

# GARMIN®

## BOAT SWITCH PRE-CONFIGURED DIGITAL SWITCHING SYSTEM INSTALLATION INSTRUCTIONS

### Important Safety Information

#### WARNING

See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

Garmin® strongly recommends using a professional installer with proper knowledge of electrical systems to install the device. Incorrectly installing the device can result in serious bodily injury and damage to the vessel or the battery.

#### CAUTION

Failure to follow these cautions could result in bodily injury damage to the device and/or vessel, or poor product performance.

This device must be installed according to these instructions.

Disconnect the vessel's power supply before beginning to install this product.

Before applying power to this product, make sure it has been correctly grounded according to the installation instructions.

You must read all installation instructions before beginning the installation. If you do not understand the installation needs of this device, or if you experience difficulty during the installation, contact Garmin Product Support.

### Setting up a Garmin Boat Switch™ Device

Follow these steps to set up a Garmin Boat Switch device on the vessel. Additional information and instructions are contained in this document for your reference.

You should contact Garmin product support or your Garmin field service engineer (FSE) for assistance or if you have any questions.

- 1 Mount the Garmin Boat Switch device (*Mounting the Garmin Boat Switch Device, page 2*).
- 2 Connect the Garmin Boat Switch device to the NMEA 2000® network (*NMEA 2000 Network Connection, page 4*).
- 3 Connect the switched devices or circuits to the X1 wiring harness (*X1 Wiring Harness, page 6*) and the X2 wiring harness (*X2 Wiring Harness, page 9*).
- 4 Connect the Garmin Boat Switch device to power (*Connecting to Power, page 15*).
- 5 Configure the Garmin Boat Switch device (*Configuring the Device, page 16*).



## Mounting Considerations

Selecting the correct mounting location is critical to optimize the performance of the Garmin Boat Switch device. When selecting a mounting location, observe these considerations.

- You must mount the device in an accessible location.
  - All of the switches on this device can be activated by pressing buttons on the device directly. Because of this, the device must be accessible in case there is an issue with switching using the chartplotter.
  - Many of the settings on this device must be configured by connecting specific wires on the wiring harness to a ground wire. Because of this the device must be accessible during the configuration process.
  - This device uses software fuses, and if any of the fuses trip, you may need to reset them by pressing buttons on the device directly. Because of this, the device must be accessible during use so you can reset any tripped software fuses when needed.
- You must mount the device in a location where it is not submerged.
- You must mount the device on a flat, vertical mounting surface, with the wire harness connectors pointing down.
- You must clear mounting surface of dirt, debris, wax, or coatings.
- Mounting hardware is not included with this device. You must provide pan-head screws of the appropriate length for the mounting surface.
- You should select a location away from sources that can interfere with the device's operation. Sources of interference may include strong electromagnetic fields, such as power cables and electric motors.

## Mounting the Garmin Boat Switch Device

Before you can mount the device, you must select a location in accordance with the mounting considerations.

Mounting hardware is not provided with this device. Before you can mount the device, you must acquire pan-head screws of the appropriate length for the mounting surface.

### NOTICE

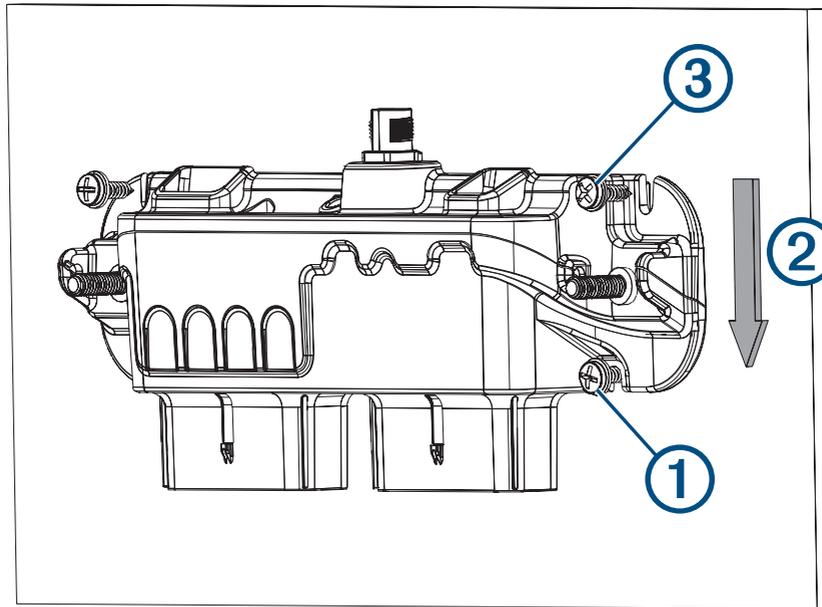
Do not use the Garmin Boat Switch device as a template when drilling the mounting holes because drilling through the mounting holes may damage the device and void the warranty.

Do not apply grease or lubricant to the screws when fastening the device to the mounting surface. Grease or other lubricants can cause damage to the device housing.

You must select pan-head screws to secure the device. Using countersunk screws can damage the device housing.

- 1 With the wiring-harness connectors pointing down, hold the device on a flat, vertical mounting surface and mark the locations for the pilot holes.
- 2 Remove the device from the mounting surface.
- 3 Using a 2 mm ( $\frac{5}{64}$  in.) drill bit, drill the pilot holes.
- 4 Verify that the mounting holes on the device line up with the pilot holes.
- 5 Fasten pan-head screws (not included) into the bottom two pilot holes ①, leaving room to attach the device.

- 6 Place the device over the screw heads, and slide it downward to lock it into place ②.



- 7 Fasten pan-head screws (not included) into the top two pilot holes ③.  
8 Secure the device to the mounting surface by tightening the four screws until they are snug.

#### NOTICE

Do not overtighten the screws because it may damage the device housing.

## Connection Considerations

You should carefully plan the layout of the device, the power wiring, the NMEA 2000 network, and all switched devices before making any connections.

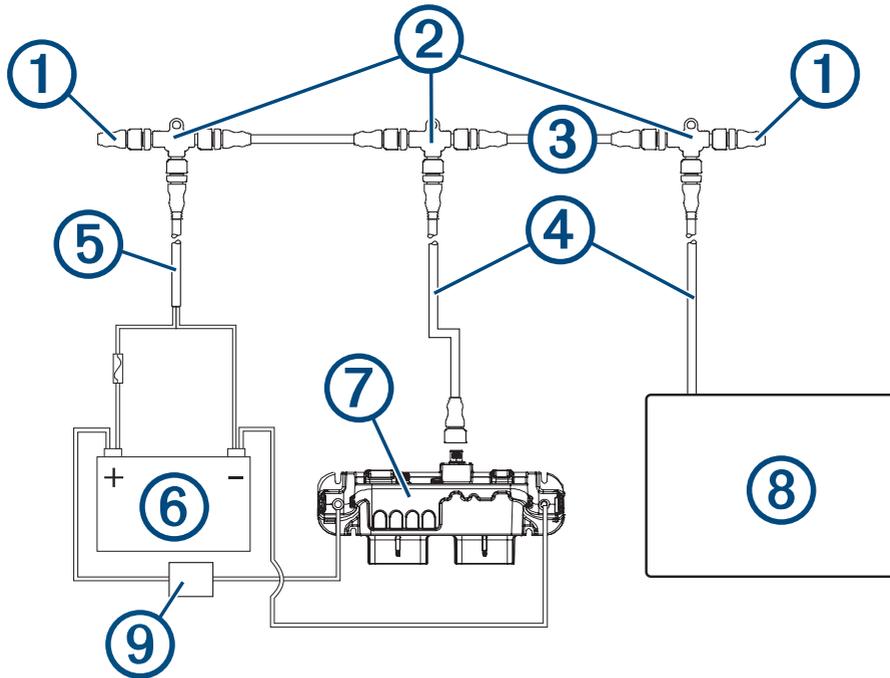
When making connections, observe these considerations.

- This device supports a maximum of 50 A total for all active channels. When planning switched connections, consider the power needs of all potential load combinations to ensure that the total active load does not exceed 50 A when in use.
- You must connect both the X1 and X2 wiring harnesses to this device, but you do not have to connect devices to every wire on the harnesses.
- You must make all bare wire connections using a marine-grade, waterproof connectors or waterproof heat-shrink.
- You must insulate any unused bare wire connections after completing installation.
- When connecting a device or circuit to the wiring harness, ensure that the power requirements for the device or circuit do not exceed the rated SW fuse for the channel.
- When extending wires, you must use the appropriate wire gauge as specified for the power wire (*Connecting to Power*, page 15) and for the individual wires on the wiring harnesses (*X1 Wiring Harness*, page 6, *X2 Wiring Harness*, page 9).
- This device must connect to the same NMEA 2000 network as the chartplotter you want to use for digital switching (*NMEA 2000 Network Connection*, page 4).

## NMEA 2000 Network Connection

This diagram shows a sample installation which you can scale to apply to the NMEA 2000 network on your vessel. The device must receive power from a dedicated power connection and does not receive power from the NMEA 2000 network (*Connecting to Power*, page 15).

If you are unfamiliar with the needs of a NMEA 2000 network, you should read the “NMEA 2000 Network Fundamentals” chapter of the *Technical Reference for NMEA 2000 Products*. To download the reference, go to [garmin.com/manuals/nmea\\_2000](http://garmin.com/manuals/nmea_2000).



Item	Description	Notes
①	NMEA 2000 terminator	NMEA 2000 terminators must connect to each end of the NMEA 2000 backbone.
②	NMEA 2000 T-connector	NMEA 2000 T-connectors must connect to one another using the sides of each T, and they must connect to NMEA 2000 devices using drop cables connected to the top of each T.
③	NMEA 2000 Backbone	
④	NMEA 2000 drop cable	A NMEA 2000 drop cable connects a device to the NMEA 2000 network. A NMEA 2000 drop cable should not exceed 6 m (20 ft.).
⑤	NMEA 2000 power cable	
⑥	12 V power source	
⑦	Garmin Boat Switch device	The Garmin Boat Switch device must connect to both the NMEA 2000 network and to switched devices to function correctly.
⑧	Garmin chartplotter	The Garmin chartplotter must have a power connection separate from the NMEA 2000 network.
⑨	Inline 50 A circuit breaker or fuse	The Garmin Boat Switch must connect to power through a 50 A circuit breaker or fuse ( <a href="#">Connecting to Power, page 15</a> ).

## Connecting Devices to the Wiring Harnesses

You must use the provided wiring harnesses to connect switched devices to the Garmin Boat Switch device.

### WARNING

In order to avoid accidental short circuits, disconnect the power supply to the Garmin Boat Switch before making any connections. Failure to disconnect the power supply could result in serious bodily injury, and/or damage to the device and/or vessel.

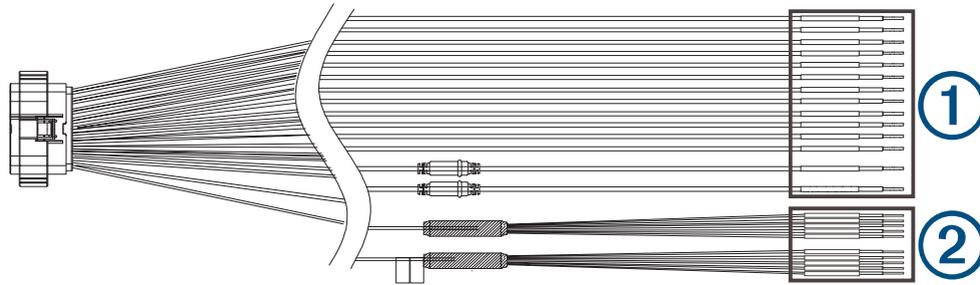
### NOTICE

To avoid possible damage to the device, the wiring harness, or the vessel, you should refer to American Boat & Yacht Council (ABYC) or your local and regional standards when determining the maximum length and gauge of wire extensions.

**NOTE:** You can view examples of common wiring installations on the Garmin website. Go to [garmin.com/manuals/boatswitch/](http://garmin.com/manuals/boatswitch/).

- Route appropriately gauged marine-grade, fully-tinned copper wire (not included) from the location of the device to the switched devices.  
**NOTE:** You should label both ends of the wire so you can easily identify which wires route to which devices.
- Connect the wire to the wiring harness using appropriately gauged marine-grade connectors.  
Because the device is pre-configured, you must connect switched devices to the appropriate wires on the wiring harness ([X1 Wiring Harness, page 6](#)), ([X2 Wiring Harness, page 9](#)).
- Connect the X1 wiring harnesses to the X1 port on the Garmin Boat Switch device.
- Connect the X2 wiring harnesses to the X2 port on the Garmin Boat Switch device.
- Verify the X1 harness is connected to the X1 plug on the Garmin Boat Switch device and the X2 harness is connected to the X2 plug on the Garmin Boat Switch device.  
**NOTE:** The Garmin Boat Switch device and connected devices will not operate correctly if the plugs are not connected correctly.

## X1 Wiring Harness



### ① X1 Primary Wire Connections

The primary wires on the X1 wiring harness connect to the appropriate devices on the vessel to allow for digital control or monitoring. When connecting a device or devices to a wire on this harness, you must use the wire gauge specified in the table at the very minimum. For long wire runs, you should consider using larger-diameter (smaller gauge number) wire to minimize power loss.

**NOTE:** You should refer to ABYC or your local and regional standards when determining the maximum length and gauge of wire extensions.

Wire Label	Wire Color	Wire Gauge	Software Fuse Rating	Wire Function
CH 1-TOGGLE 1(5A)	Gray	14 AWG	5A	Provides a latching switch output intended for use with red/green navigation lights <sup>1</sup> . By default this channel is tied to CH 2-TOGGLE 2(5A) for navigation-light control ( <a href="#">Navigation and Anchor Light Wiring, page 12</a> ).
CH 2-TOGGLE 2(5A)	Blue	14 AWG	5A	Provides a latching switch output intended for use with a white navigation/anchor light <sup>1</sup> . By default this channel is tied to CH 1-TOGGLE 1(5A) for navigation-light control ( <a href="#">Navigation and Anchor Light Wiring, page 12</a> ).
CH 3-TOGGLE 3(5A)	Orange	14 AWG	5A	Provides latching a switch output <sup>1</sup> .
CH 4-TOGGLE 4(5A)	Purple	14 AWG	5A	Provides a latching switch output <sup>1</sup> .
CH 5-TOGGLE 5(5A)	Green	14 AWG	5A	Provides a latching switch output <sup>1</sup> .
CH 6-RES TANK 1	Pink	16 AWG	N/A	Provides monitoring for tank 1 resistive sensor. Must connect to ground using the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness.
CH 7-RES TANK 2	White	16 AWG	N/A	Provides monitoring for tank 2 resistive sensor. Must connect to ground using the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness.
CH 9-TOGGLE 6(10A)	Gray with black stripe	14 AWG	10A	Provides a latching switch output <sup>1</sup> .
CH 10-TOGGLE 7(10A)	Blue with black stripe	14 AWG	10A	Provides a latching switch output <sup>1</sup> .
CH 11-LIVEWELL(10A)	Orange with black stripe	14 AWG	10A	Provides a latching switch output for a live-well pump <sup>1</sup> .
CH 12-BILGE 1 MANUAL(10A)	Brown	14 AWG	10A	Provides a latching switch output for a bilge pump <sup>1</sup> .
CH 13-BILGE 2 MANUAL(10A)	Brown	14 AWG	10A	Provides a latching switch output for a bilge pump <sup>1</sup> .
CH 14-BILGE 1 MONITOR	Brown with black stripe	16 AWG	N/A	Input for monitoring bilge pump 1 automatic operation. Generates an alarm when the pump runs for longer than 2 min. or is activated five times within 60 min. (12 Vdc)
CH 15-BILGE 2 MONITOR	Brown with black stripe	16 AWG	N/A	Input for monitoring bilge pump 2 automatic operation. Generates an alarm when the

<sup>1</sup> All switches on the Garmin Boat Switch device must be configured in the chartplotter software to function properly ([Switch Configuration, page 17](#))

Wire Label	Wire Color	Wire Gauge	Software Fuse Rating	Wire Function
				pump runs for longer than 2 min. or is activated five times within 60 min. (12 Vdc)

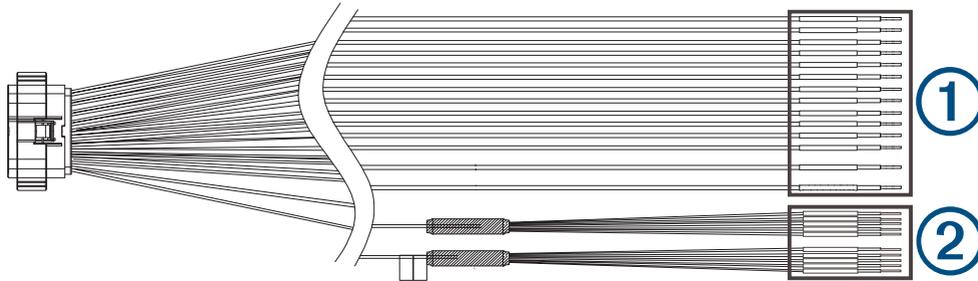
## ② X1 Breakout Wire Connections

The breakout wires on the X1 wiring harness allow you to add a physical switch to a device or circuit connected to a digital switch on the specified primary wires of the X1 and X2 wiring harnesses. Connecting these wires to the CH 32 TANK SENSOR GROUND wire on the X2 breakout wiring harness through a physical momentary switch triggers the associated latching, dimming, or momentary switch for devices connected to the correlated channels on the primary harnesses.

**NOTE:** Only momentary switches should be used for physical switches. Using physical latching or toggle switches can override the Garmin Boat Switch device and disable digital switching on that channel through the connected Garmin chartplotter.

Wire Label	Wire Color	Wire Gauge	Wire Function
SWITCH INPUT: CH1 TOGGLE 1 (OPTIONAL)	Black	18 AWG	Latching switch input for CH 1-TOGGLE 1(5A) on this wiring harness. By default this input is tied to CH 2-TOGGLE 2(5A) for navigation-light control ( <a href="#">Navigation and Anchor Light Wiring, page 12</a> ).
SWITCH INPUT: CH2 TOGGLE 2 (OPTIONAL)	Brown	18 AWG	Latching switch input for CH 2-TOGGLE 2(5A) on this wiring harness. By default this input is tied to CH 1-TOGGLE 1(5A) for navigation-light control ( <a href="#">Navigation and Anchor Light Wiring, page 12</a> ).
SWITCH INPUT: CH3 TOGGLE 3 (OPTIONAL)	Red	18 AWG	Latching switch input for CH 3-TOGGLE 3(5A) on this wiring harness.
SWITCH INPUT: CH9 TOGGLE 6 (OPTIONAL)	Orange	18 AWG	Latching switch input for CH 9-TOGGLE 6(10A) on this wiring harness.
SWITCH INPUT: CH10 TOGGLE 7 (OPTIONAL)	Yellow	18 AWG	Latching switch input for CH 10-TOGGLE 7(10A) on this wiring harness.
SWITCH INPUT: CH17 DIM 1 (OPTIONAL)	Black	18 AWG	Dimming switch input for CH 17-DIMMABLE 1(10A) on the X2 wiring harness.
SWITCH INPUT: CH18 DIM 2 (OPTIONAL)	Brown	18 AWG	Dimming switch input for CH 18-DIMMABLE 2(10A) on the X2 wiring harness.
SWITCH INPUT: CH19 DIM 3 (OPTIONAL)	Red	18 AWG	Dimming switch input for CH 19-DIMMABLE 3(10A) on the X2 wiring harness.
SWITCH INPUT: CH25 MOMENTARY 1 (OPTIONAL)	Orange	18 AWG	Momentary switch input for CH 25-MOMENTARY 1 (10A) on the X2 wiring harness.
SWITCH INPUT: CH26 MOMENTARY 2 (OPTIONAL)	Yellow	18 AWG	Momentary switch input for CH 26-MOMENTARY 2 (10A) on the X2 wiring harness.

## X2 Wiring Harness



### ① X2 Primary Wire Connections

The primary wires on the X2 wiring harness connect to the appropriate devices on the vessel to allow for digital control or monitoring. When connecting a device or devices to a wire on this harness, you must use the wire gauge specified in the table at the very minimum. For long wire runs, you should consider using larger-diameter (smaller gauge number) wire to minimize power loss.

**NOTE:** You should refer to ABYC or your local and regional standards when determining the maximum length and gauge of wire extensions.

Wire Label	Wire Color	Wire Gauge	Software Fuse Rating	Wire Function
CH 17-DIMMABLE 1(10A)	Gray	14 AWG	10A	Provides a dimmable latching switch output <sup>1</sup> .
CH 18-DIMMABLE 2(10A)	Blue	14 AWG	10A	Provides a dimmable latching switch output <sup>1</sup> .
CH 19-DIMMABLE 3(10A)	Orange	14 AWG	10A	Provides a dimmable latching switch output <sup>1</sup> .
CH 20-DIMMABLE 4(5A)	Purple	14 AWG	5A	Provides a dimmable latching switch output <sup>1</sup> .
CH 21-DIMMABLE 5(5A)	Green	14 AWG	5A	Provides a dimmable latching switch output <sup>1</sup> .
CH 22-VOLT TANK 1	Pink	16 AWG	N/A	Provides monitoring for Tank 1 voltage-based sensor. Must connect to ground using the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness.
CH 23-VOLT TANK 2	White	16 AWG	N/A	Provides monitoring for Tank 2 voltage-based sensor. Must connect to ground using the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness.
CH 25-MOMENTARY 1 (10A)	Gray with black stripe	14 AWG	10A	Provides a momentary switch output <sup>1</sup> .
CH 26-MOMENTARY 2 (10A)	Blue with black stripe	14 AWG	10A	Provides a momentary switch output <sup>1</sup> .
CH 27-MOMENTARY 3 (10A)	Orange with black stripe	14 AWG	10A	Provides a momentary switch output <sup>1</sup> .
CH 28-ALWAYS ON(10A)	Purple with black stripe	14 AWG	10A	Provides unswitched constant power.
CH 29-ALWAYS ON(10A)	Green with black stripe	14 AWG	10A	Provides unswitched constant power.
CH 30-START BATTERY SENSE (optional)	Yellow with black stripe	16 AWG	N/A	Optional connection that monitors start battery voltage. This information is provided to the NMEA 2000 network using PGN 127508.
CH 32 TANK SENSOR GROUND	Brown with black stripe	16 AWG	N/A	Connects to the ground wire from a tank sensor or physical bypass switch. This should be used with sensors connected to channels 6 and 7 on the X1 wiring harness, channels 22 and 23 on the X2 wiring harness, and all of the breakout wires for physical switches on both harnesses.

<sup>1</sup> All switches on the Garmin Boat Switch device must be configured in the chartplotter software to function properly ([Switch Configuration, page 17](#))

## ② X2 Breakout Wire Connections

One grouping of breakout wires on the X2 wiring harness allows you to add a physical switch to a pump or device connected to a digital switch on the specified primary wires of the X1 and X2 wiring harnesses. Connecting these wires to the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness through a physical momentary switch triggers the associated latching, dimming, or momentary switch for devices connected to the correlated channels on the primary harnesses.

The other grouping of breakout wires on the X2 wiring harness is used when configuring the device. Connecting these wires to the CH 32 TANK SENSOR GROUND wire on the X2 wiring harness through a physical momentary switch triggers the associated configuration command.

**NOTE:** Only momentary switches should be used for physical switches. Using physical latching or toggle switches can override the Garmin Boat Switch device and disable digital switching on that channel through the connected Garmin chartplotter.

Wire Label	Wire Color	Wire Gauge	Wire Function
SWITCH INPUT: ALL FUSE RESET	Black	18 AWG	Grounding this wire part of one option for resetting the software fuses ( <a href="#">Resetting All Software Fuses, page 22</a> ).
SWITCH INPUT: CH12 BILGE 1 (OPTIONAL)	Brown	18 AWG	Momentary switch input for a bilge pump connected to CH 12-BILGE 1 MANUAL(10A) on the X1 wiring harness.
SWITCH INPUT: CH13 BILGE 2 (OPTIONAL)	Red	18 AWG	Momentary switch input for a bilge pump connected to CH 13-BILGE 2 MANUAL(10A) on the X1 wiring harness.
SWITCH INPUT: CH11 LIVEWELL (OPTIONAL)	Orange	18 AWG	Momentary switch input for a live-well pump connected to CH 11-LIVEWELL(10A) on the X1 wiring harness.
SWITCH INPUT: CH27 MOMENTARY 3 (OPTIONAL)	Yellow	18 AWG	Momentary switch input for CH 27-MOMENTARY 3 (10A) on this wiring harness.
SWITCH INPUT: CALIBRATION ENABLE	Black	18 AWG	Grounding this wire for 5 seconds places the device into calibration mode. You must ground this wire again for five seconds to exit calibration mode ( <a href="#">Calibrating the Tank Sensors, page 18</a> ).
SWITCH INPUT: STORE MIN TANK VALUES	Brown	18 AWG	Ground this wire when configuring the tank sensors ( <a href="#">Calibrating the Tank Sensors, page 18</a> ).
SWITCH INPUT: STORE MAX TANK VALUES	Red	18 AWG	Ground this wire when configuring the tank sensors ( <a href="#">Calibrating the Tank Sensors, page 18</a> ).
SWITCH INPUT: LIVEWELL CYCLE ADJ	Orange	18 AWG	Ground this wire when configuring the live-well pump cycle settings ( <a href="#">Configuring the Livewell Automatic Pump Cycle Settings, page 19</a> ).
SWITCH INPUT: SPARE	Yellow	18 AWG	Unused

## Navigation and Anchor Light Wiring

### NOTICE

It is your responsibility to comply with applicable laws, regulations, and standards related to the use and/or operation of marine navigation lights. Garmin is not responsible for any fines, penalties, citations, or damages that may be incurred due to any such lack of compliance.

The first three channels on this device can be used for navigation lighting to satisfy the international regulations for preventing collisions at sea. Depending on the navigation-lighting configuration on your boat, you can choose from three different options for activating these lights.

**NOTE:** You can view examples of common wiring installations including these navigation light options on the Garmin website. Go to [garmin.com/manuals/boatswitch/](http://garmin.com/manuals/boatswitch/).

**Option A (default):** One connection for red/green navigation lights, and one connection for white navigation/anchor lights (*Navigation Lights Option A, page 12*).

**Option B:** One connection for red/green/white navigation lights, and one connection for anchor lights (*Navigation Lights Option B, page 13*).

**Option C:** One connection for red/green/white navigation lights, one connection for steaming lights, and one connection for anchor lights (*Navigation Lights Option C, page 14*).

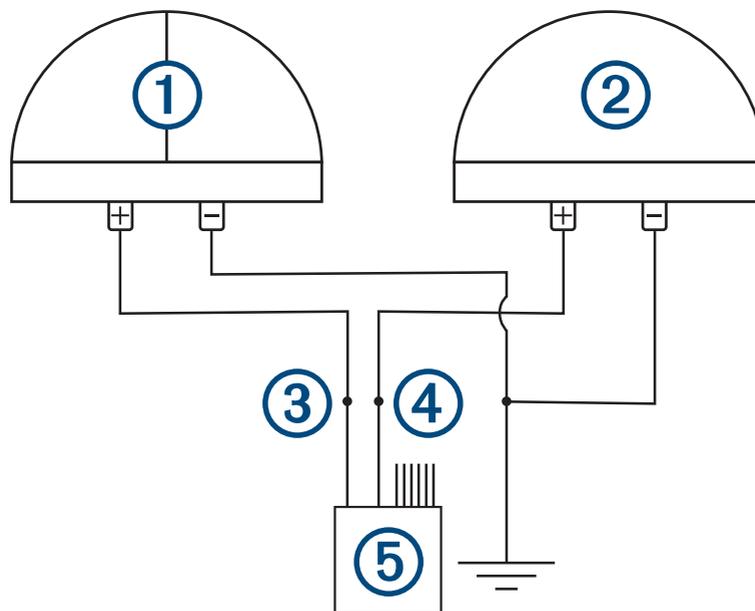
**Deactivated:** The first three channels are not interconnected, and act as assignable independent switches. These switches can still be used for lighting, but connected lights must be turned on and off independently of one another (*Configuring The Navigation Light Option, page 21*).

### Navigation Lights Option A

By default, the device is set to this option. Channels 1 and 2 are interlocked and intended for one connection to red and green navigation lights and one connection to white navigation/anchor lights.

When the device is connected properly using this option, it functions as described below.

- When underway, pressing the switch for channel 1 turns on and off both channel 1 and channel 2 (both red and green navigation lights and white navigation/anchor lights).
- When at anchor, pressing the switch for channel 2 turns on and off channel 2 only (white navigation/anchor lights), and turns off channel 1 (red and green navigation lights) if it is already on.



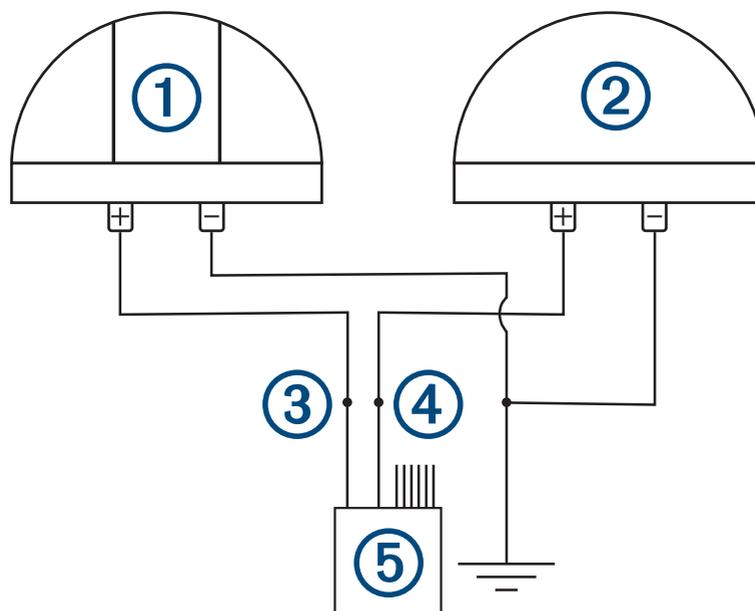
①	Red and green navigation lights
②	White navigation/anchor light(s)
③	CH 1-TOGGLE 1(5A) wire
④	CH 2-TOGGLE 2(5A) wire
⑤	X1 wiring harness
⊥	Power ground

### Navigation Lights Option B

You can configure the device so that channels 1 and 2 are interlocked and intended for one connection to red/green/white navigation lights and one connection to an anchor light.

When the device is connected properly using this option, it functions as described below.

- When underway, pressing the switch for channel 1 turns on and off only channel 1 (red/green/white navigation lights) and turns off channel 2 (anchor light) if it is already on.
- When at anchor, pressing the switch for channel 2 turns on and off only channel 2 only (anchor light), and turns off channel 1 (red/green/white navigation lights) if it is already on.



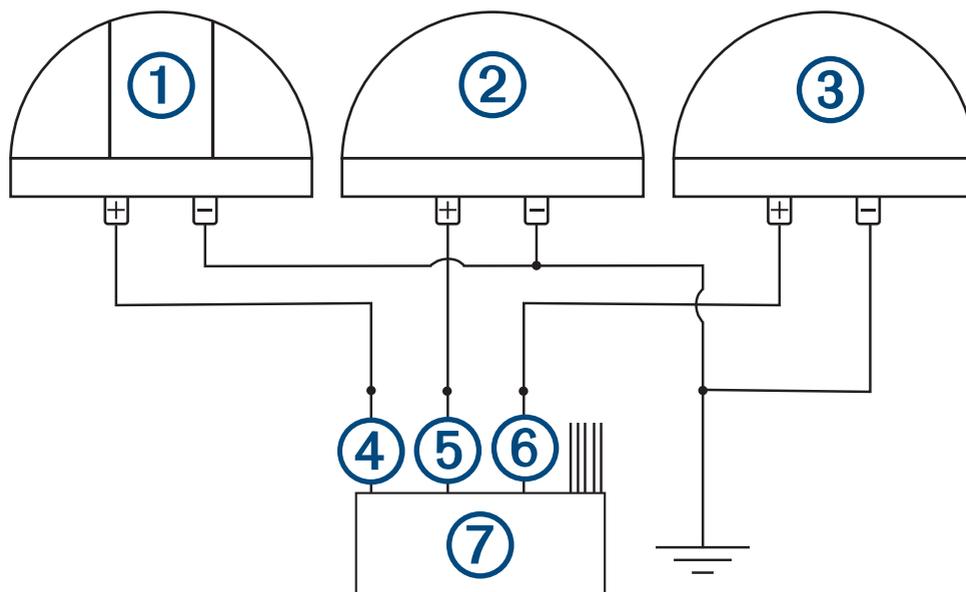
①	Red, green, and white navigation lights
②	Anchor light
③	CH 1-TOGGLE 1(5A) wire
④	CH 2-TOGGLE 2(5A) wire
⑤	X1 wiring harness
⊥	Power ground

### Navigation Lights Option C

You can configure the device so that channels 1, 2, and 3 are interlocked and intended for one connection to red/green/white navigation lights, one connection to a steaming light, and one connection to an anchor light.

When the device is connected properly using this option, it functions as described below.

- When underway under sail, pressing the switch for channel 1 turns on and off channel 1 (red/green/white navigation lights), and turns off channel 2 (steaming light) and channel three (anchor light) if either are already on.
- When underway under engine, pressing the switch for channel 2 turns on and off channel 1 (red/green/white navigation lights), and channel 2 (steaming light), and turns off channel 3 (anchor light) if it is already on.
- When at anchor, pressing the switch for channel 3 turns on and off only channel 3 (anchor light), and turns off channel 1 (red/green/white navigation lights) and channel 2 (steaming light) if either are already on.



①	Red, green, and white navigation lights
②	Steaming light
③	White anchor light
④	CH 1-TOGGLE 1(5A) wire
⑤	CH 2-TOGGLE 2(5A) wire
⑥	CH 3-TOGGLE 3(5A) wire
⑦	X1 wiring harness
	Power ground

## Connecting to Power

### WARNING

The wiring (not included) from the power source to the positive terminal of the Garmin Boat Switch device must run through a 50 A circuit breaker or in-line fuse (not included) as close to the power source as possible. You must connect the positive wire to the fuse or circuit breaker. Connecting the device to power without a circuit breaker or in-line fuse may cause a fire if there is a short in the cable, resulting in property damage and/or serious personal injury.

- If the device is powered by a battery, use a circuit breaker or fuse rated to protect a cable of the gauge used to connect the device to the battery. See the ABYC or your local and regional standards for the required fuse or breaker rating.
- If the device is powered by a source other than a battery, use a circuit breaker or fuse rated to the lower of 50 A or the maximum current of the power source.

### CAUTION

A power cable is not provided with this device. You must use 6 AWG marine-grade, fully-tinned copper wire with insulation rated for 105°C (221°F) to connect the device to power and to ground for most installations. For long wire runs, you should consider using larger-diameter (smaller gauge number) wire to minimize power loss. Using the improper wire gauge for the power cable can result in damage to the device, the wiring, and the vessel, as well as causing personal injury.

You should refer to ABYC or your local and regional standards when determining the maximum length and gauge of wire extensions.

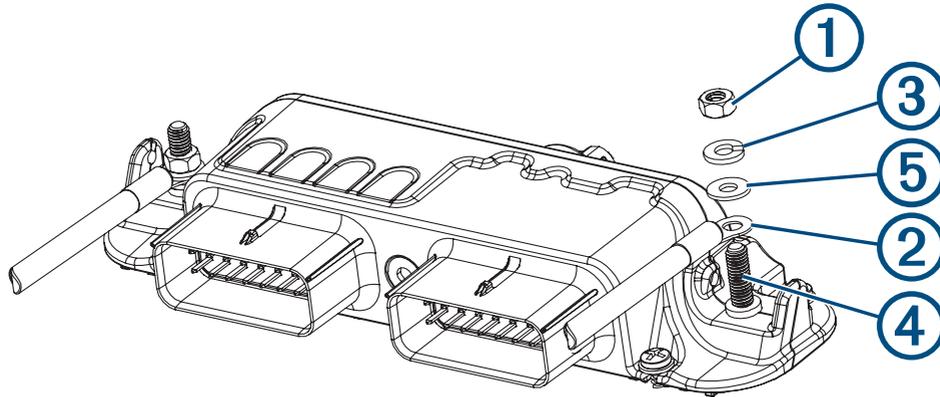
### NOTICE

The total maximum output of the Garmin Boat Switch device is 50 A.

Power is supplied to the device through two M6 bolt terminals. You must connect the power and ground wires to the bolt terminals using marine-grade ring terminals (not included) to ensure a solid power connection. Connecting bare wires to the bolt terminals may result in loss of power or a short circuit.

- 1 Route 6 AWG marine-grade, fully-tinned copper wire (not included) to the device and to a ground location on the boat, and select an option:
  - Install a properly rated in-line fuse on the power wire as close to the power source as possible.
  - Identify or install a circuit breaker, as close to the power source as possible, for use with the power wire.
- 2 Install marine-grade ring terminals on both the power and ground wires.
- 3 Lift the protector covering the positive terminal.

- Using a 10 mm ( $\frac{3}{8}$  in.) socket, remove the nut ①, lock washer ②, and flat washer ③ from the terminal bolt ④.



- Place the ring terminal ⑤ at the end of the positive power wire on the terminal bolt.
- Place the washer, lock washer, and nut on the terminal bolt.
- Using a 10 mm ( $\frac{3}{8}$  in.) wrench or socket, tighten the nut to a torque of 4.5 Nm to secure the power wire to the terminal bolt.

#### NOTICE

Do not overtighten the nut. Overtightening the nut can break the terminal bolt, and a broken terminal bolt cannot be used or repaired.

- Lower the protector to cover the positive terminal.
- Repeat steps 3 through 8 for the negative terminal and the 6 AWG ground wire (not included).

## Configuring the Device

Some digital switches must be configured through a Garmin chartplotter before use. You must connect all switches and switched devices to the Garmin Boat Switch device and power before configuring them using a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device.

### Accessing Digital Switching

Digital switching is controlled through a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device.

**NOTE:** Some switches only appear when the Garmin Boat Switch device is in calibration mode (*Calibrating the Tank Sensors, page 18*). You may need to add a page to see new switches after adding a device to the wiring harness or entering calibration mode (*Adding a Switch Page, page 16*).

From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Vessel > Switching**.

### Adding a Switch Page

You may need to add a page to see new switches after adding a device to the wiring harness or entering calibration mode.

From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Vessel > Switching > Options > Setup > Add Page**.

## Switch Configuration

By default, the Garmin chartplotter software is configured so that activating a switch on the chartplotter screen sends a latching signal a connected digital switching device. Because the Garmin Boat Switch device is designed to provide both latching and momentary switches within the switching device, the chartplotter must be configured so that a momentary signal is sent to the Garmin Boat Switch device instead. This allows the Garmin Boat Switch device to activate the appropriate switch type (either latching or momentary) within the device based upon the channel.

You must configure all of the following switches as momentary in the chartplotter software for proper operation ([Configuring a Switch as Momentary, page 17](#)).

Switch Number	Switch Name/Wire Label
1	CH 1-TOGGLE 1(5A)
2	CH 2-TOGGLE 2(5A)
3	CH 3-TOGGLE 3(5A)
4	CH 4-TOGGLE 4(5A)
5	CH 5-TOGGLE 5(5A)
9	CH 9-TOGGLE 6(10A)
10	CH 10-TOGGLE 7(10A)
11	CH 11-LIVEWELL(10A)
12	CH 12-BILGE 1 MANUAL(10A)
13	CH 13-BILGE 2 MANUAL(10A)
17	CH 17-DIMMABLE 1(10A)
18	CH 18-DIMMABLE 2(10A)
19	CH 19-DIMMABLE 3(10A)
20	CH 20-DIMMABLE 4(5A)
21	CH 21-DIMMABLE 5(5A)
25	CH 25-MOMENTARY 1 (10A)
26	CH 26-MOMENTARY 2 (10A)
27	CH 27-MOMENTARY 3 (10A)

### Configuring a Switch as Momentary

All latching and momentary channels on the Garmin Boat Switch device must be configured in the chartplotter software as momentary switches for proper operation.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Options > Settings > My Vessel > Switching > NMEA Standard**.
- 2 Select the switch number.
- 3 Select **Configuration > Momentary**.

## Calibrating the Tank Sensors

The minimum and maximum fluid levels must be configured for the tank sensors to function properly.

**NOTE:** To calibrate the sensors, you must connect specific wires in one of the breakout cables in the X2 wiring harness to a common ground as directed (*X2 Wiring Harness, page 9*). You can connect these wires to ground through physical momentary switches for convenience.

- 1 Ensure all of the tank sensors are properly connected.
- 2 Connect the SWITCH INPUT: CALIBRATION ENABLE wire to a common ground for five seconds.  
The screen displays Tank sensor calibration mode activated.
- 3 Set all of the tank sensors to the minimum fill position, and connect the SWITCH INPUT: STORE MIN TANK VALUES wire to a common ground for three seconds.  
The screen displays Tank sensor calibration: Min values stored.
- 4 Set all of the tank sensors to the maximum fill position, and connect the SWITCH INPUT: STORE MAX TANK VALUES wire to a common ground for three seconds.  
The screen displays Tank sensor calibration: Max values stored.
- 5 Connect the SWITCH INPUT: CALIBRATION ENABLE wire to a common ground for five seconds.  
The screen displays Tank sensor calibration mode deactivated.  
**NOTE:** Calibration mode automatically deactivates after 10 minutes if no calibration wires are connected to ground.

## Selecting the Tank Fluid Type

The fluid type must be defined for each connected tank sensor using this procedure. The fluid level PGN is not transmitted for unconfigured or incorrectly configured tank sensor channels. The fluid type must be defined for all of the following channels if you connected sensors to the device.

- CH 6-RES TANK 1 (*Resistive Tank Sensor 1 (Channel 6), page 18*)
  - CH 7-RES TANK 2 (*Resistive Tank Sensor 2 (Channel 7), page 19*)
  - CH 22-VOLT TANK 1 (*Voltage Tank Sensor 1 (Channel 22), page 19*)
  - CH 23-VOLT TANK 2 (*Voltage Tank Sensor 2 (Channel 23), page 19*)
- 1 Ensure all of the tank sensors are properly connected to the appropriate wiring harness.
  - 2 Connect the SWITCH INPUT: CALIBRATION ENABLE wire to a common ground for five seconds.  
The screen displays Tank sensor calibration mode activated, and switches 100 through 119 appear on the Garmin chartplotter.
  - 3 Select the appropriate switch for the tank sensor channel and fluid type.  
The screen displays a confirmation message.
  - 4 Repeat the previous step for each tank sensor you need to configure.
  - 5 Connect the SWITCH INPUT: CALIBRATION ENABLE wire to a common ground for five seconds.  
The screen displays Tank sensor calibration mode deactivated.  
**NOTE:** Calibration mode automatically deactivates after 10 minutes if no calibration switches are used. The chartplotter must be power cycled to hide the calibration switches.

## Resistive Tank Sensor I (Channel 6)

Device Switch	NMEA 2000 Fluid Type	NMEA 2000 PGN	NMEA 2000 Instance
100	Fuel (Default)	127505	0
101	Fresh Water	127505	0
102	Waste Water	127505	0
103	Black Water	127505	0
104	Live Well	127505	0

## Resistive Tank Sensor 2 (Channel 7)

Device Switch	NMEA 2000 Fluid Type	NMEA 2000 PGN	NMEA 2000 Instance
105	Fuel (Default)	127505	1
106	Fresh Water	127505	1
107	Waste Water	127505	1
108	Black Water	127505	1
109	Live Well	127505	1

## Voltage Tank Sensor I (Channel 22)

Device Switch	NMEA 2000 Fluid Type	NMEA 2000 PGN	NMEA 2000 Instance
110	Fuel (Default)	127505	2
111	Fresh Water	127505	2
112	Waste Water	127505	2
113	Black Water	127505	2
114	Live Well	127505	2

## Voltage Tank Sensor 2 (Channel 23)

Device Switch	NMEA 2000 Fluid Type	NMEA 2000 PGN	NMEA 2000 Instance
115	Fuel (Default)	127505	3
116	Fresh water	127505	3
117	Waste water	127505	3
118	Black water	127505	3
119	Live well	127505	3

## Configuring the Livewell Automatic Pump Cycle Settings

When activated, a connected livewell pump runs for 1 minute and stops. By default, this device activates the livewell every 5 minutes, and the activation cycle time can be configured. You can change this value to 1, 3, 5, 7, 9 11, 13, or 15 minutes.

**NOTE:** You can bypass this activation cycle and set the pump to run continuously by holding the livewell switch on the Garmin chartplotter for 3 seconds. When bypassed, the pump runs continuously until stopped.

- 1 Connect the SWITCH INPUT: LIVEWELL CYCLE ADJ wire to a common ground for three seconds.

The runtime-cycle setting changes to the next higher delay. The screen displays the new time between cycles.

- 2 Repeat the previous step to increase the delay up to a maximum of 15 minutes.

**NOTE:** When the live-well pump cycle is set to 15 minutes, you must connect the SWITCH INPUT: LIVEWELL CYCLE ADJ wire to a common ground for three seconds to set the runtime to back to 1 minute.

## Naming a Switch

You can provide a custom name to be used instead of the default name for each switch.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Options > Settings > My Vessel > Switching > NMEA Standard**.
- 2 Select the switch number.
- 3 Select **Name > Change Name**.
- 4 Enter a new name.
- 5 Select **Done**.

## Labeling a Switch

You can provide a custom label for each switch. The switch label is separate from the switch name.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Options > Settings > My Vessel > Switching > NMEA Standard**.
- 2 Select the switch number.
- 3 Select **Label > Edit Label**.
- 4 Enter a new label.
- 5 Select **Done**.

## Showing and Hiding Switches

You can select which switches are hidden or displayed on the Garmin chartplotter.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Options > Settings > My Vessel > Switching > NMEA Standard**.
- 2 Select the switch number.
- 3 Select **Visibility** to show or hide the switch.

## Using the Bilge Pump Switches

You can manually operate connected bilge pumps by using switches 12 and 13 on the Garmin chartplotter.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Vessel > Switching**.
- 2 Select an option:
  - Press and hold the bilge pump switch for one second to run the bilge pump for 2 minutes.
  - Press and hold the bilge pump switch for three seconds to run the bilge pump continuously.**NOTE:** Your Garmin chartplotter notifies you every 5 minutes while continuous mode is active.

## Using Dimmable Lights

You can operate connected dimmable lights by using switches 17 through 21 on the Garmin chartplotter.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Vessel > Switching**.
- 2 Select an option:
  - Press a dimmable light switch to turn a light on or off.  
**NOTE:** The light turns on at the dim level set when the light was last turned off.
  - With a light on, press and hold a dimmable light switch dim the light, and release to stop dimming.
  - With a light off, press and hold a dimmable light switch to turn on the light at 100% brightness.

## Configuring The Navigation Light Option

By default, channels 1 and 2 are interlocked for navigation lighting to satisfy the international regulations for preventing collisions at sea ([Navigation and Anchor Light Wiring, page 12](#)). Depending on the lighting specifics of your boat, you may need to configure the Garmin Boat Switch device to use the wiring option you that applies to your installation type.

If you do not intend to connect navigation and anchor lights to the device, you can configure channels 1 and 2 to operate independently as normal latching switches.

- 1 From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select **Vessel > Switching**.
- 2 Press and hold switch 1 for 5 seconds.  
Switch 1 starts flashing.
- 3 Press and hold switch 2 for 5 seconds.  
The switch stops flashing, and a message confirms the newly selected wiring option.
- 4 Repeat the previous two steps until the device is configured for the wiring option that applies to your installation type.

**NOTE:** After selecting option C, the next configuration option in the cycle deactivates the interlocks so that channels 1, 2, and 3 operate independently as normal latching switches.

## Manually Operating the Device

You can directly control some digital switches using the hard keys on the Garmin Boat Switch device. You do not need a Garmin chartplotter connection for manual switching.

**NOTE:** Manually activating or deactivating digital switches overrides the Garmin chartplotter digital switching page. You must clear all manual overrides before you can use the switches on the digital switching page on the Garmin chartplotter ([Manually Resetting Switches, page 22](#)).

### Manually Activating Switches

You can manually activate individual switches on the Garmin Boat Switch device using the device hard keys.

- 1 On the Garmin Boat Switch device, press →.  
The screen displays SEL.
- 2 Press → to select the channel you want to activate.
- 3 Hold **MAN ON/MAN OFF** for two seconds.  
The selected channel is manually overridden and active. The green channel indicator LED blinks rapidly, and the screen displays ON.

### Manually Deactivating Switches

You can manually deactivate individual switches on the Garmin Boat Switch device using the device hard keys.

- 1 On the Garmin Boat Switch device, press →.  
The screen displays SEL.
- 2 Press → to select the channel you want to deactivate.
- 3 Hold **MAN ON/MAN OFF** for five seconds.  
The selected channel is manually overridden and deactivated. The red channel indicator LED blinks rapidly, and the screen displays OFF.

## Manually Resetting Switches

You must manually reset the manually operated switches on the Garmin Boat Switch device to reenable digital switch controls through a Garmin chartplotter. On the device, the indicator LEDs for manually operated channels rapidly blink green or red.

- 1 Press → on the Garmin Boat Switch device.

The screen displays SEL.

- 2 Press → to select the channel you want to reset.

- 3 Hold **RESET/AUTO** for two seconds.

The selected channel resets. The channel indicator LED stops rapidly blinking red or green.

## Software Fuses

The Garmin Boat Switch device use software fuses to protect connected devices and cables. A Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device notifies you when a software fuse has been tripped. A tripped fuse is indicated directly on the Garmin Boat Switch device with a red continuance channel LED indicator on the top of the Garmin Boat Switch device.

### Resetting All Software Fuses

This device contains software fuses to protect each channel. You can use various methods to reset one or more of the software fuses if they trip.

- From a Garmin chartplotter connected to the same NMEA 2000 network as the Garmin Boat Switch device, select software switch 200 for one second to acknowledge the fuse alarm, then select it again to reset all tripped fuses.
- Connect the SWITCH INPUT: ALL FUSE RESET wire on the X2 wiring harness to a common ground for one second to acknowledge the fuse alarm, and connect it to a common ground for one second again to reset all tripped fuses.

### Resetting Individual Software Fuses

You can reset individual software fuses on the Garmin Boat Switch device if one or more of the software fuses trip. When the red channel indicator LED is solid, it indicates the software fuse for that channel has tripped and must be reset.

- 1 Press → on the Garmin Boat Switch device.

The screen displays SEL.

- 2 Press → to select the channel of the fuse you want to reset.

- 3 Hold **RESET/AUTO** for two seconds.

The selected fuse resets. The solid red channel indicator LED turns off.

## Specifications

Temperature range	From -20° to 55°C (from -4° to 131°F)
Material	Polycarbonate
Water rating	IEC 60529 IPX65 <sup>1</sup>
Dimensions (W × H × D)	229 × 106 × 41 mm (9 × 4 <sup>3</sup> / <sub>16</sub> × 1 <sup>5</sup> / <sub>8</sub> in.)
Weight	400 g (14.08 oz.)
Input voltage	From 0 to 16 Vdc
NMEA 2000 LEN @ 9 Vdc	0
Fuse	50 A
Compass-safe distance	5 cm (2 in.)
Max. power usage at 12 Vdc	50 A
Typical current draw at 12 Vdc	Approximately 65 mA

## NMEA 2000 PGN Information

### Transmit and Receive

PGN	Description
127501	Binary switch
127502	Binary switch
127505	Fluid level
127508	Battery status

<sup>1</sup> The device withstands incidental exposure to water of up to 1 m for up to 30 min. For more information, go to [www.garmin.com/waterrating](http://www.garmin.com/waterrating).

## Garmin Boat Switch LED Codes

The color and blink sequence of the status LEDs on the Garmin Boat Switch device indicate its operational status and the status of in-use and overridden switches.

LED Label	LED Color	LED State	Status
	Green	Slow blinking	The Garmin Boat Switch device is connected to power.
COM	Green	Rapid blinking	The Garmin Boat Switch device is connected to the NMEA 2000 network. The blink interval changes based on the amount of data being transferred.
COM	Red	Solid	The Garmin Boat Switch is not connected to the NMEA 2000 network. Indicates a connection or communication failure with the NMEA 2000 network.
1-31	Green	Solid	The designated channel switch is active.
1-31	Green	Slow blinking	The designated channel switch is selected.
1-31	Green	Rapid blinking	The designated channel switch is manually activated.
1-31	Red	Rapid blinking	The designated channel switch is manually deactivated.
1-31	Red	Solid	The designated channel switch has tripped a software fuse.

## Display Codes

The characters shown on the screen of the Garmin Boat Switch device indicate its operational status.

Display Code	Status
SEL	The Garmin Boat Switch device is in manual selection mode.
CUA	The Garmin Boat Switch device is operating normally.
C01-C29	The designated channel switch is selected.
ON	The designated channel switch is manually activated.
OFF	The designated channel switch is manually deactivated.
ddd	The Garmin Boat Switch device is exiting manual selection mode.

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航海網路設備

Garmin Corporation

連絡地址

製造銷售:台灣國際航電股份有限公司

聯絡地址:新北市汐止區樟樹二路 68 號

電話:(02)2642-8999

客服專線:(02)2642-9199