Measure photon flux density (PFD) beyond the standard range of 400-700 nm (PAR)



apogee® INSTRUMENTS

QUANTUM LIGHT POLLUTION SENSOR | SQ-640 Series

Features

Multiple Output Options
- Attached to a hand-held meter
- Analog, 4 to 20 mA, or SDI-12 output

Accurate, Stable Measurements
Cosine-corrected with directional errors less than ± 5 % at a solar zenith angle of 75°. Long-term non-stability less than 2 % per year.

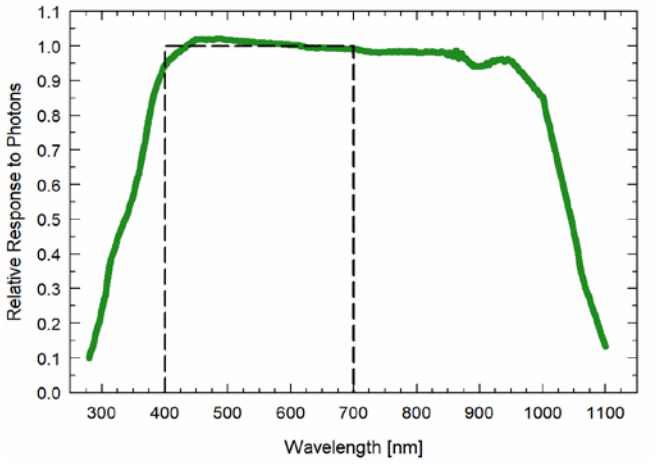
Unique Design
Many plants are affected by interruptions in dark periods even by extremely dim light. Apogee's new Quantum Light Pollution Sensor is designed to detect photons from 340-1040 nm that are below the sensitivity level of a typical quantum sensor. Detecting stray photons that disrupt the night is critical in preventing negative effects in plants such as plant hermaphrodism and stunted growth. Since the detector on the Quantum Light Pollution sensor is sensitive to radiation with wavelengths up to 1100 nm, beyond the range of wavelengths that influence plants, **we recommend using Quantum Light Pollution sensors in indoor grow environments utilizing LED lights**. The patented, dome-shaped aluminum head is cosine-corrected, self-cleaning, and fully-potted for a waterproof design.

Typical PFD Measurement Applications
- Incoming PFD measurements over plant canopies in indoor greenhouses or in growth chambers, and reflected or under-canopy (transmitted) PFD measurements in the same environments
- This particular sensors should only be used for photon flux density measurements under LEDs

SQ-647



Spectral Response

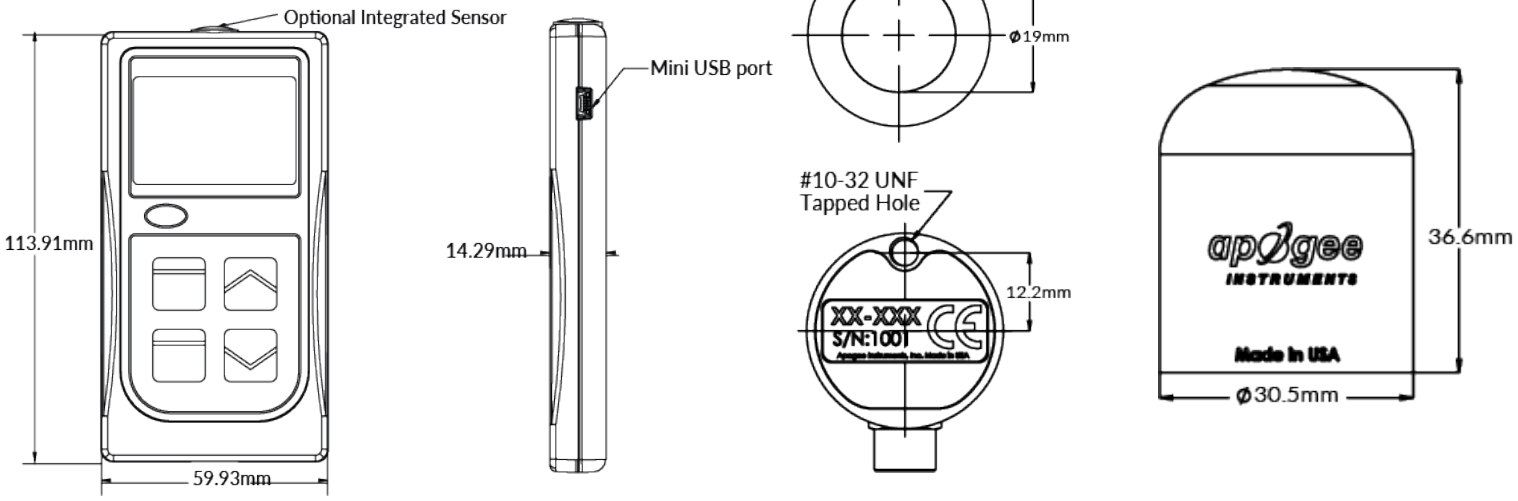


Mean spectral response measurements of six replicate Apogee SQ-600 series Quantum Light Pollution Sensors. Spectral response measurements were made at 10 nm increments across a wavelength range of 300 to 1100 nm in a monochromator with an attached electric light source. Measured spectral data from each quantum sensor were normalized by the measured spectral response of the monochromator/electric light combination, which was measured with a spectroradiometer

Calibration Traceability

Apogee Instruments SQ-600 series quantum sensors are calibrated through side-by-side comparison to the mean of four transfer standard quantum sensors under a reference lamp. The transfer standard quantum sensors are recalibrated with a quartz halogen lamp traceable to the National Institute of Standards and Technology (NIST).

Dimensions



Product Specifications

	SQ-640-SS	SQ-644-SS	SQ-647 (SDI-12)
Power Supply	Self-powered	12 to 24 V DC	5.5 to 24 V DC
Current Draw	—	Maximum of 20 mA	1.4 mA (quiescent), 1.8 mA (active)
Sensitivity	1 mV per µmol m^{-2} s^{-1}	0.08 mA per µmol m^{-2} s^{-1}	—
Calibration Factor	1 µmol m^{-2} s^{-1} per mV	12.5 µmol m^{-2} s^{-1} per mA	Custom for each sensor and stored in the firmware
Calibration Uncertainty	± 5 %		
Measurement Range	0 to 200 µmol m^{-2} s^{-1}		
Measurement Repeatability	Less than 0.5 %		
Calibrated Output Range	0 to 200 mV		
Long-term Drift	Less than 2 % per year		
Non-linearity	Less than 1 % (up to 4000 µmol m^{-2} s^{-1})		
Response Time	Less than 1 ms		
Field of View	180°		
Spectral Range	340 to 1040 nm ± 5 nm (wavelengths where response is greater than 50 % of maximum)		
Directional (Cosine) Response	± 2 % at 45° zenith angle, ± 5 % at 75° zenith angle (see Directional Response below)		
Temperature Response	-0.11 ± 0.04 % 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	30.5 mm diameter, 37 mm height		
Mass (with 5 m of cable)	140 g		
Cable	5 m of two conductor, shielded, twisted-pair wire; TPR jacket; pigtail lead wires; stainless steel (316), M8 connector		
Warranty	4 years against defects in materials and workmanship		