

General Specifications:

Power Input	100-240 VAC 50/60 Hz
Detector Type	Extended wavelength InGaAs linear array
Pixels	256 x 1 @ 50µm x 250µm per element
Spectrograph F#	3.5
Spectrograph Optical Layout	Crossed Czerny-Turner
Dynamic Range	High Dynamic Mode 13,000:1, High Sensitivity Mode 6,250:1
Digitizer Resolution	16-bit or 65,535:1
Readout Speed	1 MHz
Data Transfer Speed	3ms per spectrum in fast acquisition mode
Integration Time	10µs to > 30ms
External Trigger	Aux Port
Operating Temperature	0°C - 35°C
TE Cooling	Two-Stage: -10°C
Weight	Spectrometer: 1.4 kg (3.1 lbs) Power Supply: 0.9 kg (1.9 lbs)
Dimensions	Spectrometer unit: 192mm x 109mm x 68mm (7.5in x 4.3in x 2.7in) Power supply unit: 189mm x 169mm x 77mm (7.5in x 6.6in x 3.0in)
Computer Interface	USB 2.0
Operating Systems	Windows: XP, Vista (32-bit), 7 (32-bit)

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About the Sol™ 2.2

The Sol™ 2.2 products are low cost, high performance linear InGaAs array spectrometers, featuring 256 (standard), 512, and 1024 pixels and TE Cooling down to -10°C, all while providing high throughput and large dynamic range.

Each spectrometer features an SMA905 fiber optic input, a built-in 16-bit digitizer, and is USB 2.0 plug-and-play compatible. Using the included software, the user can choose between high sensitivity and high dynamic range mode. Customized spectral resolution and application support are available.

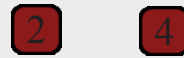
Spectrometer Sol™ 2.2

1100 - 2200nm NIR TE Cooled InGaAs Array Spectrometer



Ordering Info

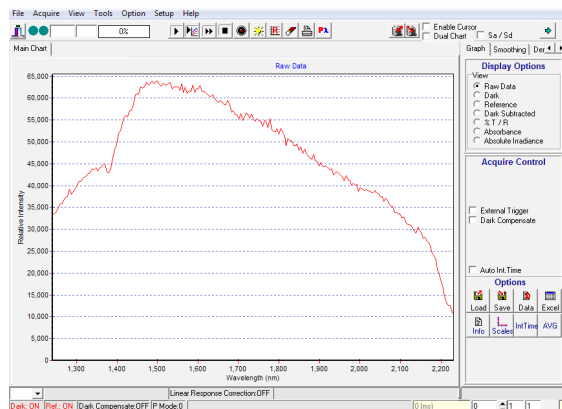
Ordering Code: Sol™ 2.2



To order your custom system, fill in the slit ordering code (2) and grating ordering code (4).

Software

BWSpec™ features a wide range of tools designed to allow complex measurements and calculations to be completed at the click of a button. BWSpec™ allows the user to choose between multiple data formats and offers optimization of scanning parameters such as integration time and laser power output. In addition to powerful data acquisition and data processing, other features include automatic dark removal, spectrum smoothing, and manual/auto baseline correction. The software also contains an OCX interface for users to collect spectrum in Thermo Scientific GRAMS/AI.



To find out more:

Contact our Application Team for your unique solution.

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Web: www.bwtek.com · E-mail: www.bwtek.com/contact

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Applications

- Process Monitoring
- NIR Spectroscopy
- Quality Control
- On-line Analyzer
- Material Identification

Features:

- 1100nm - 2200nm Spectral Range
- 12nm FWHM Spectral Resolution or customized
- Built-in 16-bit Digitizer
- Optional Shutter Available
- Optional RS232 Interface

Accessories

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

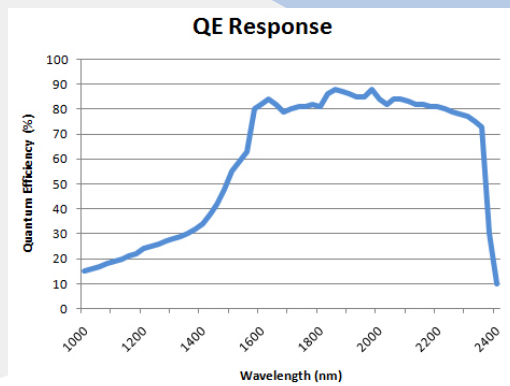
Workings of a Spectrometer:

Configurable Detector

6 As the dispersed light strikes the detector's pixels, the electronics digitize the data to be displayed

The standard Sol™ 2.2 features a TE Cooled 256 element linear InGaAs photo diode array Detector with a pixel format of 256 x 1 elements @ 50µm pixel width and 250µm pixel height with 256 effective (Active) pixels. Each pixel represents a portion of the spectrum and as the incident light strikes the individual pixels across the photo diode, the electronics translate and display their intensity using our software, BWSpec™. The quantum efficiency (QE), dynamic range (DR), and noise level of the array detector largely dictates the spectrometer 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. Using BWSpec, the detector mode can be switched between High Sensitivity and High Dynamic modes allowing for a greater control over the detector's sensitivity.

Specifications	
Wavelength Range	1100nm - 2200nm
Pixels	256, Others Available
Pixel Size	50µm x 250µm
Well Depth	High Dynamic: ~100,000,000 e High Sensitivity: ~40,000,000 e
Digitization Rate	1 MHz



Standard Thermoelectric Cooler

7 Reduces dark noise and increases the dynamic range

Cooling an array detector with a built-in thermoelectric cooler (TEC) is an effective way to reduce dark current and noise as well as to enhance the dynamic range and detection limit.

When the InGaAs is cooled down to -10°C by the TEC, from a room temperature of 25°C, the dark current is reduced by 12.25 times and the dark noise is reduced by 3.5 times. This allows the spectrometer to operate at longer exposure times and to detect weaker optical signals.

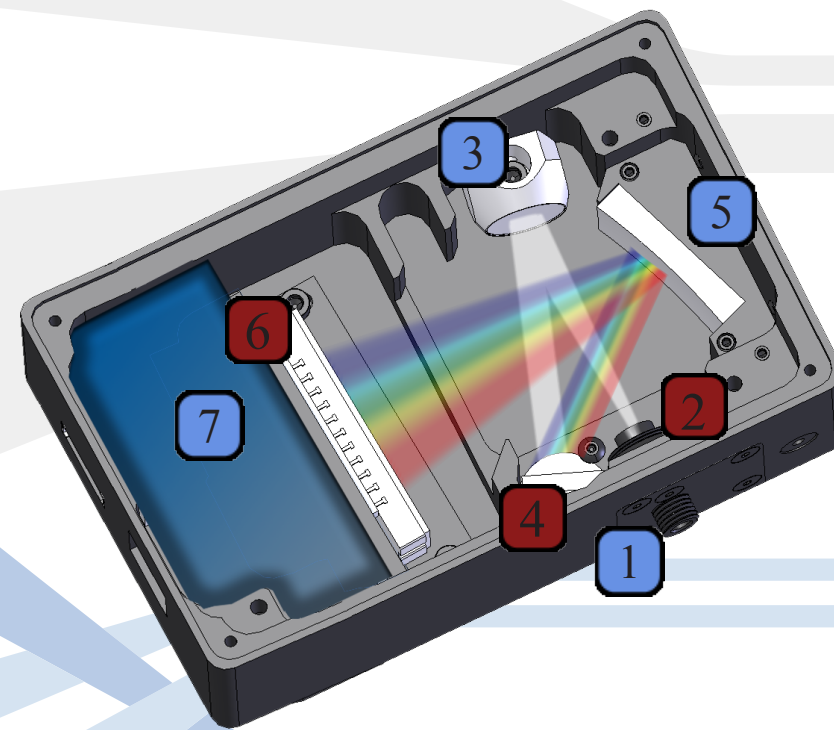
Standard Collimating Mirror

3 Collimates and redirects the light beam towards the grating

Standard Focusing Mirror

5 Refocuses the dispersed light onto the detector

Both mirrors are F# matched focusing mirrors coated with a special coating which enhances the NIR signal



Configurable Slit

2 Determines the photon flux and optical resolution

Light entering into a spectrometer's optical bench is focused onto a pre-mounted and aligned slit, which ultimately determines the optical resolution and throughput of the spectrometer.

We offer a variety of slit widths and heights to match your specific application needs: from 50µm - 800µm wide and from 1mm - 2mm high (1mm being our standard height).

Using a 256 Pixel Array

Slit Option	Dimensions	Resolution	Ordering Code
50µm	50µm wide x 1mm high	~13.0nm	Slit-50
100µm	100µm wide x 1mm high	~26.0nm	Slit-100
Custom Configurations Available			

Record your Slit Ordering Code on the back page.

Standard SMA 905 Precision fiber coupler

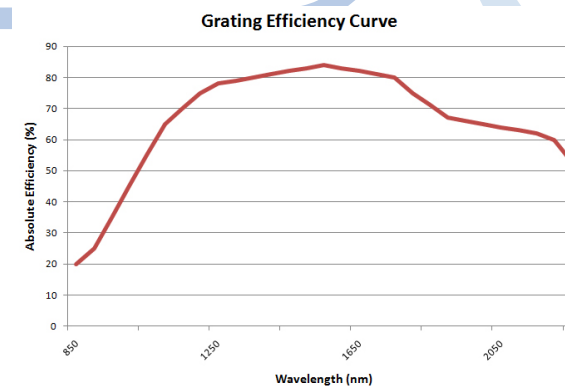
By coupling the SMA 905 adaptor with a fiber or lens, light will be guided to the slit and optically matched. This ensures reproducibility for light coupling from the fiber or lens into the optical bench.

Configurable Grating

4 Wavelength Range and Spectral Resolution

The groove frequency of the grating determines two key aspects of the spectrometer's performance: the spectral resolution and the wavelength coverage. The higher the groove frequency the more resolution the instrument will achieve; however, the wavelength coverage will be less. Inversely, decreasing the groove frequency increases wavelength coverage at the sacrifice of spectral resolution. With gratings to choose from we can customize your application needs.

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 the grating will have in a specific wavelength region. We have a variety of blaze angles available per groove frequency to match your application needs.



Best Efficiency	Spectral Coverage (nm)	Resolution (nm) 50µm Slit	Ordering Code
NIR	1100-2200	~13.0	EG01
Custom Configurations Available			

Record your Grating Ordering Code on the back page.