

GARMIN[®]

GHC™ 20



Owner's Manual

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Introduction

⚠ WARNING

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

You are responsible for the safe and prudent operation of your vessel. The autopilot is a tool that enhances your capability to operate your boat. It does not relieve you of the responsibility of safely operating your boat. Avoid navigational hazards and never leave the helm unattended.

You are responsible for the safe and prudent operation of your vessel. Sonar is a tool that enhances your awareness of the water beneath your boat. It does not relieve you of the responsibility of observing the water around your boat as you navigate.

Learn to operate the autopilot on calm and hazard-free open water.

Use caution when operating the autopilot near hazards in the water, such as docks, pilings, and other boats.

The autopilot system continuously adjusts the steering of your boat to maintain a constant heading. In addition to the basic heading-hold functionality, the system allows manual steering and several modes of automatic-steering functions and patterns.

You can operate the autopilot system using the helm control device. Using the helm control, you engage and steer, set up, and customize the autopilot system.

For information about installing, see the installation instructions for each device.

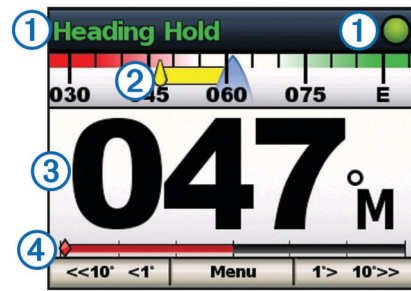
Device Overview



- | | |
|---|-------------------------------------------------------------------------------------------------------------------|
| ① | Select to place the autopilot in standby mode and return to the heading screen. |
| ② | Select to open a menu or perform the function listed above the key. |
| ③ | Select to open the display settings menu.
Press twice to adjust the backlight.
Hold to turn off the device. |

Heading Screen

The heading screen displays the status of the autopilot.



- | | |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ① | Autopilot status/autopilot status indicator.
"Standby" appears in yellow, and the autopilot status indicator appears in yellow when the device is in standby mode.
"Heading Hold" appears in green, and the autopilot status indicator appears in green when the device is in heading hold. |
| ② | Heading trend indicator. |
| ③ | Actual heading (in standby mode)
Intended heading (with the autopilot is engaged) |
| ④ | Rudder position indicator (This functionality is available only when a rudder sensor is connected.) |

Standby Mode

⚠ CAUTION

The autopilot does not steer the boat in standby mode. You are responsible for controlling the helm, when in standby mode.

In standby mode, you can engage the autopilot and adjust settings.

"Standby" appears in yellow and the yellow LED indicator appears in the upper-right corner of the screen when the device is in standby mode.

Powerboat Autopilot Operation

Heading Hold

You can engage the autopilot heading hold function to maintain your current heading without steering the helm.

Engaging the Autopilot

When you engage the autopilot, the autopilot takes control of the helm and steers the boat to maintain your heading.

From the heading screen, select **Engage**.

"Heading Hold" appears in green at the top of the heading screen, and a green icon appears in the upper-right corner of the screen when the device is in heading hold. Your intended heading shows in the center of the heading screen.

Heading Adjustment

When the autopilot is engaged, you can adjust the heading using the keys on the helm control or using the helm if your autopilot is equipped with Shadow Drive™ technology.

Enabling Shadow Drive

NOTE: The Shadow Drive feature is for use only on power planing hull or power displacement hull boats.

Select **Menu > Setup > User Autopilot Setup > Shadow Drive**.

Adjusting Shadow Drive Sensitivity

Select **Menu > Setup > User Autopilot Setup > Shadow Drive Sensitivity**.

Adjusting the Heading with the Helm

NOTE: You must enable the Shadow Drive feature before you can adjust the heading using the helm (*Enabling Shadow Drive*, page 1).

With the autopilot engaged, manually steer the boat.

The autopilot activates Shadow Drive mode.

When you release the helm and manually maintain a specific heading for a few seconds, the autopilot resumes a heading hold at the new heading. The heading trend indicator appears, and the autopilot status indicator turns green to indicate the autopilot has control of the boat.

Selecting the Steering Mode

Rudder steering mode turns the boat in 1° increments when you select a key.

Step steering mode turns the boat in increments of 10°. You can customize step turn size increments (*Adjusting the Step Steering Increment*, page 2).

- 1 Select **Menu**.
- 2 Select **Steering Mode** to toggle between rudder steering mode and step steering mode.

NOTE: Rudder steering mode is for use only on power planing hull or power displacement hull boats.

Adjusting the Heading with the Keys

Before you can steer your boat using the keys at the bottom of the helm control, you must have the autopilot engaged.

- Select **←** or **→** to use rudder steering mode.
NOTE: Rudder steering mode is for use only on power planing hull or power displacement hull boats.
- Hold **1° > 10° >>** or **<< 10° < 1°** to use step steering mode.

Adjusting the Step Steering Increment

- 1 Select **Menu > Steering Mode > Step Turn Size**.
- 2 Select **↑** or **↓**.
- 3 Select **Done**.

Direction Control

Direction control informs the autopilot which direction the boat is moving (forward or reverse) using the helm control.

Enabling Direction Control

- 1 Select **Menu > Setup > User Autopilot Setup > Direction Control**.
- 2 Select **Enabled**.

Using Direction Control

Before you can use direction control, you must enable the direction control functionality (*Enabling Direction Control*, page 2).

When traveling in standby mode, select **Direction**.

 appears in the upper-right corner.

Steering Patterns

WARNING

You are responsible for the safe operation of your boat. Do not begin a pattern until you are certain that the water is clear of obstacles.

The autopilot can steer the boat in preset patterns for fishing, and it can also perform other specialty maneuvers such as U-turns and Williamson turns.

Pattern steering is not based on GPS, and it can be used without a GPS device connected to the autopilot.

Zigzag Pattern

The zigzag pattern steers the boat from port to starboard and back, over a specified time and angle, across your current heading.

Setting Up the Zigzag Pattern

You can modify the amplitude and period of the zigzag pattern. The default values are 30° and 1.5 minutes.

- 1 Select **Menu > Pattern Steering > Zigzag > Setup > Zigzag Amplitude**.
- 2 Select **↑** or **↓** to set the amplitude in increments of 5°.
- 3 Select **Done**.
- 4 Select **Setup > Zigzag Period**.
- 5 Select **↑** or **↓** to set the period.
- 6 Select **Done**.

Following a Zigzag Pattern

Select **Menu > Pattern Steering > Zigzag > Engage**.

Circles Pattern

The circles pattern steers the boat in a continuous circle, in a specified direction, and at a specified time interval.

Setting Up the Circles Pattern

- 1 Select **Menu > Pattern Steering > Circles > Time**.
- 2 Select **↑** or **↓** to set the time.
- 3 Select **Done**.

Following the Circles Pattern

- 1 Select **Menu > Pattern Steering > Circles > Engage**.
- 2 Select an option:
 - Select **→** to begin a clockwise turn.
 - Select **←** to begin a counter-clockwise turn.

U-Turn Pattern

The u-turn pattern turns the boat around 180° and maintains the new heading. There are no settings to adjust the u-turn pattern.

Following the U-Turn Pattern

- 1 Select **Menu > Pattern Steering > U-Turn > Engage**.
- 2 Select an option:
 - Select **→** to begin a starboard turn.
 - Select **←** to begin a port turn.

Williamson Turn

The Williamson turn pattern turns the boat around with the intent of running alongside the location where the Williamson turn pattern was initiated. There are no settings to adjust the Williamson turn pattern.

The Williamson turn pattern can be used in man overboard situations.

Following the Williamson Turn Pattern

WARNING

The Williamson turn pattern is not determined by GPS and is affected by wind, current, and speed. Be ready to adjust the throttle and take the helm to avoid harm to a person in the water.

CAUTION

The boat must be below planing speed when using this pattern.

- 1 Select **Menu > Pattern Steering > Williamson Turn > Engage**.
- 2 Select an option:
 - Select **→** to begin a starboard turn.
 - Select **←** to begin a port turn.

Canceling a Steering Pattern

- Physically steer the boat.
NOTE: Shadow Drive must be enabled to cancel a steering pattern by physically steering the boat.
- Select **←** or **→** to cancel a pattern using rudder steering mode.
- Select **<<10° <1° or 1°> 10°>>** to cancel a pattern using step steering mode.
- Select **Standby**.

GPS Steering Patterns

⚠ WARNING

You are responsible for the safe operation of your boat. Do not begin a GPS pattern until you are certain that the water is clear of obstacles.

⚠ CAUTION

Garmin® recommends using Follow Route only under motor power. Using Follow Route while under sail can cause an unexpected gybe, risking damage to your sailboat. Unattended sails and rigging can be damaged or cause injury to any crew or passengers during an unexpected gybe maneuver.

NOTE: The autopilot must be connected to a NMEA 2000® or NMEA® 0183 compatible chartplotter to follow a GPS steering pattern.

The autopilot can steer the boat along a route defined by your GPS device or in preset patterns based on a GPS location (waypoint). To use GPS steering, you must have a compatible GPS device connected to the autopilot using NMEA 2000 or NMEA 0183. GPS steering patterns are based on a GPS waypoint to which you are actively navigating using your optional GPS device. This waypoint is called the active waypoint.

Following a GPS Steering Route

The autopilot can steer the boat according to a route defined on a compatible GPS device.

- 1 Create and navigate a route on your GPS device.
- 2 Select **Menu > GPS Steering > Follow Route**.

Orbit Pattern

The orbit pattern steers the boat in a continuous circle around the active waypoint. The size of the circle is defined by your distance from the active waypoint when you begin the orbit pattern.

Following an Orbit Pattern

- 1 Select **Menu > GPS Steering > Orbit > Engage**.
- 2 Select an option:
 - Select **→** to begin a clockwise turn.
 - Select **←** to begin a counter-clockwise turn.

Cloverleaf Pattern

The cloverleaf pattern steers the boat to repeatedly pass over an active waypoint. When you begin the cloverleaf pattern, the autopilot drives the boat toward the active waypoint and begins the cloverleaf pattern.

Setting Up the Cloverleaf Pattern

You can adjust the distance from the waypoint at which the autopilot turns your boat for another pass over the waypoint. The default setting turns the boat at a range of 1000 ft. (300 m) from the active waypoint.

between the waypoint and the location where the autopilot turns the boat

- 1 Select **Menu > GPS Steering > Cloverleaf > Length**.
- 2 Select **↑** or **↓** to set the range.
- 3 Select **Done**.

Following the Cloverleaf Pattern

- 1 Select **Menu > GPS Steering > Cloverleaf > Engage**.
- 2 Select an option:
 - To begin a starboard turn, select **→**.
 - To begin a port turn, select **←**.

Search Pattern

The search pattern steers the boat in increasingly larger circles outward from the active waypoint, forming a spiral pattern. When you begin the search pattern, the autopilot drives the boat to the active waypoint and begins the pattern.

Setting Up the Search Pattern

You can adjust the distance between each circle in the spiral. The default distance between circles is 50 ft. (20 m).

- 1 Select **Menu > GPS Steering > Search > Spacing**.
- 2 Select **↑** or **↓** to set the distance.
- 3 Select **Done**.

Following the Search Pattern

- 1 Select **Menu > GPS Steering > Search > Engage**.
- 2 Select an option:
 - To begin a starboard turn, select **→**.
 - To begin a port turn, select **←**.

Sailboat Autopilot Operation

⚠ CAUTION

When engaged, the autopilot controls only the rudder. You and your crew remain responsible for the sails while the autopilot is engaged.

In addition to heading hold, you can use the autopilot to maintain a wind hold. You can also use the autopilot to control the rudder while tacking and gybing.

Wind Hold

You can set the autopilot to maintain a specific bearing relative to the current wind angle. Your device must be connected to a NMEA 2000 or NMEA 0183 compatible wind sensor to perform a wind hold or a wind-based tack or gybe.

Setting the Wind Hold Type

Before you can enable the wind hold type, you must connect a NMEA 2000 or NMEA 0183 wind sensor to the autopilot.

For advanced autopilot configuration, see the installation instructions included with your autopilot.

- 1 Select **Menu > Setup > User Autopilot Setup > Wind Hold Type**.
- 2 Select **Apparent** or **True**.

Engaging Wind Hold

Before you can enable the wind hold type, you must connect a NMEA 2000 or NMEA 0183 wind sensor to the autopilot.

When the autopilot is in standby mode, select **Wind Hold**.

Engaging Wind Hold from Heading Hold

Before you can enable the wind hold type, you must connect a NMEA 2000 or NMEA 0183 wind sensor to the autopilot.

With heading hold engaged, select **Menu > Wind Hold**.

Adjusting the Wind Hold Angle with the Autopilot

You can adjust the wind hold angle on the autopilot when wind hold is engaged.

- To adjust the wind hold angle in increments of 1°, select **<<10° <1° or 1°> 10°>>**.
- To adjust the wind hold angle in increments of 10°, hold **<<10° <1° or 1°> 10°>>**.

Tack and Gybe

You can set the autopilot to perform a tack or gybe while heading hold or wind hold is engaged.

Tacking and Gybing from Heading Hold

- 1 Engage heading hold (*Engaging the Autopilot, page 1*).
- 2 Select **Menu > Tack/Gybe**.
- 3 Select **←** or **→** to choose a direction.

The autopilot steers your boat through a tack or gybe, and "Tacking" displays on the heading screen until the maneuver is complete.

Tacking and Gybing from Wind Hold

Before you can engage wind hold, you must have a wind sensor installed.

- 1 Engage wind hold (*Engaging Wind Hold, page 3*).
- 2 Select **Menu > Tack/Gybe**.
- 3 Select **Tack** or **Gybe**.

The autopilot steers your boat through a tack or gybe, and information about the progress of the tack or gybe appears on the screen.

Setting a Tack and Gybe Delay

The tack and gybe delay allows you to delay steering a tack and gybe after you initiate the maneuver.

- 1 Select **Menu > Setup > User Autopilot Setup > Sailing Configuration > Tack/Gybe Delay**.
- 2 Select the length of the delay.
- 3 If necessary, select **Done**.

Enabling the Gybe Inhibitor

NOTE: The gybe inhibitor does not prevent you from manually performing a gybe using the helm or step steering.

The gybe inhibitor prevents the autopilot from performing a gybe.

- 1 Select **Menu > Setup > User Autopilot Setup > Sailing Configuration > Gybe Inhibitor**.
- 2 Select **Enabled**.

Adjusting the Autopilot Response

When in sailboat mode, the Response setting allows you to adjust the rudder gain quickly to account for varying wind conditions.

- 1 From the autopilot screen, select **Menu > Response**.
- 2 Adjust the rudder response.

If you need the rudder to be more responsive and move quicker, increase the value. If the rudder is moving too much, decrease the value.

Device Configuration

User Autopilot Settings

Select **Menu > Setup > User Autopilot Setup**.

Power Mode: Sets the device power mode to normal or economy mode. Economy power mode allows you to set the percentage of power used to run the autopilot.

Power Saver: Controls the aggressiveness of the autopilot. The autopilot makes fewer adjustments in power saver mode.

Wind Limiter: Slows the rate of turn as the wind direction approaches the stern, when in sailboat mode during a gybe. If the rate of turn is too slow, decrease this value. If the rate of turn is too fast, increase this value.

Configuring the Remote Control

NOTE: The Garmin quatix® watch can be configured to act as a remote control for the helm control. See the instructions that came with the watch for more information.

You can connect one optional remote control to the helm control.

Select **Menu > Setup > Remote**.

Searching for a Remote Control

Select **Menu > Setup > Remote > Search for Remote**.

Pairing a Remote

- 1 Search for a remote control (*Searching for a Remote Control, page 4*).

- 2 Begin pairing the remote control according to the instructions that came with that accessory.

A message appears on the helm control after the remote has been paired successfully.

- 3 Select **Connect**.

Assigning Remote Button Actions

⚠ CAUTION

If you assign a pattern to a button on the remote control, remember that you are responsible for the safe operation of your boat. Do not begin a pattern until you are certain the water is clear of obstacles.

NOTE: If you assign direction control functionality to a button on the remote, the autopilot must be in standby mode to change the direction (forward or reverse).

- 1 Select **Menu > Setup > Remote**.
- 2 Select a remote button to assign an action to.
- 3 Select a button action.
- 4 If necessary, repeat steps 2 and 3 for the remaining buttons.

Disconnecting a Remote Control

- 1 Select **Menu > Setup > Remote**.
- 2 Select **Disconnect Remote**.

Display Settings

Select **Menu > Setup > Display**.

Color Mode: Sets the device to display day or night colors.

Configure Colors: Sets the color configuration for each color mode. For day color mode, you can select a full color or high contrast color configuration. For night color mode, you can select a full color, red and black, or green and black color configuration.

Backlight: Sets the backlight level.

Network Sharing: Allows you to share color mode, color configuration, and backlight settings with other devices across the NMEA 2000 network.

System Settings

Select **Menu > Setup > System**.

Units: Sets the units of measure.

Heading: Sets the reference used in calculating heading information.

Variance: Adjusts the variance from true north. This setting is only available when the heading is set to True.

Beeper: Sets if and when audible sounds are used.

Auto Power: Enables the device to turn on automatically when the NMEA 2000 network turns on.

GHC Low Volt. Alarm: Sounds an alarm when the voltage of the power supply connected to the device drops below a specified level.

Language: Sets the on-screen language.

Operating Mode: Allows you to set the operating mode to normal or store demo mode.

System Information: Allows you to view software information.

Factory Defaults: Resets the unit to factory defaults.

Selecting the Preferred Heading Source

If you have more than one heading source on the network, you can select a your preferred source. The source could be a compatible GPS compass or a magnetic heading sensor.

NOTICE

For best results, use a Garmin sensor for the heading source. Using a third-party GPS compass can cause the data to be delivered erratically and may result in excessive delays. The autopilot needs timely information, and therefore cannot often use third-party GPS compass data for GPS location or speed. If a third-party GPS compass is used, the autopilot will likely report loss of navigation data and speed source periodically.

1 Select **Menu > Setup > Preferred Sources > Heading Source**

2 Select a source.

If the selected heading source is unavailable, the autopilot screen does not display any data. You should select a different heading source, if possible.

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