

Spectrometer *i-trometer*[™]

High Performance Back-thinned CCD Spectrometer



The *i-trometer*[™] features a linearly summed 2048 x 64 element back-thinned (BT) CCD detector, and is optimized for UV performance through the use of an aberration corrected concave holographic grating, to minimize stray light. The BT CCD offers superior quantum efficiency, signal-to-noise, and dynamic range, making it ideal for a variety of UV/Vis/NIR applications. The *i-trometer*[™] features a built-in 16-bit digitizer, USB 2.0 interface and external trigger.

Standard spectral configurations range from 180nm - 1050nm and resolutions range between 0.6nm and 6.0nm. Custom configurations are available for OEM applications.

Applications:

- UV / Vis / Short-wave NIR Spectroscopy
- UV / Vis / NIR Lamp Characterization
- HPLC Detection
- Solar Monitoring

Features:

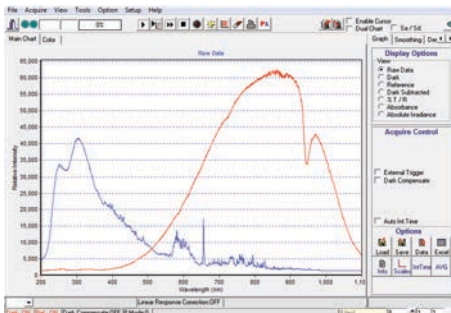
- High UV, Vis, NIR Response
- Wide Dynamic Range
- High Throughput
- High Stray Light Rejection
- USB 2.0 High Speed Interface

Accessories:

- Light Sources
- Fiber Patch Cords
- Fiber Sampling Probes
- Fiber Sample Holders

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:

DC Power Input	5V DC @ < 0.8 Amps
AC Adapter Input	100 - 240VAC 50/60 Hz, 0.5A @ 120VAC
Detector Type	Back-thinned CCD Array
Pixels	2048 @ Equivalent 14mm x 896mm (14x64)
Spectrograph f/#	3.0
Spectrograph Optical Layout	Concave Holographic, Aberration Corrected, Flat Field
Dynamic Range	33,300
Digitizer Resolution	16-bit or 65,535 to 1
Readout Speed	375 kHz
Data Transfer Speed	Up to 65 Spectra Per Second Via USB 2.0
Integration Time	7ms to >= 20,000ms
External Trigger	Aux Port
Operating Temperature	15°C to 35°C
Weight	~ 2.6 lbs (1.2 kg)
Dimensions	6.22in x 4.01in x 3.30in (158mm x 102mm x 84mm)
Computer Interface	USB 2.0 / 1.1
Operating Systems	Windows: XP, Vista, 7

Technical Details

i-trometer™

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 190-1100nm
10µm	10µm wide x 2mm high	~2.0nm
25µm	25µm wide x 2mm high	~2.5nm
50µm	50µm wide x 2mm high	~3.2nm
100µm	100µm wide x 2mm high	~6.0nm
200µm	200µm wide x 2mm high	Call
Custom Configurations Available		

Standard **Folding Mirror**

3 Redirects Light Towards Grating

The folding mirror redirects the light from the slit towards the holographic grating to be dispersed and refocused. This mirror is 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 **Concave Holographic Grating**

4 Collects, Disperses and Refocuses Light

This one compact optical component collects, disperses, and refocuses light onto the detector, by effectively combining the grating and focusing mirror found in standard Czerny-Turner optical benches. The optimized holographic grating delivers excellent efficiency and stray-light reduction and is able to provide a faster f/#, delivering higher throughput.

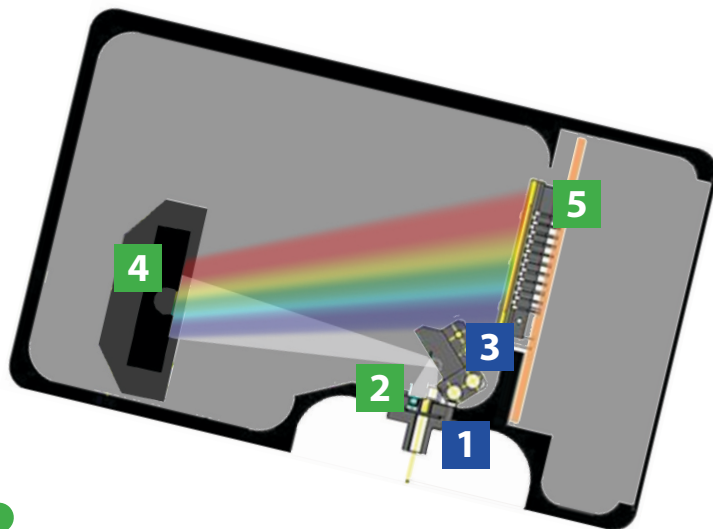
Best Efficiency	Spectral Coverage (nm)
UV / Vis	180-450
UV / NIR	190-800
Vis / NIR	400-800
UV / Vis	200-550
UV / NIR	190-1100
UV / Vis	350-750
UV - NIR	350-1050
Custom Configurations Available	

Configurable **Array Detector**

5 Measures Entire Spectrum Simultaneously

The *i*-trometer™ features a linearly summed 2048 x 64 element back-thinned (BT) CCD detector where pixels are vertically binned, making an effective pixel size of 14µm x 896µm 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 of this BT CCD is increased by > 30% compared to most front illuminated linear CCD arrays. This detector also has very low read out noise, allowing for low light level detection.



Specifications	
Wavelength Range	190nm - 1100nm
Pixels	2048 x 64
Pixel Size	14µm x 14µm
Well Depth	~200,000 e
Digitization Rate	375 kHz

