



GHP™ 10V Installation Instructions

To obtain the best possible performance and to avoid damage to your boat, install your GHP 10V marine autopilot system according to the following instructions. **Read all installation instructions before proceeding with the installation.** If you experience difficulty during the installation, contact Garmin Product Support or seek the advice of a professional installer.

The GHP 10V is compatible with C3 or newer Volvo® EVC systems. Contact Volvo for information on updating older EVC systems.

Product Registration

Help us better support you by completing our online registration today! Connect to our Web site at <http://my.garmin.com>. Keep the original sales receipt, or a photocopy, in a safe place.

For future reference, write the serial number assigned to each component of your GHP 10V system in the spaces provided on [page 2](#). The serial numbers are located on a sticker on each component.

Contact Garmin

Contact Garmin Product Support if you have any questions while installing or using your GHP 10V autopilot system. In the USA, go to www.garmin.com/support, or contact Garmin USA by phone at (913) 397.8200 or (800) 800.1020.

In the UK, contact Garmin (Europe) Ltd. by phone at 0808 2380000.

In Europe, go to www.garmin.com/support and click **Contact Support** for in-country support information, or contact Garmin (Europe) Ltd. by phone at +44 (0) 870.8501241.

Warnings

- **You are responsible for the safe and prudent operation of your vessel.** The GHP 10V is a tool that will enhance your capability to operate your boat. It does not relieve you from the responsibility of safely operating your boat. Avoid navigational hazards and never leave the helm unattended.
- Always be prepared to promptly regain manual control of your boat.
- Learn to operate the GHP 10V on calm and hazard-free open water.
- Use caution when operating the GHP 10V at high speeds near hazards in the water, such as docks, pilings, and other boats.
- See the *Important Safety and Product Information* guide in the product box for product warnings and other important information.

Cautions

- Always wear safety goggles, ear protection, and a dust mask when drilling, cutting, or sanding.
- When drilling or cutting, always check the opposite side of the surface. Be aware of fuel tanks, electrical cables, and hydraulic hoses.
- Do not connect the CCU interface connector on either the CCU cable or the Autopilot Gateway to a NMEA 2000® network.

GHP 10V Package Contents and Needed Tools

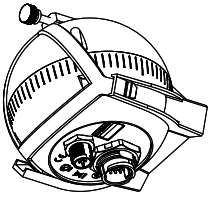
The GHP 10V autopilot system consists of multiple components, each sold separately. You must know how the components operate together in order to correctly plan the installation on your boat.

As you familiarize yourself with the GHP 10 components, confirm that your package includes the following items. If any parts are missing, contact your Garmin dealer immediately.

Main Components

The GHP 10V autopilot system consists of three main components, the Course Computer Unit (CCU), Autopilot Gateway, and the GHC™ 10 user control interface.

Course Computer Unit (CCU)

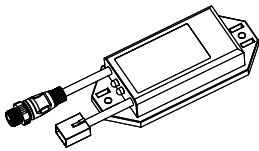


The CCU acts as the “brain” of the GHP 10V autopilot system. The CCU contains the sensory equipment used to determine heading and rate of turn. The CCU connects to the Autopilot Gateway, to the GHC 10 (yellow signal wire), and to the alarm buzzer using the CCU cable. In addition, the CCU also connects to a NMEA 2000 network to communicate with the GHC 10 and to communicate with an optional NMEA 2000-compatible GPS device.

Garmin replacement part number: 010-11353-00

Serial number _____

Autopilot Gateway



The Autopilot Gateway allows the GHP 10V autopilot system to steer the boat through the Volvo steering system. The Autopilot Gateway connects to the CCU through the CCU cable and connects to the Volvo steering system using a proprietary Volvo connector.

Garmin replacement part number: 010-11349-00

Serial number _____

GHC 10



Use the GHC 10 to operate the GHP 10V autopilot system. Using the GHC 10, you engage and control the GHP 10V. You also set up and customize the GHP 10V using the GHC 10. The GHC 10 connects to a NMEA 2000 network to communicate with the CCU and with an optional NMEA 2000-compatible GPS device (to use waypoint and route information). If a NMEA 2000-compatible GPS device is not available, you can wire the GHC 10 to an optional NMEA 0183-compatible GPS device instead.

Garmin replacement part number: 010-00688-00

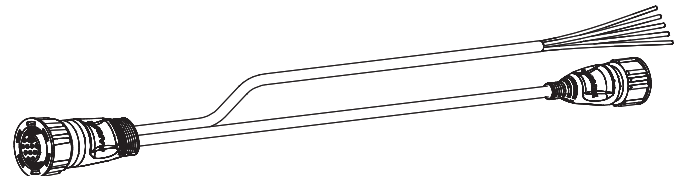
Serial number _____

Cables and Connectors


Use the included cables to connect the GHP 10V components to power, to each other, to an alarm (provided), and to optional devices such as a NMEA 2000- or NMEA 0183-compatible GPS device.

CCU cable

Use this cable to connect the CCU to the Autopilot Gateway. Additionally, a portion of this cable contains color-coded wires with bare ends. Use these wires to connect the CCU to power, to the GHC 10 (yellow signal wire), and to the included alarm. You can use a NMEA 2000 drop cable to extend the CCU cable, if necessary, though you should not connect this cable to a NMEA 2000 network.

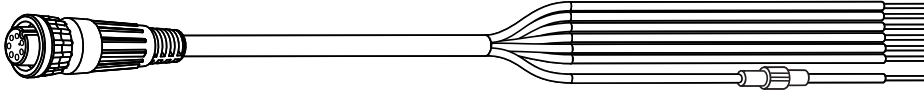


Garmin replacement part number: 010-11351-00

 **CAUTION:** Do not connect this cable to a NMEA 2000 network.

GHC 10 Power/Data Cable

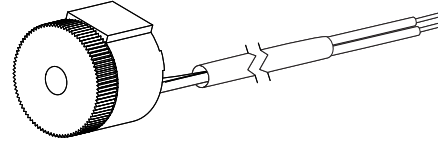
Use this cable (packaged with the GHC 10) to connect the GHC 10 to power, to the CCU, and to an optional NMEA 0183-compatible GPS device (if you do not have a NMEA 2000-compatible GPS device on the NMEA 2000 network).



(Garmin replacement part number: 010-11074-00)

Alarm

Wire the included alarm to the CCU using the CCU cable. The alarm provides audible alerts from the GHP 10V.

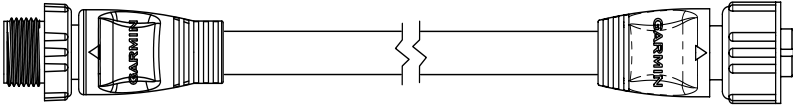
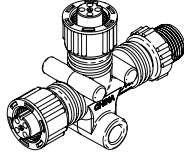
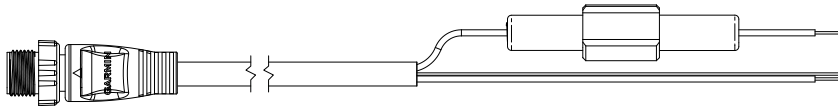
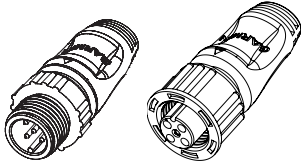


(Garmin replacement part number: 010-11056-00)

NMEA 2000 Cables and Connectors

The NMEA 2000 cables connect the CCU and the GHC 10 to the NMEA 2000 network. Use the NMEA 2000 power cable and two terminators to create a NMEA 2000 network on your boat if one does not exist. Additional NMEA 2000 cables and connectors are available, if necessary. You can use a NMEA 2000 drop cable to extend the CCU cable, if necessary.

For more information on NMEA 2000, see [page 9](#).

 <p>NMEA 2000 drop cable, 6 1/2 ft. (2 m) (two included) Garmin replacement part number: 010-11076-00</p>	 <p>NMEA 2000 T-connector (three included) Garmin replacement part number: 010-11078-00</p>
 <p>NMEA 2000 power cable (one included) Garmin replacement part number: 010-11079-00</p>	 <p>NMEA 2000 terminators (one of each included) Garmin replacement part number (male): 010-11080-00; Garmin replacement part number (female): 010-11081-00</p>

Tools

- Safety glasses
- Drill and drill bits
- 3¹⁷/₃₂ in. (90 mm) hole saw
- Scissors
- Wire cutters/strippers
- File and sandpaper
- Phillips screwdriver and flat screwdriver
- Cable ties
- Waterproof wire connectors
- Compass (to test for magnetic interference when finding a suitable location for the CCU)
- Surface-specific mounting hardware (screws or bolts)
- Marine sealant
- Anti-seize lubricant (optional)
- Additional NMEA 2000 cables and connectors (optional)

 **NOTE:** Mounting screws are provided for the GHC 10 and for the CCU. If the provided screws are not appropriate for the mounting surface, you will need to provide the correct types of screws.

Preparation

Before installing the GHP 10V autopilot system, it is important that you completely understand where all the components will be located on your boat. Temporarily place all the components where you plan to install them. Ensure that all cables can reach the necessary components before mounting any of the components.

Electrical/Data Connection and Mounting Considerations

The GHP 10 components connect to each other and to power using the included cables. Ensure that the correct cables reach each component, and ensure that each component is in an acceptable location before mounting any components. Read the following considerations and consult the diagram on the next page before you begin installation.

CCU

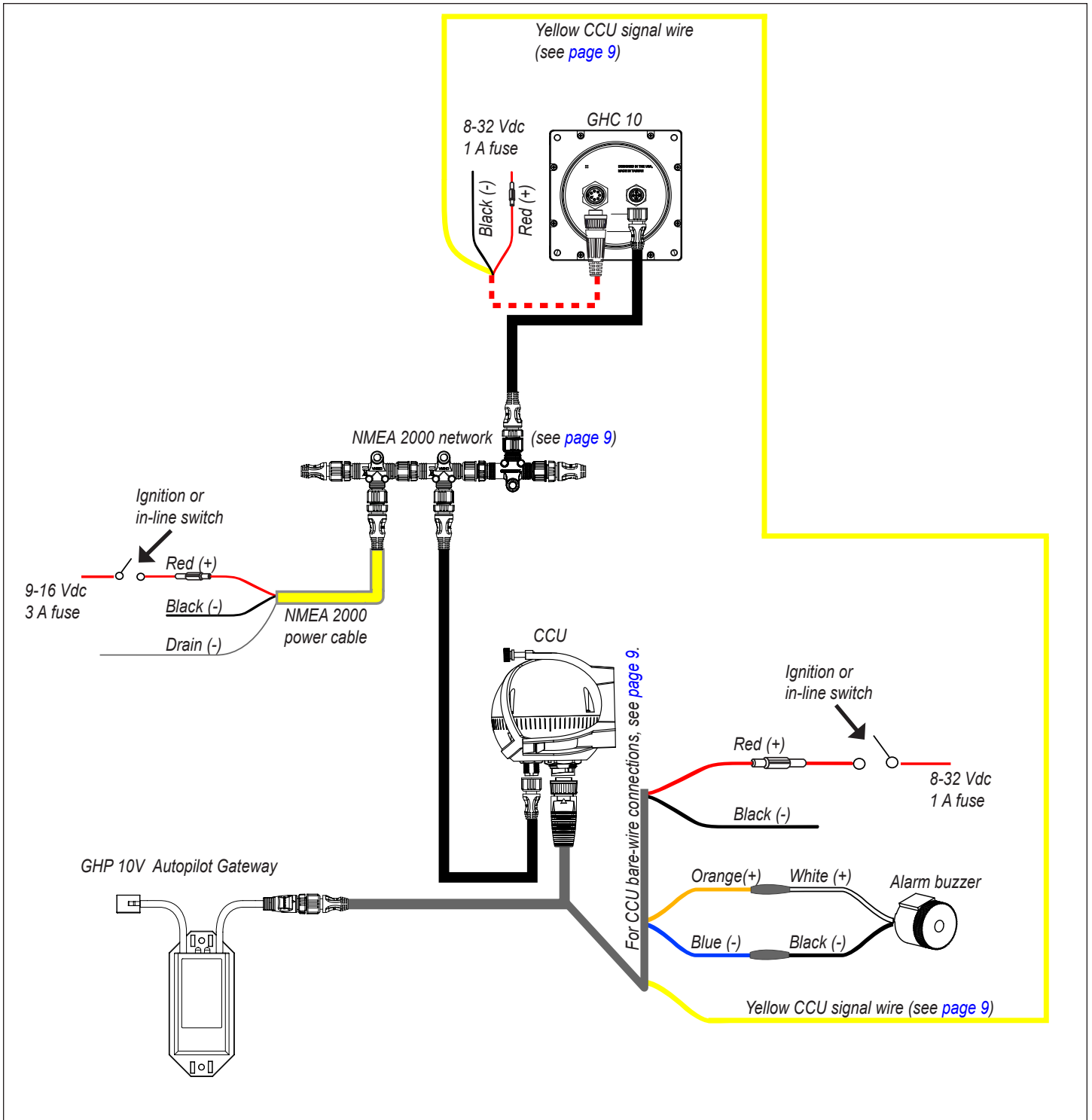
- Do not mount the CCU in a location where it will be submerged or exposed to wash-down.
- **Mount the CCU in the forward half of the boat, no higher than 10 ft. (3.05 m) above the waterline.**
- You can mount the CCU below the waterline, as long as it is not in a location where it will be submerged or exposed to wash-down.
- Mount the CCU bracket on a vertical surface or under a horizontal surface, so that the connected wires hang straight down.
- **Do not mount the CCU near magnetic material, magnets (speakers and electric motors), or high-current wires.** Mount the CCU at least 24 in. (0.61 m) away from movable or changing magnetic disturbances such as anchors, anchor chain, wiper motors, and tool boxes. Use a handheld compass to test for magnetic interference in the area.
- The CCU cable connects the CCU to the Autopilot Gateway, and provides 9 1/2 ft. (3 m) of cable between the CCU and the Autopilot Gateway. If you cannot mount the CCU within 9 1/2 ft. (3 m) of the Autopilot Gateway, use a NMEA 2000 drop cable up to 20 ft. (6m) long (not included) to extend the cable. **Do not connect the CCU cable to a NMEA 2000 network.**
- The CCU cable connects the CCU to power, to the alarm buzzer, and to the yellow CCU signal wire of the GHC 10 using wires with bare ends. See [page 7](#) for wiring instructions and diagrams.

CCU and GHC 10

- The CCU and the GHC 10 connect to a NMEA 2000 network using dedicated NMEA 2000 communication ports. If you do not have a NMEA 2000 network on your boat, the equipment necessary to build one is provided. For instructions on setting up the NMEA 2000 network, see [page 11](#).
- You can connect an optional NMEA 2000-compatible GPS device to the NMEA 2000 network to use waypoint and route data with the GHP 10.

GHC 10

- Wire the GHC 10 to the battery of the boat and to the yellow CCU signal wire of the Autopilot Gateway cable.
- If you do not have an optional NMEA 2000-compatible GPS device, you can wire an optional NMEA 0183-compatible GPS device to the power/data cable of the GHC 10 instead (see [page 12](#)).



GHP 10V General Wiring Diagram

Installation Procedures

After you have completely planned the GHP 10V installation on your boat, and have satisfied all the mounting and wiring considerations for your particular installation, you can begin mounting and connecting the components.

Installing the Course Computer Unit (CCU)

Install the CCU by mounting it to your boat, connecting it to the Autopilot Gateway and to a NMEA 2000 network, and wiring it to power, to the alarm buzzer, and to the yellow CCU signal wire on the GHC 10.

Mounting the CCU

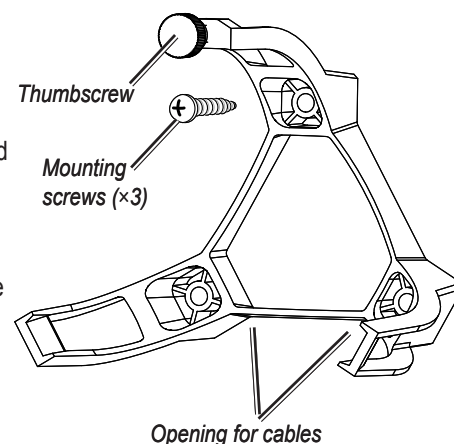
Mount the CCU on the boat by using the included bracket. The CCU bracket has two portions: the mounting portion and the securing portion. Install the mounting portion on the mounting surface, and secure the CCU in the bracket with the securing portion.

When mounting the CCU:

- **Mount the CCU in the forward half of the boat, no higher than 10 ft. (3.05 m) above the waterline.**
- You can mount the CCU below the waterline, as long as it is not in a location where it will be submerged or exposed to wash-down.
- Mount the CCU bracket on a vertical surface or under a horizontal surface, so that the connected wires hang straight down.
- **Do not mount the CCU near magnetic material, magnets (speakers and electric motors), or high-current wires.**
- Mount the CCU at least 24 in. (0.6 m) away from movable or changing magnetic disturbances such as anchors, anchor chain, wiper motors, and tool boxes.
- Use a handheld compass to verify the absence of magnetic interference. If the handheld compass does not point north when you hold it in the location you want to mount the CCU, then there is magnetic interference. Choose another location and test again.
- If possible, mount the CCU within 9 1/2 ft. (3 m) of the Autopilot Gateway. If you cannot mount the CCU within 9 1/2 ft. (3 m) of the Autopilot Gateway, use a NMEA 2000 drop cable up to 20 ft. (6m) long (not included) to extend the cable. **Do not connect the CCU cable to a NMEA 2000 network.**

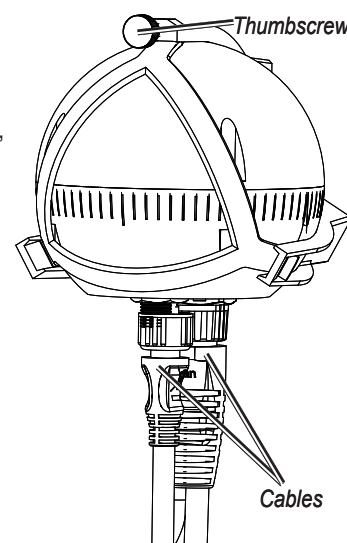
To mount the CCU bracket:

1. Determine the best location for the CCU on your boat. Use a handheld compass to be sure that the location is free of magnetic interference.
2. Determine the correct type of screws for the mounting surface. Mounting screws are included with the CCU, but you may need to provide different screws or use bolts if the supplied screws are not suitable for the mounting surface.
3. Use the mounting template provided on [page 19](#). Be sure to orient the template with an opening at the bottom, because the CCU cables must hang straight down. Tape the template to the mounting location.
4. Drill pilot holes at the three locations on the mounting template.
5. Use screws or bolts to secure the mounting portion of the CCU bracket.



To secure the CCU in the CCU bracket:

1. Connect the CCU cable and the NMEA 2000 drop cable to the CCU.
2. Place the CCU in the mounting portion of the CCU bracket with the wires hanging straight down, toward the water.
3. Place the securing portion of the bracket over the ball and snap it into the mounting portion of the bracket, starting with the two arms that do not have the thumbscrew.
4. Make sure the cables hang straight down, toward the water, and connect the arm with the thumbscrew. **The cables must hang straight down for the CCU to accurately read your heading.**
5. Hand-tighten the thumbscrew until the CCU is held firmly in the bracket. **Do not overtighten the thumbscrew.**



Wiring the CCU

Route the connector-terminated end of the CCU cable to the location where you plan to access the Volvo multilink bus, and install a NMEA 2000 drop cable extension (not included) if necessary. Connect the cable to the Autopilot Gateway after you have installed the gateway (page 7).

Route the bare-wire end of the CCU cable to the location best suited to wire it to power, to the alarm buzzer, and to the GHC 10. Wire the CCU to the alarm buzzer and to the GHC 10 after you have installed the alarm buzzer and the GHC 10 (see pages 7 and 8).

To wire the CCU to power:

1. On the bare-wire end of the CCU cable, isolate the red (+) and black (-) wires.
2. Connect the red (+ or positive) and black (- or ground) wires to power and ground through the ignition switch or through an external switch.
If the red (+) and black (-) wires are not long enough, extend the appropriate wires with 22 AWG wire.
3. Solder and cover all bare-wire connections.

Installing the Autopilot Gateway

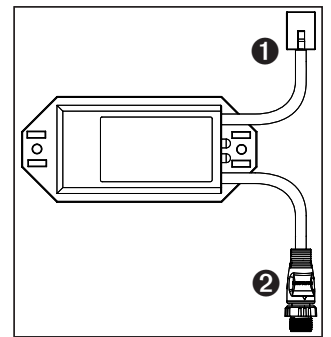
The Autopilot Gateway allows the GHP 10V Autopilot System to communicate with the Volvo EVC system and steer the boat.

Mounting the Autopilot Gateway

Mount the Autopilot Gateway near the location where you plan to access the Volvo proprietary multilink bus, and ensure that the Volvo interface cable reaches the location where you plan to access the Volvo multilink bus. Secure the Autopilot Gateway with cable ties or other appropriate mounting hardware (not included).

Connecting the Autopilot Gateway

1. Open the Volvo multilink bus and disconnect the multilink breakout cable.
2. Connect the proprietary Volvo connector (❶) from the Autopilot Gateway to the multilink bus using the included Y-cable.
3. Close the Volvo multilink bus.
4. Connect the CCU interface connector (❷) to the CCU cable.



Autopilot Gateway Connectors

CAUTION: Do not connect the CCU interface connector on either the CCU cable or the Autopilot Gateway to a NMEA 2000 network.

Installing the Alarm Buzzer

The alarm buzzer audibly alerts you to important GHP 10V events.

Mounting the Alarm Buzzer

Mount the alarm buzzer near the helm station. You can mount the alarm buzzer under the dashboard if you prefer. Secure the alarm buzzer with cable ties or other appropriate mounting hardware (not included).

Wiring the Alarm Buzzer

1. Route the alarm-buzzer cable to the bare-wire end of the CCU cable. If the cable is not long enough, extend the appropriate wires with 28 AWG wire.
2. Use the table below to make the appropriate connections.

Alarm Buzzer Wire Color	CCU cable Wire Color
White (+)	Orange (+)
Black (-)	Blue (-)

Alarm Buzzer Wiring Table

3. Solder and cover all bare-wire connections.

Installing the GHC 10


Install the GHC 10 by flush-mounting it in the dashboard near the helm, connecting it to power and to the yellow CCU signal wire from the CCU cable, and connecting it to a NMEA 2000 network. Optionally, you can connect the GHC 10 to a NMEA 2000- or NMEA 0183-compatible GPS device to use waypoint and route data.

Mounting the GHC 10

Flush mount the GHC 10 in the dashboard near the helm.


When you select an installation location for the GHC 10, choose a location with the following characteristics:

- Provides optimal viewing as you operate your vessel.
- Allows easy access to the keypad on the GHC 10.
- Is strong enough to support the weight of the GHC 10 and protect it from excessive vibration or shock.
- Allows room for the routing and connection of the cables for power and data. There should be at least a 3-inch (8 cm) clearance behind the case.
- Is at least 9½ in. (0.24 m) from a magnetic compass, to avoid interference.
- Is in an area that is not exposed to extreme temperature conditions.


 **CAUTION:** The temperature range for the GHC 10 is from 5°F to 158°F (from -15°C to 70°C). Extended exposure to temperatures outside of this range (in storage or operating conditions) may cause failure of the LCD screen or other components. This type of failure and related consequences are not covered by the limited warranty.

To flush mount the GHC 10:

1. A flush-mount template is included in the product box. Trim the template and ensure it will fit in the location at which you want to flush mount the GHC 10.
2. The flush-mount template has adhesive on the back. Remove the protective liner and apply the template to the location where you want to flush mount the GHC 10.
3. Use the 3¹⁷/₃₂ in. (90 mm) hole saw to cut the mounting surface along the line indicated on the flush-mount template. Use a file and sandpaper to refine the size of the cutout, if needed.
4. Place the GHC 10 into the cutout to confirm that the four mounting holes are correct after refining the cutout. If not, mark the correct locations of the four mounting holes. Remove the GHC 10 from the cutout.
5. Drill the four 1/8 in. (3.2 mm) pilot holes.

 **NOTE:** If you are mounting the GHC 10 in fiberglass, 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.

6. Remove the remainder of the template.
7. Place the GHC 10 into the cutout.
8. Securely tighten the four mounting screws through the GHC 10 into the drilled mounting holes.

 **NOTE:** Stainless-steel screws may bind when screwed into fiberglass and overtightened. Garmin recommends applying an anti-galling, stainless anti-seize lubricant to the screws before installing them.

9. Snap the mounting covers into place to install them.



Wiring the GHC 10 to Power and to the CCU Cable

With the GHC 10 power/data cable, wire the GHC 10 to power and to **the yellow CCU signal wire on the CCU cable**. Optionally, you can wire the GHC 10 power/data cable to a NMEA 0183-compatible GPS device to use waypoint and route information with the GHP 10V, although a NMEA 2000-compatible GPS device is preferred.

To wire the GHC 10 to power:

1. Route the GHC 10 power/data cable to the boat battery.
2. Connect the red (+ or positive) wire to the positive voltage terminal. (If you use the fuse block on the boat, route the positive connection through the fuse.)
3. Connect the black (- or ground) wire to the negative voltage terminal.
4. Install or check the AGC/3AG – 1 A fuse (on the fuse block or in the in-line holder).
5. Connect the power/data cable to the GHC 10.

Notes:

- The replacement fuse is an AGC/3AG – 1 A fuse.
- If it is necessary to extend the power wires, use 18 AWG wire.
- If your boat has an electrical system, you might be able to wire the GHC 10 directly to an unused holder on your current fuse block. If you are using the fuse block, remove the in-line fuse holder supplied with the GHC 10.



CAUTION: The GHC 10 maximum input voltage is 32 Vdc. Do not exceed this voltage, because this can damage the GHC 10 and void the warranty.



NOTE: During a typical installation, use only the red, black, and yellow wires. The other wires are used for NMEA 0183 connections, and do not have to be connected for normal operation of the GHC 10. For information on connecting to a NMEA 0183-compatible GPS device, see [page 12](#).

To wire the yellow CCU signal wire from the GHC 10 power/data cable to the CCU cable:

1. Route the GHC 10 power/data cable to the bare end of the color-coded wires from the CCU cable. If the cable is not long enough, extend the yellow CCU signal wire with 22 AWG wire.
2. Connect the yellow CCU signal wire from the GHC 10 power/data cable to the yellow wire on the CCU cable.
If you install multiple GHC 10 units and want to turn the GHP 10V autopilot system on with any of the installed GHC 10 units, connect all of the yellow CCU signal wires from the GHC 10 units to the yellow wire on the CCU cable.
3. Solder and cover all bare-wire connections.



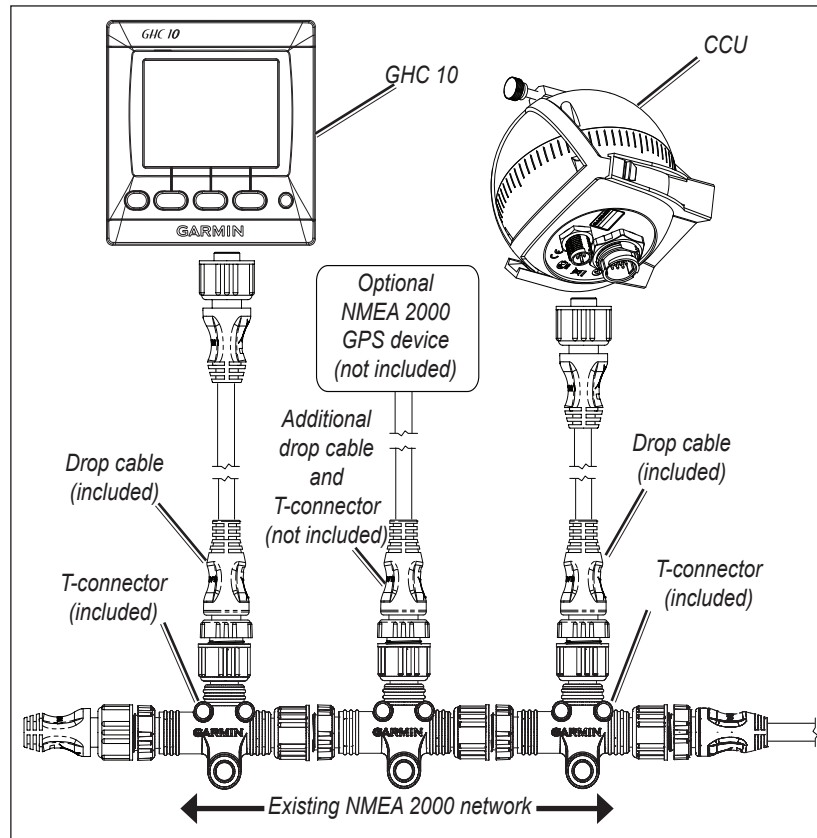
NOTE: The yellow CCU signal wire must be connected from the GHC 10 power/data cable to the CCU cable, or else the GHP 10V autopilot system will not power on with the GHC 10.

Connecting the GHC 10 to a NMEA 2000 Network

Connect the GHC 10 to the CCU through your existing NMEA 2000 network. If you do not have an existing NMEA 2000 network on your boat, you will need to create one. Optionally, you can connect a NMEA 2000-compatible GPS device to your NMEA 2000 network to use waypoint and route information with the GHP 10V. For more information on NMEA 2000, visit www.garmin.com.

To connect the GHC 10 to your existing NMEA 2000 network:

1. Determine where you would like to connect the GHC 10 to your existing NMEA 2000 network.
2. Disconnect one side of a NMEA 2000 T-connector from the network at an appropriate location.
3. If you need to extend the NMEA 2000 network backbone, connect an appropriate NMEA 2000 backbone extension cable (not included) to the side of the T-connector you disconnected.
4. Add the included T-connector for the GHC 10 to the NMEA 2000 network by connecting it to the side of the T-connector you disconnected.
5. Route the included drop cable to the bottom of the T-connector you just added to your NMEA 2000 network. If the included drop cable is not long enough, you can use a drop cable up to 20 ft. (6 m) long (not included).
6. Connect the drop cable to the T-connector and the GHC 10.



Connecting the GHC 10 (and CCU) to an Existing NMEA 2000 Network

To connect the CCU to your existing NMEA 2000 network:

Connect the CCU to your existing NMEA 2000 network by following the procedures you used to connect the GHC 10 to your existing NMEA 2000 network, above.

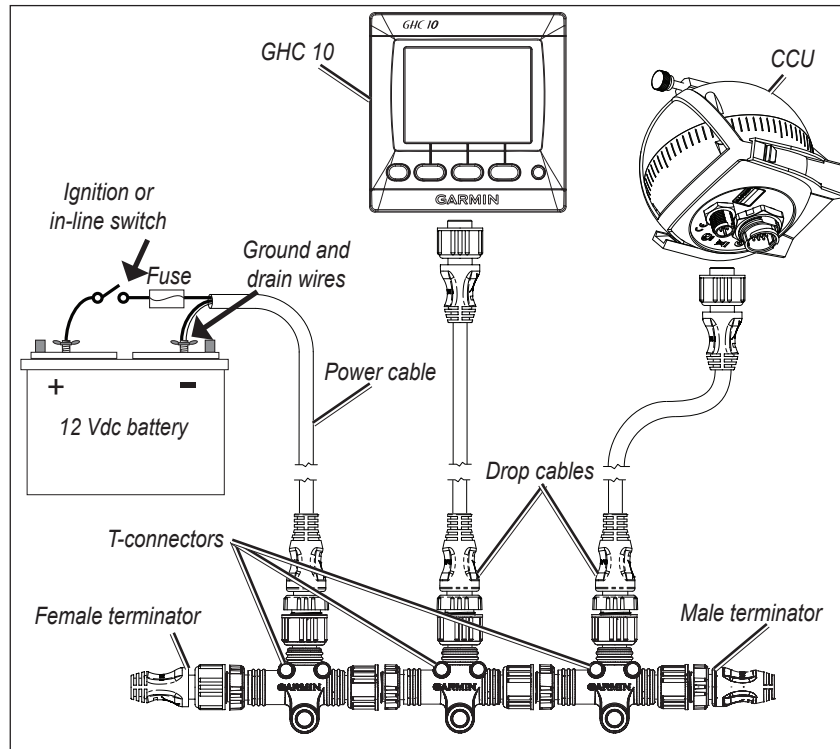
Notes:

- Neither the CCU nor the GHC 10 is powered by the NMEA 2000 network. They must be separately connected to power sources (see [pages 7 and 9](#)).
- The GHC 10 must also connect to the CCU with the yellow CCU signal wire in the GHC 10 power/data cable.
- To add additional sensors to your NMEA 2000 network, follow the instructions included with the sensors.

To create a basic NMEA 2000 network for the GHC 10 and the CCU:

1. Connect three T-connectors (two of the three are not included) together by their sides.
2. A NMEA 2000 power cable (not included) must be connected to a 12 Vdc power source through a switch. Connect to the ignition switch of the boat if possible, or through an appropriate additional switch (not included).
3. Connect a NMEA 2000 power cable (not included) to one of the T-connectors.
4. Connect the included NMEA 2000 drop cable to one of the T-connectors and to the GHC 10.
5. Connect a NMEA 2000 drop cable (not included) to the remaining T-connector and to the CCU.
6. Connect the appropriate NMEA 2000 terminators (not included) to each end of the combined T-connectors.

CAUTION: You must connect the NMEA 2000 power cable to the boat ignition switch, or through another in-line switch. The GHC 10 will drain your battery if it is connected directly.



Creating a Basic NMEA 2000 Network for the GHC 10 and the CCU

Notes:

- To add additional sensors to your NMEA 2000 network, follow the instructions included with the sensors.
- The GHC 10 is not powered by the NMEA 2000 network. It must be separately connected to the power source.
- The GHC 10 must also connect to the CCU with the yellow CCU signal wire in the GHC 10 power/data cable.

Connecting an Optional GPS Device to the GHP 10V Autopilot System

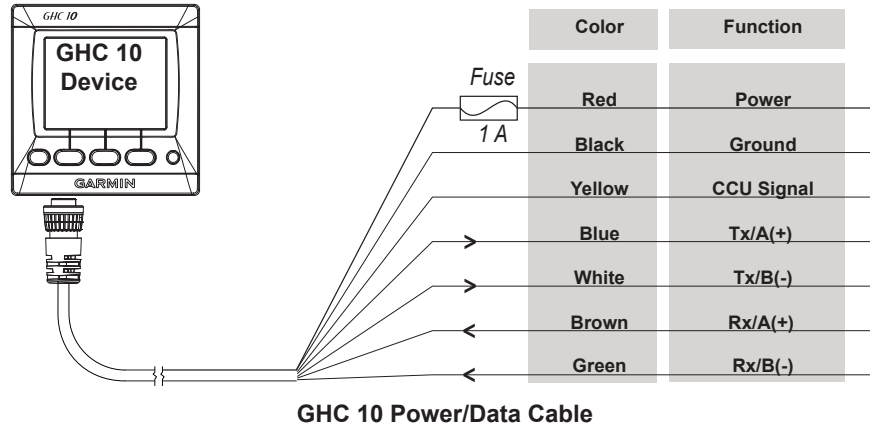
To use an optional optional GPS device with the GHP 10V, either connect a NMEA 2000-compatible GPS device to the NMEA 2000 network, or connect a NMEA 0183-compatible GPS device directly to the GHC 10.

To connect an optional NMEA 2000-compatible GPS device to your GHP 10V:

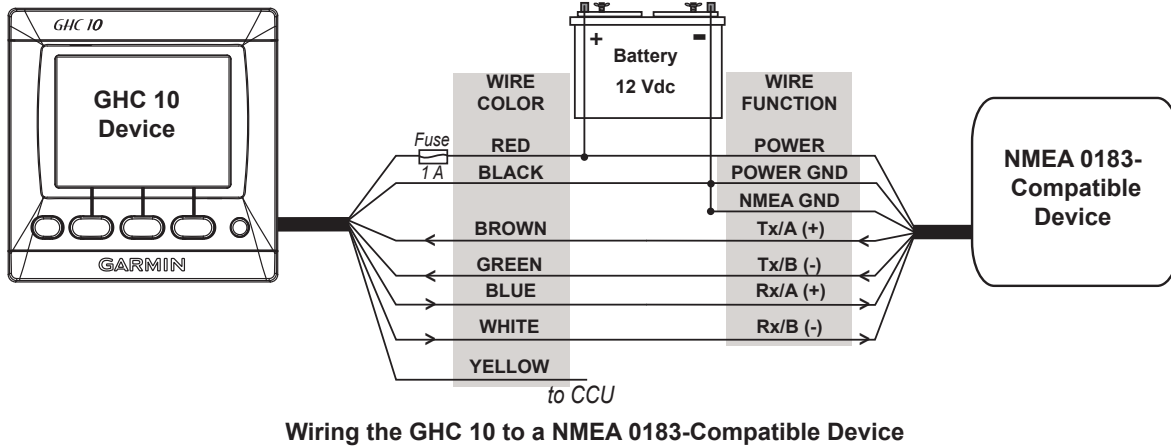
1. Add an additional T-connector (not included) for the optional GPS device you want to add to the NMEA 2000 network.
2. Connect the GPS device to the T-connector by following the instructions provided with the GPS device.

To connect an optional NMEA 0183-compatible GPS device to your GHP 10V:

1. Determine the NMEA 0183 wiring assignments of your NMEA 0183-compatible GPS device.
2. Use the GHC 10 power/data cable wiring diagrams to correctly wire your NMEA 0183-compatible GPS device.
3. Use 22 AWG twisted-pair wire for extended runs of wire.
4. Solder and cover all bare-wire connections.



Example:



Notes:

- Consult the installation instructions for your NMEA 0183-compatible device to identify the Transfer (Tx) A(+) and B(-) wires.
- If your NMEA 0183-compatible device has only one transmitting wire (Tx), connect it to the brown wire (Rx/A) from the GHC 10, and connect the green wire (Rx/B) to ground.
- If your NMEA 0183-compatible device has only one receiving wire (Rx), connect it to the blue wire (Tx/A) from the GHC 10, and leave the white wire (Tx/B) unconnected.
- The yellow (CCU signal) wire must be wired to the yellow wire of the CCU cable.

Configuring the GHP 10V

The GHP 10V autopilot system must be configured and tuned to your boat dynamics and motor configuration.



NOTE: The Dockside Wizard and any hydraulic setup options are not used when configuring the GHP 10V autopilot system.


Advanced Configuration Power-on Procedure

Advanced configuration options are not available on the GHC 10 under normal usage conditions. To access the advanced configuration settings of the GHP 10V, use the advanced configuration power-on procedure.



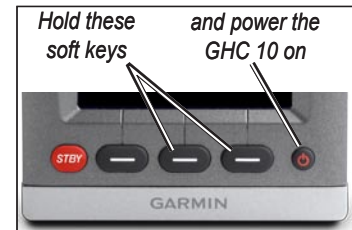
NOTE: The first time you power on the GHP 10V, you will be prompted to complete the Sea Trial Wizard. You do not need to power on the unit using this power-on procedure to run the wizard for the first time. Only use this procedure if you wish to fine-tune the autopilot or re-run the Sea Trial Wizard in the future.

To perform the advanced configuration power-on procedure:

1. With the power off, press both the center and the right soft keys on the GHC 10.
2. While holding the center and the right soft keys, press and hold the  **Power** key.
3. Hold all 3 keys until the heading screen appears, and then release the keys.

To ensure that the advanced configuration options are available:

1. From the heading screen, select **Menu > Setup**.
2. If the option for **Dealer Autopilot Configuration** is available, you correctly performed the advanced configuration power-on procedure.
3. See [page 15](#) for more information on the settings available under **Dealer Autopilot Configuration**.



Advanced Configuration Power-on Procedure

The Sea Trial Wizard

The first time you power on the GHP 10V, you are prompted to complete a short setup sequence on the GHC 10. Use the soft keys to select the settings. After you complete the initial setup, you are ready to start the Sea Trial Wizard. You must complete the Sea Trial Wizard before you can use the autopilot system to control your boat.

The Sea Trial Wizard configures the fundamental sensors on the autopilot, and it is extremely important to complete the wizard in conditions appropriate for your boat. In general, it is highly recommended to complete the Sea Trial Wizard in calm water with little or no wind. Because the nature of calm water is relative to the size and shape of your boat, be sure you choose a location where:

- Your boat does not rock while sitting still or moving very slowly.
- Your boat is not significantly affected by the wind.

While completing the Sea Trial Wizard in calm water, it is important to observe the following:

- Keep the weight on your boat balanced. DO NOT move around on the boat while completing any of the steps in the Sea Trial Wizard.
- Be sure that the engines are trimmed down, and that the trim tabs are up.

To complete the Sea Trial Wizard configuration:

1. Drive to calm, open water and select **Begin** to start the Sea Trial Wizard from the welcome screen on the GHC 10. (If the welcome screen is not showing, select **Menu > Setup > Dealer Autopilot Configuration > Wizards > Sea Trial Wizard**.)
2. **Planing RPM:** Take note of the RPM reading from the tachometer on the dashboard of your boat at the point your boat transitions from displacement to planing speed. If the tachometer value does not match the value on the GHC 10, use the arrows to adjust the value. When you are finished, select **Done**.
3. **Calibrate Compass:** Follow the directions on the GHC 10. Before you begin the compass calibration procedure, drive your boat in a slow, straight line, and wait for the wake generated by the previous step to pass.

When instructed, turn the boat slowly clockwise, taking care to make **as steady and flat** a turn as possible. **Turn slowly enough that the boat DOES NOT list.**




NOTE: If you have a dual-engine boat, slowly run the port engine forward and the starboard engine in reverse to pivot on a stationary position.

After you successfully complete the calibration, the GHC 10 displays a completion message; select **Done**. If the calibration fails, select **Retry** to begin the process again.

4. **Autotune:** Before you begin the Autotune procedure, adjust the throttle so that the boat travels at a constant RPM below planing speed, with enough speed to maintain responsive steering. Select **Begin** when you are ready. The boat will perform a number of zigzag motions while the Autotuning is in progress. When the GHC 10 displays a completion message, select **Done**. **Be sure to resume manual control of the boat when Autotuning is complete.**

If the Autotuning fails:

- Increase the throttle approximately 200 RPM and select **Retry** to begin the process again.
- If it fails again, continue retrying the process adding increments of 200 RPM.
- If you reach planing speed through adding increments of 200 RPM and the autotune procedure continues to fail, reduce speed below planing speed and select **Alternate Autotune** to begin an alternate autotuning procedure.

 **CAUTION:** The Alternate Autotune is only applicable to a small number of boats, and should be the last attempt at autotuning. Do not perform the Alternate Autotune until you are sure the standard autotune procedure will not work on your boat.

- 5a. **Set North (with an optional GPS device connected):** To perform this step, you must have a large stretch of open water available. Be sure to have at least 45 seconds of hazard-free, open water available while at planing speed. Drive the boat in a straight line, at planing speed, and select **Begin** when you are ready. When the GHC 10 displays a completion message, select **Done**. If the calibration fails, select **Retry** to begin the process again.

- 5b. **Fine Heading Adjustment (without an optional GPS device connected):** To perform this step, manually adjust the heading to match a compass on the boat or other known heading reference.

Evaluating the Results of the Autopilot Configuration


When the Sea Trial Wizard is complete, test the autopilot to be sure it is configured correctly. Test the autopilot first at slow speeds (below planing), and then test the autopilot at planing speeds.

To test the autopilot configuration:

1. Drive the boat in one direction with the autopilot engaged (heading hold). The boat should not oscillate significantly; however, a small amount of oscillation is normal.
2. Turn the boat in one direction using the autopilot. When you release the turn button, the boat should overshoot the turn and quickly correct the heading to the point at which you released the button. You will notice that the faster you are going, the greater the boat will overshoot the turn.
3. When the autopilot turns the boat, it should not feel as though it turns too aggressively or too sluggishly.
4. If the autopilot is configured properly at slow speeds, repeat these tests at planing speed, and vice versa.

To adjust the autopilot rudder gain configuration if necessary:

1. If you feel that the heading hold oscillates significantly or that the autopilot does not quickly correct the heading when turning, you can make slight adjustments to the rudder gain.

 **NOTE:** When you manually adjust the rudder gain (or counter gain), make small adjustments, and adjust only one value at a time. Test the change before entering any further adjustments.

2. Power on the GHP 10V using the advanced configuration power-on procedure ([page 13](#)).
3. On the GHC 10, select **Menu > Setup > Dealer Autopilot Configuration > Turn Fine Tuning Setup > Rudder Gains** to access the rudder gain adjustments. There are two types of gain settings at both low and high speeds:
 - **Rudder Gain**—Adjusts how aggressively the rudder holds the heading and makes turns. If you set this value too high, the autopilot may be overactive, constantly adjusting the rudder in reaction to slight heading deviations, which can lead to undesired rudder oscillation. An overactive autopilot can cause excess wear and tear on the steering system. If this value is too low, the autopilot will be slower to execute course changes and will allow more error around your desired heading.
 - **Counter Gain**—Adjusts how tightly the rudder corrects the turn overshoot. If you set this value too low, the autopilot can excessively overshoot on course changes. If this value is too high, the pilot will be slow to execute course changes and will seem less responsive.

To adjust the autopilot turning configuration if necessary:

1. If you feel that the autopilot turns the boat too aggressively or too sluggishly, you can make slight adjustments to the turn acceleration limiter.

 **NOTE:** When you manually adjust the acceleration limiter, make small adjustments. Test the change before entering any further adjustments.

2. Power on the GHP 10V using the advanced configuration power-on procedure ([page 13](#)).
3. On the GHC 10, select **Menu > Setup > Dealer Autopilot Configuration > Turn Fine Tuning Setup > Acceleration Limiter**.

Manually Running the Sea Trial Wizard

The Sea Trial Wizard allows you to quickly define all of the important configuration settings on the GHP 10V. If, after running the wizard and manually adjusting the gains, you do not feel as though the GHP 10V is working correctly, you can run the wizard again at any time.

To manually run the Sea Trial Wizard:

1. Power the GHC 10 on using the advanced configuration power-on procedure ([page 13](#)).
2. From the Heading screen, select **Menu > Setup > Dealer Autopilot Configuration > Wizards > Sea Trial Wizard**.
3. Perform the steps as prompted. For more information, see [page 13](#).

Changing Advanced Configuration Settings

You can run the Autotune automated configuration process, calibrate the compass, and define North on the GHP 10V through the GHC 10 without running the wizards. Additionally, without running the wizards, you can individually define each configuration setting. To access the automated configuration settings and the advanced configuration settings, power on the GHC 10 using the advanced configuration power-on procedure (see [page 13](#)).

To manually run the automated configuration settings:


1. From the Heading screen, select **Menu > Setup > Dealer Autopilot Configuration > Automated Setup**.
2. Select **Autotune**, **Calibrate Compass**, or **Set North**.
3. Perform the steps as prompted, as you would if you were running the Sea Trial Wizard. For more information on each automated configuration setting, see [page 13](#).

To manually define individual configuration settings:

1. From the Heading screen, select **Menu > Setup > Dealer Autopilot Configuration**.
2. Select the appropriate category of the setting you want to configure.
3. Select the setting you want to configure.

Category	Setting	Description
Tachometer Setup	Verify Tachometer	With the engine (or engines) running, compare the RPM readings on the GHC 10 with the tachometer on the dashboard of your boat.
Tachometer Setup	RPM Source	This setting is not used for the GHP 10V. The RPM information will be received from the Volvo autopilot gateway.
Tachometer Setup	Planing RPM	Take note of the RPM reading from the tachometer on the dashboard of your boat at the point your boat transitions from displacement to planing speed. If the value does not match the value on the GHC 10, use the arrows to adjust the value.
Tachometer Setup	Low RPM Limit	Take note of the RPM reading from the tachometer on the dashboard of your boat at the lowest RPM point. If the value does not match the value on the GHC 10, use the arrows to adjust the value.
Tachometer Setup	High RPM Limit	Take note of the RPM reading from the tachometer on the dashboard of your boat at the highest RPM point. If the value does not match the value on the GHC 10, use the arrows to adjust the value.
Turn Fine Tuning Setup > Rudder Gains	Low Speed	Set the rudder gain for low speeds.
Turn Fine Tuning Setup > Rudder Gains	Low Speed Counter	Set the rudder gain counter-correction for low speeds.
Turn Fine Tuning Setup > Rudder Gains	High Speed	Set the rudder gain for high speeds.
Turn Fine Tuning Setup > Rudder Gains	High Speed Counter	Set the rudder gain counter-correction for high speeds.
Turn Fine Tuning Setup	Acceleration Limiter	Limit the aggressiveness of autopilot-controlled turns. Increase the percentage to limit the turn rate, and decrease the percentage to allow higher turn rates.
Navigation Setup	Fine Heading Adjustment	Increase or decrease to fine-tune the autopilot heading.

Category	Setting	Description
Navigation Setup > NMEA Setup	NMEA Checksum	If the connected GPS unit incorrectly calculates checksums, you may still be able to use it if you turn this setting off. When off, data integrity is compromised.
Navigation Setup > NMEA Setup	Reversed XTE	If the connected GPS unit sends the incorrect steering direction with the cross-track error signal, use this setting to correct the steering direction.
Navigation Setup	Navigation Gain	Because the cross-track error data transmitted by a NMEA 0183 GPS device is only accurate within .01 mile (60 ft.), the gain may need adjustment. Increase this setting until the boat oscillates back and forth near the course line, then lower it a few levels.
Navigation Setup	Navigation Trim Gain	After adjusting the Navigation gain, increase this setting until you can see the standoff from the course line decreasing over time.

 **NOTE:** Certain configuration settings are available when using the GHC 10 normally, such as enabling and disabling the Shadow Drive, adjusting the sensitivity of the Shadow Drive, and adjusting the Sea State Filtering setting. See the configuration section of the *GHC 10 Quick Start Manual* for more information.

Appendix

Specifications

CCU

Physical

Dimensions: 3¹⁹/₃₂ in. (91.4 mm) diameter

Weight: 5.6 oz. (159 g)

Temperature Range: from 5°F to 131°F (from -15°C to 55°C)

Case Material: Fully gasketed, high-impact plastic alloy, waterproof to IEC 529 IPX7 standards

CCU Cable Length: 9¹/₂ ft. (3 m)

Power

Power Input: 9–33 Vdc

NMEA 2000 Power Input: 9–16 Vdc

NMEA 2000 LEN: 2 (100 mA)

Autopilot Gateway

Physical

Dimensions (W×H×D): 5¹/₈ × 2³/₈ × 1 in. (130 × 60 × 25 mm)

Weight: Less than 1 oz. (28 g)

Alarm Buzzer

Dimensions (L × Diameter): 2⁹/₃₂ in. × 1 in. (23 mm × 25 mm)

Weight: 2.4 oz. (68 g)

Temperature Range: from 5°F to 131°F (from -15°C to 55°C)

Cable Length: 10 ft. (3.0 m)

GHC 10

Physical

Dimensions (W×H×D): 4⁵/₁₆ × 4³/₈ × 1²⁹/₃₂ in. (109 × 48 × 111 mm)

Weight: 9.6 oz. (272 g)

Cables: Power/data cable: 6 ft. (1.8 m); NMEA 2000 drop cable and power cable: 6¹/₂ ft. (2 m)

Temp range: from 5°F to 158°F (from -15°C to 70°C)

Compass Safe Distance: 9¹/₂ in. (241 mm)

Case Material: Fully gasketed, high-impact plastic alloy, waterproof to IEC 529 IPX7 standards

Power

GMI 10 power input source: 8–32 Vdc

Fuse: AGC/3AG - 1 A

GMI 10 power usage: 2.5 W max

NMEA 2000 Power Input: 9–16 Vdc

NMEA 2000 LEN: 2 (100 mA)

NMEA 2000 PGN Information

GHC 10

Receive		Transmit	
059392	ISO Acknowledgment	059392	ISO Acknowledgment
059904	ISO Request	059904	ISO Request
060928	ISO Address Claim	060928	ISO Address Claim
126208	NMEA - Command/Request/Acknowledge Group Function	126208	NMEA - Command/Request/Acknowledge Group Function
126464	Transmit/Receive PGN List Group Function	126464	Transmit/Receive PGN List Group Function
126996	Product Information	126996	Product Information
127250	Vessel Heading	129025	Position - Rapid Update
127488	Engine Parameters - Rapid Update	129026	COG & SOG - Rapid Update
129025	Position - Rapid Update	129029	GNSS Position Data
129029	GNSS Position Data	129283	Cross Track Error
129284	Navigation Data	129284	Navigation Data
129285	Navigation - Route/WP information	129285	Navigation - Route/WP information
		129540	GNSS Sats in View

CCU

Receive		Transmit	
059392	ISO Acknowledgment	059392	ISO Acknowledgment
059904	ISO Request	059904	ISO Request
060928	ISO Address Claim	060928	ISO Address Claim
126208	NMEA - Command/Request/Acknowledge Group Function	126208	NMEA - Command/Request/Acknowledge Group Function
126996	Product Information	126464	Transmit/Receive PGN List Group Function
127258	Magnetic Variation	126996	Product Information
127488	Engine Parameters - Rapid Update	127250	Vessel Heading
129025	Position - Rapid Update	The GHP 10 and the GHC 10 are NMEA 2000 certified.	
129026	COG & SOG - Rapid Update		
129283	Cross Track Error		
129284	Navigation Data		



NMEA 0183 Information

The GHC 10, when connected to an optional NMEA 0183-compatible GPS device, uses the following NMEA 0183 sentences:

Receive—wpl, gga, grme, gsa, gsv, rmc, bod, bwc, dtm, gll, rmb, and xte.

Transmit—hdg.

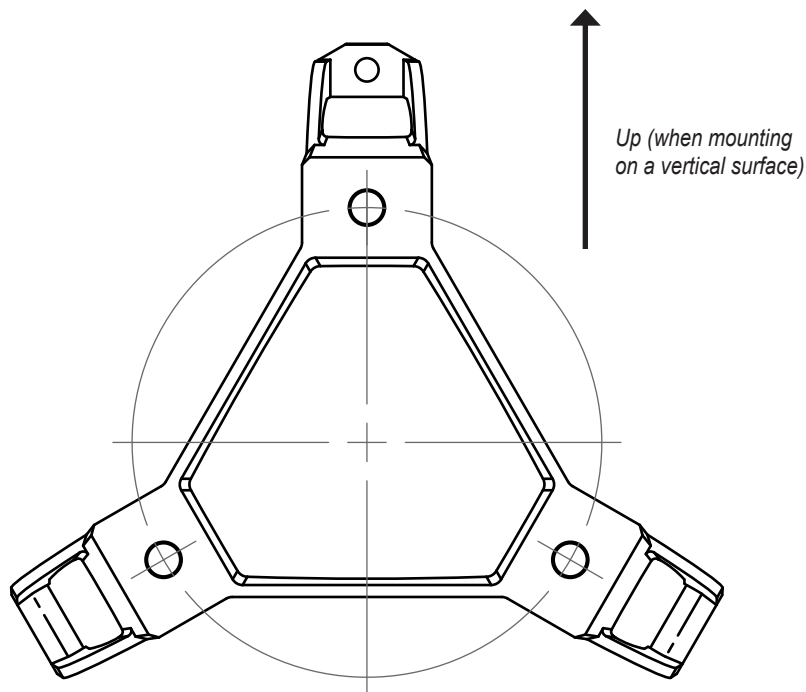
GHP 10V Installation Checklist

Detach this checklist from the installation instructions and use it to assist with the GHC 10 installation process.

Read all installation instructions before installing the GHC 10. Contact Garmin Product Support if you have any questions during the installation process.

1. Refer to the diagram and notes starting on [page 5](#) to understand the necessary electrical and data connections.
2. Lay out all of the components first. Check the cable lengths. Obtain extensions if necessary.
3. Mount the CCU by following the directions starting on [page 6](#). Mount the CCU in a location free of magnetic interference. Use a handheld compass to test for magnetic interference in the area. **Mount the CCU in the bracket so that the wires hang straight down.**
4. Mount the GHC 10 by following the directions starting on [page 8](#).
5. Mount the Autopilot Gateway by following the directions on [page 7](#).
6. Connect the Autopilot Gateway to the Volvo multilink bus (see [page 7](#)).
7. Connect the Autopilot Gateway to the CCU using the CCU cable (see [page 7](#)).
8. Connect the GHC 10 and the CCU to a NMEA 2000 network. Connect an optional NMEA 2000-compatible GPS device to the NMEA 2000 network (see [page 9](#)).
9. Wire the GHC 10 to power and to the yellow CCU signal wire on the CCU cable. Wire an optional NMEA 0183-compatible GPS device to the GHC 10 if a NMEA 2000-compatible GPS device is not available (see [page 9](#)).
10. Apply a corrosion blocker to all the installed components except the GHC 10 (Bio-Shield or Corrosion X, for example).
11. Configure the GHP 10V system by completing the Sea Trial Wizard (see [page 13](#)).

CCU Mounting Template



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