

# AvaSpec-NIR256/512-1.7-EVO NIRLine Near-Infrared Fiber-optic Spectrometer

## AvaSpec-NIR256-1.7-EVO



For measurements in the near infrared range out to 1.7  $\mu\text{m}$ , Avantes offers a new series of uncooled spectrometer configurations. The AvaSpec-NIR256-1.7-EVO and the AvaSpec-NIR512-1.7-EVO offer the same high sensitivity optical bench with the next generation of electronics. Both instruments deliver the same exceptional performance specifications such as a sample speed of only 0.53 ms/scan and integration times as fast as 20  $\mu\text{s}$ , as the Avantes instruments you have come to trust.

For applications where resolution is key, or more datapoints for modelling is required, the 512 pixel detector will be the best choice.

The AvaSpec-NIR256/512-1.7-EVO spectrometers pair the same trusted InGaAs array detectors with our ultra low-noise electronics board featuring USB3 and Giga-Ethernet connection port. Digital and analog I/O ports enable external triggering and control over the shutter and pulsed light sources and choose from two distinct software-controlled gain-setting modes, high-sensitivity mode (HS, default) and the low-noise (LN) mode.

These affordable uncooled instruments are USB powered and are available with a choice of four gratings and replaceable slits to match the bandwidth and requirements fitting your application.

Spectrometer	AvaSpec-NIR256-1.7-EVO	AvaSpec-NIR512-1.7-EVO
<b>Optical Bench</b>	Symmetrical Czerny-Turner, 50 mm focal length,	
<b>Wavelength range</b>	900-1750 nm	
<b>Resolution (slit &amp; grating dependent)</b>	2 - 50 nm	
<b>Stray-light</b>	<1%	
<b>Sensitivity HS in counts /<math>\mu\text{W}</math> per ms</b>	1.300.000 (integral 1000-1750 nm)	600.000 (integral 1000-1750 nm)
<b>Dynamic Range HS</b>	6000:1	
<b>Integration time HS</b>	20 $\mu\text{s}$ - 500 ms	
<b>Signal/Noise HS</b>	1900:1	
<b>Sensitivity LN in counts /<math>\mu\text{W}</math> per ms</b>	74.000 (integral 1000-1750 nm)	34.500 (integral 1000-1750 nm)
<b>Dynamic Range LN</b>	9000:1	
<b>Integration time LN</b>	20 $\mu\text{s}$ - 20 seconds	
<b>Signal/Noise LN</b>	5000:1	
<b>Detector</b>	InGaAs linear array, 256 pixels, 50 $\mu\text{m}$ x 500 $\mu\text{m}$	InGaAs linear array, 512 pixels, 25 $\mu\text{m}$ x 500 $\mu\text{m}$
<b>AD converter</b>	16-bit, 500 kHz	16-bit, 500 kHz
<b>Interface</b>	USB3.0 high speed, 5 Gbps, Gigabit Ethernet 1 Gbps	
<b>Sample speed with store to RAM</b>	0.53 ms /scan	
<b>Data transfer speed</b>	0.53 ms /scan (USB3)	
<b>Digital IO</b>	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital IO bi-directional, trigger, synchronization, strobe, laser	
<b>Power supply</b>	Default USB power, 600 mA or external 12VDC, 320mA (4W)	
<b>Dimensions, weight</b>	185 x 100 x 184 mm, 2.7 kg	

## Grating selection table for AvaSpec-NIR256/512-1.7-EVO

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
		256/512			
NIR	900-1750	850	200	1500	NIR200-1.5
NIR	1000-1700	340	400	1600	NIR400-1.6
NIR	900-1400	200	600	1200	NIR600-1.2
NIR	1300-1600	152	600	1600	NIR600-1.6

## Resolution table (FWHM in nm) for AvaSpec-NIR256/512-1.7-EVO

Grating (lines/mm)	Slit size (μm)				
	25*	50	100	200	500
200	5	6	12	24	50
400	2.5	3	6	12	25
600	n.a.	2	4	8	18

\* only for AvaSpec-NIR512

## Ordering Information

### AvaSpec-NIR256-1.7-EVO

- Fiber-optic Spectrometer, 50 mm AvaBench, 256 pixel InGaAs detector, high-speed USB3 and ETH interface, with replaceable slit, incl. AvaSoft-Basic, USB interface cable, OSF-850/1000-3.  
Specify grating, wavelength range and slit

### AvaSpec-NIR512-1.7-EVO

- Fiber-optic Spectrometer, 50 mm AvaBench, 512 pixel InGaAs detector, high-speed USB3 and ETH interface, with replaceable slit, incl. AvaSoft-Basic, USB interface cable, OSF-850/1000-3.  
Specify grating, wavelength range and slit

## Options

### SLIT-XX-RS

- Replaceable slit with SMA connector, specify slit size XX=25\*, 50, 100 or 200 μm

### SLIT-XX-RS-FCPC

- as SLIT-XX-RS, but with FC/PC connector

\* only for AvaSpec-NIR512



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For external triggering Avantes offers the AvaTrigger featuring optical triggering, external TTL or manually through the pushbutton.

# AvaSpec-NIR256/512-2.5-HSC-EVO

## NIRLine Near-infrared Fiber Optic Spectrometer



The NIR spectrometers in our EVO series offer more sensitivity, less weight and less size. They are based on a 100mm optical bench with a NA of 0.13 offering optimal balance between resolution and sensitivity.

The 2.5-HSC series feature 256 or 512 pixel InGaAs detectors and are available in multiple configurations. These instruments are perfect for grain, corn, wheat, soya, polymers but also for medical uses, process monitoring and other analysis. The 256 pixel detectors offer best sensitivity for most applications.

For applications where resolution is key, or more datapoints for modelling is required, the 512 pixel detector will be the best choice.

Also available on the -HSC is the userselectable gain setting mode: LN(low- noise, standard setting), which gives you a longer integration time and higher signal to noise ratio, or HS (high-sensitivity) for measuring in lowlight conditions. Analog and digital IO ports enable external triggering and control of shuttered and pulsed light sources from the AvaLight series. T

### Technical Data

Spectrometer platform	AvaSpec-NIR256-2.5-HSC-EVO	AvaSpec-NIR512-2.5-HSC-EVO
<b>Optical Bench</b>	TE-cooled Symmetrical Czerny Turner, 100 mm focal length	
<b>Wavelength Range</b>	1000 - 2500 nm	
<b>Resolution (slit &amp; grating dependent)</b>	4.4 - 85.0 nm	2.6 - 85.0 nm
<b>Pixel Dispersion (with NIR 075-1.7 grating)</b>	6.2 nm	3.1 nm
<b>Stray-light</b>	<1.0%	
<b>Sensitivity HS in counts / <math>\mu</math>W per ms (1000-2500 nm)</b>	990,000	990,000
<b>Signal/Noise HS</b>	1800:1	1900:1
<b>Integration time HS</b>	10 $\mu$ s -5ms	
<b>Sensitivity LN in counts / <math>\mu</math>W per ms (1000-2500nm)</b>	55,000	55,000
<b>Signal/Noise LN</b>	4000:1	3700:1
<b>Integration time LN</b>	10 $\mu$ s - 100 ms	
<b>Detector</b>	inGaAs linear array with 2-stage TE-cooling, 256 pixel	inGaAs linear array with 2-stage TE-cooling, 512 pixel
<b>Pixel size (WxH)</b>	50x250 $\mu$ m	25x250 $\mu$ m
<b>AD converter</b>	16 bit, 500kHz	
<b>Interface</b>	USB 3.0 high-speed, 5 Gbps Gigabit Ethernet 1 Gbps	
<b>Sample speed with on-board averaging</b>	0.54 ms/scan (USB3)	
<b>Data transfer speed</b>	1.11ms/scan (USB3)	
<b>Digital IO</b>	HD-26 connector, 2 Analog in, 2 Analog out, 13 Digital bi-directional, trigger, sync, strobe, laser	
<b>Power supply</b>	12 V, 40W	
<b>Operating Temperature range</b>	0 - 40 °C	
<b>Cooling</b>	45 °C versus ambient	
<b>Dimensions, weight</b>	185 x 145 x 185 mm, 3.5 kg.	

## Grating selection table for AvaSpec-NIR 256/512-2.5-HSC-EVO

Use	Useable range (nm)	Spectral range (nm)	Lines/mm	Blaze (nm)	Order code
NIR	1000-2500	1500	75	1700	NIR075-1.7
NIR	1000-2500	1173 - 1150*	100	2500	NIR100-2.5
NIR	1000-2500	800 - 660*	150	2000	NIR150-2.0
NIR	1000-2500	815 - 700*	150	2600	NIR150-2.6
NIR	1000-2500	574 - 530*	200	1500	NIR200-1.5

\*Depends on the starting wavelength of the grating; the higher the wavelength, the bigger the dispersion and the smaller the range to select.

## Resolution table (FWMH in nm) for AvaSpec-NIR256/512-2.5-HSC-EVO

Grating (lines/mm)	Slit size (μm)				
	25*	50	100	200	500
75	8.9	12.9	16.0	33.9	84.5
100	7.2	9.5	12.0	20.0	50.0
150	4.0	5.7	7.0	12.8	32.0
200	2.6	4.4	5.2	9.3	23.3

\* Only for AvaSpec-NIR 512

### Options

**SLIT-XX-RS** • Slit size, please specify XX = 25, 50, 100, 200 or 500 μm



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This instrument is perfect for grain, corn, wheat, soya and other analysis.