

SPECTRAL ANALYSIS / DATA SHEET

SM-4001B-U

UV High-Sensitivity Spectrometer

UV high-sensitivity spectrometer based on a Hamamatsu S10420-01 back-illuminated area CCD sensor, with selectable wavelength ranges and optical resolutions for weak-signal spectroscopy.

Overview

- Back-illuminated area CCD sensor for enhanced sensitivity in the 200–500 nm UV range.
- Selectable spectral ranges and optical resolutions through interchangeable optical components.
- 50,000:1 typical dynamic range and 800:1 signal-to-noise ratio for weak-signal measurements.
- USB 2.0 provides data transmission and power; RS232 supports system integration.



200–1100 nm OPTIONAL RANGE	~0.35 nm OPTIMAL RESOLUTION	50,000:1 DYNAMIC RANGE	USB / RS232 COMMUNICATION
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Key Advantages

- Handy and compact; the source describes the package as small as a name card.
- Crossed Czerny–Turner optical design with an interference filter to eliminate secondary diffraction spectrum.
- Standard SMA905 fiber connector and selectable wavelength range/resolution.
- Multiple trigger modes, automatic peak-wavelength and FWHM display, and fixed mounting holes for integration.
- SDK provided for secondary development and customization.

Application Scenarios

- Raman spectroscopy and fluorescence spectroscopy measurements.
- Near-infrared (NIR) and ultraviolet (UV) weak-spectrum detection.
- Weak-spectrum transmittance, absorbance and reflectance measurements.

MEASUREMENT PRINCIPLE

Crossed Czerny–Turner Optical Design

Light is coupled through a standard SMA905 fiber connector and dispersed by a crossed Czerny–Turner optical system. An interference filter is used to eliminate the secondary diffraction spectrum. The Hamamatsu S10420-01 back-illuminated area CCD sensor converts the optical signal for spectral analysis.

SYSTEM DATA

Technical Specifications

Specifications are compiled from the supplied SM-4001B-U source document. Optional wavelength ranges and resolutions are listed separately in Product Selection.

Item	Specification
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Item	Specification
Model number	SM-4001B-U
Wavelength range	200–1100 nm, optional
Detector wavelength range	200–500 nm
Resolution	Optimal ~0.35 nm
Fiber connector	SMA905
Detector	Hamamatsu S10420-01 back-illuminated area CCD sensor
Pixels	2048 × 64 pixels; each pixel 14 μm × 14 μm
Signal-to-noise ratio	800:1
A/D resolution	16 bit
Integration time	1 ms–10 s
Dynamic range	50,000:1 typical
Trigger modes	Normal, mode, software, hardware and synchronization trigger
Power consumption	5 V DC, 500 mA
Operating temperature	5–35°C (25°C recommended)
Communication interface	USB 2.0; RS232
Operating system	Win XP, Win 7, Win 8, Win 10
Linearity	>99%
Power supply	USB
Dimension	165 × 110 × 38 mm
Weight	0.7 kg

OUTPUT & COMMUNICATION

Output and System Integration

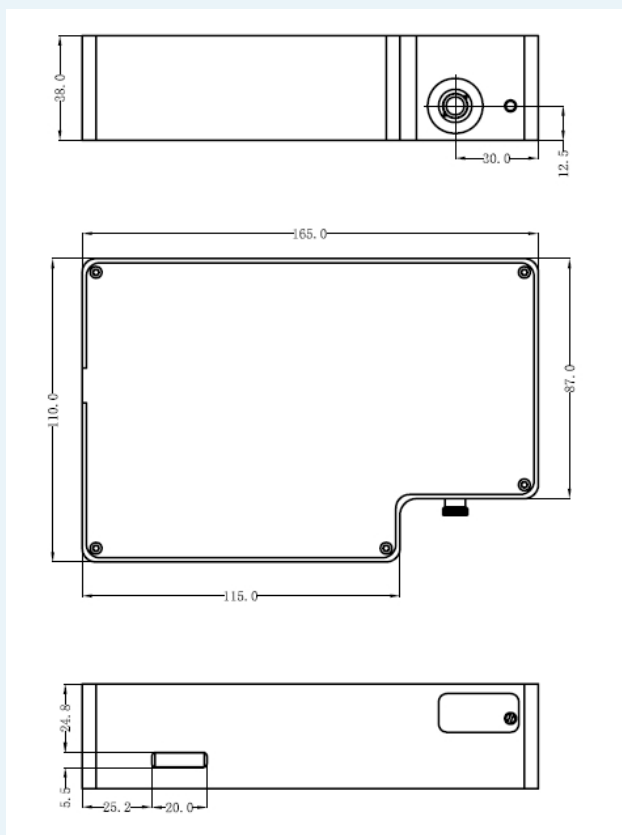
USB 2.0 provides power and data transfer, while RS232 provides serial communication. Multiple trigger modes support flexible operation and system integration; the supplied SDK supports secondary development and customization.

Interface / function	Source-supported specification
USB 2.0	Data transmission and USB power supply
RS232	Serial communication
Triggering	Normal, mode, software, hardware and synchronization trigger
Display	Automatic display of peak wavelength and FWHM
Development	SDK provided for secondary development and customization

MECHANICAL DATA

Mechanical Dimensions & Mounting

The supplied outline drawing is reproduced for mechanical reference. The specification-table envelope is 165 × 110 × 38 mm; the drawing also shows mounting and connector reference dimensions.



Outline dimensions

Key drawing references: 165 mm overall length, 110 mm overall width and 38 mm overall height.

Configuration List

No.	Component	Qty.
1	Spectrometer	1
2	USB cable	1
3	Calibration report, software and user manual	1
4	Suitcase	1

Optional Accessories

- Cooled halogen-tungsten light source.
- Straight-through quartz double-clad fiber, 200–1100 nm.
- Spectrum software.

ORDERING INFORMATION

Product Selection

The following configuration codes are transcribed from the supplied source document and use the SpeSense SM-4001B-U family name.

Model code	Wavelength range	Resolution
SM-4001B-U-01-S03L02F06G01	200–900 nm	~1 nm
SM-4001B-U-02-S03L02F06G13	200–1100 nm	~1.8 nm
SM-4001B-U-03-S03L02F06G16	180–880 nm	~1 nm
SM-4001B-U-03-S03L02F06G17	180–880 nm	~1 nm
SM-4001B-U-04-S05L00F00G06	180–413 nm	~1.4 nm
SM-4001B-U-04-S02L00F00G06	180–413 nm	~0.3 nm

CONTACT / SUPPORT

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