



CFLUX-1

Automated Soil CO₂ Flux System

- Fully automatic, programmable & stand-alone operation
- Integral CO₂ & H₂O infrared gas analyzers
- WiFi for setup & remote monitoring from desktop & mobile devices
- Easy installation & setup
- Optional sensors for soil moisture & soil temperature

A photograph of the CFLUX-1 Automated Soil CO2 Flux System in a field. The system is a white, self-contained unit with a large, circular, white chamber on top. It is mounted on a metal frame and has a white control box on the side. The unit is placed on dark soil with dry leaves scattered around it. The background is a dense forest floor with many dry leaves.

CFLUX-1 Automated Soil CO₂ Flux System

A dedicated, self-contained system for long-term deployment and unattended operation for measurement of soil CO₂ flux.

Ideal for both spatial and temporal analysis.

With all key components built into a single station, there is no limit to where systems can be placed in the field.

Shown: Stevens HydraProbe II is an optional plug and play sensor for measuring soil moisture and soil temperature. Sold separately.

The **CFLUX-1 Automated Soil CO₂ Flux System** is the latest innovation in a long line of trusted and tested technology for the measurement of soil respiration from PP Systems. Features that set the CFLUX-1 apart from other systems include:

Built-in CO₂ & H₂O Gas Analyzers

Each CFLUX-1 Automated Soil CO₂ Flux System has integral, accurate, non-dispersive infrared gas analyzers for CO₂ and H₂O. Two independent infrared gas analyzers in each system means accurate measurement and fast response times regardless of where each system is stationed – eliminating problems associated with long distances between chambers, analyzers and multiplexing devices.

A robust, water tight enclosure protects the built-in CO₂ and H₂O gas analyzers, electronics and terminal block connections.

Auto-Zero

Incorporated into each CFLUX-1 system, Auto-Zero eliminates the need for field recalibration and allows for fast warm-up, adaptation to changing ambient conditions and excellent stability and accuracy for both CO₂ and H₂O.

Soil Moisture & Soil Temperature

The CFLUX-1 has one SDI-12 input and one analog input (0-1V) for use with commercially available sensors for measurement of soil moisture and soil temperature. Soil moisture and soil temperature can be measured and recorded along with flux data.

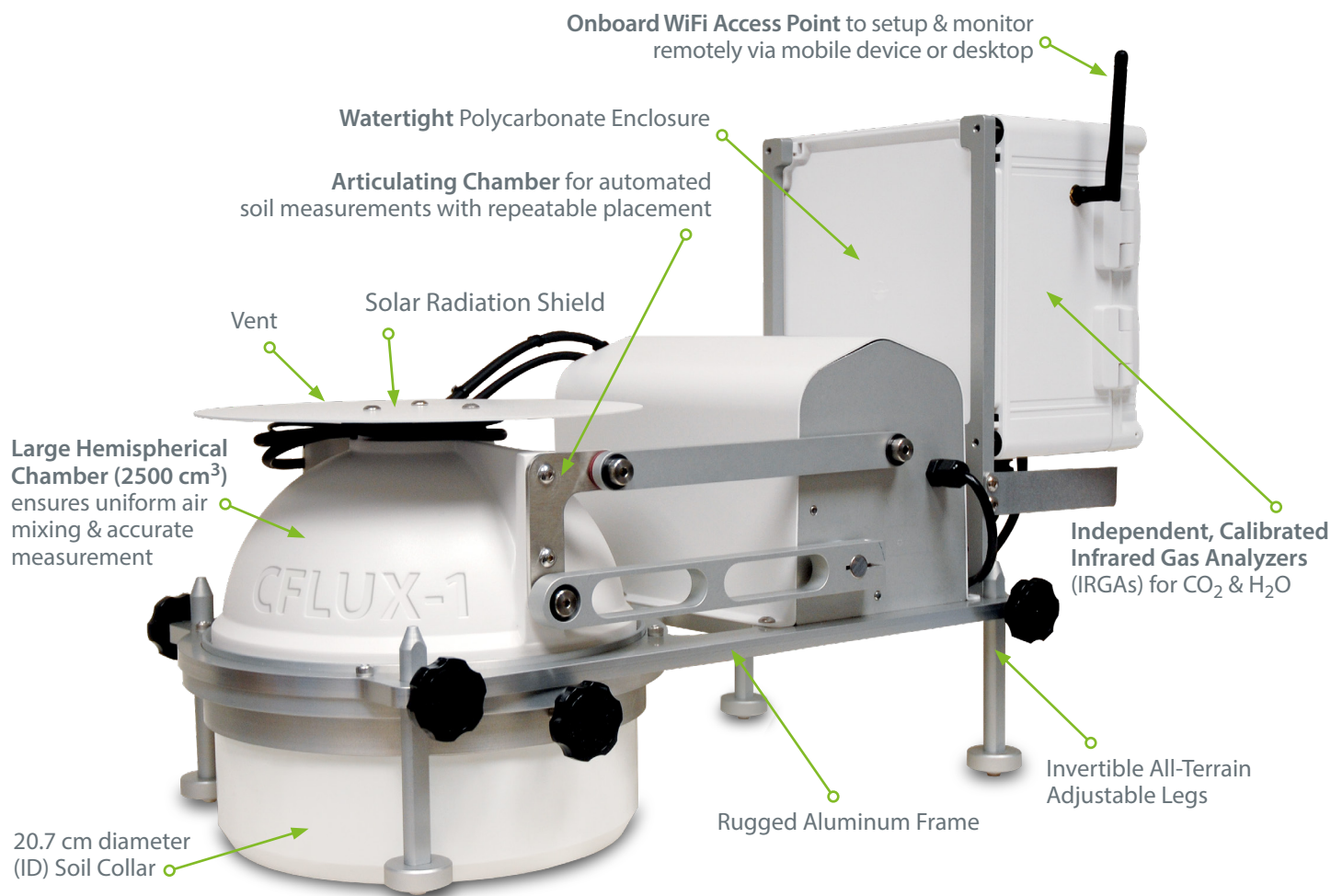
WiFi

Onboard WiFi access point is used for setting up and monitoring the system remotely from your phone or computer. If connected to a local computer with a router the CFLUX-1 system can be monitored from anywhere in the world with internet access.

Expanded Measurement Range for High CO₂ Environments

The CFLUX-1 can be calibrated up to 30000 ppm for soil CO₂ flux measurements in high CO₂ environments such as volcanic areas.

CFLUX-1 Survey • Long Term • Stand-Alone Operation



Data Storage

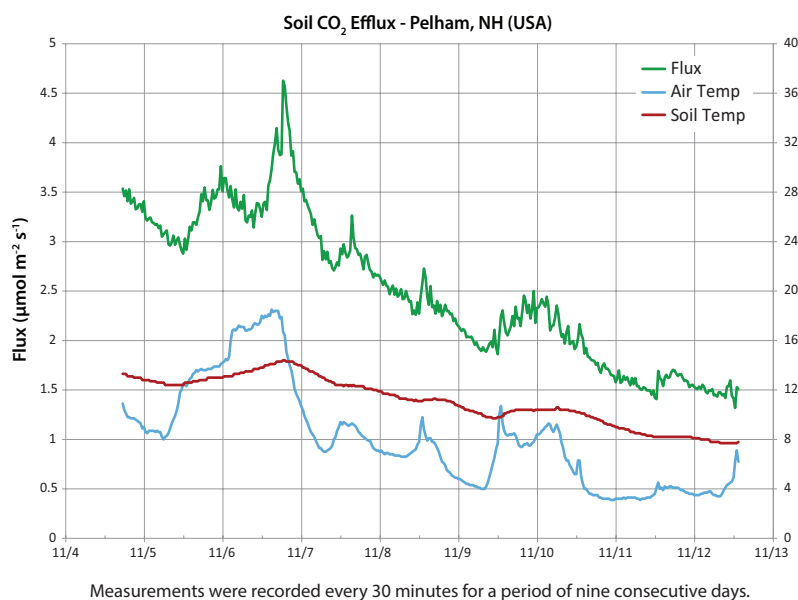
The CFLUX-1 system includes full data storage direct to a USB Flash Drive (memory stick). Sensor data and information can also easily be stored on an external data logger if necessary.

Soil Respiration Chamber

Our large hemispherical chamber (2500 cm³) is carefully designed to ensure uniform air mixing and accurate measurement of soil CO₂ flux. It includes an internal mixing fan with adjustable control that can be enabled or disabled by the user on demand, enhancing air circulation inside the chamber.

It also features a unique venting system to balance the pressure between chamber air and ambient air. A power-efficient actuator and electronics control the opening and closing of the chamber at user-defined time intervals. Four user-adjustable legs allow the chamber to be easily deployed at the field site.

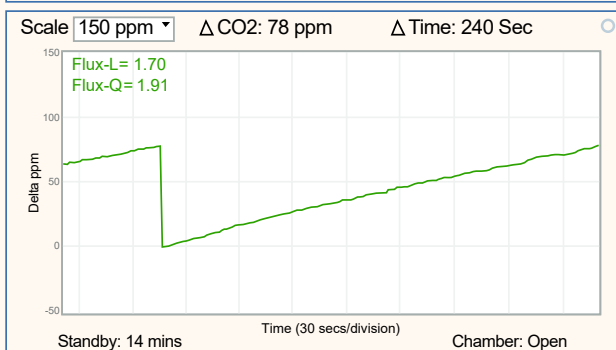
Software & Data Analysis



PP Systems

CFLUX-1 # 3

Standby: 14 mins



Sample Measurements		
CO2	Δ CO2	H2O
488 ppm	78 ppm	10.1 mbar
Flux-L	Flux-Q	Flux-E
1.70 μmol m-2 m-1	1.91 μmol m-2 m-1	1.91 μmol m-2 m-1
Air Temperature	Soil Temperature	Soil Moisture
9.3 °C	7.5 °C	20.9 %
Standby: 14 mins Chamber: Open		

System Status		
Standby Power	CO2 IRGA Temp.	H2O IRGA Temp.
High	55.0 °C	55.1 °C
Air Flow	Air Pressure	Air Temperature
0 CC/min	1017.7 mbar	9.3 °C
Voltage	Status	Absorber
12.1 Volts	System OK.	82 %
Standby: 14 mins Show More Chamber: Open		

Sensor data and information is easily viewed via computer or mobile device. Flux rates based on linear and quadratic fit are continuously calculated and displayed.

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Printed: May 2024

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Technical Specifications

Gas Analysis Unit

Analysis Method	Two non-dispersive infrared, configured as an absolute absorptiometer with microprocessor control of linearization for both CO ₂ and H ₂ O. All readings are automatically corrected for temperature, pressure and foreign gas broadening.
CO ₂ Measurement Range	0-2000 μmol mol ⁻¹ (Standard) • Precision: 1 μmol mol ⁻¹ For high CO ₂ environments the system can be calibrated up to 30000 ppm.
H ₂ O Range	0-75 mb • Precision: 0.1 mb
Pressure Compensation Range	55-115 kPa
Absolute Accuracy	< 1% of span concentration over the calibrated range but limited by the accuracy of the calibration mixture
Linearity	< 1% throughout the range
Stability	Auto-Zero at regular intervals corrects for sample cell contamination, source and detector aging and changes in electronics.
Calibration	User-programmable calibration (If required)
Warm-up Time	Approximately 15 minutes
Sampling Rate	10 Hz
Sampling Pump	Integral pump for sample (analysis) air • Range: 200-500 cc/min An internal electronic flow sensor monitors flow rate.
Air Temperature Sensor	• Range: -20 °C to +50 °C • Accuracy: +/- 0.5 °C at 25 °C
Environmental Sensor Inputs	For use with commercially available sensors (soil moisture, soil temperature. etc.) • One analog input (0-1V) • One SDI-12 input
Data Storage (USB)	USB flash drive port for date storage
WiFi	For user setup/monitoring and connectivity to internet
Power	7-16 VDC (User supplied)
Power Consumption	Warm up: 15W (12V at 1.2A) Normal operation: 7.2W (12V at 0.6A)
Enclosure	Hinged, rugged, polycarbonate enclosure
Operating Temperature	-20 to +50 °C, non-condensing
Dimensions	60.75 cm (L) x 30 cm (H) x 30 cm (W)
Weight	8.5 kg

Soil Respiration Chamber

Volume	2500 cm ³
Exposed Soil Area	336 cm ²
Soil Collar (ID)	20.7 cm (8") Diameter

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Portable • Accurate • Reliable