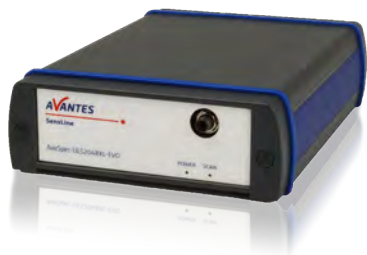


# AvaSpec-ULS2048x64-EVO SensLine High UV and NIR Sensitivity Spectrometer

## AvaSpec-ULS2048x64-EVO



Alongside the cooled AvaSpec-ULS2048x64TEC-EVO with low-noise detector, Avantes also offers the more cost-effective, uncooled AvaSpec-ULS2048x64-EVO. With its standard 2048x64 backthinned CCD detector, this spectrometer is perfect for less demanding applications in the UV and NIR range.

For applications that require integration times lower than 2 seconds, the cooling option is often not needed. For example, this uncooled AvaSpec-ULS2048x64-EVO has an established track record in various DOAS applications all over the world because of its high UV response and 0.9 mm detector height that enables detecting the wavelengths of interest.

Options include an order-sorting filter, to reduce second-order effects and purge ports for deep-UV measurements. The AvaSpec-ULS2048x64-EVO comes with a wide range of slit sizes, gratings and can be configured with SMA or FC/PC fiber-optic entrance connectors.

The AvaSpec-ULS2048x64-EVO uses the AS7010 electronics board offering USB3 (10 times faster than USB2), Gigabit Ethernet and better signal processing.

Connection to your PC is handled via USB3-connection or Ethernet, delivering a scan every 2 milliseconds. The instrument comes complete with AvaSoft-basic software, USB cable and an extensive manual.

### Technical Data

<b>Optical bench</b>	ULS, Symmetrical Czerny-Turner, 75 mm focal length
<b>Wavelength range</b>	200 - 1160 nm
<b>Resolution</b>	0.09 - 20 nm, depending on configuration (see table)
<b>Stray light</b>	< 1%, depending on the grating
<b>Sensitivity</b>	650,000 counts/ $\mu$ W per ms int. time
<b>Detector</b>	Back-thinned CCD image sensor 2048x64 pixels (height: 0.89 mm)
<b>Signal/noise</b>	450:1
<b>AD converter</b>	16-bit, 1.33 MHz
<b>Integration time</b>	2.4 ms - 25 seconds
<b>Interface</b>	USB 3.0 high-speed, 5 Gbps Gigabit Ethernet 1 Gbps
<b>Readout noise</b>	7.5 cnt RMS
<b>Dark noise</b>	11.5 cnt RMS
<b>Dynamic range</b>	6100
<b>Digital IO</b>	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser
<b>Power supply</b>	Default USB power, 885 mA. Or external 12VDC, 420 mA
<b>Dimensions, weight</b>	175 x 127 x 44,5 mm (1 channel), 1180 grams

### Timing and Triggering

<b>Sample speed with on-board averaging</b>	2.4 ms/scan
<b>Data transfer speed</b>	2.4 ms/scan
<b>Min. delay / jitter</b>	2.4 ms

### Detector Specifications

Sensitivity photons/count @ 600 nm	Sensitivity in cts/ $\mu$ W per ms int. time	QE (%) @ peak	Signal/noise	Dark noise (counts RMS)	Dynamic range
3.9	650,000	78%	450:1	11.5	1600

## Grating Selection Table

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS/NIR	200-1160**	960**	300	300	UA
UV/VIS/NIR	200-1100**	900**	300	300/1000	UNA-DB
UV/VIS	200-850	520	600	300	UB
UV	200-750	250-220*	1200	250	UC
UV	200-650	165-145*	1800	UV	UD
UV	200-580	115-70*	2400	UV	UE
UV	200-400	70-45*	3600	UV	UF
UV/VIS	250-850	520	600	400	BB
VIS/NIR	300-1160**	860**	300	500	VA
VIS	360-1000	500	600	500	VB
VIS	300-800	250-200*	1200	500	VC
VIS	350-750	145-100*	1800	500	VD
VIS	350-640	75-50*	2400	VIS	VE
NIR	500-1050	500	600	750	NB
NIR	500-1050	220-150*	1200	750	NC
NIR	600-1160	350-300	830	800	SI
NIR	600-1160**	560**	300	1000	IA
NIR	600-1160	500	600	1000	IB

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

\*\* please note that not all 2048 pixels will be used for the useable range.

## Resolution Table (FWHM in nm)

Grating (lines/mm)	Slit size (μm)					
	10	25	50	100	200	500
300	1.40	1.50	2.5	4.8	9.2	21.3
600	0.70 - 0.80*	0.75-0.85*	1.2	2.4	4.6	10.8
830	0.42 - 0.48*	0.50-0.58*	0.93	1.7	3.4	8.5
1200	0.25 - 0.31*	0.37 - 0.43*	0.52-0.66*	1.1	2.3	5.4
1800	0.17 - 0.21*	0.26 - 0.32*	0.34-0.42*	0.8	1.6	3.6
2400	0.12 - 0.18*	0.18 - 0.24*	0.26-0.34*	0.44-0.64*	1.1	2.7
3600	0.09 - 0.12*	0.11 - 0.15*	0.19	0.4	0.8	1.8

\* depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the better the resolution.

## Options

<b>-RS</b>	• Replaceable slit
<b>DCL-UV/VIS-200</b>	• Quartz detector collection lens (200 - 1100 nm)
<b>SLIT-XX</b>	• Slit size, please specify XX = 5, 10, 25, 50, 100, 200 or 500 μm
<b>SLIT-XX-RS</b>	• Replaceable slit with SMA connector, specify slit size XX = 25, 50, 100, 200 or 500 μm. Only available for AvaSpec-ULS2048CL-EVO-RS
<b>SLIT-XX-RS-FCPC</b>	• As SLIT-XX-RS, but with FC/PC connector
<b>OSF-YYY</b>	• Order-sorting filter for reduction of second-order effects please specify YYY = 305, 395, 475, 515, 550 or 600 nm
<b>OSC</b>	• Order-sorting coating with 600 nm long-pass filter for BB (>305 nm) and VB gratings, recommended with OSF-305
<b>OSC-UA</b>	• Order-sorting coating with 350 and 600 nm linear variable filter for UA, VA gratings
<b>OSC-UB</b>	• Order-sorting coating with 350 and 600 nm long-pass filter for UB or BB (<350 nm) gratings
<b>-FCPC</b>	• FC/PC fiber-optic connector