GARMIN.

THIRD-PARTY MARINE CAMERA
INTEGRATION GUIDE

Introduction

Integrating network cameras with your Garmin® marine electronics provides superior video surveillance for your boat. You can view video on every chartplotter screen on your boat, or view multiple video streams on one chartplotter combination screen. You can use touchscreen gestures to control your camera from your chartplotter, such as pinching to zoom, and swiping to pan and tilt the camera. You can customize your chartplotter to store settings with on-screen presets for each camera, such as camera position and zoom data.

A Garmin Power over Ethernet (PoE) Isolation Coupler (010-10580-10) must be used to connect standard Ethernet equipment to a Garmin Marine Network. Such equipment includes a network camera, network switch, or PoE injector. A shielded cable, such as a CAT 5e F/FTP, offers the best protection for your equipment. Connecting a PoE device directly to a Garmin Marine Network chartplotter damages the Garmin chartplotter and may damage the PoE device.

You can connect multiple supported video cameras to the Garmin Marine Network. For best network performance, Garmin recommends streaming no more than five video sources simultaneously.

You can set up combination screens to view multiple videos at once. In devices with multiple composite video inputs, only a single video function within a combination screen can use a built-in video input.

Current GPSMAP® chartplotters (excluding the 8000, 8200, 8500, 7x1, 7400, and 7600 series and older chartplotters) have built-in video encoder functionality and will share the video connected over their composite video input across every chartplotter screen on the boat.

NOTE: When you connect multiple video cameras to the Garmin Marine Network, you can insert a PoE isolation coupler in the path to create a single connection from a network switch to your Garmin electronics.

FLIR® Cameras

FLIR marine cameras provide thermal imagery, and can provide an optional lowlight camera output. When you connect a FLIR camera to your compatible chartplotter, the network detects the camera automatically and displays it in the source list. You do not need to pre-configure the camera before installation.

For a list of Garmin GPSMAP chartplotters that are compatible with FLIR M and MD series cameras, go to support.garmin.com/marine/cameras/flir.

FLIR M-Series with Network Video Output
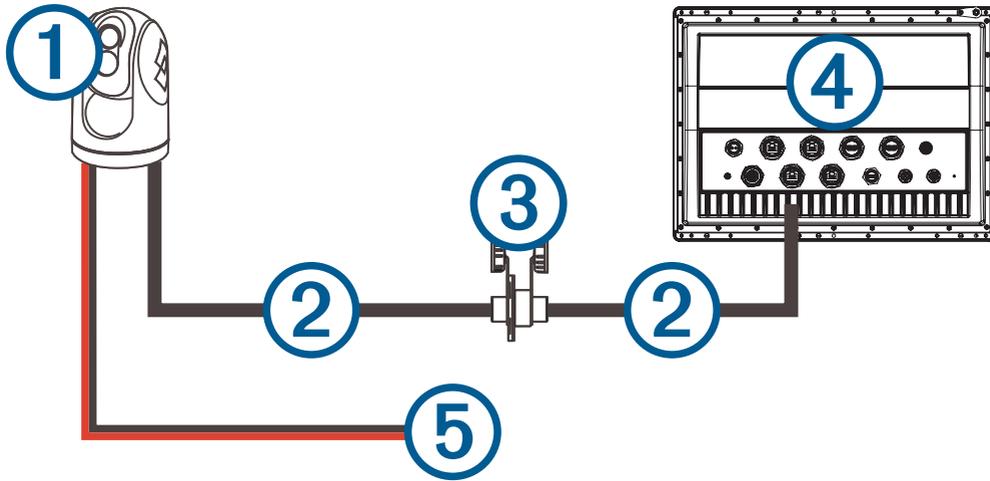
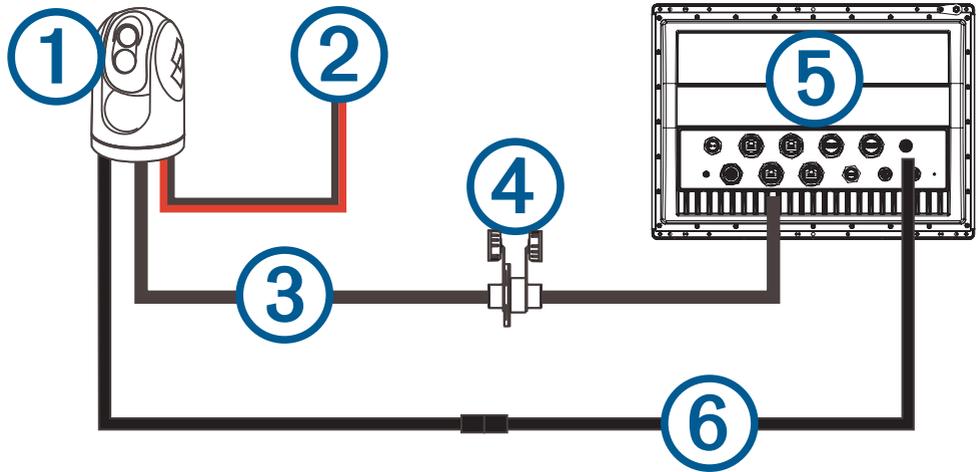| Item	Description
①	FLIR M-Series camera with network video output
②	Ethernet connection cable
③	PoE isolation coupler (010-10580-10)
④	GPSMAP chartplotter
⑤	DC power

FLIR Camera to GMS™ IO Network Port Expander Connection
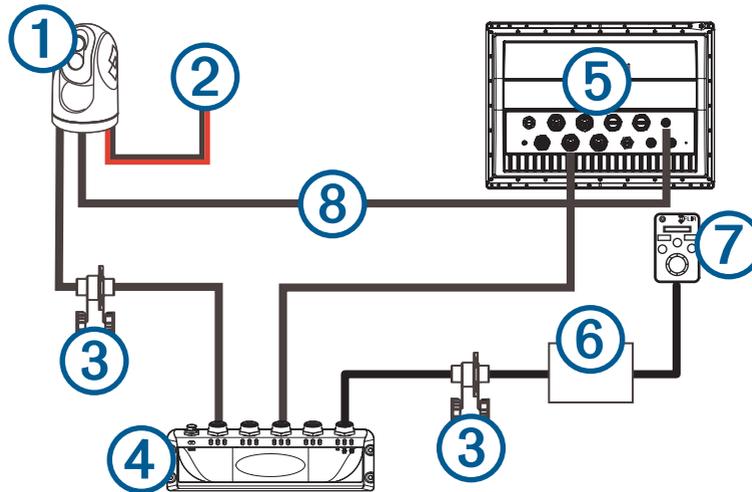
Item	Description
①	FLIR M-series camera
②	DC power
③	PoE isolation coupler (010-10580-10)
④	GMS 10 network port expander
⑤	GPSMAP chartplotter
⑥	FLIR midspan PoE injector (or equivalent)[1]
⑦	FLIR joystick
⑧	Single (V/IR) composite (BNC) video cable[2]

[1] Optional depending on the specific FLIR joystick.
[2] See *Dual Payload FLIR Models with Composite Video*, page 7 for recommended video connections from the camera to the chartplotter.

FLIR M-Series Camera without Network Video Output

Item	Description
①	FLIR M-Series camera without network video output
②	DC power
③	Ethernet cable
④	PoE isolation coupler (010-10580-10)
⑤	GPSMAP chartplotter
⑥	Single composite video (V/IR) F-type female to coaxial to BNC adapter cable

Multiple Network Camera Connection
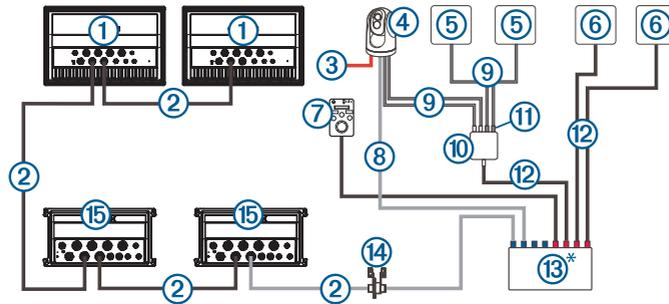
Item	Description
①	Compatible GPSMAP chartplotter
②	Garmin Marine Network cable
③	DC power
④	FLIR M-series camera
⑤	Analog or composite video camera, such as Garmin GC™ 14 (010-02667-00)
⑥	Network camera, such as Garmin GC 200 (010-02164-00)
⑦	FLIR joystick
⑧	Ethernet cable
⑨	Composite video cable
⑩	Video encoder, if required
⑪	BNC composite inputs
⑫	PoE network cable
⑬	Multi-port PoE switch[3]
⑭	Garmin PoE isolation coupler (010-10580-10)[4]
⑮	Compatible GPSMAP chartplotter

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[3] The blue ports on the multi-port PoE switch are non-powered ports. The red ports are powered ports.
[4] You should use a Garmin Marine Network waterproof connection on at least one side of the PoE isolation coupler. You can use a waterproof connection on both sides by crimping a new RJ-45 connector on one of the Garmin cables to connect to standard Ethernet equipment. For networks without a Garmin Marine Network waterproof connection, point the PoE isolation coupler down, or horizontal with a drip loop to avoid water retention around the connector.

FLIR Camera Settings

Using the chartplotter, you can change the polarity, color scheme, and scene setting (gain control) displayed on your FLIR camera. You can switch between a thermal and visible camera view on your chartplotter screen.

NOTE: You must have a dual-payload M-series FLIR camera connected to your chartplotter network to switch between views. FLIR MD-series cameras provide thermal views only.

From the video screen, select Menu.

Change Colors: Sets the color scheme of the infrared image.

Change Scene: Sets the camera to a night, night docking, day, or man overboard view.

Polarity: Sets the colors or shades that represent hot and cold in the infrared image.

Associating an Older Analog FLIR Camera with a Video Input Device

NOTE: FLIR IP cameras are plug-and-play on the Garmin Marine Network, so the cameras are automatically detected and accessible without additional setup when connected.

Associating a detected FLIR camera and a video input device creates a connection between the camera and the device. The video input device can be a built-in connection on a compatible chartplotter.

For FLIR cameras that do not support IP video, you must create an association between a FLIR camera and a chartplotter. A prompt appears the first time you select a FLIR camera as the video source. When >> appears next to the device name, you are prompted to form an association.

From the **Video Source** menu, select your device.

>> disappears from the device name.

Changing the Associated Video Input Device for a FLIR Camera

You can change the video association between the FLIR camera and its video input device after the initial association.

1 From the video screen, select your connected FLIR camera.

2 If necessary, from the video screen, select **Menu** > **Video Setup** > **Set Input**.

3 Select the source of the video feed.

Camera Tracking

When connected to the proper cameras, these chartplotter models support camera tracking.

You can use the camera tracking feature for these purposes.
- To hold the camera on a fixed compass direction (Compass Lock).
- To lock the camera at a fixed angle relative to the vessel (Vessel Lock).
- To track AIS, MARPA, or waypoint targets (also known as slew-to-cue).

To use the camera tracking features, you must connect specific sensors and cameras to the chartplotter using the Garmin Marine Network or the NMEA 2000® network.

To support Compass Lock and Vessel Lock, you must connect these sensors and cameras.
- A tracking-capable marine camera such as a newer model FLIR IP video camera
- A GPS antenna
- A heading sensor

  NOTE: For the best camera tracking performance, the heading sensor should provide 9-axis data including yaw, pitch, and roll.

In addition to the sensors and cameras needed to support Compass Lock and Vessel Lock, you must connect these additional devices to the Garmin Marine Network to support AIS and MARPA tracking.
- To track targets using AIS, you must connect a compatible AIS receiver.
- To track targets using MARPA, you must connect a compatible radar device.

Setting the Camera Angle and Height

If the camera supports camera tracking and the required equipment is connected, you should configure the camera angle and height for the best results when using the camera tracking feature.

You should make small adjustments until the camera view and camera tracking performance work as expected.

- The Camera Angle value specifies the angle at which the front of the camera points relative to the front of the boat. A Camera Angle of zero degrees indicates the front of the camera is aligned with the front of the boat.
- The Camera Height value specifies how high the camera is mounted above the heading sensor.

Dual Payload FLIR Models with Composite Video

Some FLIR camera models output multiple video streams. On these dual payload models, composite video cables are marked V/IR and IR-only from the camera. The video stream from the V/IR cable can be switched between daylight video and infrared video, and the IR-only cable provides infrared video only. The V/IR video stream offers more flexibility when using one cable only. When you need to connect the video stream directly from a camera to a single chartplotter, you should use the V/IR cable.

Both cables can be connected to chartplotters with built-in video encoders. See *Multiple Network Camera Connection*, page 5 for configuration details. This setup allows both the IR and V/IR video streams to be displayed in a single chartplotter combination screen, and these streams can be viewed on any compatible networked chartplotter. For a network with multiple chartplotters, you can connect one FLIR composite video cable to each chartplotter, allowing side-by-side display of each video stream.

Troubleshooting

Before you contact your Garmin dealer or service center, you should perform a few simple troubleshooting steps to help diagnose the problem.

My camera is installed but it is not in the video source menu

Powering up the chartplotters and cameras can take several minutes to resolve. If the camera still does not appear, you should complete these actions.

- Verify the power is connected.
- Verify the circuit breakers are set properly.
- Verify the Power over Ethernet (PoE) adapter power is on.
- Verify the Ethernet cable is connected to your chartplotter.
- Verify your router and switches are on and functioning.
- Verify the camera is working. See your camera owner's manual for camera troubleshooting information.
- Verify the camera is compatible with Garmin systems.

My video displays but I cannot control the FLIR camera

- Verify the correct video input source on the chartplotter is associated with the FLIR camera. See *Changing the Associated Video Input Device for a FLIR Camera*, page 6 for more information.
- Verify you selected the correct camera when associating the camera with the chartpotter .

My chartplotter cannot access my camera

The chartplotter may use a camera's default password to initially access the camera. When the chartplotter cannot connect to the camera because of mismatched passwords, the chartplotter displays a message that it cannot connect to the camera. When this message appears, you must reset your camera password to its factory default settings. Check the camera manufacturer instructions on resetting the camera to factory default settings.

My chartplotter combination screen will not allow a second built-in video source

Depending on the model, Garmin chartplotters can have up to four built-in, or composite, video inputs. Each input can receive a standard composite video feed from a camera. Combinations can be configured to display multiple video sources, but only a single video function within a combination can use a composite video input connection to the chartplotter. See *Multiple Network Camera Connection*, page 5 for configuration details.