Spectrafy
solar spectral sensors

SolarSIM-D2

The SolarSIM-D2 represents a ground-breaking advance in solar and atmospheric measurement. It is the world's first, full-spectrum, solar spectral irradiance meter, capable of measuring direct solar spectra and DNI, as well as atmospheric aerosols, ozone and precipitable water vapor.

The SolarSIM-D2 was born out of years of research aimed at reducing the complexity of solar and atmospheric measurement. The result is a highly accurate, low-power, reliable sensor, that can replace a swath of highly expensive and complex equipment.

The SolarSIM-D2 uses silicon photodiodes, coupled with hard-coated optical filters to accurately measure the direct solar spectrum in several narrow wavelength bands. The SolarSIM-D2's powerful radiative transfer software then uses these measurements to accurately resolve the direct solar spectrum and DNI, in addition to atmospheric aerosols, total column ozone and precipitable water vapor.

▪ All-in-one

Measure full-range spectral, total irradiance, aerosols, ozone, and more all in one, compact, reliable, digital sensor.

▪ Flexible capabilities

The SolarSIM-D2 can be deployed with any or all of its measurement capabilities activated. Designed to meet the needs of the most rigorous research while also being rugged enough for industry.

▪ Proven performance

Validated by leading laboratories all over the world including NREL, AIST and the World Radiation Centre.

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SolarSIM-D2: Specifications

Broadband Irradiance (DNI)

Spectral range	280 – 4000 nm
Custom range selection	Yes
Maximum Irradiance	2000 W/m^2
Response Time (95%)	< 0.5s
Zero offset B	n/a
Non-stability (change per year)	< 0.3%
Non-linearity	< 0.5%
Spectral selectivity	n/a
Calibration uncertainty	1.1%
Temperature response	< 0.1% (on-board temp. correction)
ISO 9060 equivalence	secondary standard*

Spectral Irradiance

Wavelength Range	280 – 4000 nm
Spectral resolution (FWHM)	±1 nm
Wavelength accuracy	± 0.1 nm
Spectral measurement uncertainty	< 5% per wavelength
Exposure time	< 1 ms
Max. acquisition rate	1 Hz
Temperature response	< 0.1% (on-board temp. correction)

Atmospheric Parameters (AOD, O_3, PWV)

Number of channels	6 physical + 3,715 calculated
AOD measurement uncertainty	± (0.005 ± 0.01/AM)
Precipitable water vapor uncertainty	< 1 mm
Ozone measurement uncertainty (daily average)	± 3 %

General

Weight	1.2 kg
Dimensions	132 x 132 x 108 mm
Power supply and use	12 VDC, <1W
Communication	RS-485 ASCII, Direct to PC, serial over ethernet, datalogger
Operating Temperature	-30 to 65 °C
Humidity Range	0 to 100% RH

*Because the SolarSIM-D2 measures only several narrow spectral bands, it does not meet the 'spectrally flat' criteria of ISO 9060. Nonetheless, the SolarSIM-G does eliminate spectral selectivity errors, because all broadband irradiance values are calculated directly from the integrals of measured spectra. The SolarSIM-D2 meets or exceeds all other ISO 9060 requirements.

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