

## Compact CCD Spectrometers (Page 1 of 2)



### Features

- Models Covering the 200-1000 nm Wavelength Range
- Rugged Czerny-Turner Design with no Moving Parts
- Minimum Integration Time of 10  $\mu$ s
- Auto-Compensation for Dark Current Noise
- High-Speed USB2.0 Connection Offers up to 200 Scans per Second
- Trigger Input for External Synchronization (TTL)
- 16-Bit A/D Converter
- 3,648 Pixel Linear CCD Array

Thorlabs' new series of fiber-based spectrometers has three models that together provide detection in the 200 to 1000 nm range. These compact Czerny-Turner spectrometers have no moving parts, making them durable tools for use in labs or out in the field. While these spectrometers are affordable, they do not lack the features that many expensive units offer such as a TTL trigger input via an SMB connector. Inside each unit is a 3,648 pixel linear array CCD, which provides high resolution spectral data (up to 12 pixels/nm).

The simple design and quality construction of the CCS series ensure a flexible tool for everyday use and allow for very easy operation. The CCS series has three connections: one SMA fiber input, a USB Type Mini B connection, and an SMB trigger input. A user friendly software package is included and has numerous tools for analyzing data.

The spectrometers are powered directly from the USB2.0 connection, which enables them to be easily transported from one location to the next. Each unit includes a 50  $\mu$ m core multimode SMA - SMA patch cable (M14L01) and a USB cable.

### Compact Housing

The compact housing of our CCS spectrometers measures only 122 mm x 80 mm x 30 mm (4.8" x 3.1" x 1.2"), roughly the size of an external hard drive. The bottom of the housing has rubber feet so that the spectrometer will not slide around on a work surface.

### Software and Drivers

The spectrometer comes with a software package, called SPLICCO, with a graphical user interface and an extensive set of drivers (C/C++, LabWindows/CVI, Dot NET, NI LabVIEW, and Visual Basic). The GUI offers the display of the spectra, background, and peaks; if required, these can all be displayed in a single window. Diverse algorithms can be applied for smoothing, averaging, or for calculating absorption and transmission. Additionally, the measurement results can be compared with other stored profiles. The included drivers allow for complete functional control of the CCS Series, allowing the user to design his or her own interface software or integrate the unit with a test and measurement setup for automated testing.

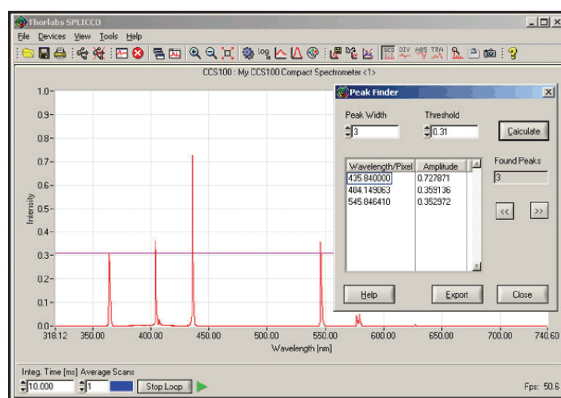


Figure 1

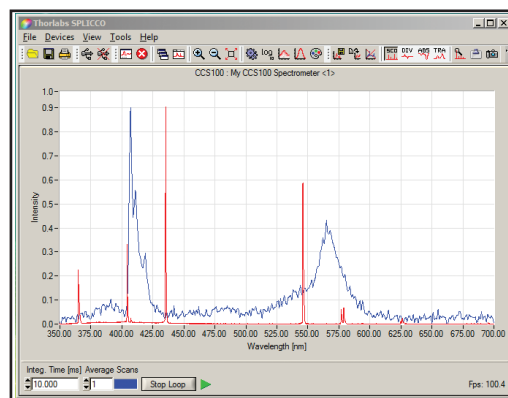


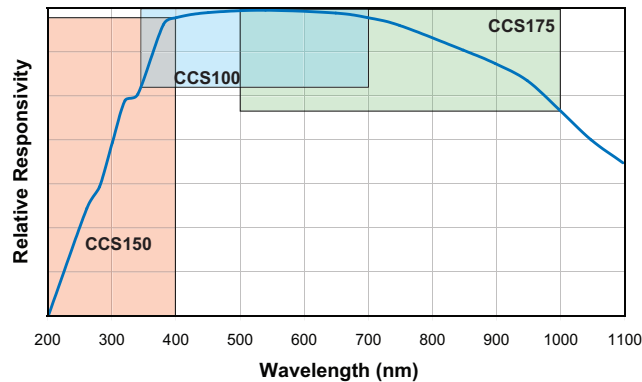
Figure 2

The graphical user interface (GUI) that is included with the CCS series of spectrometers is shown above. Data is displayed as intensity versus wavelength. Figure 1 shows the peak finder function with threshold line. Two spectrums are shown in Figure 2;

one was loaded to the software for comparison, while the other is the spectrum that the spectrometer is currently reading. The GUI is very simple to use yet has a range of features and tools necessary to analyze spectrums.

## Compact CCD Spectrometers (Page 2 of 2)

Typical Spectral Response of the CCD Sensor



### What's Included

- CCS Series Spectrometer
- User Manual
- CD ROM with SPLICCO Software and Drivers
- USB2.0 Type A to Mini B, 1.5 m
- MM Fiber, SMA to SMA, 50  $\mu$ m Core, 0.22 NA, 1 m (M14L01)
- Trigger Input Cable, SMB to BNC

ITEM#	CCS150	CCS100	CCS175
Wavelength Range (nm)	200-400 nm*	350-700 nm	500-1000 nm
Spectral Resolution	<0.5 nm FWHM @ 365 nm	<0.5 FWHM @ 435 nm	<1.0 FWHM @ 633 nm
Grating	1800 Lines/mm, 240 nm Blaze	1200 Lines/mm, 500 nm Blaze	830 Lines/mm, 800 nm Blaze
CCD Pixel Size	8 $\mu$ m x 200 $\mu$ m (8 $\mu$ m Pitch)		
Resolution	12 px/nm	10 px/nm	6 px/nm
Integration Time	10 $\mu$ s – 60 s		
Max Scan Rate	200 Scans/s		
Dynamic Range	>2000:1		
Fiber Input	SMA 905		
Included Fiber	Multimode, 50 $\mu$ m Core, SMA to SMA, 1 m		
Trigger Input	SMB		
Trigger Signal	TTL		
Trigger Frequency (Max)	100 Hz		
Trigger Pulse Length (Min)	0.5 $\mu$ s		
Trigger Delay	8.125 $\mu$ s $\pm$ 125 ns		
Interface	USB2.0		
Power Supply	via USB2.0		
Dimensions (L x W x H)	122 mm x 80 mm x 30 mm (4.80" x 3.15" x 1.18")		
Weight	<0.4 kg		

\*220-440 nm available on request.

ITEM#	\$	£	€	RMB	DESCRIPTION
CCS150	\$ 2,200.00	£1,525.00	€1,953.00	¥18,577.00	Compact Spectrometer, 200-400 nm
CCS100	\$ 1,950.00	£1,352.00	€1,731.00	¥16,466.00	Compact Spectrometer, 350-700 nm
CCS175	\$ 1,950.00	£1,352.00	€1,731.00	¥16,466.00	Compact Spectrometer, 500-1000 nm

### Patch Cables

- Many Stock SM, PM, and MM Cables
- Custom Patch Cables with Same-Day Turnaround

See Pages 843-852



LC1-USB

### USB2.0 CCD Line Camera

- 3,000 Pixel Linear Array CCD
- 350-1000 nm Spectral Range
- External Trigger Input
- Great for Custom Spectrometers

The LC1-USB line camera has a 3,000 pixel linear CCD array. It is USB2.0 compatible and capable of taking up to 190 scans/second. The LC1-USB has an external trigger input, making it ideal for use in custom spectrometers.

See Page 1307