GPS + COMPASS SENSOR INSTALLATION GUIDE

HUMMINBIRD.

ACCESSORY
MANUAL

THANK YOU!

Thank you for choosing Humminbird®, the #1 name in fishfinders. Humminbird has built its reputation by designing and manufacturing top-quality, thoroughly reliable marine equipment. Your Humminbird accessory is designed for trouble-free use in even the harshest marine environment. In the unlikely event that your Humminbird accessory does require repairs, we offer an exclusive Service Policy - free of charge during the first year after purchase, and available at a reasonable rate after the one-year period. For complete details, see the separate warranty card included with your accessory. We encourage you to read this operations manual carefully in order to get full benefit from all the features and applications of your Humminbird product.

Contact Customer Service at **1-800-633-1468** or visit our Web site at **humminbird.com**.

⚠ **WARNING!** This device should not be used as a navigational aid to prevent collision, grounding, boat damage, or personal injury. When the boat is moving, water depth may change too quickly to allow time for you to react. Always operate the boat at very slow speeds if you suspect shallow water or submerged objects.

⚠ **WARNING!** The electronic chart in your Humminbird unit is an aid to navigation designed to facilitate the use of authorized government charts, not to replace them. Only official government charts and notices to mariners contain all of the current information needed for the safety of navigation, and the captain is responsible for their prudent use.

⚠ **WARNING!** Compass Safe Distance: Do NOT install the GPS + Compass Sensor near ferrous metals or near anything that may create a magnetic field or interference. The Sensor must be installed at least 3 feet (1 m) from other magnetic or ferrous materials on the boat.

⚠️ **WARNING!** Humminbird is not responsible for the loss of data files (waypoints, routes, tracks, groups, recordings, etc.) that may occur due to direct or indirect damage to the unit's hardware or software. It is important to back up your control head's data files periodically. Data files should also be saved to your PC before restoring the unit's defaults or updating the software. See your Humminbird online account at **humminbird.com** and the operations manual on your Humminbird Manual CD for details.

⚠️ **WARNING!** Disassembly and repair of this electronic unit should only be performed by authorized service personnel. Any modification of the serial number or attempt to repair the original equipment or accessories by unauthorized individuals will void the warranty.

⚠️ **WARNING!** This product contains chemicals known to the State of California to cause cancer and/or reproductive harm.

📝 **NOTE:** Some features discussed in this manual require a separate purchase, and some features are only available on international models. Every effort has been made to clearly identify those features. Please read the manual carefully in order to understand the full capabilities of your model.

📝 **NOTE:** The illustrations in this manual may not look the same as your product, but your unit will function in the same way.

📝 **NOTE:** To purchase accessories for your control head, visit our Web site at **humminbird.com** or contact Customer Service at **1-800-633-1468**.

📝 **NOTE:** The procedures and features described in this manual are subject to change without notice. This manual was written in English and may have been translated to another language. Humminbird is not responsible for incorrect translations or discrepancies between documents.

ENVIRONMENTAL COMPLIANCE STATEMENT: It is the intention of Johnson Outdoors Marine Electronics, Inc. to be a responsible corporate citizen, operating in compliance with known and applicable environmental regulations, and a good neighbor in the communities where we make or sell our products.

WEEE DIRECTIVE: EU Directive 2002/96/EC "Waste of Electrical and Electronic Equipment Directive [WEEE]" impacts most distributors, sellers, and manufacturers of consumer electronics in the European Union. The WEEE Directive requires the producer of consumer electronics to take responsibility for the management of waste from their products to achieve environmentally responsible disposal during the product life cycle.

WEEE compliance may not be required in your location for electrical & electronic equipment (EEE), nor may it be required for EEE designed and intended as fixed or temporary installation in transportation vehicles such as automobiles, aircraft, and boats. In some European Union member states, these vehicles are considered outside of the scope of the Directive, and EEE for those applications can be considered excluded from the WEEE Directive requirement.

This symbol (WEEE wheelie bin) on product indicates the product must not be disposed of with other household refuse. It must be disposed of and collected for recycling and recovery of waste EEE. Johnson Outdoors Marine Electronics, Inc. will mark all EEE products in accordance with the WEEE Directive. It is our goal to comply in the collection, treatment, recovery, and environmentally sound disposal of those products; however, these requirements do vary within European Union member states. For more information about where you should dispose of your waste equipment for recycling and recovery and/or your European Union member state requirements, please contact your dealer or distributor from which your product was purchased.

ROHS STATEMENT: Product designed and intended as a fixed installation or part of a system in a vessel may be considered beyond the scope of Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

ATTENTION INTERNATIONAL CUSTOMERS: Products sold in the U.S. are not intended for use in the international market. Humminbird international units provide international features and are designed to meet country and regional regulations. Languages, maps, time zones, units of measurement, and warranty are examples of features that are customized for Humminbird international units purchased through our authorized international distributors.

To obtain a list of authorized international distributors, please visit our Web site at **humminbird.com** or contact Customer Service at **(334) 687-6613**.

Table of Contents

OVERVIEW

The Humminbird Sensor Accessory Kit includes the following items:

- Sensor with internal GPS receiver and compass. Cable length is 16 ft (5 m).

- Hardware kit for stem or deck mounting

- Accessory manual

    NOTE: The stem mount is not included. To purchase extension cables and other accessories, see our Web site at **humminbird.com** or call Customer Service at **1-800-633-1468**.

When connected to your fishing system, the Sensor will provide the following functionality:

- View current position

- View current track (breadcrumb trail)

- View precision speed and heading from your GPS receiver

- Save tracks and waypoints

- Travel a route and navigate from one waypoint to the next

- View the heading from the heading sensor

    NOTE: If your fishing system is a chartplotter, there will be additional functionality when it is connected to the Sensor. See your control head operations manual and the Humminbird Waypoint Management Guide for more information. The manuals are included on the CD that was included with your fishing system, or you can download these manuals from our Web site at **humminbird.com**.

How GPS Works

Your Humminbird uses GPS to determine your position and display it on a grid.

GPS uses a constellation of satellites that continually send radio signals to the earth. The GPS receiver on your boat receives signals from satellites that are visible to it. Based on time differences between each received signal, the GPS receiver determines its distance to each satellite. With distances known, the GPS receiver mathematically triangulates its own position. With 5 updates per second, the GPS receiver then calculates its velocity and bearing.

GPS was originally intended for military use; however, civilians may also take advantage of its highly accurate position capabilities, typically within +/– 2.5 to 10 meters, depending on your conditions and your Humminbird model. This means that 95% of the time, the GPS receiver will read a location within +/– 2.5 to 10 meters of your actual position.

Your GPS receiver also uses information from WAAS (the Wide Area Augmentation System), EGNOS (the European Geostationary Navigation Overlay Service), and MSAS (the MTSAT Satellite Augmentation System) satellites if they are available in your area.

How the Heading Sensor Works

The magnetic compass is one of the first known instruments for navigation. It relies on the earth's magnetic field to align a magnetic pointer towards North, also known as Magnetic North.
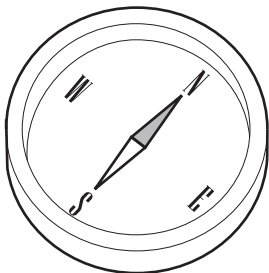
When the Sensor is connected to the control head, the heading from the internal compass will be displayed in digital format. The Heading is the direction the boat is pointing, where 000° is North, 090° is East, 180° is South, and 270° is West.

Due to wind and waves, the boat is often traveling in a slightly different direction than its heading. The direction of travel, or Course Over Ground, is provided by the GPS receiver. You can use the compass Heading with the GPS Course Over Ground and Bearing to navigate a route.

A compass' Magnetic North is affected by the local variations in the earth's magnetic field around the globe. Nautical charts will often provide the magnetic declination, or magnetic variation, for a local area so that you can confirm that Magnetic North matches True North. If you have trailered the boat to a new location, the compass' operation may also be affected by a different magnetic zone. The Humminbird control head compensates for magnetic declination and also allows you to make additional adjustments from the menu system. The details of these features are described in this manual.

INSTALLATION OVERVIEW

Use the following instructions to install the Sensor on your boat. In order to understand the installation requirements, we recommend that you read the instructions carefully before you start the installation.

Supplies: In addition to the hardware included with your accessory kit, you will need a drill and an awl or pencil. Depending on your installation requirements, you might also need to purchase extension cables or a stem mount. See *Section 1, Determine the Mounting Location* for more information.

NOTE: To purchase extension cables and other accessories, see our Web site at **humminbird.com** or call Customer Service at **1-800-633-1468**.

1 | Determine the Mounting Location

It is important to consider the following information when determining the mounting location for the Sensor:

- **Interference:** Do NOT mount the Sensor close to a VHF antenna or within the active area of a radar. Do NOT install it near ferrous metals or near anything that can create a magnetic field. Hardware and cables that handle large currents, such as batteries and power cables, are also examples of equipment that may cause interference.

- **Reception:** Mount the Sensor in an area that has full exposure to the sky. The effective area of reception is 5° above the horizon.

- **Surface:** Whether the Sensor cable will be routed down through the mounting surface or to the side, or if you're using a stem mount, the mounting surface will influence how you install the sensor. For details, see *Section 2, Install the Sensor*.

- **Cables:** Test run the Sensor cable from the chosen mounting location to the control head to confirm that the cable is long enough to accommodate the planned route. See *Section 3, Connect the Cable*.

  NOTE: 10 ft (3 m) extension cables may be purchased from Humminbird if your planned cable route exceeds 20 ft (6 m). Maximum cable length, including extension cables, should not exceed 50 ft (16 m). To purchase extension cables, or other related accessories, visit our Web site at **humminbird.com** or call Customer Service at **1-800-633-1468**.

2 | Install the Sensor

There are three different options to mount the Sensor. Proceed to the section that matches the type of mounting location you will be using, as follows:
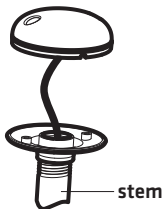
Stem Mount with 1" - 14 Thread

The Sensor will be mounted on a stem or antenna pole. Proceed to *Section A*.

stem

Deck Mount with Access Under the Mounting Location

The Sensor will be deck mounted and the cable can be routed down through the mounting surface. Proceed to *Section B*.

cable routed through the hole

Deck Mount with NO Access Under the Mounting Location

The Sensor will be deck mounted and the cable routed to the side because there is not space for a cable through or underneath the mounting location. Proceed to *Section C*.

cable routed to the side

A | Stem Mount with 1"-14 Thread

Use the following instructions to stem mount the Sensor:

> ⚠ **WARNING!** Do NOT mount the Sensor to a stem mount or antenna pole that contains ferrous metals.
>
> 📝 **NOTE:** It is important to review the mounting considerations and test run the cable route as indicated in Section 1 before proceeding with the installation.

1a. **If you have a pre-existing stem mount**, skip to step 2.

1b. **If you need to mount the antenna pole (stem)**, mark the chosen mounting location and drill a 3/4" (19 mm) diameter hole for the cable and cable connector.

1c. **If you have purchased hardware to stem mount your Sensor,** follow the instructions included with that hardware to attach the stem to the boat.

2. Screw the Sensor base onto the stem first, making sure that the stem pipe does not protrude from the Sensor base. (This adds protection to the cable when it is pulled through the pipe stem.) Deburr the pipe edges to reduce cable abrasion.

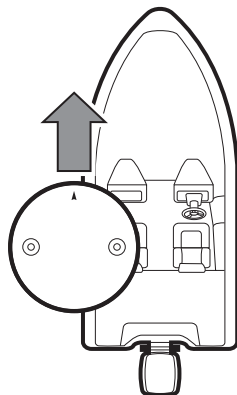**Stem Mount: Attaching the Sensor Base to the Stem**
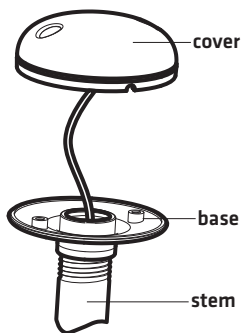
- cover
- base
- stem

3. Route the Sensor cable through the stem and through the planned cable route. To use extension cables, see the details in *Section 1, Determine the Mounting Location*.

4. Position the Sensor so the arrow on the cover is pointed straight toward the front of the boat in the direction of travel. The arrow should be parallel with the keel.

> **NOTE:** Failure to align the Sensor correctly will result in incorrect compass readings.

5. Attach the Sensor to its base using the included #6 - 7/8" (22 mm) screws. **Hand tighten only**.

Positioning the Arrow on the Compass

Attaching the Sensor to the Base

#6 - 7/8"
mounting screws

B | Deck Mount with Access Under Mounting Location

Use the following instructions to deck mount the Sensor and route the cable down through the mounting surface:

> **NOTE:** It is important to review the mounting considerations and test run the cable route as indicated in Section 1 before proceeding with the installation.

1. Mark the mounting location and drill a 3/4" (19 mm) diameter hole for the cable and cable connector.

2. Route the Sensor cable through the planned cable route. To use extension cables, see the details in *Section 1, Determine the Mounting Location.*

3. Cover the cable hole with the Sensor.

4. Position the Sensor so the arrow on the cover is pointed straight toward the front of the boat in the direction of travel. The arrow should be parallel with the keel. See the illustration *Positioning the Arrow on the Compass.*

> **NOTE:** Failure to align the Sensor correctly will result in incorrect compass readings.

5. Make sure the Sensor is flush against the surface, and mark the two mounting holes with a pencil or awl.

6. Move the Sensor to the side and drill two pilot holes, using a 5/32" (4 mm) bit.

> **NOTE:** Apply marine-grade silicone caulk or sealant to both screw and drilled holes as needed to protect your boat from water damage.

7. Align the Sensor's screw holes over the pilot screw holes and attach with the #8 - 1 1/4" (32 mm) screws. **Hand tighten only**.
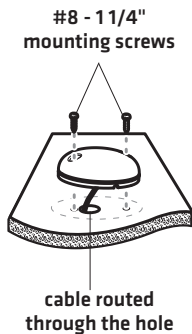
📝 **NOTE:** If the mounting surface is thin or made of a lightweight material, you may need to add reinforcing material below the mounting surface in order to support the sensor.

Positioning the Arrow on the Compass

Attaching the Sensor to the Mounting Surface

#8 - 1 1/4" mounting screws
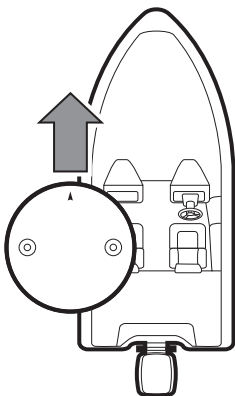
cable routed through the hole

C | Deck Mount with No Access Under Mounting Location

Use the following instructions to deck mount the Sensor and route the cable to the side if there is not space for a cable underneath the mounting location.

> 📝 **NOTE:** It is important to review the mounting considerations and test run the cable route as indicated in Section 1 before proceeding with the installation.

1. From the chosen mounting location, route the cable from the Sensor to the fishing system.

   - The Sensor has two wire routing notches. Use the cable notch closest to the intended cable route.

   - If holes are required to route the cable, they must be 3/4" [19 mm] to allow for the cable connector.

   - To use extension cables, see the details in *Section 1, Determine the Mounting Location*.

2. With the cable routed, position the Sensor in the planned mounting location with the arrow on the cover pointing straight toward the front of the boat in the direction of travel. The arrow should be parallel with the keel.

   Positioning the Arrow on the Compass

   > 📝 **NOTE:** Failure to align the Sensor correctly will result in incorrect compass readings.

3. Make sure the Sensor is flush against the surface, and mark the two mounting holes with a pencil or awl.
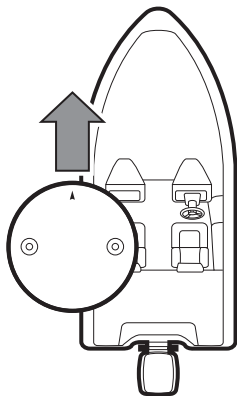
4. Move the Sensor to the side and drill the two 5/32" (4 mm) pilot holes.

> ☒ **NOTE:** Apply marine-grade silicone caulk or sealant to both screw and drilled holes as needed to protect your boat from water damage.

5. Align the Sensor's screw holes over the pilot screw holes and attach with the #8 - 1 1/4" (32 mm) screws. Hand tighten only.

Attaching the Sensor to the Mounting Surface

#8 - 1 1/4" mounting screws

cable routed to the side

3 | Connect the Cable

Use the following instructions to connect the Sensor cable to the control head:

1. Secure the cable along its path to the control head as needed, using cable ties (separate purchase required).

2. Connect the Sensor cable connector to the GPS port on the control head. The ports are labeled and the cable connectors are keyed to prevent incorrect installation, so be careful not to force the connector into the port.

Connecting to the GPS Port
(magnified view)

screw nut

cable label
(optional)

port
cover

3. Hand tighten the screw nut on the cable to secure the connection.
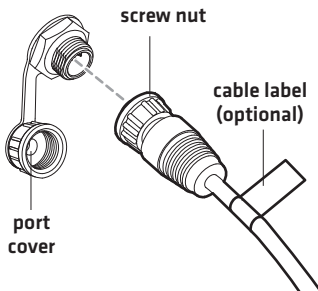
> ⚠ **CAUTION!** Do NOT mount the cables where the connectors could be submerged in water or flooded. If cables are installed in a splash-prone area, it may be helpful to apply dielectric grease to the inside of the connectors to prevent corrosion. Dielectric grease can be purchased separately from a general hardware or automotive store.

> ⚠ **WARNING!** It is important to finish all installation connections before powering on the control head.

Confirm Sensor Operation

It is important to confirm that the Sensor is installed and operating correctly by reviewing the GPS and heading data on the control head.

NOTE: The Sensor may experience a cold start upon first power up. It may take several minutes for the Sensor to locate satellites and lock a GPS position.

4 | Select the GPS Source

If Auto-Configure is turned on, the control head may not automatically select the Sensor as the primary GPS source. Use the following instructions to select the Sensor as the primary GPS source:

1. Press the POWER key to power on the control head.

2. From the Home screen, select the **GPS** tool.

3. Under **GPS Source**, select **GPS (1).**

4. Turn **OFF** Auto-Configure.

5. Select **External GPS CI**.

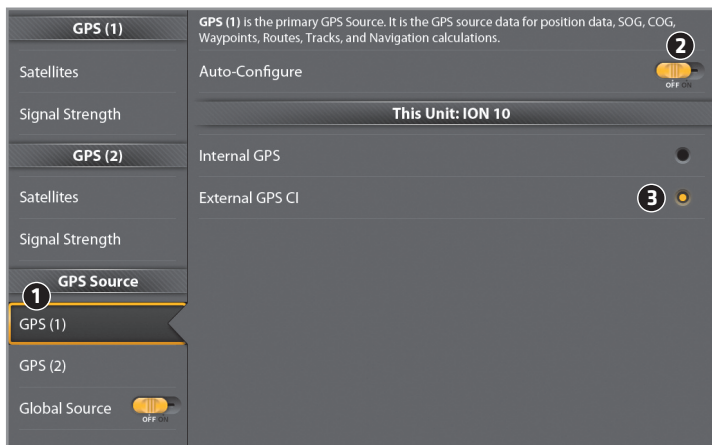**NOTE:** See the section **GPS Status Tool** for more information.

NOTE: See your control head operations manual for more information about the menu system.

NOTE: To assign a secondary GPS Source, select GPS (2).

Selecting a GPS Source

1 Select GPS (1)

**2** Turn off Auto-Configure

3 Select External GPS CI

5 | Confirm GPS Reception

Use the following instructions to confirm GPS reception:

1. From the Home screen, select the **GPS** tool.

2. Under **GPS 1**, select **Satellites**.

3. Confirm the Source indicates **External GPS CI** and the Fix Type indicates 2D, 3D, or Enhanced. Confirm the data boxes are displaying data.

   If a different GPS Source is displayed, you will have to manually select the Sensor (displayed as External GPS CI) as the main source. See *Section 4, Select the GPS Source*.

Confirming GPS Reception
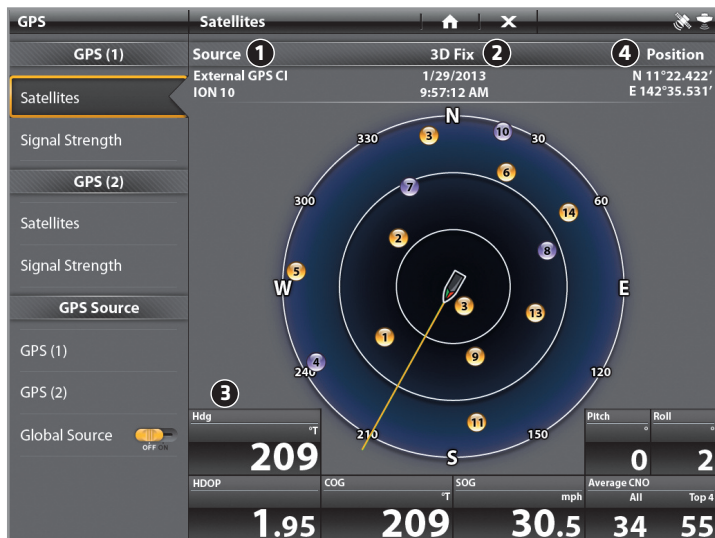
1 GPS Source

2 GPS Fix Type

3 Data Boxes

4 Position of Boat (Latitude and Longitude)

NOTE: See the section **GPS Status Tool** for details.

6 | Confirm Heading Sensor Operation

It is important to confirm that the heading sensor is installed correctly by reviewing the heading digital readout.

> **NOTE:** This procedure should be performed at slow speeds, in calm, open water, in a large area that is far from shallow water, boats, or other obstacles.

1. From the Home screen, select the **GPS** tool.

2. Under **GPS 1**, select **Satellites**.

3. Confirm the Heading (Hdg) and Course Over Ground (COG) data boxes are displayed.

> **NOTE:** See your operations manual for information about selecting data boxes.

4. Navigate the boat in a straight line, in calm, open water at 4.5 mph. Compare the Heading (Hdg) digital readout on the screen with the Course Over Ground (COG) digital readout. The readouts should be within approximately 5˚ of each other.

   To adjust the zero point of the heading sensor, open your Network settings and adjust the Heading Adjustment setting as needed. See your control head operations manual for more information.

   If the procedure failed: If there is a difference of more than 5˚ between the Heading (Hdg) and Course Over Ground (COG) digital readouts, the Sensor might be installed in a location with too much magnetic interference. Check the installation location and possible magnetic disturbances in the area.

Confirming Heading Sensor Operation
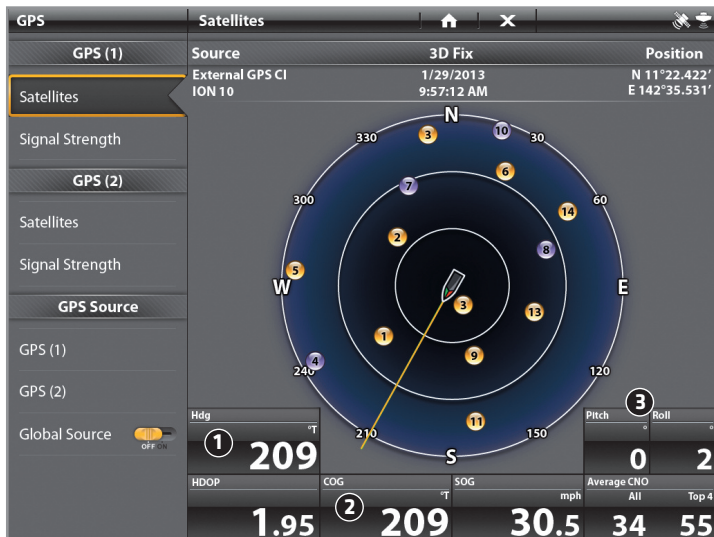
1 Heading (Hdg) Data Box with digital readout displayed.

2 Course Over Ground (COG) Data Box with digital readout displayed.

3 Pitch and Roll Data Boxes with digital readouts displayed.

GPS STATUS TOOL

The **GPS Status Tool** allows you to select a primary and secondary GPS Source, displayed as GPS 1 and GPS 2, and provides the GPS and heading data from each selected source.

The **GPS Status Tool Menu** is divided into the following menu options:

- **Satellites (GPS 1/GPS 2):** shows a sky chart and numerical data from the selected GPS receiver.

- **Signal Strength (GPS 1/GPS 2):** displays vertical bar graphs indicating the satellite signal strengths with the respecting CNO (Carrier-to-Noise) value (0-60).

- **GPS Source:** Allows you to select a primary and secondary GPS Source. See *Section 4, Select the GPS Source*.

GPS Status Tool Menu

GPS
GPS (1)
Satellites
Signal Strength
GPS (2)
Satellites
Signal Strength
GPS Source
GPS (1)
GPS (2)
Global Source OFF

Satellites

The sky chart shows the location of each visible GPS satellite with its satellite number. Up to 20 satellites can be monitored at one time.

- **Yellow satellites** indicate that the satellite is being used to determine your current position.

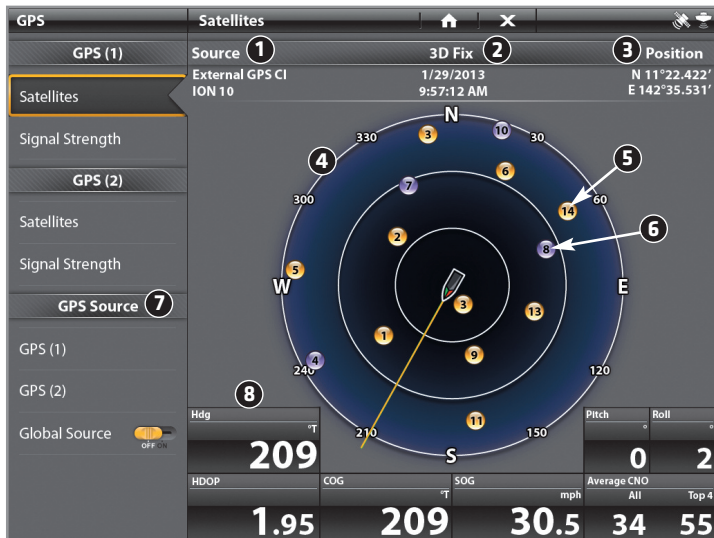- **Purple satellites** indicate that the satellite is being monitored but not used.

The following GPS and heading data is also displayed:

- **Current position** (latitude and longitude)

- **Local time and date**

- **Current GPS Fix Type:** reported as No Fix, 2D Fix, 3D Fix, or Enhanced. An Enhanced fix has been augmented using

information from WAAS, EGNOS, or MSAS. A 3D or Enhanced Fix is required for navigation.

- **HDOP (the Horizontal Dilution of Precision):** A GPS system parameter which depends on the current satellite configuration. HDOP is used to calculate the Estimated Position Error.

GPS Status Tool: Satellites

1 Current GPS Source

2 GPS Fix Type

3 Current Position (Latitude and Longitude)

4 Sky Chart

5 Satellites being used

6 Satellites being monitored

7 GPS Source Selection Menu

8 Data Boxes

Signal Strength

A bar graph indicating the satellite signal strengths with the respecting CNO (Carrier-to-Noise) value (0-60) is displayed for each satellite being monitored.

- **Yellow bar graphs** indicate that the satellite is being used.

- **Purple bar graphs** indicate that the satellite is being monitored but not used.

- The **satellite number** is listed above the bar graph, and corresponds to the number shown on the sky chart (see the illustration *GPS Status Tool: Satellites*).

Signal Strengths
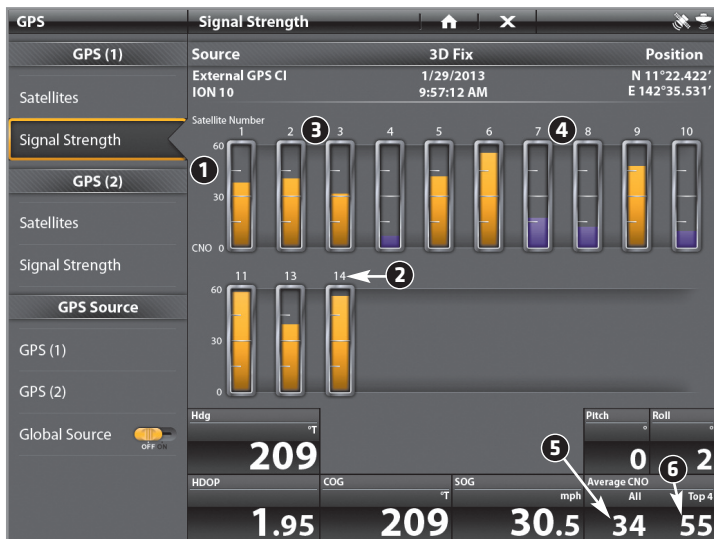
1 CNO Value Range (0-60)

2 Satellite Number

3 Satellites being used (yellow)

4 Satellites being monitored (purple)

5 Average CNO value of all satellites being used

6 Average CNO value of the top four satellites being used

NMEA 0183 Output Sentences

The Sensor is compatible with the NMEA 0183 sentences shown below.

NMEA 0183 Sentence	Description
GGA	Global Positioning System Fix Data, Standard
GSA	GNSS DOP and Active Satellites, Standard
GSV	GNSS Satellites in View, Standard
HDG	Heading, Deviation & Variation, Standard
RMC	Recommended Minimum Specification GNSS Data, Standard
EPE	Estimated Position Error, Custom
PNR	Pitch and Roll, Custom

Contact Humminbird

Contact Humminbird Customer Service in any of the following ways:

Web site:

humminbird.com

E-mail:

service@humminbird.com

Telephone:

1-800-633-1468

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Eufaula, AL 36027 USA

Hours of Operation:

Monday - Friday

8:00 a.m. to 4:30 p.m. [Central Standard Time]

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