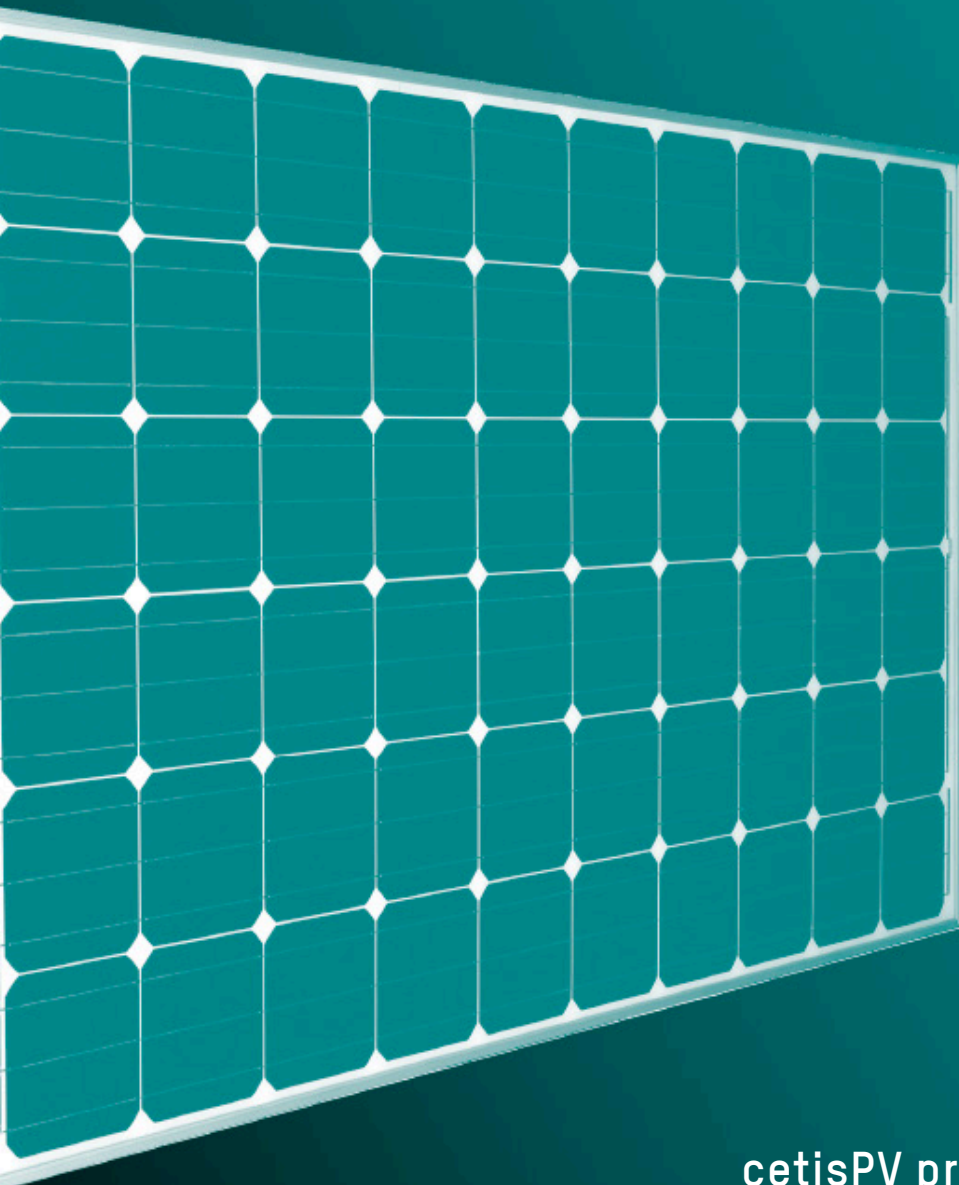




cetisPV- Moduletest3

Class A+A+A+ high-precision
lab tester system for IV measurements
of solar modules



cetisPV product line



Configuration example

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The **cetisPV-Moduletest3** is an IV measurement system developed for high-end R&D, laboratory and quality control demands. The system includes the solar simulator, the IV measuring system and an optimized dark chamber.

The programmable pulsed solar simulator provides highly stable irradiance output over long flash times from a single light source. Combined with the h.a.l.m. IV curve tracer, this system is designed to match the demands of current and up-coming solar cell technologies.

The system is controlled by the versatile **PVControl** software, allowing instant, in-depth data analysis. h.a.l.m.'s advanced hysteresis feature ensures steady-state data evaluation free from capacitance effects even for highest efficiency modules.

The optional **cetisPV-EL3-M**, a high-power electronic load, extends the measuring range of the curve tracer to allow module dark IV measurements, precise measurements in low current ranges and better evaluation of series resistance. All systems can be equipped with additional electroluminescence imaging solutions and a temperature controlled test chamber.

Technical specifications

Cycle Time	20 s
Flash duration	up to 110 ms
Flash profiles	single, double, triple level, ramp
Repeatability (standard deviation)	Isc and Voc $\leq \pm 0.1\%$ / Pmpp and FF $\leq \pm 0.15\%$
Measurement resolution	$< 0.004\%$ (3 synchronous 16-bit channels for voltage, current and irradiance)
Measurement accuracy	$< 0.05\%$ FSR for current and voltage measurements
Voltage measurement ranges	-16 bis +12,5/+25/+50/+125/+250 V $\pm 4 / \pm 8 / \pm 20 / \pm 32 / \pm 56 / \pm 80 / \text{ca. } \pm 140$ V (with optional cetisPV-EL3-M)
Current measurement ranges	+20/+10/+4/+2/+1/+0,5/+0,2/+0,1 A $\pm 20 / \pm 10 / \pm 4 / \pm 2$ A / $\pm 160 / \pm 80 / \pm 32 / \pm 16$ mA (with optional cetisPV-EL3-M)
Standard illumination area	up to 2,100 mm x 1,400 mm
Dimensions of dark chamber incl. flasher	4,000 mm x 3,500 mm x 2,500 mm (L x W x H)
Spectral match*	0.9 – 1.1 (class A 0.75 – 1.25)
Non-uniformity of irradiance*	$< 1\%$ (class A $\leq 2\%$)
Short-term instability of irradiance*	$< 0.05\%$ (class A $\leq 0.5\%$)
Long-term instability of irradiance*	$< 0.5\%$ (class A $\leq 2\%$)
Lamp lifetime (guaranteed/typical)	100,000 / 300,000 flashes
Optional packages	EL imaging, temperature-controlled dark chamber

*IEC 60904-9 Ed. 2 Technical data are subject to change without notice.

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