

Exemplar® Pro

Deep Cooled Smart Spectrometer



The Exemplar® Pro is a high performance smart spectrometer utilizing a low stray light unfolded Czerny-Turner spectrograph. It features a highly sensitive deep cooled (-25°C) back-thinned (BT) CCD detector which is linearly summed for high dynamic range. Its long focal length, coupled with a high quantum efficiency detector, provides superior data quality over the entire 190-1100nm spectral range. The Exemplar Pro features a high signal to noise ratio, making it ideal for ultra low light level applications, and also features a built-in shutter allowing for dark scan measurements, even while illuminated. As a member of the Exemplar product line, it features on board data processing and USB 3.0 communication. The Exemplar product line is optimized for multi-channel operation featuring ultra-low trigger delay and gate jitter.

The Exemplar Pro is available in the following standard configuration: wavelength range of 750-1100nm, $25\mu\text{m}$ slit, a ruled grating, and a spectral resolution of 0.6nm. Custom configurations are available.

SIGNAL TO NOISE RATIO:

Integration time of 30 minutes will give a SNR better than 540:1

SMART:

On-board processing including averaging, smoothing, and dark compensation

SPEED:

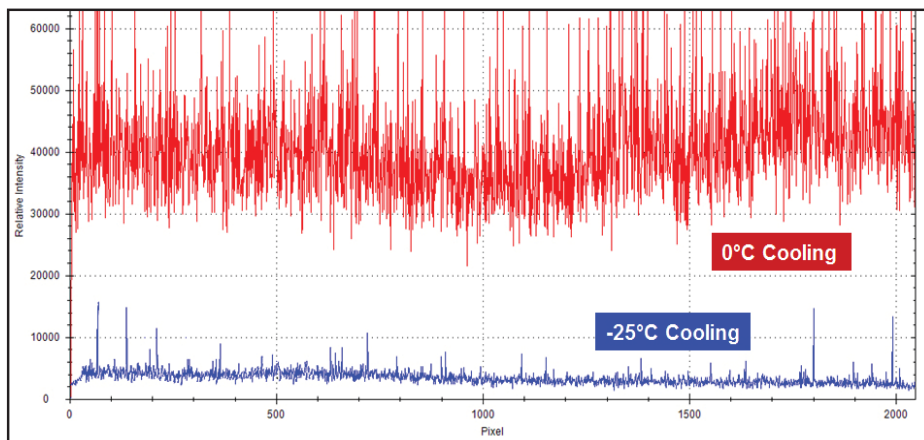
Acquires and transfers more than 140 spectra per second at an integration time of 6.3ms

SYNCHRONOUS:

Supports up to 32 devices with ultra-low trigger delay (95ns) & gate jitter ($\pm 20\text{ns}$)

Applications:

- Ultra low light level UV to NIR spectroscopy
- Raman and fluorescence spectroscopy
- On-line process monitoring
- LCD display measurement
- Biomedical spectroscopy
- Gas and water analysis
- LED characterization



Dark noise at 30 minute integration time

Specifications:

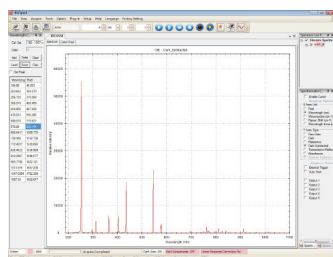
Power Input	5V DC @ 9.0A (maximum at startup) 5V DC @ 4.0A (typical at normal operation)
Detector Type	Back-thinned CCD Array
Wavelength Range	190nm - 1100nm
Detector Pixel Format	2048 effective detector elements
Effective Pixel Size	14µm x ~ 0.9mm
Spectrograph f/#	3.6
Spectrograph Optical Layout	Unfolded Czerny-Turner
Dynamic Range	50,000 (typical)
Digitizer Resolution	16-bit or 65,535:1
Data Transfer Speed	>140 spectra per second at integration time of 6.3ms in burst mode
Trigger Delay	95ns +/- 20ns (call for timing diagram)
Readout Speed	> 400kHz
Integration Time	6.3ms, adjustable in 1µs increments
Aux Port	External trigger, 4 digital outputs (2 with shutter control), 2 digital inputs, analog input, analog output and system reset
Operating Temperature	5°C - 35°C
Operational Relative Humidity	85% noncondensing
CCD Cooling	Default: -25°C at ambient of 25°C. (Δ 50°C minimum)
Weight	3.6 lbs
Dimensions	7.40in x 5.05in x 2.80in (188mm x 128mm x 71mm)
Computer Interface	USB 3.0 / 2.0
Operating Systems	Windows: 7, 8 (32-bit & 64-bit)

Additional Features:

- High UV, Vis, and NIR Response
- 2048 detector elements
- Over 60% QE at 200nm (Over 90% peak QE)
- Software-configurable cooling temperature (-25° default)
- Built-in shutter
- Ultra low noise

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.



Entrance Slit

Slit Option	Dimensions	Approx. Resolution 750 - 1050nm (Standard)
10µm	15µm wide x 1mm high	~0.4nm
25µm	25µm wide x 1mm high	~0.6nm
50µm	50µm wide x 1mm high	~0.98nm
100µm	100µm wide x 1mm high	~1.55nm
Custom Slit Widths Available		

Diffraction Grating

Best Efficiency	Spectral Coverage (nm)	Grating
NIR	750-1050	830/900
Vis	532-680	1800/500
Custom Configurations Available		

Accessories:

- Fiber sampling probes
- Fiber sample holders
- Fiber patch cords
- Light sources

Spectrograph

