TARGAS-1

Portable Photosynthesis System

Science made seamless™

- Photosynthesis
- Soil CO_2 Efflux
- Net Canopy CO_2 Flux
- Soil Temperature
- Small Volume Sampling
- PAR

PPSystems™

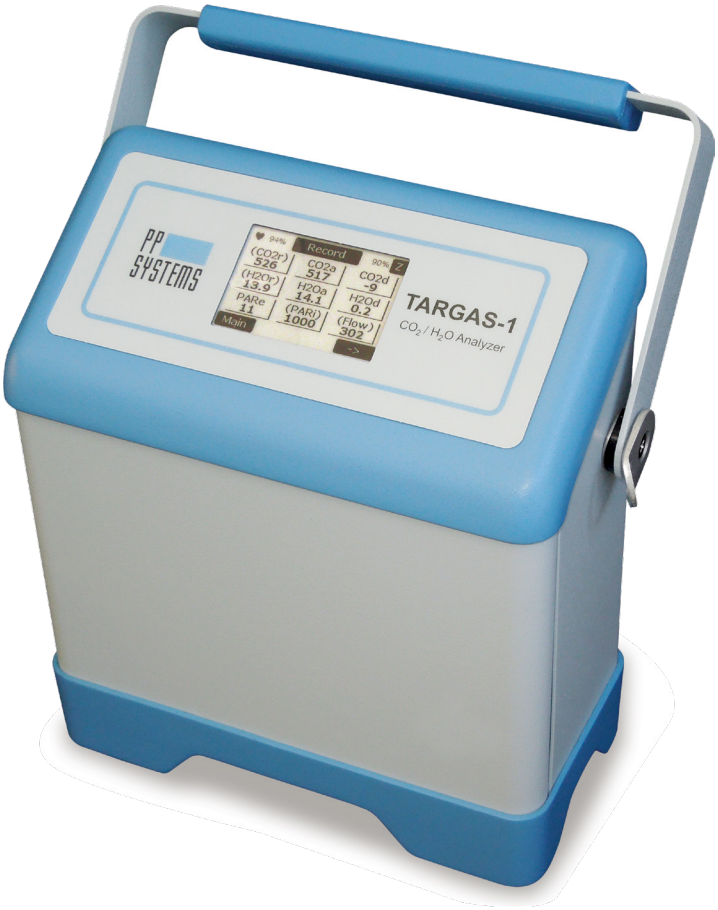
TARGAS-1 Main Console

CO_2 & H_2O Gas Analysis

The compact, lightweight (2.1 kg) **TARGAS-1** console is packaged in a rugged, aluminum enclosure with a shock absorbing polyurethane base making it extremely robust and reliable under harsh environmental conditions. It incorporates two non-dispersive infrared gas analyzers for CO_2 and H_2O providing accurate measurement and control of both. An internal air supply unit provides accurately controlled reference air to the leaf cuvette and another pump draws the sample (analysis) air to the gas analyzer. Both pumps are user controlled and accuracy is ensured by two internal electronic flow sensors.

Both the CO_2 and H_2O gas analyzers employ a non-dispersive, infrared measurement technique, coupled with microprocessor-based signal processing, to achieve excellent stability and specificity to CO_2 and H_2O. Our innovative "Auto-Zero" technology ensures fast warm-up, long-term stability, accuracy and analyzer calibration. It also minimizes the effects on span gas sensitivity, sample cell contamination, IR source aging, changes in detector sensitivity and electronics.

All electrical and gas connections, USB interface, power and desiccants are conveniently located on the console rear panel.



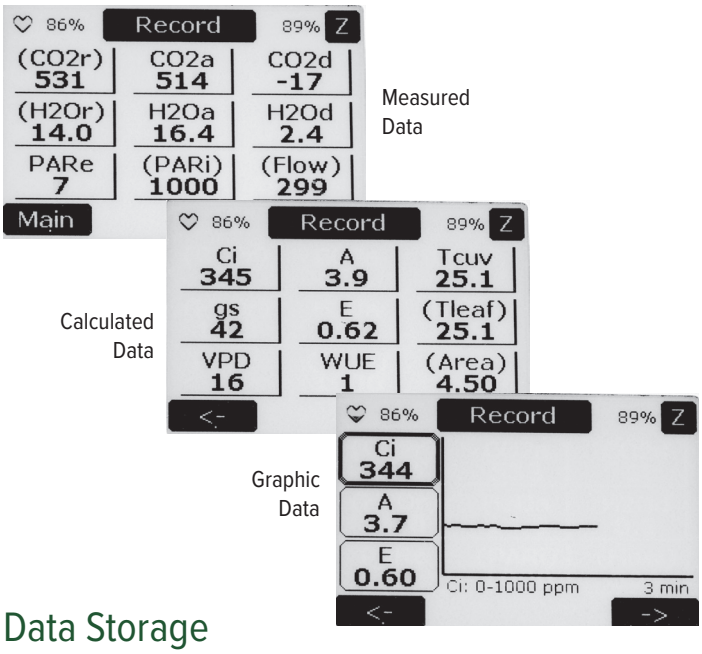
The TARGAS-1 is perfectly suited for applications that demand portability and a high degree of accuracy and control with minimal maintenance.

Powerful Battery Technology

The TARGAS-1 is supplied with a highly efficient, rechargeable Li-ion battery for up to 10 hours of field operation. The instrument can also be used with an AC power supply (included) for continuous operation from the mains in the laboratory.

Touch Display

An innovative, large, touch display (EPD) features simple and intuitive system navigation and it offers excellent viewing under high sunlight.



Data Storage

Data storage is virtually unlimited. Data is stored on a USB flash drive (memory stick) for safe storage and easy transfer of data to your PC.

PLC5 Leaf Cuvette

The lightweight (0.7 kg) and versatile PLC5 Leaf Cuvette is ideal for a wide variety of vegetation including broad leaves, narrow leaves, grasses and small needle conifers, and includes sensors for measurement of air temperature and PAR. All leaf cuvette materials are carefully selected to minimize influences such as infrared radiation, water sorption, CO_2 effects and leaks. The leaf gaskets provide an air-tight seal without causing damage to vegetation.

Light Unit (Optional)

An optional, low power LED light unit is available for light control—perfect for light response curves and cloudy days. The unit clips onto the cuvette head and can easily be removed for measurement under ambient conditions.

+ Type: LED (white)
+ Measurement Range: 0 - 2500 µmol m^{-2} s^{-1}

Environmental Sensors & Chambers

STP-2 Soil Temperature Probe

A rugged, stainless steel probe accurately measures soil temperature, and often used with our SRC-2 Soil Respiration and CPY-5 Canopy Assimilation Chambers.

Soil Temperature Range

- 0–50°C

Soil Moisture & Soil Temperature

A single sensor to accurately measure soil moisture and soil temperature.

Soil Moisture Range

- 0-100% (dry to fully saturated)

Soil Temperature Range

- -10 – +55°C

Full-Spectrum Quantum Sensor

A full-spectrum sensor to accurately measure PAR (Photosynthetically Active Radiation) in the lab or in the field under all light sources.

PAR Range

- 0–3000 µmol m^{-2} s^{-1}

TRP-3 Temperature/PAR Probe

A single probe to accurately measure air temperature and PAR.

Temperature Range

- 0–50°C

PAR Range

- 0–3000 µmol m^{-2} s^{-1}

SRC-2 Soil Respiration Chamber

A plug-and-play chamber for accurate, rapid soil CO_2 efflux measurements. It's constructed out of rugged PVC with a stainless steel ring for sealing, an internal fan for flushing and air mixing, and an air temperature sensor.

Dimensions

- 150 mm (Height) x 100 mm (Diameter)

CPY-5 Canopy Assimilation Chamber

A plug-and-play chamber for accurate, rapid net canopy CO_2 flux on low lying vegetation. The chamber is transparent and includes a fan for flushing and air mixing, and sensors for PAR and air temperature measurements.

Dimensions

- 145 mm (Height) x 146 mm (Exposed Diameter)

Exposed Area

- 167 cm^2

Optional collars are available for use with the SRC-2 and CPY-5 chambers from PP Systems International. Custom chamber are also easily integrated.

Technical Specifications

Main Console

Analysis Method	Two non-dispersive infrared gas analyzers, configured as an absolute absorptiometer with microprocessor control of linearization for both CO_2 and H_2O. All readings are automatically corrected for temperature, pressure and foreign gas broadening.
CO_2 Range	0 – 10000 µmol mol^{-1} Precision: 1 µmol mol^{-1}
H2O Range	0 – 75 mb
Pressure Compensation Range	55 – 115 kPa
Absolute Accuracy	< 1% of span concentration over the calibrated range but limited by the accuracy of the calibration mixture
Differential Accuracy	+/- 1 umol mol-1 for CO_2 differential up to 50 µmol mol^{-1}
Linearity	< 1% throughout the range
Stability	Auto-Zero at regular intervals corrects for sample cell contamination, source and detector aging and changes in electronics.
Calibration	User programmable calibration (if required)
Warm-up Time	Approximately 15 minutes
Air Supply Unit	Integral pump for supply of reference air to the leaf cuvette Range: 200 - 500 cc/min CO_2 and H_2O Control: User adjustable from 0 - 100% of ambient. A smoothing volume is recommended for fresh air intake. An internal electronic flow sensor monitors flow rate.
Sampling Pump	Integral pump for sample (Analysis) air Range: 50-200 cc/min An internal electronic flow sensor monitors flow rate.
Sampling Rate	10 Hz. Sample data is averaged and output every 1.0 seconds.
Digital Output	USB
Gas Flow Rate	200-500 cc/min (280-340 cc/min is optimal). An internal electronic flow sensor monitors flow rate.
Terminal Block	10 pin terminal block for system inputs and outputs
Analog Output	0 – 2.5V (CO_2 range selectable)
Digital Output	One mini USB for connection to external PC
Environmental Sensor Inputs	2 inputs available for use with external chambers and environmental sensors
Alarm	Visual and audible alarm/warnings
Data Storage (USB)	USB Flash Drive port for data storage in multiple formats
Mini USB	For connection to external PC
Touch Display	2.7" electronic paper touch display with 264 x 176 pixel resolution
Power	Internal, rechargeable 7.4V, 8.7 Ah Li-Ion battery provides up to 10 hours of continuous use
Power Consumption	Warm up: 15W (12V @ 1.0A) Normal operation: 7.2W (12V @ 0.6A)
Enclosure	Rugged, ergonomic, lightweight aluminum with polyurethane base
Gas Connections	Two quick connect fittings (inlet and exhaust) for use with 1/8" (.125") ID tubing
Operating Temperature	0 – 50°C, non-condensing External filtration is recommended in dirty/dusty environments.
Dimensions	20 cm L x 20 cm H 10 cm W (Enclosure only)
Weight	2.1 kg

PLC5 Leaf Cuvette

Cuvette Materials	The materials of construction are carefully selected to ensure maximum gas exchange measurement accuracy and repeatability.
Stirring Fan	High speed fan provides efficient air mixing inside the leaf chamber to ensure rapid measurement and minimal boundary layer resistance.
Cuvette Window	18 mm x 25 mm (4.5 cm^2)
Air Temperature Sensor	Precision Thermistor Range: 0-50 °C Accuracy: ± 0.3 °C at 25 °C
PAR Sensor (External)	Cosine corrected Response: 400 - 700 nm Range: 0 - 3000 µmol m^{-2} s^{-1} Accuracy: 10 µmol m^{-2} s^{-1}
Dimensions	30 cm L x 3 cm (Handle Diameter)
Weight	0.7 kg

Light Unit (Optional)

Type	Low-power LED light unit (White LEDs) easily mounts to the PLC5 Broad Leaf Cuvette.
Control Range	0 - 2500 µmol m^{-2} s^{-1}
Dimensions	6 cm (L) x 6 cm (H) x 5 cm (W)
Weight	0.1 kg

Customer Support

- **Direct U.S. and Factory Trained Technical Support:** All customers receive direct technical support from our U.S. headquarters as well as through our extensive network of factory trained distributors.
- **Personalized Attention:** As a small company, we are able to offer our customers the individual attention that they deserve. If you have an instrument in need of repair, please contact our service manager.
- **Customization:** We are often able to customize hardware or software to meet specific user requirements.
- **Development and Production Services:** We offer the use of our facilities for the development and production of equipment. If you have an idea for an instrument, we can assist you in its realization.
- **Guarantee:** All equipment manufactured by PP Systems is guaranteed for 12 months from the date of invoice against manufacturing faults and defective materials/components, parts and labor included. This guarantee does not cover misuse or damage caused due to unauthorized repair. We reserve the right to charge for customs clearance and return shipping/insurance if appropriate. For repairs beyond the warranty period, please contact us directly for advice.

Your Research Partner For Over 40 Years

Since 1984, PP Systems has been supplying quality, rugged and reliable instrumentation to customers throughout the world for high level research. *We are a world leader in the design and manufacture of instrumentation for measurement of photosynthesis, soil respiration, chlorophyll fluorescence, and CO_2/H_2O gas analysis. 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 multiple scientific publications.*

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