



 **TELEDYNE** | *Raymarine®*

CAM400

Installation & Operation Instructions

Document number: 81431 (Rev 1) | English (en-US) | Date: 09-2026 | Applicable software version: v1.03

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CHAPTER 1: IMPORTANT INFORMATION

Safety warnings



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 or damage to your vessel. It may also cause poor product performance or invalidate the product warranty.
- 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.bit.ly/rym-warranty



Warning: Potential ignition source

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



Warning: Switch off power supply

Ensure that 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 to do so in this document.

Product warnings



Warning: Powering PoE devices

PoE devices can often be powered via an Ethernet connection (PoE) OR via a dedicated power cable.

NEVER connect a PoE device's dedicated power cable when it is being supplied PoE, unless the device is specifically designed to be connected to multiple power sources, as confirmed by the device's instruction documents.

When the PoE device's dedicated power cable is not connected, any bare-end wire connections must be separately covered with insulation.



Warning: Power supply voltage

Connecting this product to a voltage supply greater than the specified maximum rating may cause permanent damage to the unit. For the correct voltage, refer to the information label affixed to the product.



Warning: Product grounding

Before applying power to this product, it MUST be correctly grounded, in accordance with the instructions provided.



Warning: Positive ground systems

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

Caution: Power supply protection

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

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.

Regulatory notices

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Teledyne Raymarine UK Limited declares that the products listed below are in conformity with the relevant sections of the listed designated standards and / or other normative documents:

- CAM400 White visible-light day and night IP mini camera. Part number: E70716.
- CAM400 White visible-light day and night IP mini camera, with an AR200 system pack. Part number: T70603.
- CAM400 Black visible-light day and night IP mini camera, part number: E70717.
- CAM400 Black visible-light day and night IP mini camera, with an AR200 system pack. Part number: T70604.

Region	Standard	Mark
UK	EMC Regulations 2016	
EU	EMC Directive 2014/30/EU	
Australia and New Zealand	AS/NZS 4471.1 & 2	

The original Declaration of Conformity certificates may be obtained via the documentation page at www.bit.ly/CAM400-docs

PSTI Compliance

For products sold into the United Kingdom (UK), use the following link to obtain the product's Statement of Compliance with the *Product Security and Telecommunications Infrastructure* (PSTI) Regulations:

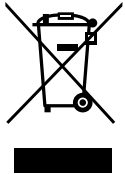
Visit the following web address and enter the product's model name or number (SKU) into the provided search field:

- www.bit.ly/rym-sec-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 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 policy and registration

Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online: www.bit.ly/rym-warranty

It is important that you register your product to receive full warranty benefits. Your product package includes a barcode label indicating the serial number of the unit. This serial number is also provided on a label affixed to the product itself. You will need this serial number when registering your product online.

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.

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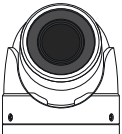
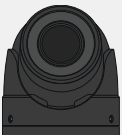
CHAPTER 2: DOCUMENT INFORMATION

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- 2.4 Document illustrations (page 13)

2.1 Applicable products

This document is applicable to the following products:

Product	Description
	• (E70716) — CAM400 White visible-light day and night IP mini camera. • (T70603) — CAM400 White visible-light day and night IP mini camera, with an AR200 system pack.
	• (E70717) — CAM400 Black visible-light day and night IP mini camera. • (T70604) — CAM400 Black visible-light day and night IP mini camera, with an AR200 system pack.

2.2 Product documentation

The following documentation is applicable to your product:

Applicable documents

Document	Description	Link
81431	CAM400 Installation and Operation Instructions (this document)	www.bit.ly/CAM400-docs
87505	CAM400 Mounting Template	www.bit.ly/CAM400-docs

Related documents

The documents listed below are only applicable when connecting the CAM400 to a compatible Raymarine chartplotter:

Document	Description	Link
81432	Axiom 2 LightHouse 5 Operation Instructions	www.bit.ly/LH5-docs
81406	LightHouse 4 Advanced Operation Instructions	www.bit.ly/LH4-docs

2.3 Printed (hardcopy) product manuals

All applicable user documentation for your product is available on our website to view or download free-of-charge. If you would prefer a **printed** (hardcopy) product manual, a Print Shop service is available, enabling you to purchase a high-quality, professionally-printed manual for your product, delivered directly to your door.

Printed manuals are ideal for keeping onboard your vessel, as a useful source of reference whenever you need assistance with your product.

Printed manuals are provided by a third-party (**Lulu Press**).

To order a printed manual, use the Lulu Press website link provided below. The manual will then be printed and delivered to the address you specify. Once an order is placed, it typically takes Lulu Press approximately 5 to 10 working days to print and deliver a printed manual.

Supplier	How to purchase
	1. Click the following link. 2. In the displayed search field, enter the required document number, e.g. <i>81406</i> www.bit.ly/rym-printshop

Note:

- Accepted methods of payment for printed manuals are credit cards and PayPal.
- Printed manuals can be shipped worldwide.

2.4 Document illustrations

While every effort is made to ensure that the illustrations provided in this publication accurately reflect the final released product, due to editorial and production lead times, your product — and if applicable — its user interface, may differ slightly from the illustrations provided in this document, depending on product variant and date of manufacture.

All images are provided for illustration purposes only.

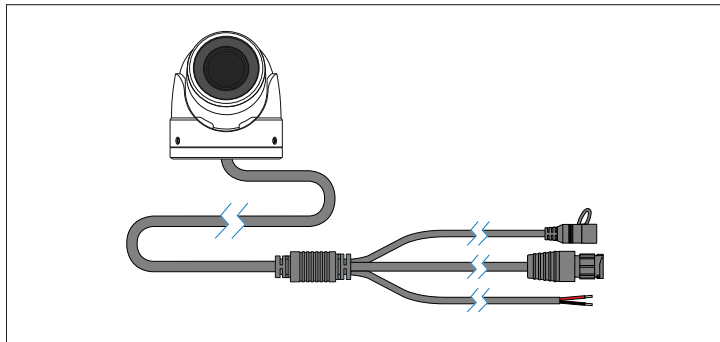
CHAPTER 3: PRODUCT AND SYSTEM OVERVIEW

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- [3.3 Example PoE system overview \(page 16\)](#)
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3.1 Product overview

The CAM400 is an infrared illuminated (I²) eyeball digital IP camera with both day and night vision. In conjunction with a compatible chartplotter or display, the camera provides a high-definition image which can be viewed or recorded for later playback.



Note:

- A single CAM400 video feed can be displayed on a maximum of 10 compatible Raymarine chartplotters at the same time (via each display's Video app).
- The video streams of up to 4 CAM400 cameras can be displayed simultaneously on a single compatible Raymarine chartplotter.

The camera includes the following features:

- 2.07 megapixel 1/2.8" progressive scan CMOS image sensor.
- 2.58 mm fixed lens
- Field Of View:
 - Horizontal FOV: 129.4°
 - Vertical FOV: 69.9°
 - Diagonal FOV: 153.6°
- 10 m (32.8 ft.) I² (infrared) beam emitter distance.
- Multi-streaming of H.264 and MJPEG video.
- Supports image resolutions up to 1920 x 1080 pixels.

- Image flip function, for ball-up (upright), or ball-down (upside-down) installation.
- Image invert function, for reverse video applications (e.g. camera pointing in the opposite direction to the vessel).
- Mechanical IR cutout filter for true day / night operation.
- Supports augmented reality features, when used in conjunction with an AR200 sensor and a compatible Raymarine chartplotter.
- Waterproof protection to IPx6 / IPx7 (suitable for above or below decks installation).
- Supports 2 power options — Class 2 Power over Ethernet (PoE) @ 48 V nominal supply voltage, or 12 V dc nominal supply voltage via the dedicated power connection.
- Low power consumption. For more information, refer to:
[p.91 — Power specification](#)

Power over Ethernet (PoE)

Power over Ethernet (PoE) is a system which allows both power and data to be passed along a single CAT 6 Ethernet cable.

There are 2 main types of PoE device:

- **Power Sourcing Equipment (PSE)** — this PoE system component provides electrical power over a CAT 6 Ethernet cable to a Powered Device (PD).
- **Powered Device (PD)** — this PoE system component is powered by the electrical power provided by the Power Sourcing Equipment (PSE).

The CAM400 is a Class 2 PD with a 48 V nominal supply voltage, which consumes 7 W maximum (with LEDs ON). Before connecting the CAM400, ensure that your Power PSE's maximum power output will not be surpassed. For further information on your PSE's maximum power output, refer to the instructions that accompany the device.

Video recording storage consumption

Camera video feed recording time guidelines.

The camera's video feed can be recorded using a compatible Raymarine 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).

3.2 Compatible chartplotters

Important camera compatibility information.

Compatible Raymarine chartplotters:

This product is compatible with the following Raymarine chartplotters:

Compatible Raymarine chartplotters	Required chartplotter software version
Axiom 2-Series: Axiom 2 Pro, Axiom 2 XL, Axiom 2	• LightHouse, v4.11.133, or later.
Axiom-Series: Axiom, Axiom+, Axiom Pro, Axiom XL	• LightHouse, v4.11.133, or later.

Note:

Chartplotters running LightHouse 4 do NOT support the *[Distance guides]* feature available in the *[Video]* app. For more information, refer to: [p.16 — Distance guides feature support](#)

Note:

Previous generations of Raymarine chartplotters are NOT supported.

Third-party compatibility

This product may be compatible with third-party chartplotters which support:

- the ONVIF Profile S protocol;
- the camera's regional video standards.

For more information, refer to the documentation supplied with the third-party device.

Note:

Raymarine does not warrant that the CAM400 will work with third-party chartplotters. Please check with the third-party manufacturer to ensure that the CAM400's camera and video specifications are supported by the display. For a list of specifications, refer to: [p.90 — Technical specification](#)

Distance guides feature support

Requirements for the use of the *[Distance guides]* feature.

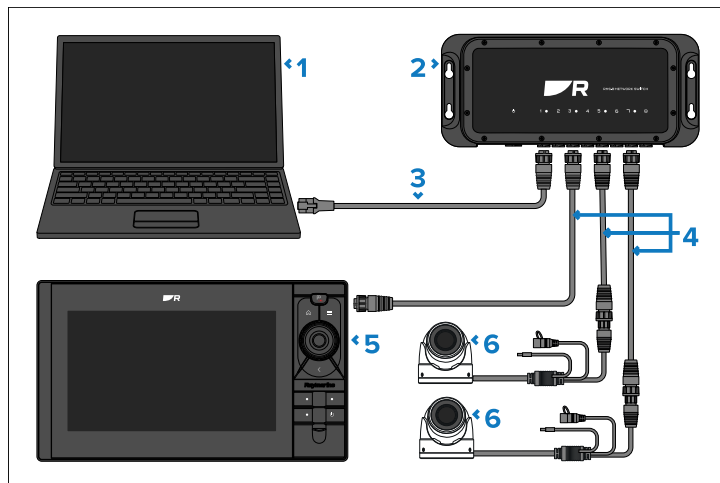
- **The CAM400's *[Distance guides]* feature is ONLY supported on Raymarine Axiom 2-Series chartplotters running LightHouse 5, v5.0.126, or later.**
- Raymarine chartplotters running versions of LightHouse 4 (or earlier) do NOT support the *[Distance guides]* feature.
- Third-party chartplotters do NOT support the *[Distance guides]* feature.

3.3 Example PoE system overview

An example overview of different products which can be connected to and used in conjunction with the CAM400, when it is being supplied Power over Ethernet (PoE) from Power Sourcing Equipment (PSE).

When the camera is being supplied Power over Ethernet, both data and power signals are transferred across a single network connection.

The system shown is intended as an example only and may differ from your planned installation.



Important:

- Any device supplying to the CAM400 must output a supply voltage in the range of 44 V dc to 57 V dc.
- When the camera's dedicated 12 V dc power connection is not used, the dedicated power cable wires must be insulated.

Description	
1	Laptop PC.
2	Power Sourcing Equipment (PSE) providing PoE to the CAM400 (RNS-8 currently illustrated).
3	RayNet (female) to RJ45 (male) adapter cable, available separately.
4	RayNet (female) to RayNet (female) cable, available separately.
5	Compatible chartplotter (Axiom 2 Pro currently illustrated).
6	CAM400.

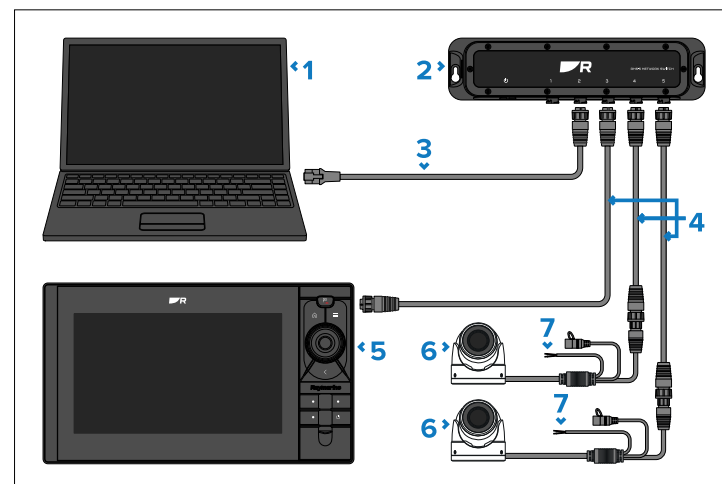
Note:

For simplicity power connections for other devices are not shown.

3.4 Example dedicated power system overview

An example overview of different products which can be connected to and used in conjunction with the CAM400, when it is being supplied power from a 12 V dc power source.

The system shown is intended as an example only and may differ from your planned installation.



Description	
1	Laptop PC.
2	Network switch (RNS-5 currently illustrated).
3	RayNet (female) to RJ45 (male) adapter cable, available separately.
4	RayNet (female) to RayNet (female) cable, available separately.
5	Compatible chartplotter (Axiom 2 Pro currently illustrated).

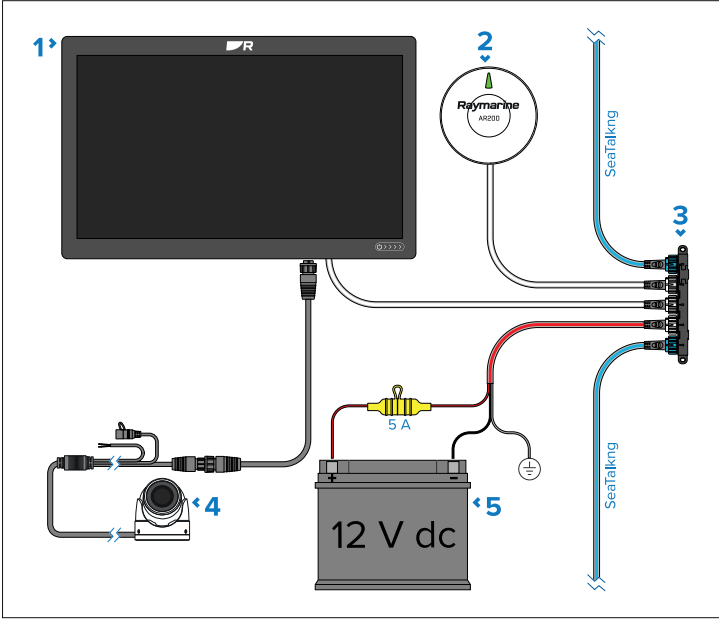
	Description
6	CAM400.
7	CAM400 12 V dc power connection. For connection information, refer to: p.45 — Dedicated power connection

For simplicity power connections for other devices is not shown.

3.5 Example Augmented Reality system overview

The camera can be used in conjunction with an AR200 sensor and a compatible chartplotter to enable ClearCruise® Augmented Reality features.

The following system example shows the components and connections required to enable ClearCruise® Augmented Reality on your system.



	Description
1	Compatible chartplotter. In this example the chartplotter is also the Power Sourcing Equipment (PSE) providing Power over Ethernet (PoE) to the camera (Axiom XL currently illustrated).
2	AR200 sensor (product number: E70537), supplied with the T70603 / T70604 system packs and available separately.
3	SeaTalk NG backbone.
4	CAM400.
5	12 V dc power supply providing power to the SeaTalk NG backbone.

Note:

ClearCruise® Augmented Reality is NOT available via the CAM400's Web browser user interface and can only be accessed through the chartplotter's Video app. For more information on ClearCruise® Augmented Reality, refer to one of the following documents:

- Axiom 2 LightHouse 5 Operation Instructions (**81432**), or;
- LightHouse 4 Operation Instructions (**81406**).

Links to the latest version of these documents can be found under the following section: [2.2 Product documentation](#)

CHAPTER 4: PARTS SUPPLIED

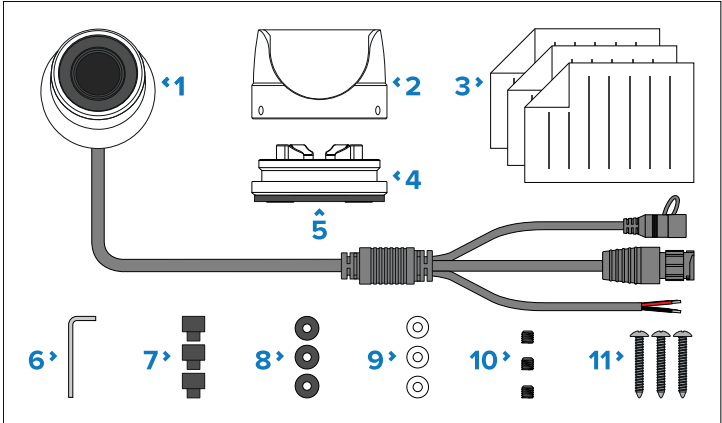
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- 4.1 Parts supplied (page 21)
- 4.2 Required additional components (page 21)
- 4.3 Inline fuse requirement (page 22)

4.1 Parts supplied

List of parts supplied with the E70716 or E70717 CAM400 cameras.

Unpack your product carefully to prevent damage or loss of parts. Check the box contents against the list below. Retain the packaging and documentation for future reference.

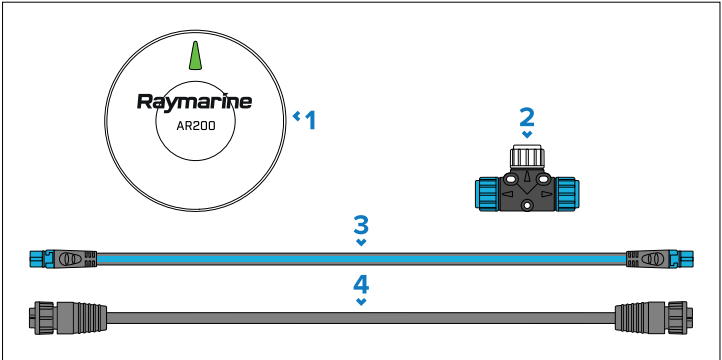


Description	
1	Camera ball — includes a fitted 1.47 m (4.82 ft) cable. The cable includes a RayNet (male) connector, a factory reset switch, and 12 V dc power wires.
2	Camera collar.
3	Documentation pack.
4	Camera base.
5	Mounting gasket (pre-fitted to the camera base).
6	2 mm Hex wrench (Allen key).
7	3x rubber plugs.
8	3x silicone washers.
9	3x white plastic washers.
10	3x grub screws.
11	3x M4 x 30 mm self-tapping mounting screws.

Additional parts supplied

List of additional parts supplied with the Augmented Reality system packs (part numbers: T70603 and T70604).

Unpack your product carefully to prevent damage or loss of parts. Check the box contents against the list below. Retain the packaging and documentation for future reference.



Description	
1	AR200 sensor.
2	SeaTalk NG T-piece connector.
3	1 m (3.28 ft) SeaTalk NG backbone cable.
4	10 m (32.81 ft) RayNet (female) to RayNet (female) cable.

4.2 Required additional components

The following additional components will be required:

- A compatible chartplotter, or other display device with an Ethernet connector and a web browser (required to view the camera's video feed).
- One of the following network cables:
 - A RayNet (female) to RayNet (female) cable⁽¹⁾ (required to connect the camera to compatible Raymarine products, or
 - A RayNet (female) to RJ45 (male) adapter cable (required to connect the camera to equipment via an RJ45 connector).

Note:

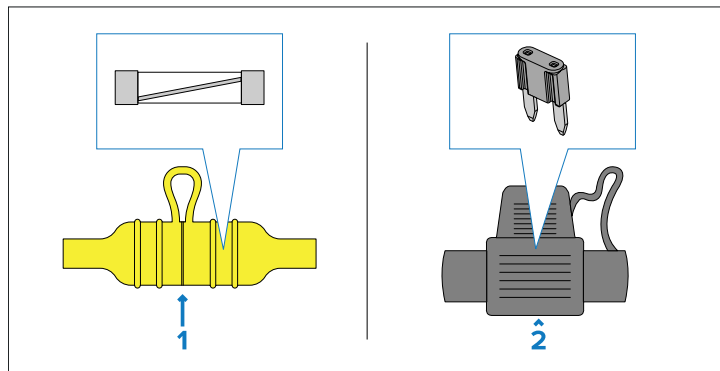
1. A 10 m (32.81 ft) RayNet (female) to RayNet (female) cable is supplied with the T70603 and T70604 system packs. For more information, refer to: [p.21 — Additional parts supplied](#)

4.3 Inline fuse requirement

If your product is NOT supplied with an inline fuse (whether separately or fitted to the power cable), you **MUST** fit a suitably-rated inline fuse to your product's red power wire, housed in a waterproof fuse holder.

The illustration below shows the two main types of inline fuse with waterproof holder, for use in marine electronics installations. Fuses in a variety of ratings are widely available at chandleries and marine electrical retailers.

Select one of the following fuse types to protect your product:



1. Waterproof fuse holder containing a “glass”-type inline fuse.
2. Waterproof fuse holder containing a “blade”-type inline fuse.

Fuse ratings:

- *Voltage rating* — must be equal to or greater than the voltage of your vessel's power supply.
- *Current rating* — refer to the *Inline fuse and thermal breaker rating* section in this document.

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:

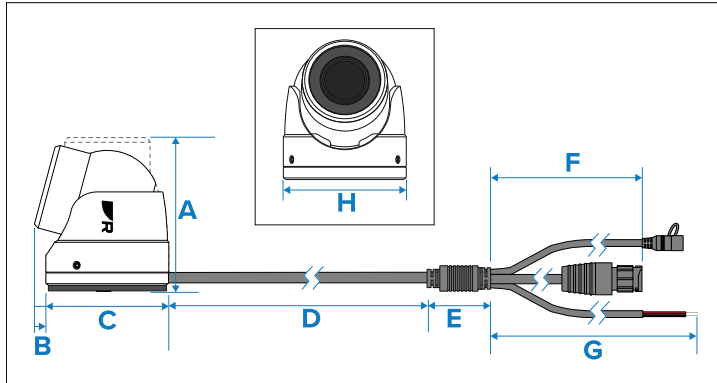
The suitable fuse rating for the thermal breaker is dependent on the number of devices you are connecting. If in doubt, consult an authorized Raymarine dealer.

CHAPTER 5: PRODUCT DIMENSIONS

CHAPTER CONTENTS

- [5.1 Product dimensions \(page 24\)](#)

5.1 Product dimensions



Description	
A	80.80 mm (3.18 in.)
B	5.98 mm (0.24 in.)
C	64.50 mm (2.54 in.) base only / 70.48 mm (2.77 in.) including lens.
D	1.31 m (4.3 ft.)
E	40.0 mm (1.57 in.)
F	150.0 mm (5.9 in.)
G	200.0 mm (7.9 in.)
H	64.50 mm (2.54 in.)

CHAPTER 6: LOCATION REQUIREMENTS

CHAPTER CONTENTS

- 6.1 Warnings and cautions (page 26)
- 6.2 Camera location requirements (page 26)
- 6.3 Location requirements for Augmented Reality (page 26)
- 6.4 General location requirements (page 26)
- 6.5 EMC installation guidelines (page 27)
- 6.6 Suppression ferrites (page 27)
- 6.7 Connections to other equipment (page 28)
- 6.8 Compass safe distance (page 28)

6.1 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.9 — Important information](#)



Warning: Potential ignition source

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

6.2 Camera location requirements

When planning the installation location, consider the following points:

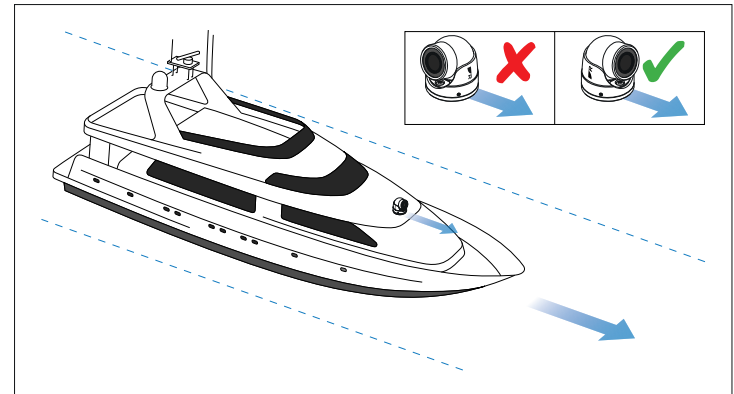
- The camera is appropriate for above and below deck mounting.
- Before selecting a mounting location, consider the required minimum cable lengths and cable routing options available.
- Select a location away from highly reflective surfaces to prevent unwanted glare from appearing on the camera's video feed image.
- Sufficient space is available for installation and removal of the camera collar.

6.3 Location requirements for Augmented Reality

Recommendations to ensure reliable and trouble free operation when using the camera for ClearCruise® Augmented Reality:

- **Direction** — the camera should be pointing towards the vessel's bow and must be in parallel alignment with the longitudinal axis (centerline) of the vessel.
- **Tilt angle** — the camera should be tilted so the water and horizon are clearly visible at all times.

Example: camera position and directional view



Note:

For more information on the additional system components and connections required to enable ClearCruise® Augmented Reality on your system, refer to: [p.18 — Example Augmented Reality system overview](#)

Note:

The camera must be calibrated via your LightHouse chartplotter's *[Camera installation]* page before Augmented Reality features can be used. For more information, refer to one of the following documents:

- Axiom 2 LightHouse 5 Operation Instructions (**81432**), or
- LightHouse 4 Advanced Operation Instructions (**81406**).

The latest version of these documents can be found under the following section: [2.2 Product documentation](#)

6.4 General location requirements

When selecting a location for your product it is important to consider a number of factors.

Factors for consideration:

- **Ventilation** — To ensure adequate airflow:

- Ensure that product is mounted in a compartment of suitable size.
- Ensure that ventilation holes are not obstructed. Allow adequate separation of all equipment.

Any specific requirements for each system component are provided later in this chapter.

- **Mounting surface** — Ensure product is adequately supported on a secure surface. Do not mount units or cut holes in places which may damage the structure of the vessel.
- **Cabling** — Ensure the product is mounted in a location which allows proper routing, support and connection of cables:
 - Minimum bend radius of 100 mm (3.94 in) unless otherwise stated.
 - Use cable clips to prevent stress on connectors.
 - If your installation requires multiple ferrites to be added to a cable then additional cable clips should be used to ensure the extra weight of the cable is supported.
- **Water ingress** — The product is suitable for mounting both above and below decks. Although the unit is waterproof, it is good practice to locate it in a protected area away from prolonged and direct exposure to rain and salt spray.
- **Electrical interference** — Select a location that is far enough away from devices that may cause interference, such as motors, generators and radio transmitters / receivers.
- **Power supply** — Select a location that is as close as possible to the vessel's DC power source. This will help to keep cable runs to a minimum.

6.5 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.

6.6 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.

6.7 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.

6.8 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.

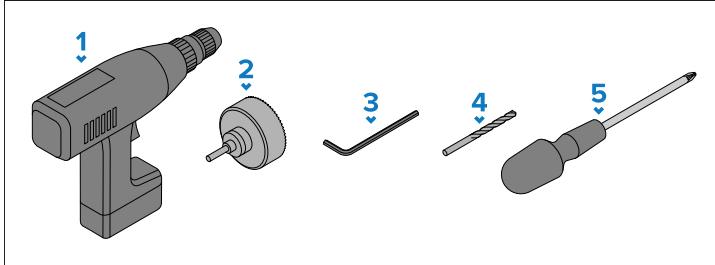
CHAPTER 7: INSTALLATION

CHAPTER CONTENTS

- 7.1 Tools required (page 30)
- 7.2 Camera orientation (page 30)
- 7.3 Camera base orientation (page 30)
- 7.4 Cable routing options (page 31)
- 7.5 Mounting (through-surface cable routing) (page 31)
- 7.6 Mounting (surface cable routing) (page 34)

7.1 Tools required

The following tools are required for installation:



Description	
1	Power drill.
2	25 mm (⁶³ / ₆₄ in) Hole saw ⁽¹⁾ .
3	2 mm Hex wrench (Allen key), supplied.
4	Drill bit ⁽²⁾ .
5	Pozidrive screwdriver.
6	Marine grade sealant ⁽¹⁾

Note:

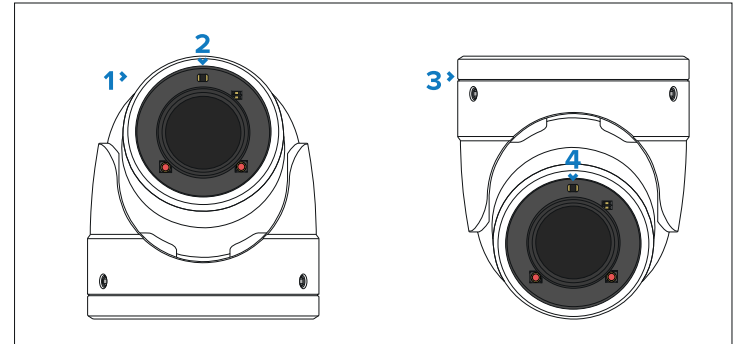
1. Items are only required when opting to route the camera's pre-fitted cable through the mounting surface.
2. The appropriate drill bit size is dependent on the thickness and material of the mounting surface.

7.2 Camera orientation

The camera supports both **ball-up**(upright) and **ball-down** (upside down) mounting orientations.

To maintain video feed orientation the ambient light sensor should be at the 12 o'clock position for both orientations.

Example: camera mounting orientations

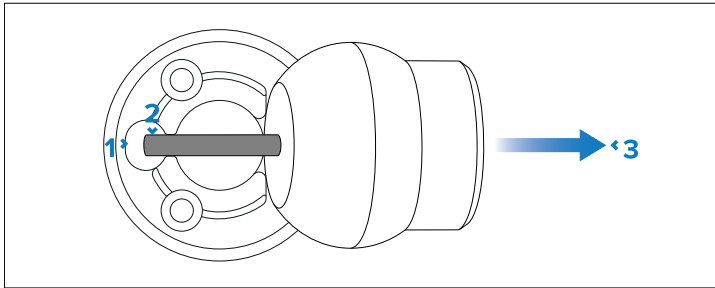


1. **Ball-up:** the camera is mounted on top of the mounting surface.
2. Ambient light sensor position for **Ball-up** installations.
3. **Ball-down:** the camera is suspended upside down below the mounting surface.
4. Ambient light sensor position for **Ball-down** installations.

7.3 Camera base orientation

Correct camera base orientation is important to maximize adjustment range and prevent cable damage.

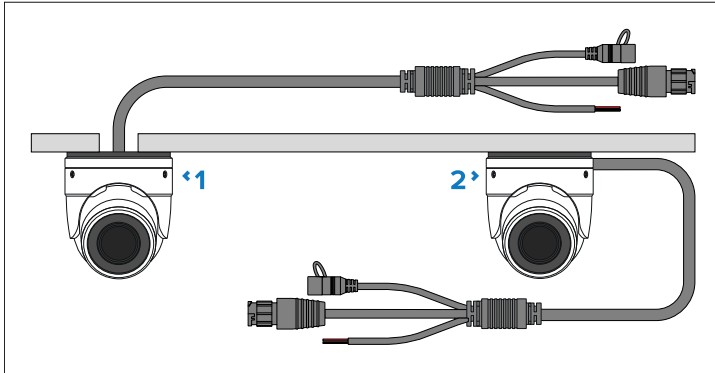
The camera base should be installed with the cable feed hole directly behind the desired viewing direction.



1. Cable feed hole
2. Cable
3. Viewing direction

7.4 Cable routing options

Two cable routing options are available.



1. Through-surface cable routing (option 1). For more information, refer to: [7.6 Mounting \(surface cable routing\)](#)
2. Surface cable routing (option 2). For more information, refer to: [7.5 Mounting \(through-surface cable routing\)](#)

7.5 Mounting (through-surface cable routing)

Preparing the mounting surface (through-surface cable routing)

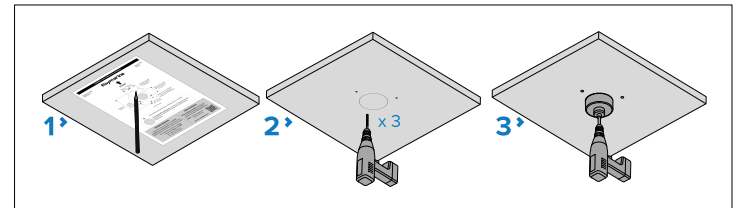
The mounting surface must be prepared correctly for through-surface cable routing.

Prerequisites:

- Ensure that you have selected a suitable mounting location based on the requirements listed in the following section: [p.25 — Location requirements](#)
- Ensure that you have identified all cable connections required and routed the necessary cables to your selected mounting location.
- Ensure that the provided fixings are suitable for the mounting surface material and thickness.

Note:

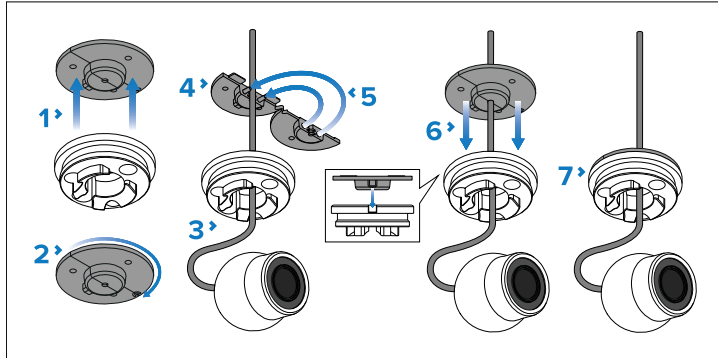
Ensure that the mounting template is orientated correctly; the “Front” arrow on the template should point in the desired viewing direction.



1. Use the supplied mounting template to mark out the location of the 3 fixing holes and the 25 mm ($\frac{63}{64}$ in) cable feed-through hole.
2. Drill the 3 x holes required for the fixings at the marked locations.
3. Drill the 25 mm ($\frac{63}{64}$ in) cable feed-through hole

Mounting gasket installation (through-surface cable routing)

In through-surface cable routing installations the camera cable must pass through the center of the mounting gasket.



1. Remove the mounting gasket from the camera base.
2. Open the mounting gasket by gently pulling the two halves apart on the side opposite to the gasket's hinge.
3. Route the camera's cable through the camera base.
4. Position the mounting gasket on the camera cable beneath the camera base, ensuring that the cable is seated in the gasket's cable feed hole.
5. Close the mounting gasket, ensuring that the rubber locator pins are fully seated in the corresponding holes and that the 2 alignment tabs engage in the corresponding recesses.
6. Align the mounting gasket's cable channel plug with the corresponding cable exit channel in the camera base, then re-insert the mounting gasket into the camera base by sliding it down the cable.

Ensure that the gasket halves do not separate while the gasket is being moved down the cable and re-inserted into the camera base.

7. Ensure that the gasket is fully seated around the circumference of the camera base.

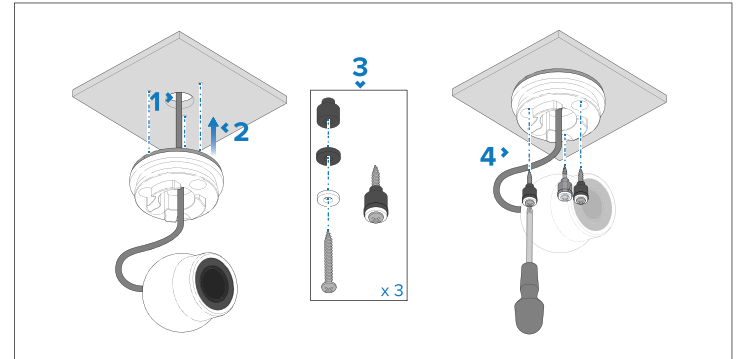
Mounting the camera base (through-surface cable routing)

Procedure for mounting the camera base for installations using through-surface cable routing.

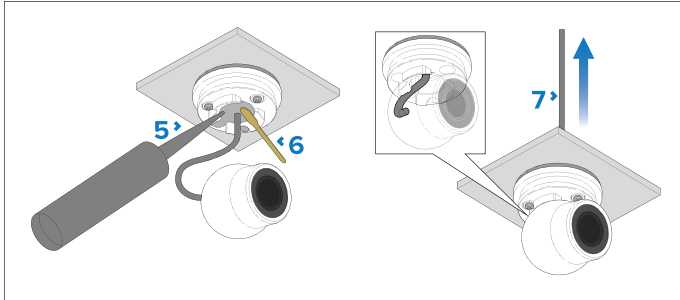
Pre-requisites:

Before mounting the unit, ensure that you have:

- Prepared the mounting surface correctly for through-surface cable routing.
- Installed the gasket correctly for through-surface cable routing.



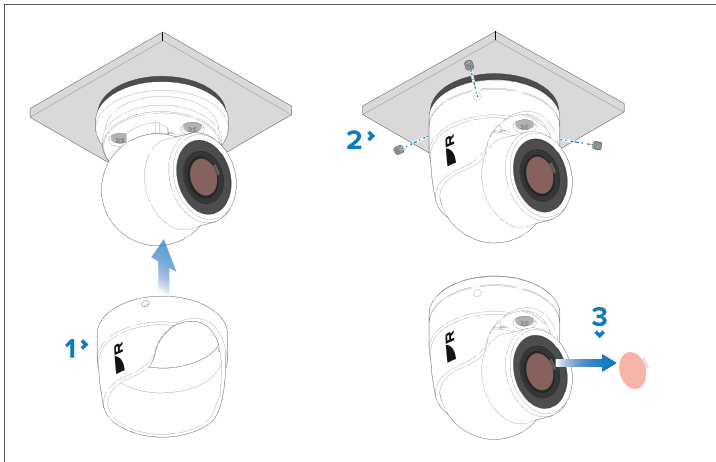
1. Feed the camera cable through the 25 mm ($\frac{63}{64}$ in) cable hole in the mounting surface.
2. Align the fixing holes in the camera base with the fixing holes in the mounting surface, and hold the camera base in place.
3. Place the mounting hardware over the fixing screws in the following order: white plastic washers, silicone washers, and then rubber plugs.
4. Insert the mounting hardware into the mounting holes and secure by tightening the fixing screws to a torque of 1.4 N·m (1.03 lbf·ft).



5. Fill the center of the camera base and the cable feed hole with an appropriate marine-grade neutral-cure silicone sealant, ensuring that the exposed gasket is completely covered.
6. If required, use a small spatula or similar tool to flatten the sealant and ensure a uniform coating all over the gasket surface and around the cable.
7. Gently pull the camera cable through the cable feed hole until the camera ball is seated in the top of the camera base. Remove any excess sealant from the cable.

Attaching the collar

The collar is used to secure the camera ball to the camera base.



1. Place the camera collar on top of the camera base.

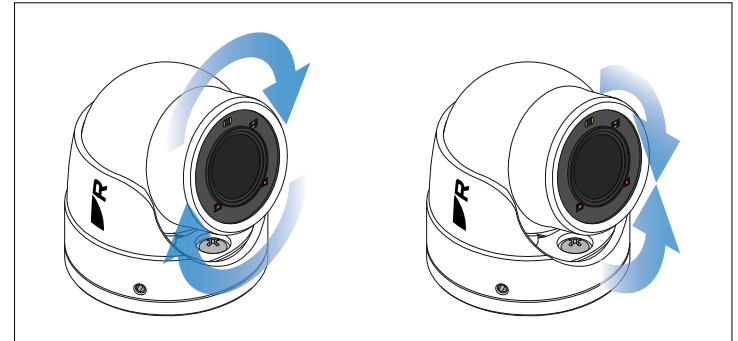
2. Insert the supplied grub screws into the camera collar, then tighten them evenly using the supplied hex wrench (Allen key) until secure.
3. Remove the protective film covering the camera's lens.

Adjusting the camera view

The camera viewing angle can be adjusted.

Pre-requisites:

The camera must be installed and connected to a chartplotter, or device with a web browser so the video feed can be viewed. Refer to the relevant *Connections* chapter(s) for information about camera connections.



1. Power up the system and check the camera's video feed in the chartplotter's *[Video]* app, or via the camera's web interface.
2. If the image is not level, or is aimed too high or too low, adjust the camera ball by hand as required.
3. If required, you can loosen the 3 x grub screws a couple of turns to provide greater range of adjustment.

Note:

- If you loosened the grub screws don't forget to retighten them.
- The Augmented Reality feature requires further setup and calibration from within the chartplotter's *[Video]* app.

7.6 Mounting (surface cable routing)

Preparing the mounting surface (surface cable routing)

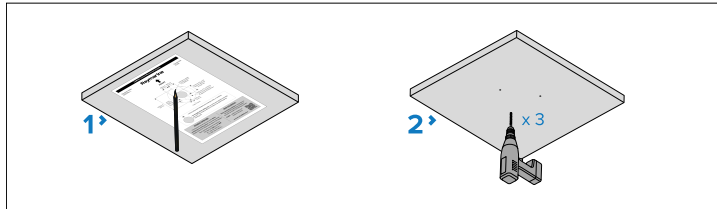
The mounting surface must be prepared correctly for surface cable routing.

Prerequisites:

- Ensure that you have selected a suitable mounting location based on the requirements listed throughout the following section:
[p.25 — Location requirements](#)
- Ensure that you have identified all cable connections required and routed the necessary cables to your selected mounting location.
- Ensure that the provided fixings are suitable for your mounting surface material and thickness.

Note:

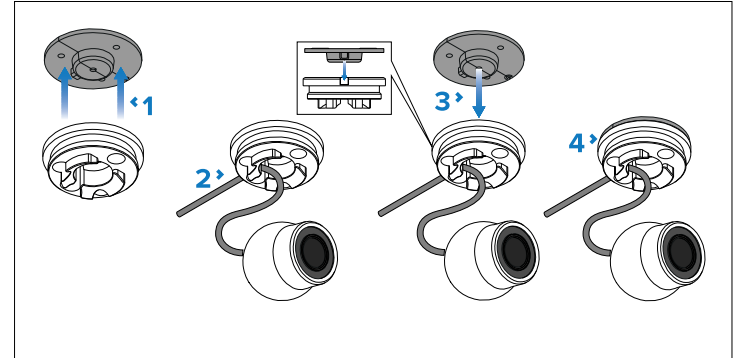
Ensure that the mounting template is orientated correctly the Front arrow on the template should point in the desired viewing direction.



1. Use the supplied mounting template to mark out the location of the 3 fixing holes.
2. Drill the 3 x holes required for the fixings at the marked locations.

Mounting gasket installation (surface cable routing)

In installations where the cabling is routed on the mounting surface the camera cable must pass through the cable feed hole and out of the exit channel..



1. Remove the mounting gasket from the camera base.
2. Route the camera cable through the cable feed hole and out of the exit channel in the camera base.
3. Align the mounting gasket's cable channel plug with the corresponding cable exit channel in the camera base, then reinsert the mounting gasket into the camera base.
4. Ensure that the gasket is fully seated around the circumference of the camera base.

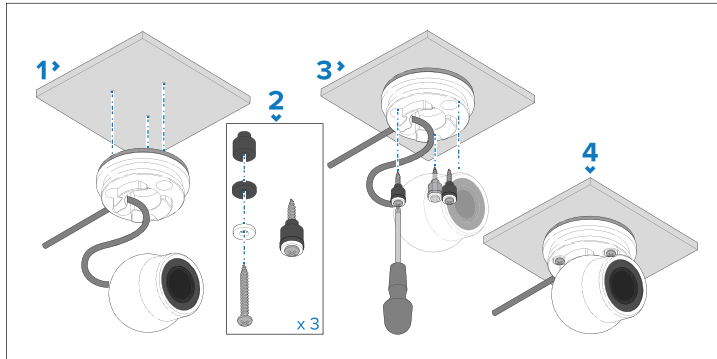
Mounting the unit (surface cable routing)

Procedure for mounting the camera base for installations using surface cable routing.

Pre-requisites:

Before mounting the unit, ensure that you have:

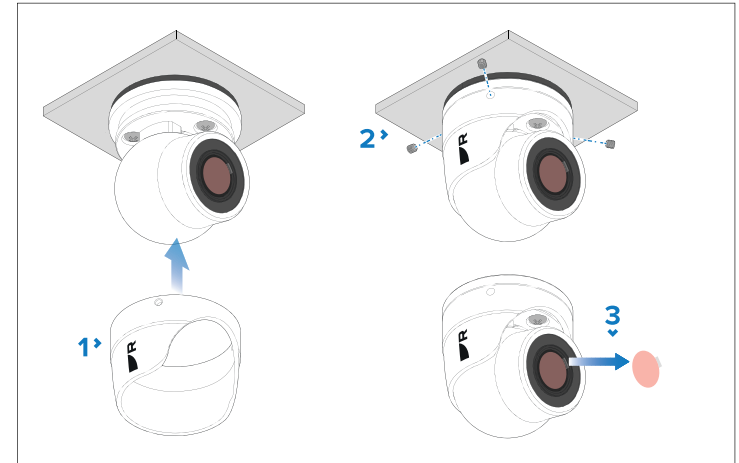
- Prepared the surface correctly for surface cable routing.
- Installed the gasket correctly for surface cable routing.



1. Align the fixing holes in the camera base with the fixing holes in the mounting surface and hold the camera base in place.
2. Place the mounting hardware over the fixing screws in the following order: white plastic washers, silicone washers, and then rubber plugs.
3. Insert the mounting hardware into the mounting holes and secure by tightening the fixing screws to a torque of 1.4 N·m (1.03 lbf·ft).
4. Gently pull the camera cable through the cable feed hole until the camera ball is seated in the top of the camera base. Remove any excess sealant from the cable.

Attaching the collar

The collar is used to secure the camera ball to the camera base.



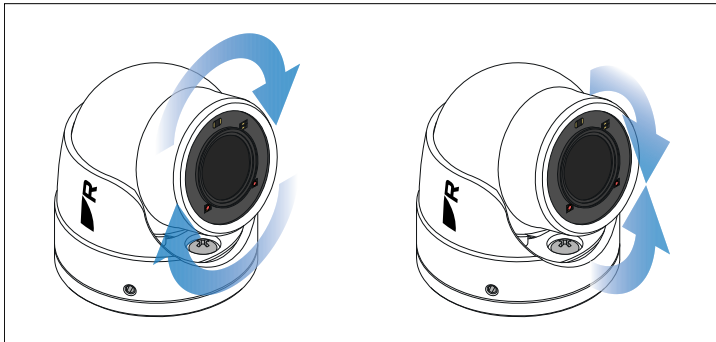
1. Place the camera collar on top of the camera base.
2. Insert the supplied grub screws into the camera collar, then tighten them evenly using the supplied hex wrench (Allen key) until secure.
3. Remove the protective film covering the camera's lens.

Adjusting the camera view

The camera viewing angle can be adjusted.

Pre-requisites:

The camera must be installed and connected to a chartplotter, or device with a web browser so the video feed can be viewed. Refer to the relevant *Connections* chapter(s) for information about camera connections.



1. Power up the system and check the camera's video feed in the chartplotter's *[Video]* app, or via the camera's web interface.
2. If the image is not level, or is aimed too high or too low, adjust the camera ball by hand as required.
3. If required, you can loosen the 3 x grub screws a couple of turns to provide greater range of adjustment.

Note:

- If you loosened the grub screws don't forget to retighten them.
- The Augmented Reality feature requires further setup and calibration from within the chartplotter's *[Video]* app.

CHAPTER 8: CABLES AND CONNECTIONS — GENERAL INFORMATION

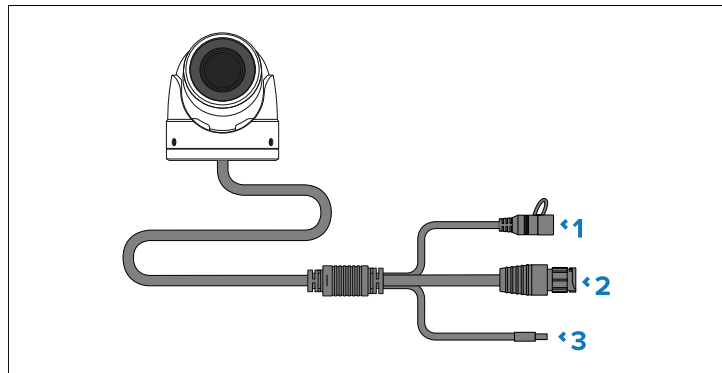
CHAPTER CONTENTS

- [8.1 Camera cable connections \(page 38\)](#)
- [8.2 Power options \(page 38\)](#)
- [8.3 General cabling guidance \(page 39\)](#)

8.1 Camera cable connections

An overview of the camera's cable connections.

The CAM400 is supplied with a 1.47 m (4.82 ft) fitted cable that includes the following connections:



Connection

1 Factory reset switch

- Pressing this switch will reset the camera and any user settings to the factory default settings. Only use this switch if you encounter issues with the operation of the camera that cannot be resolved using the provided troubleshooting information: [p.82 — Troubleshooting](#)
- The protective cap must remain fitted at all times when the factory reset switch is not in use.

2 RayNet (male) connector

- This connection is used to stream video from the camera and can also be used to power the camera, when connected to Power Sourcing Equipment (PSE).

3 12 V dc power cable

This connection is used to provide the camera its own dedicated 12 V dc power supply. The power cable is supplied with insulation fitted. Use this connection if you are not powering the camera via PoE.

For information on individual cable connection lengths, refer to [p.24 — Product dimensions](#)

Note:

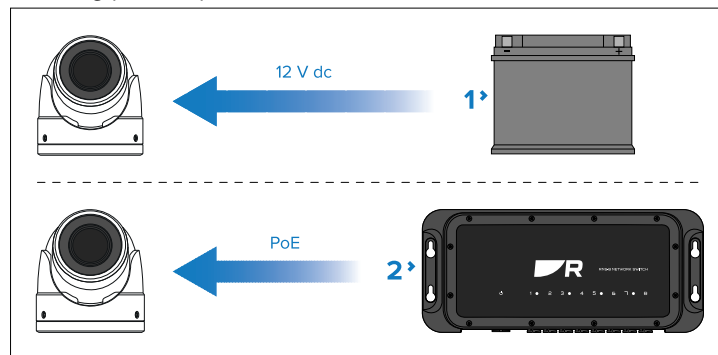
For more information on suitable cables and connections, refer to:

- [p.44 — Dedicated power and network connections](#)
- [p.41 — PoE network connections](#)

8.2 Power options

The camera supports two power options.

It is recommended that the product is powered using **only one** of the following power options:



Description

1 Dedicated power connection

Connection to a vessel's 12 V dc power supply using the camera's dedicated power cable. For more information, refer to: [p.45 — Dedicated power connection](#)
The dedicated power cable requires wire stripping if it is going to be used.

2 Power over Ethernet (PoE):

Connection to Power Sourcing Equipment (PSE) (e.g. a PoE Injector or a PoE network switch), using the camera's RayNet (Ethernet) connection. A single network connection carries both data signals and power. For more information, refer to: [p.42 — Power over Ethernet \(PoE\)](#)

8.3 General cabling guidance

Cable types and length

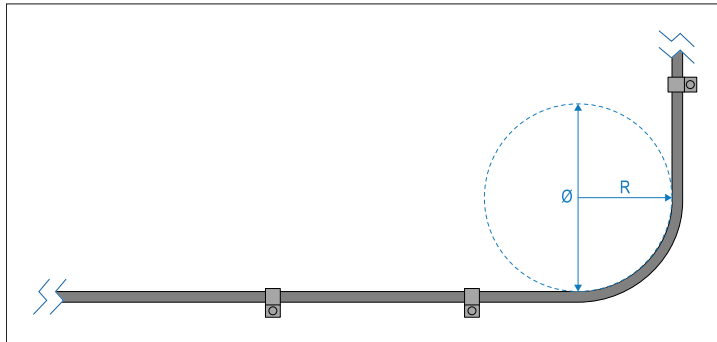
It is important to use cables of the appropriate type and length.

- 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 and bend radius

To maximize cable performance and lifespan, it's important to ensure that all cables are routed correctly and adequate space is provided to allow for each cable's minimum bend radius.

Minimum cable bend radius



Do NOT bend cables excessively. Wherever possible, ensure that your chosen product installation location allows enough clearance for the minimum cable bend diameter specified in the following table:

	Description	Value
Ø	Cable minimum bend diameter .	200 mm (7.87 in.)
R	Cable minimum bend radius .	100 mm (3.94 in.)

Note:

For products where multiple different cable types are connected, each with a different minimum cable bend radius, the higher figure is provided in the table above (i.e. the cable with the greatest minimum bend radius is specified).

Cable routing — best practices

- 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 (conduit).
- 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 adapters (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, adapters, or other signal-coupling devices used in cable runs **maintain all shield connections throughout the cable run.**

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.

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 wires

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

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 wires

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



Warning: Positive ground systems

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

CHAPTER 9: POE CONNECTION

CHAPTER CONTENTS

- [9.1 Power over Ethernet \(PoE\) \(page 42\)](#)
- [9.2 Network connection \(page 42\)](#)
- [9.3 Example PoE system overview \(page 42\)](#)

9.1 Power over Ethernet (PoE)

Power over Ethernet (PoE) is a system which allows both power and data to be passed along a single CAT 6 Ethernet cable.

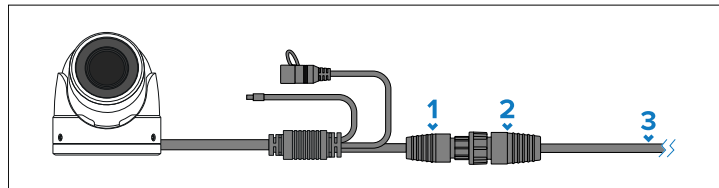
There are 2 main types of PoE device:

- **Power Sourcing Equipment (PSE)** — this PoE system component provides electrical power over a CAT 6 Ethernet cable to a Powered Device (PD).
- **Powered Device (PD)** — this PoE system component is powered by the electrical power provided by the Power Sourcing Equipment (PSE).

The CAM400 is a Class 2 PD with a 48 V nominal supply voltage, which consumes 7 W maximum (with LEDs ON). Before connecting the CAM400, ensure that your Power PSE's maximum power output will not be surpassed. For further information on your PSE's maximum power output, refer to the instructions that accompany the device.

9.2 Network connection

The camera is connected to the network using the network cable connection that has a male RayNet connector.



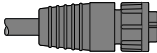
Description

- 1 Male RayNet cable connector.
- 2 Female RayNet cable connector.
- 3 Connection to network device.

Ensuring correct orientation, insert the camera's Male RayNet cable connector. into the Female RayNet cable connector of the network cable connected to your network device. Turn the Female RayNet cable connector's locking collar clockwise to lock into position.

Network cable connector types

There are 2 types of applicable network cable connectors — RayNet and RJ45

Connector	Description
	RayNet RayNet connectors are used to connect to a Raymarine network product, such as a network switch or chartplotter.
	RJ45 RJ45 connectors are used to connect to a third party network device, such as a network switch or laptop computer.

Network cable extensions

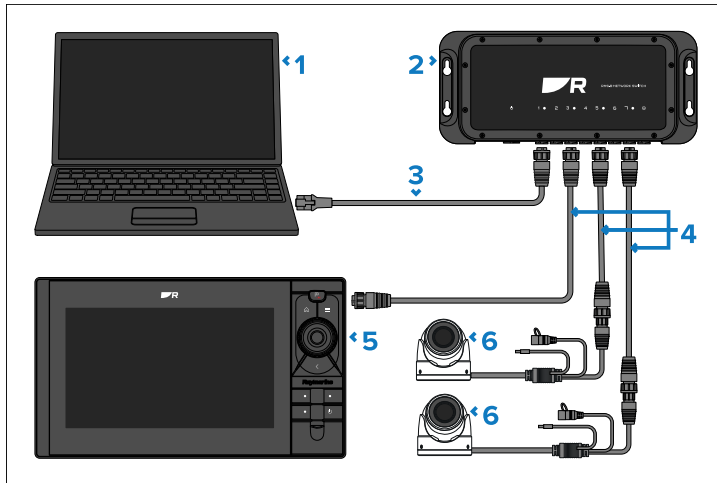
If you wish to extend the length of a network cable connected to your product, refer to the following section for further information:
[p.93 — Spares and accessories](#)

9.3 Example PoE system overview

An example overview of different products which can be connected to and used in conjunction with the CAM400, when it is being supplied Power over Ethernet (PoE) from Power Sourcing Equipment (PSE).

When the camera is being supplied Power over Ethernet, both data and power signals are transferred across a single network connection.

The system shown is intended as an example only and may differ from your planned installation.



Note:

For simplicity power connections for other devices are not shown.

Important:

- Any device supplying to the CAM400 must output a supply voltage in the range of 44 V dc to 57 V dc.
- When the camera's dedicated 12 V dc power connection is not used, the dedicated power cable wires must be insulated.

Description	
1	Laptop PC.
2	Power Sourcing Equipment (PSE) providing PoE to the CAM400 (RNS-8 currently illustrated).
3	RayNet (female) to RJ45 (male) adapter cable, available separately.
4	RayNet (female) to RayNet (female) cable, available separately.
5	Compatible chartplotter (Axiom 2 Pro currently illustrated).
6	CAM400.

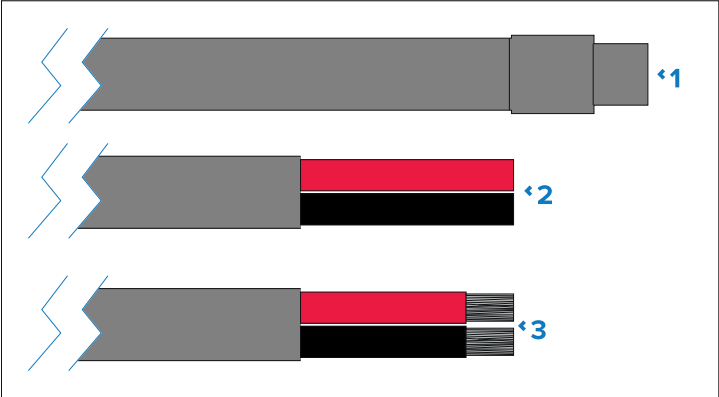
CHAPTER 10: DEDICATED POWER AND NETWORK CONNECTIONS

CHAPTER CONTENTS

- 10.1 Preparing the power cable (page 45)
- 10.2 Dedicated power connection (page 45)
- 10.3 Network connection (page 48)
- 10.4 Example dedicated power system overview (page 48)

10.1 Preparing the power cable

The camera's dedicated power cable is supplied with insulation fitted. The insulation must be removed and the wires stripped to allow connection.



Using appropriate wire cutters / strippers:

- 1. Cut the insulation from the end of the power cable.
- 2. Remove a section of the outer sheath⁽¹⁾.
- 3. Remove a section of sheath from each wire.

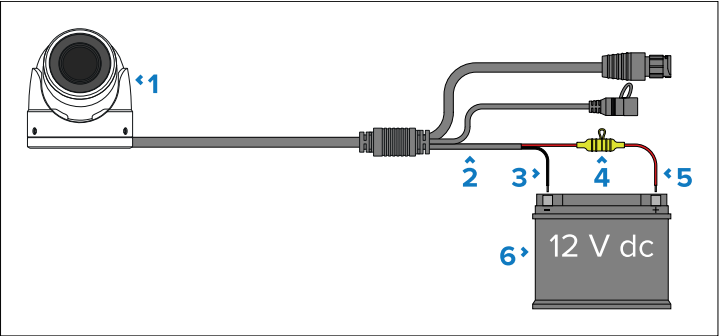
Note:

- 1. Actual strip length will vary depending on application.

10.2 Dedicated power connection

The CAM400 can be powered from a 12 V dc power source.

The camera's power cable can be used to create a bare-wire connection to a 12 V dc power supply:



Description	
1	CAM400.
2	CAM400's dedicated power cable.
3	Black wire (negative) — connects to the power supply's negative terminal.
4	Waterproof fuse holder containing a suitable-rated inline fuse (not supplied), which must be fitted to the red positive wire. For further fuse rating information, refer to: p.45 — Inline fuse and thermal breaker ratings
5	Red wire (positive) — connects to the power supply's positive terminal.
6	12 V dc power supply.

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

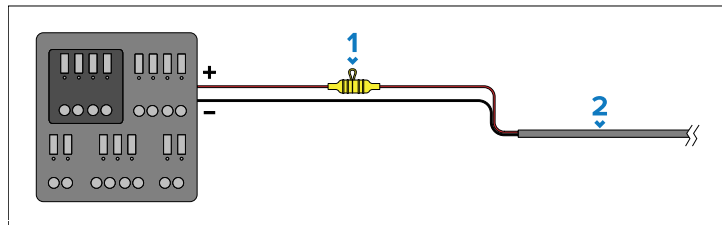
Recommendations and best practice.

- 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)

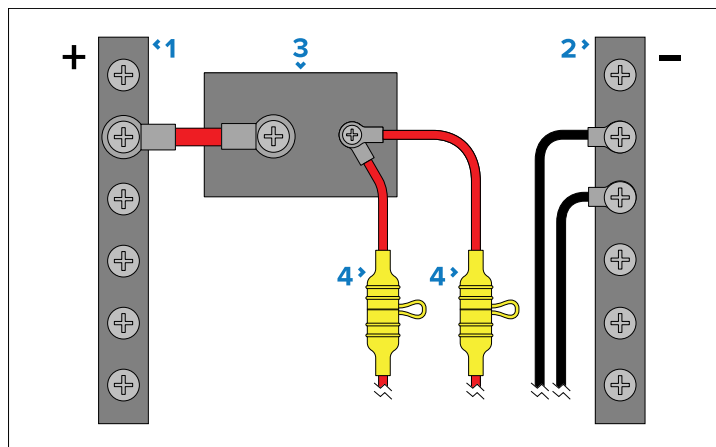


Description

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 mm²) 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

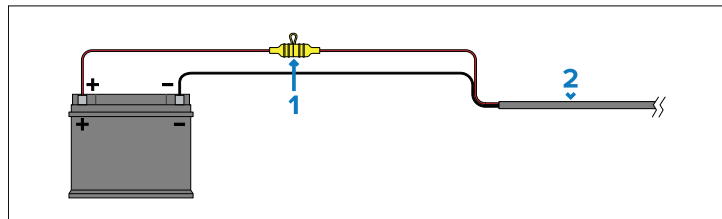
Description	
3	Circuit breaker
4	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: <i>Inline fuse and thermal breaker ratings</i> .

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: <i>Inline fuse and thermal breaker ratings</i> .
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 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, the total current load of the device, and the length of the cable run — as the cable run length increases, the greater the voltage drop will be from one end of the power cable to the other.
- 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
<8 (<25)	16 (1.31 mm ²)
16 (50)	14 (2.08 mm ²)
24 (75)	12 (3.31 mm ²)
>32 (>100)	10 (5.26 mm ²)

Important:

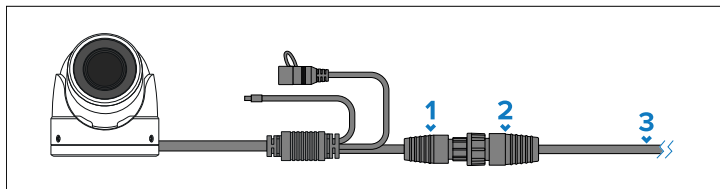
Be aware that some products in your system (such as sonar modules) can create voltage peaks at certain times, which may impact the voltage available to other products during the peaks.

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.)

10.3 Network connection

The camera is connected to the network using the network cable connection that has a male RayNet connector.



	Description
1	Male RayNet cable connector.
2	Female RayNet cable connector.
3	Connection to network device.

Ensuring correct orientation, insert the camera's Male RayNet cable connector. into the Female RayNet cable connector of the network cable connected to your network device. Turn the Female RayNet cable connector's locking collar clockwise to lock into position.

Network cable connector types

There are 2 types of applicable network cable connectors — RayNet and RJ45

Connector	Description
	RayNet RayNet connectors are used to connect to a Raymarine network product, such as a network switch or chartplotter.
	RJ45 RJ45 connectors are used to connect to a third party network device, such as a network switch or laptop computer.

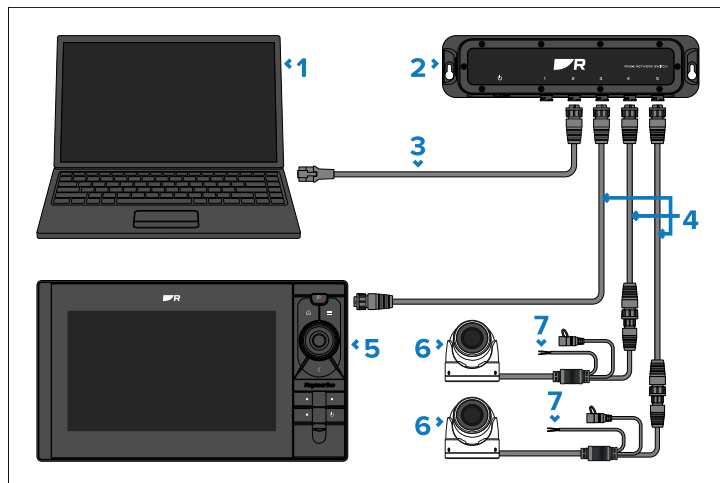
Network cable extensions

If you wish to extend the length of a network cable connected to your product, refer to the following section for further information:
[p.93 — Spares and accessories](#)

10.4 Example dedicated power system overview

An example overview of different products which can be connected to and used in conjunction with the CAM400, when it is being supplied power from a 12 V dc power source.

The system shown is intended as an example only and may differ from your planned installation.



Description

- 1 Laptop PC.
- 2 Network switch (RNS-5 currently illustrated).
- 3 RayNet (female) to RJ45 (male) adapter cable, available separately.
- 4 RayNet (female) to RayNet (female) cable, available separately.
- 5 Compatible chartplotter (Axiom 2 Pro currently illustrated).
- 6 CAM400.
- 7 CAM400 12 V dc power connection. For connection information, refer to: [p.45 — Dedicated power connection](#)

Note:

For simplicity power connections for other devices is not shown.

CHAPTER 11: SETUP AND OPERATION VIA RAYMARINE CHARTPLOTTER

CHAPTER CONTENTS

- [11.1 Chartplotter software version \(page 51\)](#)
- [11.2 Automatic camera detection \(page 51\)](#)
- [11.3 Camera operation via the chartplotter Video app \(page 51\)](#)
- [11.4 Logging in to the user interface from a chartplotter \(page 51\)](#)

11.1 Chartplotter software version

To ensure optimum performance and compatibility with external devices, your chartplotter must be using the latest software version.

To download the latest software, visit: www.bit.ly/rym-software

11.2 Automatic camera detection

By default, the camera is configured to allow a compatible Raymarine chartplotter to automatically detect the camera and display the camera's primary video feed in the *[Video]* app.

If the camera's *[Stream Format]* or *[Network]* settings have been modified from their default values, or if the chartplotter's DHCP network settings have been modified, the video feed may not be displayed in the *[Video]* app.

In this situation, reset the settings to their default values and try again.

11.3 Camera operation via the chartplotter Video app

The camera's video feed can be viewed using the *[Video]* app on a compatible Raymarine chartplotter.

The *[Video]* app enables you to view, record and play back footage from the camera. For information about using the *[Video]* app, refer to the relevant LightHouse *Operation Instructions*.

Document	Description	Link
81432	Axiom 2 LightHouse 5 Operation Instructions	www.bit.ly/LH5-docs
81406	LightHouse 4 Advanced Operation Instructions	www.bit.ly/LH4-docs

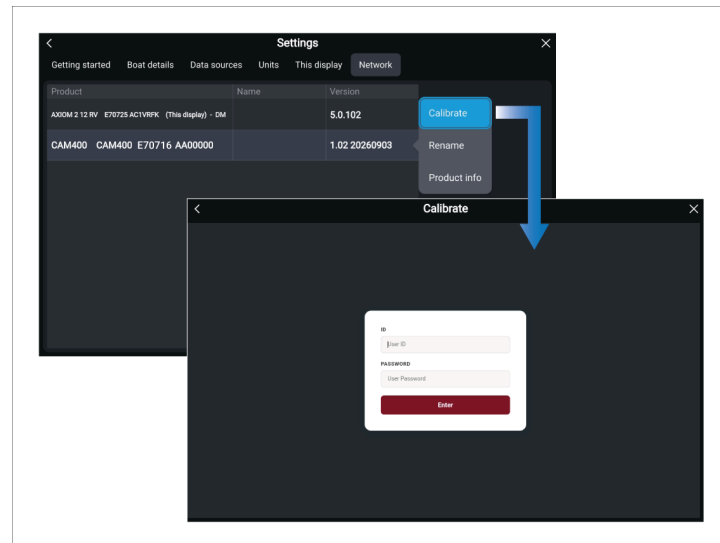
Note:

- A single CAM400 video feed can be displayed on a maximum of 10 compatible Raymarine chartplotters at the same time (via each display's Video app).
- The video streams of up to 4 CAM400 cameras can be displayed simultaneously on a single compatible Raymarine chartplotter.

11.4 Logging in to the user interface from a chartplotter

The camera's user interface can be accessed from a compatible Raymarine chartplotter.

To access the camera's user interface from the chartplotter:



1. Navigate to the *[Network]* settings menu: *[Homescreen > Settings > Network]*.
2. Select the camera from the list of network devices.
3. Select the *[Calibrate]* option. from the pop-over menu.
Once selected, the camera's user interface log in page will be displayed on-the chartplotter screen.
4. Enter the username.
The default username is: admin.
5. Enter the password.
The default password is printed on the camera's product label.
6. Select the *[Enter]* button.

The *[Live view]* page is displayed.

For details of the camera's user interface, refer to:

p.56 — User interface (settings)

CHAPTER 12: SETUP AND OPERATION VIA PC / LAPTOP

CHAPTER CONTENTS

- [12.1 Camera IP address \(page 53\)](#)
- [12.2 Logging in to the user interface from a web browser \(page 55\)](#)

12.1 Camera IP address

To access the camera's user interface from a third party network device with a web browser you need to know the camera's IP address.

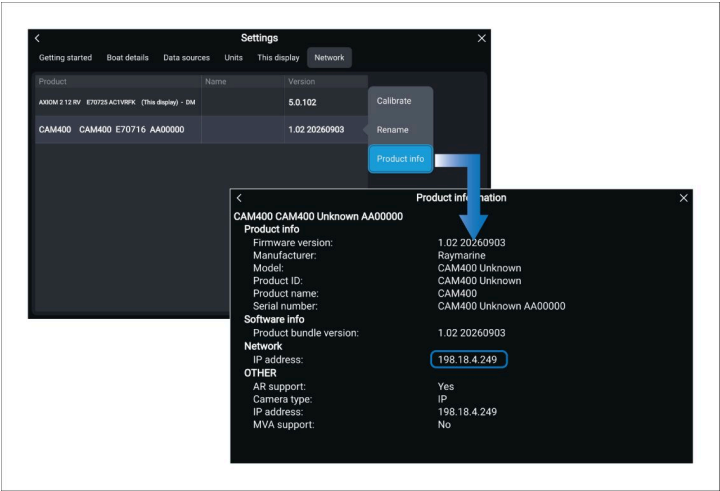
The following methods can be used to obtain the camera's IP address:

- Via a compatible Raymarine chartplotter, refer to: [p.53 — Finding the camera IP address from the chartplotter](#)
- Via a Windows PC / laptop or a router, refer to: [p.54 — How to find an IP address](#)
- Via a dedicate application. For an example, refer to: [p.54 — IP discovery via a device manager app](#)

Finding the camera IP address from the chartplotter

You can find the camera's IP address from the camera's product info page on the chartplotter.

To access the camera's product information from the chartplotter :



1. Navigate to the [Network] settings menu: [Homescreen > Settings > Network].
2. Select the camera from the list of network devices.
3. Select the [Product info] option from the pop-over menu.

Setup and operation via PC / laptop

The [Product information] page is displayed. The camera's IP address can be found under the [Network] details.

Camera IP address discovery

Before you can access the camera's web interface page(s), you first need to know the camera's IP address. The way in which you obtain this IP address depends on: 1) **which device** in the network is allocating the IP addresses; and 2) **how** the IP network addresses are allocated. The majority of IP networks are configured to allocate IP addresses to connected devices automatically. However, on some networks, it will be necessary to configure the camera's IP address manually.

IP address allocation methods

Method	Description
Automatic: via DHCP or link local address	Certain networks will allocate an IP address for the camera automatically, via DHCP (<i>Dynamic Host Configuration Protocol</i>). Windows PCs also have <i>link local</i> support, which means that if a DHCP server is not found on the IP network, the camera will fallback to using a link local address, in the 169.254.x.x range. In this scenario, no further IP configuration is required, and you will be able to access the camera's web interface page by entering its IP address into the web browser's address bar. How to find the camera's IP address: Refer to: p.54 — How to find an IP address
Manual: via a static IP address	Networks that do NOT use DHCP or link local IP addressing require a static IP address to be permanently assigned to each connected device. An IP address can be assigned manually using the camera's Configuration page. However, before you can access this page and change the camera's default IP address to a static address of your choosing, you must first find out the camera's existing factory-configured IP address. How to find the camera's IP address: Refer to: p.54 — How to find an IP address

Note:

When setting a static IP address, be aware that some IP network policies impose IP address *octet filtering* rules, which may require the numbers in a specific octet of the address to be within a specific range. In this scenario, it may not be possible to assign a static IP address to the device if the address is not in the correct range, and it will be necessary to refer to the vessel's IP network administrator.

Note:

IP addresses are self-allocated by certain Raymarine equipment in the following range: 198.18.0.32 to 198.18.3.255 (inclusive). On networks featuring Raymarine-branded IP devices, you must avoid placing any devices in this range using manual (static) IP addresses.

How to find an IP address

The majority of IP networks are configured to allocate IP addresses to connected devices automatically. There are a variety of ways for discovering a device's IP address, and the method differs depending on the platform:

On a Windows PC or laptop:**Method 1:**

1. Open Windows **File** Explorer, and click on the "*Network*" category in the sidebar on the left.
2. Find the relevant device via its serial number in the list of devices, and then right-click on its icon and select "*Properties*".
3. The IP address will be listed in the displayed web page.

Method 2:

Use third-party IP scanning software (such as *Wireshark*) to scan the devices on your IP network. The IP address of all devices will be listed in the scan results.

On a network router connected to the same IP network:

1. Access the router's web interface page via a web browser (the router's IP address is typically *192.168.1.1* or *192.168.0.1*). It is also usually printed on the Router's product label.
2. Navigate to the "*Device List*", "*Connected Devices*", or "*DHCP Clients*" section.
3. The connected IP devices and their IP addresses will be listed.

On an chartplotter:

The IP address for connected devices is usually displayed on a *Diagnostics* page. Refer to the display's *Operation Instructions* document for instructions on how to access the Diagnostics page.

IP discovery via a device manager app

Dedicated application are available that enable you to find a device's IP address.

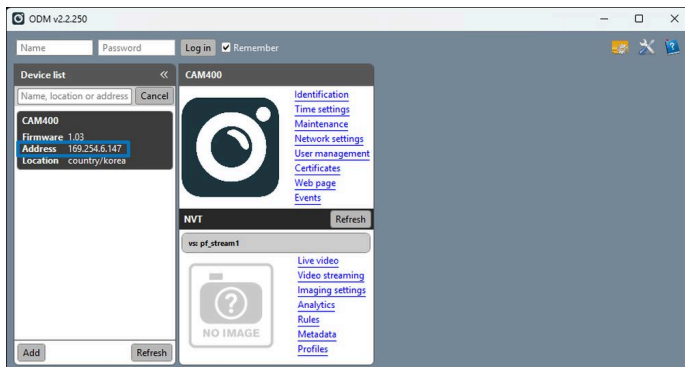
Note:

The following instructions are provided as an example and are based on an the *ODM Device Manager* application. The *ODM Device Manager* application is a third party application and as such is subject to change depending upon which version of application you are using.

In order to access the camera's IP address and user interface using the ODM application, follow the steps below:

1. Ensure that the camera is powered and connected to the same network as your PC.
2. Open the following website in your browser: <https://sourceforge.net/projects/onvifdm/>
3. Click on the *[Download]* icon.
4. Once the download is complete either, click the downloaded file from the download notification, or double click the file from your *[Downloads]* folder.
5. Follow the initial setup wizard's onscreen prompts.
6. Once installation is complete, if required open the installed application.

The application will open and display details of detected devices:

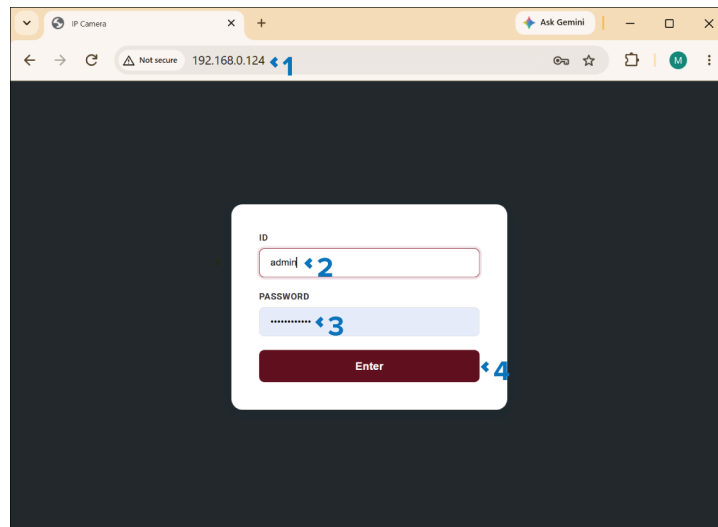


You can now access the device's user interface by entering its IP *[Address]* in the address bar of a supported web browser in the following format: **https://xxx.xx.x.xxx**. IP cameras can take up to 60 seconds to appear on a network. If the camera does not appear in the *[Device list]*, ensure that you have waited a sufficient amount of time before attempting to *[Refresh]*. If you cannot connect to the user interface after entering the camera's IP address into your web browser, ensure that your computer is using the same IP address range as the camera before re-trying. For more information, refer to: [p.53 — Camera IP address discovery](#)

12.2 Logging in to the user interface from a web browser

The camera's user interface can be accessed from a laptop PC or other networked device that has a web browser.

You will need to know the camera's assigned IP address. For information on discovering the camera's IP address, refer to: [p.53 — Camera IP address](#)



1. Enter the camera's IP address in your browser's address bar.
2. Enter the username.
The default username is: admin.
3. Enter the password.
The default password is printed on the product label.
4. Select the *[Enter]* button.

The Live view page is displayed.
For details of the camera's user interface, refer to: [p.56 — User interface \(settings\)](#)

CHAPTER 13: USER INTERFACE (SETTINGS)

CHAPTER CONTENTS

- 13.1 CAM400 User interface (page 57)
- 13.2 Live view page (page 57)
- 13.3 Navigation pane (page 58)
- 13.4 System information page (page 58)
- 13.5 Camera Setting (page 60)
- 13.6 Stream Format (page 63)
- 13.7 Motion Detection (page 67)
- 13.8 Password Change (page 68)
- 13.9 User Account (page 68)
- 13.10 Network Setting (page 69)
- 13.11 DNS (page 70)
- 13.12 NTP (page 70)
- 13.13 RTSP (page 71)
- 13.14 Port Setting (page 71)
- 13.15 IP Filter (page 72)
- 13.16 System Upgrade (page 73)
- 13.17 System Restart (page 74)
- 13.18 Factory Default (page 75)
- 13.19 Date / Time (page 75)
- 13.20 System Logs (page 76)

13.1 CAM400 User interface

The CAM400 includes a built-in user interface, which can be used to view the camera's video feed and configure the camera's settings.

For the majority of installations, there should be no need to access the camera's user interface. If you do need to change any of the camera settings, there are 2 options:

1. The camera is designed to be plug-and-play with compatible Raymarine chartplotters, with installation-specific settings being available directly from the chartplotter's *[Video]* app.
2. Alternatively, the camera's built-in user interface may be accessed via a web browser, running on a compatible Raymarine chartplotter, or a PC or laptop, for example.

Note:

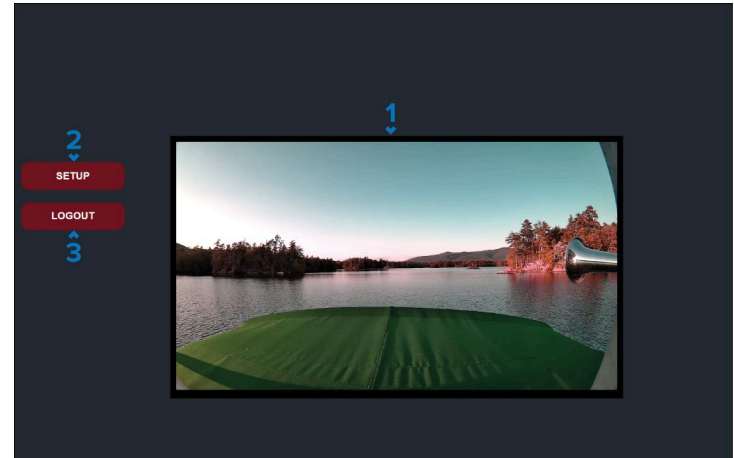
- Changing certain network and stream-related settings can prevent the camera being detected on the network, or prevent the video feed from being displayed.
- If you are connecting to a network or system that requires non-default settings, ensure that you know the required configuration before changing the camera's settings.

13.2 Live view page

The *[LIVE VIEW]* page provides the live video feed being received from the camera.

The *[LIVE VIEW]* page is the default page opened when you log in to the camera's user interface. It can also be accessed by selecting the *[LIVE VIEW]* option from the *[Navigation pane]* on the left side of the page.

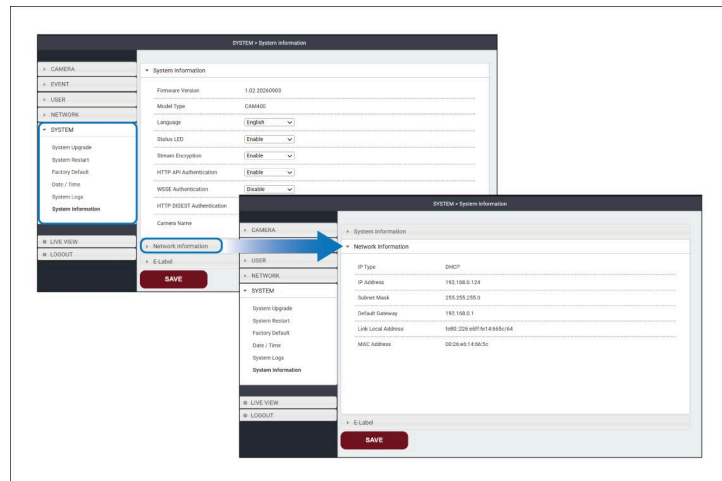
The *[LIVE VIEW]* page includes the following:



1. Live view — The live video feed from the camera.
2. *[SETUP]* button — select to view the camera's settings.
3. *[LOGOUT]* button — select to log out of the user interface.

13.3 Navigation pane

The user interface is navigated using the expandable *[Navigation pane]* located on the left side of the camera's settings pages.



Selecting an item in the *[Navigation pane]* opens the top-level page for that section and expands the *[Navigation pane]* to reveal the available pages for that section.

Settings pages are also arranged with expandable sections. Selecting a section's heading will expand the section to reveal its contents and collapse the previously expanded section.

13.4 System information page

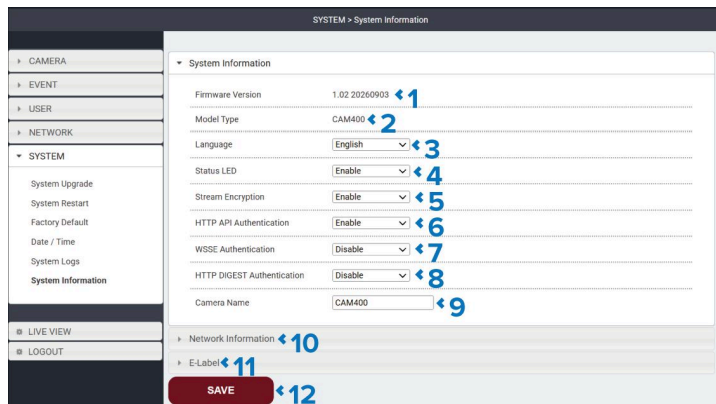
The *[System information]* page provides settings and information related to the system and network. Electronic regulatory labels (E-Labels) are also available.

The *[System information]* page is the first page that is opened when the *[SETUP]* button is selected from the *[LIVE VIEW]* page. The *[System information]* page can also be accessed by selecting: *[SYSTEM > System Information]* in the *[Navigation]* pane. The *[System information]* page includes the following expandable sections:

- *[System information section]*
- *[Network information section]*

- *[E-Label section]*

[System information section]



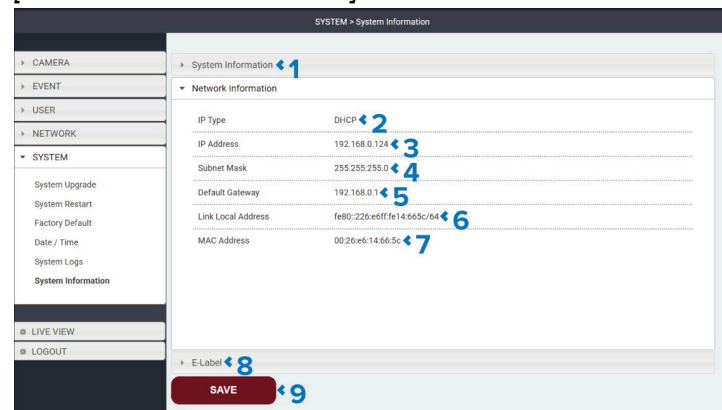
Description

- 1 *[Firmware Version]*
The camera's current firmware version is displayed
- 2 *[Model Type]*
The camera's model is displayed.
- 3 *[Language]* drop down
Select the language that you want the user interface to use. The user interface language will change once the *[SAVE]* button is selected.
- 4 *[Status LED]* drop down
[Enable] or *[Disable]* the camera's status LED.
- 5 *[Stream Encryption]*
[Enable] or *[Disable]* encryption of the camera's video streams.
Enabling *[Stream Encryption]* prevents unauthorized access and network packet capture.

Description	
6	<i>[HTTP API Authentication]</i> <i>[Enable]</i> or <i>[Disable]</i> <i>[HTTP API authentication]</i>. Control whether applications can access and control the camera through its HTTP-based API. Important: Disabling this setting will prevent access to the user interface via the chartplotter.
7	<i>[WSSE Authentication]</i> <i>[Enable]</i> or <i>[Disable]</i> <i>[WSSE Authentication]</i>. Control whether the camera uses a cryptographic password digest in place of the normal password. Important: Enabling this setting prevents the camera from being detected by compatible chartplotters. Access to the camera's user interface is also blocked unless the client device has been specifically configured to use WSSE authentication.
8	<i>[HTTP DIGEST Authentication]</i> <i>[Enable]</i> or <i>[Disable]</i> <i>[HTTP DIGEST Authentication]</i>. Control whether the camera uses a challenge-response exchange for authentication. Important: Enabling this setting prevents the camera from being detected by compatible chartplotters. Access to the camera's user interface is also blocked unless the client device has been specifically configured to use HTTP DIGEST authentication.

Description	
9	<i>[Camera Name]</i> The default name is <i>CAM400</i>, you can assign a more meaningful name to help identify the camera on your network. This setting does not impact the camera name displayed on chartplotters. The camera can also be assigned a meaningful name from the <i>[Network]</i> settings menu and the <i>[Video]</i> app settings menu on your chartplotter.
10	<i>[Network Information]</i> heading Select to view the <i>[Network Information]</i> section.
11	<i>[E-Labels]</i> heading Select to view the <i>[E-Labels]</i> section.
12	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

[Network information section]



Description	
1	<i>[System Information]</i> heading Select to view the <i>[System Information]</i> section.
2	<i>[IP Type]</i> Identifies if the IP address has been assigned via a <i>[DHCP]</i> server or has been manually assigned a <i>[Static]</i> IP address.

Description	
3	<i>[IP Address]</i> Identifies the camera's current IP address.
4	<i>[Subnet Mask]</i> Identifies the networks subnet mask
5	<i>[Default Gateway]</i> Identifies the IP address of the network's default gateway.
6	<i>[Link Local Address]</i> Identifies the camera's IPV6 <i>[Link Local Address]</i> . If IPV6 is enabled on the client, the <i>[Link Local Address]</i> is always present, even if the camera has not obtained an IPV4 address from the DHCP server.
7	<i>[MAC Address]</i> Identifies the camera's unique MAC address.
8	<i>[E-Labels] heading</i> Select to view the <i>[E-Labels]</i> section.
9	<i>[SAVE] button</i> Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

[E-Label section]

Description	
1	<i>[System Information] heading</i> Select to view the <i>[System Information]</i> section.
2	<i>[Network Information] heading</i> Select to view the <i>[Network Information]</i> section.
3	Product identification Details related to product identification.
4	<i>[Product markings]</i> Logos for applicable regulatory compliance / approvals.

13.5 Camera Setting

The *[Camera Setting]* page provides settings to adjust the video feed image.

The *[Camera Setting]* page is accessed by selecting: *[CAMERA > Camera Setting]* in the *[Navigation]* pane.

Description	
1	Live view The live video from the camera is displayed.
2	Basic Image Settings The basic image settings include: <i>[Brightness]</i>, <i>[Contrast]</i>, <i>[Sharpness]</i>, <i>[Saturation]</i>, and <i>[Hue]</i>. Use the slider controls to adjust the individual settings. The default values are 128 and can be adjusted from 0 to 255.
3	<i>[Day/Night]</i> drop down <i>[AUTO]</i> is the default value which will automatically switch between day and night mode based on the thresholds set in the <i>[D to N Level]</i> and <i>[N to D Level]</i> settings. The <i>[Day/Night]</i> settings can also be set to <i>[COLOR]</i> day mode or <i>[B/W]</i> infrared night mode. When set to <i>[COLOR]</i> or <i>[B/W]</i> the camera will not switch modes automatically when lighting conditions change.
4	<i>[D to N Level]</i> slider Sets the light level threshold at which the camera automatically switches from <i>[COLOR]</i> day mode to <i>[B/W]</i> infrared night mode. • A lower value switches to night mode sooner. • A higher value remains in day mode longer.
5	<i>[N to D Level]</i> slider Sets the light level threshold at which the camera automatically switches back from <i>[B/W]</i> infrared night mode to <i>[COLOR]</i> day mode. • A lower value: returns to day mode sooner. • A higher value: requires more ambient light before returning to day mode.
6	<i>[White Balance]</i> The <i>[White Balance]</i> is set to <i>[ATW]</i> Auto Tracking White and cannot be changed.

Description	
7	<i>[HDR]</i> drop down The <i>[HDR]</i> High Dynamic Range setting improves visibility in scenes with significant variations in brightness by enhancing detail in both dark and bright areas of the image. Higher settings apply a stronger enhancement effect. The available options are: • <i>[OFF]</i> — Standard image processing. • <i>[LOW]</i> — Applies a small amount of dynamic range enhancement. • <i>[MIDDLE]</i> — Applies a moderate level of enhancement suitable for most high contrast scenes. • <i>[HIGH]</i> — Maximizes dynamic range enhancement, improving visibility in challenging lighting conditions with bright and dark areas in the same scene.
8	<i>[D-WDR]</i> drop down The <i>[D-WDR]</i> Digital Wide Dynamic Range setting digitally brightens dark areas and reduces overexposed areas to improve visibility in high-contrast scenes. The available options are: • <i>[OFF]</i> — <i>[D-WDR]</i> is disabled. • <i>[LOW]</i> — Applies a small amount of dynamic range enhancement. • <i>[MIDDLE]</i> — Applies a moderate level of enhancement suitable for most high contrast scenes. • <i>[HIGH]</i> — Maximizes dynamic range enhancement, improving visibility in challenging lighting conditions with bright and dark areas in the same scene. • <i>[AUTO]</i> — The camera automatically adjust the level of enhancement based on the current scene.

Description	
9	<i>[DSS]</i> drop down The <i>[DSS]</i> Digital Slow Shutter setting increases the camera's exposure time in low-light conditions to produce a brighter image. Higher settings provide greater low-light sensitivity but may increase motion blur when objects or the camera are moving. The available options are: • <i>[OFF]</i> — DSS is disabled. • <i>[x2]</i> — Doubles the exposure time to improves low-light performance. • <i>[x4]</i> — Quadruples exposure time. • <i>[x6]</i> — Six times normal exposure. • <i>[x8]</i> — Maximum exposure, providing the brightest image in extremely low-light conditions.
10	<i>[3DNR]</i> drop down The <i>[3DNR]</i> 3-Dimensional Noise Reduction setting reduces image noise by analyzing differences between consecutive video frames. The available options are: • <i>[OFF]</i> — <i>[3DNR]</i> is disabled. • <i>[ON]</i> — <i>[3DNR]</i> is enabled. This setting can improve image quality in low-light, reduce video bitrate and storage requirements.
11	<i>[Flip/Mirror]</i> drop down The <i>[Flip/Mirror]</i> setting changes the orientation of the video image to suit different mounting positions and viewing requirements. The available options are: • <i>[OFF]</i> — Normal image orientation. • <i>[MIRROR]</i> — Flips the image horizontally (left-to-right). • <i>[V-FLIP]</i> — Flips the image vertically (top-to-bottom). • <i>[ROTATE]</i> — Rotates the image 180°

Description	
12	<i>[2DNR]</i> drop down The <i>[2DNR]</i> 2-Dimensional Noise Reduction setting reduces image noise by analyzing image noise within a single frame. The available options are: • <i>[OFF]</i> — <i>[2DNR]</i> is disabled. • <i>[ON]</i> — <i>[2DNR]</i> is enabled.
13	<i>[Smart IR]</i> drop down The <i>[Smart IR]</i> setting automatically adjusts infrared LED brightness to prevent close objects from appearing overexposed at night. Higher levels provide stronger IR compensation. This setting helps maintain consistent image brightness at varying distances. The available options are: • <i>[OFF]</i> — disabled. • <i>[LEVEL 1]</i> to <i>[LEVEL 16]</i> — <i>[LEVEL 9]</i> is the default value.
14	<i>[Anti Flicker]</i> drop down The <i>[Anti Flicker]</i> setting reduces image flicker caused by mains-powered lighting. If flickering is experienced select the relevant setting for your region. The available options are: • <i>[OFF]</i> — disabled. • <i>[50 Hz]</i> — 50 Hz regions include: UK, Europe, and most of Asia. • <i>[60 Hz]</i> — 60 Hz regions include: North America and some other countries.

Description

- 15** *[Shutter Speed]* drop down
The *[Shutter Speed]* setting controls how long the camera's image sensor is exposed to light. Faster shutter speeds reduce motion blur but require more light. Slower shutter speeds increase brightness but may introduce motion blur. *[AUTO]* allows the camera to select an appropriate shutter speed automatically.
The available options are:

- *[AUTO]* — This is the default option and allows the camera to automatically decide the appropriate shutter speed.
- *[1/30]*, *[1/60]*, *[1/100]*, *[1/120]*, *[1/240]*, *[1/480]*, *[1/1000]*, *[1/2000]*, *[1/5000]*, and *[1/10000]*.

The manual shutter speed selection specifies the amount of time each video frame is exposed to light. For example: the *[1/30]* setting will expose each video frame to light for one-thirtieth of a second.

- 16** *[Factory Reset]* button
Selecting the *[Factory Reset]* button will reset the *[Camera settings]* to their factory default values.

13.6 Stream Format

The *[Stream Format]* page provides settings to adjust the camera's video streams.

The *[Stream Format]* page is accessed by selecting: *[CAMERA > Stream Format]* in the *[Navigation]* pane.

The *[Stream Format]* page includes the following expandable sections:

- *[1st Stream Setting]*
- *[2nd Stream Setting]*
- *[3rd Stream Setting]*

1st Stream Setting

CAMERA > Streaming Format

▼ CAMERA

Camera Setting
Stream Format

▶ EVENT

▶ USER

▶ NETWORK

▶ SYSTEM

■ LIVE VIEW

■ LOGOUT

▼ 1st Stream Setting

Codec: H.264

Resolution: 1280x720

Frame rate: 25

G.O.P: 25

Bitrate mode: VBR

Bitrate: Low Normal High 4000000 bps

▶ 2nd Stream Setting

▶ 3rd Stream Setting

SAVE

Description	
1	<i>[Codec]</i> drop down The <i>[Codec]</i> setting determines the video compression used for the stream. The available options are: • <i>[H.264]</i> — Provides efficient compression suitable for most applications (Default option). • <i>[MJPEG]</i> — Encodes each video frame as a separate jpeg image. suitable for a wider range of legacy devices and software. Changing the <i>[Codec]</i> setting to <i>[MJPEG]</i> will change the available settings and options. Refer to the <i>[3rd stream settings]</i> for the available <i>[MJPEG]</i> stream settings.
2	<i>[Resolution]</i> drop down The <i>[Resolution]</i> setting specifies the size of the image in pixels. Higher resolutions provide more image detail but requires more bandwidth and processing resources. The available options are: • <i>[1920 x 1080]</i> — Full HD resolution. This is the highest level of image detail available for this stream. • <i>[1280 x 720]</i> — HD resolution (Default option). • <i>[800 x 448]</i> — Enhanced standard definition. • <i>[640 x 360]</i> — Low bandwidth widescreen resolution. • <i>[352 x 288]</i> — Minimum bandwidth resolution for basic monitoring.
3	<i>[Frame rate]</i> drop down The <i>[Frame rate]</i> setting specifies the number of video frames transmitted each second. Higher frame rates provide smoother motion but require more bandwidth. The available options are: • <i>[1]</i> to <i>[30]</i> (Default is <i>[25]</i>)

Description	
4	<i>[G.O.P.]</i> drop down The Group Of Pictures <i>[G.O.P.]</i> setting specifies the interval between full reference frames (I-frames) within the video stream. Lower values increase image quality during motion and improve seek performance but require more bandwidth. Higher values reduce bandwidth usage but can make compression artefacts more noticeable during movement. The available options are: • <i>[1]</i> to <i>[30]</i> (Default is <i>[25]</i>)
5	<i>[Bitrate mode]</i> drop down The <i>[Bitrate mode]</i> setting specifies how the camera controls the amount of data used by the video stream. The available options are: • <i>[VBR]</i> — Variable Bit Rate varies bandwidth usage according to scene complexity and movement. Typically provides the best balance of image quality and bandwidth efficiency (default option). • <i>[CBR]</i> — Constant Bit Rate maintains a fixed bandwidth usage regardless of scene content.
6	<i>[Bitrate]</i> slider The <i>[Bitrate]</i> setting specifies the maximum amount of data used by the video stream. Lower bitrates reduce bandwidth usage and file sizes. Higher bitrates improve image quality, particularly in scenes with significant movement or detail. • <i>[32000 bps]</i> to <i>[12300000 bps]</i> (Default is <i>[4000000 bps]</i>).
7	<i>[2nd Stream Setting]</i> heading Select to expand the <i>[2nd Stream Setting]</i> section.
8	<i>[3rd Stream Setting]</i> heading Select to expand the <i>[3rd Stream Setting]</i> section.
9	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

2nd Stream Setting

Description

- 1 *[1st Stream Setting]* heading
Select to expand the *[1st Stream Setting]* section.
- 2 *[Codec]* drop down
The *[Codec]* setting determines the video compression used for the stream. The available options are:
 - *[H.264]* — Provides efficient compression suitable for most applications (Default option).
 - *[MJPEG]* — Encodes each video frame as a separate jpeg image. suitable for a wider range of legacy devices and software.

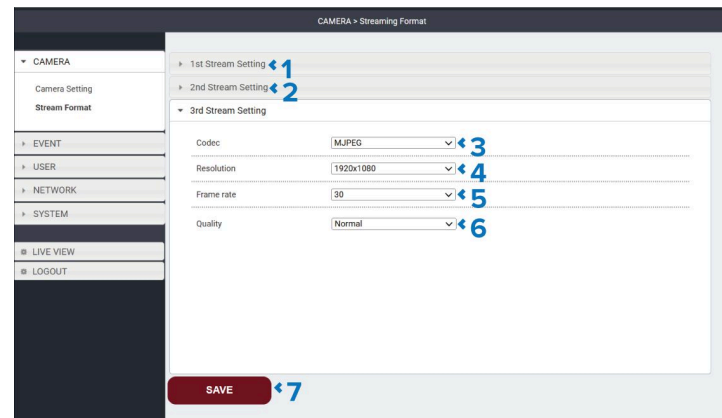
Changing the *[Codec]* setting to *[MJPEG]* will change the available settings and options. Refer to the *[3rd stream settings]* for the available *[MJPEG]* stream settings.

Description

- 3 *[Resolution]* drop down
The *[Resolution]* setting specifies the size of the image in pixels. Higher resolutions provide more image detail but requires more bandwidth and processing resources. The available options are:
 - *[800 x 448]* — Enhanced standard definition. This is the highest level of image detail available for this stream.
 - *[640 x 360]* — Low bandwidth widescreen resolution (Default option).
 - *[352 x 288]* — Minimum bandwidth resolution for basic monitoring.
- 4 *[Frame rate]* drop down
The *[Frame rate]* setting specifies the number of video frames transmitted each second. Higher frame rates provide smoother motion but require more bandwidth. The available options are:
 - *[1]* to *[30]* (Default is *[25]*)
- 5 *[G.O.P.]* drop down
The Group Of Pictures *[G.O.P.]* setting specifies the interval between full reference frames (I-frames) within the video stream. Lower values increase image quality during motion and improve seek performance but require more bandwidth. Higher values reduce bandwidth usage but can make compression artefacts more noticeable during movement. The available options are:
 - *[1]* to *[30]* (Default is *[25]*)

Description	
6	<i>[Bitrate mode]</i> drop down The <i>[Bitrate mode]</i> setting specifies how the camera controls the amount of data used by the video stream. The available options are: • <i>[VBR]</i> — Variable Bit Rate varies bandwidth usage according to scene complexity and movement. Typically provides the best balance of image quality and bandwidth efficiency (default option) . • <i>[CBR]</i> —Constant Bit Rate maintains a fixed bandwidth usage regardless of scene content
7	<i>[Bitrate]</i> slider The <i>[Bitrate]</i> setting specifies the maximum amount of data used by the video stream. Lower bitrates reduce bandwidth usage and file sizes. Higher bitrates improve image quality, particularly in scenes with significant movement or detail. • <i>[32000 bps]</i> to <i>[12300000 bps]</i> Default is <i>[1200000 bps]</i>.
8	<i>[3rd Stream Setting]</i> heading Select to expand the <i>[3rd Stream Setting]</i> section.
9	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

3rd Stream Setting



Description	
1	<i>[1st Stream Setting]</i> heading Select to expand the <i>[1st Stream Setting]</i> section.
2	<i>[2nd Stream Setting]</i> heading Select to expand the <i>[2nd Stream Setting]</i> section.
3	<i>[Codec]</i> drop down The <i>[Codec]</i> setting for the 3rd stream is <i>[MJPEG]</i> and cannot be changed.
4	<i>[Resolution]</i> drop down The <i>[Resolution]</i> setting specifies the size of the image in pixels. Higher resolutions provide more image detail but requires more bandwidth and processing resources. The available options are: • <i>[1920 x 1080]</i> — Full HD resolution This is the highest level of image detail available for this stream (Default option). • <i>[1280 x 720]</i> — HD resolution. • <i>[800 x 448]</i> — Enhanced standard definition. • <i>[640 x 360]</i> — Low bandwidth widescreen resolution.

Description

- *[352 x 288]*— Minimum bandwidth resolution for basic monitoring.

5 *[Frame rate]* drop down
The *[Frame rate]* setting specifies the number of video frames transmitted each second. Higher frame rates provide smoother motion but require more bandwidth. The available options are:

- *[1]* to *[30]* (Default is *[30]*)

6 *[Quality]* drop down
When using the *[MJPEG]* *[Codec]* the *[Quality]* setting replaces the *[G.O.P.]*, *[Bitrate mode]*, and *[Bitrate]* settings. The *[Quality]* setting specifies the quality for the *[MJPEG]* video streams. The following options are available:

- *[Low]*— Provides a lower image quality with reduced bandwidth and storage requirements.
- *[Normal]*— Provides a balance between image quality and bandwidth usage (Default option).
- *[High]*— Provides the best image quality with increased bandwidth and storage requirements

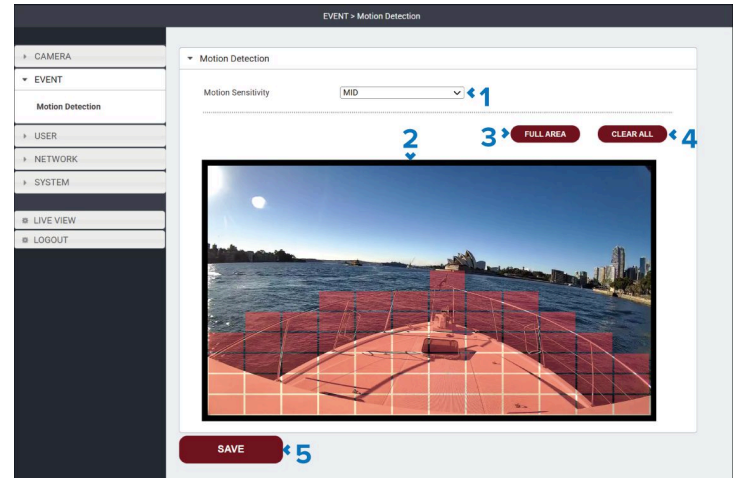
7 *[SAVE]* button
Select the *[SAVE]* button to save any changes you have made before leaving the page.

13.7 Motion Detection

The *[Motion Detection]* page is used to configure the camera's motion detection alarm.

The *[Motion Detection]* page is accessed by selecting: *[EVENT > Motion Detection]* in the *[Navigation]* pane.

The *[Motion Detection]* feature uses a grid overlay to define the areas of the image that are monitored for motion. Red grid cells indicate active motion detection zones. Motion detected in these zones will cause an event to trigger.



Description

1 *[Motion Sensitivity]* drop down
The *[Motion Sensitivity]* settings specifies how sensitive the active zones are to motion. The higher the sensitivity settings the more sensitive active areas are to motion.

- *[LOWEST]*
- *[LOW]*
- *[MID]*
- *[HIGH]*
- *[HIGHEST]*

2 *[Live View]* pane
The Live View pane shows the live video feed from the camera and provides the grid overview used to define the active motion areas.
Red cells indicate active motion areas, clear areas indicate inactive motion areas. Selecting a cell or a clear area either adds or removes active cells.

3 *[FULL AREA]* button
Select the *[FULL AREA]* button to mark the whole image as active for motion detection.

Description	
4	<i>[CLEAR ALL]</i> button Select the <i>[CLEAR ALL]</i> button to mark the whole image as inactive for motion detection.
5	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

13.8 Password Change

The password used to log in to the user interface can be changed.

The *[Password Change]* page is accessed by selecting: *[USER > Password Change]* in the *[Navigation]* pane.

The *[Password Change]* page is used to change the user interface log in password.

Description	
1	<i>[Old Password]</i> field Enter the existing password for the use interface.
2	<i>[New Password]</i> field Enter the new password for the use interface.
3	<i>[Confirm New Password]</i> field Enter the new password again to confirm.
4	<i>[Change]</i> button Select the <i>[Change]</i> button to save the new password.
5	<i>[Reset]</i> button Select the <i>[Reset]</i> button to reset the password to the factory default password, found on the product label.

13.9 User Account

Additional users accounts can be created, each with a unique *[ID]* and *[Password]*. for accessing the user interface.

The *[User Account]* page is accessed by selecting: *[USER > User Account]* in the *[Navigation]* pane.

Description	
1	<i>[ID]</i> field Enter the username <i>[ID]</i> for the new user.
2	<i>[PASSWORD]</i> field Enter the password the user will use to log in to the camera's user interface.
3	<i>[CONFIRM PASSWORD]</i> field Enter the password again to confirm.
4	<i>[ADD/MODIFY]</i> button Select the <i>[ADD/MODIFY]</i> button to add the user account to the <i>[User List]</i> .
5	<i>[User List]</i> A list of all users that can currently access the camera's user interface.
6	<i>[DELETE]</i> button Select the <i>[DELETE]</i> button to remove the currently selected user account.

Note:
The admin user cannot be deleted

13.10 Network Setting

The *[Network Setting]* page is used to view and configure the camera's *[IPv4]* and *[IPv6]* addresses.

The *[Network Setting]* page is accessed by selecting: *[NETWORK > Network Setting]* in the *[Navigation]* pane.

Different settings are available depending on the *[Version]* selected.

Version: IPv4

Description

- 1** *[Version]* drop down
Use the *[Version]* drop down to switch between:
 - *[IPv4]*
 - *[IPv6]*Changing the *[Version]* will change the available settings.
- 2** *[IP Type]* radio button
The majority of systems use DHCP to obtain IP addresses automatically. The available options are:
 - *[Static]* — Camera's IP address is entered manually.
 - *[DHCP]* — Camera's IP address is assigned via DHCP (Default option).
- 3** *[IP Address]* field
When *[IP Type]* is set to *[Static]* you can enter an *[IP Address]* for the camera.

Description

- 4** *[Subnet Mask]* field
When *[IP Type]* is set to *[Static]* you can enter the network's *[Subnet Mask]*.
- 5** *[Default Gateway]* field
When *[IP Type]* is set to *[Static]* you can enter the IP address for the network's *[Default Gateway]*.
- 6** *[SAVE]* button
Select the *[SAVE]* button to save any changes you have made before leaving the page.

Version: IPv6

Description

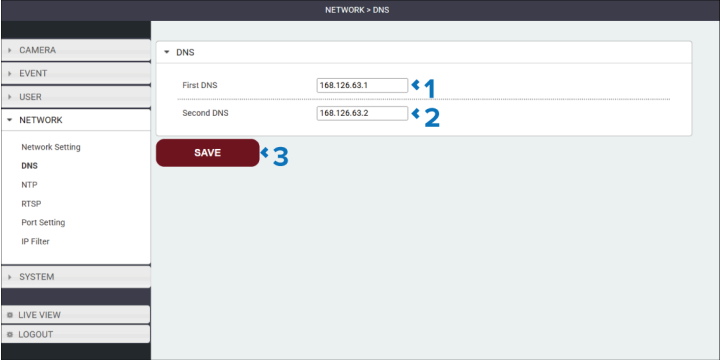
- 1** *[Version]* drop down
Use the Version drop down to switch between:
 - *[IPv4]*
 - *[IPv6]*
- 2** *[Link Local Address]*
Identifies the camera's IPV6 *[Link Local Address]*. If IPv6 is enabled on the client, the *[Link Local Address]* is always present, even if the camera has not obtained an IPv4 address from the DHCP server.
- 3** *[IP Address]* field
Enter an *[IPv6]* address for the camera.

Description	
4	[Default Gateway] field Enter the [IPv6] address for the [Default Gateway].
5	[SAVE] button Select the [SAVE] button to save any changes you have made before leaving the page.

13.11 DNS

The [DNS] page is used to view and configure the DNS servers the camera uses.

The [DNS] page is accessed by selecting: [NETWORK > DNS] in the [Navigation] pane.

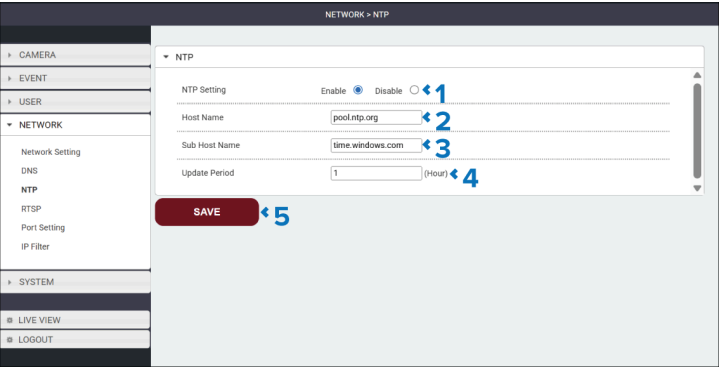


Description	
1	[First DNS] field View or modify the primary DNS server the camera will use.
2	[Second DNS] View or modify the secondary DNS server the camera will use. The [Second DNS] will be used if the primary server cannot be reached.
3	[SAVE] button Select the [SAVE] button to save any changes you have made before leaving the page.

13.12 NTP

If enabled the [NTP] page is used to view and configure the Network Time Protocol (NTP) that the camera will use to automatically obtain date and time.

The [NTP] page is accessed by selecting: [NETWORK > NTP] in the [Navigation] pane.



Description	
1	[NTP Setting] radio button [Enable] or [Disable] the use of an [NTP] server.
2	[Host Name] Enter the address for the NTP server. For example: "pool.ntp.org".
3	[Sub Host Name] Enter the sub host name for the NTP server. For example: "uk.pool.ntp.org".
4	[Update Period] Specify the update period in hours.
5	[SAVE] button Select the [SAVE] button to save any changes you have made before leaving the page.

13.13 RTSP

The *[RTSP]* page is used to view and configure the camera's *[RTSP]* streams.

The *[RTSP]* page is accessed by selecting: *[NETWORK > RTSP]* in the *[Navigation]* pane.

Description

- 1 *[RTSP Port]* field
Specifies the TCP / UDP port used for Real Time Streaming Protocol (RTSP) communications. The default port is 554.
- 2 *[Keep-Alive (UDP)]* field
Specifies how often (in minutes) the camera checks whether a UDP streaming connection is still active.
- 3 *[Main Stream]*
This is for the primary *[1st stream]*.
- 4 *[Sub Stream 1]*
This is for the secondary *[2nd stream]*.
- 5 *[Sub Stream 2]*
This is for the third camera stream *[3rd stream]*.
- 6 *[Metadata]*
This stream contains only camera metadata.
- 7 *[IP]* fields
Specifies the multicast group IP address used for each stream. To receive the streams all devices must be able to access the specified multicast address.

Description

- 8 *[Port]* field
Specifies the UDP port used to transmit the multicast stream. Each stream must use a unique port number.
- 9 *[TTL]* field
The Time To Live *[TTL]* setting specifies the maximum number of network router hops that multicast packets can traverse before being discarded.
The Default value is 64. Lower values will restrict the stream to nearby network segments. Higher values allow the stream to travel across more network devices.
- 10 *[Auto Start]* tick box
Determines whether multicast streaming starts automatically when the camera powers on. The available options are:
 - Ticked (Enabled) — multicast stream starts automatically.
 - Unticked (Disabled) — multicast stream starts only when requested by a client or management system.
- 11 *[SAVE]* button
Select the *[SAVE]* button to save any changes you have made before leaving the page.

13.14 Port Setting

The *[Port Setting]* page is used to view and configure the ports the camera will use for streaming and control.

The *[Port Setting]* page is accessed by selecting: *[NETWORK > Port Setting]* in the *[Navigation]* pane.

Description

- 1 *[AV Stream Port]* field
Specifies the network port used to transmit the camera's audio and video stream to compatible client devices.
- 2 *[Event Port]* field
Specifies the network port used to transmit event notifications generated by the camera, such as motion detection events.
- 3 *[Upgrade Port]* field
Specifies the network port used when uploading firmware updates to the camera.
- 4 *[HTTP Port]* field
Specifies the port used for **unsecured** web browser access to the camera's user interface. The default is port 80. Using the default port the camera's user interface can be accessed from a web browser using its IP address (e.g.: <http://198.18.4.249>). If the port number is changed the port number will need to be added when accessing the user interface (e.g.: <http://198.18.4.249:66>).

Description

- 5 *[HTTPS Port]* field
Specifies the port used for **secured** web browser access to the camera's user interface. The default is port 80. Using the default port the camera's user interface can be accessed from a web browser using its IP address (e.g.: <https://198.18.4.249>). If the port number is changed the port number will need to be added when accessing the user interface (e.g.: <https://198.18.4.249:66>).
- 6 *[SAVE]* button
Select the *[SAVE]* button to save any changes you have made before leaving the page.

13.15 IP Filter

The *[IP Filter]* page enables you to allow or block access to specific IP addresses or ranges of IP addresses.

The *[IP Filter]* page is accessed by selecting: *[NETWORK > IP Filter]* in the *[Navigation]* pane.

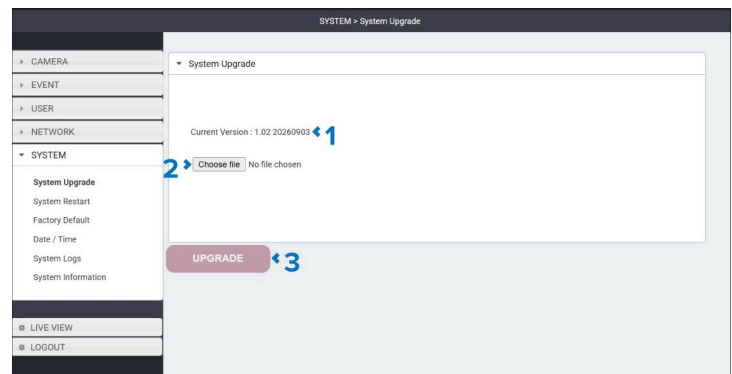
	Description
1	<i>[Enable]</i> tick box Enables or disables IP address filtering. The available options are: • Ticked (Enabled) — Access to the camera is controlled according to the configured <i>[IP Filter]</i> rules. • Unticked (Disabled) — IP filtering is not applied, any device with network access can attempt to connect to the camera.
2	<i>[All Accept / All Drop]</i> radio button Specifies the default action applied to IP addresses that do not match a filter rule. The available options are: • <i>[All Accept]</i> — Connections are allowed unless a rule specifically blocks them. • <i>[All Drop]</i> — Connections are blocked unless a rule specifically allows them.
3	<i>[Policy]</i> radio button Specifies the action applied when adding a new filter rule. The available options are: • <i>[Accept]</i> — Connections are allowed from the specified IP address or IP address range. • <i>[Drop]</i> — Connections are blocked from the specified IP address or IP address range.
4	<i>[Rule]</i> field and drop down Specifies the IP address or IP address range to which the policy will be applied Enter a single IP address in the field, or if adding a range enter the first IP address in the range and then select the end IP addresses final octet from the drop down (e.g.: 198.18.4.10 — 20 will apply to IP addresses ending 10 through 20).
5	<i>[Add]</i> button Select the <i>[Add]</i> button to add the policy to the IP filter list.
6	<i>[Delete]</i> button Select the <i>[Delete]</i> button to remove the selected rule from the IP filter list.

	Description
7	<i>[Clear]</i> button Select the <i>[Clear]</i> button to remove all rules from the IP filter list.
8	<i>[IP Count]</i> field Displays the number of IP addresses currently being filtered out of the total number that can be filtered. Up to 100 IP addresses can be filtered.
9	<i>[Rule list]</i> A list of all current filtering rules.
10	<i>[Accept the IP address of this computer]</i> tick box Automatically permits access from the computer currently being used to access the camera. This option prevents the current connection from being blocked when restrictive IP filtering rules are applied.
11	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

13.16 System Upgrade

The *[System Upgrade]* page can be used to check the camera's current firmware version and perform firmware upgrades.

The *[System Upgrade]* page is accessed by selecting: *[SYSTEM > System Upgrade]* in the *[Navigation]* pane.



Description

- 1 *[Current version]*
Identifies the camera's current firmware version.
- 2 *[Choose file]* button
Select the *[Choose file]* button to specify a new firmware file to use for the Upgrade.
Once select the new firmware version is displayed next to the button.
- 3 *[UPGRADE]* button
Select the *[UPGRADE]* button to commence the firmware upgrade.

Caution: Installing software updates

- The software update process is carried out at your own risk. Before initiating the update process ensure you have backed up any important files.
- Ensure that the product(s) has a reliable power supply and that the update process is not interrupted.
- Damage caused by an incomplete update is not covered by Raymarine warranty.
- By downloading the software update package, you agree to these terms.

13.17 System Restart

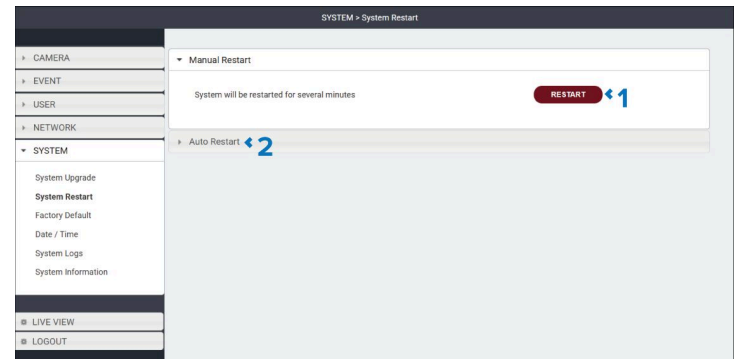
The *[System Restart]* page is used to manually restart the camera or configure the camera to automatically restart at a specified time on specified days..

The *[System Restart]* page is accessed by selecting: *[SYSTEM > System Restart]* in the *[Navigation]* pane.

The *[System Restart]* page includes the following expandable sections:

- *[Manual Restart]*
- *[Auto Restart]*

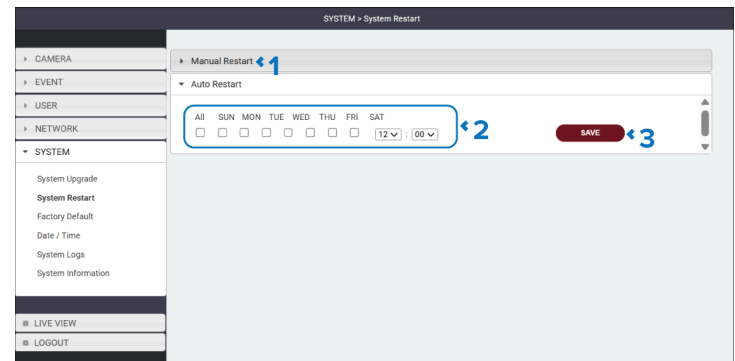
Manual Restart



Description

- 1 *[RESTART]* button
Select the *[RESTART]* button to reboot the camera.
- 2 *[Auto restart]* heading
Select the *[Auto restart]* heading to display the automatic restart options

Auto Restart

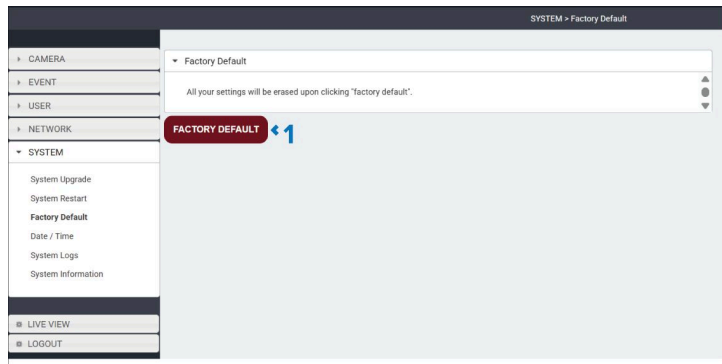


Description	
1	<i>[Manual Restart]</i> heading Select the <i>[Manual Restart]</i> heading to view the <i>[RESTART]</i> button.
2	<i>[Days and time]</i> tick boxes and drop downs Specify the days and time of day the camera will automatically restart.
3	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

13.18 Factory Default

The *[Factory Default]* page is used to reset the camera to its factory default settings.

The *[Factory Default]* page is accessed by selecting: *[SYSTEM > Factory Default]* in the *[Navigation]* pane.

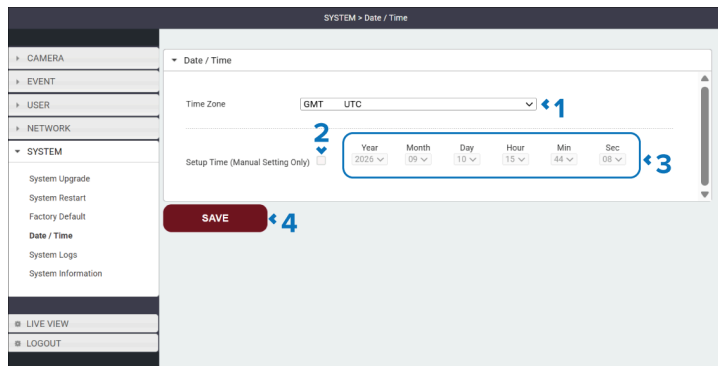


Description	
1	<i>[FACTORY DEFAULT]</i> button Select the <i>[FACTORY DEFAULT]</i> button to erase all customized settings and reset the camera back to its factory default settings.

13.19 Date / Time

The *[Date / Time]* page is used to specify the camera's *[Time Zone]*. If an NTP server has not been configured, this page can also be used to manually set the camera's date and time.

The *[Date / Time]* page is accessed by selecting: *[SYSTEM > Date / Time]* in the *[Navigation]* pane.

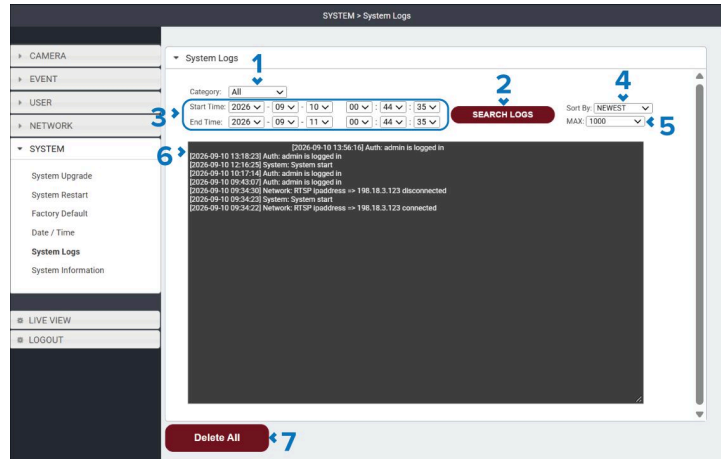


Description	
1	<i>[Time Zone]</i> drop down Specifies the local time zone used by the camera. Select the time zone corresponding to the camera's location to ensure event logs display the correct local date and time.
2	<i>[Setup Time (Manual Setting Only)]</i> tick box When ticked the camera's date and time can be configured manually using the date and time drop down boxes.
3	<i>[Time and date]</i> drop downs Select the relevant values from the drop down boxes to configure the camera's date and time.
4	<i>[SAVE]</i> button Select the <i>[SAVE]</i> button to save any changes you have made before leaving the page.

13.20 System Logs

The *[System Logs]* page is used to view, search and delete system logs.

The *[System Logs]* page is accessed by selecting: *[SYSTEM > System Logs]* in the *[Navigation]* pane.



Description

- 1 *[Category]* drop down
Search for logs of the specified category. The available options are:
 - *[All]* — All categories will be searched for
 - *[System]*
 - *[Auth]*
 - *[Network]*
 - *[Stream]*
 - *[Codec]*
- 2 *[SEARCH LOGS]* button
Select the *[SEARCH LOGS]* button to perform a search based on the specified criteria.

Description

- 3 *[Start Time / End Time]* drop downs
Enter the start date and time and the end date and time in the relevant drop down boxes to search for logs created within the specified dates and times
- 4 *[Sort By]* drop down
Specify whether the results are sorted by *[NEWEST]* or *[OLDEST]* dated logs.
- 5 *[MAX]* drop down
Specify the maximum number of logs to be retrieved.
- 6 *[Logs entries]* list
Displays all system log events or log events within the search criteria.
- 7 *[Delete All]* button
Select the *[Delete All]* button to erase all system logs.

CHAPTER 14: AUGMENTED REALITY

CHAPTER CONTENTS

- [14.1 Augmented Reality \(AR\) overview \(page 78\)](#)
- [14.2 Example Augmented Reality system overview \(page 78\)](#)

14.1 Augmented Reality (AR) overview

ClearCruise Augmented Reality uses data from the display's Chart app and displays this data in realtime as an overlay in the Video app.



The *[Augmented Reality]* feature places layers of digital information directly over the top of the Video app's video feed. Data from the Chart app is used to generate informative text and images (flags) on the Video app. When calibrated correctly, ClearCruise™ Augmented Reality accurately overlays automatically-updating flags on the Video app so they overlap real-life objects.

The Augmented Reality feature requires an Axiom-Series or Axiom 2-Series chartplotter, an AR200 sensor, and a compatible camera. For a list of compatible cameras, refer to: [p.102 — ClearCruise compatible cameras](#)

Note:

- The Augmented Reality feature requires correct camera calibration for accurate image overlay.
- The Augmented Reality feature serves as an aid to navigation and situational awareness only, and should not be solely relied on for precise navigation. **Always maintain a visual watch.**

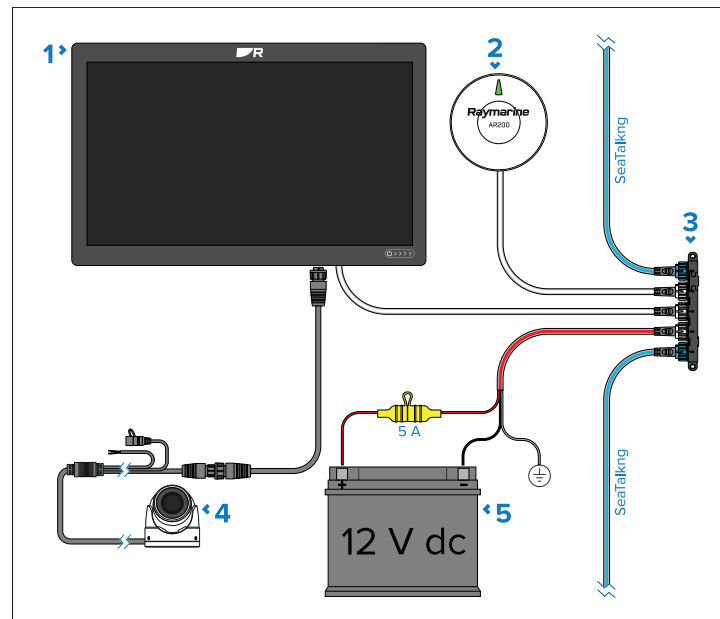
Important:

Rear-facing cameras with a flipped or mirrored image may not place Augmented Reality content as accurately as a forward-facing camera.

14.2 Example Augmented Reality system overview

The camera can be used in conjunction with an AR200 sensor and a compatible chartplotter to enable ClearCruise® Augmented Reality features.

The following system example shows the components and connections required to enable ClearCruise® Augmented Reality on your system.



Description	
1	Compatible chartplotter. In this example the chartplotter is also the Power Sourcing Equipment (PSE) providing Power over Ethernet (PoE) to the camera (Axiom XL currently illustrated).
2	AR200 sensor (product number: E70537), supplied with the T70603 / T70604 system packs and available separately.
3	SeaTalk NG backbone.
4	CAM400.
5	12 V dc power supply providing power to the SeaTalk NG backbone.

Note:

ClearCruise® Augmented Reality is NOT available via the CAM400's Web browser user interface and can only be accessed through the chartplotter's Video app. For more information on ClearCruise® Augmented Reality, refer to one of the following documents:

- Axiom 2 LightHouse 5 Operation Instructions (**81432**), or;
- LightHouse 4 Operation Instructions (**81406**).

Links to the latest version of these documents can be found under the following section: [2.2 Product documentation](#)

CHAPTER 15: MAINTENANCE

CHAPTER CONTENTS

- 15.1 Routine checks (page 81)
- 15.2 Unit cleaning instructions (page 81)

15.1 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.

15.2 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 16: TROUBLESHOOTING

CHAPTER CONTENTS

- [16.1 Troubleshooting \(page 83\)](#)

16.1 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 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 and servicing* section of this manual for useful links and contact details.

PoE power connection troubleshooting

Information to assist you in troubleshooting power connection issues.

Before troubleshooting problems with your Power over Ethernet power connection, ensure that you have read and followed the power connection guidance provided and restarted the device. If you continue to experience issues, follow the guidance provided below.

Troubleshooting issue	User action(s)
Product does not switch on, or keeps switching off:	Blown fuse / tripped breaker: • Check the condition of your relevant fuses, breakers and connections, and replace if necessary. • If the fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE. Poor / damaged / insecure power supply cable / connections: • Check to ensure that all connections (e.g. between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE) are secure, clean and free from corrosion. Replace if necessary.

Troubleshooting issue	User action(s)
	• Ensure that all cable connectors are correctly orientated, fully inserted and in the locked position. • With the unit switched on, try flexing each cable connector to see if this causes the unit to restart or lose power. Replace if necessary. • With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary. Incorrect power connection: • Check to ensure that connections between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE are correct. Insufficient power source: • Any device supplying Power over Ethernet to the CAM400 must output a supply voltage in the range of 44 V to 57 V dc.

Non-PoE power connection troubleshooting

Information to assist you in troubleshooting power connection issues.

Before troubleshooting problems with your non-Power over Ethernet power connection, ensure that you have read and followed the power connection guidance provided and restarted the device. If you continue to experience issues, follow the guidance provided below.

Troubleshooting issue	User action(s)
Product does not switch on, or keeps switching off:	Blown fuse / tripped breaker: • Check the condition of the relevant fuses, breakers and connections, and replace if necessary.

Troubleshooting issue	User action(s)
	• If the fuse keeps blowing, check for cable damage, broken connector pins or incorrect wiring. Poor / damaged / insecure power supply cable / connections: • Check the vessel's battery voltage and the condition of the battery terminals and power supply cables, ensuring that connections are secure, clean and free from corrosion. Replace if necessary. • Check the power pigtail cable and your power supply connection for signs of damage or corrosion, and replace if necessary. • With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary. Incorrect power connection: • The power supply may be wired incorrectly, ensure the installation instructions have been followed. Insufficient power source: • Check that the power supply (battery or distribution panel) is providing a minimum of 10.8 V to the unit.

IP camera troubleshooting

Troubleshooting issue	User action(s)
Camera not shown under the multifunction display network list:	IP cameras can take up to 60 seconds to appear on a network. Ensure that you have waited a sufficient amount of time before attempting the troubleshooting actions listed below. • 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 your chartplotter and camera are physically connected to the same network. • Ensure that your chartplotter is running the latest software version. • Try power cycling the camera while leaving your chartplotter powered. • Ensure that the camera's IP-network parameters have been configured correctly via the Web browser user interface.
Camera shown under the multifunction display network list, but no video is displayed:	A single CAM400 video feed can be displayed on a maximum of 10 compatible Raymarine multifunction displays at the same time (via each display's Video app). • Using the Video application on your chartplotter, cycle through the available camera feeds to see if the camera image is displayed. • Ensure that the video codec option selected in the camera's Web browser user interface is supported by your multifunction display.
Cannot find the camera's	IP cameras can take up to 60 seconds to appear on a network. Ensure that you have

Troubleshooting issue	User action(s)
IP address (PC connection):	waited a sufficient amount of time before attempting the troubleshooting actions listed below. • Ensure any VPN software installed on your PC is disabled. • Ensure that you have read and followed the guidance provided under the following section: p.54 — How to find an IP address

Augmented Reality (AR) Troubleshooting

Troubleshooting issue	User action(s)
AR options not available in Video app:	For AIS flags to be displayed, compatible AIS hardware must be operational and connected to the same network as your chartplotter. • Ensure your camera is AR compatible. • Ensure that the correct AR-compatible camera has been selected in the Video app menu. • Ensure your AR200 is correctly installed and on the same network as the chartplotter from which you are using the AR features. • Ensure that your chartplotter is running LightHouse v4.11.133 or later. • The Compass bar, AIS, Waypoint and Chart object flags can be enabled and disabled from the <i>[ClearCruise]settings</i> page: <i>[Video app > Menu > Settings > ClearCruise]</i>. Ensure relevant options are enabled.
AR flags do not appear directly above on-screen target:	Depending on the classification of the target's AIS hardware, transmitted position updates may be sent up to 3 minutes apart and therefore the flag may appear up to 3 minutes behind the actual onscreen target.

Troubleshooting issue

User action(s)

- Ensure that the horizontal FOV setting is set to the correct value. The horizontal FOV setting must be set to 53° when using AR with a CAM400.
- If your AR200 is installed in a location which includes a source of magnetic interference large enough to affect AR flag placement, you may need to re-install the AR200 in a different location.
- Reset the AR200 calibration by selecting *[Reset]* from the AR200 calibration page: *[Homescreen > Settings > Network > Data sources > Heading > Raymarine AR200 Attitude > Calibrate]*. If the problem persists, you may need to move your AR200 to a location with less magnetic interference.
- Flipping and / or reversing the camera's image via an chartplotter or the Web browser user interface will prevent augmented reality objects from appearing correctly onscreen. It is recommended instead that you attempt to rotate the camera ball by hand to the correct orientation. For further information on how to correctly orientate your camera by hand, refer to the following section: [p.35 — Adjusting the camera view](#)

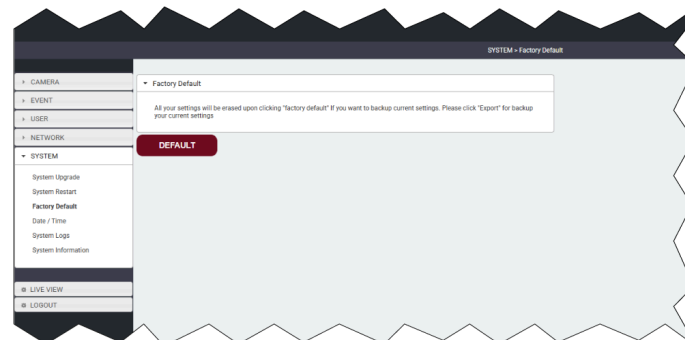
Factory reset

If you wish to restore the camera's default setting configuration, or, if you are experiencing problems with the camera which cannot be resolved using the troubleshooting advice provided, you may need to perform a factory reset.

Performing a factory reset via the user interface

To perform a factory reset via the Web browser user interface:

1. Navigate to: *[Setup > SYSTEM > Factory Default]*.



2. Select the *[FACTORY DEFAULT]* button.

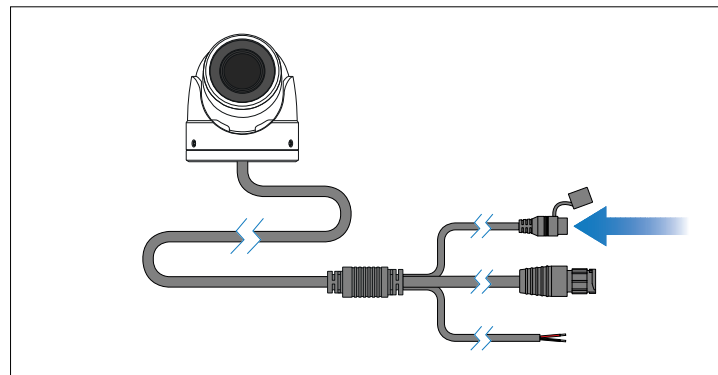
3. Once prompted, select the *[OK]* button.

For information on accessing the camera's user interface, refer to:

- [p.51 — Logging in to the user interface from a chartplotter](#), or
- [p.55 — Logging in to the user interface from a web browser](#)

Performing a factory reset using the factory reset switch

To perform a factory reset using the camera's factory reset switch:



1. While the camera powered on, press and hold the factory reset switch.

Note:

A protective cap is attached to the factory reset switch. The protective cap must be fitted when the factory reset switch is not in use.

CHAPTER 17: TECHNICAL SUPPORT

CHAPTER CONTENTS

- 17.1 Raymarine technical support and servicing (page 88)
- 17.2 Learning resources (page 89)

17.1 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.

Servicing and warranty

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

Visit the Raymarine website to **read the latest warranty policy**, and **register** your product's warranty online:

- www.bit.ly/rym-warranty

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

- Web: www.bit.ly/rym-service
- Tel: +44 (0)1329 246 932

United States (US):

- Web: www.bit.ly/rym-service
- Tel: +1 (603) 324 7900

Web support

Please visit the “Support” area of the Raymarine website for:

- **Manuals and Documents** — www.bit.ly/rym-docs
- **Technical support forum** — www.bit.ly/rym-support
- **Software updates** — www.bit.ly/rym-software

Telephone and online support

Region	Contact details
All regions	Online support: www.bit.ly/rym-support
United Kingdom (UK) and EMEA	Telephone: +44 (0)1329 246 777 Address: Marine House, Cartwright Drive, Fareham, PO15 5RJ, UK.
United States (US)	Telephone: Tel: +1 (603) 324 7900 (Toll-free: +800 539 5539) Address: 110 Lowell Road, Hudson, NH 03051, USA.
Australia and New Zealand (Raymarine subsidiary)	Telephone: +61 2 8977 0300 Address: Suite 1.01, 26 Rodborough Road, Frenchs Forest, NSW, 2086, Australia.
France (Raymarine subsidiary)	Telephone: +33 (0)1 46 49 72 30 Address: 35 avenue Michel Crépeau, 17000 La Rochelle - France.
Germany (Raymarine subsidiary)	Telephone: +49 40 237 808 0 Address: Atlantic-Haus, Zirkusweg 1, 20359 Hamburg.
Italy (Raymarine subsidiary)	Telephone: +39 02 9945 1001 Address: Via L. Manara 2, 20812 Limbiate (MB), Italy.
Spain (Authorized Raymarine distributor)	Telephone: +34 96 2965 102 Email: sat@azimut.es
Netherlands / Benelux (Authorized Raymarine distributor)	Telephone: +31 (0)26 3614 905 Address: Florijnweg 21G, 6883 JN VELP, Nederland.

Region	Contact details
Sweden (Raymarine subsidiary)	Telephone: +46 (0)317 633 670 Address: Bolshedens Industriväg 18, 427 50 Billdal, Sweden.
Finland (Raymarine subsidiary)	Telephone: +358 (0)207 619 937 Address: Suomalaistentie 1-3, 02270 Espoo, Finland.
Norway (Raymarine subsidiary)	Telephone: +47 692 64 600 Address: Årvollskogen 30, 1529 Moss, Norway.
Denmark (Raymarine subsidiary)	Telephone: +45 437 164 64 Address: Centervej 7, 4600 Køge, Denmark.
Russia (Distributor)	Telephone: Tel: +7 495 788 0508 Email: info@mikstmarine.ru

Diagnostic product information

Diagnostic product information can be viewed and exported from a Raymarine LightHouse chartplotter, for supported products networked using RayNet (Ethernet), RJ45, RJ45 (SeaTalk HS) or SeaTalk NG / NMEA 2000 cables.

Diagnostic product information includes technical data related to the connected product, such as serial numbers, network addresses, firmware version numbers, and so on. It is useful for 2 main purposes:

1. Sending detailed product information to the Raymarine product support team, in the event of a problem or fault with your product. The information can be exported to a MicroSD card, and you can then copy the file for the purposes of emailing it to the product support team. For contact details, refer to: [p.87 – Technical support](#)
2. Maintaining detailed off-boat records. This is particularly useful for vessels that have multiple Raymarine products installed.

To view or export diagnostic product information, access the *[Diagnostics]* menu. For instructions on how to access this menu, refer to the relevant *Operation Instructions* for your chartplotter.

17.2 Learning resources

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

Video tutorials

Raymarine official channel on YouTube

- <http://www.youtube.com/user/RaymarineInc>

Training courses

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

- www.bit.ly/rym-training

Technical support forum

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

- www.bit.ly/rym-support

CHAPTER 18: TECHNICAL SPECIFICATION

CHAPTER CONTENTS

- 18.1 Physical specification (page 91)
- 18.2 Power specification (page 91)
- 18.3 Environmental specification (page 91)
- 18.4 Camera specification (page 91)
- 18.5 Video specification (page 91)
- 18.6 Conformance specification (page 92)
- 18.7 Product markings (page 92)

18.1 Physical specification

Specification	
Dimensions:	Max height: 80.80 mm (3.18 in.), Width: 64.50 mm (2.54 in.) For further dimensions, refer to: p.24 — Product dimensions
Product weight:	0.390 kg (0.860 lbs)

18.2 Power specification

Specification	
Nominal supply voltage:	12 V dc
Operating voltage range:	10.8 V to 15.6 V dc
Power consumption:	2.1 W Nominal @ 12 V dc / 5 W maximum (LEDs ON)
Current:	<420mA (Maximum) @ 12 V dc
Power over Ethernet:	• PoE Class 2 (6.49 W Max) • IEEE 802.af (Type 1) Class 2
Inline fuse rating:	2A
Thermal breaker rating:	3A

18.3 Environmental specification

Specification	
Operating temperature:	– 20° C (– 4° F) to + 60° C (140° F)
Storage temperature:	– 30° C (– 22° F) to + 70° C (158° F)
Relative humidity:	up to 95% @ 60° C (140 °F)
Waterproof rating:	IPx6 / IPx7

18.4 Camera specification

Specification	
Sensor / DSP:	1/2.8" CMOS image sensor
Scanning system:	Progressive scan
Total pixels:	1920 (H) x 1080 (V) (2.07 million pixels)
Illumination:	850 nm Infrared - 10 m (32.8 ft.) range
Lens / Field of View:	2.58 mm fixed lens (129.4° HFOV / 69.9° VFOV / 153.6° DFOV).
Day / Night:	True day / night operation with mechanical IR cutout filter
Mirroring:	Horizontal & Vertical — configured via the Web browser user interface

18.5 Video specification

Specification	
Compression:	H.264 / MJPEG
Resolutions:	1920 x 1080 maximum
Video Streaming:	Triple stream: • Stream 1: H.264 / MJPEG • Stream 2: H.264 / MJPEG • Stream 3: MJPEG
Frame Rate:	• Adjustable between 1 to 30 fps • Maximum: 30 fps
Bit Rate:	• Variable Bit Rate (VBR): 256 Kbit/sec to 12.3 Mbit/sec • Constant Bit Rate (CBR): 32 Kbit/sec to 12.3 Mbit/sec
Bit Rate Control:	H.264 (CBR / VBR), MJPEG (Quality Control)

18.6 Conformance specification

This product is compliant or approved to the following standards or by the listed entities.

Specification	
Environmental:	• EN 60945: 2002 including Corrigendum 1 (2008), Section 8 Exposed • EN IEC 60529: 1989 + A1: 1999 + A2: 2013 for IPx6 & IPx7
EMC:	• Directive 2014/30/EU and UK EMC Regulations 2016 SI 2016 No 1091. • EN 60945: 2002 including Corrigendum 1 (2008)
RoHS:	• Directive 2011/65/EU and RoHS Regulations 2012 (as amended): Great Britain • EN IEC 6300: 2018

18.7 Product markings

This product includes the following approval / compliance markings and/or IDs.

Markings			
UKCA	Australia & New Zealand RCM	CE	WEEE Directive

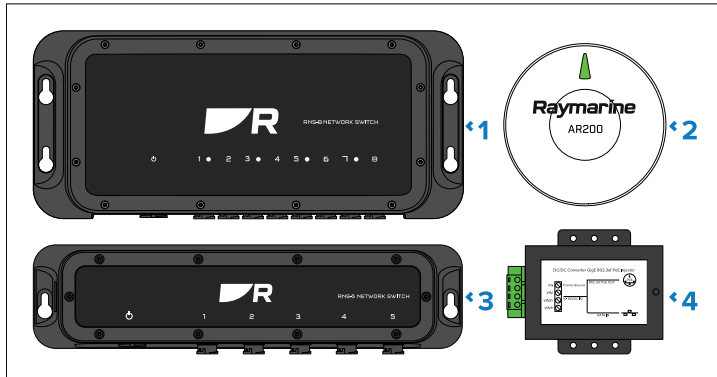
CHAPTER 19: SPARES AND ACCESSORIES

CHAPTER CONTENTS

- [19.1 Spares and accessories \(page 94\)](#)
- [19.2 RayNet to RayNet cables and connectors \(page 95\)](#)
- [19.3 RayNet to RJ45, and RJ45 \(SeaTalk HS\) adapter cables \(page 96\)](#)

19.1 Spares and accessories

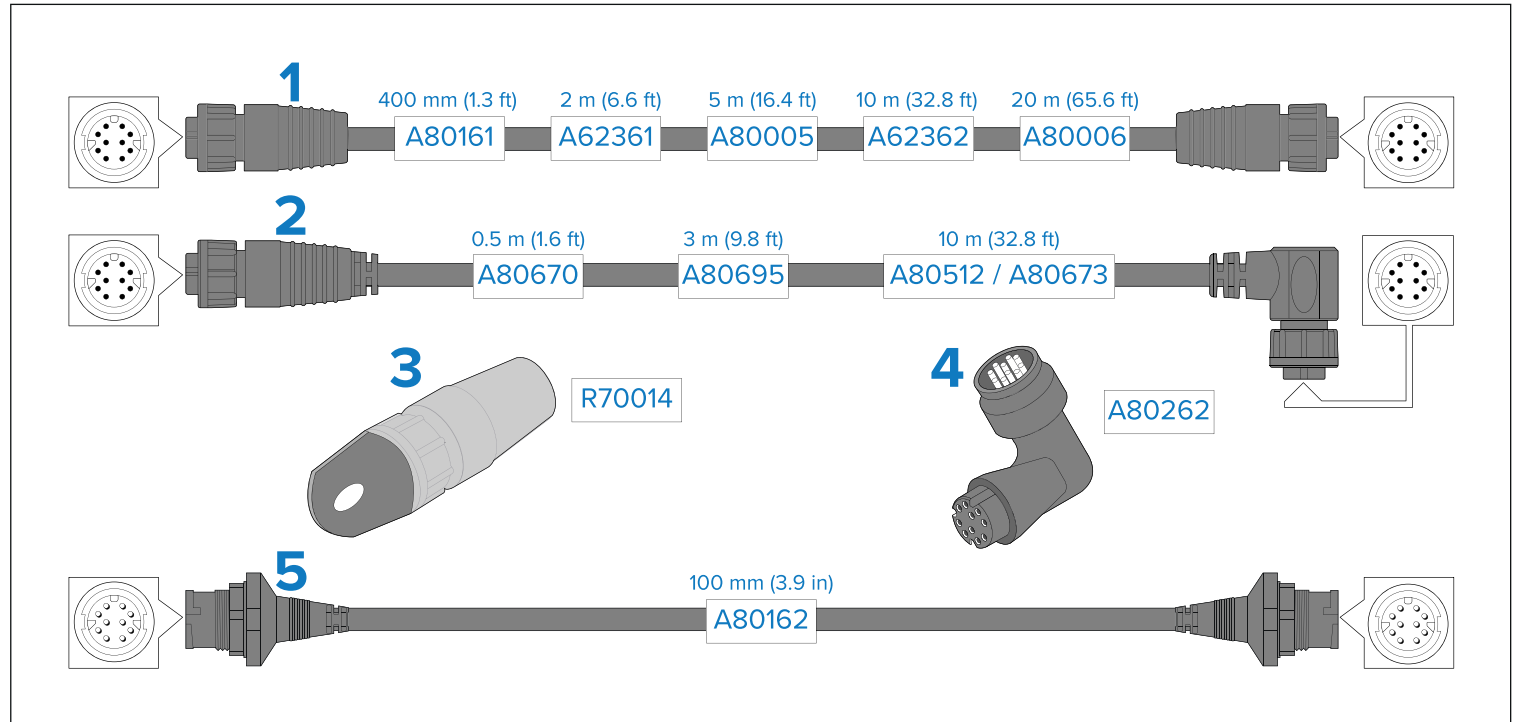
The following spares and accessories are available for your product:



Description

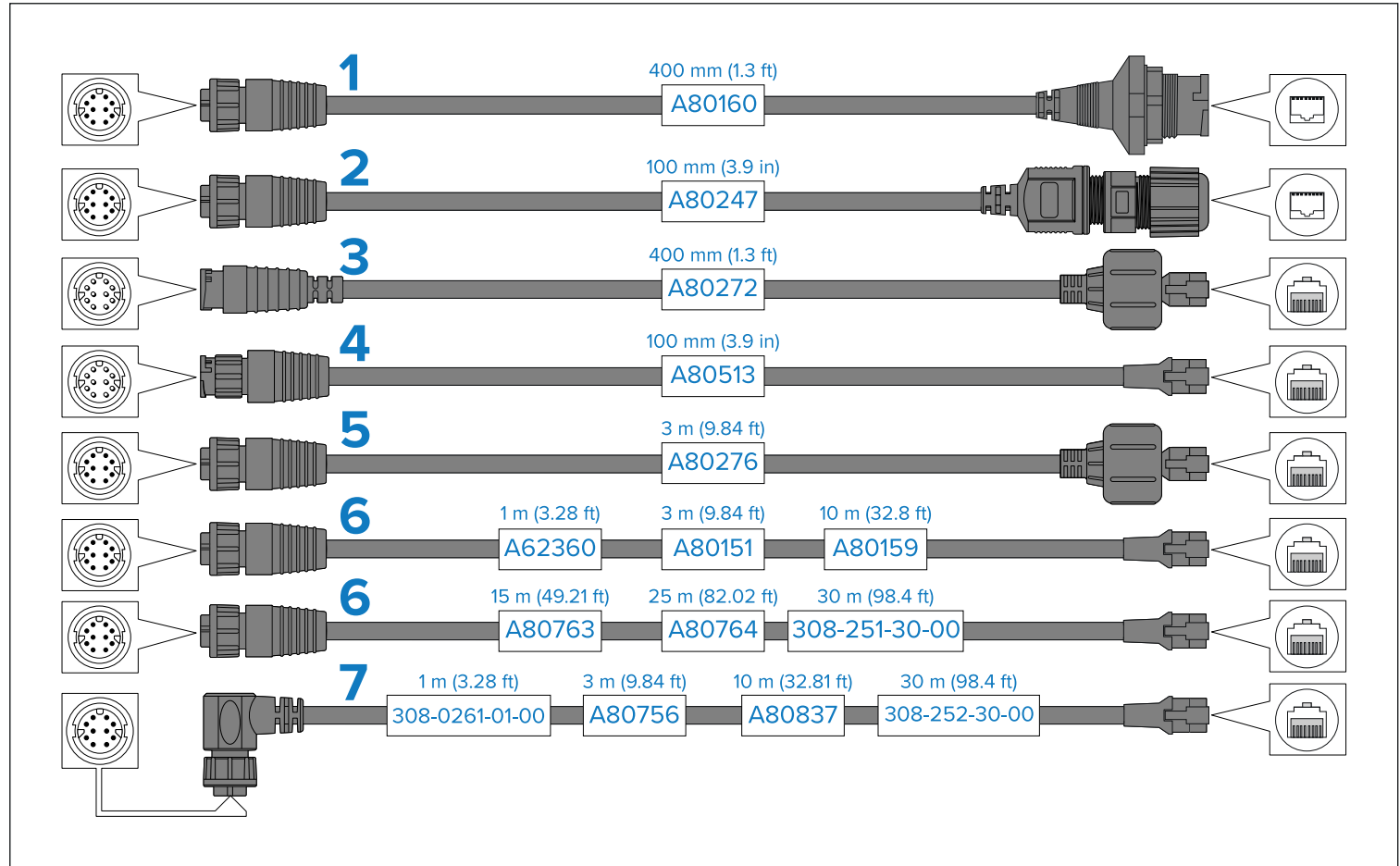
- 1 (A80732) — RNS-8 network switch.
- 2 (E70537) — AR200 sensor.
- 3 (A80731) — RNS-5 network switch.
- 4 (A80811) — PoE Injector (2nd Generation; 5 Gbit).

19.2 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.

19.3 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.

Appendix A Ethernet (IPv4) networking of Raymarine devices with third-party products

Raymarine uses a custom Ethernet (IPv4) networking configuration. Use the following information to help you understand how Raymarine's Ethernet (IPv4) implementation interacts with third-party Ethernet (IPv4) devices on your vessel, such as routers, switches, Access Points (APs) etc.

Important:

- Third-party networking products such as routers, switches, and Access Points (APs) *may* work when connected to Raymarine networks, when configured correctly. However, correct operation is not guaranteed. It's important to refer to the instructions provided by the relevant third-party device manufacturer, to ensure that your intended use of a third-party device is consistent with the device's design intent.
- Raymarine does not warrant that Raymarine products are compatible with products manufactured by any person or entity other than Raymarine.
- When using third-party products in your Raymarine electronics network, you should be aware of, and understand, the concepts and limitations described in the following Disclaimer: [p.10 — Disclaimer](#)

Overview

- Ethernet (IPv4) networking is a method for interconnecting multiple electronic devices, allowing many devices to function in a network and share data using only a single RJ45 or RayNet connection for each device.
- In order to function correctly, every Ethernet (IPv4) device (whether Raymarine or third-party) must have a unique IP address allocated to it, and it must not conflict with that of any other device.
- IPv4 addresses can be centrally-allocated to devices either **automatically**, using a method known as *DHCP* (Dynamic Host Configuration Protocol), or **manually** (i.e. allocated a static IP address). The most common method for allocating IPv4 addresses on vessel electronics networks is *DHCP*. In this configuration, the *server* device is known as a *DHCP server*.

Client / Server device	Example(s)
Raymarine IPv4 DHCP client	• Radar scanner (e.g. Quantum-Series) • Sonar module (e.g. CP470) • IP camera (e.g. CAM400)
Raymarine IPv4 DHCP server and self-addressing device	• Chartplotter, running the LightHouse operating system (e.g. Axiom-Series) • Marine Router (e.g. YachtSense Link)
Third-party IPv4 DHCP client	IP camera
Third-party IPv4 DHCP server	• Router • Switch • Access Point (AP)

Note:

The DHCP server maintains a pool of IP addresses and “leases” an address to any DHCP-enabled client, when the client device first powers up and announces its presence on the network. Because the IP addresses are dynamic (leased) rather than static (permanently assigned), addresses no longer in use are automatically returned to the DHCP server's pool, for subsequent reallocation.

It's also possible to have multiple DHCP servers issuing addresses on an IPv4 network, but to avoid addressing conflicts, all DHCP servers must be carefully configured to only allocate IP addresses in distinct address ranges. The *subnet mask* must also be carefully configured, to ensure that devices can correctly communicate with one another.

Implementation

- Raymarine Ethernet (IPv4) devices expect to use a private **Raymarine IPv4 network**, which is designed to be internal to the vessel only. Raymarine has carefully chosen a specific IP address range (**198.18.0.0/21**) to ensure that it does not interfere with

any external IP address ranges, or other legacy and real-world addressing constraints (including but not limited to marina Wi-Fi networks).

Note:

Raymarine's IP address range is for **local traffic** within the **vessel's private Raymarine network only**, and does NOT traverse across Raymarine products to external networks, or to the Internet.

- In a Raymarine Ethernet (IPv4) network, IP addresses are self-allocated by certain Raymarine equipment in the following range: **198.18.0.32 to 198.18.3.255** (inclusive). **You must avoid placing any devices in this range using manual (static) IP addresses.**
- Whether your network includes only Raymarine Ethernet (IP) devices, or a mixture of Raymarine and third-party Ethernet (IPv4) devices, you have 3 options for configuring the Ethernet (IPv4) network and managing the IP addresses for your devices:
 1. Use a Raymarine device as the sole DHCP server to allocate IP addresses automatically to all Raymarine and third-party Ethernet (IPv4) devices on the network. **For the purposes of simplicity and reliability, this is the recommended option for most vessels.** The following Raymarine devices can act as DHCP servers:
 - a. **Raymarine chartplotter**, running LightHouse v3.15.62 or later., or
 - b. **Raymarine YachtSense Link router**

Note:

If both a Raymarine chartplotter **and** YachtSense Link router are present in the same network, the YachtSense Link router **MUST** be configured as the DHCP server for that network. To facilitate this, the Raymarine chartplotter's DHCP setting defaults to *Automatic* as standard. On power up, if the YachtSense Link router is detected on the Ethernet network, any chartplotters in the network will disable their own *DHCP Server*, to permit the YachtSense Link router to manage the network's IP addresses. Only Raymarine chartplotters running LightHouse v4.1.65 or later are compatible with the YachtSense Link router. Additionally, the most recent versions of the LightHouse and YachtSense Link software must be used.

2. Use a third-party Ethernet (IPv4) device (such as a router or Access Point) to allocate IP addresses automatically, as a sole *DHCP server*. To do this, refer to the *Configuring a third-party router as DHCP server* section, below.

Note:

Any Raymarine chartplotters will still self-allocate their own IP address, even if a third-party DHCP server is being used to allocate IP addresses to other Raymarine or non-Raymarine *DHCP client* devices (Camera, Radar, Sonar etc.) on the network.

3. Manually configure static IP addresses for your devices. The address range **198.18.0.32 to 198.18.3.255** (inclusive) is used by Raymarine equipment, and any other third-party equipment on the network should not be set to a static IP address in this range. It should instead be set elsewhere in the 198.18.0.0/21 range.

Adding third-party devices to your Raymarine Ethernet (IP) network

- It is recommended that any third-party products connecting to a Raymarine Ethernet (IPv4) network (e.g., a third-party IP camera) are configured as DHCP clients, so that they automatically get allocated a correct IP address within the range used by the **Raymarine IPv4 network**. If this is not possible, (for example, in the scenario that your third-party IP Camera requires a static IP address), you should configure the product to have a static

IP address within the following range: **198.18.0.1 to 198.18.0.31** (inclusive).

- Any third-party router in your network should be performing IPv4 *Network Address Translation* (NAT) from the private address to another one on an upstream interface.

Configuring a third-party router as DHCP server

In the scenario that you wish to use a third-party DHCP server to allocate the IP addresses for your vessel's IPv4 network, use the following information to help you configure the third-party DHCP server to work with Raymarine Ethernet (IPv4) client devices:

1. Configure the third-party DHCP server / router to use Raymarine's subnet details, which are as follows:
 - a. Set the DHCP server's IP address to **198.18.0.1**
 - b. Set the *netmask* to /21, i.e. **255.255.248.0**
 - c. Set the DHCP range from **198.18.4.0 to 198.18.7.254** (inclusive). If this is not possible, ensure that the address range is smaller than this (but within the range of **198.18.4.0 to 198.18.7.254** (inclusive)).
 - d. The address range **198.18.0.32 to 198.18.3.255** (inclusive) is used by Raymarine equipment, and therefore you must ensure that any other third-party equipment on the network is NOT set to a static IP address in this range.
2. It may be necessary to set the DHCP setting for **all** of the chartplotters on the vessel to *[Off]*. However, the default option (*[Auto]*) will likely work fine in many cases. If for any reason the third-party DHCP server starts up after the chartplotter starts up, the user should manually set the chartplotter's DHCP switch to *[Off]*. This is because, when the chartplotter starts up, its DHCP *[Auto]* feature tries to detect if another DHCP server is already present on the network.
3. In case of failure of the third-party device, the chartplotters can be easily configured to be the DHCP server again, by setting the chartplotter's DHCP setting back to *[Auto]*.

Adding third-party Wi-Fi Access Points / Wi-Fi routers to your Raymarine Ethernet (IPv4) network

- There is a large volume of multicast IPv4 traffic on the Raymarine Ethernet (IPv4) network. Many consumer Wi-Fi Access Points /

Wi-Fi routers simply bridge all multicast traffic from the Ethernet interface to the Wi-Fi interface when there are connected Wi-Fi clients. This will result not only in poor Wi-Fi performance but also in a reduction of usable Wi-Fi spectrum to other Wi-Fi users and vessels in the vicinity. If using a third-party Wi-Fi Access Point or Wi-Fi router, Raymarine recommends that *IGMP Snooping* is enabled on the third-party device, and additional checks are performed, in order to ensure that your device is not bridging any unexpected multicast traffic to its Wi-Fi interface from the Raymarine Ethernet (IPv4) network.

- Raymarine's YachtSense Link router is pre-configured with IGMP Snooping enabled, and therefore does not bridge internal multicast traffic on the wired network to the Wi-Fi network. No additional configuration is required in this respect.

Appendix B ClearCruise compatible cameras

Cameras that support ClearCruise® features.

Ensure your camera and chartplotter are updated to the latest available software. Visit www.bit.ly/rym-software to obtain the latest software for your Raymarine products.

Object Detection

Camera model / series:	
M100-Series	M200-Series
M300-Series	

Augmented Reality

Camera model / series:	
CAM210IP	CAM220IP
CAM400	CAM400
M100-Series	M200-Series
M300-Series	

Note:

Augmented Reality also requires an AR200 sensor (part number: E70537).

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