

SOLAR SIMULATOR

LED-Based AAA Solar Simulator with Single Wavelength Control

OVERVIEW

SIM-1030 is a high performance solar simulator with 16 cm x 16 cm uniform area, suitable for measurement of small cells as well as module size cells. The light source is a full-LED long-life lamp, composed of multiple LEDs with different wavelengths, covering the spectral range of 380 nm – 1000 nm. The lamp can be positioned in any direction for top, down or side illumination. The solar simulator works on manual mode, as well as PC control mode. In manual mode simple AM1.5 illumination is provided by the lamp. For PC control mode, fractions of AM1.5 illumination is possible. Besides, with single LED adjustment one can do spectral re-sponsivity tests at different wavelengths.

FEATURES

- Full-LED long-life light source
- AAA class solar simulator
- 0.1 Sun- 1.0 Sun variable light intensity
- Spectral range 380 nm- 1000 nm
- Manual as well as PC control modes
- Top, down or side illumination
- 16 cm x 16 cm uniform illumination area
- Suited for solar cells as well as photo-electrochemical cells
- Single wavelength illumination for spectral tests



SPECIFICATIONS

SIM-1030 Technical Specifications	
Model	SIM-1030
Light source	Multiple LED source
Wavelength range	380-1000 nm
Non-uniformity of irradiance	< 2% (Class A)
Spectral match	< 5% (Class A+)
Temporal instability	< 0.5% (Class A)
Calibration cell	Calibrated silicon cell
Direction of illumination	Top, down or side
Main box size (l x w x h)	40 cm x 40 cm x 50 cm
Sample box features	mechanical jack (height adjustment), cooling fan
Sample box size (l x w x h)	40 cm x 40 cm x 25 cm
PC connection	USB 3.0
Operation modes	Manual/ PC control
Software control modes	Lamp intensity adjustment Single LED adjustment
Lamp intensity adjustment	0.1 Sun- 1.0 Sun
Spectrum Filters	Virtual filters: >900 nm and >850 nm
Temperature sensor	On LED heat sink, temperature displayed in software
Thermal Protection	Heat sink temperature
Input power	100-240 VAC, 50-60 Hz, 500 W
Weight	20 Kg

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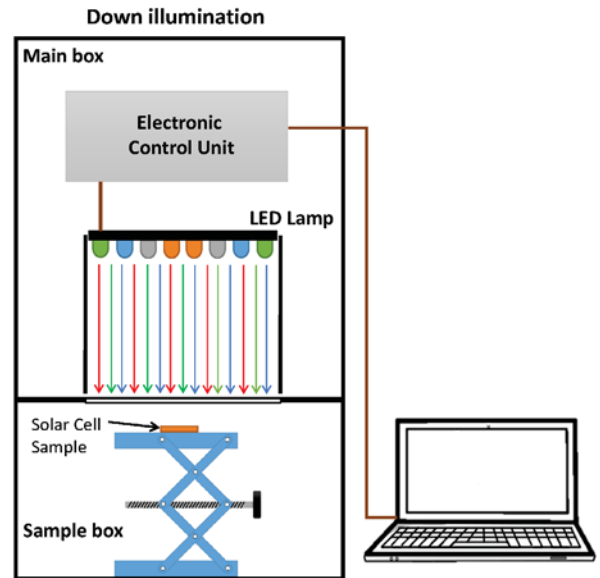
HOW IT WORKS

The LED solar simulator is based on a lamp comprising multiple LEDs with different wavelengths, forming together a spectrum similar to AM1.5 solar light. The advantage of LED solar simulators is the high stability of LEDs compared to Xe arc lamps, as well as the possibility to tune the spectrum, change intensity or use single wavelength light.

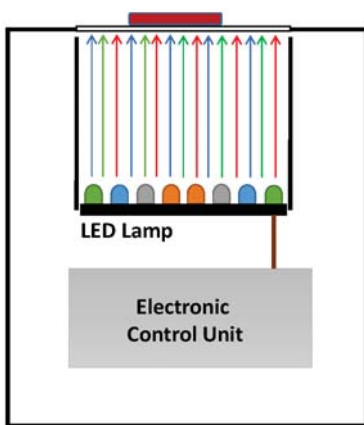
In SIM-1030 the design of the LED lamp allows high spectral matching, as well as excellent uniformity and temporal stability of light. A highly optimized electronics guarantees stable and maintenance-free operation of the device.

In a typical configuration (figure), a laboratory jack inside the sample box is used to adjust the height of the solar cell sample. To measure and adjust the light intensity at the solar cell sample, a calibrated silicon cell (supplied together with the solar simulator) is placed near or at the position of sample. The advantage of using sample box is that it blocks the light from outside (important for low intensity measurements or single LED measurements). The cooling fan on the sample box prevents over-heat of the solar cell samples.

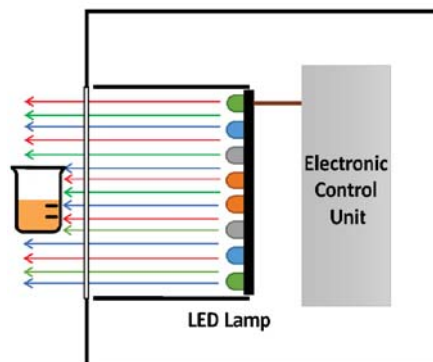
The solar simulator can be easily placed at different sides, so that it is possible to illuminate the sample in different directions. As shown in the figure, in the top illumination, the sample can be placed on top of the window plate. Side illumination is possibly best suited for photoelectrochemical cells that require illumination on the electrode.



Top illumination



Side illumination



Down illumination

