SOZ03- Irradiance Sensor Datasheet & Installation Guide

DATA LOGGERS | ZERO EXPORT DEVICE | PV DG SYNC

WEATHER SENSORS | MFM METERS | SPD | MODBUS REPEATERS

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WS102 Introduction

SOZ03 is Mono Crystalline Silicon Solar Cell (50 x 50 mm²) laminated under special Solar Glass with excellent UV resistance and long-term stability, which has Plain integration into the top cover of advanced weatherproof junction box made of UV resistant material with cable gland and screw-less terminal for the connection of the measuring cable

Features

- ✓ NES – Germany make
- ✓ High precision shunt resistor directly soldered to the terminals of the cell
- ✓ Linear output signal in the range 0...1500 W/m²
- ✓ Individual calibration of each sensors in the natural sunlight close to AM 1,5 spectrum by
- ✓ means of a compatible calibrated reference cell
- ✓ Accuracy of monthly sums compared to a W.M.O. class 1 Pyranometer (e.g. CMP 11)
- ✓ According to ISO 9060: better ±5 % under standard conditions.
- ✓ Very small drift of <0.3 / year (experience since 1989)

Specifications

Type - Mono crystalline Silicon Solar Cell Size
Casing -50x 50 mm² Housing Material UV-resistant PVC plastic IP65
Storage Temperature- -45° to +70°C
Range 0 - 1800 W/m2 (Actual might vary, as per tag/sticker on sensor)
Calibration interval period recommended- 1 Year

Output ***(either of one)***
MODBUS OUTPUT – RS485 Output in D+ & D- (Optional, Need Additional Converter)
Analog Output - Current output 4-20 mA
Analog Output - Voltage Output 0-5 V

Working Principle

SOZ03 sensor is based on the absorption of electromagnetic radiation by a detector element. The sensor has a detector element, typically a photodiode or a thermopile, that absorbs the electromagnetic radiation and generates a small electrical current. This current is proportional to the intensity of the radiation and can be measured and used to calculate the irradiance.
The SOZ03 sensor also has electronic circuitry that amplifies the electrical current generated by the detector element and converts it into a signal that can be read in required output.

INSTALLATION

Location for sensors installation

The sensor should be placed at a distance from the PV panels that allows it to accurately measure the intensity of sunlight that is absorbed by the PV cells. It is to be mounted in an area where there is no obstruction in the path of the sunlight from sunrise to sunset or shadow cast on device by buildings, constructions, trees etc as obstructions may affects directly the measurement of direct irradiance . Make sure that it is mounted in place, where its surface can be cleaned on regular basis. The irradiance sensor must be installed at the same azimuth and tilt angle as that of the PV array. If possible, avoid locating the sensors in dusty locations.

Tools Required

- Adjustable Wrench or pliers
- Wire cutters and stripper
- Multi meter
- Drill machine with drill drill bit (4.7 mm) to drill pilot holes
- Cable ties and Electrical Tapes to cover the wire

Mounting

- Once the basic Installation at the locations chosen is completed, final leveling of the sensor(s) should be done in its operating location. Please note Small errors in alignment can produce significant errors
- Try to limit obstructions to below 5 degrees, where the effect will be minimal.
- Ensure that the cables are free of crimps. And Gland is at the bottom and tightened fully to avoid precipitation or water inflow
- After installation, Shade the sensor and make sure the reading changes accordingly.
- If required, adjust the position of the sensor by tightening or loosening the leveling screws.
- When pointed directly at the sun, the shadows from the alignment fins should appear as shown in the illustration below

Calibration and Reading

In case of MODBUS Output – sensors are pre calibrated and Gives default output.

In case of Analog Output -

- IF **Output is voltage based** : 0 - 5 VDC (0- 1800 W/m2)
- IF **Output current based:** 4-20mA (0-1800 W/m2)
  W/m2 = 112.5 (Output in mA – 4)

Caution: Wipe the surfaces of the shield with a damp cloth to remove dirt and dust on regular basis and also check for the loose connections or tilt angle of time to time basis.