USB Smart Quantum Sensor | SQ-420

The versatile SQ-420 can be used two ways- it can be connected directly to a computer for real time measurements and data logging, or it can be connected to a standard USB power source and act as a stand-alone datalogger.

Internal Data Storage

The sensor has internal data storage capability with the ability to hold up to 10,000 measurements. This allows the sensor to collect data while connected to a stand-alone 5 V DC power supply such as a USB wall adapter.

No Datalogger Required

The sensor can be connected to a desktop, laptop, or tablet computer via a USB 2.0 type A plug to be used with the Apogee software. The included Apogee software gives the user control of data logging and calibration settings, provides a real time output display and graph of PPFD measurements, and allows the data set to be saved as a csv file.

Independent Calibration

The SQ-420 is calibrated independently for sunlight and electric light to improve measurement accuracy. The light source calibration can be selected in the settings menu of the Apogee software.

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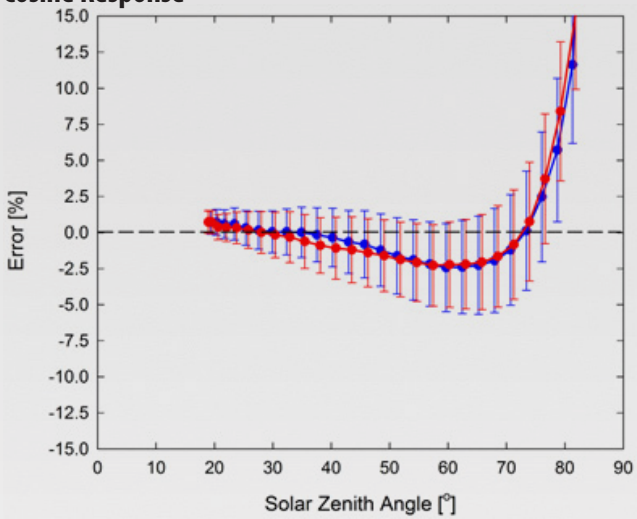
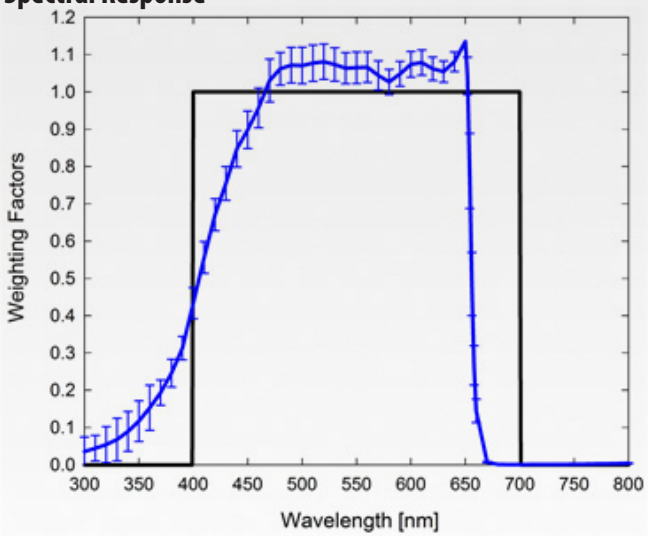
apogee INSTRUMENTS
Logan, UT

Cosine Response



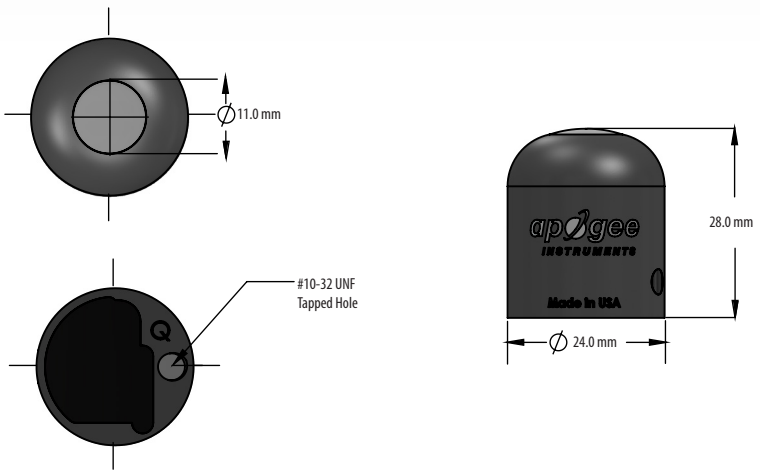
Mean cosine response of twenty-three replicate sensors (**error bars represent two standard deviations above and below mean**). Cosine response measurements were made by direct side-by-side comparison to the mean of four reference thermopile pyranometers, with solar zenith angle-dependent factors applied to convert total shortwave radiation to PPFD. Blue points represent the AM response and red points represent the PM response.

Spectral Response



Mean spectral response of six sensors (**error bars represent two standard deviations above and below mean**) compared to PAR (PPFD) weighting function. Spectral response measurements were made at 10 nm increments across a wavelength range of 300 to 800 nm in a monochromator with an attached electric light source. Measured spectral data from each quantum sensor were normalized by the measured spectral response of the monochromator/electric light combination, which was measured with a spectroradiometer.

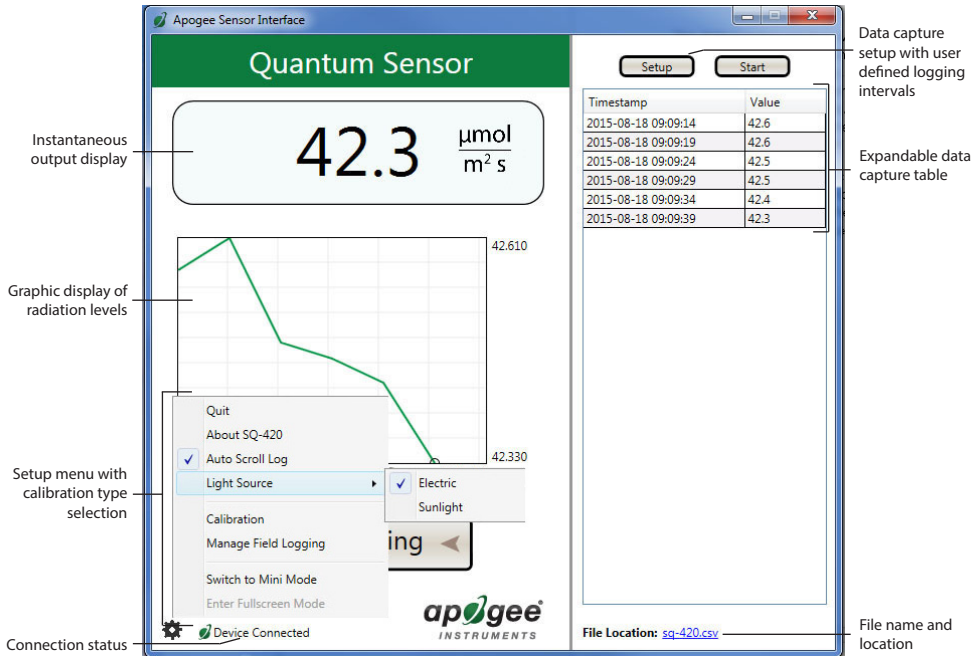
Dimensions



Calibration Traceability

Apogee Instruments SQ series quantum sensors are calibrated through side-by-side comparison to the mean of four Apogee model SQ-110 or SQ-120 transfer standard quantum sensors under high output T5 cool white fluorescent lamps. The transfer standard quantum sensors are calibrated through side-by-side comparison to the mean of at least three LI-COR model LI-190 reference quantum sensors under high output T5 cool white fluorescent lamps. The reference quantum sensors are recalibrated every six months with a LI-COR model 1800-02 Optical Radiation calibrator using a 200 W quartz halogen lamp. The 1800-02 and quartz halogen lamp are traceable to the National Institute of Standards and Technology (NIST).

Software Overview



SQ-420

Resolution	0.1 µmol m^{-2} s^{-1}
Calibration Factor	custom for each sensor and stored in the firmware
Calibration Uncertainty	± 5 %
Measurement Repeatability	less than 1 %
Long-term Drift (Non-stability)	less than 2 % per year
Non-linearity	less than 1 % (up to 3000 µmol m^{-2} s^{-1})
Response Time	software updates every second
Field of View	180°
Spectral Range	410 to 655 nm (wavelengths where response is greater than 50 % of maximum)
Directional (Cosine) Response	± 5 % at 75° zenith angle
Temperature Response	0.06 ± 0.06 % per C
Operating Environment	-40 to 70 C; 0 to 100 % relative humidity; can be submerged in water up to depths of 30 m
Dimensions	24 mm diameter; 28 mm height
Mass	90 g (with 5 m of lead wire)
USB Cable	4.6 m (15 ft)
Current Draw (when Logging)	5.1 mA
Warranty	4 years against defects in materials and workmanship