

Field guide to

Instruments for the earth sciences



LI-COR®



Plants: the physiology of photosynthesis

Photosynthesis drives biological productivity on earth, from the smallest cyanobacteria to the largest trees. Meanwhile, water scarcity can limit crop productivity worldwide. LI-COR instruments answer questions about photosynthesis and water by measuring photosynthetic CO_2 gas exchange, chlorophyll *a* fluorescence, porometry, and other parameters that advance discovery and improve crop yield.

LI-6800 Portable Photosynthesis System

The LI-6800 is the global standard for photosynthesis research – it is 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. The LI-6800 leads to more published research than any other system available.

The Dynamic Assimilation™ Technique is the fastest leaf-level survey measurement available. Dynamic assimilation is only available in the LI-6800 due to high flow rates combined with high-precision infrared gas analyzers in the head. The LI-6800 measures photosynthesis in artificial or natural spectral conditions – whether under a light source, plant canopy, cloudy skies, or direct sun – for the most versatile system available.

www.licor.com/6800

6800-09 Soil CO₂ Flux Chamber

Plant scientists with an interest in soil can use the LI-6800 as a soil CO₂ flux system with the 6800-09 Soil CO₂ Flux Chamber. This chamber converts the LI-6800 open gas exchange system into a closed soil CO₂ 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 data that can be optimized in SoilFluxPro® Software.

licor.com/6800-chambers





6800-18 Aquatic Chamber

The 6800-18 Aquatic Chamber extends LI-6800 capabilities to aquatic samples – to explore questions related to photosynthesis of algae in suspension and other samples that must remain humid. The chamber provides simultaneous measurements of CO₂ gas exchange and PAM chlorophyll *a* fluorescence of the sample.

www.licor.com/aquatic

LI-600 Porometer/Fluorometer

The LI-600 is a compact porometer with an optional Pulse-Amplitude Modulation (PAM) fluorometer that measures stomatal conductance and chlorophyll *a* fluorescence over the same leaf area. Capable of completing a measurement in seconds, the LI-600 provides the speed and precision needed for rapid surveys of many leaves.

The LI-600 and LI-600N both include a GPS receiver and an accelerometer/magnetometer that record the information needed to calculate and report 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.



LI-600 Porometer/Fluorometer

LI-600N Porometer/Fluorometer

LI-600N Porometer/Fluorometer

The LI-600N offers combined chlorophyll *a* fluorescence and stomatal conductance measurements from needles, grasses, and other narrow leaves.

With built-in measurements of GPS location, leaf orientation, and leaf angle, the LI-600N brings rapid conductance measurements to narrow leaves and grasses. For evergreen trees, turfgrass, and other plants with narrow leaves, the LI-600N can fill in the missing porometry measurements for entire categories of plants.

www.licor.com/600



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.

LI-7500DS Open Path CO₂/H₂O Analyzer

The only system available that can measure landscape level CO₂ flux with as few as 4 watts, each LI-7500DS includes the SmartFlux® System, is compatible with the most popular sonic anemometer models, and computes results in real time with EddyPro® on the SmartFlux® System.

LI-7200RS Enclosed CO₂/H₂O Analyzer

The enclosed CO₂ analyzer preferred by flux networks worldwide, each LI-7200RS includes the SmartFlux® System, is compatible with the most popular sonic anemometer models, and computes results in real time with EddyPro® on the SmartFlux® System.

LI-7700 Open Path CH₄ Analyzer

Add methane flux measurements to any LI-COR eddy covariance system with as few as 8 additional watts. Data are logged to the SmartFlux® System, and methane flux results are computed in real time by EddyPro® Software on the SmartFlux® System.

www.licor.com/ec





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. Data and diagnostics are recorded on the SmartFlux System, along with final flux results.

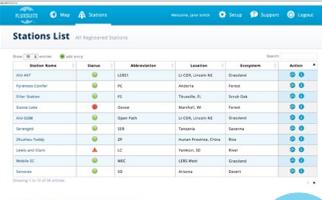
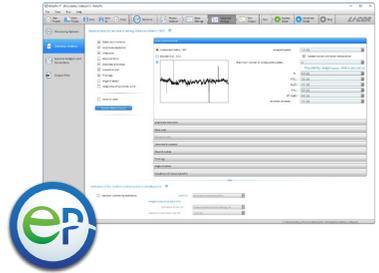
Biomet Data Collection

Each eddy covariance system supports a full suite of biological and meteorological sensors, so you can collect additional environmental data at each site. Supported sensors include a PhenoCam, soil moisture probes, air temperature probes, light sensors, radiometers, a rain gauge, and more.

www.licor.com/ec

EddyPro® Software

EddyPro lets you select the most appropriate processing steps and apply them to large eddy covariance datasets for real-time flux computations on the SmartFlux System and dependable re-evaluations on your desktop personal computer.



Station Name	Status	Abbreviation	Location	Equipment	Access
USC001	🟢	USC001	USC001, US001-ME	Granier	🔒
Hydrology Center	🟢	HC	Hydrology, IL	Forest	🔒
Eller Station	🟢	ES	Hydrology, IL	Forest	🔒
Urban Station	🟢	US	Hydrology, IL	Forest	🔒
USC002	🟢	USC002	USC002, US002-ME	Granier	🔒
USC003	🟢	USC003	USC003, US003-ME	Granier	🔒
USC004	🟢	USC004	USC004, US004-ME	Granier	🔒
USC005	🟢	USC005	USC005, US005-ME	Granier	🔒
USC006	🟢	USC006	USC006, US006-ME	Granier	🔒
USC007	🟢	USC007	USC007, US007-ME	Granier	🔒
USC008	🟢	USC008	USC008, US008-ME	Granier	🔒
USC009	🟢	USC009	USC009, US009-ME	Granier	🔒
USC010	🟢	USC010	USC010, US010-ME	Granier	🔒
USC011	🟢	USC011	USC011, US011-ME	Granier	🔒
USC012	🟢	USC012	USC012, US012-ME	Granier	🔒
USC013	🟢	USC013	USC013, US013-ME	Granier	🔒
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USC020	🟢	USC020	USC020, US020-ME	Granier	🔒

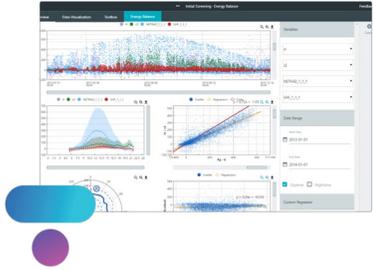


FluxSuite® Software

FluxSuite provides access to your site – even when you can't be there – with online results, system status information, and configurable email alerts.

Tovi® Software

Tovi allows you to visualize a lengthy time series of flux results, screen data for quality, gap-fill missing periods, assess the flux footprint, and more. With Tovi, you can discover the story in your eddy covariance data with ease.



LI-710 Evapotranspiration Sensor

Water scarcity affects agricultural productivity every year, all over the world. The LI-710 Evapotranspiration Sensor provides answers about water nearly everywhere that water matters.

Accurate, dependable measurements of the total water lost to evaporation and transpiration can help optimize irrigation, improve planning during periods of drought, and provide data that are critical to managing water resources.

www.licor.com/710







Wind: the world's smallest and lightest 3D sonic anemometers

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

www.licor.com/trisonica

LI-550 TriSonica® Mini Wind and Weather Sensor

The LI-550 TriSonica® Mini is small enough to fit in the palm of your hand, yet it is a powerful and highly accurate mobile sensing system engineered for atmospheric monitoring, weather reporting, and ecosystem research. Available in a pipe-mount and a flat-base configuration, the LI-550 is easy to install on fixed or portable towers for real-time 3-dimensional air flow measurements.

LI-560 TriSonica® Sphere Ultrasonic Anemometer

Designed to deliver precise vertical wind speed measurements and sampling rates up to 100 Hz, the LI-560 is ideal for UAS-based atmospheric turbulence measurements, while retaining light weight and durability.

LI-570 TriSonica® Data Logger

Recording data from the TriSonica® anemometers is a breeze with the LI-570, with support for up to four LI-550s or up to three LI-560s. The LI-570 provides power, data collection, and interface options for TriSonica® anemometers and other serial devices, as well as support for a GPS receiver and cellular radio.

LI-570 TriSonica®
Data Logger



LI-560 TriSonica® Sphere
Ultrasonic Anemometer



LI-550 TriSonica® Mini
Wind and Weather Sensor



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, and are viewable on your computer, smartphone, or tablet through a web browser.

www.licor.com/soil

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-7820 N₂O/H₂O
Trace Gas Analyzer

LI-7810 CH₄/CO₂/H₂O
Trace Gas Analyzer



LI-870 CO₂ Gas Analyzer
for Soil Gas Flux Systems

LI-870 CO₂ Gas Analyzer for Soil Gas Flux Systems

Based on the proven LI-850 platform, the LI-870 is designed for soil CO₂ flux measurements.

LI-7810 CH₄/CO₂/H₂O Trace Gas Analyzer

Measure CH₄ from soil.

LI-7820 N₂O/H₂O Trace Gas Analyzer

For N₂O measurements from soil.

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

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 today, with simple connections to the LI-870, LI-7810, and LI-7820.

www.licor.com/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. You can 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.

www.licor.com/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 the greatest statistical power out of your results.

www.licor.com/soilfluxpro





Gases: precise, stable measurements of CO₂, H₂O, CH₄, N₂O, isotopes of CO₂, and NH₃

Precise, accurate, and stable, yet rugged 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.

www.licor.com/trace-gas



LI-7810 CH₄/CO₂/H₂O Trace Gas Analyzer

High-precision, stable, and dependable CH₄ measurements for the lab bench or field.

LI-7815 CO₂/H₂O Trace Gas Analyzer

Trusted CO₂ measurements from the LI-COR patented laser-based spectroscopy platform.

LI-7820 N₂O/H₂O Trace Gas Analyzer

Measures N₂O wherever you go – from soils, air, or anywhere that N₂O matters.

LI-7825 CO₂ Isotopes and NH₃ Trace Gas Analyzer

Measures the four most abundant CO₂ gas isotopologues in air and reports $\delta^{13}\text{C}$, $\delta^{17}\text{O}$, $\delta^{18}\text{O}$, and NH₃ with high precision and accuracy.



LI-850 CO₂/H₂O Gas Analyzer

LI-830 CO₂ Gas Analyzer



LI-850 CO₂/H₂O Gas Analyzer and LI-830 CO₂ Gas Analyzer

The LI-850 and LI-830 are just right for general purpose CO₂ measurements, providing excellent performance at an economical price. With a broad measurement range, optional pumps and displays, and versatile data communication options, the LI-850 and LI-830 are designed to support many applications including greenhouse CO₂ concentration measurements, ambient CO₂ monitoring, respirometry measurements, and more.

www.licor.com/gas-analysis



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 to 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.

www.licor.com/2200C



Light: the global standard for light measurements

50 years of experience inform the design of LI-COR light sensors, and we make better sensors as a result. That is why LI-COR light and radiation sensors are the industry standard for light measurements. Each sensor represents years of experience in optical design, attention to detail in manufacturing, and an unwavering commitment to quality.

www.licor.com/light



LI-180 Spectrometer

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



LI-190R Quantum Sensor

Measures photosynthetic photon flux density (PPFD) from any light source regardless of the spectral characteristics due to the uniform sensitivity.



LI-200R Pyranometer Sensor

A low-cost pyranometer that is used for solar power optimization, meteorological stations, and other applications that require global solar radiant energy measurements.



LI-210R Photometric Sensor

Measures light as perceived by the typical human eye. It is used to evaluate indoor light intensity, light uniformity, and illumination in work areas.



LI-191R Line Quantum Sensor

For a PPFD measurement integrated over a one-meter length. It is used to measure the intensity of PAR penetrating plant canopies as a combination of shade and sun flecks.



LI-192 Underwater Quantum Sensor

To measure upwelling or downwelling PPFD at depths in a water column, the measurements are useful for light for algal photosynthesis and turbidity measurements.



LI-193 Spherical Quantum Sensor

To measure the photon flux fluence rate coming from all directions in water, measurements represent the total photosynthetically active radiation available at a single location in water.



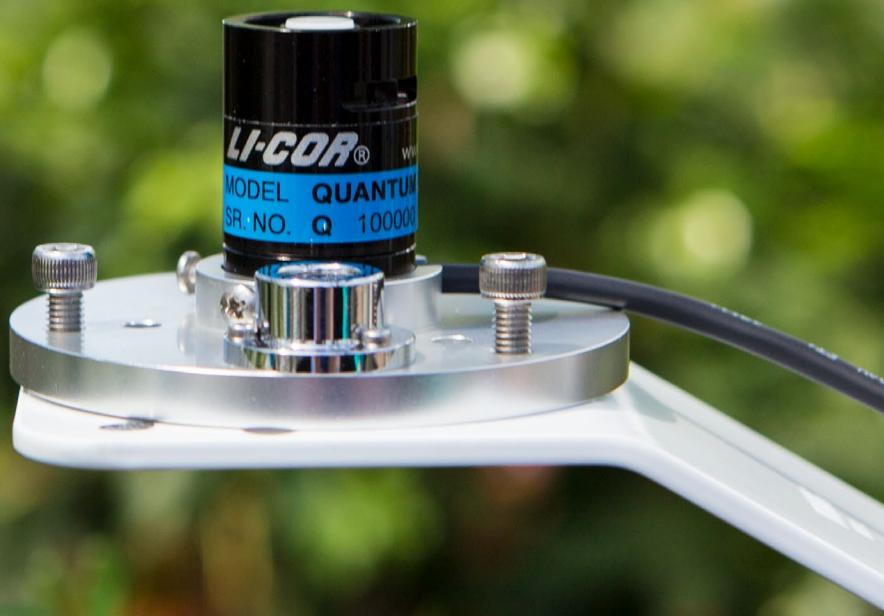
LI-250A Light Meter

The LI-250A Light Meter is a handheld digital meter that displays measurements from the attached sensor.



LI-1500 Light Sensor Logger

A weather resistant, handheld, programmable, high-speed logger for LI-COR light sensors, the LI-1500 features a USB port for data transfer and an optional GPS receiver.



LI-COR®
MODEL QUANTUM
SR. NO. Q 10000



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