

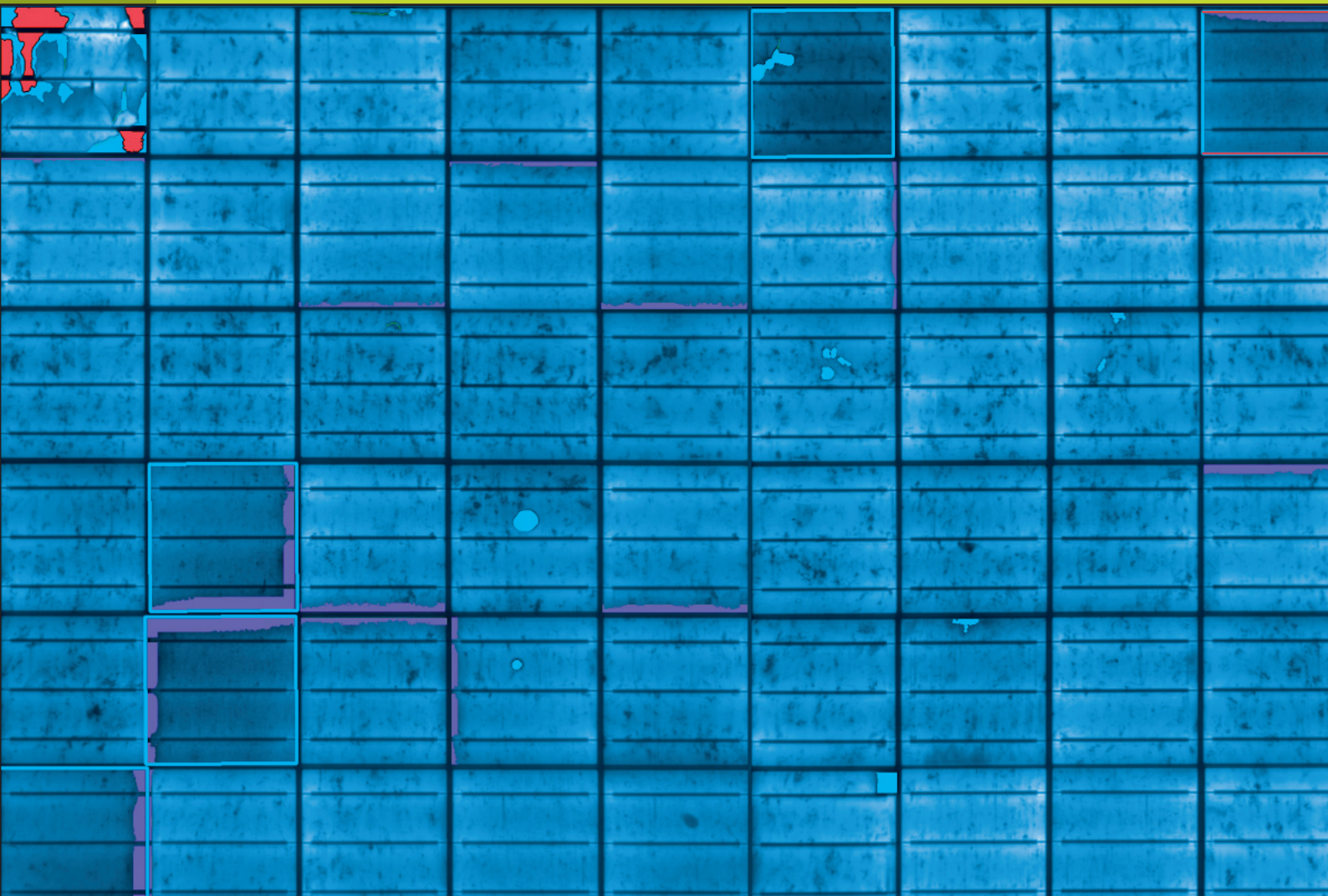
# greateyes

## DISCOVER WHAT THE EYE CAN'T SEE

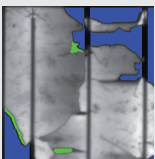
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### LumiSolarProfessional (LSP) Inline System

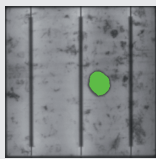
Advanced Electroluminescence Inspection for  
Pre-laminates and Solar Modules



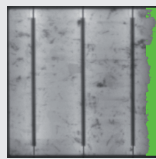
# DISCOVER WHAT THE EYE CAN'T SEE



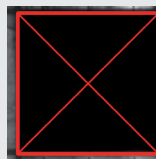
Inactive areas



Contaminations



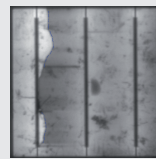
Edge defects



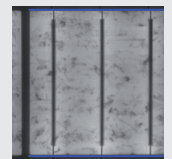
Dead cells



Rotated cells



Mikro- / Cracks



Misaligned cells

LSA automation and greateyes offer an advanced LumiSolarProfessional (LSP) inline inspection system for pre-laminates and solar modules. The tool is not only capable to detect micro cracks, low intensity cells and contaminations, it also determines misaligned bus bars, rotated solar cells and other quality issues fastly.



The LSP Inline system exhibits a fast cycle time below 30sec including feed-in, inspection, automatic defect recognition, pass/fail decision and unloading. The unique design of the tool provide significant higher throughput and analysis power compared to conventional in-line EL inspection tools. Precise quality control, higher yield and cost savings are the main reason for implementing the machine in the production line.

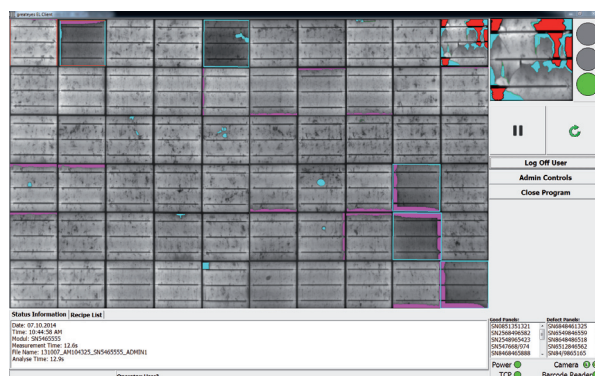
In contrast to other vendors the new inspection system uses two scientific greateyes cameras in combination with high-throughput objectives allowing for fast detection of the weak electroluminescence. Furthermore an innovative automatic image analysis software provides superior performance in the detection of failures within pre-laminates or solar modules.

## General specifications

System	Turn-key electroluminescence inline inspection system
Substrates	Pre-laminates or modules
Cell type	mono- and polycrystalline silicon, thin-film, HIT, IBC
Max. size	2.0m x 1.0m
Complete cycle time	26sec (including feed-in, feed-out)
Nominal throughput	138 modules/hour
Inspection	Sunny side down
Defect detection	Cracks, inactive cell areas, micro-cracks, contaminations, low intensity cells, inactive (dead) cells, edge defects, misaligned bus bars, misaligned/rotated cells
Imaging Subsystem	Two scientific 16bit large format greateyes cameras, resolution 500µm
Dimensions (W x D x H)	2200mm x 2200mm x 1400mm - for prelaminate inspection with long side forward
Certification	CE

## Software System

- Operator & engineer HMI
- Fully automated image analysis
- Defect identification and classification
- MES, ERP, QA interfaces
- Multiple data export capabilities
- Receipe definitions
- Statistical/ history functions
- Simplified touch panel control



## Features of the LumiSolarProfessional (LSP) Inline System

Characterization method	Forward bias electroluminescence inspection No risk measurement - drive current below short-circuit current Scientific 16bit high dynamic range imaging subsystem
Detection capabilities	Micro-cracks   Contaminations   Inactive areas   Low intensity/dead cells   Misaligned Cells   Rotated cells   Edge defects
System advantages:	High nominal throughput, low total cycle time Superior defect identification and classification compared to conventional EL systems Fixed imaging subsystem, no moving cameras, reduced maintainance & higher lifetime Counting of branched cracks, total defect area, precise recipe control
Design flexibilities	Pre-laminate or module inspection Inspection of mono- or poly-crystalline silicon, thin-film, HIT, IBC Long-side or short-side forward feed-in / feed-out Connectivity to supervisory systems (MES, ERP, QA)

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