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Release: No. 600, June 23, 2016

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**New solar module inspection system supports high-throughput production lines with >120 modules per hour in generating higher product lifetime and reduced warranty costs**

## **100% Automated Optical Inspection – Combining established and new approaches for easy high-quality module manufacturing**

**High-quality photovoltaic (PV) modules demand extremely high long-term performance, while manufacturers also want to reduce production costs as far as possible. The PV industry is therefore looking for optimum production and reliability rates in module production. The pursuit of maximum throughput is likely to make manual inspection almost obsolete: the human eye simply cannot cope with current production speeds. Automated quality inspection for process control – covering control and detection of defective parts – is the key to process optimization and to fast and cost-efficient production.**

First-rate PV module production requires the use of high-quality materials to achieve long product lifetime and high efficiency. With glass, solar cells, EVA, frames and junction

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boxes, the material costs account for more than 70 percent of the total. The process itself, including labor and energy consumption, makes up about only 10 percent of overall production costs. Using automated inspection solutions optimizes costs throughout PV module production and ensures a high-quality controlling process, in which defective parts are detected early during the processing. This minimizes reworking and increases productivity, reducing the scrap rate and saving costs for processing defective products.

The quality of incoming material is crucial to cost and yield. Automated inspection solutions ensure users the best value for their products, even at the highest speeds. This can be crucial in module production, where just one defective cell can ruin the whole module, meaning the potential loss of 60 cells and even more resources. Thorough inspection helps manufacturers to avoid these costs and leads to a higher product lifetime. This in turn reduces warranty costs by up to 80 percent and results in higher customer satisfaction. Manufacturers also receive an easy tool for documenting the produced quality before shipment.

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### **Electroluminescence inspection for modules**

Electroluminescence inspection for modules highlights defective parts and process problems and indicates possible warranty issues with absolute reliability. MOD-Q EL – the electroluminescence inspection tool from ISRA VISION/GP SOLAR – accommodates a wide variety of manufacturing scenarios, be it automated or manual inspection, inline or offline. The reliable system achieves cycle times of less than 30 seconds for optimum throughput. High resolutions allow even the smallest defects to be detected. The automatic defect detection and classification offers outstanding reliability.

### **Optical module inspection with MOD-Q VISION**

Electroluminescence has long been the most successful solution in module manufacturing. With the newly developed MOD-Q VISION, optical inspection or a combination of electroluminescence and optical inspection are equally successful. Optical inspection of solar modules is essential for shipping high-quality products. Automated inspection reveals more defects and is much more reliable than inspection by the naked eye, which is impractical for high throughputs, especially when the highest quality standards are needed. Optical inspection with ISRA

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VISION/GP SOLAR delivers cost-efficient automatic optical inspection at resolutions of up to 25  $\mu\text{m}/\text{pixel}$ . The inspection is based on established algorithms and supports any print pattern and the latest cell designs, including multi-wire, IBC and more. Cycle times of less than 30 seconds per module can be achieved. MOD-Q VISION is easy to integrate into new and existing production lines and is also suitable for framed and unframed modules after lamination.

## Images



### 600\_1.jpg

The MOD-Q system technology from ISRA VISION/GP SOLAR offers both electroluminescence and optical inspection.

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