



Application Note PVA-600-3

Checklist for Preparing to Test PV Arrays

May 16, 2011

Purpose

The Checklist for Preparing to Test PV Arrays is one of a series of application notes, videos and webinars designed to support users of the Solmetric PVA-600 PV Analyzer. The checklist evolved out of our own efforts to get the most value out of our testing sessions in the field.

The PV Analyzer itself is very easy to use and requires very little preparation, so this checklist deals mainly with other types of preparations.

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Weather

- ❑ Check the weather forecast before making travel plans. Best performance testing conditions are clear sky, 800+ W/m² irradiance in plane of array, 4-hour window centered on solar noon, and little or no wind.

PV Analyzer

- ❑ I-V Measurement Unit (charged 6 hours the night before)
- ❑ Matching wireless USB adapter, plugs into your PC
- ❑ Charger for the I-V Measurement Unit
- ❑ Connector-saver jumpers attached to PV leads
- ❑ Solmetric test leads (armored, MC-4 to giant alligator clip)
- ❑ Quick Start Guide and Quick Reference Card (in case pocket)

PC

- ❑ PC, fully charged and PVA software installed. Requires two USB ports spaced far enough apart to allow inserting USB adapters for the I-V Measurement Head and the Wireless Sensor Kit (both are large).
- ❑ PC charger
- ❑ Backup battery if needed, charged
- ❑ Flash drive to offload data at the end of the day

Solmetric Sensor Kit

- ❑ Irradiance sensor with wireless sender unit
- ❑ Thermocouple lead with wireless sender unit
- ❑ Wireless USB adapter (plugs into your PC)
- ❑ Replacement thermocouples
- ❑ Replacement batteries (charged)
- ❑ Small straight blade screwdriver for replacing batteries
- ❑ Tape for attaching thermocouples to back of modules
- ❑ Means to mount the irradiance sensor in plane of array

PV Analyzer PV Model and Array Tree

- ❑ Create a PV model
- ❑ Customize array tree folder names, if necessary

PV System Documentation

- ❑ Drawing set (especially single-line and array layout)
- ❑ PV module datasheet
- ❑ String sizing information

PV Model

- ❑ PV module manufacturer and model number
- ❑ Is this module in the PV Analyzer database?
- ❑ Which PV models are available for this module?
- ❑ If the Sandia and 5-Parameter models are not available, check that the temperature coefficients needed for the simple model are provided in the module datasheet. If not, get them from manufacturer.
- ❑ Number of modules per string
- ❑ Number of strings you'll be testing in parallel

PVA & sensor placement

- ❑ Type of structure on which array is mounted
- ❑ Placement of the PVA I-V Measurement Unit. If it's an overhead array, you may need to hang the PVA.
- ❑ Access behind modules to attach temperature sensor

String access

- ❑ Location of the combiner boxes and DC disconnects
- ❑ If accessing at inverter, identify means to isolate and connect to strings

Site access

- ❑ Permissions
- ❑ Keys to site, gates, rooftops, inverters, switchgear
- ❑ Dog issues (dog biscuits sometimes help)
- ❑ Ladders for access to roof and elevated arrays

Site safety practices & restrictions

- ❑ Authorization or personnel to open boxes
- ❑ Policy regarding how much of the system must be shut down before working on a sub-array
- ❑ Lock-out/tag-out arrangements

Personal Protective Equipment

- ❑ Hard hat
- ❑ Eye protection
- ❑ Fall protection
- ❑ Electrical safety glove kit
- ❑ Flash shield
- ❑ Sun protection (hat, clothing, sun block)

Electrical interconnect hardware for troubleshooting

- ❑ Long PV extension cable to span length of a string
- ❑ Hybrid PV cables, MC-4 to other make as needed
- ❑ Polaris taps and wire nuts
- ❑ #12 or #10, 600V wire to pigtail into terminal blocks
- ❑ PV connector parts and crimper, if repairs anticipated

Electrical tools as needed

- ❑ Digital multi-meter with probes
- ❑ AC/DC clamp-meter
- ❑ Hand-held irradiance sensor
- ❑ Temperature meter with thermocouple leads
- ❑ Ultra-long test lead for verifying system ground

Hand tools

- ❑ Insulated screwdrivers (large & small, straight & Phillips)
- ❑ Nut and screw bits, and driver
- ❑ Bit ratchet for tight spaces
- ❑ Allen wrenches, English and Metric
- ❑ Sockets and ratchet for removing PV modules
- ❑ Wire strippers
- ❑ Lineman's pliers
- ❑ Mirror for inspecting underside of mounted modules
- ❑ Compass for checking array orientation
- ❑ Tilt gauge for measuring array tilt
- ❑ Flashlight
- ❑ Binoculars for inspecting array from a distance
- ❑ Flexible grabber to retrieve dropped parts
- ❑ Electrician tool kit for more complex jobs

Module cleaning equipment

- ❑ Bucket
- ❑ Telescoping poles with brushes and squeegees
- ❑ Hose and fine spray nozzle
- ❑ Source of water

Other

- ❑ Business cards
- ❑ Digital camera
- ❑ Voice recorder
- ❑ PC and charger

Personal

- ❑ Water
- ❑ Lunch
- ❑ Cell phone
- ❑ Bluetooth headset
- ❑ First aid kit