

AvaSpec-102 Fiber Optic Spectrometer



The **AvaSpec-102 Fiber Optic Spectrometer** is based on the AvaBench-45 symmetrical Czerny-Turner design with 102 pixel Photo Diode Array. The spectrometer has a fiber optic entrance connector (standard SMA, others possible), collimating and focusing mirror and diffractive grating. A choice of 11 different gratings with different dispersion and blaze angles enable applications in the 360-1100nm range. The AvaSpec-102

can be delivered with 2 platforms of electronics with 14 bit AD converter; either with USB1.1 or the new USB2.0 interface and RS-232 interface. Applications for this instrument are low cost color measurements. Digital IO ports enable external triggering and control of shutter and pulsed light sources from the Avantes line of instruments.

The **AvaSpec-102** is also available as dual channel or multiple channel instrument (up to 8 channels), where all spectra are taken simultaneously.

The **AvaSpec-102** comes with AvaSoft-basic, a complete manual, USB interface cable and a PS-12V/1.0A power supply. AvaSoft-full and application software can be ordered separately.

Alternatively the **AvaSpec-102-SPU** is available as an option to run on USB power and does not need an additional power supply.

The new **AvaSpec-USB2** has a USB2 interface with ultrafast datasampling of 6000 spectra per second (with on board averaging) and data transfer in 1.3msec 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-102-USB2** run on USB power and comes with AvaSoft-basic, a complete manual and USB interface cable. Multiple (up to 127) USB2 spectrometers with different detectors can be externally coupled (see section multi-channel spectrometers).

Technical Specifications

Spectrometer Platform	AvaSpec-102	AvaSpec-102-USB2
Optical Bench	Symmetrical Czerny-Turner, 45 mm focal length	
Wavelength range	360-1100 nm	
Resolution	1.4 –64 nm, depending on configuration (see table)	
Stray light	< 0.3%	
Sensitivity (AvaLight-HAL, 8 µm fiber)	1000 counts/µW -per ms integration time	
Detector	Photo diode array, 102 pixels	
Signal/Noise	1000:1	
AD converter	14 bit, 1.33 MHz	14 bit, 2 MHz
Integration time	1 msec – 60 sec	0.08 msec - 10 minutes
Interface	USB version 1.1, 12 Mbps RS-232, 115.200 bps	USB version 2.0, 480 Mbps RS-232, 115.200 bps
Sample speed with on-board averaging	3 msec	0.14 msec
Data transfer speed	6-7 ms / scan (depending on # pixels transferred)	1.3 msec / scan
Digital IO	DB-15 connector, 2 Digital in, 12 Digital out	HD-26 connector, 2 Analog in, 2 Analog out, 3 Digital in, 12 Digital out, trigger, sync.
Power supply	12 VDC, reverse polarity protection, 160 mA (PS-12V/1.0A) or 5VDC USB power	Default USB power, 440 mA. Or with SPU2 external 12VDC, 440 mA
Dimensions, weight	175 x 110 x 44 mm (1 channel), 716 gr. 175 x 165 x 85 mm (2 channels), 1700 gr.	175 x 110 x 44 mm(1 channel), 716 grams

Grating Selection table for AvaSpec-102

Use	Useable range	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
VIS/NIR	360-1100	400	300	300	UA
VIS	360-750	100	1200	250	UC
VIS	360-850	200	600	370	BB
VIS/NIR	360-1100*	740*	150	500	VZ
VIS/NIR	360-1100	400	300	500	VA
VIS	360-850	200	600	500	VB
VIS	400-980	100	1200	500	VC
NIR	500-935	200	600	750	NB
NIR	500-1000	100	1200	750	NC
NIR	600-1100	400	300	1000	IA
NIR	600-1100	200	600	1000	IB

* please note that not all 102 pixels will be used for the useable range

Resolution Table (FWHM) for AvaSpec-102

Grating (lines/mm)	Slit size (µm)			
	50	100	200	500
150	13.0	13.0	26.0	64.0
300	6.4	6.4	13.0	32.0
600	3.0	3.0	6.0	16.0
1200	1.5	1.5	3.0	8.0