

# EVO Series, with CMOS detector: StarLine AvaSpec-ULS2048CL-EVO Spectrometer

Using CMOS technology instead of the conventional CCD technology, this spectrometer offers you the latest technology.

New technologies like CMOS have evolved and become a suitable alternative.

In combination with our latest AS-7010 electronics it offers you a versatile device including USB3.0 communication with 10x higher speed compared to USB2, and a second communication port which offers Gigabit Ethernet for integration in your company network and possibility for long distance communication.

Besides the high speed communication options, the EVO also offers a fast microprocessor and 50x more memory which can help you to store more spectra onboard and realise more functionality.

Options include a detector collection lens to enhance sensitivity in the 200-1100 nm range and order-sorting filter to reduce 2nd order effects. Furthermore, the AvaSpec-2048CL is available with a wide range of slit sizes, gratings and fiber-optic entrance connectors. It comes complete with AvaSoft-Basic software, USB cable and an extensive manual.

The AvaSpec-ULS2048CL-EVO is also available as OEM unit, Bench only or Rackmount version.

## AvaSpec-ULS2048CL



### Technical Data

<b>Optical Bench</b>	ULS Symmetrical Czerny-Turner, 75 mm focal length
<b>Wavelength range</b>	200-1100 nm
<b>Resolution</b>	0.06 –20 nm, depending on configuration (see table)
<b>Stray-light</b>	0.19-1.0%, depending on the grating
<b>Sensitivity</b>	375,000 counts/μW per ms integration time
<b>Detector</b>	CMOS linear Image Sensor
<b>Signal/Noise</b>	300:1
<b>AD converter</b>	16-bit, 6 MHz
<b>Integration time</b>	9 μs – 59s
<b>Interface</b>	USB 3.0 high-speed, 5 Gbps Gigabit Ethernet 1 Gbps
<b>Sample speed with on-board averaging</b>	0.38 ms /scan
<b>Data transfer speed</b>	0.38 ms/scan (USB3), 1.0 ms (ETH)
<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 USB3 power, 500 mA Or 12VDC, 300 mA

### Ordering Information

<b>AvaSpec-ULS2048CL-EVO</b>	Fiber-optic Spectrometer, 75 mm AvaBench, 2048 pixel CMOS detector 14 x 200 μm, USB powered, high-speed USB 3.0 and ETH interface, incl. AvaSoft-Basic, USB interface cable. Specify grating, wavelength range and options.
<b>PS-12V/1.0A</b>	External power supply, needed for operation in ETH mode

## Grating Selection Table for AvaSpec-ULS2048CL-EVO

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	515	600	300	UB
UV	200-750	247-218*	1200	250	UC
UV	200-650	163-143*	1800	UV	UD
UV	200-580	113-69*	2400	UV	UE
UV	200-400	69-45*	3600	UV	UF
UV/VIS	250-850	515	600	400	BB
VIS/NIR	300-1100**	800**	300	500	VA
VIS	360-1000	495	600	500	VB
VIS	300-800	247-218*	1200	500	VC
VIS	350-750	142-89*	1800	500	VD
VIS	350-640	74-49*	2400	VIS	VE
NIR	500-1050	495	600	750	NB
NIR	500-1050	218-148*	1200	750	NC
NIR	600-1100	346-297*	830	800	SI
NIR	600-1100**	500**	300	1000	IA
NIR	600-1100	495	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-ULS2048CL-EVO

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 higher the resolution

### Options

<b>-RS</b>	• Replaceable slit
<b>DCL-UV/VIS-200</b>	• Detector collection Lens to enhance sensitivity, Quartz, 200-1100 nm
<b>SLIT-XX</b>	• Slit size, please specify XX = 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 in combination with 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 2nd order effects, 3 mm thick, please specify YYY= 305, 385, 475, 515, 550, 600 nm
<b>OSC</b>	• Order sorting coating with 600 nm long-pass filter for BB (>350 nm) and VB gratings
<b>OSC-UA</b>	• Order sorting coating 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