

AvaSpec-ULS2048L-EVO

StarLine CCD Spectrometer

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The AvaSpec-ULS2048L-EVO uses our latest AS-7010 electronic board. This means it has all the advantages of the previous AvaSpec-ULS2048L-USB2, but offers USB3 communication instead of USB2, which makes for a significant increase in speed.

Unique is the second communication port which offers Gigabit Ethernet for integration in your company network and possibility for long distance communication.

This unique, first-to-the-market combination enables you to create

high-speed multichannels systems, perfectly suited for various industrial applications.

Options include a deep-UV detector coating, for better performance in the deep-UV-range, a detector collection lens to enhance sensitivity in the 200-1100 nm range and order-sorting filter to reduce second-order effects.

The AvaSpec-2048L is available with a wide range of slit sizes, gratings and fiber-optic entrance connectors as well.

Technical Data

Optical bench	ULS symmetrical Czerny-Turner, 75 mm focal length
Wavelength range	200 - 1100 nm
Resolution	0.06 - 20 nm, depending on configuration (see table)
Stray light	0.04 - 0.1%, depending on the grating
Sensitivity	470,000 counts/μW per ms integration time
Detector	CCD linear array, 2048 pixels
Signal/noise	300:1
AD converter	16-bit, 2 MHz
Integration time	1.11 ms - 10 minutes
Interface	USB 3.0 high speed, 5 Gbps Gigabit Ethernet 1 Gbps
Digital IO	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bidirectional, trigger, sync., strobe, laser
Power supply	Default USB3 power, 500 mA Or 12VDC, 300 mA
Dimensions, weight	177 x 127 x 44,5 mm (1 channel), 1135 grams

Timing and Triggering

Sample speed with on-board averaging	1.1 ms/scan
Data transfer speed	1.1 ms/scan (USB3), 3.8 ms (ETH)
Min. delay / jitter	3.28 / 0.02 μs

Detector Specifications

Sensitivity photons/count @ 600 nm	Sensitivity in cts/μW per ms int. time	QE (%) @ peak	Signal/noise	Dark noise (counts RMS)	Dynamic range
4	470,000	40%	300:1	20	3300

Grating Selection Table

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS/NIR	200 - 1100**	900**	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 - 1100**	800**	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 - 1100**	500**	300	1000	IA
NIR	600 - 1100	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	1.0	1.4	2.5	4.8	9.2	21.3
600	0.40 - 0.53*	0.7	1.2	2.4	4.6	10.8
830	0.32	0.48	0.93	1.7	3.4	8.5
1200	0.20 - 0.28*	0.27 - 0.38*	0.52 - 0.66*	1.1	2.3	5.4
1800	0.10 - 0.18*	0.20 - 0.29*	0.34 - 0.42*	0.8	1.6	3.6
2400	0.09 - 0.13*	0.13 - 0.17*	0.26 - 0.34*	0.44 - 0.64*	1.1	2.7
3600	0.06 - 0.08*	0.10	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

-RS	• Replaceable slit
DCL-UV/VIS-200	• Quartz detector collection lens (200 - 1100 nm)
SLIT-XX	• Slit size, please specify XX = 5, 10, 25, 50, 100, 200 or 500 μm
SLIT-XX-RS	• Replaceable slit with SMA connector, specify slit size XX = 25, 50, 100 or 200 μm. Only available with AvaSpec-ULS4096CL-EVO-RS
SLIT-XX-RS-FCPC	• As SLIT-XX-RS, but with FC/PC connector
OSF-YYY	• Order-sorting filter for reduction of second-order effects please specify YYY = 305, 395, 475, 515, 550 or 600 nm
OSC	• Order-sorting coating with 600 nm long-pass filter for BB (>305 nm) and VB gratings, recommended with OSF-305
OSC-UA	• Order-sorting coating with 350 and 600 nm 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
-FCPC	• FC/PC fiber-optic connector