

# SOLAR MEASUREMENT TOOLS

NRG Systems' solar measurement products deliver the data you need to plan and successfully operate your utility-scale photovoltaic project—from pre-construction resource assessment to post-construction monitoring and forecasting.

## **Measure Your Project's Potential Seamlessly**

Our sensors, instruments, and turnkey systems are designed to work together for unrivaled ease-of-use—from installation to operation.

## **Reduce Uncertainty with Bankable Data**

With your choice of pyranometers and a standardized design, our systems provide precise, site-specific measurement in any terrain.

## **Rely on Our Industry-Leading Customer Service**

All of NRG Systems' solar products are backed by our logistics, expert technical services team, and two-year warranty.



**NRG**Systems™



# SOLAR RESOURCE ASSESSMENT

## SRA SYSTEM

NRG Systems' SRA System is a turnkey measurement solution for the prospecting and formal resource assessment of utility-scale photovoltaic projects. Available with thermopile or photodiode pyranometers, this integrated system ships as a complete kit for easy installation and precise data collection.

## A Data Logger/Communications and Power Supply

### SymphoniePRO Data Logger

An advanced, user-friendly data logger purpose built for renewable energy



- High-resolution, high-accuracy analog measurements via 16-bit ADC for all meteorological sensors virtually eliminate measurement quantization error
- Differential inputs on P-SCM channels improve the measurement of small signal sensors, isolating signal from ground noise
- Reliable and secured data collection with logger access PIN, 128-bit file encryption, and channel-by-channel surge protection
- User-selectable averaging interval including 1-minute option
- 1 Hz sample data storage enables advanced studies (e.g. "ramp studies")

### Symphonie iPackGPS Communications and Autonomous Power Module

- Automatic transfer of logged data via email, or direct MetLink connection
- Worldwide operation from any location with 2G, 3G GSM or 3G CDMA, Satellite, or Modbus TCP for SCADA integration
- Integrated autonomous power supply saves installation time and powers entire system
- Customizable data transmission fits your schedule or application with call intervals ranging from 10 minutes to 14 days
- Complete iPackGPS history log to monitor events from communication sessions
- Ability to remotely update the iPackGPS firmware and configuration



## B Soiling Measurement Kit

Advance your understanding of soiling losses caused by dust, snow, and other particles

- Determine site-specific soiling loss characteristics and solar panel temperature with this turnkey soiling measurement solution
- Installs easily as an accessory to NRG's SRA System—complete with PV modules, pre-installed back-of-module temperature sensors, flexible mounting hardware, and integrated soiling interface module
- Measure short circuit current and back-of-module temperature with user's choice of statistical interval as well as optional 1 Hz sample data collection for flexible analysis options

## C Solar Sensors

Redundant Global Horizontal Irradiance

Optional Diffuse/  
Sunshine Duration

GHI				OR	DIF/SUN DUR
Li-Cor LI-200R	Hukseflux LP02	Hukseflux SR11	Hukseflux SR20		Delta-T SPN1 Sunshine Pyranometer*
<b>Photodiode</b>	<b>Second Class</b>	<b>First Class</b>	<b>Secondary Standard</b>		

ISO-9060

INCREASING ACCURACY

\*Providing global, diffuse, and sunshine duration

## D Tower

- 2.2m tower height:
  - Top-mounted pyranometers prevent tower reflections and shadows
  - Solar sensors remain within a step ladder's reach for easy routine maintenance
- Tubular tower breaks down for easy transportation
- Tilt-up design enables quick installation in less than one day
- Optional plane-of-array (POA) mounting booms are adjustable to any angle and compatible with all industry-standard pyranometers
- Angle finder included with each system

## E Meteorological Sensors



- Wind Speed
- Wind Direction
- Temperature
- Precipitation
- Relative Humidity
- Barometric Pressure

"As a key meteorological equipment vendor, NRG Systems provides top-notch products that are critical to our development efforts. Their SRA System was a cost-effective tool to improve our solar resource understanding and give comfort to our customers and financiers."

**ERIC SPIGELMAN**  
Engineering Manager  
LINCOLN RENEWABLE ENERGY





## SOLAR RESOURCE MONITORING

NRG Systems' turnkey Solar Resource Monitoring solution is ideal for operational utility-scale photovoltaic projects. The system, which ships as a complete kit for easy installation, integrates seamlessly with your SCADA network and allows for precise data collection.

- Real-time meteorological data for monitoring and forecasting applications via SymphoniePRO data logger and SCADA-enabled IPackACCESS communications and power module
- Integrated Soiling Measurement Kit to quantify site-specific impacts of dust, snow, and other particles (optional)
- Statistical data available simultaneously through MODBUS and email
- ISO-9060 Secondary Standard Pyranometers for accurate solar irradiance measurements
- Full suite of meteorological sensors for a complete understanding of site-specific weather conditions



## SENSORS FOR OEM APPLICATIONS

NRG Systems' sensors provide a low-cost, reliable way to deliver inputs to your PV tracker controller.

- Wind speed for PV tracker control
- Various signal outputs available

## WORLDWIDE SHIPPING

Short lead times

UPS Shippable

2 Year Warranty

### For more information:

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ISO 9001: 2008 Certified

## ABOUT NRG SYSTEMS

NRG is the only company that designs, manufactures, and supports fully integrated resource assessment solutions. Our measurement products and technical services are purpose-built for the global renewable energy industry. NRG pioneered wind resource assessment more than 30 years ago, when the wind industry was just beginning. Today, we serve multiple stages of wind and solar project development, from site assessment to commercial operation, in more than 150 countries.

