Avia Sail
User Guide

Avia Sail
Onboard Instrument Software
For use with NMEA 0183 and NMEA 2000®

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About Avia Sail

Welcome to Avia Sail®. We trust that you will find this application invaluable when you are out on the water.

Avia Sail presents an eye-catching display of GPS and sensor data (wind, depth, temperature, etc.) on your Windows computer. It is compatible with industry standard NMEA 0183 and NMEA 2000® data coming from most popular marine hardware. (To receive NMEA 2000 data on your PC, use the Actisense® NGT-1 Gateway.) Avia Sail has features that could cost you thousands of dollars for a dedicated marine instrumentation panel.

Avia Sail Lite is inexpensive, easy to set up and displays essential instruments in a unified dashboard.

Avia Sail Pro does everything Lite does plus:

- Allows for customized layout of up to 20 instruments.
- Runs on unlimited number of on-board computers, within a local network, in master / slave modes.
- Includes real time polar plot to get the most speed out of your vessel.
- Shares NMEA 0183 data with Fugawi Marine ENC™ on Windows®, MacENC on Mac OS® X, iNavX™ on iPhone® / iPad™ as well as most other nautical charting software.
- Easy calibration for wind direction, boat speed, and compass heading.

Running Fugawi Marine ENC 4.5 and Avia Sail side by side is a great combination: know were you are going on moving nautical chart with superb waypoint, route, and track features and at the same time see your important marine instruments.

System Requirements and Recommendations

- Microsoft® Windows® 7, Vista, or XP Service Pack 3
- 500 MHz processor (1 GHz preferred)
- 512 MB RAM
- 10 MB free space on hard drive for Avia Sail application and related files; 850 MB free space recommended for general use of Windows and Microsoft® .NET 4 Framework
- Video display: XGA 1024 x 768 pixel resolution, 65,000+ colors
- Internet connection for download and activation of software
- Available USB port(s) and/or serial COM ports for GPS and instrument connections
- Optional: Virtual Serial Port for sharing data from a COM port with other software. Recommended: VSPE® from EterLogic http://www.eterlogic.com/Products.VSPE.html
- Optional: NMEA 2000 to PC adapter. Recommended: Actisense® NGT-1 Gateway http://www.fugawi.com/ngt-1

Examples of possible system configurations:

- A netbook without a DVD drive using an Intel® Atom processor running Windows XP SP3
- A Mac OS X Macbook® Pro running a well configured Windows Vista virtual machine
- Any typical desktop or laptop computer running Windows 7, Vista, or XP SP3

Software Installation

If you purchased online and downloaded Avia Sail, do this:

1. On your hard drive, find the **aviasail.exe** file downloaded earlier.
   Note: You may wish to backup the file by burning it to a CD-R disc.
2. Click **aviasail.exe** to run the installer.
3. If a Windows security prompt asks permission to run the software, click **Run**.
4. In the Installshield wizard, click **Next** then **Install**. An Internet connection may be required for some portions of the installation such as a possible download of the Microsoft .NET 4.0 framework.
5. Click **Finish** to complete the installation.
6. Launch the software using a desktop or Start menu short-cut for Avia Sail.
7. When prompted, enter your purchased serial number for Avia Sail.

If you purchased Avia Sail on a CD disc, do this:

1. Insert the CD disc into a compatible drive. Allow a few seconds to pass for AutoPlay to begin the automated setup.
2. If AutoPlay is not enabled, browse to the CD drive using Windows Explorer (**Start** button | **Computer** on Windows Vista and 7, **My Computer** icon on Windows XP). Then click on the **Setup** application (an **.**EXE file).
3. Follow the setup instructions, agree to the software license, and click **Finish** to complete the install. An Internet connection will be required for some portions of the installation process, such as the possible download and install of the Microsoft .NET 4.0 framework.
4. Launch the software using any desktop or Start menu short-cut for Avia Sail.
5. When prompted, enter any required license codes.

Frequently Asked Questions About Installation

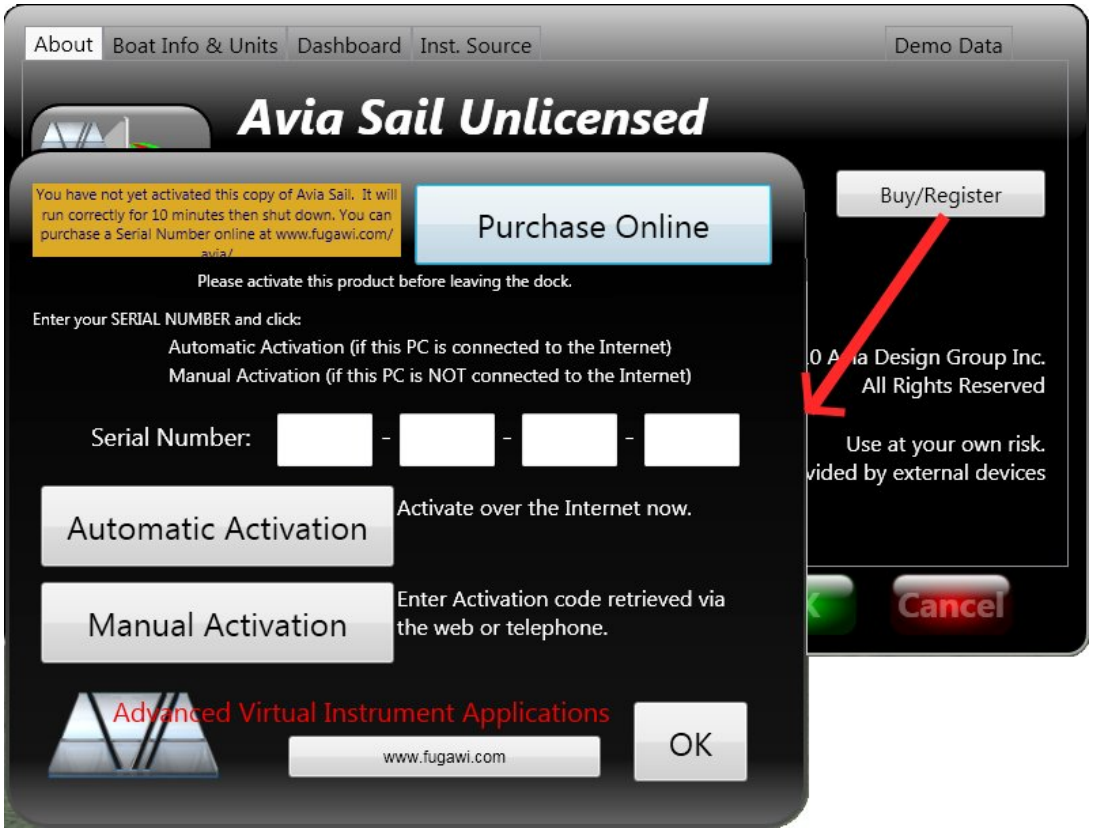
Q: Can I install the software on more than one computer?
A: Yes, you can install Avai Sail Pro on multiple computers within a network. The Master application alone is licensed, so only install and register it on the computer that connects to the boat's network. Avia Sail Pro installations in Slave mode receive data through the network from the Master.

Avia Sail Lite may be installed on a single computer.

Q: How do I uninstall Avia Sail?
A: Use your regular Windows program removal utility. On Windows 7 and Vista, click:
Start | **Control Panel** | **Programs and Features.** On Windows XP, use **Add/Remove Programs**.

Software Activation

In the Avia Sail **Setup** screen, **About** tab, click the **Buy/Register** button.



If you need to buy a software license, click the **Purchase Online** button. This leads to a Fugawi product information page with an **Order Now** link. Click that link and follow through with the shopping cart process. An e-mail with your license serial number will be sent.

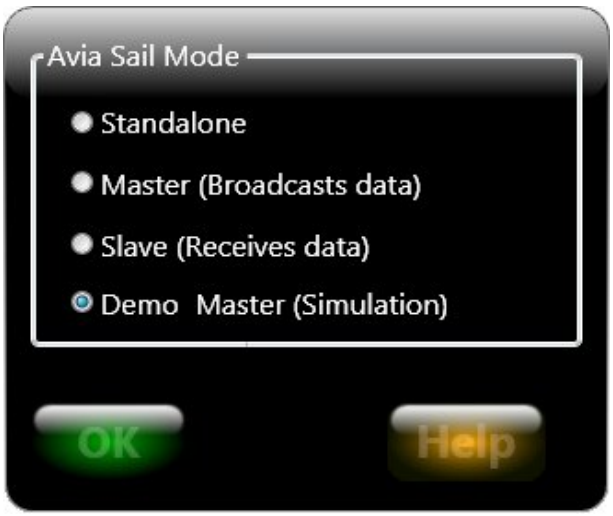
Once you have a serial number, enter it into the spaces into the input boxes. Then click either **Automatic Activation** if you have an Internet connection, or click **Manual Activation** if you need an alternate way to activate the software. To finish, click **OK**.

Frequently Asked Questions About Activation

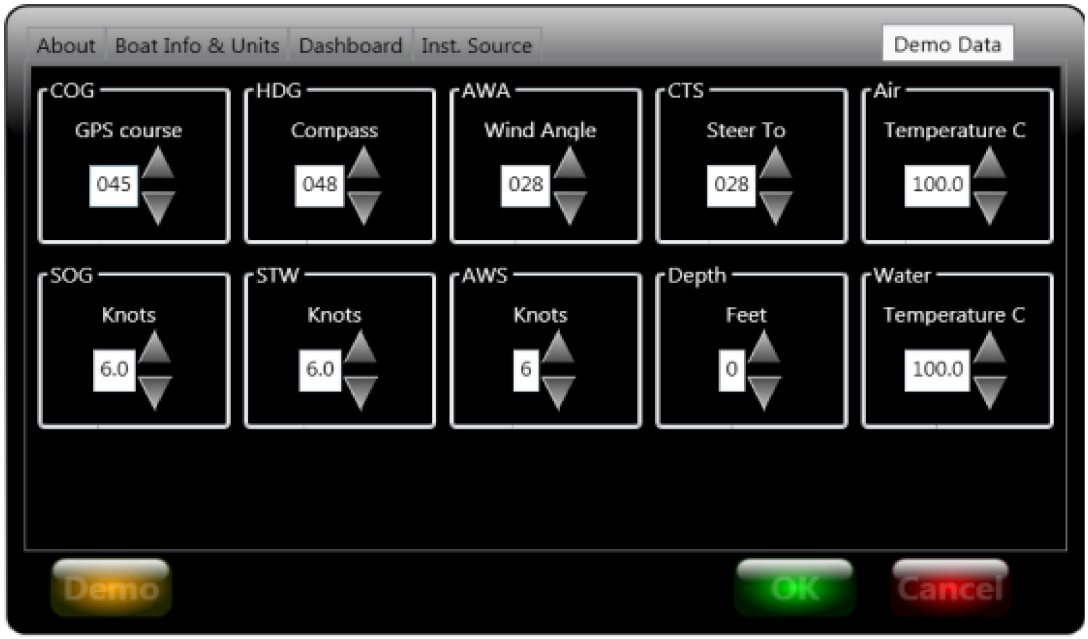
Q: I had to reinstall the software (either because my hard drive crashed or all software is moving to a new computer). How do I move the software and what do I do if my old license serial number is not accepted?
A: Please e-mail support@fugawi.com with a description of your situation. Include your software license code or Installation ID along with your full name, address, and telephone number. We will reply with your proper license code and/or follow-up information.

Using Avia Sail in Demo Mode

1. After launching Avia Sail, click the **Setup** button.
2. Click the mode button in the lower left corner which will be labelled one of **Demo**, **Slave**, **Master**, or **Standalone**.
3. From the list of data source options, select **Demo Master (Simulation)** and click **OK**.



4. Back on the start screen, click the **Demo Data** tab (upper right side).
5. Adjust any of the factors shown such as GPS course, wind angle, depth, etc. and click **OK**.

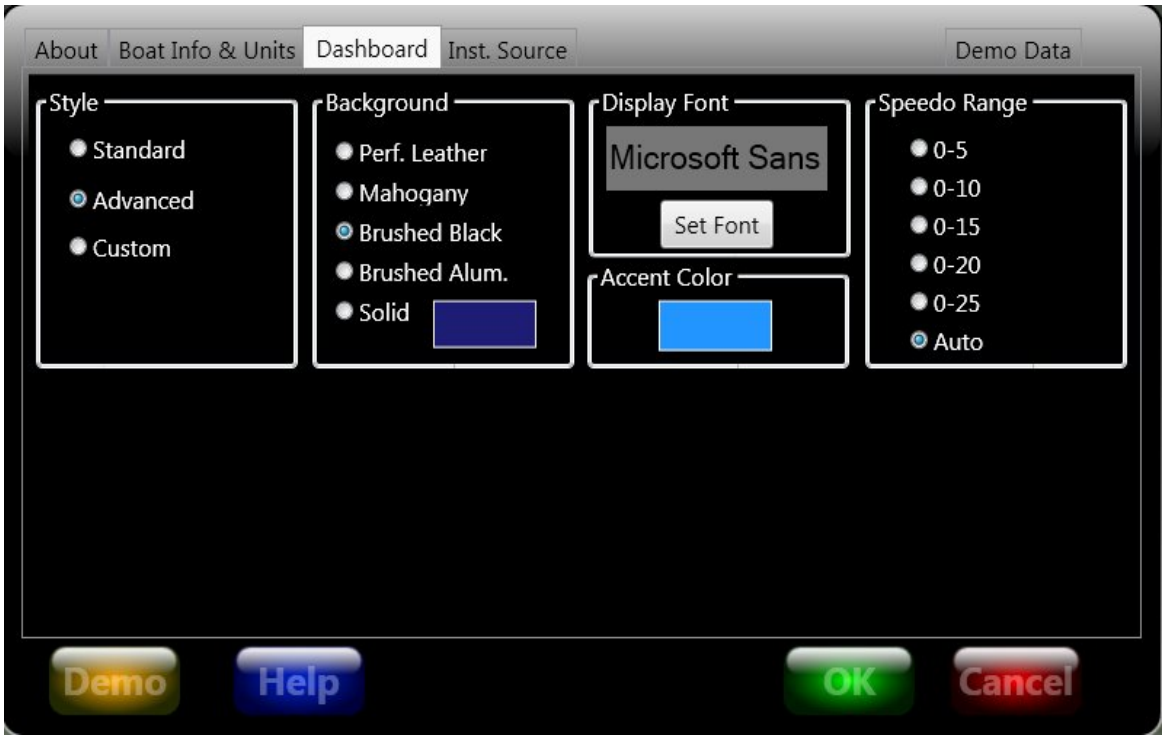


6. Optionally, select the **Boat Info & Units** tab, choose preferred measurement units, then click **OK**.
7. Click **GO** to begin learning the instrument panels screen in demonstration mode.

Dashboard Layout Setup Options

Avia Sail LITE always presents the Standard dashboard, there is nothing more to configure.

Avia Sail PRO has three options allowing you to change the look and functionality of the Avia Sail. On the Setup's **Dashboard** tab, in the **Style** box, select from **Standard**, **Advanced**, or **Custom**.



The **Standard** and **Advanced** dashboards are fixed instrument layouts. The Standard dashboard shows basic sailing instruments while the Advanced includes the Wind/Polar Gauge.

If you choose a **Standard** or **Advanced** dashboard layout in the Avia Sail setup, you can then choose a background texture or solid and choose its color. Click on the box showing the color to bring up a color selection dialog.

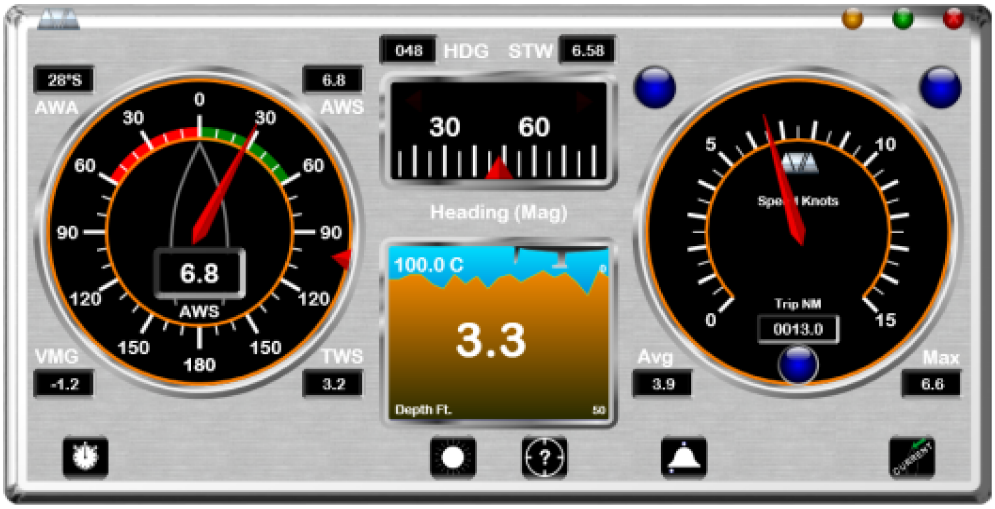
The **Set Font** button brings up a font selection dialog which controls what font will be used on the instruments. The default font is MS San Serif as we believe that a San Serif font is cleaner and looks better than serif fonts.

The **Accent Color** sets what color is used for the accent on some of graphical elements of the instruments.

The **Custom** dashboard allows you sophisticated control over what instruments are displayed, where they are displayed on the screen, and their size.

Standard Dashboard

The Standard Dashboard shows Wind Speed, GPS or Heading Compass, Depth Graph and the Analog Style Speed instrument. The dashboard may be moved by dragging it by the top bar or resized with the lower right hand corner. Help is accessed via the top left corner. On a touch screen, finger gestures substitute for the mouse cursor.

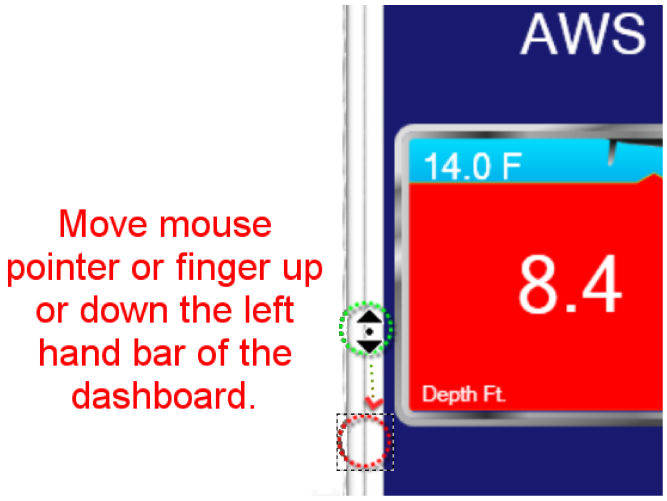


Advanced Dashboard

The Advanced Dashboard shows Apparent Wind Speed and Angle, Depth Graph, Digital Boat Speed (either SOG or STW), GPS or heading compass, Velocity Made Good, and the Wind Polar gauge. The dashboard may be moved by dragging it by the top bar or resized with the lower right hand corner. Help is accessed via the top left corner. On a touch screen, finger gestures substitute for the mouse cursor.

Standard or Advanced Dashboard Background

While actively using a dashboard, the background may be changed by dragging the mouse down the left side bar. On a touch screen, finger gestures substitute for the mouse cursor. Adjust the background according to personal preference and the light conditions on your computer's screen.



Tools Shared in All Dashboards

The dashboards include buttons for specific functions you may need to access quickly. The tools are summarized in the following table, and each tool is explained in more detail in its own Help section.

Press this button to set the shallow water depth alarm.	Press this button to start the countdown timer.
Press this button to toggle the dashboard between day and night illumination modes.	Press this button to access the instrument calibration function. This button will only be visible if you are connected to instruments.
Press this button to see the **"**Where Are We**"** page for a summary of basic information such as the time, the depth, and the current latitude and longitude.	Press this button to Show / Hide the water current gauge. Drag the panel to any location on the screen.

Shallow Water Alarm

Avia Sail includes the ability to alert you when entering water depths below a certain threshold. Set the alarm for the depth that you consider too shallow. You can either type the depth value in the field on the screen or use the up and down arrows to enter this value. Then check mark the **Alarm On** box which activates the alarm and click **OK**.

Then when your vessel goes in water less than the specified shallow water depth, the background of the depth instrument will be changed to bright red. When the vessel goes back in deeper water the red background will go away, effectively automatically resetting this alarm.

Note: This alarm is for shallow water settings only, the alarm can not be set for depths deeper than 50 feet or 20 meters.

Countdown Timer Tool

The countdown timer is an easy to use race start timer. It counts down from 5 minutes and allows for easy synchronization to the race committee signals. Once the race starts, the timer automatically disappears.

To operate the timer, simply press the stopwatch button on your dashboard, now you will see a large five minute timer overlaid across your screen.

Stopwatch: This tool is used to activate or turn off the stopwatch.

5 Min Start: This tool is used to start a five minute duration timer. Or if the timer is running, pressing this button will reset the timer to 5 minutes.

Sync button: The Sync button is used to align the timer with the start signals. If you did not quite start the timer at the 5 minute gun, simply press the sync button at the 4 minute flag and the timer will move to the 4 minutes mark. Pressing Sync moves the timer to the next closest minutes; so, for example, if you press Sync at 4:10 it will move the timer to 4:00, pressing Sync at 3:49 will move the timer to 4:00.

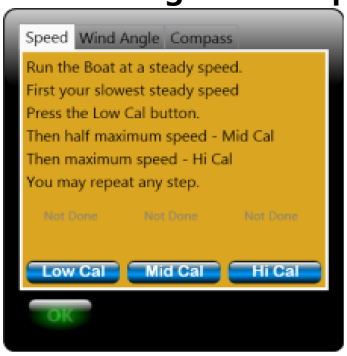
X button: This exit button is only shown on the Custom dashboard timer. It is used to remove the timer from the screen. The Standard and Advanced dashboards use the stopwatch icon for this function.

Instrument Calibration Tool

Avia Sail has functionality to very simply fine tune or calibrate your instrument readings for the most accurate results. If your instruments have their own calibration functions, we advise that you perform those steps before using Avia Sail's calibration. And if at any time you recalibrate your instruments then the Avia Sail calibration should be repeated.

There are three sensors that can and should be calibrated: Water Speed, Wind Direction and Compass. Calibrate only at slack tide or in an area with no current. A calm day is best. To determine if there is current, let your boat drift with no sails or power. If the GPS reading of SOG is equal to or less than 0.1 knot you should be acceptable to calibrate.

Calibrating Water Speed



Take your boat out and prepare to run it at three speeds: low, medium and fast. When you are running at the low speed and your boat speed is steady, press the low button, then repeat the process for medium and high speeds. If you are not sure you did this correctly, you can repeat this procedure at any time.

Calibrating Wind Angle

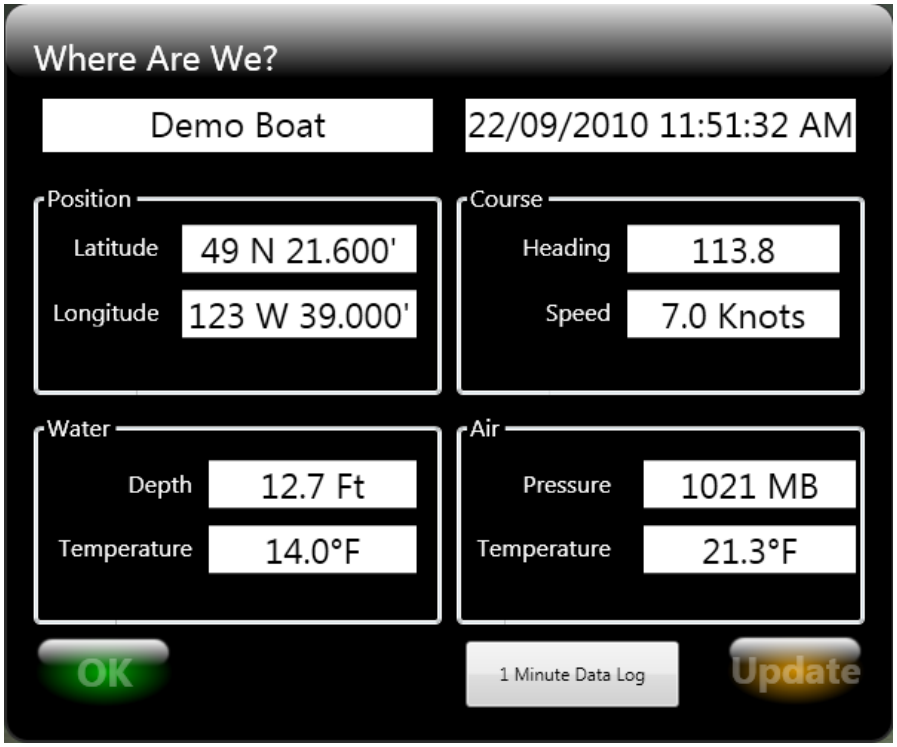
In relatively light but steady wind, or in no wind, motor your vessel directly into the wind. When you are confident that you are pointing directly into the wind, press the 0 button. Then, if you notice an error, press the **+** and **–** keys to make fine adjustments. You can repeat this procedure at any time.

Calibrating Compass Readings

Take your vessel out and turn it in two largish circles. When you begin the first circle, press the start button, when you finish the second circle the program will show a dialog to indicate the procedure is complete. If you are not sure you did this correctly, you can at any time repeat this procedure.

Where Are We? Tool

To get a quick summary of position, direction, and environmental conditions, click the **Where Are We?** button.



The data shown is a snap shot in time. If several seconds pass, you probably will wish to click the **Update** button to refresh all the numbers.

The **1 Minute Data Log** button saves a text file to your computer's hard drive at C:/Avia Logs.

Water Current Gauge

Clicking the **Current** button displays or hides the gauge for water current. The gauge panel may hover semi-transparently over the Polar Instrument panel initially, but you may drag it anywhere on the screen for separate viewing.

By comparing your speed through the water to your speed over ground, you can often determine that your boat is being impacted by water current, but is more difficult to tell the exact direction and strength of that current. This instrument will do that for you. It calculates the exact current direction and strength and shows it in simple terms.

The cyan arrow on the gauge shows the current direction and the numbers in the center of the gauge show the current strength in the unit of speed that you selected in the Avia Sail setup. Current is calculated by comparing the GPS boat speed (SOG) and heading (COG) with the boat s heading (from the electronic or fluxgate compass), and the boat's speed through the water.

Note: This instrument requires that you have a GPS, a water speed sensor and an electronic (fluxgate) compass. Best results are obtained when the speed and compass sensors have been calibrated correctly.

Controls of the Custom Dashboard's Toolbar

The tool bar for the **Custom** dashboard can be set to appear at the top or side of your computer screen, as determined in the Dashboard tab of the Setup screens. While using Avia Sail in Custom mode, the tool bar auto-hides, showing only a thin margin along the edge of the screen. Make the tool bar fully accessible by bringing a mouse pointer (or finger, on a touch screen) near the top or side of the screen.

The tools common to all dashboards are shown: timer, where are we, illumination, alarm, calibration. Additional tools unique to the Custom dashboard are explained below:

	Press this button to add a new instrument to your screen, next to the last one added. It will be the same size and type of the previous instrument. To select a particular instrument from a menu, either right click or finger gesture up or down the right hand edge. This menu has whatever items were selected in the Custom Contents setup dialog.
	Press this button to remove the active instrument (the last instrument that you touched). If no instrument is active, then this button will be disabled. To enable it, simply touch the instrument you want to remove, then press the minus button. For the Custom dashboard, there must be at least one instrument; if only one instrument is shown, it can not be deleted.
	Press this button to set the arrangement of dashboard items as locked or unlocked. Keep the dashboard unlocked until the layout is exactly the way you wish. Keep in mind that the instruments will always stay on top of all other windows on your screen unless you minimize them. Locking the dashboard **"**secures**"** the dashboard so that instruments can not be added, removed or changed by mistake.
	The red arrow button is used to minimize the Custom dashboard so that you can get all the instruments off the screen and use other programs unhindered. When this dashboard is minimized, the Avia Sail toolbar will remain at the top of your screen. You can then move your mouse or finger to this area and reactivate (un-minimize) the dashboard.
	This button stops the Avia Sail application. **Note:** If you are running in Master Mode and sending data to other Slaves on your network or sharing sensor data with other programs, stopping Avia Sail will also stop this data feed.

Custom Dashboard

The Custom dashboard allows you to arrange exactly the instruments you wish to see positioned around any chart navigation software running, such as Fugawi Marine ENC.

In the Avia Sail setup **Dashboard** tab, select the **Custom** dashboard style. Then click on the associated **Custom Contents** button. Check mark the instruments corresponding to your available sensors.

Leaving all the instruments selected on this screen is not problem, but we advise that you select only instruments that you plan to use as it makes it easier to add instruments later and reduce screen clutter.

Moving a Custom Dashboard Instrument

When you move your cursor or finger to the top of the instrument you will see that part of the frame turns turquoise. Simply click and hold on that area to drag the instrument to a new screen location.

Changing a Custom Dashboard Instrument

To change an instrument you can either run your finger up or down the right edge or right mouse click on the right edge of the instrument. This pulls up a menu that allows you to then select the instrument. Note that this menu contains only the items that have been selected in the **Custom Contents** setup dialog.

Sizing a Custom Dashboard Instrument

Move your mouse pointer or finger to the bottom right corner of the instrument, a turquoise circle will appear. Click and hold that circle then move your mouse to size the instrument.

Instrument Help

Move your mouse pointer or finger to the top left corner of the instrument, an orange glow will appear with a question mark in the middle of it. Press to access help specific to that instrument.

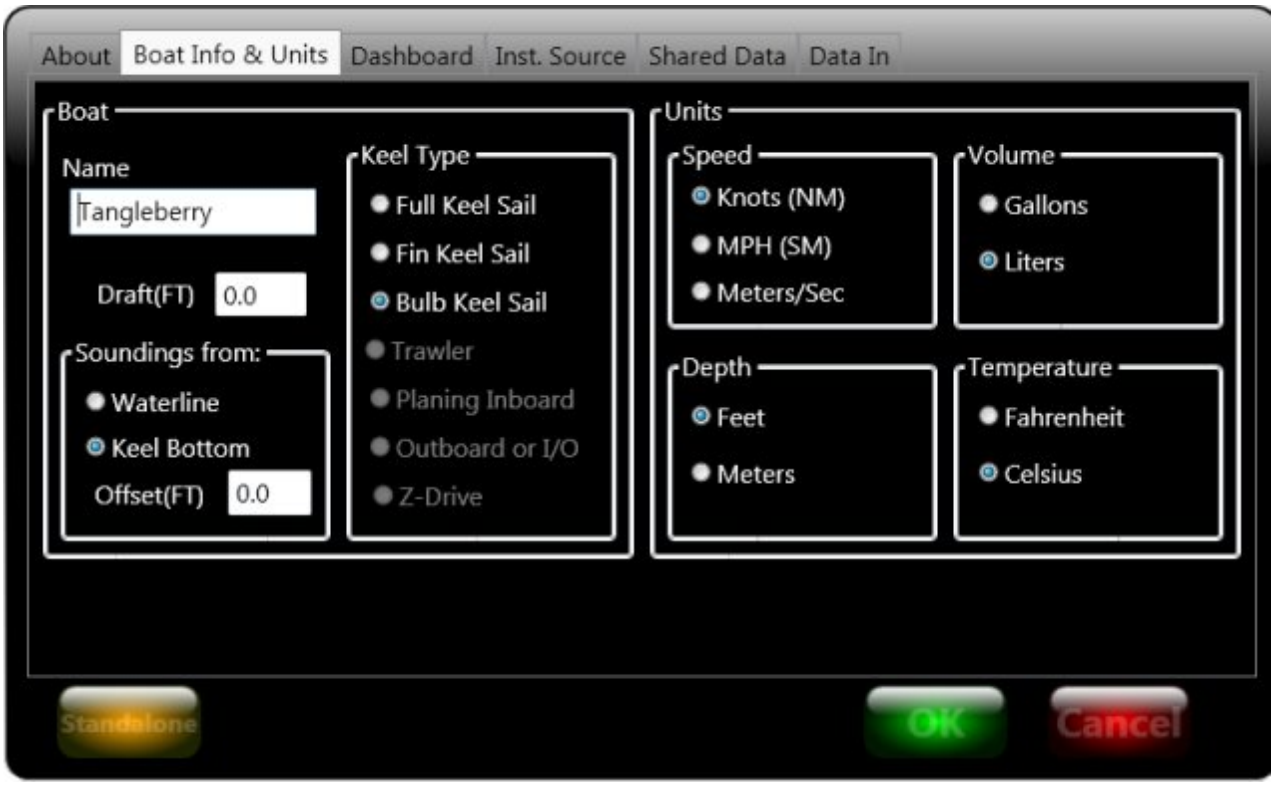
Layout as You Like, Then Lock It

Here is a typical example of a Custom dashboard with instrument panels surrounding and partially overlapping the window of a chart navigation software.

When you are satisfied with the layout of instruments, move the mouse point to reveal the Avia Sail tool bar and click the Lock icon.

Boat Information and Measurement Units

In the Avia Sail setup, **Boat Info & Units** tab, you may custom configure Avia Sail to understand some of the properties of your boat.



The Boat Information is used in the Where Are We? tool and for the Depth Instruments. The boat properties fields on this screen are only active when in Standalone, Master or Demo Mode. A computer running Avia Sail in Slave Mode gets all this information from the networked computer running Avia Sail in Master mode.

In **Name**, enter a boat name. In the **Draft** box enter the draft of a ship's hull. The draft is the vertical distance between the waterline and the bottom of the hull (keel), with the thickness of the hull included.

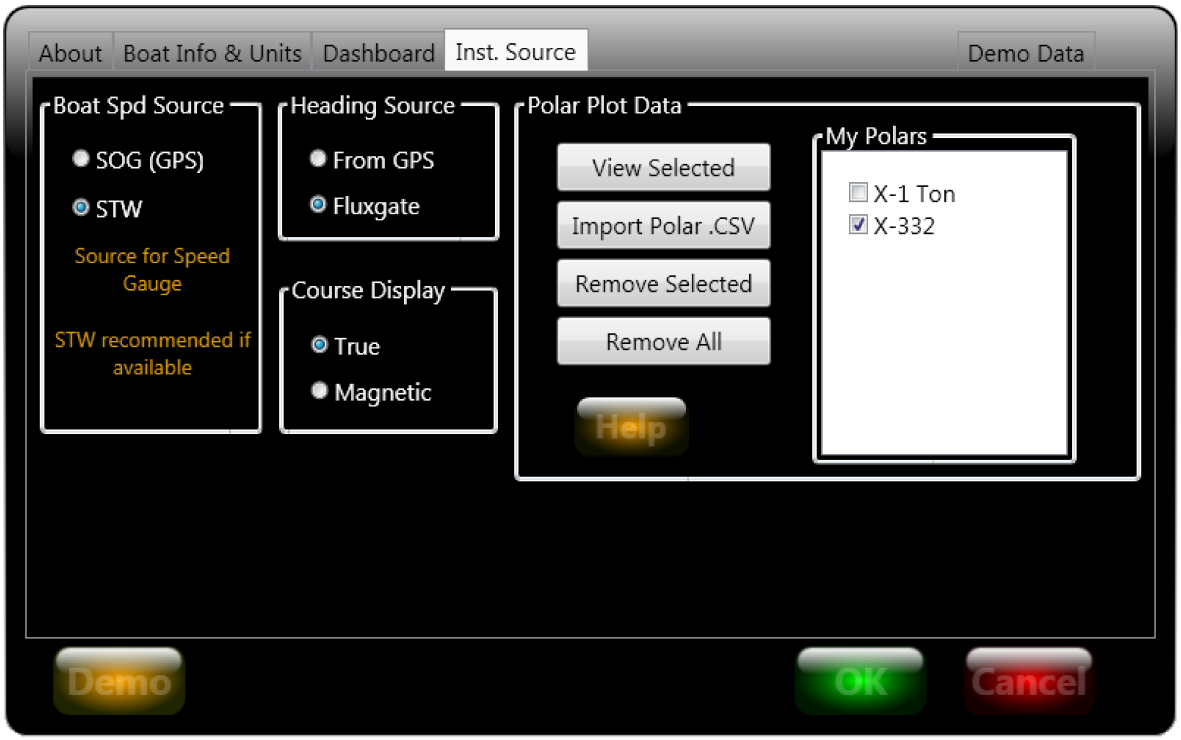
In the **Soundings from** box, select **Waterline** or **Keel Bottom**, then enter your sounding sensor's offset distance. If you are using instruments with their own displays they may have settings for keel draft and sensor offset. In that case you should leave Avia Sail settings for draft and keel offset at 0. That should result in the same reading as you other instruments. Please verify that the readings are the same.

From the available list of **Keel Type**, select the geometry of keel your boat has.

The **Units** selection controls what units of measure are displayed on the instruments and instantly changes units as shown in setup screens. The speed units (**Knots**, **MPH**, **Meters/Sec**) are used for both wind and boat speeds.

Instrument Source Setup

In the Avia Sail Setup, **Inst. Source** (instrument source) tab, you can configure for various instruments.



There are three decisions that you need to make regarding instrument sensor source selections: (1) the boat speed source, (2) the heading source, and (3) the course to display.

Boat Speed Source: This selection is used for the Speedometer display. It should be set to **STW** (Sailing True Wind) unless you do not have a speed sensor, in which case it can be set to **SOG** (Speed Over Ground). TWS (True Wind Speed) and TWA (True Wind Angle) are also calculated using these values and they represent the wind over the water, as opposed to wind over the deck.

Heading Source: This selection allows you to control whether the compass controls on the Advanced and Standard dashboard use the heading **From GPS** (Course Over Ground) or from the **Fluxgate** compass.

Course Display: This setting controls whether the compass instruments show degrees **Magnetic** or degrees **True**. The Variation factor is obtained from the GPS.

The Instrument and Sensor Data Panels

As instrument and sensor data is fed into the computer, Avia Sail updates its data panels. If an instrument or sensor is disconnected or malfunctioning, Avia Sail's data panel will not update displayed data.

The data panels available to different dashboards are:

- **Ambient Temperature –** Custom
- **Barometric Pressure –** Custom
- **Compass (GPS) –** Standard, Advanced, Custom
- **Compass (Heading) –** Standard, Advanced, Custom
- **Depth Graph –** Standard, Advanced, Custom
- **Digital Depth Gauge –** Custom
- **Heel Indicator –** Custom
- **Analog Speed Dial –** Standard, Custom
- **Digital Speed –** Advanced, Custom
- **Velocity Made Good –** Advanced, Custom
- **Water Temperature –** Custom
- **Analog Wind Dial –** Standard, Advanced, Custom
- **Digital Wind –** Advanced, Custom
- **Polar Plot and % Efficiency –** Advanced, Custom

Each of these panels is explained in the sections that follow.

Ambient Air Temperature

The Ambient Air Temperature Instrument shows the current air temperature. Temperature is shown either in degrees Celsius or degrees Fahrenheit depending on selections in the Avia Sail setup. This instrument is only available in the Custom dashboard, and assumes you have a sensor that reads air temperature and it must be a NMEA 2000 sensor.

Barometer

The Barometer Instrument shows the current atmospheric pressure in millibars. This instrument is only available in the Custom dashboard, and then only if you have a sensor that reads barometric pressure. This sensor is only available in NMEA 2000.

GPS Compass

This instrument receives its data from your GPS. At the instrument's center is a dial representing your heading using Course Over Ground (COG). When navigating to an active waypoint, a red arrow either to the right or left indicates which way you need to steer to stay on track. No red arrows indicate you are on course.

The corners of this instrument show four numeric indicators:

- **COG –** Course Over Ground: Magnetic or True, as configured in the Avia Sail setup.
- **SOG –** Speed Over Ground
- **CTS –** Course to Steer
- **XTE –** Cross Track Error: Distance your vessel strays from the proper route between two waypoints.

Heading Compass

This instrument receives most of its data from your fluxgate compass. At the center is a card showing your current heading according to the fluxgate compass. This heading is in either degrees Magnetic or True, as configured in the Avia Sail setup.

The upper corners of this instrument show:

- **HDG** (a numeric representation of what is shown on the compass card)
- **STW** (Speed through the Water).

Course Over Ground Digital Compass

Shows Course Over Ground (COG) in degrees as determined by your GPS.

Depth Graph

The depth graph instrument depicts the last 20 seconds of the bottom contour. The large number in the center of the instrument is the current depth in the units that you selected in the Avia Sail setup. The upper left corner of the panel shows the water temperature, assuming you have a water temperature sensor.

The right hand side of the display shows the scale. The scale is fixed at either 0-50 feet or 0-20 meters (depending on your depth units configured in the Avia Sail setup). If the shallow water alarm goes off the bottom color of this instrument is changed to red. The boat's keel type shown on this graph is also configured in the Avia Sail setup.

Digital Depth Gauge

The digital depth gauge shows the water depth the units you selected in the Avia Sail setup. If the shallow water alarm goes off the background color of this instrument is changed to red.

Heel Indicator

The Heel Indicator Instrument shows the horizontal heel of your vessel in degrees from vertical. This instrument is only available in the Custom dashboard, and then only if you have a sensor that reads heel. This sensor is NMEA 2000 only.

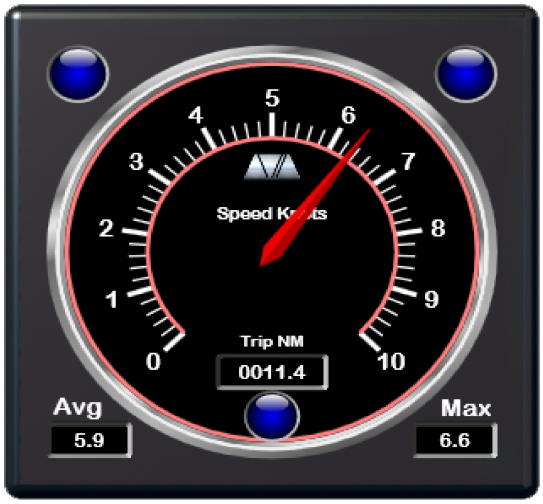
Analog Style Speed Instrument

This Speed gauge shows boat speed as either SOG (Speed Over Ground) or STW (Speed Through Water) as selected in the Avia Sail setup. The speed units are also configured in the setup.

The scale is either fixed i.e. 0-10 knots or variable, as selected in the setup. A fixed scale will always remain the same allowing you to gauge boat speed by the position of the needle, while a variable scale will occasionally change based on the boat's speed. The variable scale has the disadvantage that you always have to read the scale to know the speed, but the advantage that your speed scale are much more precise at lower speeds.

In addition, this speed instrument shows three numeric values: **Max** (maximum boat speed), Avg (average speed), and **Trip NIM** (trip distance) in the center of the dial. There are three blue buttons on the gauge used to reset these fields. Hover your mouse above the button to show text describing the button's function.

Note: The trip distance value shows the distance travelled during the current trip, this data is held at the Master or Standalone computer. Avia Sail in Slave mode will display the trip distance, but the trip distance can only be reset at the Master. If you shut down the master program the trip distance will be saved and redisplayed when you restart the program, but it is not updated while the program or computer are off.



Digital Speed Instruments

Avia Sail has two digital speed gauges, one shows Speed Over Ground (**SOG**) the other shows Boat Speed Through the Water (**STW**).

Velocity Made Good (VMG) Instrument

The VMG display shows velocity made good relative to the wind. This instrument is very handy for "round the buoy" racers who are on courses heading directly up or downwind.

The VMG instrument shows a positive number when you are beating to windward (upwind), and a negative number when you are going downwind. As a helmsman your job is to maximize the absolute number to ensure you are sailing at your optimum. For example if you are sailing upwind and the VMG is showing values like +3.7 and +4.1, you want to optimize your course to be at or above the +4.1 reading. And, if you are going downwind and seeing values like -6.2 and -5.7 you want to optimize your pointing to get the VMG reading at the -6.2 value.

Boat Speed Through the Water (**STW**) is also presented beside **VMG**.

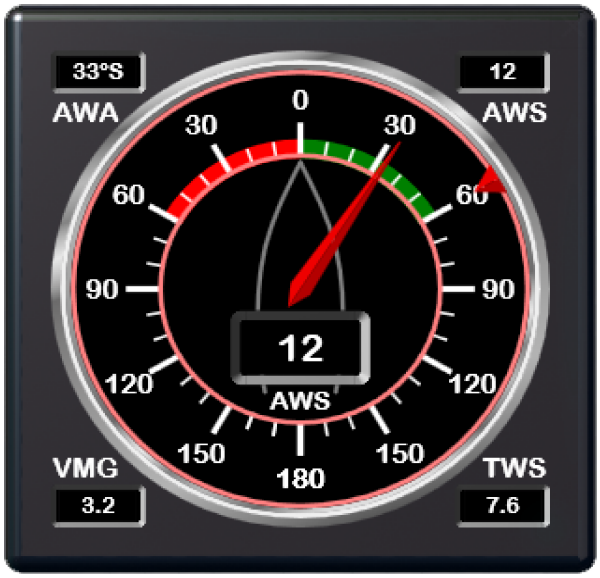
Water Temperature Instrument

The Water Temperature Instrument shows the current water temperature in either degrees Fahrenheit or degrees Celsius as defined in the Avia Sail setup. This instrument is only available in the Custom dashboard, and then only if you have a sensor that reads water temperature.

Analog Wind Instrument

This analog style wind gauge shows the apparent wind direction on the needle, while the red triangle on the outer ring shows the true wind direction. In the corners of the gauge numeric displays show Apparent Wind Angle (**AWA**), Apparent Wind Speed (**AWS**), Velocity Made Good (**VMG**), and True Wind Speed (**TWS**).

In the center of this panel there is a fifth numeric display which can show either AWA, AWS, VMG or TWS. Simply mouse click or touch tap on the center of the panel to change to the next type. This feature allows you to place what reading you consider most important in the center of the instrument.



Digital Wind Instruments

The digital wind instruments show the same data as the digital readouts: TWS, TWA, AWA, and AWS. The AWA and AWS instruments are shown on the Advanced dashboard, while the TWS and TWA instruments are only available in the Custom dashboard.

Note on True Wind: Many standard sailing instruments show True Wind Speed and Angle. These values are calculated from the Apparent Wind and Boat Speed. If STW (speed through water) is not available you can opt to use GPS SOG (Speed Over Ground) to make the calculation. This will give good results if there is little or no current, but a significant cross current will affect accuracy. When STW is used, True Wind really refers to wind over the water not wind over the ground. Wind over water is the wind you sail in, so it is the value to use when considering sail selection.

Wind Polar Plot Gauge

The Wind Polar Plot Gauge show your vessel's point of sail, the polar diagram (for the current wind speed), and indicates how the boat is performing against target speed.

The red lines on around the polar diagram are the boat s target speeds for the current wind speed. The concentric circles each represent 1 knot (or MPH or M/S) of boat speed.

The red triangle shows where the boat is currently performing. When the triangle is inside the red circular lines, your boat is performing less than its target. When on the line, it is at the target. When outside the lines it is above its target speed. Finally in the corner of the instrument a number will be displayed which compares the boat's performance to the boat s target performance. This number is shown in percentage. A percentage below 100 means you are below target, 100% means you are on target, and above 100% means you are above target.

If your Polar Instrument does not show a red circular line then you have either not selected a polar or you do not have one imported. See the section on how to Import a Polar Plot.

Zooming: If you click or touch anywhere on the diagram the gauge will zoom in showing just the current quadrant, touching again will zoom out to the full diagram.

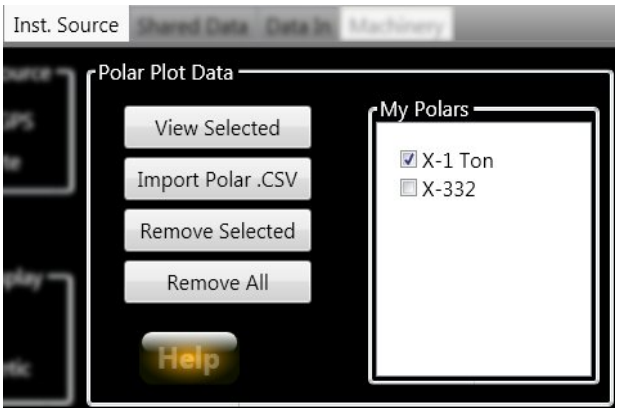
Selecting a Polar: If you right mouse click on the Polar panel you will see a list of polars that have been imported into Avia Sail. Select the polar you want to use and the instrument will start using this polar. This feature is used when you have different polars for different sail combinations and you have changed sails.

Percentage Efficiency Gauge

The Efficiency **% of Target** digital instrument is simply a display of the target percentage number shown on the Wind/Polar plot instrument. Some users prefer to see this instrument on its own. This instrument is only available in the Custom dashboard.

Managing and Understanding Polars

In the Avia Sail setup, **Inst. Source** (instrument source) tab, you may manage Polars.



One of Avia Sail s more sophisticated instruments is the Wind/Polar Gauge. This instrument shows what point of sail your vessel is on, the polar diagram calculated to the current wind speed, current boat speed relative to the current polar and a numeric display of what percentage of the target speed you are attaining.

A Polar Speed Diagram (or often called Polar, or Polar Plot) is a diagram that is typically developed by the boat designer or manufacturer. The diagram shows the optimum predicted or target boat speeds for various wind strengths and points of sail. Most boats have one polar showing predicted speeds for common sets of sails (Main, Genoa and Spinnaker). Some race boats have many polars, one for each sail combination.

If you do not have a polar plot for your boat we recommend you research the class of your boat on the manufacturer's web site; or you can try the site www.blur.se/boats or the US Sailing site.

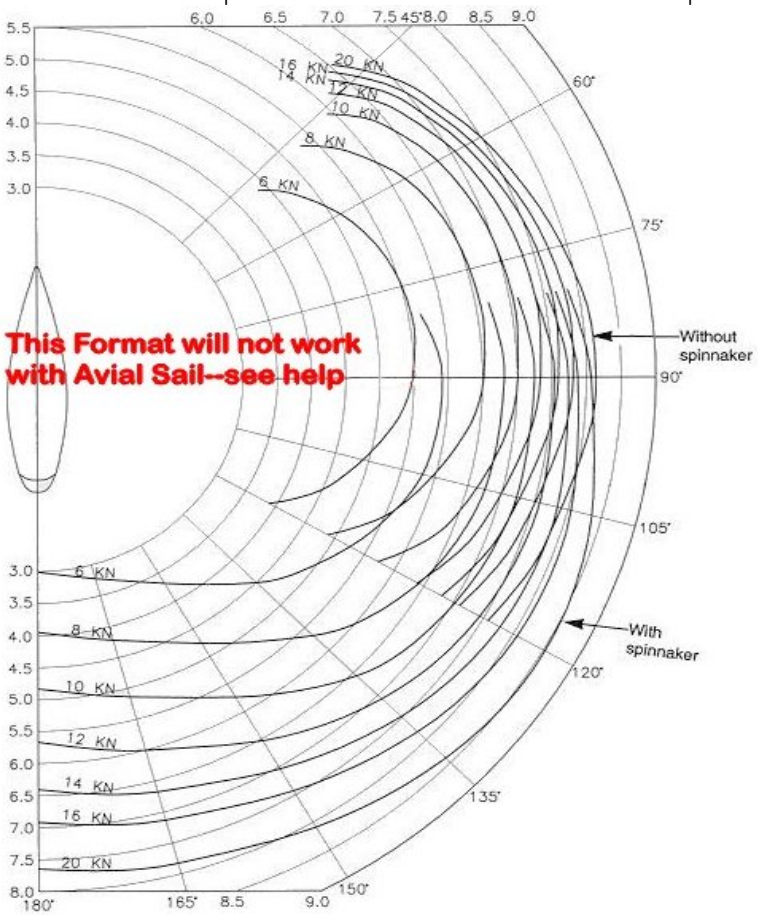
Importing a Polar

To import a Polar Plot, click on the **Import Polar .CSV** button, and select your CSV file from the file open dialog. For Avia Sail to understand your CSV file you must tell it what fields are for True Wind Speed (TWS), True Wind Angle (TWA) and Boat Speed Through the Water (STW). Avia Sail will show the headers it found in your CSV file in the column label list. You need only select the header it found then click the corresponding button **TWS**, **TWA** or **STW**.

Now select the speed units your Polar Plot uses (meters per second, miles per hour, or knots), then press the Go button. Finally you will be asked to enter a name for your Polar. If you plan to use different polars for different sail combinations or sea conditions we recommend that you use a name that will remind you what this polar will be used for. Once you have named your polar it can be renamed in Windows file explorer. Polar files are found in C:/Avia Polars and have the .PLR file extension.

Note: Avia Sail stores the Polar information locally to the computer displaying the instruments. This means that if you are running Avia Sail in a Master/Slave configuration you need to import the Polar information on each Slave as well as the master. Fortunately this only has to be done once as this information rarely changes once it is set up.

Some boats have polars that cannot be imported for use with Avia Sail. An example is illustrated here:



The illustrated polar shows two different sail combinations on the same diagram and overlapping. Avia Sail does not support overlapping targets (two targets for the same point of sail and wind strength). If your polar looks like this we recommend that you either build two polars (one for main and genoa and one for main and spinnaker) or that you build one polar with a bump on the curve where it changes from genoa targets to spinnaker targets. A polar with a bump on the curve is actually easier to use as it will nicely show you when you should start to fly your kite.

Viewing and Managing your Polars

Once you have imported a Polar you will see it in the **My Polars** list. If you select the check box next to the name and press the **View Selected** button you will see a graphic representation of that polar.

Incorrect or unneeded Polars may be removed by clicking either the **Remove Selected** or the **Remove All** button. Removing a polar will not delete the .CSV file, but it does delete the .PLR file from C:/Avia Polars.

Connecting GPS, Instruments, Sensors, Multiplexers

This section is an overview of how to connect your instruments and sensors (the “talkers“) so they stream data into your computer's input ports from which Avia Sail (the “listener“) reads the data and presents it on the computer screen. Obviously we cannot be there with you to do the wiring but this guide will give you an idea what to do. If necessary, get assistance from someone skilled in marine electronic installations to help you with the hardware connection details.

First, make a list of all the talkers you have and how they output data. The User Guide of your sensor hardware will tell you if the output is older NMEA 0183 or networked NMEA 2000®.

Second, make a list of what you have to connect these talkers to a computer. Do you have a NMEA Multiplexer? A serial multi-port to USB adapter box? Other data cables?

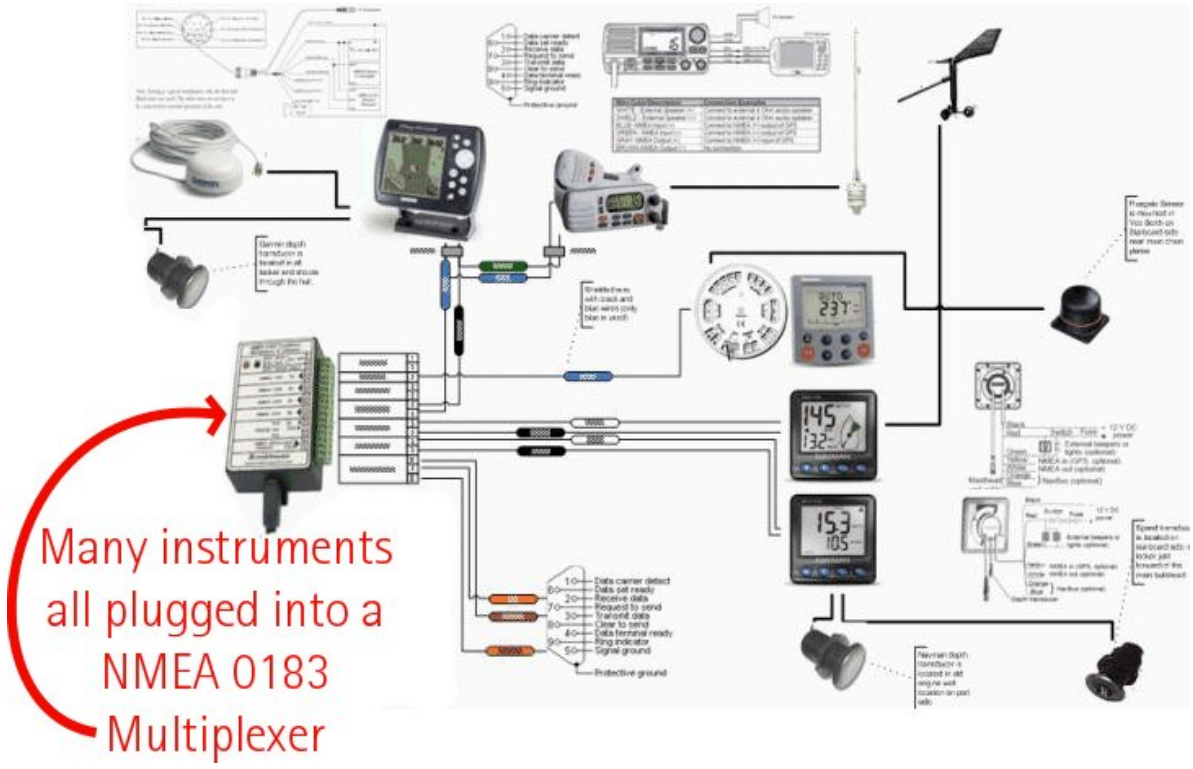
Based on these lists, read over one or both of the following sections on NMEA 0183 and NMEA 2000 connections to your computer. These sections will give you the essential ideas needed to fill in any gaps in your hardware inventory and then link everything together into Avia Sail.

NMEA 0183 with a Multiplexer

The best solution for unifying all the inputs from your NMEA 0183 talkers is with a NMEA Multiplexer. You plug in your various sensors into a single Multiplexer box. Some cables will plug in directly, others may require a special adapter. You will know what is needed by comparing the cable's plug-in end with the hardware ports in the Multiplexer. Also, consult the User Guide of your Multiplexer.

The Multiplexer buffers all the different inputs then sends the data to a PC as a single stream. Multiplexers may be purchased that connect with a serial cable (RS-232 or RS-422) or a USB cable.

If you have a lot of sensors and cables to consider, you may wish to sketch out a diagram something like the one below which combines inputs from GPS positioning, a chartplotter, water temperature, keel position, wind sensor, and other elements.



If you do not have a multiplexer, consult a trusted marine hardware dealer. Tell the dealer what NMEA 0183 sensors you have, what kind of ports your computer has (old serial DB-9? USB ports? Bluetooth®?) and get purchase advice based on your needs. Some Multiplexers have a USB connector as an optional add-on. So make sure you get a Multiplexer with all the features you need. A reliable brand name is Actisense®. See: http://www.actisense.com/HTML/Products/NMEA%20Interfaces/NMEA_Multiplexer_4/index.php

Note: Many Raymarine® chartplotters use Seatalk®, a proprietary protocol developed by Raymarine. Seatalk is not the same thing as NMEA, however you can purchase Seatalk to NMEA converters. Some Multiplexers will take both NMEA 0183 and Seatalk inputs and convert them to one NMEA 0183 output.

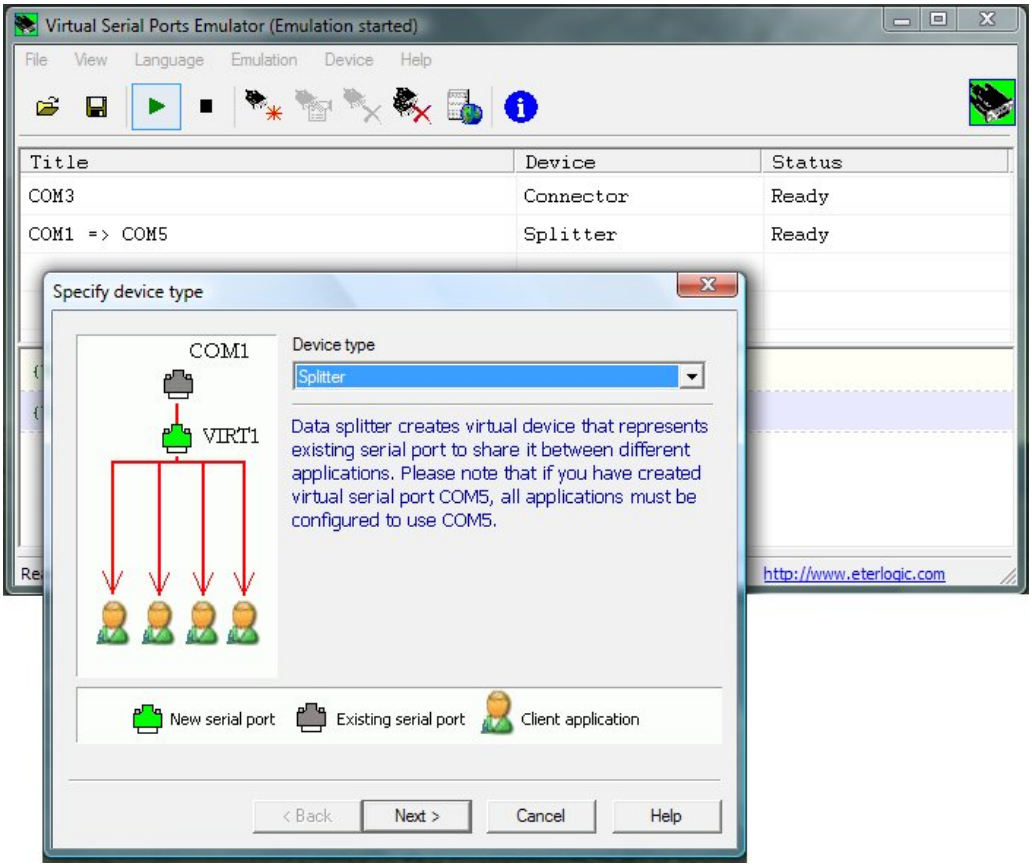
NMEA 0183 with a Serial-to-USB adapter

If you have a small number of talkers, you may use a Serial multi-port input to USB output adapter. These range in price depending on the number of serial ports and product quality. These adapters are generally found at computer equipment retailers / online stores. For example, see: www.usbgear.com/USB-Serial.html
Note: If you have a 64-bit edition of Windows, make sure your adapter has compatible drivers for it.

Virtual Serial Port Software

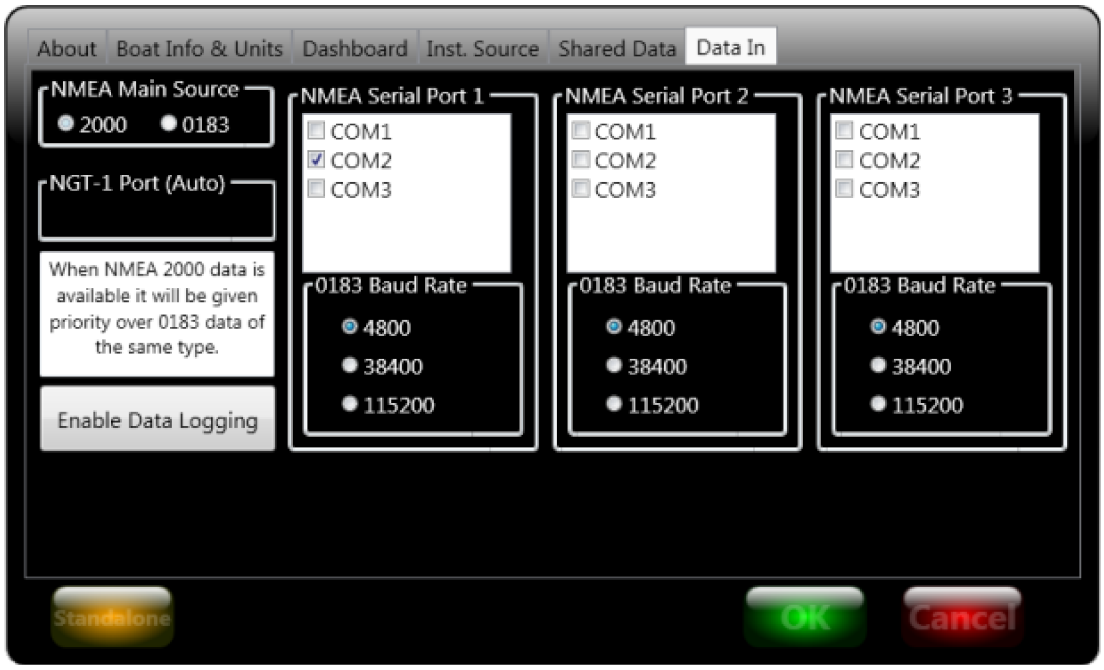
Most new computers have no hardware based serial COM ports, so data is received via USB cable. As a consequence, a virtual serial port must be present to convert the incoming data stream from USB to standard NMEA. Any quality virtual serial port software is acceptable, but the one we recommend is VSPE® from EterLogic. See: www.eterlogic.com/Products.VSPE.html

Read the help files of VSPE to understand the software in detail. In summary, what you do is click the menu **Device** | **Create**, then step through the device wizard to make a **Splitter** or perhaps a **Connector** depending on your technical needs. Make a note of whatever COM port number you set as virtual (ex. COM 6 may be a good choice). This port will send data out at a speed of 4800 baud to Avia Sail or other software. To start the virtual serial port, select it and click the **Start Emulation** (play) button.



NMEA Serial COM Port in Avia Sail Setup

When launching Avia Sail, slick the **Setup** button, then select the usage mode as either **Master** or **Standalone** mode (as opposed to **Slave** or **Demo**). Then select the **Data In** tab.



If your computer has physical or virtual COM ports, those COM ports will show in the NMEA Serial Port lists. Select the COM port(s) your instruments connect with, then select the baud rate. For NMEA 0183 the standard baud rate should be set to **4800**, except for AIS and some Multiplexers which use **38400** baud.

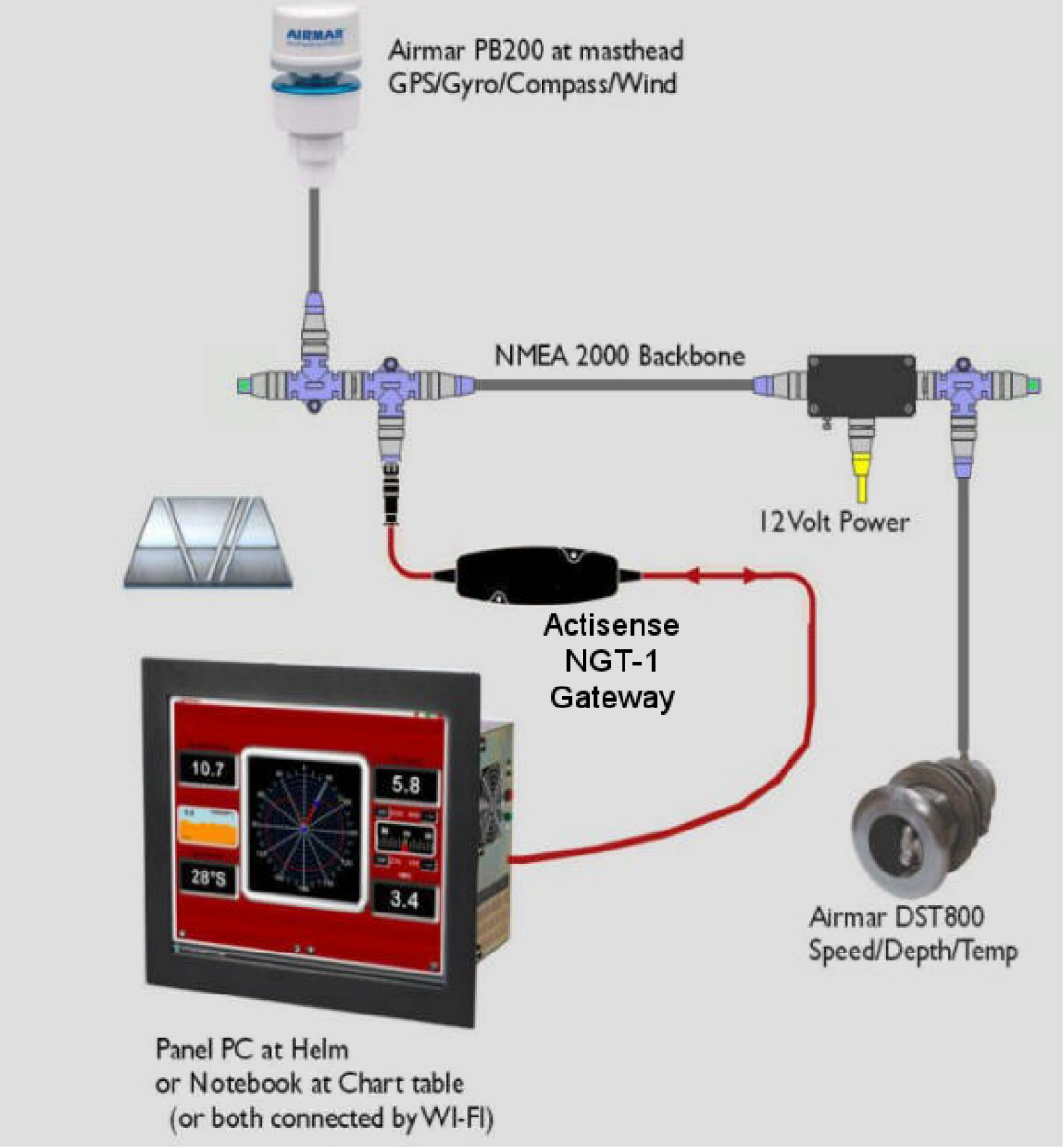
Note: If you are connected to a NMEA 2000 network via an Actisense connector, it will be automatically detected and there is no need to set it up.

If you have both NMEA 2000 and NMEA 0183 data feeds for the same sensor (ex. your chart plotter outputs NMEA 2000 which includes depth readings and you also have an older water speed/depth instrument sending NMEA 0183 data) then Avia Sail will give priority to the NMEA 2000 sensor. In other words, in the example given, the depth data from the speed/depth sensor will be ignored.

NMEA 2000

Unlike NMEA 0183 where each sensor must have its own serial connection or a multiplexer must be used, NMEA 2000® uses a network that all sensors are connected to. Avia Sail simply needs to connect to this network.

Fortunately connecting to the NMEA 2000 network is straight forward. We recommend a device called the Actisense NGT-1 gateway that connects your computer to the Network via a USB port. Purchase the Actisense NGT-1 from a trusted marine retailer and then use it to link your NMEA 2000 network to your computer via USB port. An example hardware configuration is shown below; your particular configuration will vary.



About the Actisense NGT-1 Gateway

The Actisense® NGT-1 Gateway is the preferred choice for use with Avia Sail. See www.actisense.ca.

Read the Actisense USB Driver Installation Manual first. It instructs you how to install the required drivers for Windows 7, Vista, or XP. Troubleshooting suggestions such as deleting and updating the drivers is included. Only after the drivers are installed should you plug the NGT-1 into your computer's USB port.

There are two Actisense drivers: (1) a Serial Converter that transforms USB data into a serial data stream, and (2) an Actisense USB Serial Port which creates a virtual COM port.

To see the Actisense virtual COM port in the Windows Device Manager, click **Start** | **Run...** and enter: **devmgmt.msc** (or launch Device Manager in other ways depending on your version of Windows). If you see a yellow circle with an exclamation mark beside the virtual COM port, this indicates the Actisense drivers need to be reinstalled.

In the Avia Sail setup, **Data In** tab, any detected and functioning NGT-1 Gateway will be shown and automatically used to receive data from NMEA 2000 instruments.

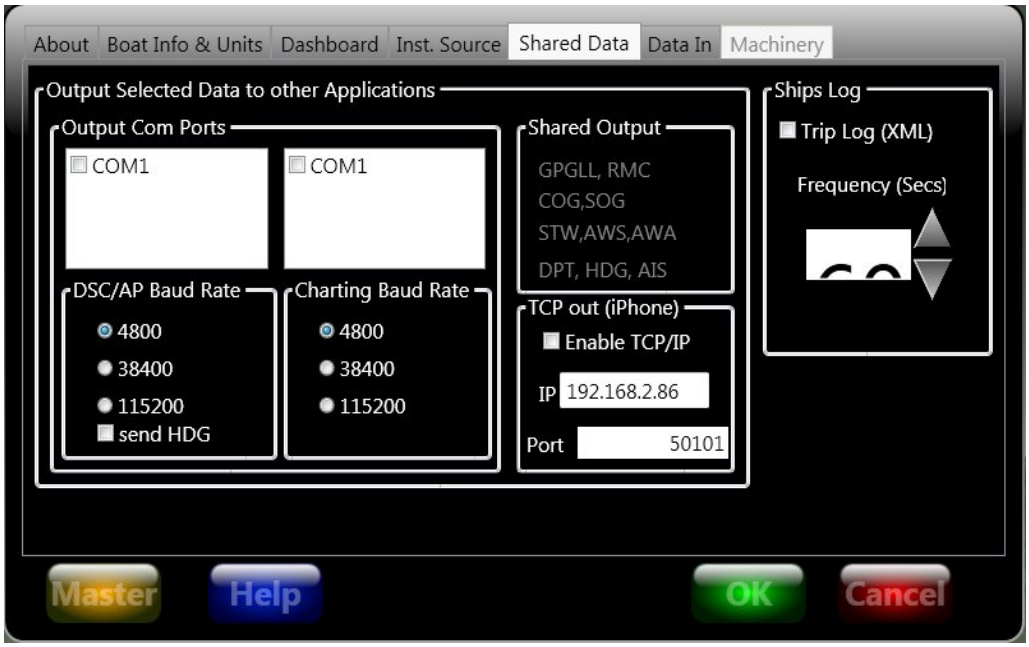
If you purchased your Actisense NGT-1 Gateway through a USA dealer, get detailed support by telephone at +44 1202 746682 or e-mail support@actisense.com. If you purchased through www.actisense.ca or a Canadian dealer, please contact support@fugawi.com or telephone +1-416-920-9300 ext 2.

Sharing Data with Fugawi Marine ENC

Avia Sail allows you to share instrument sensor data with Fugawi Marine ENC or other software on the same computer as Avia Sail. A technical challenge is that the two programs both need access to the same data feed (COM port), but Windows will not allow two programs to access the same port. The solution is to set up Avia Sail so that it passes this information on to the other program through a virtual COM port.

To set up a virtual COM port we recommend the free product Virtual Serial Ports Emulator (VSPE) available at http://www.eterlogic.com/Products.VSPE.html. (There are similar products that may also work.) Download and install VSPE, then click the menu **Device** | **Create** to make a connector. Choose an available COM port number. Do not check the **Emulate Baud Rate** option. Save the settings as a .vspe file in a known location (ex. C:/Avia Polars/) and create a shortcut to the file on the desktop. We recommend adding it to your startup menu so it runs each time the computer starts. There are instructions for this on the Eterlogic web site.

On the Avia Sail **Setup** page, **Shared Data** tab, select the COM port you just created in VSPE.



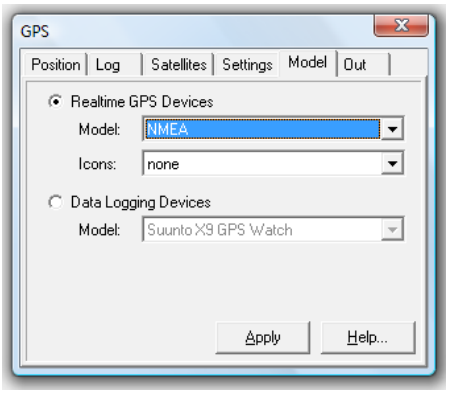
Avia Sail will then pass the sensor data to the selected COM port as NMEA 0183 data. This also means that your Fugawi Marine ENC or other navigation software, which may not support NMEA 2000 data, can still receive navigation data since Avia Sail acts as a NMEA 2000 to 0183 data converter in this context.

Note: The data output function sends data out in NMEA 0183 format, however only GPS values are translated from 2000 to 0183. This means that if all your sensors are NMEA 0183, they will all be output. However, if all your sensors are NMEA 2000 then only NMEA 0183 sentences will be output.

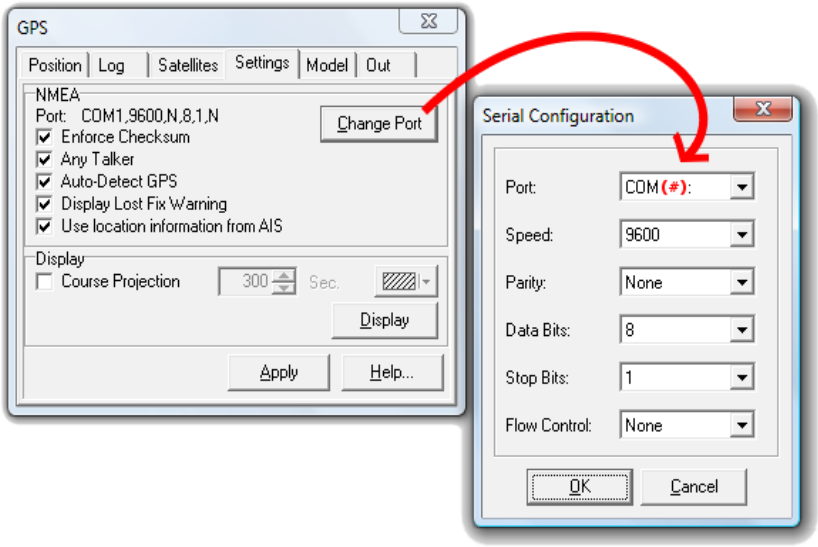
This feature does not necessarily have to be used with a virtual COM port. For example, you might want to output data to a physical device or instrument. Perhaps you have a NMEA 2000 network with sensors and you want to send position data to your DSC VHF that does not communicate with NMEA 2000. In this case you can use Avia Sail to export out of a physical COM port and wire that COM port to your VHF.

Receive NMEA 0183 Data in Fugawi Marine ENC

In Fugawi Marine ENC (updated to the most recent version), click the menu **GPS** | **Settings**.
On the **Model** tab, set the Model drop-down list to **NMEA**. Then click **Apply**.



On the **Settings** tab, click **Change Port**.



Set the **Port** to whatever virtual COM port Avia Sail is forwarding NMEA 0183 data through. The COM port number will vary. Then click **OK**, then **Apply**. You are now ready to use Fugawi Marine ENC with Avia Sail.

Sharing Data with Other Navigation Software

In your GPS navigation software, look for a setup / configuration option labelled something like NMEA 0183 IN or COM PORT SETTINGS. Such a menu should let you assign the virtual COM port shown in Avia Sail to the navigation software, after which data will be shared. Of course there are many third party navigation programs on the market and Fugawi's support is limited. If you need detailed help, consult the Help screens, User Guide and e-mail / phone support of your navigation software.

Sharing Data with iNavX on iPhone or iPad

iNavX is an iPhone or iPad app which can display data obtained from a ship's instruments via a Wi-Fi network. It is a full featured chart plotter which can also display data such as boat speed, depth, wind speed and direction and much more. It is available on the iTunes® App Store. Also see www.inavx.net.

Avia Sail is the best source of your boat's sensor data, and if you have NMEA 2000 instruments it may be the only source for use with iNavX. That is because only Avia Sail translates both NMEA 2000 and NMEA 0183 data into a format iNavX can use.

Your on-board PC must have a Wi-Fi adapter for this to work. If you have a router, and a password setup, first get the iPhone or iPad connected to the boat's wireless network. If you have no router, set up an Ad Hoc network using the Windows Control Panel's Networking utility (instructions for Windows 7 / Vista / XP are found on the iNavX help page http://www.inavx.com/help/Avia/AviaSail-iNavX.htm). The steps, in brief, for Windows 7 and Vista are:

1. If necessary, install a wireless network adapter according to manufacturer instructions.
2. Click **Start** button | **Connect To**.
3. Click the link **Set up a connection or network**.
4. Select **Set up an ad hoc (computer-to-computer network)**.
5. Click **Next**, then follow the steps given by the wizard.

Note: It is recommended you select the wizard option to make this ad hoc network permanent so you may easily use it again in the future.

Avia Sail has a built in TCP/IP server which serves the above data in NMEA 0183 streaming format to iNavX and other programs which can connect that way. The settings are found in the Avia Sail setup dialog under Shared Data. Just check mark the **Enable TCP/IP** box, and record the IP and port shown there. You can change the port if you want to, but the default port 50101 is normally unused for other purposes.

Make sure Avia Sail is running in Master, Standalone or Demo mode and is configured as above.
Note: You cannot configure the TCP/IP server in Demo mode, but you can do it in Master mode then switch modes.

On the iPhone or iPad, launch the **Settings** utility. Tap on the Wi-Fi Setting and connect to your boat's network. Once successfully connected, start iNavX. Scroll down the start page until you see **Settings**, tap it, then tap **TCP/IP NMEA client**.

Enter the **Host IP** you recorded from Avia Sail and the **Port** number. Enable **Reconnect Upon Unlock** and then set the **LINK** button to **ON**. If the link is successful it will stay on. Go to the iNavX instruments panel and verify that data are present.

You are now ready to use iNavX with Avia Sail.

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Fugawi Technical Support

Product features and other details at: www.fugawi.com/avia

Support services are available Monday to Friday, 9am to 5pm EST.

E-mail support: support@fugawi.com

Telephone support: +1-416-920-9300 extension 2

Product Activation

Product Key:

Serial Number:

Keep this information in a safe place.
You will need it to re-install the software anytime in the future.

Distributed By

FUGAWI™
KNOW WHERE YOU ARE GOING

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MAN-AVS-EN, October 4, 2010