



PV Analyzer™ PVA-600

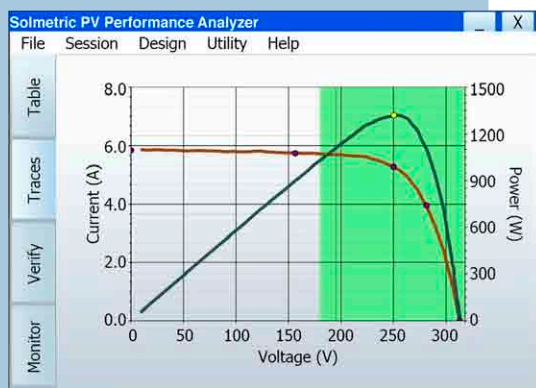
The Complete Verification Solution

That means:

- Confidence in DC performance at startup
- Smarter troubleshooting
- Faster installation and repairs
- Detailed history of array performance

Verify System Performance

The Solmetric **PV Analyzer** is a complete electrical test solution for verifying photovoltaic array performance. For each string, the analyzer measures current and power as a function of voltage. Measured results are compared to the performance predicted by advanced built-in models.



PC not included

Key Features

- I-V and P-V graphs
- Wireless convenience
- Advanced predictive PV models built-in
- Wireless irradiance and temperature sensors
- **Array-as-sensor** mode derives irradiance and cell temperature
- Inverter voltage range highlighted on I-V graphs
- Maximum input: 600V, 20A



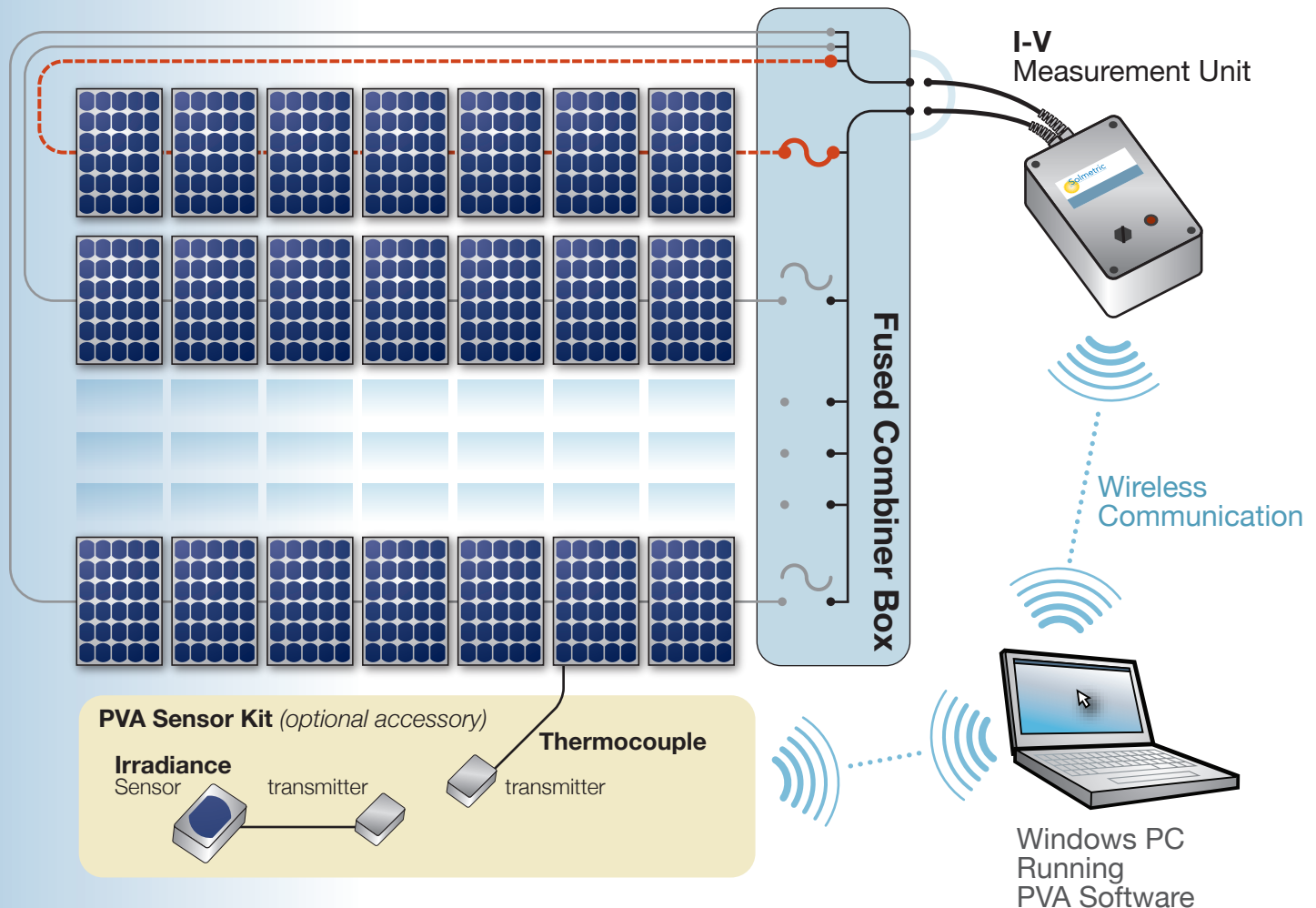
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PVA-600 Set Up, Irradiance and Temperature

Application Setup

Testing one string at a time at a fused combiner box



Measurement Modes

For accurate calculations of I-V and P-V curves, the irradiance and cell temperature must be known. The **PVA-600** obtains these values in three ways:

1. “Array-as-sensor” mode

In applications where the main objective is to demonstrate functionality and consistency among PV strings, the **PVA** extracts the irradiance and cell temperature mathematically from the measured I-V data.

- Convenient. Uses the array itself as the sensors, so external sensors are not required.
- Allows detailed comparison of the shapes of measured and predicted I-V curves, even under conditions of changing irradiance and temperature.

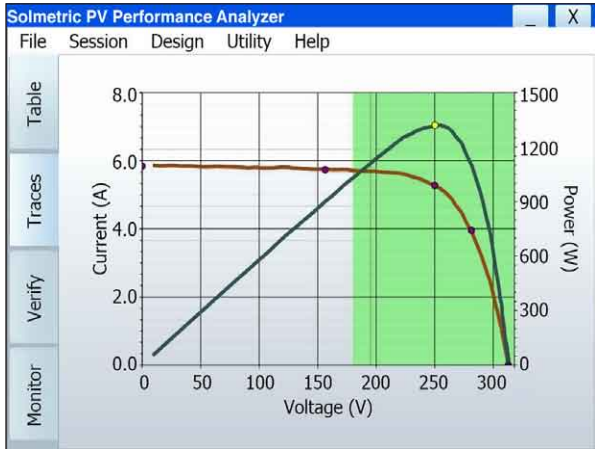
2. Manual entry by the user

If external sensors are available, sensor values can be manually entered. This method is suitable when irradiance and temperature are relatively stable.

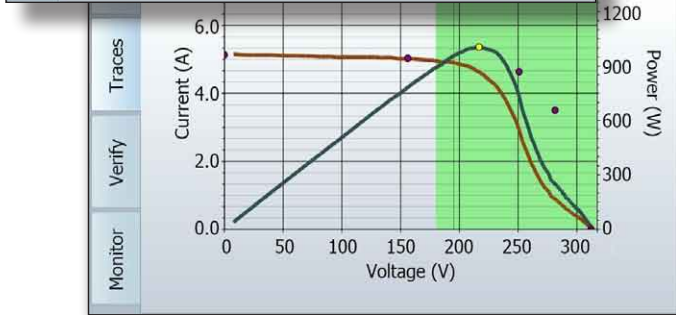
3. Measure using wireless sensors

With the **PVA Sensor Kit**, external sensors transmit the data wirelessly, improving the overall measurement accuracy under conditions of changing irradiance and temperature. A complete sensor kit is available as an accessory to support this mode.

PV Analyzer User Interface



I-V and P-V curves of a healthy PV string. Start/Stop inverter voltage range is highlighted in green.



I-V and P-V curves of a string with bypassed cell strings.

Active	Predicted		Snap Shots		
	Predicted	Measured	Meas 4	Meas 5	Meas 6
Pmax (W)	136.85	135.31	133.47	133.47	133.47
Vmp (V)	31.90	31.45	31.38	31.38	31.38
Imp (A)	4.29	4.30	4.25	4.25	4.25
Voc (V)	40.51	40.44	40.41	40.41	40.41
Isc (A)	4.71	4.80	4.76	4.76	4.76
Tpv (C)	47.49				
Epoa (W/m ²)	868.1				
Rseries (Ohms)		0.00	0.00	0.00	0.00

Tabular summary compares predicted and measured results. "Snapshot" function allows comparison of multiple results.

Design Name: Sharp NT-175UC1

Equipment: Performance Calculation Model

Array Plane: # of Modules in String: 10, # of Strings in Parallel: 2

Complete description of the PV array enables accurate performance predictions.

PV Model Choices

Performance verification methods always require comparison of measured results with a reference standard. For installed PV arrays, the standard 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
- Data for over 400 modules is included

2. Five-parameter model

Allowing for coverage of a broader range of PV modules, this advanced model is derived from module data sheet specifications. Data for over 1700 modules is included.

3. Single-point model

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

Ordering Information

PVA-600 PV Analyzer

Includes

- I-V Measurement Unit with soft carrying case
- PVA Software for Windows™
- Wireless USB Interface (for Windows laptop or UMPC)
- Connector saver jumper set (two 12-inch m-f MC-4 jumpers)
- PV cable extension set (two 5-foot m-f MC-4 jumpers)
- MC-4 to MC-3 adaptor cable set (*contact Solmetric for other connector styles*)
- Battery charger (AC adapter)

Optional Accessories

Wireless Sensor Kit:

- Irradiance sensor and wireless transmitter
- Thermocouples (5) and wireless transmitter
- Wireless USB Interface (connects to Windows laptop or UMPC)

Computer Requirements

Microsoft Windows™ 7 (64-bit or 32-bit), Windows Vista (32-bit only), Windows XP SP3 / **Processor speed** >700 MHz / **RAM** >500 MB / **Hard Drive Space** >100 MB / **Min. Display resolution** 1024 by 600 pixels / **USB ports** 2 minimum

To Purchase

Online

www.solmetric.com

Call

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General Information

Characteristic	Description
High efficiency PV modules	Extra-large capacitors mean better accuracy when measuring high-efficiency, back-contact PV 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 UMPC
PC to measurement unit interface	Wireless USB adaptor (provided)
Wireless range	10 meters (building walls) to 75 meters (open range)
Module/Inverter data	Onboard database of inverters and over 1700 modules. Updates provided at Solmetric website.
Inverter limits	Voltage limits and max power tracking range of user-selected inverter are 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 cable pouch.
DC interrupt	Measurement sweep can be paused to avoid arcing when making/breaking connection to PV source circuits.
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
Minimum Voc	20 V DC
Minimum Isc	1 A DC
I-V measurement update rate *	30 – 60 sec (or on demand)
I-V measurement time	.05 – 1 sec
Measurement points per trace	100
Ambient operating temperature range *	0 to +50 deg C
Storage temperature	-20 to +60 deg C
Battery life (continuous operation)	20 hours
Charging time	6 hours

***Note:** Update rate should be reduced when measuring in extreme heat, or when testing high voltage arrays.

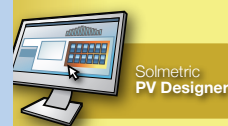
About Solmetric

Solmetric provides accurate, time-saving solutions for solar professionals.

Site Evaluation



PV Design



PV Verification

