



## MS-713 Spectroradiometer

### Technical Specifications

Continuous outdoor measurements

Instant measurement of spectrum 900 nm - 2500 nm

Excellent Long term stability of detector array

Low temperature dependency of detector

Fully controllable by PC and datalogger

The MS-713 can be used stand-alone, but is commonly used in combination with the MS-711, to cover the spectral range from 300nm to 2500nm.

Designed for Solar research activities which require spectral information measured in a very broad spectral range. Such as ground validation of satellite spectral data or future Solar energy research and resource assessment. The MS-713 all-weather spectroradiometer in combination with MS-711 extend the range to 2500nm and measure >98% of the integrated solar-terrestrial spectrum.

The MS-711 and MS-713 spectroradiometer are unique all-weather concept spectroradiometers with no moving parts and temperature controlled spectrometers. The MS-713 can be used stand-alone but in combination with the MS-711, it covers the spectral range from 300nm to 2500nm. MS-711 measures in the range from 300nm and 1100nm, and MS-713 covers the near-infrared (NIR) range between

900nm and 2500nm. Both spectroradiometers are accurately calibrated with traceability to the International Standards and issued with a calibration uncertainty budget.

Temperature changes of the detector inside the spectrometer have a strong effect on the measurement uncertainty. Therefore the sensor unit inside the MS-711 and MS713 main body is accurately controlled at a stable temperature in order to provide the best performance in a wide operating temperature range. The rugged optical design of the diffusor and input optics make the MS spectroradiometer series concept superior to any fiber optic spectroradiometer which will be susceptible to mechanical vibration and handling. The MS spectroradiometer series are designed for permanent installation but are perfectly suited as a traveling reference.

Both spectroradiometers have a separate power supply 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. Software can also be customized to the individual users requirements by making use of the existing system control functions through the open command protocol.

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 thermopile pyrheliometers and pyranometers are most suitable to quantify the total DNI or global radiation ( $W/m^2$ ), spectroradiometers give detail about the energy distribution ( $W/m^2/nm$ ), which is most important for PV or CPV cell research and performance analysis.

	<b>MS-713</b>
<b>Wavelength range</b>	900 - 2500 nm (50% points)
<b>Optical resolution FWHM</b>	< 20 nm
<b>Wavelength accuracy</b>	+/- 2 nm
<b>Directional response at 1000W/m<sup>2</sup></b>	< 3 %
<b>Temperature response -10°C to 50°C</b>	< 2 %
<b>Temp. control</b>	-20 °C
<b>Operating temperature range</b>	-30 - 50 °C
<b>Exposure time</b>	1 - 40 msec
<b>Dome material</b>	Quartz
<b>Communication</b>	RS-422 / 232C
<b>Power supply</b>	12VDC, 85VA
<b>Dimensions mm</b>	300 (D) x 200 (H)
<b>Weight</b>	7.5 kg
<b>Power supply (Power Adapter)</b>	100-240VAC, 50/60Hz
<b>Power consumption</b>	90 W
<b>Power supply operating conditions</b>	-10 to 40°C / 0 to 90 %RH
<b>Power suply dimensions (mm)</b>	320 (W) x 240 (D) x 120 (H)
<b>Power supply weight</b>	1 kg
<b>Program</b>	Analysis software WSDAc
<b>OS</b>	Microsoft Windows 7/8/9/10
<b>Functions</b>	Display and analyze data
<b>Ingress protection IP</b>	65
<b>Cable length</b>	10 m

<b>Field of View FOV</b>	<b>180 °</b>
<b>Options</b>	<b>MS-713</b>
<b>Cable length</b>	<b>20 / 30 m</b>

Specifications are subject to change without further notice.