

AvaSpec-2048x14 High UV-sensitivity back-thinned CCD Spectrometer

AvaSpec-2048x14

The AvaSpec-2048x14 Fiber Optic Spectrometers is a back-type CCD spectrometer with high quantum efficiency and high UV sensitivity. The optical design is based on the AvaBench-75 symmetrical Czerny-Turner design with a 2048x14 pixels high UV sensitive CCD image sensor. The image sensor is used as a linear array of 2048 pixels binning the vertical 14 pixels to optimize efficiency. The spectrometer has a fiber optic entrance connector (standard SMA, others possible), collimating and focusing mirror and diffractive grating. A choice of 15 different gratings with different dispersion and blaze angles enable applications in the 200-1100nm range. The AvaSpec-2048x14 comes with a



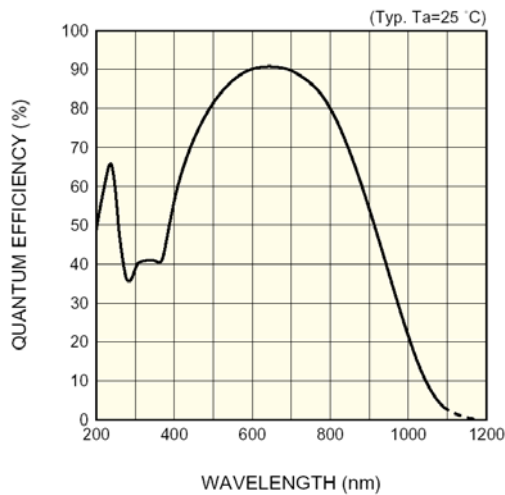
16 bit AD converter, and USB2.0 high speed interface. The AvaSpec- 2048x14 is especially suitable for measuring low light, fluorescence and UV- applications. Digital IO ports enable external triggering and control of shutter and pulsed light sources from the Avantes line of instruments. The new AvaSpec-2048x14 has a USB2 interface with fast data sampling of 200 spectra per second and data transfer in 5 msec and supports analog in-and outputs as well. Optional Bluetooth® (-BT) communication and an SDRAM card for on-board saving of spectra can be added. The AvaSpec-2048x14-USB2 runs on USB power and comes with AvaSoft-basic, a complete manual and USB interface cable. Multiple (up to 128) USB2 spectrometers with different detector types can be externally coupled (see section multi-channel spectrometers, page 30).

Technical Data

Optical Bench	Symmetrical Czerny-Turner, 75 mm focal length
Wavelength range	200 - 1100nm
Resolution	0.04 -20 nm, depending on configuration (see table)
Stray light	< 0.1%
UV Quantum efficiency	35-65% (200-300nm)
Detector	Back-thinned CCD image sensor 2048x14 pixels
Dynamic range	5200
AD converter	16 bit, 1.5 MHz
Integration time	1.5 ms - 10 min.
Interface	USB 2.0 high speed, 480 Mbps RS-232, 115.200 bps
Sample speed with on-board averaging	5 msec /scan
Data transfer speed	5 msec /scan
Digital IO	HD-26 connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, trigger, synchronization
Power supply	Default USB power, 320 mA Or with SPU2 external 12VDC, 320 mA
Dimensions, weight	175 x 110 x 44 mm(1 channel), 716 grams

Detector response curve

■ Spectral response (without window)



Grating selection table for AvaSpec-2048x14

Use	Useable range	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS/NIR	200-1100**	900**	300	300	UA
UV/VIS	200-850	520	600	250	UB
UV	200-750	250-220*	1200	250	UC
UV	200-650	165-145*	1800	250	UD
UV	200-580	115-70*	2400	250	UE
UV	220-400	75-50*	3600	250	UF
UV/VIS	250-850	520	600	370	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	145-100*	1800	500	VD
NIR	500-1050	500	600	750	NB
NIR	500-1050	220-150*	1200	750	NC
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) for AvaSpec-2048x14

Grating (lines/mm)	Slit size (μm)					
	10	25	50	100	200	500
300	0.8	1.4	2.4	4.3	8.0	20.0
600	0.4	0.7	1.2	2.1	4.1	10.0
1200	0.1-0.2*	0.2-0.3*	0.4-0.6*	0.7-1.0*	1.4-2.0*	3.3-4.8*
1800	0.07-0.12*	0.12-0.21*	0.2-0.36*	0.4-0.7*	0.7-1.4*	1.7-3.3*
2400	0.05-0.09*	0.08-0.15*	0.14-0.25*	0.3-0.5*	0.5-0.9*	1.2-2.2*
3600	0.04-0.06*	0.07-0.10*	0.11-0.16*	0.2-0.3*	0.4-0.6*	0.9-1.4*

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

Ordering Information

AvaSpec-2048x14-USB2 Fiber Optic Spectrometer, 75 mm Avabench, 2048x14 pixel back-thinned CCD detector, self powered high speed USB2 interface, incl AvaSoft-Basic, USB interface cable, specify grating, wavelength range and options

AvaSpec-2048x14-SPU2 Fiber Optic Spectrometer, 75 mm Avabench, 2048x14 pixel back-thinned CCD detector, high speed USB2 interface, incl. switch for self powered USB2 or external power for RS232, AvaSoft-Basic, USB interface cable, specify grating, wavelength range and options

Options

BT

Bluetooth® interface for USB2 platform only, including antenna

SDXXX

Internal XXX MB SD card for on board data saving, for USB2 platform only

SLIT-XX

Slit size, please specify XX = 10, 25, 50, 100, 200, 500 μm

OSF-YYY

Order sorting filter for 2nd order effects filtering, please specify YY= 375, 475, 515, 550, 590 nm

OSC

Order sorting coating with 590nm long pass filter for VA, BB and VB gratings in AvaSpec-2048x14

OSC-UA

Order sorting coating with 350 and 590nm longpass filter for UA gratings in AvaSpec-2048x14

OSC-UB

Order sorting coating with 350 and 590nm longpass filter for UB gratings in AvaSpec-2048x14