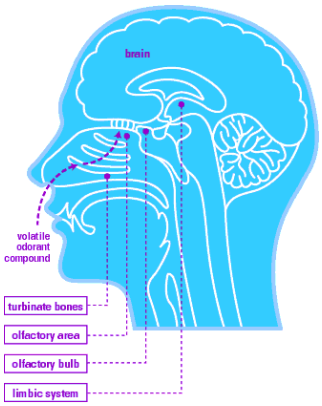
PEN3 Meteo Station

Environmental Odor Unit

When a composting plant is near to private residences it is useful to control the level (intensity) of odour leakage to guardianship the quality of life of citizens and to allow the manager of the plant to immediately intervene to the reduction of the odour emission.



The Station PEN3-Meteo has been realized for measuring and control odour leakage intensity from composting plants, landfill, waste treatment plants, etc. . It's able to measure in continuous mode , 24 hours per day, the intensity of odour in ambient air with results in olfactometric unit (OU/m^3) direct from ambient air. The heart of the station is PEN3 Airsense able to measure the finger print of odour air and by simple elaboration get the results in OU/m3 by WinMuster software inside.
The Station PEN3-Meteo is full automatic to measure, save data results and elaboration; besides it is able to measure the speed and direction of the wind as further information on the origin of the odour detect. PEN3-Meteo is complete with WI-FI connection and, modem (optional) for InterNet connection to remote control data parameters, results and all function of the system.

The system PEN3-Meteo Station is fitting with three principal unities integrated in a houses for external use:
PEN3 Intelligent Sensor Array with hot (range 150-500°C) MOS sensors array.
DCR computer for the control system, memorization of the data results connection in real time by WI-FI and/or InterNet
Meteo Station for the determination of the direction and speed of the wind
The units are insert in houses case for external use.

The Heart of system

The PEN3 Airsense, consists in an Sensor Array of MOS sensor and a software for the memorization of the fingerprint of the samples and chemometrics elaborations. Sensor Array have n.10 different MOS sensors positioned in small chamber of measure and with different temperatures for each (range 150-500°C), peculiarity this last that allows to almost notice her/it most of part of the odour substances.

The Brain of system: DCR

DCR computer and remote control with Mini ITX mainboard, Power supply for mainboard, HD 40 GB, 512 Mb RAM, Win XP Pro, WIFI device, USB-parallel adapter. Power supply switch 12 Vdc, Supervising power supply battery 12 Vdc 18 Ah battery, Secure cool fan. As optional The system could be complete with modem GSM-GPR-GPRS able to send Alarm-Message to dedicated customer phone by SMS when the limit of odour exceeds the maximum allowed.

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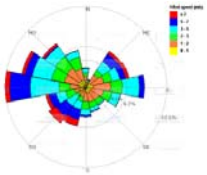
Meteo station

Meteo Station with Wind speed direction transducer, RS232 converter, Outdoor 4 pole connector and tacogoniometer. This part of system is very important about the provenience of the odour and for example using these data (PEN3 data plus meteo data) you can create dispersion model and to understand the influence of leakages on territory.



Software

Following, features and purpose of the software integrated into PEN-Meteo Station :

SQA-*Meteo**:*** view and store the data speed and wind direction with time intervals determined by the operator. These data are used to the (manual) construction of the simulation of go-down odor on territory

SQA-Alert: This part of software is very usefull when the objective is to recognize the source of odor**.** The software reads the data from the electronic nose and correlates them with data from the anemometer and stores them in database.

When the nose recognizes a substance, the software controls the wind and direction speed and associates them to the detected smell, checking if direction of substance origin is the one shown in the table configuration.

*SQA-AlelertWeb**:*** when the PEN3-Meteo is complety with modem (not included), This part of software reads data from “SQA-Alert” database and delivers them via web-browser. It also alerts if a substance is recognized.

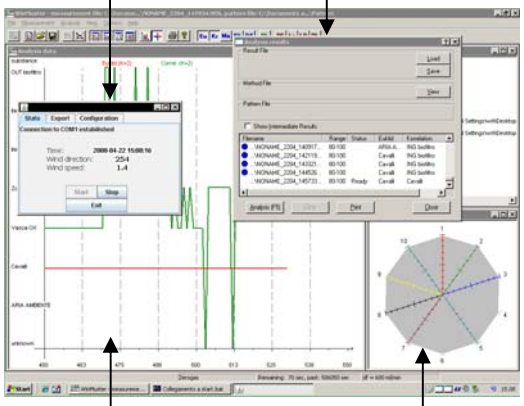
*SQA-Modemrestorer**:*** The software manages internet connection via UMTS-USB modem. It operates in “always connected” mode or “connect on ring demand” mode. It also checks if connection drops down and restores it up.

*SQA-IPUPDater**:*** The software (internet connection must be on) renews the "DynDns" account with actual IP address of the SQA, and optionally writes the same IP address into a dedicated web server (useful if DynDns service fails).

*SQA-AutoMuster**:*** The software is a macro tool that automates all needed steps to start and configures WinMuster, avoiding repetitive tasks and assuring automatic data logging and analisys restart if power supply accidentaly goes down.

Table results in OU/m3 or the rising of odour recognized

Wind data: direction and speed



Graphic with all variation of measure and results sec. to sec.

The finger print of emission time to time

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Determination of OU/m^3

To obtained the results in odour unit OU/m^3 by PEN3-Meteo is necessary to create an correlation curve by PLS (Partial Least Square Regression) method with all data analysis obtained from PEN3 against result take from EN13725 test .

The PEN3-Meteo is fitting with an standard regression curve in range 25 to 350 OU/m^3, but if you want create your dedicated regression the procedure is very easy. :

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Environmental applications

PEN3-Meteo is used for checking the leakage of odor from a lot of industrial realities and particularly those that provoke sensorial nuisance on the surrounding territory. The standard application is determinate the intensity of odour in Olfactometric Unit (in Europe EN13725) but is possible also recognizer the ***rising of odor*** and obtained some data to understand the really impact of industrial and the odor phenomena on territories. In others words the purpose of PEN3 is the measures and evaluate to make on the presence of the odor perceived by the citizens and to understand the phenomenon of the odor and the real impact that have the industrial activities on the citizen "Quality of life".

Where and How

Composting plants, **Waste Water Plants, Solid Waste Treatment plants:** the most common purpose is the determination of the OU/m3 (olfactometric units) in emission from the systems of demolition of odor (biofilter, scrubber, etc.) and control the total emission out plant 24h per day ad libitum.
Landfill: the system is installed on border of the dump in the cone of prevalence of the wind (direction prevailing dump toward residences) or directly the complaints are had where the are odors nuisance (house of citizens, village, etc.). In this specific field the target is calculate the time of the presence of odour on territory, measure the direction and speed of wind as control of the citizens' indication of odour and for others calculation (example for diffusion model of pollutant, EPA model).

Who

The Owner of the plant that thanks to PEN3-Meteo in remote connection (by WI-FI or EtherNet or Internet) it is able to intervene in real time.
The Government Agency of Enviro Control to know in real time the situation and decide if the plant is OK or not .
Chemical Laboratories to offer their customers the Service to monitoring of the odor and environmental consulting.

PEN-Meteo is a product developed in collaboration with Airsense Analytics GmbH (D)

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