

SPECTROSCOPY CONFIGURATIONS FOR IRRADIANCE APPLICATIONS



IRRADIANCE MEASUREMENTS

Avantes instruments and accessories have been used successfully in a multitude of radiometry applications. Use cases include display monitoring, laser characterization, direct solar and solar simulator measurements, LED metrology, UV radiometry, pulsed source measurements and many more. The flexibility of Avantes instrument platform and ability to couple collection optics (integration sphere, collimator, cosine correctors) easily via fiber optics make Avantes instruments ideal for many customers and applications. Avantes offers fully NIST traceable calibrations (including ISA 17025 upon request) from 200-2500 nm as well as uncalibrated systems for customers who may have access to their own calibration facilities. Some of the many advantages of Avantes radiometry solutions include:

Size/portability – These configurations are optimized for size and with portability/transportability in mind

Value – These configurations are affordable to accommodate different budgets

Versatility – ability to achieve different configurations from one instrument

Micro-sampling for small sources or spot measurements by using fiber optics

The following details some common configurations used in radiometry applications. These configurations are not full turnkey solutions, but provide many of the key functionalities needed for common radiometry measurements.

These configurations represent examples of Avantes capabilities, but certainly more unique configurations are possible based on each application. Please contact a sales engineer to discuss your requirements.

IRRADIANCE APPLICATIONS



Solar Simulator Characterization



Atmospheric Monitoring



Lighting



Ultra-Violet Germicidal



UV Field Measurement



Greenhouse/Horticulture

SPHERE BASED RADIOMETRY SYSTEM



● Spectrometer

[AvaSpec-VARIUS™](#)

360-1100 nm range (adjustable), Resolution 2.4 nm, FCPC entrance

● Fiber Optic

[FC-UVIR600-1-MS](#)

600 micron core broadband fiber optic cable

● Integrating Sphere

[Avasphere-100-IRRAD](#)

100 mm internal diameter integrating sphere (25 mm port size)

● Calibration

[Irradiance Calibration](#)

NIST traceable calibration for UV (200-400), VIS (360-11000 nm) or NIR (1000-2500 nm) (Optional ISO 17025 calibration upon request)

MEASUREMENT TECHNIQUE

Avantes sphere based systems are designed for measurements of LED source or distance measurements of omni-directional point sources. Avantes offers 30, 50, 80, and 100 mm internal diameter integrating spheres designed for measuring external sources. All integrating sphere detector ports are baffled to avoid direct illumination. Avantes 30, 50 and 100 mm sphere are made from machined PTFE while the 100 mm sphere is a Spectralon coated spheres from our partner LabSphere. Avantes uses a keyed FCPC entrance connections for the spectrometer on all radiometry configurations and FCPC terminated fibers allowing for connection/reconnection without violation of the calibration. This ability to disconnect and reconnect fibers is vital for transport and storage of the system between usage.

SMALL SPHERE RADIOMETRY SYSTEM



Spectrometer

[AvaSpec-VARIUS™](#)

360-1100 nm range (adjustable), Resolution 2.4 nm, FCPC entrance

Integrating Sphere

[Avasphere-50-IRRAD](#)

Integrated Light Source.
50 mm, Sample-port 10 mm

Fiber Optic

[FC-UVIR600-1-MS](#)

600 micron core broadband fiber cable, FCPC termination end 1, SMA905 termination end 2

Calibration

[Irradiance Calibration](#)

NIST traceable calibration for UV (200-400), VIS (360-11000 nm) or NIR (1000-2500 nm)
(Optional ISO 17025 calibration upon request)

ADDITIONAL SPECTROMETER OPTIONS



[AvaSpec-ULS2048X64-EVO](#)
for improved signal to noise,
and enhanced sensitivity in the
800-1100nm region.

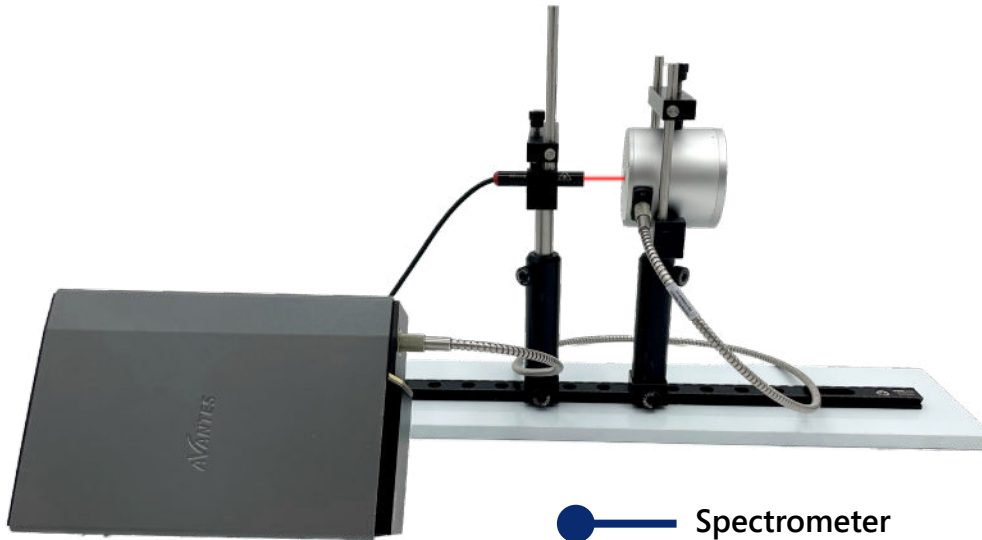


[AvaSpec-NEXOS™](#)
A more economical instrument
option



For measurements in the 1000-
1700 nm please consider the
[AvaSpec-NIR256-1.7.-HSC-EVO](#)
or [AvaSpec-NIR256-1.7-EVO](#)

LASER POWER AND WAVELENGTH METROLOGY SYSTEM



Spectrometer

[AvaSpec-VARIUS™](#)

360-1100 nm range (adjustable), Resolution 2.4 nm, FCPC entrance

Integrating Sphere

[Avasphere-50-IRRAD](#)

Integrated Light Source.

50 mm, Sample-port 10 mm

Fiber Optic

[FC-UVIR600-1-MS](#)

600 micron core broadband fiber cable, FCPC termination end 1, SMA905 termination end 2

Accessory

[TR-Rail-US](#)

Adjustable horizontal rail holder for transmission and irradiance measurements. Also consider [CLH-VAR-UV/VIS](#) variable collimating lens holder.

Calibration

[Irradiance Calibration](#)

NIST traceable calibration for UV (200-400), VIS (360-11000 nm) or NIR (1000-2500 nm) (Optional ISO 17025 calibration upon request)

ADDITIONAL SPECTROMETER/ACCESSORY OPTIONS



For pulsed lasers, the [AvaTrigger-USB2](#) external triggering cable may be used or Avantes Avatrigger external triggering box can be used if optical triggering is required.



[AvaSpec-NIR256-1.7-HSC-EVO](#) or [AvaSpec-NIR256-1.7-EVO](#)

For measurements in the 1000-1700 nm please consider the Avantes NIR spectrometer for 900-1700 nm

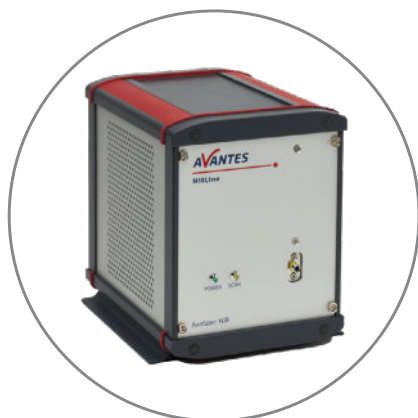
UV/VIS OR VIS/NIR IRRADIANCE SYSTEM

When an integrating sphere is cost prohibitive or not feasible due to sample geometry, a cosine corrector can be a suitable alternative. Avantes offers a variety of sizes which can be calibrated to a radiometry solution.



- **Spectrometer**
[AvaSpec-VARIUS™](#)
360-1100 nm range (adjustable), Resolution 2.4 nm, FCPC entrance
- **Fiber Optic**
[FC-UVIR600-1-MS](#)
600 micron core broadband fiber cable, FCPC termination end 1, SMA905 termination end 2
- **Accessory**
[Ava-Tripod](#)
Cosine corrector/collimating lens holder
- **Accessory**
[CC-VIS/NIR](#)
600 micron core broadband fiber cable, FCPC termination end 1, SMA905 termination end 2.
- **E. Calibration**
[Irradiance Calibration](#)
NIST traceable calibration for UV (200-400), VIS (360-11000 nm) or NIR (1000-2500 nm)
(Optional ISO 17025 calibration upon request)

ADDITIONAL SPECTROMETER OPTION



[AvaSpec-NIR256-1.7.-HSC-EVO](#) or
[AvaSpec-NIR256-1.7-EVO](#)

For measurements in the 1000-1700 nm please consider the Avantes NIR spectrometer for 900-1700 nm

AVASPEC-SOLAR-MINI+

(A TURNKEY SOLUTION FOR SOLAR SIMULATOR CHARACTERIZATION)

Model	AvaSpec-Solar-Mini+	
Spectrometer	AvaSpec-NXS2048CL	AvaSpec-Mini-NIR
Grating(s)	UV/VIS Grating VA – 300 grooves/mm	NIR Grating -NIR200-1.6
Slit Size	Slit-50	
Wavelength range	UV/VIS 300-1100 nm	NIR – 975-1700 nm
Signal to Noise	UV/VIS: 375:1	NIR: 5000:1
Calibration	Wavelength calibration, irradiance calibration to NIST traceable standard 300-1700 nm (ISO 17025 calibration also available upon request)	
Integration time range	UV/VIS 2 μ s to 20 seconds	NIR – 10 μ s to 300 ms
Dynamic range	13,700	
Fiber Optic	FC3X2-UVIR600-2.0-PMS Bifurcated to trifurcated 400 micron high OH silica fiber with BX stainless steel jacketing, 5 X SMA 905 connectors	
Collection Optic	Cosine Corrector - COL-90-UV/VIS-CC-CRADLE, COL-90-UV/VIS	
Avatrigger-USB2	External trigger box	
Dimensions/Weight	95 x 154.5 x 157 mm; 1 kg	



SOFTWARE

Unlike previous configurations featured, the AvaSpec-Solar-Mini+ is a turnkey solution for solar simulator metrology. The system conforms to the ICC6090-9 2007 and 2020 standards. The system features a trigger box to support pulsed pulsed simulators but can also measure steady state simulators. The AvaSpec-Solar-Mini+ can be controlled by Avantes AvaSoft Software but for ease of use with solar simulator characterization the system includes turnkey software from Sinton Instruments, (A leading supplier of software to the solar industry) which is fully compliant with IEC 60904

CONTACT

WE'RE HAPPY TO HELP

Curious how spectroscopy can help you reveal answers by measuring all kind of materials, in-line, at your production facility, in a lab or even in the field? Please visit our website or contact one of our technical experts, we're happy to help you.

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