

Flashlight Simulator Sol 2x2m



OPTOSOLAR

- Measures IV characteristics of PV modules—maximum power, open circuit voltage, short circuit current—at standard test conditions (STC, IEC standard 60904)
- Simulated sunlight spectrally filtered to AM 1,5 global, using Xenon flashlamps, intensity adjustable
- Suited for laboratory measurements and integration into production lines
- Spatial uniformity, temporal stability and spectrum at STC class A (IEC 60904-9).

Light source:

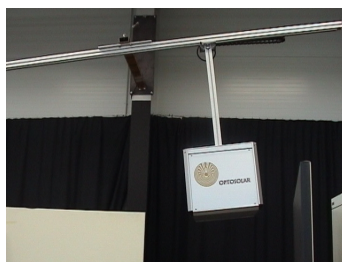
- Xenon flashlamp, spectrally filtered to AM 1.5
- Light intensity 400W/m² - ca. 1100 W/m² , or 100W/m²- ca. 1100W/m² (option)
- Illumination from front /from above
- No module heating during measurement
- Module sizes up to 200 cm x 200 cm

Data acquisition

- Measurement ranges: 0-200 V, 0-40 A or as desired (four ranges each, multiplier 1-2-4-8)
- Data acquisition 12 bit, 16 bit option
- Generation of module serial number, classification of power, printout of measurement documents, module labels, data storage in data base. Client/project/order database, etc.

Measurement technology

- During the flash plateau, an electronic load scans the IV characteristic. Special option for high capacity modules
- Measurement period ca. 6-14 ms (adjustable for high capacity modules)
- Correction of data with respect to module temperature, irradiance. Target conditions STC or other desired test conditions



Option PP additional settings to influence measurement process, MS Office™ professional for data base connectivity, high precision and stability data acquisition etc. Special database system for customer/project handling in BIPV

Equipment dimensions:

- Linear: 230 cm (h) x 100 cm x 100 cm (lamp and supply), or 60 cm x 60 cm x 60 cm (each lamp and supply), all without PC, individual adaptations are possible
- Weight 100 kg

Cell types

(multi-) crystalline silicon, amorphous silicon , III/V semiconductors, CdTe, CIS. For thin film devices, measurement precision may be dependent on physical properties (e.g. time constants) of the constituent layers

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Sol 2x2m²: Flashlight solar simulator for PV modules for laboratory measurements or production line integration. Active module side faces upward, or module is mounted vertically.

Lightsources: Xenon flash lamp

Light intensity ca. 400W/m² ... ca. 1100 W/m², (100W/m² ... ca. 1100 W/m² as option), adjustable, ca. 6 flashes per minute, computer controlled. Start of measurement by PC, keyboard, external switch or other external events. Module size up to 200 x 200 cm

Spatial uniformity: <=2% (dependent on sample size and simulator option),

Electronic load for IV measurement.

Temperature measurement: ambient light monitor temperature, module temperature, using PT100 (RTD) sensors or infrared sensors.

Measurement ranges: as desired, range multiplier: 1 2-4-8, data acquisition 12 bit, option 16 bit

includes PC, measurement and analysis software, documentation, turnkey

Measurement procedure:

During the flash plateau, the IV characteristic is scanned. Simultaneous high speed measurement of voltage, current, irradiance (standard: 60 datapoints). Correction of raw data according to international standards (IEC 60891) with respect to irradiance and temperature of test module, light monitor and reference module. Transfer of IV to STC or other reference conditions. Determination of I_{sc}, V_{oc}, MPP data for measurement protocol, data base, module label. Printout of IV for individual module datasheet. Integration into automatic production lines (option)

Operation modes:

a) Standard mode: designed for easy operation by non scientific personnel. Choice of measurement routines from module database. Determination of module properties at STC, generation of serial number, module classification (power or current at fixed voltage), user defined classification criteria (e.g. visual test results for building integrated modules), printout of data sheet, module label. Storage of data, operator name, reference devices, calibration numbers in tables, for easy database connectivity. Cri settings are hidden from operator.

b) Expert mode : password protected, full control of all simulator settings. Graph of I,V and irradiance versus time for measurement control and identification of high capacity modules, setup of all parameters of flash measurement autoseup. Optimisation of measurement procedures, storage of optimized methods in measurement procedure database.

c) Option PP: individual design of measurement protocol, data sheets, labels, higher precision dataacquisition etc.

d) Database system for BIPV (option)