and depth transducers are connected directly to instruments.
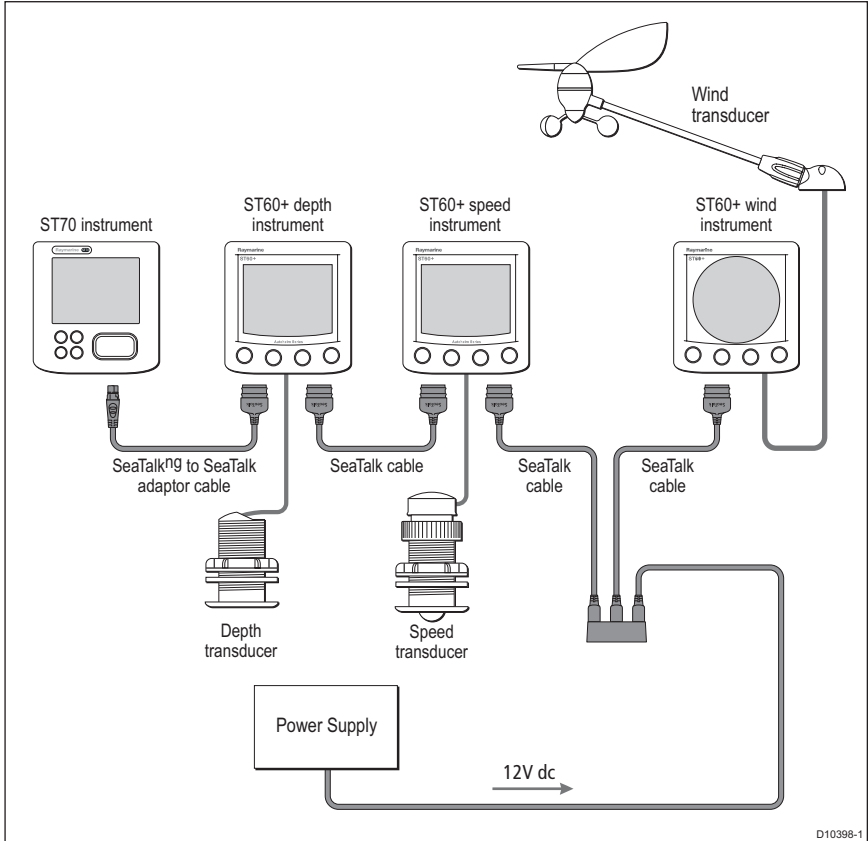
2.2   Positioning the ST70 instrument

CAUTION: Instruments must be placed a safe distance from equipment that could adversely effect their performance. Refer to the EMC guidelines on *page v.*

- There must be sufficient space to mount the instrument.
- The connection point should be within 400mm of the install location (unless you are using an extension cable). In a SeaTalk^{ng} network, the connection point will be a T-piece or connector block on the backbone cable, or another ST70 instrument; on SeaTalk, the connection point will be an existing instrument, or a connector block on the system.
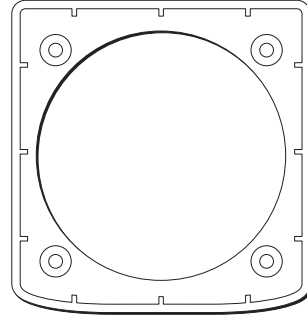- Any holes cut to mount the instrument must not compromise the vessel's structure.

ST70 dimensions

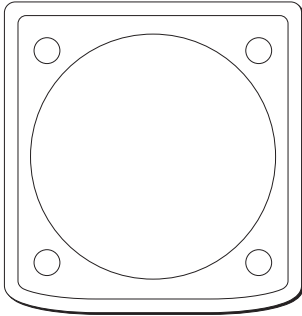D10400-1
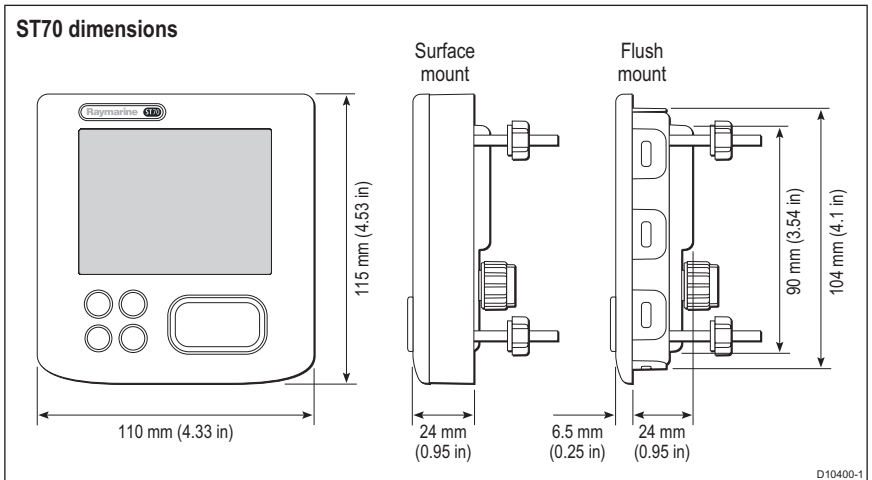
2.3 Parts supplied

ST70 instrument parts supplied

ST70 instrument (Part Number E22105)
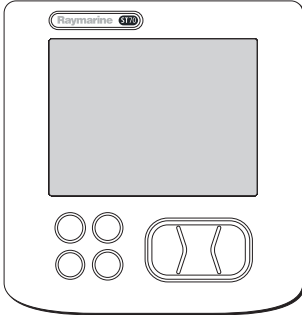
Mounting bracket (Part Number R28199)

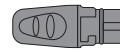Panel seal (Part Number R28200)

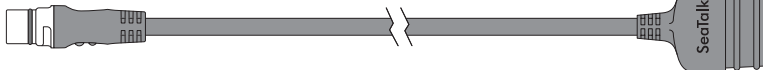Sun cover (Part Number R28198)

Raymarine

Stud (x 4)

Finger nut (x 4)

SeaTalk^{ng} blanking plug
(Part Number A06032)

SeaTalk^{ng} 400 mm cable (Part Number A06038)

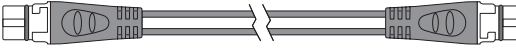SeaTalk^{ng} to SeaTalk 400 mm cable (Part Number A06047)
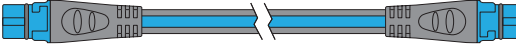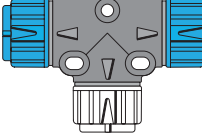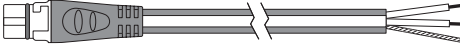
SeaTalk

D10399-1

2.4   Parts not supplied

ST70 instruments are connected to a SeaTalk or SeaTalk[ng] data system. To install the instrument to your system correctly, you may require additional cables and connectors.

Optional cabling and connectors

Depending on the location of your ST70 instrument, you may require a longer cable to connect it to the SeaTalk[ng] backbone cable.The backbone cable is supplied as part of a standard kit. Detailed information on SeaTalk[ng] connectivity is available in the SeaTalk[ng] System Installation Guide supplied with the SeaTalk[ng] backbone kit. For further information, talk to you dealer or visit the Raymarine website: www.raymarine.com.

Spur cable	Part number
	A06038 - 1 ft 3 in (400 mm)
	A06034 - 3 ft 3 in (1 m)
	A06035 - 9 ft 10 in (3 m)
	A06036 - 16 ft 4 in (5 m)
	A06067 - 65 ft 7 in (20 m)

Backbone kit	A25062
	Backbone cable - 16 ft 4 in (5 m), (x 2) 65 ft 7 in (20 m)
	T piece, (x 4)
	Backbone terminator, (x 2)
	Power cable

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Chapter 3: Installation

Read *Planning* on *page 3* of this guide before you install the instrument. It helps you to:

- Ensure you have all the correct equipment.
- Identify the install location and appropriate network connection point.

⚠️ **WARNING: Electrical safety**
Before you make any electrical connections, ensure the power supply is switched off and you have read the EMC installation guidelines (see *page v***). For safety, your boat must be at dockside before you begin installation.**

3.1 Install the instrument

Once you are certain it is safe to proceed, follow the installation procedure below.

1. Fit cable to system connection point and route to ST70 instrument location
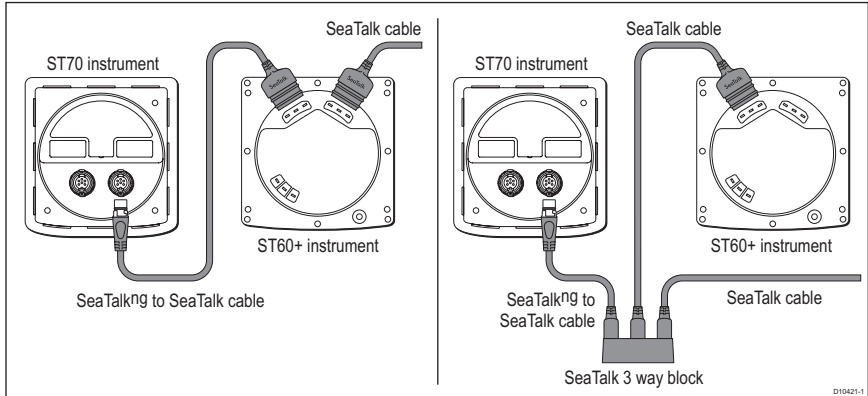
For SeaTalk^{ng}:

- Label both ends of the SeaTalk^{ng} cable, and attach it to the backbone or an existing ST70 instrument on your system.
- Route the cable to the location in which you plan to mount the ST70 instrument.
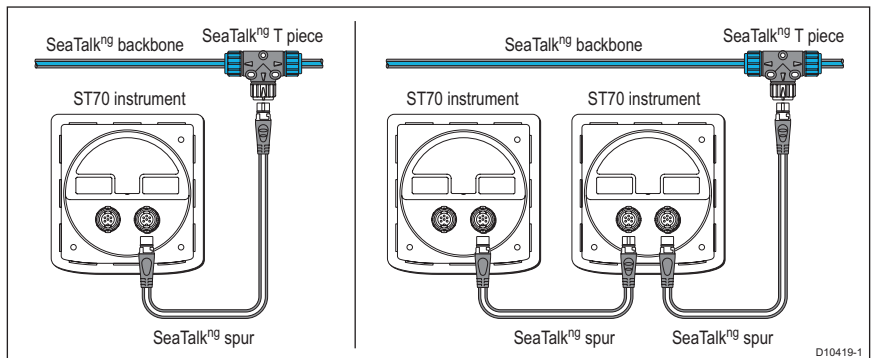
For SeaTalk:

- Label both ends of the SeaTalk^{ng}-to-SeaTalk adaptor cable, and attach it to an existing instrument or connect it to a connector block on the system.
- Route the cable to the location in which you plan to mount the ST70 instrument.

Note: *Check that the cable reaches the required location. If you wish to place the ST70 instrument further than 400mm from the connection point you will need to purchase an appropriate SeaTalk^{ng} or SeaTalk^{ng}-to-SeaTalk cable. See* page 7.

2. Cut mounting holes

- Use the appropriate flush- or surface-mount template to cut the mounting slot for the instrument and to drill holes for the fixing screws. See the back of this book for templates.
- Clean and de-burr the mounting surface.

3. Fit gaskets and brackets

Note: *Stick the self-adhesive side of the gasket to the instrument, NOT to the mounting location.*

Surface mounting

self adhesive
side

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Flush mounting

self adhesive
side

D10403-1
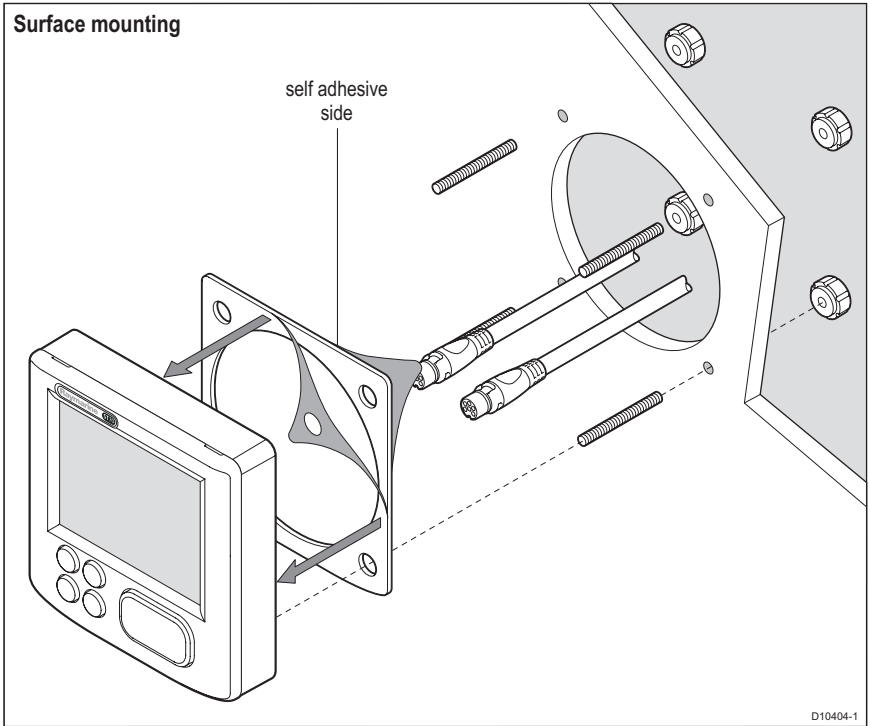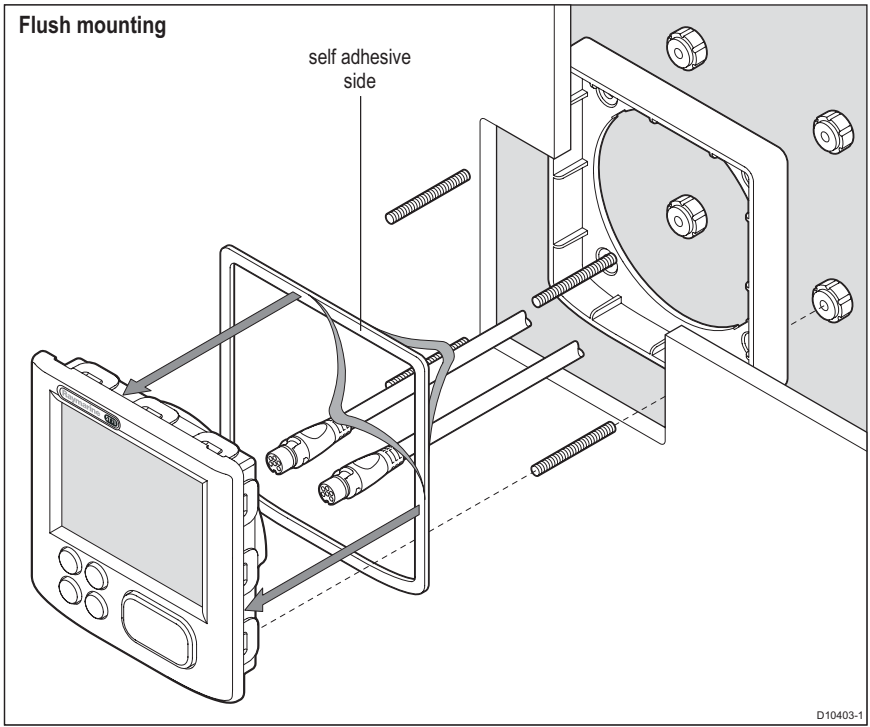
4. Attach connection cable to the instrument

2. Ensure cable end connector is correctly oriented, then fully insert

1. Rotate collar to UNLOCKED position

3. Rotate collar clockwise (2 clicks) until it snaps into the LOCKED position

D10422-1
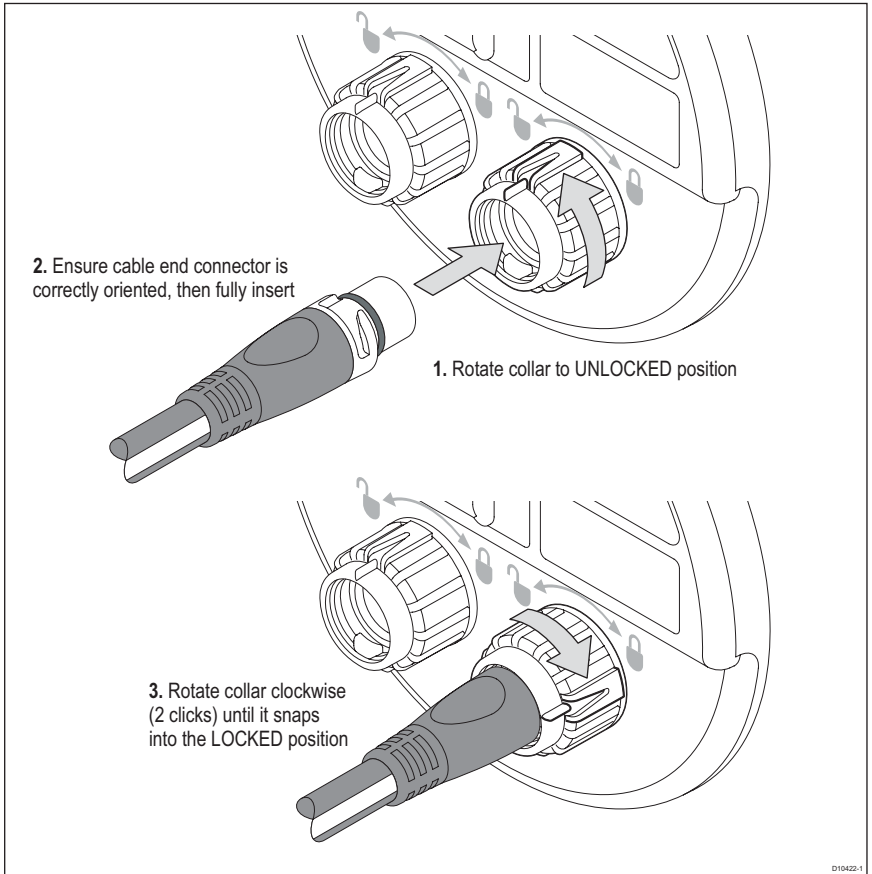
3.2 Install transducers

Transducers and pods are available for wind, depth and speed. For detailed installation instructions refer to documentation supplied with pods.

SeaTalk^{ng}

- Fit transducers to pods. Pod terminals are color-coded, so ensure that each wire is connected to the correspondingly-colored connector.
- Fit each pod to the SeaTalk^{ng} backbone using the 400mm SeaTalk^{ng} spur cable supplied with each pod. Pods must be located no further than 400mm from their corresponding connection points on the backbone.
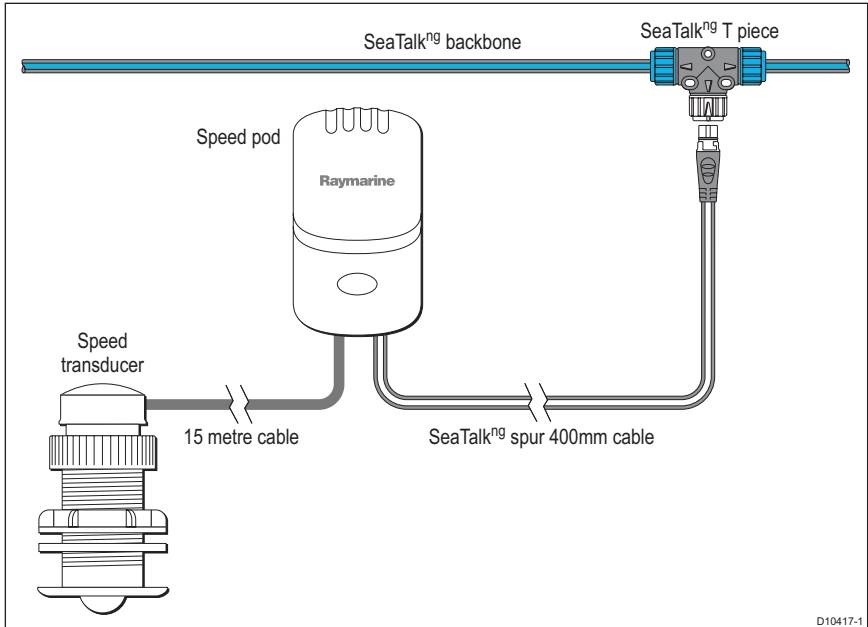
SeaTalk

CAUTION: Using the wrong type of pod could cause damage to your equipment. Before you connect a transducer to a pod, ensure that you are using the correct type of pod (speed pod for a speed transducer or depth pod for a depth transducer, for example).
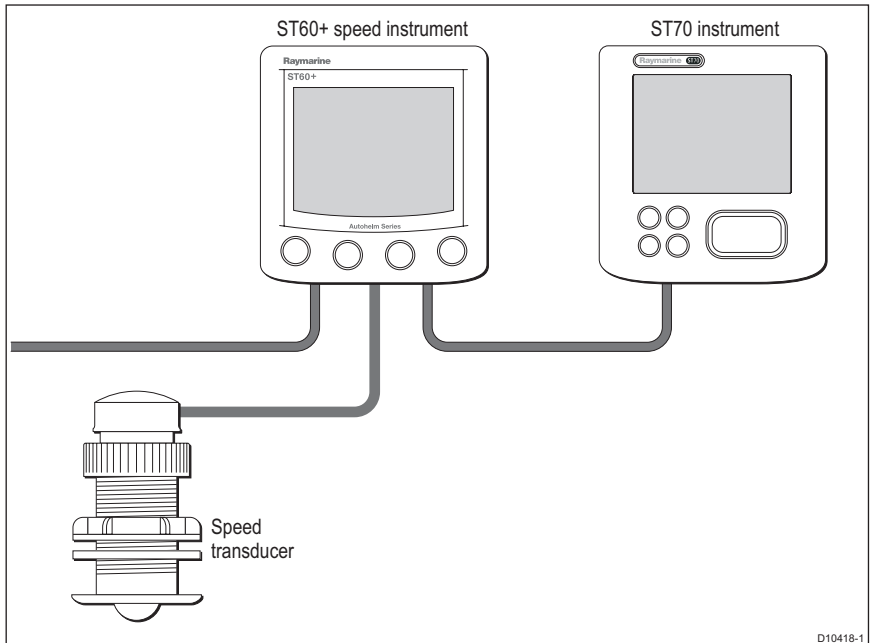
- Fit the appropriate transducer directly to its corresponding instrument as shown. Pod connectors are color-coded. Ensure that each wire is connected to its corresponding connector.

3.3 Final fix

- Ensure the controller is mounted securely.

3.4 Commission the instrument

The instrument must be commissioned before you use. For new systems this involves calibrating the instrument, which is a **safety-critical** action. Refer to the ST70 Instrument Reference Manual for instructions.

Chapter 4: Technical specifications

Supply voltage	12 V dc (nominal) 16 V dc (maximum) 9 V dc (minimum)
Current	Nominal: dependent upon screen brightness Maximum: not more than 220 mA
Physical dimensions (excluding studs)	4.33(W) x 4.53 (H) x 1.28 (D) 110 mm x 115 mm x 32.5 mm
Weight	250 g (approx.)
Connections	Two SeaTalk^{ng}
Operating temperature	-20ºC to +70ºC
Illumination	Sliding scale
Compliances	RoHS; EMC EN60945 Revision 4
Buzzer	Monotone buzzer
Load Equivalency Number (LEN)	5

Note: *System components have a Load Equivalency Number (LEN), which contributes to the overall system load. Your system has a maximum load capacity, which must not be exceeded. For more detailed information on SeaTalk^{ng} system capacity refer to the SeaTalk^{ng} Reference Manual.*

Chapter 5: Templates

UP

ST70
FLUSH MOUNT
Template

Remove
material
from shaded
area only

Drill hole,
9/32 in (7 mm)
diameter in
4 positions

4.1 in (104 mm)

3.9 in (99 mm)

Instrument edge

Sun cover edge

D10405-1

UP

ST70
SURFACE MOUNT
Template

Cut hole
3.54 in (90 mm)
diameter

**Remove material
from shaded
area only**

1.53 in (38.89 mm)

1.53 in (38.89 mm)

Drill hole,
3/16 in
(5 mm)
diameter in
2 positions

1.53 in (38.89 mm)

1.53 in (38.89 mm)

Instrument edge

Sun cover edge

D10406-1