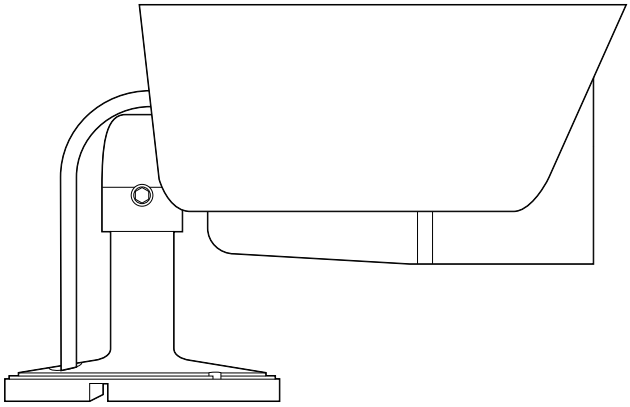
CAM200IP



Installation instructions

English
Date: 11-2014
Document number: 87232-2-EN
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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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ENGLISH
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Date: 11-2014

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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.

Warning: Powering PoE devices

This device can be powered over its ethernet connection (PoE) OR via its dedicated power cable.

NEVER connect the devices dedicated power cable when the device is being supplied PoE.

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 automatic circuit breaker.

Warning: Ensure all equipment has isolated power supply

This product features an isolated power supply. To prevent potential damage to equipment, Raymarine recommends that any external equipment connected to this product also features an isolated power supply.

Power Over Ethernet (PoE)

PoE is a system which allows electrical power to be passed from a PSE (Power Sourcing Equipment) device along the ethernet connection to supply power to a PD (Powered Device). This allows a single cable to be used to provide both data connection and electrical power to compatible devices.

PoE Classifications

PSE devices detect the indicated power range / classification of connected PDs and allocate the necessary maximum power based on the PDs classification

The PoE classifications are as follows:

PoE Class	Current (mA)	Power range (Watt)	Class description
Class 0	0 to 4	0.44 W to 12.94 W	-
Class 1	9 to 12	0.44 W to 3.84 W	Very low power
Class 2	17 to 20	3.84 W to 6.49 W	Low power
Class 3	26 to 30	6.49 W to 12.95 W	Mid power
Class 4	36 to 44	12.95 W to 25.5 W	High power

The PSE will always allocate the maximum power based on the classification of the PD.

Caution: Service and maintenance

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

Water ingress

Water ingress disclaimer

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

Disclaimer

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

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

EMC installation guidelines

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

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

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

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

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

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

Suppression ferrites

Raymarine cables may be 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.

Declaration of conformity

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

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

Product disposal

Dispose of this product in accordance with the WEEE Directive.

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

Warranty registration

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

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

IMO and SOLAS

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

Technical accuracy

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

Chapter 2: Document and product information

Chapter contents

- 2.1 Document information on page 12
- 2.2 Product overview on page 12

2.1 Document information

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

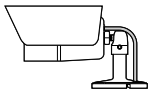
The document includes information to help you:

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

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

Applicable products

This document is applicable to the following products:

	Part number	Name	Description
	E70262	CAM200IP	Above decks I² Bullet IP Camera

Document illustrations

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

All images are provided for illustration purposes only.

Product documentation

The following documentation is applicable to your product:

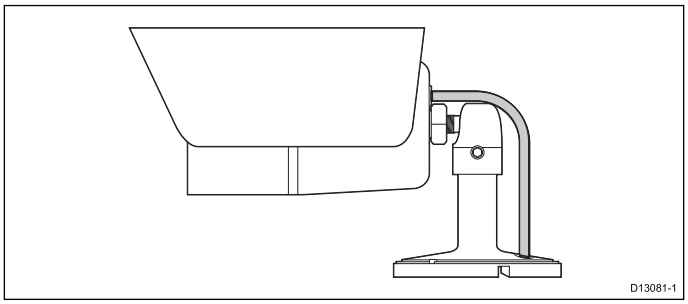
Description	Part number
CAM200IP Installation instructions Installation of a CAM200IP and connection to a wider system of marine electronics.	87232
CAM200IP Mounting template Mounting diagram for mounting a CAM200IP.	87233
a Series, c Series, e Series Installation and operation instructions Includes details for operation of the Camera application on a Series, c Series, e Series MFD.	81337
gS Series Installation and operation instructions Includes details for operation of the Camera application on a gS Series MFD.	81344

Operation instructions

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

2.2 Product overview

The CAM200IP is an Infrared illuminated (I²) bullet IP camera with both day and night vision. In conjunction with a compatible multifunction display (MFD) , the camera provides a high-definition image which can be viewed or recorded for later playback.



The camera has the following features:

- 2 mega pixel 1/2.8" SONY progressive scan CMOS image sensor for excellent image quality (Exmor)
- 6 mm mega pixel board lens
- 20 m I² beam distance
- Field of View (Diagonal = 63.6° / Horizontal = 53.3° / Vertical = 33.1° ±3°)
- Multi-streaming of H.264 and MJPEG
- HD 720p (1280 x 720 Default) – Full 1080p supported
- 12 V dc power
- Class 2 PoE device (IEEE802.3af)

The camera can also be connected to a PC which enables use of the built-in web interface to access additional features. These additional features can only be set or used via a connected PC.

Approximate record times

The approximate record times are dependant on IP camera resolution and settings, lighting conditions and available storage space.

A **Raymarine® CAM200IP**, set to factory default settings can record at an approximate rate of 22.5 MB per minute; allowing up to 44 minutes of record time per 1 GB of available storage space.

Chapter 3: Planning the installation

Chapter contents

- 3.1 Installation checklist on page 14
- 3.2 Compatible multifunction displays on page 14
- 3.3 Parts supplied on page 15
- 3.4 Tools required on page 15
- 3.5 Typical systems on page 16
- 3.6 Warnings and cautions on page 17
- 3.7 General location requirements on page 18
- 3.8 Pan and tilt on page 18
- 3.9 Product dimensions on page 19

3.1 Installation checklist

Installation includes the following activities:

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

Schematic diagram

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

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

3.2 Compatible multifunction displays

This product is compatible with the following LightHouse powered Raymarine multifunction displays.

- a Series, c Series, e Series.
- gS Series.

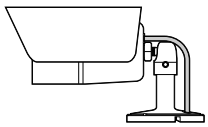
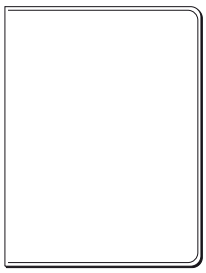
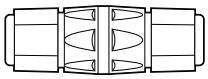
Multifunction display software requirements

The operation of this product requires that your **Raymarine® MFD** is running **LightHouse II** software version **12.xx** or later.

Note: The latest **MFD** software can be obtained by visiting www.raymarine.com/software.

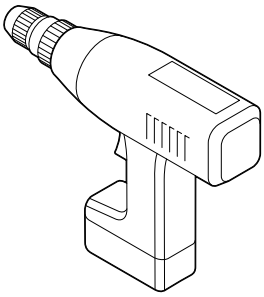
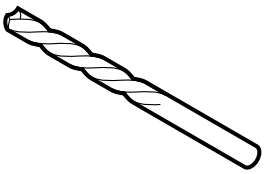
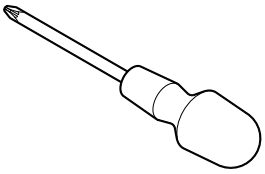
3.3 Parts supplied

The following items are supplied with your product.

Item	Description	Quantity
	IP camera (Includes a 600 mm (23.6 in) ethernet and power pigtail cables)	1
	Documentation and software pack	1
	Mounting screws	3
	Nylon washers	3
	Hex wrench (Allen key)	1
	Waterproof RJ45 coupler	1

3.4 Tools required

Product installation requires the following tools:

Item	Description
	Power drill
	Drill bit of appropriate size*
	Pozi drive screwdriver

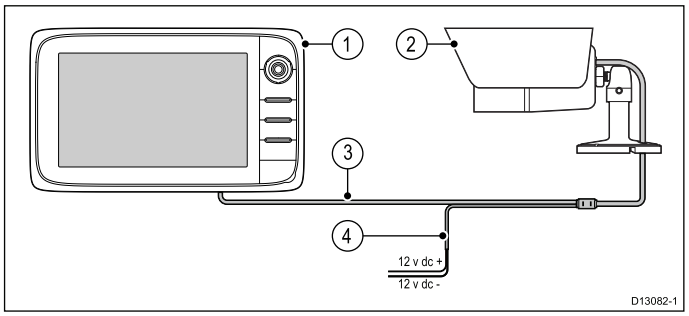
Note: * The appropriate drill bit size is dependent on the thickness and material of the mounting surface.

3.5 Typical systems

Note: The illustrations below show products that can be connected in a typical system. For information on how to connect the products, refer to the Chapter 4 Cables and connections section. For information on available cables and accessories, refer to the Chapter 11 Spares and accessories section.

Example: Basic MFD system

When connecting the product to an a, c or e Series multifunction display (MFD) the camera requires a separate power source.

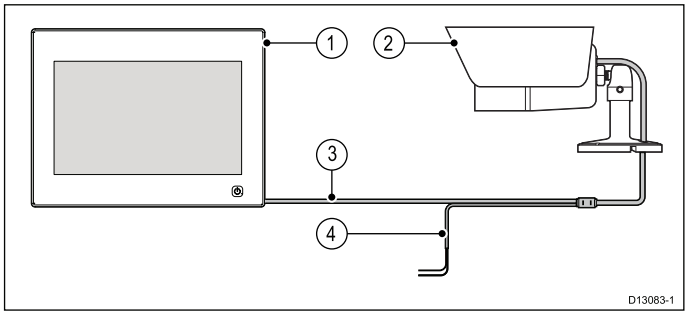


Item	Description
1	MFD
2	IP camera
3	Camera's ethernet cable
4	* Camera's power cable

Note: * The IP camera requires a separate power connection when not connected to a device that is providing Power over Ethernet PoE. Alternatively a PoE injector can be used to power the camera.

Example: Basic PoE MFD system

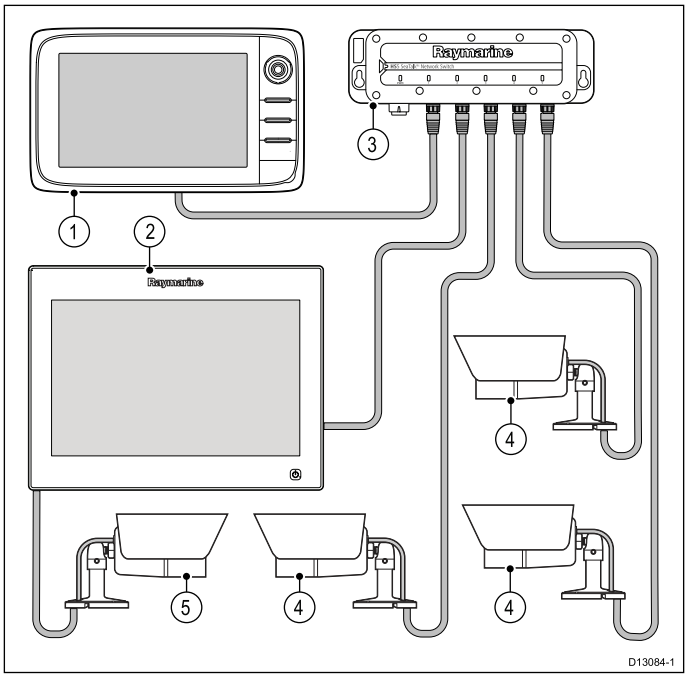
When connecting the camera directly to a gS Series multifunction display the camera can be supplied Power over Ethernet (PoE), if the display has the necessary remaining PoE allocation. Refer to the gS installation and operation instructions for details on PoE allocation.



Item	Description
1	MFD (providing PoE to the camera.)
2	IP camera
3	Camera's PoE / ethernet cable
4	** Camera's power cable (connection not required as camera is powered by PoE)

Note: ** A separate power supply is not required when the camera is being supplied PoE. NEVER connect the camera to a separate power supply when it is being provided PoE.

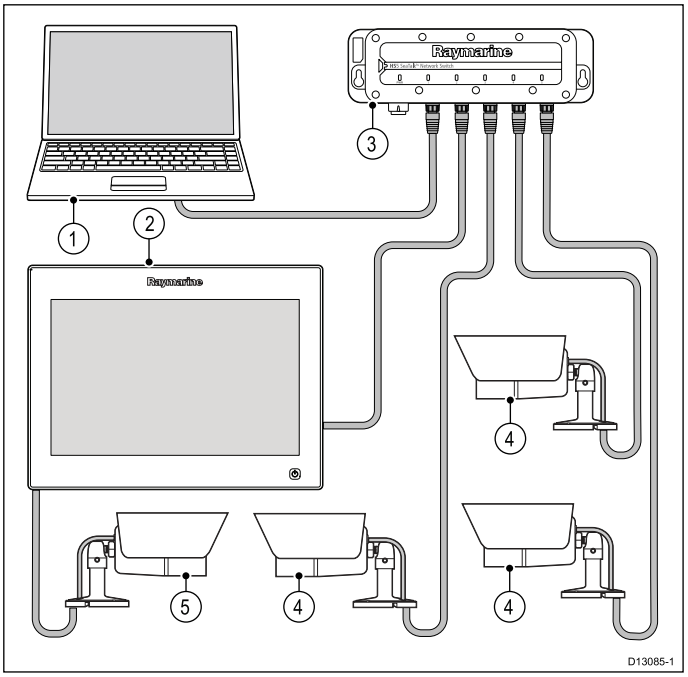
Example: Multiple camera system



Item	Description
1	MFD (no PoE)
2	MFD (with PoE)
3	Raymarine network switch
4	IP cameras (When connected to a network switch a separate power supply for each camera is required, unless the switch is capable of providing PoE.)
5	IP camera (When connected to a gS Series MFD the camera can be supplied PoE by the display.)

Example: System with Laptop

If there is a PC connected to your system you can access the products built–in web interface.



Item	Description
1	Laptop computer
2	Raymarine network switch
3	MFD (with PoE)
4	IP cameras (When connected to a network switch a separate power supply for each camera is required, unless the switch is capable of providing PoE.)
5	IP camera (When connected to a gS Series MFD the camera can be supplied PoE by the display.)

3.6 Warnings and cautions

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

3.7 General location requirements

Important considerations when choosing a suitable location for your product.

This product is suitable for mounting 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.

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 8 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.

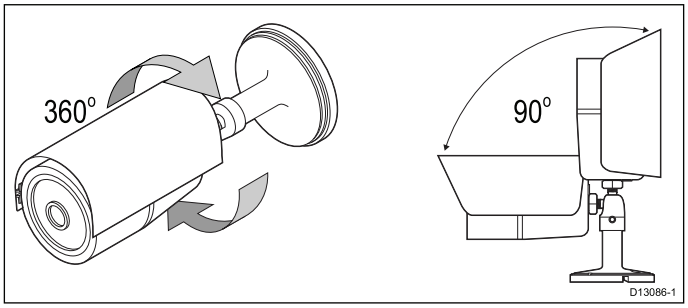
Compass safe distance

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

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

3.8 Pan and tilt

The camera's base includes a 2–axis mechanical pan tilt mechanism.

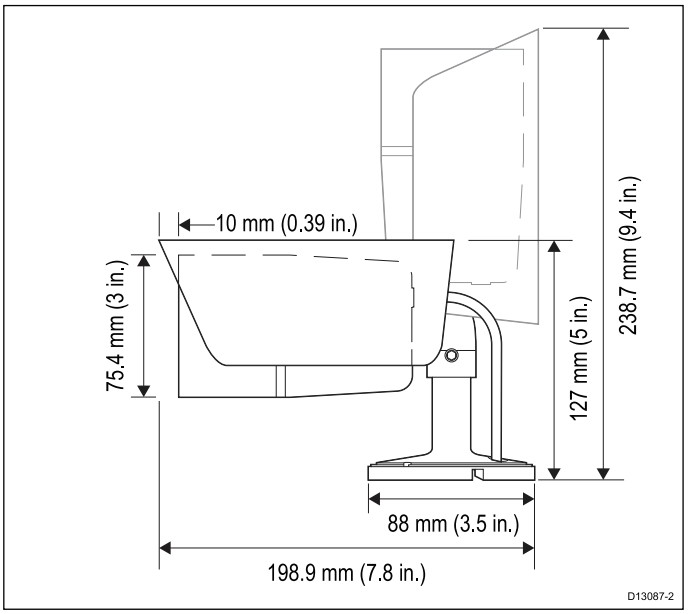


The camera's pan and tilt angles should be adjusted to the required position during installation.

The camera's pan angle can be adjusted up to 360°, the camera's tilt angle can be adjusted up to 90°.

Note: Pan and tilt angle adjustment is a mechanical procedure, performed by physically adjusting the camera's position on its base.

3.9 Product dimensions



Chapter 4: Cables and connections

Chapter contents

- 4.1 General cabling guidance on page 22
- 4.2 Connections overview on page 23
- 4.3 Power connection on page 23
- 4.4 Network connection on page 25

4.1 General cabling guidance

Cable types and length

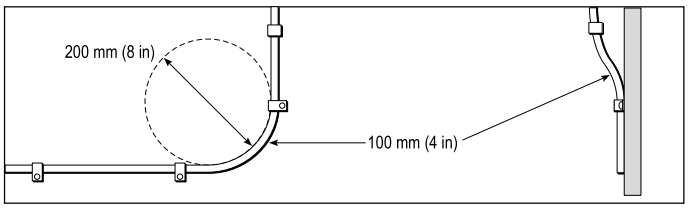
It is important to use cables of the appropriate type and length

- 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:

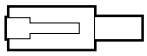
- Always use isolating transformers or a separate power-inverter to run PC's, processors, displays and other sensitive electronic instruments or devices.
- Always use an isolating transformer with Weather FAX audio cables.
- Always use an isolated power supply when using a 3rd party audio amplifier.
- 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

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

Connector	Type	Connects to:	Suitable cables
	RJ45	• RayNet network • Multifunc-tion display • PC	A Network coupler and / or RayNet to SeaTalk^{hs} adaptor cable is required. Refer to Chapter 11 Spares and accessories.
	Power	12 V dc power supply **Note:** The terminator should be removed to enable connection to a power supply.	18AWG minimum thickness for power cable extensions.

Making connections

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

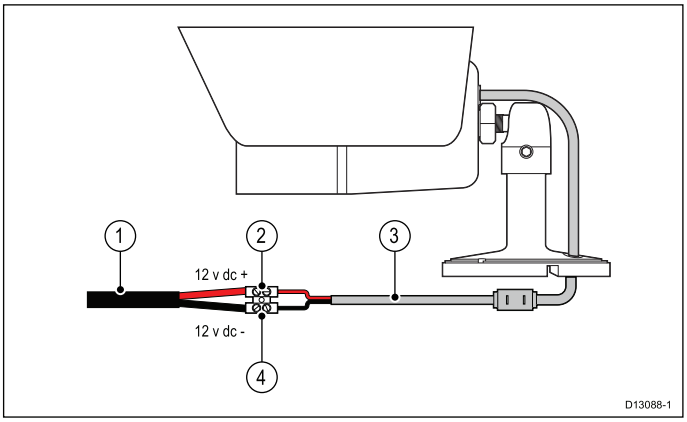
1. Ensure that the vessel's power supply is switched off.
2. Ensure that the device being connected has been installed in accordance with the installation instructions supplied with that device.
3. Ensuring correct orientation, push cable connectors fully onto the corresponding connectors.
4. If applicable, engage any locking mechanism to ensure a secure connection.
5. Ensure any bare ended wire connections are suitably insulated to prevent corrosion due to water ingress.

4.3 Power connection

Self-powered

The unit can be powered from a **12 volt dc** power supply using its dedicated power cable.

Note: The power cable is supplied with a terminator fitted, this must be removed if the device is to be self-powered.

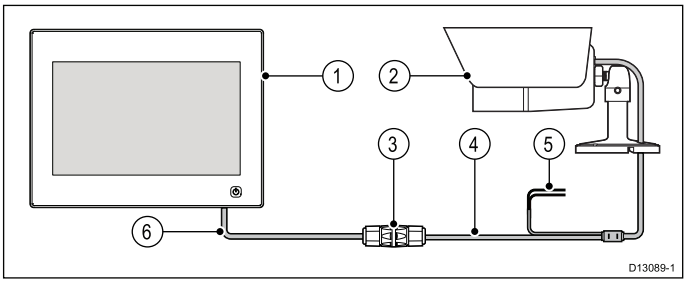


Item	Description	Connects to:
1	Vessel's 12 V dc power supply	Product's power cable
2	Positive terminal	Power supply — positive terminal
3	Product's power cable	Vessel's 12 V dc power supply
4	Negative terminal	Power supply — negative terminal

Power over Ethernet

The camera is a Class 2 PoE device. When the camera is connected directly to a gS Series multifunction display (MFD) the unit can be powered from the displays network connection.

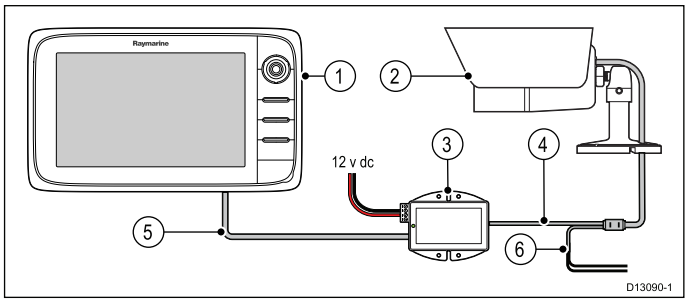
NEVER connect the camera's power supply connection when the unit is being supplied PoE.



1	MFD (providing PoE to the camera)
2	IP camera
3	Waterproof RJ45 ethernet coupler (R32142) (supplied)
4	Camera's ethernet connection
5	Camera's power cable (Connection not required as camera is being supplied PoE by the MFD.)
6	RayNet to SeaTalk^{hs} adaptor cable (not supplied)

PoE injector

The camera can also be powered using a PoE injector.



1	MFD
2	IP camera
3	PoE injector (R32141) (not supplied)
4	Camera's ethernet connection
5	RayNet to SeaTalk^{hs} adaptor cable (not supplied)
6	Camera's power cable (Connection not required as camera is being supplied PoE by the injector.)

Important: All connections should be made in a dry area and be suitably insulated to prevent corrosion and possible product damage due to water ingress.

Power Over Ethernet (PoE)

PoE is a system which allows electrical power to be passed from a PSE (Power Sourcing Equipment) device along the ethernet connection to supply power to a PD (Powered Device). This allows a single cable to be used to provide both data connection and electrical power to compatible devices.

PoE Classifications

PSE devices detect the indicated power range / classification of connected PDs and allocate the necessary maximum power based on the PDs classification

The PoE classifications are as follows:

PoE Class	Current (mA)	Power range (Watt)	Class description
Class 0	0 to 4	0.44 W to 12.94 W	-
Class 1	9 to 12	0.44 W to 3.84 W	Very low power
Class 2	17 to 20	3.84 W to 6.49 W	Low power
Class 3	26 to 30	6.49 W to 12.95 W	Mid power
Class 4	36 to 44	12.95 W to 25.5 W	High power

The PSE will always allocate the maximum power based on the classification of the PD.

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 mm^2) 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.

Power distribution

Raymarine recommends that all power connections are made via a distribution panel.

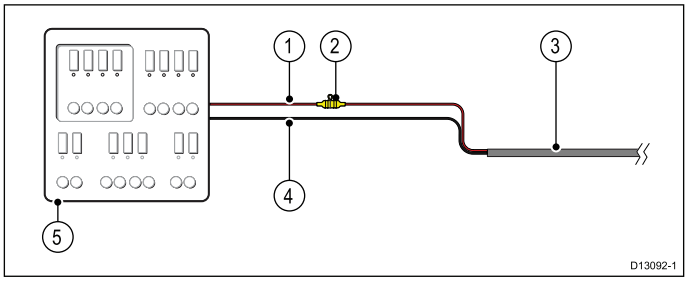
- All equipment must be powered from a breaker or switch, with appropriate circuit protection.
- Refer to the *Breakers, fuses and circuit protection* section for specific fuse and thermal breaker ratings for this product.

Breakers, fuses and circuit protection

The information below is provided as guidance to help protect your product. The example illustrations provided are for common vessel power arrangements, if you are unsure how to provide the correct level of protection then please consult a Raymarine authorized dealer for support.

Distribution panel connection

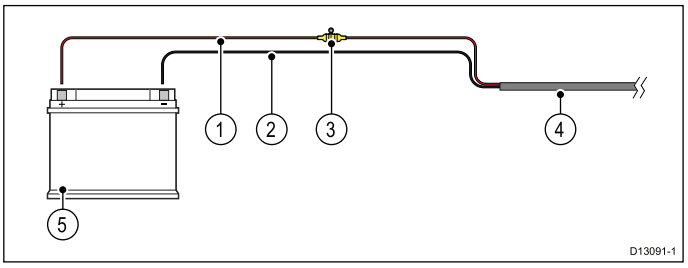
It is recommended that your product is wired through your vessel's distribution panel via a thermal breaker or fuse.



1. Vessel power supply positive (+)
2. In-line fuse. (If your products power cable does not have an in-line fuse then an one fuse should be fitted.)
3. Product power cable
4. Vessel power supply negative (-)
5. Vessel distribution panel

Battery connection

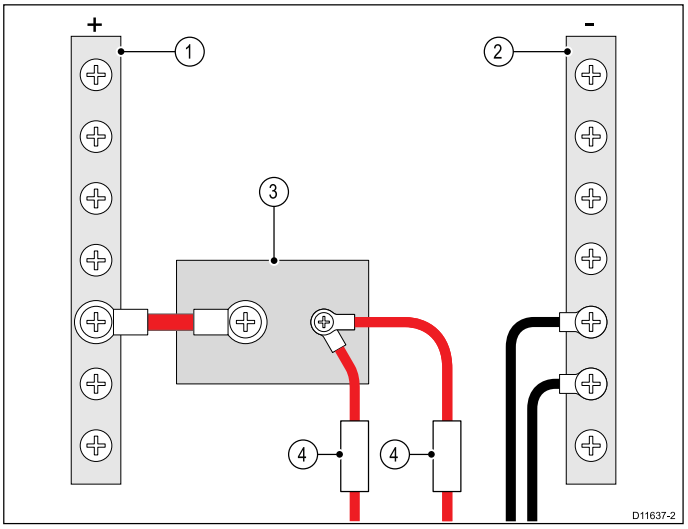
Your product may be wired directly to the battery using an in-line fuse.



1. Vessel power supply positive (+)
2. Vessel power supply negative (-)
3. In-line fuse (If your products power cable does not have a built in fuse then an in-line fuse should be fitted.)
4. Product power cable
5. Vessel battery

Sharing a breaker

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



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

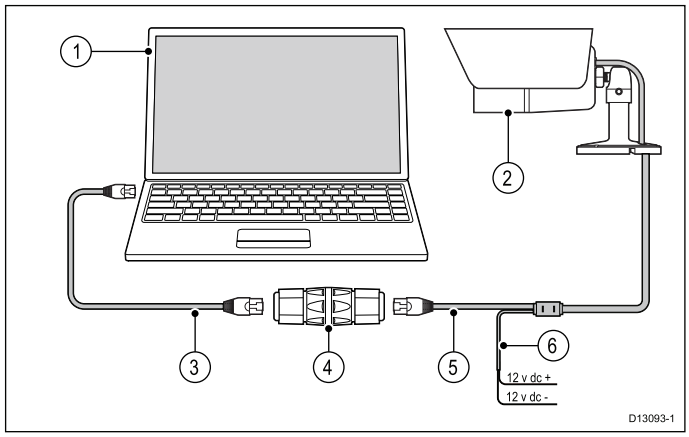
Where possible, connect individual items of equipment to individual circuit breakers. Where this is not possible, use individual in-line fuses to provide the necessary protection.

4.4 Network connection

The unit must be connected to a compatible MFD or PC to enable the video feed to be viewed.

PC connection

When connecting the camera directly to a PC the camera requires a separate power supply connection. Alternatively a PoE injector could be used to power the camera.

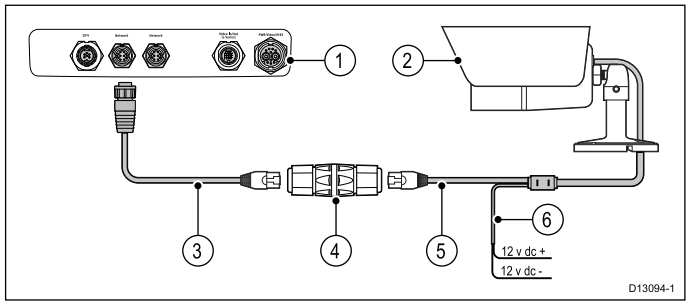


Item	Description
1	PC
2	IP camera
3	RJ45 ethernet cable
4	Waterproof RJ45 ethernet coupler (R32142) (supplied)
5	Camera's ethernet cable
6	Camera's power cable

For details on available network hardware and cables refer to Chapter 11 Spares and accessories.

Multifunction display connection

The unit can connect directly to a multifunction display. If the multifunction display provides Power over Ethernet (PoE) then a separate power supply may not be required.



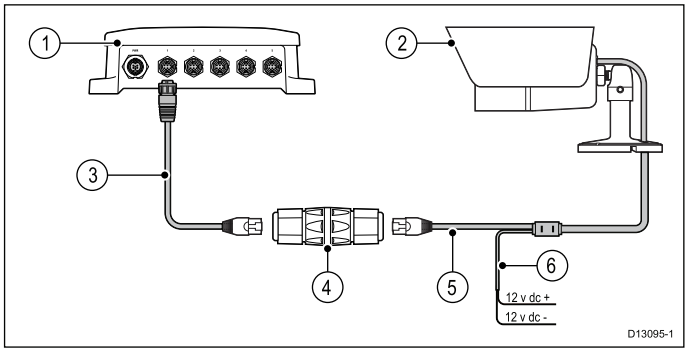
Item	Description
1	MFD rear connector panel
2	IP camera
3	RayNet to SeaTalk^{hs} (male) adaptor cable
4	Waterproof RJ45 ethernet coupler (R32142) (supplied)
5	Camera's ethernet cable
6	Camera's power cable (Connection not required if the camera is being supplied PoE by the MFD.)

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.

For details on available network hardware and cables refer to Chapter 11 Spares and accessories.

Network switch connection

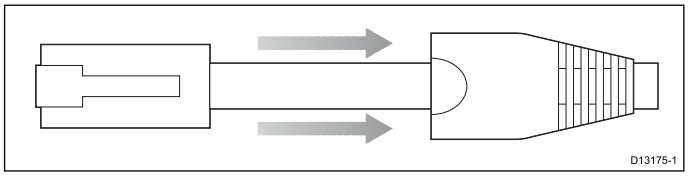
Multiple camera's can be networked together using an network switch or router.



Item	Description
1	Raymarine network switch
2	IP camera
3	RayNet to SeaTalk^{hs} adaptor cable (not supplied)
4	Waterproof RJ45 ethernet coupler (R32142) (supplied)
5	Camera's ethernet cable
6	Camera's power cable

RJ45 adaptor cable sleeve

The sleeve surrounding the RJ45 connector on the RJ45 to RayNet adaptor cables can be pulled back away from the connector to allow for connection to an ethernet coupler.



Chapter 5: Mounting

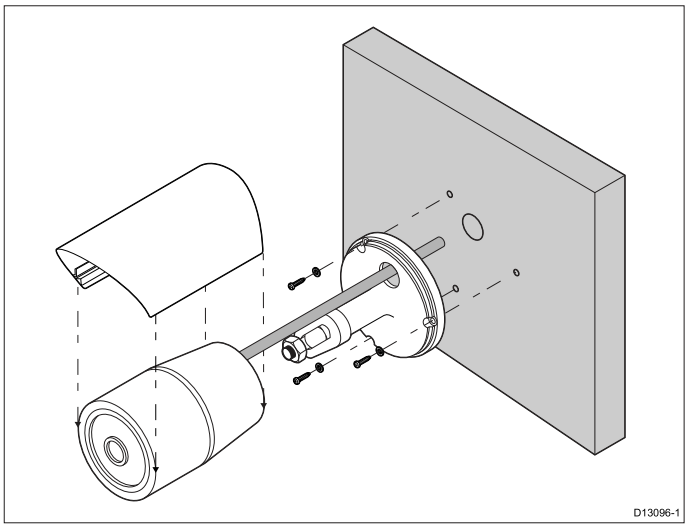
Chapter contents

- 5.1 Mounting the unit on page 28

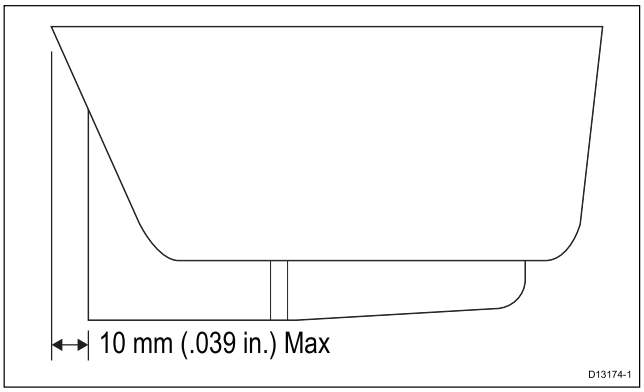
5.1 Mounting the unit

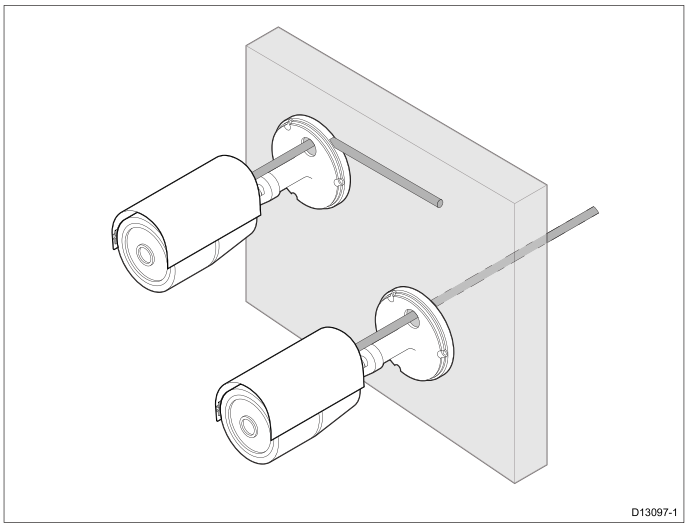
Having chosen a suitable location, install the unit as follows:

Ensure the power supply is switched off and that the necessary cables have been fed to the mounting location.



1. Check the selected location for the unit, a clear, flat area is required, which is safe to have screws fitted to.
2. Use the supplied mounting template to mark out the location of the mounting holes and if required the cable feed hole.
3. Drill the mounting holes and if required the cable feed hole at the marked locations.
4. Feed the camera's cables through the hole in the camera's base.
5. Place the base into position, lining up the holes in the camera base with the drilled holes in the mounting surface.
6. Secure the base in position using the screws and nylon washers provided, ensuring that the camera's cables sits in the camera base's cable channel or feeds through the cable feed hole in the mounting surface.
7. Attached the camera to its base and lock into position using the locknut.
8. Connect the camera's cables to the relevant cable feeds.
9. Power up the system and check the camera's feed on your display.
10. Adjust the camera's pan and tilt angle to obtain the best picture.
11. Lock the camera's position by tightening the grub screws in the camera's base, using the supplied Allen key.
12. Clip the sun cover onto the camera, ensuring it does not overhang the front of the camera by more than 10 mm (0.39 in.).





Chapter 6: Operation

Chapter contents

- 6.1 Operation instructions on page 30
- 6.2 Web browser interface on page 30
- 6.3 Reverse video and video flip on page 33
- 6.4 Resetting the camera to factory defaults on page 33

6.1 Operation instructions

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

6.2 Web browser interface

Network setup and operation

Default username, password and ports

Username	admin
Password	1234
Ports	• 80 (HTTP) • 21 (FTP) • 554 (RTSP) • 2700 (AV streaming) • 2300 (Event trigger)
IP address	DHCP enabled by default (IP address is assigned automatically.)

Camera IP address

By default the camera's IP address is assigned automatically.

You can find out what IP address your camera has been assigned using:

- IP scanner software (supplied)
- UPnP

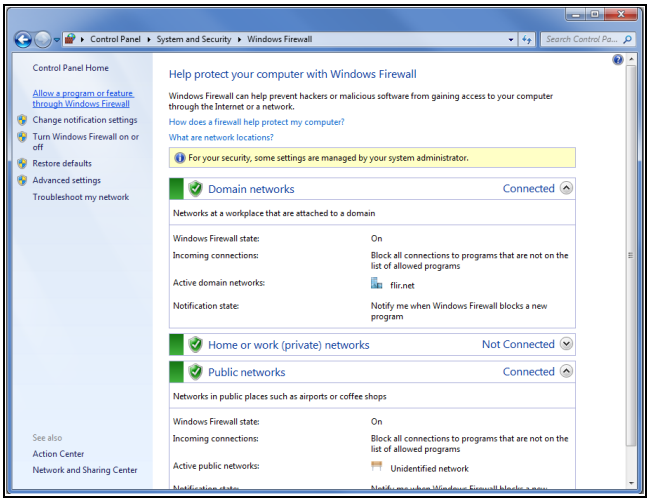
Note: * You may need to change your network settings to connect to a PC running Windows 7.

Changing network settings - Windows 7

To configure the necessary network settings on a Windows 7 PC follow the steps below

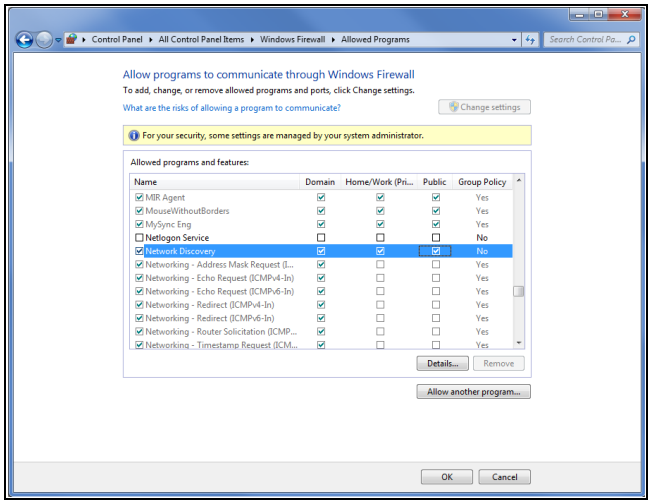
With the camera networked to the PC (refer to Chapter 4 Cables and connections for details.

1. Click **Start**.
2. Click **Control Panel**.
3. Click **System and Security**.
4. Click **Windows Firewall**.

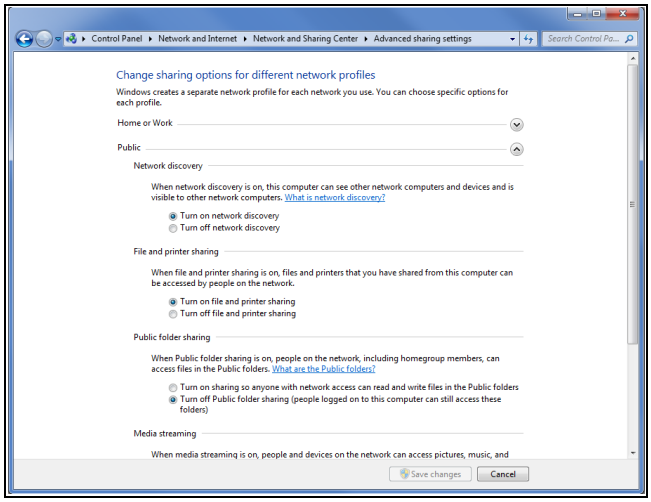


5. Click **Allow a program or feature through Windows Firewall**.
6. Scroll down the list to **Network Discovery**.

7. Place a tick in the box for the type of network that the camera is on (this is usually Public).



8. Click **OK**.
9. From the Control Panel click **Network and Internet**.
10. Click **Network and Sharing Center**.
11. Click **Change advanced sharing settings**.
12. Click on the relevant network type (e.g. Public).
13. Ensure **Turn on network discovery** is selected.



14. Click **Save changes** if you switched on network discovery, or
15. Click **Cancel** if network discovery was already turned on.

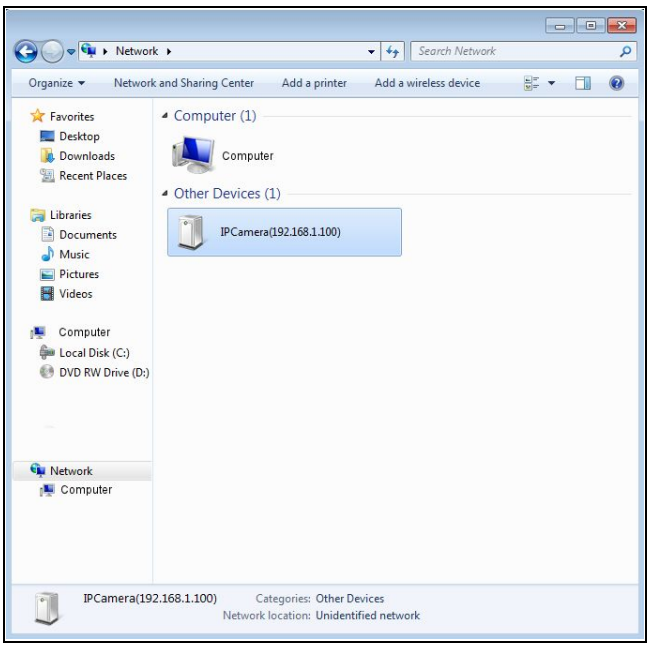
Finding the camera's IP address using Windows 7 UPnP

To use this method, your PC, and router (if used) must support UPnP (UPnP is enabled in the camera by default). The camera and the PC must be on the same network.

Ensure the camera is connected to your PC as described in Chapter 4 Cables and connections.

1. Click **Start > Computer > Network**.

   The camera appears under Network Infrastructure.



2. Double-click a camera icon to open the web interface in your default browser.
3. Enter the username and password for the camera and click **Login**.

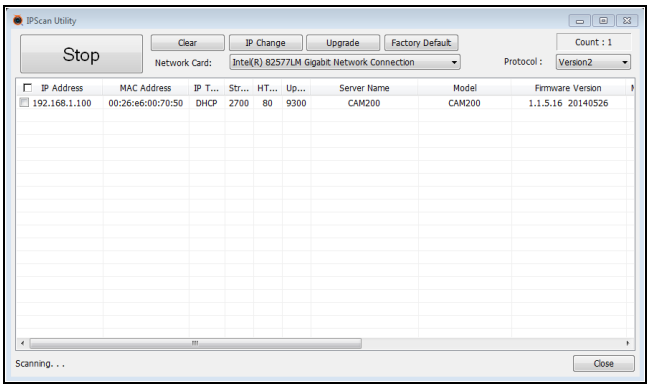
Finding the camera's IP address using IP Scanner software

To use this method, your PC, and router (if used) must support UPnP (UPnP is enabled in the camera by default). The camera and the PC must be on the same network.

Ensure the camera is connected to your PC as described in Chapter 4 Cables and connections.

1. Insert the CD that was supplied with the camera into the CD/DVD drive of your PC.
2. Navigate to the **SOFTWARE** folder.
3. Double click the IP Scanner executable file (e.g. IPScan Utility.exe).
4. Click the **SCAN** button.

   Details for any connected IP devices will be displayed.



5. Double-click the relevant camera entry to open the web interface using your default web browser.
6. Enter the username and password for the camera and click **Login**.

Supported browsers

The camera includes a built-in web interface that can be accessed using a web browser.

The following browsers are supported:

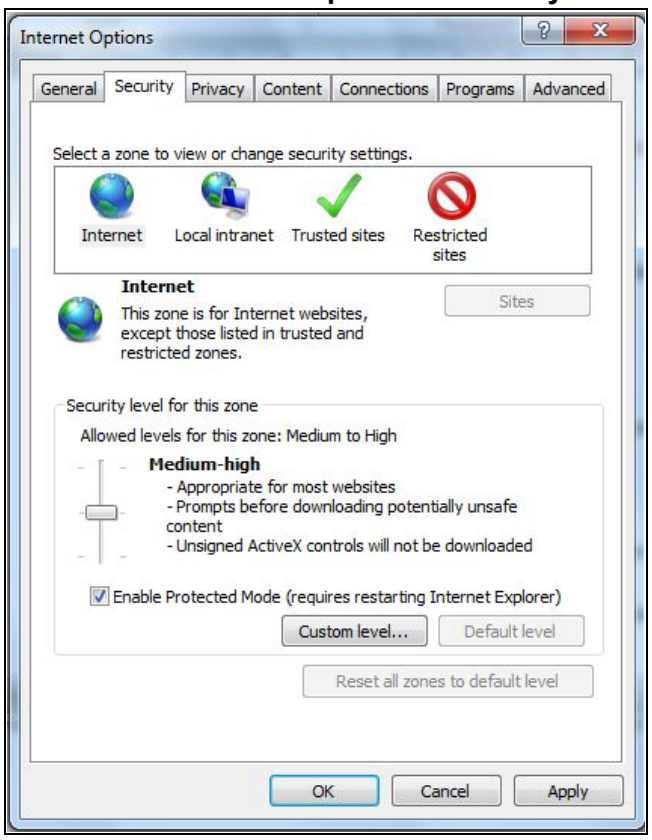
- Google Chrome (using Adobe Flash Player)

- Mozilla Firefox (using Adobe Flash Player)
- Apple Safari (using Adobe Flash Player)
- Microsoft Internet Explorer 7.0 or later, 32–bit version (using ActiveX or Adobe Flash Player)

Setting up Internet Explorer

If you are using Microsoft Internet Explorer then you may need to change the internet settings.

1. Click **Tools > Internet Options > Security**.



2. Click **Custom Level**.
3. Under **Download unsigned ActiveX controls**, click **Prompt** (recommended) or **Enable**.
4. Click **OK** and then click **OK** again.

Accessing using a web browser

1. Open your web browser from a web-enabled device connected to the same network as the IP camera.
2. Enter your camera's IP address in the browser's address bar in the following format: **http://192.168.1.100:80** and press **Return**.
3. Enter the username and password for the camera and click **Login**.

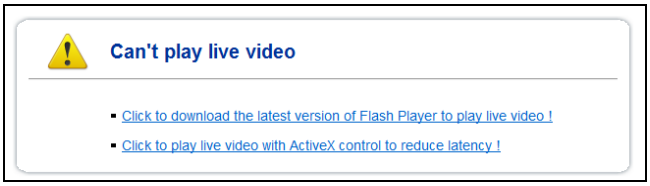
The main screen for the camera web interface is displayed. From here you can configure and view the camera feed.

Note: If you do not see the camera feed, make sure your computer has the latest version of Adobe Flash Player (Chrome, Firefox Internet Explorer and Safari) or ActiveX (Internet Explorer only) installed. After installing restart your browser and reconnect to the camera.

Internet Explorer - ActiveX and Flash Player

The ActiveX plug-in may provide smoother video performance than Flash Player.

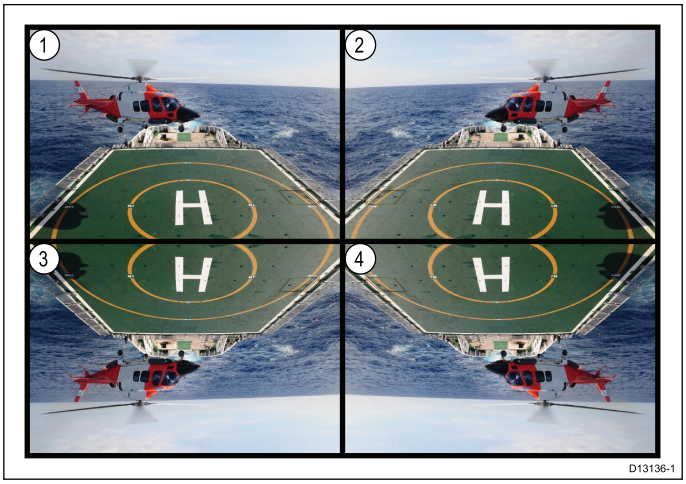
1. If your computer has Flash Player installed:
   i. Open the web interface.
   ii. Click the message above the video window.
   iii. Click inside the video area and select **Install this Add-on for all users on this computer**.
   iv. Follow the onscreen prompts.
2. If your computer does not have Flash Player installed you will be prompted to select if you would like to use ActiveX or Flash Player:



- **Click to play live video with ActiveX control to reduce latency (Recommended)** — Uses the ActiveX plug-in to connect to the camera. To install the plug-in, click on the video area, and select **Install this add-on for all users on this computer**.
- **Click to download the latest version of Flash Player to play live video** — Opens a link to download Flash Player from Adobe's website. After completing the installation, restart your browser and open the web interface.

6.3 Reverse video and video flip

The video feed can be reversed (mirror image), flipped upside down or reversed and flipped depending on your installation.



1. **Normal view** — For forward facing cameras.
2. **Mirror / reverse view** — For cameras facing aft.
3. **Image flip view** — For forward facing cameras, where the camera image appears upside down.
4. **Image flip and mirror / reverse view** — For cameras facing aft, where the camera image appears upside down.

Reversing and flipping the video

In order to reverse the video image or flip the image follow the steps below.

From the camera's Web-interface:

1. Click the **Camera** icon on the left hand side of the page.
2. Click **Camera Setup** from the quick links.
3. Select the relevant option from the **Mirror** drop down box.

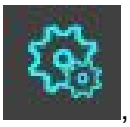
   The options available are:

   - **Off** — For forward facing cameras.
   - **Mirror** — For cameras facing aft.
   - **Flip** — For forward facing cameras, where the camera image appears upside down.
   - **Rotate** — For cameras facing aft, where the camera image appears upside down.

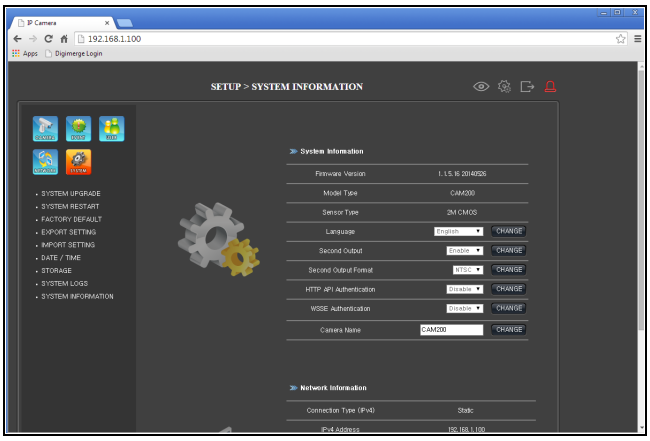
6.4 Resetting the camera to factory defaults

Follow the steps below to reset your camera's settings to their factory default values.

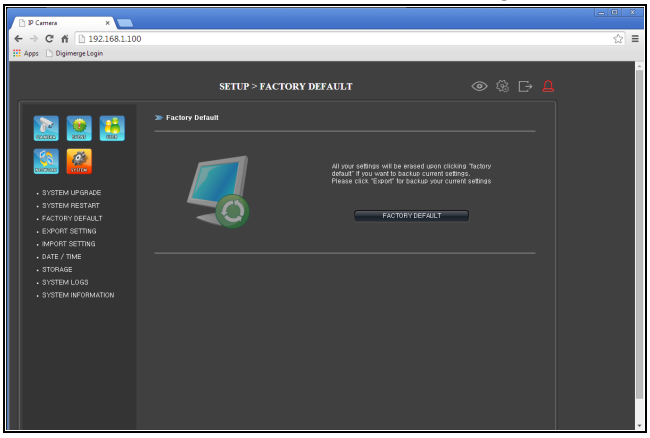
- Ensure that the camera and IP camera are connected to the same network as described in the 4.4 Network connection section.
- Ensure that your PC settings have been changed to allow access to the web interface as described in the Network setup and operation section.

1. Login to the camera's web interface.
2. Click on the Settings icon  , located in the top right hand corner of the page.

   The System Information page is displayed.



3. Click **FACTORY DEFAULT** from the quick links, located on the left hand side of the page.



4. Click **FACTORY DEFAULTS**, located near the center of the page.

   The camera will now reset itself to factory default settings.

Chapter 7: Maintenance

Chapter contents

- 7.1 Routine checks on page 36
- 7.2 Unit cleaning instructions on page 36

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.

Chapter 8: System checks and troubleshooting

Chapter contents

- 8.1 Troubleshooting on page 38
- 8.2 LED status on page 38
- 8.3 IP camera troubleshooting on page 39
- 8.4 Resetting the camera on page 40

8.1 Troubleshooting

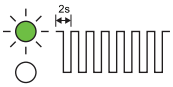
The troubleshooting information provides possible causes and corrective action required for common problems associated with marine electronics installations.

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.

8.2 LED status

The unit has an LED status indicator to help determine the camera's state.

LED sequence	LED color	State
	Solid Red	Power On
	Solid Green	Network connected and transmitting
	Blinking green	Motion detection

8.3 IP camera troubleshooting

Problem	Possible Solutions
Camera does not power on.	**Power over Ethernet (PoE) connection** • Ensure that the ethernet cable is connected correctly and that connections are secure. • Ensure you are not using a **crossover** coupler or cable as they are not appropriate for PoE applications. • Ensure that the Power Sourcing Equipment (PSE) device is switched on and has sufficient remaining power allocation to power the camera. **Dedicated power cable connection** • Ensure that the power supply meets the camera's power requirements. • Ensure that the power supply is switched on. • Ensure power cables are correctly connected and that connections are secure. **Note:** Refer to the Chapter 10 Technical specification for camera power requirements.
PSE is allocating PoE to the camera even though it is powered using a separate power supply.	• PoE allocation always takes priority over the dedicated power supply. If connecting the camera to a PSE ensure that the camera's dedicated power cable is not connected. • Alternatively re-configure the network so the camera is plugged into a non-PoE ethernet connection.
No image on multifunction display	• Using the Camera application on the MFD, Cycle through the available camera feeds to see if the IP camera image is displayed • Ensure that the camera is connected to the multifunction display in accordance with the supplied instructions. • Ensure that the camera is correctly powered on. • Ensure that the MFD and camera are physically connected to the same network. • Ensure that the MFD is running the latest version of LightHouse software.
Video performs poorly	• Insufficient bandwidth available for high quality stream. Using a connected PC, select an alternative, lower resolution stream to conserve bandwidth and improve performance on low bandwidth connections. • If using a PC and Microsoft Internet Explorer, click the message above the video area to use the ActiveX plug-in instead of Flash Player. ActiveX may provide smoother video performance.
Can't find the camera's IP address (PC connections).	By default, the camera is set to obtain an IP address by DHCP, which means it will automatically obtain an IP address from the network. • Ensure that the PC and camera are configured for the same IP address range and subnet mask (IPv4). • Try to Ping the camera's IP address. On you PC go to: **Start > Programs > Accessories > Command Prompt** and type **ping** then the **camera's local IP address** and press **Enter**. If you get a 'request timed out' message the PC and camera are not on the same network or the camera is not connected. The camera is connected if you get replies. • Ensure any VPN software installed on the PC is disabled. • With UPnP enabled go to: **My Computer > Network** and check under network infrastructure. • Ensure your PC's network settings are configured correctly. • Use the supplied IP Scanner software to find out the camera's IP address. **Note:** Refer to Network setup and operation for details on network settings.

8.4 Resetting the camera

When connected to an MFD it should not be necessary to perform a factory reset. However in the event that a factory reset is required the camera's built-in web interface must be used. The camera's web interface can be accessed when connected to a web-enabled device such as a PC.

Please refer to 6.4 Resetting the camera to factory defaults for details.

Chapter 9: Technical support

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- 9.1 Raymarine customer support on page 42

9.1 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.

Chapter 10: Technical specification

Chapter contents

- 10.1 Technical specification on page 44

10.1 Technical specification

Physical specification

Dimensions	• **Base diameter**: 89.9 mm (3.5 in) • **Overall Height**: 246 mm (9.7 in)
Weight	• **Boxed**: 1.1 Kg (2.5 lbs) • **Unboxed**: 0.9 Kg (2 lbs)

Power specification

Nominal supply voltage	12 V dc
Operating voltage range	10.8 V to 13.2 V dc
Power consumption	5.3 W Maximum (IR LEDs On)
Current	1.5 A
Power over Ethernet	PoE Class 2 (6.49 W Max) device (802.3af)

Environmental specification

Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–10°C to 50°C (14°F to 122°F)
Relative humidity	95%
Weatherproof rating	IPX6 & IPX7

Camera specification

Sensor / DSP	2.0 Mega pixel 1/2.8” Sony CMOS image sensor
Scanning system	Progressive scan
Day / Night	True Day / Night with ICR filter changer
Total pixels	1952(H) x 1116(V) 2.18 Mega pixel
Effect pixels	1944(H) x 1104(V) 2.14 Mega pixel
Minimum illumination	0 Lux (IR LEDs On)
I² Distance	20 m (65.6 ft.) (20 LEDs)
Lens	6 mm Mega pixel board lens

Video specification

Compression	H.264 High Profile @ level 4.0, Motion JPEG
Resolutions	1280 x 720 default (supporting up to 1920 x 1080 (FHD)
Video streaming	Supports multi streaming with H.264, MJPEG
Frame Rate	• H.264: 30fps @ 1920 x 1080p • MJPEG: 30fps @ VGA resolution
Bit Rate Control	• Dual stream: H.264, MJPEG • H.264: CBR / CVBR

Conformance specification

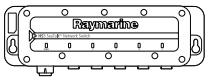
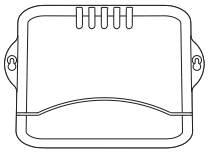
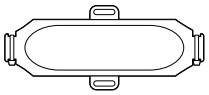
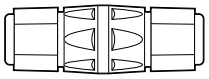
Conformance	• EN 60945:2002 • EMC Directive 2004/108/EC • Australia and New Zealand: C-Tick, Compliance Level 2

Chapter 11: Spares and accessories

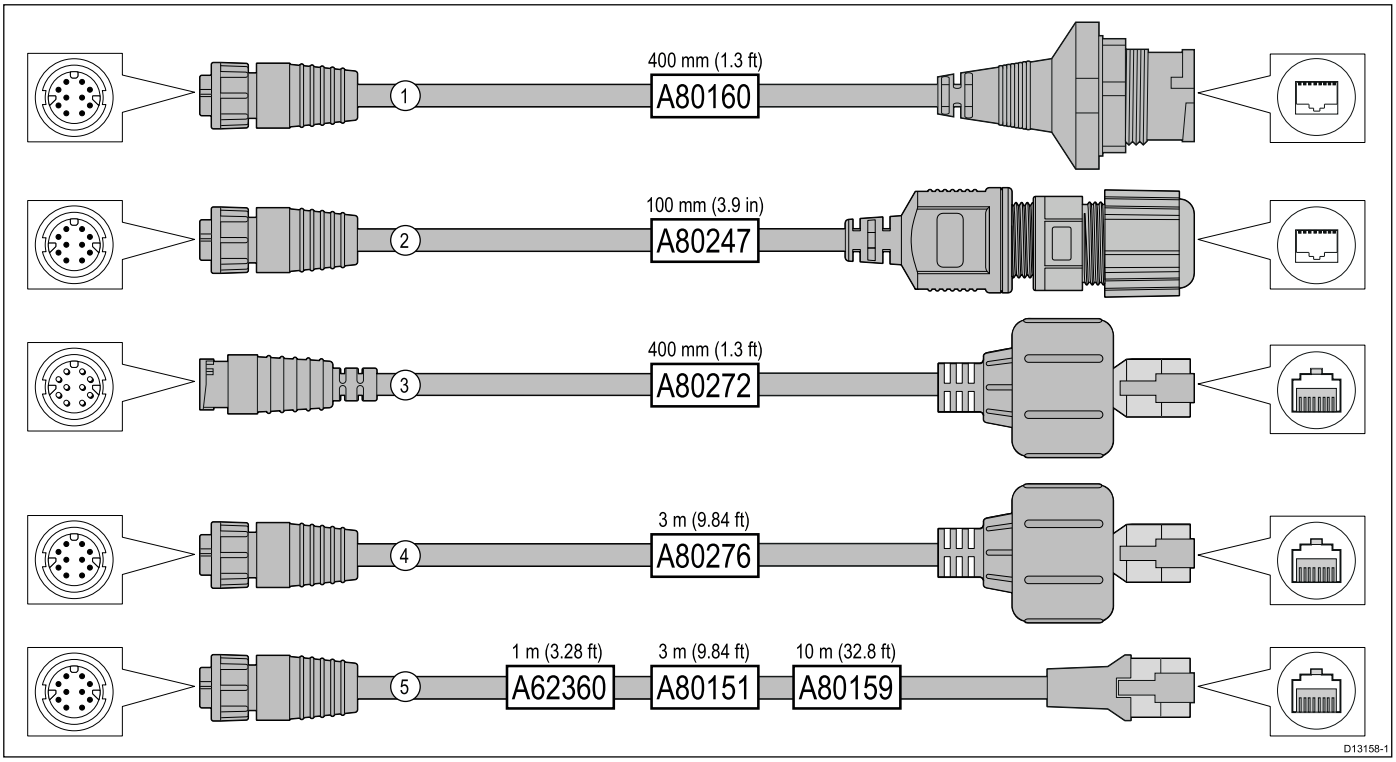
Chapter contents

- 11.1 Network hardware on page 46
- 11.2 RayNet to RJ45 adapter cables on page 47
- 11.3 Network cable connector types on page 48
- 11.4 **RayNet** to **RayNet** cables and connectors on page 49

11.1 Network hardware

Item	Part num-ber	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. **Important:** Do NOT use crossover devices for POE (Power Over Ethernet) connections.
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.

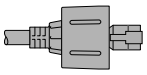
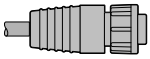
11.2 RayNet to RJ45 adapter cables



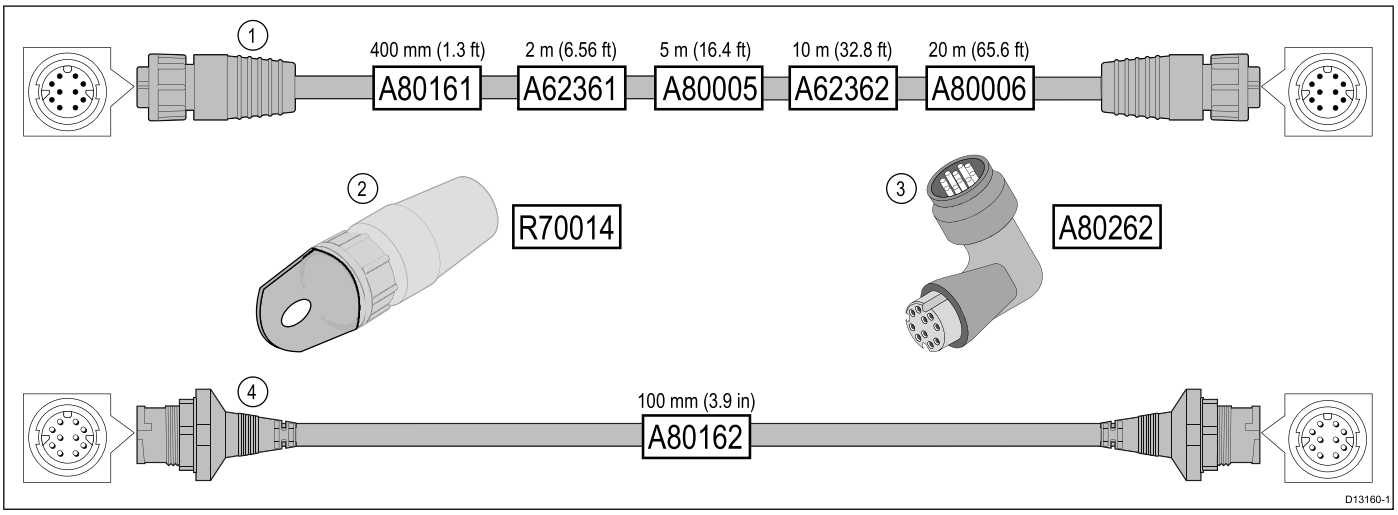
	Description	Typical use	Quantity
1	Adapter cable with a **RayNet** (female) socket on one end, and a waterproof (female) socket on the other end accepting the following cables with an **RJ45 SeaTalk^{hs}** waterproof **locking** (male) plug: • **A62245** (1.5 m). • **A62246** (15 m).	A typical use for 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 SeaTalk^{hs}** 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 SeaTalk^{hs}** (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 SeaTalk^{hs}** 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 SeaTalk^{hs}** 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 SeaTalk^{hs}** (female) socket on the other end.	Connect a **LightHouse** MFD to a legacy **SR6** switch / weather receiver or a legacy 8–port **SeaTalk^{hs}** 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

11.3 Network cable connector types

There are 2 types of network cable connector — RayNet, and RJ45 SeaTalk^{hs}.

	**RJ45 SeaTalk^{hs}** connector.
	**RayNet** connector.

11.4 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

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