



SF-9100

Distributed Soil Respiration System

The Distributed Soil Respiration System deploys multiple single-point distributed soil respiration units to measure soil CO₂ flux at multiple locations, enabling continuous, long-term monitoring of soil carbon flux. Each single-point distributed soil respiration unit includes a CO₂ infrared analyzer, controller, respiration chamber, and soil temperature & moisture sensors. Even when multiple devices are distributed across different regions, IoT SIM cards enable nationwide networking, effectively solving several issues of traditional soil respiration measurement systems:

- ◆ Eliminates pipeline length constraints, truly enabling long-distance simultaneous and synchronized monitoring;
- ◆ Enables synchronized measurement across multiple respiration chambers, eliminating errors caused by measurement asynchrony;
- ◆ Shortens the pipeline length between analyzer and respiration chamber, effectively eliminating errors from pipeline dead volume and improving accuracy.

The Distributed Soil Respiration System greatly improves sample throughput, measurement accuracy, and efficiency, truly achieving long-distance synchronized measurement. It provides a new solution for soil respiration research and represents a technical innovation for synchronous soil measurement at large spatial scales. It can be widely applied to research in ecology, agronomy, forestry, environmental science, and permafrost studies. This new technology provides novel experimental methods for scientific research, opening up greater possibilities for soil respiration measurement at large spatial scales.



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Each distributed soil respiration unit can operate independently, measuring CO_2 concentration changes within the chamber while combining self-measured air temperature, atmospheric pressure, and soil temperature data, then calculating CO_2 flux. The acquired raw data and calculated flux results are stored on the SD card. The wireless transmission unit provides remote data transmission, enabling remote parameter modification, measurement status control, and remote data downloading.

Key Features

Unique distributed soil respiration unit design for continuous, high-precision, fully automatic unattended long-term field monitoring

Multi-temporal and spatial synchronous measurement at multiple sites over large spatial scales, significantly improving sample throughput, measurement accuracy, and efficiency

Remote networking capability for real-time wireless remote data transmission and networking

Ultra-long-distance communication between distributed soil respiration units and wireless transmission units

Data encryption ensures data security during wireless transmission

No post-processing required; measurement results are automatically calculated and stored

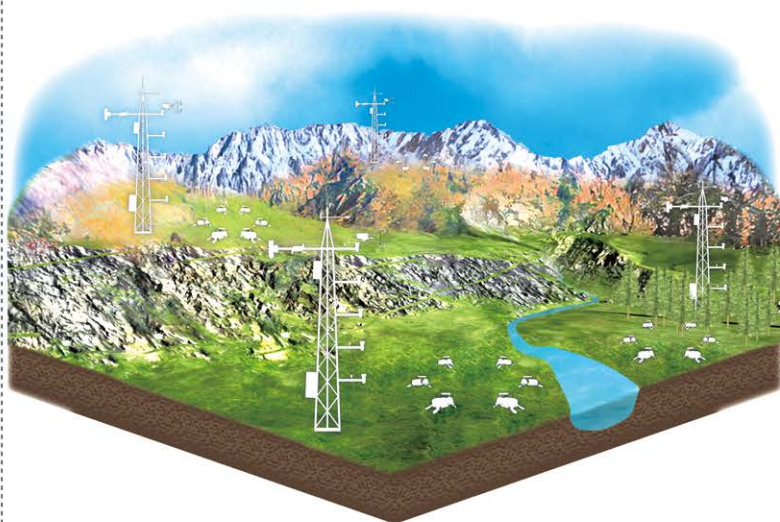
Accurate and verifiable flux measurements

Each distributed soil respiration unit can connect to auxiliary sensors for soil temperature and soil moisture

Simple operation with one-click results

Includes post-processing data analysis software

Lightweight and rugged system design



Technical Specifications

Measurement Principle	Non-Dispersive Infrared (NDIR) Gas Analysis Technology	Safety Protection	Overload protection
Measurement Range	CO ₂ : 0 - 6000 ppm (Standard Range) CO ₂ : 0 - 20000 ppm(Extended Range) H ₂ O: 0 - 60000 ppm	Operating Environment	Temperature: -20-60°C Humidity: 0-95% RH (Non-condensing)
Accuracy	<1% of reading	Waterproof Rating	IP67
Repeatability / Precision	<1ppm	Networking Method	32 GB High-Speed SD Card, Wireless Remote Storage
Optical Cavity Temperature	Constant temperature control with temperature compensation	Storage Medium	Wireless
Optical Cavity Pressure	Pressure compensation	Measurement Area	276.27cm ²
Communication Interface	WIFI、RS232、SDI-12	Atmospheric Pressure Detection	Range: 15-115 kPa, Accuracy: ±1.5%
Power Supply	Solar power or AC power	Temperature Detection	Range: -25-85°C, Accuracy: ±0.5°C
Instrument Power	Power at room temperature: 6.5 W	Product Dimensions	63.4 X 36.9 X 28.6 cm
Maximum Power	40W	Product Weight	11kg

After-Sales Support: Lifetime technical support and after-sales service
Manufacturer: China, LICA (LICA United Technology Limited)