Biospherical Instruments Inc.

Optical Instruments
for Environmental
Monitoring

QCP-2000, Cosine PAR Sensors

Measuring Downwelling Irradiance over PAR(400-700nm)

Cosine PAR sensors in our new QCP-2000 series, feature a newly-designed pressure housing and an improved cosine collector design. The standard sensor is rated to 2,000meters. However, by addition of a high-pressure connector, these instruments may be deployed to depths of 10,000m. As with our other "Q-Series" sensors, the QCP utilizes a filtered silicon photodetector that has a flat quantum response over PAR (Photosynthetically Active Radiation; 400 – 700 nm).

The most noteworthy improvement in this new series is the capability of direct connection to a PC or laptop computer. Our **QCP-2100** sensors contain imbedded calibration information and data are transmitted directly into the computer. This new low-power circuitry requires no batteries, relying instead upon power from the host computer's serial comport. Using the provided Windows-based data-acquisition software, these **QCP-2100** may operate at distances of 200 meters from the host PC or laptop computer. Our new **QCP-2150** sensor output's an ASCII data stream, upon power-up.

QCP-2200 linear output models, feature high-quality, low-drift, electrometer-grade amplifiers and are are compatible with most commercially available 16-bit dataloggers.

QCP-2300, a logarithmic output version is also available. This sensor was designed specifically for integration with 12-bit CTD systems and dataloggers requiring a limited-range of signal input.

The QCP sensors are rugged and compact.

Key Features

- *Compact, rugged, and low-cost*
- *1.1 cm diameter acrylic cosine collector*
- *Designed to measure downwelling PAR (400-700 nm) irradiance to depths of 10,000 meters*
- *QCP-2100 includes operating software allowing direct connection to a Windows PC or laptop computer*

Specifications

Optical Features

Cosine Irradiance Collector: 1.1 cm diameter solid acrylic collector / diffuser.

Photodetector: Blue-enhanced, high-stability silicon detector with dichroic blocking filters.

PAR Spectral Response: Equal (better than ±10%) quantum response from 400 nm to 700 nm with response sharply attenuated above 700 nm and below 400 nm. Spectral response-induced errors will cause less than 5% errors in naturally occurring light fields.

Cosine Directional Response: ±0 to 65°, ±7%, ±65 to 86°, ±10%

Sensitivity: When purchased alone, the sensor is calibrated in quanta/(cm^2·sec))/volt. Nominal sensitivity is 1 volt = $1x10^{17}$ quanta/(cm^2·sec) (slightly less than full sunlight). Noise level is typically less than 1 millivolt, temperature coefficient of the dark signal is less than 10 microvolts/°C, and response temperature coefficient is less than 0.15%/°C.

Electronic Features

Measured Signals:
PAR Dynamic Range: $1.4x10^{-5}$ µE/(cm^2·sec) to 0.5 µE/(cm^2·sec)

Mechanical Features

Dimensions:
Diameter: 5 cm
Height: 19.0cm
Weight: 1.1 kg

Housing Materials:
Collector:
Machined Acrylic
Housing:
Hard anodized aluminum

Environmental

Temperature Range: -2°C to 35°C

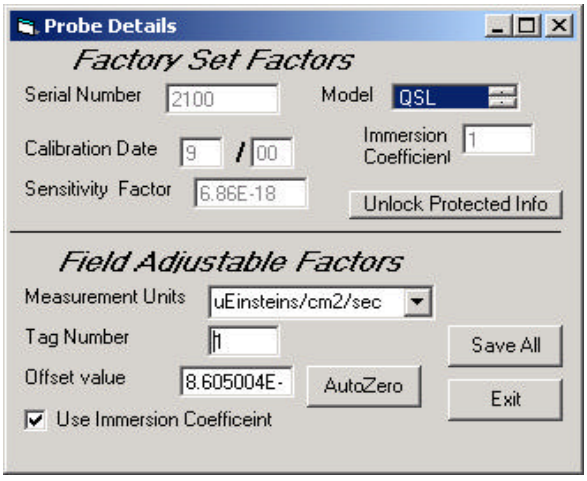
Calibration

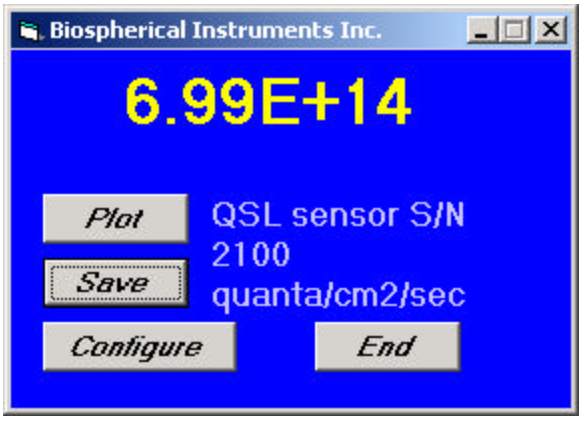
The QCP-2000 sensors are calibrated using a National Institute of Standards and Technology- (NIST) traceable 1000-watt type FEL Standard of Spectral Irradiance using procedures recommended by NIST. Annual recalibration is strongly recommended.

Software

LOGGER-2100 data-acquisition software is included with each QCP-2100 sensor. LOGGER-2100 is compatible with most Microsoft Windows® platforms, including Windows 98, 2000, NT, ME and XP. Data are in a digital format and transfered to the PC or laptop at 9600 baud. The user may configure this software to display in Quanta or MicroEinsteins.

Fully calibrated with lamps traceable to NIST, each digital sensor contains imbedded calibration factors.





BSI's new operating software, LOGGER-2100 logs and displays calibrated data in either Quanta or µEinsteins .

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**Specifications subject to change without notice*