CAM300

HD DIGITAL MINIDOME IP CAMERA

INSTALLATION & OPERATION INSTRUCTIONS

Raymarine®

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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, damage to your vessel and/or poor product performance.
> - Raymarine highly recommends certified installation by a Raymarine approved installer. A certified installation qualifies for enhanced product warranty benefits. Register your warranty on the Raymarine website: www.raymarine.com/warranty

> **Warning: 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 the vessel's power supply is switched OFF before starting to install this product. Do NOT connect or disconnect equipment with the power switched on, unless instructed in this document.

Product warnings

> **Warning: 12 Volt dc only**
>
> This product must ONLY be connected to a **12 V dc** power source.

> **Warning: Power supply voltage**
>
> Connecting this product to a voltage supply greater than the specified maximum rating may cause permanent damage to the unit. Refer to the product's information label for the correct voltage.

> **Warning: Positive ground systems**
>
> Do not connect this unit to a system which has positive grounding.

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

> **Caution: Power supply protection**
>
> When installing this product ensure the power source is adequately protected by means of a suitably-rated fuse or thermal circuit breaker.

> **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

Disclaimer

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

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

Declaration of conformity

FLIR Belgium BVBA declares that the following products are in compliance with the EMC Directive 2014/30/EU:

• CAM300 Day and Night Eyeball IP camera, part number: E70660

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

Product disposal

Dispose of this product in accordance with the WEEE Directive.

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

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

Warranty registration

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

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

IMO and SOLAS

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

Technical accuracy

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

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CHAPTER 2: DOCUMENT INFORMATION

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2.1 Applicable products

This document is applicable to the following products:

CAM300 (E70660) — Day and Night Eyeball IP camera

2.2 Document illustrations

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

All images are provided for illustration purposes only.

2.3 Product documentation

The following documentation is applicable to your product:

Applicable documents

- **81411** — CAM300 Installation and Operation Instructions (this document).
- **87444** — CAM300 Mounting Template.

The following documents listed below are only applicable when connecting the CAM300 to a compatible Raymarine® multifunction display:

- **81406** — LightHouse™ 4 Advanced Operation Instructions.
- **81370** — LightHouse™ 3 Advanced Operation Instructions.
- **81360** — LightHouse™ 2 Operation Instructions.

CHAPTER 3: PRODUCT AND SYSTEM OVERVIEW

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3.1 Product overview

The CAM300 is an infrared illuminated (I^2) eyeball digital IP camera with both day and night vision. In conjunction with a compatible multifunction display, the camera provides a high-definition image which can be viewed or recorded for later playback.
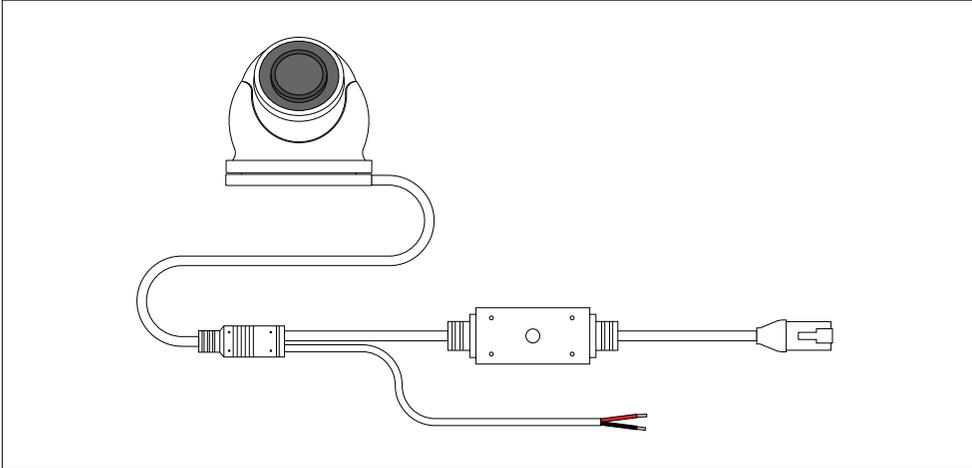
Note:

- A single CAM300 video feed can be displayed on a maximum of 3 compatible Raymarine® multifunction displays at the same time (via each display's Video app).
- The video streams of up to 4 CAM300 cameras can be displayed simultaneously on a single compatible Raymarine® multifunction display.

The camera has the following features:

- 3 megapixel 1/4" CMOS image sensor.
- 1.8 mm wide-angle Field of View (FoV), 125° Horizontal x 70° Vertical.
- 10 m (33 ft.) I^2 (infrared) beam emitter distance.
- Multi-streaming of H.264 and H.265 video.
- Support for image resolutions up to 2304 x 1296 (3 megapixel max).
- 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).

- ONVIF (Profile S) support, for compatibility with a wide range of security systems and applications.
- Mechanical IR cutout filter for true day / night operation.
- Supports augmented reality features, via the optional AR200 sensor and a compatible Raymarine® multifunction display.
- Waterproof to IPx6.
- 12 V dc power.
- Class 1 PoE device for easy single cable installation for both power and data signals.

Power over Ethernet (PoE)

Power over Ethernet (PoE) is a system that allows electrical power to be passed from a PSE (Power Sourcing Equipment) to a PD (Powered Device), via a single ethernet connection. This means that one ethernet cable can provide both power and data to a compatible device, simplifying installation.

The CAM300 is a Class 1 PD (Powered Device), which consumes 1 W Nominal / 1.8 W Maximum (IR LEDs ON), @ 12 V dc. Before connecting the camera, ensure that your 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.

Approximate recording storage space consumption

Camera video feed recording time guidelines.

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

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

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

As a general guideline, when set to factory default settings, the CAM300 video stream requires approximately **7.1 MByte** of storage **per minute** of video footage (this equates to approximately 140 minutes of recording per 1 GByte of storage space).

3.2 Compatible MFDs and LightHouse software

Important camera compatibility information.

- This product is compatible with third-party MFDs / Chartplotters. For more information, refer to the device's instruction manual.

- This product is compatible with the following Raymarine® MFDs / Chartplotters:

Compatible Raymarine® MFDs	Required MFD software version
Axiom 2 Series: Axiom 2 Pro Axiom 2 XL	• Axiom 2 Pro: *LightHouse 4, v4.3.54 or later* • Axiom 2 XL: *LightHouse 4, v4.4.70 or later*
Axiom Series: Axiom, Axiom+, Axiom Pro, Axiom XL	• *LightHouse 4, v4.1 or later* (for optimal camera feature compatibility) • *LightHouse 4, v4.0 or later* • *LightHouse 3, v3.12.217* • *LightHouse 3, versions 3.0.66 to 3.11.xx*
eS Series: eS75, eS77, eS78, eS97, eS98, eS127, eS128, eS165	• *LightHouse 3, v3.12.217* • *LightHouse 3, versions 3.0.66 to 3.11.xx* • *LightHouse 2, Release 19*
gS Series: gS95, gS125, gS165, gS195	• *LightHouse 3, v3.12.217* • *LightHouse 3, versions 3.0.66 to 3.11.xx* • *LightHouse 2, Release 19*
"New" a Series: a65, a67, a68, a75, a77, a78, a95, a95, a97, a98, a125, a127, a128	• *LightHouse 2, Release 19*

Compatible Raymarine® MFDs	Required MFD software version
"New" c Series: c95, c97, c125, c127	• *LightHouse 2, Release 19*
"New" e Series: e7, e7D, e95, e97, e125, e127, e165	• *LightHouse 2, Release 19*

Important:

Not all camera features are supported in all versions of LightHouse. For a feature support list, refer to: **p.14 — LightHouse software camera feature support**

Important:

Raymarine® does not warrant that the CAM300 will work with a third-party multifunction display. Please check with the third-party multifunction display manufacturer that the CAM300's camera and video specifications are supported by the display. For a list of specifications, refer to: **p.79 — Camera specification**

Note:

To obtain the latest software for your Raymarine products, visit: www.raymarine.com/software

LightHouse software camera feature support

Important camera feature compatibility information, for different versions of LightHouse MFD software.

LightHouse MFD software version	Camera feature support
• *LightHouse 4, v4.1.75 or later*	• Full support, including image flip options in Video App.
• *LightHouse 4, v4.0.xx*	• Compatibility is limited to viewing the video feed and accessing the web interface only.

LightHouse MFD software version	Camera feature support
• *LightHouse 3, v3.12.217, or later*	• Compatibility is limited to viewing the video feed and accessing the web interface only. • Maximum camera video resolution when displayed in the MFD Video App is limited to 720p.
• *LightHouse 3, versions 3.0.66 to 3.11.xx*	• Compatibility is limited to viewing the video feed only. • Maximum camera video resolution when displayed in the MFD Video App is limited to 720p.
• *LightHouse 2, Release 19*	• Compatibility is limited to viewing the video feed only. • Maximum camera video resolution when displayed in the MFD Camera App is limited to 720p.

Incompatible multifunction displays

This product is NOT compatible with the following legacy Raymarine® multifunction displays:

• **E-Series Widescreen** — E90W, E120W, E140W
• **C-Series Widescreen** — C90W, C120W, C140W
• **G-Series** — GPM400
• **"Classic" E-Series** — E80, E120
• **"Classic" C-Series** — C70, C80, C120
• **"Classic" A-Series** — A50, A50D, A57D, A70, A70D

Software updates

The software running on the product can be updated.

• Software updates are periodically released to improve product performance and add new features.

• Refer to www.raymarine.com/software for the latest software updates and the software update procedure for your specific product.

Important:

• To prevent potential software-related issues with your product, always follow the relevant update instructions carefully and in the sequence provided.

• If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine® technical support.

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 unit 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.

3.3 Required additional components

Network cables

For information on the cables that are suitable for your product, refer to the following section: **p.33 — Network connections**

Cable extensions

Some installations may also require extensions to network or power cables. For further information on cable extensions, refer to the following sections:

• **p.33 — Network connections**
• **p.36 — PoE power connections**
• **p.39 — Non-PoE power connections**
• **p.81 — Spares and accessories**

3.4 System overview (example only)

The following illustrations provide an overview of different products which can be connected to and used in conjunction with the CAM300.

The system configurations shown are intended as an example only and may differ from your planned installation.
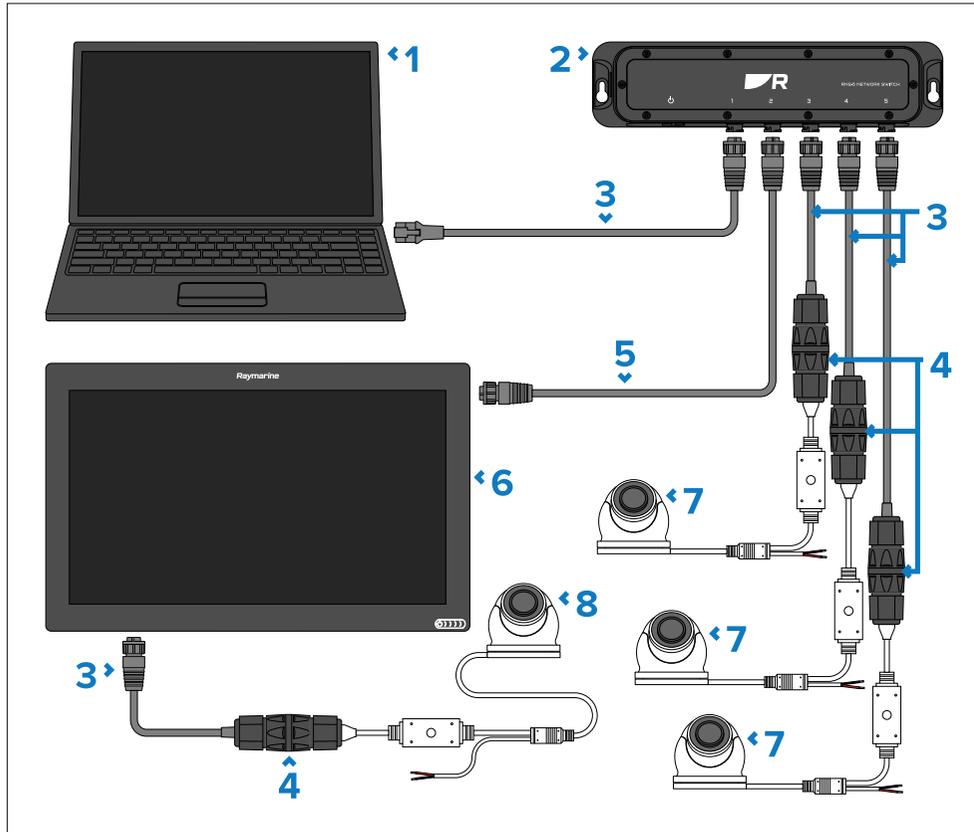
1. PC.
2. RayNet network switch.
3. RayNet (female) to RJ45 (male) adapter cable (A62360 — **not supplied**).
4. RJ45 to RJ45 waterproof coupler (4115028 — **not supplied**).
5. RayNet (female) to RayNet (female) cable (A80161 — **not supplied**).
6. PSE (Power sourcing Equipment) providing PoE (Power over Ethernet) to the camera (Axiom XL currently illustrated).

7. CAM300 connected to a power supply.
8. CAM300 connected to PSE (Power Sourcing Equipment).

Note:

Power connections are not shown in this illustration. For power connection information, refer to the following sections:

- **p.36 — PoE power connections**
- **p.39 — Non-PoE power connections**

Augmented Reality (optional)

The CAM300 can be optionally used with a Raymarine® LightHouse™ 4 multifunction display running version 4.1 (or above) and a AR200 to enable ClearCruise™ Augmented Reality features. Below is a system example which shows the components and connections required to enable ClearCruise™ Augmented Reality on your system.

1. PSE (Power Sourcing Equipment) providing PoE (Power over ethernet) to the camera (Axiom XL currently illustrated).

2. AR200 (E70537 — **not supplied**).

3. SeaTalkng ® backbone.

4. CAM300 connected to a PSE (Power Sourcing Equipment).

5. 12 V dc power supply providing power to the SeaTalkng ® backbone.

CHAPTER 4: PARTS SUPPLIED

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4.1 Parts supplied

List of parts supplied in the product box.

Item	Description
1	CAM300 — includes an approximate 670 mm (2.2 ft) fitted cable, featuring an RJ45 (male) and power connector.
2	Mounting screws (x3) — self-tapping 3.5 mm x 32 mm A4.
3	Documentation.
4	Hex wrench (Allen key), M3.
5	Waterproof gasket.

Note:

A RayNet to RJ45 adapter cable is also required when connecting the camera to a compatible Raymarine® multifunction display or network switch. For further information, refer to the following section:
p.81 — Spares and accessories

4.2 Inline fuse requirement

Your product requires a suitably-rated inline fuse to be fitted to the red power wire, housed in a waterproof fuse holder.

This fuse and its fuse holder are **NOT supplied** with your product, and must be obtained separately, from a marine or electrical retailer.
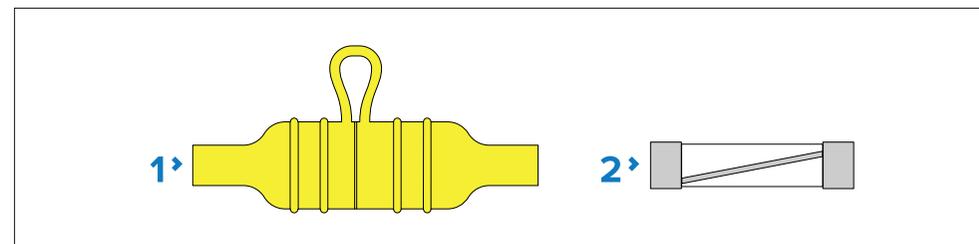
1. Waterproof fuse holder.
2. Suitably-rated inline fuse.

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 listed below.

Inline fuse and thermal breaker ratings

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

Inline fuse rating	Thermal breaker rating
250 mA	3 A

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

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5.1 Product dimensions
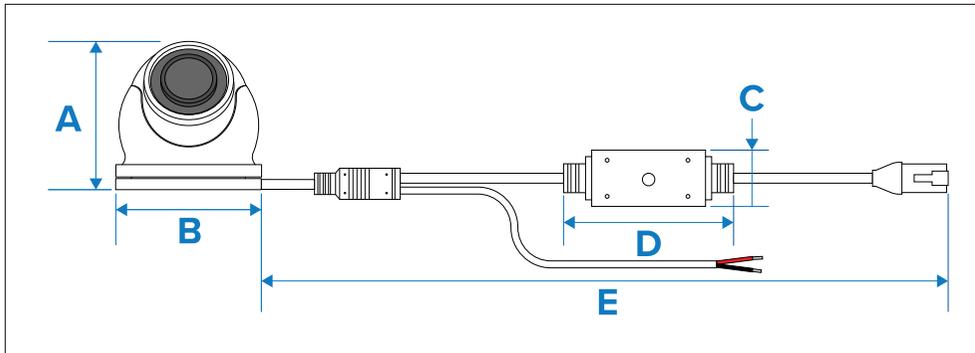
Item	Dimension
A	60.10 mm (2.37 in).
B	59.00 mm (2.32 in).
C	23.50 mm (0.93 in).
D	69.50 mm (2.74 in).
E	670.00 mm (2.2 ft) (approx).

CHAPTER 6: LOCATION REQUIREMENTS

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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.8 — 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 General location requirements

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

Key factors which can affect product performance are:

- **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.

6.3 EMC installation guidelines

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

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

Note:

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

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

- Raymarine® equipment and cables connected to it are:
  - At least 1 m (3.3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (6.6 ft).
  - More than 2 m (6.6 ft) from the path of a radar beam. A radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The product is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine® specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

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

6.4 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.

6.5 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.

6.6 Compass safe distance

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

When choosing a suitable location for the product you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3.3 ft) in all directions. However for some smaller

vessels it may not be possible to locate the product this far away from a compass. In this situation, when choosing the installation location for your product, ensure that the compass is not affected by the product when it is in a powered state.

6.7 Augmented Reality

If your product is being used for Augmented Reality it is important to consider its position and directional view for operation.

Before proceeding, ensure that you have read and followed the advice provided within the following section: **p.23 — General location requirements**

Please consider the following recommendations to ensure reliable and trouble free operation:

- **Direction** — the product 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 product should be tilted so the water and horizon are clearly visible at all times.

Example: camera position and directional view
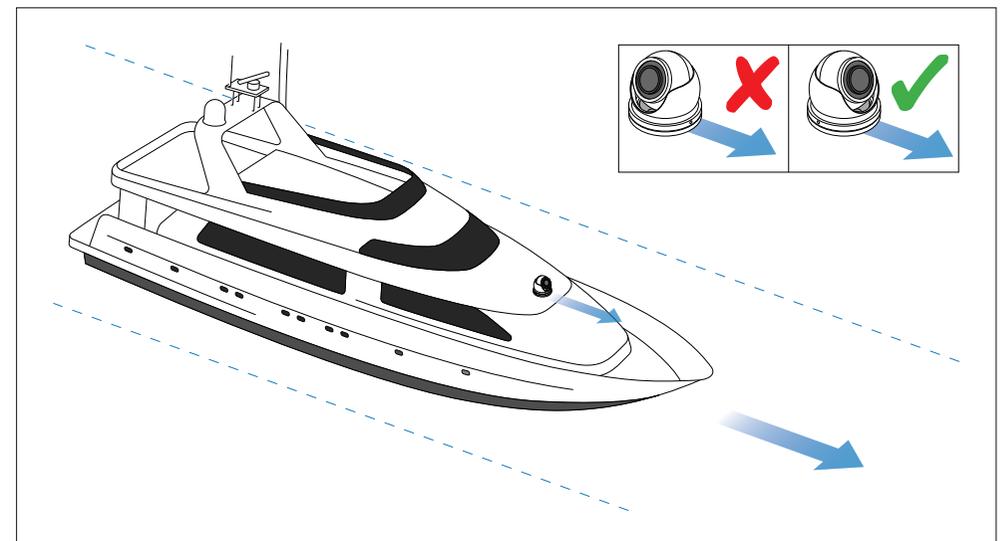
Note:

- The product must be calibrated with your MFD system in the *[Camera Installation]* page before Augmented Reality features can be used. Please refer to your MFD operation instructions manual for more information.

CHAPTER 7: CABLES AND CONNECTIONS — GENERAL INFORMATION

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7.1 General cabling guidance

Cable types and length

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

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

Routing cables

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

- Do NOT bend cables excessively. Wherever possible, ensure a minimum bend diameter of 200 mm (8 in) / minimum bend radius of 100 mm (4 in).

- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
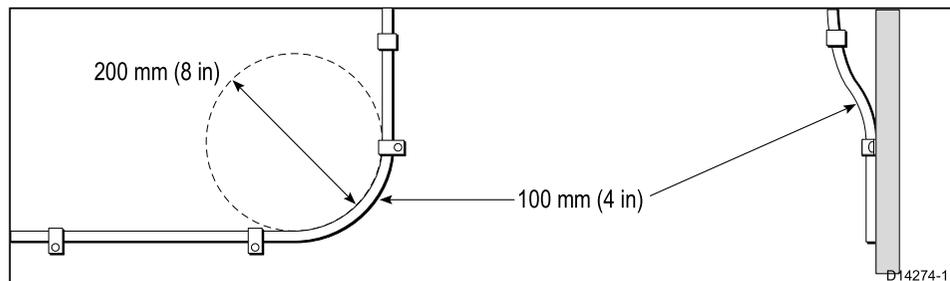- Secure cables in place using tie-wraps or lacing twine. Coil any extra cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through.
- Do NOT run cables near to engines or fluorescent lights.

Always route data cables as far away as possible from:

- other equipment and cables,
- high current carrying ac and dc power lines,
- antennae.

Strain relief

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 PC's, processors, displays and other sensitive electronic instruments or devices.
- Always use an isolating transformer with Weather FAX audio cables.
- Always use an isolated power supply when using a 3rd party audio amplifier.
- Always use an RS232/NMEA converter with optical isolation on the signal lines.
- Always make sure that PC's or other sensitive electronic devices have a dedicated power circuit.

Cable shielding

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

> ⚠ **Warning: Positive ground systems**
>
> Do not connect this unit to a system which has positive grounding.

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.

7.2 Connections overview

The CAM300 includes the following 67.0 cm (2.20 ft) (approx.) connectors:
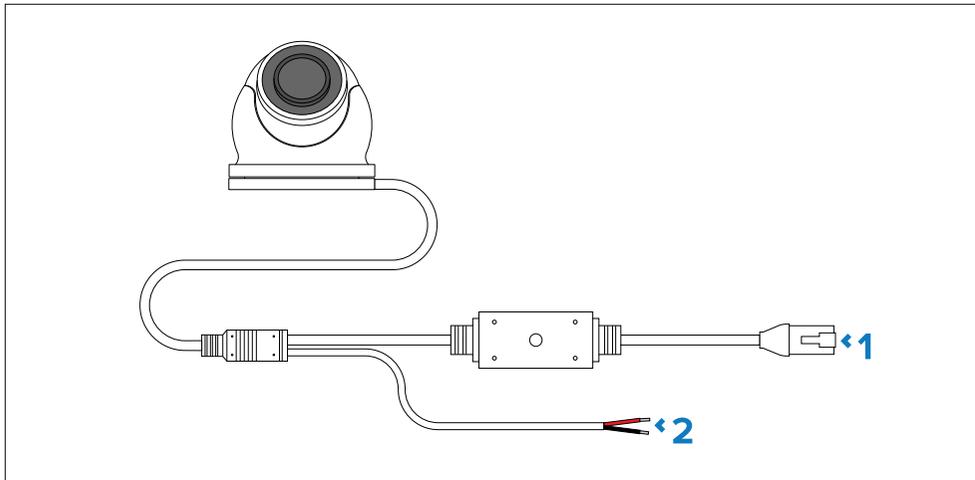
1. RJ45 (male) ethernet.

2. 12 V dc power (**if powering the camera via PoE, do NOT connect this to a 12 V dc feed**).

> **Note:**
>
> For further network and power connection information, refer to the following sections:
>
> - **p.33 — Network connections**
> - **p.36 — PoE power connections**
> - **p.39 — Non-PoE power connections**

CHAPTER 8: MOUNTING

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8.1 Tools required

1. Power drill.

2. Pozidrive screwdriver.

3. Drill bit.

4. Hex wrench (Allen key) — supplied.

5. 24 mm ($^{15}/_{16}$ in) Hole saw (only required if you are routing the camera's fitted cable through the mounting surface).

Note:

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

8.2 Camera orientation

The camera can be mounted in 2 different orientations, referred to as "ball-up" (upright) and "ball-down" (upside down).

When mounting your camera, ensure that the green infrared sensor is centered at the top (as illustrated below).

Example: camera mounting orientations
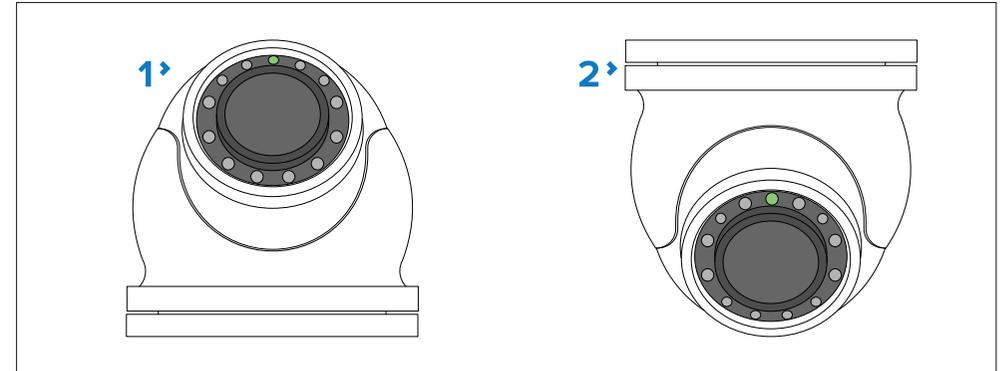
1. Ball-up: the camera is mounted on top of the mounting surface, and the green infrared sensor is centered **away** from the attached metallic collar.

2. Ball-down: the camera is suspended upside down below the mounting surface, and the green infrared sensor is centered **toward** the attached metallic collar.

8.3 Mounting options

The camera can be mounted in 2 different ways depending upon your preferred installation method:
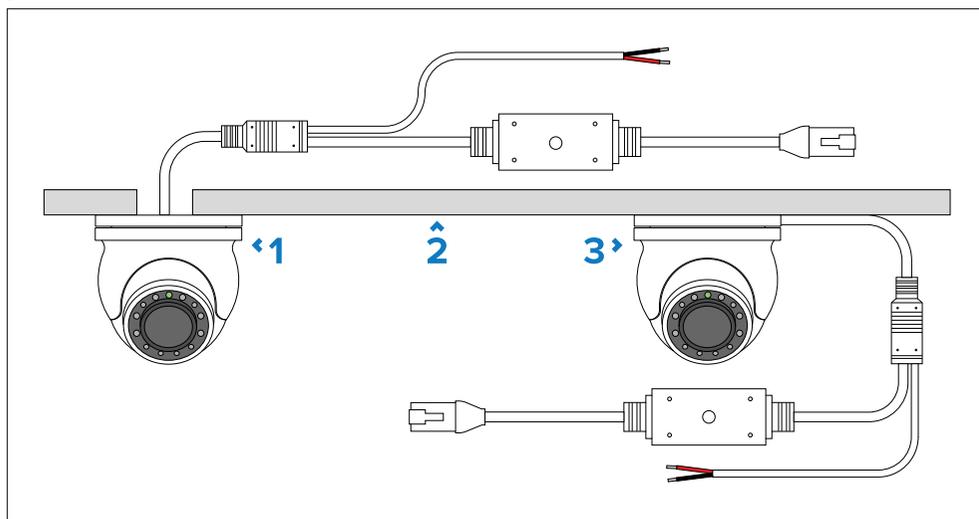
1. Through surface cabling (option 1).
2. Mounting surface.
3. Above surface cabling (option 2).

Before installing the unit, ensure the power supply is switched off and that the necessary power and network cables have been fed to the mounting location.

8.4 Mounting the unit (through-surface cabling)

Note:

The camera is supplied partly assembled. The external metallic collar protects the camera ball when the camera is in use. You must (re)attach the collar to the camera base after mounting the camera.

Having chosen a suitable location, install the unit as follows:
1. Remove all components from the box.
2. Check the selected location for the unit. A clear, flat area is required, which is suitable for drill holes for the camera's fitted cable and mounting screws.

3. Use the supplied mounting template to mark out the location of the mounting holes and the 24 mm ($^{15}/_{16}$ in) cable feed hole.
4. Drill the holes required at the marked locations.
5. Remove the grub screws from the side of the camera's base, using the supplied hex wrench (Allen key).
6. Disconnect the camera body and collar from the base of the camera.
7. Feed the fitted cable through the supplied waterproof gasket, and then the cable feed hole.

Example: through-surface cabling

8. Peel the adhesive cover off of the waterproof gasket.
9. Align the waterproof gasket underneath the camera's base with the mounting screw holes, and attach the gasket onto the camera base.
10. Secure the base in position using the mounting screws provided.
11. Connect the camera's fitted cable to the relevant power and network connections.
12. Adjust the position of the ball by hand so that the camera's green infrared sensor is centered at the top.
13. Power up the system and check the camera's video feed.
14. Adjust the position of the ball by hand to obtain the best picture, along with the collar if your camera's view is obscured.
15. Align and re-insert the grub screws.

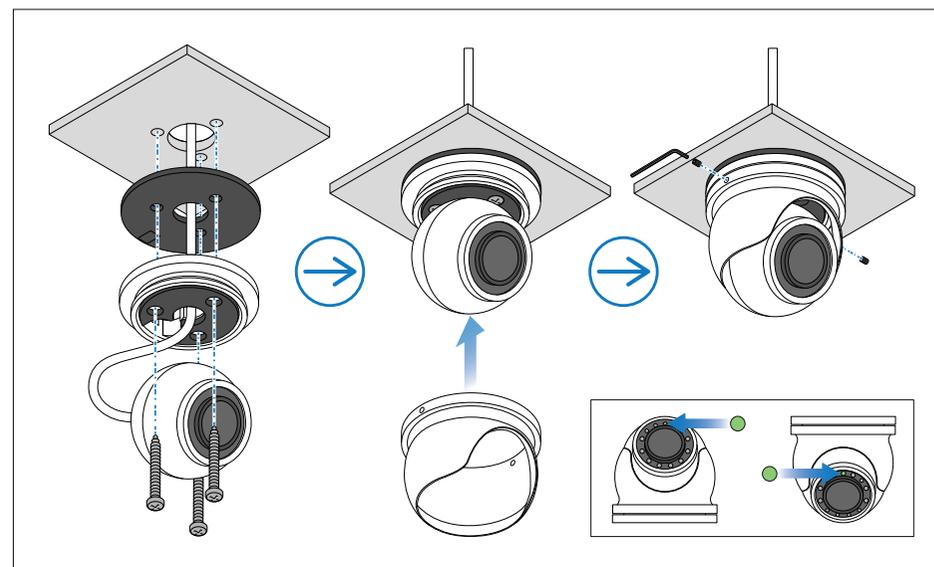## 8.5 Mounting the unit (above-surface cabling)

Note:

The camera is supplied partly assembled. The external metallic collar protects the camera ball when the camera is in use. You must (re)attach the collar to the camera base after mounting the camera.

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

1. Remove all components from the box.
2. Check the selected location for the unit. A clear, flat area is required, which is suitable for the mounting screws.
3. Use the supplied mounting template to mark out the location of the mounting holes.
4. Drill the holes required at the marked locations.
5. Remove the grub screws from the side of the camera's base using the supplied hex wrench (Allen key).
6. Disconnect the camera body and collar from the base of the camera.
7. Feed the fitted cable through the camera base's cable channel.

    Example: above-surface cabling

8. Peel the adhesive cover off of the waterproof gasket.
9. Align the waterproof gasket underneath the camera's base with the mounting screw holes, and attach the gasket onto the camera base.
10. Secure the base in position using the mounting screws provided.
11. Connect the camera's fitted cable to the relevant power and network connections.
12. Adjust the position of the ball by hand so that the camera's green infrared sensor is centered at the top.
13. Power up the system and check the camera's video feed.
14. Adjust the position of the ball by hand to obtain the best picture, along with the collar if your camera's view is obscured.
15. Align and re-insert the grub screws.

Note:

Augmented Reality objects will not appear correctly onscreen if the camera is centered inaccurately.

CHAPTER 9: NETWORK CONNECTIONS

CHAPTER CONTENTS

9.1 Network cable connector types

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

Connector	Description
	RayNet
	RJ45

9.2 Network connection

The CAM300 can be connected to equipment featuring either a RayNet or RJ45 network connector. An adapter cable must be used when connecting the camera to equipment featuring a RayNet network connector.

The following section will provide two different network connection scenarios that may be applicable when connecting the camera to your equipment:

1. **p.34 — PoE network connection**

2. **p.34 — Non-PoE network connection**

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

PoE network connection
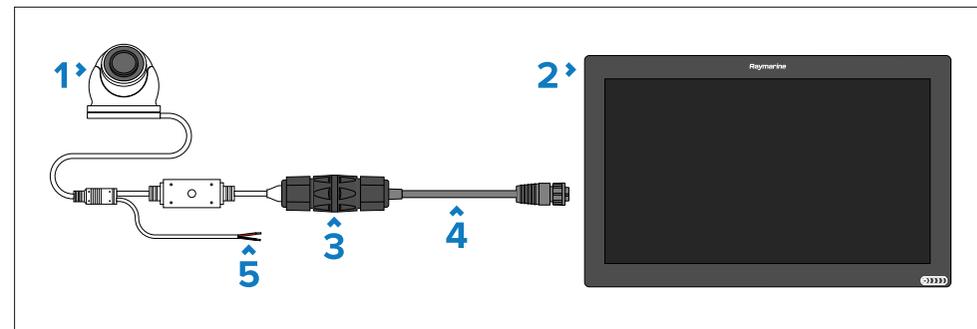
1. CAM300.

2. PSE (Power Sourcing Equipment) providing PoE (Power over Ethernet) to the camera (Axiom XL currently illustrated).

3. RJ45 to RJ45 waterproof coupler (4115028 — **not supplied**).

4. RayNet (female) to RJ45 (male) adapter cable (A62360 — **not supplied**).

5. Camera power cable — **DO NOT CONNECT** if the camera is being supplied PoE (Power over Ethernet).

For details on the available network hardware and cables, refer to the following section: **p.81 — Spares and accessories**

Non-PoE network connection
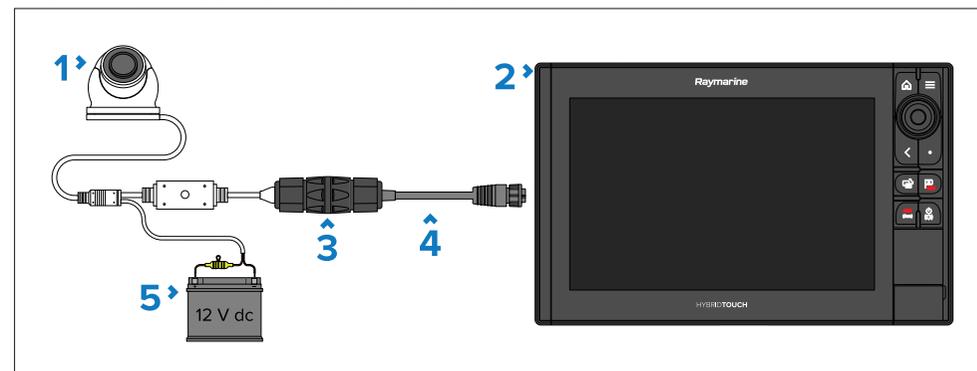
1. CAM300.

2. Raymarine® multifunction display.

3. RJ45 to RJ45 waterproof coupler (4115028 — **not supplied**).

4. RayNet (female) to RJ45 (male) adapter cable (A62360 — **not supplied**).

5. 12 V dc power supply providing power to the camera.

For details on the available network hardware and cables, refer to the following section: **p.81 — Spares and accessories**

Network cable extensions

If you wish to extend the length of a network cable connected to your product, you can refer to the following section for further information: **p.81 — Spares and accessories**

CHAPTER 10: POE POWER CONNECTIONS

CHAPTER CONTENTS

10.1 Power options

This product must be powered using ONE of the following methods:

1. **PoE (Power over Ethernet)** — Either:
   - Direct connection to a PSE (Power Sourcing Equipment). Only one cable is required to carry both data and power signals.
   - Connection to a suitably-powered PoE injector or PoE network switch. Only one cable is required to carry both data and power signals between the camera and the PoE injector. However, the PoE injector itself will require its own power source, and a separate ethernet network cable to a PC, Raymarine® multifunction display or Raymarine® network switch. The PoE injector method is useful if the camera is located a long distance from a power source.

2. **Self-powered**
   - Direct connection to a vessel's power supply using the supplied power cable. With the direct connection method, a separate ethernet network cable is required when connecting to a PC, Raymarine® multifunction display or Raymarine® network switch.

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

10.2 Power over Ethernet (PoE)

Power over Ethernet (PoE) is a system that allows electrical power to be passed from a PSE (Power Sourcing Equipment) to a PD (Powered Device), via a single ethernet connection. This means that one ethernet cable can provide both power and data to a compatible device, simplifying installation.

The CAM300 is a Class 1 PD (Powered Device), which consumes 1 W Nominal / 1.8 W Maximum (IR LEDs ON), @ 12 V dc. Before connecting the camera, ensure that your 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.

PSE (Power Sourcing Equipment) power connection

The CAM300 can be powered via a PSE's (Power Sourcing Equipment) Ethernet connection.
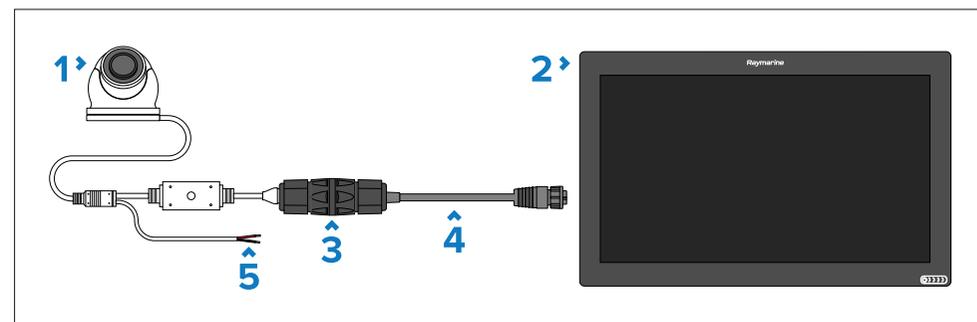
1. CAM300.

2. PSE (Power Sourcing Equipment) providing PoE (Power over Ethernet) to the camera (Axiom XL currently illustrated).

3. RJ45 to RJ45 waterproof coupler (4115028 — **not supplied**).

4. RayNet (female) to RJ45 (male) adapter cable (A62360 — **not supplied**).

5. Camera power cable — **DO NOT CONNECT** if the camera is being supplied PoE (Power over Ethernet).

For further information on the cabling required, refer to the following section:

PoE injector power connection

The CAM300 can also be powered using a PoE injector.
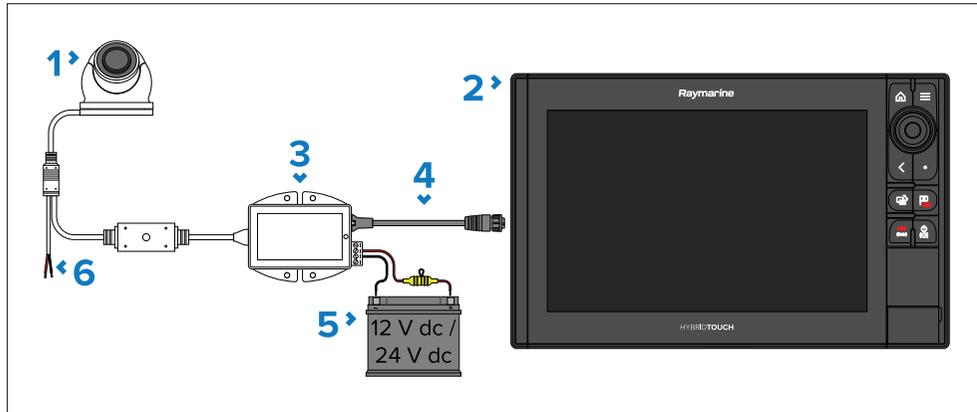
1. CAM300.

2. Raymarine® multifunction display.

3. PoE injector (4113746 — **not supplied**).

4. RayNet (female) to RJ45 (male) adapter cable (A62360 — **not supplied**).

5. 12 / 24 V dc power supply providing power to the PoE injector.

6. Camera power cable — **DO NOT CONNECT** if the camera is being supplied PoE (Power over Ethernet).

For further information on the cabling required, refer to the following section:
p.84 — RayNet to RJ45 adapter cables

Network cable extensions

If you wish to extend the length of a network cable connected to your product, you can refer to the following section for further information:
p.81 — Spares and accessories

PoE LED indication

The following blue LED will illuminate when the CAM300 is being supplied PoE:
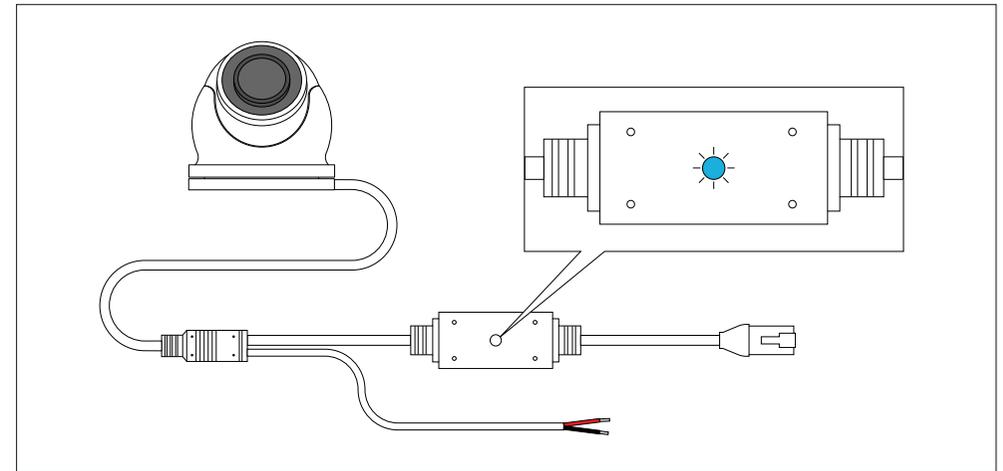
If the LED is not illuminated after you have connected the RJ45 connector to either a PSE or PoE injector, refer to the troubleshooting information found within the following section: **p.71 — PoE power connection troubleshooting**

CHAPTER 11: NON-POE POWER CONNECTIONS

CHAPTER CONTENTS

11.1 Power options

This product must be powered using ONE of the following methods:

1. **PoE (Power over Ethernet)** — Either:

   - Direct connection to a PSE (Power Sourcing Equipment). Only one cable is required to carry both data and power signals.

   - Connection to a suitably-powered PoE injector or PoE network switch. Only one cable is required to carry both data and power signals between the camera and the PoE injector. However, the PoE injector itself will require its own power source, and a separate ethernet network cable to a PC, Raymarine® multifunction display or Raymarine® network switch. The PoE injector method is useful if the camera is located a long distance from a power source.

2. **Self-powered**

   - Direct connection to a vessel's power supply using the supplied power cable. With the direct connection method, a separate ethernet network cable is required when connecting to a PC, Raymarine® multifunction display or Raymarine® network switch.

⚡ **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.

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

⚡ **Warning: 12 Volt dc only**

This product must ONLY be connected to a **12 V dc** power source.

11.2 Dedicated power connection

The unit can be powered from a **12 V dc** power supply using its dedicated power cable.
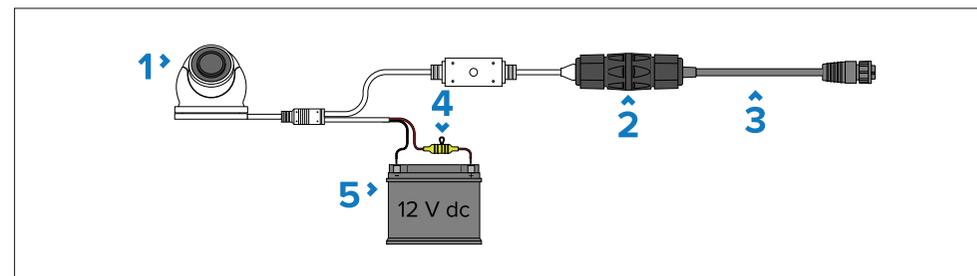
1. CAM300.

2. RJ45 to RJ45 waterproof coupler (4115028 — **not supplied**).

3. RJ45 (male) to RayNet (female) adapter cable (A62360 — **not supplied**). **DO NOT CONNECT** to a PSE (Power sourcing Equipment) if the camera is being supplied power via the dedicated power cable.

4. A waterproof fuse holder containing a suitably-rated in-line fuse **must** be fitted (**not supplied**) — see below for fuse ratings.

5. 12 V dc power supply providing power to the camera.

Inline fuse and thermal breaker ratings

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

Inline fuse rating	Thermal breaker rating
250 mA	3 A

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.

11.3 Grounding not required

This product is fully insulated and does NOT require separate grounding.

11.4 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:
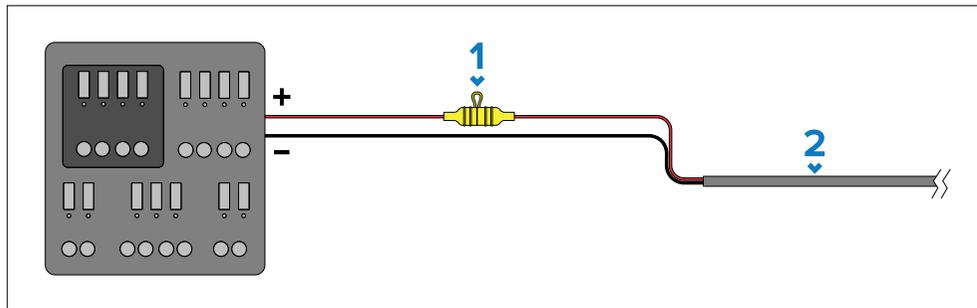
Important:

- 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)

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

- It is recommended that the supplied power cable is connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.

- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm^2) cable.

- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is not possible and more than one item of equipment shares a breaker, use individual inline fuses for each power circuit to provide the necessary protection.
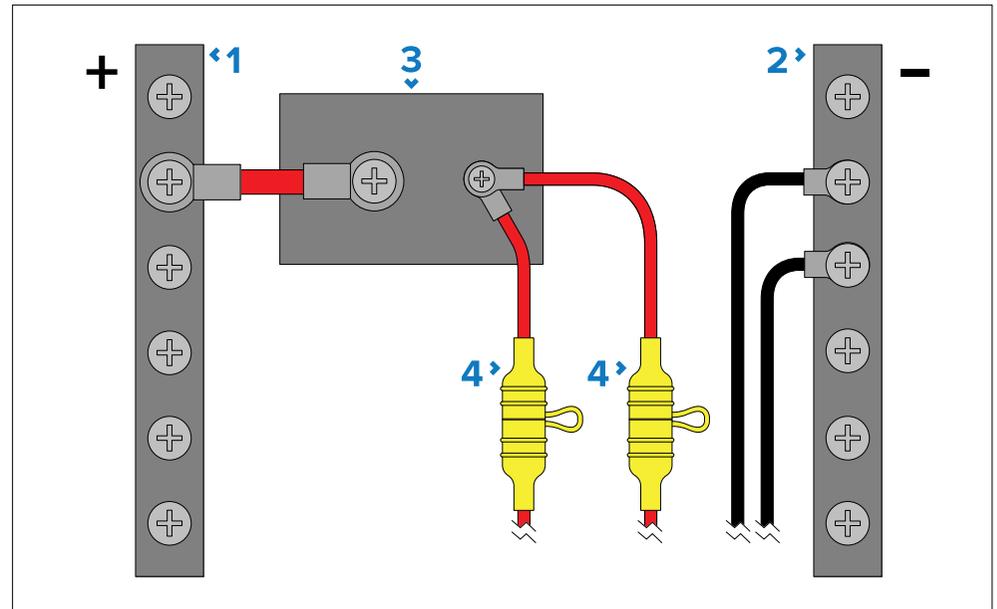
Item	Description
1	Positive (+) bar
2	Negative (-) bar

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

Important:

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

Implementation — direct connection to battery

- Where connection to a power distribution panel is not possible, the power cable supplied with your product may be connected directly to the vessel's battery, via a suitably rated fuse or breaker.

- The power cable supplied with your product does NOT include a separate drain wire. Therefore, only the power cable's red and black wires need to be connected.

- If the power cable is NOT supplied with a fitted inline fuse, you MUST fit a suitably rated fuse or breaker between the red wire and the battery's positive terminal.

- Refer to the inline fuse ratings provided in the product's documentation.

- If you need to extend the length of the power cable supplied with your product, ensure you observe the dedicated *Power cable extensions* advice provided in the product's documentation.

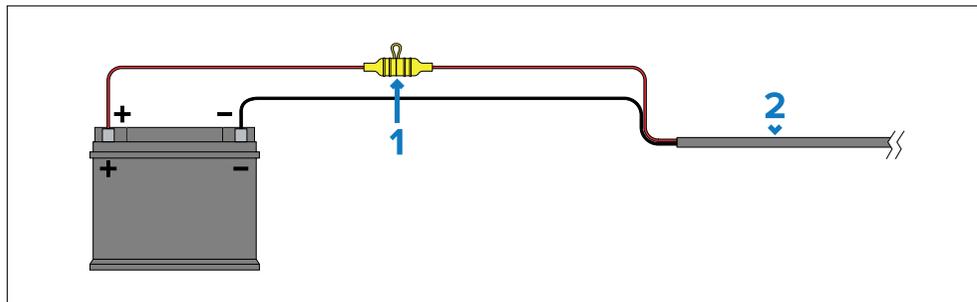| Item	Description
1	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.
2	Product power cable.

More information

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

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

11.5 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 and the total load of the device and the length of the cable run. Refer to the following table for typical **minimum** power cable wire gauges:

Cable length in meters (feet)	Wire gauge in AWG (mm^2) for 12 V supply
<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.)

CHAPTER 12: CAMERA SETUP AND OPERATION VIA RAYMARINE MFD

CHAPTER CONTENTS

12.1 Setting up the camera via a Raymarine® MFD

The CAM300 must be connected to the same network as your multifunction display in order for it to be detected.

Before attempting to establish a connection between your Raymarine® multifunction display and the camera, ensure that you have read and understood the relevant power connection safety information found within the following sections:

- **p.33 — Network connections**
- **p.36 — PoE power connections**
- **p.39 — Non-PoE power connections**

If you have previously changed the *[IP Type]*, *[Auto IP]* or *[Video Codec]* Web interface settings before attempting to connect the CAM300 to your multifunction display, you may experience Video app display issues or camera detection difficulties. Ensure that these settings have been reverted to default before attempting to use the CAM300 with your multifunction display.

In order to setup the camera for use with your Raymarine® multifunction display, follow the steps listed below.

1. From the *[Diagnostics]* menu: *[Homescreen > Settings > Network > Diagnostics > DHCP]*.
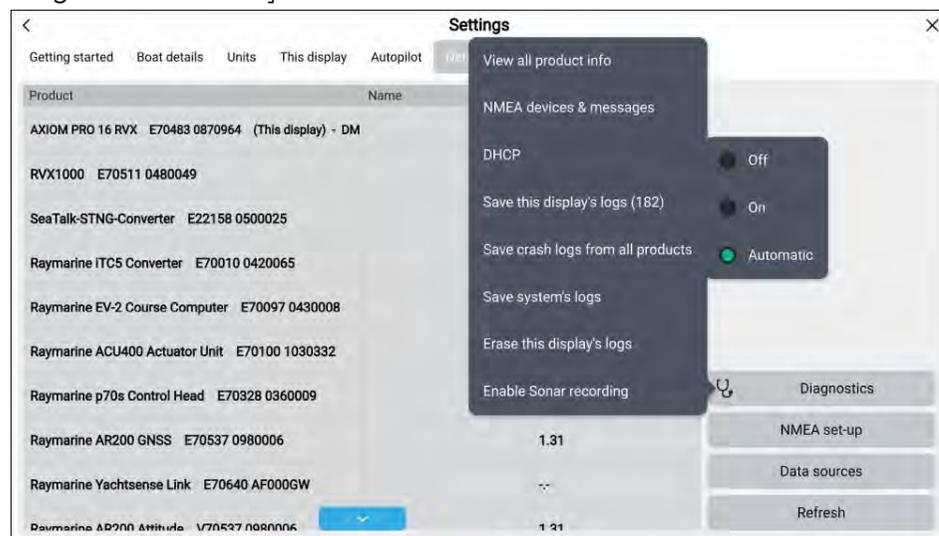
2. Select the *[Automatic]* option.
3. Press the *[Refresh]* button.

An IP camera can take up to 60 seconds to appear on a network. If the CAM300 does not appear under your multifunction display *[Product information]* or *[Network]* device list, ensure that you have waited a sufficient amount of time before attempting to *[Refresh]* via the *[Network]* menu.

If correctly configured, the CAM300 will appear on the Raymarine® multifunction display *[Network]* tab and the Video app live camera feed.

If you are experiencing issues, ensure that you have read and followed the information listed above before referring to the troubleshooting advice found within the following section: **p.70 — Troubleshooting**

12.2 Camera operation via the Raymarine® MFD Video app

The CAM300's video feed can be viewed by using a connected Raymarine® multifunction display running LightHouse™ 2 and above.

The Raymarine® multifunction display Video app enables you to view, record and play back footage from a connected IP (Internet Protocol) digital video feed. For further Video app information, refer to the LightHouse™ Operation Instructions manual which accompanies your display: www.raymarine.com/manuals

Note:

- The CAM300 video feed can be displayed across a maximum of 3 Raymarine® multifunction display Video apps at the same time.
- The video streams of up to 4 CAM300 cameras can be displayed simultaneously on a single compatible Raymarine® multifunction display.

Multifunction display software version

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

Visit www.raymarine.com/software to download the latest software.

12.3 Camera operation via the Web interface (LightHouse™ 4 / LightHouse™ 3)

Raymarine® LightHouse™ 4 (version 4.1.75 or later) and LightHouse™ 3 (version 3.12.217 or later) multifunction displays which are connected to the CAM300 can directly access and change the camera's Web browser user interface settings by using the *[Calibrate]* function.

In order to access the Web browser user interface:

1. From the *[Network]* menu: *[Homescreen > Settings > Network]*
2. Select the *[CAM300]* product description.
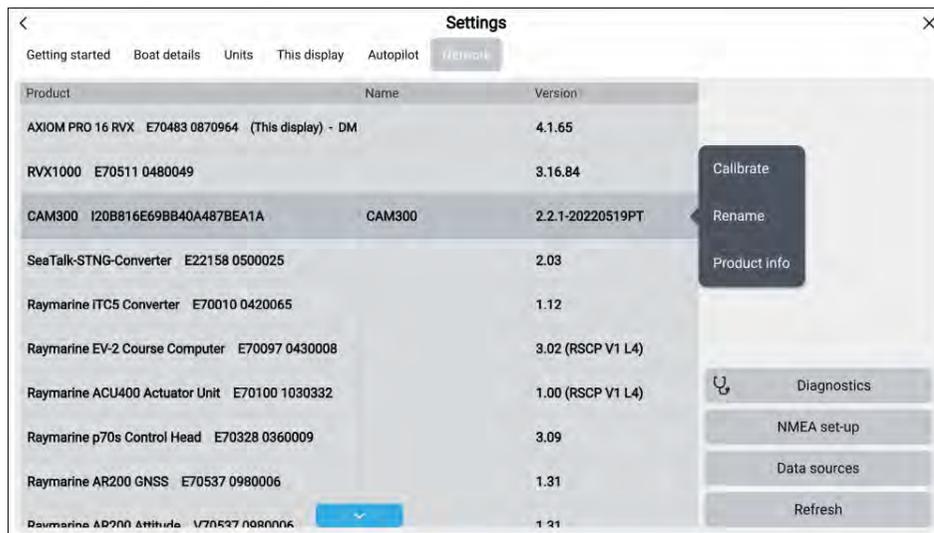
3. Select the *[Calibrate]* option.

You will now have access to the camera's Web browser user interface.

> **Note:**
>
> For further information on how to login and configure the camera's Web browser user interface, refer to the following sections:
>
> - p.51 — Logging in to the Web browser user interface
>
> - p.52 — Web browser user interface overview

CHAPTER 13: CAMERA SETUP AND OPERATION VIA WINDOWS 10 OR APPLE MAC PC

CHAPTER CONTENTS

13.1 Camera IP address discovery options

The CAM300's IP address can be obtained and used to access the built-in Web browser user interface via a number of different ways.

The following section will provide 2 different scenarios that may be applicable when obtaining the CAM300's IP address and connecting to the Web browser user interface:

1. **p.48 — Accessing the camera's IP address via ONVIF Device Manager**

2. **p.49 — Accessing the camera's IP address via a Raymarine® MFD**

13.2 Accessing the camera's IP address via ONVIF Device Manager

The following instructions are subject to change depending upon which version of ONVIF Device Manager you are running.

In order to access the camera's IP address and Web browser user interface using ONVIF Device Manager, follow the steps listed below:

1. Ensure that the camera is powered and connected to the same network as your PC.

2. Open the ONVIF Device Manager website in your browser: https://sourceforge.net/projects/onvifdm/

3. Click on the *[Download]* icon.

4. Click the *[ODM]* Windows Installer Package which can be found onscreen or within your *[Downloads]* folder.

5. Follow the initial setup wizard's onscreen prompts.

6. Double-click and open the *[ONVIF Device Manager]* executable once the installation has finished.

   The following ONVIF Device Manager homescreen will be displayed:

You can now access the CAM300's Web interface by typing the IP address found under the ONVIF Device Manager *[Device list]* into one of the supported Web browsers in the following format: **http://xxx.xx.x.xxx**.

IP cameras can take up to 60 seconds to appear on a network. If the CAM300 does not appear under the ONVIF Device Manager *[Device list]*, ensure that you have waited a sufficient amount of time before attempting to *[Refresh]*.

If you cannot connect to the Web browser user interface after entering the camera's IP address into your default browser, ensure that your computer is on the same IP address range as the camera before retrying.

Note:

For further information on which Web browsers are supported, refer to the following section: **p.51 — Supported browsers**

For further information on how to change your computer's IP address range, refer to one of the following sections:

- **p.49 — Changing the IP address range on a Windows 10 PC**

- **p.50 — Changing the IP address range on an Apple Mac PC**

It is recommended that your PC is restarted after the IP address has been changed.

13.3 Accessing the camera's IP address via a Raymarine® MFD

The following instructions are subject to change depending upon which version of LightHouse™ your multifunction display is running. The instructions listed below are only applicable to multifunction displays running LightHouse™ 4 or LightHouse™ 3. For further information on how to access the diagnostic product information menu, refer to the LightHouse™ Operation Instructions manual which is relevant to your display.

Before proceeding, ensure that your display has been setup in accordance with the instructions provided within the following section: **p.45 — Setting up the camera via a Raymarine® MFD**

In order to access the camera's IP address using your MFD's diagnostic product information, follow the steps listed below:

1. Ensure that your product and multifunction display are connected to the same network as your Windows 10 or Apple Mac PC.
2. Select *[Homescreen > Settings > Network > Diagnostics > View all product info]*.
3. Scroll down the list of *[Product information]* until you find the CAM300's *[IP address]*.

You can now access the CAM300's Web interface by typing the IP address found under the *[Product information]* list into one of the supported Web browsers in the following format: **http://xxx.xx.x.xxx**.

IP cameras can take up to 60 seconds to appear on a network. If the CAM300 does not appear under your multifunction display *[Product information]* or *[Network]* device list, ensure that you have waited a sufficient amount of time before attempting to *[Refresh]* via the *[Network]* menu.

If you cannot access the Web browser user interface after entering the camera's IP address into your default browser, ensure that your computer is on the same IP address range as the camera before retrying.

Note:

For further information on which Web browsers are supported, refer to the following section: **p.51 — Supported browsers**

For further information on how to change your computer's IP address range, refer to one of the following sections:

- **p.49 — Changing the IP address range on a Windows 10 PC**
- **p.50 — Changing the IP address range on an Apple Mac PC**

It is recommended that your PC is restarted after the IP address has been changed.

13.4 IP address range

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

Changing the IP address range on a Windows 10 PC

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

Note:

You will need to know the IP address of your product for step 10. This can be found by referring to one of the following sections:

- **p.48 — Accessing the camera's IP address via ONVIF Device Manager**
- **p.49 — Accessing the camera's IP address via a Raymarine® MFD**

1. Click *[Start]*.
2. Click *[Settings]*.
3. Click *[Network and Internet]*.
4. Click *[Change adapter options]*.
5. Select and right click the *[network]* the product is communicating on.
6. Click *[Properties]*.
7. Scroll to *[Internet Protocol Version 4 (TCP/IPv4)]* and select it.
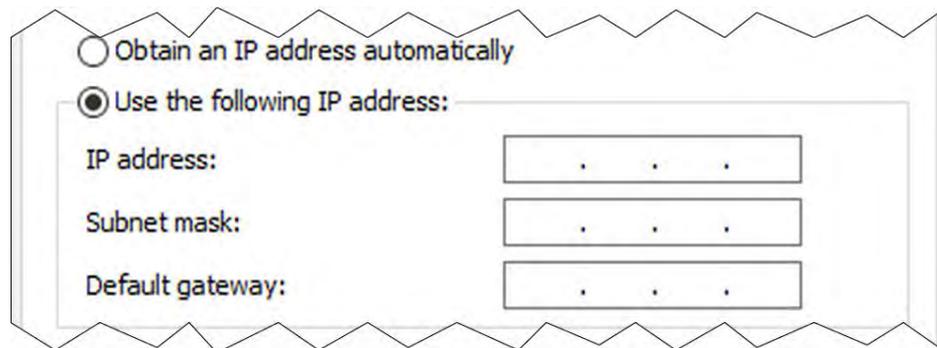
8. Click *[Properties]*.
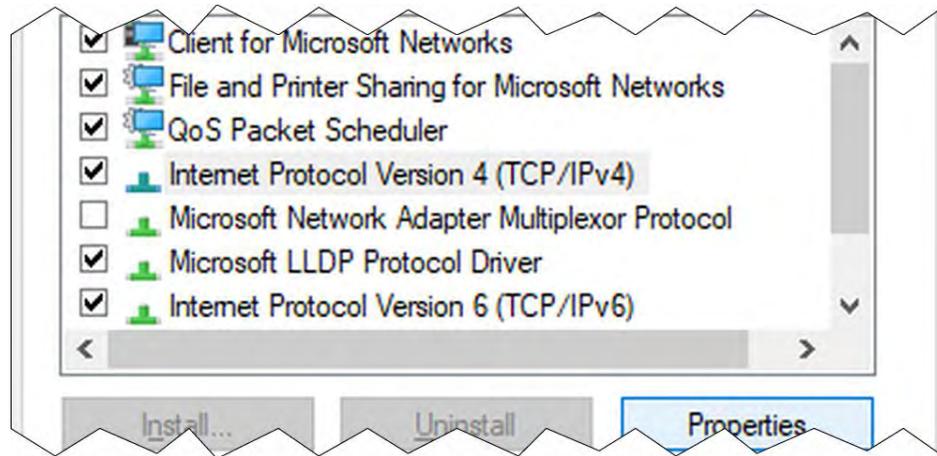
9. Click *[Use the following IP address]*.
10. Enter the *[IP address]* so it matches the IP address of your product.
11. Change the **last three digits** of the IP address to a number between **1–254** (these digits must not match the IP address of the product or any other device on the network).
12. Enter the *[Subnet mask]* 255.255.255.0
13. Click *[OK]*.

You can now access the product by typing its IP address into one of the supported browsers.

Note:

For further information on which browsers are supported, refer to the following section: **p.51 — Supported browsers**

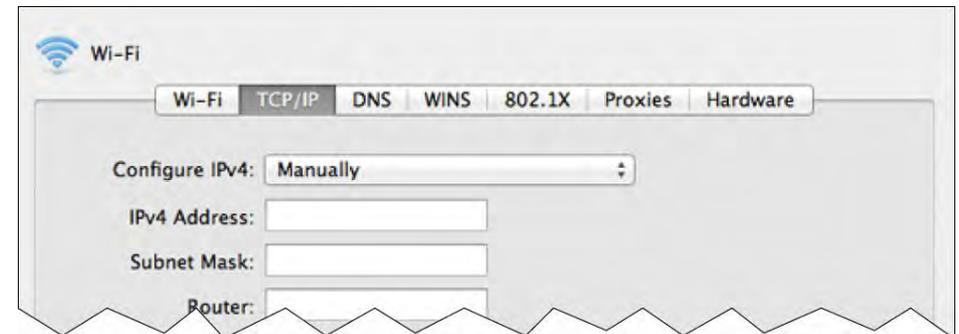## Changing the IP address range on an Apple Mac PC

To configure the necessary IP address range settings on an Apple Mac PC, follow the steps listed below:

Note:

You will need to know the IP address of your product for step 8. This can be found by referring to one of the following sections:

- **p.48 — Accessing the camera's IP address via ONVIF Device Manager**
- **p.49 — Accessing the camera's IP address via a Raymarine® MFD**

1. Click the *[Apple menu]*
2. Click *[System Preferences]*
3. Click *[Network]*
4. Select the *[network]* the product is communicating on from the sidebar
5. Click *[Advanced]*
6. Click *[TCP/IP]*
7. From the *[Configure IPv4]* menu, select *[Manually]*
8. Enter the *[IP address]* so it matches the IP address of your product.
9. Change the **last three digits** of the IP address to a number between **1–254** (these digits must not match the IP address of the product or any other device on the network).
10. Enter the *[Subnet mask]* 255.255.255.0
11. Click *[OK]*

You can now access the product by typing its IP address into one of the supported browsers.

13.5 Supported browsers

The camera's Web browser user interface can be accessed by using one of the following Web browsers:

- Internet Explorer
- Microsoft Edge's Internet Explorer mode (Windows 10 / 11)
- Microsoft Edge [1]
- Google Chrome [1]
- Mozilla Firefox [1]
- Safari [1]

13.6 Logging in to the Web browser user interface

You can login to the camera's Web browser user interface by using the following login details:

- Username: admin
- Password: _____

To access the CAM300's Web browser user interface:

1. Open your Web browser on a device connected to the same network as the camera.
2. Enter your camera's IP address in the browser's address bar in the following format: **http://xxx.xx.x.xxx**

   The following login screen will be displayed:

3. Enter the camera's default username: admin
4. Leave the camera's default password blank.
5. Select your preferred stream type.
6. Select your preferred language.
7. Click *[Login]*.

13.7 Web browser user interface overview

Important:

Access to the Web browser user interface is provided to ensure that the relevant settings which are required for a multifunction display can be configured (if required).

The Web interface supports multiple camera models. As a result, some settings are either not supported by the camera, not supported without the use of a PC, or not supported without the use of Internet Explorer / Microsoft Edge's Internet Explorer mode (Windows 10 / 11).

Changes to camera settings should only be made by someone who has expertise with IP cameras and a thorough understanding of each setting. Changing certain settings may cause you to experience issues with the camera.

The camera's Web browser user interface is split into the following 4 sections:

The Web browser user interface menu options are subject to change depending upon which firmware version your device is running. Refer to the Raymarine® website for details on how to update your product: www.raymarine.com/software

Live menu

The *[Live]* menu displays the camera's video feed and any additional overlay settings that have been enabled from the *[Remote Setting]* menu. The following options can be selected from the *[Live]* menu display:
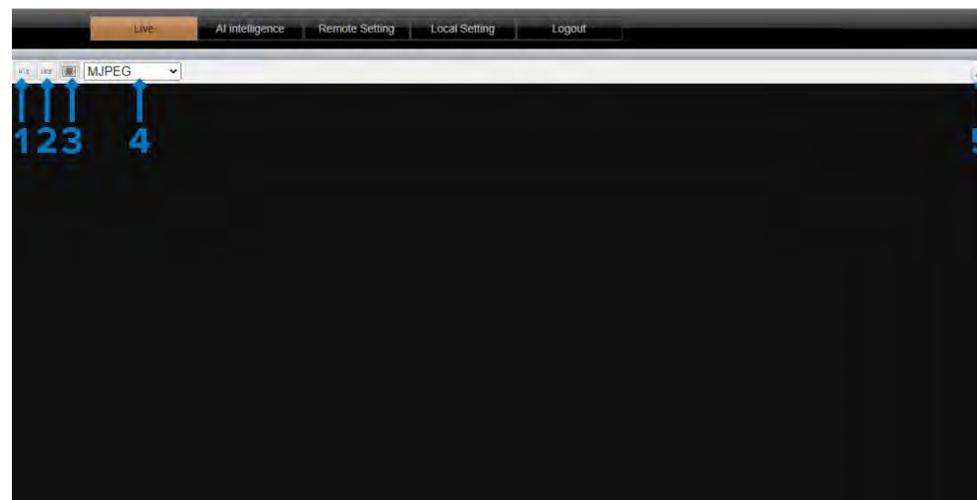
1. *[4:3]* — Enables you to change the live video feed to a 4:3 aspect ratio.

2. *[16:9]* — Enables you to change the live video feed to a 16:9 aspect ratio.

3. *[Stretched Display]* — Enables you to stretch the live video feed to fit your screen's display.

4. **(PC ONLY)** *[QuickTime / VLC / MJPEG]* — Enables you to change between the Quicktime, VLC and MJPEG media players.

Note:

- QuickTime Player 7 is no longer supported.

- VLC is not accessible by default and must be downloaded separately.

5. *[Pan-tilt-zoom]* — This setting is not supported by the CAM300.

AI Intelligence menu

The *[AI Intelligence]* menu is split into the following subsection(s):

1. *[Intelligent Detection]*
2. *[Voice Alarm]*
3. *[Overlay Settings]*

Intelligent Detection

The settings found within this section are not supported on a multifunction display, and will not function unless you are using the Web browser user interface in Internet Explorer or Microsoft Edge's Internet Explorer mode (Windows 10 / 11).

> **Note:**
>
> For information on the settings found within this section and how to enable Microsoft Edge's Internet Explorer mode, refer to the appendix:
>
> - **p.87 — Enabling Internet Explorer mode on Microsoft Edge (Windows 10 / 11)**
>
> - **p.87 — Internet Explorer dependent settings**

Voice Alarm

The settings found within this section are not supported by the CAM300.

Overlay Settings

The settings found within this section are not supported on a multifunction display, and will not function unless you are using the Web browser user interface in Internet Explorer or Microsoft Edge's Internet Explorer mode (Windows 10 / 11).

> **Note:**
>
> For information on the settings found within this section and how to enable Microsoft Edge's Internet Explorer mode, refer to the appendix:
>
> - **p.87 — Enabling Internet Explorer mode on Microsoft Edge (Windows 10 / 11)**
>
> - **p.87 — Internet Explorer dependent settings**

Remote Setting menu

The *[Remote Setting]* options menu is split into the following section(s):

1. *[Camera Config]*
2. *[Network Config]*

3. *[Code Config]*

4. *[Alarm Config]*

5. *[System Config]*

6. *[System Maintain]*

Camera Config

The *[Camera Config]* subsection contains a set of changeable OSD (onscreen display) configurations, image control values and privacy zone settings.

OSD Config

Menu item and description	Option(s)
[Name] [1] Enables you to write (30 character limit) and display up to 5 customizable Name labels on the onscreen display. • To add an additional Name label, click the *[+]* icon located on the right hand side of the table. • To remove the a Name label, click the *[—]* icon located on the right hand side of the table. • **(PC ONLY)** To move the location of a Name label, click and drag the red box across the video feed preview. By default, this setting is placed at the top-left of your onscreen display.	• *[Name Field]* • *[+]* • *[—]*
[Additional Overlay Information] [1] Enables you to display both the camera resolution and bit rate on the onscreen display. **(PC ONLY)** To move the location of the Additional Overlay Information setting that you have selected, click and drag the red box across the video feed preview. By default, this setting is placed at the top-left of your onscreen display.	• *[No Superposition]* • *[Superposition Resolution]* • *[Superimposed Bit Rate]* • *[Overlay Resolution and Bit Rate]*

Menu item and description	Option(s)
[Channel Display] Allows you to show (Enable) or hide (Disable) the Additional Overlay Information and Name settings on the live video feed. This setting will only function if you have configured either the Name or Additional Overlay Information setting.	• *[Enable]* • *[Disable]*
[Time Display] [2] N / A	

Note:

(1) This setting is not fully supported on a multifunction display Web interface.

(2) This setting is not supported by the CAM300.

Image Control

Menu item and description	Option(s)
[Image Mode] Enables you to change the Image Mode setting between one of the following modes: Standard Mode • Sets the Image Mode setting to default. Faceless Exposure Mode • Automatically adjusts the camera's exposure levels depending on how far a person is from the camera lens. Licence Plate Mode • Enhances the camera's video image in order to make vehicle licence plates easier to read.	• *[Standard Mode]* • *[Faceless Exposure Mode]* • *[Licence Plate Mode]*
[IR-CUT Mode] **(3)** Enables you to set the camera's infrared filter as permanently open, closed, or to automatically cycle between open and closed based upon the current time / environmental lighting conditions.	• *[Automatic (Passive Mode)]* • *[Automatic (Active Mode)]* • *[Day]* • *[Night]* • *[Timing]*
[IR-CUT Sensitivity] **(2)** N / A	
[IR-CUT Delay] **(3)** Enables you to change how long (in seconds) the environmental lighting conditions must remain the same before the infrared filter changes position. This setting is only available if you have set the IR-CUT Mode setting to Automatic (Passive Mode) or Automatic (Active Mode).	• *[3] — [15]*

Menu item and description	Option(s)
[Day Time] Enables you to set a specific start and end time when the camera's infrared filter will be closed. This setting is dependent upon your camera's time configuration. In order to configure your time and date settings, navigate to: *[Remote Setting > System Config > Time Setting]*. This setting is only available if you have set the IR-CUT Mode setting to Timing.	• *[Start Time]* • *[End Time]*
[IR-CUT Reverse] Enables you to reverse the infrared filter activation trigger when set to Open. This causes the filter to retract when light levels are high, allowing the sensor to access more light (including infrared light).	• *[Open]* • *[Close]*
[Brightness] Enables you to change the Brightness value of the camera's image. By default, the Brightness value is set to 50.	• *[0] — [100]*
[Contrast] Enables you to change the Contrast value of the camera's image. By default, the Contrast value is set to 50.	• *[0] — [100]*
[Saturation] Enables you to change the Saturation value of the camera's image. By default, the Saturation value is set to 50.	• *[0] — [100]*
[Hue] Enables you to change the Hue value of the camera's image. By default, the Hue value is set to 50.	• *[0] — [100]*

Menu item and description	Option(s)
[Sharpness] Enables you to change the Sharpness value of the camera's image. By default, the Sharpness value is set to 50.	• [0] — [100]
[Flicker Control] Enables you to reduce the amount of flickering displayed on the camera's video feed, by adjusting the shutter speed to match the frequency of your lighting's power source.	• [50HZ] • [60HZ] • [Close]
[Iris Type] [2] N / A	
[Time Exposure] Enables you to change the camera shutter speed. Long duration shutter speeds cause stationary aspects of the image to appear sharper while moving aspects of the image appear as blurred. Short duration shutter speeds cause stationary aspects of the image to appear as less sharp while moving aspects of the image appear clearer.	• [Auto] • [1/25]—[1/10000]
[Gain] Enables you to increase the camera's image brightness in lower lighting conditions. By default, this setting is set to Auto.	• [Auto] • [6dB] — [42dB]
[White Balance] Enables you to change the color temperature balance of your camera's image, allowing warm or cold color temperatures to appear as white. By default, this setting is set to Auto.	• [Incandescent] • [Warm] • [Fluorescent] • [Natural] • [Manual] • [Auto] • [Locked]

Menu item and description	Option(s)
[Red Gain] Enables you to change the Red color gain of your camera's image. By default, this setting is set to 50. This setting is only available if you have set the White Balance setting to Manual.	• [0] — [100]
[Blue Gain] Enables you to change the Blue color gain of your camera's image. By default, this setting is set to 50. This setting is only available if you have set the White Balance setting to Manual.	• [0] — [100]
[3D Noise Reduction] Enables you to reduce the amount of noise shown on the camera's image.	• [Auto] • [Weak] • [Normal] • [Strong]
[BLC] Enables you to increase the amount of light exposure in dark environments. It is only recommended that you set this option to Open in low lighting conditions.	• [Open] • [Close]
[WDR] Enables you to improve the camera's image quality when exposed to both bright and dark (high-contrast) lighting conditions within the same image.	• [Auto] • [Weak] • [Normal] • [Strong]
[Image Flip][4] Enables you to flip and mirror the camera video feed. This setting will require changing if your camera has been installed in the "ball-down" orientation. For further information, refer to the following section: **p.30 — Camera orientation**	• [Close] • [Leftright] • [Updown] • [Center]

Privacy Zone

Menu item and description	Option(s)
[Privacy Zone] Enables you to turn the Privacy Zone settings either On or Off.	• *[On]* • *[Off]*
[Window 1–4] **(5)** Enables you to select up to 4 Windows which will be hidden from the live video feed display. Each Window can be: • **(PC ONLY)** Moved, by clicking and dragging the Window across the video feed preview. • **(PC ONLY)** Resized, by clicking and dragging the white box located at the bottom right of the Window. • Toggled On or Off, by clicking the corresponding button(s) located underneath the video feed preview. This setting will only function if you have Enabled the Privacy Zone setting.	• *[On]* • *[Off]*

Network Config

The *[Network Config]* subsection contains a set of changeable IP address and network port settings.

Under normal circumstances the network configuration settings should not need to be changed.

Network Config

Menu item and description	Option(s)
[IP Type] **(6)** Enables you to change whether the camera's IP address is Static or assigned via DHCP (Dynamic Host Configuration Protocol). By default, this setting is set to DHCP.	• *[DHCP]* • *[Static]*
[Auto IP] **(6)** Allows you to change whether the camera's IP address is automatically assigned. By default, this setting is set to Disable.	• *[Enable]* • *[Disable]*
[IP Address] Enables you to manually configure your camera's IP address. This setting is only available if you have set the IP Type setting to Static.	• *[IP Address Field]*
[Subnet Mask] Enables you to configure your Subnet Mask setting. This setting is only available if you have set the IP Type setting to Static.	• *[Subnet Mask Field]*
[Gateway] Enables you to configure your default Gateway setting. This setting is only available if you have set the IP Type setting to Static.	• *[Gateway Field]*

Menu item and description	Option(s)
[Primary DNS] Enables you to configure your Primary DNS (Domain Name System) setting.	• [Primary DNS Field]
[Alternate DNS] Enables you configure your Alternative DNS (Domain Name System) setting.	• [Alternate DNS Field]
[MAC Address] Enables you to view your MAC address.	

Important:

(6) Changing either setting may cause issues to occur when attempting to connect the CAM300 to a multifunction display. It is recommended that these settings are left as default. If IP address issues are experienced after changing either setting, attempt to use the ONVIF Device Manager to rediscover your camera's assigned IP address.

Port Config

Menu item and description	Options
[HTTP Port] Enables you to configure your HTTP (Hypertext Transfer Protocol) Port setting.	• [HTTP Port Field]
[Command Port] Enables you to configure your Command Port setting.	• [Command Port Field]
[Media Port] Enables you to configure your Media Port setting.	• [Media Port Field]

RTSP Config

Menu item and description	Options
[RTSP Port] Enables you to configure your RTSP (Real Time Streaming Protocol) Port setting.	• [RTSP Port Field]

P2P Config

Menu item and description	Options
[P2P] Allows you to either Enable or Disable P2P (Peer 2 Peer) connections.	• [Enable] • [Disable]
[UID] Enables you to view the UID (Unique ID Number) which is used for P2P (Peer 2 Peer) connections.	
[Status] Enables you to view the status of your P2P (Peer 2 Peer) connection.	• [Online] • [Offline]

Code Config

The *[Code Config]* subsection contains a set of changeable video stream, audio and image capture configuration settings.

Code Parameters

Menu item and description	Option(s)
[Stream Type] [7] — (Main Stream / Sub Stream tabs) Enables you to view the camera stream type. By default, the Stream Type setting is set to Video Stream.	• *[Video & Audio Stream]* • *[Video Stream]*
[Video Codec] [8] — (Main Stream / Sub Stream tabs) Enables you to change the Video Codec between H.264 (Advanced Video Coding) and H.265 (High-Efficiency Video Coding). By default, the Video Codec setting is set to H.264. The H.264 (Advanced Video Coding) setting requires lower processing power at the cost of a higher storage space and bandwidth requirement. The H.265 (High-Efficiency Video Coding) setting requires lower storage space and bandwidth at the cost of a higher processing power.	• *[H.264]* • *[H.265]*
[Resolution] — (Main Stream / Sub Stream tabs) Enables you to change the camera streaming resolution. It is recommended that you change this setting to best match the resolution of your display. Screen resolutions for Raymarine® multifunction displays can be found within the relevant LightHouse™ Operation instruction manuals.	Main Stream: • *[3MP (2304*1296)]* • *[1080P (1921*1080)]* • *[720P (1280*720)]* Sub Stream: • *[448P (800*448)]* • *[D1 (704*576)]* • *[360P (640*360)]* • *[CIF (352*288)]*

Menu item and description	Option(s)
[I Frame Interval] — (Main Stream / Sub Stream tabs) Enables you to change the number of subsequent frames (delta frames) that occur between each I-frame. Increasing the I Frame Interval causes a lower amount of storage space and bandwidth to be used, at the cost of a worsened image quality. Decreasing the I Frame Interval causes a higher amount of storage space and bandwidth to be used, at the benefit of an improved image quality.	• *[1] — [200]*
[FPS] — (Main Stream / Sub Stream tabs) Enables you to change the FPS (Frame Per Second) value. A higher frame rate will typically ensure a better video quality, but will require more storage space and a higher bandwidth. A lower frame rate will typically provide a poorer video quality, but will ensure that less storage space and a lower bandwidth is required.	• *[1] — [30]*
[Rate Control] — (Main Stream / Sub Stream tabs) Enables you to change the Bit Rate Control settings. CBR (Constant Bit Rate) ensures a higher video quality at the cost of a higher storage and bandwidth requirement. VBR (Variable Bit Rate) ensures a lower storage and bandwidth requirement at the cost of a lower video quality.	• *[CBR]* • *[VBR]*

Menu item and description	Option(s)
[Bitrate] — (Main Stream / Sub Stream tabs) Enables you to either manually set the Bitrate or to choose from a list of pre-defined values. This setting is only available if you have set the Rate Control setting to CBR.	• *[Pre-defined]* • *[Manual Input]*
[Quality] — (Main Stream / Sub Stream tabs) Enables you to change the Quality setting. This setting is only available if you have set the Rate Control setting to VBR.	• *[Highest]* — *[Lowest]*

Note:

(7) The *[Video & Audio Stream]* setting is not supported by the CAM300.

(8) The *[H.265]* setting is not supported by Raymarine® multifunction displays at this time.

Audio Parameters

The settings found within this section are not supported by the CAM300.

Capture Configuration

The settings found within this section are not supported by the CAM300.

Alarm Config

The settings found within this section are not supported by the CAM300.

System Config

The *[System Config]* submenu contains a set of changeable time and date settings, user-management settings, PTZ (Pan-tilt-zoom) settings and a viewable device information page.

Time Setting

Menu item and description	Option(s)
[Date Format] — (Date / Time tab) Enables you to change the date format. If the Time Display setting has been enabled under *[Camera Config > OSD Config > Time Display > Enable]*, any change made here will be reflected upon the onscreen display.	• *[YY-MM-DD]* • *[MM-DD-YY]* • *[DD-MM-YY]*
[Time Format] — (Date / Time tab) Enables you to change the time format. If the Time Display setting has been enabled under *[Camera Config > OSD Config > Time Display > Enable]*, any change made here will be reflected upon the onscreen display.	• *[12 Hour]* • *[24 Hour]*
[Device Date Time] — (Date / Time tab) Enables you to synchronize the camera's time and date settings with the time and date settings of a connected device. To synchronize the camera's time and date settings, press the button located on the right hand side of the table.	• *[Sync with PC date time]*

Menu item and description	Option(s)
[NTP Timing] — (Date / Time tab) Allows you to Enable or Disable Network Time Protocol settings.	• *[Open]* • *[Close]*
[Time Zone] — (Date / Time tab) Enables you to select between 37 different time zones. This setting is only available if you have set the NTP Timing setting to Open.	• *[GMT -12:00]* — *[GMT +13:00]*
[Sync Interval] — (Date / Time tab) Enables you to select how often the camera's time and date settings are (re)synchronized. This setting is only available if you have set the NTP Timing setting to Open.	• *[01 Hour]* — *[12 Hour]*
[Server Address] — (Date / Time tab) Enables you to select between 8 preset internet time servers or to input a different time server manually by typing into the Server Address box. If you are experiencing accuracy issues with your camera's time and date settings, it is recommended that you try a different server. This setting is only available if you have set the NTP Timing setting to Open.	• *[pool.ntp.org]* • *[time.win-dows.com]* • *[time.nist.gov]* • *[time-nw.nist.gov]* • *[ntp1.inrim.it]* • *[time.kriss.re.kr]* • *[time.nuri.net]* • *[time.apple.com]*
[Enable DST] — (DST tab) Allows you to enable or disable the DST (Daylight Saving Time) settings.	• *[Open]* • *[Close]*

Menu item and description	Option(s)
[Daylight Saving Time Mode] — (DST tab) Enables you to change the Daylight Saving Time settings format between either a drop-down calendar or a MM-DD formatted cascade menu. This setting is only available if you have set the Enable DST setting to Open.	• *[Date]* • *[Week]*
[Time Offset] — (DST tab) Enables you to change the amount of time that is offset during the DST (Daylight Saving Time) start and end dates. This setting is only available if you have set the Enable DST setting to Open.	• *[1 Hour]* • *[2 Hour]*
[Start Time] — (DST tab) Enables you to select when DST (Daylight Saving Time) starts. This setting is only available if you have set the Enable DST setting to Open.	• *[Month / Date / Day — H / M / S]*
[End Time] — (DST tab) Enables you to select when DST (Daylight Saving Time) ends. This setting is only available if you have set the Enable DST setting to Open.	• *[Month / Date / Day — H / M / S]*

User Management

Menu item and description	Option(s)
[Enable / Disable] Allows you to Enable or Disable up to 5 user accounts which can access the camera's live video feed. Additional user accounts **are not** able to modify device parameters.	• *[Enable]* • *[Disable]*
[Password] [9] Enables you to set, change and remove pre-existing account passwords. Passwords must be 8 to 16 characters long and can contain digits, lower case and upper case letters.	• *[Password Field]*

Important:

(9) Raymarine® recommends that you do not set a password, as the CAM300 does not contain a password reset process.

Note:

(9) If a password has been set for the Web browser user interface's administrator account, image flip functionality via a dedicated multifunction display camera / video app will be prevented.

Device Info

Menu item and description	Option(s)
[Device Name] Enables you to view the camera name.	
[Device Model] Enables you to view the camera model.	
[Device Serial Number] Enables you to view camera's serial number.	

Menu item and description	Option(s)
[Software Version] Enables you to view camera software version.	
[WEB Version] Enables you to view camera WEB version.	
[Alarm Input Number] [2] N / A	
[Alarm Output Number] [2] N / A	
[Voice Talk] [2] N / A	

Note:

(2) This setting is not supported by the CAM300.

PTZ Setting

The settings found within this section are not supported by the CAM300.

System Maintain

The *[System Maintain]* subsection contains a set of changeable automatic maintenance schedules, firmware update options and factory reset options.

Auto Reboot

Menu item and description	Option(s)
[Maintenance Mode] Enables you to change how often the camera will enter a self-maintenance mode.	• *[Disable]* • *[Every Day]* • *[Every Week]* • *[Once]*
[Week Plan] Enables you to select which day(s) of the week the camera will automatically reboot. This setting is only available if you have set the Maintenance Mode setting to Every Week.	• *[Sun]* • *[Mon]* • *[Tue]* • *[Wed]* • *[Thu]* • *[Fri]* • *[Sat]*
[Maintenance Time] Enables you to select what time the scheduled maintenance will begin. This setting is only available if you have set the Maintenance Mode setting to either Every Day, Every Week, or Once.	• *[00:00] — [23:59]*
[Next Maintenance Time] Enables you to view when the next maintenance period is scheduled. This setting is only available if you have set the Maintenance Mode setting to either Every Day or Every Week.	

Firmware Update

The settings found within this section are not supported on a multifunction display, and will not function unless you are using the Web browser user interface in Internet Explorer or Microsoft Edge's Internet Explorer mode (Windows 10 / 11).

Note:

For information on the settings found within this section and how to enable Microsoft Edge's Internet Explorer mode, refer to the appendix:

- **p.87 — Enabling Internet Explorer mode on Microsoft Edge (Windows 10 / 11)**

- **p.87 — Internet Explorer dependent settings**

Restore Default

Menu item and description	Option(s)
[Simple Recovery] Enables you to reset the camera settings back to factory default. The Web browser user interface may stop responding once you have pressed the Save button. If this occurs, it is recommended that you wait until the camera starts to respond.	• *[Selected]* • *[Unselected]*
[Full Recovery] Enables you to reset **both** the camera settings and IP address back to factory default. The Web browser user interface may stop responding once you have pressed the Save button. If this occurs, it is recommended that you wait until the camera starts to respond. The camera IP address will change after initiating a Full Recovery. For instructions on how to find out the camera's IP address, refer to the following section: **p.47 — Camera setup via Windows 10 or Apple Mac PC**	• *[Selected]* • *[Unselected]*
[Reboot] Enables you to power reboot the camera. If you are experiencing problems with the CAM300, it is recommended that you perform a Reboot before attempting either the Simple Recovery or Full Recovery option. The Web browser user interface may stop responding once you have pressed the Save button. If this occurs, it is recommended that you wait until the camera starts to respond.	• *[Selected]* • *[Unselected]*

Local Setting menu

The settings found within this section are not supported by the CAM300.

CHAPTER 14: AUGMENTED REALITY

CHAPTER CONTENTS

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® or , Axiom® 2 display, an AR200 sensor, and a compatible camera.

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 Augmented Reality (optional)

The CAM300 can be optionally used with a Raymarine® LightHouse™ 4 multifunction display running version 4.1 (or above) and a AR200 to enable ClearCruise™ Augmented Reality features. Below is a system example which shows the components and connections required to enable ClearCruise™ Augmented Reality on your system.
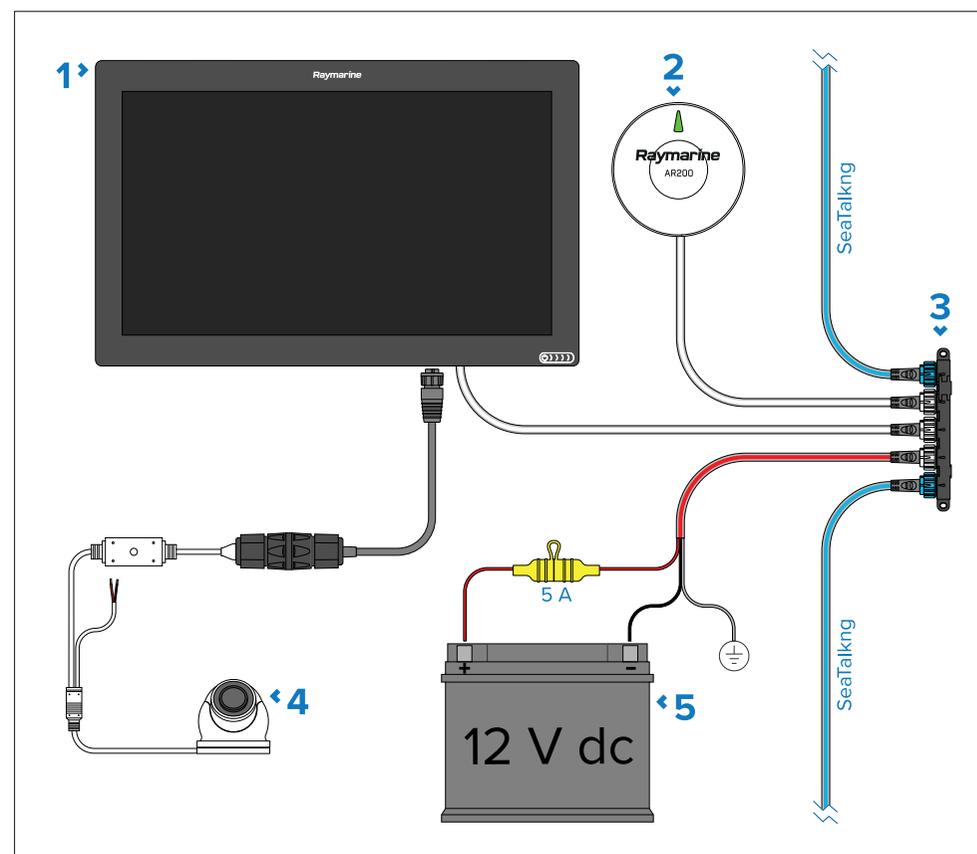
1. PSE (Power Sourcing Equipment) providing PoE (Power over ethernet) to the camera (Axiom XL currently illustrated).

2. AR200 (E70537 — **not supplied**).

3. SeaTalkng ® backbone.

4. CAM300 connected to a PSE (Power Sourcing Equipment).

5. 12 V dc power supply providing power to the SeaTalkng ® backbone.

> **Note:**
>
> ClearCruise™ Augmented Reality is not available via the CAM300's Web browser user interface.
>
> For more information on ClearCruise™ Augmented Reality, please refer to the LightHouse™ 4 Advanced Operation Instructions (**81406**).

CHAPTER 15: MAINTENANCE

CHAPTER CONTENTS

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

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

Before packing and shipping, all Raymarine® products are subjected to comprehensive testing and quality assurance programs. If you do experience problems with your product, this section will help you to diagnose and correct problems to restore normal operation.

If after referring to this section you are still having problems with your product, please refer to the *Technical support* section of this manual for useful links and Raymarine® Product Support contact details.

16.2 Power connection troubleshooting

PoE allocation always takes priority over the dedicated power supply. If you are connecting the camera to a PSE (Power Supplying Equipment), ensure that the camera's dedicated power cable **IS NOT** connected, or alternatively re-configure the network so the camera is plugged into a non-PoE ethernet connection.

> ⚡ **Warning: Powering PoE devices**
>
> PoE devices can often be powered via an ethernet connection (PoE) OR via a dedicated power cable.
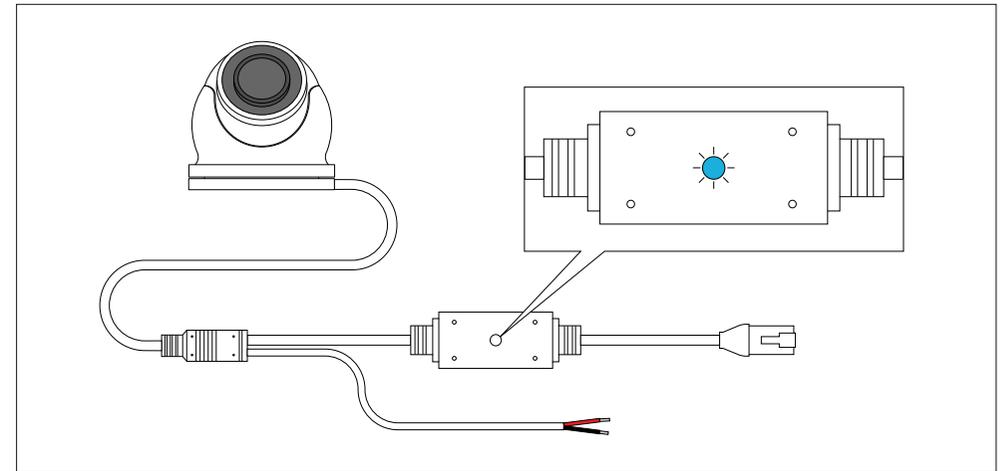>
> NEVER connect a PoE device's dedicated power cable when it is being supplied PoE.
>
> When the PoE device's dedicated power cable is not connected, any bare end wire connections must be separately covered with insulation.

16.3 PoE power connection troubleshooting

Before troubleshooting problems with your PoE (Power over Ethernet) power connection, ensure that you have read and followed the power connection guidance provided and performed a power cycle/reboot of the device. The troubleshooting information below can be used if you are experiencing problems when powering your product via PoE.

Example: PoE LED

Troubleshooting issue	User action(s)
Flashing (blue) — Transferring data:	• Normal operation — no user action is required.
Light off (no color) — Powered OFF:	• Ensure that the Ethernet cable is connected correctly and that connections are secure. • Ensure that the PSE (Power Sourcing Equipment) is switched on and has sufficient remaining power allocation to power the camera.

16.4 Non-PoE power connection troubleshooting

Before troubleshooting problems with your non-PoE (non-Power over Ethernet) power connection, ensure that you have read and followed the power connection guidance provided and performed a power cycle/reboot of the device. The troubleshooting information below can be used if you are experiencing problems when powering your product via non-PoE.

Troubleshooting issue	User action(s)
Camera does not power on:	• Ensure that the power supply meets the camera's power requirements. • Ensure that the power supply is switched on. • Ensure power cables are correctly connected and that connections are secure. For information on the camera power requirements, refer to the following section: **p.78 — Technical specification**

16.5 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 MFD and camera are physically connected to the same network. • Ensure that your MFD is running the latest software version.

Troubleshooting issue	User action(s)
	• Try power cycling the camera while leaving your MFD powered. • Ensure that the *[IP Type]* and *[Auto IP]* settings found within the Web browser user interface under: *[Remote Setting > Network Config > Network Config]* are both set to default.
Camera shown under the multifunction display network list, but no video is displayed:	The CAM300 video feed can be displayed across a maximum of 3 Raymarine® multifunction display Video apps at the same time. • Using the Video application on your MFD, cycle through the available camera feeds to see if the camera image is displayed. • Ensure that the selected *[Video Codec]* setting found within the Web browser user interface under: *[Remote Setting > Code Config > Code Parameters]* is supported by your multifunction display. By default, the *[Video Codec]* setting is set to *[H.264]*. • Ensure that the *[Privacy Zone]* setting found within the Web browser user interface under: *[Remote Setting > Camera Config > Privacy Zone]* is set to *[Off]*. • If the administrator account is currently secured by a password, remove the password and then power cycle your multifunction display before reattempting to view the camera's video display.
Raymarine® LightHouse™ 4 multifunction display image flip functionality prevented / not working via the MFD Video app.	• Ensure that your multifunction display is running software version 4.1.140 or later. • If the administrator account is currently secured by a password, remove the password and then power cycle your multifunction display before reattempting to flip the camera's image.

Troubleshooting issue	User action(s)
Video performs poorly (insufficient bandwidth):	• Select an alternate stream to conserve bandwidth and performance on low bandwidth connections via the Web browser user interface's User Login page.

Troubleshooting issue	User action(s)
Cannot find the camera's IP address (PC connection):	By default, the camera is set to obtain an IP address by DHCP, which means it will automatically obtain an IP address from the network. 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 your PC and camera are configured for the same IP address range and subnet mask (IPv4).
	• Try to Ping the camera's IP address. On your PC, search and open the *[Command Prompt]* application via the window's search bar at the bottom left hand side of your screen. Once the *[Command Prompt]* application has opened, type *[ping]* then the camera's local IP address in the following format: **http://xxx.xx.x.xxx** and press *[Return]*. If you get a 'request timed out' message, the PC and camera are not on the same network or the camera is not connected. The camera is connected if you receive a reply.
	• Ensure any VPN software installed on your PC is disabled.
	• Attempt to use either the ONVIF Device Manager or the diagnostic product information of a MFD running on the same network in order to find the camera's IP address. For instructions on how to find your camera's IP address, refer to the following section: **p.47 — Camera setup and operation via Windows 10 or Apple Mac PC**
Web browser user interface setting does not work:	• Ensure that you have read and understood the relevant setting information.
	• Ensure that you have selected *[Save]* to confirm your setting changes.

16.6 Resetting the camera

If you are experiencing problems with the camera which cannot be resolved by using the troubleshooting guidance provided, you may need to perform a factory reset by using the Web browser user interface *[Simple Recovery]* or *[Full Recovery]* settings found within: *[Remote Setting > System maintenance > Restore default]*.

For further information on the *[Simple Recovery]* and *[Full Recovery]* settings, refer to the following section: **p.53 — Remote Setting menu**

16.7 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 MFD. • 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 MFD from which you are using the AR features. • Ensure that your MFD is running LightHouse™ 4 version 4.1 or above. • The Compass bar, AIS, Waypoint and Chart object flags can be enabled and disabled from the *[ClearCruise]* settings page: *[Video app > Menu > Settings > ClearCruise]*. 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 90° when using AR with a CAM300 due to the camera's fisheye lens. • 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 a MFD 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.29 — Mounting**

CHAPTER 17: TECHNICAL SUPPORT

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17.1 Raymarine product support and servicing

Raymarine provides a comprehensive product support service, as well as warranty, service, and repairs. You can access these services through the Raymarine website, telephone, and e-mail.

Product information

If you need to request service or support, please have the following information to hand:

- Product name.
- Product identity.
- Serial number.
- Software application version.
- System diagrams.

You can obtain this product information using diagnostic pages of the connected display.

Servicing and warranty

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

Don't forget to visit the Raymarine website to register your product for extended warranty benefits: https://www.raymarine.com/en-us/support/product-registration

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

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

United States (US):

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

Web support

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

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

Worldwide support

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

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

United States (US):

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

Australia and New Zealand (Raymarine subsidiary):

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

France (Raymarine subsidiary):

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

Germany (Raymarine subsidiary):

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

Italy (Raymarine subsidiary):

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

Spain (Authorized Raymarine distributor):

- E-Mail: sat@azimut.es
- Tel: +34 96 2965 102

Netherlands (Raymarine subsidiary):

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

Sweden (Raymarine subsidiary):

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

Finland (Raymarine subsidiary):

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

Norway (Raymarine subsidiary):

- E-Mail: support.no@raymarine.com

- Tel: +47 692 64 600

Denmark (Raymarine subsidiary):

- E-Mail: support.dk@raymarine.com

- Tel: +45 437 164 64

Russia (Authorized Raymarine distributor):

- E-Mail: info@mikstmarine.ru

- Tel: +7 495 788 0508

Diagnostic product information

Diagnostic product information can be viewed and exported from a Raymarine® LightHouse multifunction display, for supported products networked using RayNet, RJ45, or SeaTalkng ® / 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.75 — 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 multifunction display.

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:

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

Technical support forum

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

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

CHAPTER 18: TECHNICAL SPECIFICATION

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18.1 Physical specification

Specification	
Base diameter:	59.5 mm (2.34 in)
Height:	52.9 mm (2.08 in)
Weight:	0.420 kg (0.926 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:	1 W Nominal @ 12 V DC / 1.8 W Maximum (LEDs ON)
Current:	<150 mA (Maximum) @ 12 V DC
Power over Ethernet:	PoE Class 1 (1.8 W Max) device (IEEE802.3af)
Inline fuse rating:	250 mA
Thermal breaker rating:	3 A
IEEE Standard:	IEEE802.3af

18.3 Environmental specification

Specification	
Operating temperature:	– 20° C (– 4° F) to + 65° C (149° F)
Storage temperature:	– 30° C (– 22° F) to + 65° C (149° F)
Relative humidity:	up to 85% @ 65° C (149 °F)
Waterproof rating:	IPx6

18.4 Camera specification

Specification	
ONVIF version:	21.06 master version
Sensor / DSP:	1/4" CMOS Sensor
Scanning system:	Progressive scan
Total pixels:	2304 (H) x 1296 (V)
Illumination:	6 x 850nm Infrared - 10 meter range
Lens / Field of View:	1.8mm Standard (125° Horizontal FoV x 70° Vertical FoV)
Day / Night:	True day / night operation with mechanical IR cutout filter
Automatic Gain Control:	Supported / Multiple Levels
Mirroring:	Horizontal & Vertical — configured via the Web browser user interface

18.5 Video specification

Specification	
Compression:	H.264
Resolutions:	2304 x 1296 (3MP) Max
Video Processing:	H.264 Codec / Dual Stream
Frame Rate:	30 fps
Bit Rate:	VBR / CBR 256KB/s ~ 12.3 MB/s
Bit Rate Control:	H.264 CBR / VBR

18.6 Conformance specification

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

CHAPTER 19: SPARES AND ACCESSORIES

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19.1 Spares and accessories

The following spare parts and accessories are available for your product:

- **E70537** — AR200 SeaTalkng ® Augmented Reality Sensor.
- **4113746** — 12 V Power over Ethernet (PoE) Injector.
- **4115028** — RJ45 to RJ45 waterproof coupler.

19.2 RayNet to RayNet cables and connectors

1

400 mm (1.3 ft)	2 m (6.56 ft)	5 m (16.4 ft)	10 m (32.8 ft)	20 m (65.6 ft)
A80161	A62361	A80005	A62362	A80006

2

10 m (32.8 ft)
A80512

3 R70014

4 A80262

5

100 mm (3.9 in)
A80162
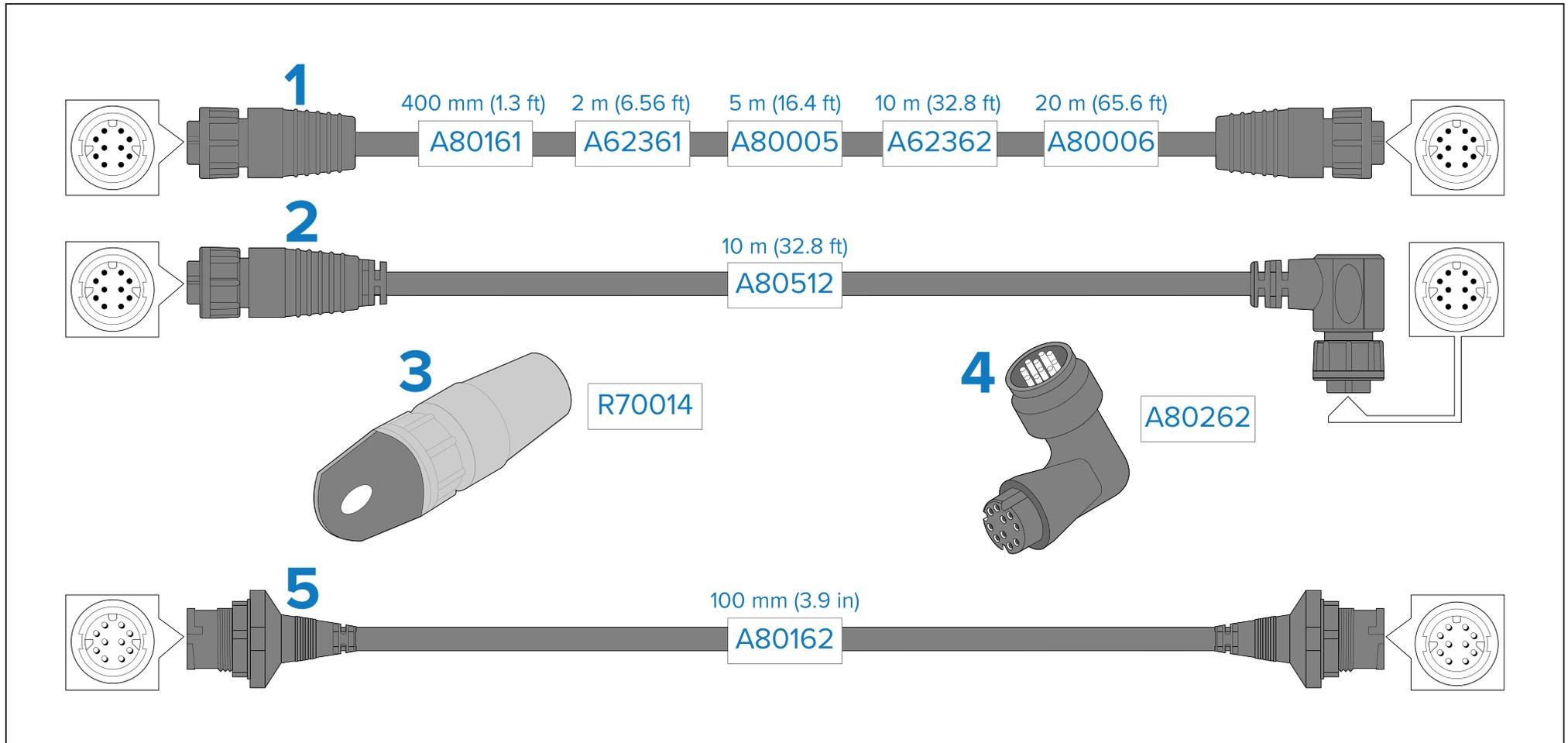
1. Standard RayNet connection cable with a RayNet (female) socket on both ends.

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 (SeaTalkhs) adapter cables

1 400 mm (1.3 ft) A80160

2 100 mm (3.9 in) A80247

3 400 mm (1.3 ft) A80272

4 100 mm (3.9 in) A80513

5 3 m (9.84 ft) A80276

6 1 m (3.28 ft) A62360 | 3 m (9.84 ft) A80151 | 10 m (32.8 ft) A80159 | 30 m (98.4 ft) 308-251-30-00

7 30 m (98.4 ft) 308-252-30-00
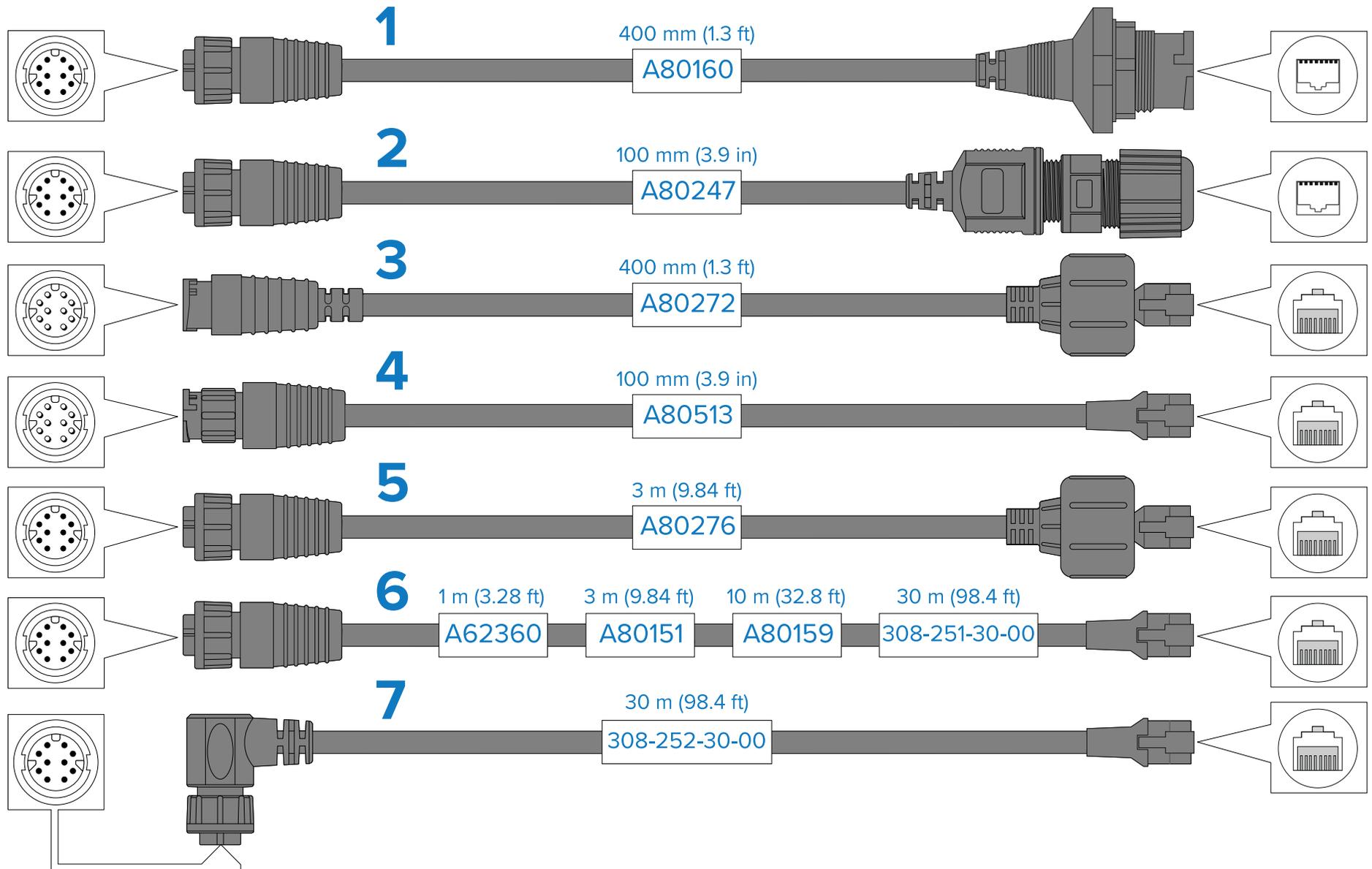
1. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalkhs ®) socket on the other end, accepting the following cables with an RJ45 (SeaTalkhs ®) waterproof locking (male) plug:

   - A62245 (1.5 m).

   - A62246 (15 m).

2. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalkhs ®) 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 (SeaTalkhs ®) 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 (SeaTalkhs ®) 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 Enabling Internet Explorer mode on Microsoft Edge (Windows 10 / 11)

To enable the Internet Explorer compatibility mode on Microsoft Edge, follow the steps listed below:

1. Click the *[. . .]* menu cascade located at the top right hand of the screen.
2. Click *[Settings]*.
3. Click *[Default browser]*.
4. Set the *[Allow sites to be reloaded in Internet Explorer mode]* setting to *[Allow]*.
5. Click the blue *[Restart]* button to apply the previous changes.
6. Once on the page that you wish to open in Internet Explorer compatibility mode, click the *[. . .]* menu cascade located at the top right hand of the screen.
7. Click *[Reload in Internet Explorer mode]*.

Appendix B Internet Explorer dependent settings

The following CAM300 Web interface settings require Internet Explorer or Microsoft Edge's Internet Explorer mode in order to function.

Important:

Raymarine® does not warrant that these settings will work without the use of a discontinued browser.

Intelligent detection

Menu item and description	Option(s)
[Enable] — (*Human Shape Detection* tab) Allows you to Enable or Disable the *Human Shape Detection* setting, which causes a green stick-figure icon to be displayed on the browser interface when a human shape is detected by the camera.	• *[Enable]* • *[Disable]*
[Sensitivity] — (*Human Shape Detection* tab) Enables you to change the sensitivity of the *Human Shape Detection* setting. This setting is only available if you have Enabled the *Human Shape Detection* setting.	• *[High]* • *[Middle]* • *[Low]*
[Enable] — (*Motion* tab) Allows you to Enable or Disable the *Motion Detection* setting, which causes a green 'M' to be displayed in the browser interface when motion is detected by the camera. Additional onscreen indicators can be triggered via the *Motion Detection* setting. These onscreen indicators can be found within the following section: *[AI Intelligence > Overlay Settings]*.	• *[Enable]* • *[Disable]*
[Sensitivity] — (*Motion* tab) Enables you to change the sensitivity of the *Motion Detection* setting. This setting is only available if you have enabled the *Motion Detection* setting.	• *[High]* • *[Middle]* • *[Low]*

Menu item and description	Option(s)
[Schedule] [3] — (Schedule tab) Enables you to select which times and days of the week you wish the camera's detection settings to trigger. By default, the entire Schedule grid will be automatically highlighted green (enabled). • To enable an hour period, click the corresponding cell to turn it green. • To disable an hour period, click the corresponding cell to turn it gray. • To enable or disable multiple cells at once, click and drag starting from the top left, and down to the bottom right of the cell block that you wish to change.	• [All Day] • [Manual Input]
[Defense Area] — (Defense Area tab) Enables you to select a Defense Area on the video feed preview which will be monitored for activity. Any activity outside of the defined area will not be monitored by the camera for alarm activity. • To add a Defense Area, click and drag one of the 6 preset shapes located on the right hand side of the screen to the view feed preview. • To move a Defense Area, click and drag the frame of the shape to your desired position. • To adjust a Defense Area, click and drag one of the red points to change the frame to your desired shape. • To clear all Defense Areas drawn, click the [CLEAR] button located underneath the video preview. This setting will only function if you have enabled either the Human Shape Detection or Motion Detection feature.	• [Triangle] • [Rectangle] • [Pentagon] • [L-shape] • [Heptagon] • [T-shape] • [CLEAR]

Overlay settings

Menu item and description	Option(s)
[Human Frame] Enables you to select whether a box is displayed around a "humanoid" object when motion is detected by the camera. The box will follow the "humanoid" object as it moves within the frame. This feature can be toggled On and Off for both the camera's Main Stream and Subcode Stream. This feature will detect motion across the entire frame unless you have defined a specific Defense Area. This feature will run permanently unless you have defined a specific Schedule.	• [On] • [Off]
[Protective Frame] Enables you to select whether a colored box is displayed around the Web browser window if an alarm is triggered. The box will change color from green (no activity detected) to red (activity detected) if alarm activity is detected. This feature can be toggled On and Off for both the camera's Main Stream and Subcode Stream. This feature will detect motion across the entire frame unless you have defined a specific Defense Area. This feature will run permanently unless you have defined a specific Schedule.	• [On] • [Off]

Firmware Update

Menu item and description	Option(s)
[Upgrade file path] Enables you to select and update the camera's firmware from a file located on your local drive. Firmware update files can be downloaded from the Raymarine® website: www.raymarine.com/software If in doubt as to the correct procedure for updating your product software, refer to your dealer or Raymarine technical support.	• *[Scan]* • *[Upgrade]*

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Upgrading, *See* Software updates

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