User Manual

INDEX

1. CONTEXT

1.1. Object of this document

The object of this document is to introduce users to EasyWind Tokyo edition and how to use its components, available features and functions, in order to ensure a correct and optimised management of the product.

1.2. Introduction to EasyWind

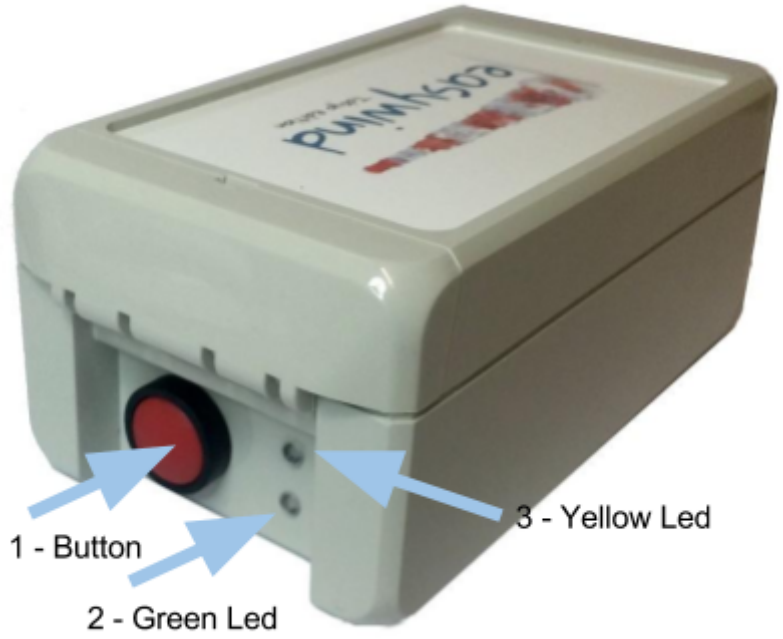
EasyWind obtains wind conditions information from an ultrasonic meteorological sensor, and displays it in a user friendly web interface, accessible by portable devices such as mobile phones and tablets via a wireless network.

2. COMPONENTS

		
Ultrasonic Wind sensor	**Reception Unit**	**Data / Power Connection Cables** ✓ Power cable. ✓ Data cable

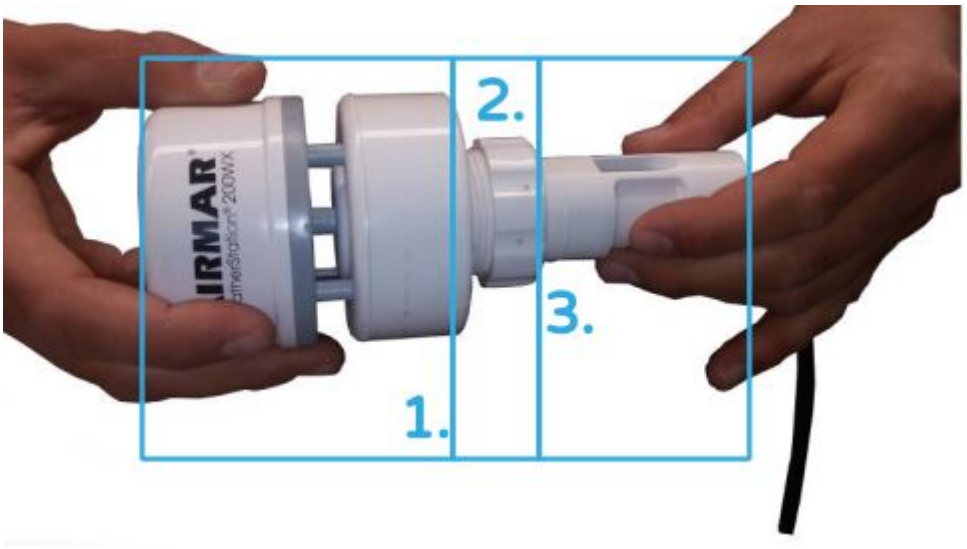
3. DETAILED COMPONENTS

EASYWIND RECEPTION UNIT



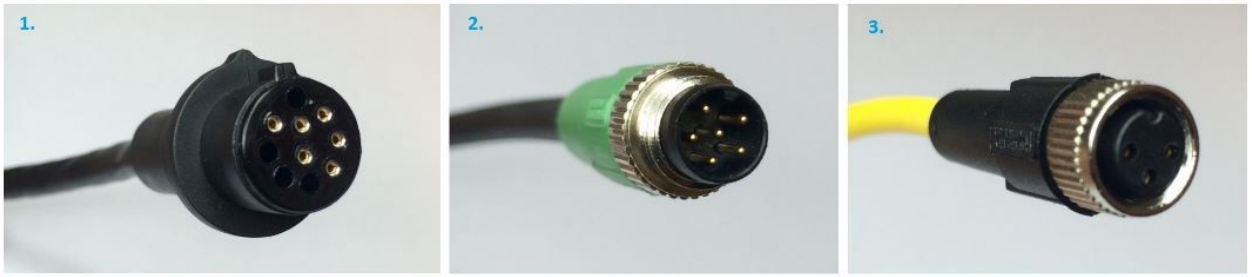
1. *Button: check the manual for its behaviour*
2. *Green led: Power up led. If light on the unit is powered on.*
3. *Yellow led: Status update, check the entire manual for behaviour*

EASYWIND SENSOR



1. *Ultrasonic sensor.*
2. *Sensor nut.*
3. *Base.*

DATA / POWER CABLE CONNECTORS



1. *Power/data connector to sensor.*
2. *Data connector from reception unit to sensor.*
3. *Power connector from reception unit to support boat.*

4. INSTALLATION

4.1. Sensor connection

1. Unscrew sensor base from sensor.
2. Pass power connector to sensor through the sensor base.
3. Connect power connector to sensor.
4. Screw sensor base to sensor.

1. 	2. 
3. 	3. 

4.2. Sensor placement

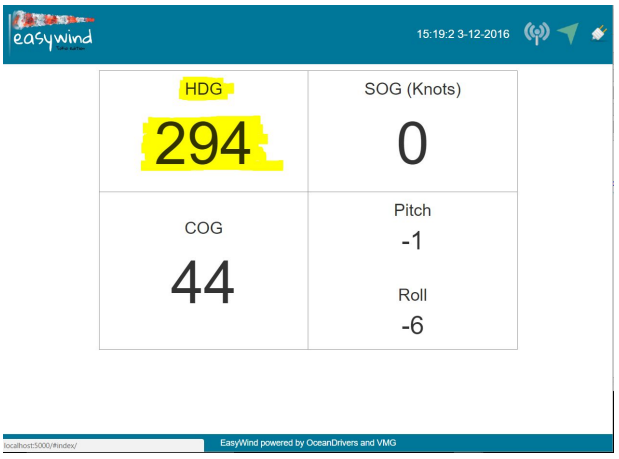
1. **Fix the sensor base upon a wind mast in the support boat.**

   ***The recommended mast high is 2.5 - 3 meters above sea level. Depending on the motor boat that is placed could be higher. It is important the wind sensor has clear view to the wind**

2. **IMPORTANT: Make sure the sensor dent exactly matches the bow of the support boat.**
3. **IMPORTANT: In order to ensure this, once EasyWind is connected and working, GOTO the BOAT CONDITIONS MENU, and, check that the boat's heading (not COG) matches a manual compass reading or known bearing.**

2.

3.



4.3. Reception unit connection

1. Connect data cable to reception unit, make sure the cable dent exactly matches with connector. (To fix the connection, screw on the cable tie)
2. Connect power cable to reception unit, make sure the cable dent exactly matches with connector. (To fix the connection, screw on the cable tie)
3. Connect power cable to support boat (12 Volts) using a 1Amp fuse*.

*Please note that 1Amp fuse is required between Reception Unit and Support Boat Power for overcurrent protection.

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 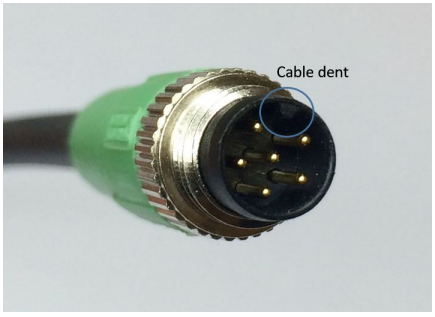
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 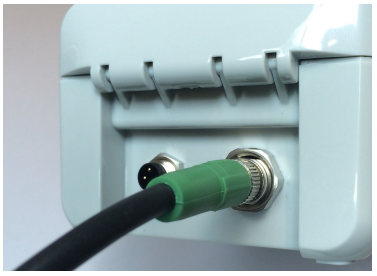 </td></tr>
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 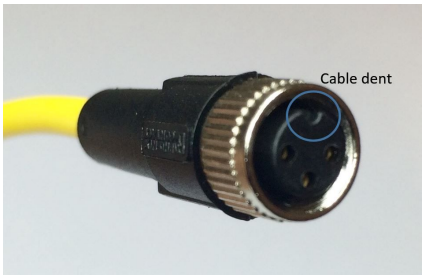
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 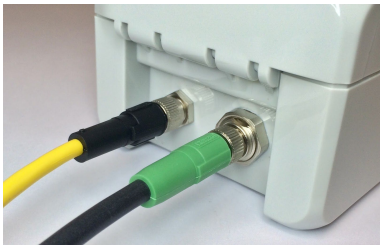 </td></tr>
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 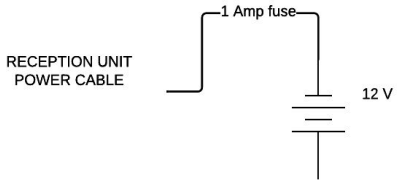
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Damages to the system due to a missing fuse (such as overheating or fire) will NOT be covered by warranty.

EasyWind compass within the wind sensor should be calibrated and ready to use when acquired, however, if it the sensor has undergone non usage periods and/or heavy transport conditions, it may require a calibration procedure.

5. SAFE POWER OFF

The unit has a safe power off. It is important to not corrupt the database of the unit.

- **Press the button for 3 seconds.**
- **You will see one blink in yellow per second.**
- **When you see 3 blinks release the button**
- **The unit will respond with 3 quick blinks.**
- **The yellow led will be lighted and fixed until it is safe to stop the unit.**
- **When the yellow led stops it is safe to unplug the power cable from the reception unit.**

6. USAGE RECOMMENDATIONS

Please follow the below recommendations for an optimal usage and results:.

- ✓ **Before starting to use your EasyWind product, read the full EasyWind manual carefully and refer to your EasyWind support team in case you have any doubt regarding how to use EasyWind.**
- ✓ **Misuse will not be covered by EasyWind's Support Team or any warranty.**
- ✓ **Always ensure you perfectly close your EasyWind Reception Unit while carrying out samples with the cable connected.**
- ✓ **When using EasyWind, please ensure you are stopped, or under a constant speed and direction; else, the sampling may be affected, and the average values altered!**
- ✓ **For security reasons, and to prevent other EasyWind interferences, change WIFI name and password before first use. Please beware sharing EasyWind passwords, as it may cause a network overload and/or confusion with samples. NOTE WELL YOUR NEW EASYWIND NAME AND PASSWORD BEFORE MODIFYING THE SETTINGS.**

7. SETTING UP EASYWIND BEFORE YOUR FIRST SAMPLE

RECEPTION UNIT + PORTABLE MOBILE / TABLET DEVICE

1. **Ensure your reception unit is connected to power.**
2. **Connect to EasyWind WIFI network using your smartphone or tablet.**

   Once the reception unit has been powered, the wifi network may take from 15 to 60 seconds to show up.

   This time may vary according to the smartphone or tablet which is being used.
3. **In your browser, GOTO URL 192.168.42.1**
4. **GOTO menu option SYSTEM CONFIGURATION.**
5. **Within the SCREEN OPTIONS, revise the following settings are according to your needs:**
   - ✓ **WIND SPEED UNITS.**
   - ✓ **MAGNETIC DEVIATION.**
   - ✓ **TIME ZONE.**
   - ✓ **REAL-TIME STATS VISUALIZATION SETTINGS.**
6. **Within the MANAGE IDENTIFIERS toggle, please give your EasyWInd an ALIAS NAME (write on the text field, and click on the UPDATE BUTTON to save).**
7. **Change your WIFI NETWORK name and password (Do not forget to save your settings!).**
   - ✓ **DEFAULT WIFI NAME: *PROVIDED IN YOUR EASYWIND DELIVERY NOTE*.**
   - ✓ **DEFAULT WIFI PASSWORD: *easywind*.**

NOTE WELL YOUR NEW EASYWIND NAME AND PASSWORD BEFORE MODIFYING THESE SETTINGS!

In order to make effective your new wifi settings, you will need to POWER OFF and POWER ON your reception unit and reconnect to your new wifi network, with the new name and password.

YOUR EASYWIND EQUIPMENT IS NOW READY TO PROVIDE YOUR FIRST SAMPLES!

7.1. Conventions and default values

- ✓ **1 SAMPLE = N Measurements.**
- ✓ **TIME = UTC.**
- ✓ **WIND SPEED DEFAULT UNITS: m/s.**

8. ACCESS EASYWIND

Your EasyWind software is available via your web browser, through your EasyWind wifi network at the following URL: 192.168.42.1. You will be able to access your EasyWind website via any tablet mobile device or PC with a wifi connection module. Follow the below steps to access EasyWind:

1. **Power ON your Reception Unit.**
2. **Connect to EasyWind WIFI network using your smartphone or tablet.**
3. **In your browser, GOTO URL 192.168.42.1.**
4. **Welcome to EasyWind!**

9. SOFTWARE

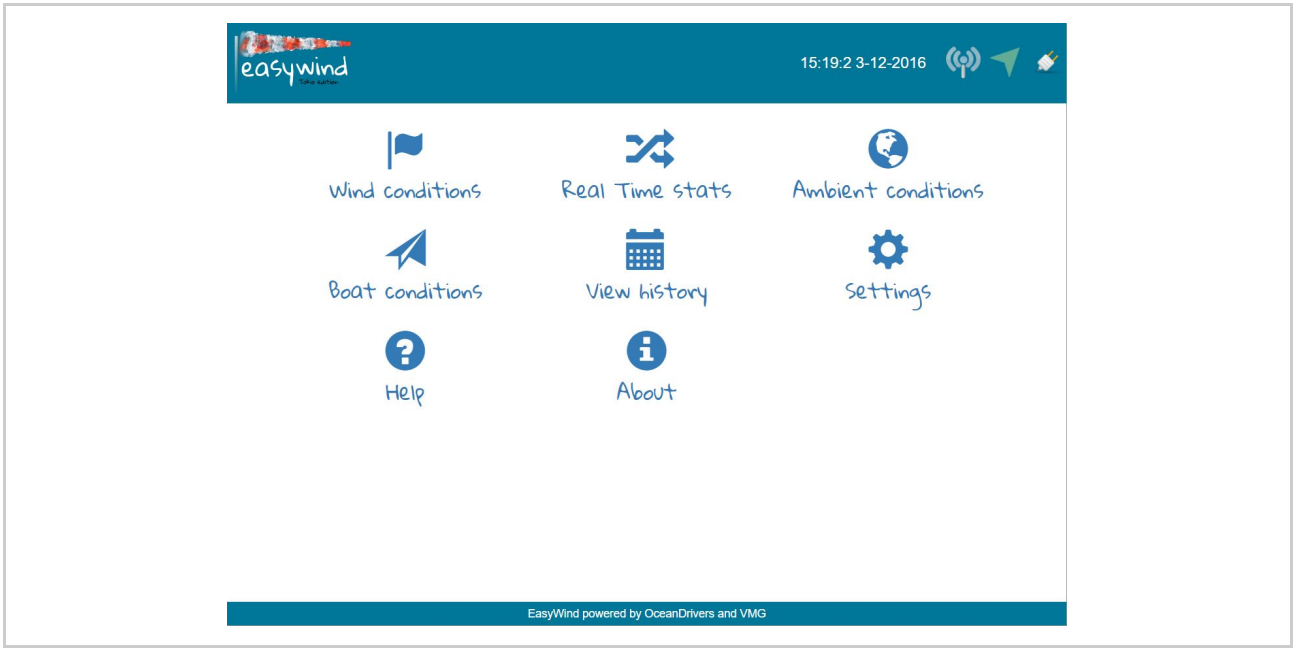
9.1. Availability

Your EasyWind software is available via your web browser, through your EasyWind wifi network at the following URL: 192.168.42.1. You will be able to access your EasyWind website via any tablet mobile device or PC with a wifi connection module.

9.2. Sections

EasyWind Website main menu consists of the following options; each of them will be further detailed in this user Guide:

- ✓ **WIND CONDITIONS** — Displays numerical values regarding real-time measurements.
- ✓ **REAL TIME STATS** — Displays statistics regarding real-time measurements.
- ✓ **AMBIENT CONDITIONS** — Displays real-time ambient conditions measurements.
- ✓ **BOAT CONDITIONS** — Displays real-time boat conditions.
- ✓ **VIEW HISTORY** — In order to view your past EasyWind session calendar.
- ✓ **SETTINGS** — Configuration parameters.
- ✓ **HELP** — Help with EasyWind.
- ✓ **ABOUT** — Learn more about EasyWind project.

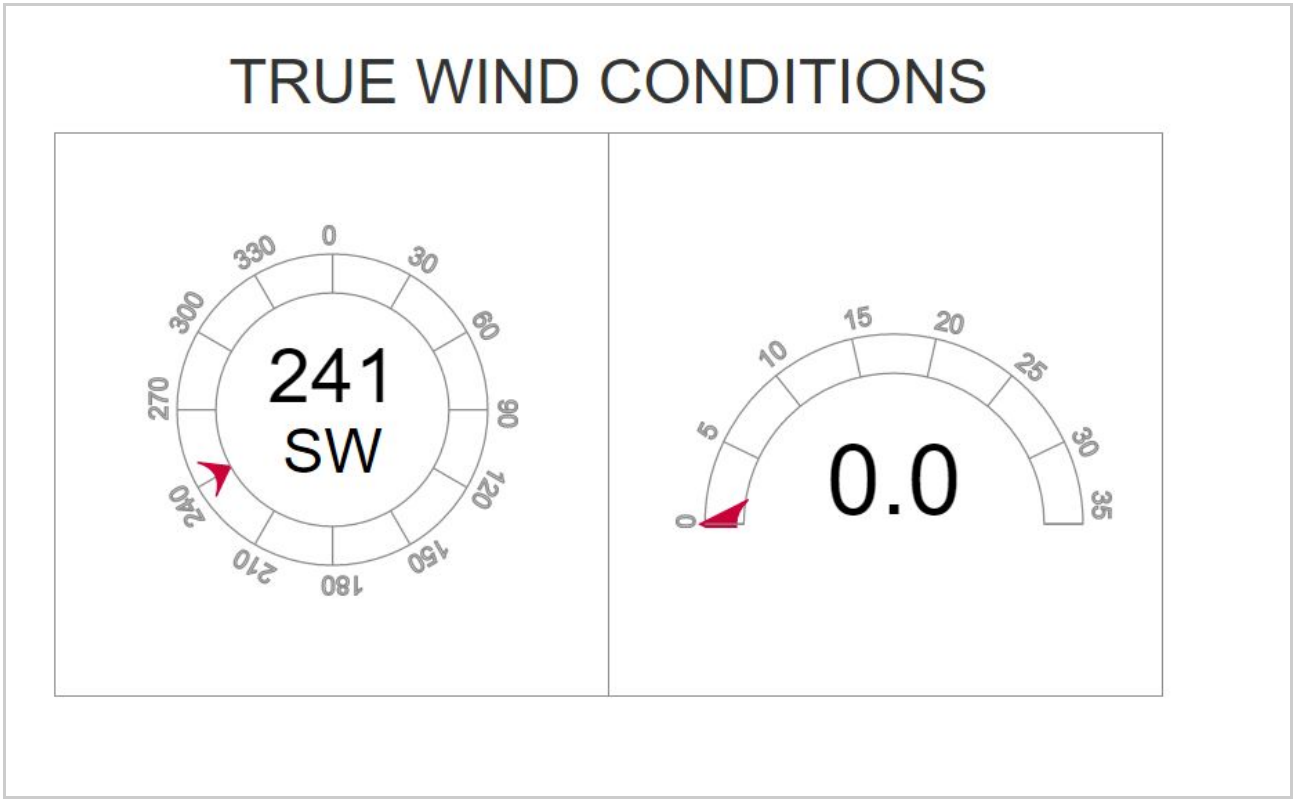


TIP! *Clicking on the top bar at any of the windows and sections always returns the user to the index menu page.*
The wind sensor AUTOMATICALLY CONNECTS to the RECEPTION UNIT, and a connection icon is displayed at the right hand-side of the top bar. If displayed connection icon is disconnected, please click on it to connect manually.

9.3. Wind conditions

This window has been designed to display real-time wind conditions:

- ✓ **WIND DIRECTION ANGLE: In degrees.**
- ✓ **WIND CARDINAL DIRECTION: Cardinal direction.**
- ✓ **WIND SPEED: Units can be configured from the SYSTEM CONFIGURATION SECTION.**



9.4. Real-time stats

This window has been designed to display real-time wind statistics via a graphical display.

9.4.1. Time Selector

Exclusive toggle buttons which enable the user to choose 5 measurements time-windows. Default times are 1' / 5' / 10' / 15' / 30', these can be modified according to the users needs via the SYSTEM CONFIGURATION SECTION:

- ✓ **1' : Displays wind measurements for the last minute.**
- ✓ **5' : Displays wind measurements for the last 5 minutes. DEFAULT VALUE.**
- ✓ **10' : Displays wind measurements for the last 10 minutes.**
- ✓ **15' : Displays wind measurements for the last 15 minutes.**
- ✓ **30' : Displays wind measurements for the last 30 minutes.**

NOTE: The web application may take longer in loading larger time-frames due to the amount of managed data.

9.4.2. True Wind Direction Relative to Mean

Graphical display for wind direction relative to the mean value, which will enable users to view the wind direction change trends in time.

SCIENTIFIC NOTE

The mean value is calculated as a moving average, which is based upon a fixed set of the last values the se is providing (moving average window). The number of values which are taken to calculate the average wil the mean the following way:

- ✓ **Less values (shorter moving average window): Mean reacts more rapidly to the latest trends.**
- ✓ **More values (longer moving average window): Mean takes into account older values, and therefc will show longer and smoother trends.**

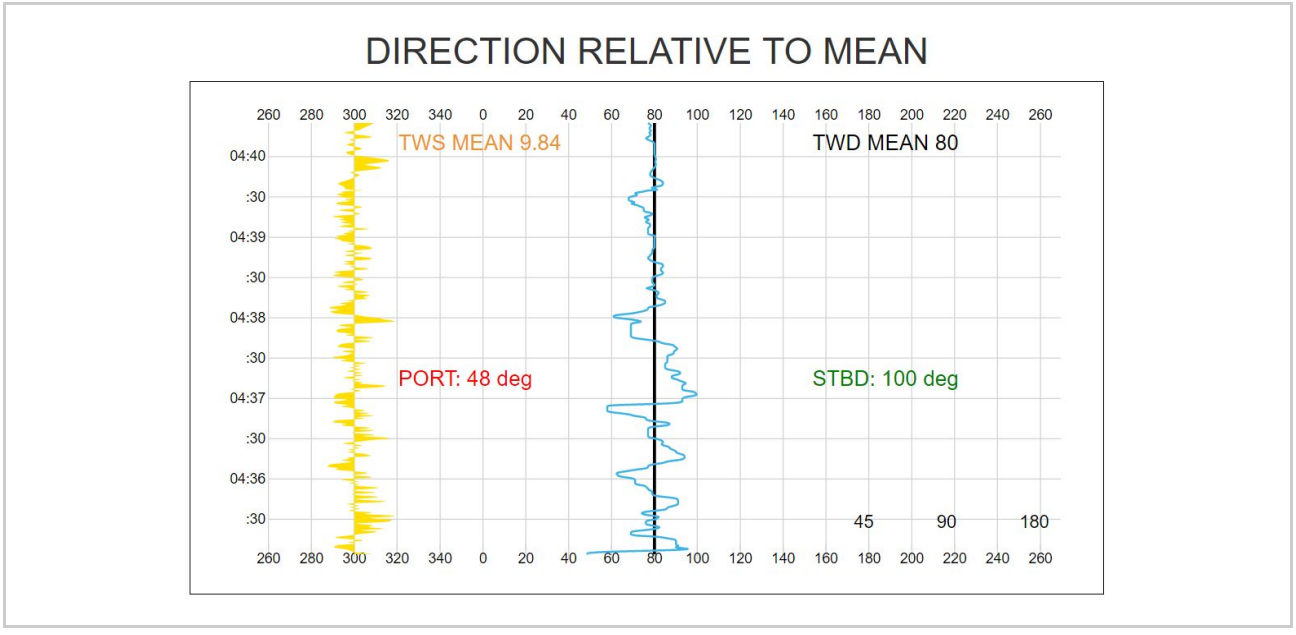
The following formula is being applied to calculate the moving average:

value = (value + ((mean of N samples)*N)) / (N+1)

Where N is the number of values taken into account for the moving average window.

Further information about moving average.

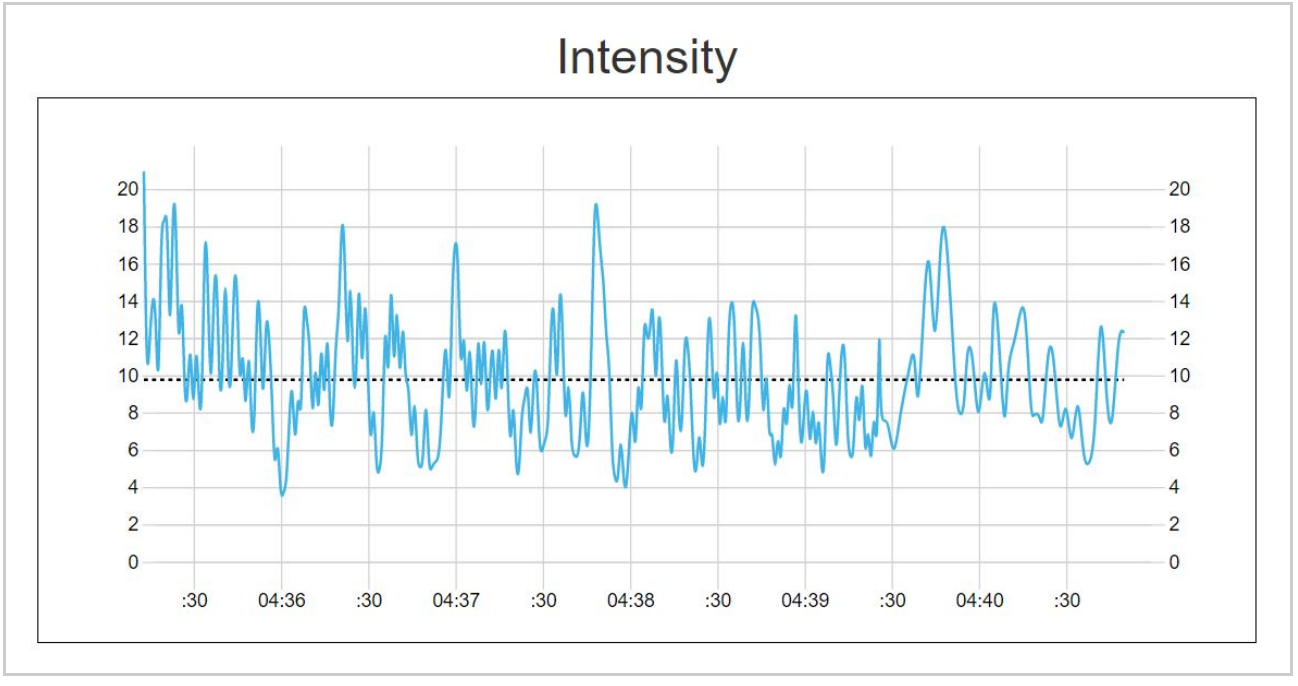
- ✓ X AXIS: Wind direction relative to the mean value, centered at 0º, and running from -180º to +180º.
- ✓ Y AXIS: Time axis which displays values dynamically. The overall data displayed depends on the time selector above described.
- ✓ TRUE WIND DIRECTION RELATIVE TO MEAN: True wind direction values. Represented as a BLUE LINE which will be printed dynamically according to time and relative to the mean value.
- ✓ TWS MEAN VALUE: Displays the true wind speed mean numerical value; ORANGE TEXT.
  - ✓ Default value for the moving average window is set at the SYSTEM CONFIGURATION SECTION.
  - ✓ This setting is synchronised with the TRUE WIND SPEED graph below.
- ✓ TWD MEAN VALUE: Displays the true wind speed mean numerical value; BLACK TEXT.
- ✓ PORT: Displays the minimum PORT (or left) value, relative to the mean; RED TEXT.
- ✓ STBR: Displays the maximum STARBOARD (or right) value, relative to the mean; GREEN TEXT.
- ✓ WIND INTENSITY GRAPH: Represented by a grey shadow area graph; displays the wind intensity, related to its mean, according to time. This enables users to rapidly detect and compare wind direction changes related to intensity variations.
  - ✓ If graph curves to the right-hand side, wind intensity is GROWING.
  - ✓ If graph curves to the left-hand side, wind intensity is DECREASING.
  - ✓ Default value for the moving average window is set at the SYSTEM CONFIGURATION SECTION (MEAN WINDOW).
  - ✓



9.4.3. True Wind Speed

Graphical display for wind speed, represented together with the mean value; which will enable the user to view the wind speed change trends in time.

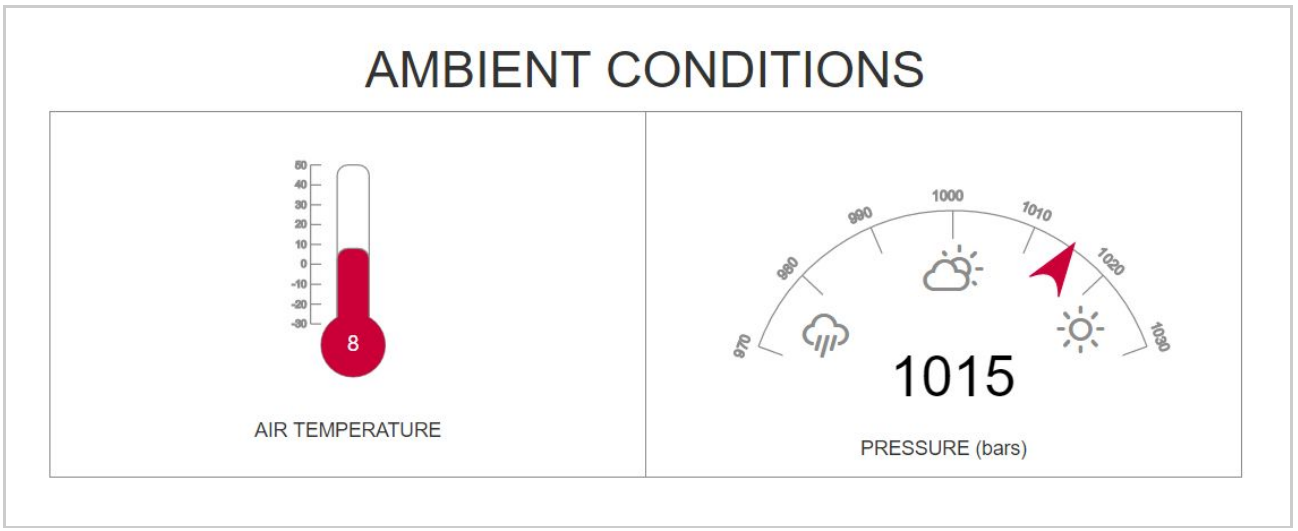
- ✓ **X AXIS: Time axis displays values dynamically. The overall data displayed depends on the time selector above described.**
- ✓ **Y AXIS: Wind speed values. Units can be configured at the SYSTEM ONFIGURATION SECTION.**
- ✓ **MEAN LINE: Mean wind speed reference, represented as an ORANGE LINE.**
- ✓ **MEAN VALUE: Displays the wind speed numerical mean value; ORANGE TEXT.**
  - ✓ **Default value for the moving average window is set at the SYSTEM CONFIGURATION SECTION (MEAN WINDOW).**
  - ✓ **This setting is synchronised with the TRUE WIND DIRECTION graph above.**
- ✓ **TRUE WIND SPEED: True wind speed values. Represented as a BLUE LINE which is printed dynamically according to time.**
- ✓ **LAST VALUE: Displays the numerical last wind speed measurement; BLUE TEXT. If user clicks upon the value, the TRUE WIND SPEED LINE will hide from the graph. Re-displayed when clicked upon again (toggle display).**



9.5. Ambient conditions

This window has been designed to display real-time ambient conditions; these values may vary according to the brand and type of sensor:

- ✓ **AIR TEMPERATURE: In Celsius Degrees.**
- ✓ **PRESSURE: In Bars.**

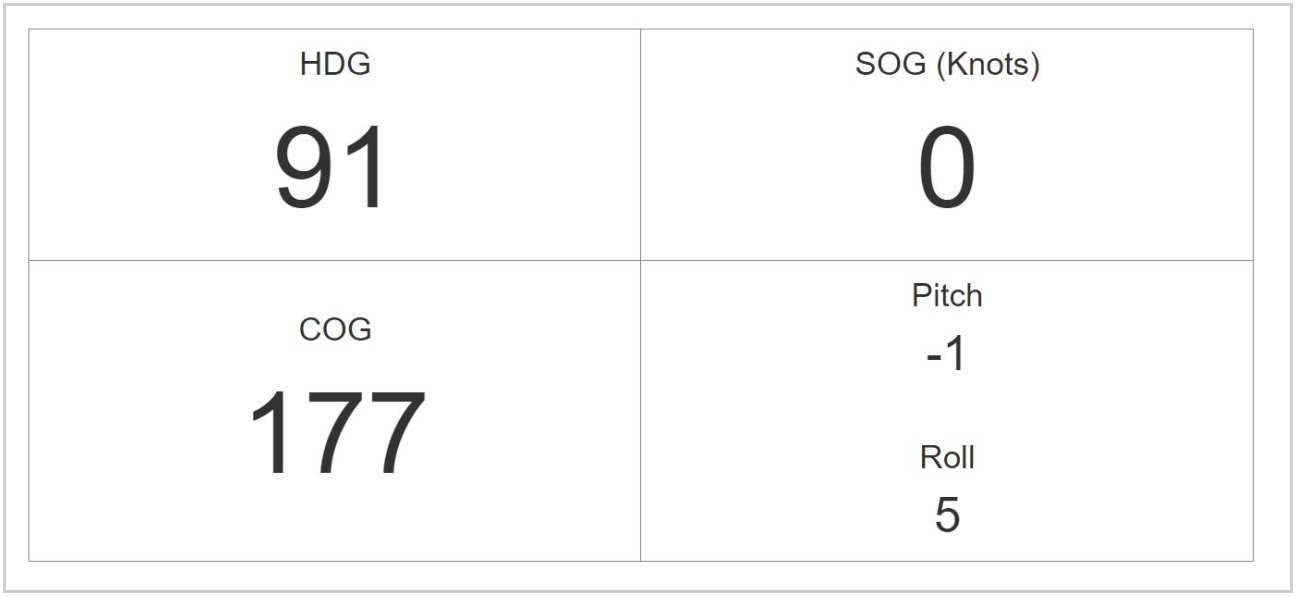


9.6. Boat conditions

This window has been designed to display real-time boat conditions; displayed variables may vary according to the brand and type of sensor:

- ✓ **HDG: Boat Heading. Degrees.**
- ✓ **SOG: Boat Speed Over Ground.**
- ✓ **COG: Boat Course Over Ground. Degrees.**
- ✓ **PITCH / ROLL / YAW: Boat Pitch, Roll (useful and Yaw (if available). Degrees.**

These values are useful for the initial calibration of the sensor.

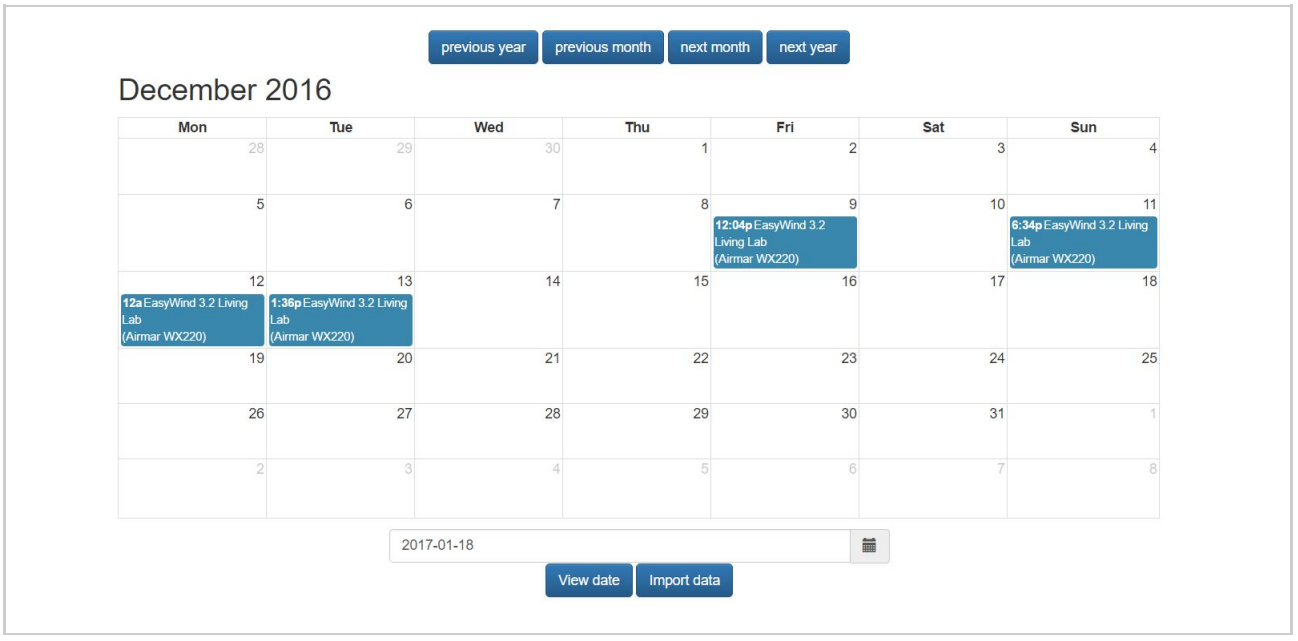


9.7. View history

9.7.1. Session Calendar

This window will display a calendar which will include the sessions which have been carried out with EasyWind.

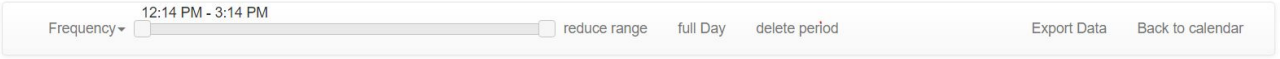
- ✓ **DATE SELECTOR: Quick selection of a given date.**
- ✓ **DATE SELECTION ARROWS: Allows users to move between dates sequentially, or to select today's date.**
- ✓ **DAY / WEEK / MONTH VIEW: Day / week / month calendar view selector. DEFAULT VALUE = MONTH.**
- ✓ **IMPORT OPTION: Described separately HERE.**



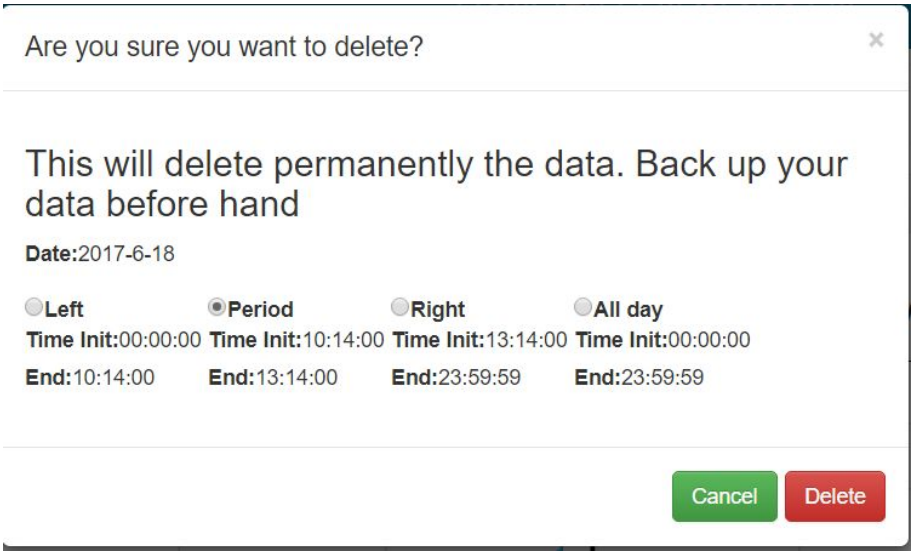
NOTE: Due to the large amount of data which is processed within this window; loading operation may take some time please be patient until window is fully loaded.

9.7.2. Session Details

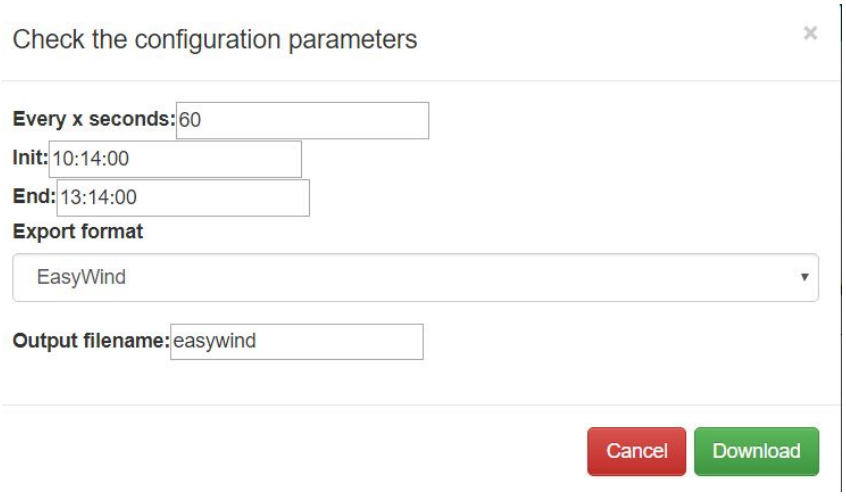
This window provides full information about a given sampling period:



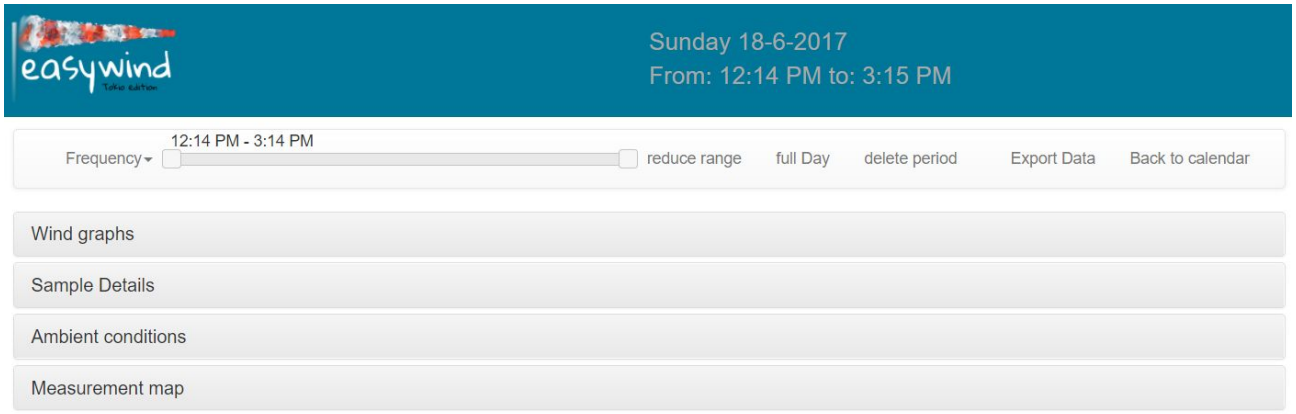
- ✓ **SAMPLE FREQUENCY: Time selector which enables user to view the session's details according to a higher or lower sampling per time-period;. Window performance is affected when selecting higher sample frequencies; please be patient and wait for the window to load completely.**
  - ✓ **1 ' : One sample per minute in order to calculate the mean values. DEFAULT VALUE.**
  - ✓ **30' ' : One sample per every 30 seconds in order to calculate the mean values.**
  - ✓ **20' ' : One sample per every 20 seconds in order to calculate the mean values.**
  - ✓ **10' ' : One sample per every 10 seconds in order to calculate the mean values.**
- ✓ **SLIDER: init and end time for this period. Click on reduce range to apply changes**
- ✓ **REDUCE RANGE: apply changes on the slider to reduce the range**
- ✓ **FULL DAY: restore period to full day.**
- ✓ **DELETE PERIOD: delete samples for the period. There are 4 options, left of the period to remove samples from early morning. Right to delete from the end to to midnight. The period you selected or the entire day of data. Here you can see a screenshot.**



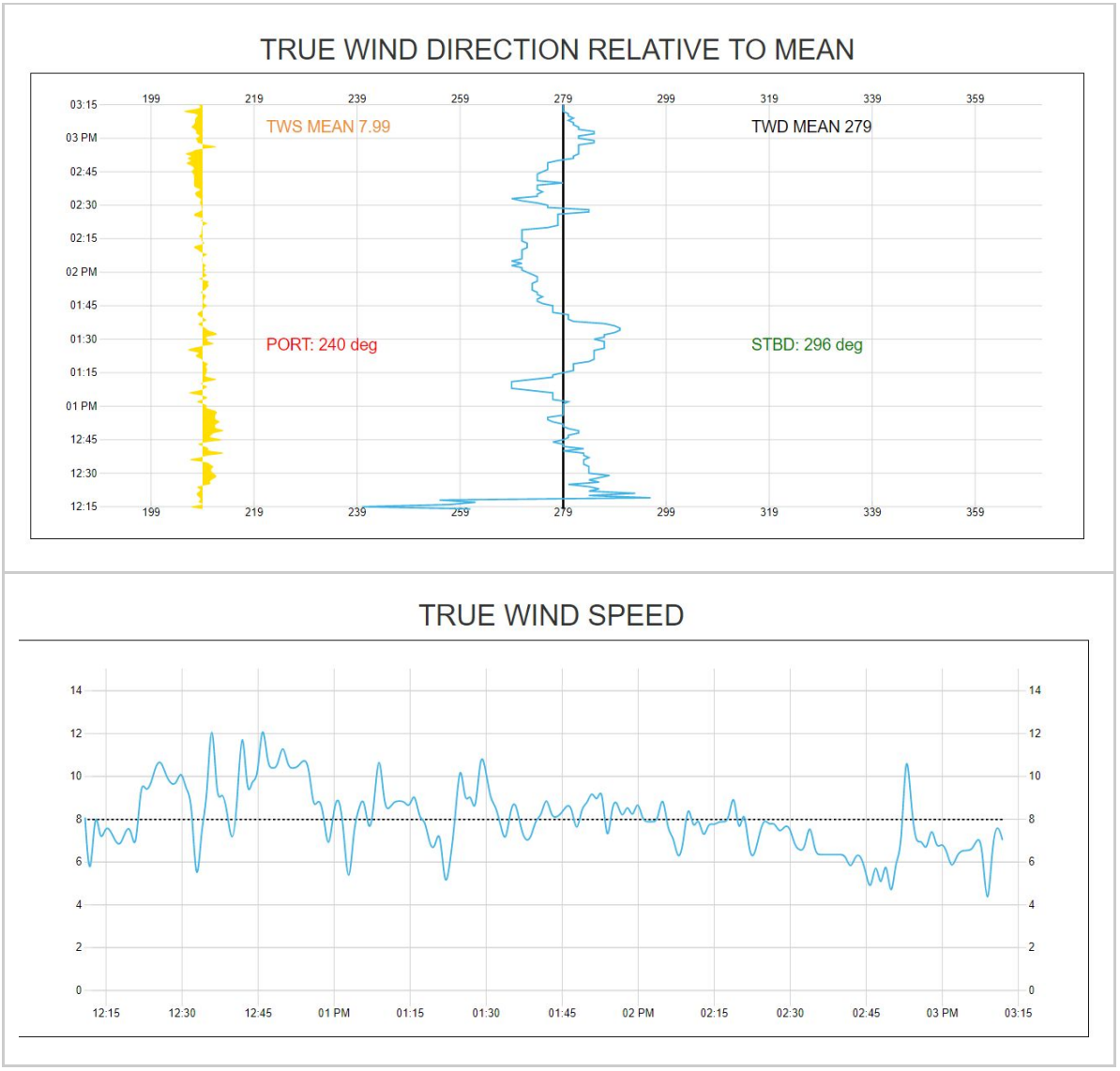
- ✓ **EXPORT DATA: this option is to export data from the period. The options**
  - ✓ **<u>Frequency:</u> is dividing the factor. 60 means 1 sample per minute. This value don't apply to the easywind format.**
  - ✓ **<u>Init/End:</u> period to download the data.**
  - ✓ **Export format:**
    - **EasyWind: backup format or sharing. You can import it afterwards.**
    - **CSV: comma separate values to open with excell. Check the units on top and the variables. Time will be in UTC and the wind vaues in m/s.**
    - **GPX: standard GPS exchange format to use with google earth to track it.**



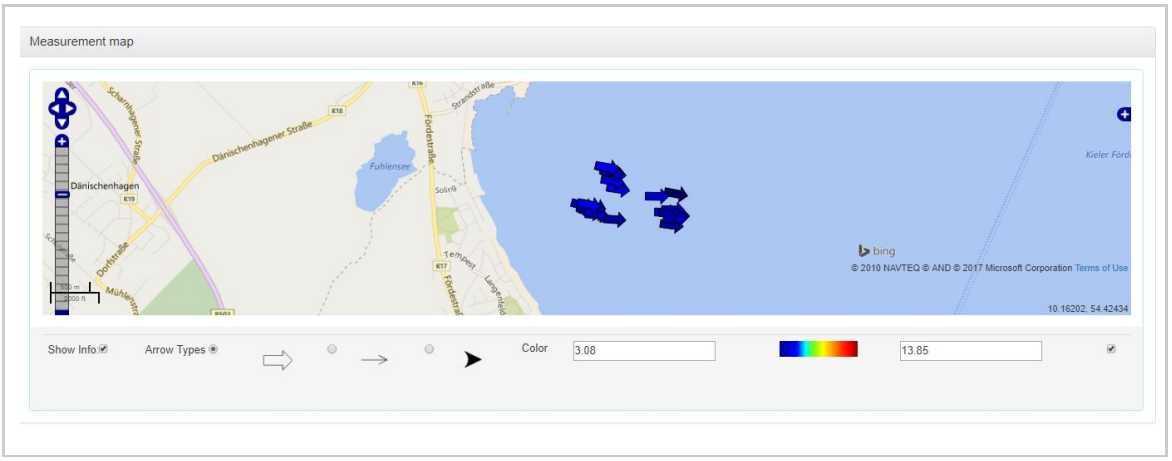
GENERAL OPTIONS



✓ **WIND GRAPHS: Session's wind conditions graphical display, same as the REAL-TIME STATS section.**



✓ **MEASUREMENT MAP: Session's positional route represented upon a map.**



✓ **SAMPLE DETAILS: Full details about the session:**

Sample Details

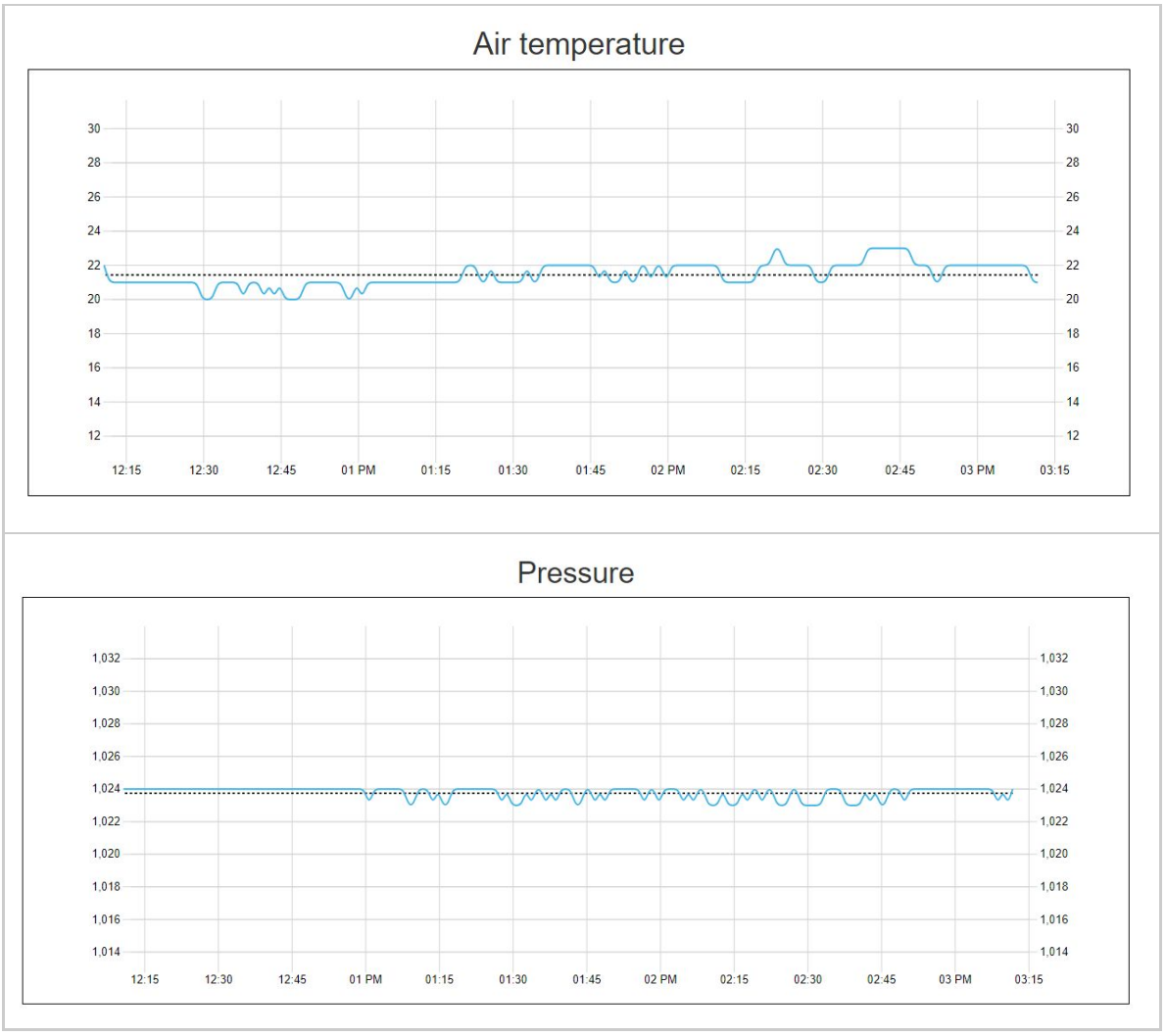
Details

Period:	START: 2017-5-18 12:14:00 END: 2017-5-18 3:15:00
Station:	b827ebfb1540

General stats

	min	mean	max
Wind Speed	3.08	7.99	13.85
Wind Direction	240	279	296
Air Temperature	20	21.43	23
Pressure	1023	1023.74	1024

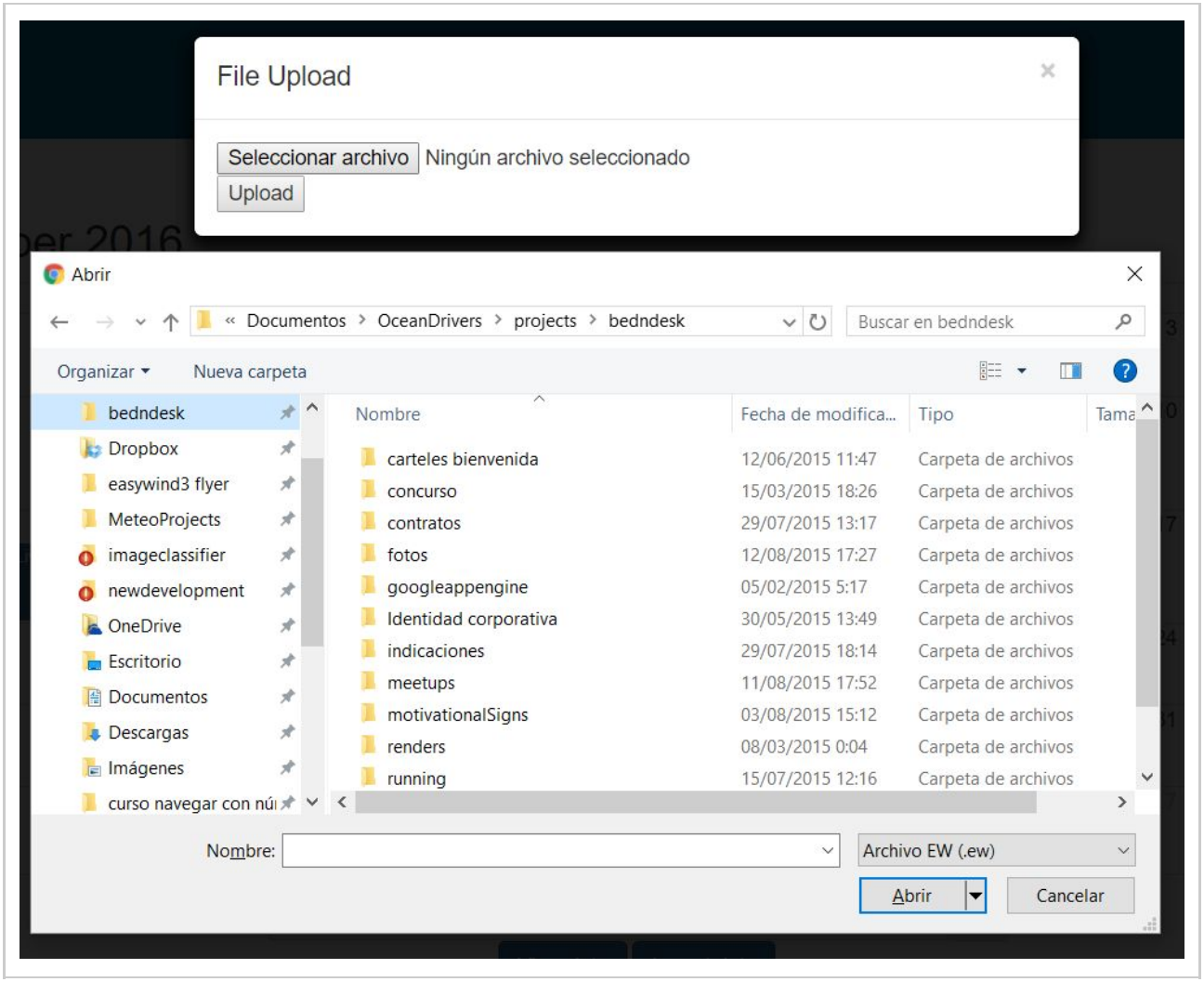
✓ **AMBIENT CONDITIONS: Session's temperature and pressure conditions graphical display.**



9.7.4. Import

EasyWind from your backups sessions or from other EasyWind Reception Units (previously exported) can be imported using EasyWind's format .ew. In order to import new sessions:

1. **Click on the IMPORT button.**
2. **Choose the .ew file from your local device, by using the browsing window.**
3. **Click on the UPLOAD button. ***
4. **Your samples will be available within your VIEW HISTORY calendar.**



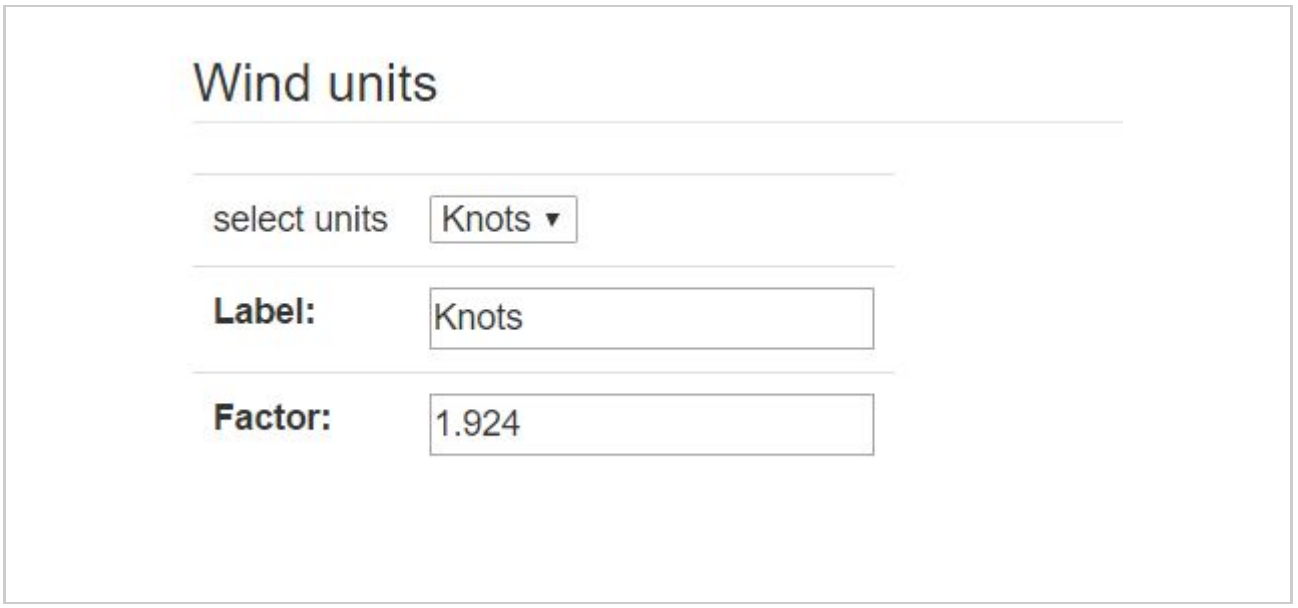
**** NOTE: The importing process may take a few minutes according to the amount of data within the imported session.***

9.8. Settings

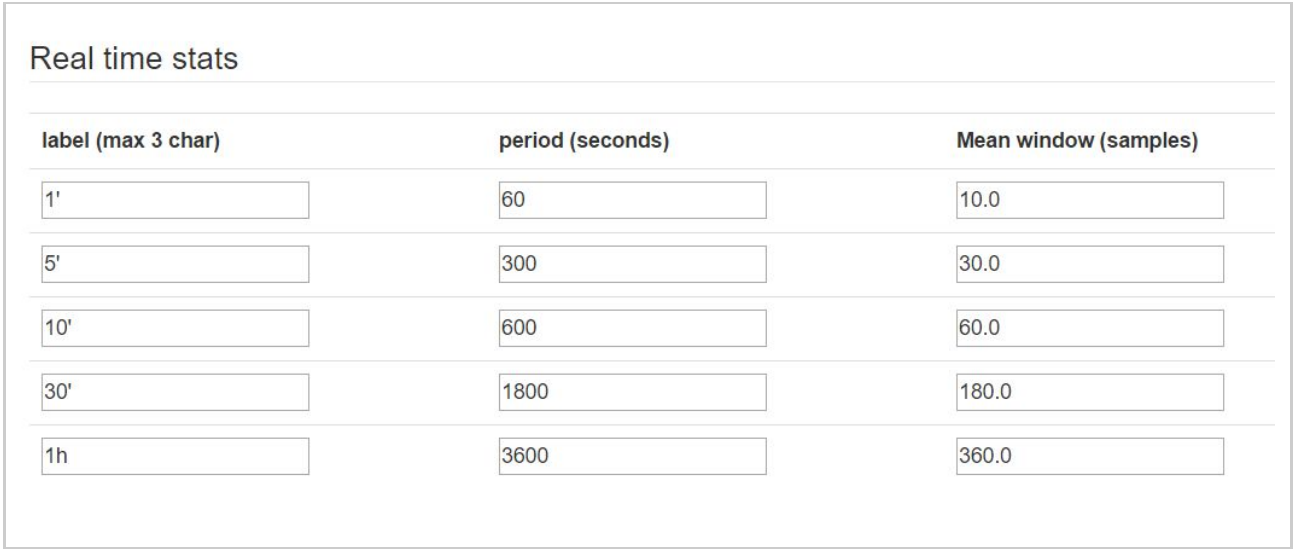
9.8.1. Application options

This section provides the possibility of configuring some settings which affect EasyWind:

- ✓ **WIND UNITS: Drop-down menu for the user to select wind speed units.**



- ✓ **REAL TIME STATS: User configurable parameters for the real time stats section:**
  - ✓ **Label: Label for the time periods to be displayed as toggle selectors.**
  - ✓ **Period: Sampling time-period to be displayed, in seconds.**
  - ✓ **Mean Window: moving average time window, for graph filtering with the + / - buttons.**



✓ **TIME CONTROL: Configurable user time-zone (DEFAULT VALUE IS UTC).**

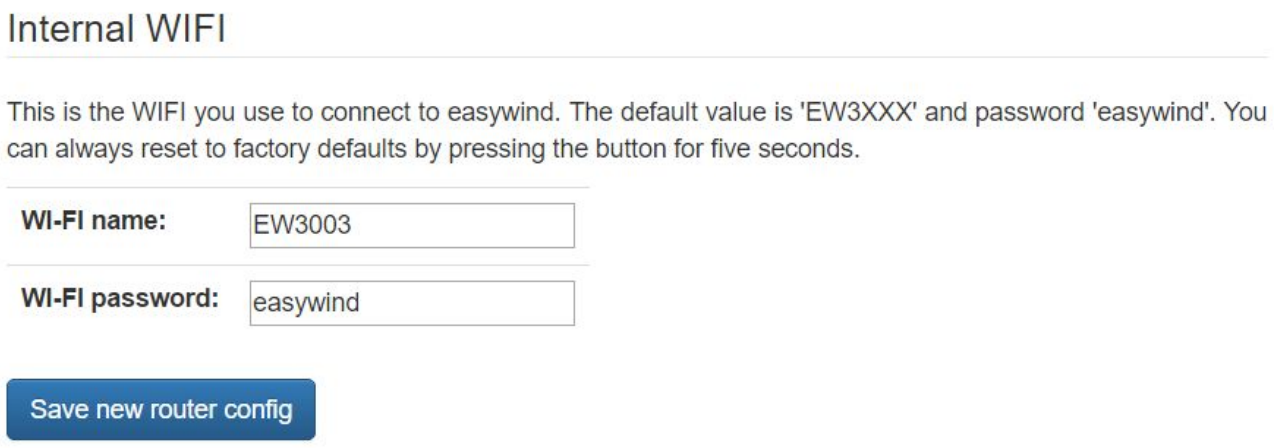
✓ **MAGNETIC DEVIATION: Users can introduce a magnetic deviation, given the location they are in, and this will taken into account in the sample results.**

9.8.2. Wifi Settings

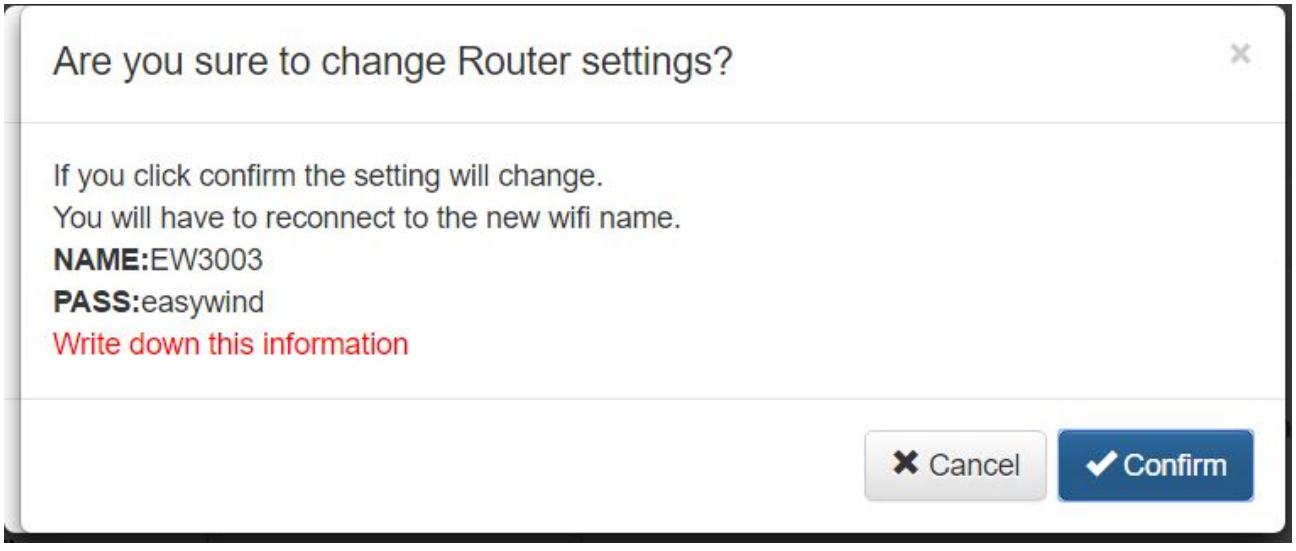
9.8.2.1. Internal Wifi configuration

This section provides the possibility of changing the name and password of the wifi network created by EasyWind Reception Unit.

- ✓ **Input your new wi-fi name.**
- ✓ **Input your new wi-fi password.**
- ✓ **Make sure you remember your new wi-fi settings.**

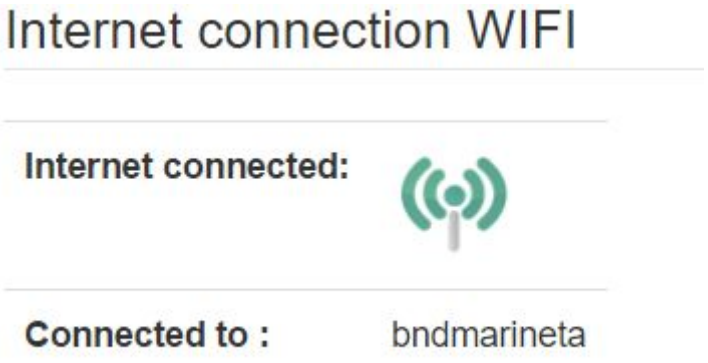


When you click on save new router configuration you will see the following confirmation screen



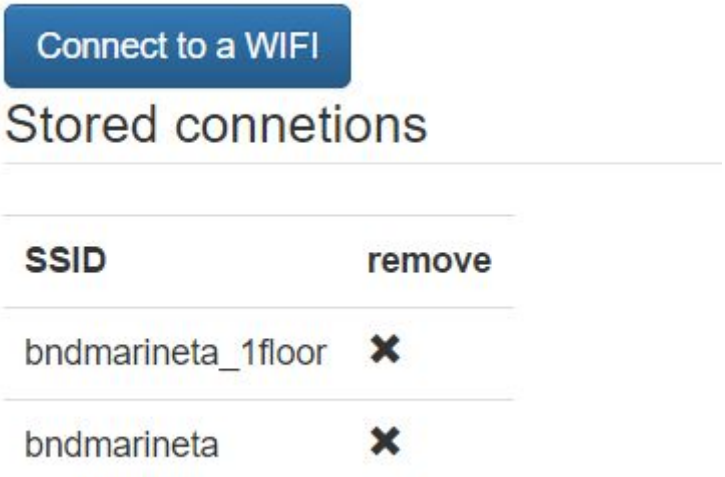
9.8.2.2. Connect to a WIFI to provide internet and support

The first section shows if the internet is connected. Here you can see the two status. It also shows the SSID of the connected WIFI.



This is how it is displayed if there is no internet connection

To add a new WIFI connection you must click on connect to a WIFI. Underneath you can see the already stored connection. They are prioritized by order of appearance. In case two network connections are available at the same time it will connect to the top of the list.

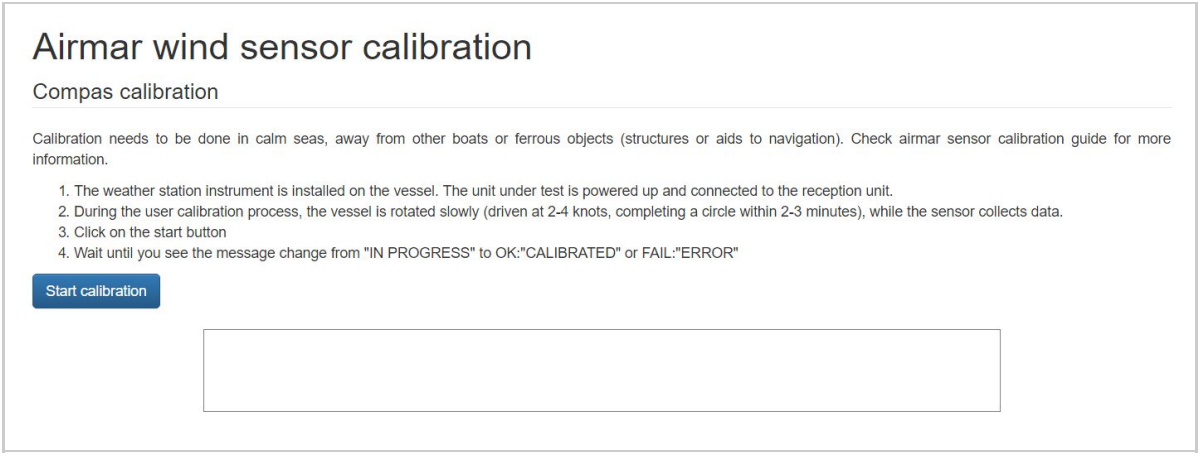


When you click on Connect to a WIFI it will appear a list of available WIFI's SSID in the area on the following screen:

9.8.3. Wind Sensor Calibration

In order to calibrate the compass within the wind sensor, an auto-calibration procedure is provided; please read carefully before proceeding:

- ✓ **Navigate to a calm sea area, away from other boats or ferrous objects (structures or aids to navigation).**
- ✓ **Check that the weather station instrument is correctly installed on the vessel and the unit under test is powered up and connected to the reception unit.**
- ✓ **Access EasyWind Software.**
- ✓ **GOTO menu option SETTINGS/ WIND SENSOR CALIBRATION / Compass Calibration.**
- ✓ **PRESS START BUTTON, the calibration screen will start flashing and will display: *IN PROGRESS …***
- ✓ **Within 2-3 minutes, slowly rotate the vessel (4-6 knots) in a circular turn, until the message changes to one of the following:**
  - ***OK / CALIBRATED*: The calibration process has been successfully completed.**
  - ***TIME-OUT*: The rotation motion is too slow and has been timed out.**
  - ***FAIL / ERROR*: An error has occurred; repeating the process is recommended.**

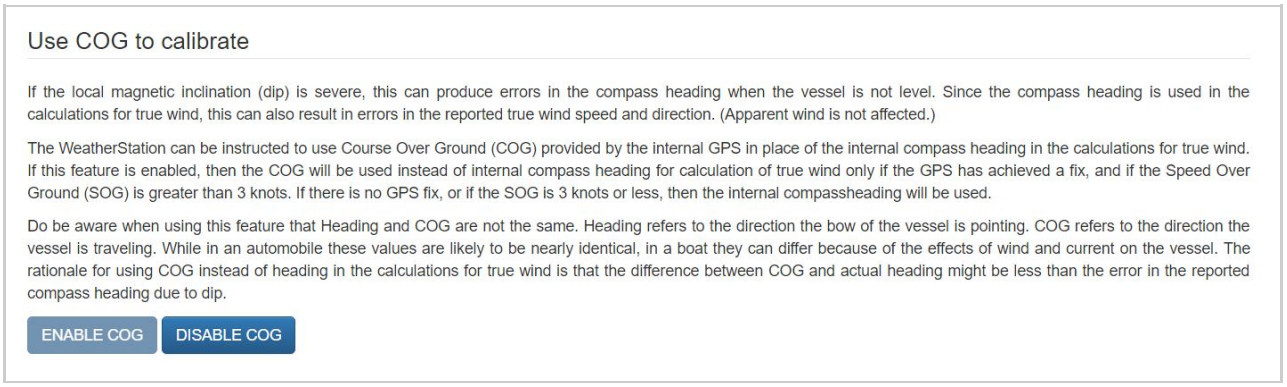


9.8.3.1. Use COG to calculate true wind

If the local magnetic inclination (dip) is severe, this can produce errors in the compass heading when the vessel is not leveled. Since the compass heading is used in the calculations for true wind, this can also result in errors in the reported true wind speed and direction (apparent wind is not affected).

The WeatherStation can be instructed to use Course Over Ground (COG) provided by the internal GPS in place of the internal compass heading in the calculations for true wind. If this feature is enabled, then the COG will be used instead of internal compass heading for calculation of true wind only if the GPS has achieved a fix, and if the Speed Over Ground (SOG) is greater than 3 knots. If there is no GPS fix or if the SOG is 3 knots or less, then the internal compass heading will be used.

Do be aware when using this feature that Heading and COG are not the same. Heading refers to the direction the bow of the vessel is pointing to. COG refers to the direction the vessel is travelling. While in an automobile these values are likely to be nearly identical, in a boat they can differ because of the effects of wind and current on the vessel. The rationale for using COG instead of heading in the calculations for true wind is that the difference between COG and actual heading might be less than the error in the reported compass heading due to dip.



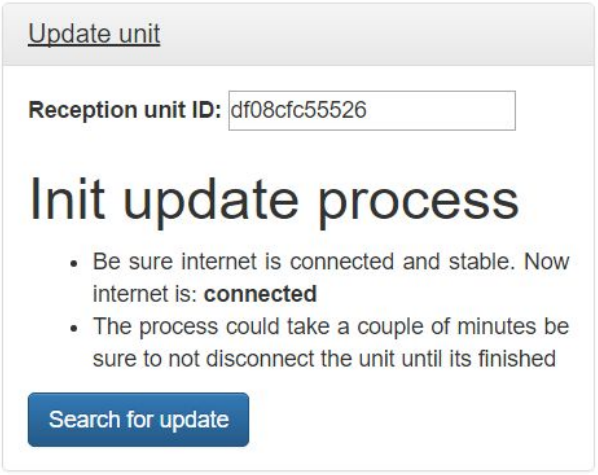
9.8.4. Software Update

EasyWind team will regularly update the software in order to enhance its performance, solve any minor bugs and to add extended functionalities. In order to update your EasyWind software:

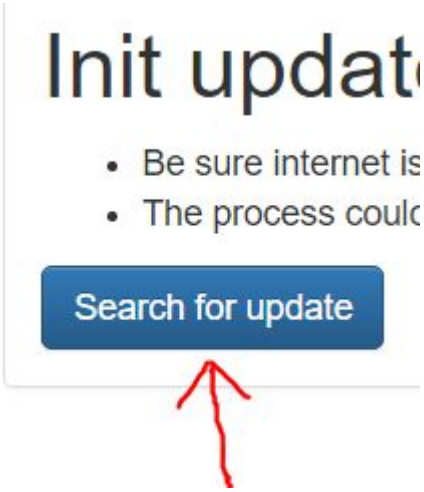
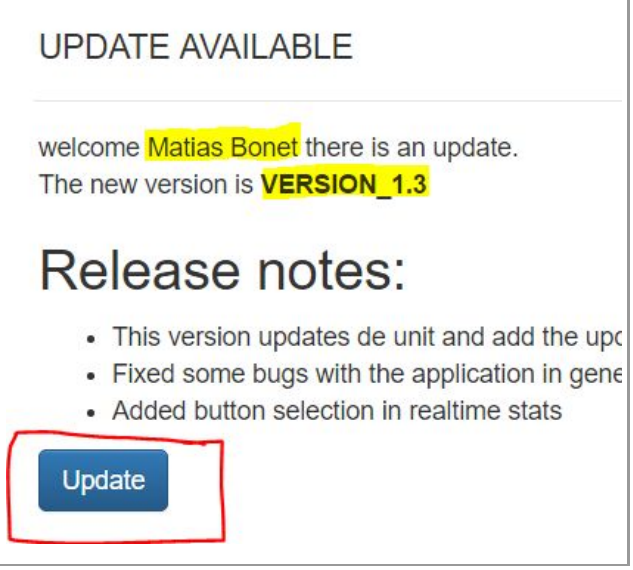
1. **Connect your reception unit to a power supply. Use your battery pack fully charged, provide a 12V output.**

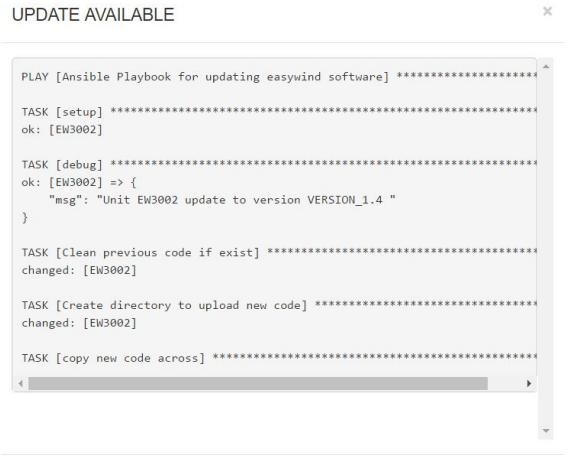
2. **Connect your reception unit to the internet: check the WIFI connection section The update options will not appear until the unit is conected to internet.**

***If you are not connected under update unit will only appear the Unit ID**

Access the SETTINGS.	**Open the UPDATE UNIT TOGGLE.**
	

*** The Search for update will only appear if you are connected to internet**

Click on the Search for update.	If there is an available update will appear. Click update
	

During the update process you will a log messag Wait until the next message appear.	When the process is finished this message appear.
	

9.9. Help

EasyWind is really “EASY” to use so you will probably not use this section that much! But in case you need it, you can find in this section the contact email, a version of this user manual and also the contact information to ask for our technician for help.

9.10. About easywind

Information about EasyWind project and partners involved. Easywind has been developed in collaboration between Ocean Drivers and VMG.. To create the best product of the market, the easiest, fastest and with the best combination of software and hardware.

10. CHECKS

10.1. Unit powered on

In order to verify that the reception unit is powered ON, please ensure that the GREEN LED IS LIGHTED.

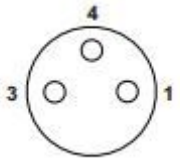
10.2. Software running

Press the button for 1 second and wait until the yellow led flash. This means the unit is not only powered on but the software is running and listening to your events.

11. TROUBLESHOOTING

11.1. Troubleshooting when Reception unit is powered by Battery Pack.

- **My Reception Unit does not work:**
  If your green LED is not powered on, check your power Cable Connection, cable dent must fit with connector dent (review 4.3.2).
  If the power cable is correctly connected, make sure that your battery is fully charged, connecting it to the charger, if the charger LED is RED you must wait until it turns on GREEN.
  If your battery is fully charged, check Voltage output from battery, measuring between pin number 1 and pin number 4. Voltage output must be between 11V and 13 V.

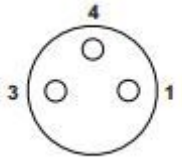


Pin assignment

If you have checked everything and the issues still appearing, please contact with your EasyWind provider.

11.2. Troubleshooting when Reception unit is powered by Power Cable.

- **My Reception Unit does not work:**
  If your green LED is not powered on, check your power Cable Connection, cable dent must fit with connector dent (review 4.3.2).
  If the power cable is correctly connected, make sure that you are connected to your power source (e.x: rib battery). Check that your 1 Amp fuse is not blown.
  If everything is correctly connected, check that the Voltage between pin number 1 and pin number 4. is between 11V and 13 V.



Pin assignment

If you have checked everything and the issues still appearing, please contact with your EasyWind provider.

11.3. Troubleshooting when Reception unit is correctly powered and you have problems receiving data from ultrasonic wind sensor.

If your reception is working correctly, but you have problems to get data in your mobile device, please follow below instructions:

- **I do not receive data:**
  If you are able to open the web interface but you do not receive data, check your data cable connection, cable dent must fit with connector dent (review 4.3.1). Please also check sensor connection (review 4.1).
  If sensor is properly connected, make sure that the wind sensor unit is installed in a clear sky position as, it is mandatory for the system to work that you acquire GPS position.
- **Data received is no correct:**
  If you are receiving data, but it is not correct, please check your wind sensor alignment. The sensor arrow must match with the bow of the boat (review 4.2.2). To

  Please install the sensor and the reception unit at least 1 metre away from any ferrous metals, speakers, electronic device, VHF radio or other GPS device.

  For more details about ultrasonic wind sensor, check the sensor manual included in your Easy Wind package.