

# WEATHER STATIONS FOR SOLAR POWER MONITORING

## Environmental Monitoring for Optimizing Solar Power Generation Efficiency

Environmental monitoring is critical to optimizing the efficiency of solar power generation. Beginning with site assessment, on-site meteorological monitoring factors into overall project performance and ROI. Weather stations provide reliable data on parameters such as solar radiation, wind speed and direction, temperature, and precipitation that influence location and efficiency of solar panels.

### Flexibility, Automation, Integration

Columbia Weather Systems offers three turnkey weather monitoring systems for solar energy projects of any scale. Data collection is automated with the Weather MicroServer, offering multiple interfaces and monitoring options (Modbus RTU, Modbus TCP, BACnet, Browser Interface and more) to integrate with SCADA or other plant monitoring systems. Standard packages can be customized to suit most requirements.

**Solar 1 Weather Stations** feature an all-in-one sensor unit with ultrasonic wind direction and speed measurements, impact rain gauge, capacitive relative humidity, temperature and barometric pressure readings. No moving parts enhances



*Solar 1 Weather Station features all-in-one sensor module for ease of installation and virtually no maintenance.*



*The Solar 2 Weather Station combines the flexibility of modular sensor package with the reliability and affordability of mechanical wind sensors. Individual sensors can be sited optimally.*

ease of installation and durability. The impact rain sensor offers precipitation accumulation and rate. Connected through the Weather MicroServer, the Solar 1 Weather Station includes panel temperature and solar radiation sensor(s).

**Solar 2 Weather Stations** combine the flexibility of modular sensor package with the reliability and affordability of mechanical wind sensors. Individual sensors can be sited optimally with air temperature and humidity sensors in a radiation shield, solid state barometric pressure sensor, plus panel temperature and solar radiation sensor(s) with optional tipping bucket rain gauge. Data is output through the Weather MicroServer.

**Solar 3 Weather Stations** feature the Weather MicroServer with air temperature, panel temperature, and solar radiation sensor(s). Additional optional sensors are available.

### **Easy Installation and Operation**

CWS weather stations are preferred for ease of installation. The systems come complete, tested and pre-configured to facilitate easy installation by your local site electrician or electrical contractor. They do not require programming or special training to install, operate and maintain. No long-term contract is required. You own the equipment and the data. We are readily available for free technical assistance in the unlikely event it is required.

### **Monitoring Weather Conditions Helps Optimize Project Performance**

Solar 1 Weather Stations from Columbia Weather Systems provide meteorological data to Swinerton Renewable Energy's proprietary SCADA system at solar energy project sites across North America. The construction company offers turn-key solar power solutions for utility-scale and distributed generation projects. Operations and maintenance management provides performance guarantees based on site analysis. Monitoring weather conditions is vital to optimizing performance.



*This Solar 1 Weather Station installation shows two radiation sensors, one at plane of array and one at GHI, as well as the Orion weather sensor module on the mast at right. Photo courtesy of Industrial Electrical Contactors Ltd.*

*“Your weather stations are quality and your service is outstanding. Way to go!”*

*~ Garrett Duncan  
Solar Construction Project Manager*

Swinerton’s weather stations include the Orion sensor module plus a panel temperature sensor and two solar radiation sensors – one at plane of array and the other on a tracker. The system is connected through the Weather MicroServer. “We like the price point, always get a response, and it integrates easily into our SCADA system,” said Joe Brotherton, manager of the technical services team.

Columbia Weather integrated the Hukseflux SR20 solar sensor for a Canadian Swinerton project. SR20 is a pyranometer of the highest category in the ISO 9060 classification system: secondary standard. This solar radiation sensor is used where the highest measurement accuracy is required. The weather station utilizes an Acromag amplifier to amplify the solar sensor output to higher voltages suitable to CWS’s Microserver inputs and individual sensors’ sensitivities. The Acromag also includes programmable relay control to turn on and off sensor heaters to minimize the effect of dew and ice.

### **Weather Data Provides Context for Performance**

Cleanspark, a microgrid company with controls for distributed energy resource management systems based in San Diego, uses a Solar 2 Weather Station to give context to their performance metrics. They use weather-corrected solar generation data based on measured irradiance from the weather station versus modeled irradiance when calculating actual performance versus modeled for contractual obligations. Additionally, weather data “will be the basis of certain alarm conditions as well as reporting,” according to Bryan Huber, chief operations officer. “Weather information is highly useful for load and production forecasting.”



## **Professional Weather Stations. Professional Weather Monitoring.**

At Columbia Weather Systems, our job is to make weather monitoring easy, so you can focus on doing your job well. We have been in the weather monitoring business for over 35 years and working specifically with the solar energy industry since 2009, providing weather stations to hundreds of solar energy projects from small to utility-scale. “Your weather stations are quality and your service is outstanding,” said Garrett Duncan, a solar construction project manager.

Our staff offers personal, friendly technical support at every stage. Whether your solar energy project is large or small, meteorological instruments can provide data to make your operations more efficient. Contact us to help you select the best weather station for your requirements.

Call or email to discover how we can help make weather monitoring easy for you: 1 888 508-7375 / [info@columbiaweather.com](mailto:info@columbiaweather.com)

For additional information visit: [ColumbiaWeather.com](http://ColumbiaWeather.com)

