

## Portable soil Fluxmeter

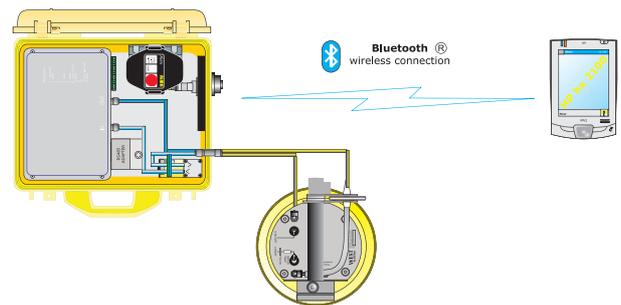


# Portable soil Fluxmeter

The WEST Systems Fluxmeter is a portable instrument for the measurement of diffuse degassing phenomena, based on the accumulation chamber method, suitable for volcanic and geothermal areas as well as soil respiration rate in agronomy.

This method studied for soil respiration in agronomy (Parkinson, 1981) and for soil degassing in volcanic areas (Cioni et al. 1998), has been designed by WEST Systems to obtain a portable instrument that allows the performance of measurements with very good accuracy in a short time. The instrument allows a wide range evaluation of the amount of soil gas flux, and can be also used for the survey of biogas non controlled emissions on landfills. The instrument is extremely versatile and allow

measurement of flux in 2/4 minutes. A floating adapter for the accumulation chamber allows to measure flux at the water-atmosphere interface; (bubbling at the surface of sea, lakes, rivers, wetlands, rice paddies, pools).



## Characteristics

### Specifications

Total Weight: less than 8.2 Kg/16 lbs to be carried using the backpack-like support vest. The field operator will also have to carry one of the accumulation chambers and the palmtop.

### Warm Up & battery endurance

Only at instrument cold start-up a warm-up time of 20 minutes is required. The typical measurement time ranges from 2 to 4 minutes and the autonomy of the instrument is about 4 hours with a single NiMH 14.4 Volts, 2.6 A/h battery. The instrument comes with two interchangeable batteries.

### Accumulation Chamber specifications

Accumulation chamber A diameter : 200 mm / Height: 100 mm / weight: 1.25 Kg/2.8 lbs  
Accumulation chamber B diameter : 200 mm / Height: 200mm / weight : 1.60 Kg /3.6 lbs  
Accumulation chamber C diameter : 300 mm / Height: 100mm / weight : 1.75 Kg /3.9 lbs

### Palm top computer and Software

The instrument is supplied with a custom software, FluxManager, installed on a PocketPC Color Display based on Windows Mobile operating systems that is connected to the instrument by bluetooth connection.

This software allows recording and real time visualization of the increase in concentration of the target gas in the accumulation chamber, and then the flux calculations. By using the palmtop embedded GPS the flux measurement points are automatically geo-referenced. The measurements obtained can be saved on the palmtop computer and then transferred to a desktop PC by using the SD card.

## The instrument is supplied complete with:

- › Backpack-like support vest
- › Carrying case for transport and storage
- › 2 batteries NiMH 14.4 Volts 4.5A/h and 1 NiMH battery charger and one accumulation chamber, to be choosed at order time;
- › Palmtop Pocket PC
- › User Manual, in English
- › FLUX Manager Software for Windows Mobile, in English
- › A suite of PC based software for the data post-processing

The standard flux meter configuration is supplied with a single gas detector, normally the carbon dioxide detector. The fluxmeter can host maximum 3 sensor by the way special release, based on specific customer request.

## Gas detectors

### WS-LI820-CO<sub>2</sub>

The LI-820 is a double beam infrared carbon dioxide sensor compensated for temperature and atmospheric pressure. Accuracy of concentration reading is 2% and repeatability is  $\pm 5$ ppm.

The accuracy depends on the measured flux:

- 0 to 0.5 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 25\%$
- 0.5 to 1 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 15\%$
- 1 to 150 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 10\%$
- 150 to 300 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 10\%$
- 300 to 600 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 20\%$

### WS-DRAGER CO<sub>2</sub>

The WS-DRAGER is double beam infrared carbon dioxide detector compensated for temperature. Accuracy of concentration reading is 3%. The accuracy depends on the measured flux:

- 0.5 to 5 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 25\%$
- 5 to 350 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 15\%$
- 350 to 600 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 10\%$
- 600 to 1500 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 10\%$

### WS-HC-IR

The hydrocarbons detector is based on a IR spectrometer. Accuracy of concentration reading is 5%, repeatability is 2%, detection limit is 60 ppm and resolution is 22 ppm.

The accuracy depends on the measured flux:

- 0.2 to 10 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 25\%$
- 10 to 150 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 15\%$
- 150 to 300 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 20\%$

### WSI-HC-DA

The hydrocarbons detector is based on a array of sensors to cover the entire range from few ppm up to 100%. The accuracy is of  $\pm 5\%$  of reading, and repeatability is  $\pm 3\%$ .

The accuracy depends on the measured flux:

- 1 to 1000000 millimoles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 20\%$

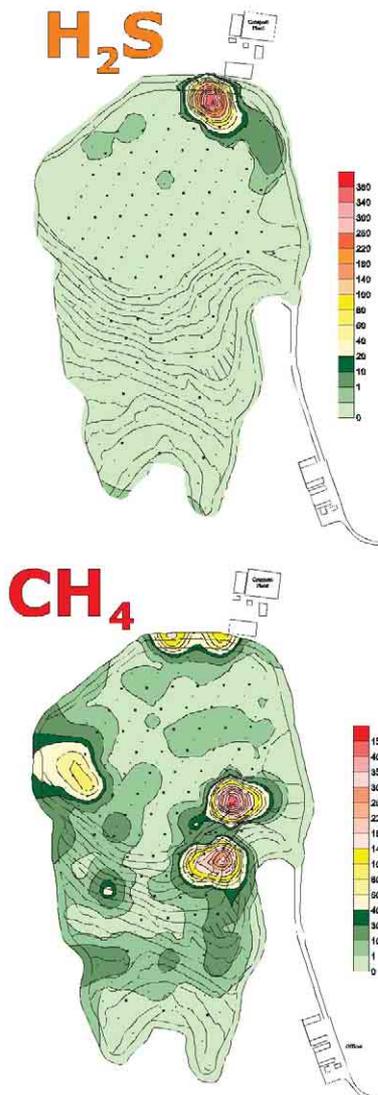
### WS-H<sub>2</sub>S

The hydrogen sulphide detector is a electrochemical cell. Full scale range is 20ppm, with a precision of 3% of reading and the repeatability is 1.5 % of span with a zero offset of 0.3%.

H<sub>2</sub>S Flux measurement range is from 0.0025 to 0.5 moles·m<sup>-2</sup>·day<sup>-1</sup>.

The accuracy depends on the measured flux:

- 0.0025 to 0.05 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 25\%$
- 0.05 to 0.5 moles·m<sup>-2</sup>·day<sup>-1</sup>  $\pm 10\%$





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## Local representative

