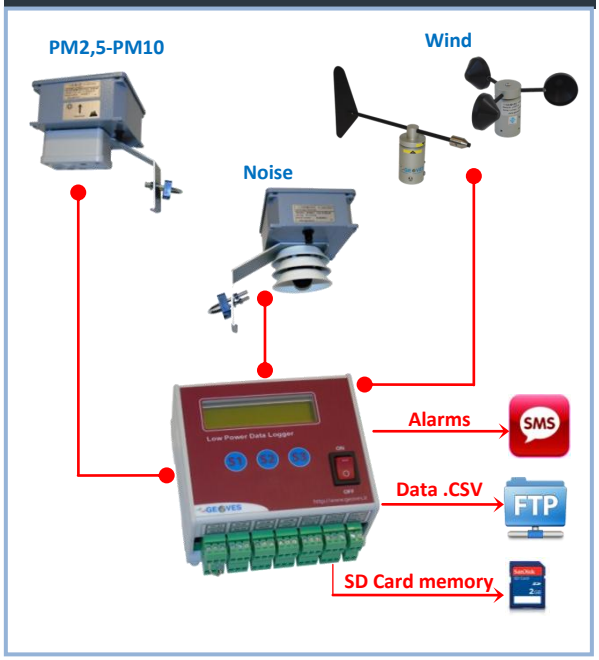
BUTTERFLY-PRV – ALARM SYSTEM FOR WIND, DUST, NOISE OVERCOMINGS (Rev.2 311020)



Generale description

BUTTERFLY-PRV is a system designed to continuously monitor the **wind, noise** and the concentration of the **fine dusts** by alerting the available personnel in situations of strong wind and high presence of particles in the air or noise.

BUTTERFLY-PRV has the main following features:

- **Display** of fine dust, noise, wind speed and direction
- Data transmission **via GPRS** on a **FTP area** (safe web area) and alarms sending **via SMS** to the on-call staff
- **Black box:** backup storage of wind, noise and dust measurements on **SD Card.** The data are in CSV format (Comma separated value) and are available on a external FTP area or on a Geoves one where the data and alarms are shown in chart format between the **web software MeteoGraph**
- **Management of all measurement alarms:**
  - **Wind intensity**
  - **High noise**
  - **High dust concentration of PM10-2,5 (option: PM1)**
- **Hysteresis control** on the anemometric measure to prevent false alarms caused by temporary wind gusts

Main applications

1) **Shipyards**: excavation and ground handling (**LCPC Setra 2000 Guidelines**)
2) **Construction**: inert, calcify, cement plants, construction sites
3) **Civil and industrial plants**: volatile deposits, landfills
4) **Environmental monitoring** with control and alarms of wind & dust and other weather parameters (rain, etc…)

Advantages and main features

- ✓ Powered by photovoltaic panel or 220Vac
- ✓ Storage on SD Card with **tamper-proof** data system
- ✓ Reliable sensors and datalogger compliant with **WMO - Annex 8** guidelines with anemometer available also in **heated anti-icing** model, **Measnet** or **Accredia** certifiable
- ✓ **Phonometric probe** with analogue output that can be interfaced for automatic management of the noise threshold alarm
- ✓ **Light scattering** dust sensor **suitable for measuring** of **PM2.5, PM10 (PM1 option)**
- ✓ **Programming** of main setup parameters
- ✓ Long-life and minimum required maintenance
- ✓ Easy to transport and mount both for fix and portable applications (fix poles or folding tripod)
- ✓ Power supply from mains 220Vac, photovoltaic panel or 12/24Vdc external power
- ✓ Fully **Italian technology**

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Technical Data

Model	Butterfly-PRV – Wind-dust-noise alarm and monitoring system
I/O Channels	n.8 analog inputs (0…5Vdc, 4…20mA, potentiometer, etc…) n.2 digital inputs in frequency (typ. 0…250Hz), for anemometers with Reed Switch or Hall effect or TTL 5Vdc outputs and rain gauges with pulse output
User Interface	n.3 multifunction buttons, 2r. 16 crt. display LCD with sliding pages
Box IP65	IP65 enclosure, in polycarbonate with anti-radiation treatment (or stainless steel) Key enclosure, cross-arms for fastening on poles (ø50…150mm) or on walls.
Power supply	From photovoltaic panel and backup battery 12Vdc From mains 220Vac and backup battery 12Vdc
Measure sampling	1s
Typical data storage	10' (WMO standard) on **SD Card** 2GB max (circular management)
Data Format	ASCII Standard .txt, compatible CSV (Comma separated value)
Data Transmission	Modem GSM/GPRS Via FTP (data) and via SMS (alarms)
Data transmission rate (via FTP)	In normal and pre-alarm conditions: every 60' In alarm conditions: every 10'
Alarms transmission (via SMS)	@alarm threshold overcoming of wind, dust and/or noise @ threshold overcoming of minimum battery voltage
Settable thresholds	Wind speed measurements PM10 Dust measurements PM2,5 Dust measurements PM1 (option) Dust measurements Noise measurements
Programming	Date and hour; anemometric constants; threshold values of alarm; anemometric unit of measure: m/s, km/h, mph, kn; FTP parameters; n.2 mobile numbers of available staff
WMO Elaborations	min, max, arithmetic mean, standard deviation, turbulence; trigonometric mean;
Compliance	WMO, LCPC Setra 2000, IEC61400-12
Operative Temperature	-40…+80°C

Butterfly-PRV – Dust, noise and wind alarm station

Model	mWS1 – Wind speed sensor (mod. WS2R with anti-icing heater)
Range	0…75m/s
Transducer	Magnetic with sinusoidal AC signal not powered
Rotation	On special bearings
Accuracy	±0.1m/s
Available certifications	**Measnet** in compliance with IEC61400-12
Housing	Anodized Aluminium

SBS2 – Anemometer bracket for ø25…50mm **poles** (other diameters on request)

Model	mWD1 – Sensore direzione vento (mod. WD2R with anti-icing heater)
Range	0…359° (real electric angle 0…352° ±4°)
Transducer	Linear Potentiometer with continuous 360°
Rotation	On special bearings
Accuracy	±2°
Housing	Anodized Aluminium

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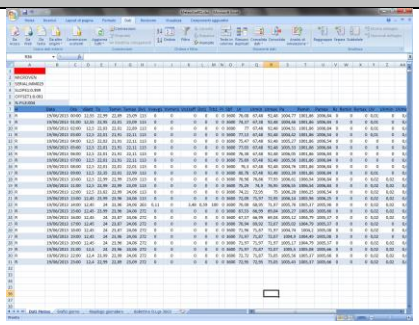
Models	SPM10-2,5-I - SPM10-2,5-1-I
Working principle	Light laser scattering
Measuring range	PM2.5: 0…1000 µg/m^3 ; PM10: 0…1000 µg/m^3 ; PM1: option
Resolution	1µg/m^3
Accuracy	±10%
Warming time	≤ 120s
Response time	90s
Outputs	4…20mA
Power	12…24Vdc
Consumption	100mA@12Vdc
Load resistance	100Ohm@12Vdc (<600 Ohm@24Vdc)
Working conditions	-20…+60°C, 0…80%
Materialis	Painted and anodized aluminum
Overall dim. and weight	Body of sensor: 190 x 140 x 120mm (bracket excluded), weight: 1100g
Connector	Plug IP68
Mounting	Universal bracket for fastening on horizontal or vertical pipes ø25…42mm

Modello	SFON-I
Transducer	Condenser microphone
Measurement range	30…120dB
Frequency range	20Hz…12.5 kHz
Accuracy	±0.5 dB (94dB a 1 KHz)
Resolution	0.1 dB
Response time	≤ 3s
Output	4…20mA
Power	12…24Vdc (typ.12Vdc)
Consumption	1.2W
Load resistance	100Ohm@12Vdc (<600 Ohm@24Vdc)
Working conditions	-20…+60°C, 10…90%
Materials	Painted and anodized aluminum
Overall dim. and weight	Sensor body: 190 x 140 x 120mm (bracket excluded), weight: 1000g

SOFTWARE

Model	Geodesk & MeteoGraph
	**Geodesk** is a basic service software, free supplied with all Geoves datalogger, that can import data recorded (on SD card or sent via GPRS or transmitted by cable from the datalogger) and generate a single data file in Excel format. In this way it's possible to create data aggregation of desired period (eg. Monthly) and then derive the tabular and graphical reports. Besides Geodesk creates the setup configuration for the functioning of Butterfly, Micro3 and LPDL Geoves dataloggers
	MeteoGraph is a web application for the numerical and graphic display of data transmitted via GPRS on FTP area from environmental monitoring stations with Geoves datalogger. The software relies on an FTP Geoves area where data is sent

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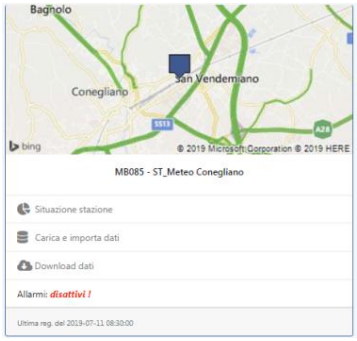
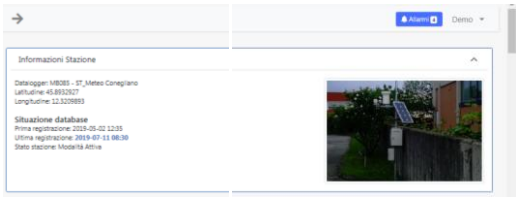
autonomously by the control units at fixed times and are available in **standard text format** with fields separated by commas (**CSV format**). The data is therefore **always usable** without the need to use proprietary communication protocols or specific programs for data decoding; furthermore, the software **does not require any installation** as Internet access is sufficient and a username and password must be entered to enter the dedicated web page and display the measurements from a PC, tablet or smartphone.
The data in text format are processed by MeteoGraph to obtain on the web page both the measurement in numeric format (eg average minimum maximum trend, etc.) and in graphic format that can be downloaded in jpg bitmap format.



Station dashboard

The available functions are:

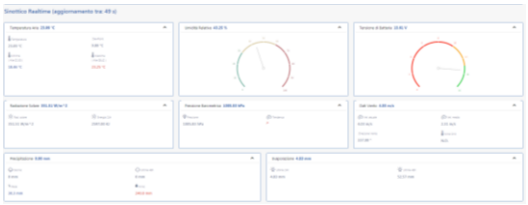
- *Station situation*: access to the graphic processing page and to the station's synoptic
- *Load and import data*: the data saved on the datalogger SD card are imported, or on a PC folder (or other support)
- *Data download*: data are downloaded in text format with fields separated by commas for simple backups or subsequent processing with other applications (eg Excel, Access, external databases or other commercially available software)
- *Alarms*: access to the station alarm management menu (optional on request)



Station situation - *Station information*

The parameters displayed are:

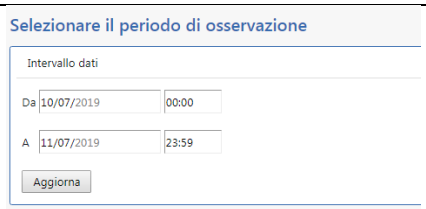
- Station unique identifier (ID)
- Name of the station
- Geographic coordinates (Latitude and Longitude)
- Data base status:
  - Date and time of Start data storage
  - Date and time Last data storage
  - Operation status of the station
- Photos of the station



Real-time synoptic of the station

The synoptic is a very useful tool for assessing the situation of the latest measurements taken by the monitoring station and assessing the meteorological or environmental situation of the site. For each measurement it is possible to associate one or more dedicated processes. For example, for the temperature it is possible to indicate the minimum and maximum value and the time in which it occurred in addition to other calculated measures such as the dew point.
The synoptic also shows:

- calculated measures
- Diagnostic data (eg battery voltage)
- Significant data for the interpretation of the measure (eg barometric tendency, wind chill, monthly precipitation, etc.)



Observation period

It is possible to select the observation period in which to carry out all the elaborations that are displayed by MeteoGraph

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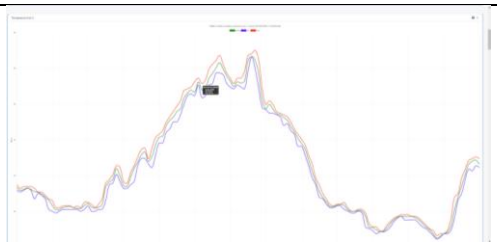
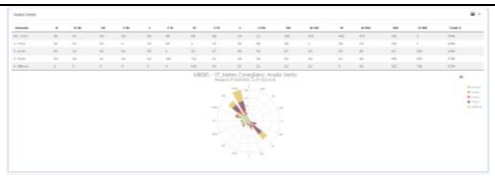


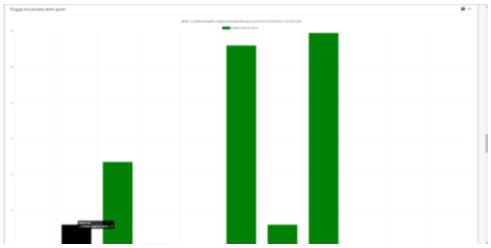
Graphic elaborations

- **Linear multi-line** for measurements where the arithmetic average is applied (eg temperature, humidity, pressure, etc.) with representation of the minimum and maximum value



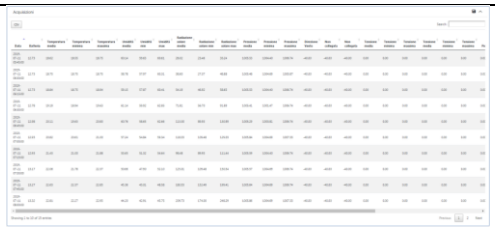
Graphic elaborations

- **Wind-rose** for the anemometer measurements



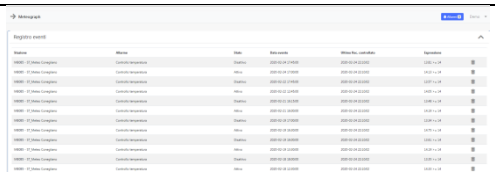
Graphic elaborations for precipitation

- Graph with hourly summation
- Monthly or annual precipitation histogram
- Other graphs are available on request or can be customized with simple filters



Tabular elaborations

Daily data table can be downloaded both in text and in .png image format



Alarm management

To manage alarms, the software allows you to set upward (> value) or downward (<value) intervention thresholds, after which alert emails are sent to the personnel in charge.
The alarms are then represented on the screen with adequate effects and colors to attract the attention of the operator

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