Raymarine®

HD DIGITAL RADOME

Installation instructions

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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.

Warning: Power supply voltage

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

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.

Caution: Power supply protection

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

Warning: High voltage

This product contains high voltage. Do NOT remove covers or attempt to access internal components, unless specifically instructed in the documentation provided.

Warning: Radio frequency radiation hazard

The radar scanner transmits electromagnetic energy at microwave frequencies which can be harmful, particularly to the eyes. Do NOT look at the scanner from close range. Ensure personnel are clear of the scanner when it is powered on.

For safety reasons, the radar must be installed above head height, out of range of personnel.

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.

Transmitted power density levels

- A power density level of 10 W/m^2 is likely at distances of 34 cm or less from the radar scanner.
- A power density level of 100 W/m^2 does not occur at any point.

IEEE statement

IEEE C95.1 – 2005 – Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

ICNIRP Guidelines

When properly installed and operated, the use of this Radar conforms to: ICNIRP Guidelines 1998 - International Commission on Non-Ionising Radiation Protection: Guidelines for limiting exposure to time-varying electric, magnetic and electro-magnetic fields (up to 300 GHz) 1998.

Water ingress

Water ingress disclaimer

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

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 (3.3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (6.6 ft).

  - More than 2 m (6.6 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.

Compass safe distance

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

When choosing a suitable location for the product you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3.3 ft) in all directions. However for some smaller vessels it may not be possible to locate the product this far away from a compass. In this situation, when choosing the installation location for your product, ensure that the compass is not affected by the product when it is in a powered state.

EMC 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.

Connections to other equipment

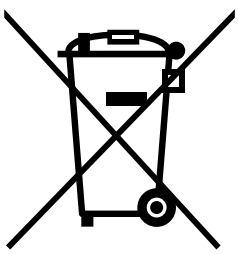
Requirement for ferrites on non-Raymarine cables

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.

Product disposal

Dispose of this product in accordance with the WEEE Directive.

The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment which contains materials, components and substances that may be hazardous and present a risk to human health and the environment when WEEE is not handled correctly.



Equipment marked with the crossed-out wheeled bin symbol indicates that the equipment should not be disposed of in unsorted household waste.
Local authorities in many regions have established collection schemes under which residents can dispose of waste electrical and electronic equipment at a recycling center or other collection point.
For more information about suitable collection points for waste electrical and electronic equipment in your region, refer to the Raymarine website: www.raymarine.eu/recycling.

Warranty registration

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

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

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.

Radar licensing

Installation and operation of this radar may be subject to individual licensing of the equipment, operator or vessel. You are strongly advised to check with the requirements of the licensing authority of your national administration. In case of any difficulties, contact your local Raymarine dealer.

FCC Notice - Radar

Changes or modifications to this equipment not expressly approved in writing by Raymarine Incorporated could violate compliance with FCC rules and void the operator's authority to operate the equipment.

MSIP Warning Statement for Radio Devices (Korea only)

- 제작자 및 설치자는 해당 무선설비가 전파혼신 가능성이 있으므로 안전 인명과 관련된
- 서비스는 할 수 없음을 사용자 설명서 등을 통하여 운용자 및 사용자에게 충분히 알릴 것
- 법에 의해 전 방향 전파 발사 및 동일한 정보를 동시에 여러 곳으로 송신하는 점-대-다지점 서비스에의 사용은 금지되어 있습니다.

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.

Operation instructions

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

All product documentation is available to download from the Raymarine website: www.raymarine.com/manuals.

Chapter 2: Product and system overview

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- 2.1 Introduction on page 14
- 2.2 Display compatibility on page 14

2.1 Introduction

This user guide describes how to install, connect and maintain your HD Digital Radome Antenna. The models covered are:

- RD418HD - 18” 4 kW Digital Radome Antenna.
- RD424HD - 24” 4 kW Digital Radome Antenna.

When properly installed and operated, the use of this radar conforms to:

- IEEE C95.1 - 2005 - Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- ICNIRP Guidelines 1998 - International Commission on Non-Ionising Radiation Protection: Guidelines for limiting exposure to time-varying electric, magnetic and electro-magnetic fields (up to 300 GHz) 1998.

The HD Digital Radome Antenna is designed and manufactured to meet the rigorous demands of the marine environment. However, it must be installed, operated and maintained properly. Please carefully read and follow the recommended procedures in this user guide.

2.2 Display compatibility

Connection via RayNet	**Connection via SeaTalkhs**
a Series LightHouse MFD	E-Series Classic E80, E120
c Series LightHouse MFD	G-Series (GPM400)
e Series LightHouse MFD	C-Series Widescreen C90W, C120W, C140W
eS Series LightHouse MFD	E-Series Widescreen E90W, E120W, E140W
gS Series LightHouse MFD	
Axiom / Axiom+ LightHouse 3 MFD	
Axiom Pro / Pro-S LightHouse 3 MFD	
Axiom XL LightHouse 3 MFD	

Display software

After installing a Digital Radar scanner, i.e. before it is used, you must ensure that any associated multi-function display (MFD) is using the **latest** software version.

To check the MFD software version, switch on the MFD and check the version number on the navigation warning screen. Note that if a scanner is not connected, the version number will only be displayed for 10 seconds.

You can download the latest MFD software, from the Raymarine website, at www.raymarine.com/software. Information on how to update the MFD software, is also available on the Raymarine website. Additional support information is available from Raymarine technical support.

Chapter 3: Parts supplied

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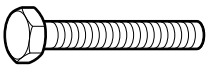
- 3.1 Parts Supplied on page 16

3.1 Parts Supplied

Check that you have been supplied with the following parts:

Radome Antenna

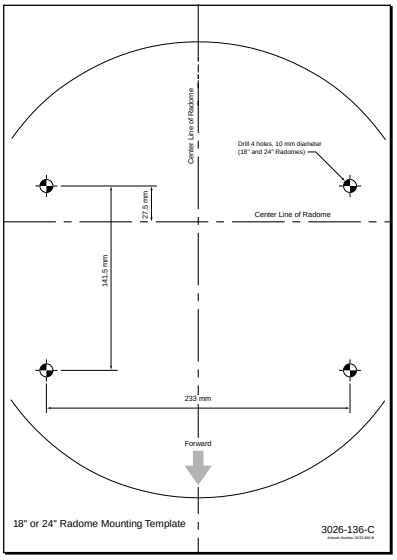


M8 bolt (x4)

Spring washer (x4)

Flat washer (x4)

Denso Paste



Installation template

D11693-1

Chapter 4: Product dimensions

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- 4.1 Dimensions - 18 inch antenna on page 18
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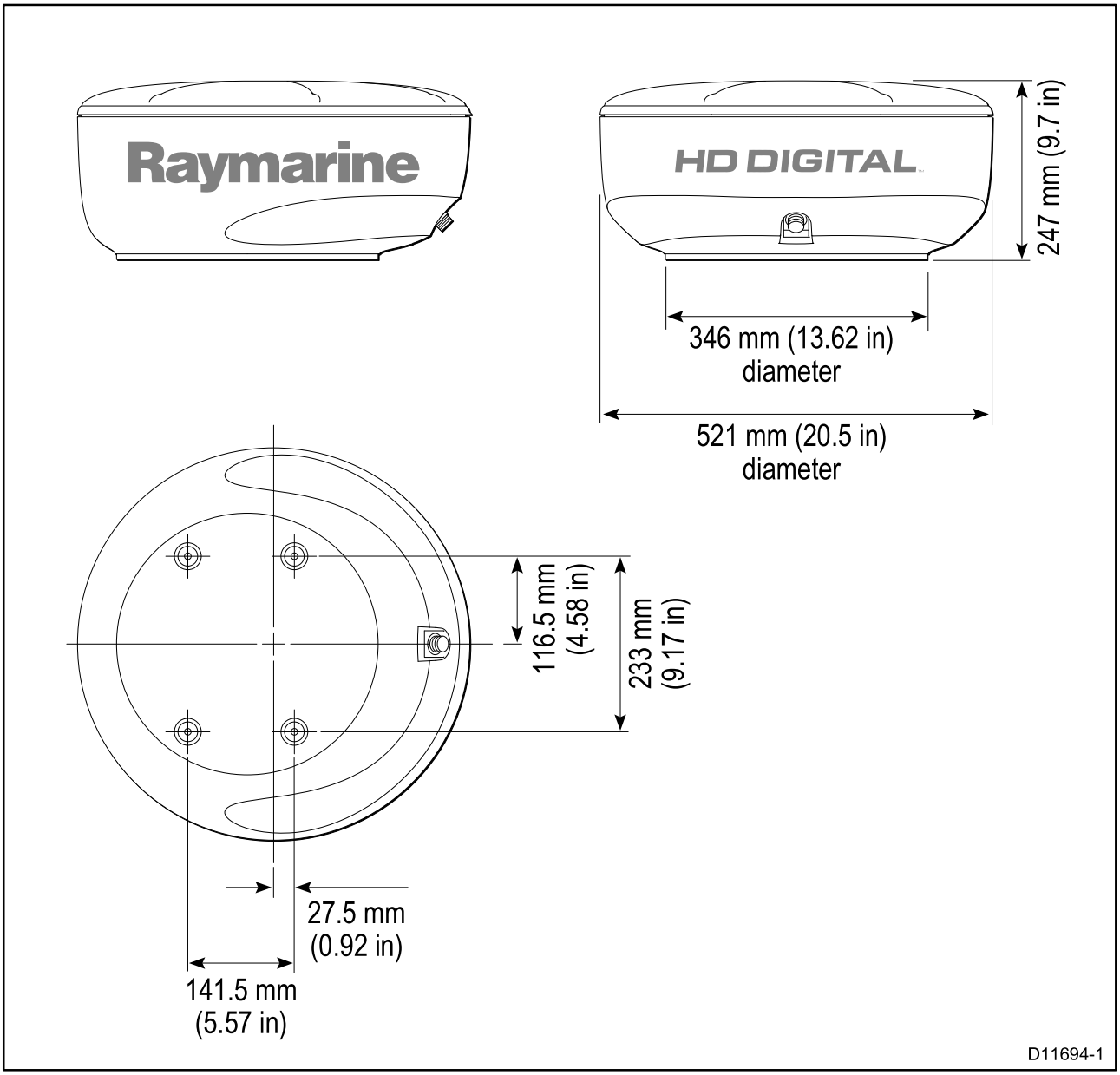
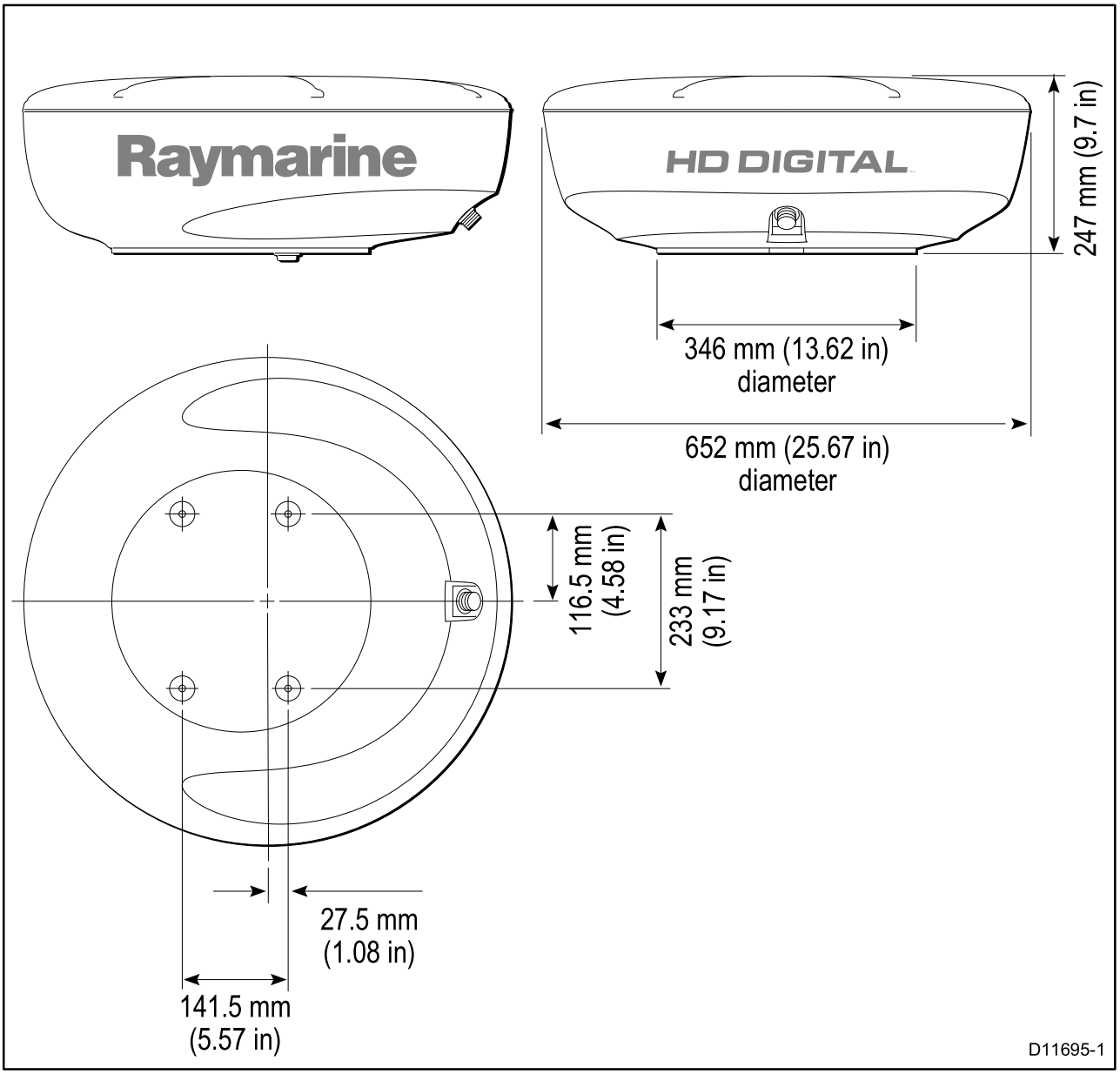
4.1 Dimensions - 18 inch antenna



4.2 Dimensions - 24 inch antenna



Chapter 5: Location requirements

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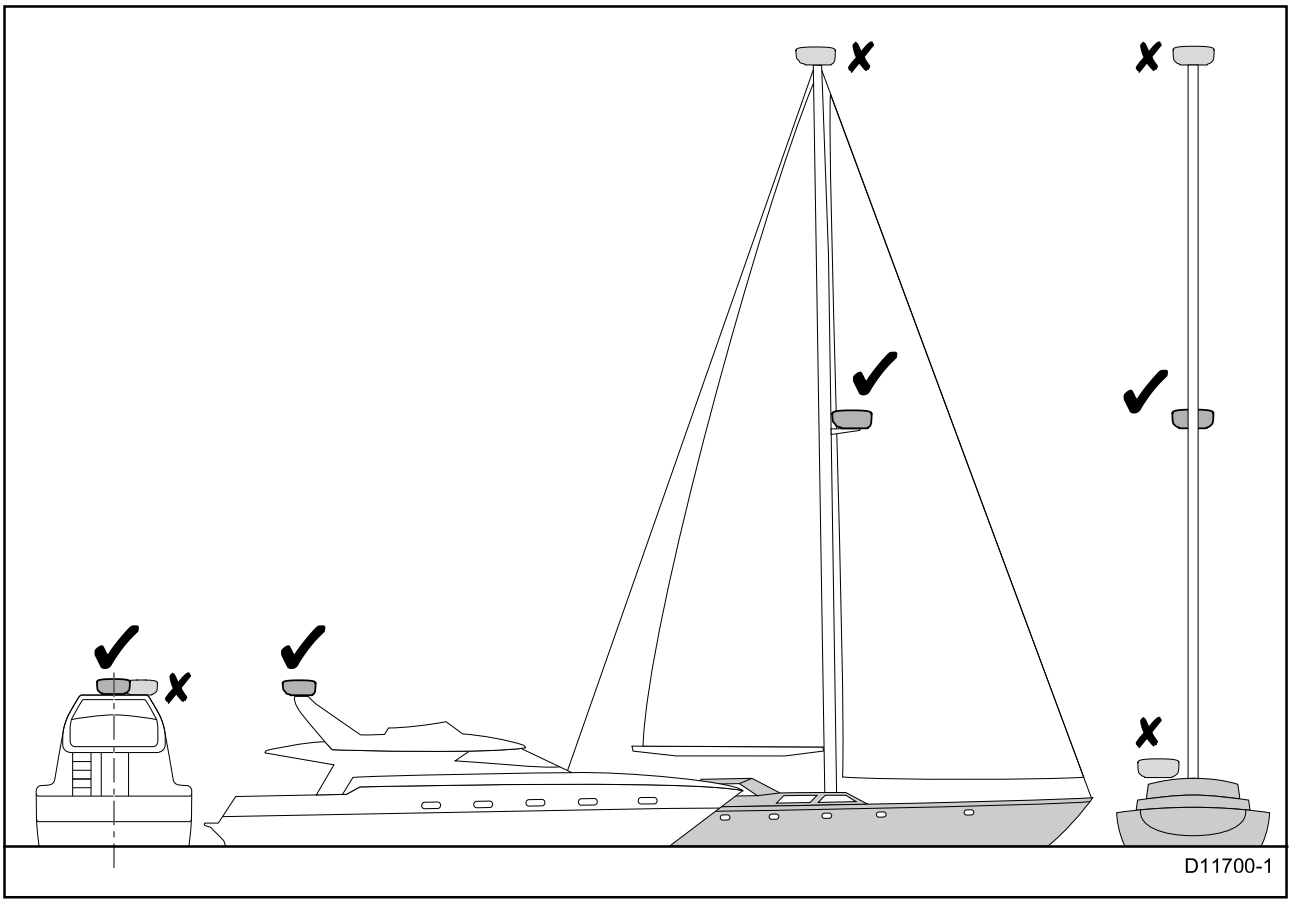
- 5.1 Antenna Position on page 22
- 5.2 Compass safe distance on page 24
- 5.3 EMC installation guidelines on page 24

5.1 Antenna Position

The optimum height for the HD Digital Radome Antenna (the antenna) is a location that is high enough above the waterline to give a long range line-of-sight to the horizon, but not so high as to be adversely affected by the boat's pitching and rolling.



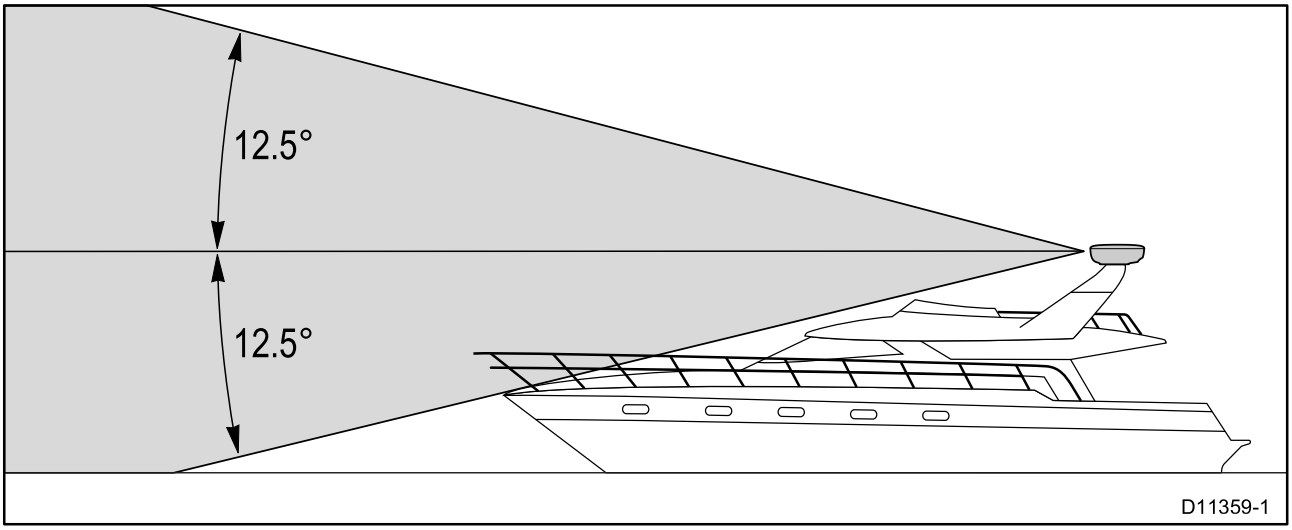
The antenna must also be mounted where it is:

- Above head height.
- Easily accessible.
- As near as possible to the boat's centerline.
- On a rigid and stable platform, capable of securely supporting the antenna under seagoing conditions.
- Clear of large objects such as the flybridge, large engine stacks, searchlights, horns, masts etc.
- Clear of heat and fumes.
- At least 1 m (3.3 ft) from a magnetic compass or other antennae.

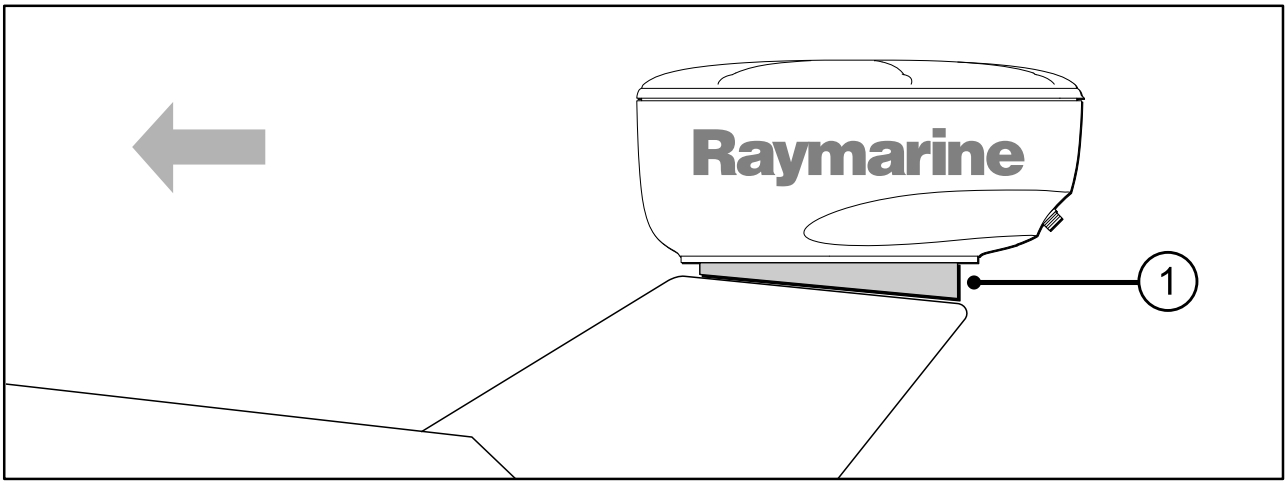
Radar scanner mounting angle

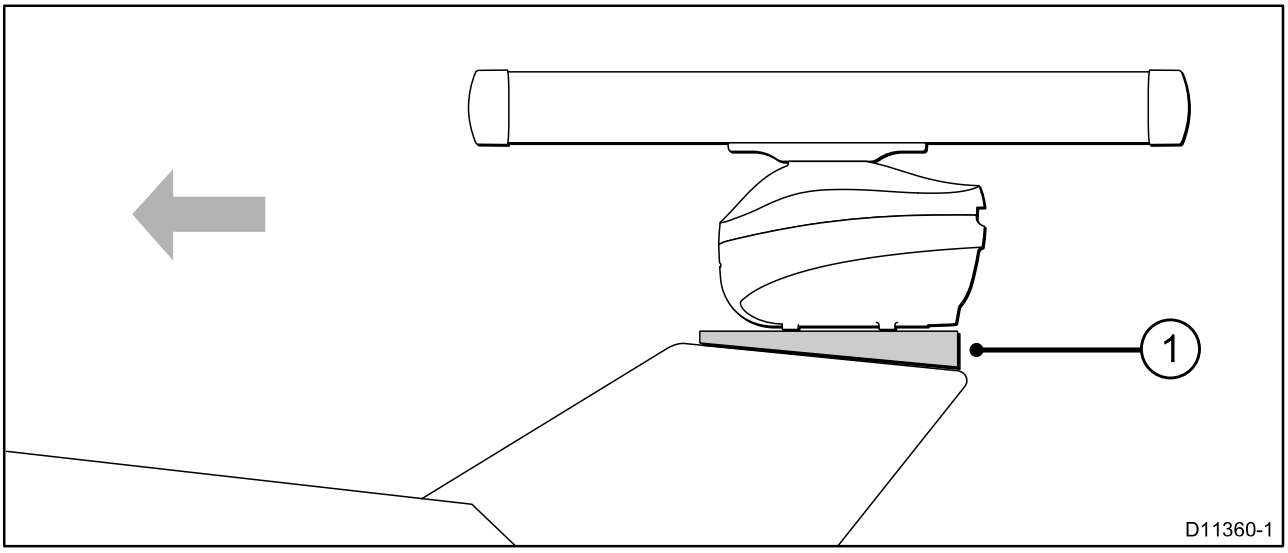
Ensure the radar scanner rotates parallel to the water line.

The radar beam from the radar scanner is approximately 25° wide in the vertical direction, to give good target detection even when your vessel pitches and rolls.



Planing hull vessels, and some displacement hull vessels, adopt a higher bow angle when the vessel is at cruising speed. This may raise the radar's main radiation angle, and can cause poor detection of nearby targets. It may be necessary to compensate for the bow rise to ensure optimum target detection. This can be achieved by fitting a wedge or washers between the mounting platform and the base of the radar scanner, so that the radar beam remains parallel to the water line when the vessel's bow rises at cruising speed.





Item	Description
1	Wedge or washers

5.2 Compass safe distance

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

When choosing a suitable location for the product you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3.3 ft) in all directions. However for some smaller vessels it may not be possible to locate the product this far away from a compass. In this situation, when choosing the installation location for your product, ensure that the compass is not affected by the product when it is in a powered state.

5.3 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 (3.3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (6.6 ft).
  - More than 2 m (6.6 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.

Chapter 6: Typical system examples - RayNet displays

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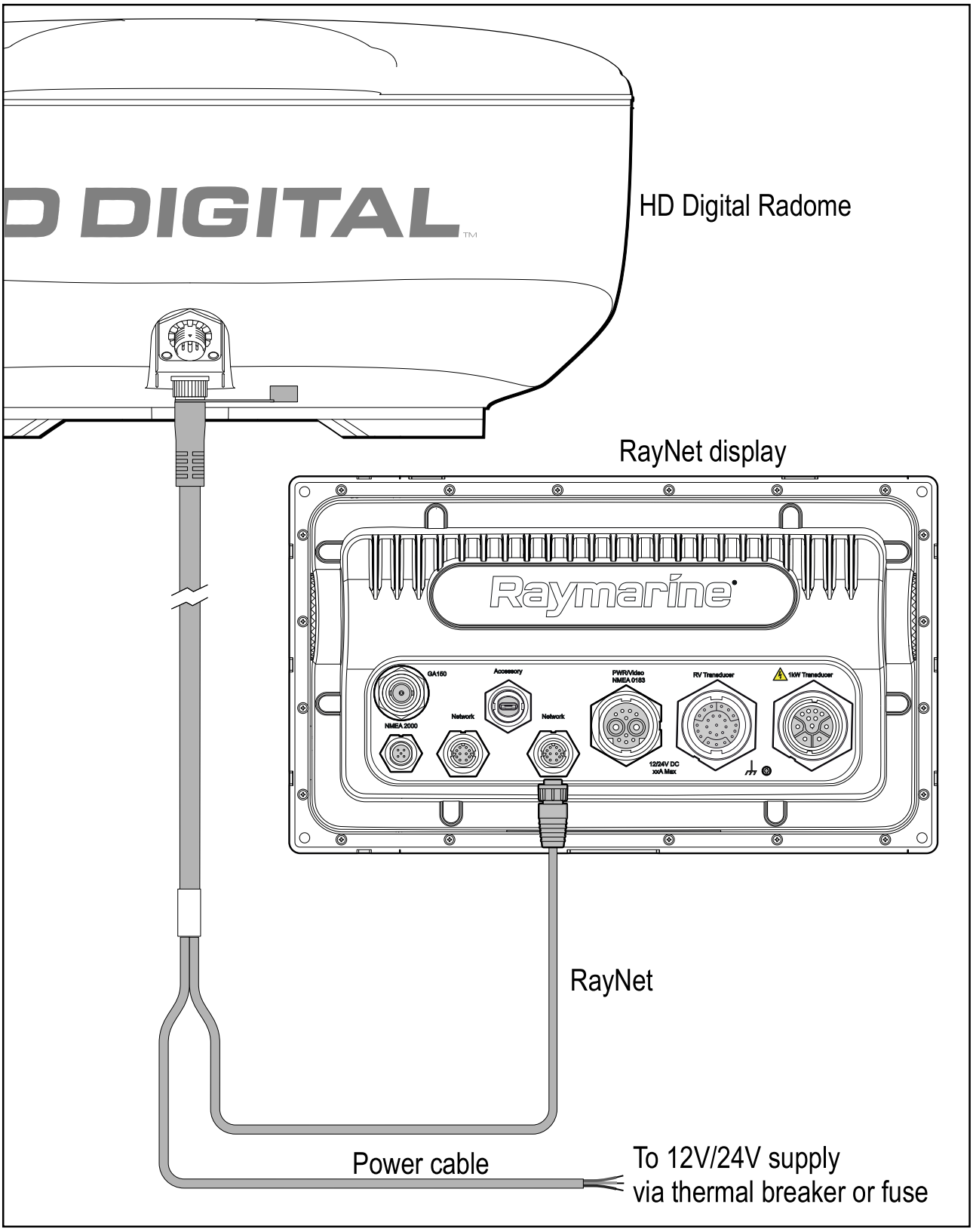
- 6.1 Direct connection to RayNet display on page 26
- 6.2 Connection to networked RayNet displays on page 27

6.1 Direct connection to RayNet display

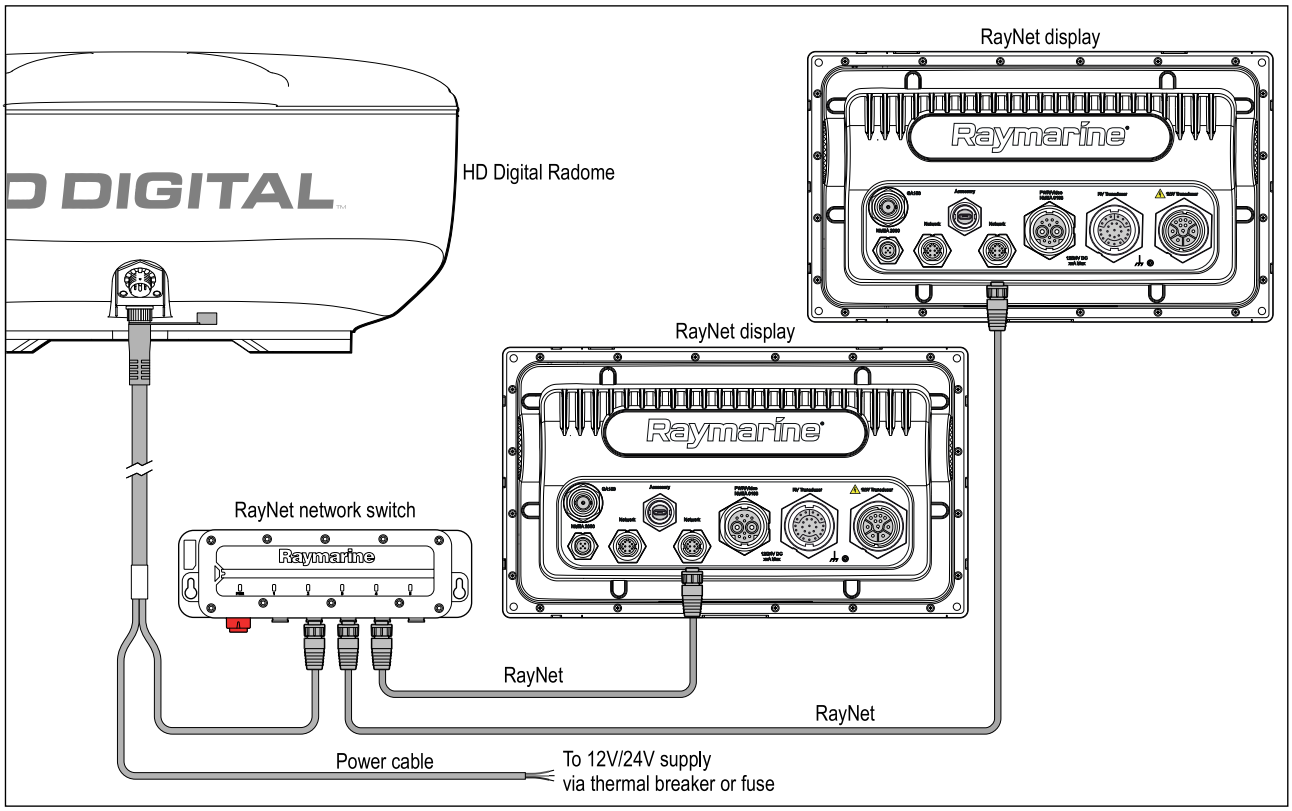
You need a digital cable, to connect both power and data to the HD Digital Radome Antenna. Depending on your product variant, it may or may not be supplied with a digital cable.



For information on suitable cables, refer to: **p.44 — Cables**

6.2 Connection to networked RayNet displays

You need a digital cable, to connect both power and data to the HD Digital Radome Antenna. Depending on your product variant, it may or may not be supplied with a digital cable.



For information on suitable cables, refer to: **p.44 — Cables**

Chapter 7: Typical system examples - legacy SeaTalkhs displays

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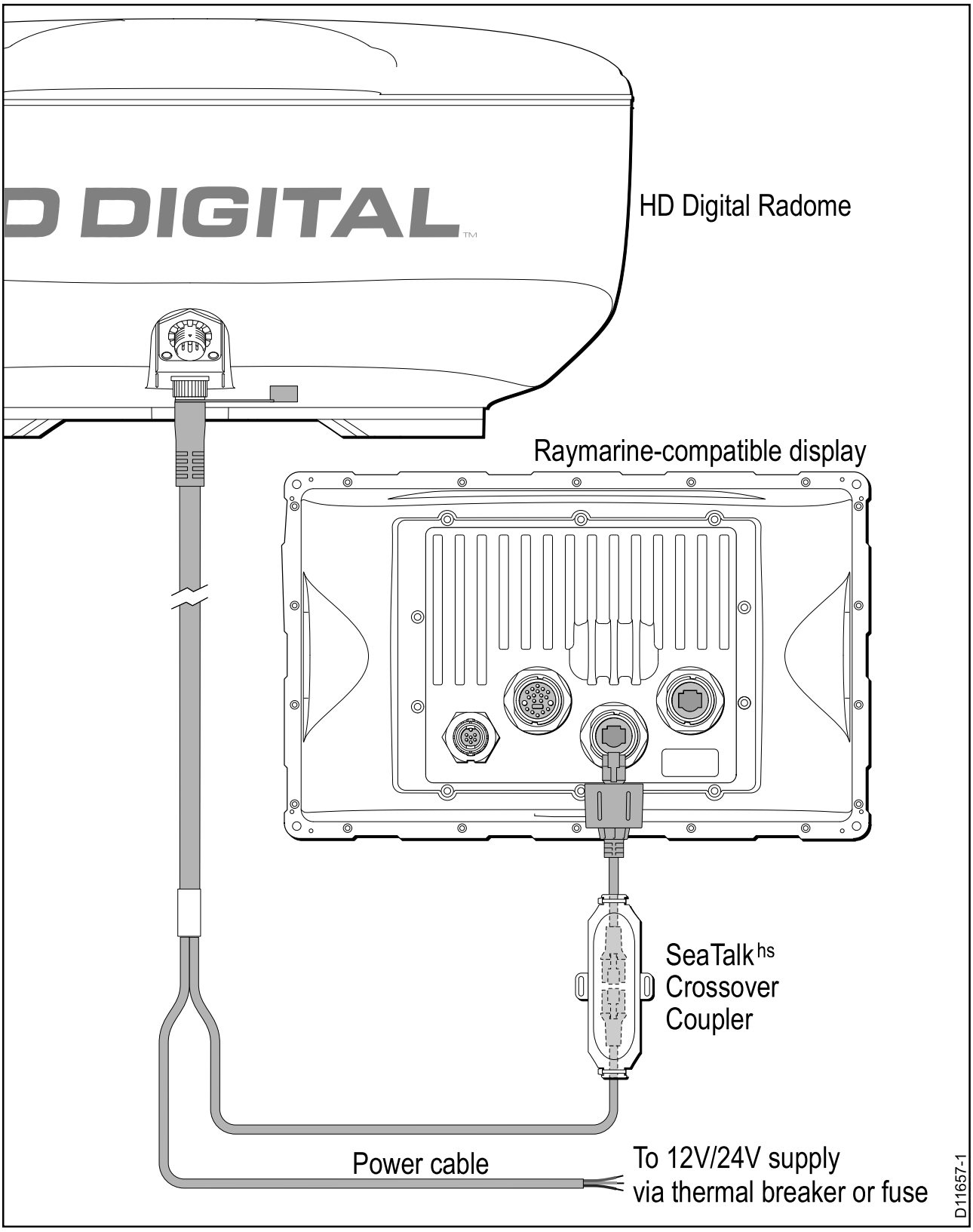
- 7.2 Connection to networked SeaTalkhs displays (non G-series) on page 31
- 7.3 Connection to G-Series Display on page 32

7.1 Direct connection to SeaTalkhs display

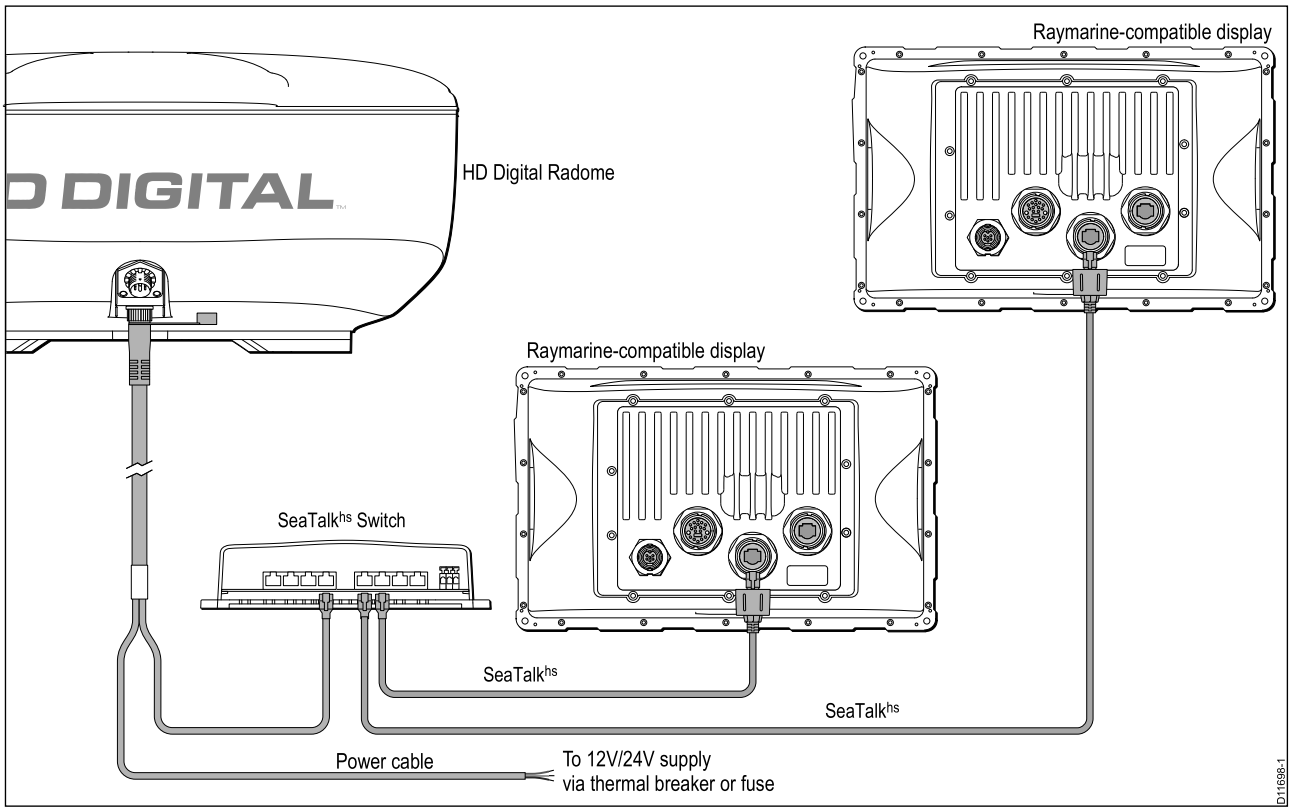
You need a digital cable, to connect both power and data to the HD Digital Radome Antenna. Depending on your product variant, it may or may not be supplied with a digital cable.



For information on suitable cables, refer to: **p.44 — Cables**

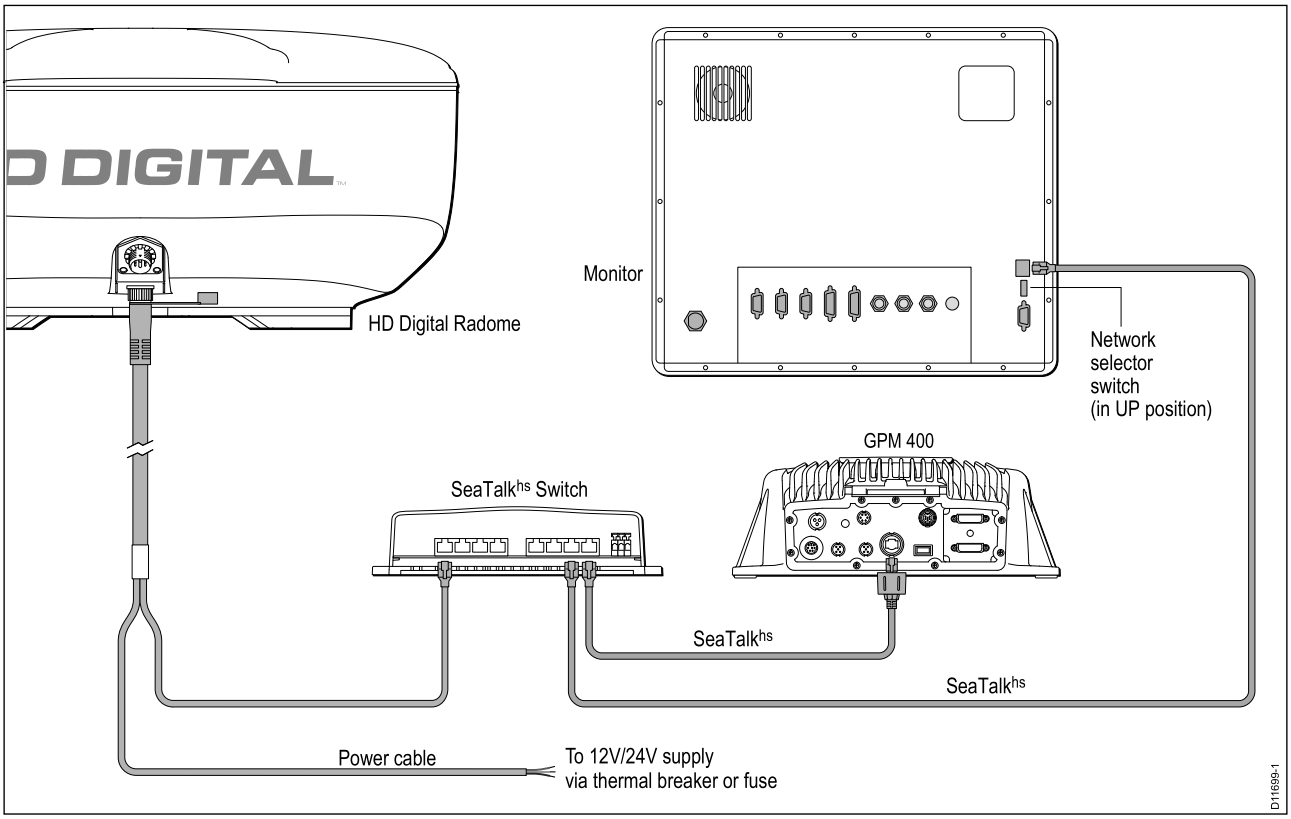
7.2 Connection to networked SeaTalkhs displays (non G-series)

You need a digital cable, to connect both power and data to the HD Digital Radome Antenna. Depending on your product variant, it may or may not be supplied with a digital cable.



For information on suitable cables, refer to: **p.44 — Cables**

7.3 Connection to G-Series Display



Chapter 8: Installation

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- 8.2 Positive ground systems on page 34
- 8.3 Items Required on page 34
- 8.4 Mast Mounting on page 34
- 8.5 Installation procedures on page 34

8.1 Product grounding

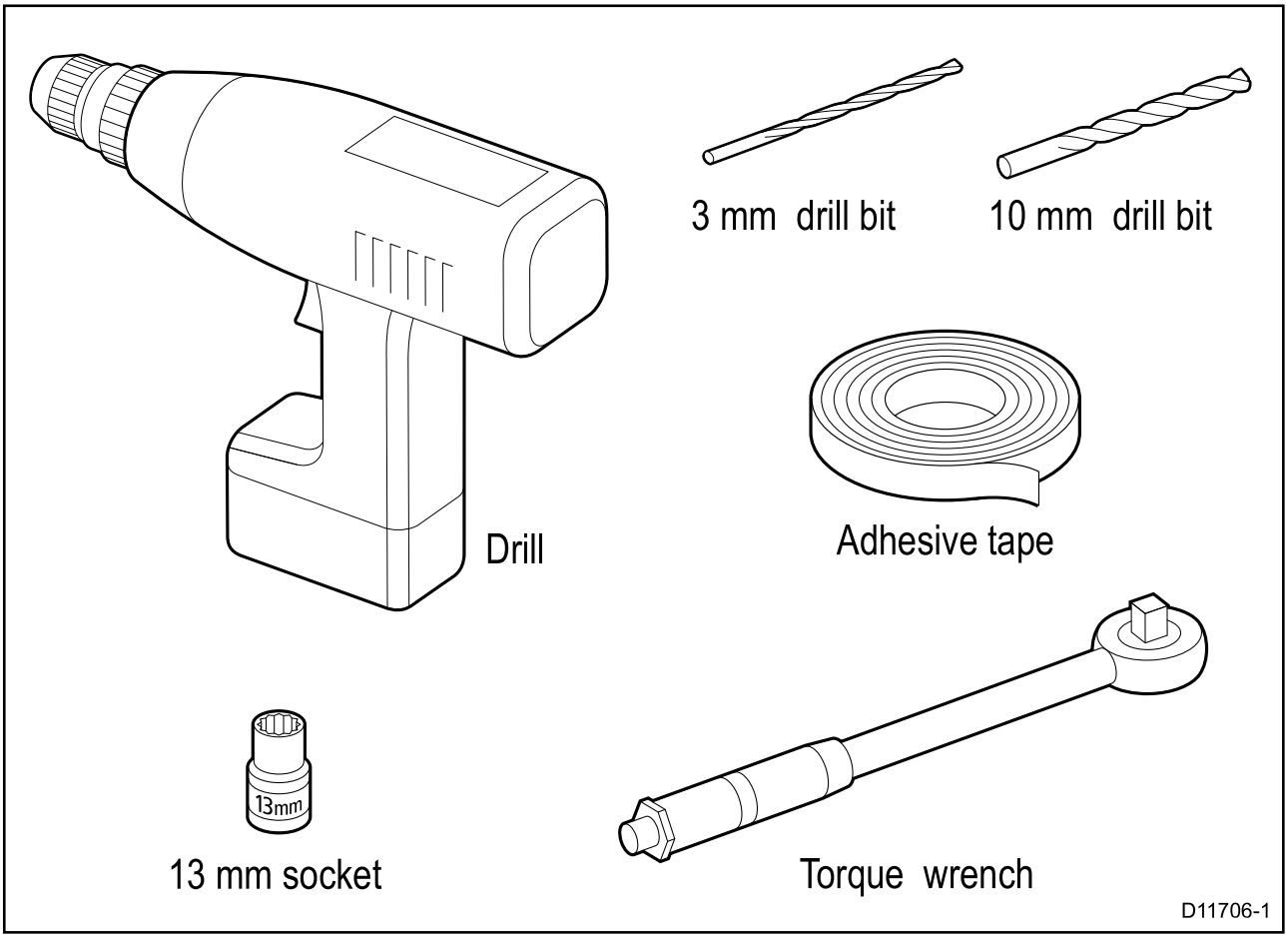
Important safety information for connections to ground.

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

8.2 Positive ground systems

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

8.3 Items Required



8.4 Mast Mounting

If the HD Digital Radome Antenna is mounted on a hollow mast, the cable may be run inside the mast for connection to the unit.

If you run the cable up a mast, take the appropriate measures to:

- Prevent the cable chafing where it enters and exits the mast.
- Minimize electrical interference by:
  - Not running the cable near other electrical equipment.
  - Not running the cable alongside power cables or antenna cables for other equipment.

8.5 Installation procedures

Use the following procedures to install the HD Digital Radome Antenna (the antenna):

- Mounting the antenna.
- Connecting to your system.
- Post installation procedures.

> **Caution: Mounting Bolts**
>
> Do NOT screw the antenna mounting bolts into the antenna base more than 25 mm (1 inch), or damage to the antenna could occur. If necessary, use shims or extra washers to prevent this happening.

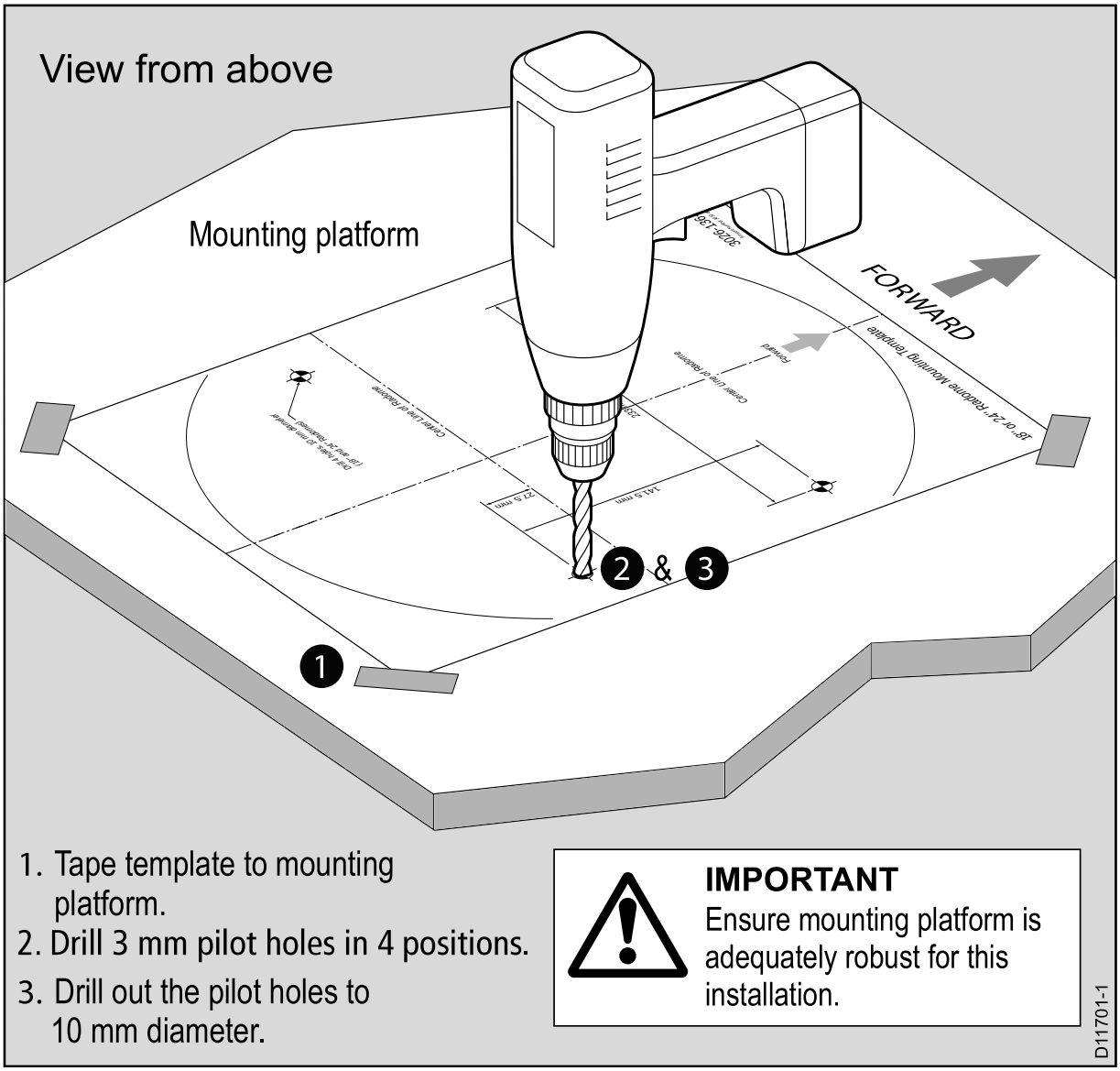
Mounting the Antenna

Use a mounting location that:

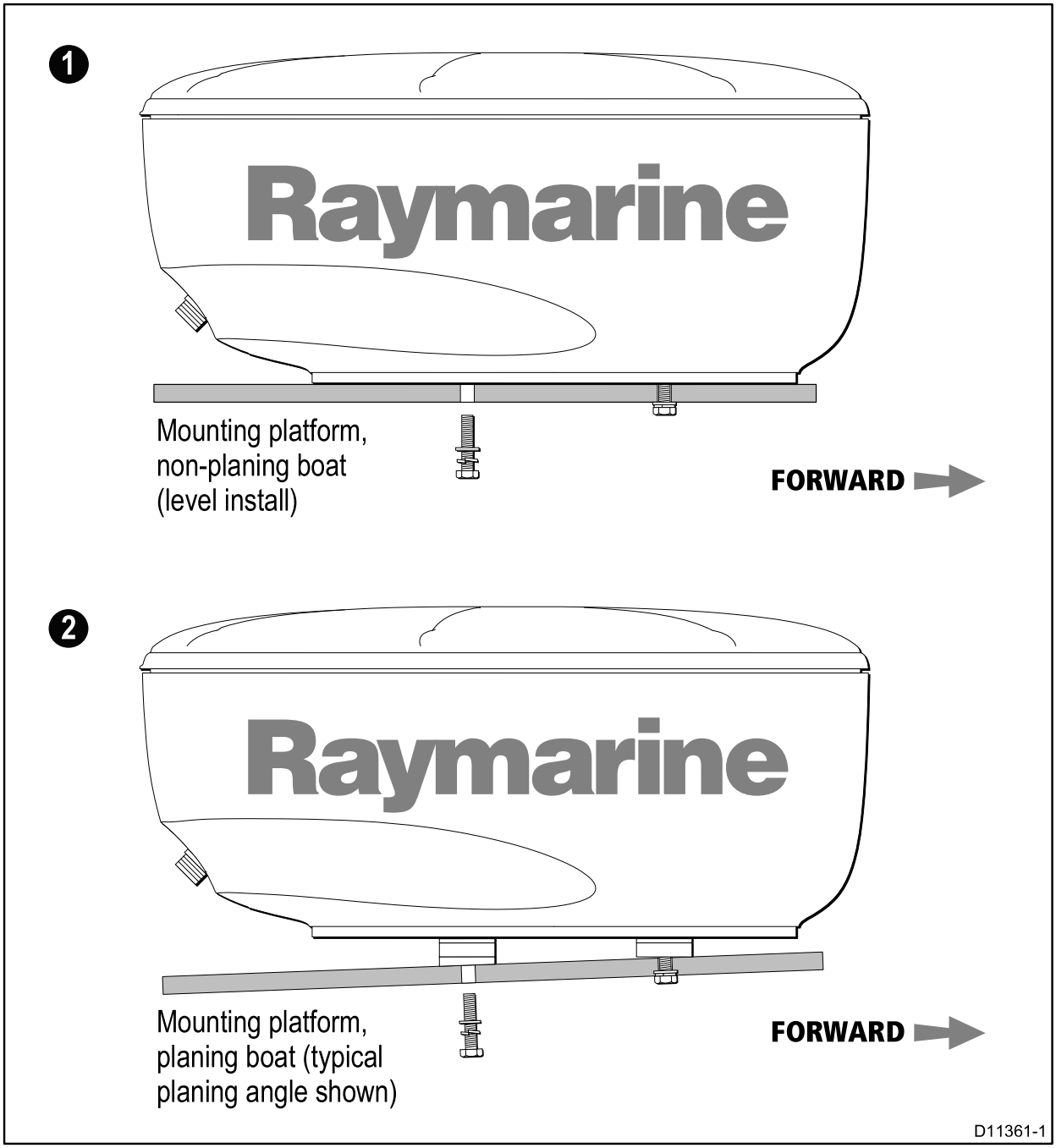
- Is robust enough to support the HD Digital Radome Antenna, under seagoing conditions.
- Meets the requirements described under *Antenna Position*

Then:

1. Prepare the mounting platform as in the following illustration.

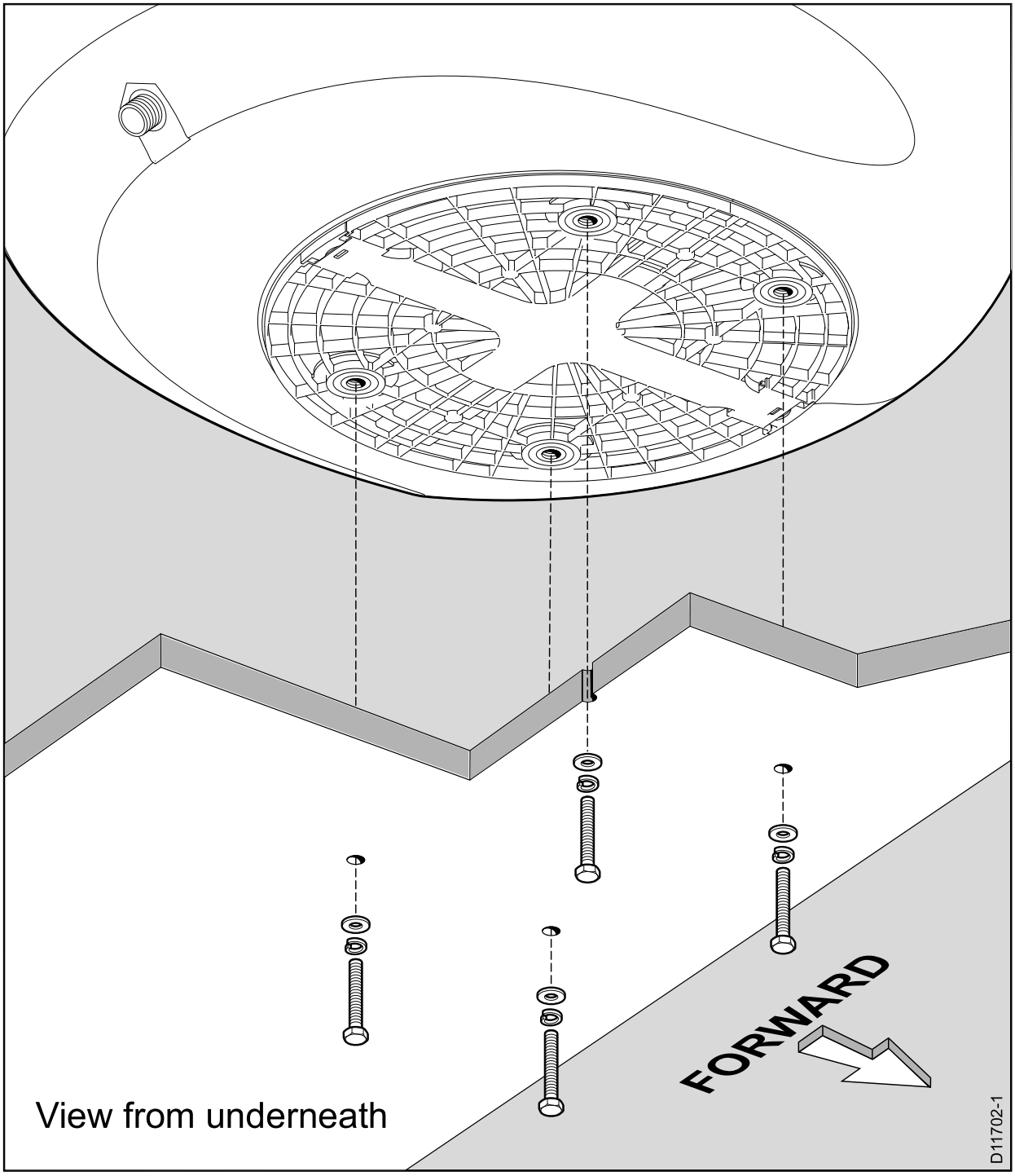


2. Place the HD Digital Radome Antenna in position. If you are fitting it on a planing vessel, shim the rear of the antenna, so that the beam points slightly down in the forward direction when the boat is at rest, to compensate for the bow rising at cruising speed



3. Lightly coat the threads of the four mounting bolts, with the Denso Paste provided.

4. Ensuring that the bolts do not enter the antenna base more than 25 mm (1 inch), secure the antenna with the 4 bolts flat washers and spring washers provided, as illustrated. If necessary, use appropriate shims or extra washers to limit the length of bolt entering the antenna base.



5. Tighten the bolts to a torque of 20 Nm (177 lbf/inch).

Chapter 9: Connections

Chapter contents

- 9.1 General cabling guidance on page 40
- 9.2 Power requirement on page 41
- 9.3 Connecting on page 43

9.1 General cabling guidance

Cable types and length

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

- Unless otherwise stated only use cables supplied by Raymarine.
- Where it is necessary to use non-Raymarine cables, ensure that they are of correct quality and gauge for their intended purpose. (e.g.: longer power cable runs may require larger wire gauges to minimize voltage drop along the run).

Strain relief

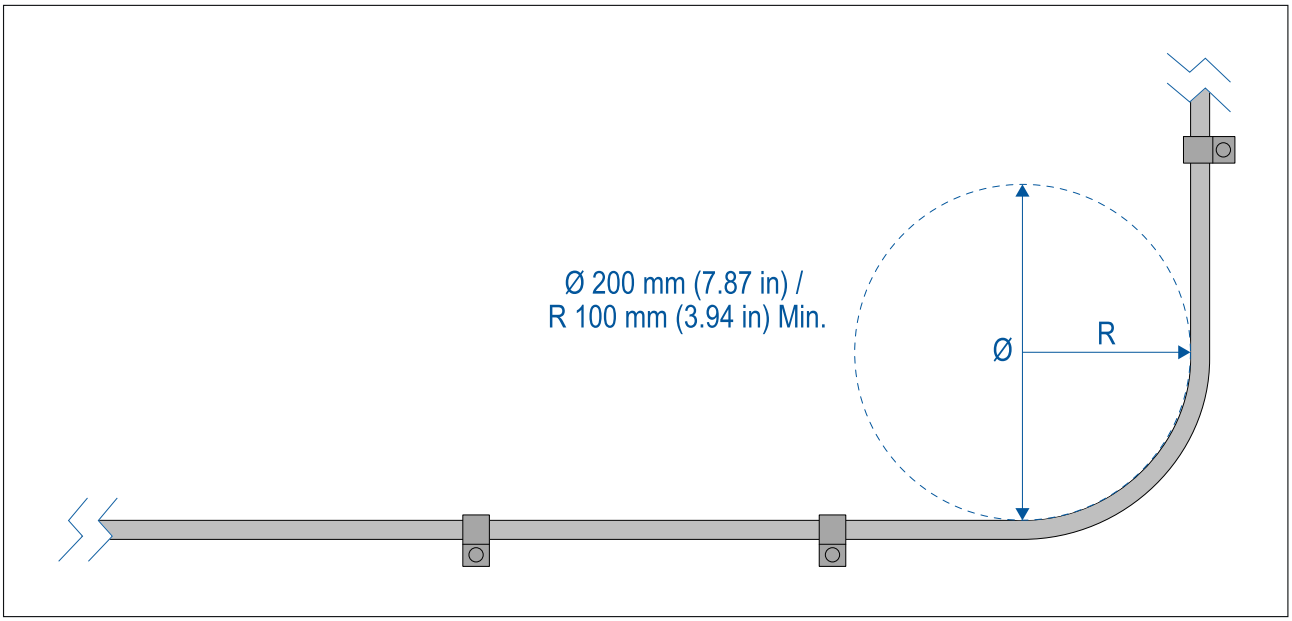
Use adequate strain relief for cabling to ensure that connectors are protected from strain and will not pull out under extreme sea conditions.

> **Caution: Pulling cables**
>
> Do NOT use cords or ropes, attached to cable connectors, to pull cables through restricted apertures (e.g. as in bulkheads), as this could cause damage to cables.

Cable routing

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

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter (Ø) of 200 mm (7.87 in) / minimum bend radius (R) of 100 mm (3.94 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 cable clips or cable ties. Coil any excess 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,
  - antennas.

Cable shielding

Ensure that cable shielding is not damaged during installation and that all cables are properly shielded.

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.

9.2 Power requirement

The HD Digital Radome Antenna must be supplied with power by either a 12 V dc or a 24 V dc supply. Do NOT connect to a 32 V system.

If you are replacing an existing Radome scanner with an HD Digital Radome Antenna, you must also replace any existing cable with the appropriate digital cable, as described in section *2.7 Cables*.

If you connect to the power supply via an isolator switch, the minimum switch rating is:

- For a 12 V system, 20 A.
- For a 24 V system, 15 A.

Warning: Positive ground systems

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

Power Supply Protection

The power supply must be protected by a suitable thermal circuit breaker or fuse, fitted close to the power source. The protection requirements are the same for both 18” and 24” HD Digital Radome Antennae, and are as follows:

- In a 12 V system, protect the power supply with either a 10 A thermal breaker, or a 15 A fuse.
- In a 24 V system, protect the power supply with either a 5 A thermal breaker, or an 8 A fuse.

Power cable lengths

The total permitted lengths of power conductor run (i.e. power cable plus cable extension) from the power source to the HD Digital Radome Antenna are :

- for 12 V systems, 20 m (65 ft)
- for 24 V systems, 35 m (115 ft)

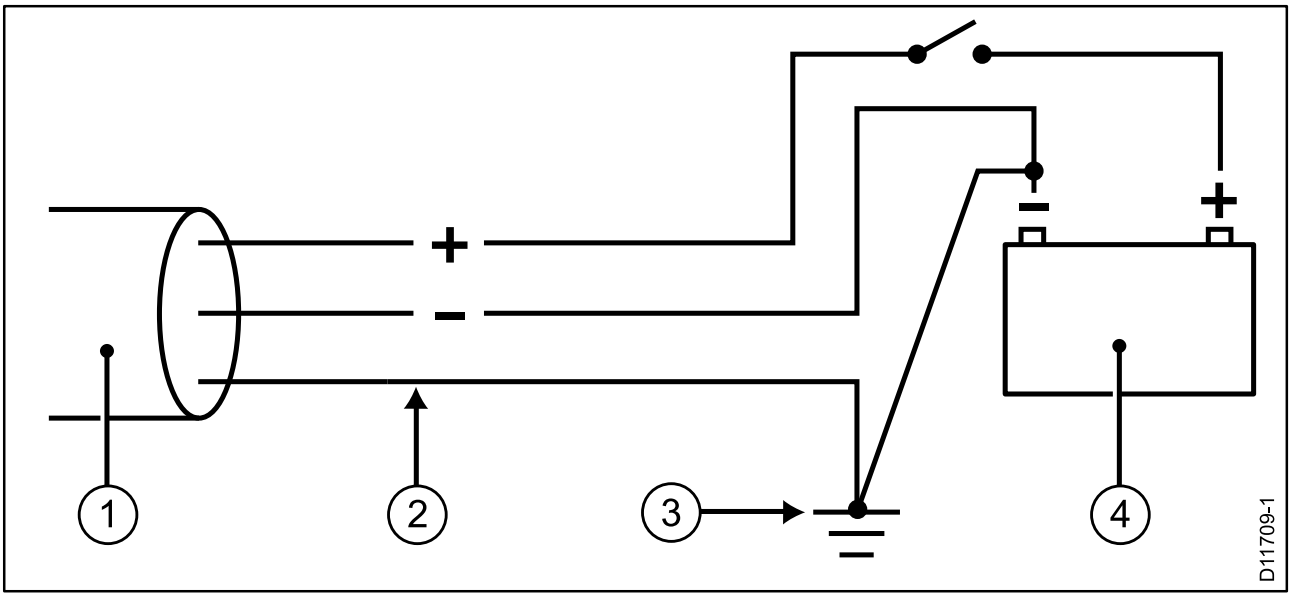
If you want to connect to a 12 V power system but a total power conductor run of more than 20 m is necessary, the use of a suitable voltage converter is recommended, to convert the 12 V supply voltage to 24 V, and thus enable you to extend the run up to 35 m. We recommend using a converter with a minimum 200 W output capacity.

Grounding requirements

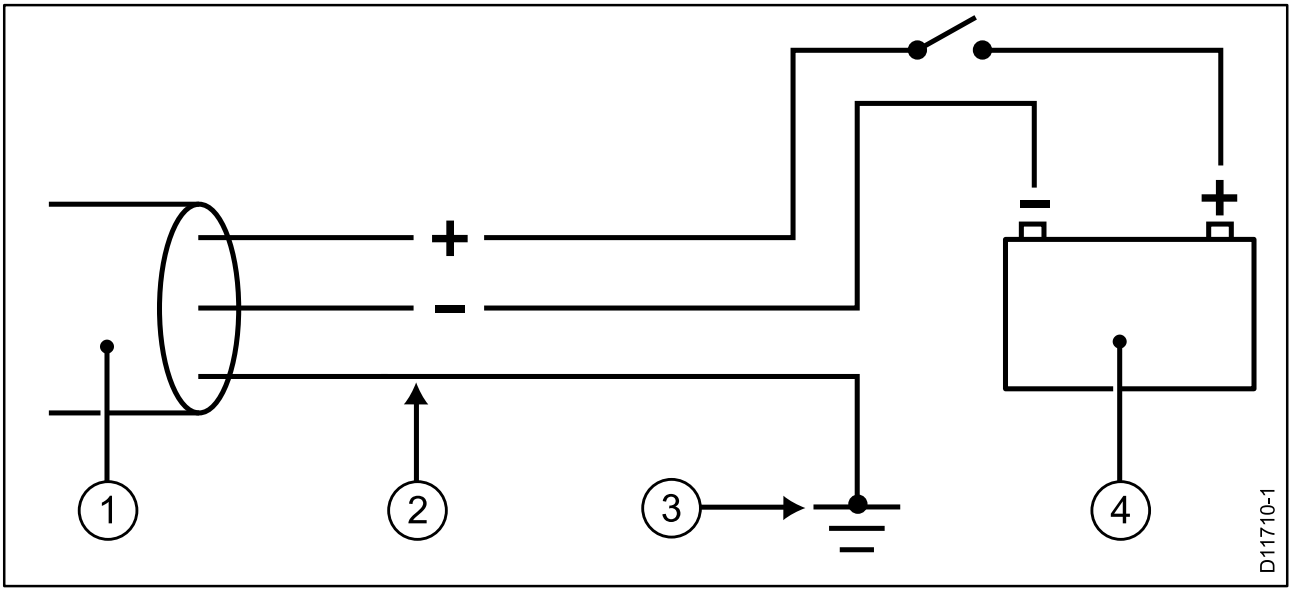
These grounding requirements are applicable for Raymarine equipment supplied with a separate drain wire or screen.

- The product power cable drain conductor (screen) must be connected to a common ground point.
- It is recommended that the common ground point is a bonded ground, i.e. with the ground point connected to battery negative, and situated as close as possible to the battery negative terminal. If a bonded ground system is not possible, a non-bonded RF ground may be used.

Bonded ground system (preferred)



RF ground system (alternative)



1. Power cable to product.
2. Drain (screen).
3. Bonded (preferred) or non-bonded RF ground.
4. Power supply or battery.

Implementation

If several items require grounding, they may first be connected to a single local point (e.g. within a switch panel), with this point connected via a single, appropriately-rated conductor, to the boat's common ground. The preferred minimum requirement for the path to ground (bonded or non-bonded) is via a flat tinned copper braid, with a 30 A rating (1/4 inch) or greater. If this is not possible, an equivalent stranded wire conductor maybe used, rated as follows:

- for runs of <1 m (3 ft), use 6 mm^2 (#10 AWG) or greater.
- for runs of >1 m (3 ft), use 8 mm^2 (#8 AWG) or greater.

In any grounding system, always keep the length of connecting braid or wires as short as possible.

Important: Do NOT connect this product to a positively-grounded power system.

References

- ISO10133/13297
- BMEA code of practice

- NMEA 0400

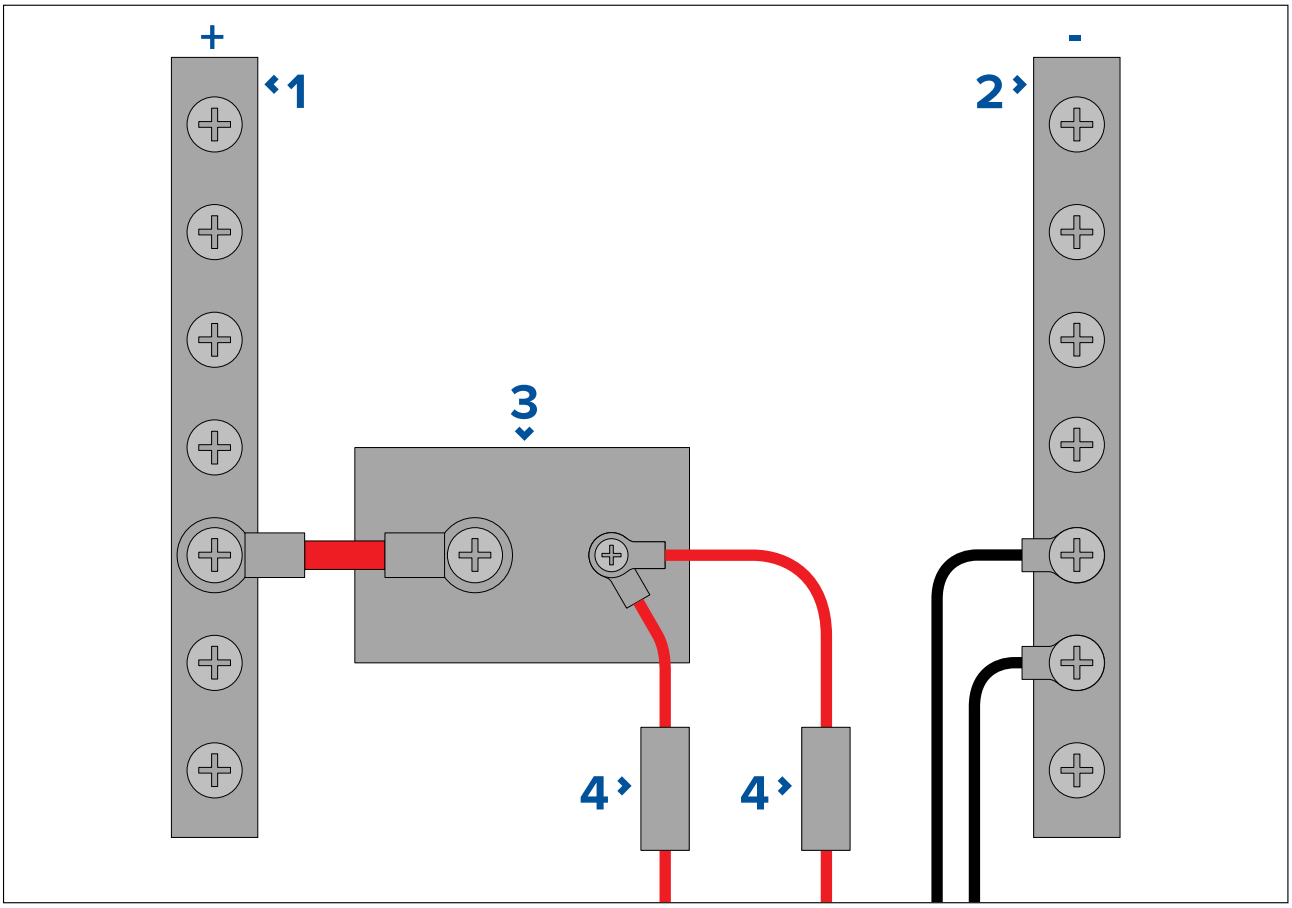
Connection procedure

Connect the power cable part of the digital cable to either a 12 V or 24 V dc supply, as follows:

1. Red wire to the supply +ve, either at the output of the battery isolator switch or at a dc distribution panel.
2. Black wire to battery negative.
3. Drain connection (screen) to the common ground point (see *Grounding*)

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.

9.3 Connecting

When connecting your HD Digital Radome Antenna, use the instructions given here and also refer to the installation instructions for the multi-function display (MFD) to which you are connecting.

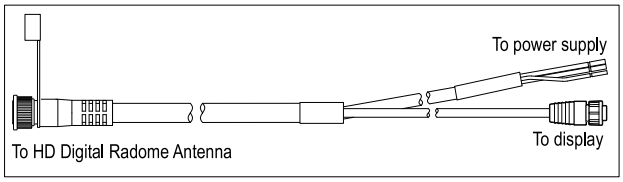
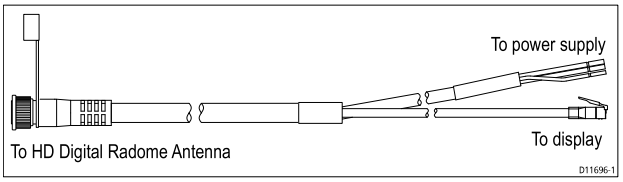
Run the digital cable from the HD Digital Radome Antenna to the signal and power connection points:

- Run the signal connector to the appropriate MFD.
- Run the power cable to a suitable 12 V or 24 V connection point on the boat's power system. We recommend connection is made at the boats power distribution panel, wherever possible.

Cables

You need a digital cable, to connect both power and data to the HD Digital Radome Antenna. Depending on your product variant, it may or may not be supplied with a digital cable.

There are 2 main types of digital cable — **SeaTalkhs** and **RayNet**. The correct cable for your system depends on the type of multi-function display you are connecting the radome to:

Connection via RayNet	**Connection via SeaTalkhs**
	
a Series LightHouse MFD	E-Series Classic E80, E120
c Series LightHouse MFD	G-Series (GPM400)
e Series LightHouse MFD	C-Series Widescreen C90W, C120W, C140W
eS Series LightHouse MFD	E-Series Widescreen E90W, E120W, E140W
gS Series LightHouse MFD	
Axiom / Axiom+ LightHouse 3 MFD	
Axiom Pro / Pro-S LightHouse 3 MFD	
Axiom XL LightHouse 3 MFD	

Digital cables

The following digital cables are available:

Cable length	**Part number — RayNet connector**	**Part number — SeaTalkhs connector**
5 m (16 ft 4 in)	A80227	A55076D
10 m (32ft 8 in) ft)	A80228	A55077D
15 m (49.2 ft)	A80229	A55078D
25 m (82 ft)	A80230	A55079D

Extension cables

The following extension cables are available. These cables extend the radar end of the digital cable, and are therefore compatible with both **SeaTalkhs** and **RayNet** variant digital cables.

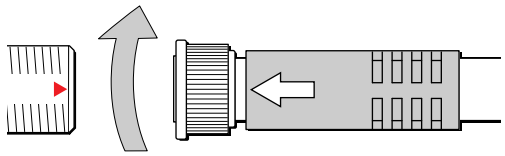
Extension length	**Part number**
2.5 m (8 ft 2 in)	A92141D
5 m (16 ft 5 in)	A55080D
10 m (32ft 9 in) ft)	A55081D

Important: Use only standard Raymarine cables. Do NOT make your own cables for use with the HD Digital Radome Antenna.

Radar scanner connection

The power and data cable connector is at the rear of the radar scanner unit.

Ensuring that the arrow on the power and data cable connector is aligned with the red triangular mark on the radar scanner connector, connect the cable to the scanners' connector, and fully hand-tighten. Do NOT use a wrench or any other tool.



Note: If the antenna connector is disconnected after initial installation, Raymarine recommends that before reconnecting, you lightly coat the connector thread with Renolit Aqua 2 Calcium grease.

Display connection

The correct connection to your multi-function display depends on whether you have a **SeaTalkhs** or **RayNet** network connector on your multi-function display.

Refer to the relevant system diagram in the following typical system example chapters:

- For **RayNet** multi-function displays, refer to: **p.25 — Typical system examples - RayNet displays**
- For **SeaTalkhs** multi-function displays, refer to: **p.29 — Typical system examples - legacy SeaTalkhs displays**

Chapter 10: Post-installation procedures

Chapter contents

- 10.1 Mechanical checks on page 48
- 10.2 Switch on & initial setup on page 48
- 10.3 Checking for interference on page 48

10.1 Mechanical checks

Before switching on the radar scanner:

- Ensure that:
  - All securing bolts are fully tightened and the appropriate mechanical locking washers are in place.
  - All connections are securely made.
  - All connecting cables and wires are secured and protected as necessary.
- Ask your local Raymarine authorized installer to check the installation.

10.2 Switch on & initial setup

Use the information given here in conjunction with the relevant information in your multi-function display (MFD) documentation, to switch on, and to carry out the initial checks and setup tasks.

1. Press and hold down the power key of your MFD until the unit beeps.

   The magnetron warm-up sequence should then start. When the warm-up is complete, the unit should enter standby mode.
2. Use the appropriate option on your MFD to power on the radar scanner; refer to the MFD operation instructions for information on how to do this.
3. If necessary, at the MFD:
   - adjust the MFD brightness.
   - change the default language settings.
4. Ensure that all personnel are clear of the antenna, then switch to transmit mode.
5. Carry out the radar operations described in the relevant MFD operation instructions and check that all functions appear to be satisfactory.
6. Check the bearing alignment to ensure that targets appear at their correct bearing relative to the boat's bow. Adjust the alignment as necessary
7. Check the display timing before using the system for navigation.

10.3 Checking for interference

Post installation check

If you have installed any system aboard a boat or made other changes to the boat's electronic systems (radar, VHF radio etc.), you need to check before casting off, that all electrical systems operate satisfactorily without any undue electrical interference, in order to conform with Electro Magnetic Compatibility (EMC) regulations. To do this:

1. Ensuring it is safe to do so, turn on all electronic systems aboard your vessel.
2. Check that the electronic systems all operate satisfactorily.

Chapter 11: Operation

Chapter contents

- 11.1 Operation instructions on page 50

11.1 Operation instructions

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

All product documentation is available to download from the Raymarine website: www.raymarine.com/manuals.

Chapter 12: Maintenance

Chapter contents

- 12.1 Switch off power on page 52
- 12.2 Service and maintenance on page 52
- 12.3 Routine equipment checks on page 52
- 12.4 Maintenance on page 52
- 12.5 Product cleaning on page 52

12.1 Switch off power

Short desc is not printed, but is used in searches

Before commencing any maintenance task, switch off all power to the product.

12.2 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.

12.3 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.

12.4 Maintenance

Once a year:

1. Remove one of the antenna-securing bolts and associated washers.
2. Clean the bolt and washers.
3. Use Denso paste to lightly re-grease the bolt thread.
4. Replace the bolt and associated washers.
5. Repeat steps 1 to 5 for all antenna-securing bolts.
6. Tighten all antenna-securing bolts to a torque of 20 Nm (177 lbf/inch).

Periodically, carry out these other maintenance tasks:

- Ensure the antenna is firmly attached to the mounting surface
- Check that the cable connections are in good condition and securely attached.
- Examine all cables for signs of chafing, cuts or other damage. If the antenna connector shows any sign of corrosion:
  1. Disconnect it.
  2. Clean the connector.
  3. Lightly re-coat the connector threads with Renolit Aqua 2 Calcium grease.
  4. Reconnect and hand-tighten the connection until it is secure.

12.5 Product cleaning

Best cleaning practices.

When cleaning products:

- Switch off power supply.
- Lightly rinse or flush with clean, cool fresh water.
- Do NOT use: abrasive, acidic, ammonia, solvent or other chemical based cleaning products.
- Do NOT use a jet wash.

Chapter 13: Troubleshooting

Chapter contents

- 13.1 Troubleshooting on page 54

13.1 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.

Troubleshooting procedure

Use the following table to identify problems and remedial actions.

Symptom	Action
No Data Source or **No Scanner** message on display.	Ensure the digital cable is securely connected at both ends and is in good condition. Ensure power supply thermal breaker has not tripped or fuse has not blown. If necessary, reset breaker or replace fuse ONCE ONLY. If breaker keeps tripping or fuse keeps blowing, contact Raymarine technical support for assistance. Ensure power supply maintains the correct voltage when the system is switched on. Ensure all products in the system have the correct software. Contact Raymarine technical support for assistance. If the HD Digital Radome Antenna is connected to the multi-function display (MFD) via a SeaTalk hs switch, ensure that: • All relevant equipment is correctly connected to the SeaTalk hs switch. • The SeaTalk hs switch power supply is satisfactory. • The SeaTalk hs switch is in good condition. • SeaTalk hs cables are securely connected and in good condition.
Displayed bearing is different to the true bearing.	Carry out the bearing alignment procedure described in the installation guide for the relevant MFD.

Chapter 14: Technical support

Chapter contents

- 14.1 Raymarine product support and servicing on page 56
- 14.2 Learning resources on page 57

14.1 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 diagnostic pages of the connected MFD.

Servicing and warranty

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

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

United Kingdom (UK), EMEA, and Asia Pacific:

- E-Mail: emea.service@raymarine.com
- Tel: +44 (0)1329 246 932

United States (US):

- E-Mail: rm-usrepair@flir.com
- Tel: +1 (603) 324 7900

Web support

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

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

Worldwide support

United Kingdom (UK), EMEA, and Asia Pacific:

- Help desk: https://raymarine.custhelp.com/app/ask
- Tel: +44 (0)1329 246 777

United States (US):

- Help desk: https://raymarine.custhelp.com/app/ask
- Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539)

Australia and New Zealand (Raymarine subsidiary):

- E-Mail: aus.support@raymarine.com
- Tel: +61 2 8977 0300

France (Raymarine subsidiary):

- E-Mail: support.fr@raymarine.com
- Tel: +33 (0)1 46 49 72 30

Germany (Raymarine subsidiary):

- E-Mail: support.de@raymarine.com
- Tel: +49 40 237 808 0

Italy (Raymarine subsidiary):

- E-Mail: support.it@raymarine.com
- Tel: +39 02 9945 1001

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es

- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

- E-Mail: support.nl@raymarine.com
- Tel: +31 (0)26 3614 905

Sweden (Raymarine subsidiary):

- E-Mail: support.se@raymarine.com
- Tel: +46 (0)317 633 670

Finland (Raymarine subsidiary):

- E-Mail: support.fi@raymarine.com
- Tel: +358 (0)207 619 937

Norway (Raymarine subsidiary):

- E-Mail: support.no@raymarine.com
- Tel: +47 692 64 600

Denmark (Raymarine subsidiary):

- E-Mail: support.dk@raymarine.com
- Tel: +45 437 164 64

Russia (Authorized Raymarine distributor):

- E-Mail: info@mikstmarine.ru
- Tel: +7 495 788 0508

14.2 Learning resources

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

Video tutorials

Raymarine official channel on YouTube:

- YouTube

LightHouse™ 3 tips and tricks:

- Raymarine website

Video Gallery:

- Raymarine website

Note:

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

Training courses

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

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

Technical support forum

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

- http://forum.raymarine.com

Chapter 15: Technical specification

Chapter contents

- 15.1 Technical specification on page 60

15.1 Technical specification

Approvals

Approvals:	**Certification:**
USA:	47CFR FCC Part 2 & Part 80 Certificate of Approval
Canada:	RSS138 Iss. 1 Technical Acceptance Certificate
European Union & EFTA:	R & TTE Directive 1999/05/EC Certificate of Opinion
Australia/New Zealand:	ACMA Declaration of Conformity Compliance level 3

General

Dimensions: 18 in antenna (RD418HD) 24 in antenna (RD424HD):	 Φ521 mm x 247 mm (20.5 in x 9.7 in) Φ652 mm x 247 mm (25.67 in x 9.7 in)
Weight: 18 in antenna (RD418HD) 24 in antenna (RD424HD):	 9.5 kg (21 lbs) 10 kg (22 lbs)
Supply voltage:	Either 12 V dc or 24 V dc nominal Minimum:10.8 V Maximum: 33 V
Power consumption:	60 W (25 W standby)
Environmental: Waterproof to: Operating temperature range: Humidity: Maximum wind speed:	 IPX6 -25 °C to +55 °C (-13 °F to +131 °F). Up to 95% at 35 °C (95 °F) 100 kts
Maximum range scale:	48 Nautical miles (Nm)

Transmitter

Type:	Solid-state modulator, driving magnetron
Transmit frequency:	9405 MHz ±25 MHz
Peak power output:	4 kW
Duplexer:	Circulator
Standby mode:	Magnetron heater - ON Magnetron control - ON All other services - OFF

Range (Nm)	**Expanded range (Nm)**	**Pulse width (ns)**	**PRF**
1/8, 1/4		75	3 kHz
1/2		100	3 kHz
3/4	1/8, 1/4	150	3 kHz
	1/2	200	3 kHz
1 1/2	3/4	330	2 kHz
3		430	1.5 kHz
	1 1/2	520	1.3 kHz
6, 12, 24 & 48	3, 6, 12, 24 & 48	900	820 Hz

Antenna

Type:	Patch array
Beamwidth (nominal)	Horizontal: 4.9° (18 in antenna), 3.9° (24 in antenna) Vertical: 25°
Polarization:	Horizontal
Rotation speed:	24 rpm nominal 48 rpm with compatible displays

Receiver

Intermediate frequency:	70 MHz
Receiver characteristic:	Linear
Receiver noise:	Less than 5 dB (including low noise converter and IF amplifier)
Bandwidth:	Matched digital filter for each pulse length

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www.raymarine.com

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