GARMIN.

GPSMAP® 7400/7600 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.

When connecting the power cable, do not remove the in-line fuse holder. To prevent the possibility of injury or product damage caused by fire or overheating, the appropriate fuse must be in place as indicated in the product specifications. In addition, connecting the power cable without the appropriate fuse in place will void the product warranty.

⚠ CAUTION

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 obtain the best performance and to avoid damage to your boat, install the device according to these instructions.

Read all installation instructions before proceeding with the installation. If you experience difficulty during the installation, contact Garmin® Product Support.

Registering Your Device

Help us better support you by completing our online registration today.

- Go to http://my.garmin.com.
- Keep the original sales receipt, or a photocopy, in a safe place.

Contacting Garmin Product Support

- Go to www.garmin.com/support for in-country support information.
- In the USA, call 913-397-8200 or 1-800-800-1020.
- In the UK, call 0808 238 0000.
- In Europe, call +44 (0) 870 850 1241.

Software Update

You may need to update the device software when you install the device or add an accessory to the device.

Loading the New Software on a Memory Card

1 Insert a memory card into the card slot on the computer.
2 Go to www.garmin.com/support/software/marine.html.

3 Select **Download** next to "Garmin Marine Network with SD card."
4 Read and agree to the terms.
5 Select **Download**.
6 Select **Run**.
7 Select the drive associated with the memory card, and select **Next** > **Finish**.

Updating the Device Software

Before you can update the software, you must obtain a software-update memory card or load the latest software onto a memory card.

1 Turn on the chartplotter.
2 After the home screen appears, insert the memory card into the card slot.

   NOTE: In order for the software update instructions to appear, the device must be fully booted before the card is inserted.
3 Follow the on-screen instructions.
4 Wait several minutes while the software update process completes.

   The device returns to normal operation after the software update process is complete.
5 Remove the memory card.

   NOTE: If the memory card is removed before the device restarts fully, the software update is not complete.

Tools Needed

- Drill and drill bits
  - Bail mount: drill bits appropriate for the surface and hardware
  - Flush mount: 13 mm ($1/_2$ in.) drill bit, 7.2 mm ($5/_{16}$ in.), and 3.5 mm ($1/_8$ in.) drill bit
- #2 Phillips screwdriver
- Jigsaw or rotary tool
- File and sandpaper
- Marine sealant (recommended)

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.

Using the included hardware and template, you can mount the device using one of two methods. You can use the included bracket and hardware to bail mount the device, or you can use the included template and hardware to flush mount the device in the dashboard.

When selecting a mounting location, you should observe these considerations.

- The location should provide optimal viewing as you operate your boat.
- The location should allow for easy access to all device interfaces, such as the keypad, touchscreen, and card reader, if applicable.
- The location must be strong enough to support the weight of the device and protect it from excessive vibration or shock.
- To avoid interference with a magnetic compass, the device should not be installed closer to a compass than the

compass-safe distance value listed in the product specifications.

- The location must allow room for the routing and connection of all cables.
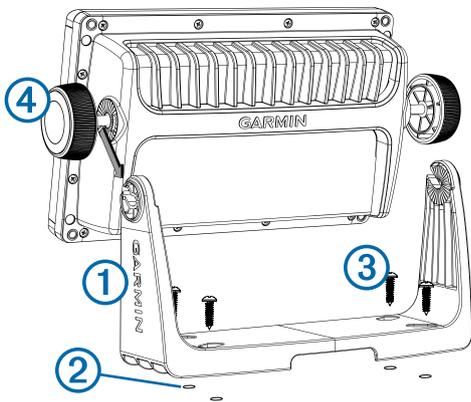
Bail Mounting the Device

If you are mounting the bracket on fiberglass with screws, it is recommended to use a countersink bit to drill a clearance counterbore through only the top gel-coat layer. This will help to avoid any cracking in the gel-coat layer when the screws are tightened.

The bail-mounting hardware (screws and washers, or nuts, washers, and bolts) is not included. Before you can bail mount the device, you must choose mounting hardware that fits the holes in the bail mount bracket and securely attaches it to your specific mounting surface. The size of the pilot holes required depends on the mounting hardware you choose.

1 Using the included bail mount bracket ① as a template, mark the location of the four pilot holes ②.

2 Using a drill bit appropriate for your mounting hardware, drill the pilot holes.

3 Secure the bail mount bracket to the surface using your mounting hardware ③.

4 Install the bail mount knobs ④ on the sides of the device.

5 Place the device in the bail mount bracket, and tighten the bail mount knobs.

Flush Mounting the Device

Be careful when cutting the hole to flush mount the device. 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 device after it is mounted.

The included template and hardware can be used to flush mount the device in your dashboard.

1 Trim the template, and make sure it fits in the location where you want to mount the device.

2 Secure the template to the selected location.

3 Using a 13 mm ($^1/_2$ in.) drill bit, drill one or more of the holes inside the corners of the solid line on the template to prepare the mounting surface for cutting.

4 Using a jigsaw or a rotary tool, cut the mounting surface along the inside line on the template.

5 Place the device 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 device fits correctly in the cutout, ensure the mounting holes on the device line up with the larger 7.2 mm ($^5/_{16}$ in.) holes on the template.

8 If the mounting holes on the device do not line up, mark the new hole locations.

9 Using a 7.2 mm ($^5/_{16}$ in.) drill bit, drill the larger holes.

10 Starting in one corner of the template, place a nut plate ① over the larger hole ② drilled in step 9.
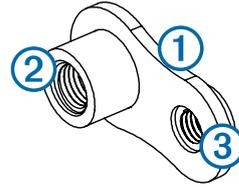
The smaller 3.5 mm ($^1/_8$ in.) hole ③ on the nut plate should line up with the smaller hole on the template.

11 If the smaller 3.5 mm ($^1/_8$ in.) hole on the nut plate does not line up with the smaller hole on the template, mark the new hole location.

12 Repeat steps 10 and 11 to verify placement of the remaining nut plates and holes on the template.

13 Using a 3.5 mm ($^1/_8$ in.) drill bit, drill the smaller holes.

14 Remove the template from the mounting surface.

15 Starting in one corner of the mounting location, place a nut plate ④ on the back of the mounting surface, lining up the large and small holes.

The raised portion of the nut plate should fit into the larger hole.
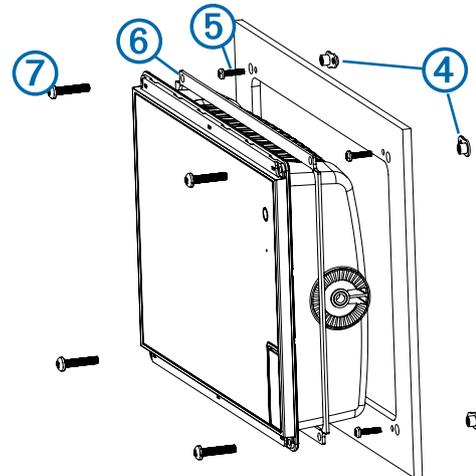
16 Secure the nut plate to the mounting surface by fastening an included M3 screw ⑤ through the smaller 3.5 mm ($^1/_8$ in.) hole.

17 Repeat steps 15–16 to secure the remaining nut plates to the mounting surface.

18 Install the rubber gasket ⑥ on the back of the device.

The pieces of the rubber gasket have adhesive on the back. Make sure you remove the protective liner before installing them on the device.

19 If you will not have access to the back of the device after you mount it, connect all necessary cables to the device before placing it into the cutout.

NOTE: To prevent corrosion of the metal contacts, cover unused connectors with the attached weather caps.

20 Apply marine sealant between the mounting surface and the device to properly seal and prevent leakage behind the dashboard.

21 If you will have access to the back of the device, apply marine sealant around the cutout.

22 Place the device into the cutout.

23 Secure the device to the mounting surface using the included M4 screws ⑦.

24 Wipe away all excess marine sealant.

25 Install the decorative bezel by snapping it in place around the edges of the device.

Cable and Connection Considerations

- For easer cable routing, the Garmin Marine Network cables, the power and NMEA® 0183 cables, and the transducer cable are packaged without the locking rings installed. You should route the cables before you install the locking rings.
- After connecting a locking ring to a cable, make sure the ring is securely connected and the o-ring is in place so the power or data connection remains secure.

About the Wiring Harness

- The wiring harness connects the device to power, NMEA 0183 devices, and a lamp or a horn for visible or audible alerts.
- The wiring harness is packaged without the locking ring installed. You should route the cable before you install the locking ring.
- After connecting a locking ring to the wiring harness, you should make sure the ring is securely connected and the o-ring is in place so the connection remains secure.
- The device has two internal NMEA 0183 ports that are used to connect to NMEA 0183 compliant devices. When connecting to a device for both transmitting and receiving, you must make sure to use wires from the same internal NMEA 0183 port.
- If it is necessary to extend the power and ground wires, you must use 16 AWG (1.31 mm²) wire.
- If it is necessary to extend the NMEA 0183 or alarm wires, you must use 22 AWG (.33 mm²) wire.
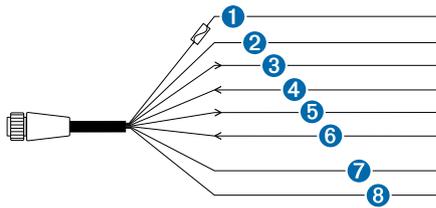
Item	Wire Color	Wire Function
①	Red	Power
②	Black	Ground (power and NMEA 0183)
③	Blue	NMEA 0183 internal port 1 Tx (out)
④	Brown	NMEA 0183 internal port 1 Rx (in)
⑤	Gray	NMEA 0183 internal port 2 Tx (out)
⑥	Violet	NMEA 0183 internal port 2 Rx (in)
⑦	Orange	Accessory on
⑧	Yellow	Alarm low

Connecting the Wiring Harness to Power

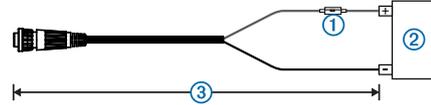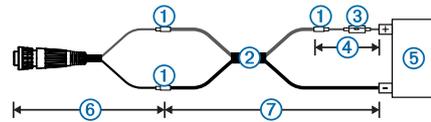**1** Route the wiring harness to the power source and to the device.

2 Connect the red wire to the positive (+) battery terminal, and connect the black wire to the negative (-) battery terminal.

3 Install the locking ring and o-ring on the end of the wiring harness.

4 Connect the wiring harness to the device by turning the locking ring clockwise.

Power Cable Extensions

If necessary, the power cable can be extended using the appropriate wire gauge for the length of the extension.

Item	Description
①	Fuse
②	Battery
③	1.8 m (6 ft.) without extension

| Item	Description
①	Splice
②	• 12 AWG (3.31 mm²) extension wire, up to 4.6 m (15 ft.) • 10 AWG (5.26 mm²) extension wire, up to 7 m (23 ft.) • 8 AWG (8.36 mm²) extension wire, up to 11 m (36 ft.)
③	Fuse
④	20.3 cm (8 in.)
⑤	Battery
⑥	20.3 cm (8 in.)
⑦	11 m (36 ft.) maximum extension

Additional Grounding Consideration

This consideration is applicable only to devices that have a grounding screw. Not all models have a grounding screw.

This device should not need additional chassis grounding in most installation situations. If you experience interference, 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.
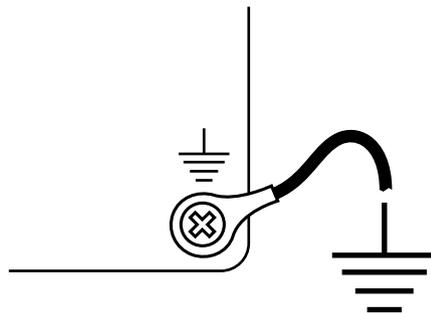
Garmin Marine Network Considerations

This device can connect to additional Garmin Marine Network devices to share data such as radar, sonar, and detailed mapping. When connecting Garmin Marine Network devices to this device, observe these considerations.

- A Garmin Marine Network cable must be used for all Garmin Marine Network connections.
  - Third-party CAT5 cable and RJ45 connectors must not be used for Garmin Marine Network connections.
  - Additional Garmin Marine Network cables and connectors are available from your Garmin dealer.
- The NETWORK ports on the device each act as a network switch. Any compatible device can be connected to any NETWORK port to share data with all devices on the boat connected by a Garmin Marine Network cable.

## NMEA 2000® Considerations

NOTICE

If you have an existing NMEA 2000 network on your boat, it should already be connected to power. Do not connect the NMEA 2000 power cable to an existing NMEA 2000 network, because only one power source should be connected to a NMEA 2000 network.

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.

This device can connect to a NMEA 2000 network on your boat to share data from NMEA 2000 compatible devices such as a GPS antenna or a VHF radio. The included NMEA 2000 cables and connectors allow you to connect the device to your existing NMEA 2000 network. If you do not have an existing NMEA 2000 network you can create a basic one using cables from Garmin.

If you are unfamiliar with NMEA 2000, you should read the "NMEA 2000 Network Fundamentals" chapter of the *Technical Reference for NMEA 2000 Products*. You can find this document using the "Manuals" link on the product page for your device at www.garmin.com.

The port labeled NMEA 2000 is used to connect the device to a standard NMEA 2000 network.
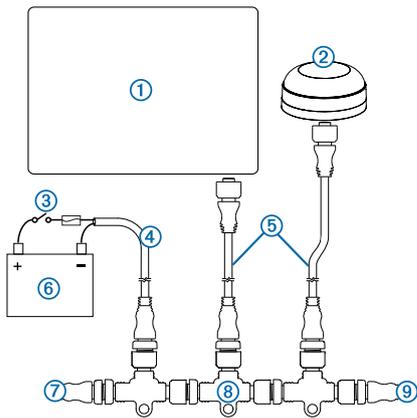
Item	Description
①	NMEA 2000 compatible Garmin device
②	GPS antenna
③	Ignition or in-line switch

Item	Description
④	NMEA 2000 power cable
⑤	NMEA 2000 drop cable
⑥	12 Vdc power source
⑦	NMEA 2000 terminator or backbone cable
⑧	NMEA 2000 T-connector
⑨	NMEA 2000 terminator or backbone cable

NMEA 0183 Connection Considerations

- The installation instructions provided with your NMEA 0183 compatible device should contain the information you need to identify the transmitting (Tx) and receiving (Rx) A (+) and B (-) wires.
- When connecting NMEA 0183 devices with two transmitting and two receiving wires, it is not necessary for the NMEA 2000 bus and the NMEA 0183 device to connect to a common ground.
- When connecting a NMEA 0183 device with only one transmitting (Tx) wire or with only one receiving (Rx) wire, the NMEA 2000 bus and the NMEA 0183 device must be connected to a common ground.

NMEA 0183 Connection Diagram
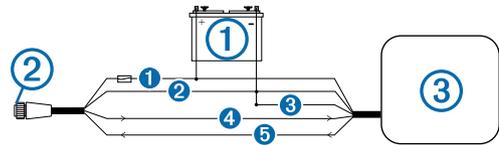
Item	Description
①	12 Vdc power source
②	Wiring harness
③	NMEA 0183 compliant device

Item	Garmin Wire Function	Garmin Wire Color	NMEA 0183 Device Wire Function
❶	Power	Red	Power
❷	Ground	Black	Data ground
❸	Tx/Rx		Tx/Rx/B (-)
❹	Tx	Blue	Rx/A (+)
❺	Rx	Brown	Tx/A (+)

Lamp or Horn Connections

The device can be used with a lamp, a horn, or both, to sound or flash an alert when the chartplotter displays a message. This is optional, and the alarm wire is not necessary for the device to function normally. When connecting the device to a lamp or horn, observe these considerations.

- The alarm circuit switches to a low-voltage state when the alarm sounds.
- The maximum current is 100 mA, and a relay is needed to limit the current from the chartplotter to 100 mA.
- To toggle visual and audible alerts manually, you can install single-pole, single-throw switches.

Item	Description
①	Power source
②	Power cable
③	Horn
④	Lamp
⑤	NMEA 0183 cable
⑥	Relay (100 mA coil current)
⑦	Toggle switches to enable and disable lamp or horn alerts

Item	Wire Color	Wire Function
❶	Red	Power
❷	Black	Ground
❸	Yellow	Alarm

Video Input and Output Considerations

This device allows video input from composite and digital video sources, depending on the model, and video output to a monitor. When connecting video input and output sources, observe these considerations.

- The chartplotter may have one composite-video input port labeled CVBS IN or two composite-video input ports labeled VIDEO 1 and VIDEO 2.
  - The composite-video ports use BNC connectors. You can use a BNC to RCA adapter to connect a composite-video source with RCA connectors to these ports.
  - The video from sources connected to these ports is available only for display on the device or additional monitor connected to the device. Composite video is not shared across the Garmin Marine Network or NMEA 2000 network.
- The chartplotter may have one DVI-D video output port. You can connect the port to view a mirror image of the screen on a computer monitor or HD TV using a DVI-D or DVI-I cable.
  - If needed, you can use a DVI-D to HDMI® adapter to connect to an HD TV or other HDMI compatible display.
  - If needed, you can use a DVI-I to VGA adapter to connect to a computer monitor or other VGA compatible display.
  - Although it is recommended to use DVI cables sold by Garmin, high-quality third-party DVI cables may be used. You should test the DVI cable by connecting the devices before routing the cable.

Specifications

Physical Specifications

Device	Specification	Measurement
All models	Temperature range	From -15° to 55°C (5° to 131°F)
	Material	Die-cast aluminum and polycarbonate plastic
	Water rating*	IEC 60529 IPX7
Seven-inch models	Dimensions (W × H × D)	222 × 142 × 66 mm (8.75 × 5.6 × 2.6 in.)
	Display size (W × H)	155 × 86 mm (6.1 × 3.4 in.)
	Weight	1.13 kg (2.5 lbs)
Eight-inch models	Dimensions (W × H × D)	244 × 160 × 76 mm (9.6 × 6.3 × 3.0 in.)
	Display size (W × H)	178 × 102 mm (7.0 × 4.0 in.)
	Weight	1.41 kg (3.1 lbs)
Ten-inch models	Dimensions (W × H × D)	290 × 206 × 79 mm (11.4 × 8.1 × 3.1 in.)
	Display size (W × H)	218 × 135 mm (8.6 × 5.3 in.)
	Weight	2.36 kg (5.2 lbs)
Twelve-inch models	Dimensions (W × H × D)	330 × 226 × 79 mm (13.0 × 8.9 × 3.1 in.)
	Display size (W × H)	262 × 163 mm (10.3 × 6.4 in.)
	Weight	2.72 kg (6.0 lbs)

*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.

Electrical Specifications

Device	Specification	Measurement
All models	Input power	10–32 Vdc
	Fuse	5 A, 125 V fast-acting
	NMEA 2000 LEN	2
	NMEA 2000 Draw	75 mA max.
Seven-inch models	Max. power usage at 10 Vdc	24 W
	Typical current draw at 12 Vdc	1.5 A
	Max. current draw at 12 Vdc	2.0 A
	Compass-safe distance	310 mm (12.2 in.)
Eight-inch models	Max. power usage at 10 Vdc	27 W

Device	Specification	Measurement
	Typical current draw at 12 Vdc	1.8 A
	Max. current draw at 12 Vdc	2.3 A
	Compass-safe distance	310 mm (12.2 in.)
Ten-inch models	Max. power usage at 10 Vdc	30 W
	Typical current draw at 12 Vdc	1.95 A
	Max. current draw at 12 Vdc	2.5 A
	Compass-safe distance	460 mm (18.11 in.)
Twelve-inch models	Max. power usage at 10 Vdc	36 W
	Typical current draw at 12 Vdc	2.5 A
	Max. current draw at 12 Vdc	3.0 A
	Compass-safe distance	460 mm (18.11 in.)

NMEA 2000 PGN Information

Type	PGN	Description
Transmit and receive	059392	ISO acknowledgment
	059904	ISO request
	060928	ISO address claim
	126208	NMEA: Command, request, and acknowledge group function
	126464	Transmit and receive PGN list group function
	126996	Product information
	129026	COG and SOG: Rapid update
	129029	GNSS position data
	129540	GNSS satellites in view
	130306	Wind data
	130312	Temperature
Transmit	127250	Vessel heading
	127258	Magnetic variance
	128259	Speed: Water referenced
	128267	Water depth
	129025	Position: Rapid update
	129283	Cross track error
	129284	Navigation data
	129285	Navigation route and waypoint info
Receive	126992	System time
	127250	Vessel heading
	127489	Engine parameters: Dynamic
	127488	Engine parameters: Rapid update
	127493	Transmission parameters: Dynamic
	127505	Fluid level
	128259	Speed: Water referenced
	128267	Water depth
	129025	Position: Rapid update
	129038	AIS class A position report
	129039	AIS class B position report
	129040	AIS class B extended position report
	129539	GNSS DOPs
	129794	AIS class A static and voyage related data
	129809	AIS class B "CS" static data report, part A
	129810	AIS class B "CS" static data report, part B
	130310	Environmental parameters
	130311	Environmental parameters (obsolete)

Type	PGN	Description
	130313	Humidity
	130314	Actual pressure

NMEA 0183 Information

Type	Sentence	Description
Transmit	GPAPB	APB: Heading or track controller (autopilot) sentence "B"
	GPBOD	BOD: Bearing (origin to destination)
	GPBWC	BWC: Bearing and distance to waypoint
	GPGGA	GGA: Global positioning system fix data
	GPGLL	GLL: Geographic position (latitude and longitude)
	GPGSA	GSA: GNSS DOP and active satellites
	GPGSV	GSV: GNSS satellites in view
	GPRMB	RMB: Recommended minimum navigation information
	GPRMC	RMC: Recommended minimum specific GNSS data
	GPRTE	RTE: Routes
	GPVTG	VTG: Course over ground and ground speed
	GPWPL	WPL: Waypoint location
	GPXTE	XTE: Cross track error
	PGRME	E: Estimated error
	PGRMM	M: Map datum
	PGRMZ	Z: Altitude
	SDDBT	DBT: Depth below transducer
	SDDPT	DPT: Depth
	SDMTW	MTW: Water temperature
	SDVHW	VHW: Water speed and heading
Receive	DPT	Depth
	DBT	Depth below transducer
	MTW	Water temperature
	VHW	Water speed and heading
	WPL	Waypoint location
	DSC	Digital selective calling information
	DSE	Expanded digital selective calling
	HDG	Heading, deviation, and variation
	HDM	Heading, magnetic
	MWD	Wind direction and speed
	MDA	Meteorological composite
	MWV	Wind speed and angle
	VDM	AIS VHF data-link message

You can purchase complete information about National Marine Electronics Association (NMEA) format and sentences from: NMEA, Seven Riggs Avenue, Severna Park, MD 21146 USA (www.nmea.org)