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# THORLABS

## LS2000C - March 8, 2018

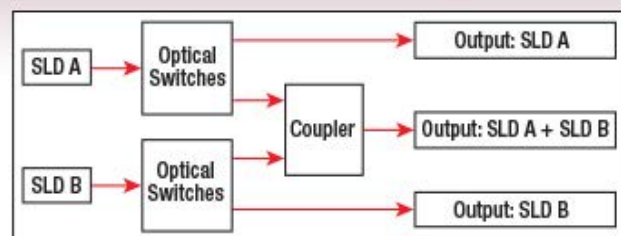
Item # LS2000C was discontinued on March 8, 2018. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### EXTENDED BROADBAND SLD LIGHT SOURCE

- ▶ Dual SLD Light Source for Broadband Spectral Applications
- ▶ Ideal for High-Resolution OCT Systems
- ▶ Three High-Power Fiber-Coupled Output Channels



**LS2000C**  
 (Fiber Patch Cables Not Included)



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#### OVERVIEW

##### Features

- Superluminescent Diodes (SLDs) Tuned for OCT Applications
- Dual SLD Light Source for Broadband Spectral Output
- Three Output Channels (See Table to the Right)
- 1300 nm Center Wavelength (Combined Channel A+B)
- >10 mW Output per Channel
- FC/APC Connectors
- Each SLD can be Independently Controlled
- Control via Front Panel or USB Interface

Thorlabs has partnered with Praevium Research to develop the LS2000C Extended Bandwidth SLD Light Source. In OCT imaging systems, the optical bandwidth of the light source is inversely proportional to the axial resolution. To provide higher axial resolution than currently possible with a single SLD, this source combines the output of a matched pair of SLDs to provide a single light source with an extended bandwidth ideal for high resolution OCT imaging applications.

The matched-pair SLDs have offset emission spectra, selected such that their combined output provides broadband emission

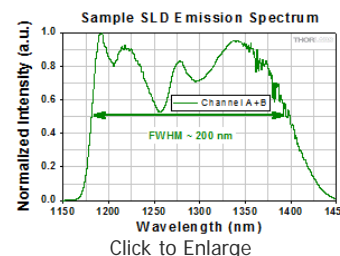
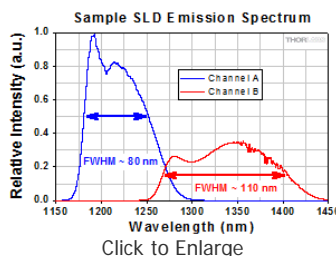
##### Key Specifications<sup>a</sup>

| Matched-Pair SLD Characteristics |                          |         |                        |
|----------------------------------|--------------------------|---------|------------------------|
| Channel/SLD Output               | A                        | B       | A+B                    |
| Central Wavelength (Typ.)        | 1225 nm                  | 1340 nm | 1300 nm                |
| FWHM Bandwidth (Typ.)            | 80 nm                    | 110 nm  | 200 nm<br>(170 nm Min) |
| 10 dB Bandwidth (Typ.)           | 100 nm                   | 150 nm  | 235 nm                 |
| Fiber-Coupled Power              | >10 mW per Channel       |         |                        |
| Noise (Typ.)                     | <0.2% (Source Dependent) |         |                        |
| Controller Characteristics       |                          |         |                        |
| Adjustment Range                 | 0 - Full Power           |         |                        |
| Temperature Control              | 14.00 to 30.00 °C        |         |                        |
| Operating Temperature            | 10 - 30 °C               |         |                        |
| Fiber/Connector                  | SMF-28e, FC/APC          |         |                        |

- Please refer to the *Specs* tab for full specifications.

with peak-to-valley intensity differences of less than 3 dB, as illustrated in the Channel A+B spectrum below.

The source offers three FC/APC fiber connectors on the front panel of the LS2000C. The first two channels provide access to the output of the two independent SLDs, while the third channel provides extended bandwidth output by combining the output of the two SLDs. The combined channel has a bandwidth of >170 nm and output power greater than 10 mW from each channel. Channels A and B can operate simultaneously, while Channel A+B must be run independently of the others.



The LS2000C Extended Broadband SLD Light Source packages the matched-pair SLDs into a single compact housing. Like our other 1300 nm SLD for OCT, these SLDs have an integrated isolator, thermistor, and TEC element for optimal performance. The LS2000C front panel provides independent control of the output of each SLD. Additionally, the front panel of the unit has an enable/disable output button for each SLD as well as a reset button to return the device to the factory presets.

The LS2000C SLD light source can be completely controlled using either the front panel interface or through a PC via the USB connection on the back of the unit. When using the USB interface, the source can be controlled with the provided software as well as through command line language.

### OCT Scan of an Onion Skin

This extended light source can be used in OCT imaging systems to produce images with a resolution of ~3 μm in biological (n = 1.33) samples. The images below demonstrate the increased resolution obtained when the light source is switched from a 90 nm bandwidth single SLD source to a 200 nm extended bandwidth SLD source.

Image Taken Using a 90 nm Bandwidth SLD

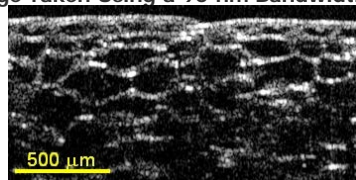
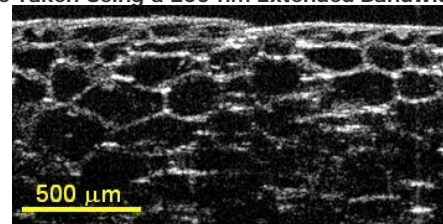


Image Taken Using a 200 nm Extended Bandwidth SLD



OCT Imaging with a 90 nm bandwidth (FWHM) source provides ~9 μm of axial resolution, as demonstrated in the top image of an onion skin. Incorporating an extended broadband SLD, based on matched-pair SLD light sources that together provide a bandwidth of 200 nm (typical, FWHM), enables imaging at axial resolutions less than 4 μm, as demonstrated above. The higher resolution provided by the extended broadband SLD enables visualization of distinct layers in the onion skin.

[Hide Specs](#)

### S P E C S

| Specifications                               |                          |         |                        |
|--|--------------------------|---------|------------------------|
| <b>Optical Performance Specifications</b>    |                          |         |                        |
| Channel                                      | 1                        | 2       | 3                      |
| SLD Output                                   | SLD A                    | SLD B   | SLD A + SLD B          |
| Central Wavelength (Typ.)                    | 1225 nm                  | 1340 nm | 1300 nm                |
| FWHM Bandwidth (Typ.)                        | 80 nm                    | 110 nm  | 200 nm<br>(170 nm Min) |
| 10 dB Bandwidth (Typ.)                       | 100 nm                   | 150 nm  | 235 nm                 |
| Fiber-Coupled Power                          | >10 mW per Channel       |         |                        |
| Noise (Typ.)                                 | <0.2% (Source Dependent) |         |                        |
| <b>Electrical Performance Specifications</b> |                          |         |                        |
| Current Set point Resolution                 | 0.1 mA                   |         |                        |
| Temperature Adjust Range                     | 14.00 to 30.00 °C        |         |                        |
| Temp Set point Resolution                    | ±0.01 °C                 |         |                        |

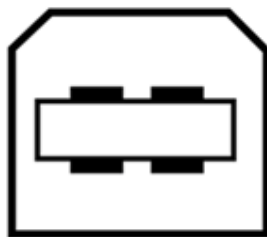
| General Specifications   |   |
|--------------------------|---|
| AC Input                 | 100 - 240 VAC, 50 - 60 Hz                                       |
| Input Power              | 65 VA (Max)   |
| Fuse Ratings             | 500 mA  |
| Fuse Type                | IEC60127-2/III (250 V, Slow Blow Type 'T')                      |
| Fuse Size                | 5 mm x 20 mm  |
| Dimensions (W x H x D)   | 12.6" x 2.5" x 10.6"<br>(320 mm x 64 mm x 269 mm)               |
| Weight                   | 7.3 lbs (3.3 kg)  |
| Operating Temperature    | 10 to 30 °C   |
| Storage Temperature      | 0 to 50 °C  |
| Connections and Controls |   |
| Interface Control        | Optical Encoder with Pushbutton                                 |
| Enable and Laser Select  | Keypad Switch Enable with LED indication                        |
| Power On                 | Key Switch  |
| Fiber/Connector          | SMF-28e, FC/APC<br>Use Item # FCC-7020 for Cleaning (Included)  |
| Display                  | LCD, 16 x 2 Alphanumeric Characters                             |
| Input Power Connection   | IEC Connector   |
| Interlock                | 2.5 mm Mono Phono Jack  |
| Communications           |   |
| Communications Port      | USB 2.0   |
| Connection               | USB Type B Connector  |
| Cable (Included)         | 2 m USB Type A to Type B Cable<br>(Replacement Item # USB-A-79) |

[Hide Connections](#)

## CONNECTIONS

### Computer Interface

#### USB Type B



USB Type B to Type A Cable Included

[Hide Part Numbers](#)

| Part Number | Description  | Price       | Availability |
|-------------|--|-------------|--------------|
| LS2000C     | Extended Bandwidth SLD Source, 1325 nm, Bandwidth > 170 nm | \$13,350.00 | Lead Time    |