

PV METEOROLOGY / DATA SHEET
SS1000-02

PV Weather Station

Solar-powered photovoltaic weather station for solar radiation, environmental and PV module monitoring with automatic solar tracking and 4G / Ethernet data upload.

Overview

SS1000-02 is a dedicated PV weather station for photovoltaic power plant environmental monitoring. It can measure tilted solar radiation, sunshine duration, total solar radiation, direct solar radiation, diffuse solar radiation, wind speed, wind direction, temperature, humidity, atmospheric pressure, longitude, latitude and module temperature.

The solar radiation system uses a fully automatic solar tracking platform. It combines sensor-based tracking and GPS solar-trajectory tracking to maintain high-accuracy solar tracking while reducing the need for on-site maintenance.

The station supports solar power supply with a wide-temperature maintenance-free gel battery. Data can be uploaded via 4G or Ethernet to a cloud monitoring platform and can also be integrated through a Modbus-RTU slave interface.



Solar tracking Sensor + GPS	Radiation range 0-2000 W/m²	Wind speed 0-70 m/s	Data upload 4G / Ethernet / Modbus-RTU
--	---	--------------------------------------	---

Key Advantages

- Measures PV-specific parameters including tilted radiation, sunshine duration, total/direct/diffuse solar radiation, reflected radiation, wind and module temperature.
- Monitoring elements are flexible and can be adjusted according to project requirements.
- Fully automatic solar tracking using sensor tracking plus GPS solar trajectory tracking.
- Solar power system with wide-temperature maintenance-free gel battery for field sites without mains power.
- 4G data upload with cloud platform and APP access; optional Ethernet data upload.

Application Scenarios

- Photovoltaic power plant environmental monitoring.
- Solar resource assessment and radiation measurement.
- PV module temperature and site meteorology monitoring.
- Remote unmanned monitoring stations powered by solar panels.
- SCADA / PLC integration through Modbus-RTU slave interface.

MEASUREMENT PRINCIPLE

Technical Principle

The station uses multiple meteorological and solar-radiation sensors installed on a dual-pole structure. The automatic solar tracker continuously aligns solar-radiation sensors using sensor feedback and GPS-based solar trajectory tracking. The system collects PV site meteorology and radiation data, then uploads data through 4G / Ethernet or provides a Modbus-RTU slave interface for local integration.

SYSTEM DATA

General Specifications

Item	Specification
External power supply	220V AC power supply
Solar power supply	Matched solar panel and battery; battery endurance about 2-3 days
Data upload interface	4G or Ethernet data upload; Modbus-RTU slave interface
Data upload interval	20 s to 65535 s adjustable; default 300 s
Installation structure	Dual-pole design with calculated spacing to minimize mutual influence between devices
Outdoor durability	High-strength pole mounting frame for long-term outdoor operation under strong wind, rain and snow

SOLAR RADIATION

Radiation & Solar Tracking Specifications

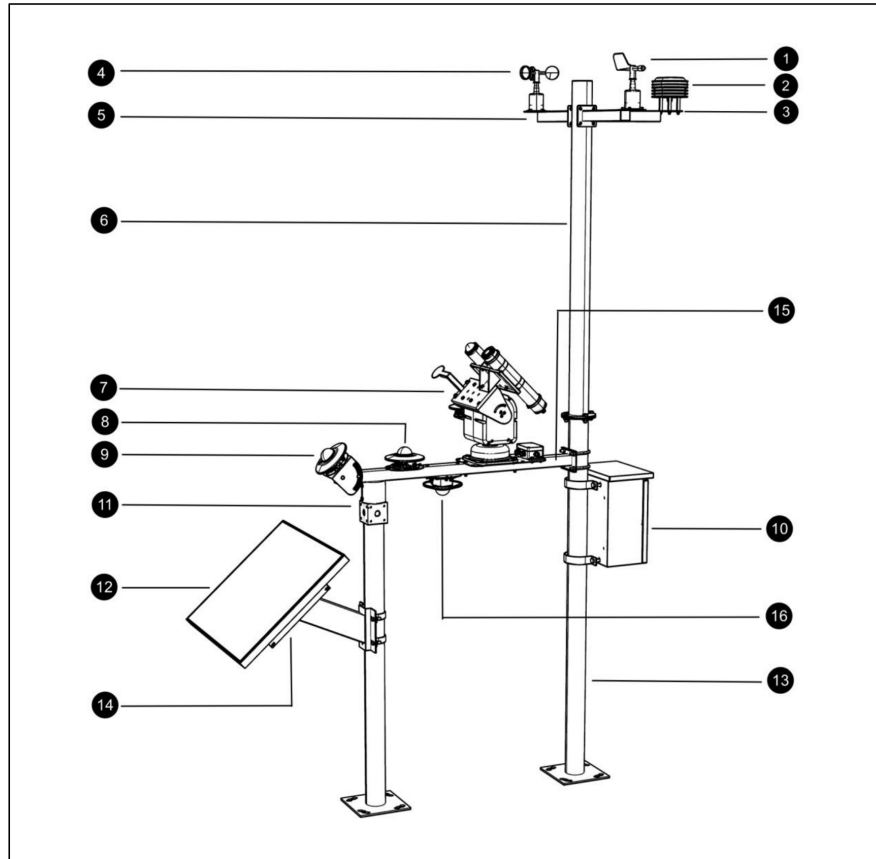
Parameter	Specification
Direct solar radiation	Range: 0-2000 W/m ² ; accuracy: ±3%; resolution: 1 W/m ²
Diffuse solar radiation	Range: 0-2000 W/m ² ; accuracy: ±3%; resolution: 1 W/m ²
Total solar radiation	Range: 0-2000 W/m ² ; accuracy: ±3%; resolution: 1 W/m ²
Automatic solar tracker	Vertical adjustment: 0-90°; horizontal adjustment: 0-300°
Tracking mode	Solar sensor tracking + GPS tracking
Optional radiation elements	Tilted radiation, reflected radiation, albedo when total radiation and reflected radiation are both selected, sunshine duration, illuminance

METEOROLOGICAL DATA
Weather Sensor Specifications

Parameter	Specification
Wind speed	Range: 0-70 m/s; accuracy: $\pm(0.2 + 0.03V)$ m/s @0-30 m/s, 25°C; V represents wind speed; response time ≤ 1 s
Wind direction	Range: 0-359.9°
Louver-box temperature / humidity / pressure	Range: -20°C to +60°C, 0%RH to 100%RH, 0-120 kPa
PV module temperature	Range: -40°C to +120°C

OPTIONAL ELEMENTS
Monitoring Element Selection

No.	Monitoring Element
1	Wind speed, including 2-minute wind speed, 10-minute wind speed and wind force
2	Wind direction
3	PV module temperature
4	Air temperature and humidity, including maximum temperature, minimum temperature and dew-point temperature
5	Atmospheric pressure
6	Total solar radiation
7	Direct normal radiation, including horizontal direct radiation and daily / monthly / annual accumulated values
8	Tilted radiation, including daily / monthly / annual accumulated values
9	Horizontal diffuse radiation, including daily / monthly / annual accumulated values
10	Reflected radiation; albedo can be monitored when total radiation is also selected
11	Sunshine duration
12	Illuminance

FUNCTIONAL STRUCTURE
Main Components


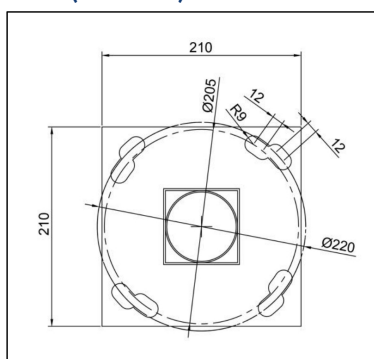
No.	Name	Function
1	Wind direction transmitter	Monitors wind direction
2	Louver box	Monitors temperature, humidity and atmospheric pressure
3	Weather mounting plate	Mounts wind direction, wind speed and louver box to the crossbeam
4	Wind speed transmitter	Detects wind speed
5	Mounting crossbeam	Fixes installed devices to the pole
6	M1 upper pole	Installs devices on the cross arm and connects to the lower pole by flange
7	Automatic solar tracking transmitter	Automatically tracks the sun through GPS + optical tracking
8	Total solar radiation	Monitors total solar radiation

	transmitter	
9	Tilted radiation transmitter	Measures tilted total radiation at adjustable angles
10	Powder-coated metal control box	Stores solar controller and weather station main controller
11	M6 pole	Works with M1 pole to install the M9 cross arm
12	Solar panel	60 W solar panel; source states 7.5 h charging of 38 Ah from 0 to 100%
13	M1 lower pole	Supports the M1 upper pole and control box
14	Module temperature transmitter	Measures PV module rear-side temperature
15	M9 cross arm	Installs multiple solar radiation sensors
16	Reflected radiation sensor	Measures ground-reflected radiation

MECHANICAL DATA

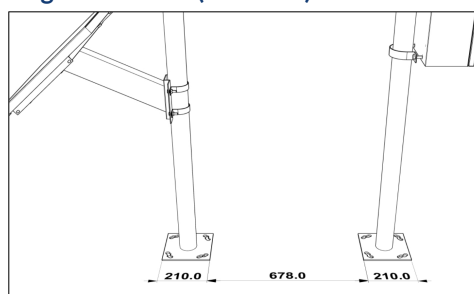
Installation Dimensions

M6 / M1 Pole Base (unit: mm)



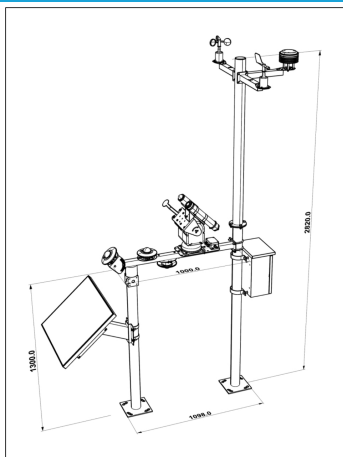
Overall Dimensions (unit: mm)

Pole Spacing Dimensions (unit: mm)



Dimension Notes

- Base size shown as 210 mm × 210 mm with circular mounting features from the source drawing.
- Pole spacing drawing shows 678.0 mm between bases and 210.0 mm base references.
- Overall drawing shows 2820.0 mm height, 1300.0 mm solar-panel height reference and 1098.0 mm overall lower spacing.



CONFIGURATION

Product Selection

Code	Description
SS	Company code
1000-02	PV weather station
M9	Fixed expansion-bolt mounting pole
DC12	Solar panel and battery power supply
Y	220V AC power supply
4G	4G upload mode
ETH	Ethernet upload mode

CONTACT / SUPPORT

SpeSense Technologies Inc.

Add: No. 9 Yuhe Road, Guitang Subdistrict, Yuhua District, Changsha City

Tel: +86-15386478166

Email: info@spesense.com

Web: www.spesense.com



WhatsApp / WeChat