CFLUX-1

Automated Soil CO_2 Flux System

- Fully automatic, programmable & stand-alone operation
- Integral CO_2 & H_2O infrared gas analyzers
- WiFi for setup & remote monitoring from desktop & mobile devices
- Easy installation & setup
- Optional sensors for soil moisture & temperature

PP SYSTEMS
ppsystems.com

CFLUX-1 Automated Soil CO_2 Flux System

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

Ideal for both spatial and temporal analysis.

The **CFLUX-1 Automated Soil CO_2 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 CO_2 & H_2O Gas Analyzer

Each CFLUX-1 Automated Soil CO_2 Flux System has an integral, accurate, non-dispersive infrared gas analyzer for CO_2 and H_2O. 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 CO_2 and H_2O 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 CO_2 and H_2O.

Expanded Measurement Range for High CO_2 Environments

The CFLUX-1 can be calibrated up to 30000 ppm for soil CO_2 flux measurements in high CO_2 environments such as volcanic areas.

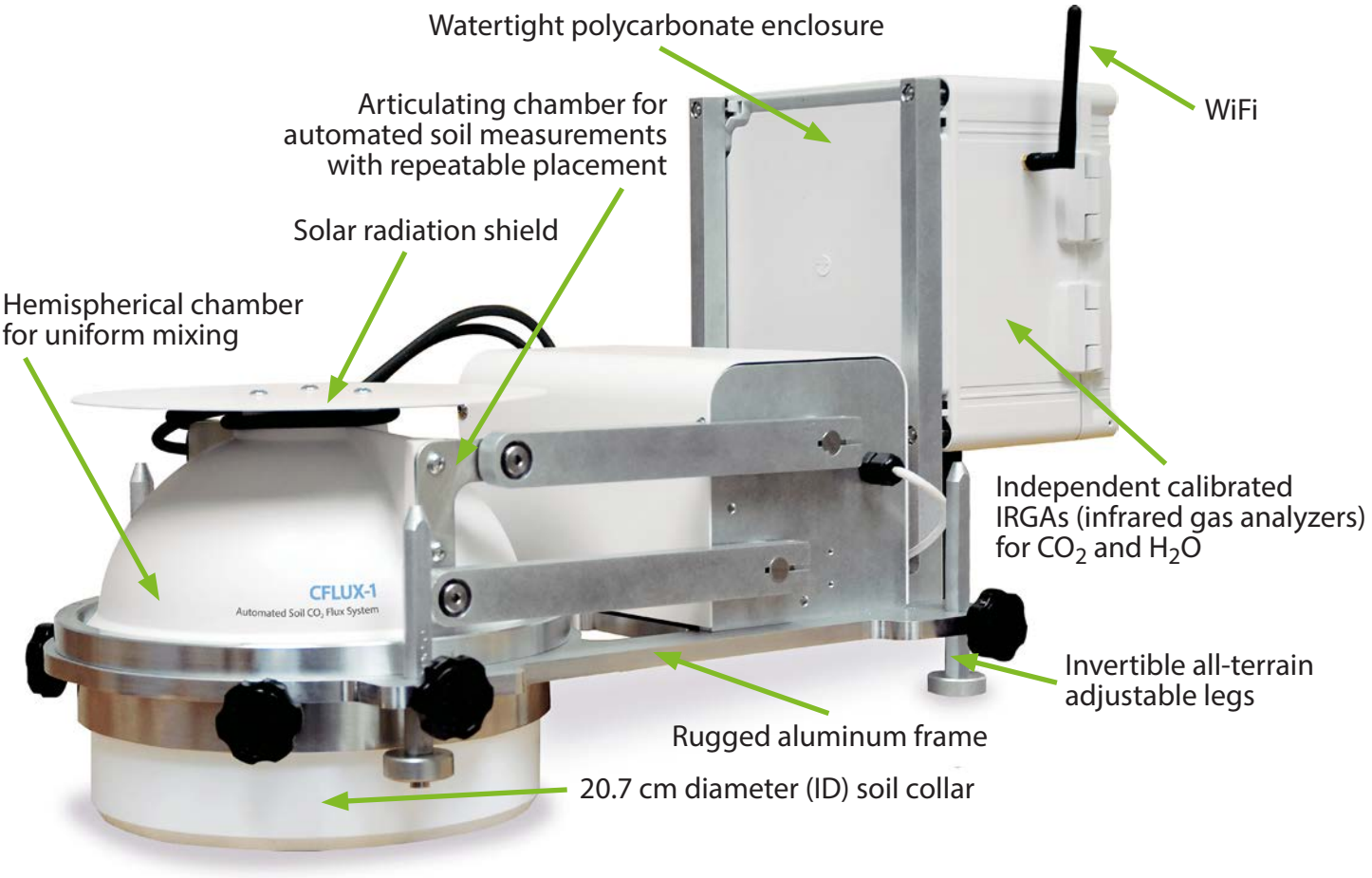
Data Storage

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.

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.

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



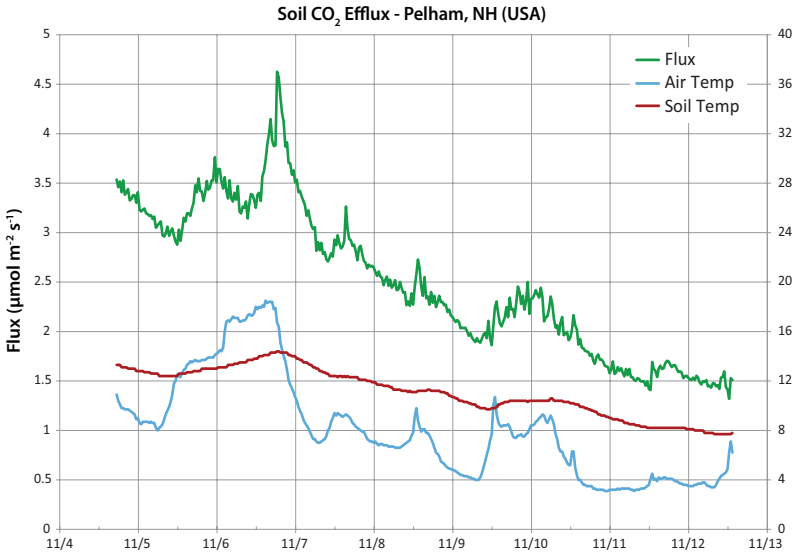
Soil Temperature & Soil Moisture

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.

Soil Respiration Chamber

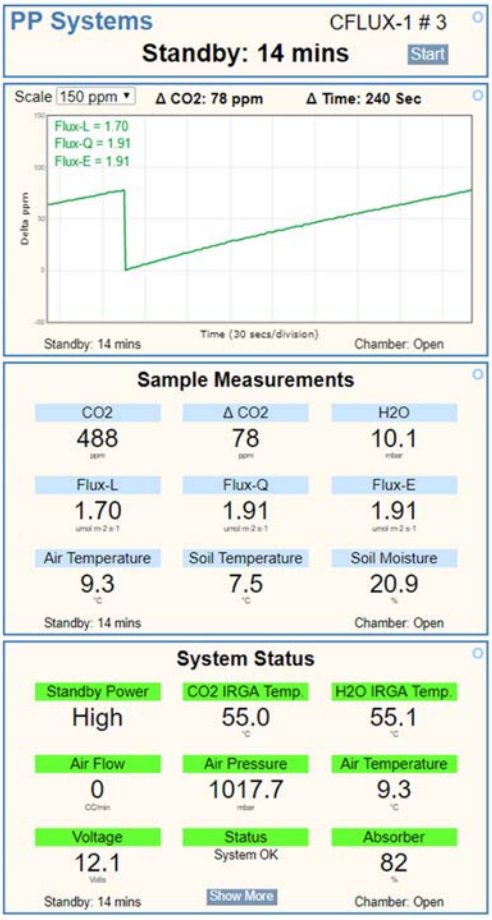
Our large hemispherical chamber (2500 cm^3) is carefully designed to ensure uniform air mixing and accurate measurement of soil CO_2 flux. It also features a unique venting system to balance the pressure between chamber air and ambient air. A power-efficient actuator and electronics control the opening 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



Measurements were recorded every 30 minutes for a period of nine consecutive days.

CFLUX-1 is a dedicated, self-contained system for long-term, unattended measurement of soil CO_2 flux. With all key components built into a single station, there is no limit to where systems can be placed in the field.



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

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_2O. 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_2O Range	0-75 mb • Precision: 0.1 mb
Pressure Compensation Range	80-115 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

For further information, please contact us at:

PP SYSTEMS
ppsystems.com

110 Haverhill Road, Suite 301
Amesbury, MA 01913 U.S.A.
TEL +1 978-834-0505
FAX +1 978-834-0545
EMAIL sales@ppsystems.com
URL www.ppsystems.com

Printed: December 2017

Portable • Accurate • Reliable