

CELL

# LIVS

*(LINE I-V Scanner)*



**For quality screening. . . .**  
**For evaluation and analysis of**  
**deterioration or defects. . . .**



※本製品は、(独)産業技術総合研究所の研究成果を活用しています。(特許第4765052号)

**CELL SYSTEM Co., Ltd.**



## **LIVS (LINE I-V Scanner) PVC-3300T**

### **OVER VIEW**

This system, PVC-3300T, adopts a new measuring method which is different from many existing testers using solar simulator.

PVC-3300T is that,

- 1) a light-source head (linearly aligned LED's) moves from end to end over the entire light-receiving surface,
- 2) and the optical I/V characteristics of each linear division are measured sequentially at every step,
- 3) then using the information of the inner-surface distribution, that is of parameters obtained by scanning, PVC-3300T diagnoses and evaluates performance uniformity and detects defective points of the tested panel.

It is speedy; scanning time of entire surface of a 300mm x 300mm sized panel is about 10 seconds (\*1) (\*2).

(\*1) When measuring I/V under the following conditions: 5mm-scanning width x 60 lines and 200 steps per line.

(\*2) Display speed is not considered. Scanning time may change depending on response speed of the tested panel.

### **FEATURE**

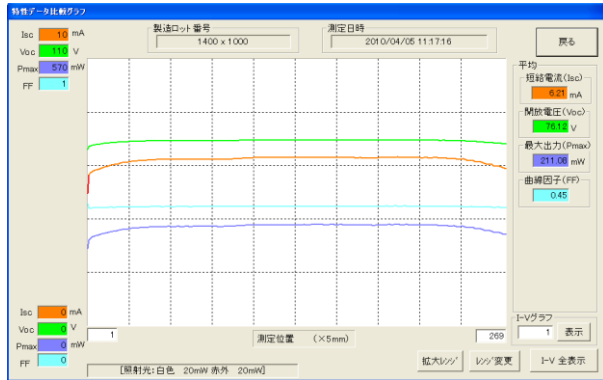
1. PVC-3300T can diagnose modules of up to the maximum testing size.
2. The light-source head scans the surface of a module. Then I/V characteristics of each line of the whole area will be measured and defective points are detected.
3. The light-source head is a combination of white and infrared LED's. This two-color combination enables to obtain the characteristics information in the depth direction of a thin film. (Different output power for each white and infrared LED's can be assigned.)
4. The irradiance of the light source is  $80\text{mW}/\text{cm}^2$ , that is 80% of a solar simulator ( $100\text{mW}/\text{cm}^2$ ).
5. It takes only about 10 seconds for scanning the entire 300mm x 300mm area.
6. Isc (short-circuit current), Voc (release voltage), Pmax (maximum output power), and FF (fill factor) are calculated in real time, so these characteristic values can be applied to Quality judgment at a production line.

## SPECIFICATIONS

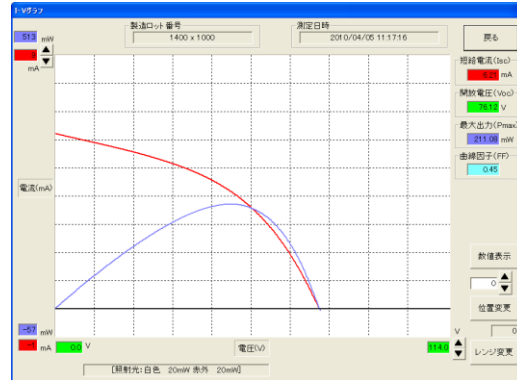
1. Test Object
  - Test Object Thin-film, Dye-sensitized, and Organic thin-film Solar cells
  - Max. Panel Size 300mm (L) x 300mm (W)
  
2. Voltage Generation Unit
  - Output Voltage -10V to +50V
  - Output Current -3A to +3A
  - Step Voltage 0.01V (Min. resolution ability)
  - Step Time Interval 20  $\mu$  sec. (Min. time)
  - Number of Steps Max. 600 steps
  
3. Measuring Unit
  - 3-1 Measuring items and Measuring range
    - Measuring Line Pitch 5mm (Line Pitch can set from 1mm)
    - Applied Voltage -10V to +50V (20  $\mu$  sec./sample)
    - Output Current -30mA to +30mA (20  $\mu$  sec./sample)  
-3A to +3A (when DARK I/V measured)
    - LED Drive Current (4ch) 0A to 1A (100m sec./sample)
    - LED Output Light (4ch) 0W to 1W (100m sec./sample)
    - LED Temperature 0 to 100 degrees C (100m Sec./sample)
  - 3-2 Saving Data
    - I/V Characteristics Data (I, V) x 600 steps x 60 lines
    - Characteristics Values (Isc, Voc, Pmax) x 60 lines
  
4. Light Source Unit
  - Lamp White and Infrared LED array
  - Irradiance 80mW/cm<sup>2</sup>
  - Driving Voltage MAX. 72V x 4ch
  - Driving Current MAX. 1A x 4ch
  - Profile Slit Light 5mm (W) x 370mm (L)  
The slit light of the 1mm width (option)
  - Control Mode ACC (Constant Current Control) or  
APC (Constant Power Control)
  - LED Cooling Air cooling
  
5. Scanning Unit
  - Scanning Method Movement of Light-source Head by AC servomotor
  - Scanning Speed Max. 50mm/sec.
  - Scanning Distance Max. 350mm
  
6. Others
  - Power Source AC100V 6A (0.6KW)
  - Dimensions 580 (W) x 851 (D) x 285 (H) mm
  - Weight 30kg or less

# MEASUREMENT EXAMPLES

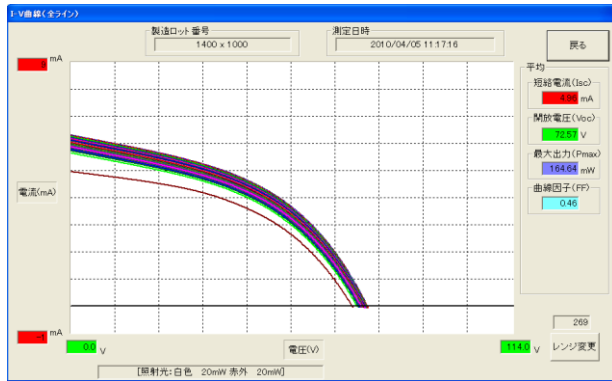
## 1. Comparison of Characteristics Data



## 2. I/V Curve



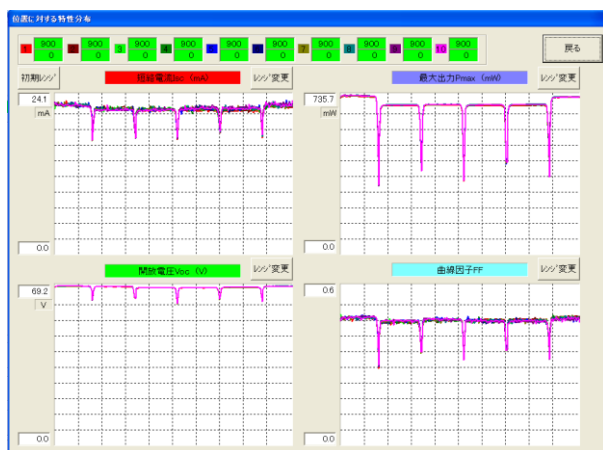
## 3. I/V Curve Comparison



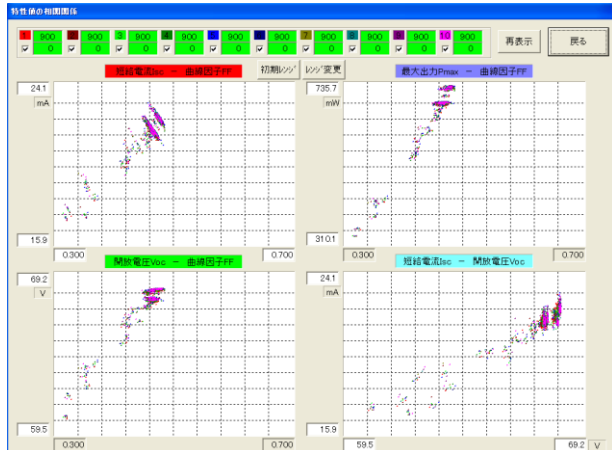
## 4. Numerical Display of Characteristics Values

	平均値	標準偏差	最小値	最大値
短絡電流 (Isc)	9.2135	0.0007	8.9240	9.2140
開放電圧 (Voc)	76.1256	0.0015	75.9770	76.4870
最大出力 (Pmax)	211.0777	0.0018	194.0250	216.0200
曲線因子 (FF)	0.4462	0.0015	0.4408	0.4572

## 5. Comparison of Characteristics Values for Locations



## 6. Correlativity among Characteristics Values



\* Specifications and design are subject to change without notice.

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