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WEATHER STATION FOR SOLAR INSTALLER

Our Si sensor Si-RS485TC-2T-v can be extended with external sensors. These external sensors are connected to the Si sensor with a waterproof connector. The measured values are readable thru the RS485 port without an extra programming. The sensor Vwind-Si for the measurement of the wind speed and one external temperature sensor can be connected. As temperature sensors the Tmodul-Si for module temperature and the Tamb-Si for ambient temperature are available.
Please note that only one temperature sensor can be connected.

Accessories for Si-RS485TC-2T-v

Wind Speed Sensor Vwind-Si

Module Temperature Sensor Tmodul-Si

Ambient Temperature Sensor Tamb-Si

Weather and Sun Protection Shield Tamb-Si

Type	Measurements	Range	Cable Lenth	Comment
Vwind-Si	Wind Speed	0...40 m/s	5 m	Including Mounting Angle
Tmodul-Si	Module Temperature	-40...+90°C	3 m	Incl. Double Sided Tape
Tamb-Si	Ambient Temperature	-40...+90°C	3 m	---
Shield Tamb-Si	Weather Protection	---	---	Incl. Mounting Material

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Solar Irradiance Sensor PV Reference Cells for your Monitoring

Silicon solar irradiation sensors (Si sensors) offer an economical but robust and reliable solution for measuring solar irradiance levels, particularly for monitoring photovoltaic systems. The design of the sensor element, which corresponds to that of a photovoltaic module, make these sensors ideally suited as a reference for monitoring photovoltaic systems.

Photovoltaic Reference Cells for PV Monitoring

Our photovoltaic reference cells offer an economical but robust and reliable solution for measuring solar irradiance levels, particularly for monitoring photovoltaic systems. The design of these silicon solar irradiation sensors (Si sensors), which corresponds to that of a photovoltaic module, make these sensors ideally suited as a reference for monitoring photovoltaic systems. The spectral sensitivity, which corresponds to that of photovoltaic modules, and the very similar incident angle modifier, enable a precise analysis of photovoltaic yields using measured values from the sensor.

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We have been manufacturing various types of Si sensors since 1994. So far, we have sold several 10,000 pv reference cells worldwide.

The **Measurement Uncertainty** of all Si sensors with RS485 and the Si-mV-85-Pt100(0) is class A as per IEC 61724-1. All other Si sensors are class B. The **Measurement Uncertainty** of our pv reference cells with temperature compensation depends on the sensor type. The digital Si sensor have in the range of 100 to 1500 W/sqm an uncertainty of ±1.0 W/qm ± 2.0% of reading.

All our pv reference cells have **consistend measuring ranges** of the solar irradiance (0 to 1500 W/sqm) and the internal temperature of the sensor cell (-40 to +90°C).

We offer wind-direction and wind-speed indicators available in a number of different designs. The product palette ranges from simple low-cost devices to high-quality and robust sensors with outstanding price-performance ratios, as well as highly accurate precision sensors.

All of the models are available with various output signals, such as pulse signals, analogue signals (mA or V), resistance signals or RS485 interfaces.

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Wind Velocity

Measuring Range	Max. 50 to 75 m/s
Error	1% to 5%
Output Signal	- Impulse (Reed-Relays, Open Collector) - 1, 5 or 10 V - 0...20 mA, 4...20 mA - RS485
Versions	- Cup star Anemometer - Ultrasonic

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Module Temperature Sensor

We supply economical surface temperature sensors for universal application as well as for photovoltaics. These photovoltaic module temperature sensors are with many different industrial output signals available

Ambient Temperature Sensor

We supply economical photovoltaic ambient temperature sensors for universal application as well as for photovoltaics. Many different industrial output signals are available.

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Accessories and Options for our Temperature Sensors

Beside our standard sensors we also offer customized solutions.

Simply send us your inquiry with your requirements and we will offer you an optimized product.

Options

- Custom specific Cable Length
- Plug / Socket Connection instead of fixed Cable
- Custom specific Measurement Range
- ...

Accessories

- Weather Protection Shield Tamb-Si for Ambient Temperature Sensors with external Pt1000 sensor

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Selection Table for Digital Silicon Irradiance Sensors
Si-RS485 Series
with Optional External Sensors Tamb-Si, Tmodul-Si and Vwind-Si

All measured parameters are transfered via one Modbus cable (except solution 6).

Solution	Measured Parameters	Sensor Types	Accessories	Notes
1	1. Solar Irradiance 2. Temperature of Sensor Cell[1]	Si-RS485TC-T-MB	None	- Temperature of sensor cell
2	1. Solar Irradiance 2. Temperature of Sensor Cell[1] 3. Ambient Temperature	Si-RS485TC-2T-MB	None	- Si sensor with firmly connected ambient cable temperature sensor (3 m connection cable) - Optional **Shield Tamb-Si** as a weather and radiation protection
3	1. Solar Irradiance 2. Temperature of Sensor Cell[1] 3. Module Temperature	Si-RS485TC-T-Tm-MB	None	- Si sensor with firmly connected module temperature sensor (3 m connection cable)
4	1. Solar Irradiance 2. Temperature of Sensor Cell[1] 3. Ambient Temperature 4. Wind Speed	Si-RS485TC-2T-v-MB	Tamb-Si[2] Vwind-Si[3]	- Si sensor with waterproof connectors for **one** temperature sensor and one wind speed sensor - External sensors with preconfigurated plugs - Optional **Shield Tamb-Si** as a weather and radiation protection
5	1. Solar Irradiance 2. Temperature of Sensor Cell[1] 3. Module Temperature 4. Wind Speed	Si-RS485TC-2T-v-MB	Tmodul-Si[2] Vwind-Si[3]	- Si sensor with waterproof connectors for one temperature sensor and one wind speed sensor - External sensors with preconfigurated plugs
6	1. Solar Irradiance 2. Temperature of Sensor Cell[1] 3. Module Temperature 4. Wind Speed 5. Ambient Temperature	Si-RS485TC-2T-v-MB Ta-ext-RS485-MB[4]	Tmodul-Si[2] Vwind-Si[3]	- Si sensor with waterproof connectors for one temperature sensor and one wind speed sensor - External sensors with preconfigurated plugs - Optional **Shield Tamb-Si** as a weather and radiation protection

[1] The temperature of the sensor cell is within a comparable value to the PV module temperature. A quantification of the difference between of the measurement of the temperature of the sensor and the possible PV module temperature is not possible.

[2] The temperature sensors Tamb-Si and Tmodul-Si have a 3 m connection cable.

[3] The wind speed sensor Vwind-Si has a 5 m connection cable.

[4] The ambient temperature sensor Ta-ext-RS485-MB is a separate Modbus sensor with its own Modbus cable.

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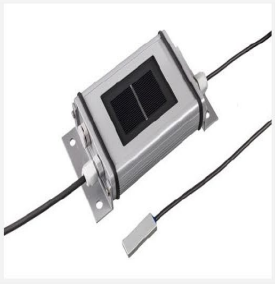
Selection Table for Digital Silicon Irradiance Sensors Si-RS485 Series
with Optional External Sensors Tamb-Si, Tmodul-Si and Vwind-Si

Solution	Sensor Types
1	Si-RS485TC-T-MB
	
2	Si-RS485TC-2T-MB
	
3	Si-RS485TC-T-Tm-MB
	

Solution	Sensor Types and Accessories
4	Si-RS485TC-2T-v-MB + Tamb-Si + Vwind-Si
	
5	Si-RS485TC-2T-v-MB + Tmodul-Si + Vwind-Si
	
6	Si-RS485TC-2T-v-MB + Tmodul-Si + Vwind-Si Ta-ext-RS485-MB
	

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SEAWARD SOLAR TESTER

PV150 388A915

PV200 389A915

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Solar Utility Pro 416A910

Solar Survey 100/200R 396A910, 396A914

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PV Analyzer I-V

The Solmetric line of **PV Analyzer** I-V curve tracers are widely used in Commissioning, Auditing, O&M, and Troubleshooting of PV systems. Features include:

- Highest accuracy and measurement throughput (measurements per hour)
- Largest display with best array troubleshooting features
- Database of 70,000 PV modules
- Measures up to 1500V at 30A
- 300-foot wireless sensor range

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- Measure position of a single ground fault in a PV string (Riso < 3 MΩ)
- Measure position of a single disconnect in PV strings (Rs > 10 kΩ)
- PV string impedance curves (health and degradation check)
- PV string series resistance Rs
- PV string string open circuit voltage Voc
- PV string string short circuit current Isc
- PV system isolation resistance Riso
- PV module voltage
- PV module bypass diode check (open or short circuit)
- PV module shunting resistance Rsh (module/cell degradation)
- Integrated timer for periodic faults
- Tone generator and tone tracer pickup
- Build in report generator (PDF, CSV, JSON)
- Operated over WIFI using either smartphone, tablet, PC or MAC

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