NIR Spectrometer Ultra-High Optical Resolution

0.04nm, 790 – 880 nm, USB

DATASHEET

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The NRRS Series Spectrometer, based on TE-cooled Silicon detectors coupled with a high throughput transmission grating, is optimized for NIR spectroscopic measurements requiring an exceptional high resolution, signal-to-noise ratio, and high dynamic range across the 790 - 880 µm spectral range. This system leverages innovative, patent-pending scanning technology, offering significant advantages: 1) Unmatched low cost; 2) Industry-leading sensitivity with deep cooling to -40°C; 3) Extended spectral coverage beyond traditional spectrometers; 4) Low power consumption; 5) Integrated MEMS chopper; 6) High- resolution performance. The NRRS series comes standard with a USB interface, power supply, and software support includes SDK examples, DLLs for custom application development, and Windows-based spectral acquisition and analysis tools. The NRRS is well suited for RAMAN applications.

Features

- Volume Phase Holographic Grating
- Collimating Lens Design
- Focusing Lens Design
- Diffraction System Optical Design
- Wavelength Calibration Algorithms
- Precise Spectrometer Calibrating Techniques
- High Sensitivity
- USB

Applications

- Laboratory use
- Testing
- Instrumentation
- Optical Coherence Tomography (OCT)

Specifications

Parameter	Min	Typical	Max	Unit
Wavelength Range	790		880	nm
Camera Resolution		4000		pixels
Bit Depth		10, 11, 12		bits
Response non-linearity		±1		%
Photo response non-uniformity		0.5		%
Integration Dead Time (in maximum exposure time)	0.01	0.6	2	s
Quantum Efficiency (QE) @850nm	54 %			
Analog gain / Digital gain	x1 x2 and x4 / x1 to x7.996			
Dynamic Range		69		dB
SNR			51	dB
Optical System Characteristics	f/#: 3.6, NA: 0.14 Focal length(R1-R2): 60 -89 @840nm			
Optical Design	T-T-T fully transmissive Czerny-Turner light path			
Grating	1800 lp/mm VPH @840nm			
Input Slit Type	Recommended - 5 µm single mode fiber, FC/PC			
Fiber Optic Interface	FC/PC			
Pixel Resolution	0.035		0.04	nm
Optical Resolution	0.03	0.04	0.07	nm
Operating Temperature	5		40	°C
Storage Temperature	-30		70	°C
Relative Humidity	0% - 85% non-condensing			
Data transfer interface	USB 3.0			

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link]:

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P +1 781-935-1200 E sales@photonwares.com W www.agiltron.com

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Ordering Information

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Prefix	**Type**	**Wavelength**	**Input Optical Power**	**Cooling ***	**Resolution ****	**Shutter**	**Chopper**	**Connector**
HRRS-	Raman = 1	790-880nm = 1 Special = 0	Standard = 1 High Power = 2	Non = 1 -5°C = 2 -20°C = 3 -40°C = 5	1nm = A1 0.5nm = 50 0.05m = 05 0.04nm = 04 Special = 00	Non = 1 Yes = 2	Non = 1 Yes = 2	SMA905 = 1 FC/PC = 2 SC/PC = 4 ST/PC = 6 Special = 0

* Non cooling is low cost for strong light measurements. At -5°C:Noise is reduced by about 4×, improving performance in low-light applications. At -40°C:Noise is reduced by about 16×, enabling high-sensitivity measurements, such as weak signal detection in spectroscopy or astronomy.

** Low resolution high sensitivity.