

RC18 Series PV Reference Cell

Digital & Analog Irradiance Sensor



Designed for PV System Monitoring

- Specifically designed for low-cost, high-accuracy solar irradiance measurements for outdoor monitoring of PV systems

No Need to Track Calibration Data

- You never have to track calibration data or reprogram data loggers or SCADA systems when you install or change out the reference cell
- Measurements are performed by a precision microcontroller circuit
- Both digital and analog outputs are internally calibrated

Cell Design

- Crystalline silicon PV cell
- Short-circuit current measured with precision shunt resistor
- Cell temperature measured with RTD
- Automatic temperature compensation as well as optional temperature output

Digital and Analog Outputs

- Both digital and analog outputs in a single, flexible product
- Digital communication uses Modbus over RS485
- Two analog outputs, user-configurable to 0-1.5V, 0-10V, or 4-20mA
- Analog output options include irradiance, short-circuit current, and temperature

Robust Mechanical Construction

- IP67-rated cast aluminum enclosure provides for protection from the elements and solid mounting

Optional Spectral Matching Filter

- Standard window is solar low-iron glass
- Optional CdTe-matching window material

Connectorized for Easy Installation

- M12 circular connector allows for easy installation, user-selectable cable lengths, and simple change-out for recalibration

Specifications

Main Data	Model name	RC18 Series
	Measurement range	0 to 1500 W/m ²
	Resolution	0.1 W/m ²
	Operating temperature	-35 to 80 °C
	Input power	8-28 VDC (12-28 VDC for 0-10V analog output)
	PV cell	Crystalline Si, 20 mm x 20 mm
	Window	Low-iron solar glass
	Cell temperature measurement	-40 to 100 °C, RTD
	Calibration data	Internally calibrated; no calibration data to manage
	Setup	Optional configuration kit allows PC-based setup
Digital	Communication protocol	Modbus over RS485, user-settable Modbus address
	Baud rate	Up to 57.6k
	Current consumption	typ. 8-15 mA
Analog	Analog output options	0-1.5V, 0-10V, or 4-20mA
	Analog output signals	Irradiance, Cell Temperature, Short-Circuit Current
	Current consumption	0-1.5V or 0-10V mode: typ. 8-15 mA 4-20mA mode: 15-55 mA
	Output impedance	0-1.5V or 0-10V mode: 2 kohm
	Internal voltage drop	4-20mA mode: Allow 3.5 V minimum
Enclosure	Material	Powder-coated cast aluminum housing
	Outdoor rating	IP67
Dimensions	Dimensions	4.53 x 2.56 x 1.18 in. / 115.1 x 65.0 x 30.0 mm
	Weight	0.6 lb / 0.3 kg
	Mounting	4 mounting holes, dia. 0.217 in. / 5.50 mm
Cable	Type	Shielded, weather resistant, UV-rated, 24 awg / 0.2 mm ²
	Cable length options	4 m, 10 m, 25 m, 50 m, 100 m, custom
	Connector	M12 circular connector, IP67
	Pinout	Power, Ground (3x), Analog 1 & 2, RS485 A & B, Shield
Measurement Specifications	Response time	0.15 s
	Electronics non-linearity	± 0.03% of range
	Repeatability	± 0.02% of range
	Temperature drift, -35 °C to 80 °C	± 0.4% at 1000 W/m ²
	Cell temperature measurement	± 1 °C
	Irradiance calibration	± 1.2%, calibrated to NREL-traceable reference standard
	Overall measurement uncertainty	± 2.0% @ 1500 W/m ² , ± 2.9% @ 100 W/m ²
	Stability	0.5% / year
Standards Compliance		IEC 61724-1 Class A, IEC 60904-2, IEC 60904-3, IEC 60904-10 CE

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