

**greateyes**

DISCOVER WHAT  
THE EYE CAN'T SEE

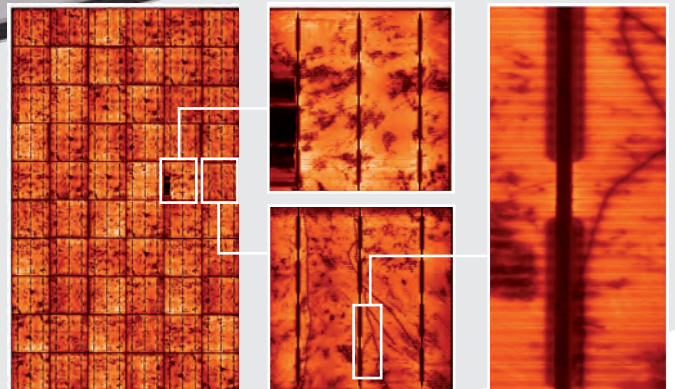
I|02

**LumiSolarProfessional Systems**

High Performance Electroluminescence (EL)  
Inspection for Solar Modules

# I|02 High Performance Electroluminescence (EL) Inspection for Solar Modules

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12000 x 20000 pixels  
= 240 Mpx

The **LumiSolarProfessional systems** utilize the electroluminescence phenomenon to image micro-cracks and other defects of photovoltaic modules which are extremely difficult or impossible to detect visually. The equipment allows to perform detailed quality control of all kinds of solar modules and strings. It was developed for research, off-line industrial inspection and quality characterisation. The design of the equipment is scalable to meet different requirements.

The **Bottom Load (BL) system** is used to inspect finished PV modules of different sizes with the sunny side up. The image resolution and geometry are flexible. The system is designed for demanding applications in research and industrial control.

The **NEW Top Load (TL) version** is dedicated to the inspection of unlaminated or finished PV modules of different sizes with the sunny side down. A slot-in mechanism in the working height allows comfortable inspection of higher volumes.

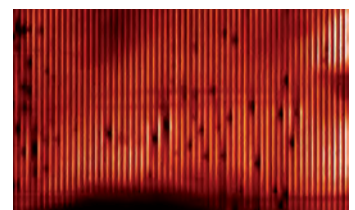
The **LumiSolarProfessional R&D** has been developed for highest demands in research. A two-axis linear drive system is employed to scan PV modules with tremendous resolution.

### LumiSolarProfessional BL

### LumiSolarProfessional TL

### LumiSolarProfessional R&D

Image Resolution	up to 8 Mpx/34 Mpx	up to 34 Mpx	up to 240 Mpx
Size of Module or String	max. 1.1 x 2.0 m	max. 1.0 x 2.0 m	medium to large formats
Imaging Unit	1 or 2 scientific CCD cameras	2 scientific CCD cameras	1 scientific CCD camera
Scanning Directions	1 axis	1 axis	2 axis
Dimensions (W:D:H), Weight	2460 x 1400 x 2000 mm, 250 kg	2460 x 1200 x 1400 mm, 250 kg	customer specific



### LumiSolarProfessional Software

Remote Control of Module Power Supply

Automated EL Image Analysis for c-Si

Dimension Measurements of Defects

Automatic Background Subtraction

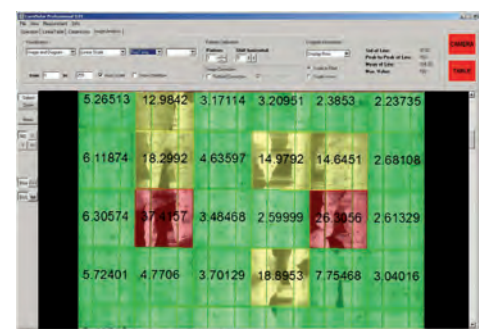
Supported File Formats:

BMP, JPEG, TXT and Raw Data

False-Color Representation of Images

Intensity Profiles in x-, y-Direction

Different Scaling and Zooming Functions



## Features of the LumiSolarProfessional Systems

Inspection Capabilities:	Shunt Detection   Micro-Crack Identification   Finger Defects Dead Cells   Broken Cells   Hotspots   Inhomogeneities and Impurities
Areas of Application:	Pre-delivery Inspection at the Manufacturer   Receiving/Pre-delivery Control at the Retail Company Final Inspection before Installation of the Solar Modules   Documentation Purposes Acceptance Tests   Failure Analysis of defect Solar Modules   Research and Development
Advantages of the System:	Suitable for different Module Sizes   Excellent Sensitivity and Image Quality   Quick Measurements Easy Operation   Comfortable Slot-In Mechanism   Turnkey System
Successfully tested on various Solar Module Types:	Monocrystalline Silicon (mono-Si)   Polycrystalline Silicon (poly-Si)   Amorphous Silicon (a-Si) Copper Indium Sulfide (CIS)   Copper Indium Gallium Selenide (CIGS)   Cadmium Telluride (CdTe) Heterojunction with Intrinsic Thin Layer (HIT)

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