Zephyrus Wind Meter

Quick Start

1. **Calibration (only the first time)**: check/set the **calibration values** of your mobile (click on the c**alibration button)**
2. **avoid measurement in presence of loud noises** (heavy traffic, combustion engines, loud talking, shots)
3. keep your fingers away from the mobile microphone and keep it in vertical position
4. orient the back of the phone upwind (keeping the display in front of you)
5. click on one of the function buttons: **Dynamic**, **Average**, **Spectrum**
6. A click on the PLAY button starts the measurement
7. A click on the RESET button clears the current measurement

Dynamic Mode

This page displays the current **wind speed**. **Maximum value** and **Average value of the entire observation period** are also provided. This mode is useful to measure a steady state wind (small fluctuations) or to plot and view on a chart the details of a dynamic wind.

The **active elements** of the page are the following: Reset button, Start/Stop button, Units button, Reference button, Calibration button.

1. **START/STOP**: to start or stop the wind recording; in stop mode it is still possible to measure any frequency component amplitude of the displayed chart just moving the frequency marker
2. **RESET**: to clear the current data
3. **UNITS:** to change the current speed unit
4. **REFERENCE**: to specify the current a chart reference level: none, AVG, MAX
5. **CALIBRATION**: in order to change the current **calibration**

Average Mode

This page displays the current averaged **wind speed** (default 1 sec averaging, settable in the calibration page). **Maximum value** (dynamic maximum) and **Average value of the entire observation period** are also provided. This mode may be useful to measure a dynamic wind when the dynamic mode results in fluctuations of 2 m/s or more.

The **active elements** of the page are the following: Reset button, Start/Stop button, Units button, Reference button, Calibration button.

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2. **RESET**: to clear the current data
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5. **CALIBRATION**: in order to change the current **calibration**

Calibration Page

In this page you can change the default calibration using the following **sliders**:

All: it sets the speed measurement of all winds (%)
Low: it sets the speed measurement of low winds (%)
Mid: it sets the speed measurement of mid winds (%)
High: it sets the speed measurement of high winds(%)

Noise: it sets the background noise level (0/10), default 2

Smooth: it sets the wind smoothing factor (it is the mean value of the last n observations: a greater size implies a higher smoothing and a lower sensibility to wind gusts). It may be useful to stabilize measures/graphs in Dynamic mode (1/10), default 3

Average: it sets the observation period (seconds) in Average Mode. It may be useful to stabilize measures/graphs in Average mode (1/10), default 1

Calibration: fast way

a) Set the **noise level:** start the dynamic mode in a silent room (no external noises like in a library or a bedroom), read after 10 seconds the average value: if greater than 0, open the calibration page and set the **noise level slider** to the average value rounding up to the nearest integer (**usually this parameter is from 1 to 3**)

b) Identify the **wind speed that leads to full scale** the instrument, calculate the percentage deviation (known_wind_value/full_scale_value*100) and match the % using the **All slider**

c) For **fine tuning** use the **High/Mid/Low sliders** for the corresponding wind ranges

Calibration: troubleshooting

1. **Wrong full scale**: all your measurement are higher or lower than expected. Open the Calibration page and use the All slider

2. **Wrong fine tuning**: maximum level measurements are fine but mid winds are higher/lower than expected. Open the Calibration page and use the corresponding slider (High/Mid/Low).

3. **No signals detected below 1 m/s or over 20 m/s:** The smart phone microphones do not work under/over a specific pressure. For instance a smartphone with a microphone with a maximum SPL of 94db cannot measure wind speeds greater than 20 m/s: the background noise level can introduce a further reduction.

Spectrum mode

This page displays the spectrum data of the current wind signal.

The **active elements** of the page are the following: Reset button, Start/Stop button, Reference button, Calibration button.

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2. **RESET**: in order to clear the current data
3. **REFERENCE**: in order to change the current signal frequency in analysis
4. **CALIBRATION**: in order to change the current **Cutoff frequency**

Spectrum Cutoff (Hz)

It is possible to specify cutoff frequency (Hz) of the wind band (**to avoid some specific interference in the low band spectrum**).

The default cutoff frequency is 400 Hz (you may vary it from 200 Hz to 500 Hz)