

## AvaSpec-256 Fiber Optic Spectrometer



The **AvaSpec-256 Fiber Optic Spectrometer** is based on the AvaBench-45 symmetrical Czerny-Turner design with 256 pixel CMOS Detector Array. The spectrometer has a fiber optic entrance connector (standard SMA, others possible), collimating and focussing mirror and diffractive grating. A choice of 13 different gratings with different dispersion and blaze angles enable applications in the 200-1100nm range.

**The AvaSpec-256** can be delivered with 2 platforms of electronics with 14 bit AD converter; either with USB1.1 or the new USB2.0 interface.

The **AvaSpec-256** is specially suitable for low noise applications. Digital I/O ports enable external triggering and control of shutter and pulsed light sources from the Avantes line of instruments.

The **AvaSpec-256** is also available as dual channel or multiple channel instrument (up to 8 channels), where all spectra are taken simultaneously.

The new **AvaSpec-USB2** has a USB2 interface with ultra fast datasampling of 1500 spectra per second (with on board averaging) and datatransfer in 1.5msec 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-256-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 detector types can be externally coupled (see section multi-channel spectrometers).

## Technical Specifications

Spectrometer Platform	AvaSpec-256	AvaSpec-256-USB2
Optical Bench	Symmetrical Czerny-Turner, 45 mm focal length	
Wavelength range	200-1100 nm	
Resolution	0.4 –64 nm, depending on configuration (see table)	
Stray light	< 0.2%	
Sensitivity (Avalight-HAL, 8 $\mu$ m fiber)	30 counts/ $\mu$ W -per ms integration time	
Detector	CMOS linear array, 256 pixels	
Signal/Noise	2000:1	
AD converter	14 bit, 330 kHz	14 bit, 500 kHz
Integration time	2 msec – 60 sec	0.6 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	4 msec / scan	0.6 msec / scan
Data transfer speed	7-9 ms / scan (depending on # pixels transferred)	1.5 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-256

Use	Useable range	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
UV/VIS/NIR	200-1100*	900*	122	250	UZ
UV/VIS/NIR	200-1100	400	300	300	UA
UV/VIS	200-850	200	600	250	UB
UV	200-750	100	1200	250	UC
UV/VIS	250-850	200	600	400	BB
VIS/NIR	300-1100*	800*	150	500	VZ
VIS/NIR	300-1100	400	300	500	VA
VIS	360-1000	200	600	500	VB
VIS	300-800	100	1200	500	VC
NIR	500-1050	200	600	750	NB
NIR	500-1050	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-256

Grating (lines/mm)	Slit size ( $\mu$ m)				
	25	50	100	200	500
150	4.5	6.4	12.8	26.0	64.0
300	2.5	3.2	6.4	13.0	32.0
600	1.0	1.5	3.0	6.0	16.0
1200	0.5	0.8	1.5	3.0	8.0