

Solar Light's **Model PMA1132 Analog Quantum Light (PAR) Sensor** measures the photon flux in wavelength range from 400 to 700 nm. There is a proportional relationship between the number of photons absorbed in 400 to 700 nm band and the rate of photosynthesis in plants. The energy of a photon is proportional to its frequency, and therefore inversely proportional to wavelength. In order to produce a signal proportional to the photon flux (number of photons per unit of area per second,) the sensor's spectral power response (Amps/[W/cm<sup>2</sup>]) must be inversely proportional to the photon's frequency and thus proportional to wavelength. Traditionally the quantum flux is measured in micro-moles (micro-Einsteins)/s/m<sup>2</sup>. The conversion factor is:

$$1 [\mu\text{E/s/m}^2] = 1 [\mu\text{mole/s/m}^2] = 6.02 \times 10^{17} [\text{quanta/s/m}^2]$$

The angular response of the PMA1132 sensor is cosine corrected, and suitable for measurements of diffuse radiation or radiation from extended sources. Several packages are available for different types of environments, including standard, low profile, weatherproof, waterproof, and high volume / OEM chassis.



### Applications

- Agriculture
- Photobiology
- Meteorology and Climatology
- Environmental Monitoring
- Educational

### Features and Benefits

- High Sensitivity
- Excellent Long-Term Stability
- Cosine Corrected
- NIST Traceable Calibration





**Standard Chassis - IP60**  
1.8" (45.8mm) High x 1.6" (40.6mm) Diameter



**Weatherproof Standard Chassis - IP68**  
Can be submersed up to 3 meters deep  
1.8" (45.8mm) High x 1.6" (40.6mm) Diameter



**Waterproof Underwater Housing - IP68**  
Can be submersed up to 100 meters deep  
3.3" (83.4 mm) High x 4.7" (119.7 mm) Diameter

### Options:

- Tripod Mounting Plate
- Weatherproof Chassis (submersible up to 3 meters)
- Waterproof Underwater Housing (submersible up to 100 meters)
- Digital Model for Interface with PMA Series Meters (Model PMA2132)

SPECIFICATIONS	
<b>Spectral Response</b>	Quantum Response (400-700nm), Figure 1
<b>Cosine Response</b>	±5% for Angles <40° (Standard Chassis)
<b>Output Signal/Range</b>	*See model chart on the next page
<b>Input Power</b>	*See model chart on the next page
<b>Operating Environment</b>	32 to 120°F (0 to +50°C)
<b>Temperature Coefficient</b>	Negligible
<b>Cable Length</b>	*See model chart on the next page
<b>Dimensions and Weight</b>	*See outline drawings

Part Number: 210039

Revision Level: C

Specifications subject to change without notice.

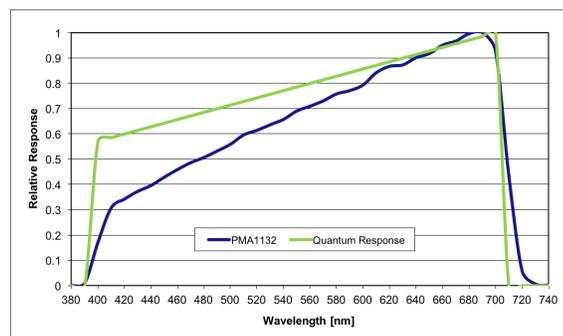


Fig. 1. Linear Spectral Response

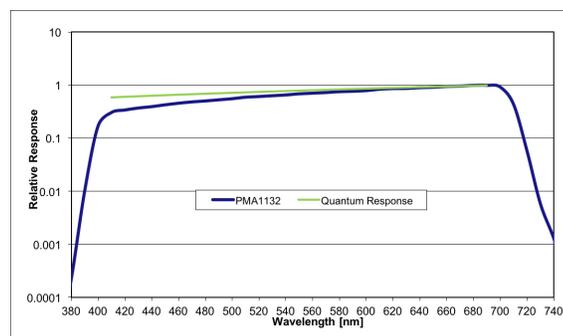


Fig. 2. Log Spectral Response

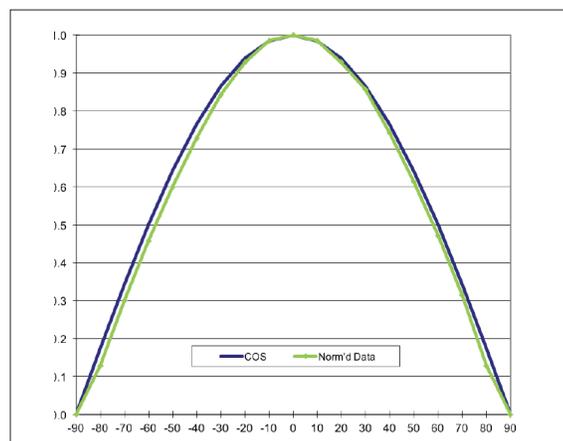


Fig. 3. Cosine Response

### Partial Model Selection Chart



STANDARD CHASSIS - IP60				
Model	Input Power	Output Signal	Range	Cable Type
PMA1132-S-05-2500	9-24 VDC @ 30 mA	0-5 VDC	2,500 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 540 [ $\text{W}/\text{m}^2$ ]	Pigtail w/ 2 meter detachable cable
PMA1132-S-420-2400	9-24 VDC @ 70 mA	4-20 mA	2,400 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 520 [ $\text{W}/\text{m}^2$ ]	Pigtail w/ 2 meter detachable cable
PMA1132	$\pm 5$ -12 VDC @ <1 mA	*0-5 VDC	20,000 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 4,300 [ $\text{W}/\text{m}^2$ ]	6' cable stripped/tinned



WEATHERPROOF CHASSIS - IP68				
Model	Input Power	Output Signal	Range	Cable Type
PMA1132-WP-05-2500	9-24 VDC @ 30 mA	0-5 VDC	2,500 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 540 [ $\text{W}/\text{m}^2$ ]	Pigtail w/ 2 meter detachable cable
PMA1132-WP-420-2400	9-24 VDC @ 70 mA	4-20 mA	2,400 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 520 [ $\text{W}/\text{m}^2$ ]	Pigtail w/ 2 meter detachable cable
PMA1132-WP	$\pm 5$ -12 VDC @ <1 mA	*0-5 VDC	20,000 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 4,300 [ $\text{W}/\text{m}^2$ ]	15' cable stripped/tinned

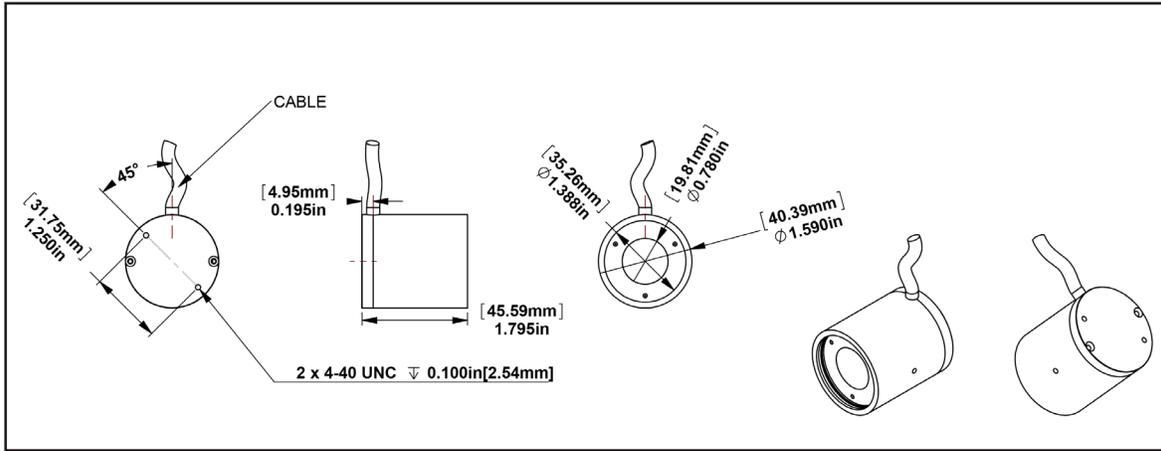


WATERPROOF UNDERWATER CHASSIS - IP68				
Model	Input Power	Output Signal	Range	Cable Type
PMA1132-UW	$\pm 5$ -12 VDC @ <1 mA	*0-5 VDC	20,000 [ $\mu\text{E}/(\text{m}^2\text{s})$ ] or 4,300 [ $\text{W}/\text{m}^2$ ]	Customer to define length required

\*0 to Supply -0.5 Volts

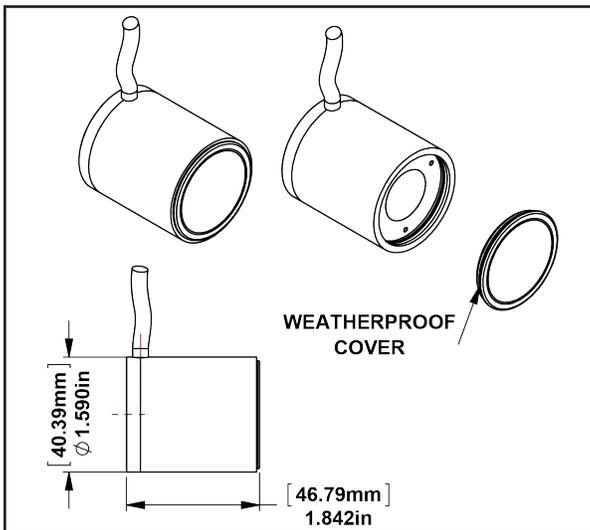
Custom ranges, cable lengths, and cable types are available upon request – please consult factory for details

## Standard Chassis



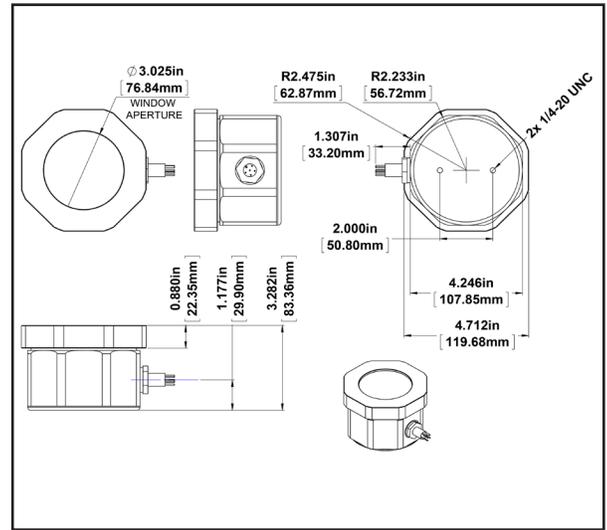
Est. Weight: 4 oz. (113 g)

## Weatherproof Chassis



Est. Weight: 4.2 oz. (119 g)

## Waterproof Underwater Housing



Est. Weight: 3.7 lbs. (1678 g)

## Analog Wiring Chart

WIRE COLOR	PMA11xx-420	PMA11xx-05	PMA11xx
White	Power Ground*	Signal Out 0-5 VDC	Signal Out 0 to Vin-0.5 VDC
Blue		Power Ground	Power Ground
Green			Analog Ground
Red			Vin +5-12 VDC
Orange			Vin -5-12 VDC
Yellow			Signal Out 0 to Vin-0.5 VDC
Black		Analog Ground	
Pink		Vin 9-24 VDC	
Brown	Vin 9-24 VDC*		
Bare or Braid		Shield	Shield
A/C Plug			

\*Current meter is connected in series with power supply and sensor

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