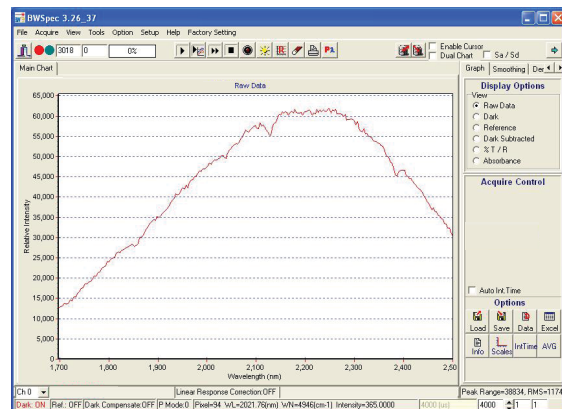


## General Specifications:

DC Power Input	DC 5V / 13A
AC Adapter Input	100 - 240VAC 50/60 Hz, 1.9A @ 120VAC
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	Maximum Dynamic Mode: 20,000:1 High Dynamic Mode: 10,000:1 High Sensitivity Mode: 2,500:1 Maximum Sensitivity Mode: 250:1
Digitizer Resolution	16-bit or 65,535:1
Readout Speed	500 kHz
Data Transfer Speed	>300 spectra per second via USB 2.0
Integration Time	250µs to >= 64 seconds
External Trigger	Aux Port
Operating Temperature	0°C - 35°C
TE Cooling	Three-Stage: -15°C @ Relative Humidity = 90%
Relative Humidity	<= 80%
Weight	1.4 kg (3.1 lbs)
Dimensions	197mm x 109mm x 68mm (7.8in x 4.3in x 2.7in)
Computer Interface	USB 2.0 / 1.1
Operating Systems	Windows: XP, Vista (32-bit), 7 (32-bit)

## 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.



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Spectrometer **Sol™ 2.6**  
1550nm - 2550nm\* NIR TE Cooled InGaAs Array Spectrometer



## Features:

- 1550nm - 2550nm\* Spectral Range
- Built-in Autozero (Noise Level Reduction)
- Built-in 16-bit Digitizer
- Low Dark Noise and High Sensitivity
- Four Sensitivity & Dynamic Range Modes for Specific Application Needs

\*Custom Ranges Available

## About the Sol™ 2.6

The Sol™ 2.6 is a high performance linear InGaAs array spectrometer featuring 256 pixels and providing high throughput and large dynamic range with TE Cooling down to -15°C via a built-in 3-Stage Cooler.

Each spectrometer features an SMA 905 fiber optic input, built-in 16-bit digitizer, USB 2.0 plug-and-play compatible, and a built-in autozero function which automatically reduces dark current and dark non-uniformity resulting in an increased signal-to-noise ratio.

Software control allows the user to choose from four types of operation modes: Maximum Dynamic, High Dynamic, High Sensitivity, and Maximum Sensitivity. Customized spectral resolution and application support are also available.

## Applications

- Process Monitoring
- NIR Spectroscopy
- Quality Control
- On-line Analyzer
- Biological Applications

## Accessories

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

# Workings of a Spectrometer:

# So1™ 2.6

## Configurable Detector

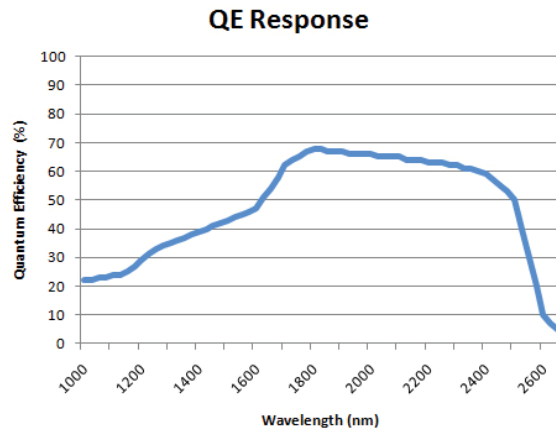
**6** As the dispersed light strikes the detector's pixels, the electronics digitize the data to be displayed

The standard So1™ 2.6 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 as the dispersed incident light strikes the individual pixels across the photo diode. The photons captured by each pixel are then translated by electronics and their intensity displayed using our 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.

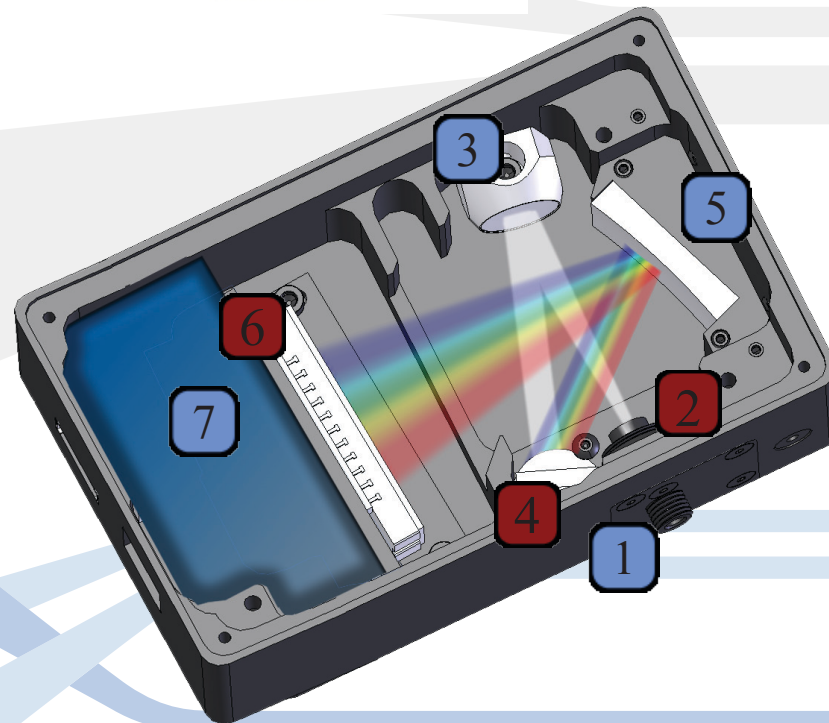
Autozero is a automatic function of the detector which reduces the dark current and dark non-uniformity by minimizing the offset voltage on each pixel during the exposure time. This results in an increase in the signal-to-noise ratio by as much as 50 times compared to units without this feature.

Using BWSpec™, the detector mode can be switched among Maximum Dynamic Range, High Dynamic Range, High Sensitivity, and Maximum Sensitivity allowing for greater control over different applications.



Specifications	
Wavelength Range	1550nm - 2550nm*
Pixels	256
Pixel Size	50µm x 250µm
Well Depth	Maximum Dynamic Mode: ~250 Me
	High Dynamic Mode: ~125 Me
	High Sensitivity Mode: ~12.5 Me
Maximum Sensitivity Mode: ~1.25 Me	
Digitization Rate	500 kHz

\*Custom Ranges Available



## 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 spectral resolution

Light entering into a spectrometer's optical bench via a fiber or lens is focused onto 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 and heights to match your specific application needs: from 75µm - 800µm wide and 1mm and 2mm high (1mm being our standard height).

### Using a 256 Pixel Array

Slit Option	Dimensions	Resolution
75µm	75µm wide x 1mm high	~15.0nm
Custom Configurations Available		

## 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 detector array is cooled down to -15°C by the TEC from a room temperature of 25°C, the dark current is reduced by ~32 times and the dark noise is reduced by a factor of ~5.7. This allows the spectrometer to operate at longer exposure times and to detect weaker optical signals.

## Configurable Grating

**4** Wavelength Range and Spectral Resolution

The groove frequency of the grating determines two key aspects of the spectrometer's performance: the wavelength coverage and the spectral resolution. The higher the groove frequency the more resolution the instrument will achieve but the wavelength coverage will be less. Inversely, decreasing the groove frequency increases wavelength coverage at the cost of spectral resolution. With over twenty-five gratings offered, we can customize the spectrometer to suit 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.

## Standard SMA 905

**1** 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.

Best Efficiency	Spectral Coverage (nm)	Grating
NIR	1550-2550	100/2500
Custom Configurations Available		