

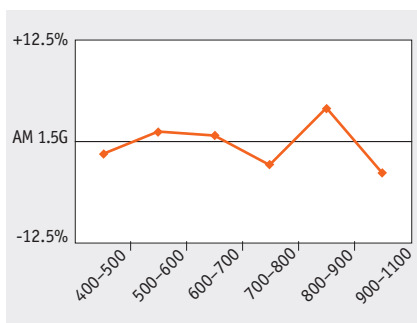
QuickSun[®] 130E

High-performance cell tester for laboratories and quality control

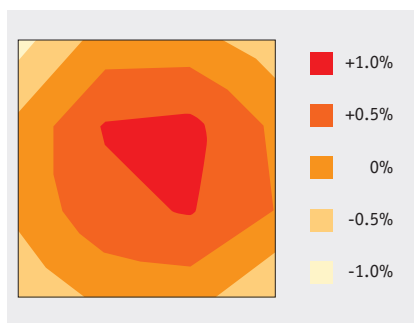


- ✓ Class A+A+A+ solar simulator
- ✓ Reliable results for the highest efficiency cells (PERC, HJT, IBC, bifacial)
- ✓ Test jig for bifacial cells
- ✓ Options: EL imaging, dark reverse IV, and temperature coefficients

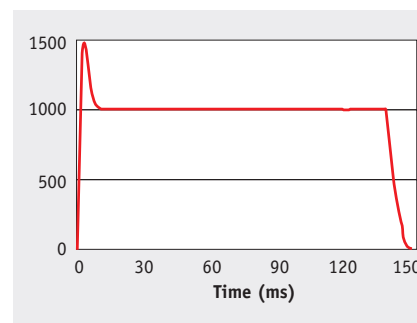
Spectrum: Class A+



Irradiance non-uniformity: Class A+



STI and LTI: Class A+

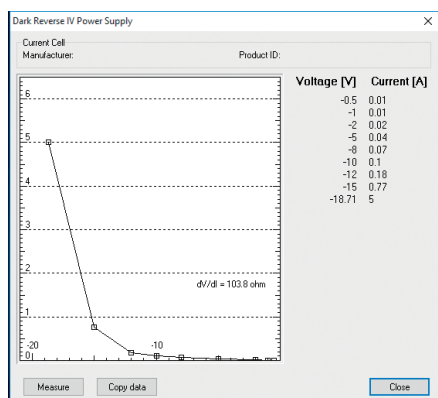


Endeas Oy

has been providing innovative testing technology to the PV industry since 2001. We satisfy the needs of our customers with precise, dependable, and easily operated equipment and expert support based on our profound understanding of photovoltaics measurement technology. The reliability of our solutions is proven by more than 550 systems delivered worldwide.

QuickSun 130E is a versatile manually operated Xenon flash simulator for testing both ordinary and high capacitance crystalline silicon solar cells. A detailed test report is included with every simulator, proving class A+A+A+ performance with respect to spectrum, irradiance non-uniformity, and short-term instability (STI). The Xenon technology spectrum is continuous, from 300 nm up to 1,200 nm, and it complies without any reservations with the future standard IEC 60904-9 Ed.3. Long-term instability (LTI) is also within class A+ tolerances during the 100 ms long flash pulse – even the high efficiency and capacitance IBC and HJT modules can be measured accurately by applying the Capacitance Compensation (CAC) method.

Manually operated Kelvin contacted test jig is easily adjustable for crystalline silicon cells having four to six busbars. The cell support plate of the test jig has a very low reflectance making the test jig suitable for bifacial cells.



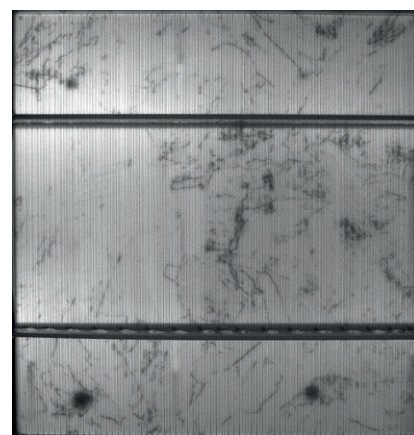
and IEC 60891 ed.2 while QuickSun software measures IV characteristics at different temperatures.

Dark reverse IV characteristics can be measured with the DR-IV option providing information both on shunt and avalanche characteristics at elevated reverse voltages.

EL imaging instrumentation can be easily integrated with the basic QuickSun 130 E. Better than 100 μm pixel resolution images are recorded with an exposure time of a few seconds.

Extended test area up to 32 x 42 cm, e.g. for testing also mini modules, is available. Irradiance non-uniformity is measured with a 2 x 2 cm^2 sensor

which guarantees that also thin film samples which typically have small area cells will be measured accurately. Flash pulse duration and throughput are optimized for each case individually.



Temperature correction coefficients can be measured when the test jig is equipped with an optional controller for heating the cells up to 70 °C. Correction coefficients are calculated and evaluated automatically as described in the stand-

Key characteristics

Test area	160 mm x 160 mm	Customizable up to 320 mm x 420 mm
Contacting	4-wire / Kelvin	4 – 6 busbars, bifacial
Load	Feedback controlled MOSFET	Adjustable bias 0 – 4.5 V
Voltage sweep	Isc -> Voc, Voc -> Isc	Capacitance Compensation (CAC) method
Voltage measurement	1 – 4 V (other scales on request)	Accuracy better than 0.2 %
Current measurement	0.5 – 25 A (other scales on request)	Accuracy better than 0.2 %
Flash pulse length	100 ms	LTI A+
Irradiance control	200 – 1200 W/m ²	Resolution 1 W/m ²
Cell temperature control	RT – 70 °C	Accuracy 1 °C
Pmp repeatability	(max-min) / (max+min) < 0.25 %	Stdev σ < 0.1 %
Average flash tube lifetime	500 000 flashes	
Operation temperature	15 – 35 °C	
Mains	1~, 110 / 230 Vac, 20 / 10 A, 50-60 Hz	