

Spectroradiometer MS-711 + RSB-01S

New Generation

Reference for spectral measurements UV-VIS-NIR

EKO



Beyond Accuracy.

MS-711

Spectroradiometer New generation

The new generation grating spectroradiometer MS-711 is designed to provide the most accurate solar spectral data outdoors. The MS-711 is a unique all weather sensor, without any moving parts. The detector core is temperature controlled to provide accurate irradiance measurement data within the spectral range from 300nm to 1100nm (UV-Visible-NIR).

MS-711 is accurately calibrated with traceability to the International Standards and issued with a calibration uncertainty budget. The rugged optical design of the diffusor and input optics make the MS concept superior to any fiber optic spectroradiometer which will be susceptible to mechanical vibration and handling. The MS spectroradiometers are designed for permanent installation, but are perfectly suited as a traveling reference.

MS-711 has a separate power supply unit and can be controlled through RS232 / 422 by a PC or data logger. The PC software provides different functions for operating, data management and visualisation. Through the open command protocol of the defined system control functions, software can be developed by the individual user. Measuring spectral irradiance is a must to understand the effect of the non-uniform energy distribution of the sun. Since the solar spectrum varies as a function of air-mass and composition of the atmosphere, the MS-711 reveals those details. While broadband sensors quantify irradiance in W/m² spectroradiometers provide detail about the energy distribution by wavelength, which is most important for PV or CPV cell research and performance analysis.

Features

- Reference for spectral measurements UV-VIS-NIR
- High optical resolution <7nm
- Operating temperature range -10 to 50°C
- Made for outdoor solar research
- Robust design no moving parts
- NIST Traceable calibration

Specifications

	MS-711
Wavelength range	300 - 1100 nm
Optical resolution FWHM	< 7 nm
Wavelength accuracy	+/- 0.2 nm
Directional response at 1000W/m ²	< 5 %
Temperature response -10°C to 50°C	< 2 %
Temperature control	25 °C
Operating temperature range	-10 - 50 °C
Exposure time	10 - 5000 msec
Dome material	Quartz
Communication	RS-422 / 232C
Power supply	12VDC, 50VA
Dimensions (mm)	220 (D) x 197 (H)
Weight	4.5 kg
Ingress protection IP	65
Power supply (Power Adapter)	100-240VAC, 50/60Hz
Power consumption	50 W
Power supply operating conditions	-10 to 40°C / 0 to 90 %RH
Power supply dimensions (mm)	320 (W) x 240 (D) x 80 (H)
Power supply weight	1 kg
Program	Analysis software WSDAc
OS	Microsoft Windows 7/8/9/10
Functions	Display and analyze data
Cable Length	10 m
Field of View	180 °

RSB-01S

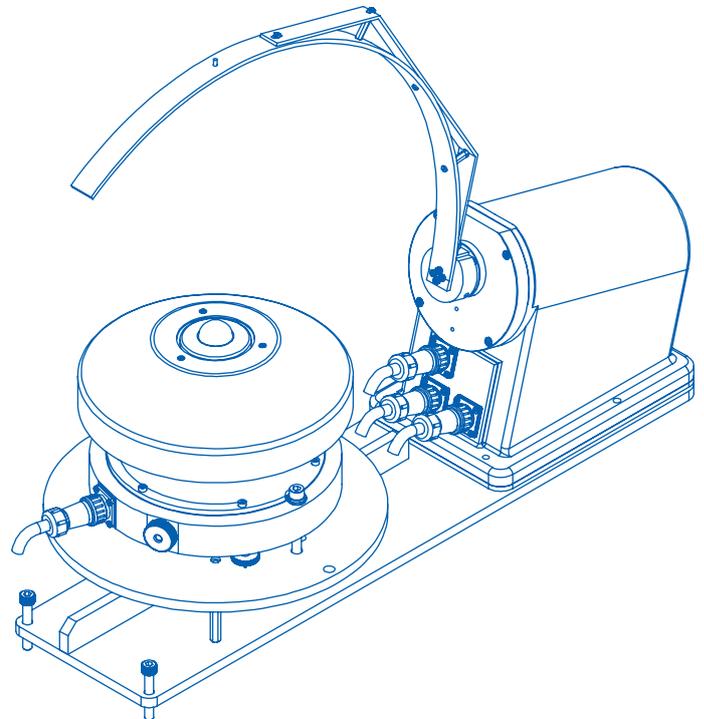
Rotating Shadow Band
New generation



For spectral measurement of the three irradiance components (DNI, GHI, DHI) we took a different approach. A spectroradiometer with rotating Shadow Band (RSB) is an attractive alternative to a conventional 3 component sun tracker system. Just one spectroradiometer used for all measurements lowers the costs associated with the instrumentation required. Accurate DNI measurements can be obtained from a MS-711 Global spectroradiometer with RSB comparing with the MS-711 DNI spectroradiometer on a sun-tracker. The comparison between the outputs spectral DNI from the two configurations reveals a consistency in the method and the measurements of all 3 irradiance components. EKO will provide the RSB solution for all spectroradiometer models.

Features

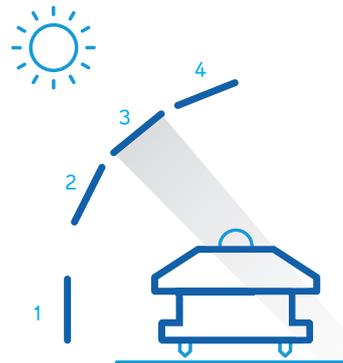
- Measure components (DNI/GHI/DHI)
- Set-up horizontal or POA
- All weather solution
- Reliable and robust design, maintenance free
- GPS receiver for easy set-up
- Compatible with all EKO spectroradiometers
- PC or datalogger control



RSB Measuring principle

In the setup with Rotating Shadow Band, the MS-711 detector is centric to the narrow shadow band rotation axis. As the RSB rotates, four measurements are acquired in less than 1 minute for four different positions of the shadow band. In the 1st position (Irr. 1) the shadow band rests outside of the instrument field of view; 2nd position (Irr. 2) the shadow band stops at -5° from the Sun disk; 3rd position (Irr. 3) the RSB covers the solar disk to perform the DHI measurement; Lastly, in the 4th position (Irr. 4) the shadow band stops $+5^\circ$ after the Sun disk. Hence the irradiance components (DNI, GHI, DHI) can be calculated.

DNI is retrieved by relating the measurements with the 1st and 3rd position of the band, while the 2nd and 4th measurement are used to apply a correction to the estimated DNI.



RSB sweeping steps:
Irr. 1: GHI
Irr. 2: -5° deg.
Irr. 3: DHI
Irr. 4: $+5^\circ$ deg.

Specifications

	RSB-01S
Compatibility with	MS-711 (MS-700/701/710/700N/712)
Shadow Band geometry	5° FOV
Measurement interval time	1 to 60 minutes
Operating temperature range	-20 to 50°C
Power supply	100-230 VAC
Power consumption	15 W / 8W (stand by)
Dimensions	W 680 x L 170 x H 260 mm
Weight	13 kg
Communication	RS-422 to USB

Power Cable 10m and optional length 20 / 30m
Communication cable 10m and optional length 20 / 30m

