

## MICROVEN1 – LOW CONSUMPTION MINILOGGERS FOR WIND POWER (Rev.0)



### Description

The micro-dataloggers **MicroVen1** are professional acquisition systems for anemometric data, designed and built by Geoves in compliance to **IEC61400-12** norms and **WMO** guidelines.

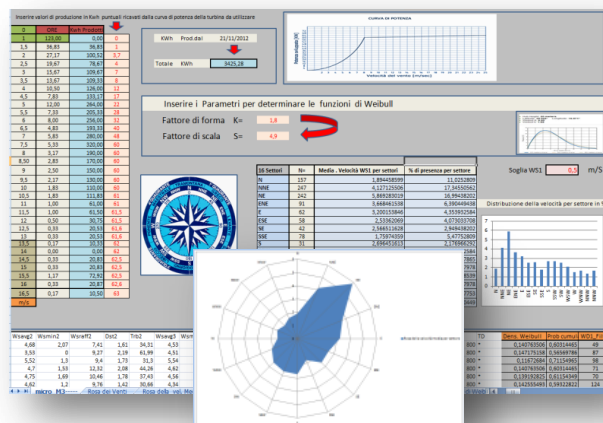
MicroVen is **extremely compact**, with **very low consumption** and very cheap, characteristics that make it particularly suitable for Micro and Mini wind applications where the investment for the anemometric campaign must be minimal.

MicroVen dataloggers have been certified by **Measnet** laboratories, which represent an International Network recognized from Banks when the certification of anemometric data is required for the **eolic energy investments**. The Measnet establishes the fundamental criteria so that the detected anemometric measurements have a total significance to derive the **wind producibility** of a site.

For this reason the **MicroVen** dataloggers are provided with **Windgraf1** software which allows to upload anemometric data, insert the power curve of desired wind turbine (released from the manufacturer) and get all specific elaborations to have all info on eolic producibility of the site (**Weibull**, **Wind Rose**, **hours of wind frequency**, etc...).

### Advantages

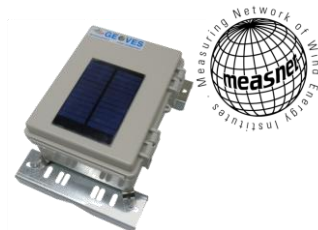
- ✓ **IEC61400-12** conformity and **MEASNET** certification for bank investments
- ✓ **Continuous sampling** (1Hz = 1 measure x second) of measurements. Sampling >1s are not meaningful for eolic energy monitoring
- ✓ **Elaborations** every **1-5-10-15-30-60'** of minimum, average, gust, standard deviation and turbulence
- ✓ **Data storage** on SD Card memory, data protected against tampering (bank requirements). Autonomy >500days
- ✓ Multifunction buttons to insert the anemometric constants (slope and offset), setup of date and hour, scroll the measures and the battery data (diagnostic)
- ✓ **Display LCD**
- ✓ **Very low consumption** and long life of backup battery
- ✓ **Protection**: very high immunity to lightning (sensors not powered or galvanically isolated)
- ✓ Possibility to connect passive anemometers of other manufacturers (Davis, NRG, Thies, others on request)
- ✓ Possibility to connect a specific thermometer for the measurement of the air temperature, useful to evaluate frost and ice formation on the sensor and to determine the air density
- ✓ The stored data in the SD Card are in text CSV format (Comma Separated Value); the data can be read on the PC by any software such as Notepad, Excel, Access, etc....
- ✓ Easy to use and install



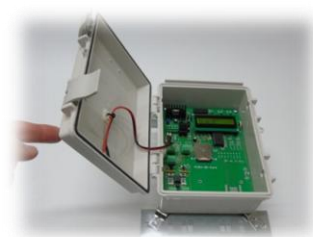
Internal view of MicroVen1  
datalogger

## Technical features

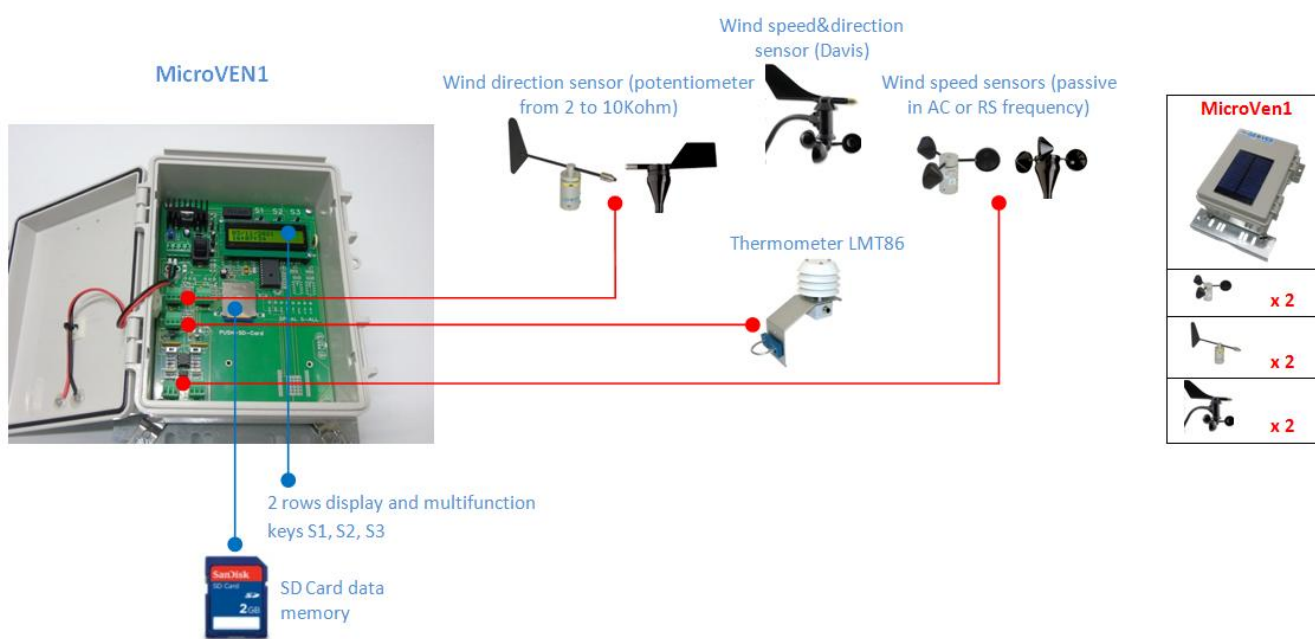
Model	mVEN1 Vers.2.0 (Conf. ISDM-E) – Anemometric Dataloggers
Input channels	n.2 wind speed, n.2 wind direction, 1 thermometer, battery voltage (mV)
Box IP66	Plastic housing, Dim.: 210x160x100mm (brackets excluded), hermetic closure and padlock with key, universal brackets for pole mounting (standard U-bolts for poles Ø90...120mm, others on request)
Wind measure sampling	1s
Data storage	1-5-10-15-30-60' on <b>SD Card</b> up to 2GB
Include Power supply:	AA Rechargeable batteries and photovoltaic cell 1W@6Vdc From 15 to 20 days endurance in sun absence with >5' storage rate
Optional auxiliary power	External 12Vdc o 5W@12Vdc photovoltaic panel (recommended <u>for data storage every minute</u> )
IEC61400-12 Elaborations	<b>Wind Speed:</b> min, max (gust), arithmetic average, standard deviation, turbulence; <b>Wind Direction:</b> trigonometric average; <b>Air Temperature:</b> arithmetic average
HMI	Multifunction buttons for the setup of date, hour and anemometric constants (slope and offset) 2 rows LCD to display: measurements, date and hour, battery voltage (diagnostic data) and the S/N of the datalogger
Certifications	Measnet
Connectable Anemometers	Geoves, Davis, NRG, Young, Thies (others on request)



MicroVEN1



## Layout and e anemometers link



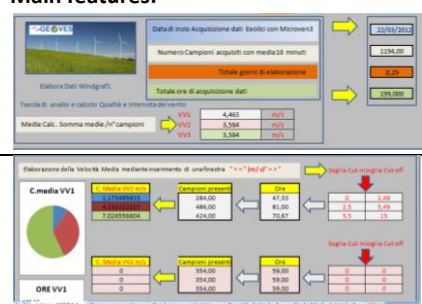


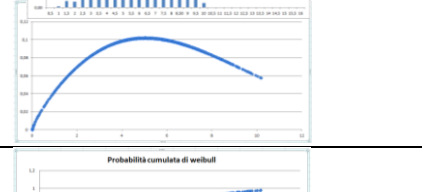
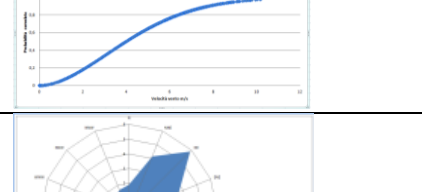
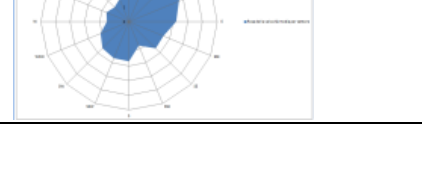
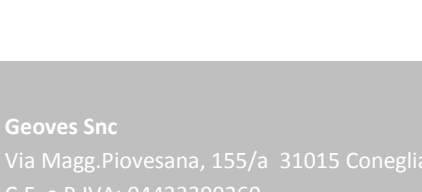
## Software Geodesk & Windgraf1 (provided with the datalogger)



A USB-key is supplied with the MicroVen1 datalogger containing both the technical documentation of the Geoves instrumentation and the Geoves application software for data management.

The software contained are:

1. **Geodesk:** application for importing the data files recorded in the SD Card of the Microven datalogger in a single excel file
2. **Windgraf1:** application for the preliminary estimation of the producibility of a wind turbine that allows you to correlate the anemometric data to the wind turbine power curve issued by the manufacturer. The description of this application is given below

Model	WindGraf 1 – Software package for wind data management
<b>Main features:</b> 	<b>WindGraf1</b> allows the upload of anemometric data, the configuration and setting of chosen wind turbine power curve; in this way it's possible getting all wind elaborations necessary to calculate the eolic yield of the site
	<b>Preliminary wind power analysis</b> In this table it is possible to preliminarily evaluate the frequency of the wind hours available for each single anemometer. The table allows to correlate the wind speed measured at the different heights in which the anemometers are installed
	<b>Graph "Hours of wind frequency"</b> The graph illustrates the hours of wind frequency divided by steps of intensity of 0.5 m / s.
	<b>Report "Generated Wind Power"</b> The report allows user to set the power curve parameters of the wind turbine supplied by the manufacturer to relate it to the wind speed and frequency time. In this way it's calculated the power energy in KW/h generated in the period of interest.
	<b>Graph "Weibull probability density"</b> The Weibull probability density graph represents an statistical distribution estimate that expresses the probability that the wind speed be within a certain range of values of known speed. The graph is calculated by setting the form factor and the scale factor
	<b>Graph "Weibull cumulated probability"</b> The Weibull cumulative probability graph represents an statistical distribution estimate that expresses the probability that the wind speed be below a speed threshold. The graph is calculated by setting the form factor and the scale factor
	<b>Graph "Wind Rose"</b> The wind rose graph is a radial representation of the frequency of the winds shown over a compass. The wind rose is subdivided on 16 sectors of the compass where can be seen the intensity classes related to the wind direction, so that user can locate the cardinal point where can be generated greater wind energy.