

# AVANTES

Spectroscopy measurement

# BUNDLES



## Color measurement of small areas



Ideal for color measurements, this bundle features an AvaSpec-ULS2048 spectrometer, tuned for visible light. Furthermore a D65 halogen light source for illumination and a reflection probe together with a reflection probe holder.

Typical applications:

- In-line reproducibility
  - Small spots & lines
- ... and many more

### Order information: AvaSpec-Color-A

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2	Grating BB (360-780nm) 200 µm slit AvaSoft-Full & AvaSoft-Color
<b>Light source</b>	AvaLight-HAL-Mini	PS-12V/2.08A
<b>Fiber optics</b>	FCR-7UV200-2 reflection probe RPH reflection probe holder	
<b>Included</b>	WS-2 white reflection tile	

## Color measurement of surfaces (total diffuse light)



Wide angle diffuse light from the sample is used to measure color. This uses a hand held 50 mm integrating sphere and a compact spectrometer. Measurement is free of the gloss specular component. The measurement optics are placed under a 8° angle (D/8 SPIN).

Typical applications:

- Rough surfaces
  - Textile and printed paper
  - Fruits
- ... and many more

### Order information: AvaSpec-Color-B

<b>Spectrometer</b>	AvaSpec-ULS3648-USB2	Grating BB (360-780nm) 100 µm slit AvaSoft-Full & AvaSoft-Color
<b>Light source</b>	AvaSphere-50-LS-HAL-12V	
<b>Fiber optics</b>	FC-UV200-2-ME	
<b>Included</b>	WS-2 white reflection tile	

## AvaSpec-LaserChecker



This spectrometer/ fiber combination allows you to quickly check the wavelength of your laser.

Simply catch the laserlight with the fiber and analyse your laserwavelength with analysis software AvaSoft 8.

The AvaSpec-LaserChecker works in the 500-1000nm range with an optical resolution of 0.7nm.

### Order information: AvaSpec-LaserChecker

<b>Spectrometer</b>	AvaSpec-Mini3648	Grating-MN600-1.00 set for 500-1000nm; Resolution: 0.7nm; OSF475; Slit-25, AvaSoft-Basic
<b>Fiber optics</b>	FC-IR200-1	

# Gemology



The easy way to answer two basic questions: "what are the characteristics of the stone I'm measuring?" and "are these characteristics natural?" is the Ava-GEM. It includes a sphere and a special gemology white reference tile to determine fast and without a doubt what your answers to the two questions will be.

Typical applications:

- Color
- Natural or artificial
- Artificial coloring

... and many more

## Order information: Ava-GEM

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2	Grating VA (360-1000nm) 25 µm slit, DCL-UV/VIS, OSC AvaSoft-Full
<b>Fiber optics</b>	FC-UV600-2 reflection probe	
<b>Included</b>	AvaSphere-50-LS-HAL-12V AvaSphere-50-HOLD WS-2-GEM	PS-12V/2.08A

# Fluorescence



In spectroscopy fluorescence is one of the more challenging setups, due to the low fluorescent emission (about 3% of the excitation energy). The AvaSpec-2048L gives the highest sensitivity and the AvaLight-LED series provides excitation at the requested wavelength.

Typical applications:

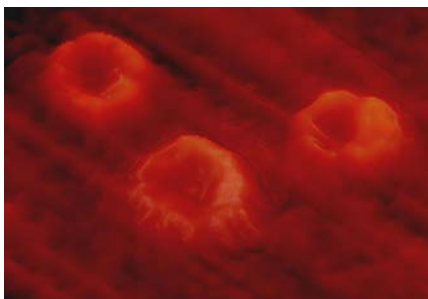
- Dyes identification
- Fluorescent lamps
- Diagnosis of malignancies
- Fluorescent labeling

... and many more

## Order information: Ava-Fluorescence

<b>Spectrometer</b>	AvaSpec-ULS2048L-USB2	Grating VA (350-1000nm) 200 µm slit, DCL-UV/VIS-200, OSC AvaSoft-Full
<b>Light source</b>	AvaLight-LEDxxx	Power supply
<b>Fiber optics</b>	FCR-UV200/600-2-IND FCR-FLTIP-IND	

# Biomedical



Non-invasive is the preferred choice for many patients. Spectroscopy helps achieving the goal of non-intrusive measurement devices. This bundle non-invasively measures concentrations of unknown samples or changes in concentration over time. This bundle is meant for R&D usage.

Typical applications:

- Oxygen in blood
- Hemoglobin
- Microvascular circulation

... and many more

## Order information: Ava-Biomedical

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2	Grating NB (500-1000nm) 50 µm slit, OSF-475 AvaSoft-Full and AvaSoft-Chem
<b>Light source</b>	AvaLight-HAL	Power supply
<b>Fiber optics</b>	FCR-7IR200-2-MS-PK-S	
<b>Included</b>	WS-2	

# Cost effective, high resolution plasma measurement



Plasmas are known for many emission peaks, located closely together. To separate these peaks, Avantes has developed multichannel spectrometers. This 200 to 1030nm quad-channel spectrometer boasts an optical resolution of 0.18-0.22 nm, four times better than a standard AvaSpec-ULS2048 covering the same range. In AvaSoft Spectroscopy Software, the four channels are combined as if you were working with only one spectrometer.

Typical applications:

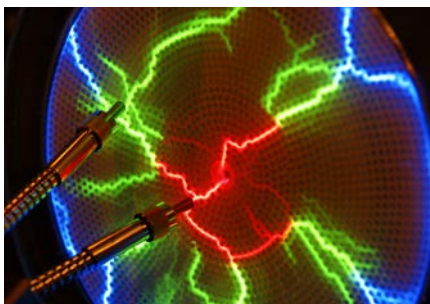
- Semi-conductor
- Solar cells
- Razor blades
- Fusion reactors
- Glass & coating

... and many more

## Order information: AvaSpec-Plasma-A

<b>Spectrometers</b>	4-channel desktop housing 4 x AvaSpec-ULS2048-USB2	Gratings: • UC (200-458nm), 0.18 nm • VC (455-683nm), 0.19 nm • NC (680-974nm), 0.20 nm • NC (870-1030nm), 0.22 nm  All channels with 10 µm slit, DCL-UV/VIS detector collection lens & OSF-600 order sorting filter (where needed)
<b>Fiber optics</b>	FC4-UVIR400-2 multifurcated fiber	
<b>Included</b>	AvaSoft-Full spectroscopy software SPECline-A analytical software	

# Extreme high resolution plasma measurement



For even higher resolution than the above-mentioned quad-channel spectrometer, this version features eight channels, with an optical resolution of up to 0.10 nm. The wavelength range is 200-1070 nm, which means it detects from ultraviolet, through visible, up to near infrared light.

Typical applications:

- Semi-conductor
- Solar cells
- Razor blades
- Fusion reactors
- Glass & coating

... and many more

The system is delivered in a 19" rack-mountable enclosure.

## Order information: AvaSpec-Plasma-B

<b>Spectrometers</b>	8-channel 19" rackmountable enclosure 8 x AvaSpec-ULS2048-USB2	Gratings: • UE (200-320, 318-420 & 417-505 nm), 0.10 nm • VE (500-565 nm), 0.10 nm • VD (565-670), 0.12 nm • VD (668-750 nm), 0.14 nm • NC (745-930 nm), 0.20 nm • NC (920-1070 nm), 0.22 nm  All channels with 10 µm slit, DCL-UV/VIS detector collection lens & OSF-600 order sorting filter (where needed)
<b>Fiber optics</b>	FC8-UVIR400-2 multifurcated fiber	
<b>Included</b>	AvaSoft-Full spectroscopy software SPECline-A analytical software	

## UV/VIS/NIR Absorbance



Designed for broadband measurements, this UV/VIS absorbance bundle features a high power deuterium halogen light source with integrated shutter and a variable dip probe. A versatile bundle to measure absorbance in most situations.

Typical applications:

- Colorization of fluids
- In-line measurements
- Color of liquids in test tubes and flasks

... and many more

### Order information: Ava-Absorbance

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2	Grating UA (200-1100nm) 25 µm slit, DUV, DCL-UV/VIS OSC-UA Order Sorting Filter AvaSoft-Full
<b>Light source</b>	AvaLight-DH-S	
<b>Fiber optics</b>	FDP-7UV200-VAR Dip Probe	

## Irradiance / Spectroradiometry



Irradiance means measuring how much light reaches a specific place. This is why a cosine corrector is included: it collects light from a 180 degree angle. The comprehensive AvaSoft-Irrad allows fully calibrated traceable radiometric and photometric measurements

Typical applications:

- Solar lighting
- Environmental & general lighting

... and many more

### Order information: Ava-IRRAD-A

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2 FC/PC	Grating UA (200-1100nm) 25 µm slit, DUV, DLC-UV/VIS OSC-UA Order Sorting Filter AvaSoft-Full & AvaSoft-Irrad Irrad-CAL-UV/VIS
<b>Fiber optics</b>	FC-UVIR200-2-ME-1FCPC	
<b>Included</b>	CC-VIS/NIR	

## LED light measurements



More and more countries ban incandescent lamps from being sold, hugely boosting LED sales. Avantes supplies the needed tools for photometric and radiometric measurements.

The spectrometer is irradiance calibrated to obtain absolute values.

Typical applications:

- Irradiance
- Illuminance
- Radiometric & photometric flux
- Luminous intensity
- Color coordinates

... and many more

### Order information: Ava-LED

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2 FC/PC	Grating VA (350-1000nm) 25 µm slit, DLC-UV, OSC AvaSoft-Full & AvaSoft-Irrad Factory-calibrated system for irradiance IRRAD-CAL-VIS
<b>Fiber optics</b>	FC-UVIR600-2-ME-1FCPC	
<b>Included</b>	AvaSphere-50-IRRAD AvaSphere LED adapter	

## Thin Film



For single layer thin film measurements, this system provides the needed tools. It includes a reflection probe and a stage. It can measure thin films ranging from 10 nm to 50  $\mu\text{m}$  with a resolution of 1 nm. It supports UV/VIS and NIR measurements from 200 - 1100 nm.

Typical applications:

- Semi-conductor industry
- Solar panels
- Coating

... and many more

### Order information: Ava-ThinFilm

<b>Spectrometer</b>	AvaSpec-ULS2048-USB2	Grating UA (200-1100nm) 100 $\mu\text{m}$ slit, DCL-UV/VIS, DUV coating OSC-UA AvaSoft-ThinFilm
<b>Light source</b>	AvaLight-DHc	PS-12V/1.0A
<b>Fiber optics</b>	FCR-7UV200-2-ME reflection probe	
<b>Included</b>	ThinFilm stage & standard	

## Vacuum



Two vacuum feed-throughs are included in this bundle: one with a 200  $\mu\text{m}$  fiber cable and one with a 600  $\mu\text{m}$  diameter. Also the needed reflection probe and a deuterium halogen light source.

The AvaSpec ULS2048L is the ideal companion for this setup.

Typical applications:

- Coating
- Plasma

... and many more

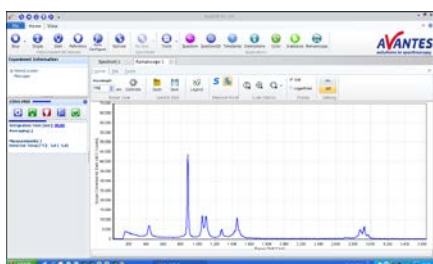
### Order information: Ava-ThinFilm

<b>Spectrometer</b>	AvaSpec-ULS2048L-USB2	Grating UA (200-1100nm), 50 $\mu\text{m}$ slit, DUV coating, OSC-UA, DCL-UV/VIS-200 AvaSoft-Full
<b>Light source</b>	AvaLight-DH-S	
<b>Fiber optics</b>	FCR-7UV200-2-ME FC-UV600-2 & FC-UV200-2	
<b>Included</b>	FC-VFT-UV200 & FC-VFT-UV600 4 interconnects	

# Avantes Raman Bundles



**AvaRaman: Raw materials**



## Raman spectroscopy:

- Analysis of liquids, powders, tablets, gels
- Measurements through transparent and semi-transparent packages

Raman Spectroscopy allows obtaining individual spectral 'fingerprints' of materials. Commonly used in chemistry, pharmaceutical and medical fields, to provide information by which molecules can be identified.

Avantes already offers Raman systems consisting of a spectrometer and a laser combined in one unit.

To offer our customers optimal performance for a reasonable price, Avantes joint forces with 2 partners to offer you a Raman Bundle consisting of a great spectrometer (3 different models), a unique Laser-Probe combination (785nm) supplying enhanced signals and an outstanding Software package to analyze the Raman spectra.

These Bundles have in common:

## For excitation

AvaLaser785 (incl.: 785 nm laser safety goggles). It has an ultra-high throughput integrated Raman probe. This novel device includes an integrated wavelength stabilized laser source with Raman filter packs, beam shaping optics and high efficiency Raman spectra collection optics.

## Features

- 785 nm Wavelength stabilized excitation source.
- High throughput optical design with 100cm<sup>-1</sup> Cut-on.
- External control box for power adjustment (manually / software controlled).



## For Analysis

AvaSoft-Raman: Basic standalone software to obtain spectra.

Panorama-Light: Panorama Light is a modular, high-end software platform for spectroscopic data evaluation.

The application meets all requirements for a comprehensive spectroscopy working environment, offering:

- Measurement with an instrument
  - 2D & 3D data visualization
  - Searching in libraries
  - Archiving in spectral libraries, including additional information
  - Printing with professional print templates
  - Conversion of many known data formats
  - Sharing data with office applications
- Panorama Light is designed to perfectly assist you and to keep you focused on your daily work.

## For Detection

We offer state of the art spectrometers based on the Avantes Star- and SensLine spectrometers, tailored for optimal performance in the Raman range of interest.

## Type of measurements

Raman techniques are used for many different materials. The Avantes bundles are really good for the use of powders and liquids. When strong signals are available (aromatic compounds, alcohol based liquids) in general AvaRaman-A is useful to perform the measurement.

When weak Raman signals occur (Integration time longer than 5 seconds) the thermo-electric-cooled (TEC) spectrometer is recommended. This is added in the Ava-Raman-B.

For very weak signals (possibly together with fluorescence background) the Ava-Raman-D is recommended. Thanks to Higher quantum efficiency in NIR and better signal /noise performance.

## Application fields

- Mineralogy & Gemology
- Raw materials identification
- Pharmaceuticals & Medical diagnostics
- Semiconductors

## Ordering Information

### AvaRaman-A

*Based on an uncooled spectrometer this is the entry bundle for reasonable strong signals.*

- Range: 150  $\text{cm}^{-1}$  - 3600  $\text{cm}^{-1}$
- Resolution: 6  $\text{cm}^{-1}$
- Spectrometer based on an AvaSpec-ULS2048L-USB2 set for (788-1100nm), slit-25, DCL-UV/VIS200, FC-PC connector)
- Also including: AvaLaser785 (incl. probe),  
AvaRaman software: Panorama Light  
Optional: Replaceable slit (add -RS)

### AvaRaman-B

*Based on the cooled version of the spectrometer offered in the bundle Ava-Raman-A .  
Cooling enables you to work with longer integration times, yet keeping the thermal noise limited.*

- Range: 150  $\text{cm}^{-1}$  - 3600  $\text{cm}^{-1}$
- Resolution: 6  $\text{cm}^{-1}$
- Spectrometer based on an AvaSpec-ULS2048LTEC-USB2 set for (788-1100nm), slit-25, DCL-UV/VIS200, FC-PC connector)
- Also including:  
AvaLaser785 (incl. probe)  
AvaRaman software: Panorama Light  
Optional: Replaceable slit (add -RS)

### AvaRaman-D

*For the most challenging applications.  
This bundle uses the AvaSpec-Hero for detection. The High end cooled back-thinned detector, low-noise electronics and optical bench with high Numerical Aperture, results in excellent Signal to Noise and Dynamic Range.*

- Range: 100  $\text{cm}^{-1}$  - 3000  $\text{cm}^{-1}$
- Resolution: 10  $\text{cm}^{-1}$
- Spectrometer based on an AvaSpec-HSC1024x58TEC-EVO set for (788-1020nm), slit-25, FC-PC connector, replaceable.
- Also including:  
AvaLaser785 (incl. probe)  
AvaRaman software: Panorama Light



**AVANTES**  
*enlightening spectroscopy*

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