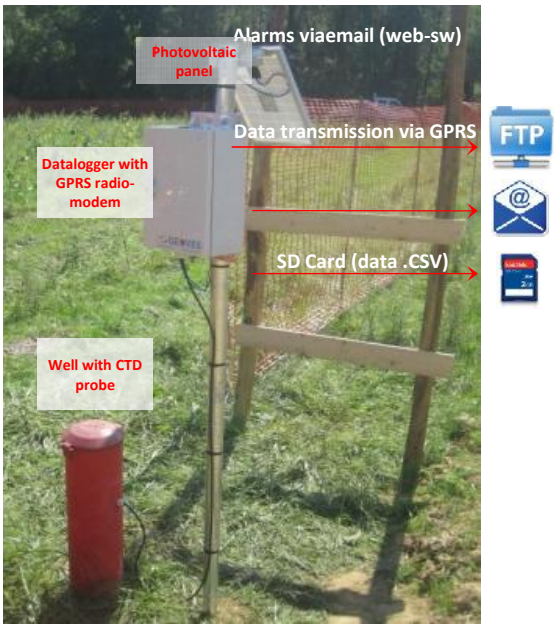
MICROMET3-CTD – HYDROLOGICAL STATIONS FOR WATER QUALITY MONITORING WITH CTD PROBE (CONDUCTIVITY-TEMPERATURE-DEPTH) (Rev.0 050523)

MicroMet3-CTD series stations are designed for monitoring water quality and key environmental parameters in accordance with Legislative Decree 152/06 (environmental and hydrological regulations) and Legislative Decree 36/2003 (implementing decree for landfill management).

MicroMet3-CTD monitoring stations perform continuous monitoring (fixed location) of temperature, conductivity and hydrometric level parameters that represent the macro descriptors of water quality; other weather or environmental measurements can also be acquired.

The datalogger, which forms the core of the monitoring station, can display, acquire, store and transmit data remotely. The remotely transmitted data are in CSV text format therefore compatible with Notepad, Excel, Access and any external software application. Should the data be sent to the Geoves FTP area the data can be processed and displayed with the MeteoGraph web software available without the need to install any proprietary software. MeteoGraph is available on PC, tablets or smartphones using any Internet browser (e.g., Chrome).



Advantages

- ✓ Low power consumption and possibility of power supply from solar panel
- ✓ No proprietary communication protocol
- ✓ Data in standard text format (CSV format) compatible with Excel, database and most common commercially available software.
- ✓ No connection charges (with GPRS wireless transmission and power supply from solar panel)
- ✓ Reliability over time and minimal maintenance required
- ✓ High measurement accuracy and resolution
- ✓ Fully Italian technology

Datalogger specs

DATALOGGER	LPDL – Low power dataloggers
Power	10…14.4Vdc (typical 12Vdc); on-board battery charger, input from photovoltaic panel, with battery monitoring (deactivation of the load <10,5Vdc, restart >12Vdc) or mains 220Vac/12Vdc power supplier
Data transmission	Wireless: GSM/GPRS via FTP (via e-mail on request) Wired: RS232, RS485, LAN 10/100Mbit with free software Geodesk for data download
Alarm transmission	via e-mail by using MeteoGraph web software (GPRS transmission)
Setup	Locally: by using Geodesk software
Configurable parameters	⎩ Date and hour with NTP synchronization (network time protocol) ⎩ Anemometer and rain gauge constants ⎩ Storage rate (5-10-15-30-60' at your choice) ⎩ Transmission rate (5-10-15-30-60' at your choice)
Storage	on 2GB SD Card with circular data management (500 days)
Working temperature	-30…+70°C
IP65 enclosure (basic model)	Plastic key enclosure Dim.: (Lxhxd) *Box1:* 250x350x160mm, crossarms for fastening on poles (ø50…150mm) or on walls.

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I/O channels	**8 analog inputs** (+ 8 optionnals on Expa8 interface) for meteorological sensors such as pyranometers, hydrometers, thermometers, barometers or chemical sensors **2 insulated digital inputs (pulse counter)** for sensors with "high" frequency up to 50KHz (anemometers, flow gauges, ecc…) and with "low" frequency output (rain gauges), sensors that requires the time counting (sunshine duration, leaf wetness,…), on/off signal (free-contacts) **1 diagnostic input** for battery voltage **1 serial input** for smart sensors connection (**n.1 multiparametric probe)**
Data elaborations	Istantanea per le misure idrologiche Min, Max, media per le misure meteorologiche Dato diagnostico della tensione di batteria
Average autonomy of a station with 1 CTD probe	**>10days**: with 12Vdc/12Ah battery, 20W photovoltaic panel, storage: 30' transmission: 60'

CTD probe - Technical description

The CTD 36XiW probes, are smart sensors for measuring hydrometric level (water column pressure), conductivity and temperature data of water; the acronym CTD stands for Conductivity, Temperature and Depth.
Temperature dependencies and nonlinearity are compensated by a mathematical model developed in the internal microcontroller.

The built-in Pt1000 temperature probe achieves an accuracy of ±0.1°C while for conductivity an accuracy of ±2.5 percent of the selected range (0.2 / 2 / 20 / 200 mS/cm) is achieved. The probes are supplied with a galvanically isolated RS485 serial interface.

The measuring probe is housed in a submersible stainless steel case and is externally powered by stabilized 12Vdc; data acquisition, recording and transmission is done on the external Geoves data logger, which provides functional and storage autonomy for long time intervals.
These features ensure high reliability and durability resulting in less maintenance required

Principle of Operation

The CTD probe detects groundwater levels through the method of relative pressure measurement with atmospheric pressure compensation using a small tube to ventilate the air at the surface.
Conductivity is increasingly being monitored combined with measurements of groundwater hydrometric level and water temperature; in this way, possible contamination from saltwater seepage, particle deposits in the water, or pollutants in general can be detected.

Advantages

- ✓ Minimal maintenance
- ✓ Good measurement resolution
- ✓ Excellent robustness
- ✓ Probe diameter < 1"

Main applications

- ✓ Continuous and portable hydrological analysis
- ✓ Measurements in groundwater (natural wells, piezometers, etc...)
- ✓ Monitoring in surface waters (rivers, lakes, streams, dams, etc...)
- ✓ Landfills
- ✓ Civil and industrial sewage treatment plants

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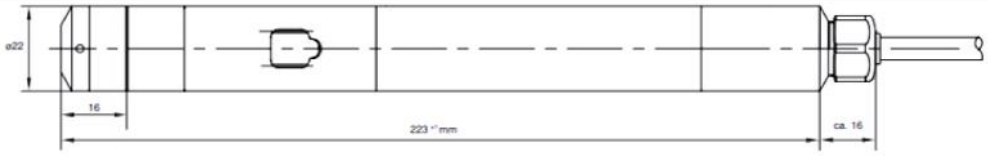
Technical specs

Model	CTD 36XiW – Water probe for Conductivity-Temperature-Depth measurements		
Parameter	**Standard Range (other on request)**	**Accuracy**	**Resolution**
1. Pt1000 Temperature:	0…50 °C (compensated)	0,1 °C	<0,01 °C
2. 6 electr. conductivity:	0.2, 2, 20 o 200 mS/cm f.s. (selectable by sw)	2,5% f.s.	≤ 0,05% f.s.
3. Water depth:	0…3bar	0,05 %FS max.	≤ 0,0005 %FS
Max working pressure	30bar (about 300m of water column)		
Working temperature	-10…80 °C		
Output interfacing	Serial RS485 port		
Cable	Shielded self-supporting with barometric compensation tube (please note: the end of the tube must remain outside the water; therefore, the submerged use limit of the probe depends on the length of the cable)		
Connector	IP68 plug		
Materials	Container: 316L stainless steel (DIN 1.4435), O-ring: Viton® Cable: Polyethylene (PE) Conductivity Sensor: Polyetheretherketone (PEEK) container; platinum electrodes		
Dimensions			
Weight	150g (cable excluded)		

POLES Models	PF2-40	PF3-55
Heights (m)	2	3
Raising	fix	telescopic
Diameters (mm)	40	Base: 55 Top: 50
Weight (kg) guy wires and accessories excluded	6kg	11kg
Heights (m)	On the soil without civil works or plinth or wall	On the plinth or wall
N. elements	1	2
Materials	Galvanized steel	
Required workers for installation	1	1


FIX Water monitoring stations with 2 and 3m poles

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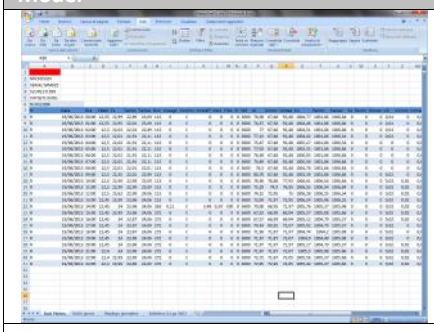
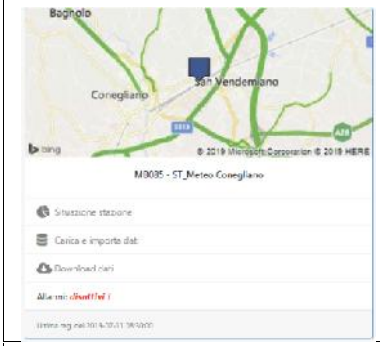
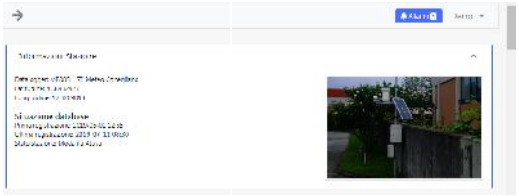
SOFTWARE Model	Geodesk & MeteoGraph
	**Geodesk** is a basic service software, free supplied with all Geoves datalogger, that can import data recorded (on SD card or sent via GPRS or transmitted by cable from the datalogger) and generate a single data file in Excel format. In this way it's possible to 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: o Date and time of Start data storage o Date and time Last data storage o 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)

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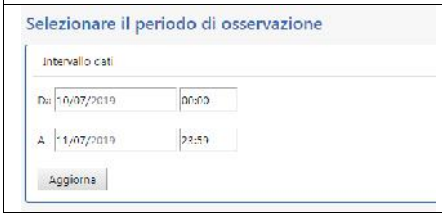
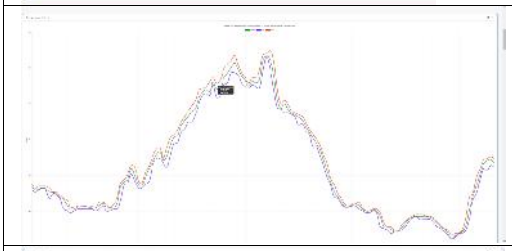
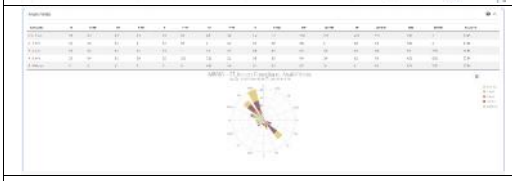
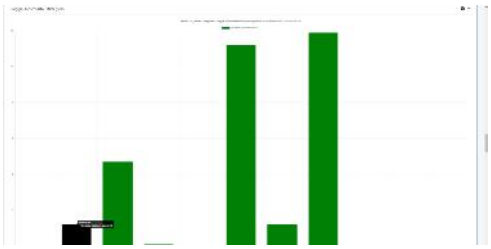
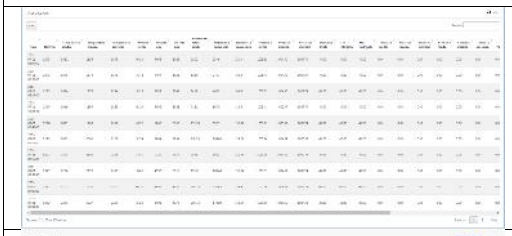
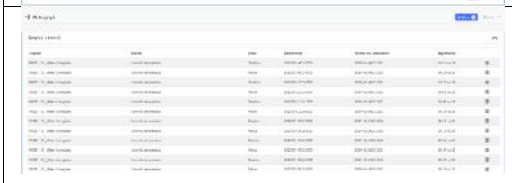
	• Significant data for the interpretation of the measure (eg barometric tendency, wind chill, monthly precipitation, etc.)
	**Observation period** It is possible to select the observation period in which to carry out all the elaborations that are displayed by MeteoGraph
	**Graphic elaborations** ⁾ **Linear 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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