

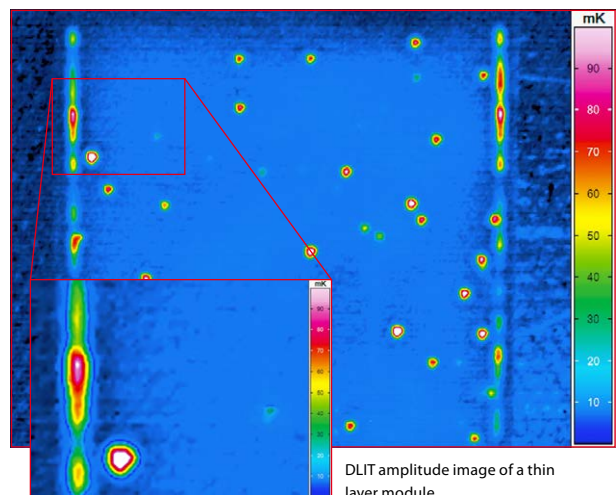
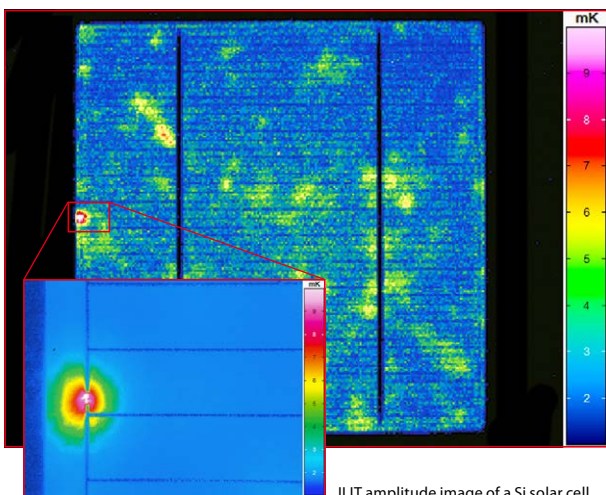
Automated Testing Solution PV-LIT

Solar Cell and Solar Module Testing Using LimoLIT (ILIT) and VomoLIT (DLIT)



Automated testing solution allows solar cells as well as complete solar modules already to be checked during the manufacturing process based on shortest measurement times (routine test) or as part of an extensive and detailed testing process with individual measurements e.g. in a test laboratory (individual testing).

The use of non-contact (LimoLIT) or contact (VomoLIT) activation of the object being measured results in local warming being induced at faults (shunts) which can then be detected and displayed by means of a high-performance thermographic camera and the use of a lock-in procedure.



The Modular Test Bench Offers the Following Benefits

- Laboratory operation and serial testing possible
- Testing of varying sizes of solar cells and solar modules
- High-performance software for recording the measurements and for saving, analysing and comparing all measurement data
- Easy handling of the samples due to horizontal operation position
- LimoLIT: illumination with an LED array – no laser necessary
- Optional accessory for fixation and tempering of the object being measured
- Identic standard configuration for fault detection based on contact and non-contact activation for all PV materials
- Exchangeable lenses for overview and detail views



Contact activation (VomoLIT)



Non-contact and contact activation in measurement cell (LimoLIT/VomoLIT)

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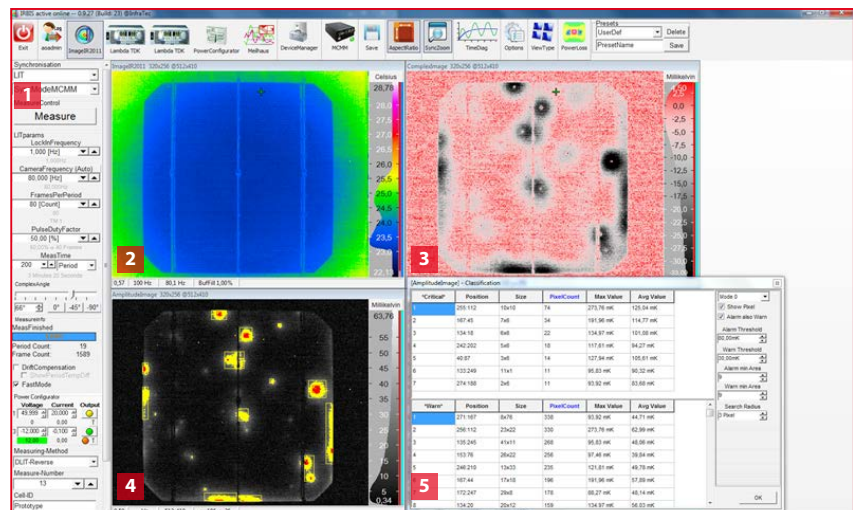
Technical Specifications

Measuring cell	ImageIR®	VarioCAM® HD head
Detector formats (IR pixels)	(1,280 × 1,024) / (640 × 512) / (320 × 256)	(1,024 × 768) / (640 × 480)
Spectral range	(2 ... 5) µm	(7.5 ... 14) µm
Frame rate (full screen mode / subwindow mode)	Up to 350 Hz / 1,200 Hz	Up to 60 Hz / 240 Hz
Contactless illumination source (ILIT)		
Illumination source, standard		Infrared LED panels (~ 220 W)
Illumination source*		Spectral selective LED panels for IR-insensitive solar cells
Contact illumination source via tactile spikes (DLIT)		
Electric solar cell contact / modul contact		For electric BIAS operation and VomoLIT up to 600 V Integration of four quadrant power supplies and special power supplies (e.g. Keithley)
Sample holder (chuck) (W × H × D)		(250 × 30 × 250) mm
Thermochuck*		Fluid cooling and heating Vacuum fixation
Objective of the infrared thermographic camera		Customer specific (microscope to wide angle)
Dimensions (W × H × D)		(500 × 1,050 × 500) mm
Weight		55 kg (without camera and chuck)
Evaluation unit		
Dimensions (W × H × D)		(553 × 589 × 600) mm
PC		19" industry PC
Power supply		230 V AC / 110 V AC
Weight		74 kg (incl. PC)

* optional

Software

- Operational software with comprehensive analysis options in laboratory conditions
- Software add-on for automatic error classification based on parameter settings
- Intuitive user interface for easy operation
- Real-time display of the object being measured in various states
- Multifaceted memory options for image data and measurement results
- Alternative 0°, 90° or freely set phase angle image for representation of complex intensity information
- Drift compensation, undersampling, DC-mode, IV measurement, power loss measurement, user and recipe management
- Different interfaces to other systems: e.g. Profibus, Ethernet



- 1 Parameter setup
- 2 Live image
- 3 Complex image

- 4 Amplitude image
- 5 Classification / phasing image