

# 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.

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.

Unlike many back-thinned CCD spectrometers, 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.

### Technical Data

<b>Optical Bench</b>	High-sensitivity asymmetrical design, 37.5 mm focal length; NA - 0.22, f/2.27
<b>Wavelength range</b>	200 - 1160 nm
<b>Resolution</b>	1 - 10 nm, depending on configuration (see table)
<b>Stray-light</b>	< 1 %
<b>Sensitivity</b>	1,100,000 counts/ $\mu$ W per ms int. time
<b>UV Quantum efficiency</b>	65% 200-250 nm 78% 550- 750 nm
<b>Detector</b>	Back-thinned CCD image sensor 2048 pixels
<b>Signal/Noise</b>	450:1
<b>AD converter</b>	16-bit, 1 MHz
<b>Integration time</b>	2 $\mu$ s - 600 seconds
<b>Interface</b>	USB 2.0 high-speed, 480 Mbps RS-232, 115.200 bps
<b>Sample speed with on-board averaging</b>	2.09 ms /scan
<b>Data transfer speed</b>	2.09 ms /scan (USB2) 432 ms / scan (RS-232)
<b>Digital IO</b>	HD-26 connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, trigger, synchronization
<b>Power supply</b>	Default USB power, 450 mA. or with SPU2 external 12VDC, 200 mA
<b>Dimensions, weight</b>	175 x 165 x 85 mm, 1,950 kg

## 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

Grating (lines/mm)	Slit size (μm)					
	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

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

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