

Global Solar Module Soiling Sensor Market 2026 by Manufacturers, Regions, Type and Application, Forecast to 2032

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Abstracts

According to our (Global Info Research) latest study, the global Solar Module Soiling Sensor market size was valued at US\$ 48.10 million in 2025 and is forecast to a readjusted size of US\$ 80.44 million by 2032 with a CAGR of 7.5% during review period.

In 2025, global Solar Module Soiling Sensor production reached approximately 11,000 units, with an average global market price of around 4,250 US\$/unit.

Solar Module Soiling Sensor is a specialized monitoring device designed to quantify the accumulation of dust, sand, salt, pollen, and other contaminants on the glass surface of photovoltaic modules, which cause light transmittance reduction and power generation losses. Adopting optical measurement principles such as blue light closed-loop technology, it integrates a reference sensing unit and a soiled sensing unit to calculate the real-time soiling ratio (SR) and relative power loss, featuring compact structure, low power consumption, and easy installation on PV panel frames. Equipped with standard communication interfaces like RS485 and Modbus, it enables seamless data transmission to plant SCADA or cloud platforms, supporting continuous, unattended monitoring across large-scale ground-mounted, distributed, and desert-region PV systems.

Driven by the global expansion of solar PV capacity and growing awareness of intelligent O&M, demand for soiling sensors rises prominently as soiling-induced generation losses remain a critical unaddressed issue, especially in arid, industrial, and coastal regions. Traditional calendar-based cleaning is inefficient and costly, creating strong market need for data-driven, precision monitoring solutions that optimize

cleaning cycles, reduce water and labor waste, and improve power output consistency. Significant business opportunities lie in developing high-precision, low-cost sensor models for diverse application scenarios, integrating AI-based loss prediction and cleaning recommendation algorithms, partnering with PV EPCs, O&M service providers, and inverter manufacturers for bundled solutions, and penetrating emerging solar markets with underdeveloped monitoring infrastructure, while compliance with international standards further enhances product competitiveness in the fast-growing renewable energy monitoring segment.

This report is a detailed and comprehensive analysis for global Solar Module Soiling Sensor market. Both quantitative and qualitative analyses are presented by manufacturers, by region & country, by Measurement Principle and by Application. As the market is constantly changing, this report explores the competition, supply and demand trends, as well as key factors that contribute to its changing demands across many markets. Company profiles and product examples of selected competitors, along with market share estimates of some of the selected leaders for the year 2025, are provided.

Key Features:

Global Solar Module Soiling Sensor market size and forecasts, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Solar Module Soiling Sensor market size and forecasts by region and country, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Solar Module Soiling Sensor market size and forecasts, by Measurement Principle and by Application, in consumption value (\$ Million), sales quantity (Units), and average selling prices (US\$/Unit), 2021-2032

Global Solar Module Soiling Sensor market shares of main players, shipments in revenue (\$ Million), sales quantity (Units), and ASP (US\$/Unit), 2021-2026

The Primary Objectives in This Report Are:

To determine the size of the total market opportunity of global and key countries

To assess the growth potential for Solar Module Soiling Sensor

To forecast future growth in each product and end-use market

To assess competitive factors affecting the marketplace

This report profiles key players in the global Solar Module Soiling Sensor market based on the following parameters - company overview, sales quantity, revenue, price, gross margin, product portfolio, geographical presence, and key developments. Key companies covered as a part of this study include Kipp & Zonen, Campbell Scientific, Atonometrics, Fracsun, Seven Sensor, Entec Solar, Rika Sensor, EKO Instruments, sun-X GmbH, etc.

This report also provides key insights about market drivers, restraints, opportunities, new product launches or approvals.

Market Segmentation

Solar Module Soiling Sensor market is split by Measurement Principle and by Application. For the period 2021-2032, the growth among segments provides accurate calculations and forecasts for consumption value by Measurement Principle, and by Application in terms of volume and value. This analysis can help you expand your business by targeting qualified niche markets.

Market segment by Measurement Principle

Optical Transmittance Type

Reference-Cell Comparison Type

Twin-Module Comparison Type

Image-Based Detection Type

Others

Market segment by Measurement Accuracy Level

Standard Accuracy Type: ?3%?5% Soiling Loss

High Accuracy Type: ?1%?3% Soiling Loss

Precision Accuracy Type: ??1% Soiling Loss

Others

Market segment by Cleaning Method

Manual-Cleaning Type

Automatic-Cleaning Type

Maintenance-Free Type

Market segment by Application

Residential

Commercial

Industrial

Agricultural

Others

Major players covered

Kipp & Zonen

Campbell Scientific

Atonometrics

Fracsun

Seven Sensor

Entec Solar

Rika Sensor

EKO Instruments

sun-X GmbH

Market segment by region, regional analysis covers

North America (United States, Canada, and Mexico)

Europe (Germany, France, United Kingdom, Russia, Italy, and Rest of Europe)

Asia-Pacific (China, Japan, Korea, India, Southeast Asia, and Australia)

South America (Brazil, Argentina, Colombia, and Rest of South America)

Middle East & Africa (Saudi Arabia, UAE, Egypt, South Africa, and Rest of Middle East & Africa)

The content of the study subjects, includes a total of 15 chapters:

Chapter 1, to describe Solar Module Soiling Sensor product scope, market overview, market estimation caveats and base year.

Chapter 2, to profile the top manufacturers of Solar Module Soiling Sensor, with price, sales quantity, revenue, and global market share of Solar Module Soiling Sensor from 2021 to 2026.

Chapter 3, the Solar Module Soiling Sensor competitive situation, sales quantity, revenue, and global market share of top manufacturers are analyzed emphatically by landscape contrast.

Chapter 4, the Solar Module Soiling Sensor breakdown data are shown at the regional level, to show the sales quantity, consumption value, and growth by regions, from 2021 to 2032.

Chapter 5 and 6, to segment the sales by Measurement Principle and by Application, with sales market share and growth rate by Measurement Principle, by Application, from 2021 to 2032.

Chapter 7, 8, 9, 10 and 11, to break the sales data at the country level, with sales quantity, consumption value, and market share for key countries in the world, from 2021 to 2026. and Solar Module Soiling Sensor market forecast, by regions, by Measurement Principle, and by Application, with sales and revenue, from 2027 to 2032.

Chapter 12, market dynamics, drivers, restraints, trends, and Porters Five Forces analysis.

Chapter 13, the key raw materials and key suppliers, and industry chain of Solar Module Soiling Sensor.

Chapter 14 and 15, to describe Solar Module Soiling Sensor sales channel, distributors, customers, research findings and conclusion.

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