

## PRI SENSORS

S2-121-SS & S2-122-SS Analog  
S2-421-SS & S2-422-SS SDI-12

### Overview

Apogee's PRI sensors combine two photodetectors that measure specific wavelength ranges. The sensors are designed to continuously measure reflectance for calculation of photochemical reflectance index (PRI) of plant canopies. PRI is related to canopy light use efficiency and is often used in studies of canopy light use efficiency and response to stress.

### Wavelength Ranges

PRI

- Green detector = 532 nm with 10 nm full-width half-maximum
- Yellow detector = 570 nm with 10 nm full-width half-maximum

$$PRI = \frac{\rho_{Green} - \rho_{Yellow}}{\rho_{Green} + \rho_{Yellow}}$$

Where  $\rho$  = reflectance (%)

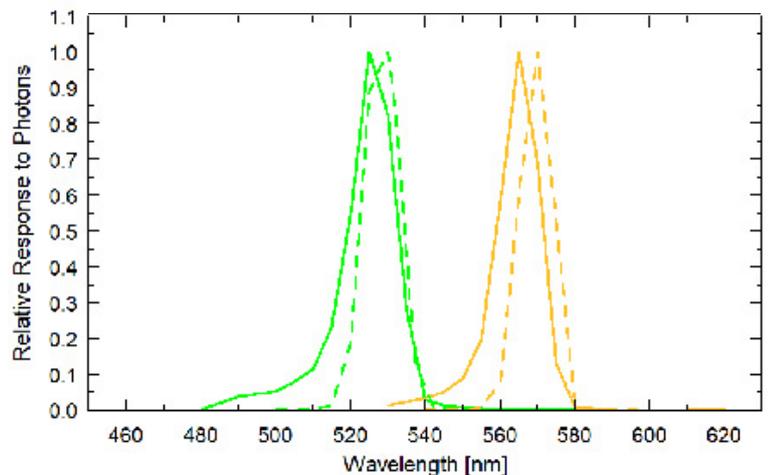


Upward-Looking  
S2-121-SS & S2-421-SS



Downward-Looking  
S2-122-SS & S2-422-SS

### Spectral Response



— S2-421: Upward-facing green      — S2-421: Upward-facing yellow  
- - S2-422: Downward-facing green      - - S2-422: Downward-facing yellow

PRI sensors have peak sensitivity at 532 nm (Green) and 570 nm (Yellow) with 10 nm full-width half-maximum. The spectral responses can be seen in the graph above.

# Product Specifications

		Analog Output		Digital Output	
		S2-121-SS (Upward-Looking)	S2-122-SS (Downward-Looking)	S2-421-SS (Upward-Looking)	S2-422-SS (Downward-Looking)
Power Supply	Self-powered			5.5 to 24 V DC	
Output (sensitivity)	1.43 mV per W m <sup>-2</sup> nm <sup>-1</sup> (Green and Yellow)	14.3 mV per W m <sup>-2</sup> nm <sup>-1</sup> sr <sup>-1</sup> (Green and Yellow)	—		
Calibration Factor (reciprocal of sensitivity)	0.7 W m <sup>-2</sup> nm <sup>-1</sup> per mV (Green and Yellow)	0.07 W m <sup>-2</sup> nm <sup>-1</sup> sr <sup>-1</sup> per mV (Green and Yellow)	Custom for each sensor and stored in firmware		
Calibration Uncertainty	± 10 %				
Output Range	5 mV (Green) 5 mV (Yellow)	10 mV (Green) 10 mV (Yellow)	SDI-12		
Wavelength Ranges	Green detector = 532 nm with 10 FWHM* Yellow detector = 570 nm with 10 nm FWHM*				
Measurement Range	2x full sunlight				
Measurement Repeatability	Less than 1 %				
Long-term Drift	Less than 2 % per year				
Response Time	Less than 1 ms			Less than 0.6 s	
Field of View	180°	40°	180°	40°	
Directional (Cosine) Response	± 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	23.5 mm diameter, 40 mm height	30.5 mm diameter, 37 mm height	23.5 mm diameter, 40 mm height	
Mass (with 5 m of cable)	140 g	110 g	140 g	110 g	
Warranty	4 years against defects in materials and workmanship				

\*FWHM = full-width half-maximum

## Features

### KEY FEATURES

Digital SDI-12 output is standard with analog options available by request. Domed diffuser promotes self-cleaning to minimize errors from dust and debris.

### HIGH QUALITY CABLE

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

### FOR BEST MEASUREMENTS

For best results, we recommend pairing upward-looking sensor(s) with downward-looking sensor(s).

