



# LASER BEAM INDUCED CURRENT



## See Solar Cells Like Never Before

The *Laser Beam Induced Current (LBIC)* systems enable fast, high-resolution mapping of the photovoltaic response of solar cells over very large areas, from single cells to modules. It is the ideal tool for measuring photovoltaic active areas, identifying defects and degradation pathways, shunts, inactive regions, and coating errors. Ultrafast laser scanning enables device testing in seconds over large areas, compared to hours with ordinary XY-stage systems. The infinityPV LBIC system is available in single-wavelength or multi-wavelength configurations for testing different photovoltaic responses and tandem devices.

### Key Features

- **Ultrafast laser scanning** – large-area PV mapping in seconds
- **High resolution** – <100  $\mu\text{m}$  mapping (40  $\mu\text{m}$  spot size)
- **Versatile testing** – compatible with silicon, CdTe, CIGS, and 3rd gen solar cells (organic, polymer, perovskite, flexible)
- **Identification of** – degradation pathways, defects, shunts, inactive regions, and defines active areas for efficiency calculations
- **Multi-wavelength options** – single or up to 4 wavelengths (400–1100 nm)
- **R2R compatibility** – inline roll-to-roll process control
- **Turn-key system** – ready-to-use with user-friendly software

### Technical Specifications

- **Laser Wavelength Range:** 400 – 1100 nm
- **Mapping Resolution:** <100  $\mu\text{m}$  (40  $\mu\text{m}$  laser spot size)
- **Testing Area:** Up to 250 × 250 mm<sup>2</sup>
- **Scan Speed:** Large-area PV mapping in seconds
- **System Noise:** Low-noise detection, immune to external light interference
- **Wavelength Options:** Single or Multi-wavelength (1–4)
- **Bias Options:** Light bias, Electrical bias
- **Sample Types:** Single cells, Modules, Flexible substrates
- **Software:** Dedicated user-friendly control and analysis suite



Fastest LBIC available



405 nm laser configuration



250 x 250m m<sup>2</sup> testing area



Available in R2R version



<100  $\mu\text{m}$  resolution



User friendly software



Learn More at [infinityPV.com](https://www.infinitypv.com)



## Benefits of infinityPV's LBIC Approach

infinityPV's LBIC system is inherently immune to noise, ensuring accurate results even in challenging conditions. It excels in mapping both concave and convex surfaces, making it an ideal solution for flexible solar cells. The turn-key system is controlled via the included infinityPV software, which features:

- Auto Calibration
- Active Area Calculation
- Color Maps
- Simple Scanning Area Selection

## Wide Wavelength Range for Versatile Applications

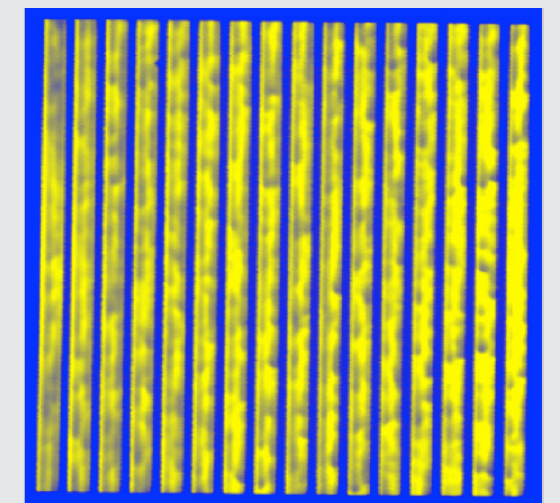
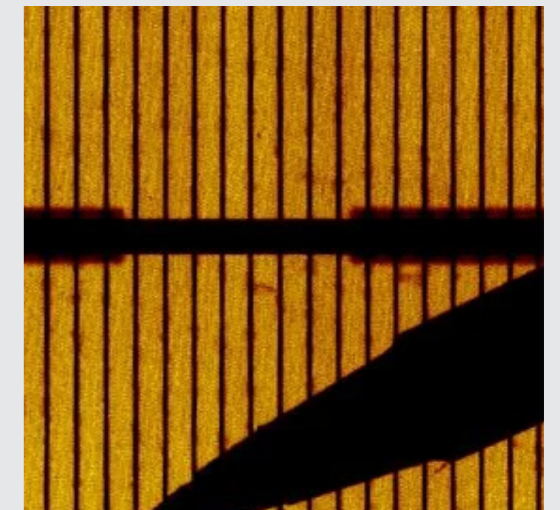
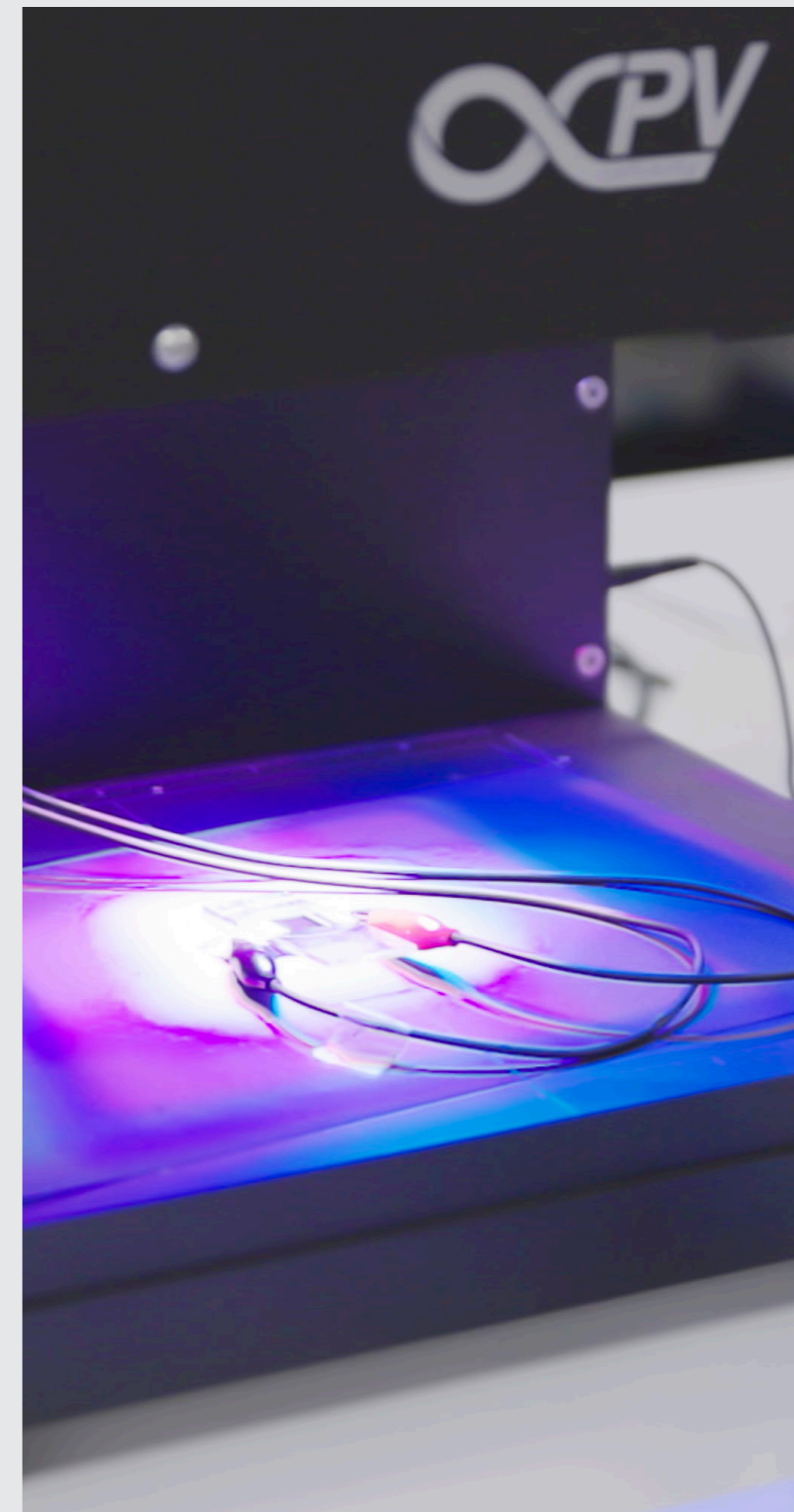
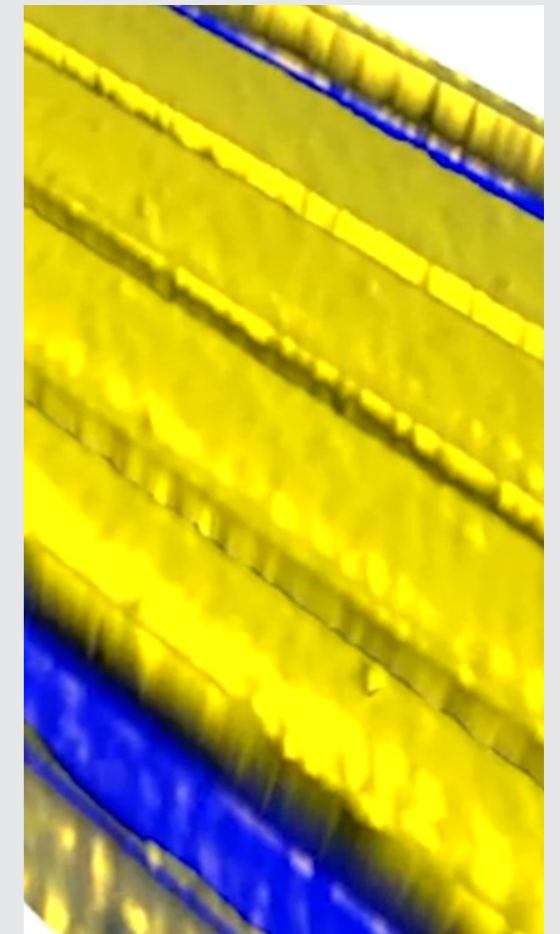
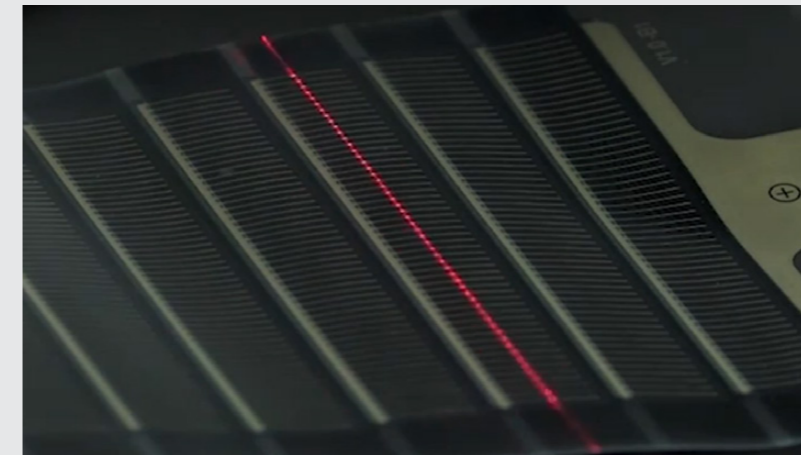
With an accessible wavelength range of 400–1100 nm, this system is well-suited for mapping single junctions, tandem devices, and modules. Differences in junction ideality within a module may lead to variations in signal strength, but the system handles this with ease.

## Defect Detection and Failure Analysis

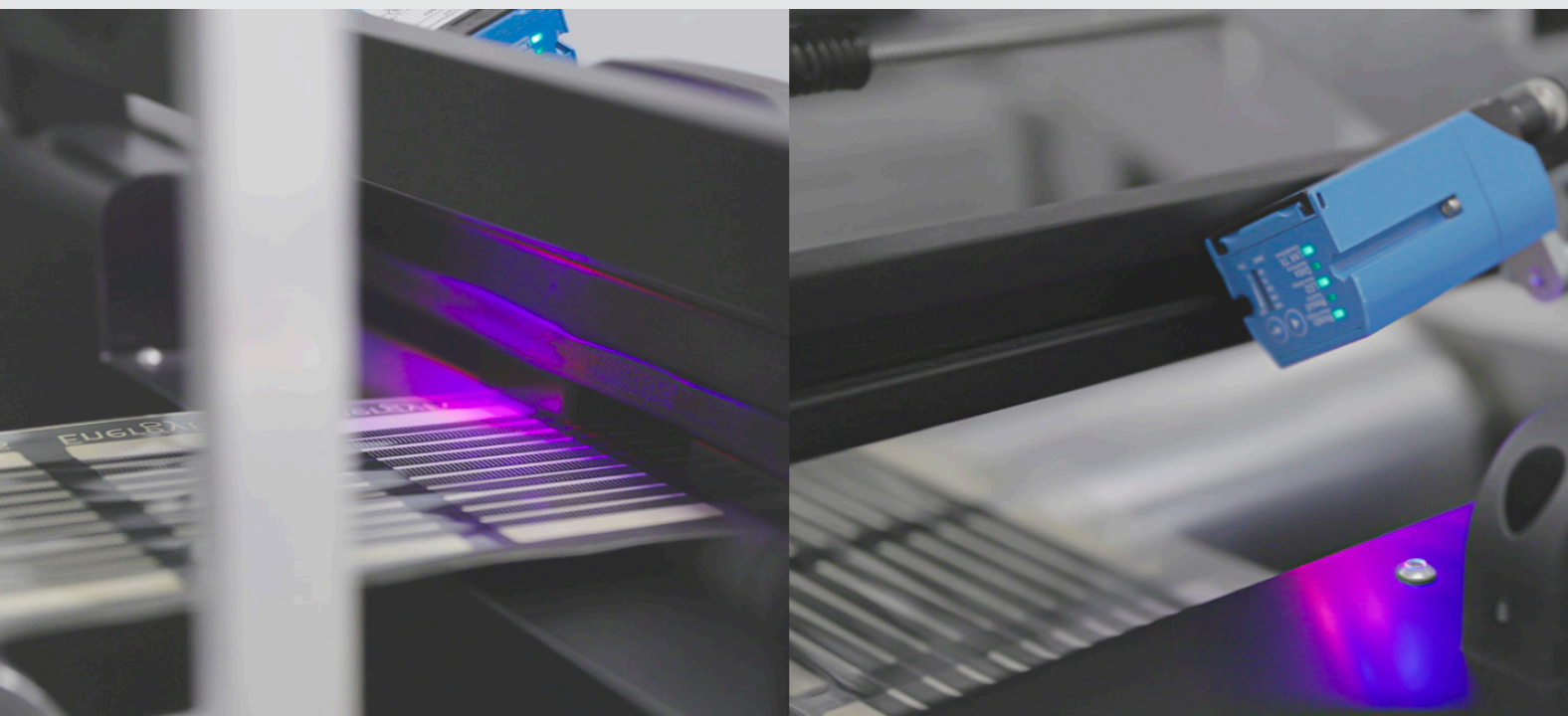
LBIC maps generated by the infinityPV system allow for the easy identification of:

- Defects
- Coating Errors
- Shunts
- Inactive Photovoltaic Regions

Additionally, the system is ideal for identifying failure modes over time in solar cells and modules that have undergone accelerated ageing tests. It can highlight issues such as ingress of permeants and contact failures.



## Roll-to-Roll LBIC



### Advanced Imaging for Printed Solar Cells

The *R2R LBIC* is a contactless, non-destructive imaging system developed for printed solar cells on flexible foils. It provides high-speed, high-resolution mapping of photovoltaic performance across near-endless rolls of material, giving manufacturers the ability to detect defects, monitor local variations, and optimize yield in real time. By capturing the performance of every pixel along the foil, it transforms quality control from a manual, sample-based process into a continuous, data-driven operation.



### From Sheet-Based to Roll-to-Roll

Traditional *LBIC* systems were designed for small, rigid solar cells and require stationary scanning inside closed cabinets, making them unsuitable for continuous foils with extreme aspect ratios. The *R2R LBIC* overcomes these limitations by enabling inline imaging directly on moving webs. Its advanced design addresses the key challenges of speed, noise, electrical contacts, and data handling, combining laboratory-level precision with the throughput required for roll-to-roll production.

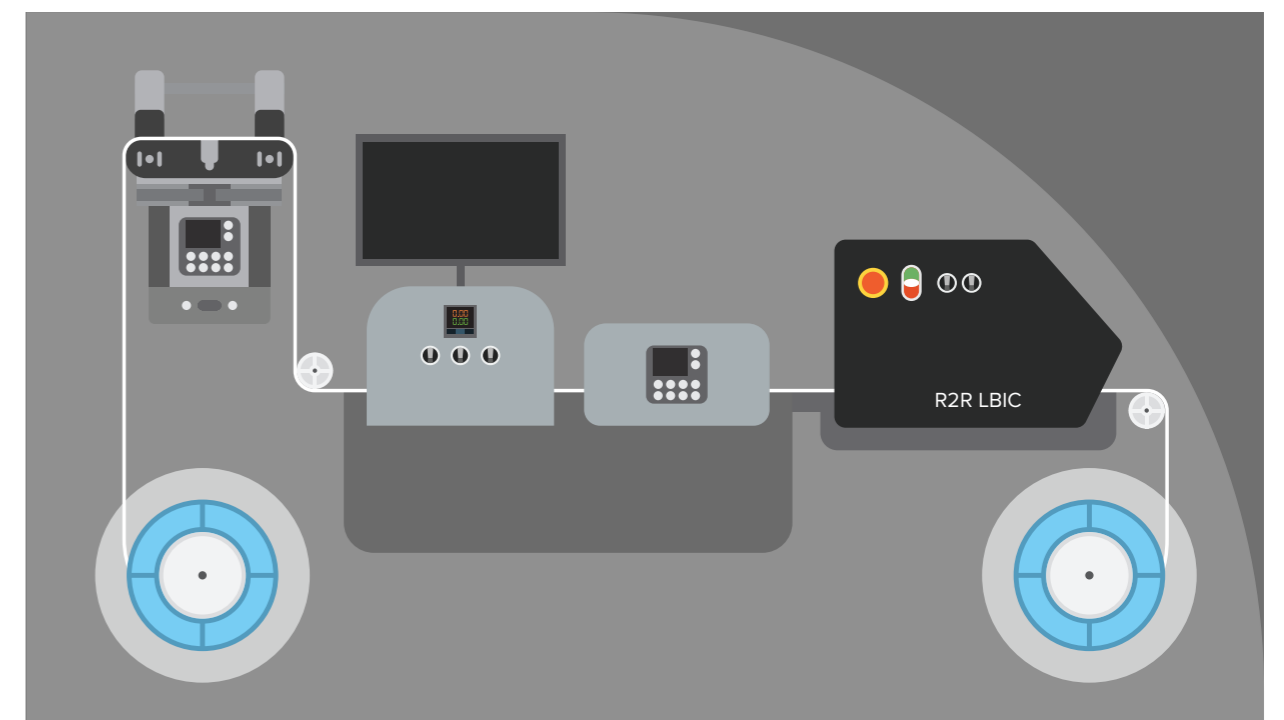
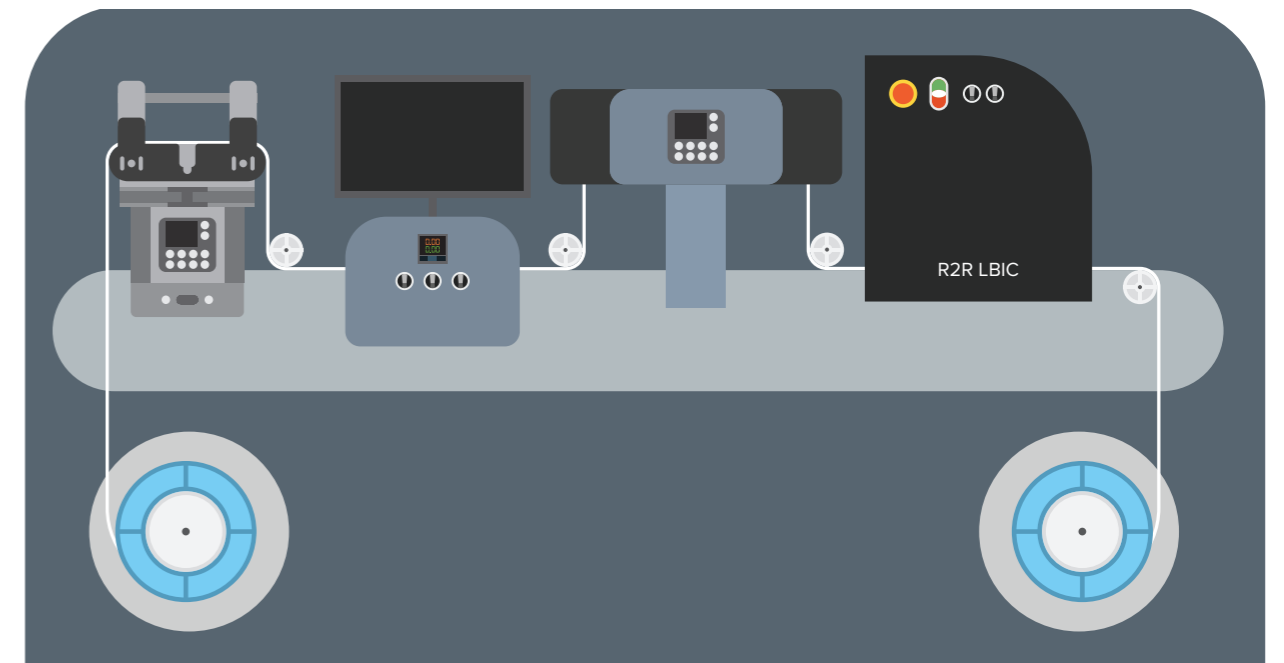


### Flexible Integration and Proven Reliability

Supporting foil widths up to 2100 millimeters, resolutions down to 40 microns, and web speeds up to 90 meters per minute, the *R2R LBIC* fits seamlessly into research or industrial environments. Its compact, self-contained design requires only a standard power connection and integrates easily into existing or new production lines. Developed over a decade of European research projects, it provides a reliable, production-ready solution for scaling printed solar cell manufacturing.

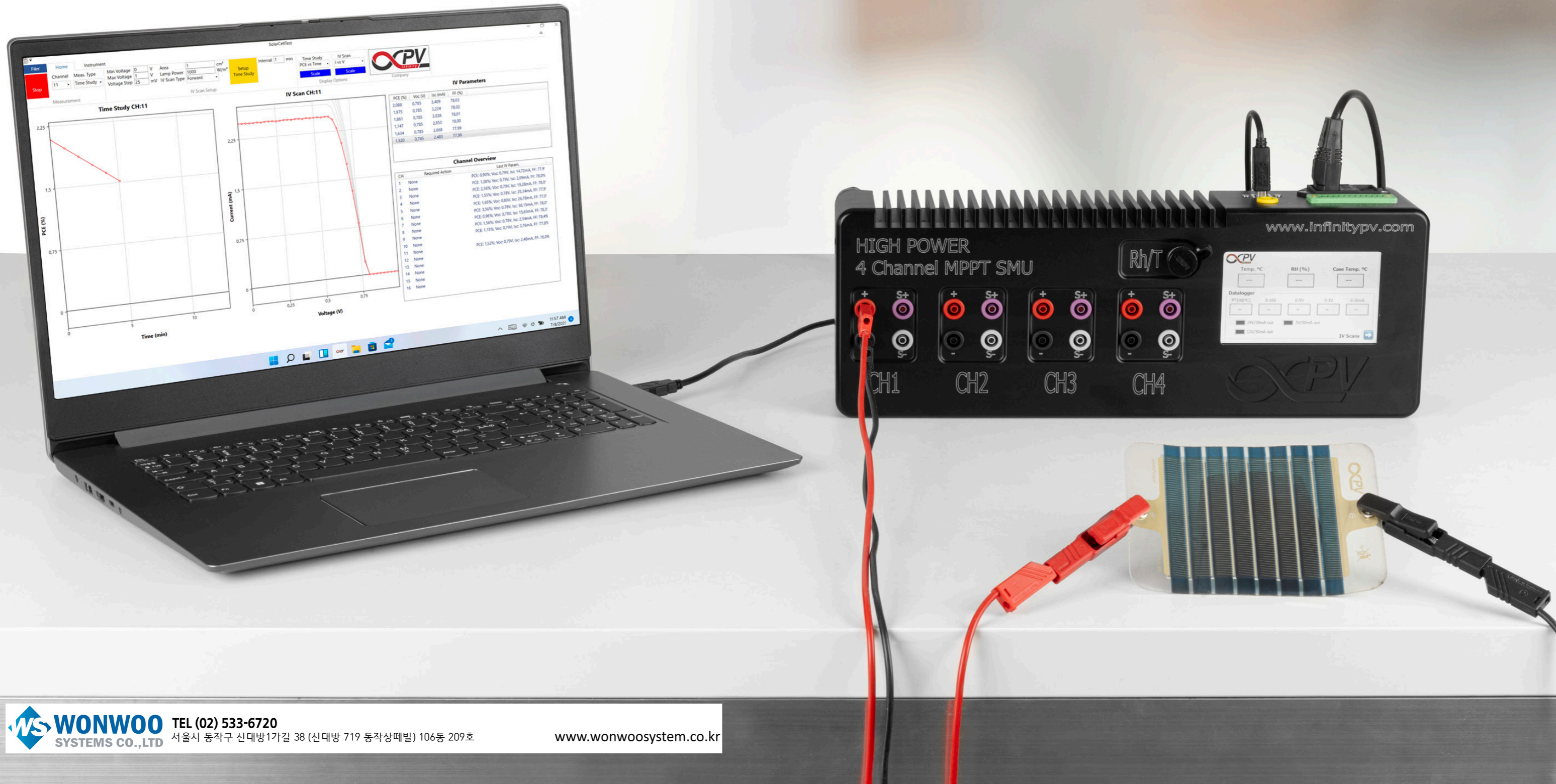
## Designed To Integrate With Your Machine

The *R2R LBIC* is designed for seamless integration into virtually any roll-to-roll setup, whether as a stand-alone unit with its own unwinder and rewinder, as an add-on to existing production lines, or as a fully integrated component within OEM machinery. Its compact, self-contained design ensures minimal infrastructure requirements, while its flexible interfacing and standardized software make it straightforward to retrofit into established equipment or to incorporate directly into new production systems. This versatility allows manufacturers to adopt *LBIC* technology at the stage most suited to their needs—whether testing the system independently, upgrading existing lines, or embedding it in next-generation roll-to-roll platforms.



# LBIC Combined with Source Measure Unit

Integrating the *LBIC* with infinityPV's *Source Measure Units* enables simultaneous, high-resolution mapping of solar cell performance and precise electrical characterization. Together, they provide real-time insight into efficiency, defects, and processing effects, streamlining research and quality control.



## Technical Specifications

### LBIC

Item	Technical Parameter
Test Area	250 x 250 mm <sup>2</sup>
Mapping Resolution (μm)	<100
Laser Spot Size	~40 μm
Laser Wavelength	400 - 1100 nm
Mapping Speed	Seconds - minutes
Number of Lasers	Up to 4
Field Modulators	Yes
Preamplifiers	Yes
Light Bias	Yes
Modulation of Light Source	Yes
Electrical Bias	Optional

### Roll-to-Roll LBIC

Item	Standard Value	Limit
Foil Width	350, 700, 1050 mm	2100 mm
Foil Length	1000 m	Infinite
Resolution	100 μm	40 μm
Web Speed	2	90
Laser Wavelength	450	1050
Image Face	Bottom	Top
Integration Distance	Foil width	1/2 Foil width
Integration Volume	2.0 x foil width cubed	1.5 x foil width cubed



### Pioneering Printed Electronics for Over 25 Years

We are infinityPV, a Danish company with a global footprint, pushing the boundaries of what's possible in printed and flexible electronics. Innovation and sustainability are at the heart of everything we do. We specialize in designing and manufacturing compact, state-of-the-art laboratory equipment that bridges the gap between research and industrial-scale production.

### What We Offer

Our product range includes high-precision slot-die coaters, roll-to-roll systems, and expertly engineered slot-die heads. These are tailored to support the development of advanced technologies such as flexible solar cells, printed batteries, fuel cells, LEDs, OLEDs, sensors, and pharmaceuticals. With deep-rooted expertise in slot-die coating and roll-to-roll processing, we deliver more than just equipment—we enable the future of electronics and materials science.

### Our Commitment

We understand that every project is unique, and we are committed to meeting your specific needs. With a well-stocked inventory, we ensure fast access to essential components and materials. We invite you to visit our production site and experience our solutions firsthand before making any commitments. Customer satisfaction is our priority. We provide lasting support for all our products and clients, ensuring that spare parts are always available or quickly manufactured when needed. At infinityPV, we stand by our technology and our customers—we leave no one behind.

