

Diffuse Degassing
continuous monitoring systems

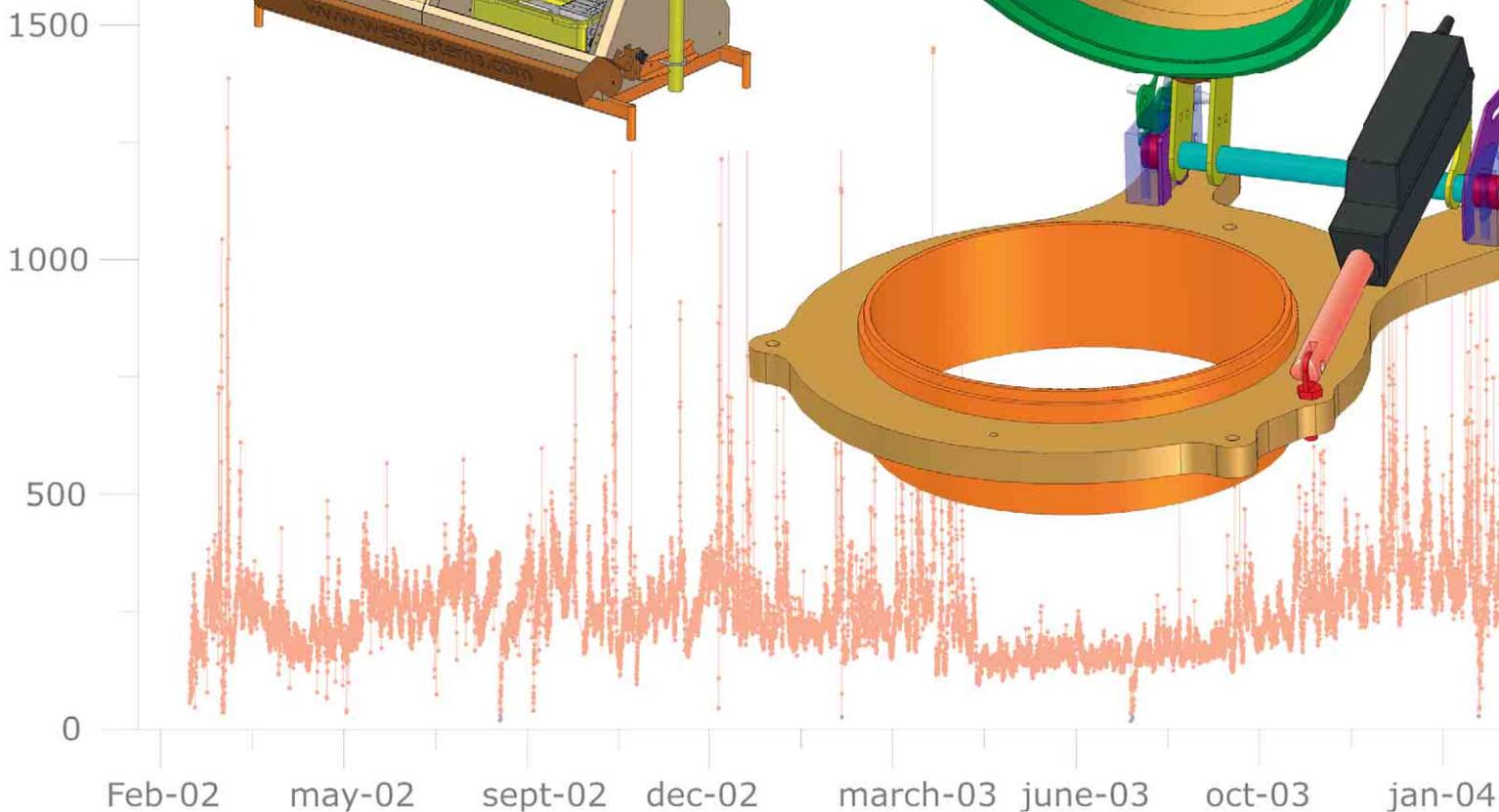
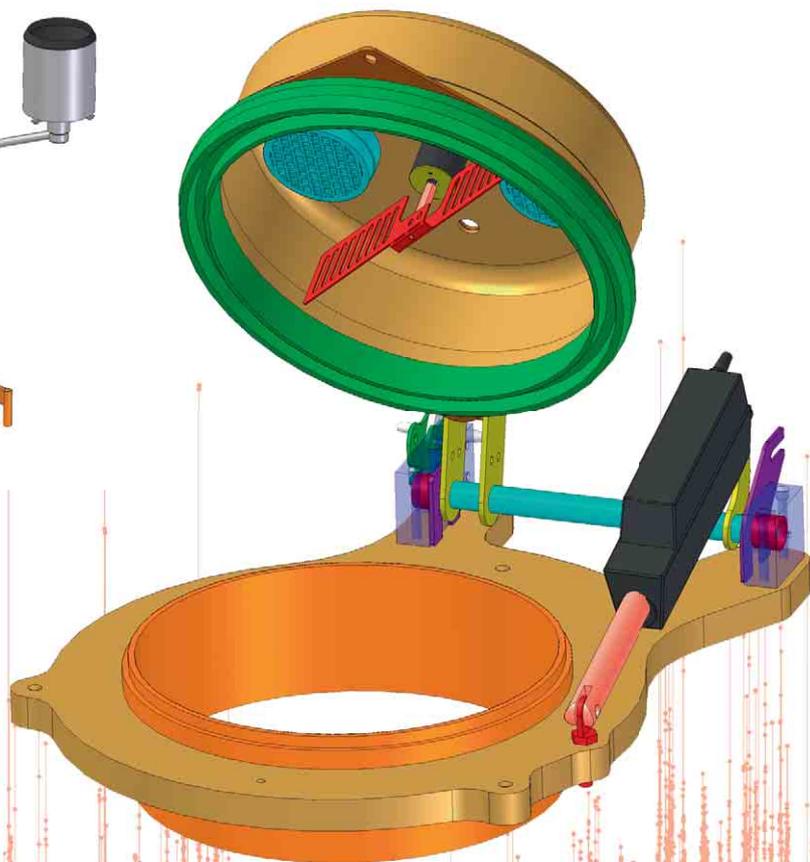
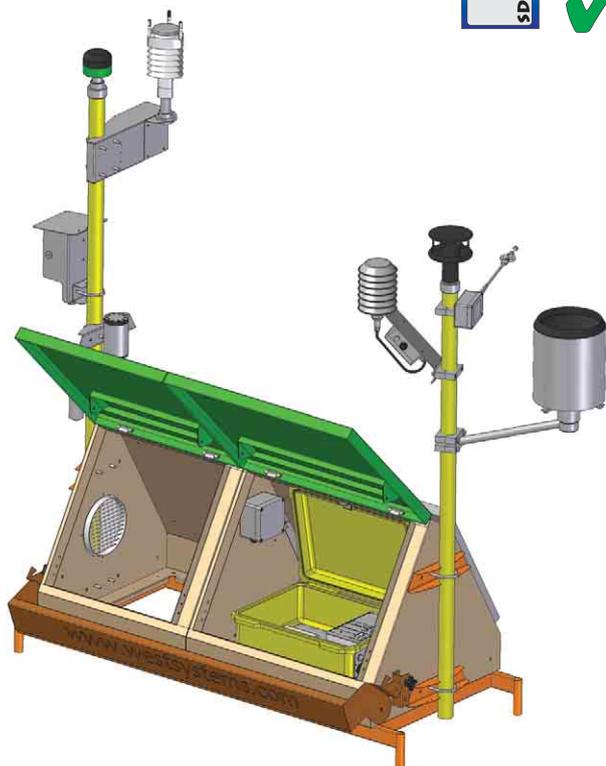
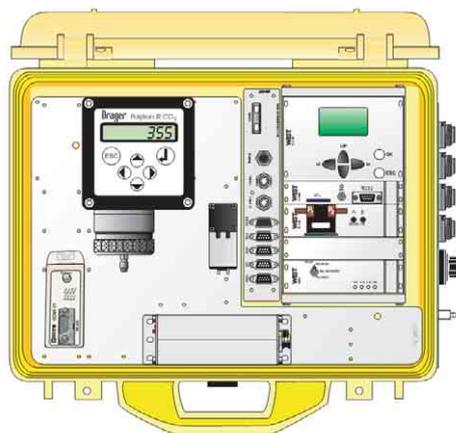


Diffuse Degassing continuous monitoring systems

The station is able to measure:

- Carbon dioxide diffuse flux from soil by means of the accumulation chamber method.
- [Optionally]: Hydrogen Sulfide diffuse flux by means of the accumulation chamber method.
- Air temperature
- Soil temperature
- Wind speed and direction
- Relative humidity in air
- Soil water content
- Barometric pressure
- Gas flow in the sampling line
- Rain fall

This is a completely automatic station, power supplied with a solar cell and backup battery, which performs the measurements cycle with a configurable frequency (default every hour).



CM.HWR8 SoilGas station

CPU	a custom programmed microcontroller that manages the functioning of the station, and the communications with the master center. The CPU stores the data into a removable SD memory (1 GB storage capacity).
Display	the station is equipped with a LCD monochromatic display for configuration and testing of the sensors.
Acquisition system	analog to digital conversion board with 8 analog inputs;
Flowmeter AWM3300	This sensor measures the quantity of gas mixture that is pumped into the measurement line. It's useful to know the pump and filters status.
Barometric pressure sensor: Vaisala Barocap PTB110	Temperature compensation. Measurements range 600-1100 hPa Linearity and hysteresis : ± 0.3 hPa
Power requirements	Low power consumption , less than 5 mA @ 12 Volts in standby
Accumulation chamber	Aluminum accumulation chamber with internal mixing device; Chamber footprint ~ 700 cm ²

CO₂ detector: Drager Polytron IR CO₂

CO₂ flux measurement range:

1 to 350 moles/m²·day precision $\pm 10\%$

350 to 600 moles/m²·day precision $\pm 25\%$

600 to 1500 moles/m²·day precision $\pm 25\%$

Environmental parameters sensors

Soil temperature sensor: Temperature Pt100 probe 0 ~ 200 °C

Soil water content by using a time Domain reflectometry probe;

Range 5- 50% (Volume of water / Volume of Soil)%

Sonic Wind speed and direction gauge;

Measurements range 0..60 m/sec. 0-360°

Thermohygrometer with double antiradiation protection.

Relative humidity range : 10~98%

Temperature range : -30~70°C

Other detectors are available on request.

Power supply

The station is supplied by solar panels.

During night and in periods of low solar radiation the power is supplied by means of a buffered battery. To avoid damage to the battery, a dedicated circuit allows the station to turn off when there is low battery power.

Shelter

The enclosure for the station is made in AISI316 steel, and supports the meteo sensors and the solar cells power supply system.

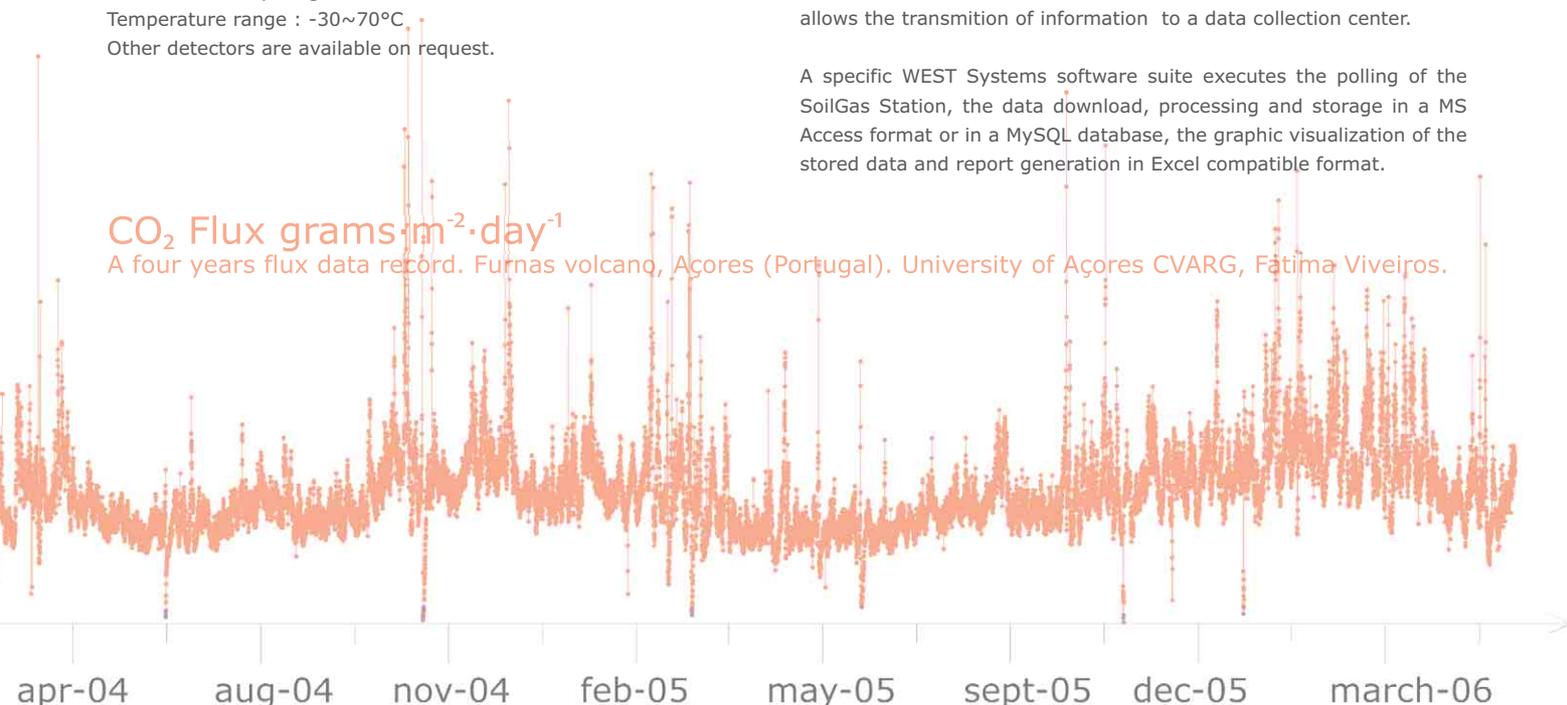
Data acquisition and processing

The station is equipped with a datalogger for acquisition and storage of the monitored parameters. A radio modem, or a GSM/GPRS modem, allows the transmission of information to a data collection center.

A specific WEST Systems software suite executes the polling of the SoilGas Station, the data download, processing and storage in a MS Access format or in a MySQL database, the graphic visualization of the stored data and report generation in Excel compatible format.

CO₂ Flux grams·m⁻²·day⁻¹

A four years flux data record. Furnas volcano, Açores (Portugal). University of Açores CVARG, Fatima Viveiros.





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