



Instrumentation for the Plant & Soil Sciences

Short Form Catalog

PP 
SYSTEMS

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Trusted and tested technology

CIRAS-2 Portable Photosynthesis System

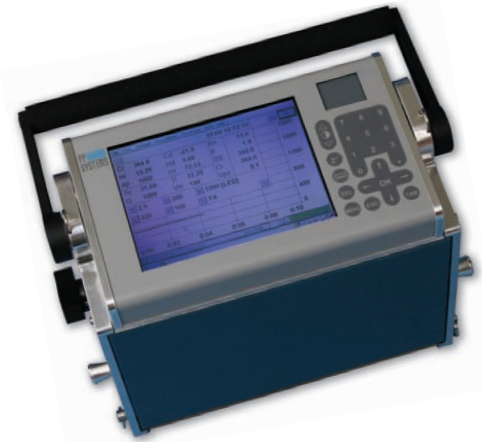


For High Level Research

One highly portable photosynthesis system with many measurement capabilities including leaf gas exchange, soil respiration, chlorophyll fluorescence, canopy net CO₂ flux.

System Features

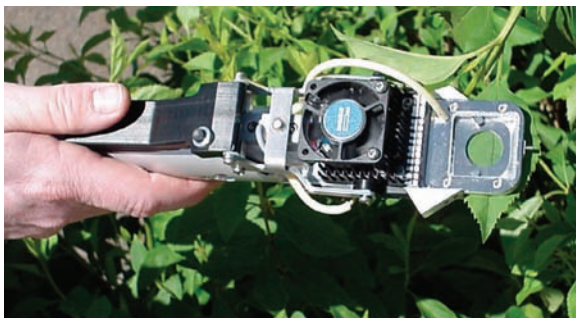
- Lightweight and field portable (7.2 kg)
- Four non-dispersive, infrared gas analyzers for CO₂ and H₂O (true differential analyzer)
- Thermostatted optical bench with built-in temperature and pressure compensation
- Built-in self calibration facility
- No laboratory or field CO₂ recalibration required
- Independent, automatic control of CO₂, H₂O, temperature and light
- Powerful user interface
- Large, full color LCD optimized for field use
- Intuitive system software
- Remote control capability
- Lightweight leaf cuvettes and LED light units for broad leaves, grasses, cereal crops and conifers



Independent, Automatic Control of CO₂ and H₂O

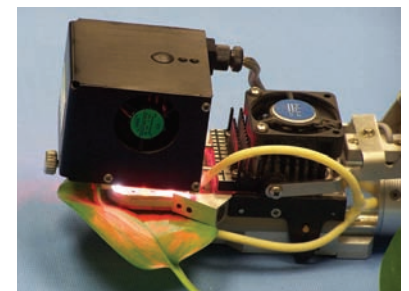
The CIRAS-2 is capable of providing independent, automatic control of CO₂ and H₂O to the leaf cuvette (reference) and within the leaf cuvette (analysis). Control of CO₂ and H₂O can be dynamic or pre-programmed for automatic response curves.

PLC6 (U) Automatic Universal Leaf Cuvette



PLC6 (U) Automatic Universal Leaf Cuvette

The PLC6 (U) Automatic Universal Leaf Cuvette is lightweight, versatile and ideal for field measurements. It is constructed from carefully selected materials for best results. Automatic temperature control is integral to the cuvette. It features 2 miniature PAR sensors located within the cuvette at the leaf surface for accurate measurement of PAR (Photosynthetically Active Radiation). Accurate leaf temperature control and measurement is ensured by an IR sensor fitted at the base of the cuvette. A remote recording switch is also available on the cuvette handle for conveniently recording measurements.



LED light units are available for automatic control of cuvette light intensity.

PLC5 (C) Automatic Conifer Leaf Cuvette



For measurement of conifers and pine needles.

PLC5 (N) Automatic Narrow Leaf Cuvette



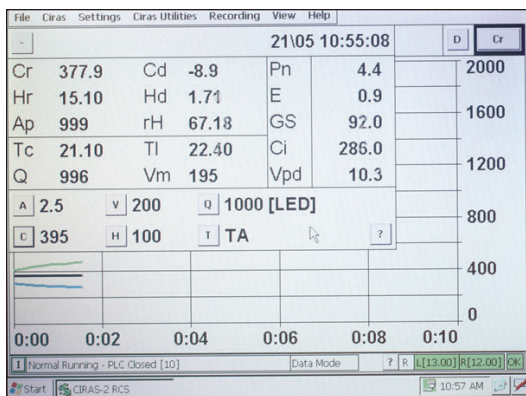
For measurement of grasses and cereal crops.

Both the PLC5 (C) and PLC5 (N) feature integral, automatic control of temperature and can be supplied with optional LED light units.

CIRAS-2 Portable Photosynthesis System

Powerful User Interface and Software

The CIRAS-2 main console features an innovative user interface that includes a large, full color display (640 x 480) optimized for field use with keypad and touchpad for user inputs. It includes both a USB and RS232 serial port for transfer of stored data and for connection to an external PC (remote control operation). A PCMCIA slot is available for use with data storage cards (unlimited data storage).



The remote control software is ideal for laboratory and teaching applications.

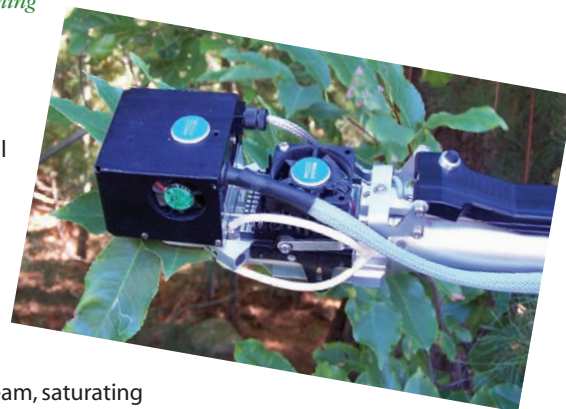
Chlorophyll Fluorescence Module (CFM)



The CIRAS-2 shown above with integral Chlorophyll Fluorescence Module (CFM) signal conditioning interface.

The CIRAS-2 with optional, integral Chlorophyll Fluorescence Module (CFM) is a powerful tool for simultaneous measurement of photosynthesis and chlorophyll fluorescence. Measurement of chlorophyll fluorescence is based on the pulse amplitude modulation (PAM) technique. The following measurement parameters are measured and calculated on demand: F_0 , F_m , F_v , F_v/F_m (Max Yield), F_s , F_m' , F_0' , $\phi PSII$ or $\Delta F/F_m'$ (Yield), qP , qNP , NPQ, PAR, TEMP and ETR.

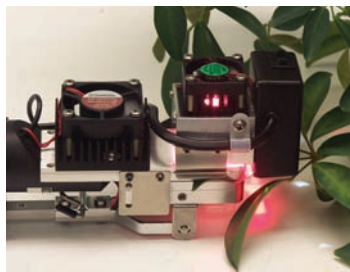
Our modified LED light unit includes full chlorophyll fluorescence detection capabilities while retaining all normal functionality as an actinic light source for gas exchange measurements. The modified unit provides the modulation beam, saturating pulses, far-red illumination and fluorescence detection required for chlorophyll fluorescence measurement in a remarkably compact, solid-state and lightweight unit. It does not require additional power sources for operation.



TPS-2 Portable Photosynthesis System

For Basic Research and Teaching

- Lightweight & field portable
- Accurate CO₂ and H₂O measurement
- Adjustable CO₂, H₂O and light for response curves
- Simple, user-friendly operation
- Full data logging and storage capability
- RS232 output for data transfer to PC



Optional LED light unit for light response curves.

Our TPS-2 Portable Photosynthesis System features a high technical specification at an affordable price making it an ideal choice for basic research and teaching. The system operation and setup protocol is extremely user friendly. Although the main application for the system is leaf gas exchange, the TPS-2 main console can also be used as a high precision, stand-alone gas analysis system for measurement of CO₂ & H₂O in the lab or field.



Soil CO₂ Efflux

The SRC-1 Soil Respiration Chamber is designed for use with both the CIRAS and EGM for rapid, accurate measurement of soil CO₂ efflux in the field. The chamber includes an air mixing fan and is constructed of rugged PVC with a stainless steel ring providing a good seal.



Soil CO₂ Efflux with EGM-4



Soil CO₂ Efflux with CIRAS-2

Net Canopy CO₂ Flux

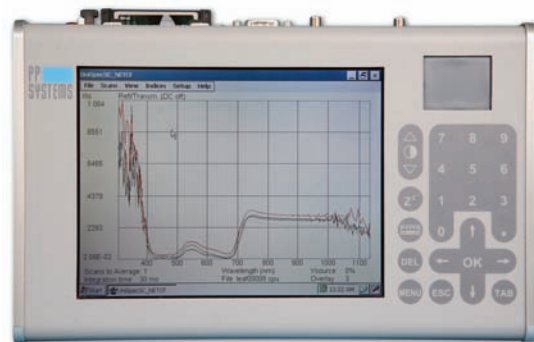


The CPY-4 is designed for closed system measurement of net canopy CO₂ flux of low lying vegetation. This chamber, which can be used with our popular EGM and CIRAS gas analyzers, includes sensors for measurement of air temperature and PAR (Photosynthetically Active Radiation). The PAR sensor is fitted onto a custom, flexible holder which allows the user to conveniently place the sensor at many different locations within the chamber. The rugged, transparent CPY-4 enclosure includes a tapered stainless steel base making it easy to seal to the soil surface or to collars placed in the field. An air mixing fan and custom manifold system ensures excellent stirring and uniform circulation within the chamber. Supplied complete with water vapor equilibrators.

An optional STP-1 Soil Temperature Probe is available for use with both the SRC-1 and CPY-4.

UniSpec-SC & UniSpec-DC Spectral Analysis Systems

Field portable instruments for measurement of vegetation reflectance.

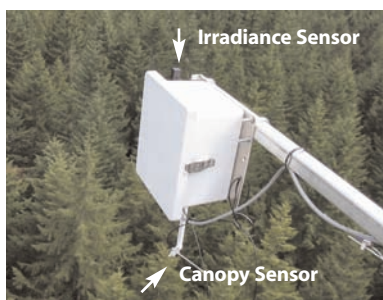


Common System Features

- High precision spectrometers
- Range: 310-1100 nm (VIS/NIR)
- No recalibration required
- Rapid measurement (< 1 second)
- Lightweight (2.0 kg)
- Field portable
- Rugged aluminum enclosure with field carrying case
- Flexible foreoptic interface
- Powerful user interface and software
- Unlimited data storage
- GPS capability

For Use In:

- Plant Physiology & Ecology
- Carbon transport and water quality
- Forestry
- Field crop monitoring
- Remote sensing
- Ground truthing
- Atmospheric science
- Aquatic plants
- Chlorophyll quantification



Remote sensing with UniSpec-DC



A complete range of accessories are available including fiber optics, leaf clips, FOV lens, reference standards and cosine receptor.



Leaf reflectance measurement in the field with UniSpec-SC

CO₂ Gas Analyzers

For Users Who Demand Accuracy, Reliability And Long Term Stability

Common CO₂ Gas Analyzer System Features

- High precision CO₂ gas analyzers
- No factory or field calibration required
- Multiple ranges up to 100,000 ppm CO₂ (10%)
- Accuracy: < 1% of span concentration over calibrated range
- Automatic pressure and temperature compensation
- Dynamic or static measurement capability (SBA-5 & EGM-4)
- Low power consumption
- Analog and digital output
- Low cost

SBA-5 CO₂ Analyzer



Small footprint (7.5 cm W x 12 cm L x 3.3 cm H) and lightweight. Ideal for OEM applications.

For Use In:

- Environmental control rooms
- Growth chambers
- Incubators
- Soil CO₂ efflux
- FACE sites
- CO₂ sequestration
- Animal/insect respiration
- Fruit storage
- Breweries
- Ambient air monitoring
- CO₂ leakage
- Indoor air quality and safety
- Industrial monitoring
- Oceanography
- Bioremediation studies
- Atmospheric studies

The SBA-5 can also be supplied in a lightweight, rugged, anodized aluminum enclosure if required.

EGM-4 Environmental Gas Analyzer for CO₂

For Use In:

- Plant physiology
- Soil CO₂ efflux
- Whole canopy assimilation
- Global change studies
- CO₂ sequestration
- Forest & agricultural meteorology
- Air-sea surface exchange (pCO₂)
- Animal/insect respiration
- Environmental toxicology
- Volcanology
- Bioremediation



Lightweight and field portable

WMA-4 CO₂ Analyzer

For Use In:

- Growth chambers
- Environmental control rooms
- Open top chambers (OTCs)
- Greenhouses and nurseries
- Incubators
- Fruit storage
- FACE sites
- Breweries
- Ambient air monitoring
- CO₂ leakage monitoring
- Indoor air quality and safety
- Industrial monitoring



Fixed installations

Environmental Sensors

PP Systems also manufactures a range of environmental probes and sensors for measurement of air temperature, soil temperature, PAR, humidity and oxygen. All probes/sensors can be used with our CIRAS and range of CO₂ gas analyzers for general environmental monitoring applications in the lab or field.



TRP-2 Temperature/PAR Probe



PAR Sensor



OP-2 Oxygen Sensor

About Us

Since 1984, PP Systems has been supplying quality, rugged and reliable instrumentation to customers throughout the world for high level research. We are considered a world leader in the design and manufacture of instrumentation for measurement of photosynthesis, soil respiration, chlorophyll fluorescence, CO₂/H₂O gas analysis and vegetation reflectance. Our customers come from a wide variety of scientific disciplines including agronomy, horticulture, biology, botany, crop and soil sciences, forestry, ecology, meteorology, oceanography and plant physiology to name a few. Our equipment is in use in over 100 countries worldwide and well documented in many prestigious scientific publications.



Corporate headquarters

Our company is based in Amesbury, Massachusetts (USA). We have developed into a small group of technical experts specializing in the design and manufacture of a wide range of scientific instrumentation for the Plant and Soil Sciences.

Product Training

PP Systems offers regular training sessions throughout the year on all products at our Amesbury, MA (USA) facility. For the latest training schedule, visit <http://www.ppsystems.com/training.htm> or speak to one of our specialists.



CO₂ & H₂O Gas Analyzers

For users that demand accuracy and stability for high level research



CIRAS-2 SC Absolute CO₂/H₂O Gas Analyzer

The CIRAS-2 SC is a single channel infrared gas analyzer for accurate, absolute measurement of CO₂ and H₂O of a single gas stream.

CIRAS-2 DC Differential CO₂/H₂O Gas Analyzer

The CIRAS-2 DC is a dual channel, true differential infrared gas analyzer featuring 4 independent gas analyzers (2 for CO₂ and 2 for H₂O). The CIRAS-2 DC is capable of accurate, absolute measurement of CO₂ and H₂O of two gas streams and displays the results as the absolute concentration of one gas stream (the reference) and the difference between the two gas streams. As such it is capable of resolving small differences between two gas streams in real time. This type of instrument (true differential analyzer) is the preferred option for plant photosynthesis and respiration measurements where differential concentrations need to be resolved to a high degree of accuracy and precision.



Common CIRAS-2 SC/DC Applications

- Plant/Crop physiology
- Animal/insect physiology
- Atmosphere & pollution
- Industrial process control
- CO₂ monitoring
- CO₂ enrichment studies

For further information, please contact us at:

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