

# RaySphere

## Solar Simulator Analysis Made Easy



### The New RaySphere Solar Analysis System

Meet the new optical measurement system for absolute irradiance measurements of solar simulators and other radiant sources. The new RaySphere from Ocean Optics measures absolute irradiance over spectral ranges from the UV to the NIR (350 to 1700 nm).

This portable system is ideal for solar simulator manufacturers and research and development labs as a tool to validate the output of installed solar flashlamps. The flash of a solar simulator is used within the photovoltaic (PV) manufacturing process for the binning of cells according to spectral response and for final PV module efficiency measurements.

The RaySphere system delivers the accuracy and resolution needed to measure and analyze the performance and stability of the flasher with ultralow jitter triggering electronics for timing the measurement to the flashes. Calibration has been validated by an accredited certification lab to ensure accurate detection, enabling evaluation and qualification of the spectral distribution of solar flashers and simulators according to the IEC 60904-9 (2007) standard.

The system includes two thermoelectrically cooled detectors that perform repeatable and accurate spectral analysis of solar flashers from 350 to 1700 nm. A second version contains a single cooled detector for measurement to 1100 nm.

RaySphere includes high-speed electronics and an intuitive powerful software interface. Brief measurement times enable detection of a complete spectrum during a flash or even during a portion of the flash. The measurement can be triggered by a fast response photodiode that reacts on the increasing intensity of the flashlight with sub-microsecond response times.

### Features

- Intuitive graphical interface
- Graphical and table display of classification results by wavelength bin
- Output of actual spectra in  $\text{mW}/\text{cm}^2/\text{nm}$
- Output of actual measurement and triggering timing with  $\pm 41 \mu\text{s}$  resolution
- Printable classification report

### Specifications

	RaySphere	RaySphere 1700
Spectral range:	350-1100 nm	300-1700 nm
Spectral resolution:	1.9 nm (FWHM) for 300 - 1100 nm 12.5 nm (FWHM) for 1100-1700 nm	
Optical input:	50 mm integrating sphere	
Detector types:	TEC stabilized Hamamatsu CCD sensor	TEC stabilized Hamamatsu InGaAs sensor
Dynamic range:	25000:1 (Back-thinned Si)	15000:1 (InGaAs)
Corrected linearity:	>99.8%	
Minimum integration time:	8 ms	
Calibration:	Calibrated for irradiance measurements using national traceable standards (NIST, PTB, CNIM)	
Calibration Accuracy:	Validated by accredited certification institute, typical values better than 2% accuracy in 400-1100 nm range	
Triggering options:	Built-in photo trigger, external trigger, manual trigger	
Operating environment:	Ambient Temperatures 10-35 °C	
Software:	Custom Analysis Software for Windows XP, Vista and 7 (32 and 64 bit)	
Communications:	USB 2.0 high-speed	

### Photo-Trigger Specifications

Jitter (Realtime):	<100 ns
Jitter (Software displayed):	164 $\mu\text{s}$
Minimum measurement time:	~9 ms
Programmable trigger delay:	1040 $\mu\text{s}$ - 168 ms
Trigger delay increment:	2.56 $\mu\text{s}$
Time resolution of display:	$\pm 41 \mu\text{s}$

**SPECTROMETERS | SAMPLING ACCESSORIES | WORLD CLASS SERVICE**



[www.oceanoptics.com](http://www.oceanoptics.com) | [info@oceanoptics.com](mailto:info@oceanoptics.com)  
+1 727-733-2447

