JCU-4

INSTALLATION & OPERATION INSTRUCTIONS

English (en-US)
Date: 04-2025
Document number: 71007 (Rev 1)

FLIR®

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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.
- Certified installation by an approved installer is recommended. A certified installation qualifies for enhanced product warranty benefits. Contact your dealer for further details.

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.

Warning: High voltage

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

Warning: Ensure safe navigation

This product is intended only as an aid to navigation and must never be used in preference to sound navigational judgment. Only official government charts and notices to mariners contain all the current information needed for safe navigation, and the captain is responsible for their prudent use. It is the user's responsibility to use official government charts, notices to mariners, caution and proper navigational skill when operating this or any other product.

Warning: Maintain a permanent watch

Always maintain a permanent watch, this will allow you to respond to situations as they develop. Failure to maintain a permanent watch puts yourself, your vessel and others at serious risk of harm.

Product warnings

Warning: Product grounding

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

Warning: Positive ground systems

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

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: Ensure all equipment has isolated power supply

This product has an isolated power supply. To prevent potential damage to equipment, it is recommended that any external equipment connected to this product also has an isolated power supply.

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: Sun covers

- If your product is supplied with a sun cover, to protect against the damaging effects of ultraviolet (UV) light, always fit the sun cover when the product is not in use.
- To avoid potential loss, sun covers must be removed when travelling at high speed, whether in water or when the vessel is being towed.

Caution: Do not open the unit

The unit is factory sealed to protect against atmospheric humidity, suspended particulates and other contaminates. It is important that you do not open the unit or remove the casing for any reason. Opening the unit will:

- compromise the seal with possible damage to the unit, and
- void the manufacturer's warranty.

Caution: Service and maintenance

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

Regulatory notices

Water ingress

Water ingress disclaimer

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

Disclaimer

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

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

EMC installation guidelines

FLIR 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:

- FLIR 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.
- FLIR specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation manual.

Note:

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

Suppression ferrites

- 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 the manufacturer 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.
- If your installation requires long cable runs, you may need to fit additional ferrites to maintain acceptable EMC performance.

Connections to other equipment

Requirement for ferrites on non-FLIR cables:

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

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

Declaration of Conformity

Raymarine UK Ltd declares that the following products are in compliance with the EMC Directive 2014/30/EU:

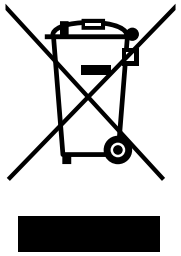
- JCU-4, part number: E70695
- JCU-4 (Joystick only), part number: E70697

The original Declaration of Conformity certificate may be viewed on the relevant product page at www.bit.ly/JCU-4-docs

Product disposal

Dispose of this product in accordance with the WEEE Directive.

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



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

Warranty policy and registration

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

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

IMO and SOLAS

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

Technical accuracy

To the best of our knowledge, the information in this document was correct at the time it was produced. However, FLIR 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, FLIR cannot accept liability for any differences between the product and this document. Please check the FLIR website (www.flir.com/marine/support) to ensure you have the most up-to-date version(s) of the documentation for your product.

Publication copyright

CHAPTER 2: DOCUMENT INFORMATION

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2.1 Applicable products

This document is applicable to the following products:

- JCU-4, part number: E70695
- JCU-4 (Joystick only), part number: E70697

2.2 Product documentation

The following documentation is applicable to your product:

Applicable documents:

Part number	Description
71007	JCU-4 Installation and Operation Instructions (this document)
77011	JCU-4 Mounting Template

Related documents:

Part number	Description
71001	M100-Series / M200-Series Installation and Operation Instructions
71004	M300-Series Thermal Camera Installation and Operation Instructions
432–0012–02–10	M400-Series Camera Operation Instructions
432–0012–01–10	M500-Series Camera Operation Instructions

Printed (hardcopy) product manuals

Raymarine / FLIR Maritime provides a Print Shop service, enabling you to purchase a high-quality, professionally-printed manual for your FLIR product, delivered directly to your door.

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

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

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

Supplier	Book purchase link
lulu	www.bit.ly/jcu4-book

Note:

- Accepted methods of payment for printed manuals are credit cards and PayPal.
- Printed manuals can be shipped worldwide.
- Further manuals will be added to the Print Shop over the coming months for both new and legacy products.
- User manuals are also available to download free-of-charge from the Raymarine website, in the popular PDF format. These PDF files can be viewed on a PC / laptop, tablet, smartphone, or on the latest generation of Raymarine multifunction displays.

2.3 Applicable software version

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

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

Product	Software version
JCU-4	v1.0.12

Check the website for the latest software:

JCU-4 **software download link**
www.bit.ly/jcu4-download

2.4 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.

CHAPTER 3: PRODUCT AND SYSTEM OVERVIEW

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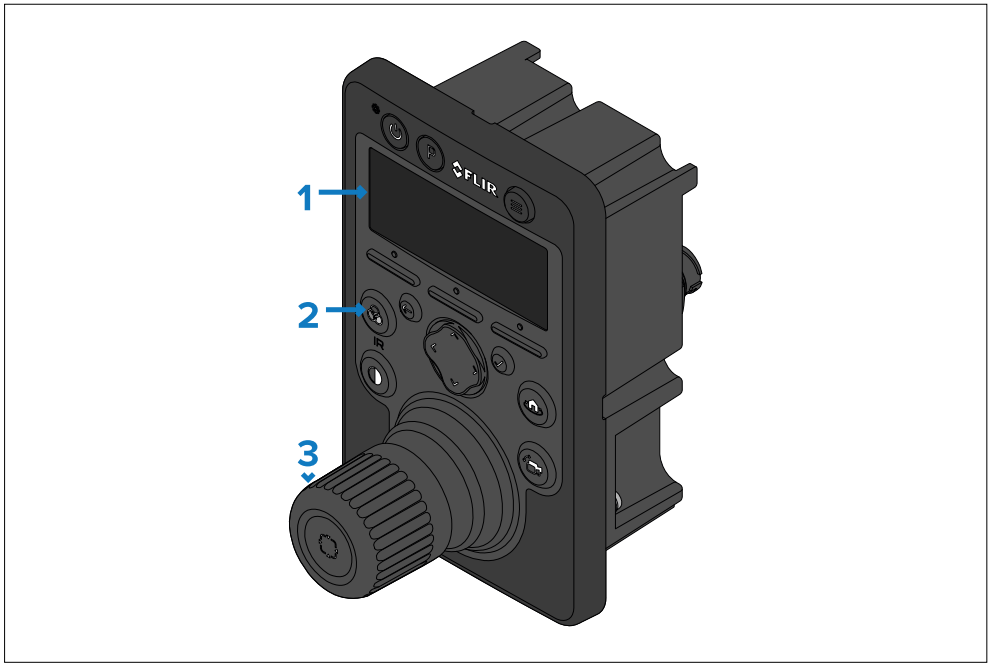
3.1 Product overview

The JCU-4 joystick control unit is an ultra-compact wired remote keypad designed to control single or multiple FLIR maritime cameras without the use of an additional control interface, such as a multifunction display / chartplotter. With two power options (Direct power and Power over Ethernet (PoE)) and the ability to be retrofitted to an existing FLIR JCU-1 or JCU-2 cut-out, the JCU-4 is ideal for providing control of your camera(s) from the required location(s) onboard your vessel.



1. LCD screen.
2. Keypad buttons.
3. Joystick.

The JCU-4 has the following key functions and features:

- IP connectivity to simplify installation and system integration.
- 2.9” backlit LCD screen for displaying camera information and menu options.
- 12 interactive buttons (including 3 user-programmable buttons, which can be re-assigned via the camera’s Web interface).
- An 8-way navigational pad which is used to navigate the JCU-4’s menus, the camera’s *[On-screen Display]* menus, and can optionally be used to pan and tilt the selected camera.
- Dedicated 3-axis joystick control which can be used to pan, tilt, and zoom (PTZ) the selected camera, and enter the *[Video tracking]* mode (M400XR / M500-Series only).
- Can be retrofitted to the mounting cutout of an existing FLIR JCU-1 or JCU-2.
- Supports direct power connection @ 12 / 24 V dc nominal supply voltage, or Class 2 Power over Ethernet (PoE) @ 48 V nominal supply voltage.
- Low power consumption — 5 W maximum at full illumination.
- Dedicated secondary RayNet (Ethernet) connector for configuration and diagnostic purposes.
- Waterproof to IPx6 (suitable for above or below decks installation).

3.2 Required additional components

This product forms part of a system of electronics and requires some or all of the following additional system components in order to fully function.

Component	Examples	More information
Power Sourcing Equipment (PSE)	• PoE Injector • PoE network switch)	**p.71 — Spares and accessories**
Compatible FLIR maritime camera	• M100-Series • M200-Series • M300-Series	For a full list of all compatible cameras, refer to: **p.17 — Compatible FLIR maritime cameras**

Component	Examples	More information
Ethernet network switch (Required in larger systems featuring multiple IP devices)	• 10/100/1000 Mbits/s network switches featuring RayNet connectors. • 10/100/1000 Mbits/s network switches featuring RJ45 connectors.	p.71 — Spares and accessories
Cable extensions	Network extension cables featuring RayNet or RJ45 connectors, as appropriate.	p.37 — Network cable extensions

3.3 Compatible FLIR maritime cameras

Your product can be used in conjunction with the following FLIR maritime cameras:

Camera series	Camera models
M100-Series:	M132
M200-Series:	M232
M300-Series:	M300, M332, M364, M364 C, M364 LR
M400-Series:	M400, M400XR
M500-Series:	M500
MD-Series:	MD324, MD625
M-Series: (2011 to 2016)	M324XP, M324L, M625XP, M625L, M612L, M618CS
M-Series Next Generation: (2017 to 2021)	M324S, M625S, M324CS, M625CS, M617CS

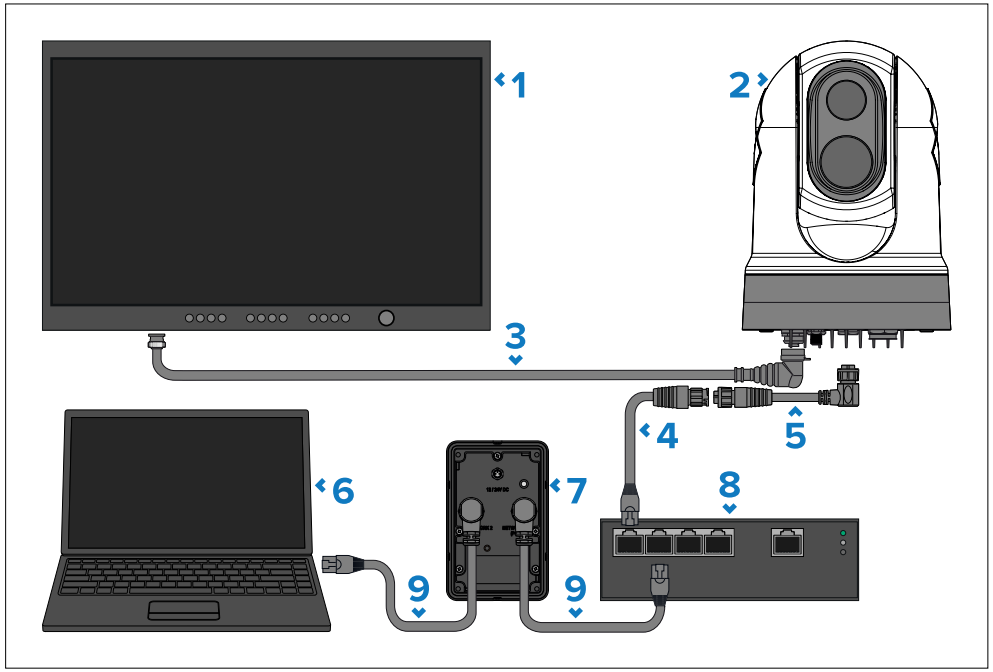
For more information on the cameras listed above, visit the FLIR website:
https://www.flir.co.uk/support/browse/marine/fixed-mount-thermal-cameras

3.4 System overview (example only)

The JCU-4 has a flexible array of connection options which enable you to integrate it with your electronics system.

With the right combination of devices and connections, you can use the JCU-4 to control a connected FLIR maritime camera's image from the most convenient locations on your vessel.

The following illustration shows a typical installation scenario. For more system configuration examples, ranging from small to large systems, refer to your FLIR maritime camera *Installation and Operation Instructions* manual:
www.bit.ly/FLIR-maritime-docs



Note:

Power connections are not shown in this illustration. For power connection information, refer to the instructions which accompany each device.

	Description
1	Digital video (SDI) monitor, available separately from third-party retailers.
2	M300-Series camera, available separately.
3	SDI video cable (BNC connectors), available separately.
4	RayNet (Ethernet) to RJ45 adapter cable, available separately.
5	Right-angled RayNet (Ethernet) to RayNet (Ethernet) cable, available separately.
6	Laptop — primarily intended for configuration and diagnostic purposes, available separately from third-party retailers.
7	JCU-4.
8	Non-PoE network switch, available separately from third-party retailers.
9	3 m (9.84 ft) Right-angled RayNet (Ethernet) to RJ45 adapter cable (1x supplied with E70695).

CHAPTER 4: PARTS SUPPLIED

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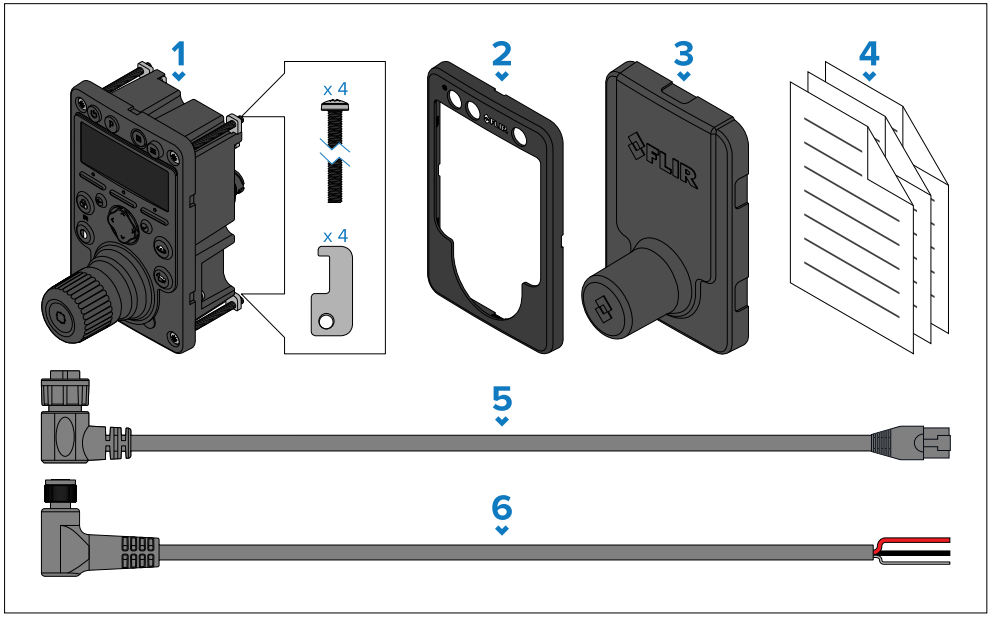
4.1 Parts supplied

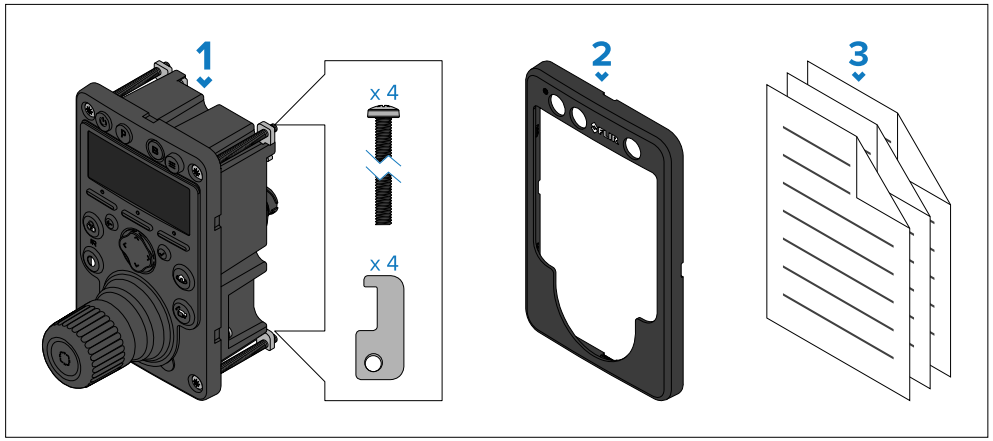
The following parts are supplied when ordering the JCU-4, part number: E70695



	Description
1	1x JCU-4 (includes 4x screws and 4x mounting plates pre-fitted).
2	1x Front cover.
3	1x Weather cover.
4	1x Documentation pack.
5	1x Right-angled RayNet (Ethernet) to RJ45 adapter cable, 3 m (9.84 ft).
6	1x Right-angled 3-pin power cable, 3 m (9.84 ft).

4.2 Parts supplied (Joystick only)

The following parts are supplied when ordering the JCU-4 (Joystick only), part number: E70697



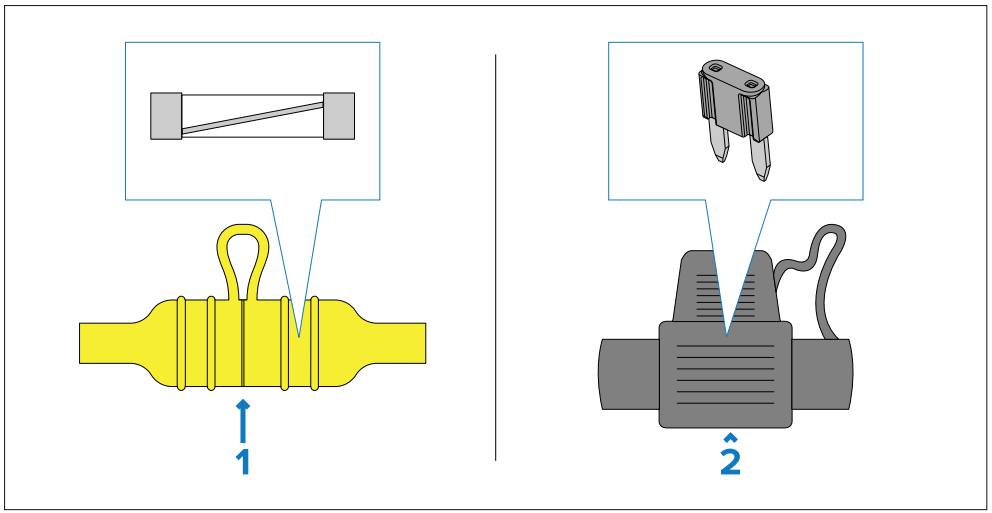
	Description
1	1x JCU-4 (includes 4x screws and 4x mounting plates pre-fitted).
2	1x Front cover.
3	1x Documentation pack.

4.3 Inline fuse requirement

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

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

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



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

Fuse ratings:

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

Inline fuse and thermal breaker ratings

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

Inline fuse rating	Thermal breaker rating
• **12 V**: 1A	• **12 V**: 1A
• **24 V**: 500mA	• **24 V**: 500mA

Note:

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

CHAPTER 5: PRODUCT DIMENSIONS

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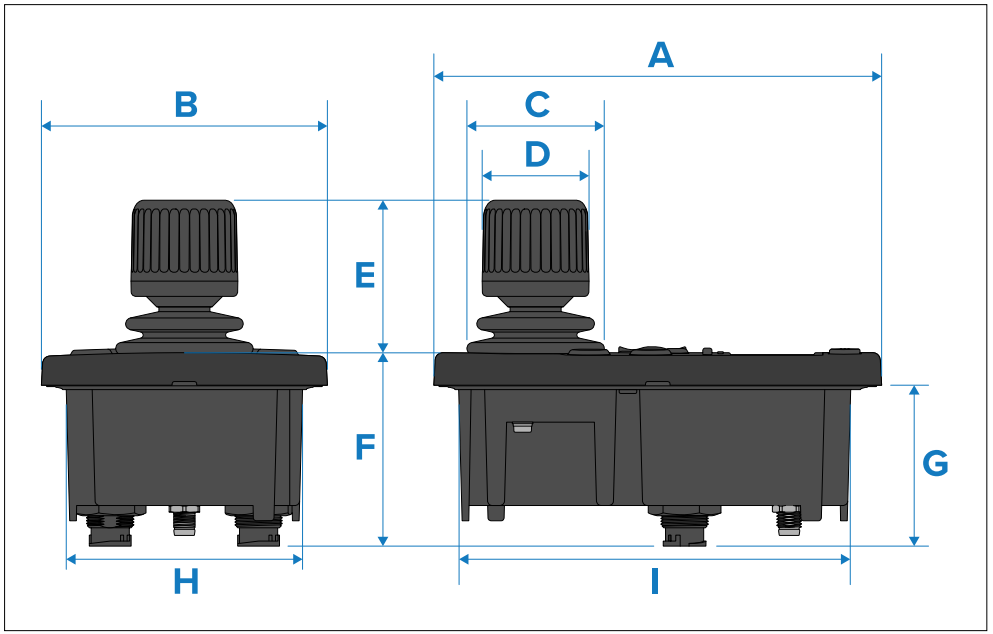
5.1 Product dimensions



	Description
A	146.66 mm (5.77 in)
B	93.66 mm (3.69 in)
C	44.99 mm (1.77 in)
D	35.00 mm (1.38 in)
E	49.94 mm (1.97 in)
F	63.36 mm (2.49 in)
G	52.71 mm (2.08 in)
H	77.50 mm (3.05 in)
I	130.00 mm (5.12 in)

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.

Factors for consideration:

- **Ventilation** — To ensure adequate airflow:
  - Ensure that product is mounted in a compartment of suitable size.
  - Ensure that ventilation holes are not obstructed. Allow adequate separation of all equipment.

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

6.3 Location requirements

When planning the installation location, consider the following points:

- Select a position on your vessel that is close to a display showing the camera video output.
- Before mounting the unit, consider the required minimum cable lengths and cable routing options available.
- Ensure the unit is mounted at least 1 m (3.28 ft) away from any equipment fitted with a magnetic compass.
- The unit must be mounted in the vertical (portrait) orientation.
- The unit must NOT be mounted higher than 2 m (6.56 ft) above the floor level at your selected mounting location.

6.4 EMC installation guidelines

FLIR 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:

- FLIR 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.
- FLIR 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.

6.5 Suppression ferrites

- 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 the manufacturer 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.
- If your installation requires long cable runs, you may need to fit additional ferrites to maintain acceptable EMC performance.

6.6 Connections to other equipment

Requirement for ferrites on non-FLIR cables:

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

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

6.7 Compass safe distance

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

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

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

CHAPTER 7: MOUNTING

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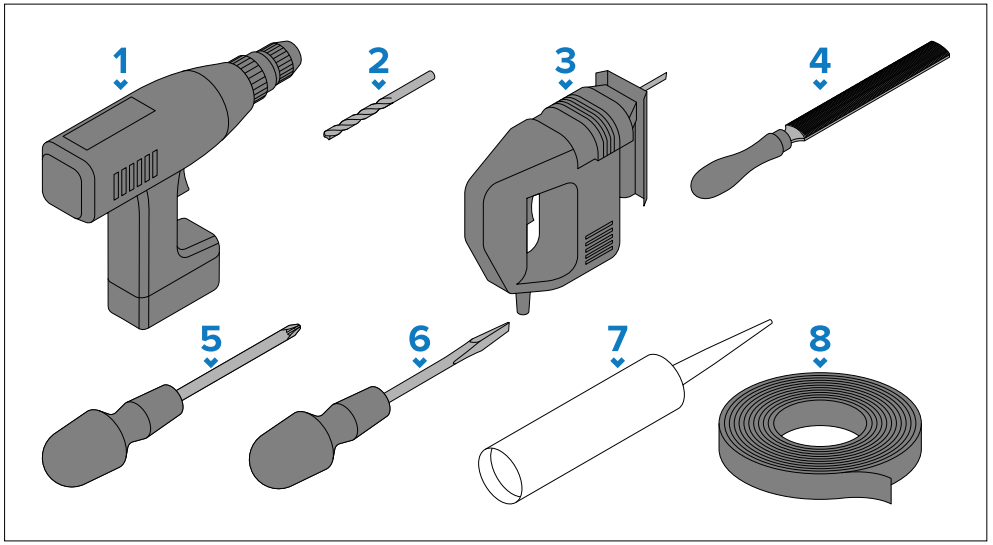
7.1 Tools required

The following tools are required for installation.



1. (1) Power drill.
2. (1) Drill bit (currently illustrated) or hole cutter of an appropriate size for the 6.0 mm (0.24 in) surface mount corner diameter cutout line (appropriate size dependent on thickness and material of mounting surface).
3. (1) Jigsaw.
4. (1) Half round file (or sandpaper).
5. Pozidrive screwdriver.
6. Flathead screwdriver.
7. Marine grade sealant.
8. Masking / self adhesive tape.

Note:

(1) Items are only required when surface mounting the display.

7.2 Mounting options

The unit can be mounted in 2 different ways, depending on your preferred installation method:

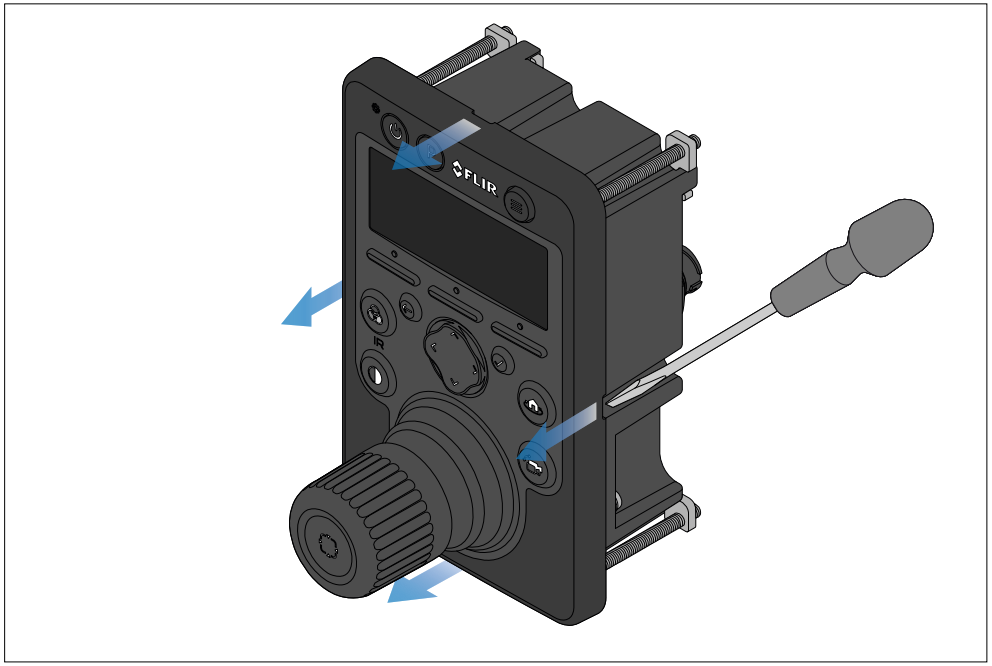
1. **Retrofit mounting** — this method should be used when the unit is being retrofitted to the mounting cutout of an existing FLIR JCU-1 or JCU-2.
2. **Surface mounting** — this method should be used when the unit is NOT being fitted to a pre-existing mounting cutout.

Note:

Both mounting methods provide an installation where the product protrudes by the thickness of the bezel from the mounting surface.

7.3 Removing the front cover

To gain access to the mounting hole locations, the front cover must first be removed.



Note:

To help prevent scratching the product, cover the tip of your screwdriver blade with a small piece of insulation tape.

1. Using a thin flat-bladed screwdriver, insert the tip of the screwdriver into an available notch (as indicated above) between the edge of the front cover and the keypad mat.
2. Gently push the front cover away from the unit to release the cover.

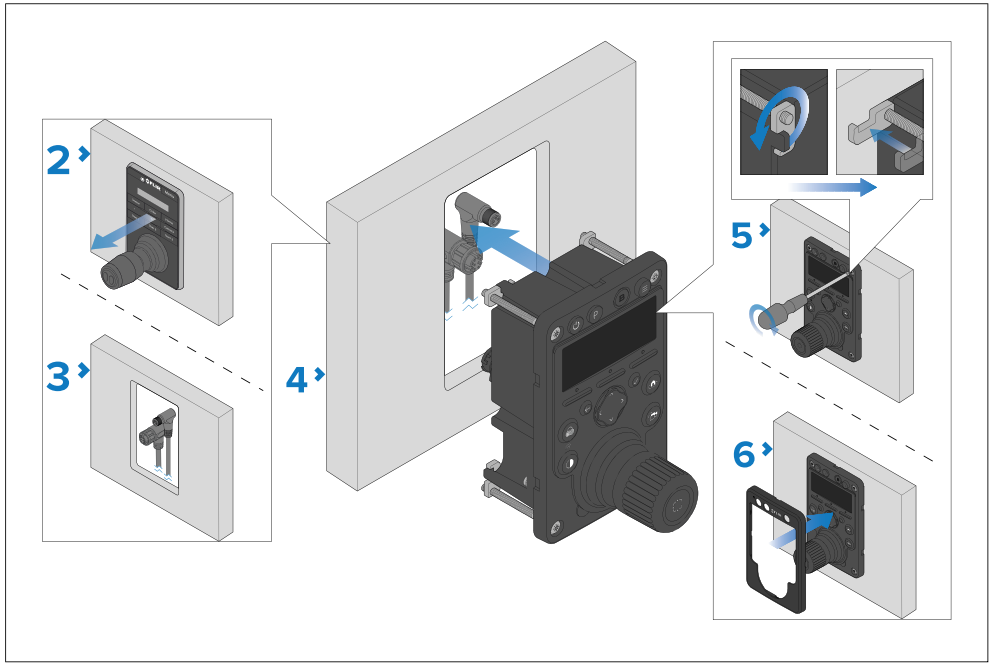
   Take care not to bend the front cover during removal.

7.4 Retrofit mounting the unit

The unit can be retrofitted to the mounting cutout of an existing FLIR JCU-1 or JCU-2. Follow the steps listed below to retrofit the unit.

Note:

It may be necessary to use a marine-grade sealant if the mounting surface is not entirely flat and stiff, or if the surface has a rough finish.



1. Check the selected location for the unit. A clear, flat area with suitable clearance behind the mounting surface is required. If this is not possible, consider creating a new cutout for the unit by following the steps found in the following section: **p.30 — Surface mounting the unit**
2. Remove the pre-existing JCU-1 / JCU-2 unit and fixings from the mounting surface cutout.
3. Depending on your cable routing plan, either:
   - Remove the existing JCU-1 / JCU-2's RJ45-to-RJ45 Ethernet cable, then route the appropriate supplied cables behind the mounting surface cutout; OR:
   - Connect the existing JCU-1 / JCU-2's RJ45-to-RJ45 Ethernet cable to a RayNet (female) to RJ45 (female) adapter cable (available separately).

   This may be difficult or not possible once the unit has been mounted.
4. With the front cover removed, connect the cables to your unit through the mounting surface cutout, then insert the unit into the cutout.

5. Using a suitable pozihead screwdriver, tighten the pre-fitted screws until the mounting plates attached to the screws are secure against the mounting surface.
6. Fit the front cover to the unit by following the instructions in the following section: p.31 — Fitting the front cover

Warning: Marine-grade sealant

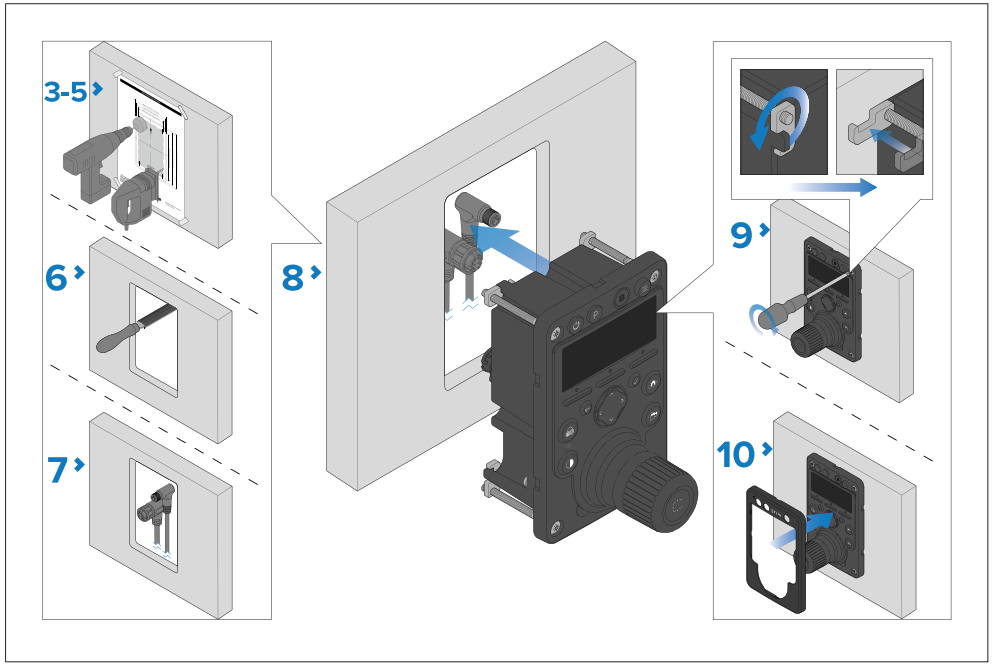
Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

7.5 Surface mounting the unit

Follow the steps listed below to surface mount the unit.

Note:

It may be necessary to use a marine-grade sealant if the mounting surface is not entirely flat and stiff, or if the surface has a rough finish.



1. Check the selected location for the unit. A clear, flat area with suitable clearance behind the panel is required.
2. Before modifying the mounting surface, refer to the dimensions supplied in this document to ensure there is enough space for the unit and all cables.
3. Fix the supplied mounting template to the selected location, using masking or self adhesive tape.
4. Use a drill and an appropriate size drill bit or hole cutter to cut out the corners of the cutout line. The corner diameter for the unit is 6 mm (0.24 in).
5. Use a jigsaw or similar cutting tool to cut out the remainder of the cutout area.
6. Ensure that the unit fits into the removed area and then remove rough edges.
7. Route the appropriate supplied cables behind the mounting surface cutout.

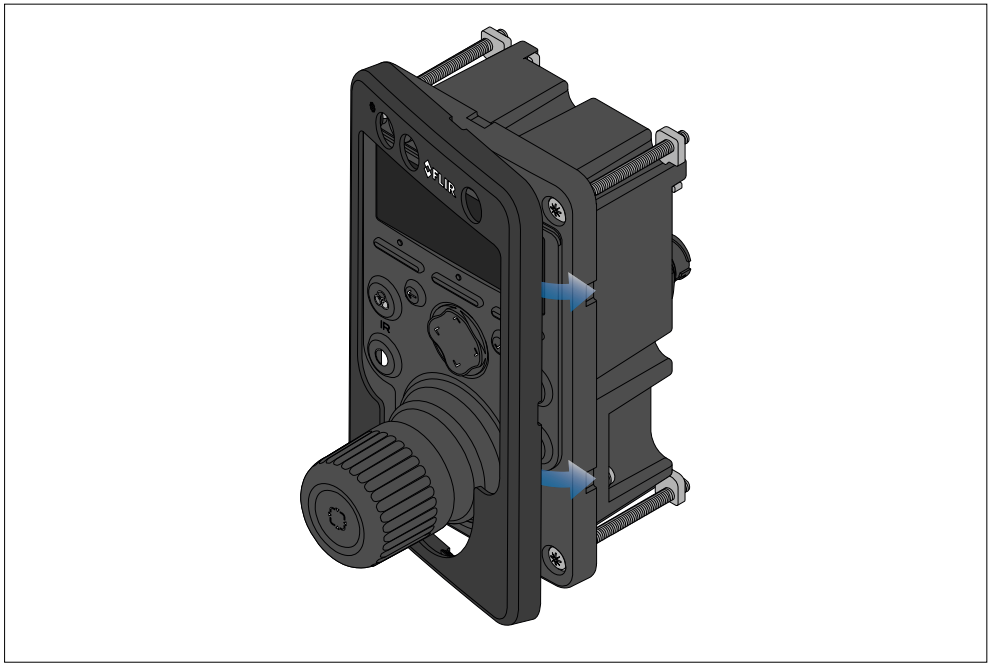
   This may be difficult or not possible once the unit has been mounted.

8. With the front cover removed, connect the cables to your unit through the mounting surface cutout, then insert the unit into the cutout.
9. Using a suitable pozihead screwdriver, tighten the pre-fitted screws until the mounting plates attached to the screws are secure against the mounting surface.
10. Fit the front cover to the unit by following the instructions found in the following section: **p.31 — Fitting the front cover**

> **Warning: Marine-grade sealant**
>
> Only use marine-grade neutral cure polyurethane sealants. Do NOT use sealants containing acetate or silicone, which can cause damage to plastic parts.

7.6 Fitting the front cover

The keypad mat should be fitted once the unit has been secured to the mounting surface.



1. Ensure the front cover is correctly orientated.
2. Starting with one of the longer edges, place the front cover over the keypad mat and gently push down so that the long edge is in position.
3. Gently push the opposite long edge of the front cover down until it is in position.
4. Once the front cover is in position, firmly push along all edges of the front cover until it is secure.

CHAPTER 8: CABLES AND CONNECTIONS — GENERAL INFORMATION

CHAPTER CONTENTS

8.1 General cabling guidance

Cable types and length

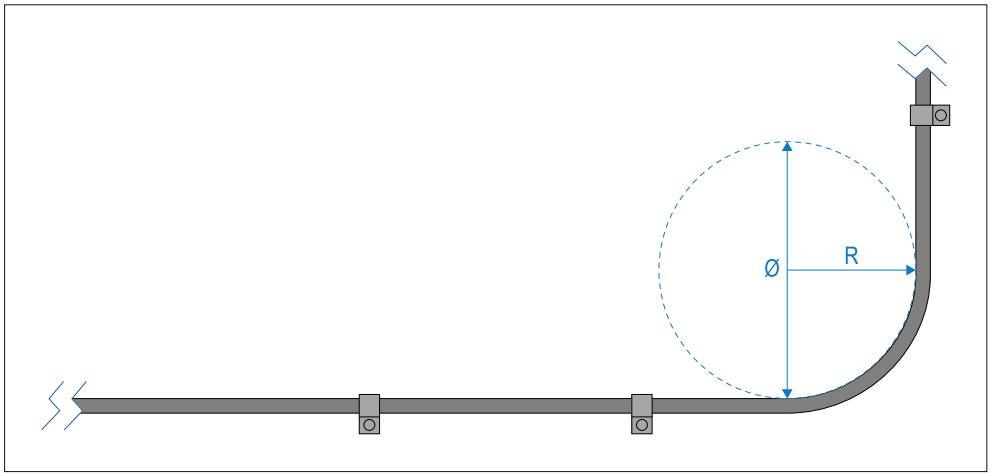
It is important to use cables of the appropriate type and length.

- Unless otherwise stated use only standard cables of the correct type, supplied by FLIR.
- Ensure that any non-FLIR cables are of the correct quality and gauge. For example, longer power cable runs may require larger wire gauges to minimize voltage drop along the run.

Cable routing and bend radius

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

Minimum cable bend radius



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

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

Note:

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

Cable routing — best practices

- Protect all cables from physical damage and exposure to heat. Use trunking or conduit where possible. Do NOT run cables through bilges or doorways, or close to moving or hot objects.
- Secure cables in place using cable clips or cable ties. Coil any excess cable and tie it out of the way.
- Where a cable passes through an exposed bulkhead or deckhead, use a suitable watertight feed-through (conduit).
- Do NOT run cables near to engines or fluorescent lights.
- Always route data cables as far away as possible from:
  - Other equipment and cables.
  - High current-carrying AC and DC power lines.
  - Antennas.

Strain relief

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

Circuit isolation

Appropriate circuit isolation is required for installations using both AC and DC current:

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

- Always ensure that PCs or other sensitive electronic devices have a dedicated power circuit.

Cable shielding

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

Important:

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

Bare-ended wire connections

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

Bare-ended wire connections

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

Unused bare-ended wires

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

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.

CHAPTER 9: NETWORK CONNECTIONS

CHAPTER CONTENTS

9.1 Power options

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

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

Multiple power sources

Product behavior when connected to more than one power supply.

Important:

If a direct power connection is made to **both** the vessel's power supply (via the JCU-4's 3-pin power connection) **and** a PSE device (via the JCU-4's PoE connection) **at the same time**, the JCU-4 will automatically default to the vessel's power supply as its sole power source.

9.2 Connections overview

The JCU-4 includes the following connections:

Connector	Suitable cables
1) Power (Only required if PoE is not used). Connects to: • 12 / 24 V dc power supply	• Right-angled power supply cable, 1x supplied.
2) 10/100/1000 Mbits/s RayNet (Ethernet) **This connection is intended for configuration and diagnostic purposes only.** Connects to: • RayNet (Ethernet) network device. • RJ45 network device.	• Right-angled RayNet (Ethernet) to RJ45 adapter cable, 1x supplied with E70695, or available separately. • Right-angled RayNet (Ethernet) to RayNet (Ethernet) cable, available separately.
3) 10/100/1000 Mbits/s PoE RayNet (Ethernet)	• Right-angled RayNet (Ethernet) to RJ45 adapter cable, 1x supplied

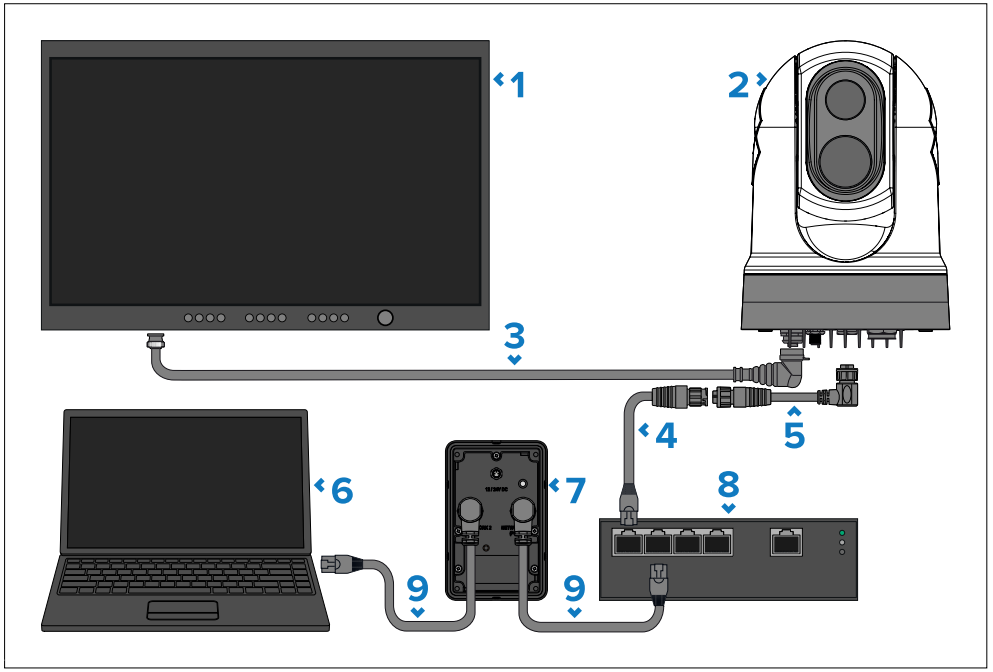
Connector	Suitable cables
• RayNet (Ethernet) network device. • RJ45 network device.	with E70695, or available separately. • Right-angled RayNet (Ethernet) to RayNet (Ethernet) cable, available separately.

9.3 System overview (example only)

The JCU-4 has a flexible array of connection options which enable you to integrate it with your electronics system.

With the right combination of devices and connections, you can use the JCU-4 to control a connected FLIR maritime camera's image from the most convenient locations on your vessel.

The following illustration shows a typical installation scenario. For more system configuration examples, ranging from small to large systems, refer to your FLIR maritime camera *Installation and Operation Instructions* manual: www.bit.ly/FLIR-maritime-docs



Note:

Power connections are not shown in this illustration. For power connection information, refer to the instructions which accompany each device.

	Description
1	Digital video (SDI) monitor, available separately from third-party retailers.
2	M300-Series camera, available separately.
3	SDI video cable (BNC connectors), available separately.
4	RayNet (Ethernet) to RJ45 adapter cable, available separately.
5	Right-angled RayNet (Ethernet) to RayNet (Ethernet) cable, available separately.
6	Laptop — primarily intended for configuration and diagnostic purposes, available separately from third-party retailers.
7	JCU-4.
8	Non-PoE network switch, available separately from third-party retailers.
9	3 m (9.84 ft) Right-angled RayNet (Ethernet) to RJ45 adapter cable (1x supplied with E70695).

Network cable extensions

If you wish to extend the length of a network cable connected to your product, refer to the following section for further information:
p.71 — Spares and accessories

CHAPTER 10: POE POWER CONNECTIONS

CHAPTER CONTENTS

10.1 Power options

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

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

Multiple power sources

Product behavior when connected to more than one power supply.

Important:

If a direct power connection is made to **both** the vessel’s power supply (via the JCU-4’s 3-pin power connection) **and** a PSE device (via the JCU-4’s PoE connection) **at the same time**, the JCU-4 will automatically default to the vessel’s power supply as its sole power source.

10.2 Power over Ethernet (PoE)

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

There are 2 main types of PoE device:

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

The JCU-4 is a Class 2 Powered Device (PD) with a 48 V nominal supply voltage, which consumes 5 W maximum (at full illumination). Before connecting the JCU-4, ensure that your Power Sourcing Equipment (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.

10.3 PSE (Power Sourcing Equipment) power connection

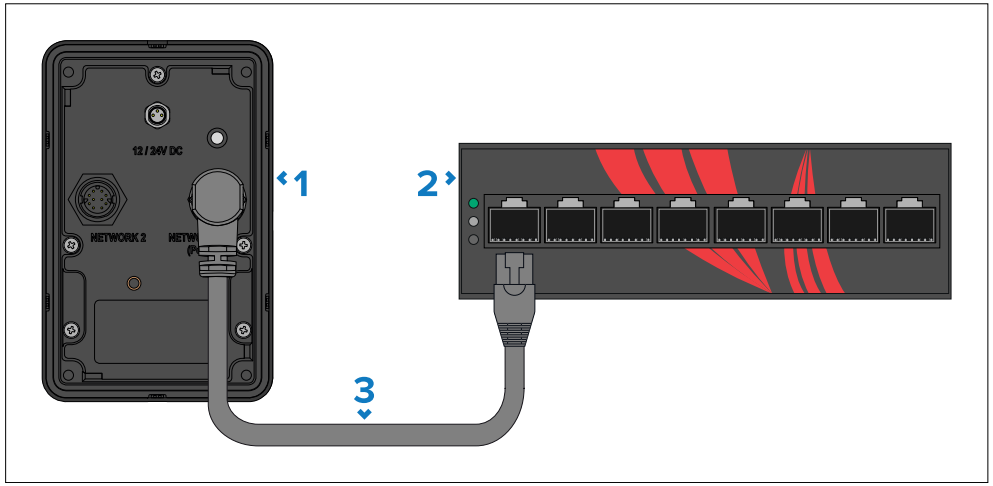
The JCU-4 can be powered via a PSE’s (Power Sourcing Equipment) Ethernet connection.

The following section will provide 2 different PSE (Power Sourcing Equipment) connection examples:

- **p.39 — PoE network switch power connection**
- **p.40 — PoE injector power connection**

PoE network switch power connection

In the following example, the PSE (*Power Sourcing Equipment*) providing power to the JCU-4 is the FLIR 8-port Gigabit Network Switch (part number: 4230175).



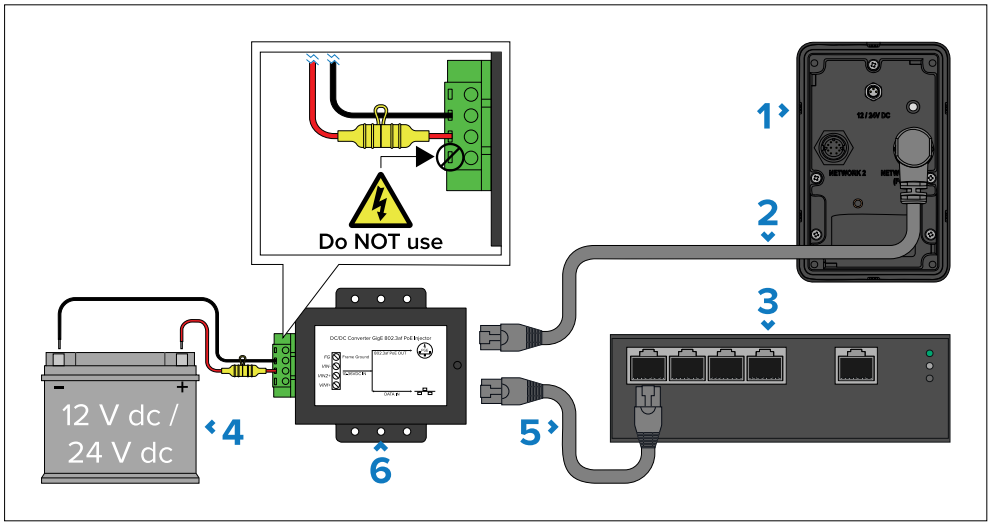
Important:

Any device supplying PoE (Power over Ethernet) to the JCU-4 must output a nominal supply voltage in the range of 44 to 57 V dc.

	Description
1	JCU-4.
2	PSE (*Power Sourcing Equipment*) providing PoE (Power over Ethernet) to the JCU-4 (e.g. PoE network switch is shown in the example above, available separately).
3	3 m (9.84 ft) Right-angled RayNet (Ethernet) to RJ45 adapter cable, 1x supplied with E70695, or available separately.

PoE injector power connection

In the following example, the PSE (*Power Sourcing Equipment*) providing power to the JCU-4 is the FLIR PoE Injector (2nd Generation; 5 Gbit) (part number: A80811).



Important:

If powering the JCU-4 via the separately-available PoE Injector (2nd Generation; 5 Gbit) (A80811), do NOT connect the power input labelled "*VIN1+*" on the PoE Injector.

Important:

Any device supplying PoE (Power over Ethernet) to the JCU-4 must output a nominal supply voltage in the range of 44 to 57 V dc.

	Description
1	JCU-4.
2	3 m (9.84 ft) Right-angled RayNet (Ethernet) to RJ45 adapter cable, 1x supplied with E70695, or available separately.
3	Non-PoE network switch, available separately from third-party retailers.
4	12 / 24 V dc power supply — providing power to the PoE Injector.
5	RJ45 to RJ45 cable, available separately.
6	PSE (*Power Sourcing Equipment*) providing PoE (Power over Ethernet) to the JCU-4 (e.g. PoE Injector (A80811) is shown in the example above, available separately).

10.4 Network cable extensions

If you wish to extend the length of a network cable connected to your product, refer to the following section for further information:
p.71 — Spares and accessories

CHAPTER 11: NON-POE POWER CONNECTIONS

CHAPTER CONTENTS

11.1 Power options

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

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

Multiple power sources

Product behavior when connected to more than one power supply.

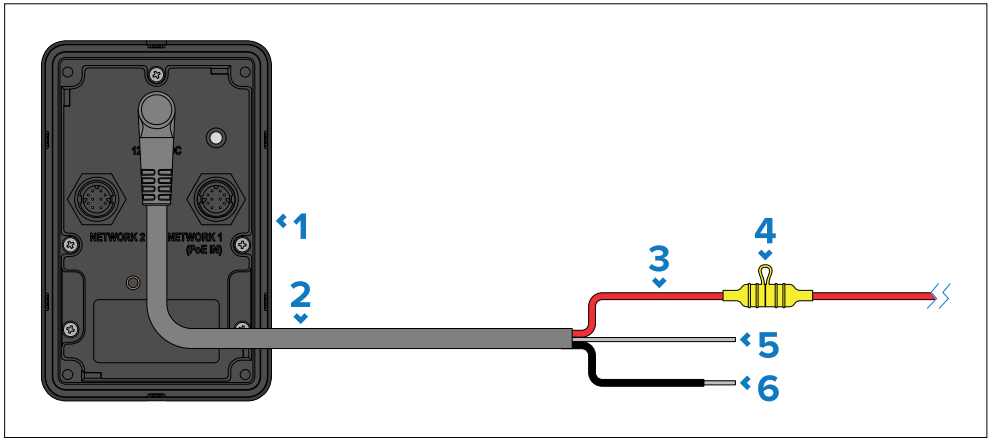
Important:

If a direct power connection is made to **both** the vessel's power supply (via the JCU-4's 3-pin power connection) **and** a PSE device (via the JCU-4's PoE connection) **at the same time**, the JCU-4 will automatically default to the vessel's power supply as its sole power source.

11.2 Direct power connection

The JCU-4 can be powered directly from a 12 V or 24 V power source, using the 3 m (9.8 ft) right-angled 3-pin power cable (supplied with E70695, or available separately). **The direct power connection is only required if PoE is not used to power the JCU-4)**.

The right-angled 3-pin power cable includes bare stripped wires, which are suitable for direct connection to a 12 V or 24 V power supply:



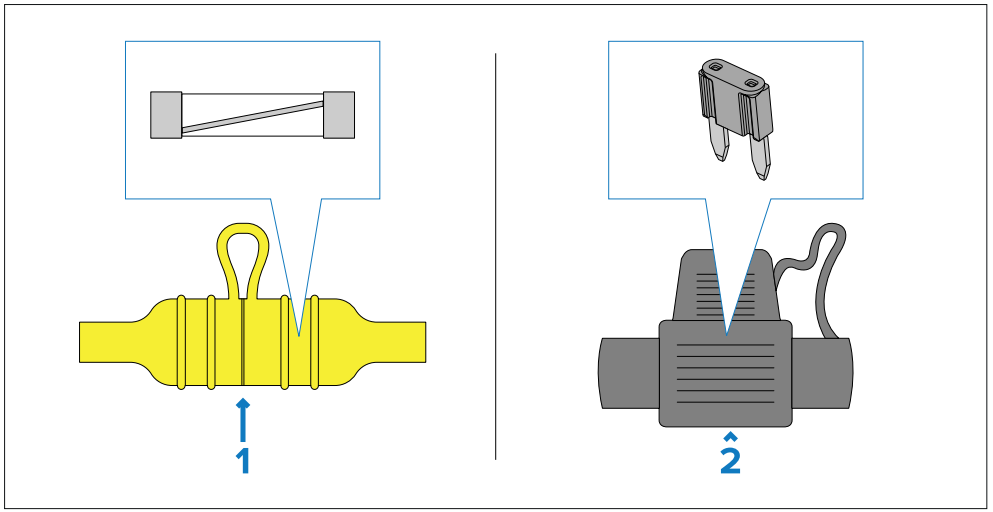
	Description
1	JCU-4.
2	3 m (9.8 ft) Right-angled 3-pin power cable, 1x supplied with E70695, or available separately.
3	Red wire (positive) — connects to the power supply's positive terminal.
4	Waterproof fuse holder containing a suitably-rated inline fuse (**not supplied**), which must be fitted to the red positive wire — refer to the following fuse ratings: **p.43 — Inline fuse and thermal breaker ratings**
5	Gray wire (drain) — connects to the vessel RF ground (if available), or the negative battery terminal.
6	Black wire (negative) — connects to the power supply's negative terminal.

11.3 Inline fuse requirement

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

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

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



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

Fuse ratings:

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

11.4 Inline fuse and thermal breaker ratings

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

Inline fuse rating	Thermal breaker rating
• **12 V**: 1A	• **12 V**: 1A
• **24 V**: 500mA	• **24 V**: 500mA

Note:

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

11.5 Power distribution

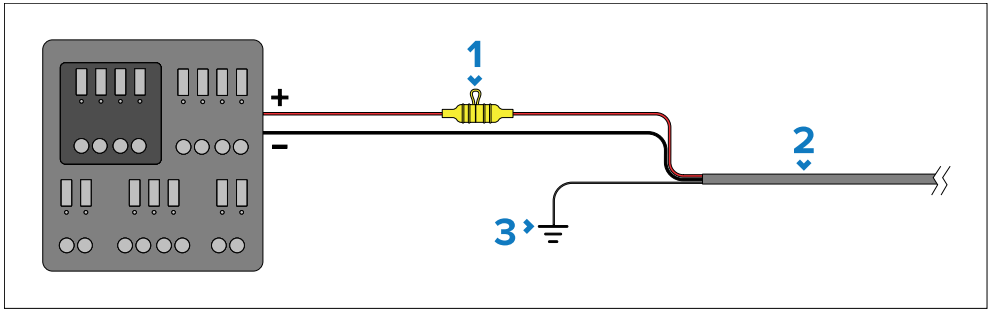
Recommendations and best practice for the power connection of products supplied with a drain wire as part of the supplied power cable.

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

Important:

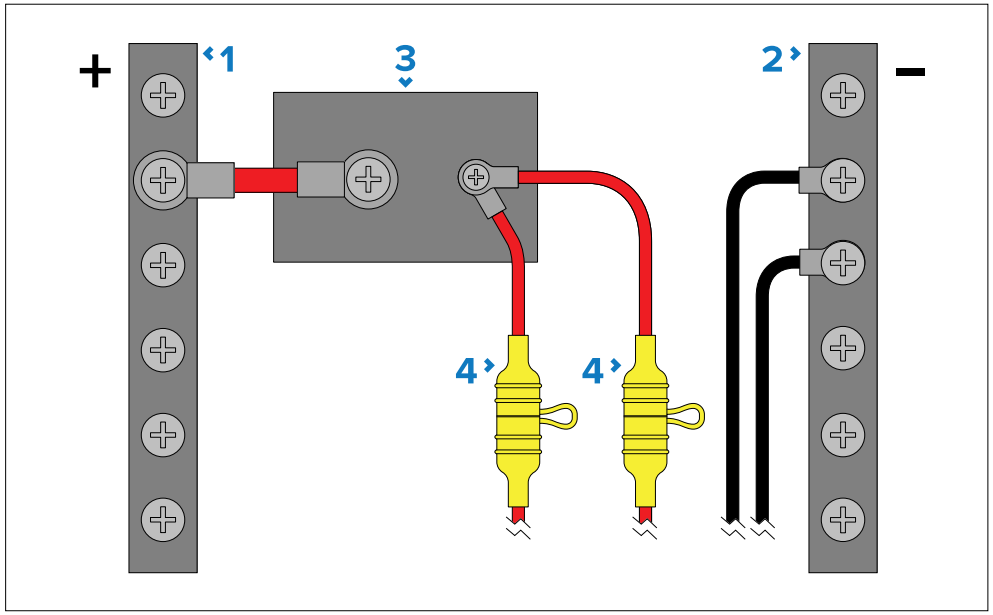
- When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system, which may impact the voltage available to other products during the peaks.
- The information provided below is for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

Implementation — connection to distribution panel (Recommended)



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

- 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 1 item of equipment shares a breaker, use individual inline fuses for each power circuit to provide the necessary protection.
- The power cable supplied with your product includes a drain wire, which must be connected to the vessel's common RF ground.

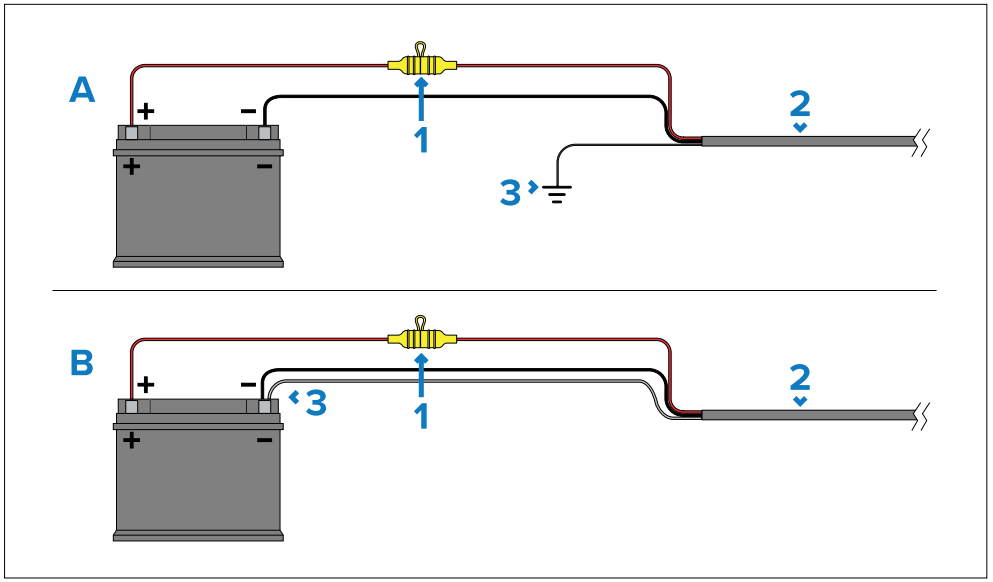


	Description
1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Waterproof fuse holder containing a suitably-rated inline fuse must be fitted. For suitable fuse rating, refer to: *Inline fuse and thermal breaker ratings*.

Important:

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

Implementation — direct connection to battery



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

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

Battery connection scenario A:

Suitable for a vessel with a common RF ground point. In this scenario, the power cable's drain wire should be connected to the vessel's common ground point.

Battery connection scenario B:

Suitable for a vessel without a common grounding point. In this case, the power cable's drain wire should be connected directly to the battery's negative terminal.

Grounding

Ensure that you observe any additional grounding advice provided in the product's documentation.

More information

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

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ISO 13297: Small craft — Electrical systems — Alternating and direct current installations
- ISO 10133: Small craft — Electrical systems — Extra-low-voltage d.c. installations
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

11.6 Power cable extension (12 / 24 V systems)

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

- The power cable for each unit in your system should be run as a separate, single length of 2-wire cable from the unit to the vessel's battery or distribution panel.
- Ensure that the extension cable is of a sufficient gauge for the supply voltage and the total load of the device and the length of the cable run. Refer to the following table for typical **minimum** power cable wire gauges:

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

Important:

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

Important:

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

11.7 Power cable drain wire connection

The power cable supplied with this product includes a dedicated drain wire for connection to a vessel's Radio Frequency (RF) ground point (if available), or the negative battery terminal.

The purpose of the drain wire is to drain excess voltage from the cable shield, giving it a path to safety. The drain wire protects the cable's inner signal conductors from electrical noise emitted by other cables and devices.

Although the drain wire is not intended to ground the product's internal circuits, it's important that the drain wire is connected to the vessel's common RF ground point, which should be used for all equipment in your system. If several items require grounding, the drain wires and dedicated ground connections (if available) of all equipment should first be connected to a single local point (e.g. within a distribution panel), and then this point connected via an appropriately-rated conductor to the vessel's RF common ground point. An RF ground point is typically a circuit with a very low-impedance signal at Radio Frequency, connected to the sea via an electrode immersed in the sea, or bonded to the inner side of the hull in an area that is underwater.

On vessels without an RF ground system, the drain wires and dedicated ground connections (if available) of all equipment should be connected directly to the vessel's negative battery terminal.

The dc power system should be either:

- Negative grounded ("bonded"), with the negative battery terminal connected to the vessel's RF ground.
- Floating, with neither battery terminal connected to the vessel's ground.

The preferred minimum requirement for the path to ground (bonded or non-bonded) is via a flat tinned copper braid, with a 30 A rating or greater. If this is not possible, an equivalent stranded wire conductor may be used, rated as follows:

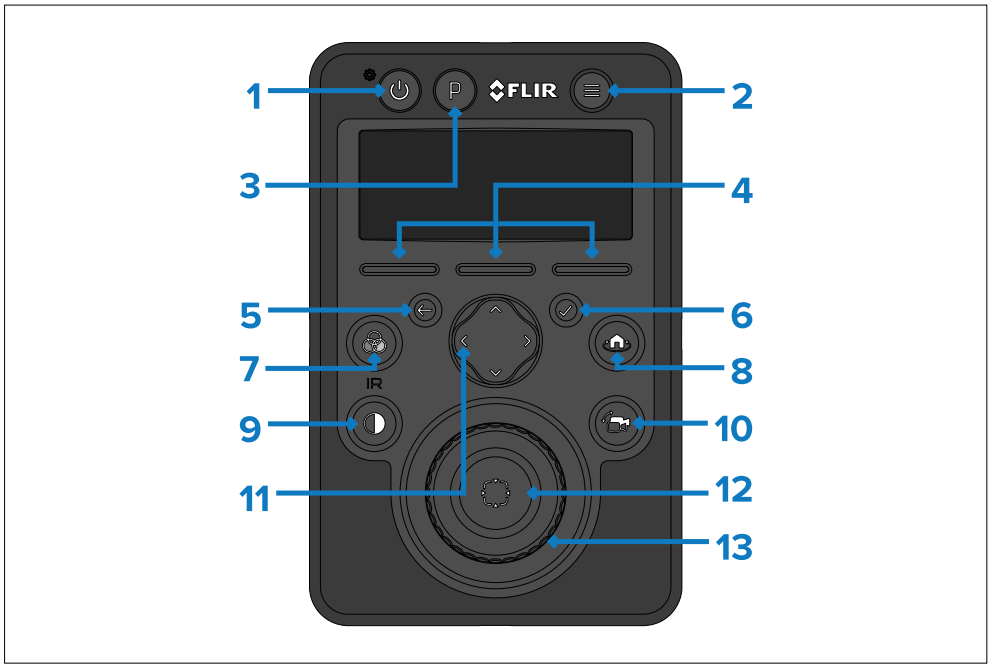
- for runs of <1 m (3.3 ft), use 6 mm2 (10 AWG) or greater.
- for runs of >1 m (3.3 ft), use 8 mm2 (8 AWG) or greater.

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

CHAPTER 12: OPERATION

CHAPTER CONTENTS

12.1 Controls overview



	Description
1	*[Power]* • With the JCU-4 powered off, press to power on. • With the JCU-4 powered on, press to display the *[Brightness]* menu. For more information, refer to: **p.52 — Brightness menu** • With the *[Brightness]* menu displayed, press to increase the JCU-4's brightness by 25%. • With the JCU-4 powered on, press and hold to display the *[Power down]* menu. For more information, refer to: **p.52 — Power down menu**
2	*[On-screen Display]* • **(M300-Series, M400-Series and M500-Series cameras only)** Press to show / hide the *[On-screen Display]* menu on a networked video display. For more information, refer to the documentation supplied with your compatible FLIR maritime camera.
3	*[Park]* • Press to park the controlled camera. For more information, refer to the documentation supplied with your compatible FLIR maritime camera.
4	*[Softkey 1, Softkey 2, Softkey 3]* • With the *[Controlled camera]* screen displayed, press to initiate the assigned user-programmable button (UPB) action. For more information, refer to: **p.53 — User-programmable buttons (UPBs)** • **(M300-Series, M400-Series and M500-Series cameras only)** With the *[Controlled camera]* screen displayed, press and hold to display the on-screen display *[User-programmable buttons]* submenu on a networked video display. • With a (sub)menu displayed, press to initiate the corresponding menu command.

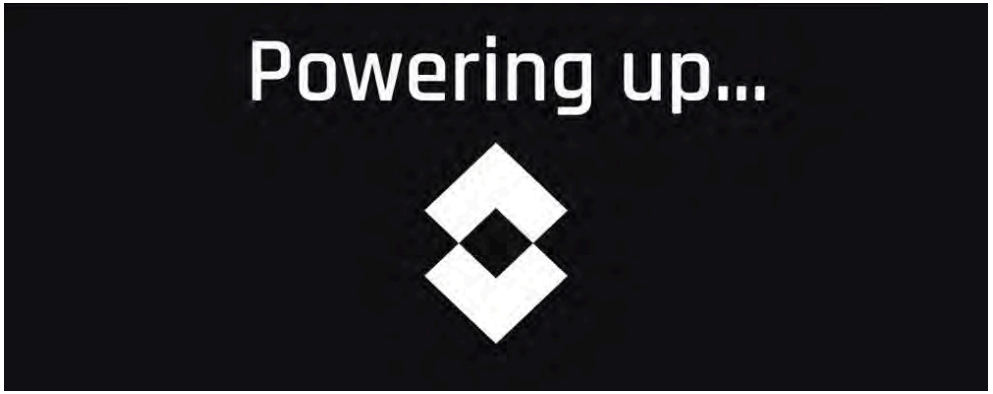
	Description
5	*[Back]* • With a (sub)menu displayed, press to return back to the previous screen.
6	*[Select]* • With a (sub)menu displayed, press to select the highlighted item.
7	*[IR Color]* • Press to cycle between infrared color palettes on the active video feed. • With the joystick pushed upward, press and hold to display your unit and controlled camera's IP address. For more information, refer to: **p.53 — IP address menu**
8	*[Home]* • Press to return the camera to the configured home position. • Press and hold to save the current azimuth and elevation as the active camera's home position. For more information, refer to the documentation supplied with your compatible FLIR maritime camera.
9	*[IR Contrast]* • Press to cycle between infrared contrast palettes on the active video feed. • **(M400-Series and M500-Series cameras only)** Press and hold to display the *[Manual focus]* menu. For more information, refer to: **p.51 — Manual focus menu**
10	*[Active feed switch]* • **(Multi-payload cameras only)** Press to toggle between infrared and visible on the active and secondary video feeds. • Press and hold to display the *[Select camera]* menu. For more information, refer to: **p.51 — Select camera menu**

	Description
11	*[Navigation pad]* • Press to pan and tilt the selected camera. • With a (sub)menu displayed, press to change the highlighted menu option.
12	*[Video tracking]* • **(M400XR / M500-Series cameras only)** Press to invoke a tracking box on the video feed. With a tracking box displayed on the video feed and a target centered within the tracking box, press again to engage target tracking. For more information, refer to the documentation supplied with your compatible FLIR maritime camera.
13	*[Joystick]* • Twist to zoom the active camera. • Push up / down to tilt the active camera. • Push left or right to rotate the active camera.

12.2 Powering on the unit

Once the power cable has been connected and adequate power is being supplied, the JCU-4 can be turned on by pressing the *[Power]* button.

After the *[Power]* button has been pressed, the following screen will be displayed as your unit begins to power on:



12.3 Camera detection

The JCU-4 will automatically attempt to search for compatible FLIR maritime cameras on the network once every 30 seconds.

Note:

If a compatible camera is connected to your network and cannot be automatically detected by your unit after a prolonged period, refer to the following section for troubleshooting information:
p.64 — System checks and troubleshooting

12.4 Controlled camera

Once the start-up process has been completed, the following *[Controlled camera]* screen will be displayed.

From the *[Controlled camera]* screen, the following key information can be viewed and / or interacted with:

	Description
1	*[Camera name]* Indicates the camera which is currently being controlled.
2	*[Active feed]* Indicates whether the infrared or visible video feed is currently active for the controlled camera.
3	*[User programmable button (UPB) 1]* Corresponds to the *[UPB 1]* action assigned on your FLIR maritime camera's Web browser user interface. While viewing the *[Controlled camera]* screen: • Pressing the *[Softkey 1]* button will initiate the assigned action. • **(M300-Series / M400-Series / M500-Series cameras only)** Pressing and holding the *[Softkey 1]* button shows the on-screen display *[User-programmable buttons]* submenu on a networked video monitor.

	Description
4	*[User programmable button (UPB) 2]* Corresponds to the *[UPB 2]* action assigned on your FLIR maritime camera's Web browser user interface. While viewing the *[Controlled camera]* screen: • Pressing the *[Softkey 2]* button will initiate the assigned action. • **(M300-Series / M400-Series / M500-Series cameras only)** Pressing and holding the *[Softkey 2]* button shows the on-screen display *[User-programmable buttons]* submenu on a networked video monitor.
5	*[User programmable button (UPB) 3]* Corresponds to the *[UPB 3]* action assigned on your FLIR maritime camera's Web browser user interface. While viewing the *[Controlled camera]* screen: • Pressing the *[Softkey 3]* button will initiate the assigned action. • **(M300-Series / M400-Series / M500-Series cameras only)** Pressing and holding the *[Softkey 3]* button shows the on-screen display *[User-programmable buttons]* submenu on a networked video monitor.

Note:

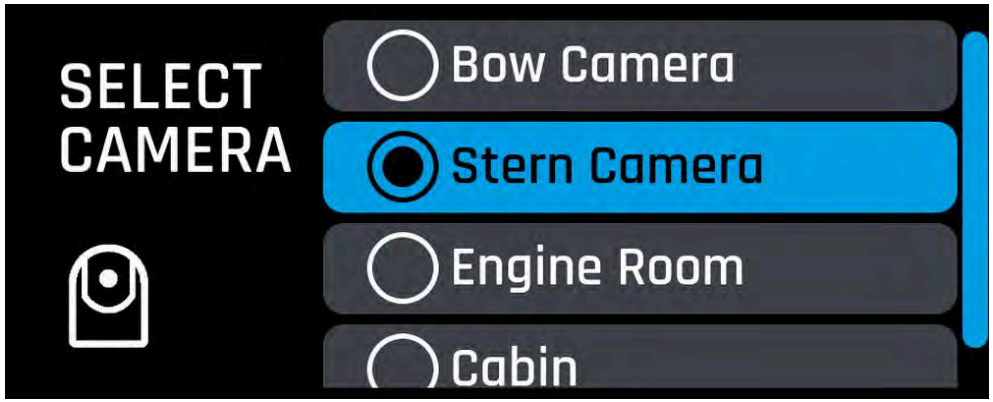
For more information on how to configure the user-programmable button (UPB) actions assigned on your compatible FLIR maritime camera's Web browser user interface, refer to:

- **p.53 — Programming UPBs via the Web interface (M100, M200, M400 or M500–Series)**
- **p.53 — Programming UPBs via the Web interface (M300 Series)**

12.5 Select camera menu

If more than one compatible FLIR maritime camera has been detected by the JCU-4, you can change which camera your unit is currently controlling by pressing and holding the *[Active feed switch]* button.

Once held, the following *[Select camera]* menu is displayed:



Note:

If a compatible FLIR maritime camera is connected to your network and cannot be automatically detected by your unit after a prolonged period, refer to the following section for troubleshooting information:
p.64 — System checks and troubleshooting

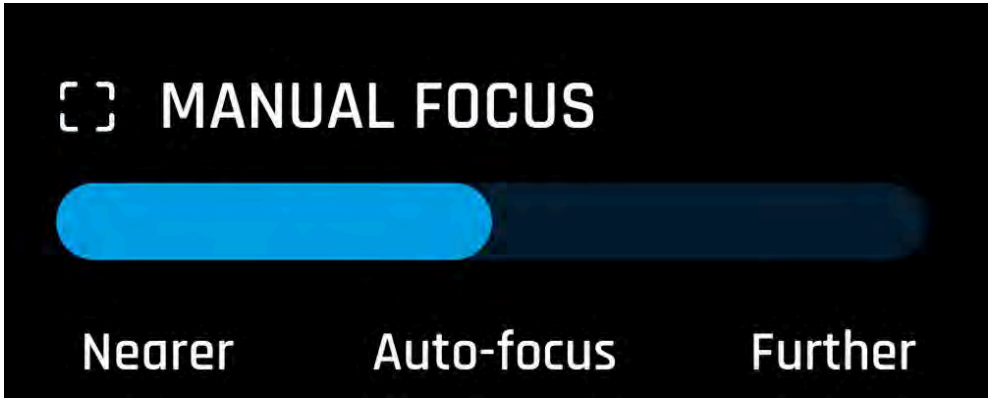
12.6 Manual focus menu (M400-Series / M500-Series cameras only)

You can adjust the focal distance of the active camera feed by pressing and holding the JCU-4's *[IR Contrast]* button.

Note:

The *[Manual focus]* menu is only supported by M400-Series and M500-Series FLIR maritime cameras.

Once held, the following *[Manual focus]* menu is displayed:



From the *[Manual focus]* menu, the actions listed below can be initiated:

- *[Nearer]* — Select to reduce the focal distance.
- *[Auto-focus]* — Select to automatically adjust the focal distance.
- *[Further]* — Select to increase the focal distance.

12.7 Brightness menu

The JCU-4's LCD brightness and button illumination can be changed by pressing the *[Power]* button.

Once pressed, the following *[Brightness]* menu will appear.

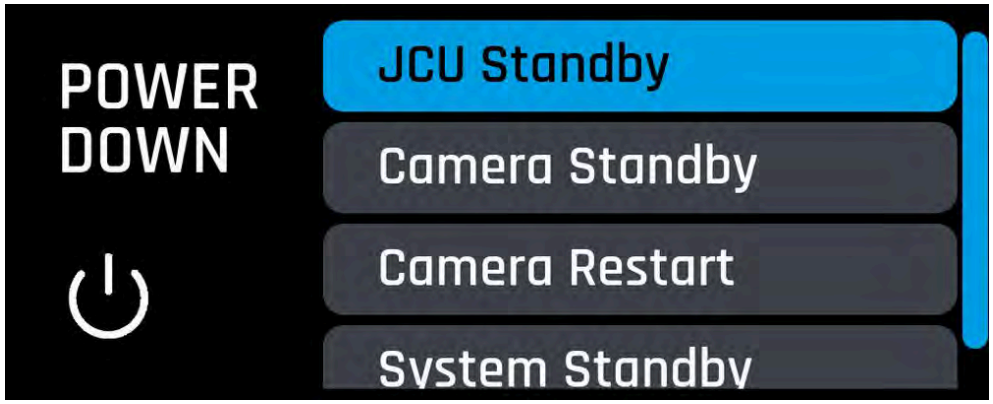
From the *[Brightness]* menu, the LCD brightness and button illumination can be:

- Increased (+ 25%) by pressing the *[Power]* button.
- Increased (+ 5%) by pressing either the *[Navigation pad (right)]* or *[Softkey 3]* buttons.
- Decreased (- 5%) by pressing either the *[Navigation pad (left)]* or *[Softkey 1]* buttons.

12.8 Power down menu

The JCU-4 and other compatible FLIR maritime cameras on your network can be remotely set to standby and / or restarted, by pressing and holding the *[Power]* button.

With the *[Power]* button held, the following *[Power down]* menu is displayed:

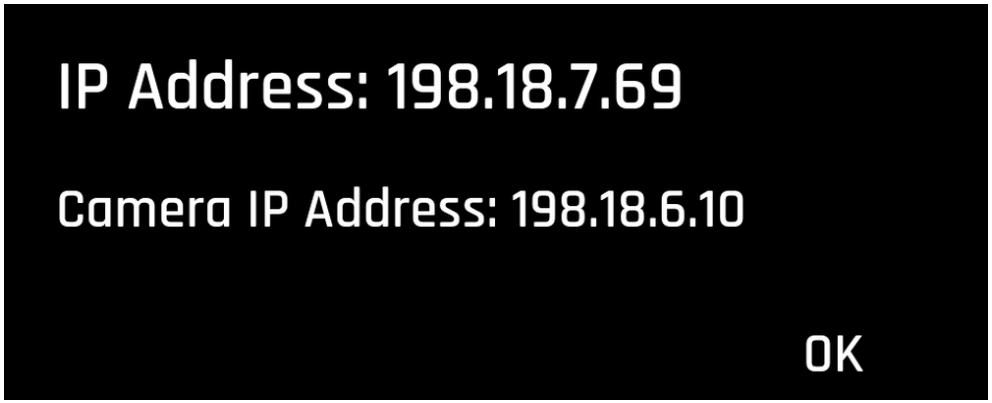


From the *[Power button]* menu, the actions listed below can be initiated:

- *[JCU standby]* — Causes the JCU-4 to enter a standby state until operation is resumed.
- *[Camera standby]* — Causes the controlled camera to enter a standby state until operation is resumed.
- *[Camera restart]* — Causes the controlled camera to perform a restart.
- *[System standby]* — Causes the both the JCU-4 and controlled camera to enter a standby state until operation is resumed.

12.9 IP address menu

If required for network configuration purposes, the JCU-4 and controlled camera's assigned IP addresses can be displayed by pressing and holding the *[IR Color]* button and pushing the joystick upwards for 3 seconds.



12.10 User-programmable buttons (UPBs)

The JCU's User-programmable buttons (UPBs) can be configured from a compatible FLIR maritime camera's Web browser user interface.

You can assign a different action to each UPB (for example, "Park" or "Surveillance mode") on a per-camera basis.

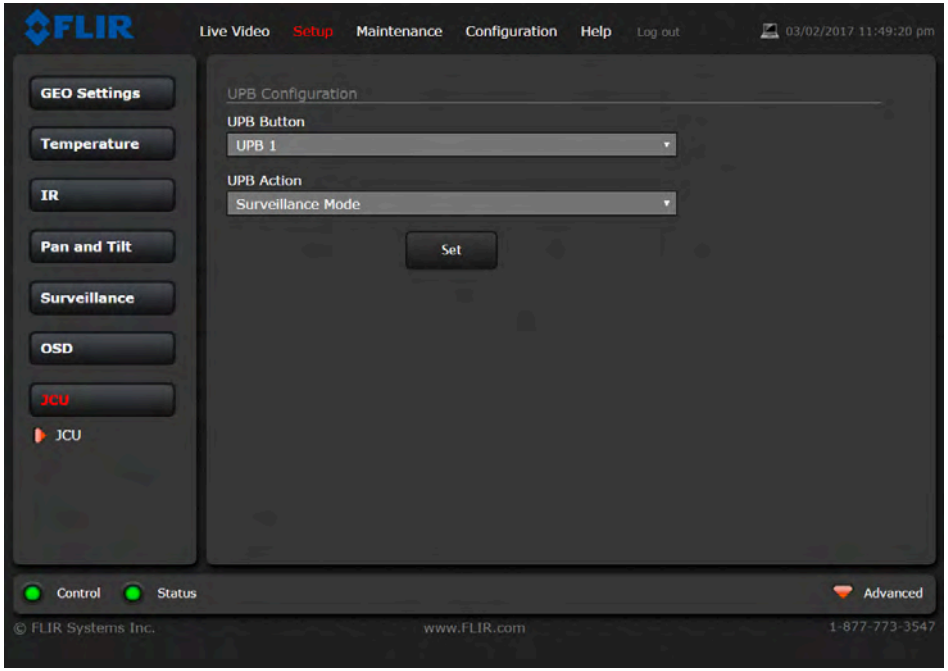
Note:

UPB assignments apply to individual cameras rather than specific JCU units. This means that, if you are using a single JCU unit to control 2 FLIR maritime cameras, UPB number 1 could be configured to initiate a different action on each camera.

Programming UPBs via the Web interface (M100-Series, M200-Series, M400-Series or M500-Series)

To configure the JCU's user-programmable buttons (UPBs) using an M100-Series, M200-Series, M400-Series or M500-Series camera's Web browser user interface:

1. From the camera's Web browser user interface, select *[Setup]* on the top menu.
   The *[Setup]* is displayed.
2. From the left-hand panel, select *[JCU]*.
   The *[UPB Configuration]* panel is displayed:



3. From the *[UPB Button]* list, select the button you wish to configure.
4. From the *[UPB Action]* list, choose the camera action you wish to associate with that UPB button.
5. Repeat steps 3 and 4 for each UPB you wish to configure.
6. Click *[Set]* to save the UPB Configuration.

Programming UPBs via the Web interface (M300-Series)

To configure the JCU's user-programmable buttons (UPBs) using an M300-Series camera's Web browser user interface:

1. From the camera's Web browser user interface, select *[System Settings]* at the bottom left of the menu.
   The *[Settings]* menus are displayed.

2. From the menus displayed at the top, select *[JCU]*.
   The *[JCU]* setting page is displayed:

3. From the *[UPB Button]* list, select the button you wish to configure.
4. From the *[UPB Action]* list, choose the camera action you wish to associate with that UPB button.
5. Repeat steps 3 and 4 for each UPB you wish to configure.
6. Select *[Save]* to save the UPB Configuration.

On Screen Display (OSD) menu

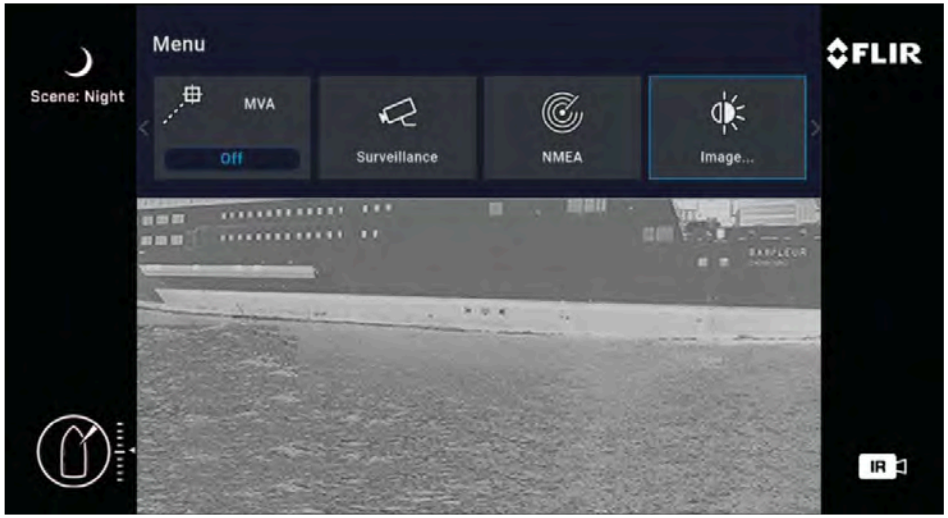
User-programmable buttons (UPBs) can also be assigned from the On Screen Display (OSD) menu when connected to a video display.

Note:

The *[OSD]* menu is only available with M300, M400 and M500 FLIR maritime cameras.

To configure the UPBs using the camera's *[OSD]* menu:

1. Press the *[Menu]* button.
   The *[OSD]* menu is displayed:



2. Scroll through the menu using the joystick, and select *[Settings]*.
   The *[Settings]* menu is displayed.
3. Select *[User Interface]*.
   The *[User Interface]* menu is displayed.
4. From the *[UPB Button]* list, select the button you wish to configure.
5. From the *[UPB Action]* list, choose the camera action you wish to associate with that UPB button.
6. Repeat steps 4 and 5 for each UPB you wish to configure.

CHAPTER 13: CONFIGURATION

CHAPTER CONTENTS

13.1 Web browser user interface overview

This section describes how to use a Web browser to communicate with and configure your JCU-4.

The JCU-4 is a network device that communicates over an Ethernet network using Internet Protocol (IP). Using a Web browser, you can perform software updates and configure your unit's network configuration settings.

Note:

- Changes to configuration settings should only be made by someone who has expertise with JCU-4 devices and a thorough understanding of how each setting will affect the JCU-4. Haphazard changes can lead to potential problems.
- You can use various types of IP-networked devices to interact with the JCU-4 Web interface (such as a laptop, PC or tablet). The device must be connected to the same network as the JCU-4 (or connected directly).

13.2 Setting up a network connection

The JCU-4 supports DHCP and UPnP to simplify the process of finding your unit on a network, and connecting to it using a Web browser.

Note:

The Web browser must be running on a device that is on the same network as the JCU-4.

DHCP (**D**ynamic **H**ost **C**ontrol **P**rotocol) is used to automatically assign IP addresses and other important IP-network parameters to devices on a network. The JCU-4 is set to use DHCP by default.

UPnP (**U**niversal **P**lug a**n**d **P**lay) is a protocol that helps the JCU-4 identify itself to other network devices.

Note:

- You should not attempt to set the JCU-4's IP-network parameters manually unless you have previous experience with configuring IP networks.
- The JCU-4 will be automatically assigned a link-local IP address if it is configured to use DHCP and a DHCP server is not available on your network.

To set up a network connection between your IP device (such as a laptop or PC), and the JCU-4:

1.
   - If your system already includes a network switch, connect both the JCU-4 and the IP device that will run your Web browser to the switch, then power-on the JCU-4, network switch, and IP device. Refer to the following section for example network connections: **p.35 — Network connections**
   - If you don't have any existing networking hardware (such as a network switch), connect the JCU-4 and IP device together directly, then power-on the JCU-4 and IP device. Refer to the following section for example network connections: **p.35 — Network connections**
2. Make sure that your IP device is:
   a. *configured to obtain an IP address automatically*. For Windows 7, 8, 10 and 11:

i. Go to *[Control Panel]*, then *[Network and Sharing Center > Change adapter settings]*.

ii. Right-click the network connection corresponding to the wired Ethernet connection on your IP device (often labelled “Local Area Connection”) and select *[Properties]*.

iii. Select the *[Networking]* tab.

iv. Under *[This connection uses the following items]*, select *[Internet Protocol Version 4 (TCP/IPv4)]*.

v. Select *[Properties]*.

vi. Check that the option to *[Obtain an IP address automatically]* is selected.

b. *configured to detect UPnP devices*. For Windows 7, 8, 10 and 11:

i. Go to *[Control Panel > Network and Sharing Center > Advanced sharing settings]*.

ii. Check that the option to turn on *[Network discovery]* is selected.

3. The JCU-4 is automatically added to the list of devices located by your IP device, and is named according to the product name, and serial number (for example: *JCU-4_1234567*. For Windows 7, 8, 10 and 11, the JCU-4 is listed in Windows Explorer under *[Network]*.

4. Under *[Network]*, double-click the JCU-4 item to open the JCU-4’s Web page. To show more information about the JCU-4, including its IP address, right-click the JCU-4 item and select *[Properties]*.

Note:

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.64 — System checks and troubleshooting

13.3 Logging in to the Web browser user interface

You can log in to the JCU-4’s Web interface using the login details provided on the serial number label located on the rear of your unit and / or in the product box:

To log in:

1. Go to the JCU-4’s Web page by:

   - Entering the JCU-4’s IP address directly into the address bar of your Web browser, OR:
   - Double-clicking the JCU-4 device listed in “Network” in Windows Explorer.

   For more information, refer to: ***p.56 — Setting up a network connection***

   The login screen is displayed:

2. Enter the password referenced above, then select *[Login]*.

13.4 Web browser user interface

The Web browser user interface is split into the following 3 pages, which can be accessed at any time using the sidebar menu located on the left side of your screen:

1. **p.58 — Product information page**
2. **p.59 — Setup page**
3. **p.60 — Diagnostics page**

The available Web browser user interface menu options are subject to change depending upon which software version your device is running. Ensure that your device is running the latest software by visiting the Raymarine / FLIR maritime website: www.raymarine.com/software

Product information page

Once you have successfully logged into the Web interface you will be directed to the *[Product information]* page, where additional information for your unit can be found.

The following information is displayed on the *[Product information]* page.

Hardware:

Item	Description
[Friendly Name]	Provides a description of the network name assigned to the JCU-4.
[Serial Number]	Provides the JCU-4's serial number.

Software:

Item	Description
[Version]	Provides the JCU-4's current software version number.

Network:

Item	Description
[Mode] / *[IP]* / *[Gateway]* / *[Mask]*	Provides a description of the JCU-4's configured IP-network parameters. For more information, refer to: **Network menu**

Setup page

The *[Setup]* page provides access to a series of menus and associated configuration settings which impact how your unit operates and connects to other devices within your system.

From the *[Setup]* page, the following menus can be accessed:

1. **Network menu**
2. **Joystick menu**
3. **Softkey menu**
4. **System menu**

Network menu

The *[Network]* menu contains configuration options related to your unit's IP-network parameters.

The following options can be found under the *[Network]* menu.

Network Settings:

Option	Description
[DHCP]	Select to automatically assign the JCU-4's IP-network parameters via DHCP (Dynamic Host Configuration Protocol). By default, the JCU-4 is set to use DHCP.
[Static]	Select to manually assign a static IP address to the JCU-4.
[IP Address]	Select to manually configure the JCU-4's IP address. This setting is only available if the JCU-4's IP address type is set to *[Static]*.
[Netmask]	Select to manually configure the JCU-4's Netmask address. This setting is only available if the JCU-4's IP address type is set to *[Static]*.
[Gateway]	Select to manually configure the JCU-4's Gateway address. This setting is only available if the JCU-4's IP address type is set to *[Static]*.
[Save]	Select to save the current setting configuration. Once the *[Save]* button has been selected, the JCU-4 must be rebooted via the *[Reboot]* popup in order to initiate any changes created.

Joystick menu

This menu is not currently available.

Softkey menu

This menu is not currently available.

System menu

The *[System]* menu contains configuration options which enable you to perform an update, or reset your unit to factory default settings.

The following options can be found in the *[System]* menu.

Firmware:

Option	Description
[Choose file]	Select to navigate the Windows (file) Explorer and choose a file containing the updated JCU-4 firmware.
[Upgrade]	Select to initiate an update once a corresponding file has been chosen.

Factory Reset:

Option	Description
[Partial reset]	Select to reset all configuration settings / options to factory default, other than those found under the *[Network]* menu.
[Full reset]	Select to reset all configuration settings / options to factory default.

Reboot:

Option	Description
[Reboot]	Select to initiate a reboot (device restart).

Diagnostics page

This page is for use by FLIR support teams only.

13.5 Troubleshooting

Setting a static IP address

In some circumstances, you may need to set a static IP address for the JCU-4's IP-network, rather than relying on the automatic IP addresses provided by the DHCP server (the JCU-4's default setting).

Note:

Unless you are specifically instructed in FLIR documentation, or have previous experience of configuring IP networks, you should NOT attempt to set the JCU-4's IP-network parameters manually. If you mis-configure the IP-network parameters, your unit may stop working correctly or become inaccessible on the network.

This procedure assumes that you have already established a network connection, and can access the JCU-4 Web interface. To configure the JCU-4's IP network parameters manually:

1. Log into the JCU-4's Web interface.
   For more information on how to log in, refer to:
   p.57 — Logging in to the Web browser user interface
2. From the *[Product information]* page, select the *[Setup]* page.

3. Select the *[Network]* menu.
4. Select *[Static]*.
5. Adjust values for the *[IP Address]*, *[Netmask]* and *[Gateway]* fields as required.

Important:

Ensure that you keep a record of any changes made when attempting to set the IP-network parameters manually, as you may require this information to access the JCU-4's Web browser user interface in the future.

6. Select *[Save]*.

   Once the *[Save]* button has been selected, the JCU-4 must be rebooted via the *[Reboot]* popup in order to initiate any changes created.

CHAPTER 14: MAINTENANCE

CHAPTER CONTENTS

14.1 Service and maintenance

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

14.2 Routine equipment checks

It is recommended that you perform the following routine checks, on a regular basis, to ensure the correct and reliable operation of your equipment:

- Examine all cables for signs of damage or wear and tear.
- Check that all cables are securely connected.

14.3 Cleaning the unit

1. Power the unit off.
2. Wipe the unit's enclosure with a clean, lint-free microfibre cloth.
3. If necessary, use a mild detergent to remove grease marks from the unit's enclosure.
4. Rinse the screen with fresh water to remove all dirt particles and salt deposits.
5. Allow the screen to dry naturally.
6. If any smears remain, very gently wipe the screen with a clean, lint free microfibre cloth.

CHAPTER 15: SYSTEM CHECKS AND TROUBLESHOOTING

CHAPTER CONTENTS

15.1 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 FLIR 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 FLIR technical support contact details.

15.2 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.

Product does not turn on or keeps turning off:

Possible causes	Possible solutions
Blown fuse / tripped breaker:	1. Check the condition of your relevant fuses, breakers and connections, and replace if necessary. 2. If the fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE.
Poor / damaged / insecure power supply cable / connections:	1. Check to ensure that all connections (e.g. between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE) are secure, clean and free from corrosion. Replace if necessary. 2. Ensure that the power cable connector is correctly orientated, fully inserted and in the locked position. 3. With the unit turned on, try flexing the power cable connector to see if this causes the unit to restart or lose power. Replace if necessary. 4. With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary.

Possible causes	Possible solutions
Incorrect power connection:	1. Check to ensure that connections between your unit, the PSE (Power Sourcing Equipment) and the power source providing power to the PSE are correct.
Power source insufficient:	1. Any device supplying PoE (Power over Ethernet) to the JCU-4 must output a nominal supply voltage of 44 V to 57 V dc.

15.3 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.

Product does not turn on or keeps turning off:

Possible causes	Possible solutions
Blown fuse / tripped breaker:	1. Check the condition of your relevant fuses, breakers and connections, and replace if necessary. 2. If the fuse keeps blowing check for cable damage, broken connector pins or incorrect wiring.
Poor / damaged / insecure power supply cable / connections:	1. Check the vessel's battery voltage and the condition of the battery terminals and power supply cables, ensuring connections are secure, clean and free from corrosion. Replace if necessary. 2. Check the power cable and your power supply connection for signs of damage or corrosion, and replace if necessary. 3. Ensure that the power cable connector is correctly orientated, fully inserted and in the locked position. 4. With the unit turned on, try flexing the power cable connector to see if this causes the unit to restart or lose power. Replace if necessary. 5. With the product under load, using a multi-meter, check for high voltage drop across all connectors / fuses etc, and replace if necessary.
Incorrect power connection:	1. The power supply may be wired incorrectly, ensure the installation instructions have been followed.
Power source insufficient:	1. Check that your power supply (battery or distribution panel) is providing a minimum of 8 V to the unit.

15.4 System data troubleshooting

Networked camera(s) not available on your joystick controller(s):

Possible causes	Possible solutions
Connection problem:	1. Check that the FLIR maritime camera(s) are correctly powered and operational. 2. Check that the controller(s) and FLIR maritime camera(s) are correctly connected to the same network. 3. Check the relevant product and or network cabling and connections for signs of damage or corrosion, and replace if necessary. 4. If applicable, check the status of your Ethernet network switch.
Software mismatch between equipment may prevent communication:	1. Ensure that all products have the latest software installed.
IP network parameter configured incorrectly:	1. If the JCU-4 has been configured to use a *[Static]* IP address, ensure that you have correctly configured your IP-network parameter settings (e.g. *[IP address]* and *[Netmask]* and *[Gateway]* settings) via the Web browser user interface. For more information, refer to: **p.58 — Web browser user interface**

15.5 Miscellaneous troubleshooting

Erratic or unresponsive controls:

Possible causes	Possible solutions
Connection problem:	1. Check that the FLIR maritime camera(s) are correctly powered and operational. 2. Check that the controller(s) and FLIR maritime camera(s) are correctly connected to the same network. 3. Check the relevant product and or network cabling and connections for signs of damage or corrosion, and replace if necessary. 4. If applicable, check the status of your Ethernet network switch.
Control conflict (e.g. caused by multiple users at different stations):	1. Ensure that no other controllers are in use at the same time.
Problem with the controller:	1. Check cabling between the controller and the Power Sourcing Equipment (e.g. PoE Injector / PoE network switch). 2. If available, check any other controllers that have been connected to your system. If the other controllers are operating as intended, this will eliminate the possibility of a more fundamental camera fault.

LCD is too bright or dark:

Possible causes	Possible solutions
Brightness level is set too high or low:	1. Change the current LCD brightness and button illumination via the *[Brightness]* menu. For more information, refer to: **p.52 — Brightness configuration**

15.6 FLIR Maritime product support and servicing

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

Product information

If you need to request service or support, please have the following information to hand. You can obtain this product information using the menus within your product.

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

Web portal support

Service	Web portal
Camera support	https://support.FLIR.com
Return product	https://customer.FLIR.com

Servicing and warranty

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

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

Telephone and online support

Region	Contact details
All regions	**Online support:** https://customer.flir.com/messages
United Kingdom (UK) and EMEA	**Telephone:** +44 (0)1329 246 777
Asia Pacific	**Telephone:** +61 2 8977 0300
United States (US)	**Telephone:** +1 (603) 324 7900 (Toll-free: +800 539 5539)
Australia and New Zealand	**Telephone:** +61 2 8977 0300
France	**Telephone:** +33 (0)1 46 49 72 30
Germany	**Telephone:** +49 (0)40 237 808 0
Italy	**Telephone:** +39 02 9945 1001
Benelux	**Telephone:** +31 (0)263 614 905
Sweden	**Telephone:** +46 (0)317 633 670
Finland	**Telephone:** +358 (0)207 619 937
Norway	**Telephone:** +47 692 64 600
Denmark	**Telephone:** +45 437 164 64
Singapore	**Telephone:** +65 6275 3585

CHAPTER 16: TECHNICAL SPECIFICATION

CHAPTER CONTENTS

16.1 Physical specification

Specification	
Width:	93.66 mm (3.69 in)
Height:	146.66 mm (5.77 in)
Depth:	63.36 mm (2.49 in)
Depth (including joystick):	113.30 mm (4.46 in)

16.2 Power specification

Specification	
PoE class:	Class 2
Nominal supply voltage:	• PoE: 48 V dc • Alternate power: 12 V / 24 V dc
Operating voltage range:	• PoE: 44 V to 57 V dc • Alternate power: 8 V to 32 V dc
Power consumption:	5 W Max with full keypad illumination.
IEEE Standard:	IEEE 802.3af

16.3 Network specification

Specification	
Network connection ports:	• 1x 10/100/1000 Mbits/s RayNet (Ethernet) • 1x 10/100/1000 Mbits/s PoE RayNet (Ethernet)

16.4 Display specification

Specification	
LCD Size:	2.9”
LCD Type:	IPS TFT LCD
Active area:	26.51 mm x 67.68 mm
Brightness / Luminance:	600 nits / 600 cd/m^2
Viewing angles:	80 + / 80 +
Resolution:	376 (H) x 960 (W) pixels (RBG)
Contrast ratio:	1:1500

16.5 Environmental specification

Specification	
Operating temperature:	-25 ºC to +55 ºC (-13 ºF to 131 ºF)
Storage temperature:	-30 ºC to +70 ºC (-22 ºF to 158 ºF)
Relative humidity:	Maximum 93% @ + 40 °C (104 °F)
Waterproof rating:	IPx6

16.6 Conformance specification

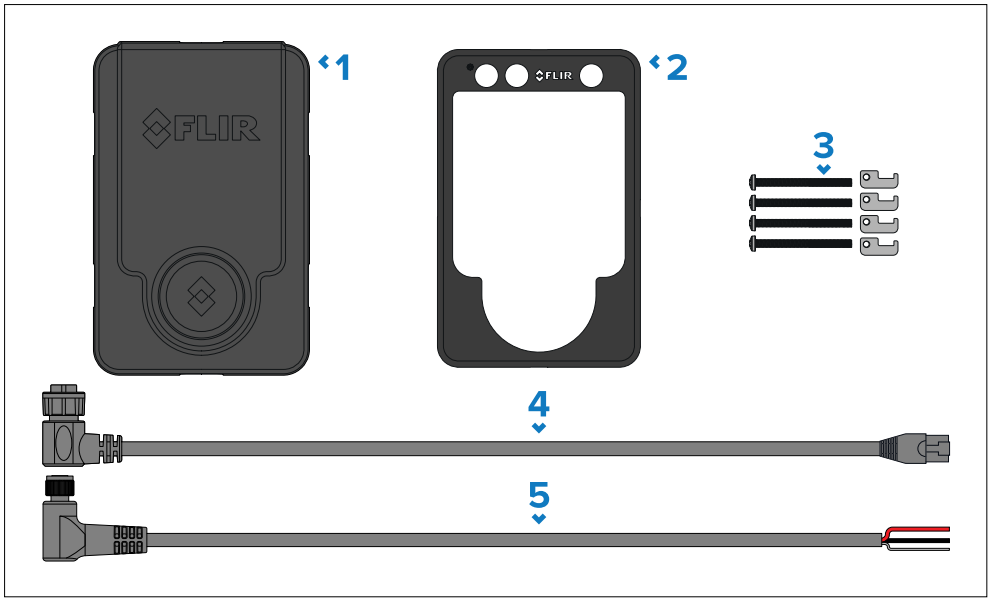
Specification	
Europe, UK, Australia & New Zealand:	• IEC/EN 60945:2002 • IEC/EN 62368-1:2020
USA:	FCC CFR 47, Part 15B
Canada:	ICES-003, RSS-GEN, Issue 5
Ethernet / PoE:	• IEEE 802.3 • IEEE 802.3af

CHAPTER 17: SPARES AND ACCESSORIES

CHAPTER CONTENTS

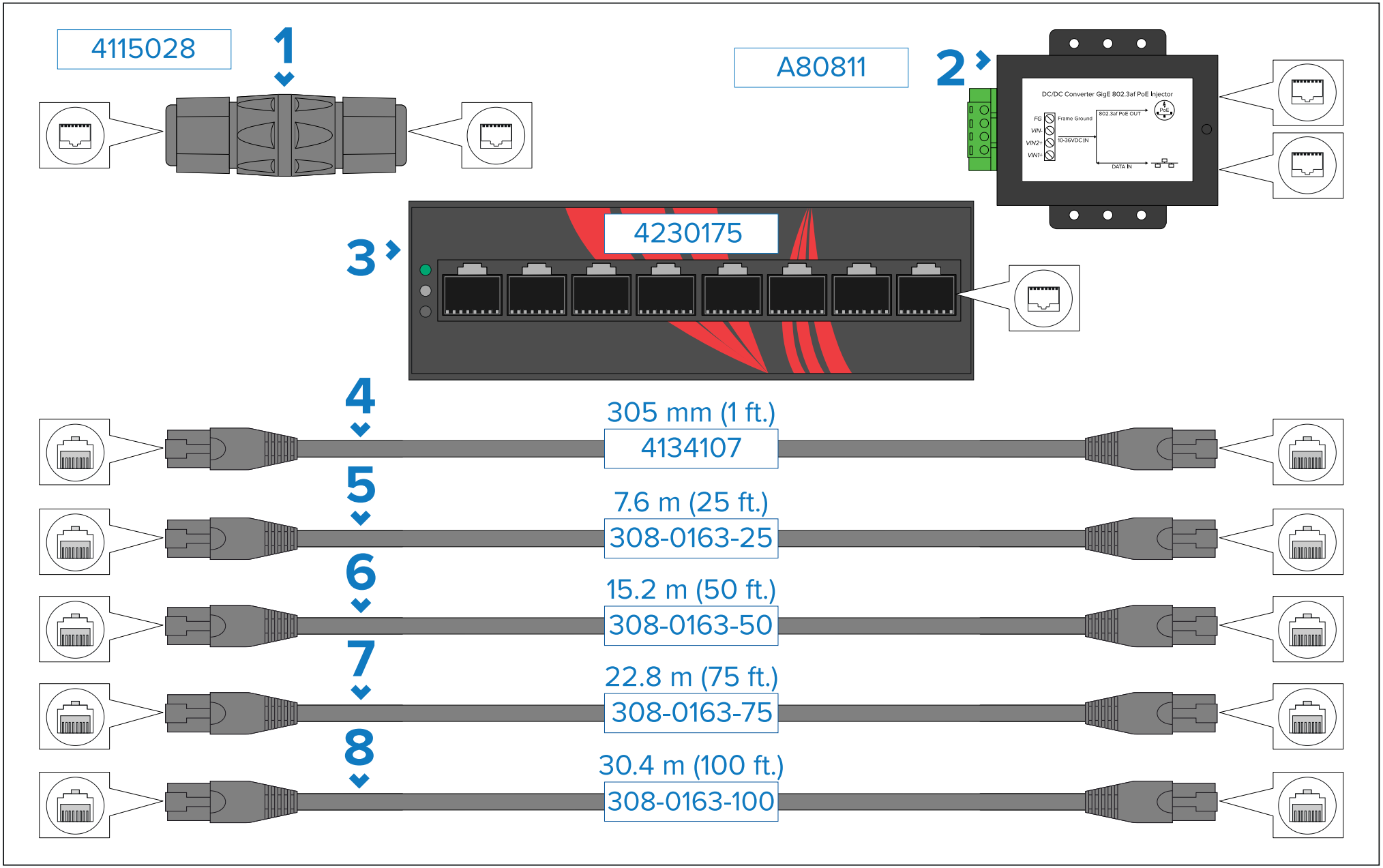
17.1 Spares and accessories

The following spares and accessories are available for your product:



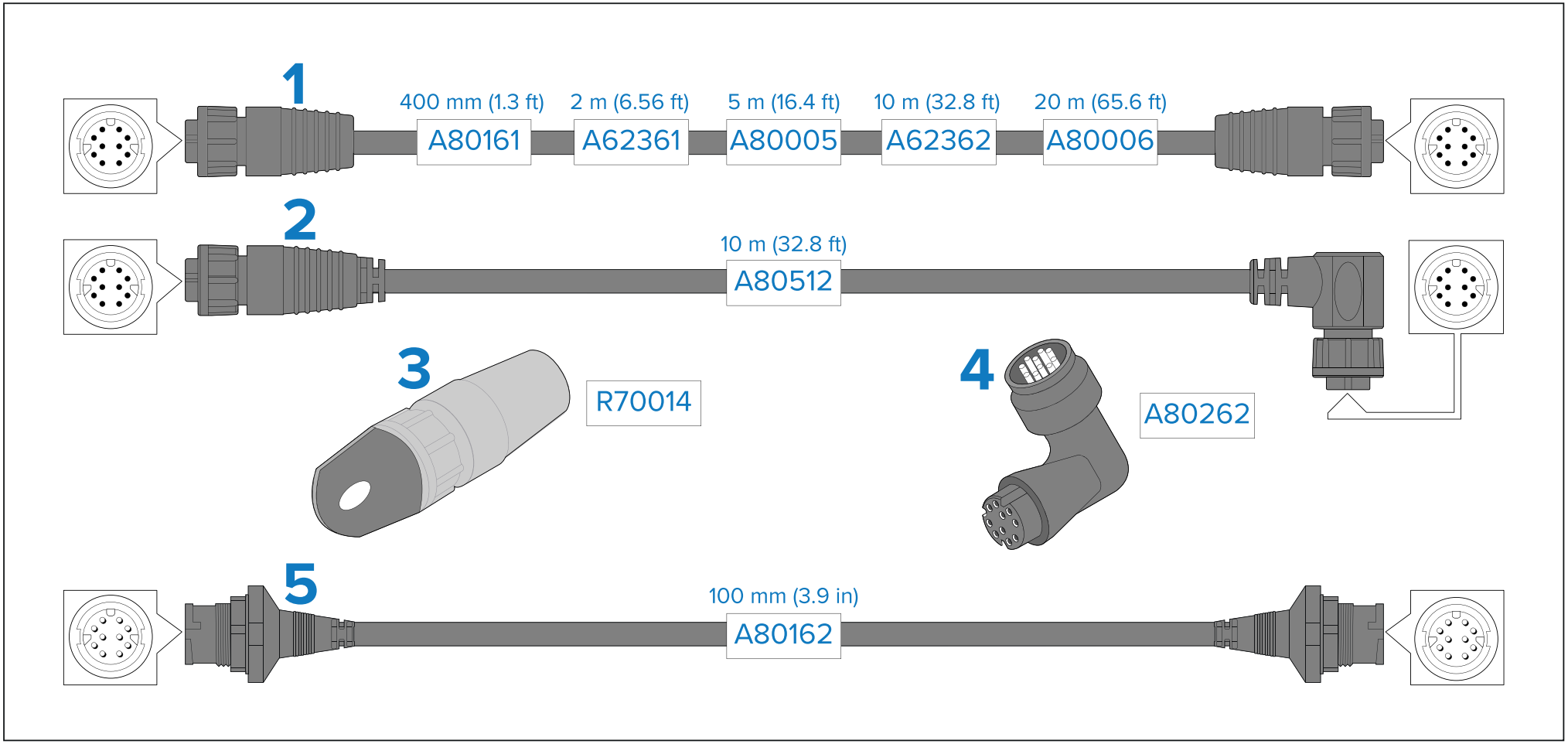
	Part	Description
1	**A80748**	JCU-4 weatherproof cover.
2	**R70979**	JCU-4 front fascia / cover.
3	**A80749**	JCU-4 mounting kit.
4	**A80756**	JCU-4 Right-angled RayNet (Ethernet) to RJ45 adapter cable, 3 m (9.8 ft).
5	**A80757**	JCU-4 Right-angled 3-pin power cable, 3 m (9.8 ft).

17.2 FLIR networking accessories



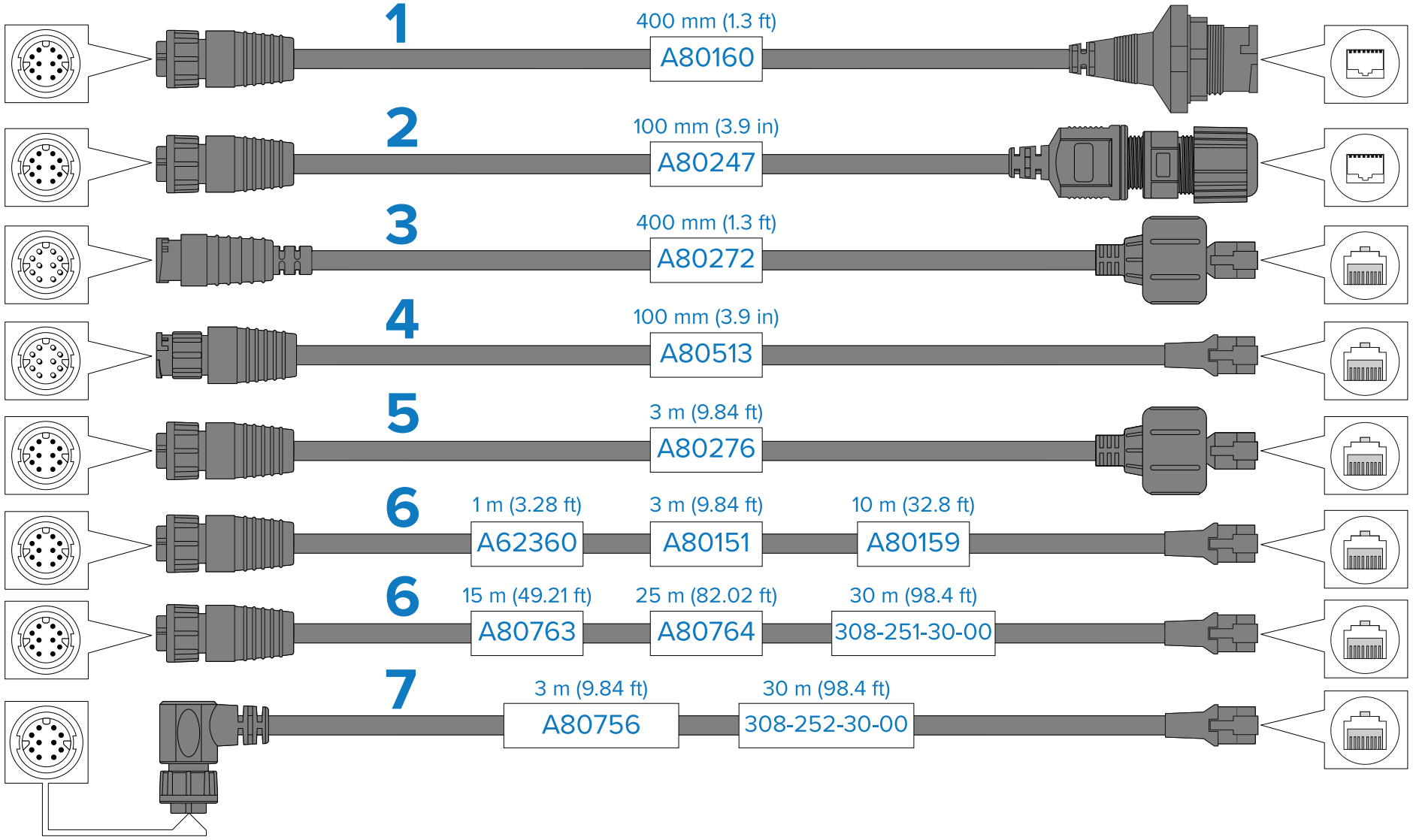
1. RJ45 coupler, for joining 2 separate RJ45 network cables together to achieve longer cable runs.
2. PoE Injector (2nd Generation; 5 Gbit). Supplies power to a non-PoE network connection. Typical use is for powering a JCU-Series controller connected to a non-PoE network switch.
3. PoE 8-port Gigabit Network Switch.
4. 305 mm (1 ft.) RJ45-to-RJ45 Ethernet cable, double shielded with LSZH low interference jacket.
5. 7.6 m (25 ft.) RJ45-to-RJ45 Ethernet cable, double shielded with LSZH low interference jacket.
6. 15.2 m (50 ft.) RJ45-to-RJ45 Ethernet cable, double shielded with LSZH low interference jacket.
7. 22.8 m (75 ft.) RJ45-to-RJ45 Ethernet cable, double shielded with LSZH low interference jacket.
8. 30.4 m (100 ft.) RJ45-to-RJ45 Ethernet cable, double shielded with LSZH low interference jacket.

17.3 RayNet to RayNet cables and connectors



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

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



1. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalk HS) socket on the other end, accepting the following cables with an RJ45 (SeaTalk HS) waterproof locking (male) plug:
   - A62245 (1.5 m).
   - A62246 (15 m).
2. Adapter cable with a RayNet (female) socket on one end, and a waterproof (female) RJ45 (SeaTalk HS) socket on the other end, along with a locking gland for a watertight fit.
3. Adapter cable with a RayNet (male) plug on one end, and an RJ45 (SeaTalk HS) waterproof (male) plug on the other end.
4. Adapter cable with a RayNet (male) plug on one end, and an RJ45 (male) plug on the other end.
5. Adapter cable with a RayNet (female) socket on one end, and an RJ45 (SeaTalk HS) waterproof (male) plug on the other end.
6. Adapter cable with a RayNet (female) socket on one end, and an RJ45 (male) plug on the other end.
7. Adapter cable with a right-angled RayNet (female) socket on one end, and an RJ45 (male) plug on the other end.

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