GARMIN

FF 650 GPS

Owner's Manual

Table of Contents

Introduction

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

FF 650 GPS Dimensions
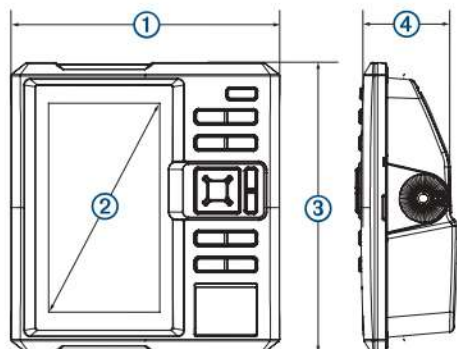
①	176 mm (6.94 in.)
②	178 mm (7 in.)
③	190 mm (7.5 in.)
④	81.8 mm (3.25 in.)

Device Overview

①	Power key
②	Device keys

Keys

⏻	Hold to turn the device on or off. Select to adjust the backlight, adjust the color mode, configure colors, and enable and disable sonar.
MARK/WPT MOB	From a 2D chart or sonar page with the sonar paused, select to mark your cursor position as a mark. From a 2D chart with the cursor invisible and no menu shown, select to mark your boat position as a mark. From a 2D chart or sonar page, select **MENU > MARK/WPT** to mark your boat position as a mark. From any other page, select to mark your boat position as a mark. From a 2D chart or sonar page with the sonar paused, hold to mark your cursor position as a waypoint. From a 2D chart with the cursor invisible and no menu shown, hold to mark your boat position as a waypoint. From a 2D chart or sonar page, select MENU, and hold MARK/WPT to mark your boat position as a waypoint. From any other page, hold to mark your boat position as a waypoint. Hold to open the man overboard (MOB) option.
GOTO	Select to go to a selected waypoint or location.
GAIN/ CLUTTER	From a sonar screen, select to adjust the gain. From a sonar screen, hold to open the clutter menu.
RANGE/ ZOOM	From a sonar screen, select to adjust the sonar range. From a sonar screen, hold to open the zoom menu.
▲ ▼	Select to scroll, highlight options, and move the cursor.
◄ ►	Select to scroll, highlight options, and move the cursor. Select to pause sonar.
✚	Select to zoom in to a view.
━	Select to zoom out of a view.
BACK	Select to return to the previous screen. Hold to return to the home screen.
SELECT	Select to select options and acknowledge messages.
MENU	Select to open the options menu for each page.
PAGE	Select to scroll through pages.

Contacting Garmin® Product Support

Go to www.garmin.com.sg/support for in-country support information.

Selecting the Transducer Type

If you are not using the included transducer, you must set the transducer type to enable the sonar to function optimally. If you are using the included transducer, you do not need to complete these steps.

1. Select **Settings > My Vessel > Transducer Type**.
2. Select the type of transducer you are using.

Zooming In and Out of the Waypoint Map

The zoom level is indicated by the scale number at the bottom of the waypoint map. The bar under the scale number represents that distance on the waypoint map.

- Select ━ to zoom out.
- Select ✚ to zoom in.

Panning on the Waypoint Map

You can move the waypoint map to view an area other than your present location.

Use the arrow keys to pan.

Adjusting the Backlight

1. Select **Settings > System > Display > Backlight**.

   TIP: Press ⏻ > **Backlight** from any screen to open the backlight settings.
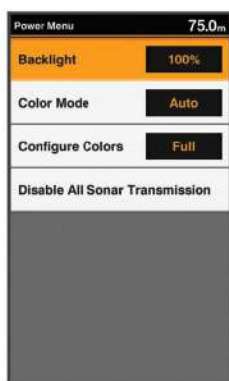
2 Adjust the backlight.

Changing the Color Mode

1 Select **Settings** > **System** > **Display** > **Color Mode**.

TIP: Press ⏻ > **Color Mode** from any screen to access the color settings.

2 Select an option:
- To use a light background, select **Day Colors**.
- To use a dark background, select **Night Colors**.

  TIP: You can configure the night color mode. Select **Configure Colors**, and select an option.
- To allow the device to display day or night colors automatically, based on the time of day, select **Auto**.

Setting the Beeper

You can set when the device makes sounds.

1 Select **Settings** > **System** > **Beeper**.

2 Select an option:
- To have the device beep when you select an item and when an alarm is triggered, select **On (Selections and Alarms)**.
- To have the device beep only when alarms are triggered, select **Alarms Only**.

GPS Satellite Signal Acquisition

When you turn on the fishfinder, the GPS receiver must collect satellite data and establish the current location. When the fishfinder acquires satellite signals, ▂▃▄▅ appears at the top of the Home screen. When the fishfinder loses satellite signals, ▂▃▄▅ disappears and a flashing question mark appears over 🯆 on the screen.

For more information about GPS, go to www.garmin.com /aboutGPS.

Home Screen

The home screen provides access to all of the features in the device. The features are dependant on the accessories you have connected to the device.

When viewing another screen, you can return to the home screen by holding BACK. You can customize the layout of the screens and the items shown on the home screen.

Customizing the Home Screen

You can add items to and rearrange items on the Home screen.

1 From the Home screen, select **Customize Home**.

2 Select an option:
- To rearrange an item, select **Rearrange**, select the item to move, and select the new location.
- To add an item to the Home screen, select **Add**, and select the new item.
- To remove an item you have added to the Home screen, select **Remove**, and select the item.

Adding a New Layout to the Home Screen

You can create a custom screen to suit your needs, which is added to your home screen.

1 Select **Customize Home** > **Add** > **Add New Layout**.

2 Select the first and second screens to include in the layout.

3 Select an option:
- To change the orientation of the windows, select **Split**.
- To customize the data shown on the screen, select **Overlay Numbers**.
- To turn on and off the compass tape data bar, select **Overlay Numbers** > **Compass Tape**.

4 Select **Next**.

5 Enter a name for the layout.

TIP:
- Select SELECT to save.
- Hold MENU to clear data.
- Select ➕ or ➖ to change letter case.

6 Use the arrow keys to resize the windows.

7 Use the arrow keys to select location in the home screen.

Page Shortcuts

You can quickly open commonly used pages by selecting PAGE from any page.

🐟	Traditional
🐟	ClearVü
⚓	Waypoint Map
◎	AIS Radar
🛣	Highway

Default Shortcuts

⇥🐟	Shift Zoom
⇥🐟	ClearVüShift Zoom
🐟🐟	Split Frequency
📈	Depth Data Graph
📈	Temperature Data Graph
📋	Numbers
Ⓢ	Compass
📋	Trip
📈	Speed Data Graph

Available Shortcuts

Editing the Page Shortcuts

Before you can change a page in the shortcuts menu, you must add the page to your home screen (*Customizing the Home Screen*, page 2).

You can change the pages that appear in the shortcuts menu.

1 From the page you want to add to the shortcuts menu, hold **PAGE**.

   An editable shortcuts menu appears.

2 Select **PAGE** to select the location in the menu for the shortcut.

3 Select **SELECT** > **Yes**.

Adding the Numbers or Trip Page

Before you can customize the Numbers or Trip screens, you must add them to the home screen.

1 Select **Customize Home** > **Add** > **Navigation Info**.

2 Select **Numbers** or **Trip**.

Numbers

To customize the Numbers screen, select **Numbers** > **MENU**.

Change Numbers: Sets what type of data is displayed.

Change Layout: Sets the amount of number data that is displayed.

Trip Page

To customize the Trip screen, select **Trip** > **MENU**.

Reset Trip: Resets the trip data and allows you to record new trip data.

Reset Odometer: Resets the odometer data and allows you to record new odometer data.

Reset Maximum Speed: Resets the maximum speed for the trip and allows you to record a new maximum speed.

Adding the Data Graphs or Temperature Data Graphs Screen

You can view graphical sonar data on the home screen using the Depth Data Graph screen. You can view temperature data on the home screen using the Temperature Data Graph screen.

1 From the home screen, select **Customize Home** > **Add**.

2 Select **Depth Data Graph** or **Temperature Data Graph**.

Adding the Depth Data Graph Page

Before you can customize the Depth Data Graph page, you must add it to the home screen.

From the home screen, select **Customize Home** > **Add** > **Sonar** > **Depth Data Graph**.

Data Fields

Data fields display multiple types of information in one area, such as depth, heading, and bearing. Some data fields require you to be navigating or require a connection to sensors to display data. For example, a temperature sensor must be connected to the chartplotter to display the temperature data field.

The data fields on a page depend on the type of data associated with that page. For example, a sonar page automatically displays sonar-related information such as Depth.

You can configure the data fields that display on a page. Select **MENU** > **Overlay Numbers**.

Sonar

The full screen page, the split frequency page, and the flasher page are visual representations of the area beneath your boat. You can customize these sonar views.

Full Screen Sonar

You can see a full-view graph of sonar readings from a transducer on the full screen.

Select Traditional.
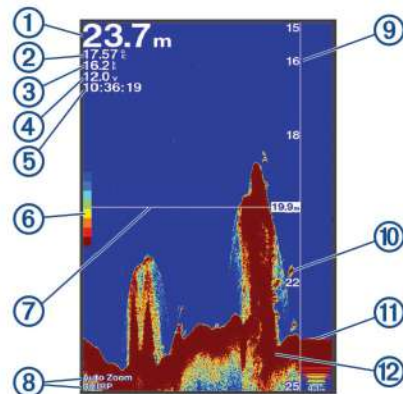
①	Bottom depth
②	Water temperature
③	GPS speed
④	Device voltage
⑤	Time
⑥	Color bar

⑦	Depth line
⑧	Transducer type and frequency, zoom type, and color filter status
⑨	Depth indicator as the sonar data screen scrolls from right to left
⑩	Suspended targets (fish)
⑪	A-scope
⑫	Bottom echo

Garmin ClearVü Sonar View

NOTE: To receive Garmin ClearVü scanning sonar, you need a compatible transducer.

Garmin ClearVü high-frequency sonar provides a detailed picture of the fishing environment around the boat in a detailed representation of structures the boat is passing over.
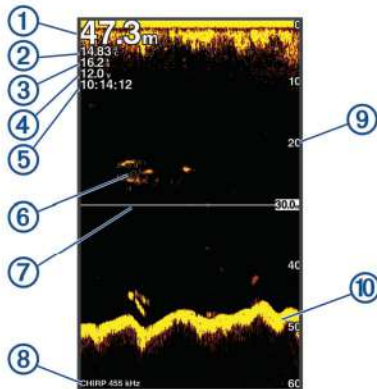
①	Bottom depth
②	Water temperature
③	GPS speed
④	Device voltage
⑤	Time
⑥	Suspended targets (fish)
⑦	Depth line
⑧	Transducer type and frequency, and zoom type
⑨	Depth indicator as the sonar data screen scrolls from right to left
⑩	Bottom echo

Traditional transducers emit a conical beam. The Garmin ClearVü scanning sonar technology emits two narrow beams, similar to the shape of the beam in a copying machine. These beams provide a clearer, picture-like image of what is around the boat.
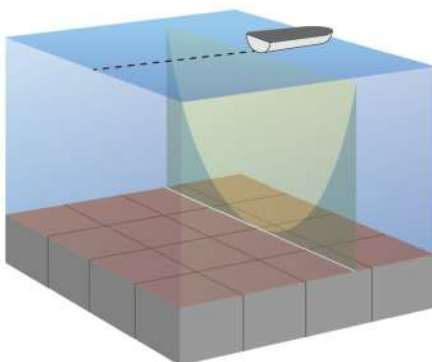
Split-Screen Frequency

You can view two frequencies from the split frequency screen.
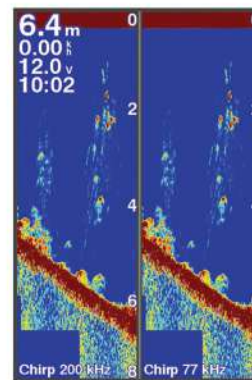
Shift-Zoom View

On the sonar screen, you can see a full-view graph of sonar readings on the right side of the screen, and a magnified portion of that graph on the left side of the screen.

Shift allows you to set the depth range on which the sonar is focused. This allows you to zoom in a higher resolution in the focused depth.

When using shift, bottom tracking may not work effectively, because the sonar looks for data within the depth range of the focused area, which may not include the bottom. Using shift also can impact the scroll speed, because data outside the depth range of the focused area is not processed, which reduces the time required to receive and display the data. You can zoom in to the focused area, which enables you to evaluate target returns more closely at a higher resolution than just zooming alone.

The shift-zoom view is not available on all sonar screens.

From a sonar screen, select **ZOOM** > **Shift Zoom**.
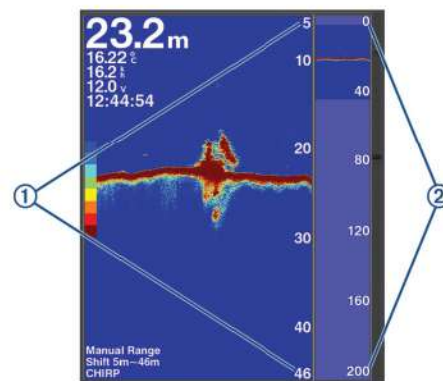
①	Zoomed depth scale
②	Depth range

Adjusting the Zoom

You can adjust the zoom manually by specifying the span and a fixed starting depth. For example, when the depth is 15 m and the starting depth is 5 m, the device displays a magnified area from 5 to 20 m deep.

You also can allow the device to adjust the zoom automatically by specifying a span. The device calculates the zoom area from the bottom of the water. For example, if you select a span of 10 m, the device displays a magnified area from the bottom of the water to 10 m above the bottom.

1 From a sonar screen, select **RANGE/ZOOM**.

2 Select an option:
- Select **Bottom Lock** to lock the screen to the water bottom.
- Select **Manual** or **Digital Zoom** to manually set the zoom.
- Select **Auto** to automatically set the zoom.
- Select **Shift Zoom** to manually adjust the zoom.

Locking the Screen to the Water Bottom

You can lock the screen to the water bottom. For example, if you select a span of 20 meters, the device shows an area from the water bottom to 20 meters above the bottom. The span appears on the right side.

1 From a sonar view, select **MENU** > **ZOOM** > **Bottom Lock**.
2 Select a span.

Zooming on the Sonar Screen

Digital zoom magnifies the image after it is captured by sonar. You can set the zoom manually.

1 From a sonar screen select **RANGE/ZOOM** > **Digital Zoom**.
2 Select the zoom level.

Reducing the Clutter

You can quickly change the settings to reduce noise and clutter on the sonar screen.

1 From a sonar view, hold **GAIN/CLUTTER**.
2 Select one or more options:
- To adjust the sensitivity to reduce the effects of interference from nearby sources of noise, select **Interference**.
- To hide sonar returns near the surface of the water, select **Surface Noise**.
- To adjust the time varying gain, which can reduce noise, select **TVG**.

Pausing the Sonar Display

You can pause the sonar to create a mark or a waypoint.

Select ◄ or ►.

Creating a Mark or Waypoint on a Sonar Screen Using Your Present Location

1 Pause the sonar.
2 Select an option:
- To create a mark at the cursor, select **MARK/WPT**.
- To create a waypoint at the cursor, hold **MARK/WPT**.
- To create a mark at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
- To create a waypoint at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
3 If necessary, edit the mark or waypoint information.

Creating a Waypoint on a Sonar Screen Using a Different Location

1 Select ◄ or ► to pause the sonar.
2 Using the arrow keys, select a location.
3 Select an option:
- To create a mark, select **MARK**.
- To create a waypoint, hold **MARK**.
4 If necessary, edit the mark or waypoint information.

Sonar Frequencies

NOTE: The frequencies that are available depend on the transducer being used.

Adjusting the frequency helps adapt the sonar for your particular goals and the present depth of the water.

Selecting Frequencies

NOTE: You cannot adjust the frequency for all sonar views and transducers.

You can indicate which frequencies appear on the sonar screen.

1 From a sonar view, select **MENU** > **Frequency**.

2 Select a frequency suited to your needs and water depth.

For more information on frequencies, see *Sonar Frequencies*, page 5.

Creating a Frequency Preset

NOTE: Not available with all transducers.

You can create a preset to save a specific sonar frequency, which allows you to change frequencies quickly.

1 From a sonar view, select **MENU** > **Frequency**.
2 Select **Add**.
3 Enter a frequency.

Sonar Gain

The gain setting controls the sensitivity of the sonar receiver to compensate for water depth and water clarity. Increasing the gain shows more detail, and decreasing the gain reduces screen clutter.

NOTE: Setting the gain on one sonar view applies the setting to all the views.

Setting the Gain Automatically

NOTE: To set the gain on the split-frequency screen, you must set each frequency separately.

1 From a sonar view, select **GAIN**.

2 Select ▼ > **Enable Auto Gain**.
3 Select an option:
   - To display higher-sensitivity, weaker sonar returns with more noise automatically, select **Auto High**.
   - To display medium-sensitivity sonar returns with moderate noise automatically, select **Auto Med**.
   - To display lower-sensitivity sonar returns with less noise automatically, select **Auto Low**.

Setting the Gain Manually

1 From a sonar screen, select **GAIN**.
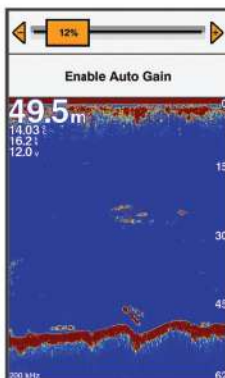
2 Select ✚ or ▶ until you begin to see noise in the water portion of the screen.
3 Select ▬ or ◀ to decrease the gain.

Adjusting the Range of the Depth Scale

You can adjust the range of the depth scale that appears on the right side of the screen. Automatic ranging keeps the bottom within the lower third of the sonar screen, and can be useful for tracking the bottom where there are slow or moderate terrain changes.

When the depth changes dramatically, like a drop off or cliff, manually adjusting the range allows a view of a specified depth range. The bottom is shown on the screen as long as the bottom is anywhere within the manual range established.

1 From a sonar screen, select **RANGE**.
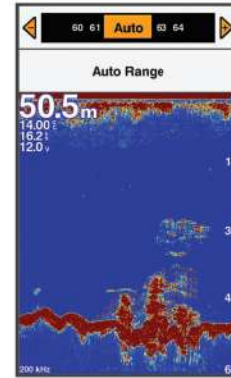
2 Select an option:
   - To allow the device to adjust the range automatically based on the depth, select Auto Range.
   - To increase or decrease the range manually, select ✚ or ▬.

   NOTE: From a sonar screen, select ✚ and ▬ to quickly manually adjust the range.

Sonar Setup

NOTE: Not all options and settings apply to all models, sounder modules, and transducers.

Showing and Adjusting the Depth Line

You can show and adjust a horizontal line on a sonar screen. The depth of the line is indicated on the right side of the screen.

NOTE: Showing a depth line on one screen displays the depth line on all the screens.

1 From a sonar screen, select **MENU** > **Sonar Setup** > **Depth Line**.
2 Select **MENU**.
3 To adjust the **Depth Line**, select ▲ or ▼.

Setting the Scroll Speed

You can set the rate at which the sonar image moves across the screen. A higher scroll speed shows more detail, especially while moving or trolling. A lower scroll speed displays sonar information on the screen longer. Setting the scroll speed on one sonar view applies to all the sonar views.

1 From a sonar view, select **MENU** > **Sonar Setup** > **Scroll Speed**.

2 Select an option:
   - To adjust the scroll speed automatically using speed-over-ground, select **Auto**.

   The Auto setting selects a scroll rate to match the boat speed, so targets in the water are drawn with the correct aspect ratio and appear less distorted.

- To use a very fast scroll speed, select **Ultrascroll®**.

The Ultrascroll option quickly scrolls new sonar data, but with a reduced image quality. For most situations, the Fast option provides a good balance between a quickly scrolling image and targets that are less distorted.

Sonar Appearance Settings

From a sonar view, select **MENU** > **Sonar Setup** > **Appearance**.

Sonar Appearance	50.9ₘ
Color Scheme	Blue
Edge	Off
A-Scope	Off
Fish Symbols	Off
Color Filter	>
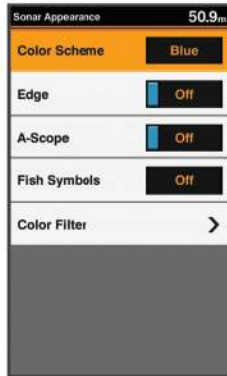
⚠ WARNING

Information is for reference only. Disabling warnings for underwater hazards can result in death, personal injury, or property damage. You are responsible for the safe and prudent operation of your vessel.

Color Scheme: Sets the color scheme.

Edge: Highlights the strongest signal from the bottom to help define the hardness or softness of the signal.

A-Scope: Displays a vertical flasher along the right side of the screen that shows instantaneously the range to targets along a scale.

Fish Symbols: Sets how the sonar interprets suspended targets.

Color Filter: Sets which colors are removed from the screen.

Turning On the A-Scope

NOTE: This feature is not available in all sonar views.

The a-scope is a vertical flasher along the right side of the full-screen sonar view. This feature expands the most recently received sonar data so that it is easier to see. It can also be helpful for detecting fish that are close to the bottom.

From a sonar view, select **MENU** > **Sonar Setup** > **Appearance** > **A-Scope**.

Configuring the Appearance of Suspended Targets

**NOTE:** Configuring the appearance of suspended targets on one screen applies that setting to all screens.

NOTE: This feature is not available on all sonar views.

🐟	Shows suspended targets as symbols.
🐟	Shows suspended targets as symbols with target depth information.
🐟	Shows suspended targets as symbols with background sonar information.
🐟	Shows suspended targets as symbols with background sonar information and target depth information.

1 From a sonar screen, select **MENU** > **Sonar Setup** > **Appearance** > **Fish Symbols**.
2 Select an option.

Overlay Numbers

From a chart, 3D chart view, or a combinations screen, select **MENU** > **Chart Setup** > **Overlay Numbers** > **Show**.

Edit Layout: Sets the layout of the data overlay, or data fields. You can select the data to be shown within each data field.

Navigation Inset: Shows the navigation inset when the vessel is navigating to a destination.

Navigation Inset Setup: Allows you to configure the navigation inset to show Route Leg Details, and to control when the inset appears before a turn or destination.

Compass Tape: Shows the compass tape data bar when the vessel is navigating to a destination.

Compass

The compass uses GPS course over ground (COG) to guide you to your destination, and does not account for other factors that can affect your destination, such as currents and tides.

Select **Navigation Info** > **Compass**.
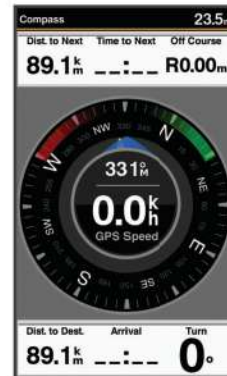
Depth and Water Temperature Graphs

If you are using a depth-capable transducer, or are receiving water depth information over NMEA® 0183, you can view a graphic log of depth readings over time. If you are using a temperature-capable transducer, or are receiving water temperature information over NMEA 0183, you can view a graphic log of temperature readings over time.

The graphs scroll to the left as information is received.

Before you can view the depth data graph page or temperature graph page, you must add the page to your home screen (*Customizing the Home Screen*, page 2). Select Depth Data Graph or Temperature Data Graph.

Waypoints and Marks

Waypoints are locations you record and store in the device that allow you to navigate back to a location. Waypoints display on the screen as a blue flag, and include the waypoint name and symbol.

Marks are locations you record without navigation information. Marks display on the screen as a dot with a symbol, and are hidden in the Waypoints and Marks list by default. When you

transfer a mark to another device, the mark is converted to a waypoint.

You can save a maximum of 12,000 waypoints and marks.

Creating a Mark or Waypoint on a Sonar Screen Using Your Present Location

1 Pause the sonar.
2 Select an option:
   - To create a mark at the cursor, select **MARK/WPT**.
   - To create a waypoint at the cursor, hold **MARK/WPT**.
   - To create a mark at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
   - To create a waypoint at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
3 If necessary, edit the mark or waypoint information.

Creating a Waypoint on a Sonar Screen Using a Different Location

1 Select ◄ or ► to pause the sonar.
2 Using the arrow keys, select a location.
3 Select an option:
   - To create a mark, select **MARK**.
   - To create a waypoint, hold **MARK**.
4 If necessary, edit the mark or waypoint information.

Creating a Mark or Waypoint

1 Select an option:
   - To create a mark at the cursor, select **MARK/WPT**.
   - To create a waypoint at the cursor, hold **MARK/WPT**.
   - To create a mark at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
   - To create a waypoint at your boat position, with the cursor invisible and no menu shown, select **MARK/WPT**.
2 If necessary, edit the mark or waypoint information.

Editing a Saved Waypoint

1 Select **User Data** > **Waypoints**.
2 Select a waypoint.
3 Select **Edit Waypoint**.
4 Select an option:
   - To add a name, select **Name**, and enter a name.
   - To change the symbol, select **Symbol**.
   - To change the depth, select **Depth**.
   - To change the water temperature, select **Water Temp.**.
   - To change the comment, select **Comment**.
   - To move the position of the waypoint, select **Position**.

Marking and Navigating to a Man Overboard Location

From any screen, select **MARK** > **Man Overboard** > **Yes**.

The fishfinder sets a direct course back to the location.

Navigating to a Waypoint

1 Pan the waypoint map to find the waypoint.
2 Place the center of the cursor on the center of the waypoint symbol.

   The waypoint name appears on the screen.
3 Select the waypoint.
4 Select **Navigate To** > **Go To**.

Measuring Distance on the Waypoint Map

You can measure the distance between two locations.

1 From the waypoint map, begin panning (*Panning on the Waypoint Map*, page 1).
2 Select **SELECT** > **Measure Distance**.

   The distance and other data appear on the screen.

Deleting a Waypoint or an MOB

1 Select **User Data** > **Waypoints**.
2 Select a waypoint or an MOB.
3 Select **Delete** > **OK**.

Deleting All Waypoints

Select **User Data** > **Manage Data** > **Clear User Data** > **Waypoints** > **All**.

Sharing Waypoints and Routes Across Devices

Before you can share waypoints and routes, you must connect the devices using a data sharing cable. The data sharing cable is an accessory you can purchase.

You can share waypoint and route data between two compatible chartplotters installed on your boat. You must turn on user data sharing for both devices to share data.

Select **User Data** > **Manage Data** > **User Data Sharing** > **On** on both devices.

User Data Settings

Select **User Data**.

Marks and Waypoints: Shows the list of marks and waypoints.

Tracks: Shows the track option menu.

Routes & Auto Guidance Paths: Shows the list of routes.

Proximity Waypoint: Shows the list of particular locations within a specified range.

Search by Name: Allows you to search for saved routes, tracks, and waypoints by name.

Manage Data: Shows memory usage, and allows you to clear data for routes, tracks, waypoints, and boundaries.
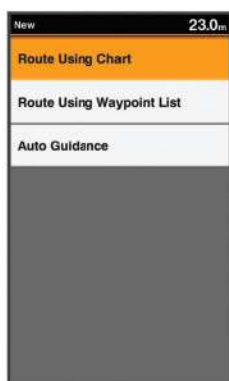
Routes

A route is a sequence of waypoints or locations that leads you to your final destination.

Creating and Navigating a Route Using the Waypoint Map

The starting point can be your present location or another location.

1 Select **User Data** > **Routes & Auto Guidance Paths** > **New** > **Route Using Chart**.

2 Pan the waypoint map to select the starting location of the route.

3 Follow the onscreen instructions to add a turns.

4 Select **MENU** > **Navigate To**.

5 Select an option.

Creating and Navigating a Route Using the Waypoint List

1 Select **User Data** > **Routes & Auto Guidance Paths** > **New** > **Route Using Waypoint List**.

2 Select waypoints.

3 Select **BACK** > **Navigate To**.

Editing a Saved Route

You can change the name of a route or change the turns the route contains.

1 Select **User Data** > **Routes & Auto Guidance Paths**.

2 Select a route.

3 Select **Edit Route**.

4 Select an option:
  - To change the name, select **Name**, and enter the name.
  - To select a waypoint from the turn list, select **Edit Turns** > **Use Turn List**, and select a waypoint from the list.
  - To select a turn using the chart, select **Edit Turns** > **Route Using Chart**, and select a location on the chart.

Viewing a List of Routes

Select **User Data** > **Routes & Auto Guidance Paths**.

Browsing for and Navigating a Saved Route

Before you can browse a list of routes and navigate to one of them, you must create and save at least one route.

1 Select **User Data** > **Routes & Auto Guidance Paths**.

2 Select a route.

3 Select **Navigate To**.

4 Select an option:
  - To navigate the route from the starting point used when the route was created, select **Forward**.
  - To navigate the route from the destination point used when the route was created, select **Backward**.

A magenta line appears. In the center of the magenta line is a thinner purple line that represents the corrected course from your present location to the destination. The corrected course is dynamic, and it moves with your boat when you are off course.

5 Review the course indicated by the magenta line.

6 Follow the magenta line along each leg in the route, steering to avoid land, shallow water, and other obstacles.

7 If you are off course, follow the purple line (corrected course) to go to your destination, or steer back to the magenta line (direct course).

Deleting a Saved Route

1 Select **User Data** > **Routes & Auto Guidance Paths**.

2 Select a route.

3 Select **Delete**.

Deleting All Saved Routes

Select **User Data** > **Manage Data** > **Clear User Data** > **Routes & Auto Guidance Paths**.

Track

A track is a recording of the current path of your boat. You can show your current track in waypoint map view.

Setting the Color of the Track

1 Select **User Data** > **Tracks** > **Active Track Options** > **Track Color**.

2 Select a track color.

Clearing the Track

Select **User Data** > **Tracks** > **Clear Active Track** > **OK**.

Managing the Track Log Memory During Recording

1 Select **User Data** > **Tracks** > **Active Track Options**.

2 Select **Record Mode**.

3 Select an option:
  - To record a track log until the track memory is full, select **Fill**.
  - To continuously record a track log, replacing the oldest track data with new data, select **Wrap**.

Configuring the Recording Interval of the Track Log

You can indicate the frequency at which the track plot is recorded. Recording more frequent plots is more accurate but fills the track log faster. The resolution interval is recommended for the most efficient use of memory.

1 Select **User Data** > **Tracks** > **Active Track Options** > **Record Interval** > **Interval**.

2 Select an option:
  - To record the track based on a distance between points, select **Distance** > **Change**, and enter the distance.
  - To record the track based on a time interval, select **Time** > **Change**, and enter the time interval.
  - To record the track plot based on a variance from your course, select **Resolution** > **Change**, and enter the maximum error allowed from the true course before recording a track point.

## Deleting All Saved Waypoints, Routes, and Tracks

Select **User Data** > **Manage Data** > **Clear User Data** > **All** > **OK**.

AIS Radar

The Automatic Identification System (AIS) enables you to identify and track other vessels, and alerts you to area traffic.

When connected to an external AIS device, the chartplotter can show some AIS information about other vessels that are within range, equipped with a transponder, and are actively transmitting AIS information. The information reported for each vessel includes the Maritime Mobile Service Identity (MMSI), location, GPS speed, GPS heading, time that has elapsed since the last position of the vessel was reported, nearest approach, and time to the nearest approach.

The AIS Radar screen provides a pictorial representation of the AIS vessels around you, similar to a radar display, and a list of those vessels.
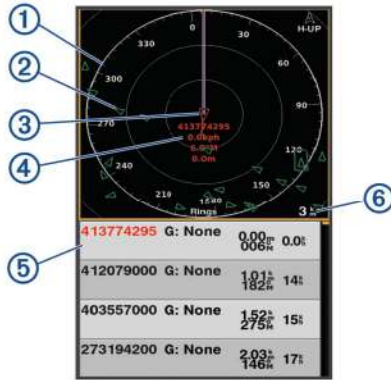
①	Bearing ring
②	Target in the safe range
③	Active target
④	Active target Maritime Mobile Service Identity (MMSI) and details
⑤	AIS targets list
⑥	Range

Adjusting the AIS Radar Range

• Select ━ to decrease the range.
• Select ✚ to increase the range.

Marking a Waypoint on the AIS Radar Screen

1 From the **AIS Radar** screen, use the arrow keys to select a location.
2 Select **MARK**.

Viewing a List of AIS Threats

From the AIS Radar screen, you can view and customize the appearance of a list of AIS threats.

From the **AIS Radar** screen, select **MENU** > **AIS List**.

Customizing the Display of the AIS Radar Screen

You can configure how other vessels appear on the AIS Radar screen.

1 From the **AIS Radar** screen, select **MENU** > **AIS Display Setup**.
2 Select an option:
   • To set the maximum distance of AIS vessels to display, select **AIS Display Max. Range**.
   • To set the minimum speed of AIS vessels to display, select **AIS Display Min. Speed**.
   • To show details about AIS-activated vessels, select **Details** > **Show**.
   • To set the projected heading time for AIS-activated vessels, select **Projected Heading**.
   • To show the tracks of AIS-activated vessels, select **Trails**.

• To show the outlines of AIS vessels, select **Vessel Outline**.

Creating an AIS Group

An AIS group is a collection of specific vessels, such as a sailing club or flotilla.

1 From the **AIS Radar** screen, select **MENU** > **AIS Group**.
2 Select a group.
3 Select AIS vessels.
4 Select **SELECT**.

Enabling AIS Transmission Test Alerts

To avoid a large number of test alerts and symbols in crowded areas such as marinas, you can select to receive or ignore AIS test messages. To test an AIS emergency device, you must enable the chartplotter to receive test alerts.

1 From the **AIS Radar** screen, select **MENU** > **AIS Alarm**.
2 Select an option:
   • To receive or ignore Emergency Position Indicating Radio Beacon (EPRIB) test signals, select **AIS-EPIRB Test**.
   • To receive or ignore Man Overboard (MOB) test signals, select **AIS-MOB Test**.
   • To receive or ignore Search and Rescue Transponder (SART) test signals, select **AIS-SART Test**.

Setting the Safe-Zone Collision Alarm

The safe-zone collision alarm is used only with AIS. The safe zone is used for collision avoidance, and can be customized.

1 From the **AIS Radar** screen, select **MENU** > **AIS Alarm**.
2 Select **AIS Alarm** > **On**.

   When the AIS alarm is turned off, the message banner and audible alarm are disabled, but the object is still labeled as dangerous on the screen.

3 Select **Range**.
4 Select a distance for the safe-zone radius around your vessel.
5 Select **Time To**.
6 Select a time at which the alarm will sound if a target is determined to intersect the safe zone.

   For example, to be notified of a pending intersection 10 minutes before it will likely occur, set Time To to 10, and the alarm will sound 10 minutes before the vessel intersects the safe zone.

A message banner appears and an alarm sounds when an AIS-activated vessel enters the safe-zone area around your boat. The object is also labeled as dangerous on the screen. When the alarm is off, the message banner and audible alarm are disabled, but the object is still labeled as dangerous on the screen.

VRM and EBL

The variable range marker (VRM) and the electronic bearing line (EBL) measure the distance and bearing from your boat to a target object. On the Radar screen, the VRM appears as a circle that is centered on the present location of your boat, and the EBL appears as a line that begins at the present location of your boat and intersects the VRM. The point of intersection is the target of the VRM and the EBL.

Showing the VRM and EBL

From the **AIS Radar** screen, select **MENU** > **Show VRM/EBL**.

Adjusting the VRM and EBL

Before you can adjust the VRM and EBL, you must show them*Showing the VRM and EBL*, page 10.

You can adjust the diameter of the VRM and the angle of the EBL, which moves the intersection point of the VRM and the EBL.

1 From the **AIS Radar** screen, select **MENU** > **Adjust VRM/EBL** > **Move VRM/EBL**.
2 Use the arrow keys to adjust the VRM and EBL.
3 Select **SELECT**.

Measuring the Range and Bearing to a Target Object

1 From the **AIS Radar** screen, select the target location.
2 Select **SELECT** > **Measure Distance**.

   The range and the bearing to the target location appear.

3 If necessary, use the arrow keys to move the target to a new location.
4 Select **BACK**.

AIS Radar Appearance Settings

From the AIS Radar screen, select **MENU** > **Appearance**.

Orientation: Sets the perspective of the AIS Radar screen.

Color Scheme: Sets the color scheme for the AIS Radar screen.

Heading Line: Shows an extension from the bow of the boat in the direction of travel on the AIS Radar screen.

Range Rings: Shows the range rings that help you to visualize distances on the AIS Radar screen.

Bearing Ring: Shows a bearing relative to your heading or based on a north reference, to help you determine the bearing to an object shown on the AIS Radar screen.

Nav Lines: Shows the navigation lines that indicate the course you have set using Route To, Auto Guidance, or Go To.

**Marks and Waypoints**: Shows waypoints on the AIS Radar screen.

Highway Page

The highway page provides steering guidance as you navigate to your destination. The graphic highway display shows each route waypoint in sequence. The line down the center of the highway represents your preferred track line. You can customize the page layout and data fields.

Opening the Highway Page

Before you can use the Highway page, you must be navigating to a destination.

From the home screen, select **Highway**.
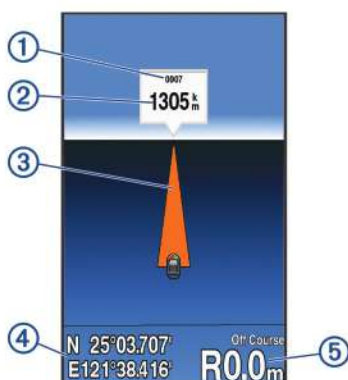
①	Mark or waypoint
②	Distance to destination
③	Track line
④	Coordinates
⑤	Distance off course

Showing and Customizing the Highway Overlay Numbers

You can customize the data shown on the screen.

1 From the Highway screen, select **MENU** > **Overlay Numbers** > **Show**.
2 Select **Edit Layout**.
3 Using ✚ and ▬, select a layout.

4 Select an overlay box.
5 Select the data to show.
6 Select **BACK**.

Digital Selective Calling

Networked Chartplotter and VHF Radio Functionality

If you have a NMEA 0183 VHF radio connected to your chartplotter, these features are enabled.

- The chartplotter can transfer your GPS position to your radio. If your radio is capable, GPS position information is transmitted with DSC calls.
- The chartplotter can receive digital selective calling (DSC) distress and position information from the radio.
- The chartplotter can track the positions of vessels sending position reports.

Turning On DSC

Select **Settings** > **Other Vessels** > **DSC**.

DSC List

The DSC list is a log of the most recent DSC calls and other DSC contacts you have entered. The DSC list can contain up to 100 entries. The DSC list shows the most recent call from a boat. If a second call is received from the same boat, it replaces the first call in the call list.

Viewing the DSC List

Before you can view the DSC list, the chartplotter must be connected to a VHF radio that supports DSC.

Select **Navigation Info** > **Other Vessels** > **DSC List**.

Adding a DSC Contact

You can add a vessel to your DSC list. You can make calls to a DSC contact from the chartplotter.

1 Select **Navigation Info** > **Other Vessels** > **DSC List** > **Add Contact**.
2 Enter the Maritime Mobile Service Identity (MMSI) of the vessel.
3 Enter the name of the vessel.

Incoming Distress Calls

If your compatible chartplotter and VHF radio are connected using NMEA 0183, your chartplotter alerts you when your VHF radio receives a DSC distress call. If position information was sent with the distress call, that information is also available and recorded with the call.

⬛ designates a distress call in the DSC list and marks the position of the vessel on the Navigation chart at the time of the DSC distress call.

Navigating to a Vessel in Distress

⬛ designates a distress call in the DSC list and marks the position of a vessel on the Navigation chart at the time of the DSC distress call.

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select **Navigate To**.
4 Select **Go To** or **Route To**.

Position Tracking

When you connect the chartplotter to a VHF radio using NMEA 0183, you can track vessels that send position reports.

Every position report call received is logged in the DSC list (*DSC List*, page 11).

Viewing a Position Report

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select an option:
   - To switch to position report details, select ▶.
   - To switch to a Navigation chart marking the location, select ◀.
   - To switch to a Navigation chart marking the location, select **Next Page**.
   - To view the position report details, select **Previous Page**.

Navigating to a Tracked Vessel

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select **Navigate To**.
4 Select **Go To** or **Route To**.

Creating a Waypoint at the Position of a Tracked Vessel

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select **Create Waypoint**.

Editing Information in a Position Report

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select **Edit**.
   - To enter the name of the vessel, select **Name**.
   - To select a new symbol, select **Symbol**, if available.
   - To enter a comment, select **Comment**.

- To show a trail line for the vessel if your radio is tracking the position of the vessel, select **Trail**.
- To select a color for the trail line, select **Trail Line**.

Deleting a Position-Report Call

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a position-report call.
3 Select **Edit** > **Clear Report**.

Viewing Vessel Trails on the Chart

You can view trails for all tracked vessels on some chart views. By default, a black line indicates the path of the vessel, a black dot indicates each previously reported position of a tracked vessel, and a blue flag indicates the last reported position of the vessel.

1 From a chart or 3D chart view, select **MENU** > **Other Vessels** > **DSC Trails**.
2 Select the number of hours to show tracked vessels on the chart.

   For example, if you select 4 Hours, all trail points that are less than four hours old appear for all tracked vessels.

Individual Routine Calls

When you connect the chartplotter to a Garmin VHF radio, you can use the chartplotter interface to set up an individual routine call.

When setting up an individual routine call from your chartplotter, you can select the DSC channel on which you want to communicate. The radio transmits this request with your call.

Selecting a DSC Channel

NOTE: The selection of a DSC channel is limited to those channels that are available in all frequency bands. The default channel is 72. If you select a different channel, the chartplotter uses that channel for subsequent calls until you call using another channel.

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a vessel or a station to call.
3 Select **Call With Radio** > **Channel**.
4 Select an available channel.

Making an Individual Routine Call

NOTE: When initiating a call from the chartplotter, if the radio does not have an MMSI number programmed, the radio will not receive call information.

1 Select **Navigation Info** > **Other Vessels** > **DSC List**.
2 Select a vessel or a station to call.
3 Select **Call With Radio**.
4 If necessary, select **Channel**, and select a new channel.
5 Select **Send**.

   The chartplotter sends information about the call to the radio.
6 On your Garmin VHF radio, select **Call**.

Making an Individual Routine Call to an AIS Target

1 From a chart or 3D chart view, select an AIS target.
2 Select **AIS Vessel** > **Call With Radio**.
3 If necessary, select **Channel**, and select a new channel.
4 Select **Send**.

   The chartplotter sends information about the call to the radio.
5 On your Garmin VHF radio, select **Call**.

Device Configuration

FF 650 GPS Settings Menu Tree

- System
  - Display
    - Backlight
    - Color Mode
    - Configure Colors
  - Beeper
  - GPS
    - Skyview
    - GPS Mode
    - SBAS
    - Speed Filter
  - Auto Power
    - Off
    - On
  - Language
  - System Information
    - Event Log
    - Software Information
    - Factory Settings
  - Simulator
- My Vessel
  - Keel Offset
  - Temp. Offset
  - Calibrate Water Speed
- Communications
  - Serial Port
  - NMEA 0183 Setup
    - Sounder
    - Route
    - System
    - Garmin
    - Posn Precision
    - XTE Precision
    - Waypoint IDs
    - MMSI
    - Diagnostics
    - Defaults
- Alarms
  - Navigation
    - Arrival
      - Type
      - Activation
      - Change Time
    - Anchor Drag
    - Off Course
  - System
    - Alarm Clock
    - Device Voltage
    - GPS Accuracy
  - Sonar
    - Shallow Water
    - Deep Water
    - Water Temp.
    - Fish
      - Off
      - ●––●––
      - ●––●–
      - ●–
  - AIS
    - AIS Alarm
    - Time To
    - Range
    - AIS-EPIRB Test
    - AIS-MOB Test
    - AIS-SART Test
- Units
  - System Units
  - Variance
  - North Reference
  - Position Format
  - Map Datum
  - Time Format
  - Time Zone
- Navigation
  - Route Labels
  - Auto Guidance
  - Turn Transition Activation
  - Turn Transition Time
  - Route Start
- Other Vessels
  - AIS
  - DSC
  - AIS Alarm
    - AIS Alarm
    - Time To
    - Range
    - AIS-EPIRB Test
    - AIS-MOB Test
    - AIS-SART Test

System Settings

Select **Settings** > **System**.
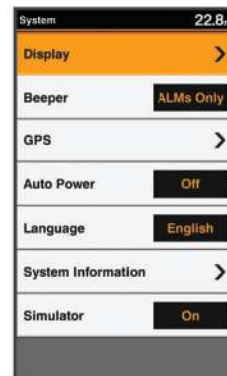
Display: Adjusts the backlight brightness (*Adjusting the Backlight*, page 1) and color scheme (*Changing the Color Mode*, page 2).

Beeper: Turns on and off the tone that sounds for alarms and selections (*Setting the Beeper*, page 2).

GPS: Provides information about the GPS satellite settings and fix, and allows you to select a GPS system.

Auto Power: Turns on the device automatically when power is applied.

Language: Sets the on-screen language.

System Information: Provides information about the device and the software version.

Simulator: Turns on the simulator and allows you to set the speed and simulated location.

System Information

Select **Settings** > **Settings** > **System Information**.

Event Log: Allows you to view a log of system events.

Software Information: Provides information about the device and the software version.

Garmin Devices: Provides information about connected Garmin devices.

Factory Settings: Restores the device to factory settings.

> **NOTE:** This deletes any setting information you have entered.

My Vessel Settings

NOTE: Some settings and options require additional hardware.

Select **Settings** > **My Vessel**.

Keel Offset: Offsets the surface reading for the depth of a keel, making it possible to measure depth from the bottom of the keel instead of from the transducer location (*Setting the Keel Offset*, page 14).

Temp. Offset: Compensates for the water temperature reading from a temperature-capable transducer (*Setting the Water Temperature Offset*, page 14).

Calibrate Water Speed: Calibrates the speed-sensing transducer or sensor*Calibrating a Water Speed Device*, page 14.

Transducer Type: Displays the type of transducer connected to the device (*Selecting the Transducer Type*, page 1).

Setting the Keel Offset

You can enter a keel offset to compensate the surface reading for the depth of a keel, making it possible to measure water depth or depth below the keel instead of depth below the transducer. Enter a positive number to offset for a keel. You can enter a negative number to compensate for a large vessel that may draw several feet of water.

NOTE: A buffer of 2 to 3 feet from the bottom of the keel is recommended to ensure a safe distance from the keel to the bottom.

1 Complete an action, based on the location of the transducer:
   - If the transducer is installed at the water line ①, measure the distance from the transducer location to the keel of the boat. Enter this value in steps 3 and 4 as a positive number to display depth below keel.
   - If the transducer is installed at the bottom of the keel ②, measure the distance from the transducer to the water line. Enter this value in steps 3 and 4 as a negative number to display water depth. Enter a 0 in this value to display depth below keel and depth below transducer.
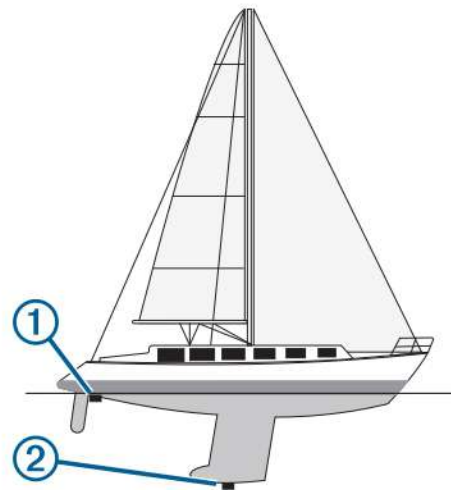
2 Select **Settings** > **My Vessel** > **Keel Offset**.
3 Select ➕ or ➖ based on the location of the transducer.
4 Enter the distance measured in step 1.

Setting the Water Temperature Offset

You can set the temperature offset to compensate for the temperature reading from a temperature-capable sensor.

1 Measure the water temperature using the temperature-capable transducer that is connected to the device.
2 Measure the water temperature using a different thermometer or temperature sensor that is known to be accurate.
3 Subtract the water temperature measured in step 1 from the water temperature measured in step 2.

   This is the temperature offset. Enter this value in step 5 as a positive number if the sensor connected to the device measures the water temperature as being colder than it actually is. Enter this value in step 5 as a negative number if the sensor connected to the device measures the water temperature as being warmer than it actually is.
4 Select **Settings** > **My Vessel** > **Temp. Offset**.
5 Use the arrow keys to enter water temperature offset measured in step 3.

Calibrating a Water Speed Device

If you have a speed-sensing transducer connected to the chartplotter, you can calibrate that speed-sensing device to improve the accuracy of water-speed data displayed by the chartplotter.

1 Select **Settings** > **My Vessel** > **Calibrate Water Speed**.
2 Follow the on-screen instructions.

   If the boat is not moving fast enough or the speed sensor is not registering a speed, a message appears.
3 Select **OK**, and safely increase the boat speed.
4 If the message appears again, stop the boat, and ensure the speed-sensor wheel is not stuck.
5 If the wheel turns freely, check the cable connections.
6 If you continue to get the message, contact Garmin product support.

Alarms Settings

Navigation Alarms

Select **Settings** > **Alarms** > **Navigation**.

Arrival: Sets an alarm to sound when you are within a specified distance or time from a turn or a destination.

Anchor Drag: Sets an alarm to sound when you exceed a specified drift distance while anchored.

Off Course: Sets an alarm to sound when you are off course by a specified distance.
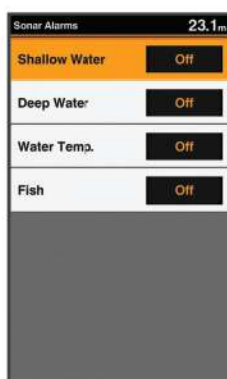
System Alarms

Select **Settings** > **Alarms** > **System**.

Alarm Clock: Sets an alarm clock.

Device Voltage: Sets an alarm to sound when the battery reaches a specified low voltage.

GPS Accuracy: Sets an alarm to sound when the GPS location accuracy falls outside the user-defined value.

Sonar Alarms

Select **Settings** > **Alarms** > **Sonar**.

Shallow Water: Sounds when the water depth is shallower than the specified depth.

Deep Water: Sounds when the water depth is deeper than the specified depth.

Water Temp.: Sounds when the water temperature varies more than ± 2°F (± 1.1°C). Alarm settings are saved when the device is turned off.

NOTE: You must connect the device to a temperature-capable transducer to use this alarm.

Fish

Fish: Sets an alarm to sound when the device detects a suspended target.

- • sets the alarm to sound when fish of all sizes are detected.
- • sets the alarm to sound only when medium or large fish are detected.
- • sets the alarm to sound only when large fish are detected.

Unit Settings

Select **Settings** > **Units**.

System Units: Sets the unit format for the device.

Variance: Sets the magnetic declination, the angle between magnetic north and true north, for your present location.

North Reference: Sets the direction references used in calculating heading information. True sets geographic north as the north reference. Grid sets grid north as the north reference (000º). Magnetic sets the magnetic north as the north reference.

Position Format: Sets the position format in which a given location reading appears. Do not change this setting unless you are using a map or chart that specifies a different position format.

Map Datum: Sets the coordinate system on which the map is structured. Do not change this setting unless you are using a map or chart that specifies a different map datum.

Time Format: Sets a 12-hour, 24-hour, or UTC time format.

Time Zone: Sets the time zone.

Daylight Saving Time: Turns daylight savings time off or on.

Communications Settings

NOTE: Some settings and options require additional charts or hardware.

Select **Settings** > **Communications**.

Serial Port: Sets the input/output format for the serial port to use when connecting the chartplotter to external NMEA devices, computers, or other Garmin devices.

NMEA 0183 Setup: Sets the NMEA 0183 sentences the chartplotter transmits, how many digits to the right of the decimal point are transmitted in a NMEA output, and how waypoints are identified (*NMEA 0183 Settings*, page 15).

NMEA 0183 Settings

Select **Settings** > **Communications** > **NMEA 0183 Setup**.

Sounder: Enables NMEA 0183 output sentences for the sounder (if applicable).

Route: Enables NMEA 0183 output sentences for routes.

System: Enables NMEA 0183 output sentences for system information.

Garmin: Enables NMEA 0183 output sentences for Garmin proprietary sentences.

Posn Precision: Adjusts the number of digits to the right of the decimal point for transmission of NMEA output.

XTE Precision: Adjusts the number of digits to the right of the decimal point for crosstalk error output.

Waypoint IDs: Sets the device to transmit waypoint names or numbers via NMEA 0183 while navigating. Using numbers may resolve compatibility issues with older NMEA 0183 autopilots.

MMSI: Allows you to enter your Mobile Marine Safety Identity (MMSI) number.

Diagnostics: Displays NMEA 0183 diagnostic information.

Defaults: Restores the NMEA 0183 settings to the original factory defaults.

Navigation Settings

NOTE: Some settings and options require additional hardware.

Select **Settings** > **Navigation**.

Route Labels: Sets the type of labels shown with route turns on the map.

Turn Transition Activation: Sets the turn transition to be calculated based on time or distance.

Turn Transition Time: Sets how many minutes before the turn that you transition to it as the next leg, when Time is selected for the Turn Transition Activation setting.

Turn Transition Distance: Sets how far before the turn that you transition to it as the next leg, when Distance is selected for the Turn Transition Activation setting.

Route Start: Selects a starting point for route navigation. You can select Boat to start navigation from the current vessel location, or Waypoints to start from the first waypoint on the route.

Restoring the Factory Default Settings

NOTE: This deletes all settings information you have entered.

Select **Settings** > **System** > **System Information** > **Factory Settings**.

Appendix

Registering Your Device

Help us better support you by completing our online registration today. Keep the original sales receipt, or a photocopy, in a safe place.
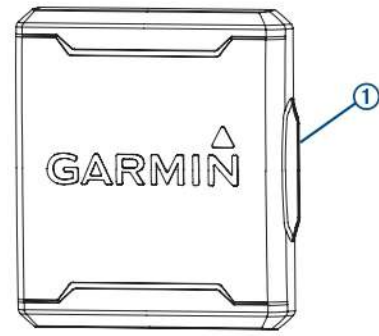
1 Go to my.garmin.com/registration.
2 Sign in to your Garmin account.

Sun Cover

The sun cover protects the screen when the device is not in use.

NOTE: The sun cover is an optional accessory that is sold separately.

To remove the cover, hold the cover at the tab ①, and pull forward.

FF 650 GPS Specifications

Item	Measurement
Dimensions (W x H x D)	176 x 190 x 81.8 mm (6.94 x 7.5 x 3.25 in.)
Weight	780 g (1.7 lbs)
Screen size	6 inch
Resolution (W x H)	480 x 800 pixels
Temperature range	From -15° to 55°C (from 5° to 131°F)
Input power	From 10 to 36 Vdc
Typical current draw	0.8 A
Max. power usage	23W @ 12 Vdc
Water rating	IEC 60529 IPX7[1]
Frequencies	Traditional: 50/77/200 kHz CHIRP: 260/455/800 kHz
Transmit power (RMS)[2]	600 W
Max. depth[3]	701 m (2300 ft.) freshwater, 335 m (1100 ft.) seawater at 77 kHz
Compass-safe distance	30 cm (11.8 in.)
Fuse	6 A
Max. waypoints	12,000
Max. routes	200
Max. active track points	50,000

Troubleshooting

My device does not turn on

- Push the power cable all the way into the back of the device.

  Even if the cable seems to be connected, you should push firmly so that it is fully seated.

- Make sure the power source is generating power.

  You can check this several ways. For example, you can check whether other devices powered by the source are functioning.

- Check the fuse in the power cable.

  The fuse should be located in a holder that is part of the red wire of the power cable. Check that the proper size fuse is installed. Refer to the label on the cable or the installation instructions for the exact fuse size needed. Check the fuse to make sure there is still a connection inside of the fuse. You can test the fuse using a multimeter. If the fuse is good, the multimeter reads 0 ohm.

- Check to make sure the device is receiving at least 10 Vdc, but 12 Vdc is recommended.

  To check the voltage, measure the female power and ground sockets of the power cable for DC voltage. If the voltage is less than 10 Vdc, the device will not turn on.

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[1] The device withstands incidental exposure to water of up to 1 m for up to 30 min. For more information, go to www.garmin.com/waterrating.
[2] Dependent upon transducer rating and depth
[3] Dependent upon the transducer, water salinity, bottom type, and other water conditions.

My sonar does not work

- Push the transducer cable all the way into the back of the device.

  Even if the cable seems to be connected, you should push firmly so that it is fully seated.

- Check to make sure the sonar transmission is turned on.

My device is not creating waypoints in the correct location

You can manually enter a waypoint location to transfer and share data from one device to the next. If you have manually entered a waypoint using coordinates, and the location of the point does not appear where the point should be, the map datum and position format of the device may not match the map datum and position format originally used to mark the waypoint.

Position format is the way in which the GPS receiver's position appears on the screen. This is commonly displayed as latitude/ longitude in degrees and minutes, with options for degrees, minutes and second, degrees only, or one of several grid formats.

Map datum is a math model which depicts a part of the surface of the earth. Latitude and longitude lines on a paper map are referenced to a specific map datum.

1 Find out which map datum and position format was used when the original waypoint was created.

  If the original waypoint was taken from a map, there should be a legend on the map that lists the map datum and position format used to create that map. Most often this is found near the map key.

2 Select **Settings** > **Units**.

3 Select the correct map datum and position format settings.

4 Create the waypoint again.

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	X	O	O	O	O	O
屏幕/背光	X	X	O	O	O	O
金属零件	X	O	O	O	O	O
电缆 电缆组件 连接器	X	O	O	O	O	O

本表格依据 SJ/T11364 的规定编制。
O: 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
X: 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
*该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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