

READ ME

This readme is an explanatory note on the datasets you are about to be used. These datasets were made with great deal of work and coordination among different partners therefore we would kindly appreciate your reference to this dataset if you use it in your work.

There is a humble trial to explain this complex dataset (as every dataset is) but please try to reach me in case some things are not that clear enough.

Contact Details

Nikolaos Chrysochoidis-Antsos

chrisoconicko@hotmail.com

0031 (0) 6 207 49 804

This ReadMe file does the following

- explains the structure of the dataset,
- how to read the dataset files (something like a metadata, but more practical),
- ways to utilize the datasets,
- explains the experimental set-up properties with an extensive picture/photo collection with explanatory material,
- recommendations for utilization

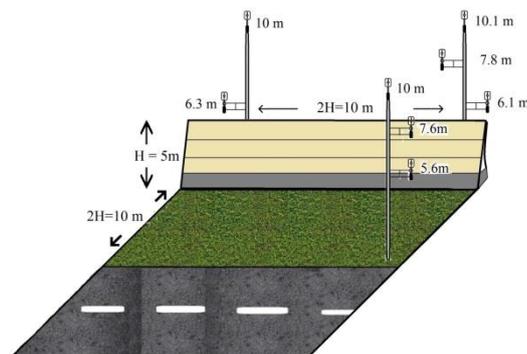
The best way to start is with some pictures and explanations. The equipment used in this set-up is:

- 8 Gill WindMasters sonic anemometers (all files in the folders)
- 1 Davis Weather Station (the file in the main directory that contains all the periods of recording – files in each sub-folder for that particular period)



The picture at the left side shows the sonic anemometers and the weather station installed on the 2 poles on top of the noise barrier. While the graph below shows the heights and the positions of the poles and sonic anemometers.

***All instruments are aligned with the North**



SUB FOLDERING EXPLANATION

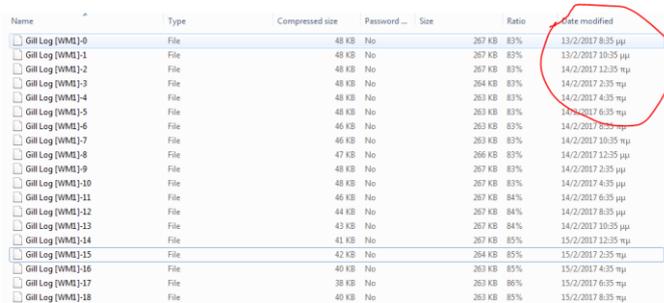
When you enter or unzip the “All Sonic Anemometer Data” you’ll find several folders.

These folders contain sets of data that have been recorded in different periods.

Look below to understand the different names.

However, I suggest that the best way to treat the data is to name the folders yourself for later use, as every data handling procedure for each research topic needs different foldering.

My advice to locate the date/time is to check the Date Created property of each last folder before locating the .txt files that contain the sonic anemometer data and the weatherlink dataset (weather station) just like in the picture below. Read all the passage and then find your own way through the dataset.



Name	Type	Compressed size	Password	Size	Ratio	Date modified
Gill Log [WMI]-0	File	48 KB	No	267 KB	83%	13/2/2017 8:35 µµ
Gill Log [WMI]-1	File	48 KB	No	267 KB	83%	13/2/2017 10:35 µµ
Gill Log [WMI]-2	File	48 KB	No	267 KB	83%	14/2/2017 12:35 µµ
Gill Log [WMI]-3	File	48 KB	No	264 KB	83%	14/2/2017 2:35 µµ
Gill Log [WMI]-4	File	48 KB	No	263 KB	83%	14/2/2017 4:35 µµ
Gill Log [WMI]-5	File	48 KB	No	263 KB	83%	14/2/2017 6:35 µµ
Gill Log [WMI]-6	File	46 KB	No	263 KB	83%	14/2/2017 8:35 µµ
Gill Log [WMI]-7	File	46 KB	No	263 KB	83%	14/2/2017 10:35 µµ
Gill Log [WMI]-8	File	47 KB	No	266 KB	83%	14/2/2017 12:35 µµ
Gill Log [WMI]-9	File	48 KB	No	267 KB	83%	14/2/2017 2:35 µµ
Gill Log [WMI]-10	File	48 KB	No	267 KB	83%	14/2/2017 4:35 µµ
Gill Log [WMI]-11	File	46 KB	No	267 KB	84%	14/2/2017 6:35 µµ
Gill Log [WMI]-12	File	44 KB	No	267 KB	84%	14/2/2017 8:35 µµ
Gill Log [WMI]-13	File	43 KB	No	267 KB	84%	14/2/2017 10:35 µµ
Gill Log [WMI]-14	File	41 KB	No	267 KB	85%	15/2/2017 12:35 µµ
Gill Log [WMI]-15	File	42 KB	No	264 KB	85%	15/2/2017 2:35 µµ
Gill Log [WMI]-16	File	40 KB	No	263 KB	85%	15/2/2017 4:35 µµ
Gill Log [WMI]-17	File	38 KB	No	263 KB	86%	15/2/2017 6:35 µµ
Gill Log [WMI]-18	File	40 KB	No	263 KB	85%	15/2/2017 8:35 µµ

The folders might be in this format

1) 20180528 – 4Hz

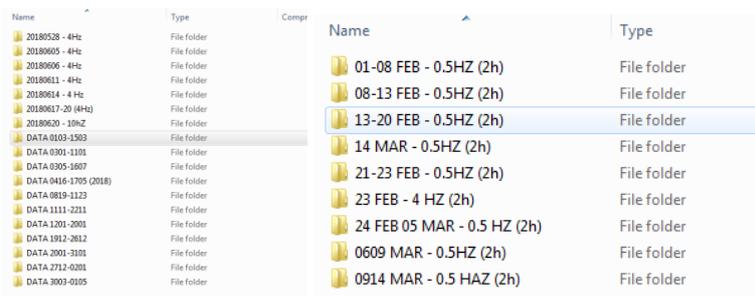
Which means, the data recording started at 28th May 2018 with a sampling frequency of 4Hz (4 times a second)

2) DATA 0103-1509

Which reflects a set of subfolders of different recorded periods within 1st March and 15th March (the year in that case should be looked within the folders and the dates of creation of the files)

3) 01-08 FEB – 0.5Hz (2h)

Which means that there are files in this subfolder from 1st until 8th of February with a sampling frequency of 0.5Hz and a sampling period of each file of 2hours. This means that every 2 hours a file was generated for each sonic anemometer. Since we have 8 anemometers there are 8 files per hour. So $8 * 24 = 192$ files per day



Name	Type
20180528 - 4Hz	File folder
20180605 - 4Hz	File folder
20180606 - 4Hz	File folder
20180611 - 4Hz	File folder
20180614 - 4 Hz	File folder
20180617-20 (4Hz)	File folder
20180620 - 10h2	File folder
DATA 0103-1503	File folder
DATA 0201-1101	File folder
DATA 0305-1607	File folder
DATA 0416-1705 (2018)	File folder
DATA 0819-1123	File folder
DATA 1111-2211	File folder
DATA 1201-2001	File folder
DATA 1912-2612	File folder
DATA 2001-3101	File folder
DATA 2712-0201	File folder
DATA 3003-0105	File folder
01-08 FEB - 0.5HZ (2h)	File folder
08-13 FEB - 0.5HZ (2h)	File folder
13-20 FEB - 0.5HZ (2h)	File folder
14 MAR - 0.5HZ (2h)	File folder
21-23 FEB - 0.5HZ (2h)	File folder
23 FEB - 4 HZ (2h)	File folder
24 FEB 05 MAR - 0.5 HZ (2h)	File folder
0609 MAR - 0.5HZ (2h)	File folder
0914 MAR - 0.5 HAZ (2h)	File folder

FILE EXPLANATION

The files in each subfolder of each period are named as:

Gill Log [WM1]-0

where

WM1 – stands for the particular anemometer

0 (or 1,2,3....n) – stands for the additionally generated file in this time sequence (most of time periods of the files are 120 minutes but there a few exceptions)

Therefore one files can give you 12 sets of 10-minutes (which is the common practise of wind resource assessments)

<input type="checkbox"/> Gill Log [WM6]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM10]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM1]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM4]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM5]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM7]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM8]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM9]-693	24/4/2018 10:08 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM6]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM9]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM10]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM1]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM4]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM5]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM7]-692	24/4/2018 10:06 πμ	File	10 KB
<input type="checkbox"/> Gill Log [WM8]-692	24/4/2018 10:06 πμ	File	10 KB

For the location of each sonic anemometer with respect to the noise barrier please refer to the picture below



DATA IN FILE EXPLANATION

Each file is a comma-separated set of data. With 5 starting lines explaining the file contents. Please refer into the following manual for further information

(<http://gillinstruments.com/data/manuals/WindMaster-and-Windmaster-Pro-Manual.pdf>)

```
WindView Log File
Name: WM1
Output Format: GILL_UVW_THREE_AXIS
Log file opened: 2/1/2017 1:24:15 PM

A,+001.43,+002.84,-
000.87,M,+339.46,+012.93,00,-----3A,1
,2/1/2017 1:24:16 PM

A,+003.89,+004.55,-
000.40,M,+339.57,+013.12,00,-----37,2
,2/1/2017 1:24:18 PM

A,+004.18,+002.24,-
000.60,M,+339.56,+013.10,00,-----39,3
,1-2-2017 13:24:20

A,+003.24,+002.93,+000.10,M,+339.46,+012.93,00,
-----37,4,1-2-2017 13:24:22
```

The lines below

Check the manual to understand the data better, but as a quick reference.

A – is a sonic anemometer identifier not useful). The next 3 highlighted numbers are U_x , U_y and U_z .

The 4 highlighted number is the sonic temperature.

The last date and time is the time-stamp of this line.

NOTE 1 (if the sampling frequency is not indicated in the sub-folder index, you can back calculate and trace the sampling frequencies of all files within 1 folder from the date/time in the file)

For example for the last 2 row check that 13:24:20 and 13:24:22, this means that there's a sample every 2 seconds which in turn is a sampling Frequency of 0.5Hz.

NOTE2 U_z needs a correction factor found in Gill instruments manual (specific for each type of data handling)

Date	Time	Temp Out	Hi Temp	Low Temp	Out Hum	Dew Pt.	Wind Speed	Wind Dir	Wind Run	HI Speed	HI Dir	Wind Chill	Heat Index	THW Index	THSW Index	Bar	Rain Rate	Solar Rad.	Solar Energy	Hi Solar Rad.	Heat D-D	Cool D-D	In Temp	In Hum	In Dew	In Heat	In EMC	In Air Density	ET	Wind Samp	Wind Tx	Wind Recpt	Ac. Int.
3/1/2017	0:01	4.3	4.3	4.3	89	2.6	0.9 WSW	0.05	1.3 WSW	1.3 WSW	1.3 WSW	4.1	4.2	4.1	2	1025.9	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	23	1	100	1
3/1/2017	0:02	4.3	4.3	4.3	89	2.6	1.3 WSW	0.08	1.8 WSW	1.8 WSW	3.3	4.2	3.3	1.2	1026	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	23	1	100	1
3/1/2017	0:03	4.2	4.2	4.2	89	2.6	0.9 WSW	0.05	1.3 WSW	1.3 WSW	4.1	4.2	4	1.9	1025.9	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	24	1	100	1
3/1/2017	0:04	4.2	4.2	4.2	89	2.6	0.9 WSW	0.05	1.3 WSW	1.3 WSW	4.1	4.2	4	1.9	1026	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	23	1	100	1
3/1/2017	0:05	4.2	4.2	4.2	89	2.5	1.3 WSW	0.08	1.3 WSW	1.3 WSW	3.2	4.1	3.2	1.1	1026	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	23	1	100	1
3/1/2017	0:06	4.2	4.2	4.2	89	2.5	1.8 SW	0.11	2.2 WSW	2.2 WSW	2.6	4.1	2.6	0.5	1026	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	24	1	100	1
3/1/2017	0:07	4.1	4.2	4.1	89	2.5	1.3 SW	0.08	1.8 WSW	1.8 WSW	3.2	4.1	3.1	1.1	1025.9	0	0	0	0	0	0	0.01	0	9.1	72	4.3	8.8	1382	0	22	1	95.7	1

WEATHERLINK DATA

The Weatherlink data come from the weather station installed on the 2nd pole at a height of around 7.80 meters. There are numerous properties that can be found, better find online the Davis Weather Station Vantage Pro 2 manual to explain the data.

You can check on the text-file at the left-side of the text, the various properties that have been recorded.

The units of each variable can be found online but the most important ones for wind where:

Wind Speed (m/s)

Wind Direction (N,NNE,NE,NEN,E...S...W...)

Temperatures (in C⁰)

Sampling period for wind is every 2.5 seconds and the shown value is the average of those 25 values per minute. The same applies for the wind direction

There are also other additional data that could be useful such as solar radiation and rainfall. Please refer to the manuals for more info about the units as they have not been used in the experiment but are great to include for further research purposes.