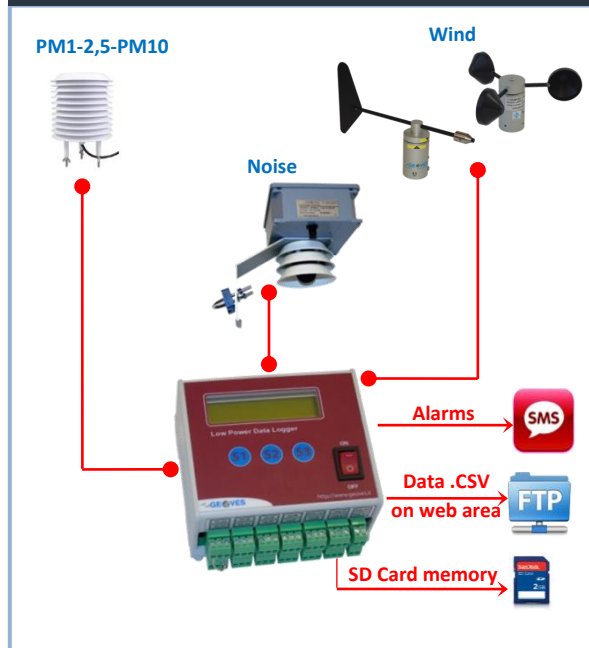


BUTTERFLY-PRV – ALARM SYSTEM FOR WIND, DUST, NOISE OVERCOMINGS (Rev.3 24032026)



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:

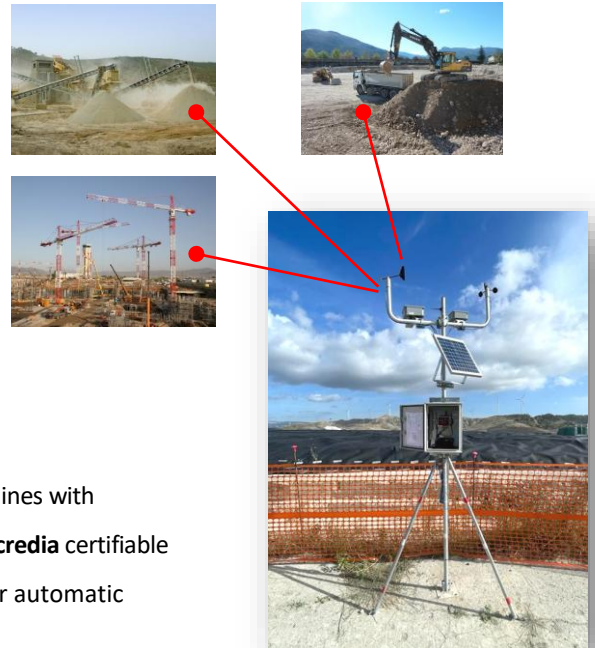
- **Display** of fine dust, noise, wind speed and direction
- Data transmission **via LTE/GPRS** on an **FTP area** (safe web area) and alarms sending **via SMS** to the on-call staff
- **Black box**: backup storage of wind, noise and dust measurements on **SD Card**. The data are in CSV format (Comma 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)**
 - **Other weather and pollutants measurements (on request)**
- **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 measurement** 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**



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	GPRS/LTE router 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) 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 possible Elaborations	min, max, arithmetic mean, standard deviation, turbulence; trigonometric mean;
Compliance	WMO, LCPC Setra 2000, IEC61400-12
Operative Temperature	-40...+80°C

Model	mWS1 – Wind speed sensor
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

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

***Note:** Other meteorological sensors are available on request (eg. thermohygrometer, rain gauge, etc...)



Butterfly-PRV – Dust, noise and wind alarm station



ø25...60mm poles (other diameters on request)



Models	SPM10-2,5-I - SPM10-2,5-1-I Dust sensors
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...42 or 40...60mm



Modello	SFON-I Noise probe
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
Mounting	Universal bracket for fastening on horizontal or vertical pipes ø25...42 or 40...60mm

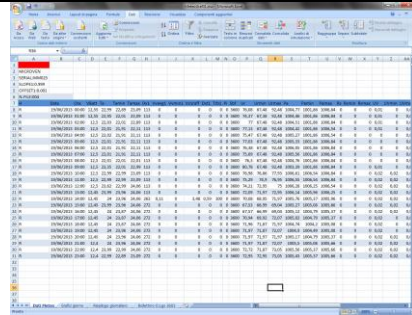


Other connectable sensors for pollutants measurements

Model	Measure	Standard range (other on request)	Resolution	Accuracy
SCO2- I	Carbon dioxide (CO ₂)	0...2.000 o 0...5.000ppm	0,5...1% f.s.	< ±5% of full scale
SCOHR- I	Carbon monoxide (CO)	0...10.000ppb	10ppb	±5% of full scale
SSO2HR-I	Sulphur dioxide (SO ₂)	0...5.000ppb	10ppb	
SH2SHR-I	Sulphured hydrogen (H ₂ S)	0...5.000ppb	10ppb	
SNO2HR-I	Nitrogen dioxide (NO ₂)	0...5.000ppb	10ppb	
SO3HR-I	Ozone (O ₃)	0...5.000ppb	10ppb	
SNH3HR-I	Ammonia (NH ₃)	0...10.000ppb	10ppb	
SSMELL-I	Odorous substances	0...5.000ppb	10ppb	
SVOCHR-I	Volatile Organic Compounds (VOC)	0...10.000ppb	10ppb	

SOFTWARE

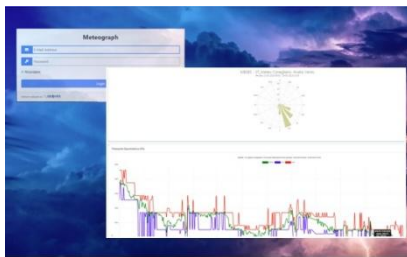
Model



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.

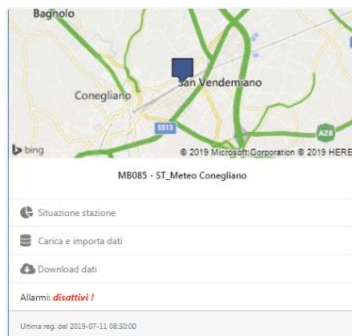
Besides Geodesk creates the setup configuration for the functioning of Butterfly, Micro3 and LPDL Geoves dataloggers



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 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.

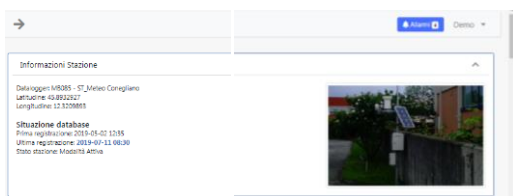
The data in text format are processed by MeteoGraph to obtain on the web page both the measurement in numeric format (eg average minimum maximum trend, etc.) and in graphic format that can be downloaded in jpg bitmap format.



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)



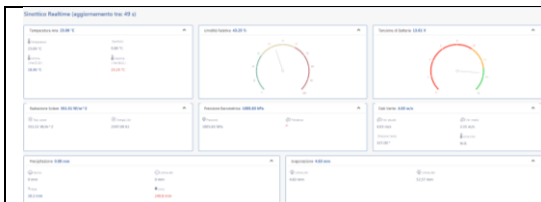
Station situation - Station information

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.)

Selezionare il periodo di osservazione

Intervallo dati

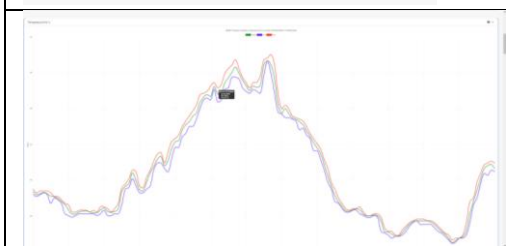
Da 10/07/2019 00:00

A 11/07/2019 23:59

Aggiorna

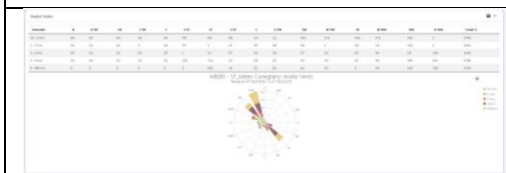
Observation period

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



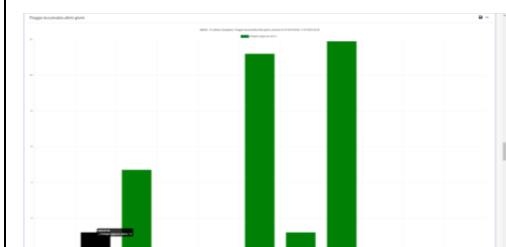
Graphic elaborations

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



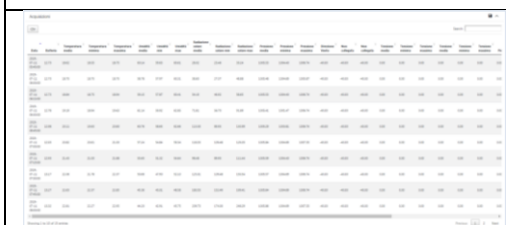
Graphic elaborations

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



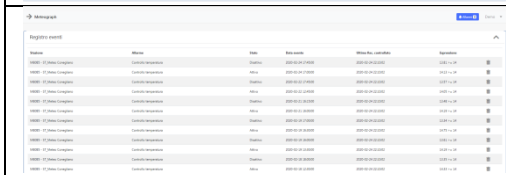
Graphic elaborations for precipitation

- 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