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solar spectral sensors

# SolarBand-C3

The SolarBand-C3 represents an exciting step forward in the measurement of diffuse solar irradiance. The SolarBand-C3 combines the accuracy of an automated shadow band with the reliability of a fully enclosed system to provide accurate, affordable measurements of diffuse, global and direct irradiance, from a single, digital sensor with no external moving parts.

The SolarBand-C3 employs three photodiodes (two global, one diffuse) and an automated, internal shadow band to measure global and diffuse irradiances simultaneously. The shadow band is mounted to an internal motor that slowly rotates over the course of each day, ensuring that the diffuse sensor remains continuously shaded.

The SolarBand-C3 is built for ease-of-use and is equipped with industry-standard features such as RS-485 Modbus communication, internal diagnostics, built-in heating and third-party calibration support, while also introducing on-board GPS and automated alignment verification.

- Measures GHI, DHI and DNI
- Internal automated shadow band
- No external moving parts
- Automated alignment verification
- Digital RS-485 communication
- Onboard tilt sensor
- Internal heating
- Internal GPS
- Third-party recalibration support

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# SolarBand-C3: Specifications

## Diffuse Horizontal Irradiance

| | |
|---|---|
| Accuracy (k=2) | ± 4% Daily integral<br>± 4% ± 5 W/m² hourly average<br>± 5% ± 5 W/m² individual readings |
| Measurement range | 0 - 2000 W/m² |
| Response time (95%) | < 0.1s |
| Non-stability (change per year) | < 0.2% |
| Non-linearity | < 0.5% |
| Zero offset A | n/a |
| Zero offset B | n/a |
| Spectral range | 300-1130nm |
| Temperature response (-10 °C - +40 °C) | < 0.5% (on-board temp. correction) |
| Latitude capability | -90° to +90° |

## Global Horizontal Irradiance

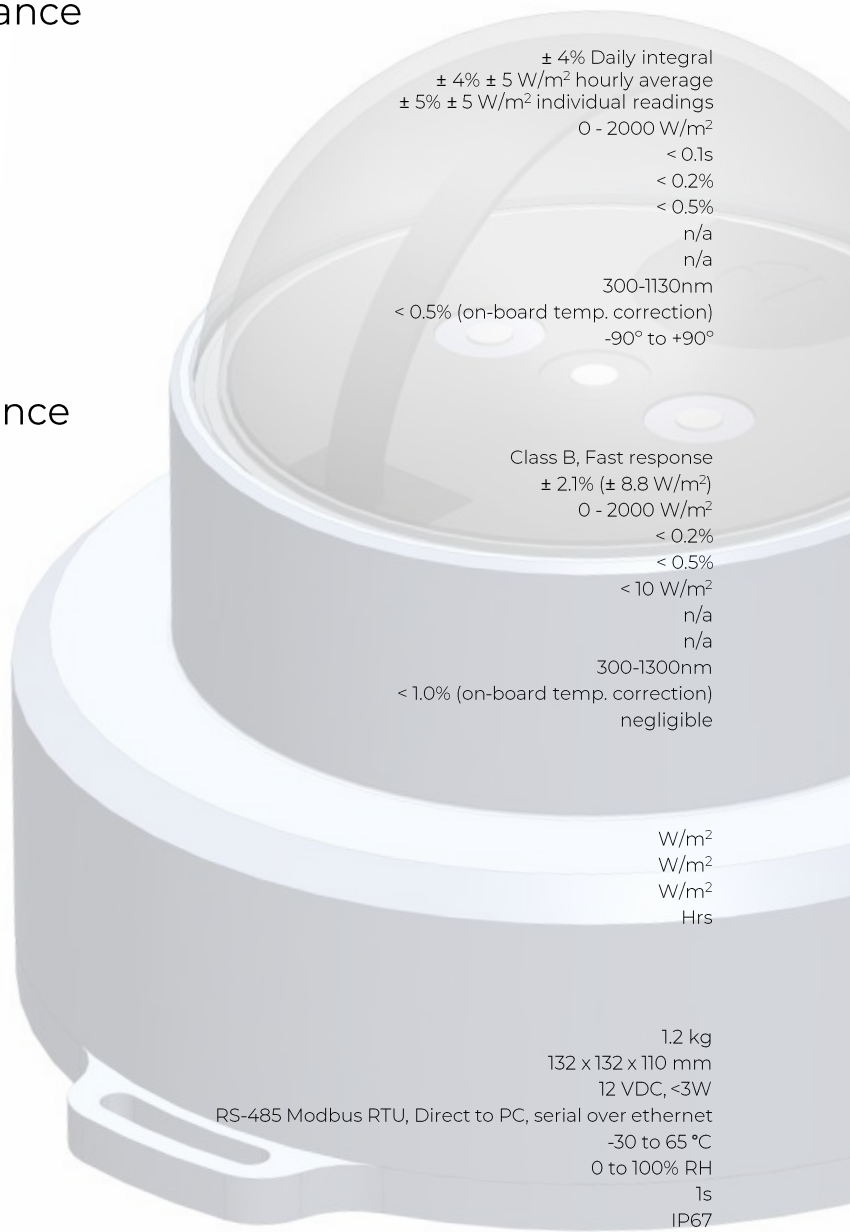
| | |
|---|---|
| ISO 9060:2018 classification (excl. spectral error) | Class B, Fast response |
| Max. spectral error (per ISO9060:2018) | ± 2.1% (± 8.8 W/m²) |
| Measurement range | 0 - 2000 W/m² |
| Non-stability (change per year) | < 0.2% |
| Non-linearity | < 0.5% |
| Cosine error | < 10 W/m² |
| Zero offset A | n/a |
| Zero offset B | n/a |
| Spectral range | 300-1300nm |
| Temperature response (-10 °C - +40 °C) | < 1.0% (on-board temp. correction) |
| Tilt response | negligible |

## Measurands

| | |
|---|---|
| Global horizontal solar irradiance | W/m² |
| Diffuse horizontal solar irradiance | W/m² |
| Direct normal solar irradiance (calculated) | W/m² |
| Sunshine duration | Hrs |

## General

| | |
|---|---|
| Weight | 1.2 kg |
| Dimensions | 132 x 132 x 110 mm |
| Power supply and use | 12 VDC, <3W |
| Communication | RS-485 Modbus RTU, Direct to PC, serial over ethernet |
| Operating temperature range | -30 to 65 °C |
| Humidity range | 0 to 100% RH |
| Max measurement frequency | 1s |
| Ingress protection rating | IP67 |
| Mounting | Three M4 thru-holes, equally spaced on 130mm circle |



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