

AvaSpec-3648 Fiber Optic Spectrometer



The **AvaSpec-3648** Fiber Optic Spectrometers is based on the AvaBench-75 symmetrical Czerny-Turner design with 3648 pixel CCD Detector Array.

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-3648** comes with a 14 bit AD converter, and USB2.0 high speed interface.

The **AvaSpec- 3648** is especially suitable for measuring high speed and high resolution applications, such as LIBS and pulsed light sources. An optional detector coating can enhance the CCD performance for the UV range and a detector collection lens offers high sensitivity. Digital IO ports enable external triggering and control of shutter and pulsed light sources from the Avantes line of instruments.

The new **AvaSpec-3648** has a USB2 interface with fast data sampling of 270 spectra per second and data transfer in 3.7 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-3648-USB2 runs 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

Optical Bench	Symmetrical Czerny-Turner, 75 mm focal length
Wavelength range	200 - 1100nm
Resolution	0.025 –20 nm, depending on configuration (see table)
Stray light	< 0.1%
Sensitivity (AvaLight-HAL, 8 μ m fiber)	12000 counts/ μ W per ms integration time
Detector	CCD linear array, 3648 pixels
Signal/Noise	300:1
AD converter	14 bit, 1 MHz
Integration time	10 μ sec – 10 min.
Interface	USB 2.0 high speed, 480 Mbps RS-232, 115.200 bps
Sample speed with on-board averaging	3.7 msec /scan
Data transfer speed	3.7 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, 440 mA Or with SPU2 external 12VDC, 440 mA
Dimensions, weight	175 x 110 x 44 mm(1 channel), 716 grams

Grating Selection table for AvaSpec-3648

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.

** please note that all 3648 pixels will be used for the useable range

Resolution Table (FWHM) for AvaSpec-3648

Grating (lines/mm)	Slit size (μ m)					
	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