

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



## QUANTUM LIGHT POLLUTION SENSOR | SQ-640

### Features

#### Multiple Output Options

- As a separate sensor
- Attached to a hand-held meter

#### Accurate, Stable Measurements

Cosine-corrected with directional errors less than  $\pm 5\%$  at a solar zenith angle of  $75^\circ$ . Long-term non-stability less than  $2\%$  per year.

#### Unique Design

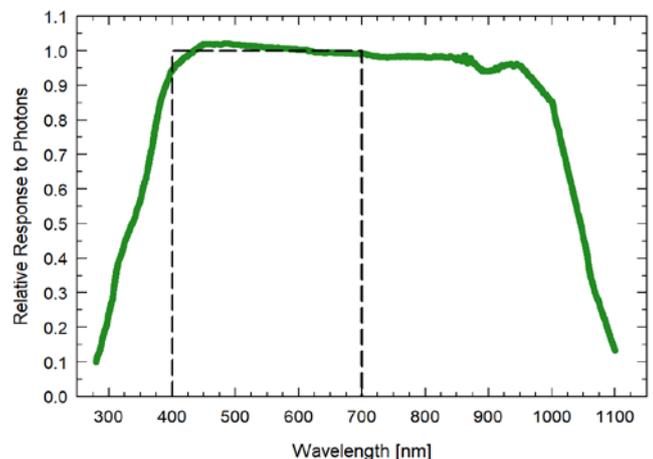
Many plants are affected by interruptions in dark periods even by extremely dim light. Apogee's new Quantum Light Pollution Sensor is designed to detect photons from 340-1040 nm that are below the sensitivity level of a typical quantum sensor. Detecting stray photons that disrupt the night, even those from IR security camera lights, is critical in preventing negative effects in plants such as plant hermaphroditism 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



#### Spectral Response

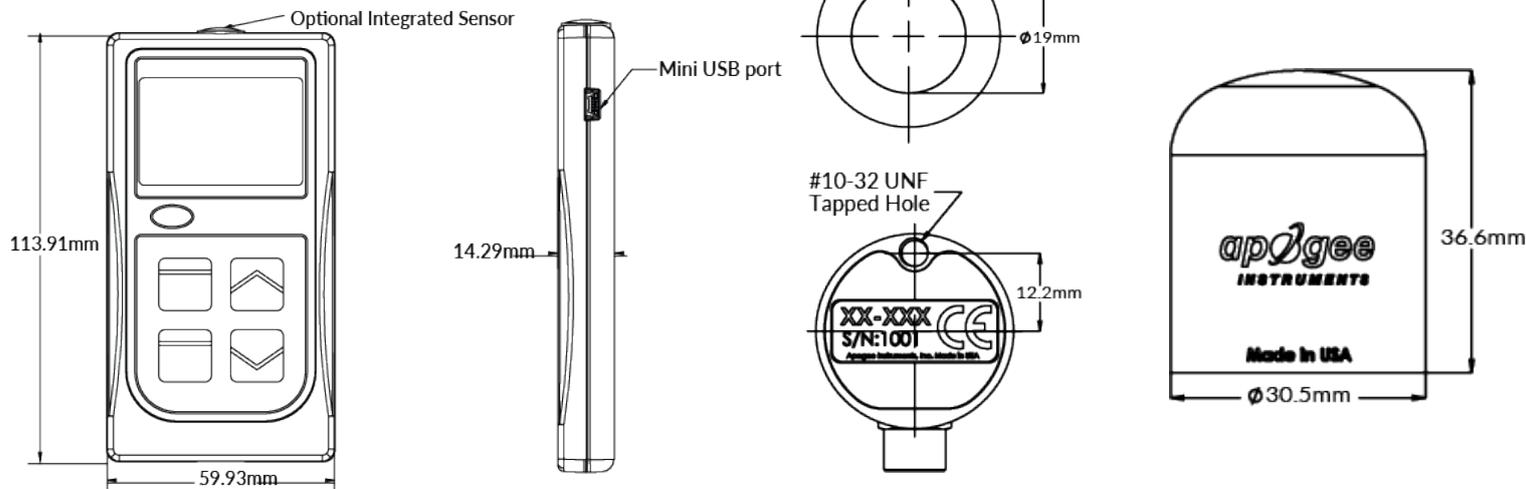


Mean spectral response measurements of six replicate Apogee SQ-600 series Quantum Light Pollution Sensors. Spectral response measurements were made at 10 nm increments across a wavelength range of 300 to 1100 nm in a monochromator with an attached electric light source. Measured spectral data from each 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
Power Supply	Self-powered
Sensitivity	1 mV per $\mu\text{mol m}^{-2} \text{s}^{-1}$
Calibration Factor	1 $\mu\text{mol m}^{-2} \text{s}^{-1}$ per mV
Calibration Uncertainty	$\pm 5 \%$
Measurement Range	0 to 200 $\mu\text{mol m}^{-2} \text{s}^{-1}$
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 $\mu\text{mol m}^{-2} \text{s}^{-1}$ )
Response Time	Less than 1 ms
Field of View	180°
Spectral Range	340 to 1040 nm $\pm 5$ nm (wavelengths where response is greater than 50 % of maximum)
Directional (Cosine) Response	$\pm 2 \%$ at 45° zenith angle, $\pm 5 \%$ at 75° zenith angle
Temperature Response	$-0.11 \pm 0.04 \%$ per C
Operating Environment	0 to 50 C; less than 90 % non-condensing relative humidity up to 30 C; less than 70 % non-condensing relative humidity from 30 to 50 C; separate sensors can be submerged in water up to depths of 30 m
Meter Dimensions	113.9 mm height, 59.9 mm width
Sensor Dimensions	30.5 mm diameter, 37 mm height
Mass	140 g (with 5 m of lead wire)
Cable	5 m of two conductor, shielded, twisted-pair wire; TPR jacket; pigtail lead wires; stainless steel (316), M8 connector located 25 cm from sensor head
Warranty	4 years against defects in materials and workmanship