

GARMIN®

GPS 24XD HVS NMEA® 0183 INSTALLATION INSTRUCTIONS

Important Safety 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.

For the best performance and to avoid damage to your boat, read all installation instructions before proceeding. Install the device per these instructions. Use the appropriate fasteners, tools, and mounts listed, which are available at most marine dealers.

The Garmin® GPS 24xd HVS (NMEA 0183) high-sensitivity GPS antenna provides position information over NMEA 0183. The GPS 24xd can be connected to a Garmin chartplotter or another NMEA 0183 compliant device.

For more information, go to garmin.com.

Tools Needed

- Drill
- 3.2 mm (1/8 in.) drill bit
- 19 mm (3/4 in.) drill bit for a pole-mount cable-hole
- 25 mm (1 in.) hole saw for a surface-mount cable-hole
- Countersink bit for mounting on fiberglass
- Screws for under-deck mounting
- Screwdriver, appropriate for the screw type
- Marine sealant (optional)
- Solder and shrink wrap for all wiring connections when limiting the antenna to 1 Hz (*Limiting the Antenna Update Rate, page 14*).



Mounting the Antenna

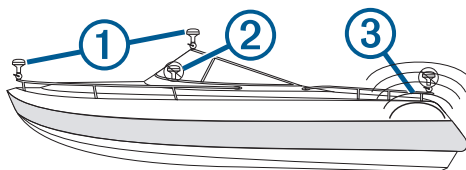
Antenna Mounting Considerations

⚠ CAUTION

Do not install or store the antenna near strong magnets, including speakers. A strong magnetic field can damage the antenna.

You can mount the antenna on a flat surface or attach it to a standard 1 in. OD, 14 threads per inch, pipe-threaded pole (not included). You can route the cable outside of the pole or through the pole. For best performance, consider these guidelines when selecting the antenna mounting location.

- To ensure the best reception, the antenna should be mounted in a location that has a clear, unobstructed view of the sky in all directions ①.



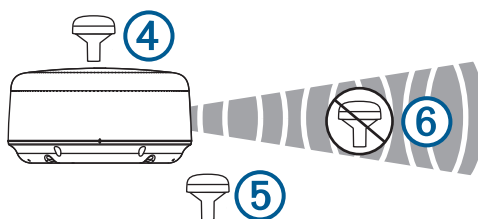
- The antenna should not be mounted where it is shaded by the superstructure of the boat ②, a radome antenna, or the mast.
- The antenna should not be mounted near the engine or other sources of Electromagnetic Interference (EMI) ③.
- The antenna should not be mounted near known ferrous metal objects such as a toolbox or compass.
- A handheld compass should be used to test for magnetic interference in the area where the antenna is to be mounted. Your boat, motors, and devices must be on during the test.

If the needle on the handheld compass moves when you hold it where you intend to mount the antenna, magnetic interference is present. You must choose another location and test again.

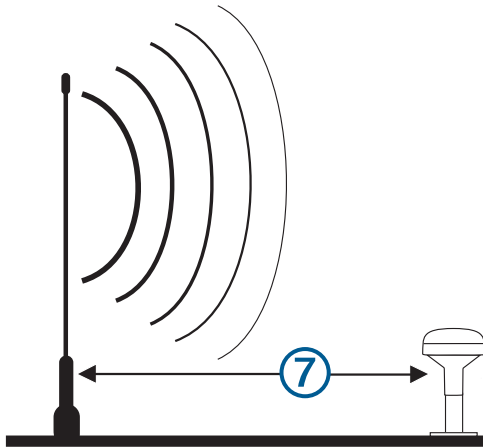
- Mounting screws are provided with the antenna. If you use mounting hardware other than the provided screws, the hardware must be made of quality stainless steel or brass material to avoid magnetic interference with the antenna.

NOTE: Test all mounting hardware with a handheld compass to make sure no magnetic fields are present in the hardware.

- If a radar is present, the antenna should be mounted above the path of the radar ④. If necessary, the antenna may be mounted below the path of the radar ⑤.



- The antenna should not be mounted directly in the path of the radar ⑥.
- The antenna should not be mounted within 1 m (3 ft.) of a VHF radio antenna or the path of a radar ⑦.



Testing the Mounting Location

- 1 Temporarily secure the antenna in the preferred mounting location and test it for correct operation.
- 2 If you experience interference with other electronics, move the antenna to a different location, and test it again.
- 3 Repeat steps 1–2 until you observe full or acceptable signal strength.
- 4 Permanently mount the antenna.

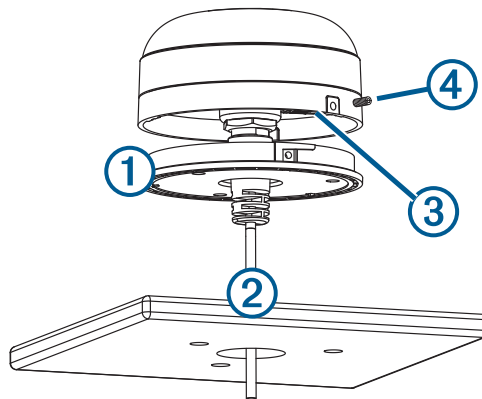
Surface Mounting the Antenna

NOTICE

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 cracking in the gel-coat layer when the screws are tightened.

Before you permanently mount the antenna, you must test the mounting location for correct operation (*Testing the Mounting Location*, page 3).

- 1 Using the surface-mount bracket ① as your mounting template, mark the three pilot-hole locations and trace the cable-hole in the center of the bracket.



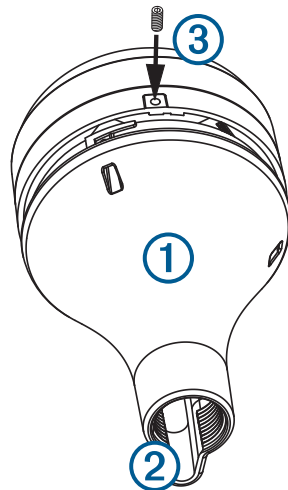
- 2 Set the surface-mount bracket aside.
Do not drill through the bracket.
- 3 Drill the three 3.2 mm ($\frac{1}{8}$ in.) pilot holes.
- 4 Drill the 25 mm (1 in.) cable hole in the center.
- 5 Use the included M4 screws to secure the surface-mount bracket to the mounting surface.
- 6 Route the cable ② through the center hole, and connect it to the antenna.
- 7 Verify the large gasket ③ is in place on the bottom of the antenna, place the antenna on the surface-mount bracket, and twist it clockwise to lock it in place.
- 8 Secure the antenna to the mounting bracket with the included M3 screw ④.
- 9 Route the cable away from sources of electronic interference.

Mounting the Antenna on a Pole

Mounting the Antenna with the Cable Routed Outside the Pole

Before you permanently mount the antenna, you must test the mounting location for correct operation (*Testing the Mounting Location*, page 3).

- 1 Route the cable through the pole-mount adapter ①, and place the cable in the vertical slot ② along the base of the pole-mount adapter.



- 2 Screw the pole-mount adapter onto a standard 1 in. OD, 14 threads per inch, pipe-threaded pole (not included).

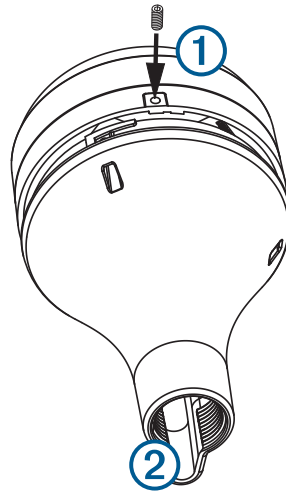
Do not overtighten the adapter on the pole.

- 3 Connect the cable to the antenna.
- 4 Place the antenna on the pole-mount adapter and twist it clockwise to lock it in place.
- 5 Secure the antenna to the adapter with the included M3 set screw ③.
- 6 With the antenna installed on the pole mount, fill the remaining gap in the vertical cable slot with a marine sealant (optional).
- 7 Attach the pole to the boat if it is not already attached.
- 8 Route the cable away from sources of electronic interference.

Mounting the Antenna with the Cable Routed Through the Pole

Before you permanently mount the antenna, you must test the mounting location for correct operation (*Testing the Mounting Location*, page 3).

- 1 Position a standard 1 in. OD, 14 threads per inch, pipe-threaded pole (not included) in the selected location, and mark the approximate center of the pole.
- 2 Drill a hole using a 19 mm ($\frac{3}{4}$ in.) drill bit for the cable to pass through.
- 3 Fasten the pole to the boat.
- 4 Thread the pole-mount adapter onto the pole.
Do not overtighten the adapter.
- 5 Route the cable through the pole and connect it to the antenna.
- 6 Place the antenna on the pole-mount adapter and twist it clockwise to lock it in place.
- 7 Secure the antenna to the adapter with the included M3 set screw ①.



- 8 With the antenna installed on the pole mount, fill the vertical cable slot ② with a marine sealant (optional).
- 9 Route the cable away from sources of electronic interference.

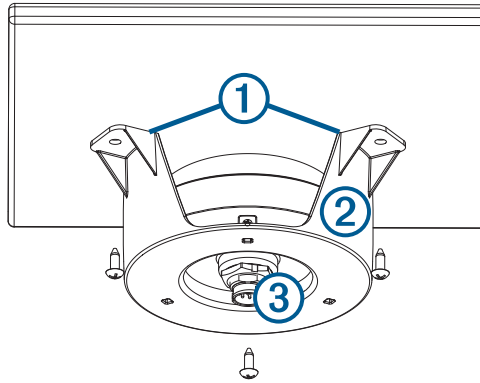
Mounting the Antenna Under a Surface

NOTICE

Verify that the supplied screws will not penetrate the surface before you install the under-deck mounting bracket. If the supplied screws are too long, use surface-appropriate screws instead.

Because the antenna cannot acquire signals through metal, it must be mounted under a fiberglass surface only.

- 1 Determine and test the location under a fiberglass surface where you want to mount the antenna (*Testing the Mounting Location*, page 3).

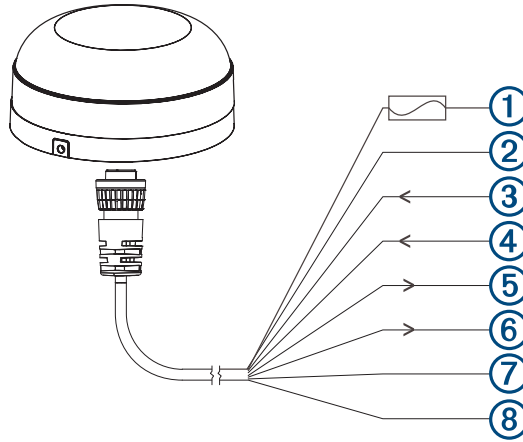


- 2 Place the adhesive pads ① on the under-deck mounting bracket ②.
- 3 Place the antenna in the under-deck mounting bracket.
- 4 Adhere the under-deck mounting bracket to the mounting surface.
- 5 Secure the under-deck mounting bracket to the mounting surface with screws.
- 6 Connect the cable to the antenna ③.
- 7 Route the cable away from sources of electronic interference.

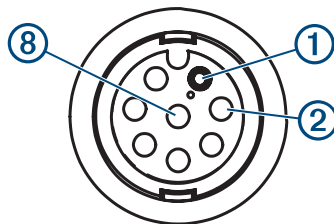
Connecting the Antenna

Power and NMEA 0183 Wiring

The antenna must be connected to power and to a NMEA 0183 compliant device. The diagrams show how to correctly wire the antenna. You can connect up to three NMEA 0183 compliant devices to receive data from one antenna.



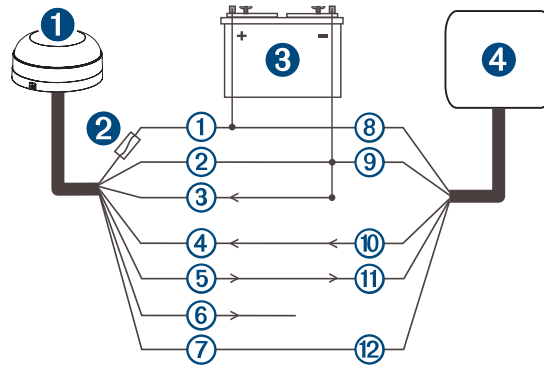
Wire	Color	Function	Pin
①	Red	Power (1 A fuse)	3
②	Black	Ground	2
③	White/orange	Rx/B (In -)	7
④	White	Rx/A (In +)	1
⑤	Gray	Tx/A (Out +)	6
⑥	White/red	Tx/B (Out -)	5
⑦	Orange	Accessory on	4
⑧	Purple	Pulse per second (PPS)	8



①	Pin 1
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②	Pin 2
⑧	Pin 8

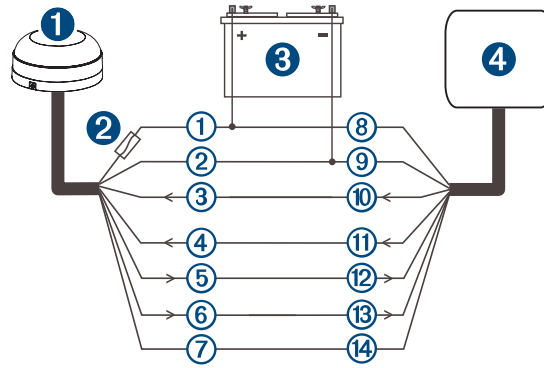
Connection from the Antenna to a Garmin Chartplotter (Single-Ended)



Item	Description
①	Antenna
②	1 A fuse
③	Power source
④	Garmin NMEA 0183 compatible chartplotter

GPS 24xd wire	Color	GPS 24xd wire function	Chartplotter wire
①	Red	Power (1 A fuse)	⑧
②	Black	Ground	⑨
③	White/orange (ground)	Rx/B (In -)	
④	White	Rx/A (In +)	⑩
⑤	Gray	Tx/A (Out +)	⑪
⑥	White/red (unconnected)	Tx/B (Out -)	
⑦	Orange	Accessory on	⑫

NMEA 0183 Wiring for Two-Way Communication



Item	Description
①	Antenna
②	1 Amp fuse
③	Power source
④	Garmin NMEA 0183 compatible chartplotter

GPS 24xd wire	Color	Chartplotter wire	Chartplotter wire function
①	Red	⑧	Power (+)
②	Black	⑨	Ground (-)
③	White/orange	⑩	Tx/B (Out -)
④	White	⑪	Tx/A (Out +)
⑤	Gray	⑫	Rx/A (In +)
⑥	White/red	⑬	Rx/B (In -)
⑦	Orange	⑭	Accessory on

NMEA 0183 Connection Exceptions

CAUTION

The orange accessory on wire is used when connecting the antenna to a Garmin chartplotter, or other NMEA 0183 device that has a defined accessory signal wire. If you are connecting the antenna to a device that does not have an accessory signal wire, connect the orange wire from the antenna to ground and connect the antenna power wire to the ignition or install an in-line switch. The antenna will drain the battery of the boat if it is not switched.

- If your NMEA 0183 compliant device has only one receiving wire (Rx), connect it to the gray wire (Tx/A (Out +)) from the antenna, and leave the white/red wire (Tx/B (Out -)) from the antenna unconnected.
- If your NMEA 0183 compliant device has only one transmitting wire (Tx), connect it to the white wire (Rx/A (In +)) from the antenna, and connect the white/orange wire (Rx/B (In -)) from the antenna to ground.

Heading Calibration

After installation is complete, you must calibrate the heading and perform the auto heading alignment to receive magnetic heading data.

Performing Basic Calibration

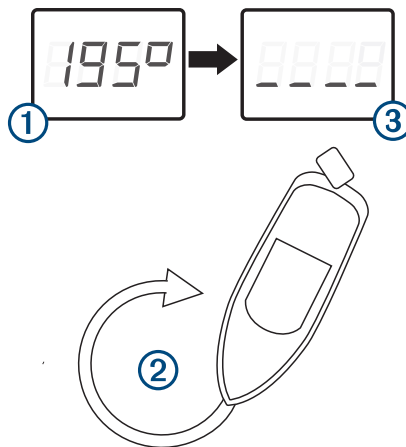
You must be able to view heading data from the antenna on a connected chartplotter or marine instrument before you can perform basic calibration. If you cannot view heading data on your connected display, check the power connections and the display's NMEA 0183 settings.

When performing basic calibration, you first calibrate the compass and then align the heading in one continuous procedure.

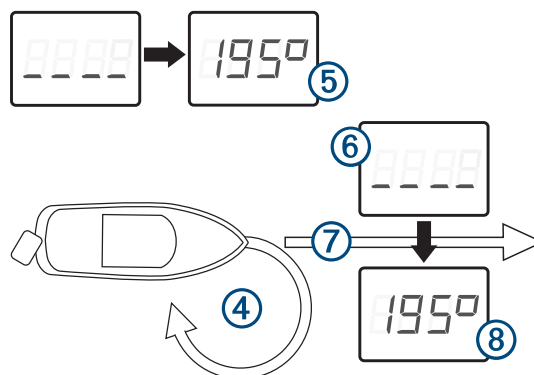
NOTE: The boat must be able to reach a cruising speed of at least 6.4 km/h (4 mph) to perform the heading alignment.

- 1 Drive the boat to a location with calm, open water.
- 2 Set the display to view heading data from the connected antenna.
NOTE: You must not use GPS Course Over Ground (COG) to perform basic calibration.
- 3 Disconnect power from the antenna.
- 4 Wait while the boat becomes level and stationary.
- 5 Turn on power to the antenna, and wait until the heading data appears on the display ①.

NOTE: If you are performing the first basic calibration after a factory reset, the heading is blank.



- 6 Within three minutes, complete two full, slow, tight circles ②, taking care to keep the boat as steady and level as possible.
The boat should not list during calibration.
When the antenna is prepared to calibrate the compass, the heading data disappears from the display ③.
You may receive an error message that the heading was lost. You can ignore this message.
- 7 Continue turning in the same direction at the same speed ④ for approximately 1 1/2 rotations until the heading data appears ⑤.



When the heading data appears, the compass has been calibrated successfully, and you can align the heading (optional).

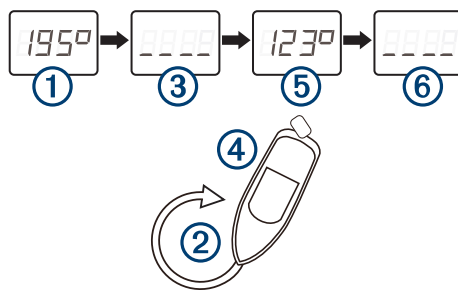
- 8 Select an option.
 - If you want to align the heading to match the front of the boat, proceed to the next step.
 - If you do not want to align the heading, stop turning and wait, keeping the boat stationary. Over the next two minutes the heading data should disappear and then reappear. When the heading data reappears, the compass should be calibrated and no heading offset should be applied.

NOTE: If an unwanted heading offset is applied, repeat the calibration procedure.
- 9 Continue turning in the same direction at the same speed for approximately ten seconds, until the heading data disappears from the display ⑥.
- 10 When it is safe, straighten the boat and drive in a straight line ⑦ at cruising speed (must be at least 6.4 km/h (4 mph)) until the heading data appears ⑧.
When the heading appears, the compass has been calibrated, and the heading has been aligned on the antenna.
- 11 Test the results of the calibration, and repeat this procedure if necessary.

Disabling the Magnetic Heading Data

If you cannot mount the antenna in an ideal location for magnetic heading and GPS performance, you can disable the magnetic heading data.

- 1 Drive the boat to a location with calm, open water.
- 2 Set the display to view heading data from the antenna.
- 3 Disconnect power from the antenna.
- 4 Wait while the boat becomes level and stationary.
- 5 Turn on power to the antenna, and wait until the heading data appears on the display ①.



- 6 Within three minutes, complete two full, slow, tight circles ②, taking care to keep the boat as steady and level as possible.
Heading data disappears to indicate that the antenna has detected the start of the procedure ③.
You may receive an error message that the heading was lost. You can ignore this message.
- 7 Bring the boat to a complete stop ④, and remain stationary for two minutes.
After two minutes, the heading data reappears with a fixed value of 123 degrees ⑤ to indicate heading will be disabled on the next power cycle.
NOTE: If the magnetic heading is displayed, the fixed value is 123 degrees. If the true heading is displayed, the fixed value may deviate because of corrections from magnetic variation.
- 8 Disconnect power from the antenna.
- 9 Turn on power to the antenna, and verify that heading has been disabled ⑥.

Limiting the Antenna Update Rate

By default, the antenna outputs position data updates 10 times per second using serial communications rate of 38400 bps. By installing the included resistor cable, the antenna can be limited to output position updates once per second using serial communications rate of 4800 bps.

- 1 Mount the antenna according to these instructions ([Mounting the Antenna, page 2](#)).
- 2 If necessary, cut the cable to the appropriate length for the installation.
- 3 Solder the included Update Rate Select cable to the orange Accessory on wire.
- 4 Use the heat-shrink tubing around the soldered connections.
- 5 If you have not connected the antenna already, connect the power and data cable ([NMEA 0183 Wiring for Two-Way Communication, page 10](#)).

Cleaning the Outer Casing

NOTICE

Avoid chemical cleaners and solvents that can damage plastic components.

- 1 Clean the outer casing of the device using a cloth dampened with a mild detergent solution.
- 2 Wipe the device dry.

Appendix

Software Update

You must update the Garmin chartplotter software when you install this device. For instructions on updating the software, see your chartplotter owner's manual at support.garmin.com.

Specifications

Dimensions (diameter x height)	3 ¹⁹ / ₃₂ × 1 ¹⁵ / ₁₆ in. (91.6 × 49.5 mm)
Weight	201 g (7.1 oz.)
Cable length	30 ft. (9.14 m)
Temperature range	From -30° to 80°C (from -22° to 176°F)
Case material	Fully gasketed, high-impact plastic alloy
Water rating	IEC 60529 IPX6 and IPX7 ¹
Compass-safe distance	12.7 mm (0.5 in.)
Input voltage	From 8 to 32 Vdc
Max. input current	200 mA @ 12 Vdc
Typical input current	150 mA @ 12 Vdc

¹ The device withstands incidental exposure to water of up to 1 m for up to 30 min, and is protected against powerful jets of water. For more information, go to www.garmin.com/waterrating.

NMEA 0183 Information

Transmit

Sentence	Description
GPGGA	Global Positioning System Fix Data
GPGSA	GNSS DOP and Active Satellites
GPGSV and GLGSV	GNSS Satellites in View
GPRMC	Recommended Minimum Specific GNSS Data
GPVTG	Course Over Ground and Ground Speed
GPGLL	Geographic Position (latitude and longitude)
GPGNS	GNSS Fix Data
HCHDG	Heading, Deviation and Variation
PGRME	Estimated Error Information
PGRMF	GPS Fix Data
PGRMM	Map Datum
PGRMT	Sensor Status Information
PGRMV	Velocity Information
PGRMB	DPGS Beacon Information
PGRMID	Device ID Information

Receive

Sentence	Description
PGRMI	Sensor Initialization Information
PGRMC	Sensor Configuration Information
PGRMC1	Additional Sensor Configuration Information
PGRMC2	Additional Sensor Configuration Information 2
PGRMO	Output Sentence Enable/Disable
PGRMID	Device ID information
PGRMT	Device information control

Declaration of Conformity

Hereby, Garmin declares that this product is in compliance with the Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address: garmin.com/compliance.

UK Declaration of Conformity

Hereby, Garmin declares that this product is in compliance with the relevant statutory requirements. The full text of the declaration of conformity is available at the following internet address: garmin.com/compliance.

Innovation, Science and Economic Development Canada Compliance

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

FCC Compliance

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications if not installed and used in accordance with the instructions. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This product does not contain any user-serviceable parts. Repairs should only be made by an authorized Garmin service center. Unauthorized repairs or modifications could result in permanent damage to the equipment, and void your warranty and your authority to operate this device under Part 15 regulations.

Limited Warranty

The Garmin standard limited warranty applies to this accessory. For more information, go to www.garmin.com/support/warranty.

物質宣言

部件名称	有毒有害物质或元素					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
印刷电路板组件	×	○	○	○	○	○
金属零件	×	○	○	○	○	○
电缆 电缆组件 连接器	×	○	○	○	○	○

本表格依据 SJ/T11364 的规定编制。

○: 代表此种部件的所有均质材料中所含的该种有害物质均低于 (GB/T26572) 规定的限量

×: 代表此种部件所用的均质材料中, 至少有一类材料其所含的有害物质高于 (GB/T26572) 规定的限量

*該產品說明書應提供在環保使用期限和特殊標記的部分詳細講解產品的擔保使用條件。



產品

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Garmin Corporation

