Phyto-Sensor Group

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Newsletter

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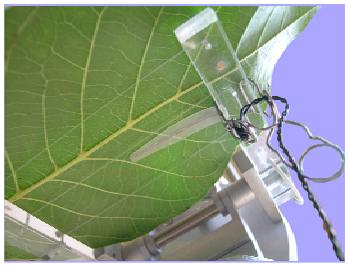
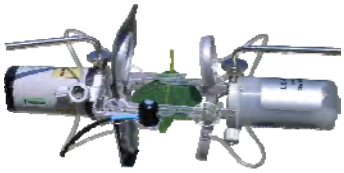
♦ New optional Temperature sensor for LC-4B Leaf Chamber now provides stomatal conductance monitoring



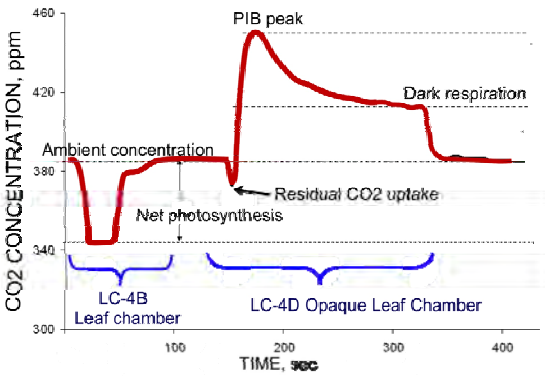
The new LT-LC Leaf Temperature Sensor has a stainless steel wire clip for fixing on a leaf chamber. The miniature bead thermistor has good contact with the leaf due to oblong elastic plate. The thermistor's leads are positioned along a leaf surface to minimize effect on leaf temperature. The LT-LC sensor may be connected to any of eight optional analog inputs of the PTM-48A Photosynthesis Monitor. Evaluation of the leaf stomatal conductance is based on the measured transpiration rate and the known conductance of the boundary layer inside the LC-4B leaf chamber. When configuring the sensor in the PC program, the user shall specify input number of the leaf chamber equipped with the LT-LC sensor. Two new column will appear in the data table of the leaf chamber: initial leaf temperature and stomatal conductance.

♦ Partitioning of CO_2 exchange with paired LC-4B leaf chamber and the new LC-4D opaque leaf chamber!



Illuminated leaves exhibit large transient CO_2 release when first exposed to darkness. This rapid increase is termed the respiratory post-illumination burst (PIB), followed by a second slower rise in respiration, which is termed light-enhanced-dark-respiration (LEDR)* The first peak of post-illumination CO_2 release is usually considered as indication of photorespiration rate. The PIB technique may be easily realized in PTM-48A Monitor by using a leaf chamber with opaque window. Thus, by using a pair of leaf chambers, the regular transparent chamber and the opaque one, the Monitor may represent a full cycle of CO_2 exchange that allows a keen user to realize partitioning of the leaf CO_2 exchange.

The LC-4B Leaf chamber starts the measuring cycle, Then, the opaque LC-4D camber put the leaf to darkness. The typical record of the CO2 Analyzer on C3 plants is shown below:



♦ New rigid design of the LT-1 Leaf Temperature Sensor: now made from stainless steel wire

In the past, the clip of LT-1 sensor was made from plastic. Many users reported about slow degradation of the plastic in harsh environment, and also about occasional damage of this soft material. Recently, we re-designed the LT-1 sensor. Now, the clip is made from lightweight stainless steel wire. The weight of the probe is 1.6 g only! Now it is fully resistant to weather conditions and occasional shocks.

The LC-4D Leaf Chamber and the above mentioned technique was tested extensively in the Laboratory of Bioenergetics of the Institute of Plant Ecology and Physiology of the Moldova Academy of Sciences. The results may be presented by request.

♦ Field test of the PTM-48A Photosynthesis Monitor powered with the car battery.

According to the specification, the PTM-48A Photosynthesis Monitor may be powered from the external 12 Vdc battery. The Monitor has a built-in alarm system that warns a user when the battery is low (first alarm) and when the battery is flat (last alarm) Recently, the Monitor with four leaf chambers has been tested in operation with the regular 60 Ah car battery. The first low battery alarm took place after about 400 measuring cycles. With 1-hour sampling time, it worked more than 16 days!

The PTM-48A Monitor automatically detects peaks and plateaus of the CO_2 curve and place the results in the data file. Thus, the Monitor records Net Photosynthesis, PIB peak and Dark respiration with the same sampling time as all other measurements.