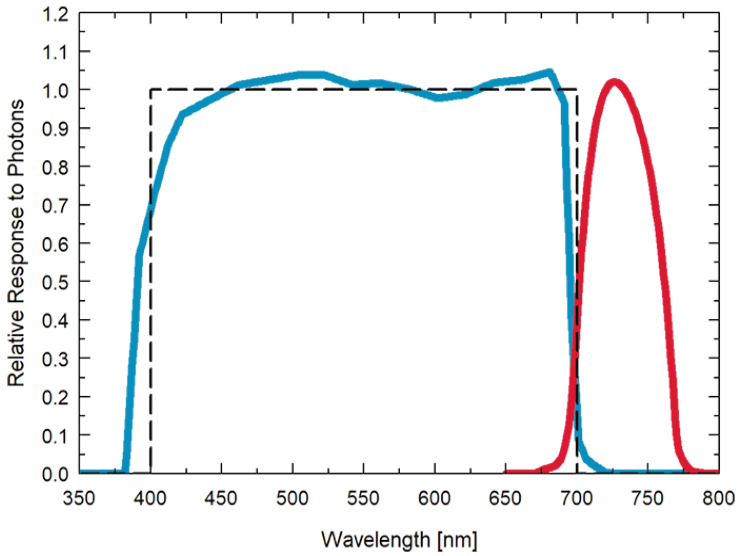
PAR-FAR SENSORS

S2-141-SS, S2-441-SS, & S2-442-SS

Spectral Response



Spectral response of PAR detector (blue) and Far-red detector (red) compared to defined response of plants to radiation (dashed).

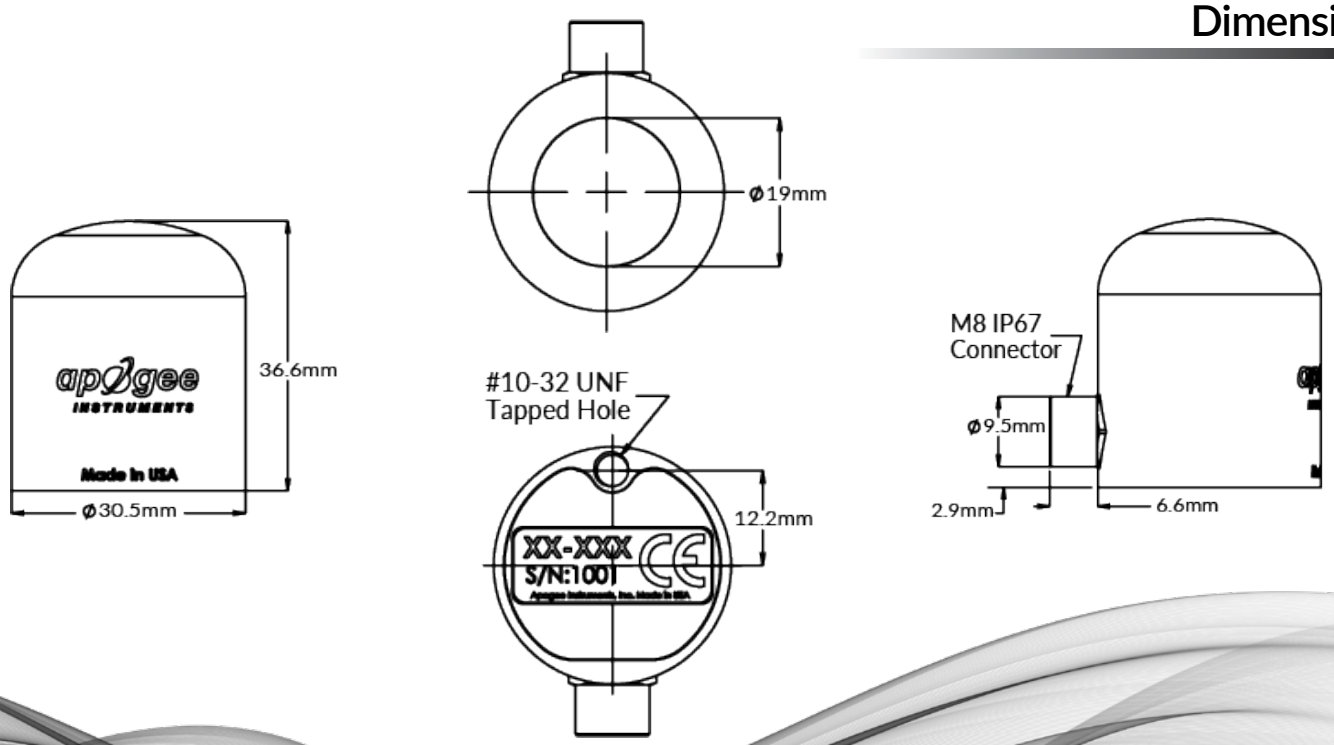
Product Specifications

	S2-141-SS	S2-441-SS	S2-442-SS
Power Supply	Self-powered	5.5 to 24 V DC	
Current Draw	–	1.4 mA (quiescent), 1.8 mA (active)	RS-232 quiescent 36.87 mA, active 37.06 mA; RS-485 quiescent 37.37 mA, active 42.30 mA
Output (sensitivity)	0.01 mV per µmol m^{-2} s^{-1} (PAR) 0.02 mV per µmol m^{-2} s^{-1} (Far-red)	–	
Calibration Factor (reciprocal of sensitivity)	~ 100 µmol m^{-2} s^{-1} per mV (PAR) ~ 50 µmol m^{-2} s^{-1} per mV (Far-red)	Custom for each sensor and stored in firmware	
Calibration Uncertainty	± 5 %		
Output Range	0 to 40 mV (PAR) 0 to 20 mV (Far-red)	SDI-12	Modbus
Measurement Repeatability	Less than 1 %		
Long-term Drift	Less than 2 % per year		
Non-linearity	Less than 1 % (up to 4000 µmol m^{-2} s^{-1}) (PAR) Less than 1 % (up to 1000 µmol m^{-2} s^{-1}) (Far-red)		
Response Time	Less than 1 ms	Less than 0.6 s	–
Field of View	180°		
Spectral Ranges (see graph)	389 to 692 nm ± 5 nm (PAR) 702 to 761 nm ± 5 nm (Far-red)		
Directional (Cosine) Response	± 2 % at 45°; ± 5 % at 75° zenith angle		
Temperature Response	Less than 0.1 % per C		
Housing	Anodized aluminum body with acrylic diffuser		
IP Rating	IP68		
Operating Environment	-40 to 70 C; 0 to 100 % relative humidity		
Dimensions	30.5 mm diameter, 37 mm height		
Mass (with 5 m of cable)	140 g		
Warranty	4 years against defects in materials and workmanship		

Overview

The new Apogee PAR-FAR sensor is a research-grade tool for measuring both the traditional PPFD photosynthetic photon flux and separately quantifying the photon flux of far-red photons (700-760 nm). The outputs include the traditional quantum flux, the far-red photon flux, and the far-red fraction (far-red photon flux density / sum of PPFD and far-red photon flux density). This sensor quantifies far-red photons, and for many applications it reduces the need for a more complex measurement with a spectroradiometer.

Dimensions



Features

TYPICAL APPLICATIONS

- Monitoring plant light environments
- Research plant morphogenic activity
- Photobiology studies

KEY FEATURES

Digital SDI-12 output is standard with analog and Modbus options available. A domed diffuser promotes self-cleaning to minimize errors from dust and debris.

HIGH QUALITY CABLE

Pigtail-lead sensors feature on IP68, marine-grade stainless-steel cable connectors attached directly to the sensor head to simplify sensor removal for maintenance and recalibration.