

Solmetric PV Analyzer™

PV Analyzer
I-V Curve Tracer
SolSensor™
Wireless PV Reference Sensor

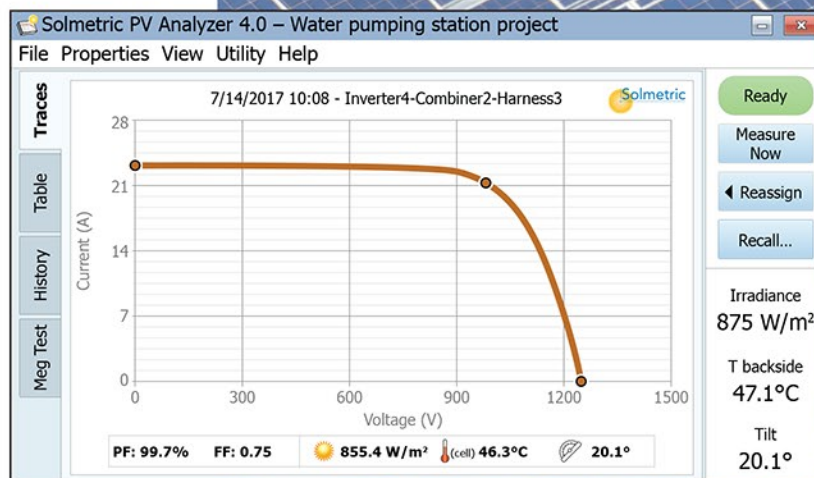
Measure your Return On Irradiance™

Save time, reduce risk, and maximize ROI during:

- Commissioning
- O&M
- Auditing
- Troubleshooting

Industry Leading Features

- Highest measurement throughput, even in hot environments.
- Best I-V accuracy & resolution.
- Best irradiance & temperature accuracy.
- Most reliable Go/NoGo testing.
- 300 ft wireless range.
- Largest user interface and clear visualization of performance issues.



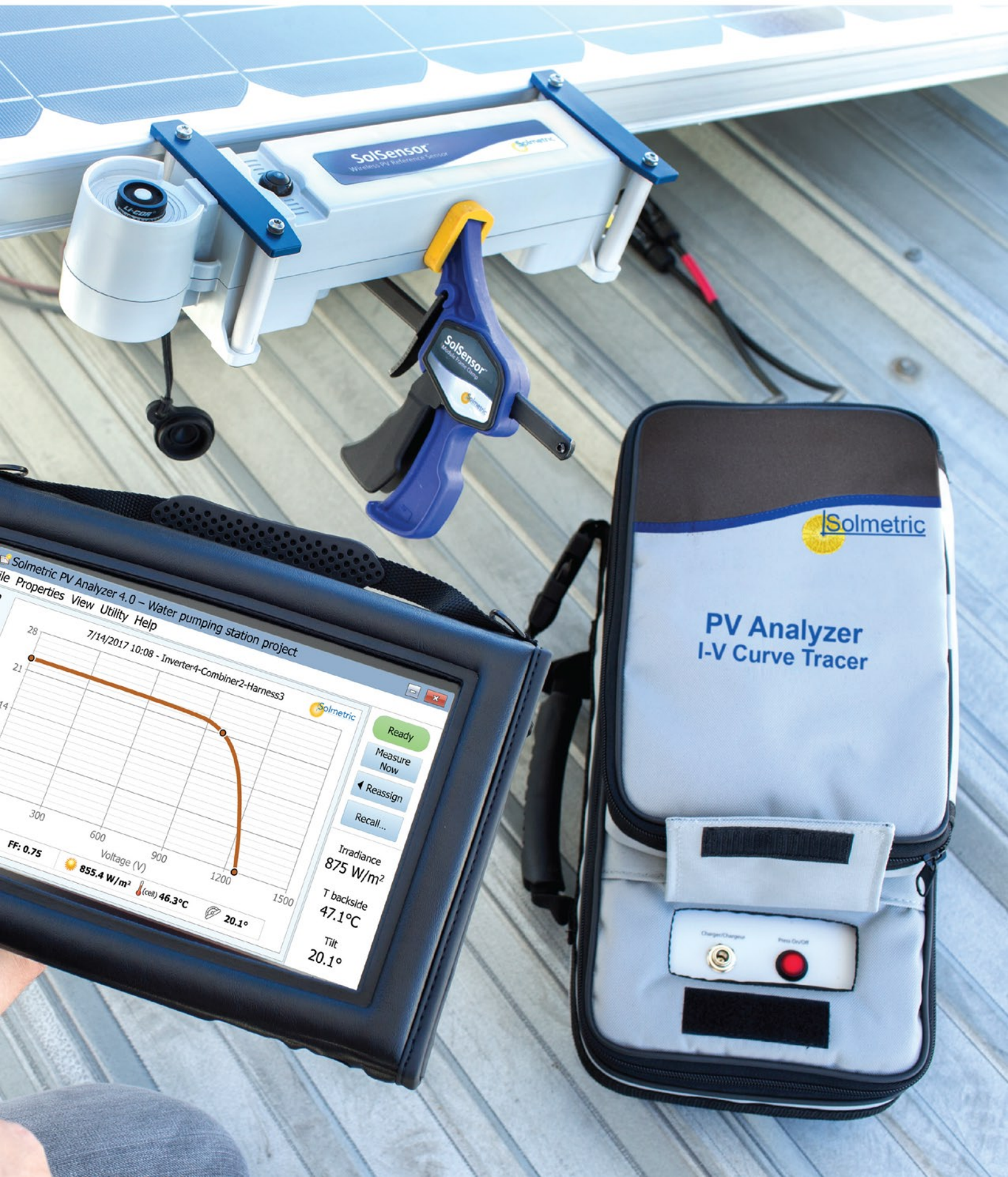
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EFFICIENCY
STRINGS



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PV Array Commissioning | O&M | Auditing | Troubleshooting



I-V Curve Measurement

The I-V curve measurement provides I_{sc} , V_{oc} , I_{mp} , V_{mp} , P_{max} , Fill Factor, and Performance Factor (the ratio of measured to expected maximum power).

The measurement is typically performed at a combiner box, using the fuses to select the string under test.

I-V Curve Accuracy and Detail

The design of the PVA is optimized to accurately measure both standard and high efficiency modules, and the number of I-V curve points can be switched from 100 to 500 for demanding applications.

Setup

1. Deploy SolSensor
2. Open DC disconnect
3. Lift string fuses
4. Clip test leads to buss bars

Measurement

5. Insert a fuse
6. Measure I-V curve
7. Save result
8. Repeat for next string...

High Throughput in Hot Conditions

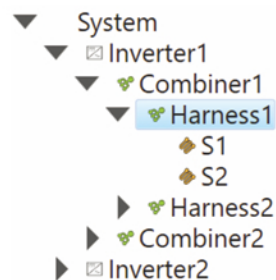
All I-V curve tracers absorb energy with each measurement. The PVA's high thermal capacity allows it to commission 3.5 MW of PV in an hour without overheating, even in environments exceeding 110°F ambient.

Time-Saving Interface

With a tablet PC as your user interface, perform more tests per hour and display the data in multiple, easy to read formats.

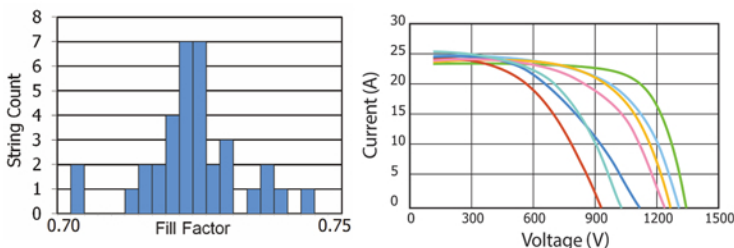
Save your measurements by touching your customized array tree at the branch you are measuring.

The software automatically calculates the expected I-V curve and displays the Performance Factor.



Data Analysis and Reporting

The I-V Data Analysis Tool, provided with the PVA, automates the process of preparing detailed, professional reports of your measurement results. The tool generates a table of the key performance parameter values for each string, group I-V graphs for each combiner box, and histograms showing how the data for each parameter is distributed.



SolSensor

Wireless PV Reference Sensor

SolSensor provides irradiance, temperature, and module tilt data to the PV model.

The model uses this information to predict the I-V curve shape at operating conditions, and to translate the measured curve to STC.

SolSensor clamps to the module frame, automatically orienting the irradiance sensor in the plane of the array.



Irradiance Accuracy

The spectral response of SolSensor's silicon photodiode sensor is corrected for the PV technology under test. Special factors are provided for multi- and mono-crystalline cells as well as CdTe and other thin film technologies. The sensor is temperature compensated and the angular response of each unit is calibrated for rotation and elevation.

As a result of these features, SolSensor makes accurate irradiance measurements over a broad range of technologies, sky conditions, and sun angles, allowing I-V curve measurements earlier and later in the day.

Temperature Accuracy

SolSensor provides two external thermocouple inputs for measuring module backside and/or ambient temperatures. Effective cell temperature can also be calculated directly from the measured I-V curve using methods described in IEC 60904-5.

The PVA's **SmartTemp** feature blends these two methods for best advantage. Temperature is calculated from the measured I-V curve at high irradiance, taken from the thermocouple at low irradiance, and derived from a blend of the two at intermediate irradiance values.

Wireless Interfaces

The PVA communicates with your PC by Zigbee (PVA-1000) or wifi (PVA-1500). The SolSensor has a line of sight wireless range of 100 meters.




That means no wires underfoot, quick setup, and the ability to move around while troubleshooting strings. Measure multiple combiner boxes with a single SolSensor setup.



GENERAL INFORMATION

Characteristic	Description
High-efficiency PV Modules	Engineered to accurately measure high-efficiency, as well as standard, PV modules & strings.
User Interface	Bright, colorful graphics and touch screen controls for operator efficiency, ease-of-use, and in-field analysis. Runs on user's Windows tablet or laptop.
Wireless Interfaces	Wireless interface between user's tablet or laptop, I-V unit, and SolSensor.
Advanced PV Models	Accurately predicts performance at operating conditions. Checks your results immediately.
Equipment Database	Models for 70,000+ PV modules with automatic updates. Ability to create custom modules.
Included in PVA Kit	I-V Unit, SolSensor, Windows application, Alligator test leads, MC-4 tool, Chargers, Data Analysis Tool, SolSensor clamp, 2 thermocouples plus adhesive discs, Sensor cleaning supplies.
Options	Transit case (included with PVA-1500HE), Field charging kit, Training.

SPECIFICATIONS

	PVA-1000	PVA-1500V4	PVA-1500T	PVA-1500HE
Voltage Range (Voc)	20 to 1000V DC	20 to 1500V DC		
Voltage Accuracy	±0.5% ± 0.25V			
Current Accuracy	±0.5% ± 0.04A			
I-V Trace Points	100 or 500 Selectable			
I-V Sweep Duration	0.05 to 2s. Typically 0.2s for PV Strings.			
Operating Temperature (ambient)	32 to 113°F (0 to +45°C)			
Interface to Tablet or Laptop	Wireless USB	WiFi		
Weight	14 lb			16 lb
Dimensions	17" x 8.5" x 6"			21" x 8.5" x 6"
Safety and Regulatory	  CAT III 1000V	 CAT III 1500V		
Maximum Current (Isc)				
Module Efficiency <19%	20/30A DC	30A DC		
Module Efficiency ≥19%	10A DC *			30A DC
Measurement Throughput				
Sweep-to-sweep delay (@Voc ≤ 1350V)		<18s	<9s	
Max # I-V sweeps per hour (@Voc ≤ 1350V)		200 sweeps/hr	400 sweeps/hr	
Max megawatts measured per hour **		2.6 MW/hr	3.5 MW/hr	
Thermal Capacity--# I-V Sweeps Before PVA Must Cool Down **				
77°F Ambient, 18s Sweep-to-sweep delay		800	Unlimited	
77°F Ambient, 9s Sweep-to-sweep delay		N/A	Unlimited	
113°F Ambient, 18s Sweep-to-sweep delay		225	450	
113°F Ambient, 9s Sweep-to-sweep delay		N/A	330	
SolSensor				
Irradiance Accuracy	±2% Typical (600 to 1500 W/m ² , Si cells)			
Cell Temperature Accuracy	±2°C Typical, SmartTemp Method			
Tilt Accuracy	±2° Typical (0 to 45°)			
Update Interval	Irradiance: 0.1s, Temperature: 1s			
Wireless Range	100m (Open line of sight)			

* Strings of high efficiency modules ≥19% efficiency cannot be measured in parallel or have a current over 10A.

** Assumes reference PV system with Voc = 1300V, Vmp = 1100V, Imp = 25A, 16 strings per combiner, 5 min to move to next combiner with no measurements. No direct sunlight on I-V unit.