

# USB2000+ Spectrometer

## User-configured for Maximum Flexibility



The USB2000+ Spectrometer is a clever combination of technologies: a powerful 2-MHz A/D converter, programmable electronics, a 2048-element CCD-array detector and a high-speed USB 2.0 port.

This innovative design produces our fastest spectrometer and provides resolution to 0.35 nm (FWHM). The USB2000+ allows you to capture and store a full spectrum into memory up to once per millisecond (nearly 1,000 full spectra every second) when the spectrometer is interfaced to a computer via a USB 2.0 port (performance may vary depending on computer and process loading). The USB2000+ is perfect for chemical, biochemical and other applications where fast reactions need to be monitored.

### Features

- Up to 1,000 full spectra/second
- Programmable microcontroller
- Modular design – hundreds of configurations possible
- Built-to-suit wavelength range and resolution
- Automatically reads the wavelength calibration coefficients of the spectrometer and configures operating software
- USB-to-PC interface; no external power requirements
- RoHS and CE compliance

### Programmable Microcontroller

The USB2000+ has an onboard programmable microcontroller that provides flexibility in controlling the spectrometer and accessories. Through a 22-pin connector, you can implement all operating parameters in the software, such as controlling external light sources, creating processes and routines and retrieving data from external devices.

Physical	
Dimensions:	89.1 mm x 63.3 mm x 34.4 mm
Weight:	190 g
Detector	
Detector:	Sony ILX511B linear silicon CCD array
Detector range:	200-1100 nm
Pixels:	2048 pixels
Pixel size:	14 $\mu\text{m}$ x 200 $\mu\text{m}$
Pixel well depth:	~62,500 electrons
Sensitivity:	75 photons/count at 400 nm; 41 photons/count at 600 nm
Optical Bench	
Design:	f/4, Symmetrical crossed Czerny-Turner
Focal length:	42 mm input; 68 mm output
Entrance aperture:	5, 10, 25, 50, 100 or 200 $\mu\text{m}$ wide slits or fiber (no slit)
Grating options:	14 different gratings, UV through Shortwave NIR
XR grating option:	Yes
Detector collection lens option:	Yes, L2
OFLV filter options:	OFLV-200-850; OFLV-350-1000
Other bench filter options:	Longpass OF-1 filters
Collimating and focusing mirrors:	Standard or SAG+
UV enhanced window:	Yes, UV2 quartz window
Fiber optic connector:	SMA 905 to 0.22 numerical aperture single-strand optical fiber
Spectroscopic	
Wavelength range:	Grating-dependent
Optical resolution:	~0.3-10.0 nm FWHM
Signal-to-noise ratio:	250:1 (at full signal)
A/D resolution:	16 bit
Dark noise:	50 RMS counts
Dynamic range:	8.5 x 10 <sup>7</sup> (system); 1300:1 for a single acquisition
Integration time:	1 ms to 65 seconds (20 seconds typical)
Stray light:	<0.05% at 600 nm; <0.10% at 435 nm
Corrected linearity:	>99%
Electronics	
Power consumption:	250 mA @ 5 VDC
Data transfer speed:	Full scans to memory every 1 ms with USB 2.0 or 1.1 port, 300 ms with serial port
Inputs/Outputs:	Yes, onboard digital user-programmable GPIOs
Analog channels:	No
Auto nulling:	No
Breakout box compatibility:	No
Trigger modes:	4 modes
Strobe functions:	Yes
Gated delay feature:	Yes
Connector:	22-pin connector