

Sensors • Global Radiometer

PMA2140



Measures the Power of
Incident Radiation from
400 to 1100nm

Applications

- Meteorology
- Agriculture
- Solar Power Research and Testing
- Heating and Air Conditioning
- Lighting
- Physics and Optical Laboratories

Features and Benefits

- Wide Spectral Range
- Excellent Long-Term Stability
- Cosine Corrected
- NIST Traceable Calibration
- High Sensitivity
- Low Cost

The PMA2140 global radiometer is suitable for irradiance measurements within the range of 400 to 1100nm, especially in these cost-sensitive applications where the flat spectral response of thermopile based instruments is not needed.

The PMA2140 can be used to monitor the global solar irradiance (direct + diffuse). It is factory calibrated to read accurately the global solar irradiance (from 300 to 2800nm) if exposed to the standard sun, even though the detector is not sensitive beyond 1100nm. This is achieved by applying a correction factor during calibration (see the calibration section). The radiant power within the range of 400-1100nm constitutes about 75% of the total solar radiation for an overhead sun under clear sky.

High sensitivity permits measurements of weak sources but caution is advised when measuring artificial sources since the spectral distribution of the source's irradiance will affect the reading. A correction factor can be calculated to take the spectral distribution into account.

The detector is equipped with a cosine diffuser that assures an angular response within 5% of the cosine function for incident angles below 60 degrees. It makes it suitable for measurements of diffuse radiation and radiation from extended sources.

Calibration

The PMA2140 is factory-calibrated by transfer from a NIST-traceable standard lamp.

In order to facilitate the use of PMA2140 radiometer for solar radiation monitoring the calibration procedure takes into account the limited spectral response of the sensor and the distribution of solar radiation. The CIE standard sun was assumed for the calculations. As a result, the PMA2140 sensor will read the correct global irradiance under the standard sun conditions, even though its spectral response is limited to a portion of the entire solar spectrum. Measurement of sources other than the standard sun will yield an error which can be predicted if the spectral distribution of the source is known.

Yearly re-calibration is recommended.

Specifications	
Spectral Response	400-1100nm Figure 1
Angular Response	5% for Angles <60°, Figure 2
Range	200 [MED/Hr], 1,160 [$\mu\text{W}/\text{cm}^2$]
Display Resolution	0.001 [MED/Hr], 0.01 [$\mu\text{W}/\text{cm}^2$]
Operating Environment	32 to 120 °F (0 to +50 °C) No Precipitation
Cable	6 ft. Straight Cable (1.82m)
Diameter	1.6" (40.6mm)
Height	1.8" (45.8mm)
Weight	7.1 oz. (200 grams)
Irradiance from Typical Sources	Solar radiation, clear sky: 1100 W/m ²
150W Xenon Lamp at 8"	180 W/cm ²
Ordering Information	
PMA2140	Global Radiometer
See PMA2141 Class II Pyranometer for ISO classified global radiation measurements from 305 to 2800nm	
References	
¹ "Solar Spectral Irradiance" Technical Report of the CIE, Publ No CIE 85	

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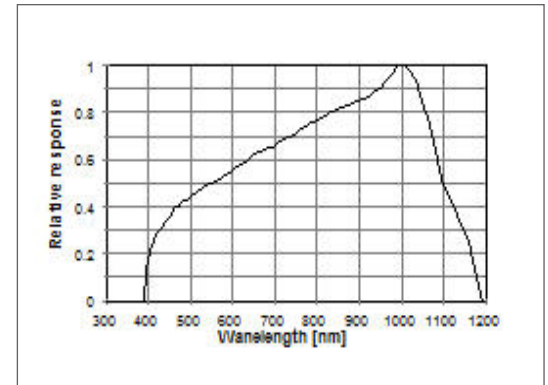


Fig. 1. PMA2140 Spectral Response

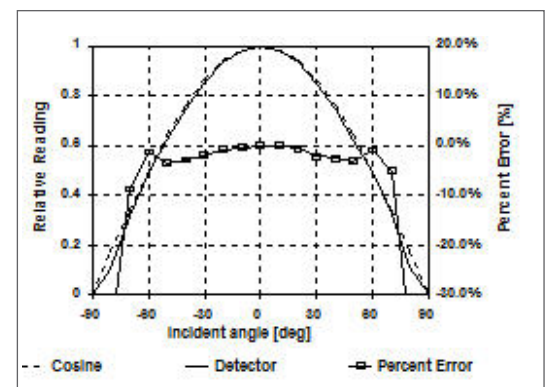


Fig. 2. PMA2140 Angular Response