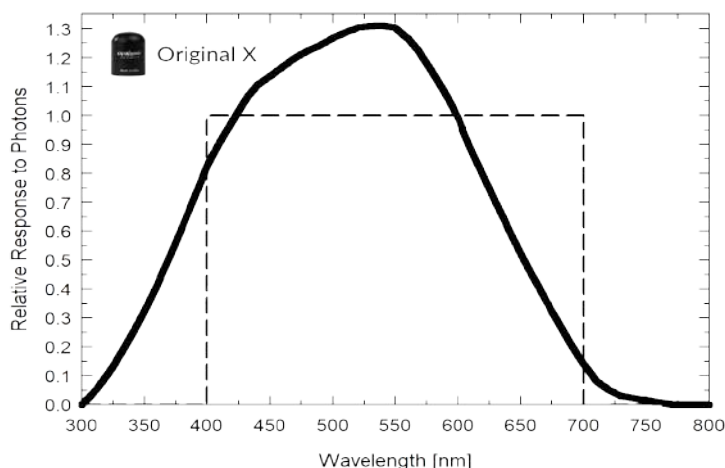




Response Graph



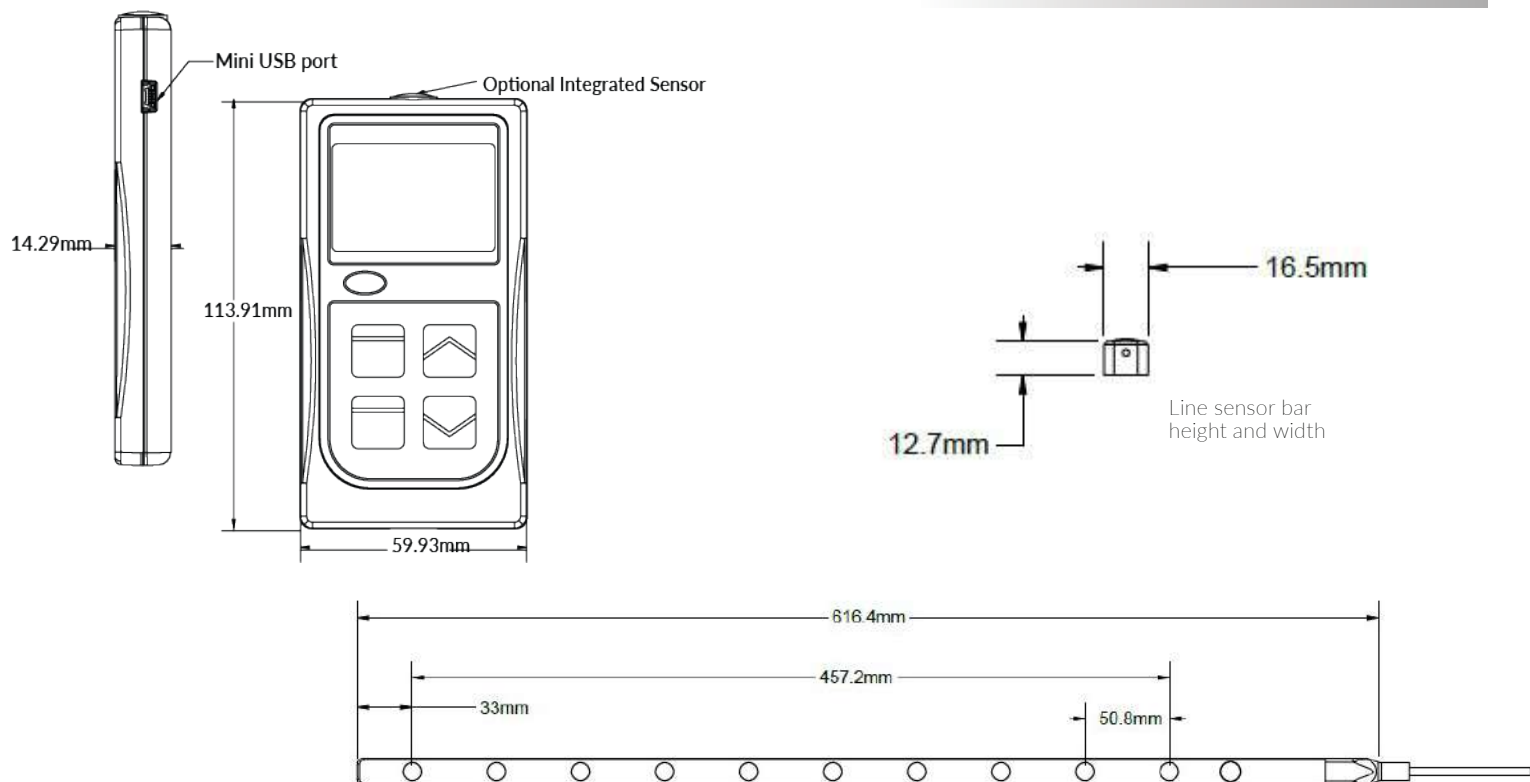
Mean **spectral response** of six SQ X series quantum sensors compared to defined PAR 400-700 nm (dotted line).

Apogee Line Quantums

Apogee line quantum sensors measure a spatial average of photosynthetically active radiation. The MQ-301X has a separate sensor bar with 10 sensors, while the handheld meter displays and stores measurements. The sensor housing design features an integrated bubble level and is fully potted, making the sensor water- and weatherproof.

Product Specifications

	MQ-301X	SQ-301X
Sensitivity	-	0.1 mV per $\mu\text{mol m}^{-2} \text{s}^{-1}$
Calibrated Output Range	-	0 to 250 mV
Calibration Uncertainty	$\pm 5 \%$	
Measurement Repeatability	Less than 0.5 %	
Long-term Drift (Non-stability)	Less than 2 % per year	
Non-linearity	Less than 1 % (up to $2500 \mu\text{mol m}^{-2} \text{s}^{-1}$)	
Response Time	Less than 1 ms	
Field of View	180°	
Spectral Range	370 to 650 nm (wavelengths where response is greater than 50 % of maximum)	
Directional (Cosine) Response	$\pm 5 \%$ at 75° angle	
Temperature Response	-0.04 % per C	
Operating Environment	-10 to 60 C; 0 to 100 % relative humidity; sensor can be submerged in water up to depths of 30 m	
Meter Dimensions	113.9 mm height, 59.9 mm width	-
Sensor Dimensions	616.4 mm length, 13.6 mm height, 16.5 mm width	
Mass	460 g	310 g
Cable	2 m of shielded, twisted-pair wire; additional cable available; TPR jacket (high water resistance, high UV stability, flexibility in cold conditions)	5 m of two conductor, shielded, twisted-pair wire; TPR jacket; pigtail lead wires; stainless steel, M8 connector located 25 cm from sensor head
Warranty	4 years against defects in materials and workmanship	



Features

TYPICAL APPLICATIONS

- Incoming and reflected PPFD over and under plant canopies in greenhouses, in fields, and in growth chambers

UNIQUE DESIGN

Cost-effective, original quantum X sensors work well for sunlight and some broadband radiation sources. The sensor housing design features an integrated bubble level and is fully potted, making the sensor water- and weatherproof.

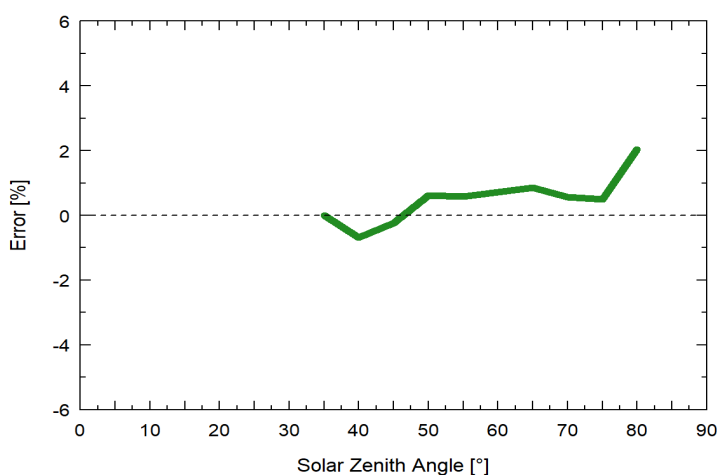
ACCURATE, STABLE MEASUREMENTS

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



CALIBRATION TRACEABILITY

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



Mean cosine response of twenty-three SQ X series quantum sensors.