Zephyrus Wind Meter

Main functions

This application brings the functionalities of a
basic Anemometer (Wind Speed Meter) to
your phone: mobile hardware introduce some
limitations (lower wind pressure range and
accuracy), but using it properly you can collect
useful information from your surveys.

Wind Speed Meter
- dynamic wind speed measuring
- simple calibration settings
- 4 values display (cur, avg, min max)
- wind direction display (compass)
- wind speed/time chart (m/s)
- share text/screen data

Quick Start

1. **Calibration (only the first time)**: check/set the **calibration values** of your mobile (see the **calibration settings page** and the **calibration page**)
2. Check that the mobile microphone does not have any "wind shield" (such as a cover or label)
3. avoid measurement in presence of loud noises (heavy traffic, motorbikes, trucks, loud talking, shots)
4. keep your fingers away from the mobile microphone (hold it by the top) and keep it in vertical position
5. orient the back of the phone upwind (keeping the display in front of you)
6. click the Wind meter button
7. A long click on the decibel number resets the current measurement
8. A click on the pause button stops the measurement, a click on the play button restarts the measure

Start Page

Button functions:

1. **Dynamic**: this mode (100ms) is useful to measure a steady state wind (small fluctuations) or to plot and view on a chart the details of a dynamic wind. Minimum value, maximum value and Average value of the entire observation period are also provided. In this mode it is possible (**menu functions**) to set an **instantaneous threshold** (if exceeded it changes the max value color to red), to open the **calibration page**, to **share text/screen data**

2. **Help**: User guide

Menu functions:
1. **HELP**: it shows the app user guide
2. **SETTINGS**: app settings page
3. **HELP US**: email link to our service

Settings Page

This page allows to personalize all the app settings (access from the Start Page menu):

1. **Wallpapers**: it is possible to select the favorite wallpaper (default: sky)
2. **Maximum SPL***: it is possible to specify the microphone maximum SPL in dB (default 90, suitable for most mobiles)
3. **Noise level ***: it is possible to specify the background noise level (default 4); **sometimes this level needs a calibration** (see the calibration page for more details)
4. **AGC*** : it is possible to disable the mobile Automatic Gain Control active only in some mobiles (if the the app is sensible to low level talking you must check it and disable AGC!)

* Remember that a wrong setting will effect the accuracy of your measurements.
If you do not have the correct information of your mobile leave the default values or see the calibration section.

Calibration Settings

The **default calibration values are suitable for most smart phones**. If necessary it is possible to change the calibration parameters in the settings page. For a perfect calibration you need a professional anemometer, but you can get a fair calibration with the following:

1. **Noise level**: in the settings page set the noise level to 0; start the dynamic function (in m/s) in a silent room (no external noises like in a library or a bedroom), read after 10 seconds the average value (fix) : if >0, set the noise level to the fix rounding up to the nearest integer (in the settings page) .

2. Specify the **Maximum SPL** of your mobile : it is possible to specify the microphone maximum SPL in dB in the settings page (default 90, suitable for most mobiles)

3. **AGC** : if the application is sensible to low level talking (> 50 cm from the mic) you need to check it (and disable AGC!); some mobiles erroneously activate it for the application recording source

Calibration Page

In this page (to open it use the Dynamic/Average page Menu) you can change the default calibration (check before the Calibration Settings) using the available **sliders** and chart:

All slider: it changes the speed measure of all the winds (+-30%)
Low slider (Pro edition): it changes the speed measure of the low winds (+-30%)
Mid slider (Pro edition): it changes the speed measure of the mid winds (+-30%)
High slider (Pro edition): it changes the speed measure of the high winds (+-30%)

Tapping on the chart you can select the wind speed that you want to calibrate: when you move the sliders the chart curve and the wind speed change accordingly.

Fast way to calibrate the anemometer:
a) Set the **noise level** (see calibration settings)
b) Identify the wind speed that leads to **full scale** the instrument, **tap on the calibration chart on the maximum curve value** and match the known wind using the **All slider**

c) Measure a known **medium wind, tap on the calibration chart on the measured value** and match the known wind with the **Mid slider**

Troubleshooting

1. **Wrong maximum value**: all your measurement are higher or lower than expected. Enter in the settings menu and select the correct SPL maximum value or open the Calibration page and use the All slider

2. **Wrong calibration**: high level measurements are higher or lower than expected. See the Calibration page.

3. The application is **sensible to low level talking** (at a distance > 50 cm from the mic): go in the settings menu and **disable ACG (check it)**, some mobiles erroneously activate it for the application recording source.

4. **No signals detected below 1 m/s or over 20 m/s:** The smart phone microphones do not work under/over a specific pressure. In the threshold menu you can display the blue line of the anemometer speed limit (Mic Maximum) that can be detected by your microphone with the current calibration settings. For instance a smartphone with a microphone with a maximum SPL of 90db without any special windshields cannot measure wind

speeds greater than 16 m/s: the background noise level on your signal can introduce a further reduction.