Global solar radiation sensor
PS-0085-FF

Global solar radiation sensor

Key Features:
- Operating with precision silicon photodiode
- Internal temperature compensation
- Outdoor UV resistant case and PTFE lens
- Analog output(voltage). On request, serial(RS485,SDI12)
- Integrated digital measuring circuit
- Each sensor is factory calibrated and tested

Applications:
- Meteorology
- Solar Fields
- Precision Agriculture

Description

The solar radiation sensor has a microcontroller-based digital circuit, for the acquisition, calibration and compensation of the measured parameters.
Based on a high performance silicon photodiode, it features a PTFE (Teflon ®) lens, which allows a very wide angle of measurement, and a high resistance to atmospheric agents and aging.

The sensor housing is manufactured with IP56 environmental protection degree; the cable exits from the bottom through a cable gland.

The sensor provides an analog output (voltage); on request, serial interface (RS485) or SDI-12 interface are also available.

The supply voltage must be between 3.3 and 5.0 VDC, and is internally regulated. On request, the supply voltage range can be extended to 5 to 15 VDC.

Dimensions:

70x70x34 mm (w/o cable gland)

Electrical specification:

Voltage supply: 3.3 – 5.0 VDC; on request: 5.0 - 12 VDC
Current consumption: < 15 mA (analog output mode); < 5 mA (digital output mode, from HW rev. 1.2)
Output interface:
- voltage output
- serial output: RS485 MODBUS RTU, 9600 to 115200 bps
- serial half-duplex (SDI-12): 1200 to 19200 bps

Technical specification:

Spectral response: 380-1100 nm
Measuring range: 0 to 2000 W/m^2
Typical accuracy: ±5%
Temperature drift: ±0.15% / °K
Stability: ± 2% / year
Operating temperature: -30 to +70 ° C
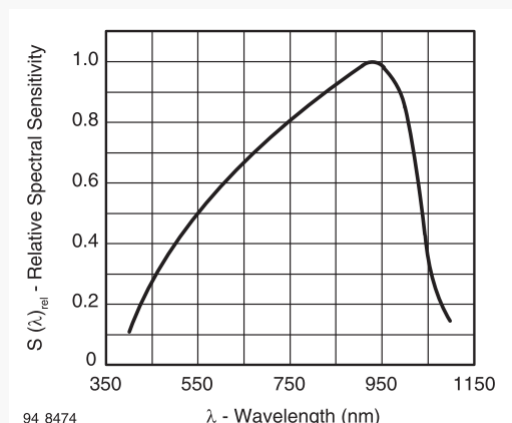Typical Output Sensitivity (analog mode): 1.464 mV * W/m^2
Response time: 1 to 30 s, basing on user selectable internal averaging time
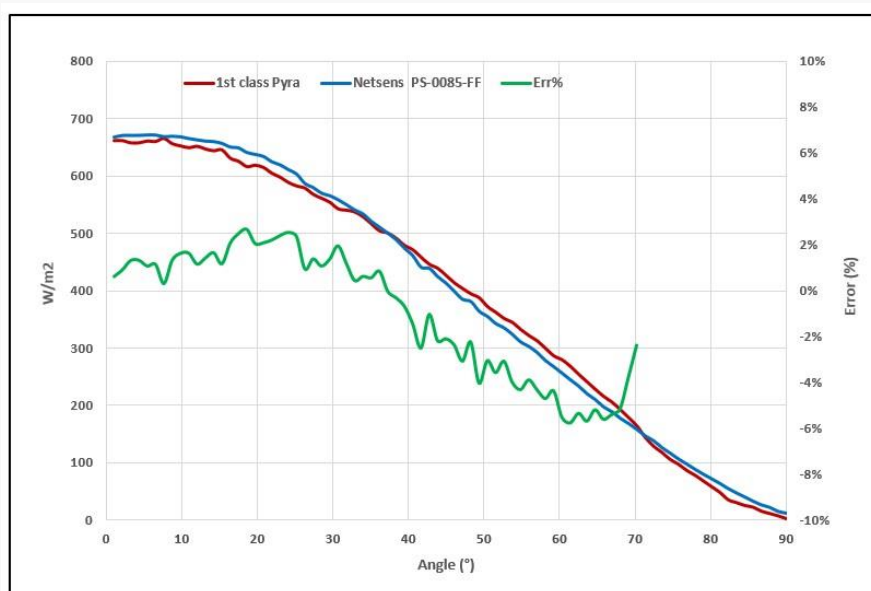Cosine response (compensated): 5% (up to 70°)
Environmental protection: IP56
Standard cable: 200 cm, longer cable on request

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Typical Spectral sensitivity vs. Wavelength

Data comparison between Netsens Solar Radiation Sensor and a calibrated First Class ISO 9060 pyranometer, with absolute error (%) from 0° to 70° in daylight conditions

Wiring diagram:

Color	Analog	RS485	SDI-12
Brown	Vcc	Vcc	Vcc
White	Ground	Ground	Ground
Green	OUT	RS485 B	DATA
Yellow	N/C	RS485 A	N/C

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RTU Modbus configuration:

The sensor may be ordered in RTU Modbus – RS485 version. Configuration parameters as follows:
- Serial interface: 115200 (default) ,n,8,1
- Modbus device ID: 54
- Data registers: from register 1 to 10, UINT16 (0x0000 > 0xFFFF)
- Output data conversion:

Channel 1: Solar Radiation level(W/mq)
Channel 2: Internal Temperature x 10 °C (20°C offset)

Example:
Channel 1, value 1207 > WVC= 1207 W/mq
Channel 2, value 451 > T=25.1°C

Installation:

The solar radiation sensor must be positioned to directly receive the solar radiation, without shadows or other perturbations. Also make sure that it is horizontally positioned: a level can be used to check the correct position. The output of the cable should be upside faced. Install the sensor on the bracket using appropriate tool, included (i.e. P/N MM-0059-KB).
Connect the sensor cable to the acquisition unit (MeteoSense, wireless units, etc.) following the instructions given in the user guide. For any questions or clarification, please contact Netsens technical support.

WARNING: Pay attention in correctly connect the power cables of the sensor; polarity reversal may compromise the integrity of the sensor and cause irreversible damage.

Traceability, packaging and shipping:

Each sensor is individually tested and a unique serial number identification is assigned, which allows tracking over time; this code can be printed on the shipping carton, on the sensor itself or alternatively on the appropriate section of the user manual. Please keep this code carefully, to be communicated to the technician in case of failure or replacement.
The sensors are sold individually equipped with its own package, which will protect the sensor during transport.
If the box is open or visibly damaged, don't accept delivery by courier. Do not open the box with knives, cutter blades, which could damage the sensor or its cable.

Ordering codes:

CODE	DESCRIPTION
PS-0085-FF	Global solar radiation sensor – Analog Output version(0-3Vdc)
PS-0085-FF-M	Global solar radiation sensor –Modbus RTU version
PS-0085-FF-S	Global solar radiation sensor –SDI12 (on request)

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Warranty:

Netsens s.r.l. warrants that the above described components will be free from defects in material and workmanship for the following time period from the purchasing:

- Two years for items purchased by final users for non professional use;
- One year for items purchased by companies and organizations for professional use.

This warranty is valid only if all the components are used accordingly to the Manufacturer's indication and to the recommendations included in this User Manual.

This warranty does not cover: batteries, fuses, lights and any other consumable equipment. Also this warranty does not apply for damages due to neglect, misuse, contamination, alteration, accident or abnormal conditions of operation or handling, including failures caused by use outside Manufacturer specifications.

This warranty covers the original purchaser and it is not transferable.

If one or more components are supposed to be defective, contact Netsens s.r.l. or your local reseller in order to obtain a valid return authorization.

Netsens s.r.l. shall not be liable for any special, indirect, incidental or consequential damages or losses, arising from any cause.

Please contact Netsens s.r.l. for any additional information concerning warranty.

Disposal of Waste Electrical & Electronic Equipment:

The symbol (crossed out wheeled-bin) on your product indicates that the product shall not be mixed or disposed with your household waste at their end of use.

The product shall be handed over to your local community waste collection point for recycling of the product. For more information, please contact your Government Waste Disposal department in your country.

Inappropriate waste handling could possibly have a negative effect on the environment and human health due to potential hazardous substances.

With your cooperation in the correct disposal of this product, you contribute to reuse, recycle and recover the product and our environment will be protected.

Revisions:

Date	Version	Page(s)	Notes
28/10/2013	1.0	1-3	First release
09/02/2017	1.1	1-3	Add Modbus RTU feature
31/07/19	1.2	1-4	HW 1.2 revision of tech specification and options