CAM200IP / CAM210IP

HD DIGITAL IP VIDEO CAMERAS

CAM200IP software version: **v1.1.5.19**

CAM210IP software version: **v2.0.0.3**

INSTALLATION & OPERATION INSTRUCTIONS

English (en-US)
Date: 09-2024
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Raymarine®

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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 highly recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Register your warranty on the Raymarine website: www.raymarine.com/warranty

Warning: Powering PoE devices

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

NEVER connect the device's 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 product's information label for the correct voltage.

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: 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 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.

Third-party hardware, such as converters, adapters, routers, switches, Access Points etc., provided by third parties, may be made available directly to you by other companies or individuals under separate terms and conditions, including separate fees and charges. Raymarine UK Ltd or its affiliates have not tested or screened the third-party hardware.

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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 (3.28 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 (6.56 ft) from the path of a Radar beam. A Radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The product is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

Note:

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

Suppression ferrites

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

Connections to other equipment

Requirement for ferrites on non-Raymarine cables:

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

For more information, refer to your third-party cable manufacturer.

Declaration of conformity

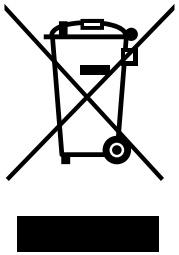
Raymarine UK Ltd declares that this product is compliant with the essential requirements of EMC Directive 2014/30/EU.

The original Declaration of Conformity certificate may be viewed on the relevant product page at: https://bit.ly/rym-docs

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: https://bit.ly/rym-recycling

Warranty registration

To register your Raymarine product ownership, please visit https://bit.ly/rym-warranty 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 (https://bit.ly/raymarine-home) to ensure you have the most up-to-date version(s) of the documentation for your product.

Publication copyright

CHAPTER 2: DOCUMENT AND PRODUCT INFORMATION

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- 2.1 Document information — page 13
- 2.2 Product overview — page 14

2.1 Document information

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

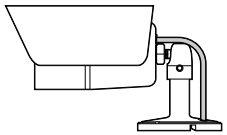
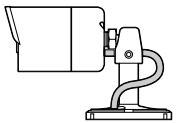
The document includes information to help you:

- 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/manuals

Applicable products

This document is applicable to the following products:

	Part number	Name	Description
	E70262	CAM200IP	Above decks Bullet IP Camera
	E70346	CAM210IP	Above decks Bullet IP Camera

Applicable software version

Product software is updated regularly to add new features and improve existing functionality.

This document has been updated to reflect the following software versions:

Product	Software version
CAM200IP	v1.1.5.19
CAM210IP	v2.0.0.3

Document illustrations

Your product and if applicable, its user interface 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 / CAM210IP Bullet IP Cameras Installation instructions Installation of a CAM200IP or CAM210IP and connection to a wider system of marine electronics.	87232
CAM200IP / CAM210IP surface mounting template Mounting diagram for mounting a CAM200IP or CAM210IP.	87233
Lighthouse MFD Operation Instructions Details the operation of the Camera application for a Series, c Series, e Series, and eS Series multifunction displays.	81360
gS Series Installation and operation instructions Includes details for operation of the Camera application on a gS Series MFD.	81344

Operation instructions

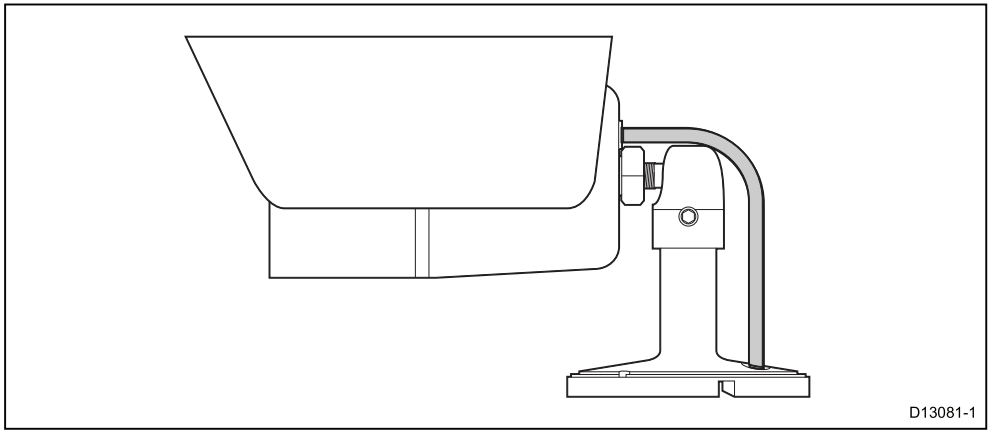
For detailed operation instructions for your product, refer to the documentation that accompanies your display.

All product documentation is available to download from the Raymarine website: https://bit.ly/rym-docs

2.2 Product overview

CAM200IP

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.

Video recording storage consumption

Camera video feed recording time guidelines.

The camera's video feed can be recorded using a Raymarine MFD/Chartplotter, or compatible third-party software.

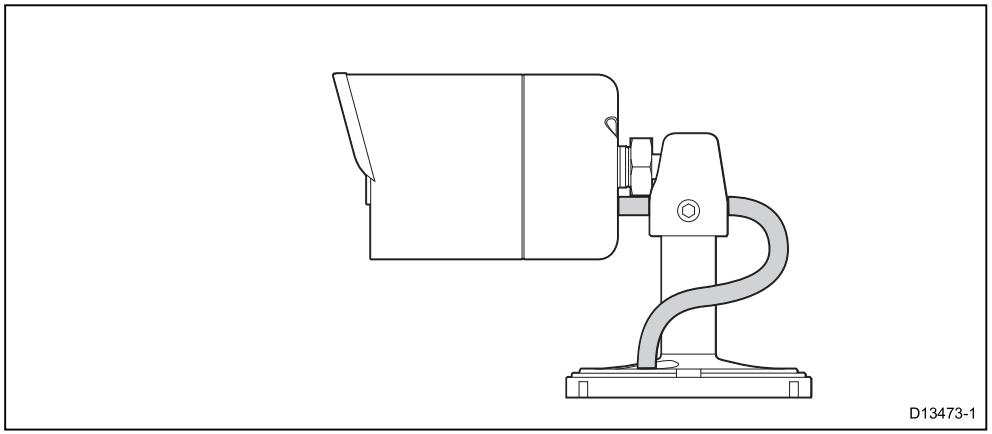
The maximum amount of available recording time is dependent upon several factors, including the ambient lighting conditions, and the camera's resolution and settings.

The available recording time is also dependent on the amount of storage space available for your connected device.

As a general and approximate guideline, when set to factory default settings, an IP camera video stream at 1080p resolution requires approximately **7.1 MByte** of storage **per minute** of video footage (this equates to approximately 140 minutes of recording time, per 1 GByte of storage space).

CAM210IP

The CAM210IP 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°)
- Integrated sunshield with black reflector
- Multi-streaming of H.264 and MJPEG
- Full HD (supports image resolutions up to 1920 x 1080 (1080p), at 30 fps)
- 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.

Video recording storage consumption

Camera video feed recording time guidelines.

The camera's video feed can be recorded using a Raymarine MFD/Chartplotter, or compatible third-party software.

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CHAPTER 3: PLANNING THE INSTALLATION

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- 3.2 Compatible multifunction displays — page 17
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- 3.9 Product dimensions — page 24

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.

- Axiom 2 Pro, Axiom 2 XL
- Axiom, Axiom+, Axiom Pro, Axiom XL.
- a Series, c Series, e Series.
- gS Series.

Lighthouse MFD software requirements

To use this product with a Raymarine® LightHouse™ MFD, ensure that your MFD is running the required version of the software.

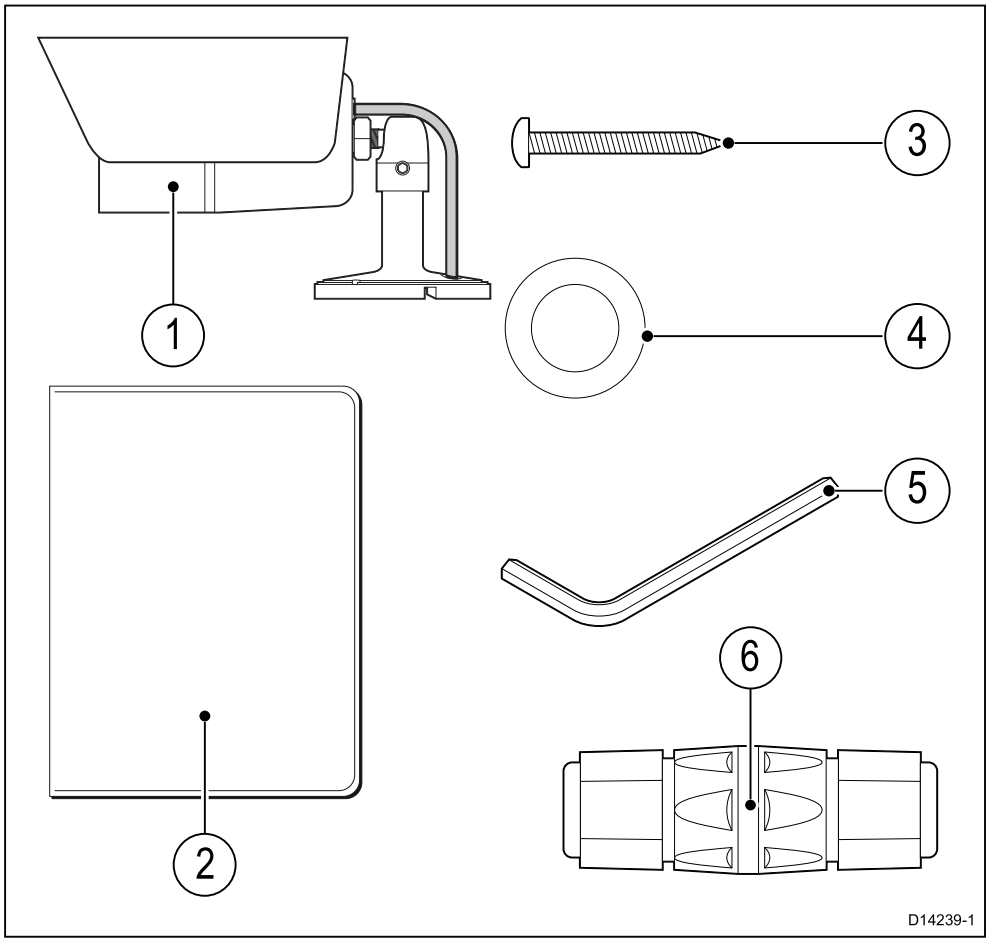
MFD software	Required version
LightHouse™ 2	R12 or later
LightHouse™ 3	3.0 or later
LightHouse™ 4	4.1 or later

Note:

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

3.3 Parts supplied

CAM200IP

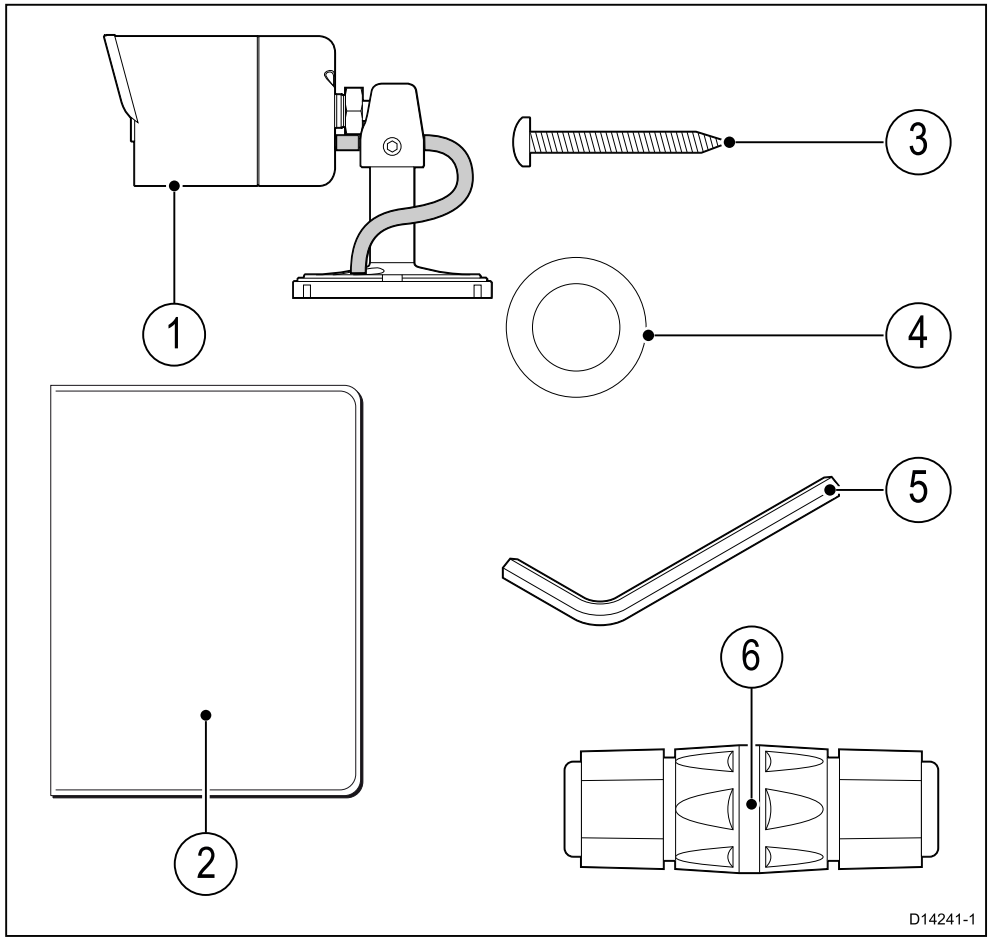


1. 200IP camera (Includes a 1 m (39.4 in) ethernet and power pigtail cable) x1
2. Documentation and software pack x1
3. Mounting screws x3
4. Nylon washers x3
5. Hex wrench (Allen key) x1
6. Waterproof RJ45 coupler x1

Note: To connect the camera to a compatible MFD, a RayNet to SeaTalk hs (male) adaptor cable is also required. Refer to *Spares and accessories* section.

CAM210IP

The following items are supplied with your product.



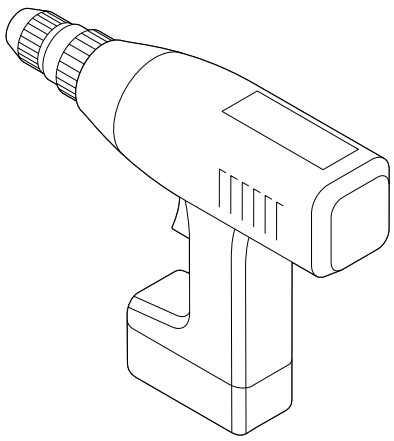
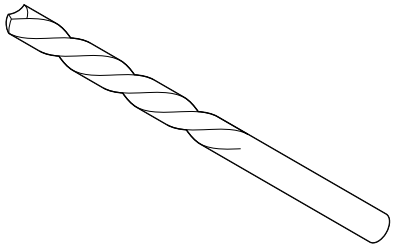
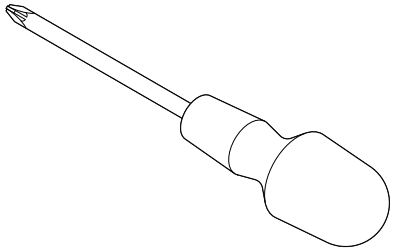
1. 210IP camera (Includes a 1 m (39.4 in) ethernet and power pigtail cable) x1
2. Documentation and software pack x1
3. Mounting screws x3

4. Nylon washers x3
5. Hex wrench (Allen key) x1
6. Waterproof RJ45 coupler x1

Note: To connect the camera to a compatible MFD, a RayNet to SeaTalk hs (male) adaptor cable is also required. Refer to *Spares and accessories* section.

3.4 Tools required

Product installation requires the following tools:

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

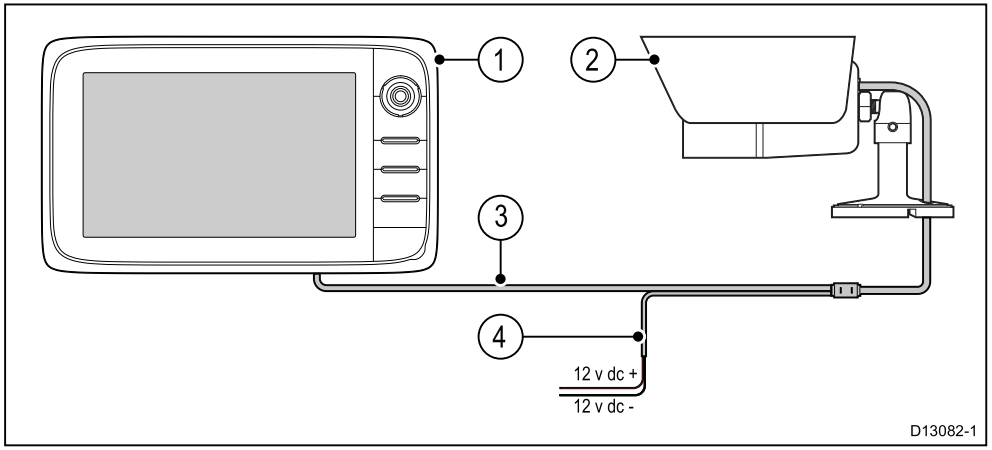
Note: * The appropriate drill bit size is dependent on the thickness and material of the mounting surface.

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 6 Cables and connections section. For information on available cables and accessories, refer to the Chapter 15 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.

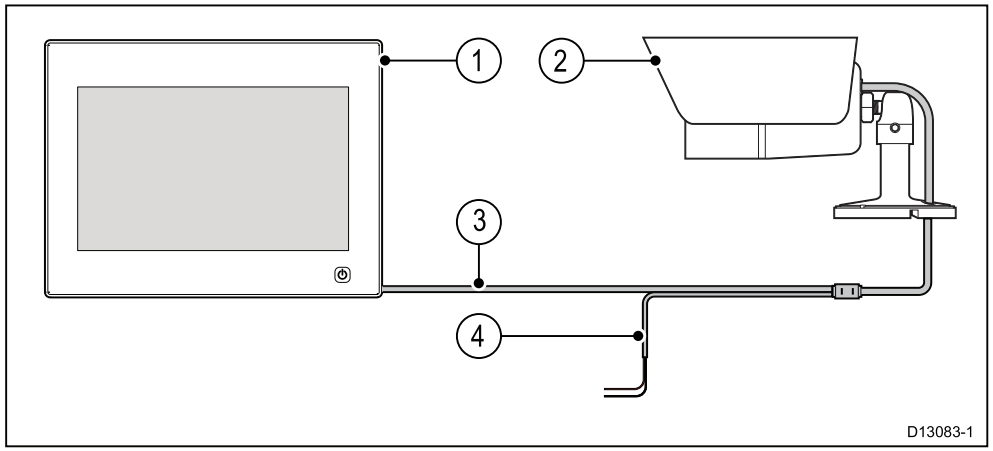


Item	Description
1	MFD
2	IP camera
3	Camera's ethernet cable
4	* Camera's power cable

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

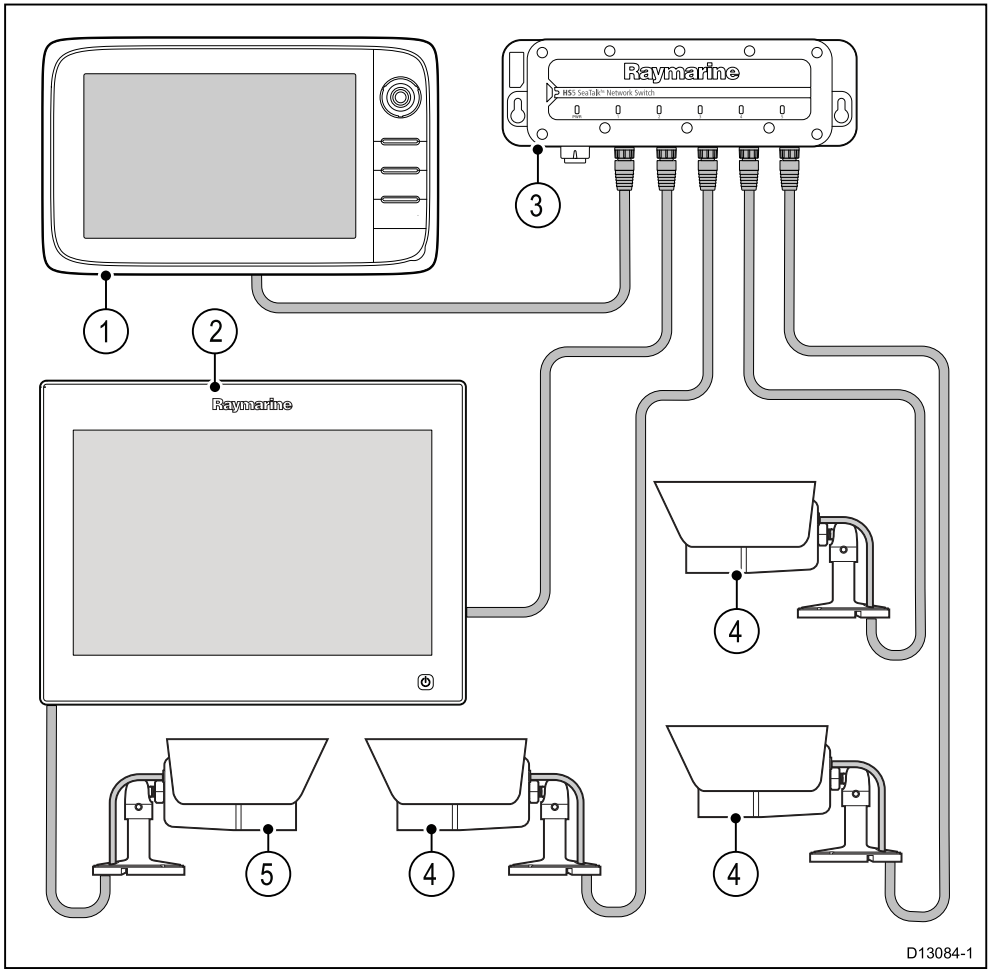
When connecting the camera directly to a gS Series multifunction display the camera can be supplied Power over Ethernet (PoE), if the display has the necessary remaining PoE allocation. Refer to the gS installation and operation instructions for details on PoE allocation.



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.

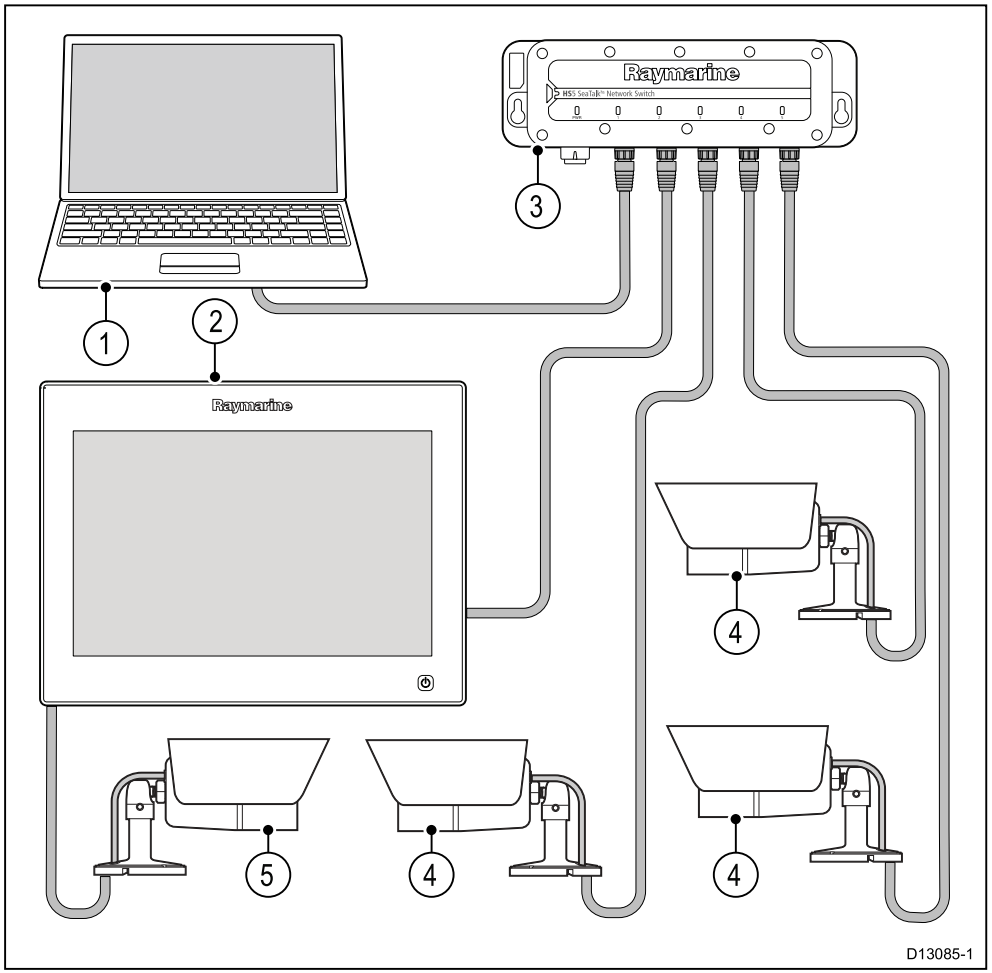
Example: Multiple camera system



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 following section of this document: **p.8 — Important information**

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. For more information, refer to the following section: **p.59 — System checks and troubleshooting**

- **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.

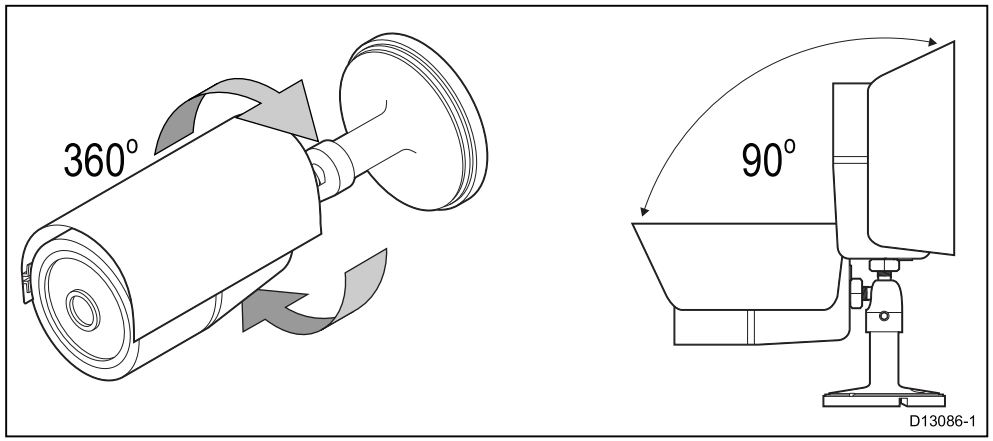
When choosing a suitable location for the product you must aim to maintain a distance of at least 1 m (3.3 ft) in all directions from any compasses.

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 on state.

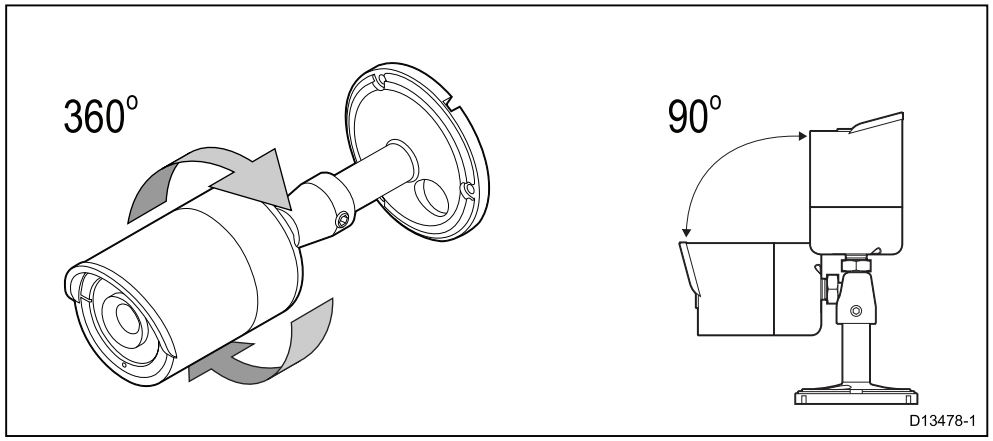
3.8 Pan and tilt

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

CAM200IP



CAM210IP



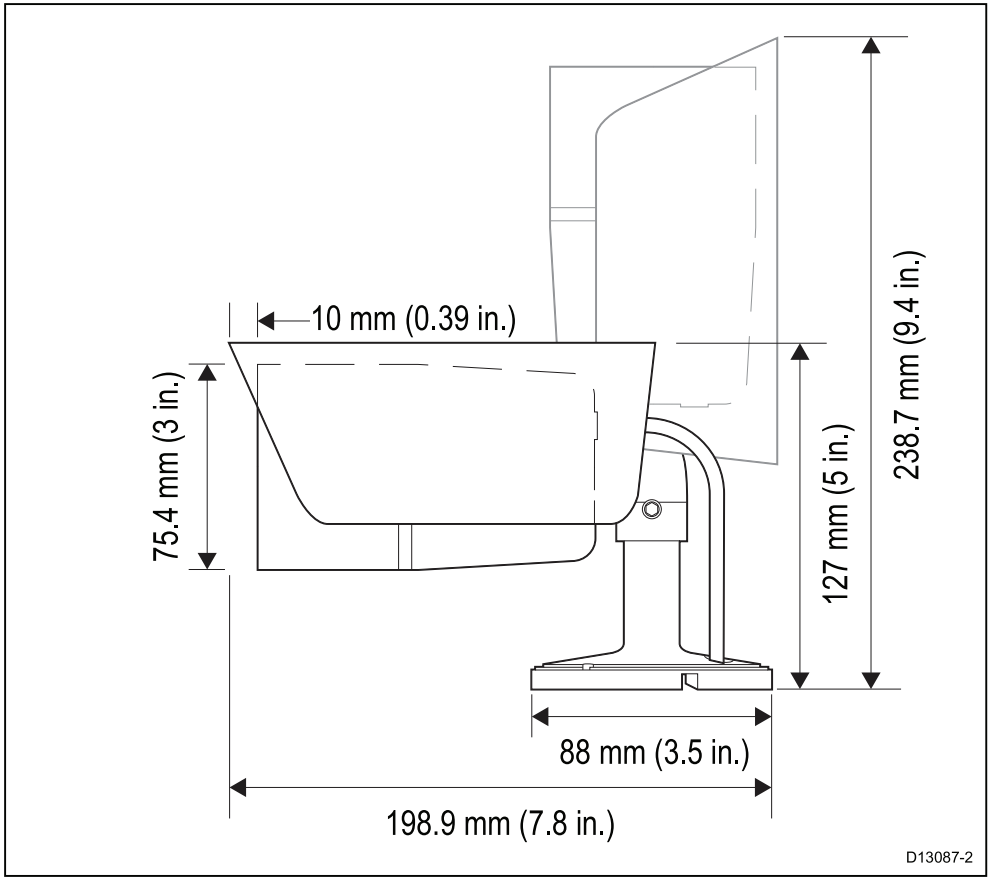
The camera's pan and tilt angles should be adjusted to the required position during installation.

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

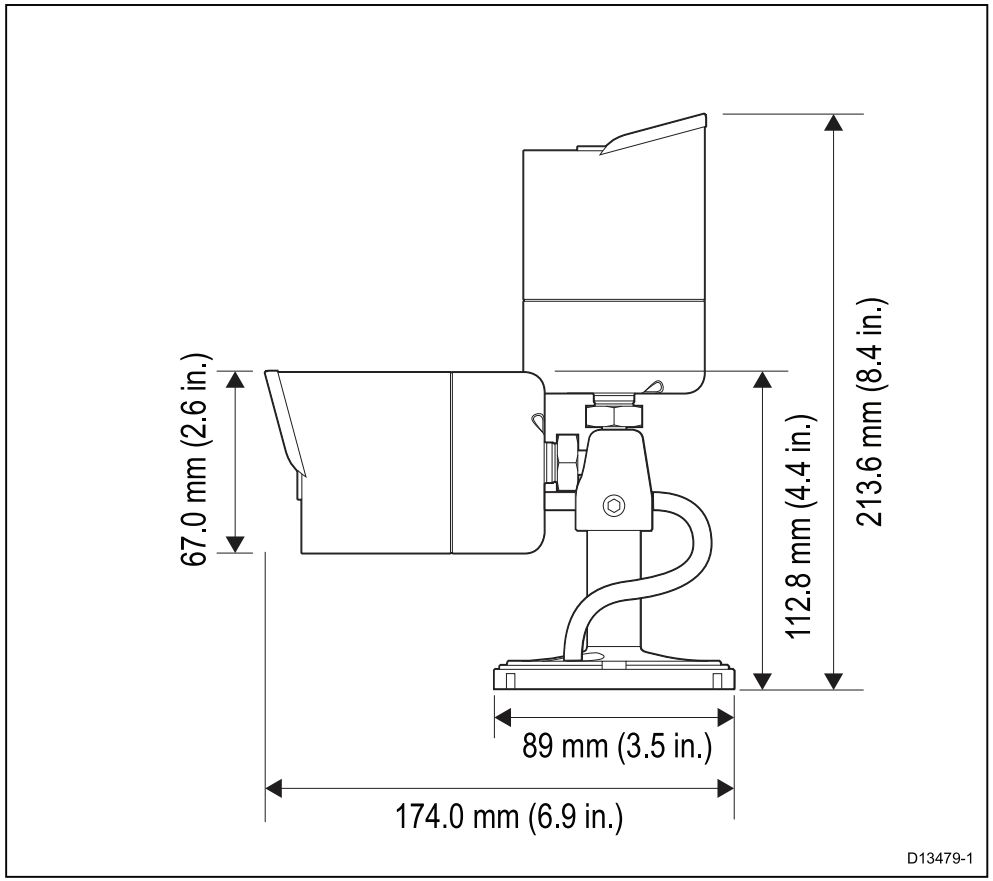
Note: Pan and tilt angle adjustment is a mechanical procedure, performed by physically adjusting the camera's position on its base.

3.9 Product dimensions

CAM200IP



CAM210IP



CHAPTER 4: MOUNTING — CAM200IP

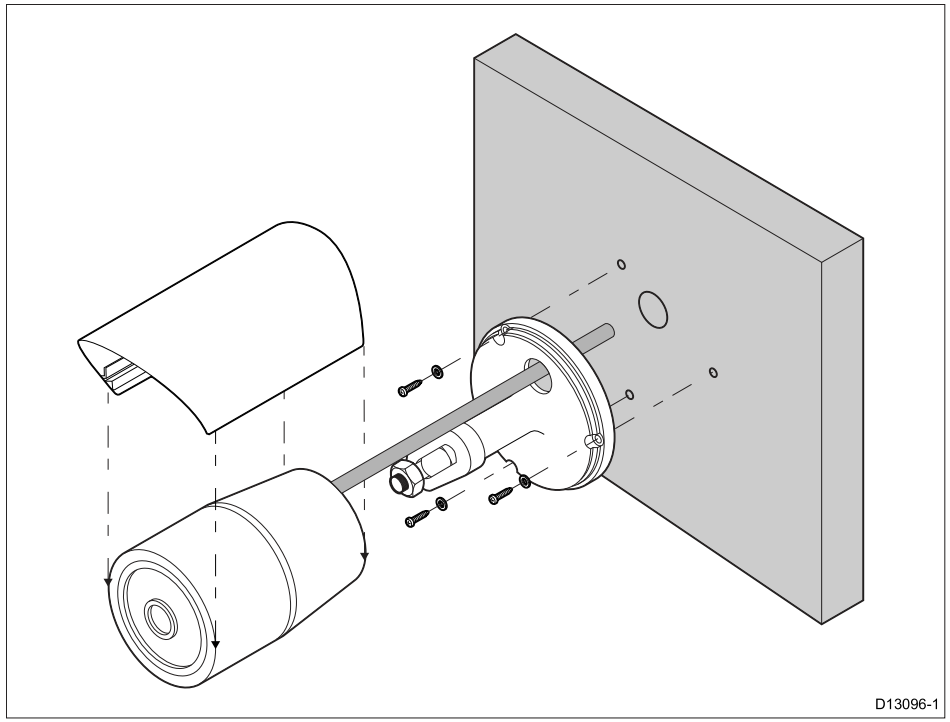
CHAPTER CONTENTS

- 4.1 Mounting the CAM200IP — page 26

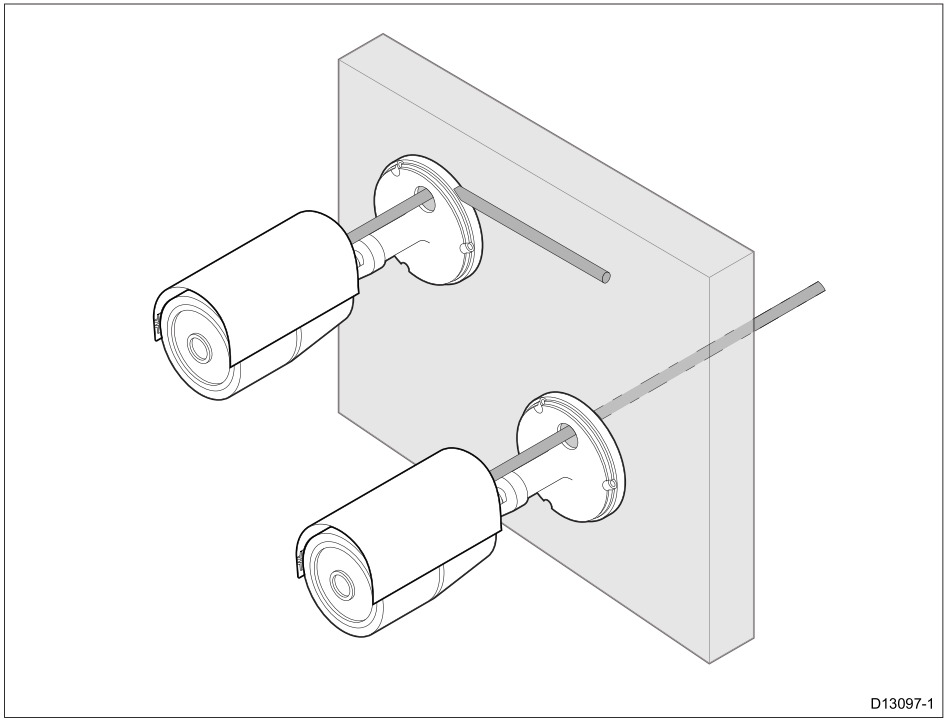
4.1 Mounting the CAM200IP

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

1. Ensure the power supply is switched off and that the necessary cables have been fed to the mounting location.
2. Check the selected location for the unit. A clear, flat area is required, which is safe to have screws fitted to.
3. Use the supplied mounting template to mark out the location of the mounting holes, and if required the cable feed hole.
4. Drill the mounting holes, and if required the cable feed hole at the marked locations.
5. Feed the camera's cables through the cable hole in the camera's base.
6. Place the base into position, lining up the mounting holes in the camera base with the drilled holes in the mounting surface.
7. Secure the base in position using the screws and nylon washers provided, ensuring that the camera's cables sit in the camera base's cable channel, or feed through the cable feed hole in the mounting surface.

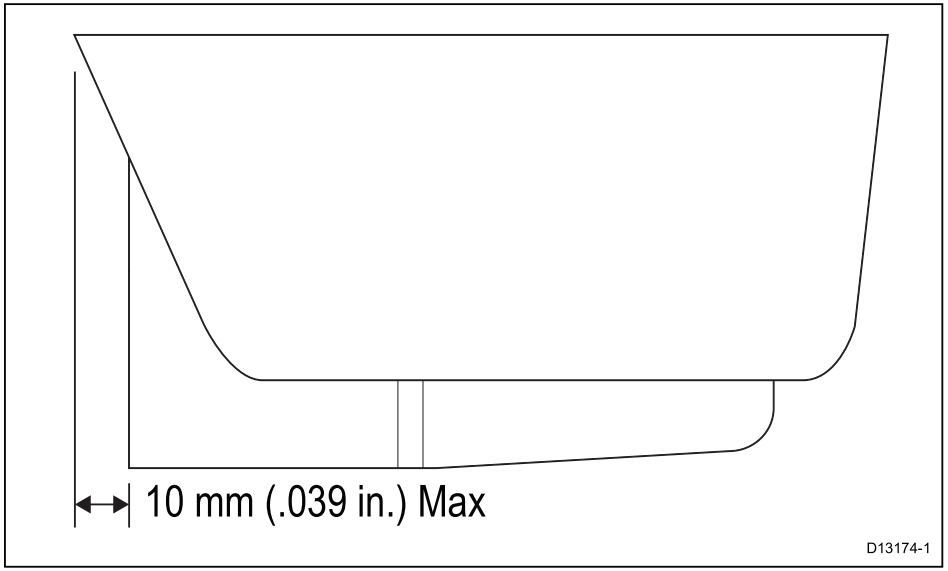


8. Attach the camera to its base and lock into position using the locknut.



9. Connect the camera's cables to the relevant cable feeds.
10. Power up the system and check the camera's video feed on your display.
11. Adjust the camera's pan and tilt angle to obtain the best picture.
12. Lock the camera's position by tightening the grub screws in the camera's base, using the supplied Allen key.

13. 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 5: MOUNTING — CAM210IP

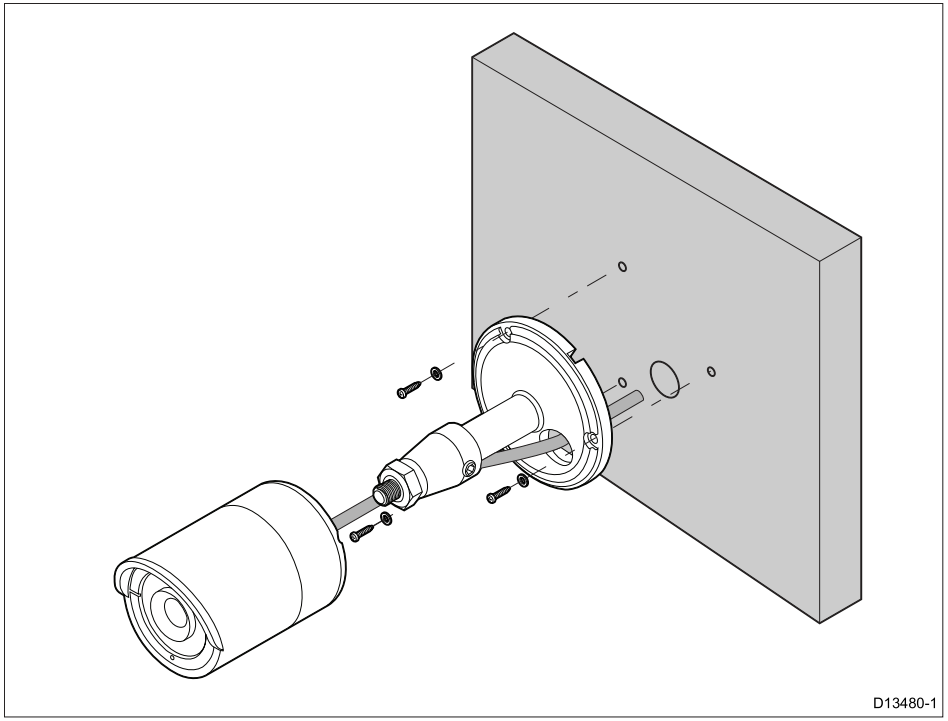
CHAPTER CONTENTS

- 5.1 Mounting the CAM210IP — page 29

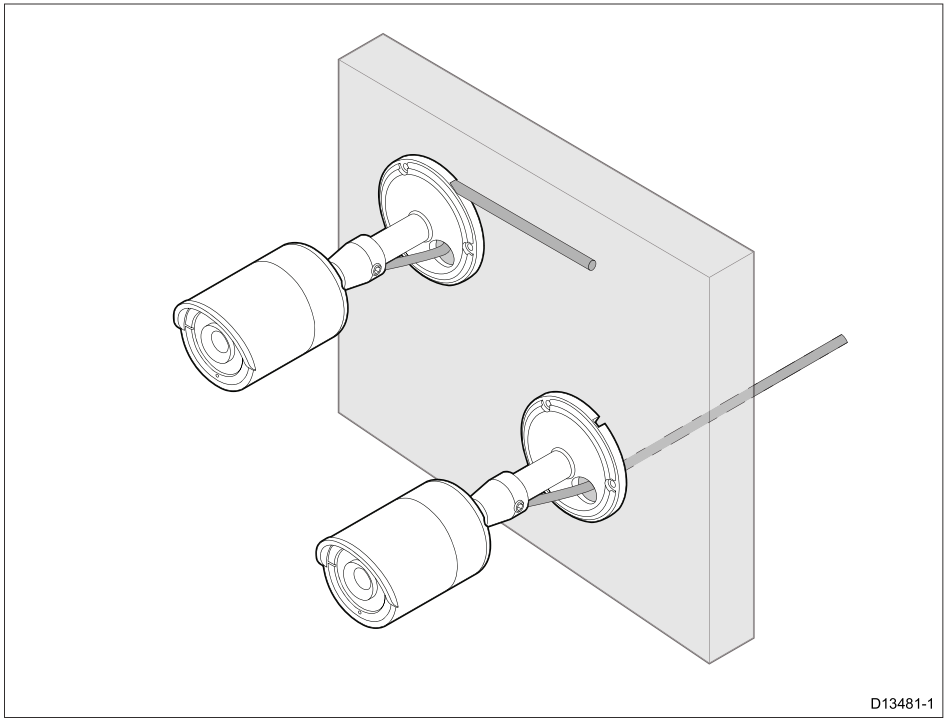
5.1 Mounting the CAM210IP

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

1. Ensure the power supply is switched off and that the necessary cables have been fed to the mounting location.
2. Check the selected location for the unit. A clear, flat area is required, which is safe to have screws fitted to.
3. Use the supplied mounting template to mark out the location of the mounting holes, and if required the cable feed hole.
4. Drill the mounting holes, and if required the cable feed hole at the marked locations.
5. Feed the camera's cables through the cable hole in the camera's base.
6. Place the base into position, lining up the mounting holes in the camera base with the drilled holes in the mounting surface.
7. Secure the base in position using the screws and nylon washers provided, ensuring that the camera's cables sit in the camera base's cable channel, or feed through the cable feed hole in the mounting surface.



8. Attach the camera to its base and lock into position using the locknut.



9. Connect the camera's cables to the relevant cable feeds.
10. Power up the system and check the camera's video feed on your display.
11. Adjust the camera's pan and tilt angle to obtain the best picture.
12. Lock the camera's position by tightening the grub screws in the camera's base, using the supplied Allen key.

CHAPTER 6: CABLES AND CONNECTIONS

CHAPTER CONTENTS

- 6.1 General cabling guidance — page 31
- 6.2 Connections overview — page 32

6.1 General cabling guidance

Cable types and length

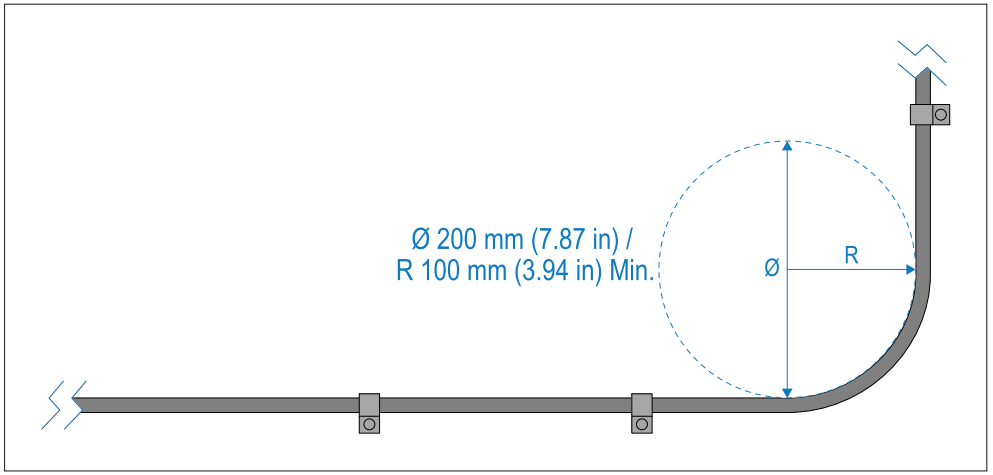
It is important to use cables of the appropriate type and length.

- 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).

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.

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.

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 PCs, processors, displays and other sensitive electronic instruments or devices.
- If using Weather FAX audio cables, always use an isolating transformer.
- If using a third-party audio amplifier, always use an isolated power supply.
- If using an RS232/NMEA converter, always ensure optical isolation on the signal lines.
- Always ensure that PCs or other sensitive electronic devices have a dedicated power circuit.

Cable shielding

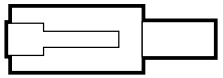
Ensure that cable shielding is not damaged during installation and that all cables are properly shielded.

Important:

Be aware that some **third-party** cables and adaptors (for example, certain Ethernet cables using RJ45 connectors) are not always shielded. To prevent breaks in cable shielding continuity and potential grounding issues, special attention is required to ensure that any cables, extension cables, adaptors, or other signal-coupling devices (such as multi-way connectors, junction boxes, terminal blocks etc.) used in cable runs **maintain all shield connections throughout the cable run**.

6.2 Connections overview

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

Connector	Type	Connects to:	Suitable cables
	RJ45	• RayNet network • Multifunction display • PC	A Network coupler and / or RayNet to SeaTalk hs adapter cable is required. For further information, refer to the following section: **p.71 — 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.

Connecting cables

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. Engage any locking mechanism to ensure a secure connection (e.g.: turn locking collars clockwise until tight, or in the locked position).
5. Ensure any bare ended wire connections are suitably insulated to prevent shorting and corrosion due to water ingress.

Bare-ended wire connections

You must ensure that any bare-ended wires are adequately protected from short circuit and water ingress.

Bare-ended wire connections

It is recommended that bare-ended wire connections are made by soldering or using crimp connectors, and then protected by wrapping the connection in electrical insulation tape.

Unused bare-ended wires

Any unused bare-ended wires should be folded back and wrapped in electrical insulation tape.

CHAPTER 7: NETWORK CONNECTIONS

CHAPTER CONTENTS

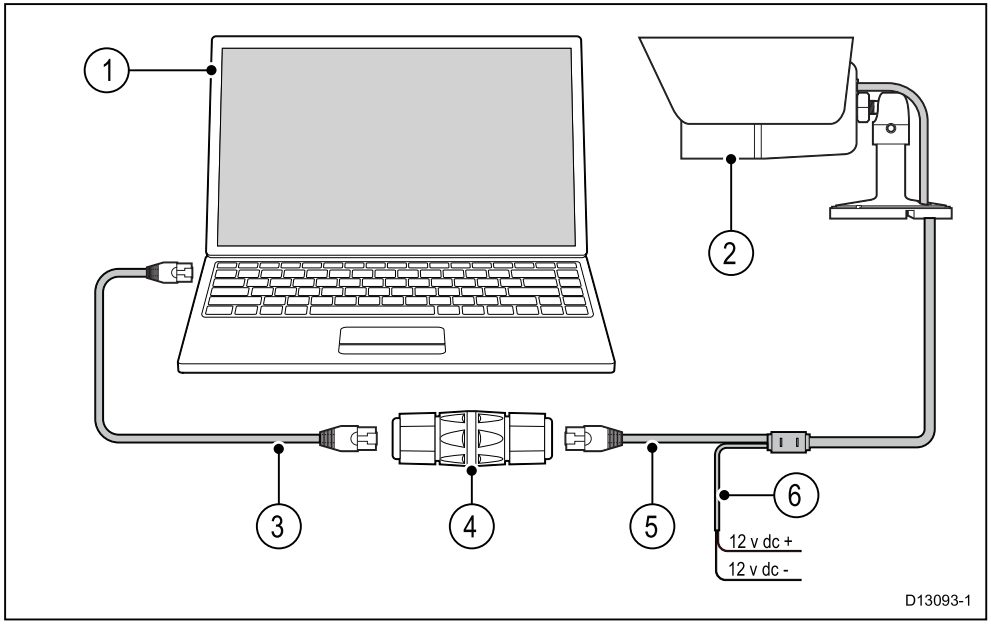
- 7.1 Network connection — page 34

7.1 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.

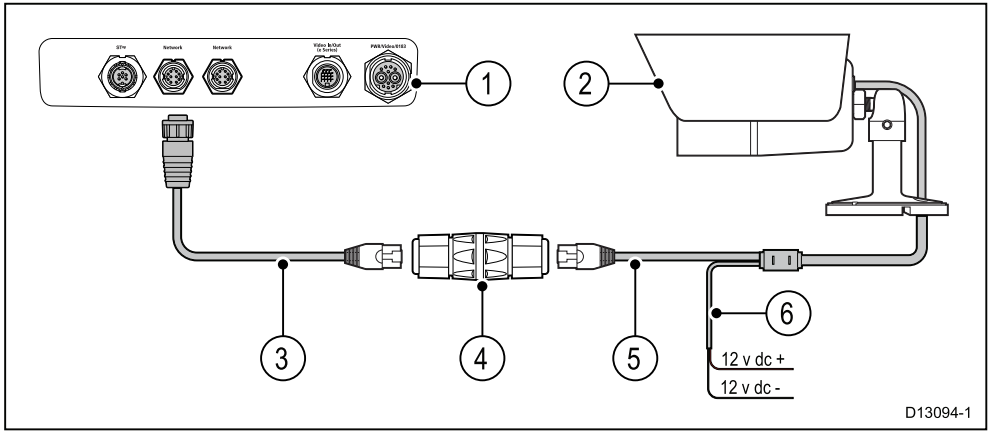


Item	Description
1	PC
2	IP camera
3	RJ45 ethernet cable
4	Waterproof RJ45 ethernet coupler (R32142) (supplied)
5	Camera's ethernet cable
6	Camera's power cable

For details on available network hardware and cables refer to Chapter 15 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.



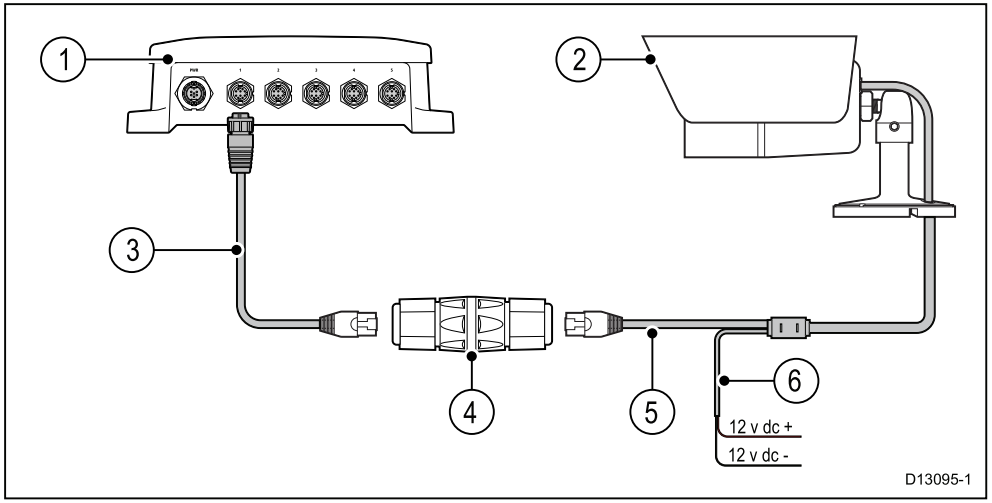
Item	Description
1	MFD rear connector panel
2	IP camera
3	RayNet to SeaTalk hs (male) adaptor cable
4	Waterproof RJ45 ethernet coupler (R32142) (supplied)
5	Camera's ethernet cable
6	Camera's power cable (Connection not required if the camera is being supplied PoE by the MFD.)

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 15 Spares and accessories.

Network switch connection

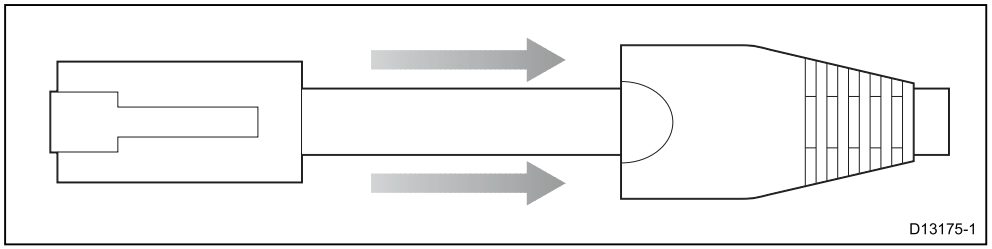
Multiple camera's can be networked together using an network switch or router.



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 8: POWER CONNECTIONS

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- 8.1 Power options — page 37
- 8.2 Powering PoE devices — page 37
- 8.3 Power connection — PoE — page 37
- 8.4 Power connection — Self-powered — page 38

8.1 Power options

This product must be powered using **only one** of the following methods:

1. **PoE (Power over Ethernet)**
   - Direct connection to a PSE (Power Sourcing Equipment) device, e.g. a PoE injector or PoE network switch. Only one Ethernet cable is required to carry both data and power signals.
2. **Self-powered**
   - Direct connection to a vessel's power supply using the supplied power cable.

8.2 Powering PoE devices

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

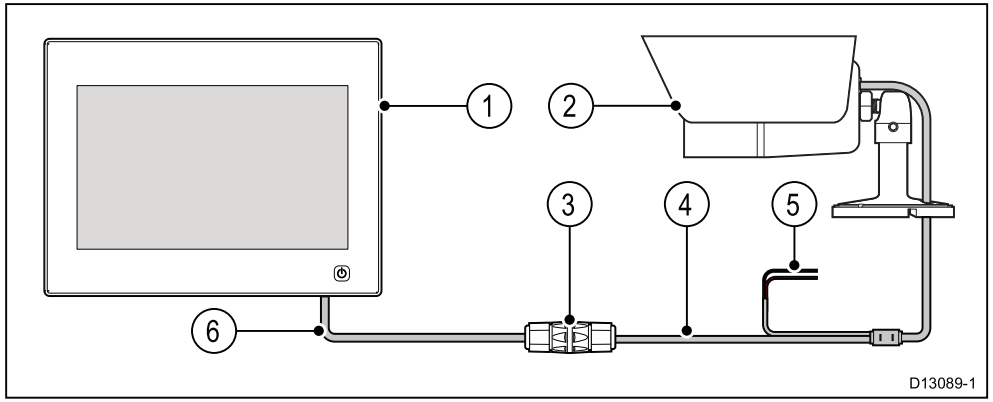
NEVER connect the device's dedicated power cable when the device is being supplied PoE.

8.3 Power connection — PoE

Power over Ethernet, via MFD

The camera is a Class 2 PoE device. When the camera is connected directly to a multifunction display (MFD) providing PoE (such as the Raymarine gS Series, Axiom XL or Axiom 2 XL), ,the unit can be powered from the display's network connection.

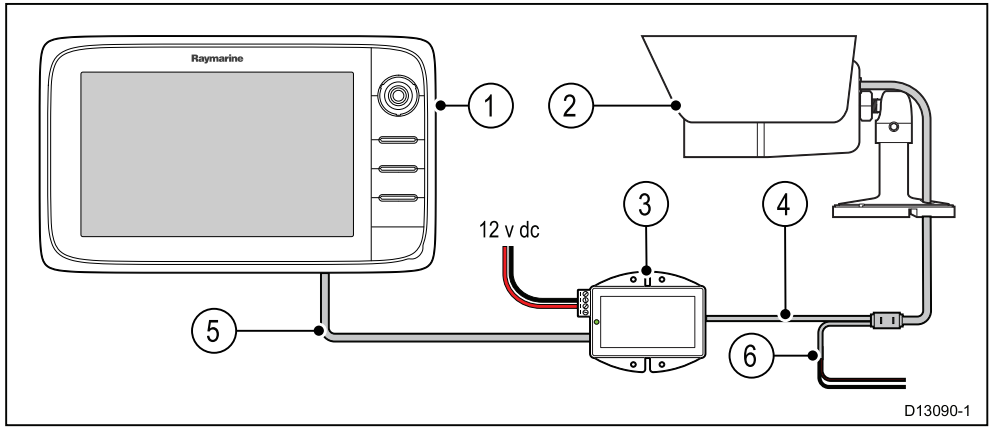
NEVER connect the camera's power supply connection when the unit is being supplied PoE.



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)

Power over Ethernet, via 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:

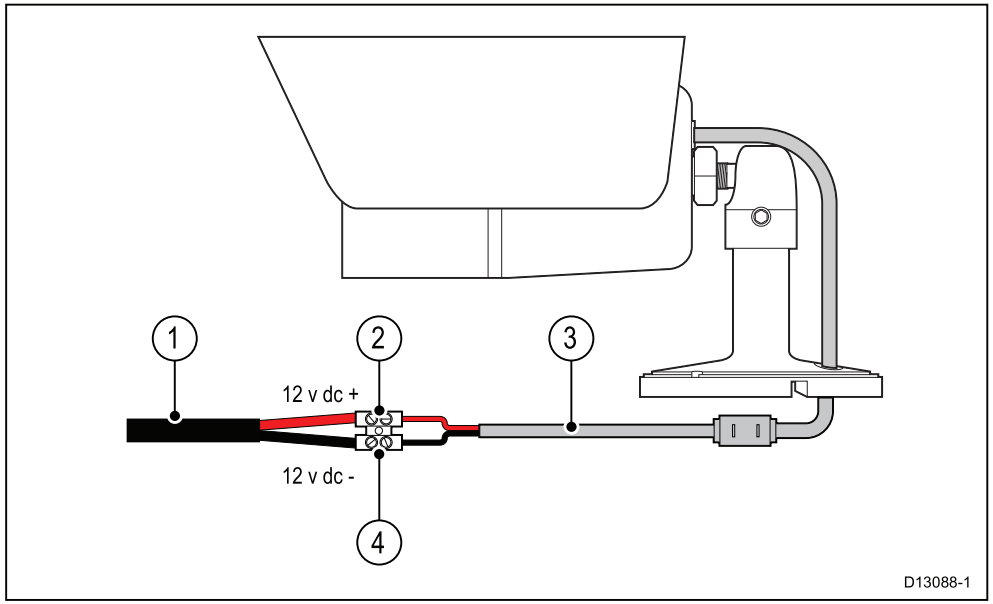
PoE Class	Current (mA)	Power range (Watt)	Class description
Class 0	0 to 4	0.44 W to 12.94 W	-
Class 1	9 to 12	0.44 W to 3.84 W	Very low power
Class 2	17 to 20	3.84 W to 6.49 W	Low power
Class 3	26 to 30	6.49 W to 12.95 W	Mid power
Class 4	36 to 44	12.95 W to 25.5 W	High power

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

8.4 Power connection — Self-powered

The camera can be powered from a **12 V 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

Inline fuse and thermal breaker ratings

The following inline fuse and thermal breaker ratings apply to your product:

Inline fuse rating	Thermal breaker rating
2A	3A

Important:

The suitable fuse rating for the thermal breaker is dependent on the number of devices you are connecting. If in doubt, consult an authorized Raymarine dealer.

Warning: Grounding not required

This product does NOT require separate grounding.

Power distribution

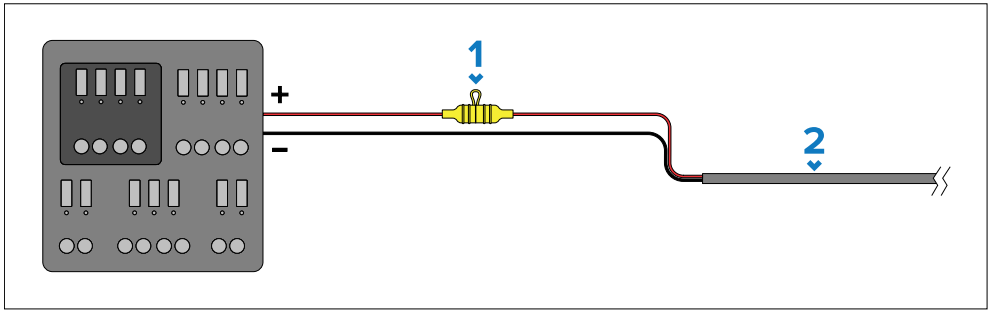
Recommendations and best practice.

- The product is supplied with a power cable, either as a separate item or a captive cable permanently attached to the product. Only use the power cable supplied with the product. Do NOT use a power cable designed for, or supplied with, a different product.
- Refer to the *Power connection* section for more information on how to identify the wires in your product's power cable, and where to connect them.
- See below for more information on implementation for some common power distribution scenarios:

Important:

- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for guidance only, to help protect your product. It covers common vessel power arrangements, but does NOT cover every scenario. If you are unsure how to provide the correct level of protection, please consult an authorized dealer or a suitably qualified professional marine electrician.

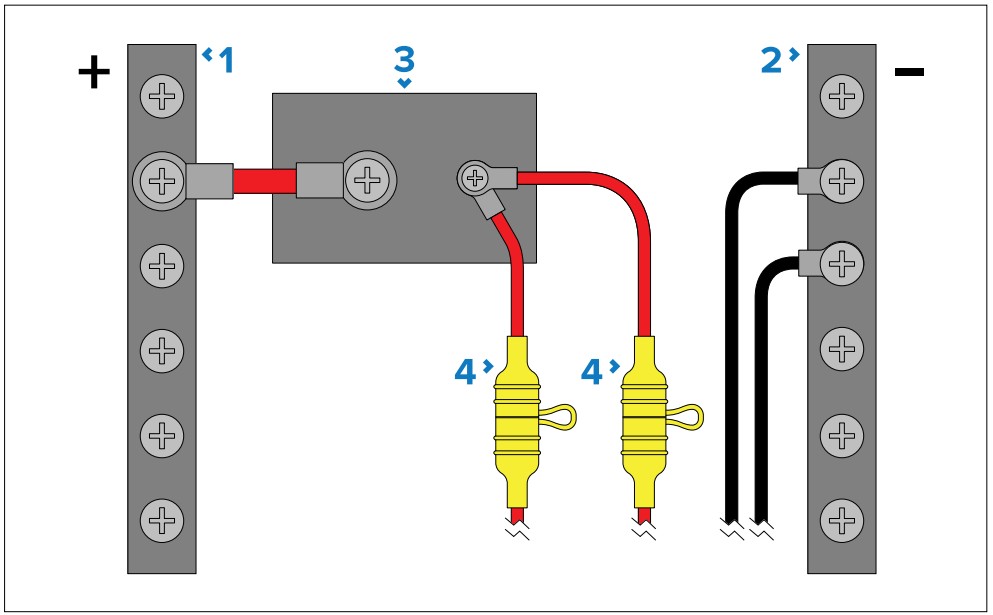
Implementation — connection to distribution panel (Recommended)



	Description
1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.
2	Product power cable.

- It is recommended that the supplied power cable is connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.
- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm^2) cable.
- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is not possible and more than one item of equipment shares a breaker, use

individual inline fuses for each power circuit to provide the necessary protection.



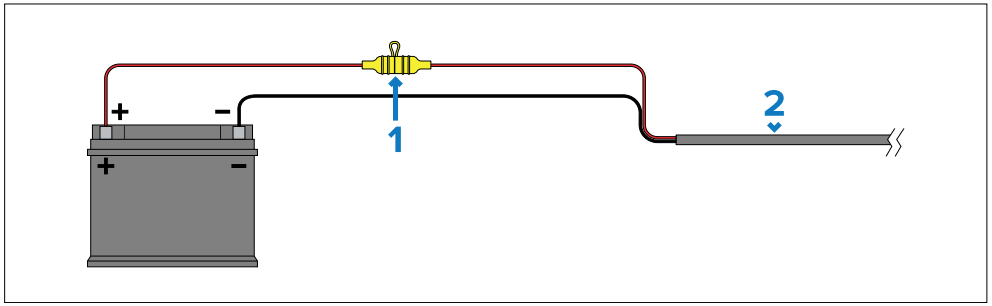
	Description
1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.

Important:

Observe the recommended fuse / breaker ratings provided in the product's documentation, however be aware that the suitable fuse / breaker rating is dependent on the number of devices being connected.

Implementation — direct connection to battery

- Where connection to a power distribution panel is not possible, the power cable supplied with your product may be connected directly to the vessel's battery, via a suitably rated fuse or breaker.
- The power cable supplied with your product does NOT include a separate drain wire. Therefore, only the power cable's red and black wires need to be connected.
- If the power cable is NOT supplied with a fitted inline fuse, you MUST fit a suitably rated fuse or breaker between the red wire and the battery's positive terminal.
- Refer to the inline fuse ratings provided in the product's documentation.
- If you need to extend the length of the power cable supplied with your product, ensure you observe the dedicated *Power cable extensions* advice provided in the product's documentation.



	Description
1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.
2	Product power cable.

More information

It is recommended that best practice is observed in all vessel electrical installations, as detailed in the following standards:

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ISO 13297: Small craft — Electrical systems — Alternating and direct current installations

- ISO 10133: Small craft — Electrical systems — Extra-low-voltage d.c. installations
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

Power cable extension (12 / 24 V systems)

If you need to extend the length of the power cable supplied with your product, ensure you observe the following advice:

- 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.
- Ensure that the extension cable is of a sufficient gauge for the supply voltage and the total load of the device and the length of the cable run. Refer to the following table for typical **minimum** power cable wire gauges:

Cable length in meters (feet)	Wire gauge in AWG (mm^2) for 12 V supply	Wire gauge in AWG (mm^2) for 24 V supply
<8 (<25)	16 (1.31 mm^2)	18 (0.82 mm^2)
16 (50)	14 (2.08 mm^2)	18 (0.82 mm^2)
24 (75)	14 (2.08 mm^2)	16 (1.31 mm^2)
>32 (>100)	14 (2.08 mm^2)	16 (1.31 mm^2)

Important:

Be aware that some products in your system (such as sonar modules) can create voltage peaks at certain times, which may impact the voltage available to other products during the peaks.

Important:

To ensure power cables (including any extension) are of a sufficient gauge, ensure that there is a continuous **minimum** voltage of **10.8 V dc** at the end of the cable where it enters the product's power connector, even with a fully flat battery at 11 V dc. (Do not assume that a flat battery is at 0 V dc. Due to the discharge profile and internal chemistry of batteries, the current drops much faster than the voltage. A "fully flat" battery still shows a positive voltage, even if it doesn't have enough current to power your device).

CHAPTER 9: OPERATION

CHAPTER CONTENTS

- 9.1 Operation instructions — page 43
- 9.2 Web browser interface — page 43
- 9.3 Reverse video and video flip — page 55
- 9.4 Resetting the camera to factory defaults — page 55

9.1 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: https://bit.ly/rym-docs

9.2 Web browser interface

Network setup and operation

Default username and password (CAM200IP)

You can log in to the Web interface using the User Name *[admin]* and the Password *[1234]*.

Default username and password (CAM210IP)

If your product was:

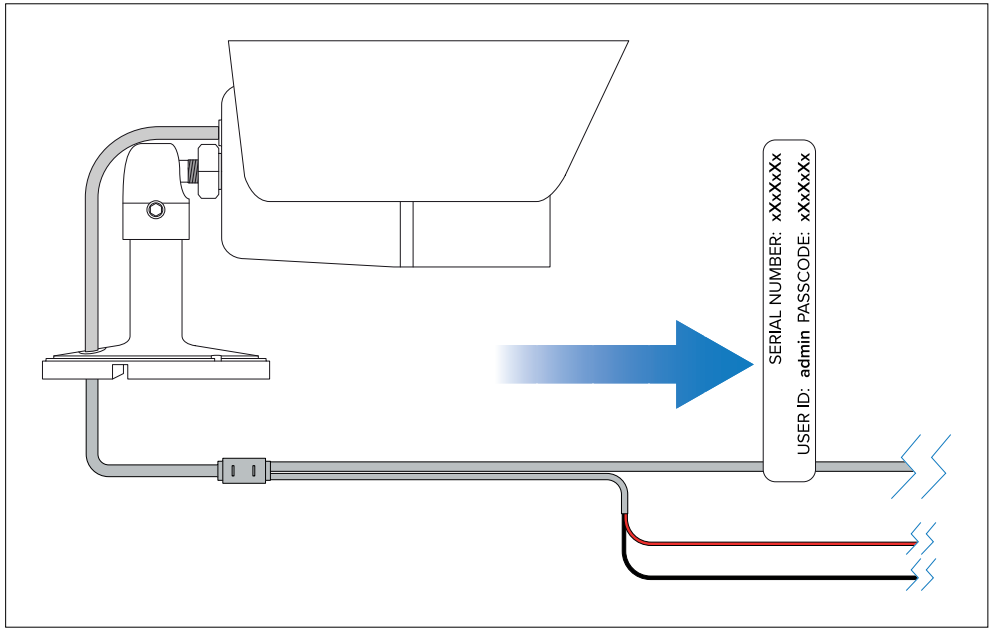
- Originally purchased outside of the UK, or;
- Originally purchased inside of the UK and obtained running a software version **earlier than** v2.0.0.3:

You can log in to the Web interface using the User Name *[admin]* and the Password *[1234]*.

If your product was:

- Originally purchased inside of the UK and obtained running software version v2.0.0.3 **or later**:

You can log in to the Web interface using the User Name *[admin]* and the Password located on the serial number label supplied in the box and / or the camera's Ethernet and power pigtail cable:



Important:

You should change the default login password to prevent unauthorized access.

Ports and IP address

Item	Description
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

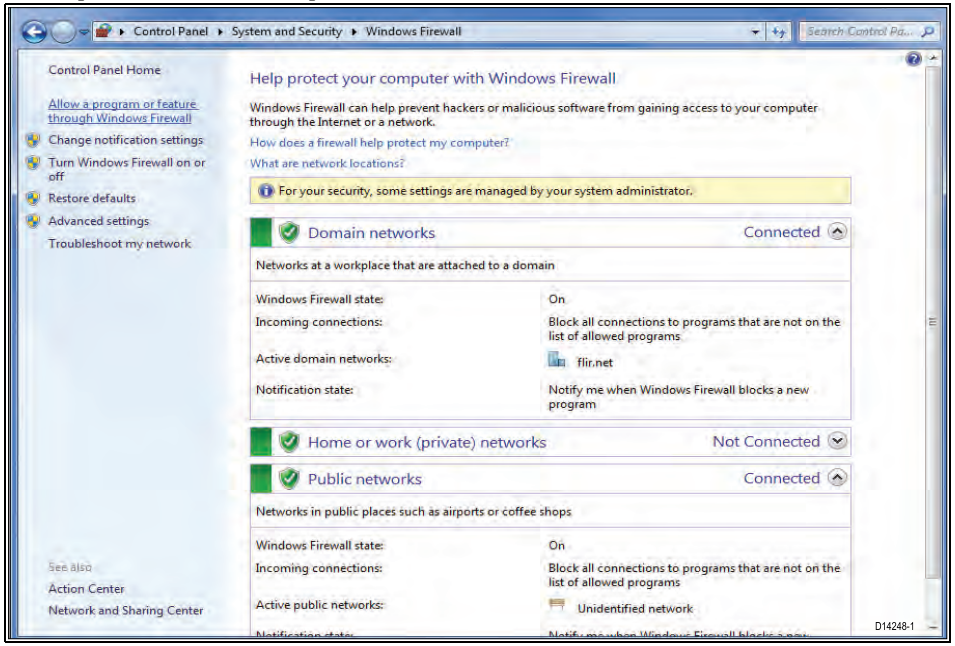
Note: * You may need to change your network settings to connect to a PC running Windows 7.

Changing network settings - Windows 7

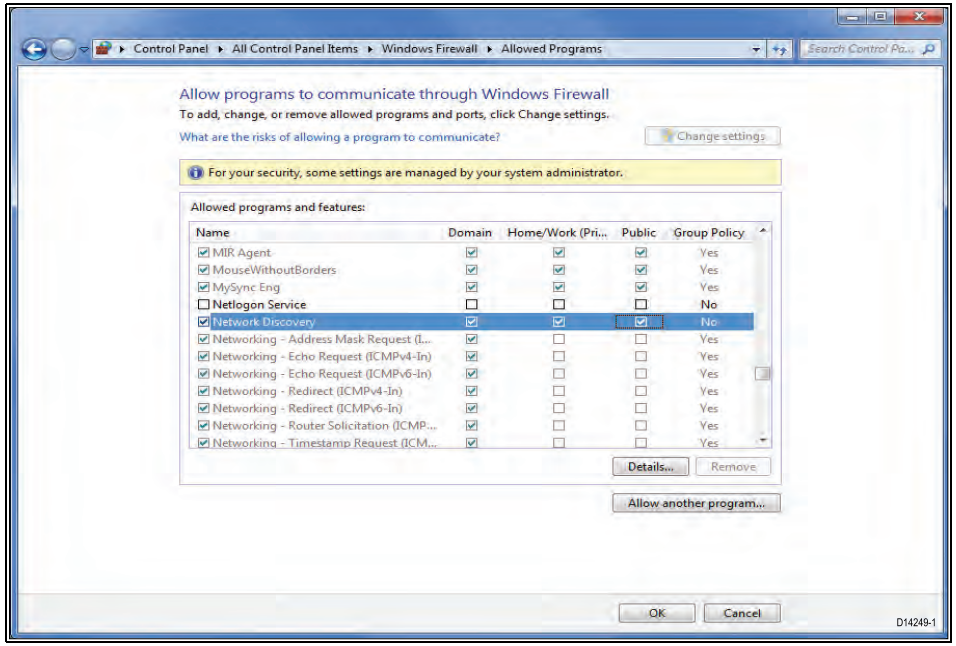
To configure the necessary network settings on a Windows 7 PC follow the steps below

With the camera networked to the PC (refer to **p.33 — Network connections** for details.

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

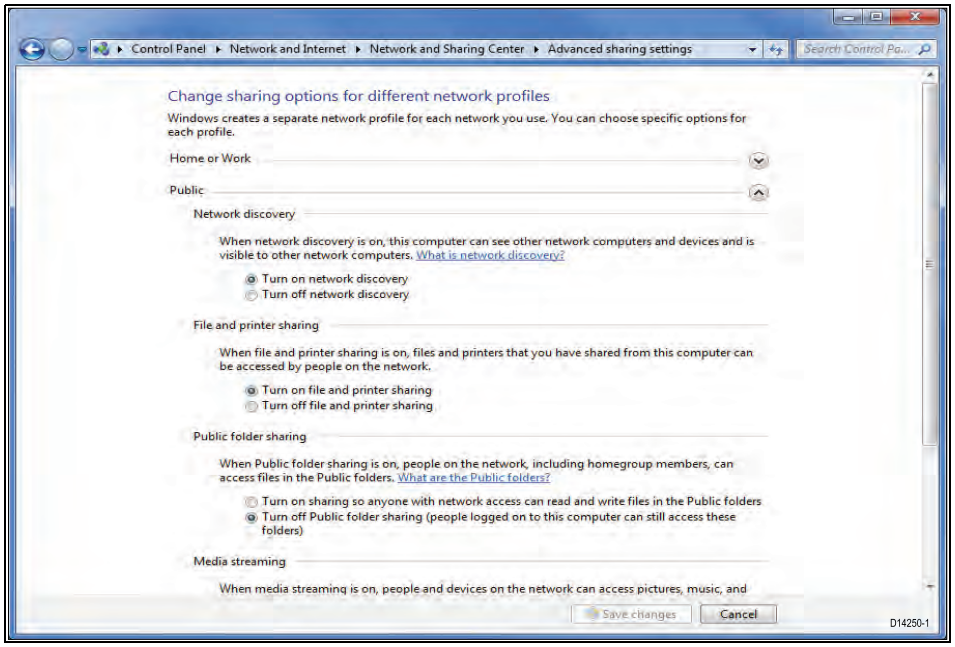


5. Click *[Allow a program or feature through Windows Firewall]*.
6. Scroll down the list to *[Network Discovery]*.
7. Place a tick in the box for the type of network that the camera is on (this is usually Public).



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.



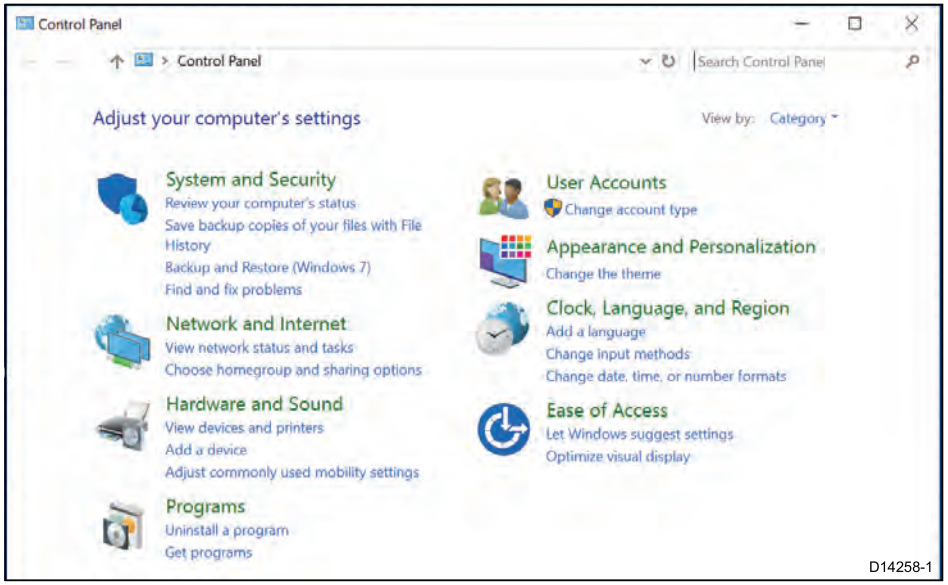
14. Click *[Save changes]* if you switched on network discovery, or
15. Click *[Cancel]* if network discovery was already turned on.

Changing network settings - Windows 10

To configure the necessary network settings on a Windows 10 PC follow the steps below:

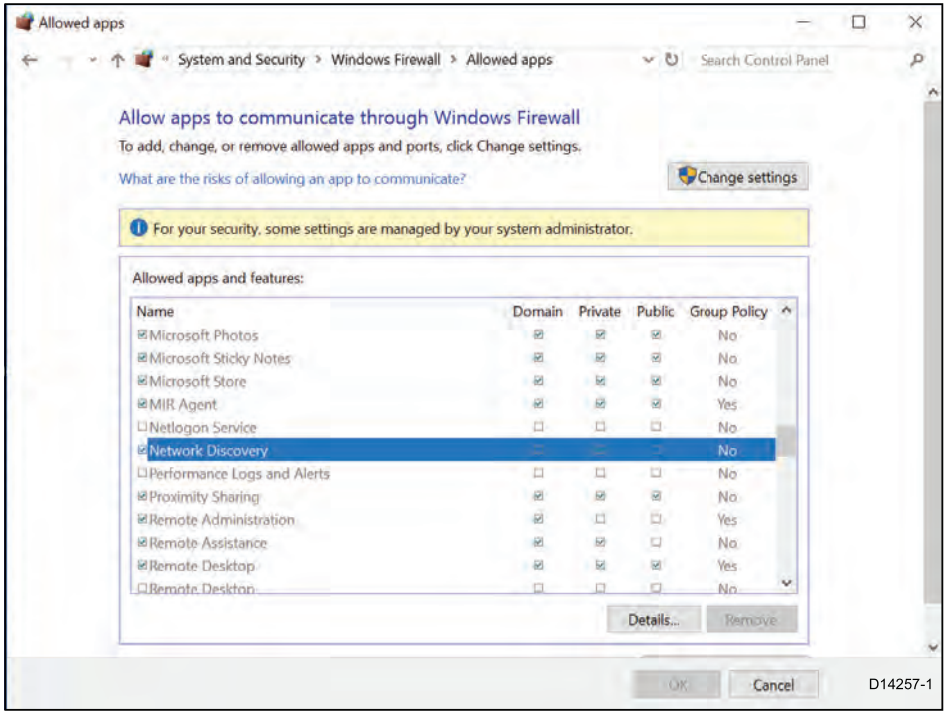
With the camera networked to the PC (for further information refer to **p.33 — Network connections**):

1. Click *[Control Panel]*.
2. Click *[System and Security]*.

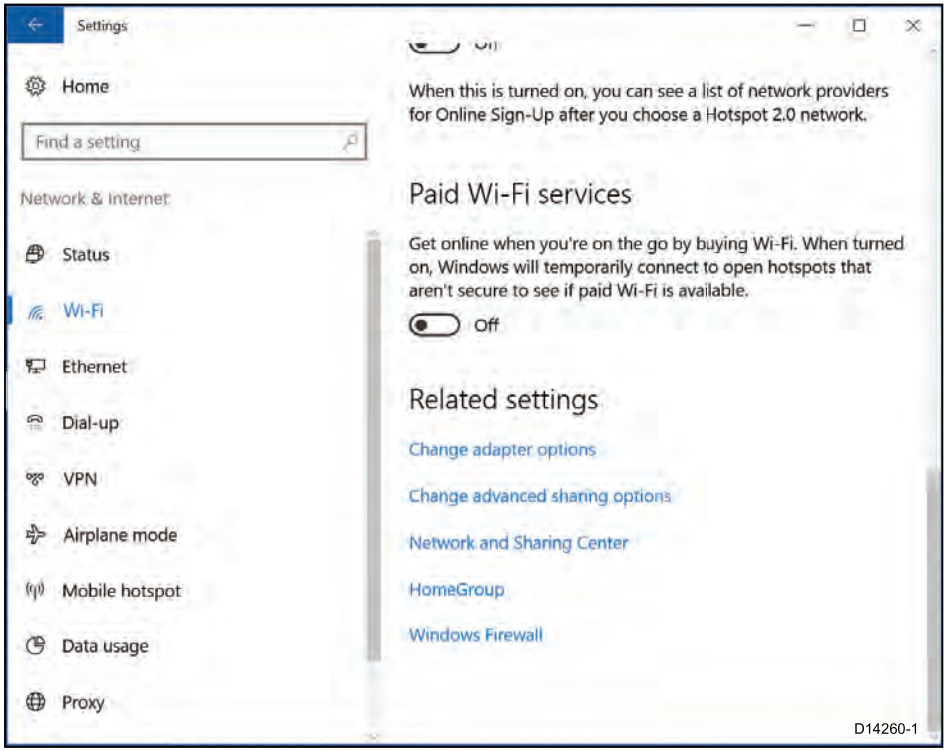


3. Under Windows Defender Firewall, click *[Allow an app through Windows Firewall]*.
4. Scroll down the list to *[Network Discovery]*.

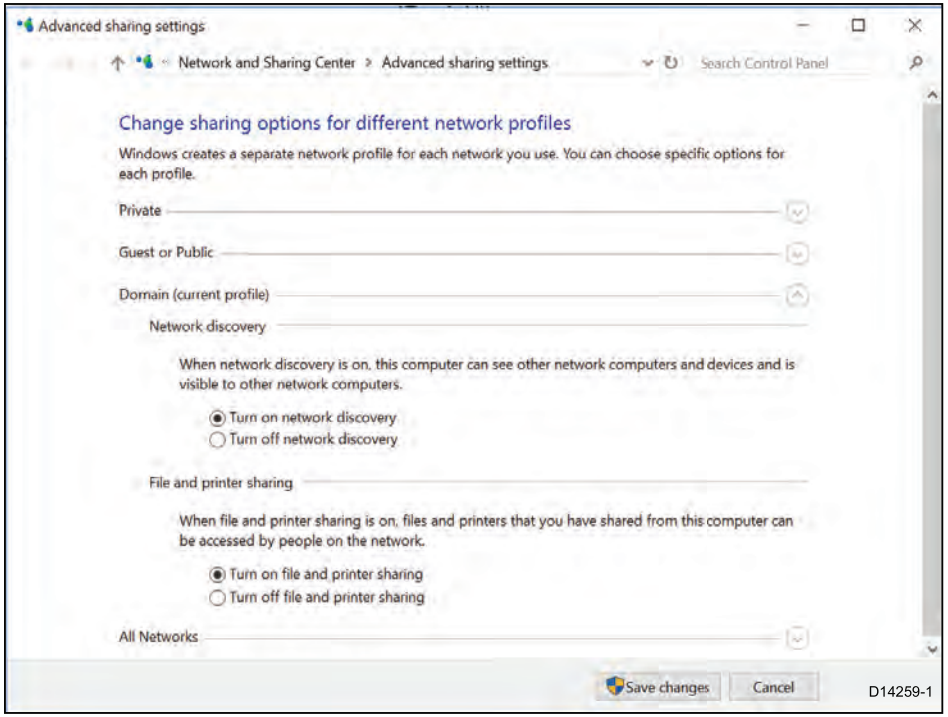
5. Place a tick in the box for the type of network that the camera is on (this is usually Public).



6. Click *[OK]*.
7. From the Settings menu click *[Network & Internet]*.
8. From the left hand panel select the network your PC and the camera are connected to.
9. Scroll down to *[Change advanced sharing options]*.



10. Ensure *[Turn on network discovery]* is selected.



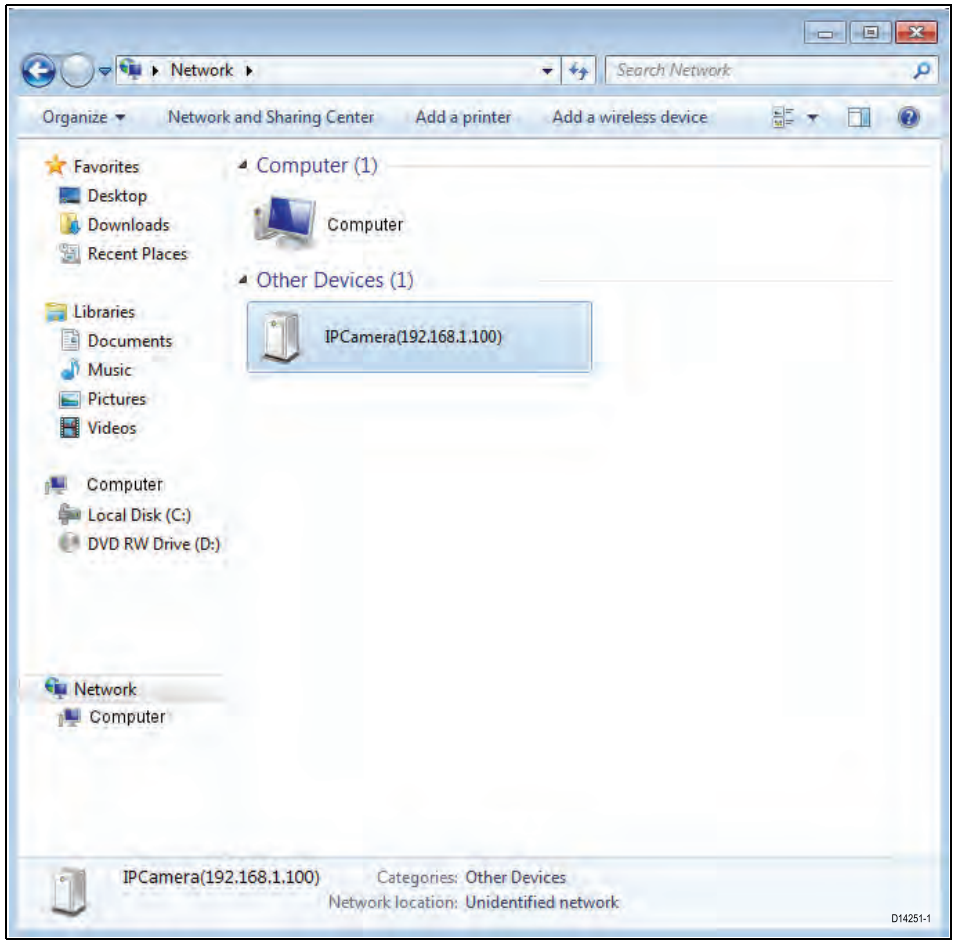
11. Click *[Save changes]* if you switched on network discovery, or
12. Click *[Cancel]* if network discovery was already turned on.

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 **p.33 — Network connections**

1. Click *[Start > Computer > Network]*.
   The camera appears under Network Infrastructure.



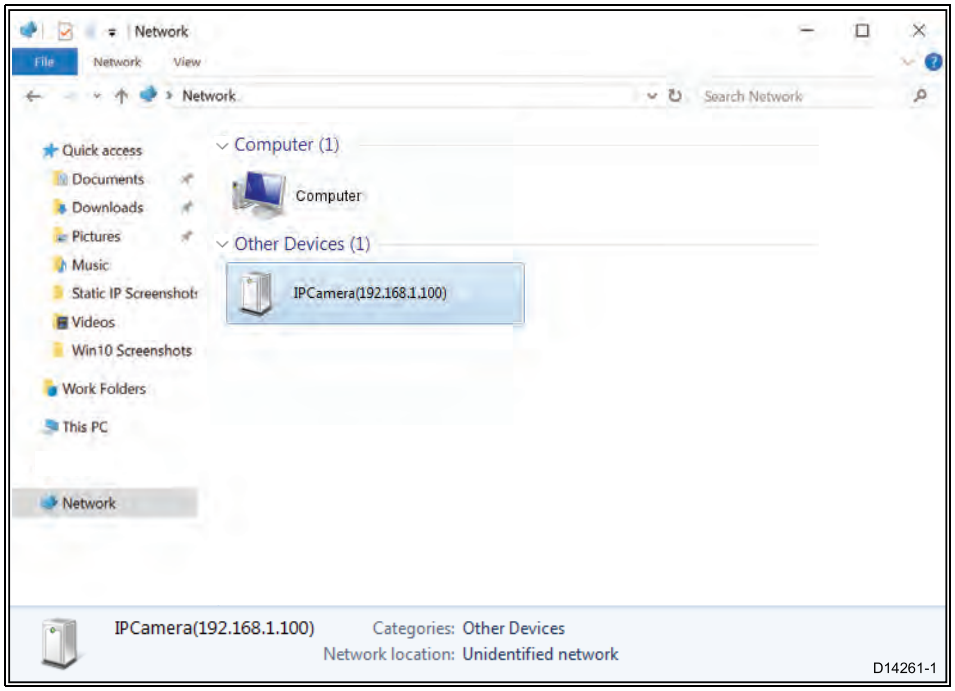
2. Double-click a camera icon to open the web interface in your default browser.
3. Enter the username and password for the camera and click *[Login]*.

Finding the camera's IP address using Windows 10 UPnP

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

Ensure the product is connected to your PC as described in **p.33 — Network connections**.

1. Click *[Start > This PC > Network]*.
   The product appears under Network Infrastructure.



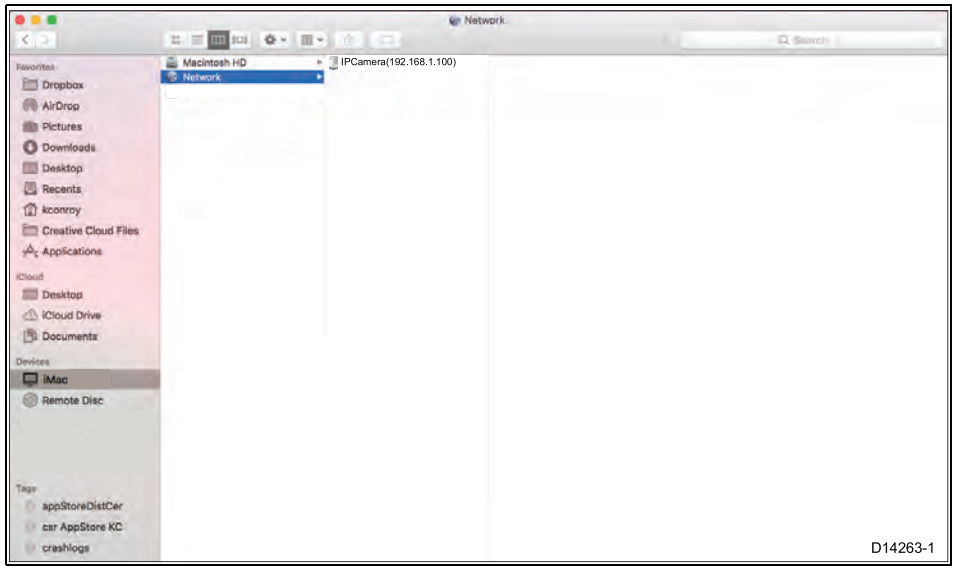
2. Double-click the product icon to open the web interface in your default browser.
3. Enter the username and password for the camera and click *[Login]*.

Finding the camera's IP address using Mac UPnP

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

Ensure the product is connected to your Mac as described in **p.33 — Network connections**.

1. Click *[Finder > Devices > Mac]*.
   The product appears under Network.



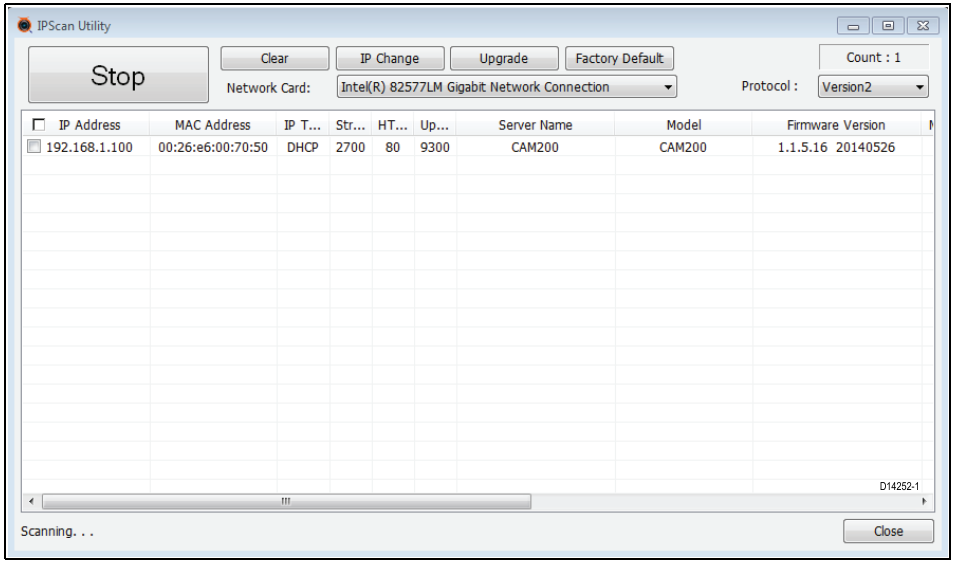
2. Double-click the product icon to open the web interface in your default browser.
3. Enter the username and password for the camera and click *[Login]*.

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 **p.33 — Network 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]*.

IP address range

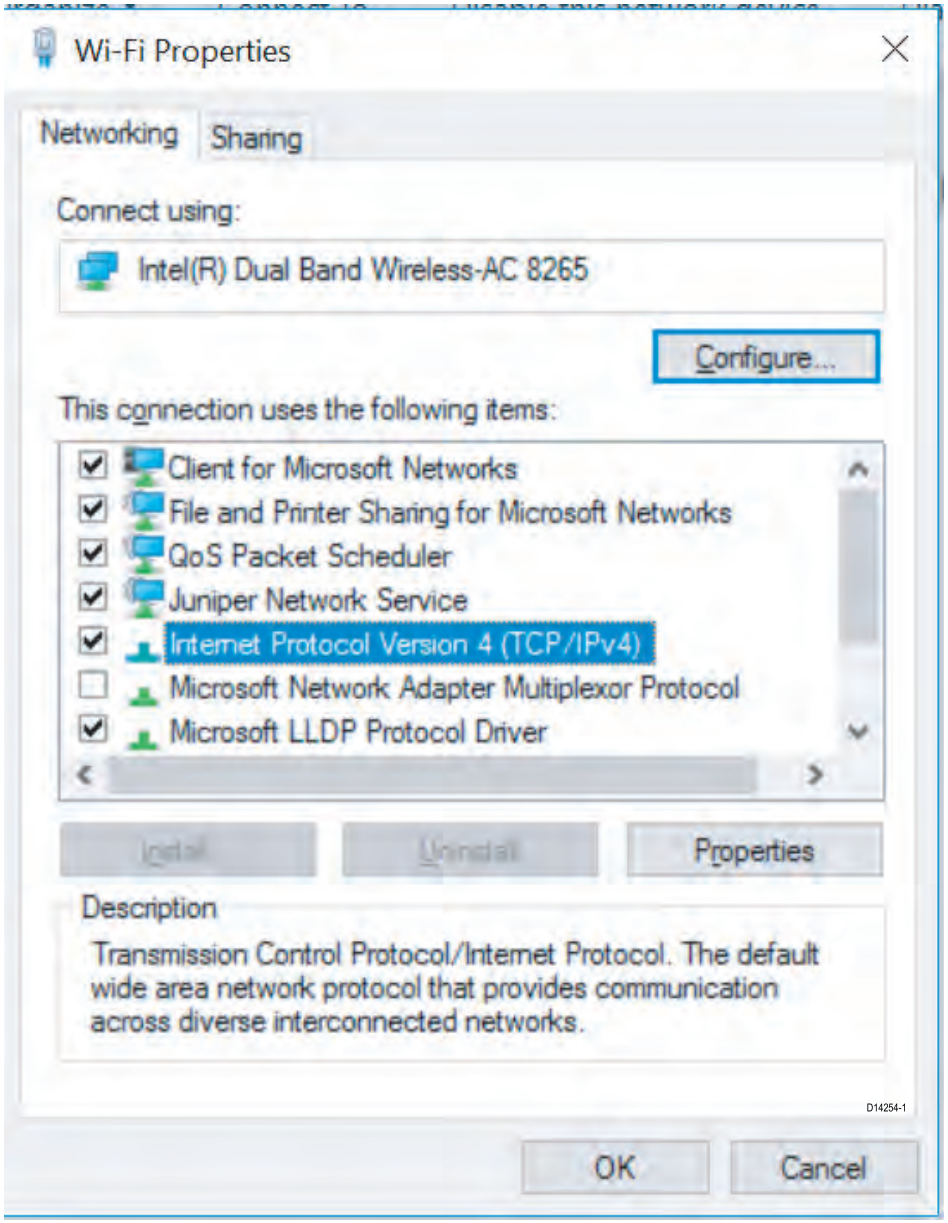
In some cases the IP address range of your computer and product will not match, meaning that you are unable to connect to the product. This issue can be resolved by assigning your computer an IP address on the same IP address range as your product.

Assigning a static IP address using Windows 7

To configure the necessary IP address settings on a Windows 7 PC follow the steps below:

Note: You need to know the IP address of your product for *[step 10]*. This can be found by referring to **Finding the camera's IP address using IP Scanner software**.

1. Click *[Start]*
2. Click *[Control Panel]*
3. Click *[Network and Sharing Center]*
4. Click *[Change adapter settings]*
5. Select and Right click the *[network]* the product is communicating on
6. Click *[Properties]*
7. Scroll to *[Internet Protocol Version 4 (TCP/IPv4)]* and select it
8. Click *[Properties]*



9. Click *[Use the following IP address]*
10. Enter the *[IP address]* so it matches the IP address of your product (default: 192.168.1.100)
11. Change the last three digits of the IP address to a number between 1–225 (these digits must not match the IP address of the product or any other device on the network).
12. Enter the *[Subnet mask]* 255.255.255.0
13. Click *[OK]*

14. You can now access the product by typing its IP address into your default browser.

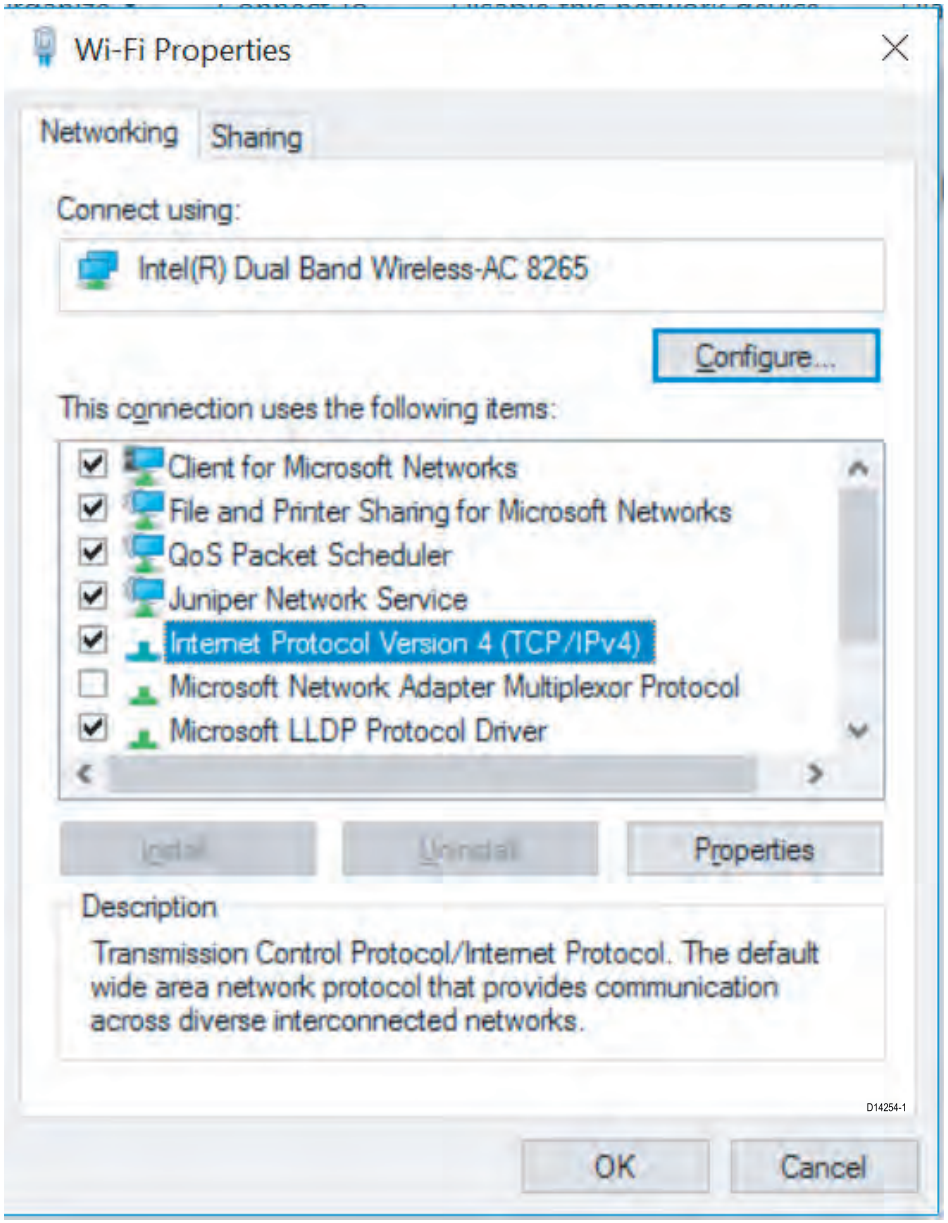
Assigning a static IP address using Windows 10

To configure the necessary IP address settings on a Windows 10 PC follow the steps below:

Note:

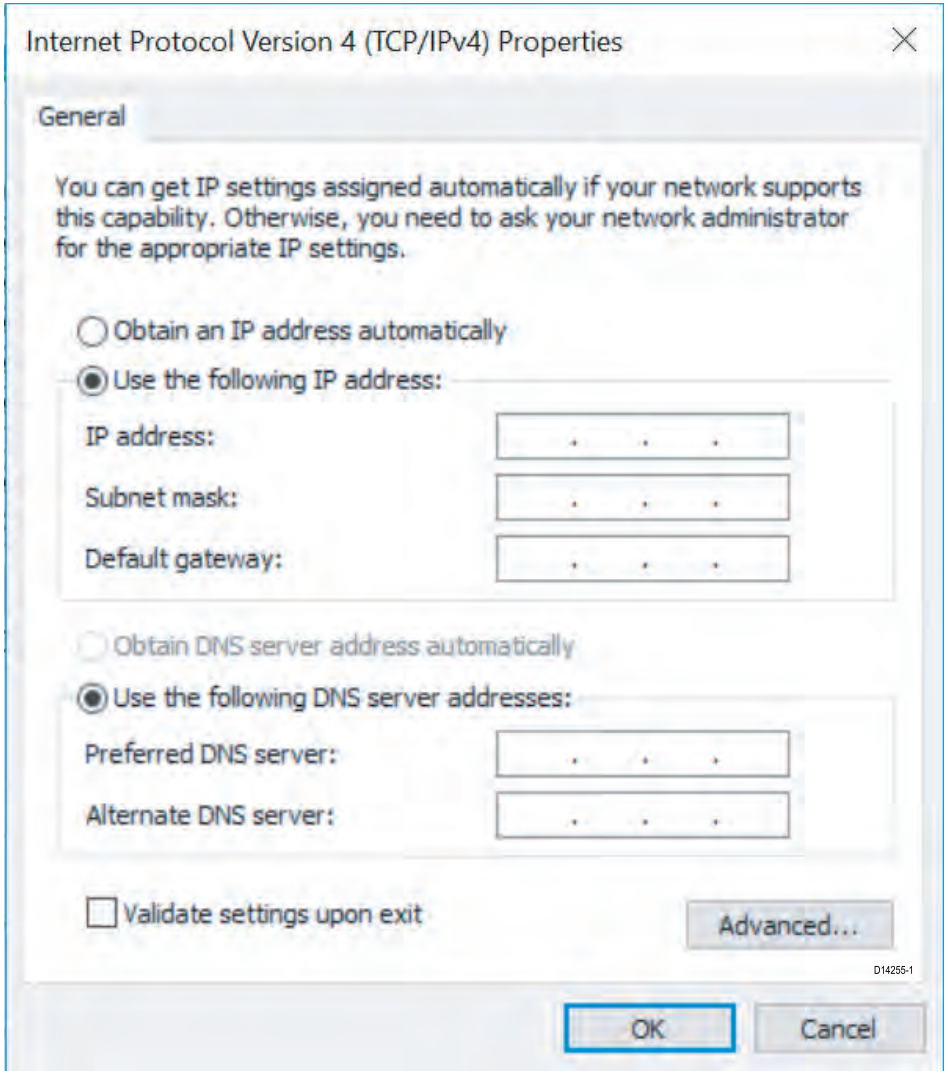
You will need to know the IP address of your product for *[step 10]*. This can be found by referring to the following section:
Finding the camera's IP address using IP Scanner software

1. Click *[Start]*
2. Click *[Settings]*
3. Click *[Network and Internet]*
4. Click *[Change adapter options]*
5. Select and Right click the *[network]* the product is communicating on
6. Click *[Properties]*
7. Scroll to *[Internet Protocol Version 4 (TCP/IPv4)]* and select it
8. Click *[Properties]*



9. Click *[Use the following IP address]*

10. Enter the *[IP address]* so it matches the IP address of your product (default: 192.168.1.100)
11. Change the last three digits of the IP address to a number between 1–225 (these digits must not match the IP address of the product or any other device on the network).
12. Enter the *[Subnet mask]* 255.255.255.0
13. Click *[OK]*



14. You can now access the product by typing its IP address into your default browser.

Assigning a static IP address using Mac

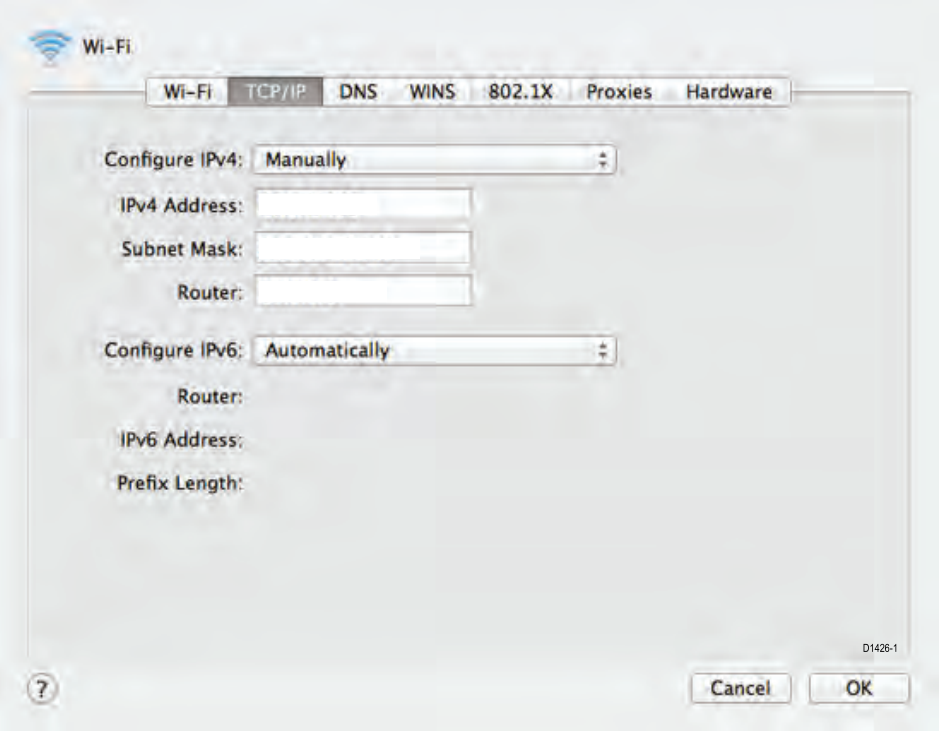
To configure the necessary IP address settings on a Mac computer follow the steps below:

Note:

You will need to know the IP address of your product for *[step 8]*. This can be found by referring to the following section:
Finding the camera's IP address using IP Scanner software

1. Click the *[Apple menu]*
2. Click *[System Preferences]*
3. Click *[Network]*
4. Select the *[network]* the product is communicating on from the sidebar
5. Click *[Advanced]*
6. Click *[TCP/IP]*
7. From the *[Configure IPv4]* menu, select *[Manually]*
8. Enter the *[IP address]* so it matches the IP address of your product (default: 192.168.1.100)
9. Change the last three digits of the IP address to a number between 1–225 (these digits must not match the IP address of the product or any other device on the network).
10. Enter the *[Subnet mask]* 255.255.255.0

11. Click *[OK]*



12. You can now access the product by typing its IP address into your default browser.

Supported browsers

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

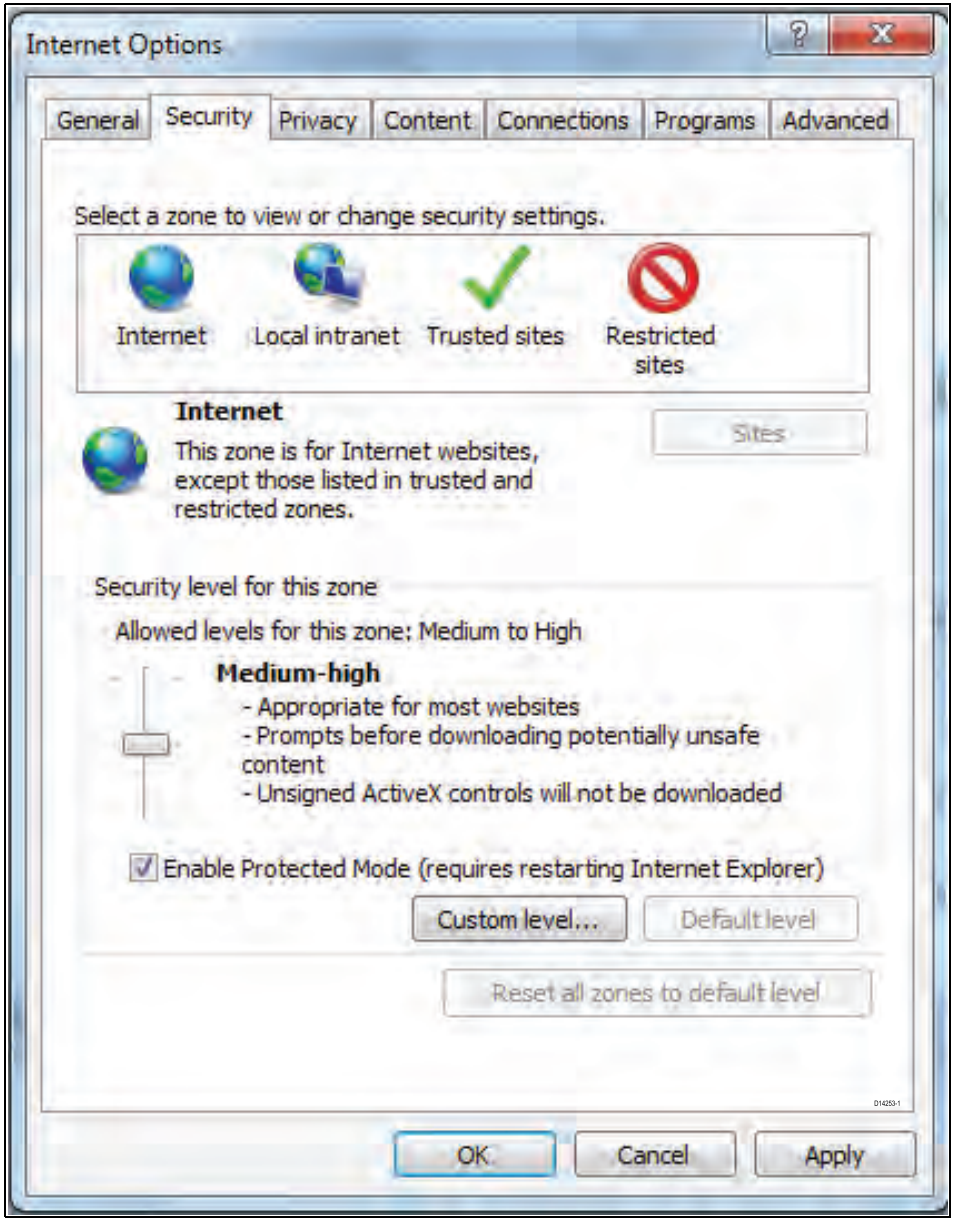
The following browsers are supported:

- 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.

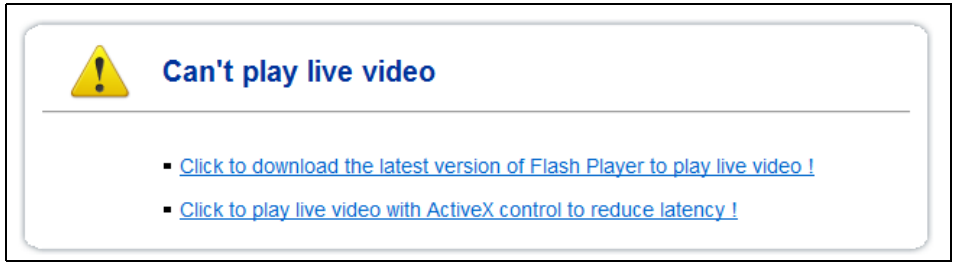
Note:

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.

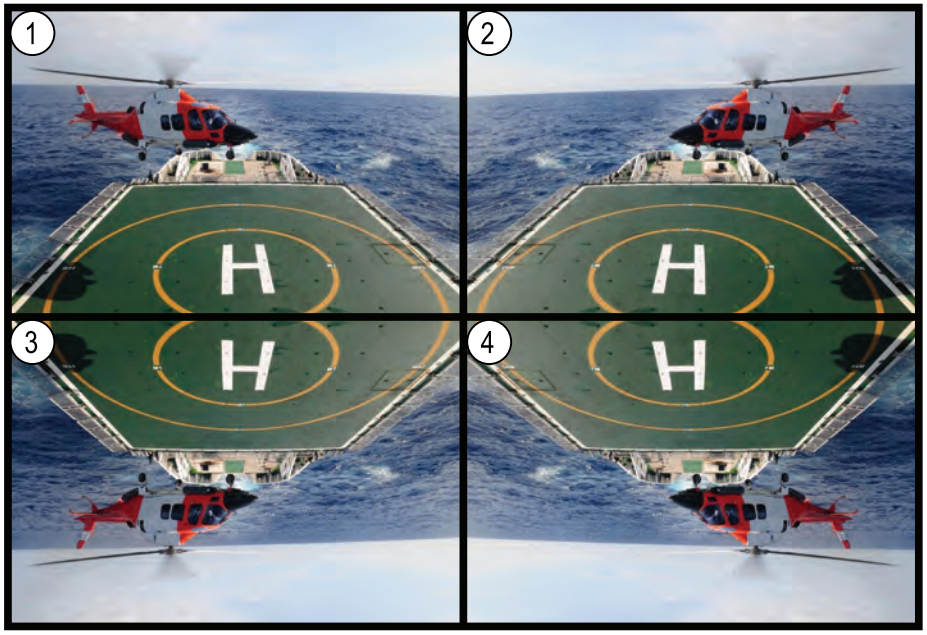
1. If your computer has Flash Player installed:
   i. Open the web interface.
   ii. Click the message above the video window.
   iii. Click inside the video area and select *[Install this Add-on for all users on this computer]*.
   iv. Follow the onscreen prompts.
2. If your computer does not have Flash 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.

9.3 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.

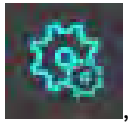
   The options available are:

   - 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.

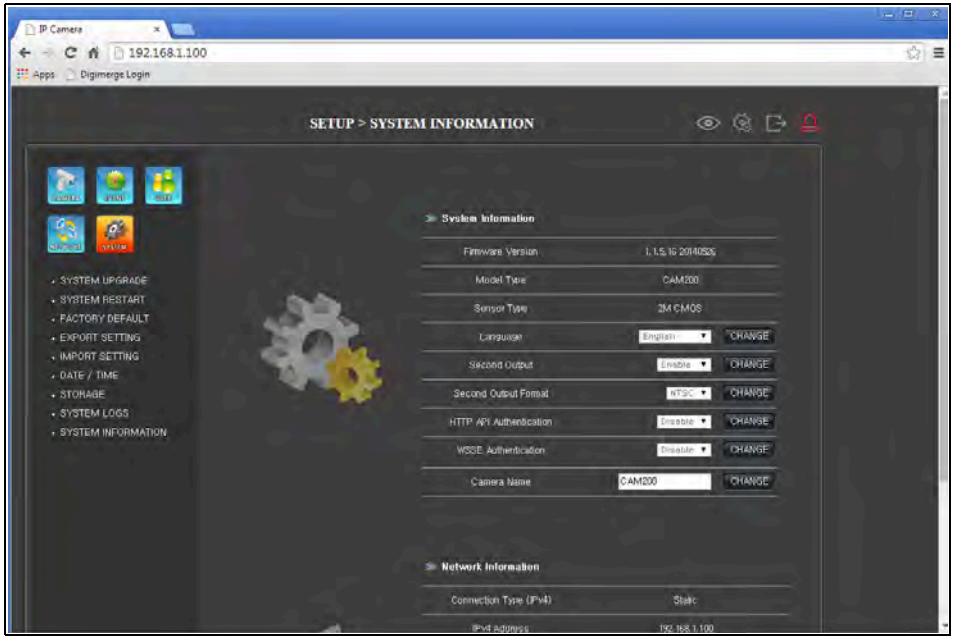
9.4 Resetting the camera to factory defaults

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

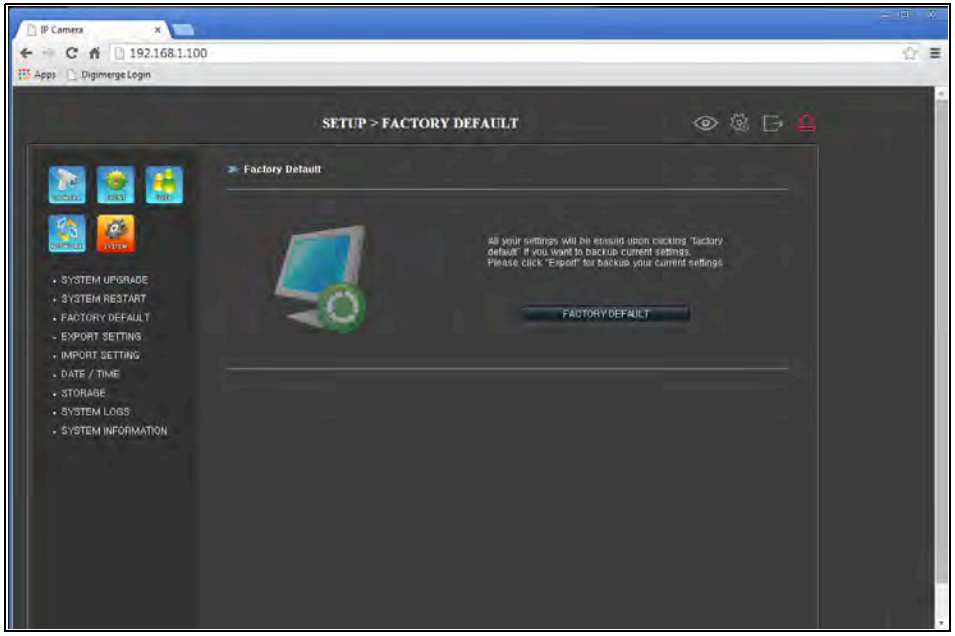
- Ensure that the camera and IP camera are connected to the same network as described in the **p.33 — Network connection** section.
- Ensure that your PC settings have been changed to allow access to the web interface as described in the **p.43 — Network setup and operation** section.

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 10: MAINTENANCE

CHAPTER CONTENTS

- 10.1 Routine checks — page 58
- 10.2 Unit cleaning instructions — page 58

10.1 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.

10.2 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 11: SYSTEM CHECKS AND TROUBLESHOOTING

CHAPTER CONTENTS

- 11.1 Troubleshooting — page 60
- 11.2 LED status — page 60
- 11.3 IP camera troubleshooting — page 61
- 11.4 Resetting the camera — page 63

11.1 Troubleshooting

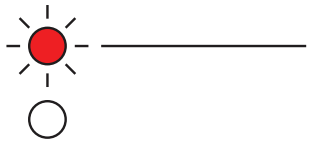
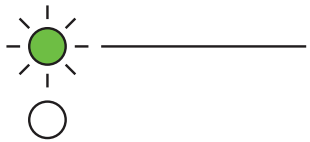
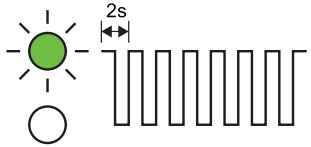
The troubleshooting section provides possible causes and the corrective action required for common problems that are associated with the installation and operation of your product.

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 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 technical support contact details.

11.2 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

11.3 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 **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. • Try power cycling the IP camera whilst leaving your MFD powered up.

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 **p.43 — Network setup and operation** for details on network settings.

11.4 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 9.4 Resetting the camera to factory defaults for details.

CHAPTER 12: TECHNICAL SUPPORT

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- 12.1 Raymarine technical support and servicing — page 65

12.1 Raymarine technical 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 display.

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: https://www.raymarine.com/en-us/support/product-registration

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** — https://raymarine.custhelp.com/app/home
- **Software updates** — http://www.raymarine.com/software

Worldwide support

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

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

United States (US):

- Help desk: https://raymarine.custhelp.com/app/home
- 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

CHAPTER 13: TECHNICAL SPECIFICATION — CAM200IP

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- 13.2 Power specification — page 68
- 13.3 Environmental specification — page 68
- 13.4 Camera specification — page 68
- 13.5 Video specification — page 68
- 13.6 Conformance specification — page 68

13.1 Physical specification

Dimensions	• Base diameter: 89.9 mm (3.5 in) • Overall Height: 213.6 mm (8.4 in)
Weight	• Boxed: 0.8 Kg (1.8 lbs) • Unboxed: 0.7 Kg (1.5 lbs)

13.2 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)

13.3 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

13.4 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)
I^2 Distance	20 m (65.6 ft.) (20 LEDs)
Lens	6 mm Mega pixel board lens

13.5 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

13.6 Conformance specification

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

CHAPTER 14: TECHNICAL SPECIFICATION — CAM210IP

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- 14.1 Physical specification — page 70
- 14.2 Power specification — page 70
- 14.3 Environmental specification — page 70
- 14.4 Camera specification — page 70
- 14.5 Video specification — page 70
- 14.6 Conformance specification — page 70

14.1 Physical specification

Dimensions	• Base diameter: 89.9 mm (3.5 in) • Overall Height: 213.6 mm (8.4 in)
Weight	• Boxed: 0.8 Kg (1.8 lbs) • Unboxed: 0.7 Kg (1.5 lbs)

14.2 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)

14.3 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

14.4 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)
I^2 Distance	20 m (65.6 ft.) (20 LEDs)
Lens	6 mm Mega pixel board lens

14.5 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

14.6 Conformance specification

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

CHAPTER 15: SPARES AND ACCESSORIES

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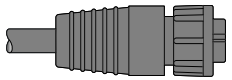
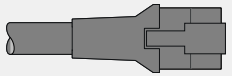
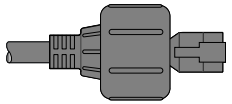
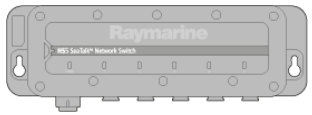
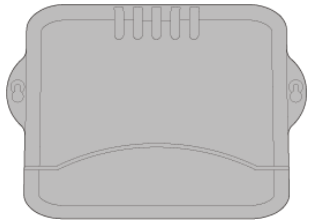
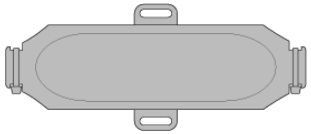
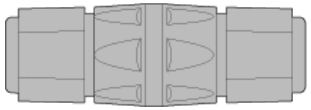
- 15.1 Network cable connector types — page 72
- 15.2 Network hardware — page 72
- 15.3 RayNet to RJ45, and RJ45 (SeaTalk HS) adapter cables — page 73
- 15.4 RayNet to RayNet cables and connectors — page 75

15.1 Network cable connector types

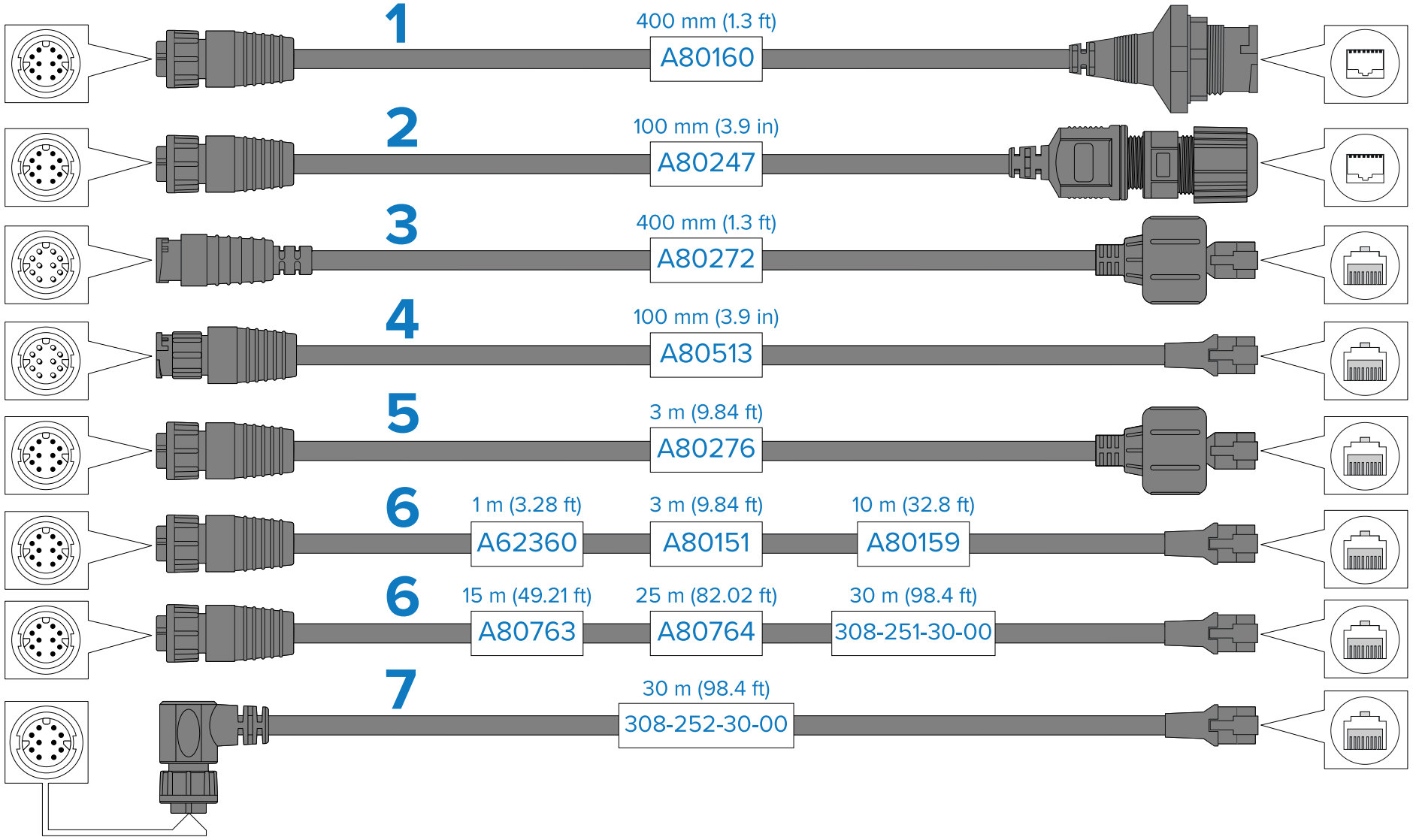
There are 3 types of network cable connectors — RayNet, RJ45 and RJ45 (SeaTalk HS).

Connector	Description
	RayNet. This connector type is waterproof.
	RJ45. This connector type is NOT waterproof.
	Waterproof RJ45 (SeaTalk HS) for connection to (legacy) Raymarine equipment featuring a lockable RJ45 (SeaTalk HS) connector. Alternatively, these cables may be coupled with suitable adapter cables for waterproof connections to equipment featuring a RayNet connector.

15.2 Network hardware

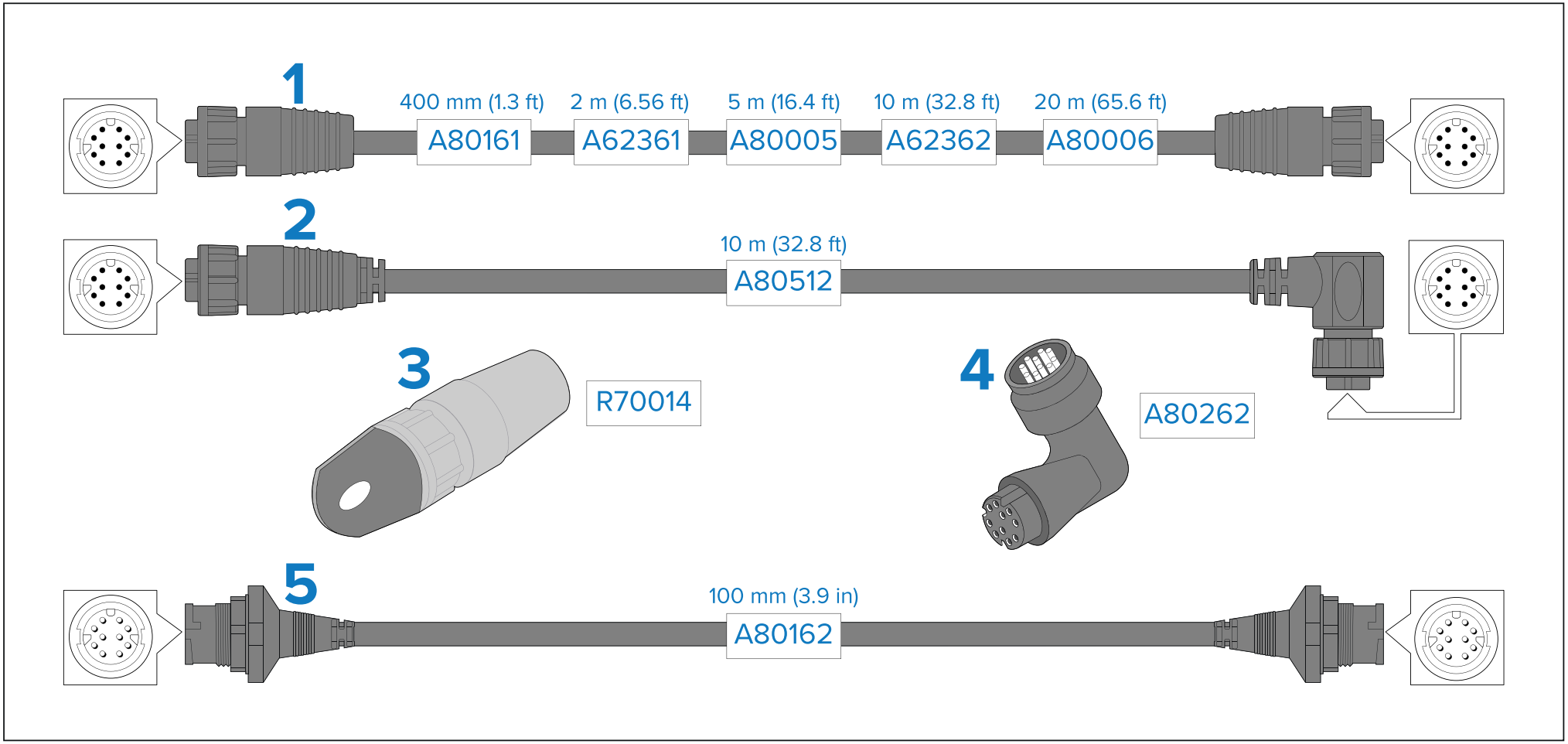
Item	Part number	Notes
HS5 RayNet network switch 	A80007	5–port switch for network connection of multiple devices featuring RayNet connectors. Equipment with RJ45 SeaTalk hs connectors can also be connected using suitable adapter cables.
RJ45 SeaTalk hs network switch 	E55058	8–port switch for network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

15.3 RayNet to RJ45, and RJ45 (SeaTalk HS) adapter cables



1. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalk HS) 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).
2. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalk HS) socket on the other end, along with a locking gland for a watertight fit.
3. Adapter cable with a RayNet (male) plug on one end, and an RJ45 (SeaTalk HS) waterproof (male) plug on the other end.
4. Adapter cable with a RayNet (male) plug on one end, and an RJ45 (male) plug on the other end.
5. Adapter cable with a RayNet (female) socket on one end, and an RJ45 (SeaTalk HS) waterproof (male) plug on the other end.
6. Adapter cable with a RayNet (female) socket on one end, and an RJ45 (male) plug on the other end.
7. Adapter cable with a right-angled RayNet (female) socket on one end, and an RJ45 (male) plug on the other end.

15.4 RayNet to RayNet cables and connectors



1. Standard RayNet connection cable with a RayNet (female) socket on both ends.
2. Right-angle RayNet connection cable with a straight RayNet (female) socket on one end, and a right-angle RayNet (female) socket on the other end. Suitable for connecting at 90° (right angle) to a device, for installations where space is limited.
3. RayNet cable puller (5 pack).
4. RayNet to RayNet right-angle coupler / adapter. Suitable for connecting RayNet cables at 90° (right angle) to devices, for installations where space is limited.
5. Adapter cable with a RayNet (male) plug on both ends. Suitable for joining (female) RayNet cables together for longer cable runs.

Appendix A Software release history (CAM200IP)

The list below is a cumulative list of the new features introduced in subsequent releases of the CAM200IP software, since the initial release (v1.1.5.19).

This list includes *new features* only. It does NOT include software maintenance items, such as bug fixes or performance improvements.

CAM200IP v1.1.5.19:

(Software release date: *July 2014*)

- Initial public release.

Appendix B Software release history (CAM210IP)

The list below is a cumulative list of the new features introduced in subsequent releases of the CAM210IP software, since the initial release (v1.1.7.1).

This list includes *new features* only. It does NOT include software maintenance items, such as bug fixes or performance improvements.

To download the software, and view the complete list of all software updates, including new features, bug fixes, and performance improvements, visit:

Software download links
www.bit.ly/cam210-download

CAM210IP v2.0.0.3 new features:

(Software release date: *August 2024*)

- Updated Web UI admin passwords to comply with the PSTI (Product Security and Telecommunications Infrastructure) regulation. For more information, refer to: **p.43 — Web browser interface**

CAM210IP v1.1.7.1:

(Software release date: *April 2016*)

- Initial public release.

Appendix C Document change history

Document	Changes
87232 (**Rev 04**) Date: 08-2024	• Separated the 'Default username, password and ports' section into three new sections with updated information: 'Default username and password (CAM200IP)', 'Default username and password (CAM210IP)' and 'Ports and IP address'. • Added an 'Applicable software version' section. • Added an 'Appendix' containing the 'Software release history' and 'Document change history' sections.
87232 (**Rev 03**) Date: 04-2016	• Added CAM210IP variant information.
87232 (**Rev 02**) Date: 11-2014	• Added sun visor placement information. • Added approximate record times. • Added LightHouse 2 v12.26 software version requirement information. • Added RJ45 adaptor cable sleeve pull-back information. • Added additional parts to the 'Parts supplied' section.
87232 (**Rev 01**) Date: 07-2014	• Initial release.

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