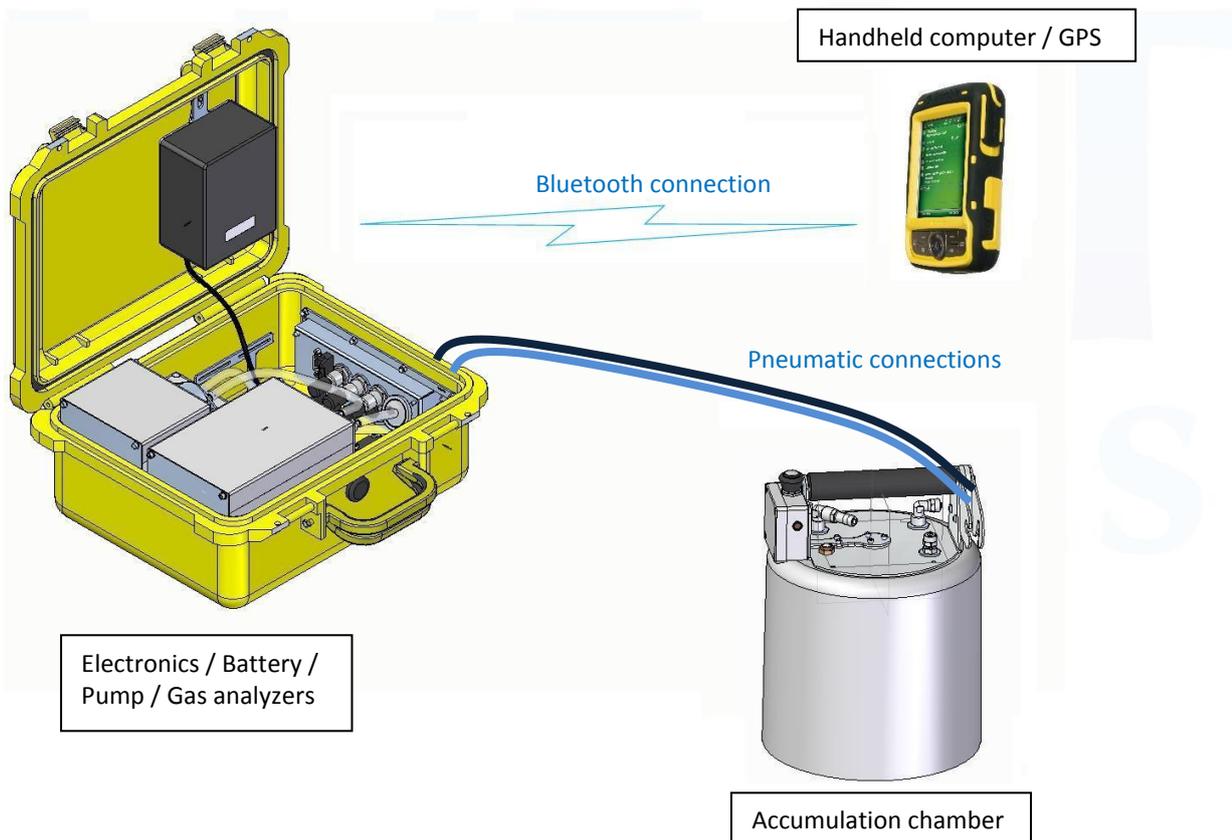


Portable soil flux meter

The WEST Systems Fluxmeter is a portable instrument for the measurement of soil diffuse flux applying the accumulation chamber method. This method studied for soil respiration in agronomy (Parkinson¹) and for soil degassing in volcanic areas, has been designed by WEST Systems to obtain a portable instrument that allows to take measurements with very high accuracy in a short time. The instrument allows a wide range evaluation of the amount of carbon dioxide (and CH₄ / H₂S using the additional optional detectors), coming from soil and can also be utilized for the evaluation of soil respiration rate in agronomy.

1 Parkinson K.J. : *An improved method for measuring soil respiration in the field*, *J.Appl.Ecology*, 18, 221-228 , 1981.



WS-LI820: Carbon dioxide flux measurement

The instrument comes with a LICOR LI-820 carbon dioxide detector with the following specifications:

A double beam infrared sensor compensated for temperature variations in the range of -10 to 45°C and for atmospheric pressure variations in the range of 660-1060 HPa. Concentration measurement range: 0-20,000 ppm. Flux measurement range: from 1 to 300,000 millimoles/m² per day (by using chamber type B)

The accuracy of measurements is a function of the flux:

Range from 1 to 1,500 millimoles/m² per day: ±25%

Range from 1.5 to 300 moles/m² per day: ±10% (Chamber B)

Range from 1.5 to 150 moles/m² per day: ±10% (Chamber A or C)

Optional WS-CH4-TLD: Methane flux measurement

The detector is based on laser diode spectroscopy technology coupled with multipass cell.

Technology: TDLAS (Tunable diode Laser Absorption Spectroscopy)

Concentration measurement range: 0.1 ppm to 10%vol

Operating temperature range: -20°C to +45°C

Methane flux measurement range: from 0.5 to 1,000,000 millimoles/m² per day.

The accuracy of measurements is a function of the flux:

Range from 0.5 to 1,500 millimoles/m² per day: ±25%

Range from 1.5 to 1,000 moles/m² per day: ±10%

Optional WS-TOX-H2S: Hydrogen sulphide flux measurement

The hydrogen sulphide detector is a electrochemical cell with the following specifications:

The full-scale concentration 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%.

H₂S Flux measurement range: from 0.0025 to 0.5 moles/m² per day.

The accuracy of measurements is a function of the flux:

Range: from 2.5 to 50 millimoles/m² per day: ±25%

Range : from 50 to 500 millimoles/m² per day: ±10%

Global positioning system receiver

The WS-GPS embedded in the palmtop, allows the Geo-referencing of the flux measurement. During the flux measurement the position/elevation data are recorded by the flux-manager software and a "mean" position of the measured point is computed in order to reduce the GPS position-fix error. The precision depends on sky-view and on satellites constellation at measurement time. The position data are reported in latitude / longitude degrees (WGS84) and after a PC based post processing (FluxRevision) also in UTM coordinates. The elevation is reported in meters.

Warm Up

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, 4.5 A/h battery. The instrument comes with two interchangeable batteries.

Accumulation Chamber specifications:

The instrument comes with one accumulation chamber (type A or B or C); the B chamber, due to its height, is less sensitive than A and C chambers but allows the measurement of higher fluxes. The chamber C has the same height and sensitivity of chamber A but it has a bigger footprint.

Accumulation chamber A

Diameter : 200 mm
Height : 100 mm
Weight: 1.5 Kg

Accumulation chamber B

Diameter : 200 mm
Height : 200 mm
Weight: 1.8 Kg

Accumulation chamber C

Diameter : 300 mm
Height : 100 mm
Weight: 2 Kg

As an additional option we can provide a floating ring for flux measurement over water surfaces. If you're interested please request a quotation.

Palmtop computer

Palmtop based on Windows Mobile (or optionally ANDROID) operating system; integrated GPS, touchscreen, wireless communication with fluxmeter (via Bluetooth);

Software

The instrument is supplied with a custom software suite:

- **FluxManager**, which allows to record and visualize the concentration curves of the target gas in the accumulation chamber, and then to calculate the flux. The measurements obtained can be saved on the palmtop computer and then transferred to a desktop PC with a USB connection or using an SD card; every measure is automatically georeferenced.
- **FluxExplorer**, which allows the on-field revision of the acquired data.
- **Fluxrevision**, that runs on a Windows based computer, allows the revision of the acquired data and the generation of a report file of the field-work, compatible with MS Excel.

Instrument Weight

- Fluxmeter WS-LI820 : 7.5 Kg
- Fluxmeter WS-LI820+ WS-TOX-H2S: 8 Kg
- Fluxmeter WS-LI820+ WS-TOX-H2S+ WS-CH4-TLD : 11 Kg
- Fluxmeter WS-LI820+ WS-CH4-TLD : 10.5 kg

The instrument is supplied complete with:

- Backpack-like support vest
- 2 batteries NiMH 14.4 Volts 4.5 Ah
- Battery Charger NiMH
- One accumulation chamber (to be chosen between type A, B or C)
- Palmtop computer
- User manual (in english)
- FluxManager software suite