AIRMAR® TECHNOLOGY CORPORATION

CAST™

Mobile App User Guide

For **Airmar Multisensors with Bluetooth® Security**

D-22819-rev.2

April 22, 2026

Patent http://www.airmar.com/patent.html

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WARNING

Navigation Aid Only – The Airmar® CAST™ app is intended only as a navigational aid and must never be considered as a replacement for caution, sound judgement, and proper navigational skill. It is used to configure and display navigational data from individual sensors. The user is responsible for the accuracy of the data used to calibrate the connected sensor. Only official government charts and NTMs contain all necessary information for safe navigation. As always, the captain is responsible for their prudent use and safety of passengers and crew.

INTRODUCTION

CAST™ is a mobile app for iOS and Android that connects wirelessly to multiple Airmar® SmartTM Multi-sensors using PSTI and other security protocols. It protects data and privacy, allowing users to monitor sensor data, configure outputs, calibrate settings, and adjust performance from their devices.

Key features of CAST:

- Customizable real-time graphical and numerical sensor data displays.
- Simple setup for NMEA 0183 sentences and CAN-NMEA 2000® PGNs.
- Choice of output protocols, data rates, and sensor settings.
- Remote firmware updates and custom user profiles.
- Encrypted communication for user and vessel data protection.

INITIAL CONNECTION TO YOUR AIRMAR SENSOR

1. Download the complimentary Airmar CAST application from either the App Store® or Google Play®.
2. Confirm that your Airmar sensor is powered on and that Bluetooth® is enabled on your mobile device.

   ***Note**: Bluetooth® signal strength may be diminished by large objects—such as fuel tanks or bulkheads—positioned between the sensor and your smart device. For optimal performance, position your device near or directly above the sensor with a clear line of sight.*

3. Upon launching CAST, your device may prompt you to grant access to features such as the camera, nearby devices, location, and wireless services; these permissions ensure full application functionality.
4. On the **Searching for Devices** screen, the application displays all available in-range sensors, each identified by its broadcast name (for example, DST820).
5. If more than one sensor is visible in the list, you may need to turn your sensor off and then on again. When the sensor is powered off, a wireless signal icon will flash next to its name, which can help identify the device. Once the flashing stops after the sensor is powered on, it is ready for pairing.

Figure 1: Searching for Devices with Wireless signal icon

6. Choose your sensor from the list. The app displays the **Connecting** screen and automatically turns on the device's camera.

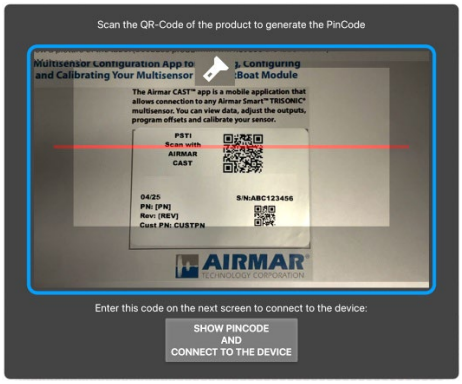


Figure 2: Scanning QR Code

7. Scan the QR Code on the label using your device's camera. You can find the QR Code on the Quick Start Guide cover page and on the Bluetooth® label attached to the sensor cable.
8. After scanning, tap **SHOW PINCODE AND CONNECT TO THE DEVICE** on your smart device. A six-digit PIN will be generated.
9. Record the six-digit code for future steps.
10. Error messages may appear if:
    - The matching sensor isn't selected
    - The sensor is off
    - There is a wireless connection issue
11. To address the issue, follow the **Initial Connection** steps again.

***Note**: If multiple connection attempts are unsuccessful, please reach out to Airmar Technical Support by submitting a ticket at: https://www.airmar.com/Product-Support.*

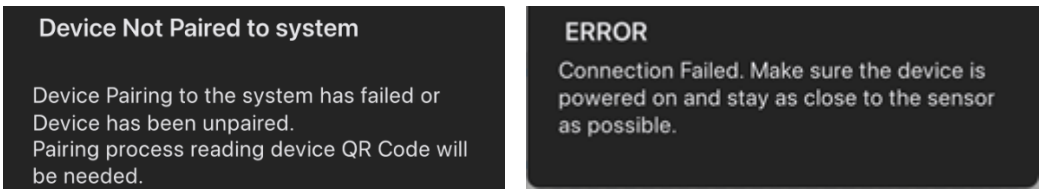


Figure 3: Not Paired/Error messages

12. Upon identifying the correct sensor, a **Bluetooth Pairing Request** prompt displays.

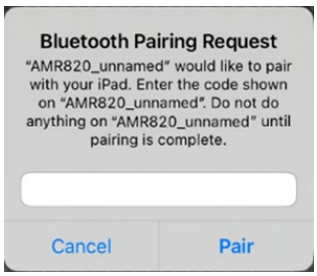


Figure 4: Bluetooth Pairing Request

13. Enter the six-digit code recorded earlier.
14. Tap **Pair** to complete the connection. A secure connection with the sensor is now established.

15. The **Customize Device** screen opens.

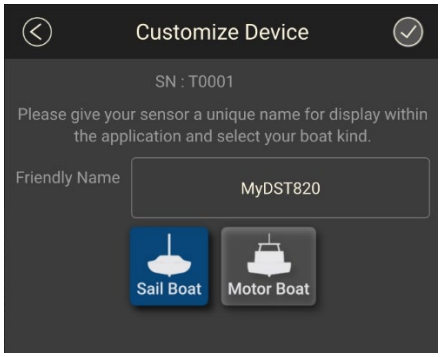


Figure 5: Customize Device

16. Enter a **Friendly Name** to identify your sensor (i.e., MyDST820). This name is displayed when reconnecting to the device in future CAST™ sessions.
17. Select your vessel type by tapping either **SAIL BOAT** or **MOTOR BOAT**.
18. Tap the check mark ✓ to save your settings. The **Device Data** screen appears, showing Depth, Trim, and Heel — this is the CAST default (Home) screen.

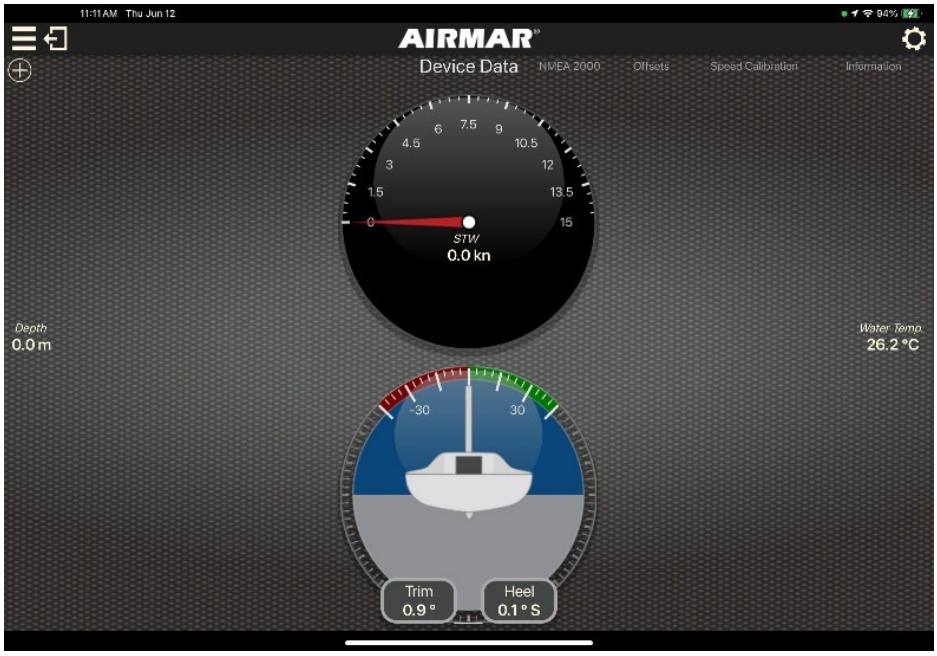


Figure 6: Device Data

***Note**: Scanning the PSTI QR code is necessary during the initial connection. If a new device is used, the Airmar® CAST app is reinstalled, or the **Remove Device** command is selected, the code must be rescanned. For future device access, it is required to retain the Quick Start Guide with QR code.*

***Important**: Do not remove the labels attached to the cable.*

19. Level the vessel and go to the **Offsets** page.
20. Check **Pitch** and **Roll** values; if not within ±0.1˚ of 0.0˚, expand the page and press **Hold to Calibrate**. CAST averages readings over about 10 seconds.

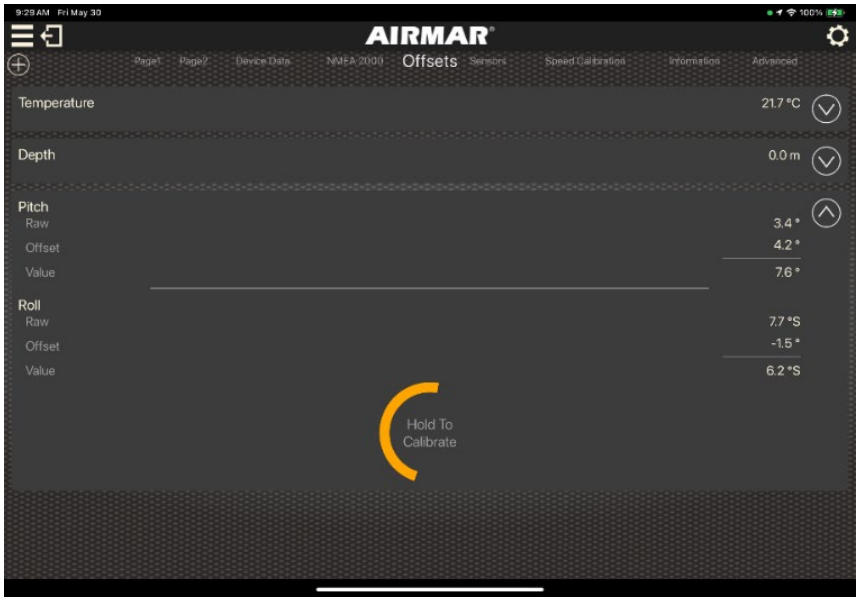


Figure 7: Calibrating Pitch and Roll Offsets

21. After calibration, both Pitch and Roll should read 0.0˚ (±0.1˚).
22. If either measurement differs by more than ±0.1˚, perform the calibration process again.

Note: *The **Roll** values display with a **"P"** for **Port** or **"S"** for **Starboard**. See the OFFSETS PAGE for more detailed information.*

CAST™ MODE OPTIONS

The CAST app offers two modes: BASIC MODE and ADVANCED MODE. By default, CAST opens in Basic mode.

To switch to Advanced mode:

1. Tap the **Mobile Menu** (☰) icon to open the CAST main menu.
2. Under **User Mode**, select **Advanced**.

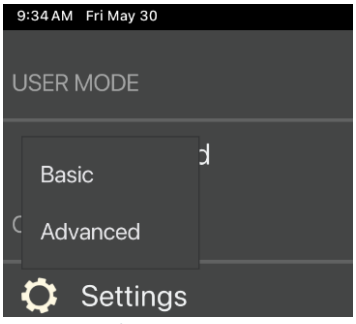


Figure 8: Basic and Advanced Modes

3. When prompted, confirm your selection by tapping **OK**.
4. To return to Basic mode, repeat the steps above and select **Basic** instead.

BASIC MODE

Basic Mode provides a simplified interface with key sensor data organized into dedicated pages. Also see ADVANCED MODE.

DEVICE DATA

1. Once your device is connected, the CAST™ app automatically shows available data from your sensor—Depth (from the transducer), Speed (through water), Attitude (Trim and Heel), and Water Temperature. Tap anywhere on the screen to switch between the graph and text view.
2. A "–" in a field indicates the function is disabled or unavailable. For example, if Depth is not displaying a value, ensure the sensor's urethane face is contacting the water. If the water body floor exceeds the sensor's maximum range, no depth data displays.
3. The speedometer starts with a default range of 0–15 knots (this adjusts based on your selected units). As speed increases, the display scales automatically to keep readings clear and easy to read.

***Note**: The CAST app shows "Depth Below Surface" if a positive depth offset is saved to the sensor, and "Depth Below Keel" if the offset is negative. See OFFSETS PAGE for setup details.*

CUSTOM PAGES

CAST™ allows you to create Custom Pages to personalize your data views beyond the default screen. To create a Custom Page:

1. Tap the **Add Page** (+) button in the top-left corner of the Device Data screen. The **Choose Page Layout** page displays.

Figure 9: Choose Page Layout Sample

2. Choose a Page Layout that matches your preferred display format. Options include:
   - One large (top), two small (bottom)
   - Two small (top), one large (bottom)
   - Two large
   - Three small
   - Four small
   - Five small
   - One large

3. A blank page layout displays.

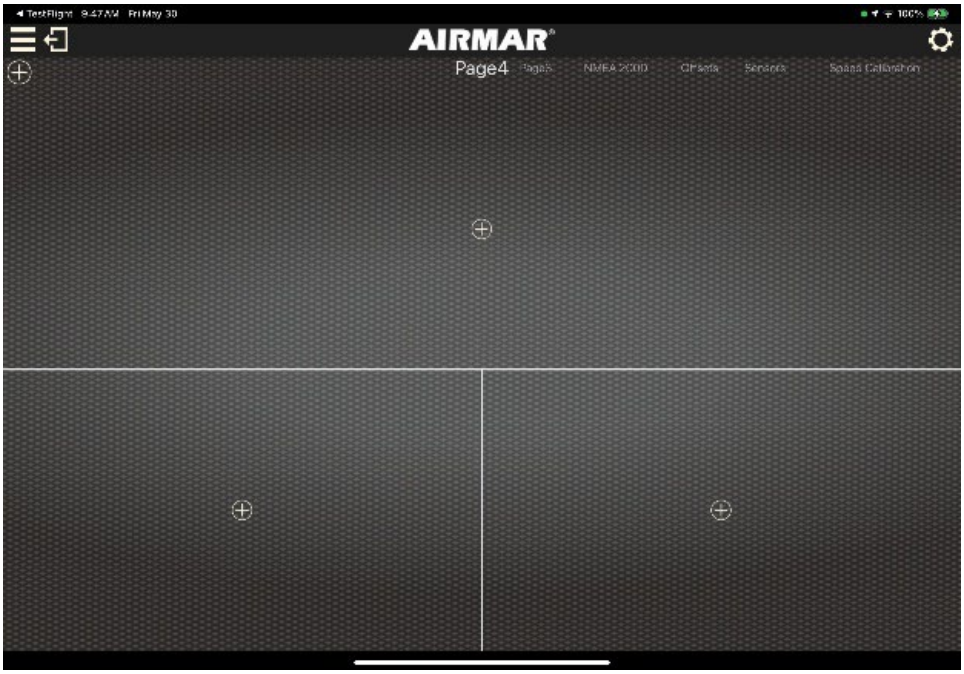


Figure 10: New Page Layout, One large (top), two small (bottom)

4. Tap **Add Data** (+) to assign a data type to each section of the layout. The **Choose Data Type** screen displays.

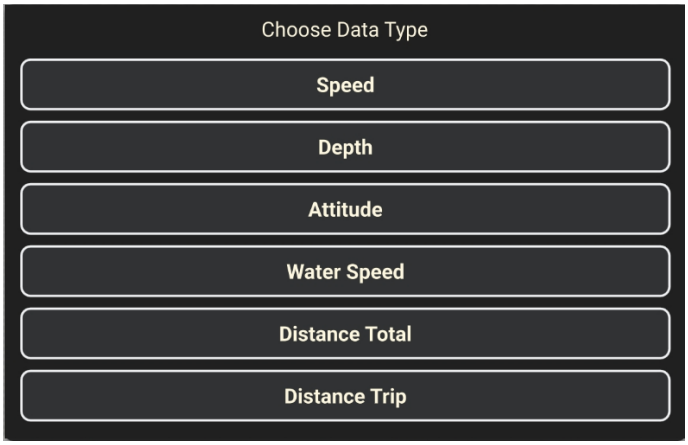


Figure 11: Choose Data Type

5. Tap a data type to update the display. Available data types include:
   - Speed
   - Depth
   - Attitude
   - Water Speed
   - Distance Total
   - Distance Trip

6. Select any of the available Data Types and the data displays.

7. Press and hold the page label, such as “Page4” to rename the page, for example "Speed."

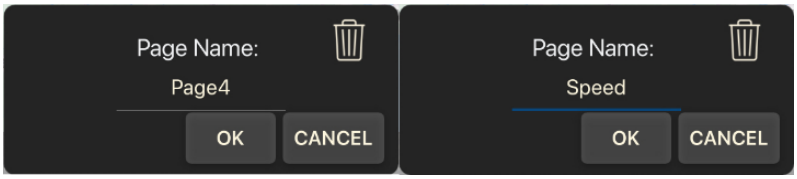


Figure 12: Renaming/Deleting Page functions

8. Press and hold the trash can button  to delete the page. Deletion is immediate without confirmation.

CUSTOMIZE THE DISPLAY

To customize the display on this or any other data pages:

1. Press and hold the data element you wish to modify, for example **Temperature**.

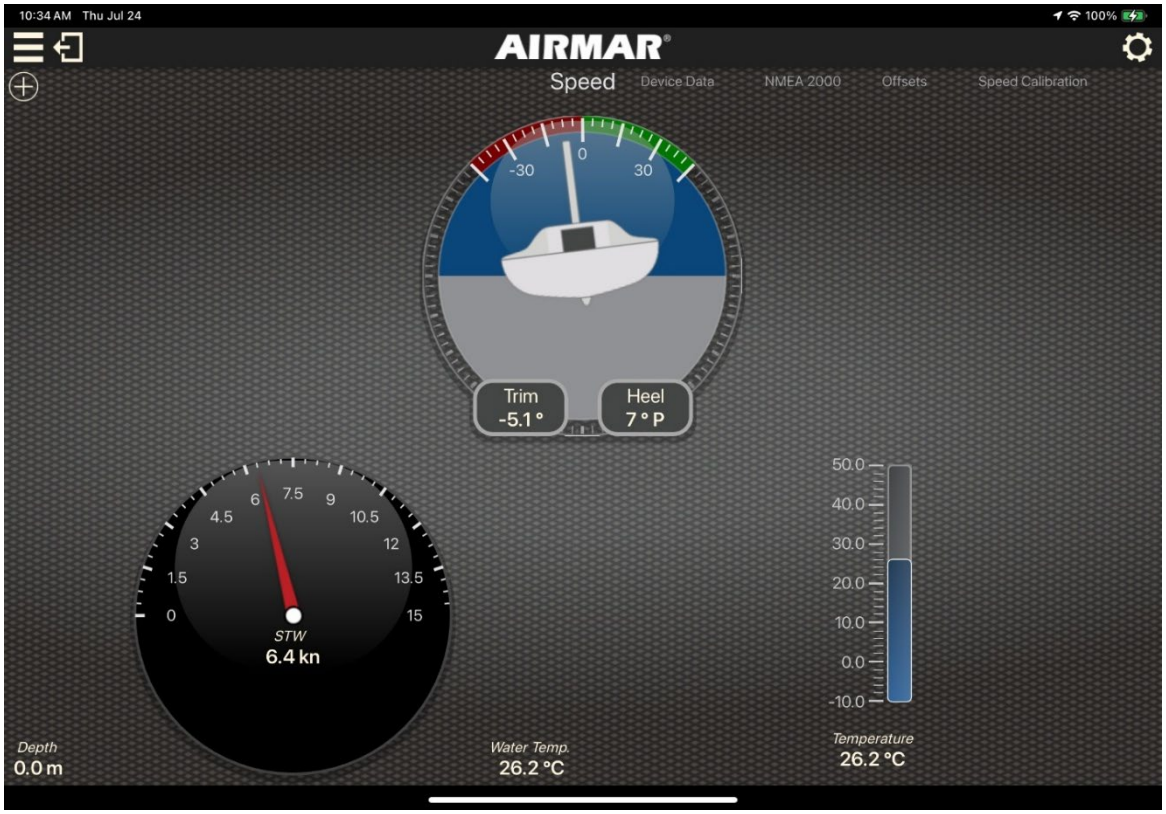


Figure 13: Custom Data Page

2. The **Choose Data Type** screen displays, shown earlier.
3. Choose the new data to display; the view updates accordingly.

NMEA 2000® PGN OUTPUTS IN CAST™

The Airmar® CAST app supports multiple NMEA 2000® PGNs, which govern sensor data formats in marine networks. The NMEA 2000® page lists all PGNs available from the connected device.

1. Tap the **NMEA 2000** page heading. The supported NMEA 2000 PGNs display.

Figure 14: NMEA 2000® Page – Attitude PGN Interval shown

2. Supported PGNs are:

   Proprietary PGNs (**Off** by default):

   - Depth Quality – PGN 65408
   - Speed Pulse Counts – PGN 65409 (paddlewheel units only)
   - Internal Temp. & Voltage – PGN 65410

   Standard PGNs (enabled by default unless otherwise stated):

   - Heartbeat – PGN 126993 (cannot be disabled)
   - Attitude – PGN 127257
   - Speed (Speed Water Reference) – PGN 128259
   - Water Depth (with Transducer Offset) – PGN 128267
   - Distance Log – PGN 128275
   - Barometer, Temperature – PGN 130310 (disabled by default)
   - Barometer, Temperature, Humidity – PGN 130311
   - Temperature – PGNs 130312 and 130316

3. Except for **Heartbeat**, each PGN can be **Enabled** or **Disabled**. When disabled, **Off** appears; when **Enabled**, the output **Interval** displays.

4. Output rates indicate the number of PGNs sent per unit time. For example, an **Attitude** (127257) PGN showing “1.00 s” means it is output once per second, while “2.00 s” indicates output once every two seconds.

   Note: When the **Interval** increases, the **Frequency** (Hz) decreases accordingly.

5. Tap the **Down** arrow  next to an item to display options.

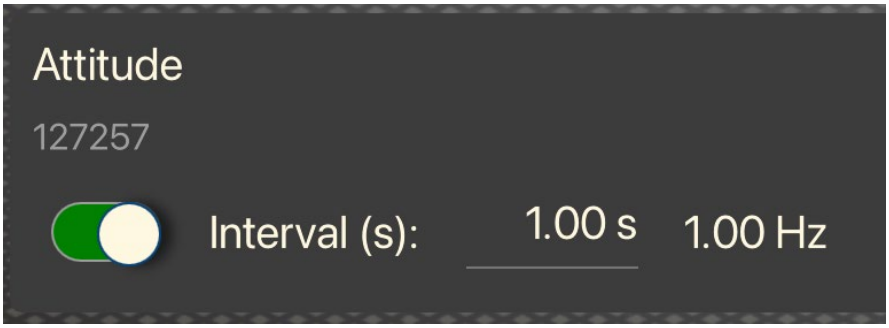
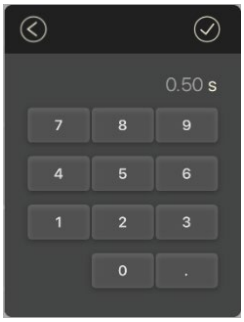
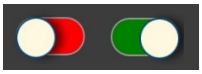


Figure 15: NMEA 2000® Page – Attitude PGN

6. Tap the value in the **Interval** field. The keypad displays.



7. Enter the new **Interval** and tap the checkmark. The new interval is set.

8. Tap the switch  to enable (Green) or disable (Red) the PGN output.

9. Tap the Up arrow  to collapse the available options.

***Note**: Changing the PGN output or output rate will not change the internal data calculation rate.*

***Important**: Disabling a PGN using the switch prevents data from being sent to the network, but it will not prevent the sensor from calculating a value internally. For example, disabling the Depth (128267) PGN prevents depth information from being provided to the network, but it will not stop the sensor from pinging for depth.*

UNITS

Units for Speed, Depth, Temperature, and Distance* can be selected individually. For example, speed can be displayed in miles per hour while distance is displayed in nautical miles.

Note: **Height and Pressure are not available for the DST820 and TriSonic Smart™ Series.*

1. Adjust the display units by tapping the **Settings** button  at the top right corner of any CAST screen. The **Settings** options display.

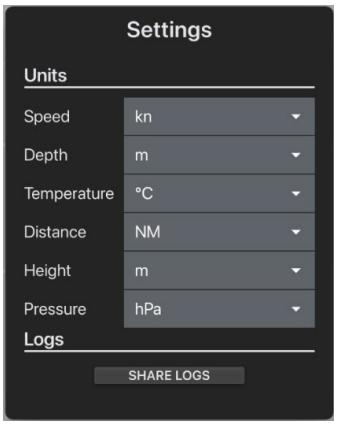


Figure 16: Settings options

2. Tap the current **Units** value, such as **kn** for **Speed**, and the available Units display in a pop-up.

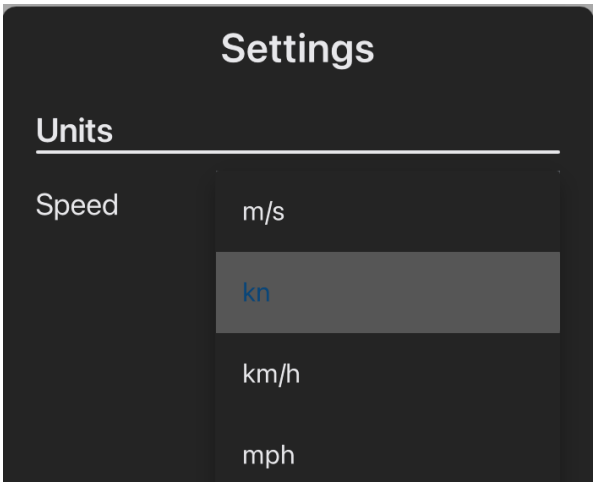


Figure 17: Settings/Units – Speed

3. Tap a different **Units** value to select; the new unit is selected.
4. Adjust other **Units** values as required.
5. Tap outside the **Settings** dialog to close it.

OFFSETS

Users can adjust any underlined value in the Airmar® CAST™ app using **Offsets**. Tap a value to open the keypad and modify or delete its **Offset**.

When entering table values, use the following guidelines:

- Tap a cell to adjust its value with the keypad.
- Enter the number, then tap the "+/-" button to make it negative.

Figure 18: Offsets page with Keypad

CAST allows users to program the following sensor offsets to match vessel-specific installation parameters:

- Temperature: Adjustable ±9.9 ˚C
- Depth: Adjustable ±10.0 m
- Pitch and Roll: Adjustable ±45˚

The **Hold to Calibrate** function enables automatic zeroing of Pitch and Roll according to the vessel's current orientation. Utilizing these settings ensures precise data output from the Airmar sensor, particularly when accounting for mounting location and vessel geometry. See INITIAL CONNECTION TO YOUR AIRMAR SENSOR

Figure 19: Offsets page – Hold to Calibrate

INFORMATION PAGE

The Information page displays sensor details and management commands. Sensor Information includes the following :

- **Device Name** – A combination of the sensor Model Number and Friendly Name.
- **Friendly Name** – The sensor name – established during Initial Connection.
- **Serial Number** – The Airmar serial number – unique to the connected device.
- **Part Number** – The Airmar part number for the connected device.
- **Firmware Version** – The current firmware version. Take note of all firmware versions for any technical inquiries.

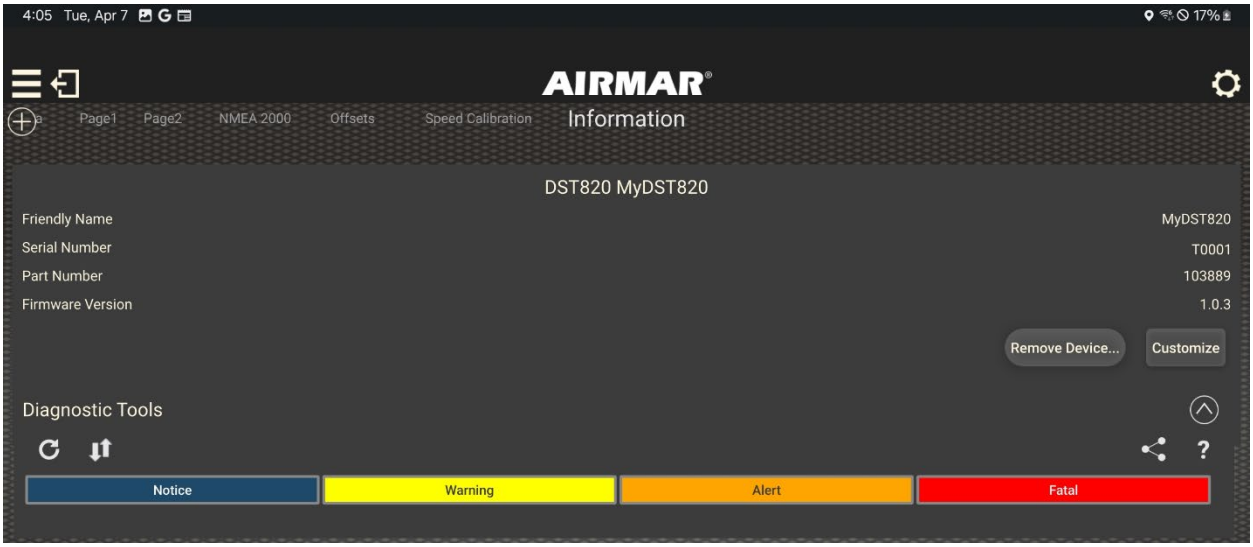


Figure 20: Information page

INFORMATION PAGE COMMANDS

- **REMOVE DEVICE...** – Tap **REMOVE DEVICE** to disconnect the sensor from the current tablet or phone. This option can be used when connecting to a different Airmar sensor or before using the **Forget Device** function in your device's Bluetooth® settings.

- **CUSTOMIZE** – Tap **CUSTOMIZE** to change the Friendly Name or to change the vessel type (Sail Boat or Motor Boat).

- **Diagnostic Tools** – Tap the down arrow button to open **Diagnostic Tools**. In this section, you can view and filter system messages in order of severity, respectively: (NOTICE, WARNING, ALERT, or FATAL).

- Tap **Share** to choose your device's Share Actions for sharing Diagnostic reports. Share actions are based on your individual device options, such as EMAIL, COPY, SAVE.

***Tip**: Using **Diagnostic Tools** helps identify error conditions and streamlines troubleshooting, keeping your system operating effectively—especially useful for technical support inquiries.*

ADVANCED MODE

Advanced Mode includes all functionalities of Basic Mode, along with additional pages for enhanced configuration and diagnostics: SENSORS and ADVANCED.

SENSORS

You can enable or disable each sensor on this page. Sensors are **Enabled** by default. When Enabled, the Sensors pings for data at a default or custom **Sensing Interval** —for example, 500 milliseconds—to match navigational requirements.

***Note**: All sensor Interval values range from 0 to 1,000 milliseconds for the following values:*

- **Pitch/Roll**
- **Temperature**
- **Voltage**
- **Depth**
- **Speed**

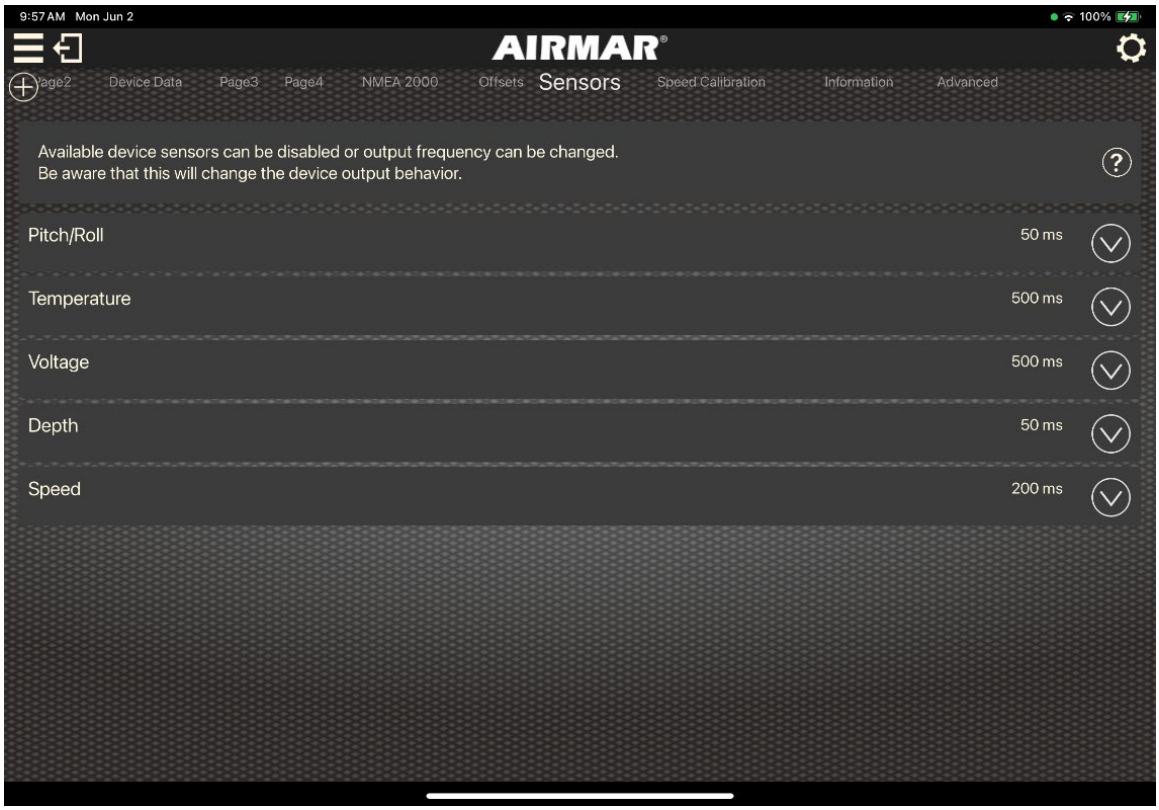


Figure 21: Sensors page

ADVANCED PAGE

The Advanced page provides greater control over sensor behavior and system operations. Options include **Depth**, **Speed Filter,** and **Demo Mode**. Commands include **UPGRADE FIRMWARE**, **RESET TRIP WATER DISTANCE** and **RESET TO DEFAULT**.

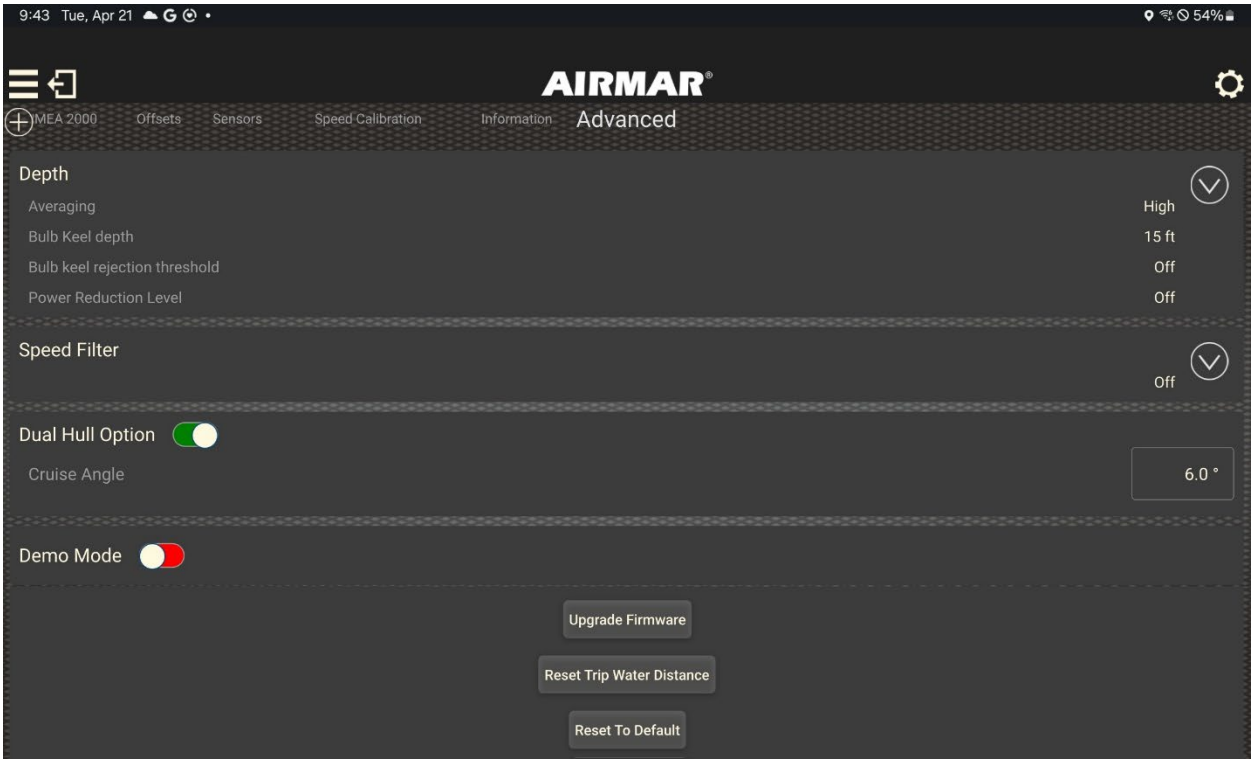


Figure 22: Advanced page

DEPTH SETTINGS

Averaging: Depth averaging refers to how CAST™ processes rapid or minor fluctuations in raw depth readings. Instead of displaying every instantaneous change (which may vary wildly due to wave action, boat motion, or turbulence), the system calculates a running average—producing a steadier, easier-to-read value. Depth Averaging, or Smoothing, options include:

- ***Off*** *– No averaging. This gives you the most real-time view of constantly changing depth values. Best used in smooth conditions or for applications where maximum responsiveness is needed.*
- ***Low*** *– Applies light smoothing. Depth readings remain fairly responsive but are filtered to reduce minor spikes or drops.*
- ***High*** *– Applies heavier smoothing. Best for choppy water, rough sea conditions, or vessels experiencing frequent motion. Provides a more stable reading by filtering out small, rapid fluctuations.*

Bulb Keel Depth: Accounts for vessels with large fin or bulb keels, such as sailboats. These keels sometimes interfere with the depth sensor's ability to track the bottom depending on where it is mounted. The effect is a consistent keel echo reflection which can be mistaken for a bottom echo if the real bottom is lost for some reason (cycling power, exceeding the operational range of the sensor, etc.) The sensor has logic that places higher detection and tracking requirements on shallow echoes to mitigate this, allowing data to represent the lowest point of the hull.

- **Off** – The vessel has no bulb keel; Depth Offsets should be entered in the **Offsets** page. The Depth Offset is the distance between the sensor position and the lowest position of the hull (typically a negative number).
- **Specified depth, in feet** – Select a Bulb Keel Depth between 7.5 and 20 feet. Select the depth setting that is ***greater than*** the depth of the keel **and** any diagonal distance from the sensor. Bulb keel entries must calculate this diagonal distance. See BULB KEEL EXAMPLE for more information.

The 6 defined values for the field are:

- 0 – Option is off.
- 7 – Apply the higher requirements to 7.5 feet
- 10 – Apply the higher requirements to 10 feet.
- 13 – Apply the higher requirements to 13 feet.
- 15 – Apply the higher requirements to 15 feet.
- 20 – Apply the higher requirements to 20 feet.

BULB KEEL EXAMPLE

The sensor is horizontally 9' from the center of the bulb keel (A). The bottom of the keel is 8' ***lower than*** the sensor position (B). Following the Pythagorean Theorem:

$$9^2 + 8^2 = 81 + 64 = 145$$

The square root of 145 is 12.04, meaning that the bottom of the keel is ~12' from the sensor (C). Therefore, select a Bulb Keel depth at the next higher setting of 13'. Your individual vessel settings will vary based on sensor location.

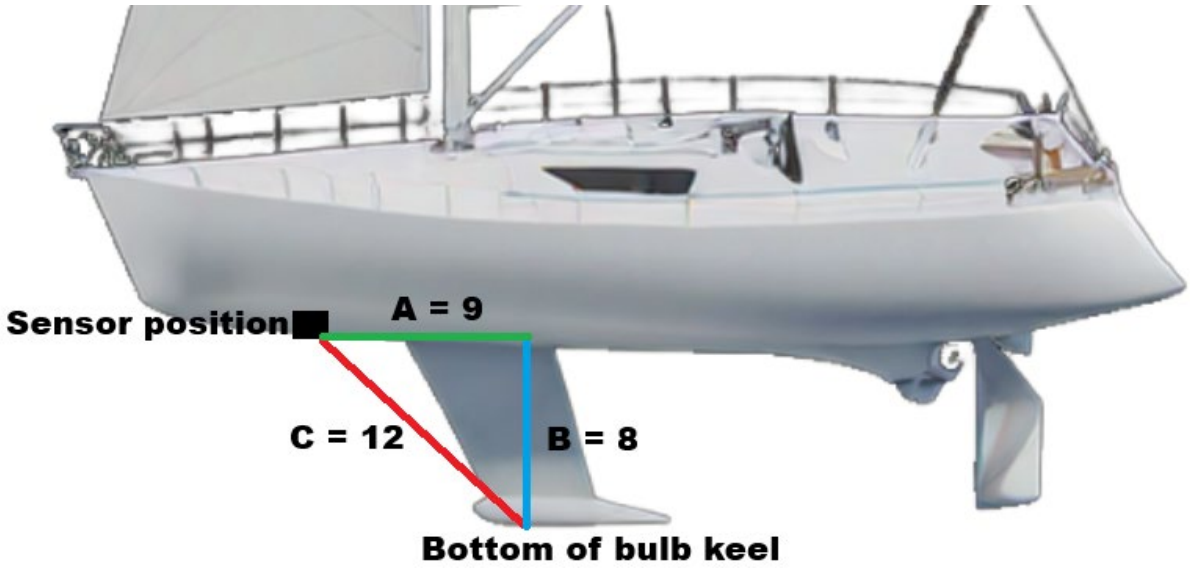


Figure 23: Sensor Position with Bulb Keel Overview

Bulb Keel Rejection Threshold: Sets a limit for ignoring abnormal depth readings based on keel displacement. Select a value between 1 and 7, with 1 being the least sensitive.

Power Reduction Level: Adjusts sensor power usage for efficiency or performance. Select a value between 1 and 8 with 1 being the lowest power reduction level.

SPEED FILTER

Choose from the following options to apply filtering that stabilizes water speed readings in dynamic conditions:

- **Off** – No filtering. The speed value updates in real time with all fluctuations.
- **Low** – Light smoothing. Speeds remain responsive with minimal delay.
- **Medium** – Moderate smoothing. Useful for general navigation with occasional water turbulence.
- **High** – Maximum smoothing. Best for reducing noise in very choppy or high-interference conditions.

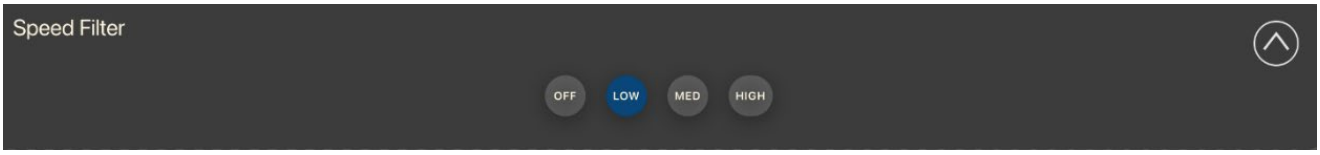
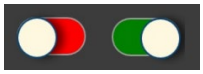


Figure 24: Speed Filter options

DUAL HULL OPTION

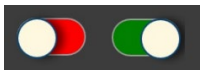
The Dual Hull Option, available only for UDST models, allows vessels with dual hull configurations, such as catamarans, to use two transducers for instances when one hull is not immersed in water. Functionally, the UDST820 must be installed on the STARBOARD side and the UDST822 must be installed on PORT side. During Initial Connection, both units must be scanned and connected to CAST separately to enable the dual switching mode. The devices must be on the same NMEA2000 bus to work correctly.

Important! Both sensors MUST HAVE Pitch and Roll calibrated to use the DUAL HULL OPTION!

1. Tap the switch  to enable (GREEN) or disable (RED) Dual Hull Mode.
2. When enabled, CAST gathers data from both units at 0 degrees up to when the **Cruise Angle** is reached.
3. The Cruise Angle default of 6 degrees represents **+3** to STARBOARD and **-3** degrees to PORT. For example, if you roll +3 degrees (STARBOARD), both sensors will report the STARBOARD side sensor data in CAST. When you roll -3 degrees (PORT), both sensors will display the PORT side data in CAST.
4. Special considerations must be made when performing Speed Calibrations in DUAL HULL instances. Refer to ADVANCED SPEED CALIBRATION – DUAL HULL MODE for additional information.

DEMO MODE

This mode simulates live sensor data for training, troubleshooting, or display purposes.

1. Tap the switch  to enable (Green) or disable (Red) Demo Mode.
2. In Demo Mode, CAST is designed to simulate real nautical conditions, displaying sample data for Speed Through Water, Attitude, Depth, and Water Temperature.
3. Disable **Demo Mode** to return to displaying live vessel data.

UPGRADE FIRMWARE

Connect to the Airmar server to check for and install firmware updates. Follow these steps to upgrade:

1. Tap **UPGRADE FIRMWARE**.
2. Tap **YES** to confirm. The process may take up to 20 minutes.
3. Keep the mobile device close to the sensor.
4. If the update is interrupted, CAST prompts you to restart from the beginning or resume from the last completed step.
5. A message box appears if the current version is up to date; no firmware updates are necessary.

RESET TRIP WATER DISTANCE

Select to clear all existing trip distance data. A warning message displays confirming the reset.

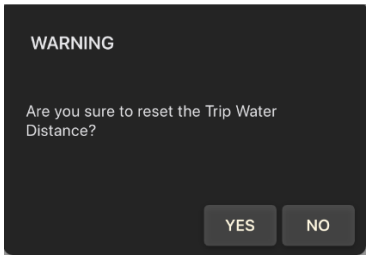


Figure 25: Reset Trip Water Distance Warning

RESET TO DEFAULT

Select to reset the device to Default Settings. A confirmation dialog displays. All device configurations will be deleted, and the device requires power cycling. Tap **Yes** to proceed.

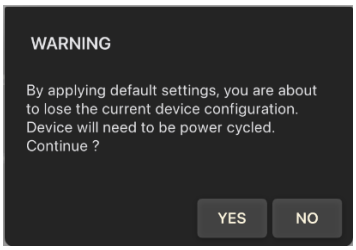


Figure 26: Reset to default Warning

OFFSETS PAGE

Offsets are available for Depth, Temperature, Heel, and Trim, allowing adjustment of displayed data according to a vessel's configuration.

An offset is an additive value that adjusts the raw data reported by the sensor. A positive offset increases the measured value, while a negative offset decreases it. The unmodified sensor reading is labeled **Raw**. To apply or update an offset, tap the underlined value in the app.

***Depth Offset**: If your keel/hull extends 1 foot below the transducer face, enter -1 as the Depth offset. One foot will then be subtracted from every depth reading, allowing the displayed depth to reflect the distance below the keel/hull.*

***Temperature**: Temperature offsets follow the same logic as Depth Offsets: the entered value is added to (or subtracted from) the sensor's raw temperature reading.*

***Heel and Trim Offsets**: Heel and Trim can also be adjusted using Offsets – measured in degrees. These allow you to manually or automatically zero the attitude readings when your vessel is at rest.*

AUTO ATTITUDE CALIBRATION

***Note**: This procedure is done at initial connection. Repeat if Heel and Trim values are inconsistent.*

1. Ensure the vessel is stationary and level.
2. Tap and hold the **Hold to Calibrate** button.
3. Over approximately 10 seconds, CAST calculates the average raw heel and trim values—progress is shown by an orange bar.

4. When the bar flashes green, the average values are applied automatically, and the sensors should then display close to 0.0° for both Heel and Trim.

   Important: *The calculation uses a time-based average, so any vessel motion during the calibration period may affect the results.*

   To calibrate manually: *You may also enter offset values directly. For example, if the raw heel is 7.8°, entering an offset of -7.8 will result in a net heel of 0.0°, effectively re-zeroing the display.*

SPEED CALIBRATION

The Airmar CAST app offers fast, accurate speed calibration, accounting for currents and hull flow changes—such as those caused by heeling. The app supports multiple calibration methods to fine-tune performance.

Heel-Corrected speed calibration requires Attitude calibration. When initially selected, **Speed Calibration** displays a notification screen. Enabling Attitude PGN and completing Attitude Calibration are necessary to proceed.

Figure 27: Speed Calibration notification screen

Basic speed compensation uses a percentage to scale measured speeds, unlike fixed-value offsets. For instance, a 10% compensation changes 10 kn to 11 kn and 20 kn to 22 kn.

Sensor readings are affected by water flow, hull shape, surface roughness, and strake placement. Always follow the transducer's installation guide for accurate positioning and calibrate the sensor in real-world conditions.

To calibrate, timing over a known distance is common, but water currents can distort results. Calibrating with raw GPS SOG may also be inaccurate if currents are present, as they affect GPS readings.

BASIC SPEED CORRECTION

The simplest way to calibrate speed is a single point percentage offset. This type of calibration applies a fixed percentage correction to every reading from the sensor.

1. Navigate to the **Speed Calibration** tab. By default, the speed calibration is set to "OFF."
2. Tap **BASIC**.

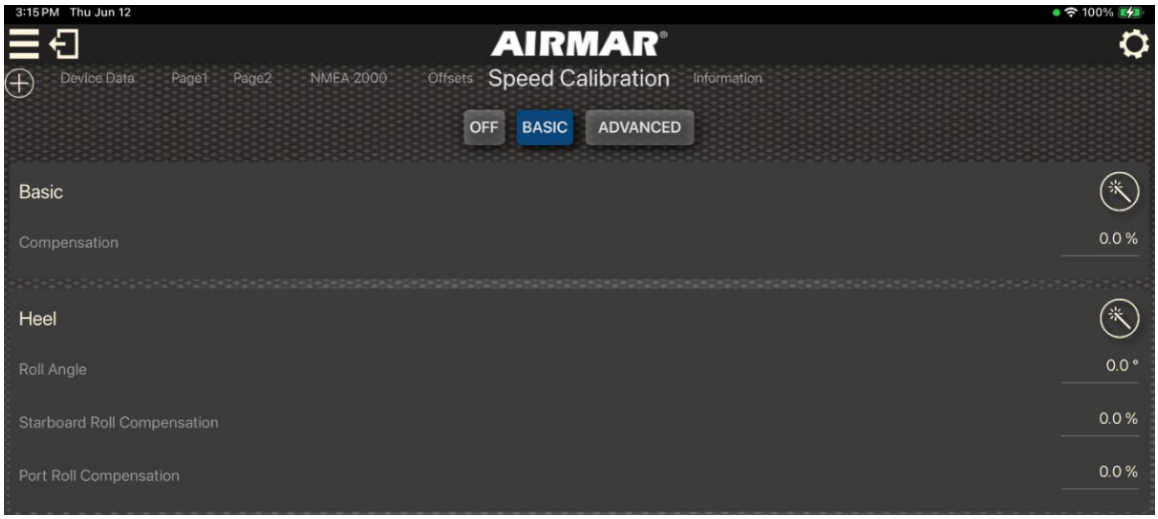


Figure 28: Speed Calibration – Basic page

3. If the desired percentage adjustment is known, you can simply enter it into the **Compensation** field.
4. See BASIC SPEED CORRECTION to have CAST™ calculate the correct percentage adjustments.

BASIC SPEED CALIBRATION

HEEL-CORRECTED SPEED CALIBRATION

> ***Note**: Make sure the Attitude PGN is enabled on the NMEA 2000® page. Once enabled, make sure the sensor has been calibrated with the boat stationary. Refer to the Offsets Page for Attitude sensor calibration. Heel-corrected Speed Calibration and the Advanced Speed Calibration Table cannot be used without Attitude enabled and calibrated.*

Boat heel angle affects speed readings from the sensor. The sensor can store calibrations for up to two angles per side, in addition to the standard setting, which requires using the **Advanced** table.

As heel changes, the sensor interpolates between calibration curves. For instance, with 15% compensation at 10° and 5% at 0°, a 10% adjustment is applied at 5 degrees. Heel-corrected calibrations follow the standard process but cannot use opposite-direction runs, so calibrate in slack water.

CAST can calculate the percentage using one of two methods.

- **SOG**: Speed through water is calculated using a GPS reference speed over ground. See SOG METHOD.
- **Distance**: Speed through water is calculated using travel time over a known distance such as a measured mile. See DISTANCE METHOD.

SOG METHOD

The SOG method allows the app to calculate your average speed over ground using the internal GPS in your smart device. You can also manually enter an average value from an external source.

1. Bring the boat up to calibration speed. This is the speed where you want the greatest accuracy in your speed reading and is different for each boat.
2. Once traveling at a constant speed and direction, tap the **Primary** button. The app will count down as it calculates an average indicated speed from the device and an average GPS SOG.
3. Once complete, the average for each value is shown and the **Primary** button changes to **Reverse**.

4. Turn the boat 180° and bring it back to the same speed used in the primary direction. You don't need to hold exactly the same speed from the primary run, but the closer, the better. Maintain a consistent speed and direction.
5. Tap **Reverse** and wait for the app to count down while the average speeds are calculated. The second run in the opposite direction allows the app to calculate (and adjust for) the speed of the current and remove it from the calculation.
6. Once complete, the app displays the calculated percentage adjustment. Tap **Apply** to save the value.
7. The speed correction value has now been calculated and saved to memory in the device. It is applied to all speed values sent to the network and transmitted wirelessly to the app. All devices connected to the NMEA 2000® network display the adjusted value.
8. The value can be manually adjusted by tapping the value on the **Speed Calibration** screen.

DISTANCE METHOD

The Distance method calibrates speed without GPS by timing how long it takes to travel a known distance at a steady speed. The app compares the calculated average speed with the sensor's indicated speed.

> ***Note:*** *Calibrating with a known distance necessitates both precise measurement between two reference points and accurate travel time recording. Shorter distances increase the likelihood of measurement error; therefore, a minimum recommended distance for speed calibration is one statute mile.*

1. Select the **Distance** button.
2. Enter the known distance between two points in the units indicated.
3. Bring the boat up to calibration speed. This is the speed where you want the greatest accuracy in your speed reading and is different for each boat.
4. When you pass the starting point, tap **Start**. The app begins counting in seconds.
5. When you pass the end point, tap **Stop**. The number of runs will increase by one and the calculated speed is shown.
6. The number of runs already completed is shown as **Completed Runs**. **Total Time** is a count of the total number of seconds for all runs. **Run Speed** shows the average recorded device speed on the last run, while **Speed** shows the overall average. **Run Correction** is the correction factor calculated on the previous run, and **Correction** is the overall average correction factor calculated.
7. Follow the same process for additional runs. If you would like to discard a run, tap **Discard Run** once complete and try again.

   > ***Note:*** *If calibrating where a strong current exists, complete an even number of runs—half in one direction and half in the opposite (about 180° apart)—to ensure the average properly reflects the current.*

8. Once complete, tap **Apply** to save the value.
9. The speed correction value has been calculated and stored in the sensor's memory. This adjustment is automatically applied to all speed data transmitted to the network and wirelessly to the app. All devices integrated with the NMEA 2000® network will display the corrected values.
10. The value can be manually adjusted by tapping the value on the **Speed Calibration** screen.

ADVANCED SPEED CALIBRATION

> ***Note:*** *The advanced speed calibration table will override any other programmed speed corrections. It will not be added on top of the existing speed calibration. Before switching to the Advanced calibration table, make sure to carefully quantify the performance of the sensor without any corrections in place.*

The Advanced Speed Calibration Table allows fine adjustment of speed correction over multiple speeds and angles.

- Up to two angles per side can be selected.
- Up to 10 non-zero speeds can be added to the table.

Note: *For Advanced Speed Calibration, set the table's highest value to match the vessel's top speed. If actual speed exceeds this, the sensor uses a linear correction based on the last value, which may quickly reduce accuracy if that value is too low. Make sure your table covers all expected speeds, regardless of how many points it contains.*

1. To use the Advanced speed calibration table, first switch speed calibration to **Off**.
2. Either manually or using 3rd party software, collect the difference between indicated speed and actual speed through water at each calibration point.
3. The table is organized with speeds in columns and heel angles in rows. Each cell is the speed correction (in units of speed, such as knots, mph, etc.) applied to that specific heel angle and speed combination.
4. The default Speed Calibration page contains two speed columns: 4.0 and 8.0, and one Port and one Starboard Heel angle of 5. Enable the Advanced Speed Calibration Table on the Speed Calibration tab to view the Speed Calibration table.

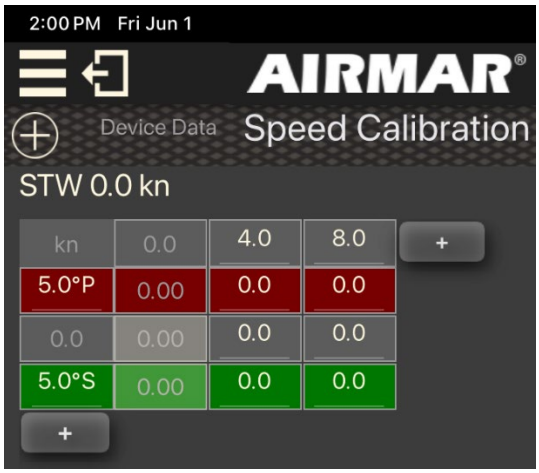
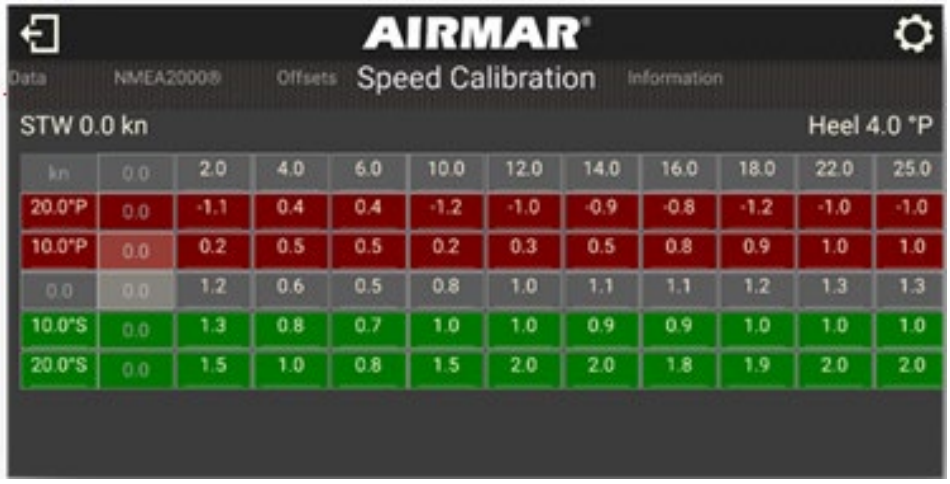


Figure 29: Advanced Speed Calibration page – Default view

5. Expand the table to the desired number of rows and columns. Input the differences measured previously. For example, if at 0° of heel and 8 kn indicated speed the actual speed through water was measured at 8.5 kn, enter 0.5 in that cell. If the actual speed through water was measured at 7.5 kn, enter -0.5 in that cell.
6. Make sure to fill out the table completely. Remove any unused rows and columns by selecting the heading and tapping the X.
7. To enter a Speed value, tap a row or column heading to edit its value. Tap **X** to delete the row or column; a confirmation message appears. Tap **+/-** to toggle between negative/positive.

Figure 30: Keypad

8. The Advanced table does not adjust the basic speed calibrations; it is a standalone method of speed calibration that overrides the others. Inaccurate STW values will occur if the table is not completely filled in.



kn	0.0	2.0	4.0	6.0	10.0	12.0	14.0	16.0	18.0	22.0	25.0
20.0°P	0.0	-1.1	0.4	0.4	-1.2	-1.0	-0.9	-0.8	-1.2	-1.0	-1.0
10.0°P	0.0	0.2	0.5	0.5	0.2	0.3	0.5	0.8	0.9	1.0	1.0
0.0	0.0	1.2	0.6	0.5	0.8	1.0	1.1	1.1	1.2	1.3	1.3
10.0°S	0.0	1.3	0.8	0.7	1.0	1.0	0.9	0.9	1.0	1.0	1.0
20.0°S	0.0	1.5	1.0	0.8	1.5	2.0	2.0	1.8	1.9	2.0	2.0

Figure 31: Sample Speed Calibration – Advanced page

9. Make sure to save a record of the table as entered. Because the Advanced speed settings override all others, the table is deleted if you return to Basic Speed Calibration settings, or if you turn Off Speed Calibration. The table speeds will need to be re-entered.

   Important*! On some devices, the Speed Calibration commands – OFF, BASIC, and ADVANCED – do not display when the device is in Landscape mode. Turn back to Portrait mode to display the commands.*

   Note: *Make sure to keep a record of the data in the Advanced table. As long as the table is active, the data is saved to memory in the sensor. If the Advanced Speed table is disabled by switching back to* ***Basic*** *or* ***Off****, on confirmation the data in the table is* ***permanently*** *deleted.*

ADVANCED SPEED CALIBRATION – DUAL HULL MODE

The Speed Calibration method is the same for each transducer; however, each transducer must be calibrated separately, and the Dual Hull Mode must be set to OFF for both transducers. Follow these instructions when performing Advanced Speed Calibration in Dual Hull configurations:

1. Connect to the Port Side Transducer in CAST.
2. Select the **Advanced** tab.
3. In **Dual Hull Option** pane, turn OFF the **Dual Hull Option** (RED).
4. Connect to the Starboard Side Transducer in CAST and turn OFF the **Dual Hull Option** (RED).
5. Perform the ADVANCED SPEED CALIBRATION for the Starboard transducer.
6. Connect to the Port Side Transducer in CAST.
7. Perform the ADVANCED SPEED CALIBRATION for the Port transducer.
8. Select the **Advanced** tab and turn ON the **Dual Hull Option** (GREEN).
9. Connect to the Starboard Side Transducer in CAST and turn ON the **Dual Hull Option** (GREEN).

35 Meadowbrook Dr., Milford, New Hampshire 03055
www.airmar.com