CAMPBELL SCIENTIFIC®
WHEN MEASUREMENTS MATTER

Solar Energy: Performance Monitoring

Data acquisition specifically designed for utility scale solar farm weather monitoring

Campbell Scientific solar farm weather monitoring systems report back to the site SCADA where the data is integrated into a data historian for short/long term performance, as well as reporting the values to the IESO.

Campbell Scientific offers data acquisition specifically designed for solar farm monitoring applications, including turnkey solutions. Key components include dataloggers, pyranometers with heated ventilators, air temperature/back of module temperature sensors, and TCP/IP communication modules. We offer all the sensors and resolution specifications which are required by the Independent Electrical System Operator (IESO) for all utility scale solar farms in the province of Ontario.

Dataloggers
Our dataloggers make and record measurements, control electrical devices, and can function as PLCs or RTUs. Because they have their own power supply (batteries, solar panels), the dataloggers continue to measure and store data and perform control during power outages. The dataloggers include many different channel types, allowing nearly all sensor types to be measured on a single unit.

Up to 2 million data points can be stored in the datalogger's non-volatile memory, while CompactFlash® cards can be used to increase data storage to tens of millions of points. Data is time and date-stamped to provide key information for identifying and analyzing past events.

Measurement Capabilities
Channel types include analog (single-ended and differential), pulse, switched excitation, and digital. Each of these channels can be independently programmed for various sensor types. Most sensors connect directly to the datalogger, eliminating the need for external signal conditioning. Multiplexers and other peripherals can be used with most of our dataloggers to increase the numbers and types of channels.

Control Capabilities
Powerful on-board instruction sets allow unattended measurement and control decisions based on time or conditional

Benefits of our Systems

1. Complies with Modbus, DNP3, OPC Protocols for simple system integration to existing SCADA or DCS systems

2. Systems perform long-term, unattended data collection

3. Systems can be configured for every aspect of the application

4. Dataloggers have on board scaling, mathematical and statistical capabilities

5. Time-stamped data is recorded allowing historical analyses

6. Supports communication technologies such as TCP/IP, RS-485, cellular, satellite, spread spectrum radio

7. Electrical devices can be controlled based on time or measured parameters

8. Rugged, low power design allows systems to operate in harsh environments

9. Systems are able to operate in temperatures as low as -40°C

CR1000 Datalogger

CMP11 Pyranometer & CVF4 Ventilation Unit

NL120 Ethernet Interface

Automated weather station for solar farm performance monitoring. Turnkey systems are available or we can customize your station to meet specific requirements.

Installation, commissioning, and maintenance services are available through our Field Services. Data collection, hosting, and display services are also available.

events. Dataloggers can be programmed to perform multiple control functions based on different scenarios.

Sensors

Typical sensors for solar monitoring applications include, but are not limited to: global horizontal and plane of array irradiance with heating and ventilation to prevent dew/frost/snow buildup on sensor domes, air and back of module temperature, wind speed and direction, and pressure sensors. Campbell Scientific dataloggers are used to measure these sensor types and many more, including digital sensors. We also offer smart sensors for smaller Fit or MicroFIT applications where not all weather parameters are required or the use of a datalogger is not practical.

Communications

Multiple telemetry and on-site options for retrieving data or reporting site conditions allow our systems to be customized to meet exact needs. Communications options include direct connect, Ethernet, cellular phone, and satellite. Systems can be programmed to send alarms or report site conditions by calling out to computers, phones, and radios, or by sending SMS or email.

Software

Our PC-based support software simplifies the entire data acquisition process, from programming to data retrieval to data display and analysis. Our software automatically manages data retrieval from networks or single stations. Robust error-checking ensures data integrity over almost any communications link.

Field Services

Campbell Scientific offers installation, commissioning, and maintenance services in support of your project. No matter the application or where your station is located, we're here to help.

Data Services

Our servers located in Edmonton can easily collect your data and images from any location while providing secure backup. Delivery and display options are very flexible and we can accommodate your varied and unique requirements.

Knowledgeable Staff

Campbell Scientific is committed to assisting our clients in the design and implementation of custom measurement systems for their specific solar monitoring needs. Our expertise in system design, production and installation ensures cost-effective, quality solutions.

If you need assistance selecting the best sensor, telemetry, and datalogger combination, please contact us. We'd be happy to answer your questions and provide the most cost-effective solution for your needs.