

Quest™ U-RS232

Spectrometer

High Performance Low Stray Light CCD Spectrometer



The Quest™ U-RS232 is a linear CCD array spectrometer optimized for UV performance using a low straylight optical bench. It features a 2048 element detector, built-in 16-bit digitizer, enhanced RS232 interface with a >500 kHz readout speed, and external trigger. The Quest™ U-RS232 is also temperature compensated, which greatly reduces the thermal drift to ~15 counts/°C. This decreases baseline drift and sustains the dynamic range.

The Quest™ U-RS232 is available in two standard spectral configurations; 200nm - 400nm and 200nm - 850nm. Custom configurations and USB communication interface are available for OEM applications.

Applications:

- UV, Vis, and NIR: Spectroscopy / Spectroradiometry / Spectrophotometry
- Wavelength Identification
- Absorbance
- Reflectance
- OEM Optical Instrumentation Component

Features:

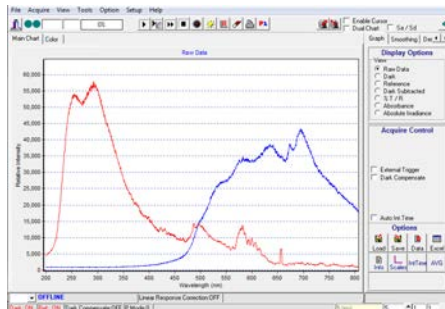
- Thermal Drift ~15 Counts/°C (Typical)
- Low Stray UV Light
- < 0.4nm Spectral Resolution
- 16-bit Digitizer
- 5ms Minimum Integration Time
- 500 kHz Readout Speed
- RS232 Communication Protocol

Accessories:

- Fiber Patch Cords
- Light Sources
- Cuvette Holders
- Inline Filter Holders
- Fiber Optic Probes

Software:

BWSpec™ is a spectral data acquisition software with a wide range of tools that are designed to perform complex measurements and calculations at the click of a button. It allows the user to choose between multiple data formats and offers optimization of scanning parameters, such as integration time. In addition to powerful data acquisition and data processing, other features include automatic dark removal, spectrum smoothing, and manual/auto baseline correction.



Specifications:

Power Input	5V DC @ < 0.5 Amps
Detector Type	Response Enhanced Linear CCD Array
Detector Pixel Format	2048 x 1 Elements @ 14µm x 200µm Per Element
Spectrograph f/#	3.6
Spectrograph Optical Layout	Czerny-Turner
Dynamic Range	275 (Typical)
Digitizer Resolution	16-bit or 65,535:1
Readout Speed	500 kHz
Data Transfer Speed	Up to 3 Spectra Per Second Via RS232 Port
Integration Time	5 - 65,535ms
Thermal Drift	~29 Counts/°C (Max)
Aux Port	External Trigger Input, Synchronized Pulse Output
Operating Temperature	5°C - 35°C
Operational Relative Humidity	85% Noncondensing
Weight	~ 0.8 lbs (0.37 kg)
Dimensions	5.14in x 3.59in x 1.37in (130.6mm x 91.2mm x 35mm)
Computer Interface	RS232
Operating Systems	Windows: XP, Vista, 7 & Embedded Systems

Technical Details

Quest™ U-RS232

Standard Fiber Coupler

1 Secures Fiber to Ensure Repeatable Results

By coupling a fiber optic to the SMA 905 adaptor, light will be guided to the slit and optically matched, ensuring reproducibility. For free space sampling, a diffuser or lens assembly can be connected directly to the SMA 905 adaptor.

Configurable Entrance Slit

2 Determines Photon Flux and Spectral Resolution

Light entering into a spectrometer's optical bench is vinyetted by a pre-mounted and aligned slit. This ultimately determines the spectral resolution and throughput of the spectrometer after grating selection. We offer a variety of slit widths to match your specific application needs: from 10µm - 200µm wide, with custom slits available.

Slit Option	Dimensions	Approx. Resolution 200-400nm
10µm	10µm wide x 1mm high	~0.4nm
25µm	25µm wide x 1mm high	~0.6nm
50µm	50µm wide x 1mm high	~1.0nm
100µm	100µm wide x 1mm high	~1.6nm
200µm	200µm wide x 1mm high	~3.0nm
Custom Slit Widths Available		

Standard Collimating Mirror

3 Collimates and Redirects Light Towards Grating

Both mirrors are f/# matched focusing mirrors coated with AlMg₂, which produces approximately 95% reflectance when working in the UV-Vis spectrum. Aluminum (Al) provides reflectance and magnesium (Mg₂) protects the aluminum from oxidation.

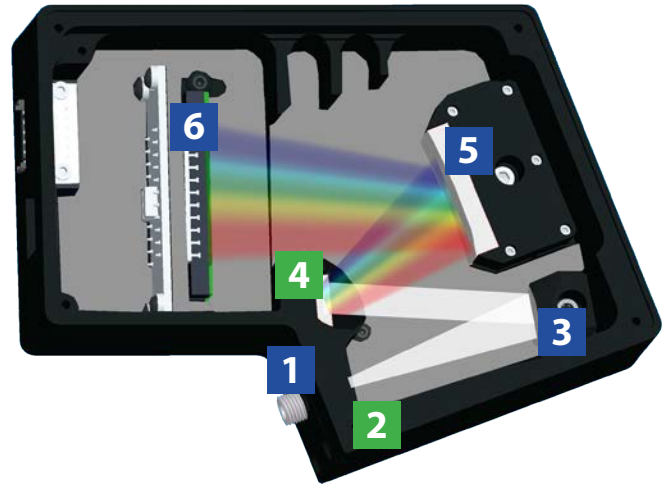
Configurable Diffraction Grating

4 Diffracts Light, Separating Spectral Components

The groove frequency of the grating determines two key aspects of the spectrometer's performance: the wavelength coverage and the spectral resolution. When the groove frequency is increased, the instrument will achieve higher resolution, but the wavelength coverage will decrease. Inversely, decreasing the groove frequency increases wavelength coverage at the cost of spectral resolution.

The blaze angle or blaze wavelength of the grating is also a key parameter in optimizing the spectrometer's performance. The blaze angle determines the maximum efficiency that the grating will have in a specific wavelength region.

Best Efficiency	Spectral Coverage (nm)	Grating
UV / Vis	200 - 400	1800/250
UV / NIR	200 - 850	600/250
Custom Configurations Available		



Standard Focusing Mirror

5 Refocuses Dispersed Light onto Detector

Both mirrors are f/# matched focusing mirrors coated with AlMg₂, which produces approximately 95% reflectance when working in the UV-Vis spectrum. Aluminum (Al) provides reflectance and magnesium (Mg₂) protects the aluminum from oxidation.

Standard Array Detector

6 Measures Entire Spectrum Simultaneously

The Quest™ U-RS232 features a 2048 x 1 linear silicon CCD array detector with a 14µm pixel width and > 2000 active pixels. As the incident light strikes the individual pixels across the CCD, each pixel represents a portion of the spectrum that the electronics can then translate and display with a given intensity using BWSpec™ software.

The quantum efficiency (QE) and noise level of the array detector greatly influences the spectrometer's sensitivity, dynamic range and signal-to-noise ratio. The spectral acquisition speed of the spectrometer is mainly determined by the detector response over a wavelength region.

Specifications	
Wavelength Range	200nm - 850nm
Pixels	2048
Pixel Size	14µm x 200µm
Well Depth	~65,000 e
Digitization Rate	500 kHz

