FIELD GUIDE TO

Instruments for the Earth Sciences

LI-COR®

Who We Are

LI-COR is a global leader in high-precision environmental measurement and monitoring solutions. Our advanced field instruments, software, and services provide industry leaders and researchers with the data they need to understand key factors affecting food, water, and energy security.

From gas analysis and plant physiology to water quality and climate conditions, LI-COR delivers reliable data and tools for both indoor and outdoor applications. Our technology enables scientists and professionals to address critical questions about some of the world's most pressing challenges in human and planetary health.

Over a Century of Earth Science Solutions

LI-COR®

50+ Years
of Environmental Measurement and Monitoring

HOBO®

40+ Years
of Environmental Monitoring and Data Logging Solutions

LEARN MORE

Plants: the Physiology of Photosynthesis

Photosynthesis drives biological productivity on Earth—from the smallest cyanobacteria to the largest trees—whereas water scarcity can limit crop productivity worldwide.

LI-COR instruments answer questions about photosynthesis and water-use by measuring photosynthetic CO_2 gas exchange, chlorophyll *a* fluorescence, stomatal conductance, and other parameters that advance discovery and lend insight to improving crop yield.

licor.com/applications/plant-health

LI-6800 Portable Photosynthesis System

The LI-6800 is the global standard for photosynthesis research and leads to more published research than any other system available. It can measure photosynthesis in both artificial and natural spectral conditions—whether under a plant canopy, cloudy skies, direct sun, or light source or artificial or supplemental light.

The LI-6800 is the only system capable of the Dynamic Assimilation™ Technique: the fastest leaf-level survey measurement available. It is also the only system that allows you to test the assumptions of steady-state measurements while providing rapid survey capabilities that are rooted in first principles.

licor.com/products/photosynthesis/LI-6800

6800-09 Soil CO_2 Flux Chamber

Expand into soil research by pairing the LI-6800 with the 6800-09 Soil CO_2 Flux Chamber. This chamber converts the LI-6800 open gas exchange system into a closed soil CO_2 flux system that features all the benefits of LI-COR soil gas flux systems: a chamber closure mechanism that prevents disturbance, a chamber shape that facilitates air mixing, and software that optimizes data.

licor.com/products/photosynthesis/LI-6800/chambers

6800-18 Aquatic Chamber

Expand into aquatic research by pairing the LI-6800 with the 6800-18 Aquatic Chamber. This chamber allows you to explore questions related to photosynthesis of algae in suspension and other samples that must remain humid. It provides simultaneous measurements of CO_2 gas exchange and Pulse-Amplitude Modulation (PAM) chlorophyll *a* fluorescence of a given aquatic sample.

licor.com/products/photosynthesis/LI-6800/aquatic

LI-600 and LI-600N Porometer/Fluorometers

The LI-600 and LI-600N are compact porometers with PAM fluorometers that simultaneously measure stomatal conductance and chlorophyll *a* fluorescence over the same leaf or needle area. They can deliver the precision you need while completing these measurements in seconds. Both models include a GPS receiver that tracks location and an accelerometer/magnetometer that records data needed to calculate a leaf's angle of incidence to the sun. A barcode generator in the software and a barcode scanner on the instrument simplify data collection and record keeping.

licor.com/products/LI-600

LI-600 Porometer/Fluorometer

Take simultaneous measurements of stomatal conductance and chlorophyll *a* fluorescence from broadleaves.

Leaf sizes: 7.5 mm minimum width and length and 2.8 mm maximum thickness

LI-600N Porometer/Fluorometer

Take simultaneous measurements of stomatal conductance and chlorophyll *a* fluorescence from single needles, narrow leaves, and grasses.

Leaf sizes: 1-3.6 mm width, 14.2 mm maximum length, and 2.8 mm maximum thickness

Ecosystems: Landscape-Level Exchange of Greenhouse Gases, Water Vapor, and Energy

Measurements of surface-atmosphere exchange of greenhouse gases, water, and energy are essential to our understanding of the global climate. Whether studying water use efficiency in crops, methane from permafrost, or carbon sequestration, LI-COR eddy covariance systems record a detailed time-series of landscape-level gas exchange data.

From instruments that provide high-speed gas and wind measurements to software for the evaluation of years-long trends, LI-COR eddy covariance systems present a complete solution for data collection, analysis, and interpretation.

licor.com/products/eddy-covariance

LI-7500DS Open Path CO_2/H_2O Analyzer

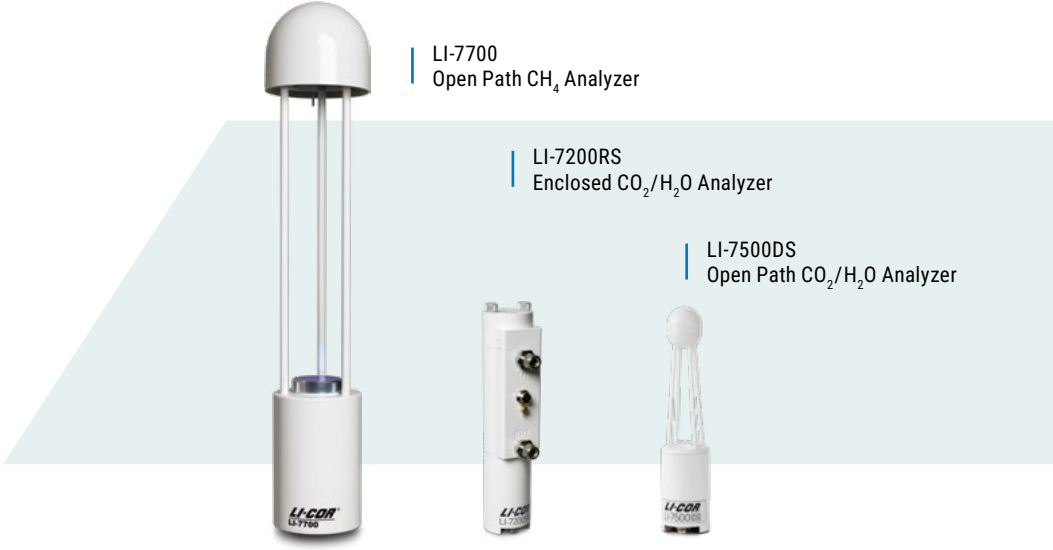
The only system available that can measure landscape level CO_2 flux with as few as 4 watts and is compatible with the most popular sonic anemometer models

LI-7200RS Enclosed CO_2/H_2O Analyzer

The enclosed CO_2 analyzer that is preferred by flux networks worldwide, measures CO_2 and water vapor, and is compatible with the most popular sonic anemometer models

LI-7700 Open Path CH_4 Analyzer

The only open path methane analyzer that is designed for field deployment in eddy covariance systems and measures CH_4 flux with as few as 8 watts



Sonic Anemometers

LI-COR eddy covariance systems are compatible with the most popular 3D sonic anemometers—including Campbell Scientific, Gill, Metek, and RM Young models.

Biomet Data Collection

LI-COR eddy covariance systems support a full suite of biomet sensors—including a PhenoCam, soil moisture probes, air temperature probes, light sensors, radiometers, and rain gauges.

licor.com/products/eddy-covariance/software

All LI-COR eddy covariance systems use the SmartFlux® System, the on-site processing and GPS synchronization component that runs EddyPro® Software.

The Carbon Node

The Carbon Node is a simple, scalable solution for eddy covariance carbon monitoring. Because it includes everything needed to quickly collect and automatically process carbon flux data in an ecosystem, it is ideal for users of all experience levels.

Use the Carbon Node as a standalone solution or in conjunction with traditional eddy covariance systems depending on research goals.

LI-720 Carbon Flux Sensor

On-site sensor that takes accurate, actionable measurements of CO_2 flux along with other data—including latent heat flux sensible heat flux, and other biomet measurements

licor.com/products/carbon-node

The Water Node

The Water Node is a streamlined, trusted solution for actual evapotranspiration data, not the estimates that traditional methods provide. This data is key to making confident decisions about water use.

The Water Node includes all the hardware and software needed to take actual evapotranspiration measurements and is easy to set up, self-powered, and low maintenance.

LI-710 Evapotranspiration Sensor

On-site sensor that takes actual evapotranspiration measurements in real time by measuring the total transport of water from evaporation and transpiration over an area

licor.com/products/water-node

Internet of the Environment (IoE®) Module

In situ hardware—including a solar power system, a mounting pole, and cellular communication equipment—that transfers a sensor's data to LI-COR Cloud®

LI-COR Cloud®

Cloud-based software that collects, stores, and provides access to the Carbon Node, the Water Node, and HOBO sensor measurement data at any time and place via the sensor's app

HOBO Weather Stations

HOBO weather stations deliver dependable weather monitoring solutions for a variety of environmental disciplines—including meteorology, hydrology, renewable energy, agricultural, and alpine research.

Choose from one of three pre-configured weather station kits or customize your own using a scalable HOBOnet wireless sensor network.

HOBO Weather Station Kits

The basic, intermediate, and advanced weather station kits deliver accurate, reliable performance even in the harshest outdoor climates. Depending on the kit, components may include a monitoring station, temp/RH sensors, wind sensors, solar radiation shields, and more.

HOBOnet Wireless Sensor Network

A remote and field-proven wireless monitoring system that can be easily configured to meet unique application and terrain requirements. Offering wide coverage with 900 Sub-GHz wireless mesh technology and deployment-ready, HOBOnet is scalable, each station connecting up to 50 wireless sensors.

licor.com/products/weather-station

Wind: The World's Smallest and Lightest 3D Sonic Anemometers

As the world's smallest and lightest ultrasonic anemometers, TriSonica® instruments can measure the wind anywhere. From UAVs to weather stations, they are designed to measure wind in more places and in more applications than were ever before possible.

licor.com/products/trisonica

LI-550 TriSonica Mini Wind and Weather Sensor

The LI-550 is a powerful and highly accurate mobile sensing system for atmospheric monitoring, weather reporting, and ecosystem research. It is small enough to fit in the palm of your hand and is available in pipe-mount and flat-base configurations for easy installation onto fixed and portable towers.

LI-560 TriSonica Sphere Ultrasonic Anemometer

The LI-560 takes accurate vertical wind speed measurements and sampling rates up to 100 Hz. Its light weight and durability make it ideal for stationary and mobile atmospheric research, including drone deployment.

Aquatic Carbon: Characterize Carbon in Aquatic Environments

Aquatic instruments from Apollo SciTech measure four key parameters that define the CO_2 system in aquatic environments: dissolved inorganic carbon (DIC), partial pressure of CO_2 (pCO_2), pH, and total alkalinity. Measuring these parameters is an essential step toward a better understanding of climate change, ocean acidification, and more.

licor.com/products/aquatic-carbon

LI-5300A Dissolved Inorganic Carbon Analyzer

Characterize inorganic carbon species, or DIC, while stationary in ships and laboratories and while using a secondary gas analyzer.

LI-5400A Underway pCO_2 System

Capture pCO_2 and trace gas measurements from a variety of freshwater and seawater environments within just 3 to 4 minutes.

LI-5700A Spectrophotometric Seawater pH Analyzer

Take highly precise and sensitive pH measurements of seawater—to assess how acidic or basic it is—using optical absorption.

LI-5800A Total Alkalinity Titrator

Measure an aquatic system's ability to absorb protons, or total alkalinity, while maintaining the pH of its environment.

Water: Monitoring Quality and Compliance

Water is vital to healthy ecosystems, agriculture, and the survival of humanity. To protect it, water quality management programs and compliance regulations play an invaluable role. From impact mitigation for urban development, to maximizing an aquaculture farm's production, accurate water quality data is crucial. Research-grade HOBO data loggers and remote monitoring solutions set the standard for accurate data collection, helping you document compliance and make the most informed decisions to ensure sustainability.

licor.com/products/water-quality

HOBO MX800 Series Water Data Loggers

A highly versatile solution for monitoring water level, conductivity/salinity, and temperature. Choose the fully submersible MX801 or the direct-read MX802 for easy data access without removing the sensor via Bluetooth data offload. Both models feature interchangeable sensors, simple calibration, and user-replaceable batteries.

HOBO MX20L

Water Level Data Loggers

Integrating Bluetooth for fast and reliable download, this rugged, affordable logger delivers high-accuracy 0.1% measurement data via the HOBOconnect app for continuous, reliable water level and temperature monitoring. Depth range options of 13, 30, or 100 feet and durable polypropylene housing built for use in both freshwater and saltwater environments.

HOBO MX2200 TidbiT

Water Temperature Data Loggers

A rugged, waterproof temperature logger with Bluetooth to deliver high-accuracy data straight to your device with the HOBOconnect app. Ideal for long-term deployments in streams, lakes, and oceans (up to 400 ft with the MX2203 or 5000 ft with the MX2204), they also detect and record the presence of water for tracking intermittent water applications.

Soil: Measure Greenhouse Gas Exchange from Soils

LI-COR soil gas flux systems combine patented technology with robust instruments to create systems that are built for long-term field deployment and survey measurements. Results from LI-COR gas analyzers are computed in real time in both the survey and long-term systems. They are viewable on your computer, smartphone, or tablet through a web browser.

licor.com/products/soil-flux

Gas Analyzers for Soil Gas Flux

LI-COR gas analyzers are designed to connect with the Smart Chamber and LI-8250 Multiplexer, providing dependable measurements that can be optimized in SoilFluxPro™ Software.

LI-870 CO_2 Gas Analyzer for Soil Gas Flux Systems

Take soil CO_2 flux measurements with an analyzer that's based on the proven LI-850 platform.

LI-7810 $CH_4/CO_2/H_2O$ Trace Gas Analyzer

Take CH_4, CO_2, and water vapor measurements from soil.

LI-7820 N_2O/H_2O Trace Gas Analyzer

Take N_2O and water vapor measurements from soil.

LI-7825 CO_2 Isotope/ NH_3 Trace Gas Analyzer

Take in-situ CO_2 isotopologues and NH_3 concentration measurements from soil.

Interested in other gases? LI-COR soil gas flux systems record data and process measurements from other gas analyzers.

licor.com/products/soil-flux

Smart Chamber

Hand-held and portable, the Smart Chamber is used for rapid surveys of greenhouse gas flux from soil. The Smart Chamber delivers results for the most important gases and offers simple connections to the LI-870, LI-7810, and LI-7820.

licor.com/products/soil-flux/smart-chamber

LI-8250 Multiplexer

For long-term deployments that support up to 36 chambers and measurements of the most important gases, the LI-8250 Multiplexer manages chamber position, flow of gases, and data logging as a tidy, fully integrated system. Deploy the system for long-term unattended measurements while viewing results from online systems on your smartphone or computer.

The LI-8250 is compatible with the 8200-104C Clear Long-Term Chamber, which allows plants within the collar to receive sunlight for net carbon exchange measurements, and the 8200-104 Long-Term Chamber, which shades the soil during a measurement.

licor.com/products/soil-flux/LI-8250

SoilFluxPro™ Software

SoilFluxPro allows you to revise the parameters of large datasets and instantly see the effect on your flux calculations. You can recompute multiple observations at a time to bring out the greatest statistical power from your results.

licor.com/products/soil-flux/soilfluxpro

Gas Analyzers for CO_2 Isotope Measurements

LI-COR automated soil gas flux monitoring systems are ideal for measuring CO_2 isotopes, a key component of understanding the movement of soil carbon within an ecosystem. By tracking its carbon cycle, you can validate carbon capture and storage programs, evaluate fertilizer or pesticide impact on soil health, conduct carbon emission studies, and more.

Your system can include soil chambers, the LI-8250, the 8250-01 Extension Manifold, the 8250-02 Calibration Manifold, and the LI-7825 CO_2 Isotope/NH_3 Trace Gas Analyzer.

LI-7825 CO_2 Isotope/NH_3 Trace Gas Analyzer

Take highly precise, accurate, in-situ, and real-time measurements of the four most common CO_2 gas isotopologues and NH_3 from soil.

Gases: Precise, Stable Measurements of CO_2, CO_2 Isotopes, H_2, CH_4, N_2O, NH_3, and H_2O

Precise, accurate, stable, and reliable, LI-COR laser-based trace gas analyzers bring new opportunities for trace gas measurements. Multiple patented technologies provide exceptional stability and precision in both atmospheric and soil gas flux measurements.

licor.com/products/trace-gas

LI-7810 $CH_4/CO_2/H_4O$ Trace Gas Analyzer

Take highly precise, stable, and dependable CH_4 measurements in the lab bench or field.

LI-7815 CO_2/H_2O Trace Gas Analyzer

Take trusted CO_2 measurements using the LI-COR patented laser-based spectroscopy platform.

LI-7820 N_2O/H_2O Trace Gas Analyzer

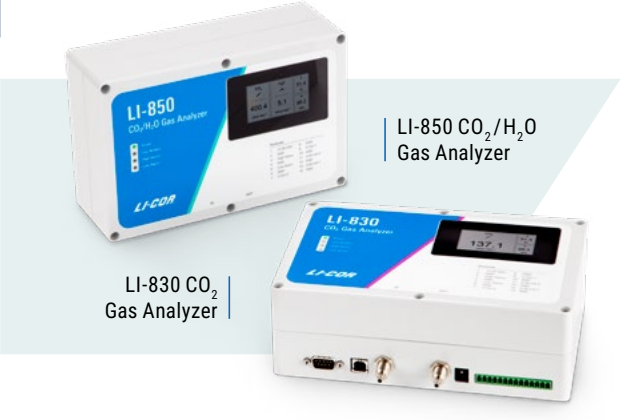
Take N_2O measurements wherever you go—from soils, air, or anywhere that N_2O matters.

LI-7825 CO_2 Isotope/NH_3 Trace Gas Analyzer

Take in-situ measurements of the four most abundant CO_2 gas isotopologues in air while reporting $\delta^{13}C$, $\delta^{17}O$, and $\delta^{18}O$ with high precision and accuracy.

LI-7835 $H_2/CH_4/H_2O$ Trace Gas Analyzer

Takes precise trace concentration measurements of gaseous H_2 and CH_4 simultaneously.



Take general purpose CO_2 measurements with excellent performance at an economical price. Both analyzers can support greenhouse CO_2 concentration measurements, ambient CO_2 monitoring, respirometry measurements, and more.

Leaf Area Index: LAI-2200C Plant Canopy Analyzer

The LAI-2200C provides indirect, non-destructive measurements of leaf area index (LAI), delivering the data that scale leaf-level measurements up to the canopy and beyond. It takes measurements under many canopy types—from grasslands and forests—and under most sky conditions—from clear to overcast. It includes software for post-processing data, masking segments, and calculating other canopy characteristics, to help you get the most meaningful results from the measurements.

licor.com/products/leaf-area/LAI-2200C

HOBO MX2308
Temp/RH/PAR Data Logger

With an integrated LI-190R quantum sensor for high-precision measurement of Photosynthetically Active Radiation (PAR), along with built-in temperature and relative humidity sensor, the MX2308 provides accurate monitoring of key environmental parameters, including Vapor Pressure Deficit (VPD) and Daily Light Integral (DLI). Effortless Bluetooth data offload streamlines fieldwork and enhances data accessibility, making it ideal for monitoring environmental conditions—from agricultural operations to academic research.

licor.com/products/light

Light: The Global Standard for Light Measurements

LI-COR light and radiation sensors are the industry standard for light measurements. Each sensor represents 50+ years of experience in optical design, attention to detail in manufacturing, and an unwavering commitment to quality.

licor.com/products/light

Standard, Line, Underwater, and Spherical Quantum Sensors

Measure photosynthetic photon density from light sources (LI-190R), in plant canopies (LI-191R), in water columns (LI-192), and from all directors in water (LI-193).

LI-191R Line Quantum Sensor

LI-192 Underwater Quantum Sensor

LI-200R Pyranometer

LI-193 Spherical Quantum Sensor

LI-180 Spectrometer

Record the spectral output of light sources at the single nanometer level, along with many other parameters.

LI-250A Light Meter and LI-1500 Light Sensor Logger

SoilFluxPro™ allows you to revise the parameters of large datasets and instantly see the effect on your flux calculations. You can recompute multiple observations at a time to bring out the greatest statistical power from your results.

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