



Maximize the performance and reliability of your solar power plant with accurate, real-time environmental monitoring

Key Benefits

- ✓ Real-Time Monitoring
- ✓ IEC-61724 Compliant
- ✓ Accurate PR Calculation
- ✓ SCADA Integration
- ✓ Reliable Sensors
- ✓ Data Logging

Overview

Buraq Integrated Solutions provides complete **Environmental Monitoring Systems (EMS)** for utility-scale and commercial solar power plants. Our high-precision environmental monitoring sensors seamlessly integrate with solar inverter data loggers and SCADA systems to provide real-time environmental data, enabling continuous performance monitoring, accurate Performance Ratio (PR) calculations and enhanced operational efficiency of Photovoltaic (PV) Power Plants.

Solar PV performance depends on environmental conditions such as solar irradiance, module temperature, and other meteorological parameters. Accurate monitoring of these parameters enables precise Performance Ratio (PR) calculations, faster fault identification, improved energy yield analysis, and compliance with international standards.

System Components

1. Pyranometer (Solar Radiation Sensor)

Provides high-accuracy solar irradiance measurements for precise Performance Ratio (PR) calculations, energy yield assessment, and IEC 61724 compliance.

2. Ambient Temperature and Humidity Sensor

Provides accurate temperature, humidity, and pressure measurements for reliable environmental and PV system monitoring.

3. Back of Module Temperature Sensor

Provides precise PV module temperature measurements for accurate performance analysis and energy yield optimization.

4. Wind Speed

Continuously measures wind speed to support environmental monitoring, equipment protection, and performance assessment.

5. Wind Direction

Detects wind direction to provide complete wind profile information for site analysis and operational monitoring.

6. Rain Gauge

Supports preventive maintenance by correlating rainfall events with PV performance and soiling conditions.

7. HMI (Human Machine Interface)

Provides an intuitive touchscreen interface for real-time visualization, configuration, alarms, and diagnostics.

8. Data Logger Integration

Our environmental monitoring sensors are designed for seamless integration with solar inverter data loggers and SCADA systems, ensuring dependable data collection, reliable logging, and continuous system monitoring.

1. Pyranometer (Solar Radiation Sensor)

Measures solar irradiance for accurate PV performance analysis. Following models are available to suit different project and accuracy requirements:

a. | MS-80SH Class A Pyranometer

Specifications	
Response Time 95%	< 10s
Temperature Response (-20°C ~ 50°C)	± 1%
Spectral Range	285 ~ 3000 nm



b. | BS200-A Class A Pyranometer

Specifications	
Response Time 95%	<5 s
Temperature Response (-10 ~ 40°C)	<1%
Spectral Range	280 ~ 3000 nm (50% Transmittance)



c. | MS-60S Class B Pyranometer

Specifications	
Response Time 95%	< 20s
Temperature Response (-20°C ~ 50°C)	± 2%
Spectral Range	285 ~ 3000 nm



d. | SP-522 Class C Pyranometer

Specifications	
Temperature Response	Less than 5 % from -15 ~ 45°C
Spectral Range	385 ~ 2105 nm



e. | BS200-03 Pyranometer

Specifications	
Response Time	≤20s(99%)
Spectral Range	300 ~ 3200 nm



f. | BS200-04 Pyranometer

Specifications	
Response Time	≤5s
Spectral Range	300 ~ 1100 nm



2. Ambient Temperature and Humidity Sensor

Monitors key atmospheric conditions affecting solar plant performance. Following models are available with optional barometric pressure measurement:

a. | BS330-21 Air Temperature, Relative Humidity and Atmospheric Pressure Sensor

Specifications			
Item	Output	Pulses	4-20mA
Range	-40°C ~ 60°C	0 ~ 100%RH	100 ~ 1100hPa
Resolution	0.1°C	0.5%RH	0.1hPa
Accuracy	±0.5°C	±3%RH	±1hPa

(Barometer is optionally available)



b. | BS330-01 Atmospheric Temperature, Humidity and Pressure Sensor

Specifications			
Item	Output	Pulses	4-20mA
Range	-40°C ~ 60°C	0 ~ 100%RH	100 ~ 1100hPa
Resolution	0.1°C	0.5%RH	0.1hPa
Accuracy	±0.5°C	±3%RH	±1hPa

(Barometer is optionally available)

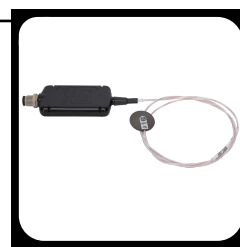


3. Back of Module Temperature Sensor

Measures PV module temperature for accurate performance monitoring. Following models are available for reliable module temperature measurement:

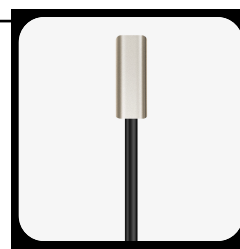
a. | CS241DM Back of Module

Specifications	
Operating Temperature Range	-40° ~ 150°C
Measurement Uncertainty	±0.3°C



b. | BS220-01 Back of Module

Specifications	
Range	-50 ~ 100°C, -20 ~ 50°C
Accuracy	±0.5°C



4. Wind Speed

Measures wind speed for environmental monitoring and plant protection. Following models are available for various operating conditions:

a. | BS100-01 Wind Speed

Specifications	
Range	0 ~ 60m/s
Accuracy	$\pm 0.5\text{m/s}(<5\text{m/s})$ $\pm 2\%FS(\geq 5\text{m/s})$



b. | BS100-02 Wind Speed

Specifications	
Range	0 ~ 45m/s
Accuracy	$\pm(0.3+0.03V)\text{m/s};$ (V is the Current Wind Speed)



5. Wind Direction

Measures wind direction for comprehensive weather monitoring. Following models are available to meet different monitoring requirements:

a. | BS110-01 Wind Direction

Specifications	
Accuracy	$\pm 3^\circ$
Resolution	1° or 22.5°



b. | BS110-02 Wind Direction

Specifications	
Accuracy	$\pm 3^\circ$
Resolution	1°



6. Rain Gauge

Measures rainfall accurately for environmental and site condition monitoring. Following models are available for dependable precipitation measurement:

a. | BS400-01 Rain Gauge (Stainless Steel)

Specifications	
Rainfall Collector	Diameter: $\Phi 200\text{mm}$, Height: 350mm
Resolution	0.1mm, 0.2mm
Accuracy (2mm/min)	$\pm 4\%$



b. | BS400-04 Rain Gauge

Specifications	
Rainfall Collector	Diameter: $\phi 200\text{mm}$, Height: 271mm
Resolution	0.2mm
Accuracy (2mm/min)	$\pm 4\%$



7. HMI (Human Machine Interface)

Provides real-time system monitoring, visualization, and configuration. Following HMI options are available in multiple display sizes:

a. | 7" Touch Screen HMI

Specifications	
Monitor	7" TFT
Resolution	1024x600 Pixels
Touch Type	Resistance-Type



b. | 10" Touch Screen HMI

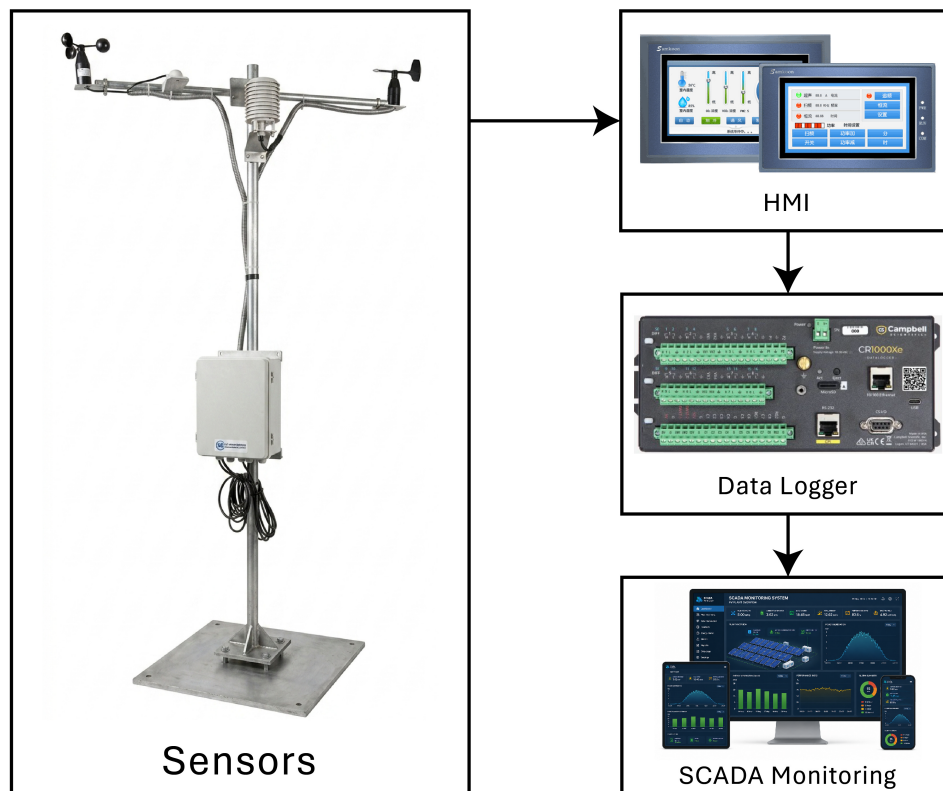
Specifications	
Monitor	10.1" TFT
Resolution	1280x800 Pixels
Touch Type	Resistance-Type



System Architecture

The system architecture enables seamless data acquisition, processing, and monitoring for PV plants. Environmental sensors continuously measure key meteorological parameters and transmit the data to the HMI for local visualization and configuration.

The Data Logger processes and stores the collected data before sending it to the SCADA Monitoring System, where users can access real-time dashboards, historical trends, alarms, and performance analytics for efficient plant monitoring and decision-making.



For comprehensive details, visit: www.buraq.com/ems-pv-plants