LEDs GO OUTSIDE!



The SINUS-2100 Outdoor is the ideal solar simulator for outdoor use to test solar modules that have been already installed in solar farms. It enables very cost–efficient testing of modules, e.g. short before end of warranty period without the need to disassemble the power plant.

Its nearly perfect simulation of the sun's spectrum enables highly accurate solar module efficiency measurement at minimum operating costs due to the long life time of LEDs. It is fully portable and can be handled by two operators. The SINUS-2100 Outdoor is based on a product idea developed by Prof. Dr. Franz Baumgartner at ZHAW, one of the leading universities of applied sciences in Switzerland.

FEATURES

- Matches class A+AA+ criteria
- Adjustable Multi color LED light source
- Long exposure time for high-efficiency solar modules
- Battery powered for full independence on site
- Optional built in energy storage
- Optional wireless operation
- Optional GPS data logging
- Optional Bypass Diode testing
- Optional Barcode reader

BENEFITS

- Low operating costs
- Light weight and Portable
- Fast onsite measurement (1 module/min)
- Intuitive and ergonomic GUI (touch screen)

CLASSIFICATION

	SINUS-2100 Outdoor		Class AAA requirements
Spectral Match	Class A+	0.90 - 1.10	0.75 - 1.25
Non-uniformity of irradiance	Class A	< 2%	2%
Short-term instability (STI)	Class A	< 0.5	< 0.5
Long term instability (LTI)	Class A+	< 1%	2%

SPECTRAL QUALITY

Wavelength range (nm)	SINUS-2100 Outdoor	AM1.5
400 - 500	18.4%	18.4%
500 - 600	19.9%	19.9%
600 - 700	18.4%	18.4%
700 - 800	14.9%	14.9%
800 - 900	12.5%	12.5%
900 -1,100	15.9%	15.9%
400 - 1,100	100%	100%

FUNCTIONALITY

IV curve measurement	Under LED illumination at variable intensities, under natural sun light
Solar cell parameter analytics	Voc, Isc, FF, Pmpp and efficiency
Temperature measurement	At back sheet with pyranometer
Temperature correction	Solar cell parameters are adjusted according to IEC 60904-5, IEC 60891
User defined analytics	Open software interface allows export of all measured data for analysis and import of classification criteria
Power requirements	50Hz 230V AC or 60Hz 120V AC for battery charger
GPS data logging	System is ready to log GPS data for data enrichment (Option)
Bypass Diode Test	Diode testing using selective string illumination (Option)
Wireless Operation	Built in energy storage + wireless communication (Option)

PRODUCT FEATURES

Intensity range	As required: from 0.1 up to 1 sun
Spectrum	AM1.5, AM0 or any customer defined spectrum possible with light engine including illumination by single colors
Irradiance time	from 10 ms up 200 ms
Flash-to-flash time interval	10 s
Voltage resolution	0.025%
Current resolution	0.025%
Accuracy	< 0.1%
IV curve measurement duration	from 10 ms up to 200 ms
Integration time for current	As required
Number of measurement points	up to 5.000
Test area	For modules with up to 72 solar cell (6 inch), 1300mm x 2300mm
Setup weight	35kg
2x transport case	1350mm x 850mm x 600mm; 45kg each
Weight / IV electronics	12 kg

TECHNOLOGIES AND COMPONENTS

Light source	Multiple individually controlled LEDs with different peak wavelengths. Strings can be illuminated with different intensities.
Cooling	Cooling of LED boards via air cooling.
IV measurement	Passive load with 14 bit calibrated analog-digital converter and calibrated shunt resistor
System control	Laptop or Tablet runs application software and controls hardware Barcode reader for easy module identification (Option)
User interface	Graphical User Interface with user friendly touch operation

SCOPE OF DELIVERY

Portable and disassemble Light Engine
Power Supply (energy storage & charging station)
IV electronics in hard case
Laptop / Tablet with Touch Screen
Cables

CONTACT

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