Spectrometric solutions from components to systems

JETI TECHNISCHE INSTRUMENTE GMBH

spectraval 1501

VIS Spectroradiometer

spectraval 1501 is a compact spectroradiometer for the visible spectral range. It can be used for spectral Radiance and Irradiance* measurements with a viewing angle of 1.8°. The actual measuring area is marked by a red circle.

There are special versions of **spectraval 1501** available: spectraval 1501-HiRes (with increased optical resolution), spectraval 1501-NIR (with a wavelength range up to 1000 nm), spectraval 1501-LAN (with additional LAN interface instead of Bluetooth) and spectraval 1501-focus (compatible with add-on optics).

spectraval 1501 is delivered with the radiometric software JETI LiVal (demo version see jeti.com), but it can also be used with special programs for monitor calibration (CalMAN, ColourSpace, ChromaPure).

Highlights:

- Optimized operation routines
- Piezo-electric shutter for dark signal compensation
- Suited for HDR (Luminance values up to 140 000 cd/m² can be measured)
- Implementation into customer specific applications possible using:
  Radiometric DLLs (Windows applications) or
  Serial commands (SCPI-like syntax) (Windows and Linux applications)

Advantages:

- Bluetooth and USB interfaces
- USB or battery powered
- Compact solution
- Fast measurement
- Precise results due to high quality spectrograph and NIST traceable calibration
- Comfortable handling due to Bluetooth interface
- Measurement of source repetition rate

Software **JETI LiVal**:

- Intuitive operation
- Weighting the obtained spectrum with an action function
- Classification of samples
- Easy data export to Excel and CSV
- Automatic detection of attached accessories
- Specific calculations as PAR, circadian metrics and metamerism according to ISO 23603

Examples for application are the following:

- Calibration of broadcast monitors
- Color adjustment of digital projectors
- Color characterization of LED displays
- Color measurement of video walls
- spectraval 1501-HiRes: measurement of RGB Laser projectors
- spectraval 1501-NIR: remote sensing, spectral measurement of plant lighting
- spectraval 1501-LAN: spectral measurements in production and production environment
- spectraval 1501-focus: measurement of small symbols and display segments

Specifications

Optical parameters

Spectral range	
spectraval 1501	380 ... 780 nm / spectraval 1501-NIR: 380 … 1000 nm
Optical bandwidth	
spectraval 1501	< 4.5 nm (FWHM) / spectraval 1501-HiRes: 2 nm[1] (FWHM)
Wavelength resolution	1 nm
Digital electronic resolution	16 bit ADC
Viewing angle	1.8°
Measuring distance/ diameter (measured from front end of the device)	20 cm – Ø 8 mm; 100 cm – Ø 33 mm

Measuring values

Spectral Radiance, Luminance, total Radiance, x,y, u',v', CCT, CRI, color purity, RGB and others
*For measurements of spectral Irradiance/Illuminance an optional diffusor is required (available at jeti.com).

Measuring ranges and typical measuring uncertainties (according to CIE TN 009:2019)

Luminance measuring range	0.2 … 180 000 cd/m² (Illuminant A) 0.2 … 140 000 cd/m² (typical warm white LED) (higher values with optional filter)
Luminance accuracy	± 4.4 % (Illuminant A @ 100 cd/m², k=2)
Luminance reproducibility	± 1 % (Illuminant A)
Chromaticity accuracy	± 0.002 x, y (Illuminant A, k=2)
Color reproducibility	± 0.0005 x, y (Illuminant A)
Illuminance* measuring range	1 ... 1 800 000 lx (Illuminant A) 1 ... 1 500 000 lx (typical warm white LED)
CCT reproducibility	± 20 K (Illuminant A)
Max. wavelength error	± 0.2 nm (HgAr line source)
Polarization error f8	< 2 %

Other technical data

Dispersive element	Imaging grating (flat field)
Light receiving element	CCD line array 2048 pixels (binned) (4096 pixels at spectraval 1501-HiRes)
Power supply	Battery and USB powered
Interfaces	USB 2.0 full speed Bluetooth, alternatively LAN
Dimensions	140 mm x 80 mm x 70 mm
Weight	400 g
Operating conditions	Temperature 10 ... 40 °C Humidity < 85 % relative humidity at 35 °C
Accessories (included)	PC software JETI LiVal for Windows 10/ 11, operating instructions and software development kit on USB flash drive USB cable, tripod, carrying bag and battery charger Calibration certificate
Calibration	NIST traceable
Recommended interval	1 year

Version March 2023

[1] About 4 times higher measuring time compared to standard version