

AvaSpec-ULS2048x64TEC-EVO SensLine Thermoelectrically Cooled Fiber-Optic Spectrometer

The AvaSpec-ULS2048x64TEC-EVO is an updated version of our AvaSpec-ULS2048x64TEC spectrometer, with improved electronics and cooling.

This instrument enhances the Sensline series with its cooled, back-thinned detector. The back-thinned detector has good sensitivity in the UV and IR region. The 64 pixelheight (0.89 mm) enables catching as many photons as possible while the cooling enables long integration times up to 120 seconds with low-noise levels.

The instrument features Peltier cooling device integrated into our exclusive ultra-low stray light optical bench, which can reduce the temperature of the CCD chip to -30°C against ambient, improving the dark baseline and PRNU level significantly. The detector cooling also reduces the dark noise by a factor of 2-3.

The AvaSpec-ULS2048x64TEC-EVO uses a special low-noise version of the 2048x64 detector with integrated cooling.

All the features mentioned above make this instrument ideally suited for measuring low-light applications, such as fluorescence or low-light Raman measurements.

Optimal flexibility is guaranteed with the replaceable slit, making the instrument suitable for various kinds of applications.

The above mentioned qualities make the AvaSpec-ULS2048x64TEC-EVO an excellent choice for low light-level applications, such as fluorescence and Raman measurements, where integration times of more than 5 seconds may be needed.

AvaSpec-ULS2048x64TEC-EVO



Technical Data

Optical bench	ULS Symmetrical Czerny-Turner, 75 mm focal length
Wavelength range	200-1160 nm
Resolution	0.09 –20 nm, depending on configuration (see table)
Stray light	<1%, depending on the grating
Sensitivity	300,000 counts/μW per ms integration time
Detector	Backthinned CCD, 2048x64 pixels, low noise, integrated cooling
Temperature-cooled CCD	Max. ΔT = -30°C versus ambient. Optimal setting: 5°C
Signal/noise	550:1
AD converter	16-bit, 500 KHz
Dynamic range	19,000
Dark noise	5 cnts
Integration time	9.7 ms–120 s
Interface	USB 3.0 high speed, 5 Gbps Gigabit Ethernet 1 Gbps
Sample speed with on-board averaging	9.7 ms/scan
Data transfer speed	9.7 ms/scan (USB3) 9.7 ms/scan (ETH)
Digital IO	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser
Power supply	12 VDC, 1.5 A
Operating temperature	0-40°C
Cooling	30°C versus ambient
Dimensions, weight	185 x 145 x 185 mm, 3500 grams

Grating Selection Table for AvaSpec-ULS2048x64TEC-EVO

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	145-90*	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) for AvaSpec-ULS2048x64TEC

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

Ordering Information

AvaSpec-ULS2048x64TEC-EVO

Thermoelectrically cooled fiber-optic spectrometer, 75 mm ultra-low stray light AvaBench, 2048x64 pixel, TE-cooled and regulated low-noise CCD detector, USB3/ETH high-speed interface and replaceable slit, incl. AvaSoft-Basic, USB cable, desktop housing. Specify grating, wavelength range and options

Options

DCL-UV/VIS-200	• Detector Collection Lens to enhance sensitivity, Quartz, 200-1100 nm
SLIT-XX-RS	• Replaceable slit with SMA connector. Specify slit size XX= 10, 25, 50, 100, 200 or 500 μm
SLIT-XX-RS-FCPC	• As SLIT-XX-RS, but with FC/PC connector
OSF-YYY	• Order-sorting filter for reduction of 2 nd order effects, 1 mm thick, please specify YYY= 305, 395, 475, 515, 550 or 600 nm
OSC	• Order-sorting coating with 600 nm long-pass filter for BB (>350 nm) and VB gratings, recommended with OSF-305
OSC-UA	• Order-sorting coating with linear variable filter for UA, VA gratings
OSC-UB	• Order-sorting coating with 350 and 600 nm long-pass filter for UB or BB (<350 nm) gratings