

STR-21G-S1

Unbeatable DNI, GHI, and DHI Accuracy, from Sunrise to Sunset



Overview

The STR-21G-S1 is designed for high-precision solar radiation measurement and provides industry-leading accuracy, reliability and value for solar energy research, monitoring, and meteorological applications. 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 fast response and spectrally flat 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 results.

Features



All-Weather Tracking with Integrated GPS Receiver & 4-Quadrant Sun Sensor



Quick, Easy, Fully Automated Setup



Harmonic Drive® mechanical gear system, for maximum positioning accuracy



Low Power Consumption

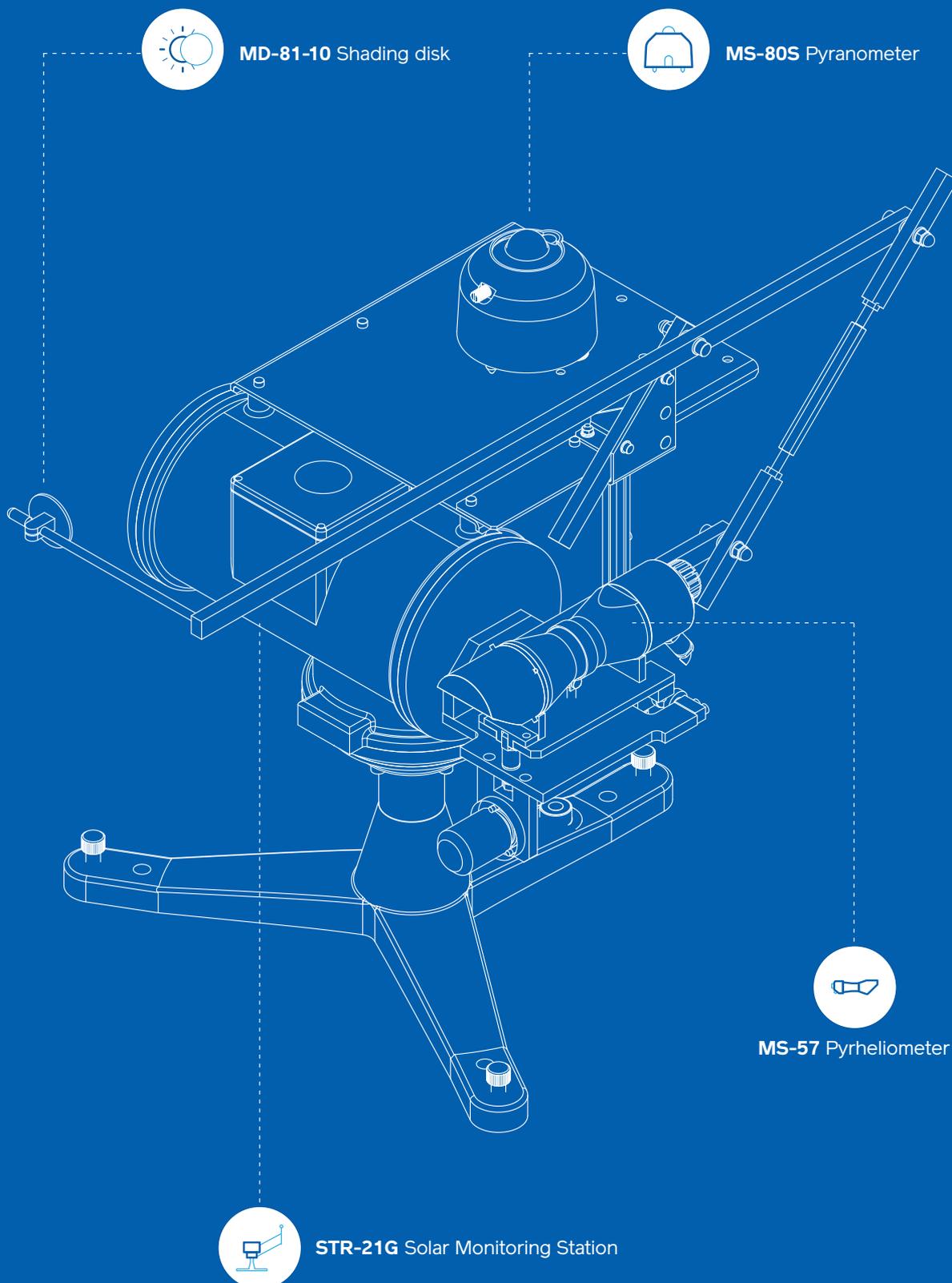


Easy Integration with any DAQ system



Deployed in Antarctica, proven in extreme climates worldwide

Configuration Diagram





STR-21G Sun Tracker

With integrated GPS receiver, 4-quadrant precision sun sensor, and Harmonic Drive® technology, the STR-21G Sun Tracker is built to deliver unparalleled precision, optimal positioning, and reliability, whatever the weather.

Easy to set up, the STR-21G automatically adjusts to the sun's position, even if the tracker is not perfectly oriented or levelled, and can support a range of Global, Diffuse and Direct Radiation measurement sensors for custom configurations.

The single configurable arm of the STR-21G can mount the MS-57 Class A Pyrheliometer for DNI readings and the optional MD-81-10 shading disk assembly, shielding any top-mounted pyranometer for diffuse solar radiation measurements.

Specifications - STR-21G

Arms	1
Pointing accuracy Solar elevation: 0 to 87°	<0.01°
Angle resolution	0.009°
Rotation angle Zenith	-15 - 95°
Rotation angle Azimuth	0 - 360°
Torque	12 Nm
Payload side arms	7 kg
Sun sensor FOV	30°
Ingress protection IP	65
Operating temperature range	-40 - 50°C
Communication	RS-422 / 232C
Power consumption	< 20 W
Motor	Stepper motor
Driving technology	Harmonic Drive®
Tracking modes	Automatic & Manual
Tripod	Table tripod
Pyrheliometer mount	Adjustable / One sensor position
Cable length	10 m
Weight	14.5 kg (With tripod)



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 diffusor 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.



MS-57 Class A Pyrhemioeter

The MS-57 Class A Pyrhemioeter is a fast, accurate, stable, and exceptionally reliable direct normal incidence (DNI) solar irradiance sensor. 'Fast-response' and 'spectrally flat' under ISO 9060:2018 specifications, each MS-57 is calibrated outdoors and tested against reference sensors fully traceable to the World Radiometric Reference.

With an integrated low power window heater to prevent dew deposition or frost on the outside window, and competition-beating long-term stability, the MS-57 is truly 'all-weather' and perfectly suited to a range of applications.

ISO Specifications - MS-80S & MS-57

ISO 9060:2018 Parameters	CLASS A	MS-80S	MS-57
Response time 95%	<10s	<0.5s	< 0.2 Sec.
Zero offset A - Thermal Radiation (200W/m ²)	± 7W/m ²	± 1W/m ²	0 W/m ²
Zero offset B - Temperature change (5K/hr)	± 2W/m ²	± 1W/m ²	< 1 W/m ²
Zero offset C - Total zero off-set	± 10W/m ²	± 2W/m ²	< 1 W/m ²
Non-stability (change/year)	± 0.8%	< 0.5%/5 years	-
Non-linearity (100 to 1000W/m ²)	± 0.5%	± 0.2%	< 0.2 %
Directional Response (at 1000W/m ² 0 to 80°)	± 10W/m ²	± 10W/m ²	-
Spectral Error	± 0.5%	± 0.2%	± 0.2%
Temperature Response (-20°C to 50°C)	± 1%	± 0.5%	-
Tilt Response (0-90° 1000W/m ²)	± 0.5%	± 0.2%	< 0.2 %
Additional Signal Processing error	± 2W/m ²	< 1 W/m ²	-

	MS-80S	MS-57
Wavelength Range (nm)	285 to 3000	200 - 4000 nm (50% points)
Irradiance range (W/m ²)	0 - 4000 W/m ²	0 - 4000 W/m ²
Nominal Sensitivity (µV/W/m ²)	N/A	Approx. 7
Signal Output	Modbus 485 RTU / SDI-12 4-20mA / 0-10mA / 0-1V*	Analog (mV)
Sensor Diagnostic	Relative Humidity ± 2% Temp. ± 0.1% / Tilt Angle ± 1°	-
Nominal Impedance	N/A	< 15000 Ω
Operating temperature	-40 to 80°C	-40 to 80°C
Supply voltage	5 - 30 VDC	-
Power Consumption	< 0.2 W	-
Ingress Protection	IP 67	IP 67
Calibration traceability / uncertainty	ISO 17025 / WRR / < 0.7% (k = 1.96)	-
Standard Cable Length	10m (Optional 20m, 30m, 50m)	10m (Optional 20m)

*Configurable with external 100Ω precision shunt resistor

Applications



An elite solution for high-precision solar radiation measurements, the STR-21G-S1 and STR-Series sun trackers are designed for solar energy research, photovoltaic system performance monitoring, and meteorological applications. It is suitable for any application that requires the highest standards of accuracy and reliability.

Related Products



STR-32G Sun Tracker

The heavy-duty STR-32G Sun Tracker is the same size as other STR series sun trackers but can tackle higher torque and x4 the load without compromising precision and performance. The additional capacity makes the STR-32G the perfect option for a wide-range of Global, Diffuse and Direct Radiation measurement sensors and spectroradiometers.

The STR-32G, featuring integrated GPS and automated, easy setup, is designed for reliability and the very toughest environments and applications.

Accessories



MV-01

Meet IEC 61724-1 standards with the MV-01 ventilator and heater, an optional add-on that helps to reduce sensor soiling and keeps the MS-80S free from dew, ice and snow. Proven in challenging environmental conditions, the MS-80S plus MV-01 is the go-to option globally for rooftop solar stations, solar parks of all sizes, and large weather monitoring sensor networks.

QR

Use the QR code to visit our website, contact our team, or find out more about the **STR-21G-S1** Solar Monitoring Station, related products, and the full range of Class and industry-leading products from EKO.



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.

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Albedometers



Pyranometers



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Sensor Signal Converters



Heat Flux



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Temperature Sensors



Sky Scanners



Thermal Cond. Testers

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