

# MS-90 Plus+

Your Total Solar Irradiance Measurement Solution



## Overview

The MS-90 Plus+ is a new angle on accuracy, a trackerless solar monitoring station combining the build quality and accuracy of different EKO sensors into one, compact, and efficient solution, a reliable, accurate, cost-saving alternative to larger sun tracker based options. Built around the unique internal rotating mirror design of the MS-90 DNI Sensor, the MS-90 Plus+ adds the industry and ISO 9060:2018 class-leading MS-80S Class A Pyranometer, and an original C-Box

smart interface, for complete DNI, GHI, and calculated DHI measurements. A practical solution to the increasing diversity of solar power plant locations and Photovoltaic (PV) applications, the MS-90 Plus+ can easily be deployed on rooftops or other inaccessible areas, and is an incredibly robust solution for difficult to reach installations where regular maintenance may be difficult or impossible.

## Features



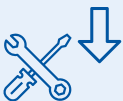
Cost-effective,  
no sun-tracker  
required



Inbuilt GPS for quick,  
accurate setup



DNI, GHI and DHI  
measurements in one  
compact solution



Low maintenance, with  
no external moving  
parts

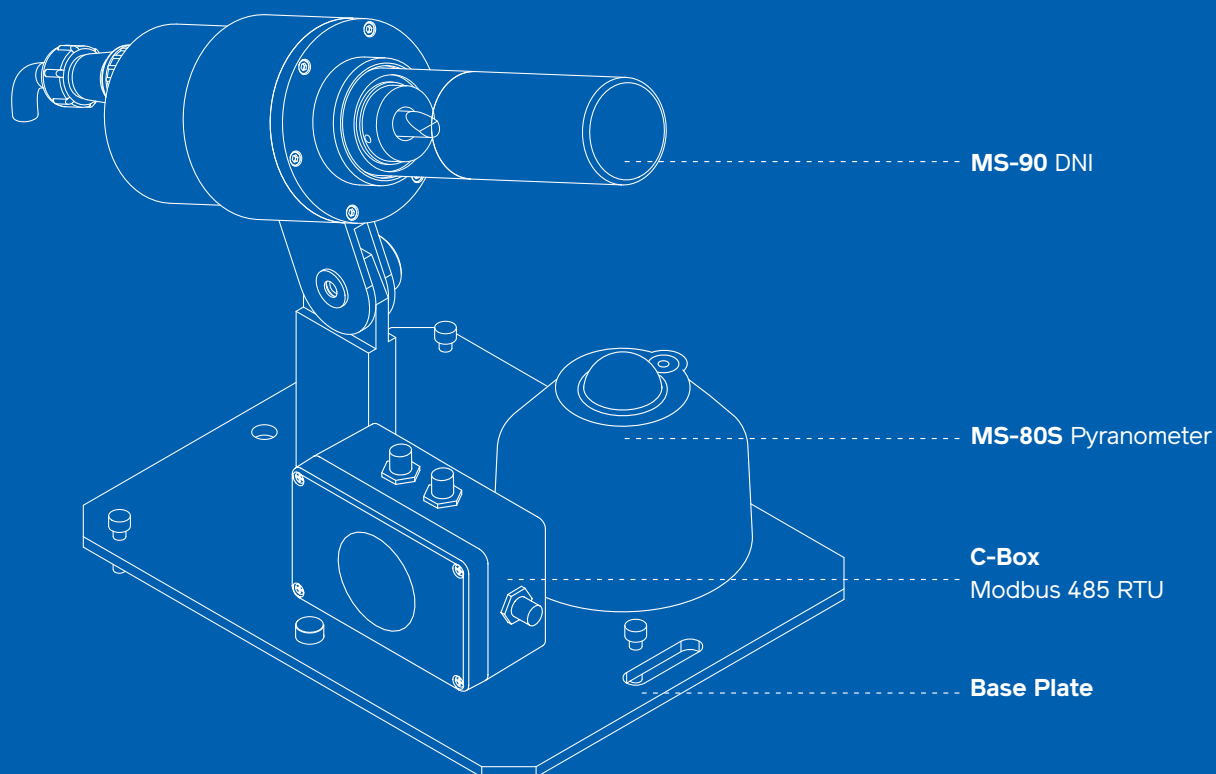


Easy Integration with any  
DAQ system

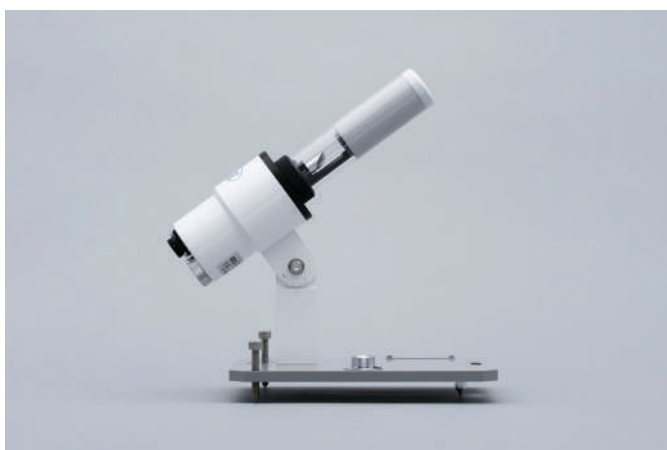


Low Power  
Consumption

## Configuration Diagram

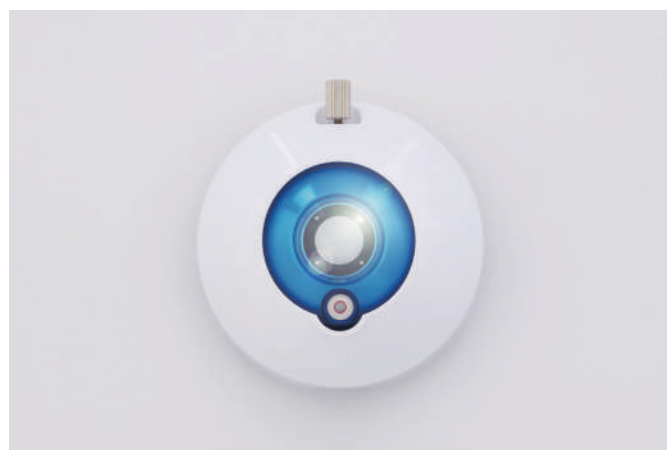


## Configuration Description



### MS-90 DNI Sensor

A revolutionary design with proven reliability, the internal rotating mirror of the MS-90 DNI Sensor is based on the hugely successful MS-093 sunshine duration meter, deployed across Japan for over 10 years at over 800 AMeDaS network weather stations. Designed to accurately measure Direct Normal Irradiance (DNI) without a sun-tracker, the MS-90 is ideal for solar energy monitoring systems and meteorological networks.



### MS-80S Class A Pyranometer

Based on a revolutionary design, the MS-80S Pyranometer is best-in-class for accuracy, speed, reliability and is one of the only top tier 'fast-response' and 'spectrally flat' Class A pyranometers with unprecedented low zero-offset behaviour available. Featuring a state-of-the-art thermopile detector and Quartz diffuser technology, new internal diagnostics, a unique 4-channel interface, and Level A EMI/EMC electronic surge filter protection, the MS-80S is IEC 61724-1 compliant and the standout choice for every application.

## Configuration Description



### C-Box Smart Interface

Sealed inside an all weather case, with GPS receiver, and Modbus 485 RTU output, the C-Box smart interface enables a range of sensor control and data processing functions. Working in tandem with the MS-90 DNI sensor and ISO 9060:2018 Class A leading MS-80S pyranometer, the C-Box, is an essential component of the unique MS-90 Plus+ trackerless solar monitoring solution, allowing the system to accurately measure DNI, GHI, and to calculate DHI from measurement data and the position of the sun.

## Applications



Designed for scientific research, industrial applications, meteorology, and photovoltaic system performance monitoring, the compact MS-90 Plus+ can easily be deployed on rooftops or other inaccessible areas. Tough and reliable, thanks to the unique design of the MS-90 DNI sensor, with an internal rotating mirror that reflects sunlight to a high-speed pyroelectric detector without the whole unit tracking the sun, the MS-90 Plus+ has no external moving parts, making it ideal for a range of applications, big and small.

## Specifications

|                             |                                                         |
|-----------------------------|---------------------------------------------------------|
| ISO 9060:2018               | Class C (DNI) + Class A (GHI, DHI)                      |
| Output                      | DNI, GHI, DHI (MODBUS 485 RTU)                          |
| DNI measurement uncertainty | < 5 % (0-70°)                                           |
| Operating temperature range | -20 - 45 °C                                             |
| Wavelength range            | 300 - 2500 nm                                           |
| Power supply                | 10.5 - 12.5 VDC                                         |
| Dimensions mm               | 350 (W) x 250 (L) x 200 (H) (Incl. optional base plate) |
| Weight                      | 2.5 kg                                                  |
| Ingress protection IP       | 67                                                      |
| Cable length                | 10 m                                                    |
| Geographic application      | Latitude (-58° to 58°) / Longitude (0° to 360°)         |
| Power consumption           | < 6 W                                                   |
| Cable length (Optional)     | 20 / 30 / 50 m                                          |
| Power supply (Optional)     | 100 to 240 VAC / 12VDC / 200 x 140 x 80mm / 2.5 kg      |



### S-Series Pyranometers

The IEC 61724-1 compliant and ISO 9060:2018 class-leading range of S-Series Pyranometers from EKO Instruments set a new standard in pyranometer performance and design, delivering unbeatable accuracy, reliability, and value. The most accurate, reliable and robust family of pyranometers in the world, S-Series sensors feature onboard diagnostics, a 5-year warranty, a unique 4-channel interface, and superior electronic protection in every class, ideal for monitoring photovoltaic system performance, scientific research, meteorological applications, and more.



### STR-21G-S1 Sun Tracker

Built on the STR-21G platform, a single-arm, 2-axis sun tracker with an easy, fully automated setup procedure and low power consumption, the STR-21G-S1 delivers smooth, consistent, and precise tracking. Together with the ISO 9060:2018 class-leading accuracy and performance of EKO's signature Class A MS-80S Pyranometer, and Class A MS-57 Pyrhemliometer, the STR-21G-S1 with shading disk assembly is an elite solution; proven worldwide in a range of environments and ready to deliver outstanding accuracy reliability and value for solar energy research, monitoring, and meteorological applications..

#### QR

Use the QR code to visit our website, contact our team, or to find out more about the **MS-90 Plus+** Trackerless Solar Monitoring Station, other related products, and the full range of industry-leading EKO sensors and instruments.



#### Explore EKO

Made in Japan for over 90 years, EKO solar energy sensors and environmental instruments are built on a legacy of innovation, an uncompromising commitment to quality, and industry-leading accuracy.

With a range of products and services to suit every project or application requirement, explore EKO now, or get in touch to find out how EKO Instruments can help you.



Albedometers



Pyranometers



Pyrhemliometers



Spectro-Radiometers

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