

# Solmetric PV Analyzer™

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

### Measure your Return On Irradiance™

Save time, reduce risk, and maximize ROI during:

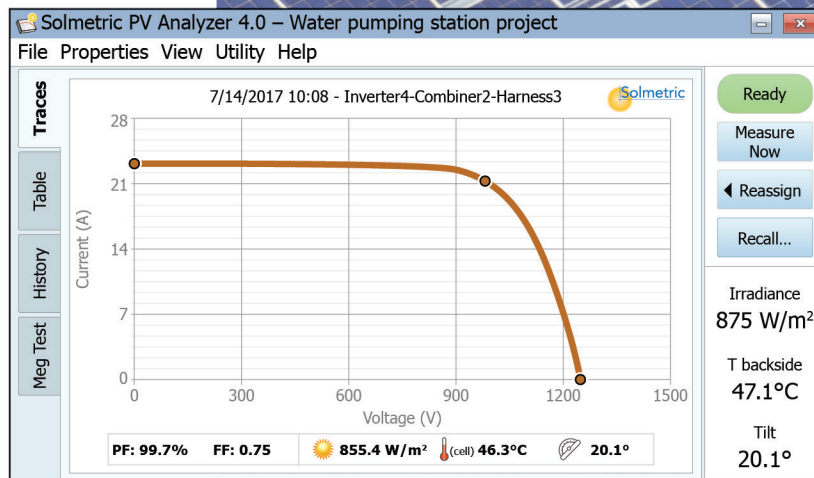
- Commissioning
- O&M
- Auditing
- Troubleshooting

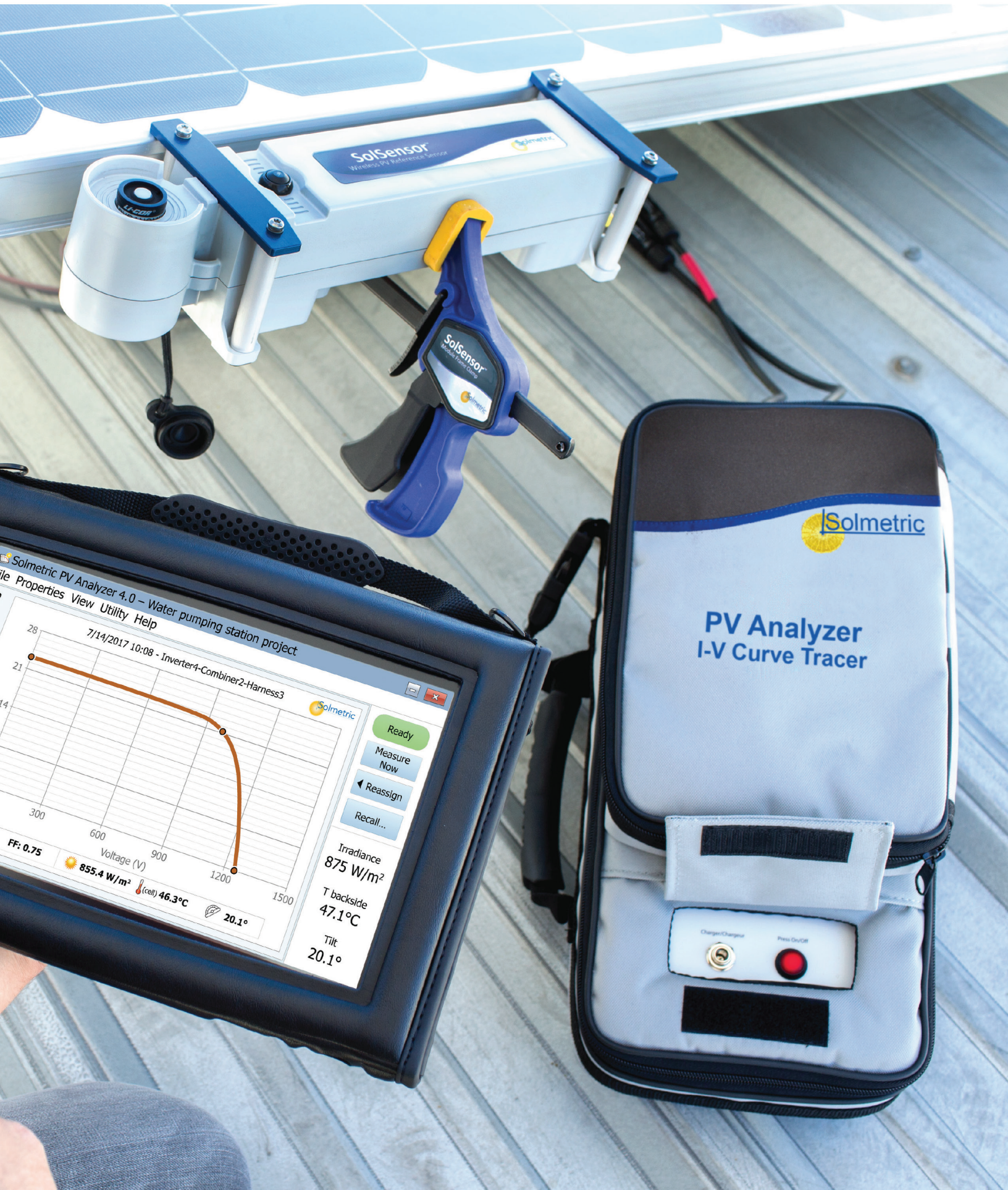
#### Industry Leading Features

- 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.



**New!**  
**1500V**  
**30A**





SolSensor  
Wireless PV Reference Sensor

SolSensor  
Handheld Field Clamp



Solmetric

PV Analyzer  
I-V Curve Tracer

Charger/Chargent

Press On/Off

## 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.

### 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...

## I-V Curve Accuracy and Detail

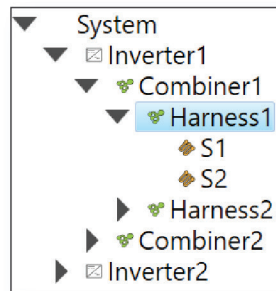
The design of the PVA is optimized to accurately measure both standard and high efficiency modules, and the number of I-V curve points can be switched from 100 to 500 for demanding applications.

## 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 1 MW in less than 2 hours without overheating, even in environments exceeding 110°F ambient.

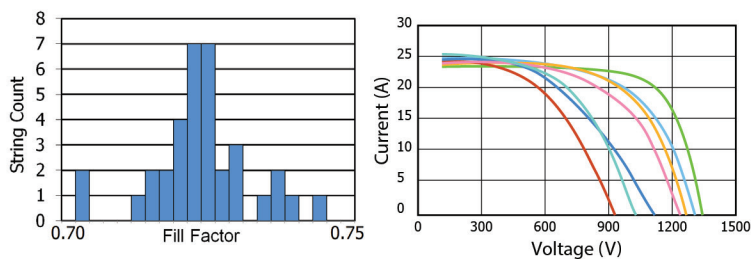
## Time-Saving Interface

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 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.



### PV Analyzer Includes:

- I-V Measurement Unit with shoulder strap
- PVA Software for Windows™
- Alligator clip test leads
- MC-4 to MC-4 ‘connector savers’
- MC-4 connector tool
- Battery charger (AC adapter)
- Data Analysis Tool




### SolSensor Includes:

- Sensor unit
- Module Frame Clamp
- Ruggedized K-type thermocouples (2)
- Thermocouple attachment adhesive discs (50)
- SolSensor tool lanyard
- Irradiance sensor cleaning supplies
- Shoulder bag

## General Information

Characteristic	Description
<b>High-efficiency PV modules</b>	Engineered to accurately measure high-efficiency as well as standard PV modules and strings.
<b>User interface</b>	Bright, colorful graphics and touch screen controls for operator efficiency, ease-of-use, and in-field analysis. Runs on user's standard Windows laptop or tablet.
<b>Wireless interfaces</b>	Wireless interface between your PC and the I-V Measurement unit and between I-V unit and SolSensor.
<b>Advanced PV models</b>	Accurately predicts performance at both STC and current conditions. Checks your results immediately.
<b>Equipment databases</b>	Models for 50,000+ PV modules. Automatic updates.
<b>High Throughput</b>	Measure 1MW in less than 2hrs at 110°F ambient.
<b>Thermal Capacity</b>	>800 measurements at 25°C ambient, 250 measurements at 45°C ambient, in example PV systems with 1300V Voc, 16 strings per combiner, and 5 min. to move to next combiner.

## I-V Specifications

Parameter	PVA-1000	PVA-1500
<b>PV voltage range</b>	0–1000 V	0-1500 V
<b>Current range</b>	0-20 A, 0-30 A	0-30 A
<b>Voltage accuracy</b> (0 to 45°C ambient)	±0.5% ± 0.25 V	
<b>Current accuracy</b> (0 to 45°C ambient)	±0.5% ± 0.04 A	
<b>Resolution</b>	25 mV, 2 mA	
<b>Current resolution</b>	2 mA	
<b>Measurement cycle time</b>	4-5s typical, measurement-to-measurement	
<b>I-V sweep duration</b>	0.05 - 2s. Typically 0.2s for PV strings.	
<b>I-V trace points</b>	100 or 500, user selectable	
<b>Operating temperature</b> (ambient)	-10 to +45°C	
<b>Battery life</b>	8 hrs continuous operation, 1000 I-V curves	
<b>Protection features</b>	Over-voltage, -current, -temperature, and reverse polarity	
<b>Safety</b>	CAT III, 1000 V  	 CAT III, 1500V



### Headquarters

117 Morris St.  
Sebastopol, CA 95472  
www.solmetric.com  
email: info@solmetric.com  
Tel: +1-707-823-4600  
Fax: +1-707-823-4620

Printed on recycled paper.

## SolSensor Specifications

Parameter	Value
<b>Irradiance accuracy</b>	±2% typical (100 to 1,500 W/m <sup>2</sup> , silicon cells)
<b>Cell temp. accuracy</b>	±2°C typical, <b>SmartTemp</b> method
<b>Tilt accuracy</b>	±2° typical (0-45°)
<b>Measurement interval</b>	Irradiance: 0.1s Temperature: 1s
<b>Wireless range</b>	100m (open line of sight)
<b>Operating temp</b>	-10 to +45°C