

# GARMIN®

## VHF 315 SERIES

### 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.

##### **CAUTION**

To avoid possible personal injury, always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding.

##### **NOTICE**

When drilling or cutting, always check what is on the opposite side of the surface to avoid damaging the vessel.

#### Tools Needed

- Pencil
- Drill
- 22 mm ( $7/8$  in.) drill bit or hole saw
- 3 mm ( $1/8$  in.) drill bit
- 13 mm ( $1/2$  in.) drill bit
- 4.76 mm ( $3/16$  in.) wrench (for mounting the handset connector)
- Additional drill bits appropriate for the surface and hardware
- Phillips screwdriver
- Rotary cutting tool or jigsaw (for mounting the active speaker)
- Marine sealant (optional)

#### Mounting Considerations

##### **NOTICE**

This device should be mounted in a location that is not exposed to extreme temperatures or conditions. The temperature range for this device is listed in the product specifications. Extended exposure to temperatures exceeding the specified temperature range, in storage or operating conditions, may cause device failure. Extreme-temperature-induced damage and related consequences are not covered by the warranty.

- You must mount the device in a location where it will not be submerged.
- You must mount the device in a location with adequate ventilation where it will not be exposed to extreme temperatures.



## VHF Antenna Mounting and EME Exposure

### WARNING

Radio operators with cardiac pacemakers, life-support machines, or electrical medical equipment should not be exposed to excessive radio-frequency (RF) fields, because the RF field may interfere with the function of their medical equipment.

### CAUTION

This device generates and radiates radio frequency (RF) electromagnetic energy (EME). Failure to observe these guidelines may expose people to RF radiation absorption exceeding the maximum permissible exposure (MPE).

Garmin® declares an MPE radius of 2.48 m (97.64 in.) for this system, which was determined using 5 W output to an omni-directional, 6 dBi gain antenna. The antenna should be installed to maintain a distance of 2.48 m (97.64 in.) between the antenna and all people.

## Mounting the Device

### NOTICE

If you are mounting the device in fiberglass, when drilling the pilot holes, use a countersink bit to drill a clearance counterbore through only the top gel-coat layer. This will help to avoid cracking in the gel-coat layer when the screws are tightened.

Before you mount the device, you must select a mounting location and determine the mounting hardware needed for the surface.

**NOTE:** Mounting hardware is included with the device, but it may not be suitable for the mounting surface.

- 1 Place the device in the mounting location and mark the location of the pilot holes.
- 2 Using a bit appropriate for the surface and the mounting hardware, drill a pilot hole for one corner of the device.
- 3 Loosely fasten the device to the surface with one corner and examine the other three pilot-hole marks.
- 4 Mark new pilot-hole locations if necessary.
- 5 Remove the device from the mounting surface.
- 6 Drill the appropriate pilot holes for the other three marks.
- 7 Secure the device to the mounting location.

## Active Speaker Mounting Considerations

### NOTICE

This device should be mounted in a location that is not exposed to extreme temperatures or conditions. The temperature range for this device is listed in the product specifications. Extended exposure to temperatures exceeding the specified temperature range, in storage or operating conditions, may cause device failure. Extreme-temperature-induced damage and related consequences are not covered by the warranty.

The included active speaker is optional, and is not required when installing the VHF 315 device. When selecting a mounting location for the active speaker, observe these considerations.

- To avoid interference with a magnetic compass, do not install the active speaker closer than 50 cm (19.6 in.) to a compass.
- You must install the active speaker inline with a GHS™ 11 handset.
- You must install the active speaker within 1.2 m (48 in.) of the location you want to connect the GHS 11 handset.
- You must install the active speaker connected to the primary handset (connected to the GHS 11 STATION 1 port) in the wheelhouse or an adjacent room, in accordance with FCC law.
- You can use the included 10 m (32 ft.) extension cable to connect the active speaker to the VHF radio. You must select a mounting location for the speaker where you can connect the extension cable to the active speaker and to the GHS 11 STATION 1 port on the VHF radio. If needed, additional extension cables are available from your Garmin dealer.

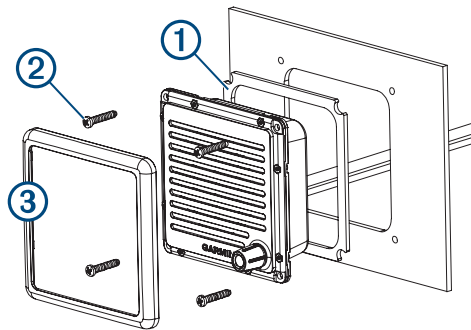
## Mounting the Active Speaker

### NOTICE

Be careful when cutting the hole to mount the speaker. There is only a small amount of clearance between the case and the mounting holes, and cutting the hole too large could compromise the stability of the speaker after it is mounted.

Before you can mount the speaker, you must select a mounting location.

- 1 Trim the template and make sure it fits at the mounting location.
- 2 Secure the template to the mounting surface.
- 3 Using a 13 mm ( $1/2$  in.) drill bit, drill a hole inside the corner of the line on the template to prepare the mounting surface for cutting.
- 4 Using a rotary-cutting tool or jigsaw, cut the mounting surface along the inside of the dashed line on the template.
- 5 Place the speaker in the cutout to test the fit.
- 6 If necessary, use a file and sandpaper to refine the size of the cutout.
- 7 After the speaker fits correctly in the cutout, ensure the mounting holes on the speaker line up with the pilot holes on the template.
- 8 If the mounting holes on the speaker do not line up, mark the new pilot-hole locations.
- 9 Using a 3 mm ( $1/8$  in.) drill bit, drill the pilot holes.
- 10 Remove the template from the mounting surface.
- 11 Install the included mounting gasket ① on the back of the speaker.



- 12 Make the necessary wiring connections (*Connecting the Active Speaker to the VHF Radio and Handset, page 7*).
- 13 Place the speaker in the cutout.
- 14 Secure the speaker to the mounting surface using the included M4 screws ②.
- 15 Snap the screw cover ③ in place.

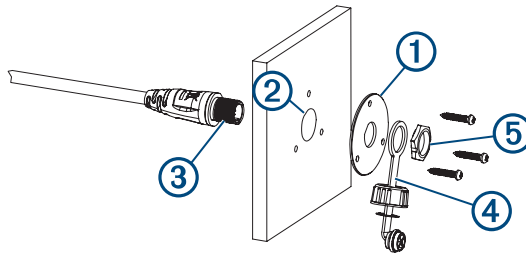
## Installing the Handset Connector in the Mounting Surface

Before drilling a hole to mount the handset connector from the active speaker, you should mount the active speaker and verify that the cable from the active speaker is long enough to reach the handset-connector mounting location (*Mounting the Active Speaker, page 4*).

If you do not install the active speaker, you must verify that the included extension cable is long enough to connect to the GHS 11 STATION 1 port on the VHF radio and to the handset-connector mounting location.

You can use the included hardware to mount the handset connector from the active speaker on the dashboard or other mounting surface. If you do not install the active speaker, you can use the hardware to mount the handset connector from the included extension cable on the dashboard or other mounting surface.

- 1 Using the mounting plate **1** as a template, trace the cable hole in the center of the mounting plate and mark the screw locations.



- 2 Set the mounting plate aside.  
Do not drill through the mounting plate.
- 3 Using a 22 mm ( $7/8$  in.) drill bit or hole saw, drill the center cable hole **2** in the mounting surface.
- 4 Using a 3 mm ( $1/8$  in.) drill bit, drill the pilot holes.
- 5 Apply marine sealant between the mounting plate and the mounting surface to help seal the holes (optional).
- 6 Using the included screws, attach the mounting plate to the mounting surface.
- 7 Select an option:
  - If you installed the active speaker, route the long cable from the active speaker to the connector mounting location.
  - If you did not install the active speaker, connect the female end of the included extension cable to the GHS 11 STATION 1 port on the VHF radio, and route the male end of the extension cable to the connector mounting location.
- 8 Feed the connector **3** through the back of the mounting surface.
- 9 Apply marine sealant around the connector in the mounting plate to help seal the hole (optional).
- 10 Secure the connector to the mounting plate using the weather cap **4** and the nut **5**.

## GHS II Mounting Considerations

### NOTICE

This device should be mounted in a location that is not exposed to extreme temperatures or conditions. The temperature range for this device is listed in the product specifications. Extended exposure to temperatures exceeding the specified temperature range, in storage or operating conditions, may cause device failure. Extreme-temperature-induced damage and related consequences are not covered by the warranty.

- You must install the primary handset (connected to the GHS 11 STATION 1 port) in the wheelhouse or an adjacent room, in accordance with FCC law.
- To avoid interference with a magnetic compass, do not install the handset closer than 60 cm (23.6 in.) to a compass.
- If you do not install the active speaker, you can use the included 10 m (32 ft.) extension cable to connect the handset to the VHF radio. You must select a mounting location for the handset where you can connect the extension cable to the handset and to the GHS 11 STATION 1 port on the VHF radio. If needed, additional extension cables are available from your Garmin dealer.
- You can use the included screws to mount the handset connector and the handset cradle mount on your boat. If the included screws are not appropriate for the mounting surface, you must purchase suitable hardware.

### Installing the Handset Cradle

You should install the handset connector in the mounting surface before installing the handset cradle ([Installing the Handset Connector in the Mounting Surface, page 5](#)).

- 1 Select a mounting location for the handset cradle near the handset connector.  
**TIP:** To help determine the best location, you can place the handset in the cradle, connect the handset to the connector, and hold it against the mounting surface.
- 2 Using the cradle as a template, mark the screw locations.
- 3 Set the cradle aside.  
Do not drill through the cradle.
- 4 Using a 3 mm ( $\frac{1}{8}$  in.) drill bit, drill the pilot holes.
- 5 Using the included M3.5 screws, secure the cradle to the mounting surface.

### Connection Considerations

You must connect the VHF 315 radio to power, to a GHS 11 handset, a VHF antenna, and a GPS source. When making connections to the device, observe the following considerations.

- You must connect the primary handset (installed in the wheelhouse or adjacent room, in accordance with FCC law) to the GHS 11 STATION 1 port.
- You can connect up to three handsets to the radio. You can purchase additional handsets from your Garmin dealer.
- You can install the included active speaker (optional) in-line with any handset connected to the radio. You can purchase additional active speakers from your Garmin dealer.
- You can connect the radio to a GPS source through the NMEA 2000® network or through an external GPS antenna (not included).

### Connecting to Power

- 1 Route the power wiring cable to the power source and to the device.
- 2 Connect the red wire to the positive (+) battery terminal, and connect the black wire to the negative (-) battery terminal.

### Additional Grounding Considerations

This device should not need any additional chassis grounding in most installation situations. If interference is experienced, the grounding screw on the housing can be used to connect the device to the water ground of the boat to help avoid the interference.

## Connecting a VHF Antenna

1 Mount the VHF antenna (sold separately) according to the installation instructions provided with the antenna.

**NOTE:** You can purchase a VHF extension cable. Go to [buy.garmin.com](http://buy.garmin.com) or contact your Garmin dealer.

2 Connect the VHF antenna cable to the VHF antenna port on the VHF device.

## Connecting the Active Speaker to the VHF Radio and Handset

Before you connect the active speaker to the VHF radio and handset, you should mount the active speaker (*Active Speaker Mounting Considerations, page 3*).

1 Route the female end of the included extension cable from the speaker mounting location to the VHF radio.

2 Connect the extension cable to the GHS 11 STATION 1 port on the VHF radio.

3 Connect the male end of the extension cable to the short cable from the active speaker.

4 Route the long cable from the active speaker to the handset connector mounting location.

5 If necessary, install the cable from the active speaker in the mounting surface (*Installing the Handset Connector in the Mounting Surface, page 5*).

6 Connect the handset to the long cable from the active speaker.

## Connecting the Handset to the VHF Radio Using an Extension Cable

If you install an active speaker with the handset, the handset connects to the radio through the active speaker (*Connecting the Active Speaker to the VHF Radio and Handset, page 7*).

1 Route the female end of the included extension cable from the handset mounting location to the VHF radio.

2 Connect the extension cable to the GHS 11 STATION 1 port on the VHF radio.

3 If necessary, install the handset connector on the extension cable in the mounting surface (*Installing the Handset Connector in the Mounting Surface, page 5*).

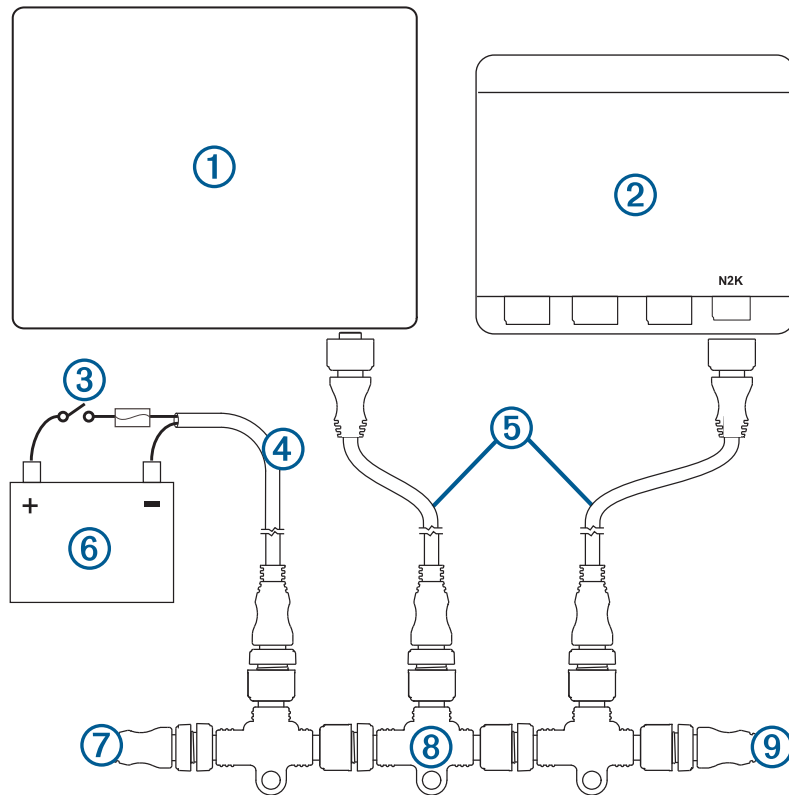
4 Connect the handset to the extension cable.

## NMEA 2000 Connections

### NOTICE

If you are installing a NMEA 2000 power cable, you must connect it to the boat ignition switch or through another in-line switch. NMEA 2000 devices will drain your battery if the NMEA 2000 power cable is connected to the battery directly.

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



Item	Description
①	Compatible NMEA 2000 chartplotter or other device
②	VHF 315 device
③	Ignition or in-line switch
④	NMEA 2000 power cable
⑤	NMEA 2000 drop cable
⑥	12 Vdc power source
⑦	NMEA 2000 terminator or backbone cable



Item	Description
⑧	NMEA 2000 T-connector
⑨	NMEA 2000 terminator or backbone cable

### Connecting the Device to a Remote GPS Antenna

This device must receive GPS information for proper functionality. You can connect the device to a NMEA 2000 network with a GPS antenna, or you can install a remote GPS antenna (not included) and connect it to the device.

- 1 Follow the instructions provided with your external GPS antenna to install it on your boat correctly.
- 2 Route the antenna cable to the back of your device, away from sources of electrical interference.
- 3 Connect the antenna cable to the GPS port on your device.

### Connecting to a Hailer Horn or PA Speaker

You can connect the VHF radio to a hailer horn or public address (PA) speaker (not included) to use a handset to make announcements.

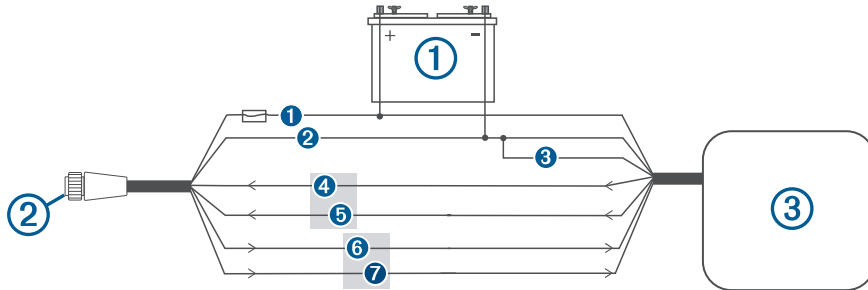
Some VHF models include a foghorn feature as part of the public address system. You can sound the foghorn through a hailer horn or PA speaker. To use the foghorn feature you must provide and install a hailer horn (optional) on the deck or tower of your boat.

- 1 If necessary, mount the hailer horn or PA speaker according to the installation instructions provided with the hailer horn or PA speaker.
 

**NOTE:** To avoid feedback, you should mount the hailer horn or PA speaker at least 3 m (10 ft.) away from, and facing away from, a handset.
- 2 Route or extend the wire from the hailer horn or PA speaker to the radio.
- 3 Connect the white wire on the data harness to the positive (+) wire from the hailer horn or PA speaker.
- 4 Connect the green wire on the data harness to the negative (-) wire from the hailer horn or PA speaker.
- 5 Cover the connections with waterproof tape or heat-shrink tubing.

## NMEA 0183 Device Connections

This diagram illustrates two-way connections for both sending and receiving data. You can also use this diagram for one-way communication. To receive information from a NMEA 0183 device, refer to items ①, ②, ③, ④, and ⑤ when connecting the Garmin device. To transmit information to a NMEA 0183 device, refer to items ①, ②, ③, ⑥, and ⑦ when connecting the Garmin device.



Item	Description
①	Power source
②	Power/NMEA 0183 cable
③	NMEA 0183 device

Item	Garmin Wire Function	Garmin Wire Color	NMEA 0183 Device Wire Function
①	Power	Red	Power
②	Power ground	Black	Power ground
③	N/A	N/A	Data ground
④	RxA (+)	Purple	TxA (+)
⑤	RxB (-)	Gray	TxB (-)
⑥	TxA (+)	Blue	RxA (+)
⑦	TxB (-)	Brown	RxB (-)

## Appendix

### VHF 315 Series Specifications

Dimensions (H x W x D)	6 x 20.5 x 18.1 cm (2.36 x 8.07 x 7.13 in.)
Weight	1.527 kg (3.37 lb.)
Operating temperature range	From -15° to 55°C (from 5° to 131°F)
Storage temperature range	From -20° to 70°C (from -4° to 158°F)
Compass-safe distance	50 mm (2 in.)
Water rating	IEC 60529 IPX7 <sup>1</sup>
Antenna connector	S0-239 (50 ohms)
Operating voltage	12 Vdc
Wireless frequency	156 to 162 MHz @ 44 dBm (25 W) maximum
Standby current draw	350 mA
Receive current draw	600 mA
Transmit current draw	From 2 A to 6 A (from 1 W to 25 W)
Maximum antenna gain	9 dBi
Antenna port impedance	50 ohms
Hailer output power	20 W at 4 ohms
Hailer horn impedance	4 ohms
NMEA 2000 LEN @ 9.0 Vdc	1 (50 mA)

### GHS II Specifications

Dimensions (H×W×D)	15.4 × 6.9 × 4.0 cm (6.1 × 2.7 × 1.6 in.)
Weight (including cable)	0.698 kg (1.54 lb.)
Operating temperature range	From -15° to 55°C (from 5° to 131°F)
Storage temperature range	From -20° to 70°C (from -4° to 158°F)
Compass-safe distance	70 cm (27.5 in.)
Water rating	IEC 60529 IPX7 <sup>2</sup>
Audio output power	1W (with 4 ohms at 10% distortion)

<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).

<sup>2</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).

## Active Speaker Specifications

Dimensions (H×W×D)	11.1 × 11.1 × 3.8 cm (4.37 × 4.37 × 1.5 in.)
Weight	349 g (11.22 oz.)
Operating temperature range	From -15° to 55°C (from 5° to 131°F)
Storage temperature range	From -20° to 70°C (from -4° to 158°F)
Compass-safe distance	50 cm (19.6 in.)
Water rating*	IEC 60529 IPX7 <sup>1</sup>
Audio output power	2.5 W nominal, 4 W max.

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<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).

## NMEA

### NMEA 2000 PGN Information

#### Transmit

PGN	Description
059392	ISO acknowledgment
060928	ISO address claim
061184	Single-frame proprietary
126208	NMEA request group function
126464	PGN's group function
126720	Fast-packet proprietary
126993	Heartbeat
126996	Product information
126998	Configuration information
129799	Radio frequency/mode/power
129808	DSC call information

#### Receive

PGN	Description
059392	ISO acknowledgment
059904	ISO request
060160	ISO transport protocol, data transfer
060416	ISO transport protocol, connection management - RTS group function
060928	ISO address claim
061184	Single-frame proprietary
065240	ISO commanded address
126208	NMEA request group function
126720	Fast-packet proprietary
129026	COG and SOG, rapid update
129029	GNSS position data
129044	Datum

## NMEA 0183 Information

### Transmit

Sentence	Description
DSC	Digital selective calling (DSC) information
DSE	Expanded digital selective calling

### Receive

Sentence	Description
DTM	Datum reference
GGA	Global positioning system fix data
GLL	Geographic position (latitude and longitude)
GNS	GNSS fix data
RMA	Recommended minimum specific Loran-C data
RMC	Recommended minimum specific GNSS data

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