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NEW INSTRUMENTS

&

LATEST INNOVATIONS!

2015

LATEST INNOVATIONS

Spectrometers

AvaSpec Mini
AvaSpec HS2048XL
AvaSpec ULS-i
AvaSpec-NIR-HSC

Light Sources

AvaLight-HAL-S-Mini

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Beam Splitter / Combiner
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Applications

AvaSpec-UV/VIS/NIR
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AvaRAMAN XHS Supreme

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AvaSpec-Mini:
Small and powerful OEM spectrometer

Looking for a very small spectrometer with a resolution as good as 0.2 nm? Then the AvaSpec-Mini is an ideal choice. It's only the size of a deck of cards, yet delivers stray-light levels lower than 0.2% and weighs only 174 grams. Easy to take anywhere you like.

The devices offer the quality and reliability that you are used to in our larger spectrometers. Yet they are fitted in a diminutive footprint making them ideal for OEM applications.

The AvaSpec-Mini finds its way into many areas of research, such as light analysis, chemical research and Raman spectroscopy.

Of course, the AvaSpec-Mini works seamlessly with Avantes spectroscopy software and the Windows and Linux libraries.

Technical data

	AvaSpec-Mini 2048(L)	AvaSpec-Mini 3648
Optical Bench	Symmetrical Czerny-Turner, 75 mm focal length	
Wavelength range	220-1100 nm	
Resolution	0.10 nm - 10.80 nm	
Stray-light	<0.2%	
Sensitivity	Similar to ULS2048(L) (no DCL)	Similar to ULS3648 (no DCL)
Detector	Sony CCD linear array, 2048 (Large) pixels	Toshiba CCD linear array, 3648 pixels
Signal/Noise	200:1 (2048);300:1 (2048L)	350:1
AD converter	16-bit, 2 MHz	16-bit, 1 MHz
Integration time	1.05ms – 10 minutes	10µs – 10 minutes
Interface	USB 2.0 (480 Mbps) / RS-232(115200 bps)	
Sample speed with on-board averaging	3.0 ms/scan	7.4 ms/scan
Data transfer speed	4.6 ms/scan	7.4 ms/scan
I/O	6 bidirectional programmable I/O; 2 analog out; 2 analog in	
Dimensions, weight	95 x 68 x 20 mm, 174 grams	
Power supply	Default USB power, 250 mA; external 5-15Vdc (RS232)	
Temperature range	0-55ºC	

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Grating selection table for AvaSpec-Mini

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
2048(L)					
UV	200-400	167	1800	250	MN 1800-0.25
VIS	330-900	530	600	500	MN 600-0.50
NIR	550-1100	520	600	1000	MN 600-1.00
3648					
UV	200-400	170	1800	250	MN 1800-0.25
VIS	330-900	535	600	500	MN 600-0.50
NIR	550-1100	525	600	1000	MN 600-1.00

Resolution table (FWHM in nm) for AvaSpec-Mini*

	Slit size (µm)					
Grating (lines/mm)	**10**	**25**	**50**	**100**	**200**	**500**
	2048 (L)					
600	0.40-0.53	0.70	1.20	2.40	4.60	10.80
1800	0.10-0.18	0.20-0.29	0.34-0.42	0.80	1.60	3.60
	3648					
600	0.30-0.36	0.58-0.60	1.17	2.20	4.50	10.00
1800	0.09-0.11	0.18	0.36-0.40	0.78	1.50	3.70
	** Typical values. Small deviations are possible.*					

Ordering Information

AvaSpec-Mini2048	• Mini Fiber-optic Spectrometer, 75 mm focal length, 2048 pixel CCD detector, USB2 powered interface
AvaSpec-Mini2048L	• Mini Fiber-optic Spectrometer, 75 mm focal length, 2048L pixel CCD detector, USB2 powered interface
AvaSpec-Mini3648	• Mini Fiber-optic Spectrometer, 75 mm focal length, 3648 pixel CCD detector, USB2 powered interface
	Specify grating, wavelength range and options.

Options

-DUV	• Deep UV detector coating (start wavelength <350nm)
SLIT-XX	• Slit size, please specify XX = 10,25, 50, 100, 200 or 500 µm
-FCPC	• FC/PC fiber-optic entrance
OSC	• Order sorting coating for grating MN 600-0.50, recommended with OSF-305
OSF-YYY	• Order-sorting filter for reduction of 2nd order effects, please specify YYY= 550 or 600 nm, depends on range
	For non-OEM users a set of preconfigured models are available

AvaSpec-Mini:
perfect solutions for
your OEM application!

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AvaSpec-HS2048XL SensLine High UV and NIR sensitivity back-thinned CCD Spectrometer

For high sensitivity applications where high resolution is not of paramount concern, the AvaSpec-HS2048XL is an exceptional instrument. Featuring Avantes' HS optical bench which has a full 0.22 numerical aperture for superior throughput, the AvaSpec-HS2048XL has a back-thinned CCD detector with 2048 pixels measuring 14X500 microns.

Unlike many back-thinned CCD spectro- meters, which have two dimensional arrays the HS2048XL has large monolithic pixels with exceptional efficiency in the UV from 200-400 nm and the NIR from 950-1160 nm while retaining sensitivity in the visible range. The unique optical design features torroid collimating and focusing mirrors to control image magnification and enhance efficiency. The instrument also features an electronic shutter, which enables integration times as low as 2 microseconds.

For configurations which require second order filtering, order-sorting filters are available. The AvaSpec-HS2048XL is available with a wide range of slit sizes, gratings and may be configured with SMA or FC/ PC fiber-optic entrance connectors.

Technical Data

Optical Bench	High-sensitivity asymmetrical design, 37.5 mm focal length; NA – 0.22, f/2.27
Wavelength range	200 - 1160 nm
Resolution	1 - 10 nm, depending on configuration (see table)
Stray-light	< 1 %
Sensitivity	1,100,000 counts/µW per ms int. time
UV Quantum efficiency	65% 200-250 nm 78% 550- 750 nm
Detector	Back-thinned CCD image sensor 2048 pixels
Signal/Noise	450:1
AD converter	16-bit, 1 MHz
Integration time	2 µs – 600 seconds
Interface	USB 2.0 high-speed, 480 Mbps RS-232, 115.200 bps
Sample speed with on-board averaging	2.09 ms /scan
Data transfer speed	2.09 ms /scan (USB2) 432 ms / scan (RS-232)
Digital IO	HD-26 connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, trigger, synchronization
Power supply	Default USB power, 450 mA. or with SPU2 external 12VDC, 200 mA
Dimensions, weight	245 x 175 x 140 mm, 3.9 kg

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Grating selection table for AvaSpec-HS2048XL

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS/NIR	200-1160	900	500	330	HS500-0.33
UV/VIS	200-660	440	1000	250	HS1000-0.25
UV	200-850	520	600	300	HS600-0.30
UV/VIS	200-850	520	600	400	HS600-0.40
UV/VIS	300-1160	860	500	560	HS500-0.56
VIS	360-1000	500	600	500	HS600-0.60
NIR	500-1050	500	600	750	HS600-0.75
VIS	350-850	460	900	550	HS900-0.55
VIS	400-722	322	1200	500	HS1200-0.5
NIR	600-1100	500	600	1000	HS600-1.0
NIR	600-1160	350	830	900	HS830-0.9
NIR	750-990	240	1200	1000	HS1200-1.0

Resolution table (FWHM in nm) for AvaSpec-HS2048XL

	Slit size (µm)					
Grating (lines/mm)	**10**	**25**	**50**	**100**	**200**	**500**
500	2.6	4.5	5.5	6.5	10.0	22.0
600	2.2	3.8	4.5	5.5	7.5	18.0
830*	2.1	3.6	4.0	5.0	7.0	15.0
900*	2.0	3.5	3.8	4.8	6.8	14.5
1000*	1.9	3.3	3.6	4.6	6.6	14.0
1200*	1.8	3.0	3.3	4.3	6.2	13.5

* theoretical values

Ordering Information

AvaSpec-HS2048XL-USB2	• High-sensitivity fiber-optic Spectrometer, 2048 large 500 µm pixel back-thinned CCD detector, USB powered, high-speed USB2 interface, incl. AvaSoft-Basic, USB interface cable. Specify grating, wavelength range and options

Options

SLIT-XX	• Slit size, please specify XX = 10, 25, 50, 100, 200 or 500 µm
OSF-YYY	• Order-sorting filter for reduction of 2nd order effects, 1 mm thick, please specify YYY= 305, 385, 475, 515, 550 or 600 nm
OSC-HS500	• Order-sorting coating with 350 and 600 nm long-pass filter for HS500 gratings in AvaSpec-HS
OSC-HS600	• Order-sorting coating with 350 and 600 nm long-pass filter for HS600 gratings in AvaSpec-HS
OSC-HS900	• Order-sorting coating with 600 nm long-pass filter for HS900 gratings in AvaSpec-HS
OSC-HS1000	• Order-sorting coating with 350 nm long-pass filter for HS1000 gratings in AvaSpec-HS
FCPC	• FC/PC fiber optic connector

The AvaSpec-HS2048XL-USB2 is ideally suited for diffuse reflection measurements (UV, VIS, NIR) and fluorescence.

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AvaSpec-ULSi
integrated miniature Spectrometer

The same quality Avantes is well-known for, now in an easy-to-install package: the ULSi is the ideal choice for any system integrator. Fiber optic spectrometers have been integrated into many end-user systems in almost all areas of research and detection. Now Avantes releases its first completely integrated spectrometer: one housing including the optimum Ultra Low Straylight optical bench and a miniaturized version of our flexible AS5216 electronics board.

The ULSi is available with the three most popular detectors Avantes offers: the Sony ILX554B with 2048 pixels, the Sony ILX511 with 2048 high pixels for extra sensitivity and the Toshiba TCD1304 high resolution 3648 pixels.

The same wide range of slits, gratings and other options available in the Starline spectroscopy lineup are also available for the ULSi.

Technical Data

Microprocessor	Coldfire, 5216, 32 bit, 64 MHz
Memory	512 KB Flash Memory, 64KB RAM
A/D converter	16 bit, 2 channels for video signal
Integration time	2 µs - 10 minutes (detector dependent)
Data Transfer speed	Detector dependent 1-5 ms
USB interface	2.0 high speed, 480 Mbps
RS-232 interface	Baudrate 115200 bps
Digital IO	36 pin Samtec connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, trigger, synchronization
Power supply	Default USB power, 350 mA/12 VDC, reverse polarity protection, 150 mA
Temperature range	0- 55 ºC
Dimensions, weight	90 x 120 x 35 mm, 580 gr.

Ordering Information

AvaSpec-ULSi2048-USB2	• OEM integrated ultra-low stray-light optical bench, 75 mm focal length, 2048 pixel CCD detector, specify grating, wavelength range and options
AvaSpec-ULSi3648-USB2	• OEM integrated ultra-low stray-light optical bench, 75 mm focal length, 3648 pixel CCD detector, specify grating, wavelength range and options
AvaSpec-ULSi2048L-USB2	• OEM integrated ultra-low stray-light optical bench, 75 mm focal length, 2048 pixel CCD detector, specify grating, wavelength range and options

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AvaSpec-NIR256-2.5-HSC

NIRLine Near-infrared Fiber Optic Spectrometer

Avantes offers a wide range of NIR spectrometers. The 2.x-series extended InGaAs instruments feature 256 or 512 pixel detectors and are available in configurations enabling measurements up to 2000, 2200 and 2500 nm. The –HSC is the improved version of the AvaSpec-NIR2.5TEC and offers improved sensitivity, less weight and less size. It is based on a 100mm optical bench with a NA of 0.13 offering optimal balance between resolution and sensitivity.
A range of gratings are available offering the possibility to tailor the instrument for optimal performance in your application.

Also available on the –HSC is the user selectable gain setting mode: LN (low-noise, standard setting), which gives you a longer integration time and higher signal to noise ratio, or HS (high-sensitivity) for measuring in low-light conditions. Analog and digital IO ports enable external triggering and control of shuttered and pulsed light sources from the AvaLight series of illumination sources.

The instrument features a dual stage thermo-electrical Peltier-cooled InGaAs detector, especially designed for measuring in the NIR range. Connection to the computer is managed through the USB2.0 interface. Data is transferred in 1.1 ms. All instruments are supplied with AvaSoft-Basic, a manual and USB/power cables.

The instrument is equipped with a replaceable slit which offers you great flexibility in your experiment.
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Technical Data

Spectrometer platform	AvaSpec-NIR256-2.5-HSC
Optical Bench	TE-cooled Symmetrical Czerny Turner, 100 mm focal length
Wavelenght Range	1000 - 2500 nm
Resolution (slit&grating dependent)	4.8-77 nm
Stray-light	<1.0%
Sensitivity HS in counts / µW per ms (1000-2500 nm)	995.000
Signal/Noise HS	1400:1
Integration time HS	10µs -5ms
Sensitivity LN in counts / uW per ms (1000-2500nm)	57.500
Signal/Noise LN	3685:1
Integration time LN	10µs -100ms
Detector	inGaAs linear array with 2-stage TE-cooling, 256 pixel
Pixel size (WxH)	50x250µm
AD converter	16 bit, 500kHz
Interface	USB2.0 high speed, 480Mbps / RS232, 115.200 bps
Sample speed with on-board averiging	0.54 ms/scan (USB2)
Data transfer speed	1.11ms/scan (USB2)
Digital IO	HD-26 connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, TLL trigger, synchronization
Power supply	12 V, 40W
Temperature range	0- 55 ºC
Cooling	45 ºC versus ambient
Dimensions, weight	185 x 145 x 185 mm, 3,5 kg.

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Grating selection table for AvaSpec-NIR256-2.5-HSC

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
NIR	1000-2500	1500	75	1700	NIR075-1.7
NIR	1000-2500	1173 - 1150*	100	2500	NIR100-2.5
NIR	1000-2500	800 - 660*	150	2000	NIR150-2.0
NIR	1000-2500	815 - 700*	150	2600	NIR150-2.6
NIR	1000-2500	574 - 530*	200	1500	NIR200-1.5

*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the smaller the range to select.

Resolution table (FWMH in nm) for AvaSpec-NIR256-2.5-HSC

	Slit size (µm)			
Grating (lines/mm)	**50**	**100**	**200**	**500**
75	12.1	15.7	30.8	77.0
100	9.5	12.4	21.0	52.5
150	6.4	8.3	14.0	35.0
200	4.8	6.1	10.6	26.5

Ordering Information

AvaSpec-NIR256-2.5-HSC	• Fiber-optic Spectrometer, 100 mm AvaBench, 256 pixel InGaAs detector with 2-stage TEC, USB powered, high-speed USB2 interface, incl. AvaSoft-Basic, USB interface cable. Specify grating, wavelength range, OSF-1000, slit

Options

SLIT-XX-RS	• Slit size, please specify XX = 50, 100, 200 or 500 µm

• Values shown are typical values

This instrument is perfect for grain, corn, wheat, soya and other analysis.

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AvaLight-HAL-(S)-MINI

AvaLight-HAL-S-MINI

From visible light to near infrared, that's where the AvaLight-HAL-Mini works best. It's a compact, stabilized halogen light source, with adjustable focusing of the fiber connection, maximizing output power at the desired wavelength. The light source also has adjustable output power to provide extra power or longer bulb life.

A filter-slot mounted on the front of the AvaLight-HAL-Mini accepts 1" round or 2" x 2" square filters, to block specific ranges of wavelengths or instantly lower the intensity.

The adjustable focus on the AvaLight-HAL-Mini helps you getting the most out of your light source: it makes sure all possible power is transmitted through your optical fiber. Bulb replacement is easy and can be done in a matter of minutes.

Optionally a combined direct-attach cuvette holder and attenuator is available (CUV-ATT-DA-HAL). For attenuation you can use the Inline Filterholder, FH-INL, or the Inline attenuator, ATT-INL.

The optical output can be controlled through a dongle at the backside or from your spectrometer. At low setting the lamp has a color temperature of 2700K but provides over 13000 hours of lifetime. The standard or medium setting changes the color temperature to 2850K and provides 50% more power with a bulb lifetime of 4000 hours. The high power setting gives a color temperature of 3000K, doubles power compared to the long-life setting and gives you up to 1000 hours of lifetime.

The AvaLight-HAL-S-Mini features an internal TTL-shutter, controllable from your AvaSpec spectrometer. This gives you the ability to use the auto-save dark option in AvaSoft spectroscopy software.

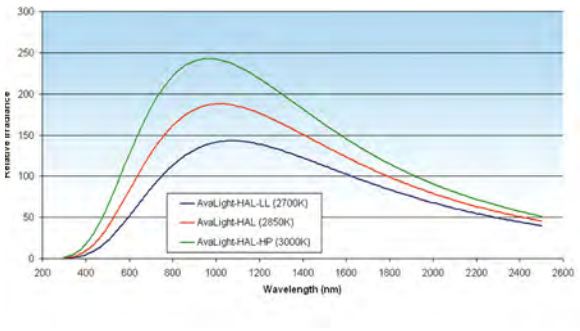

Figure 9 Spectral output of AvaLight-HAL-Mini

Direct-attach Beam Splitter-Combiner

The Beam Splitter gives you a flexible option for using dual light sources or spectrometers. The small size of the beam splitter allows it to directly mount to the front of any AvaSpec spectrometer or AvaLight lightsource, eliminating the fiber interface. Another advantage is that your existing systems can be easily upgraded to a two channel system.

Being highly adaptable, the Beam Splitter enables easy measurement of two different applications at the same time (for example a fluorescence and a absorption measurement).

Technical Data

	BSC-DA
Wavelength range	250-2000nm
Throughput	Ca. 25%
Temperature range	0-40 C
Switching time open	15 ms
Switching time close	30 ms
Maximum frequency	10 Hz
Power supply	5VDC, 0.3A (max power 1.5W)
Fiber connection	SMA-905 connector
Material mechanical	Black anodized aluminum
Material optical	UV Fused Silica
Dimensions	44 x 34 x 63 mm *
Weight	184 grams

* Exclusive COL-UV/VIS and I/O connector

Ordering Information

BSC-DA	• Direct-Attach Beam Splitter / Combiner, includes IC-DB26-BEAM-0.6 (0.6 m interface cable), needs extra PS-5V / 1.1 A power supply
IC-DB26-BEAM-2	• Interface cable (2 meters long)
PS-5V/1.1A	• Power Supply

The Beam Splitter gives you more flexibilty to measure more applications at the same time!

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In-line Fiber-optic Attenuator

For all UV-VIS-NIR applications and setups where light intensity has to be reduced, Avantes offers the in-line fiber-optic attenuator (ATT-INL-EXT) and the direct-attached fiber-optic attenuator (ATT-DA). This device is an iris attenuator which controls light throughput to avoid detector saturation. The ATT-INL-EXT is coupled between two SMA terminated fiber-optic cables, whereas the ATT-DA can be connected directly to the light source. Both devices consist of two UV/VIS/NIR collimating lenses mounted on either side of an adjustable iris.

The attenuation can be set from 0-100% and can be fixed with a set screw.

ATT-INL-EXT

Technical Data

Wavelength range	200-2500 nm
Attenuation	0-100%
Iris aperture	0.0 – 12.0 mm
Iris construction	2 x 5 leaves
Fiber connection	2 SMA-905 connectors, incl. 2 COL-UV/VIS collimating lenses
Material	Black anodized aluminum
Dimensions	60 x Ø 25 mm

Ordering Information

ATT-INL-EXT	• In-line Fiber-optic Attenuator, 0-100%, SMA connectors

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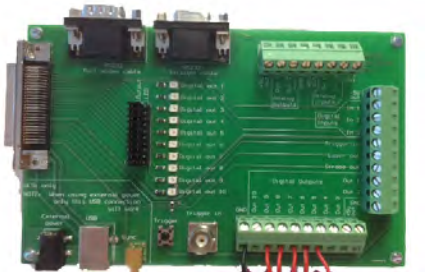
Developer kits for easy IO access

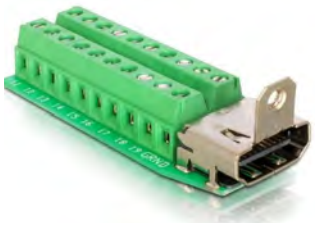
Avantes Spectrometers feature great flexibility offering multiple Input / Output connections. These IO can be used with Avasoft 8 (Time Series) or with customized applications. The DEVKITs are intended to make life easier in the development-stage. Instead of fabricating or soldering a cable with the right connections now it is easy to connect using the screw terminals.

The AVS-DEVKIT-AS(C)5216 contains the PCB-IO-EXT-BES Printed Circuit Board. This board has several screw terminals for easy connectivity to the IO points, a BNC connector for the input trigger as well a push button for manual control. All outputs have a LED indicating their status (selectable with jumpers). Furthermore RS232 connectors are provided. For the ASC version a power, USB and SYNC connector are on the PCB. The PCB-IO-EXT-BES will be connected to the AvaSpec-ULS or AvaSpec-ULSi IO Connector with an interface cable.

The AVS-DEVKIT-MINI has a breakout board with a set of screw terminals. No extra functionality is provided on this board. Connection to the AvaSpec-Mini is done with a HDMI cable.



Printed Circuit Board for AS(C)5216



Break out Board for AvaSpec-Mini

Ordering Information

AVS-DEVKIT-AS5216	• Developer Kit consisting of: PCB-IO-EXT-BES Printed Circuit Board for connection to Avantes Spectrometers with AS5216 electronics boards, to easily control and connect signals to the IO connector. IC-IOEXT-DB26 connection cable to connect the board to DB26 connector.
AVS-DEVKIT-ASC5216	• Developer Kit consisting of: PCB-IO-EXT-BES Printed Circuit Board for connection to Avantes Spectrometers with ASC5216 electronics boards, to easily control and connect signals to the IO connector. IC-IOEXT-ST40 connection cable to connect the board to ST40 connector.
AVS-DEVKIT-MINI	• Developer Kit consisting of: Breakout board Board for connection to Avantes Spectrometers type AvaSpec-MiniXXXX, to easily control and connect signals to the IO connector. HDMI connection cable to connect the board to HDMI IO connector on the AvaSpec-Mini. Conversion table with connections on the breakout board.
IC-ST36-2-OPEN	Interface cable 36 pole for AvaSpec-ULSi, 2 meter open end

The Developer Kit makes life easier in the development-stage. Connecting the screw terminals will enable you to get your application up and running in no-time!

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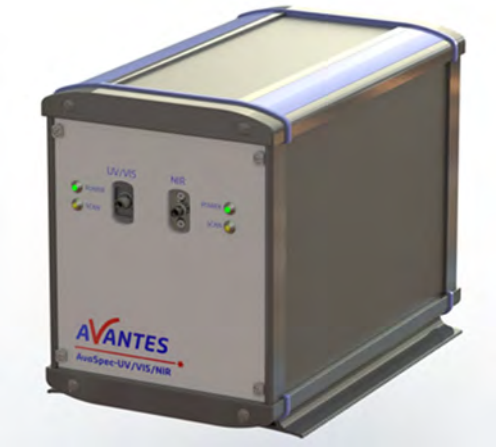

AvaSpec-UV/VIS/NIR: Broadband Spectrometer

Avantes introduces this versatile broadband spectrometer, suited for various measurements in the complete UV/VIS/NIR area. This all comes in one package, no seperate units necessary. This dual spectrometer is suited for 200-1700 nm.

This solution for versatile needs is an ideal companion in areas of Bioscience, Medical Diagnoses, Semiconductor & Solar Industry, Food & Agriculture, Geology & Mineralogy, Pharmaceutical Industry, Environmental Science, Forensic analysis, and many more.

The first channel is based on a AvaSpec-ULS2048L. The second channel is based on Avaspec-NIR256-1.7 (uncooled version). Both with replaceable slit option. Available configurations are similar to the options of both spectrometer models mentioned. Detailed info please check these datasheets.

Technical data

Connections	2 x USB2.0 2 x DB26 (DIO/RS232) 2 x SMB (synch)
Dimensions, weight	250 x 144 x 179 mm, 4.1 kg
Power supply	Default USB power, 250/350 mA

Ordering Information

AvaSpec-UV/VIS/NIR	• Dual Channel Broad Band Spectrometer consisting of: Channel 1: UV/VIS Spectrometer based on the 2048L detector with replaceable slit Channel 2: NIR Spectrometer based on the uncooled 1.7 detector with replaceable slit Incl.: USB cables, Sync cable, Avasoft-Basic Excl.: Options for both channels (grating, settings, slit, etc.) For both channels specify grating, wavelength range and options
Ordering Example	• AvaSpec-UV/VIS/NIR Channel 1: Grating – UA set for 200-1100nm, DUV, OSC-UA, Slit-25-RS Channel 2: Grating NIR200-1.5 set for 950-1700nm, Slit-50-RS Avasoft-Full

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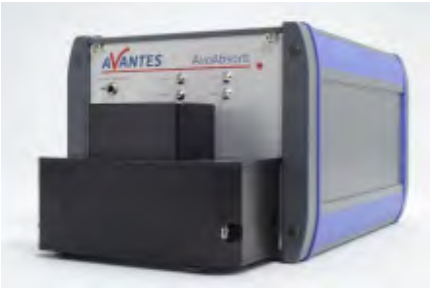
AvaAbsorb-HAL
Absorbance measurement system



The AvaAbsorb system was designed for those situations in which you would like to do consecutive sample and reference measurements in a controlled environment. This setup is normally referred to as dual beam spectroscopy. No fiber cables are used and drifting of the light source can automatically be corrected in AvaSoft. It has two cuvette holders in the front, which can be covered to prevent any interference of light. The selection between the two paths is easily done through AvaSoft or the front side switch. The path length is variable up to 60 mm, making low concentration measurements possible.

Inside, the AvaAbsorb features the AvaSpec-ULS2048L spectrometer, combined with an AvaLight-HAL series Halogen light source. This means easy measurements in the visible and near infrared range for the AvaAbsorb-HAL. The spectrometer features extra high detector pixels, enabling better signal-to-noise ratio and long term stability. .

Technical Data system

Photometric Range	0-2.5 Absorbance units
Accuracy	1.4x10 -3 Absorbance Units
Path Length	Up to 60mm
Max. Cuvette dimensions (LxWxH)	60 x12 x 55 mm
Power supply	100 - 240 VAC, 50 - 60 Hz, 32W
Dimensions (LxWxH)	306 x 179 x 144 mm
Weight	4.8 kg
	The AvaAbsorb-2048L-HAL can be controlled with the plug-in for the AvaAbsorb that is available in AvaSoft 8

Technical Data spectrometer

Optical Bench	ULS Symmetrical Czerny-Turner, 75 mm focal length
Wavelength range	300 - 1100 nm*
Slit	50µm
Resolution	2.5 nm
Stray-light	0.04 - 0.1%
Detector	CCD linear array, 2048 pixels
Signal/Noise	300:1
AD converter	116-bit, 2 MHz
Integration time	1.1 ms - 10 minutes
Interface	USB 2.0 high-speed, 480 Mbps, RS-232, 115.200 bps
Sample speed with on-board averaging	1.1 ms /scan
Data transfer speed	1.8 ms /scan (USB2) 430 ms/scan (RS-232)
Digital IO	HD-26 connector, 2 Analog in, 2 analog out, 3 digital in, 10 digital out, trigger, sync
Options	OSC, DUV2048, DCL-UV/VIS-200
Software settings	AvaSoft Full + CHEM
	*) please note that not all 2048 pixels will be used for the useable range. The power supply of the spectrometer is set to external 12V. The spectrometer will not function at USB power.

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Technical Data Lightsource

Wavelength range	360 - 2500 nm
Stability	+/- 0.1%
Time to stabilize	Ca. 15 min.
Output to bulb	12.0 VDC / 0.83A
Bulb life	>4000hrs
Bulb Color temperature	2,700 K
Temperature range	0 - 55ºC

Ordering Information

AvaAbsorb-2048-L-HAL	• Absorbance system for two (flow) cuvettes max. 50mm OPL, AvaLight-HAL Lightsource and a AvaSpec-2048L integrated. Full automatic measurement possible and AvaSoft-FULL and CHEM enabled.

The AvaAbsorb is ideally suited for stable long term measurements.

AVANTES
solutions in spectroscopy

AvaRaman-Supreme
Extreme Sensitive Raman

Raman spectroscopy is a precise and versatile measurement tool. It only has one downside: Raman signals are difficult to detect due to the required combination of high resolution with high sensitivity.

The AvaRaman-Supreme series spectrometers solve this problem by offering extremely high sensitivity combined with high resolution. Up to six times the sensitivity of a comparable priced Raman systems can be achieved. Measurements can be done faster and more precise.

By redesigning the optical bench and especially the light entrance, more than 95% of the light coming out of the fiber optic cable reaches the detector. The standard solution with an entrance slit only sees 15 percent of the photons reach the CCD.

AvaRaman-Supreme-TEC series spectrometers have a three-stage Peltier cooling systems, which provides ΔT down to -30ºC cooling to ambient for superior dark noise reduction, keeping the detector at a steady 5ºC. Thanks to the PID controller, this temperature is stable within a 0.1ºC bandwidth. All AvaRaman systems are delivered with special AvaSoft-Raman software. Panorama-Pro software is available for Raman interpretation and functional group assignment.

A selection of different probes is available to select the right one for your application. For more information on our software solutions including AvaSoft-Raman and Panorama-Pro, please refer to the software pages in our catalog.

Technical Data

	AvaRaman-Supreme-785	AvaRaman-Supreme785-TEC
	Non-cooled	Cooled
Resolution	<10 cm^{-1}	
Spectrometer	AvaSpec-XHS with 2048L detector, 1200 lines/mm grating, virtual slit	AvaSpec-XHS with 2048L detector, 1200 lines/mm grating, virtual slit, triple stage TE-cooled
Raman Shift	100-3600 cm^{-1}	
Laser Output	785 nm, up to 500 mW, Class 3b	
Laser Wavelength	785 nm	
Laser Bandwidth	< 0.2 nm	
Dimensions Housing	300 (L) x 140 (W) x 250 (H) mm	

AvaRaman probes

AvaRaman-PRB-XXX
3/8" SS low-cost focusing probe with a 200 µm excitation fiber and 400 µm read fiber. Multiple focal lengths available (5 mm, 7.5 mm (standard), 10 mm). It can withstand 80ºC. Manual shutter included, 1.5 m fibers.
Specify XXX=excitation wavelength

AvaRaman-PRB-FP-XXX
1/2" SS focusing probe with a 200 µm excitation fiber and 400 µm read fiber. Multiple focal lengths available (5 mm (standard), 7.5 mm, 10 mm). It can withstand 80ºC.
Specify XXX=excitation wavelength

AvaRaman-PRB-FIP-XXX
5/8" SS immersible focusing probe for in-situ measurements with a 200 µm excitation fiber and 400 µm read fiber. It can withstand 200ºC.
Specify XXX=excitation wavelength

AvaRaman-PRB-FC-XXX
3/8" SS immersible process probe for in-situ measurements with a 200 µm excitation fiber and 400 µm read fiber. It can withstand 500ºC and 3000psi, the probe optics provide complete background filtering.
Specify XXX=excitation wavelength

Ordering Information

AvaRaman-XHS785-USB2	Consisting of following elements: • Solid state 500 mW laser 785 nm, FWHM 0.2 nm • Spectrometer AvaSpec-XHS with 2048L detector, 1200 lines/mm grating, virtual slit • AvaSoft-Raman stand-alone software for the AvaRaman system, AvaRaman-GL-785 laser safety goggles
AvaRaman-XHS785TEC-USB2	Consisting of following elements: • Solid state 500 mW laser 785 nm, FWHM 0.2 nm • Spectrometer AvaSpec-XHS with 2048L detector, 1200 lines/mm grating, virtual slit, TE-cooled • AvaSoft-Raman stand-alone software for the AvaRaman system, AvaRaman-GL-785 laser safety goggles

Different Raman probes available, please see table above

Other accessories

AvaRaman-SH-3/8"	• Rugged sample holder for secure positioning of 3/8" Raman probes
AvaRaman-SH-1/2"	• Rugged sample holder for secure positioning of ½" Raman probes
AvaRaman-Calibrationtile	• PTFE White tile in holder for 3/8" Raman probe

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