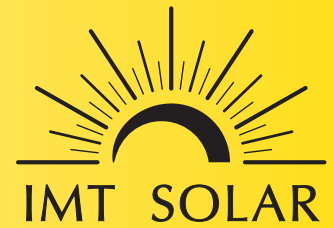


# Solar Flare™

*Long Pulse Solar Simulation System for PV Modules*



## Application

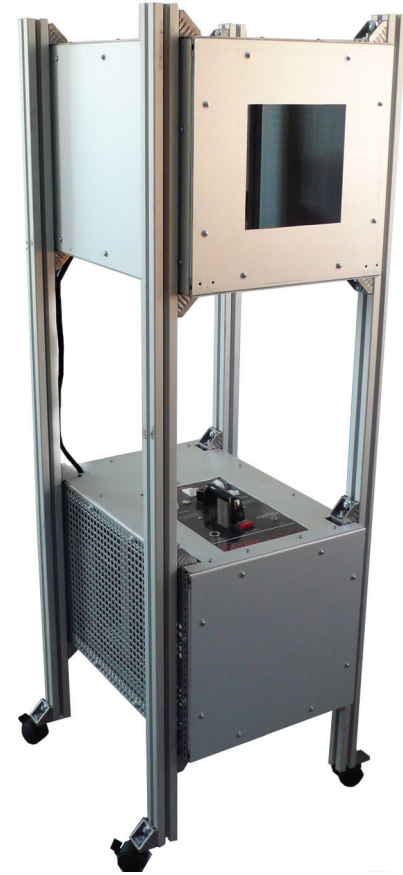
The Solar Flare™ is a low cost, long duration, flash-based sun simulator designed for testing Photovoltaic (PV) modules including components of some condenser PV systems. The simulator is optimized for production testing of PV modules in a manufacturing environment but has also been extremely valuable to developers installing utility integrated PV solar fields. Large quantities of PV panels can be thoroughly inspected quickly and efficiently just minutes before each module is installed on site. Due to the low cost of the system, it has also proved to be an excellent tool for universities with renewable energies education programs as well as testing laboratories in need of a chamber “pass/fail” graduation system.

The unit is available in a standard lab version, however IMT can provide the system in a portable package that can be integrated into a mobile trailer or container skid. Depending on the need and location, the Solar Flare™ can be purchased outright, or leased. Short-term lease packages can include a technical operator.

## Function

The simulator uses a proprietary Helix bulb design that delivers up to 4800 Joules to a test plane measuring over 2 x 2 meters. The Solar Flare™ system features a Xenon light source, adjustable power control unit, a dedicated IMT PV-KLA I-V Curve analyzer and software to measure and store I-V curves. The Solar Flare™ System also utilizes modular construction which means that the PV-KLA IV curve analyzer and software can also be used to provide reference calibration measurements under natural sunlight for PV panels thus increasing the test systems utility.

PV module measurements are accomplished using a 4-wire Kelvin technique providing high accuracy measurements. Software supplied with the system includes features that enable the easy creation of reference values for each PV module type to be tested. The software automatically compensates for irradiance changes that occur during the measurement time. Parallel sampling of Irradiance, Voltage, Current and Temperature is employed for each data point along the IV curve.



**Solar Flare Long Pulse Flash Simulator**

## Mechanical Construction

The system consists of a free standing aluminum frame containing both the Xenon flash head with a primary light aperture baffle in the upper unit and the main electronics and power supply located in lower unit control center. The system is designed for maximum portability but can be easily configured for any heavy duty production environment.

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# Solar Flare™ Specifications



## General Information

- Light Source: Xenon flash, 4800 joules
- Module Test area: 2.0 m X 2.0 m
- Irradiance: maximum 1200 W/m<sup>2</sup>
- Homogeneity: ±10 % for 1.6 m X 1.6 m, ±12 % for 2.0 m X 2.0 m
- Flash duration: 7 ms with  $|G_{min}, G_{max} - G_{measured}| < 10 \%$
- Spectrum: AM 1.5 class C
- Measuring time: up to 6 I-V curves per minute
- Repeatability of module measurement: ±0.5 %
- Power supply: 110-230 V AC single phase 50/60Hz.

## PV-KLA I-V Curve Analyzer Specifications

- Basic accuracy: ±0.2 % full scale value
- Voltage ranges: 15, 30, 60, 120 and 240 V, other ranges are available on request
- Current ranges: 2, 4, 8 and 16 A, other ranges are available on request
- Maximal sampling rate for one current-voltage data pair: 66 K samples per second
- Parallel sampling of all channels using 4 sample and hold devices
- Measuring time for I-V curve: 2 to 8 ms
- User interface: controlled directly via PC RS-232C or USB port using PVK software

## Equipment Supplied

- Solar Flare housing constructed of anodized aluminum profiles and 0.062" thick aluminum panels, specially designed flash lamp opening
- Adjustable power supply for Solar Flare, Xenon flash tube with all cabling
- Serial RS232 or USB port computer interface, including cables
- PV-KLA IV curve tracing system optimized for Solar Flare™
- Power supply for PV-KLA (optional battery supply with charging unit)
- Silicon irradiance sensor Si-02, includes 2m cable, other cable lengths available on request
- Pt100 sensor for measuring module temperature, includes 2m cable, other cable lengths available on request
- Control software PVK for Windows XP™, includes Module Reference calibration function
- Manual

## Also Available as Options

- Implementation, application specific system optimization and on-site training of personal
- Software options including output masks for measurement data and data sheets
- Other PV current and voltage measurement ranges on request
- Other sensor cable lengths

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