OPEN ENVIRONMENTAL MONITORING NETWORK - PROOF OF CONCEPT

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We present a proof of concept about an open environmental monitoring network. The network is aimed to evenly cover mainly the territory of Bulgaria, but also to include measurements from the neighbor Balkan countries. The network is built over multiple self-designed and self-made ground-based measuring stations (GBMS). Each station consists of a box, supported with two valves for better and controlled ventilation. The sensors set is built within the box. For avoiding infrared heat (mainly from the sun) the box itself will be covered by reflectors based on TiO_2, Caolin, SiO_2 and commercial Yellow GRX 86 pigment. Each GBMS include sensors for measuring ambient temperature, atmospheric pressure, relative humidity, particulate matter (size of 2.5 and 10 μm) and gamma radiation. A measure is performed each fifth minute and report is send to the server. The data is collected and is publicly available without any license restrictions on the web site www.meter.ac. The open environmental monitoring network offers a flexible interface to the users for browsing the data and derive their own conclusions. The current proof of concept network maintains over 30 ground-based measuring stations located in different parts of Bulgaria for more than half year.
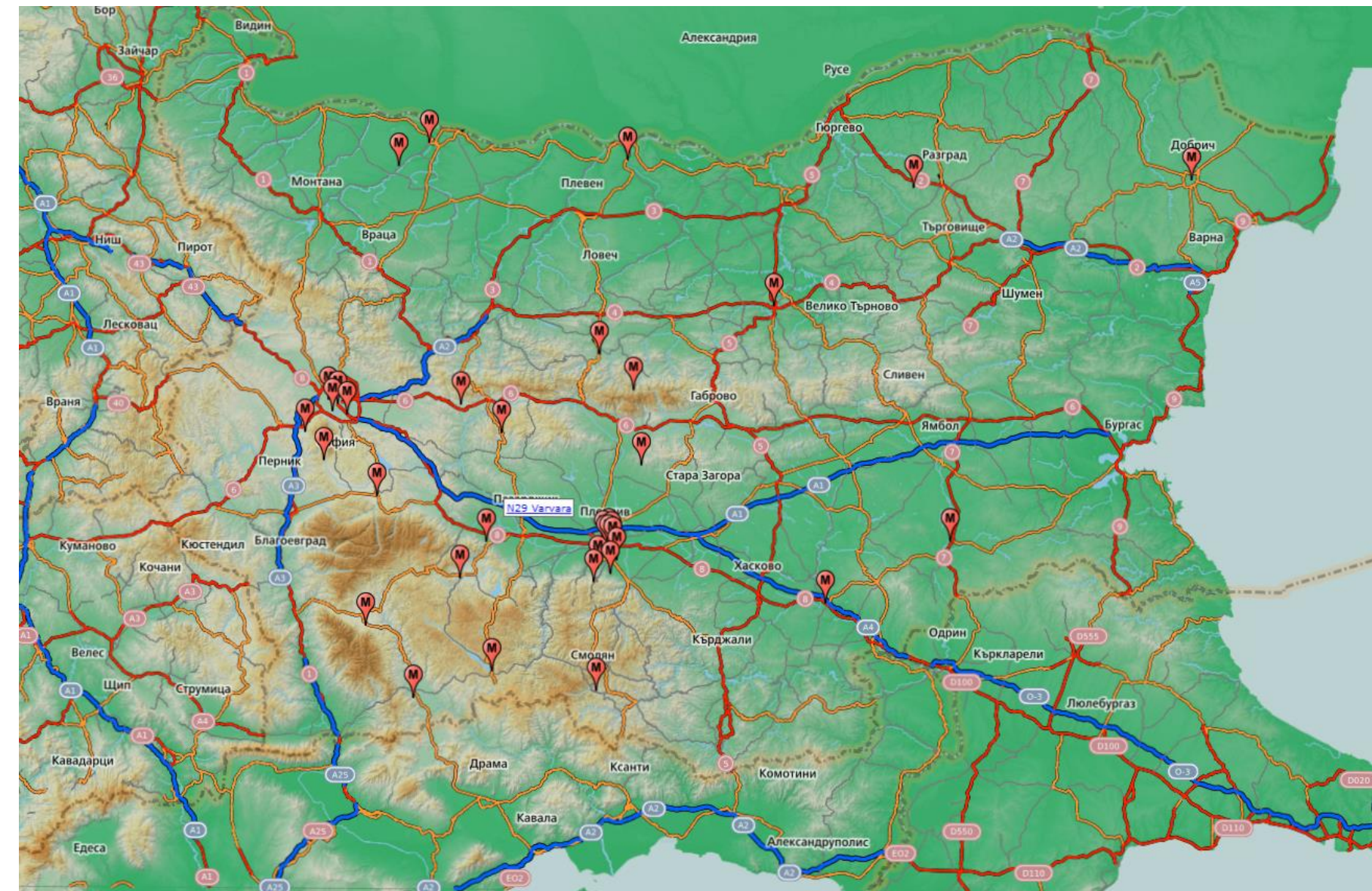
Ground-based measuring station (GBMS)
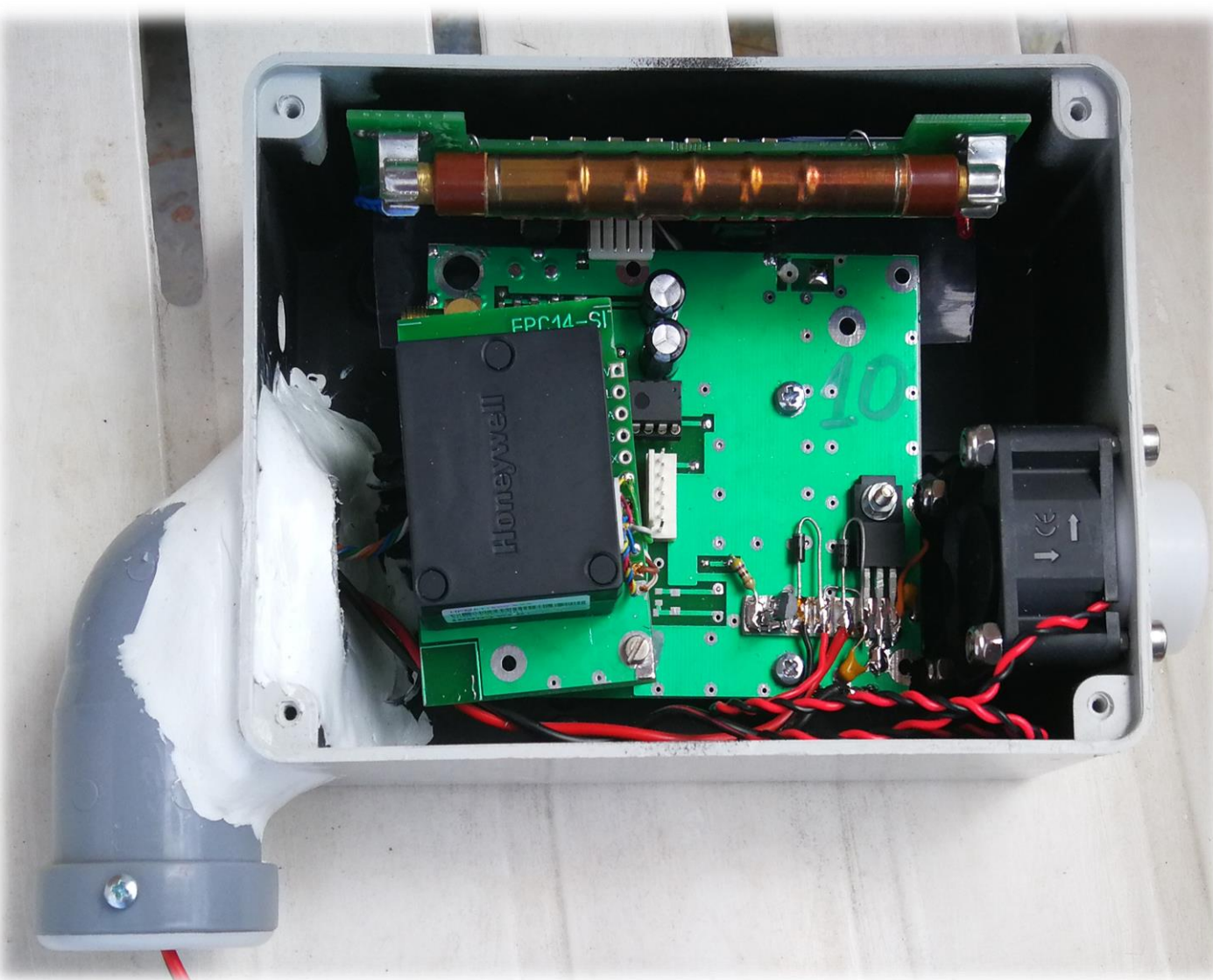
Measurements:
- Temperature
- Atmospheric pressure
- Relative humidity
- Particulate matter - size of 2.5 and 10 μm
- Gamma radiation

GBMS installed in strategical places.

Locations of the installed GBMSs

METER.AC :: [meteo] [nodes] [summary] [snapshots] [live] [about] [map] [infrastructure] [contacts]

Nodes		Status [min]	Location [place]	Alt [m]	T_{raw} [°C]	ΔT_{raw} [°C]	T_{dew} [°C]
N01		✓ 3	Plovdiv_NE	167.0	25.1		14.4
N02		✓ 4	Markovo	412.0	25.4	+0.7	14.4
N03		✓ 3	Dospat	1270.0	19.2	+2.2	
N04		✗ 11	Plovdiv_Centre	171.2	25.8	-0.1	
N08		✓ 3	Kuklen	308.0	25.8	+1.0	
N09		✓ 3	Plovdiv_E	182.0	27.5	+0.4	
N10		✓ 3	Krumovo	169.0	26.3	+1.0	
N11		✓ 4	Plovdiv_Trakia	165.0	26.2	+0.3	13.8
N13		✗ 81718	Plovdiv_Lauta	160.4	14.5		2.7
N18		✓ 4	Osenets	236.0	21.3	+0.7	17.0
N20		✓ 2	Glozhene	65.2	23.4	-0.2	19.0
N21		✓ 2	Yarlovo	1136.7	19.9	+2.9	10.5
N22		✓ 0	Mirkovo	676.4	22.8	+4.4	13.7

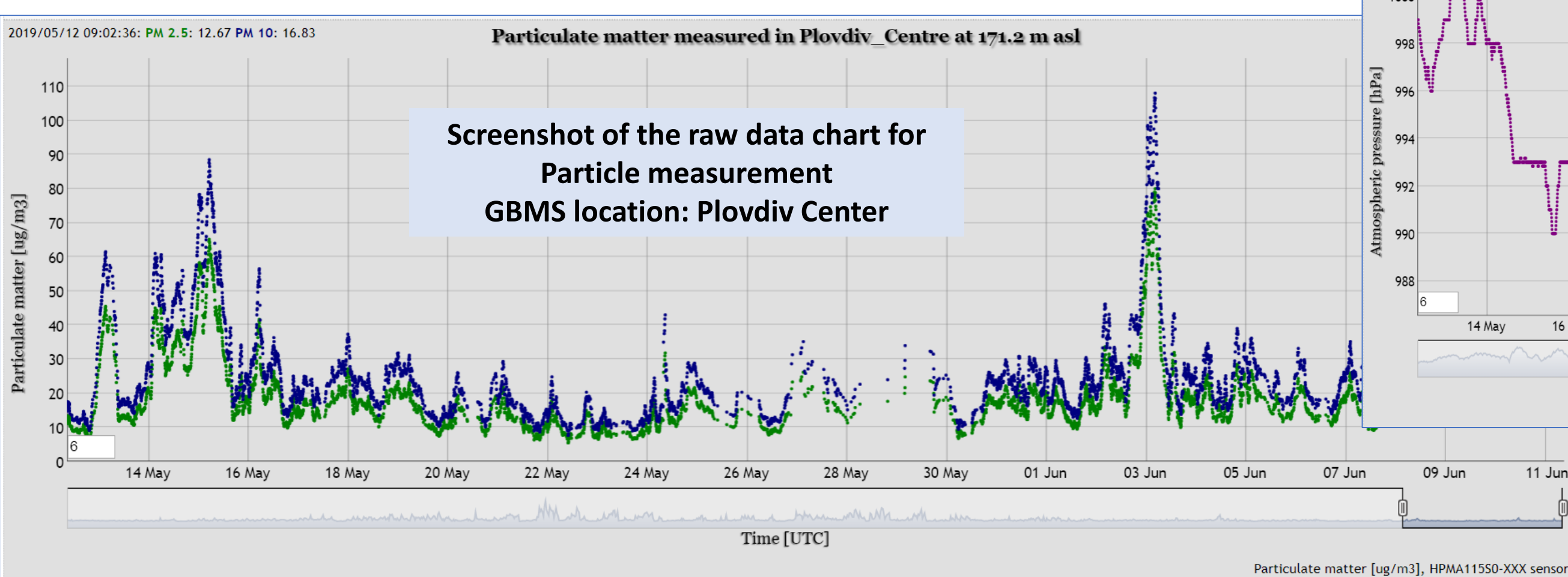At **meter.ac** you'll find all the date the stations have been gathering, presented by functional interface.

- The data collection on every 5th minute
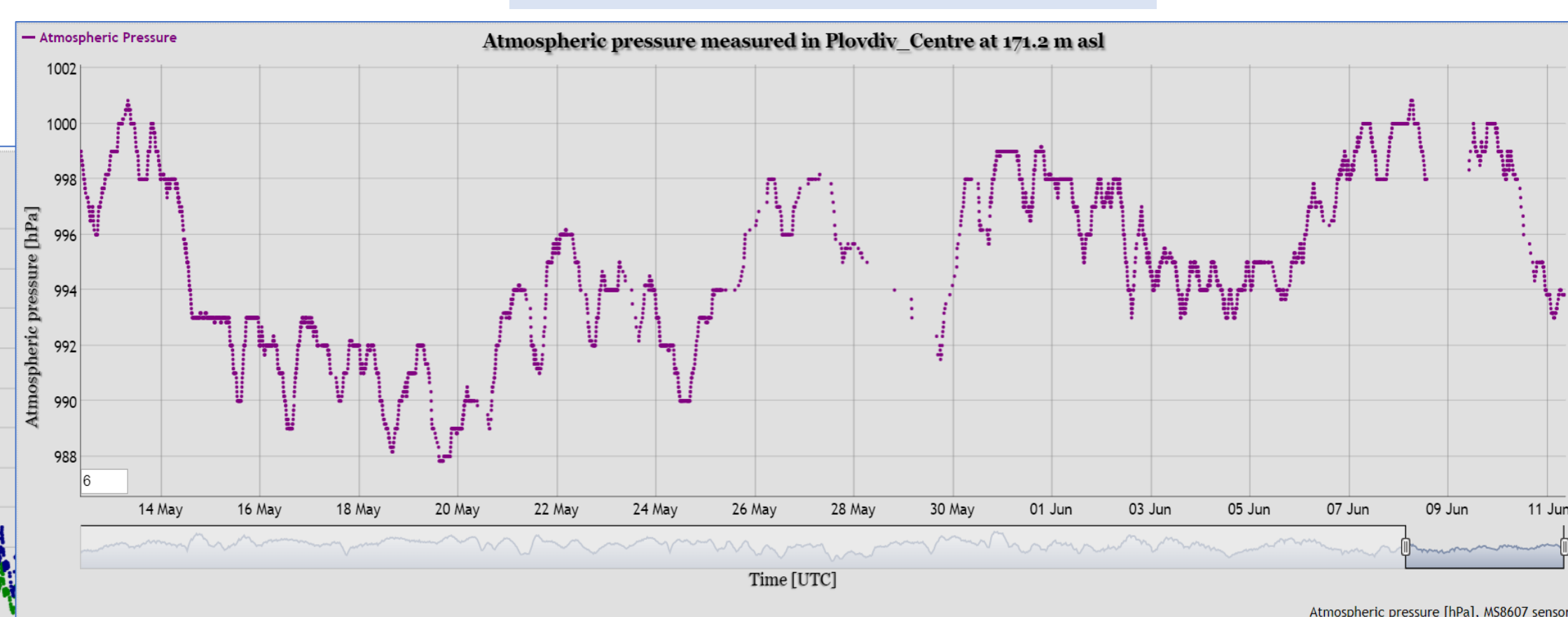- Send to the server via LoraLan connection or trough the Internet.
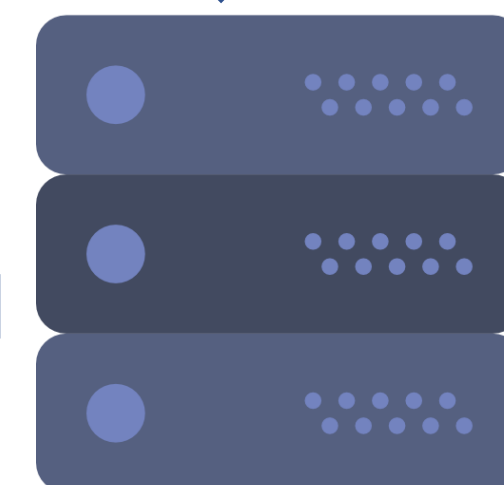
The server process, stores, and put the information on the website: **meter.ac**

Web address: https://meter.ac/

Screenshot of the raw data chart for Particle measurement GBMS location: Plovdiv Center

Screenshot of the raw data chart for Atmospheric pressure GBMS location: Plovdiv Center