AVANTES
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DATA SHEET AVASPEC-SOLARXM

SOLAR SIMULATOR SPECTRORADIOMETER

AvaSpec-SolarXM/AvaSpec-SolarXM-Dual

Solar simulator characterization is made easy with the AvaSpec-SolarXM and AvaSpec-SolarXM-Dual spectroradiometer system. These calibrated systems consists of the AvaSpec-ULS2048XL-EVO back-thinned CCD spectrometer, AvaSpec-NIR256-1.7-HSC-EVO (Dual only), 2 meter fiber optic (bifurcated fiber for the dual system), 90 degree cosine receptor, dedicated software application and NIST traceable calibration. The system and software are fully compliant with IEC 60409-9 (2016) for pulsed or steady state solar simulators providing A, B or C classification across six spectral bands. The previous 2007 IEC standard covered the range from 400-1100 nm but the new standard covers 300-1200 nm.

Spectrometer

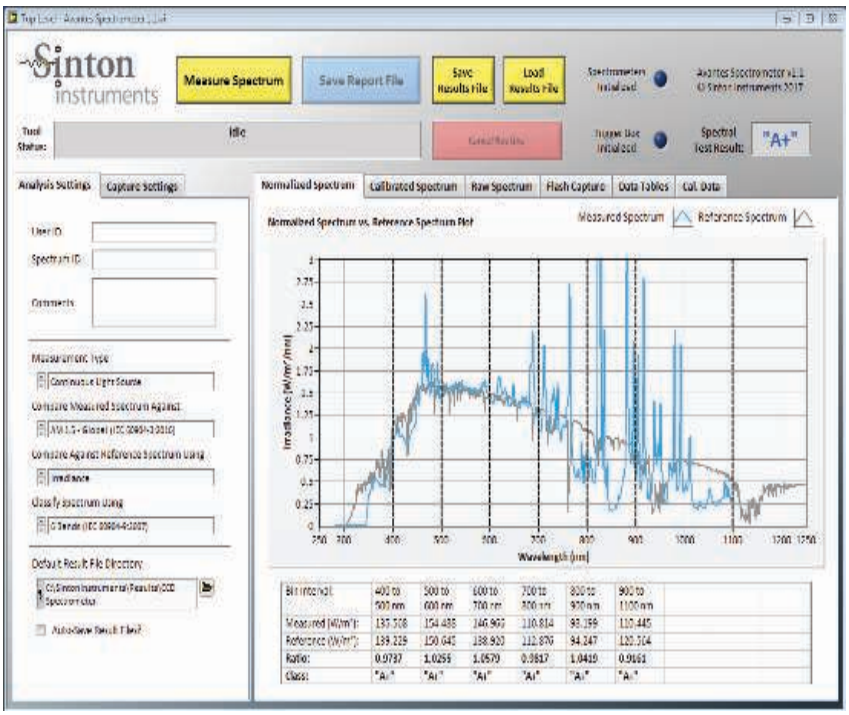
The AvaSpec-ULS2048XL-EVO is a high sensitivity spectrometer based on our exclusive ultra-low stray light design. The instrument's detector provides superior UV and NIR response making it ideal for the spectral range from 300-1100 nm. The spectrometer configuration for the Avaspec-Solar-XM provides 2.4 nm resolution from 300-1100 nm and a range of integration times from 2 µs up to 20 seconds. For the AvaSpec-Solar-XM-Dual system an additional spectrometer, the Avaspec-NIR256-1.7-EVO is added to cover the range from 1000-1250 nm. Both instruments are fitted with keyed FCPC entrance connectors making it possible to connect and disconnect the fiber optic without violating the calibration for easy transport. For the AvaSpec-SolarXM-Dual both spectrometers are synchronized via our low-profile coax synchronization cables to ensure simultaneous spectral acquisitions.

Fiber and Cosine Corrector

The fiber optic cables for the system are designed with robustness in mind featuring stainless steel interlocking jacketing surrounding a 400 micron core high OH silica/silica fiber and FCPC connector. The small form factor 90 degree cosine corrector has a 90 degree field of view making it easy to collect light under your simulator no matter how small the illumination area. The AvaSpec-SolarXM-Dual employs a bifurcated (y cable) fiber optic to port light evenly into each separate spectrometer channel.

Technical Data

Model	AvaSpec-SolarXM	AvaSpec-SolarXM-Dual
Spectrometer	AvaSpec-ULS2048XL-EVO	AvaSpec-ULS2048XL-EVO AvaSpec-NIR256-1.7-EVO
Grating(s)	Grating VA – 300 grooves/mm	Grating VA- 300 grooves/mm Grating NIR 400-1.2 – 400 grooves/mm
Slit Size	Slit-50	UV/VIS – Slit 50 NIR – Slit 50 replaceable
Wavelength range	300-1100 nm	Channel 1: 300-1100 ww Channel 2: 950-1200 nm
Signal to Noise	525:1	UV/VIS 525:1 NIR: 5000:1
Calibration	Wavelength calibration, irradiance calibration to NIST traceable standard 360-1100 nm	Wavelength calibration, irradiance calibration to NIST traceable standard 360-1200 nm
Integration time range	2 µs to 20 seconds	2 µs to 20 seconds
Dynamic range	13,700	13,700
Fiber Optic	FC-UVIR400-2-BX-FC/SMA 400 micron high OH silica fiber with BX stainless steel jacketing, 1 X SMA 905 connector, 1 X FCPC connector	FCB-UVIR400-2-BX-FC/SMA Bifurcated 400 micron high OH silica fiber with BX stainless steel jacketing, 1 X SMA 905 connector, 2 X FCPC connector
Collection Optic	COL-90-UV/VIS-CC-CRADLE	COL-90-UV/VIS-CC-CRADLE
Avatrigger	Optional External trigger box Requires upgrade to bifurcated fiber (FCB-UVIR400-2-BX-FC/SMA-SP1)	Optional External trigger box Requires upgrade to trifurcated fiber (FC3-UVIR400-2-BX-FC/SMA-SP1)



Pulsed or Steady State

The AvaSpec SolarXM and AvaSpec-SolarXM-Dual are suited for pulsed or steady state simulators. When used with a pulsed solar simulator an external trigger (TTL– 5V) may be supplied by the solar simulator or trigger may be done by the optional AvaTrigger external trigger device which provides a trigger within 300 ns of detecting a pulse. For steady state simulators the spectrometer and controlling software enables real time data collection over a range of integration times.

Sinton Instruments Software

Sinton instruments is a leading company in the world of solar metrology technologies. Sinton provides the controlling software for the AvaSpec-SolarXM/Dual. The Software provided by Sinton Instruments is fully compatible with Avantes DLL so it is capable of controlling the spectrometers settings including integration time, averaging, external trigger delay, merging of spectra. Capable of supporting both pulsed or continuous solar simulators.

The software also provides a reference spectrum for AM 1.5 which is loaded automatically during spectral acquisition for comparison to the acquired spectra. Both the 2007 and 2016 proposed IEC 60904 standards are supported for the software. All spectral bands are calculated with A, B, C scoring provided. The software provides for report and certificate print outs as well as data file exporting. The application has the ability to determine spectral mismatch factor between the measured and reference spectrums for a given device by uploading device quantum efficiency curves. Additionally, it supports the ability to compare measured and reference spectrums either by irradiance (as defined by the IEC standard), or by photon flux, which is more relevant for determining the impact on measured current.