



STMVEN – WIND MONITORING STATIONS FOR MICRO EOLIC SOURCE YIELD ASSESSMENT (LIGHT POLES AND NO CIVIL WORKS NEEDED) (Rev.3 010423)

The wind monitoring stations of the series MicroVEN have been designed and constructed entirely from Geoves in accordance with standard **IEC61400-12** and **Measnet** guidelines. MicroVEN are used for wind monitoring finalized to the evaluation of eolic yield and the next micro and small wind turbines installation.



ADVANTAGES and MAIN FEATURES

Compliance

- ✓ **IEC61400-12 compliance of:** datalogger, data elaboration, anemometers, brackets length
- ✓ Datalogger tested by **Measnet laboratory**
- ✓ **MEASNET calibration certificate** (Optional) for anemometers

Datalogger functions

- ✓ Acquisition and storage of **2 wind speed and 2 wind direction measures** and **air temperature**
- ✓ Operating autonomy up to **15/20 days** without sun and with **1s sampling rate**
- ✓ Data storage autonomy **511 days** with 2GB SD Card
- ✓ **Display** to see measurements and multi-functional buttons to setup of date, hour and anemometric constants (slope and offset)
- ✓ Power supply from **AA rechargeable batteries** and **1W@6Vdc solar cell**
- ✓ Very compact and cheap

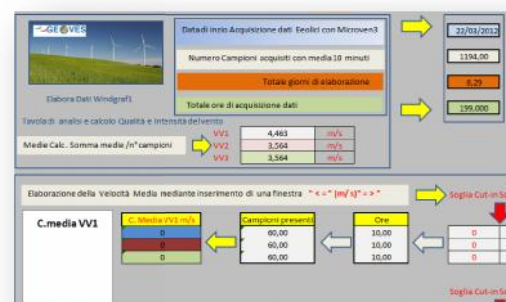


Accuracy and Reliability

- ✓ Anemometers made of **anti-corrosion anodized aluminium**, suitable for any outdoor environment
- ✓ Shielded cable with IP68 quick-fit connectors
- ✓ Memory card protected against data manipulation
- ✓ Data format: Standard Ascii text .TXT with every field separated by comma (**CSV format**); compatibility with Excel, database and the most common software available in the market
- ✓ Free software **WindGraf1** to get a good evaluation of the wind energy yield

Offered services

- ✓ Telephonic assistance
- ✓ Fully Italian Geoves technology
- ✓ After sale assistance for maintenances and calibrations
- ✓ Free training for the installation



Technical Data

Model	mVEN1 – Low Power Dataloggers
Input channels	2 wind-speed, 2 wind-direction, 1 temperature, battery voltage
Box IP66	Housing: plastic Dim.: 210x160x100mm Closure: cover with 4 screws and universal brackets to mount the box in any pole
Wind sampling measurements	1s
Data storage	1-5-10-15-30-60' on SD Card up to 2GB
Power supply included	AA rechargeable batteries + 1W@6Vdc photovoltaic cell Operating autonomy from 15 to 20 days in absence of sun and with >5' data storage
Elaborations IEC61400-12	Wind speed: Min, max (gust), arithmetic average, standard deviation, turbulence; Wind direction: trigonometric average; Temperature: 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 (other on request)



Model	mWS1 – Wind speed sensor (cup anemometer)
Range	0...75m/s
Transducer	Magnetic with sinusoidal AC signal not powered
Rotation	High performance bearings (lifetime > 2 years)
Output	Vers. -N: sinusoidal AC signal ($f_{tip.}@50m/s$ 220Hz)
Instrument constant	4.3 Hz/m/s (typical)
Accuracy	$\pm 0.1m/s$
Available certifications	Measnet compliant to IEC61400-12 norms (for bank acceptance)



Model	mWD1 – Wind direction sensor (wind vane)
Range	0...359° (true electrical angle 0...352° $\pm 4^\circ$)
Transducer	Linear Potentiometer with continuous 360°
Rotation	High performance bearings
Output	Vers. -N: Resistance variation (10KOhm)
Accuracy	$\pm 2^\circ$



Or

Model	DW6410 – Low cost combined anemometer (not certifiable for bank acceptance)
Wind speed	
Range	1...67 m/s
Transducer	Magnetic with reed signal
Output	Square wave (max frequency 90Hz)
Instrument constant	About 1 Hz/m/s (typical)
Accuracy	$\pm 1m/s$ (or $\pm 5\%$)



Wind direction	
Range	0...359° (true electrical angle 0...337,5° $\pm 22,5^\circ$)
Transducer	Potentiometer
Output	Resistance variation (10KOhm)
Accuracy	$\pm 7^\circ$

Model	LMT36 – Air temperature sensor
Range	-50...+150 °C
Transducer	Linearized Thermistor with anti-radiation shields
Accuracy	±0.5°C
Power Supply	+8...+30Vdc



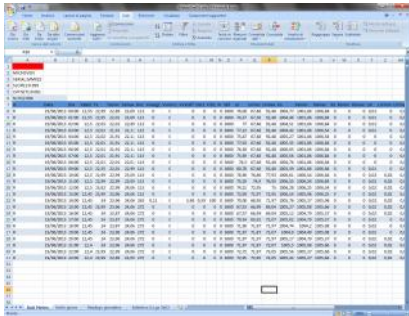
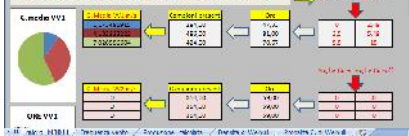
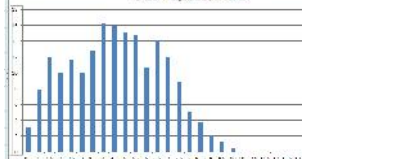
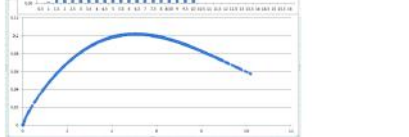
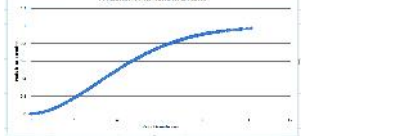
Light poles model:	PTA10-60	PTA15-70	PRF20-60
Heights (m)	10 max 3 min	15 max 3 min	20 max <3 min
Rising	manual	manual	Manual with ginpole and winch
Wind resistance up to 1000asl and without icing load	100km/h with gusts up to 130km/h		
Diameters (mm)	Base: 60 Top: 45	Base: 60 Top: 60	60
Weight (kg) guywires and accessories excluded	14kg	18kg	60kg
N. of guywires	2x3@120°	6x3@120°	5x4@90°
N. of elements	4	6	10
Housing	Aluminium	Aluminium	Galvanized steel
Required workers x installation	1/2	2	4



Standard recommended configurations in compliance to IEC61400-12

Model	10m Micro-A	15m Micro-B	20m Micro-C
Datalogger	mVEN1	mVEN1	mVEN1
Wind speed sensor	n.1@10m	n.1@15m n.1@10m	n.1@20m n.1@15m
Wind direction sensor	n.1@10m	n.1@15m	n.1@20m
Thermometer	n.1@2m (option on request)		
Pole	PTA10-60	PTA15-70	PF20-60
Calibration Certificates	Geoves and/or Measnet		
User manuals	included	included	included

SOFTWARE

Model	Geodesk – Software for datalogger setup and data export
	Geodesk Geodesk is a 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.
Model	WindGraf 1 – Software package for wind data management
Main features: 	WindGraf1 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
	Preliminary wind power analysis 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
	Graph "Hours of wind frequency" The graph illustrates the hours of wind frequency divided by steps of intensity of 0.5 m / s.
	Report "Generated Wind Power" 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.
	Graph "Weibull probability density" 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
	Graph "Weibull cumulated probability" 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
	Graph "Wind Rose" 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.