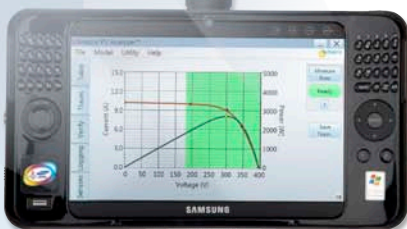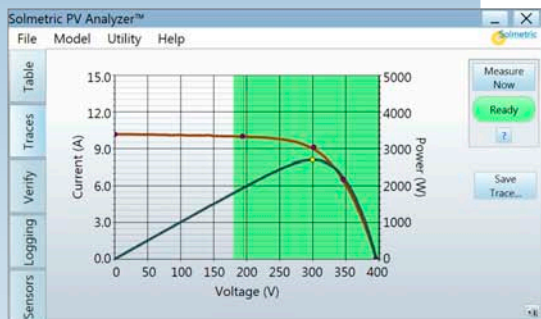# Solmetric® **PV Analyzer**™

Measure a PV string in seconds

- One electrical connection
- One measurement
- Complete performance verification

Fast and Accurate Performance Verification

- Commission new PV arrays with confidence
- Troubleshoot arrays quickly
- Demonstrate fulfillment of contract obligations
- Record an array performance baseline

I had the great fortune of learning about PV through the eyes of an IV curve tracer. I consider that education a critical part of my success in understanding and troubleshooting how PV systems operate. Now that these devices are so much more affordable, there is no good reason to not get one.

—Bill Brooks

PC not included

Key Features

- I-V curve tracing
- Built-in predictive models for performance evaluation
- Irradiance and temperature measurement options
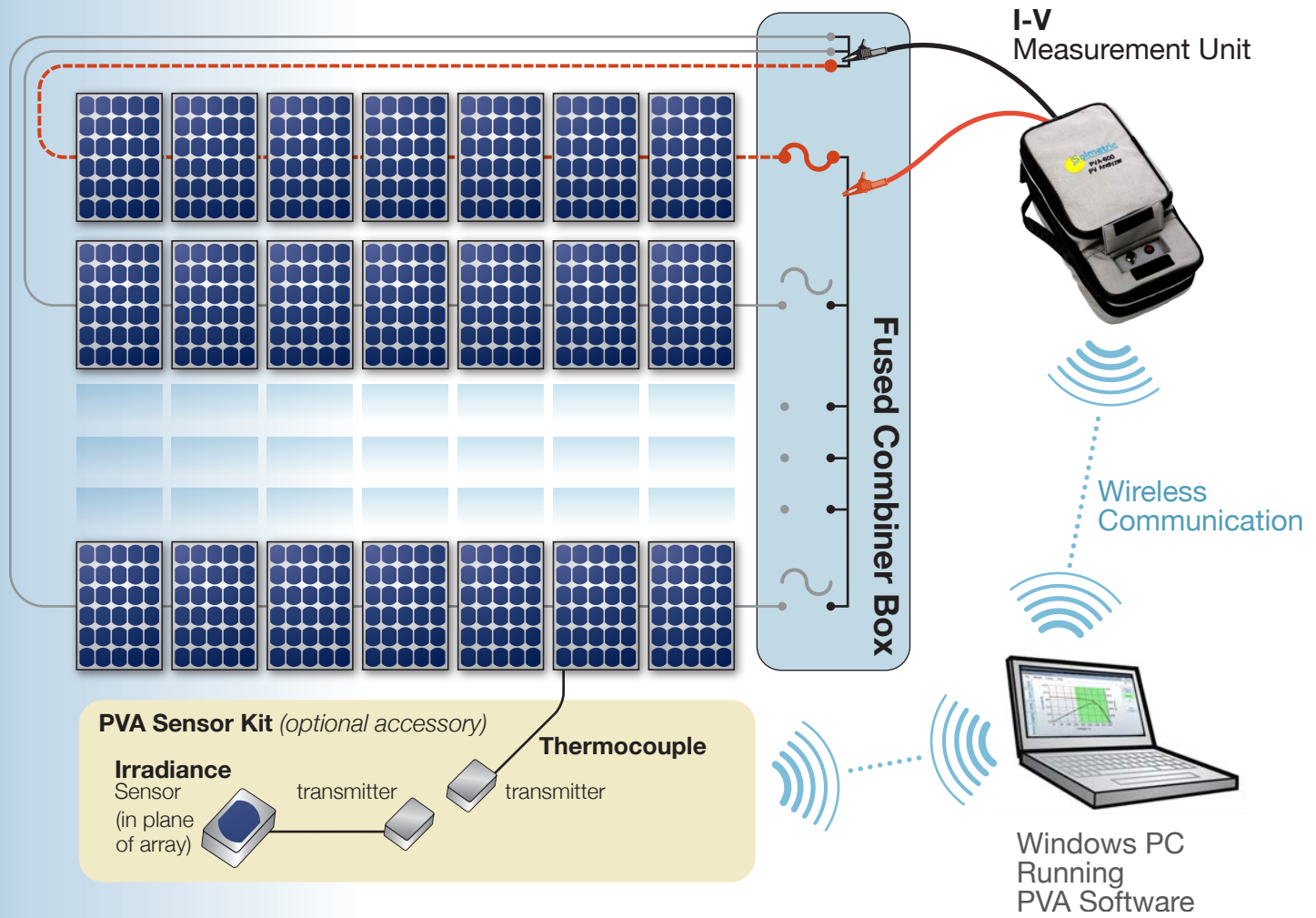- Wireless convenience and flexibility
- 600V, 20A

Solmetric

**Expert Tools.
Better Solar.**

See all our solutions at
www.solmetric.com

Courtesy Chevron Energy Solutions, © 2011

Application Setup

Testing one string at a time at a fused combiner box

I-V
Measurement Unit

Fused Combiner Box

Wireless
Communication

Windows PC
Running
PVA Software

PVA Sensor Kit *(optional accessory)*

Irradiance
Sensor
(in plane
of array)

transmitter

Thermocouple

transmitter

Irradiance and Temperature

Measuring the irradiance and temperature along with the I-V curve allows deeper analysis of array performance. The **PVA-600** provides multiple options.

1. Wireless Sensor Kit

The accessory Wireless Sensor Kit automatically captures sensor data at the time the I-V curve is measured. This saves time, reduces errors, and improves measurement accuracy under changing atmospheric conditions. (Irradiance and temperature can also be entered manually.)

2. "Array-as-sensor" mode

In some applications it is an advantage to automatically calculate the irradiance, the temperature, or both from the measured I-V curve. This allows detailed comparison of measured and predicted curve I-V curve shape, even under changing irradiance and temperature, and requires no external sensors.

PV Analyzer User Interface
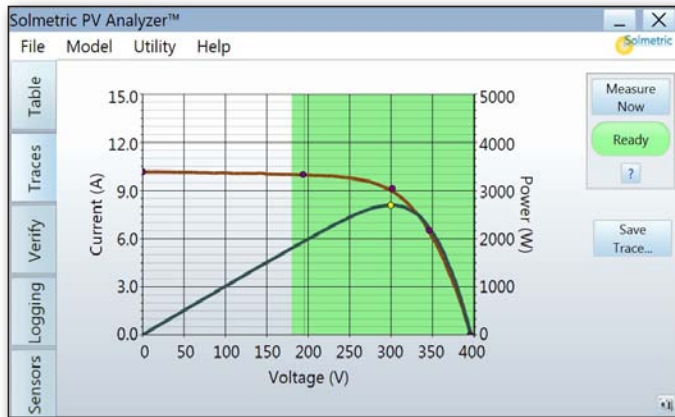
I-V and P-V curves of a healthy PV string. Inverter MPPT voltage range is highlighted in green.
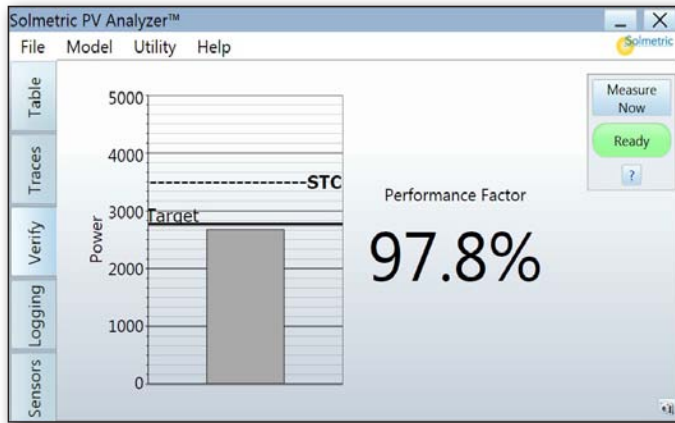
Display of measured versus predicted maximum power values.

Tabular summary compares predicted and measured results. "Snapshot" function allows comparison of multiple results as an aid to troubleshooting.

Setting up built-in PV models for comparison with measurement results.

PV Model Choices

Performance evaluations always require comparison of measured results with a reference. For installed PV arrays, the reference is a PV model. The **Solmetric PV Analyzer** compares measured and modeled array performance, taking into account the existing irradiance and temperature.

Three built-in models ensure coverage of all types of PV modules:

1. Sandia model

- The most comprehensive PV model
- Developed by Sandia National Laboratories
- Based on module measurements taken in independent laboratories
- Accounts for all performance-related factors of a PV module

2. Five-parameter model

- Developed by U. Wisconsin Solar Energy Lab
- Obtained from CEC NSHP program
- Based on independent lab measurements
- Broader range of covered PV modules

3. Single-point model

This model predicts the maximum power voltage and current at the existing irradiance and temperature. Based on data sheet STC values, this model can be used with almost any PV module with basic specifications.

Solmetric® **PV Analyzer**™

General Information

Characteristic	Description
High efficiency PV modules	Solmetric's I-V measurement technology is specially designed to accurately measure high-efficiency, back-contact PV modules as well as standard modules.
Measurement range selection	Measurement circuitry automatically optimizes to best measure the PV module or string
Control & display unit	User-provided Windows computer, eg. laptop or tablet
PC to measurement unit interface	Wireless USB adaptor (provided)
Wireless range	10–50 meters depending on line of sight.
Module/Inverter data	On-board database with thousands of PV modules and inverters. Updates provided at Solmetric website.
Inverter limits	Maximum power tracking range of user-selected inverter is superimposed on the I-V graph as a reference check on the system design.
Carrying case	Measurement unit includes a factory-installed padded soft case, with handle, shoulder strap and accessory pouch.
Protection features	Automatic safeguards protect against damage from over-temperature, over-voltage, over-current, and reverse polarity.
Dimensions	16 in. x 8 in. x 5 in. (not including cable pouch or PV leads)

Electrical Specifications

Parameter	Value
PV voltage measurement range	0–600 V DC
PV current measurement range	0–20 A DC
Recommended minimum Voc	20 V DC
Recommended minimum Isc	1 A DC
I-V measurement cycle time	4s (typical)
I-V measurement time (I-V sweep)	80–240 ms
Measurement points per trace	100 (typical)
Ambient operating temperature range *	0 to +50 deg C
Storage temperature	-20 to +60 deg C
Battery life (continuous operation)	12 hours between charges
Charging time	6 hours
Safety	IEC-61010 △ CAT III, 600 V
Protection	Over-voltage, over-current, over-temperature