CAMPBELL SCIENTIFIC
WHEN MEASUREMENTS MATTER

SunSentry

Solar Operational Meteorological Monitoring Station

IEC 61724-1:2021 Class A Meteorological Monitoring Station

Designed for utility-scale, solar-energy projects

Overview

Campbell Scientific's SunSentry Solar Operational MET Stations are purpose built to meet the wide range of solar energy monitoring demands. They are designed with ease of installation and operation, as well as maximum data availability, in mind. All measurements and parameters pass seamlessly to local Supervisory Control and Data Acquisition (SCADA) systems or on-site and off-site servers. Each station is built to operate beyond the solar energy project's lifetime.

These stations are configured to meet customer and site-specific requirements. Typical stations measure a combination of the following parameters:

- Global Horizontal Irradiance (GHI)
- Plane of Array (POA) irradiance
- Rear POA (RPOA) irradiance
- Diffuse Horizontal Irradiance (DHI)
- Albedo
- Back-of-Module (BOM) temperature
- Ambient air temperature
- Relative humidity
- Wind direction
- Wind speed
- Precipitation
- Barometric pressure
- Soiling ratio or soiling-loss index
- Snow depth (if required)
- Hail

Benefits and Features

- IEC 61724-1:2021-compliant station
- Meet California ISO or Alberta Electric System Operators (AESO) standards
- Modbus or DNP 3.0 communications to SCADA
- Quick installation and easy operation through web-based user interface (UI)
- Rugged design
- Campbell Scientific sensor mounts for easy installation

Detailed Description

The SunSentry Solar Operational Meteorological Monitoring Station is designed to meet the meteorological monitoring

portion of IEC 61724-1:2021 requirements for Class A photovoltaic (PV) system performance monitoring. These stations provide critical data for operational solar power plants.

Rugged Design

As mandated by many independent service operators, solar MET station down time must be minimized and data availability maximized. Campbell Scientific is well known throughout the world for designing and manufacturing weather stations for the most unforgiving environments on Earth. We carefully choose similarly rugged accompanying sensors for use in these multi-decade projects.

Campbell Scientific has designed the station mounting to be compatible with the infrastructure that already exists on most utility-scale solar power plants. The main MET station mounts to an I-pile driven identically to the nearest support pile for the solar racking system. Furthermore, stations have been designed to allow for installation by a single individual. See the installation guide and video for more information.

Sensors

Sensors are chosen to meet the requirements of Class A monitoring systems defined by IEC 61724-1:2021 with additional consideration given to operational ease. Campbell Scientific has also paired each sensor with our line of mounts designed for use in the PV solar market.

Irradiance

- MS-80SH Class A Fast-Response Pyranometer with lowest measurement uncertainty and an integrated dome heater
- SMP12 Class A Fast-Response Pyranometer with an integrated dome heater
- SR30-L Class A Pyranometer with RS-485 Modbus Communications with Integrated Heating and Ventilation
- DHI measurements with Class A pyranometers on trackers or SPN1 sensors
- Choice of Class A or C pyranometers, as well as PV reference cells for RPOA or albedo measurements

Back-of-Module Temperature

The CS241DM is the industry-leading, BOM temperature sensor designed for bifacial PV module temperature and PV soiling measurements. The sensor makes use of an optimized, small footprint to reduce BOM shading and eliminate surface cooling. Other improvements include greater sensor-to-module bonding/adhesion and a thinner Teflon cable with a higher temperature rating.

- DustVue Solar-Module Soiling Sensor for best-in-class PV soiling monitoring

Meteorological

A variety of multi-parameter sensors may be used. The multi-parameter sensor measures wind speed and direction via an ultrasonic sensor, as well as air temperature, relative humidity, and barometric pressure. The multi-parameter sensor used is a single, combined instrument, naturally aspirated, with no moving parts. An integrated electronic compass allows the sensor to provide accurate relative wind direction measurements without a particular orientation, making installation easier.

Factory Acceptance Testing

- Calibration sheets are digitized and saved with the system documentation.
- System components are individually labeled to assist with field installation.
- Standard Modbus and DNP3 register maps are generated to assist the SCADA integration.

Specifications

Compliance Information

- IEC 61724-1:2017 and 2021 Class A
- ISO 9060:2018 Class A Spectrally Flat and Fast Response, Class A Spectrally Flat, Class C Spectrally Flat, and Class C Fast Response
- IEC 61000-4-5 Class 4 Surge Immunity

For comprehensive details, visit: www.campbellsci.ca/sunsentry

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