

Superlum Broadband Light Sources

BLM2-D-series Miniature Broadband Light Source Modules with Extended Bandwidth.

Technical Product Specification



Document ID: SL.RD.04.003.150508
June 2019
Revision: 002



Product Description

Miniature BLM2-D series light source modules are powerful and very broadband light sources based on a combination of two SLDs with slightly different center wavelengths.

A built-in, stable and reliable dual-channel digital SLD current and temperature controller allows the switching of SLDs on and off either by a pushbutton (located on the front), or externally by TTL, or from a PC via an RS-232 port (USB upon request). SLDs operate in a constant power mode in standard models. The LEDs on the top cover provide a visual indication of the light source status.

The controller should be powered by a stabilized 5 V DC power supply. Linear DC power supplies are recommended. Pulse type DC power sources may result in considerably increased noise.

Operating parameters of each SLD are pre-set in order to achieve the best combination of spectrum width and output power. Superlum may provide a password key allowing the change of SLD parameters via RS-232 (USB).

BLM2-D modules should be put on an appropriate heatsink in order to achieve the widest possible operating temperature range. It is also possible to use BLM2-D modules without a heatsink. However, this will limit the maximum ambient operating temperature by +40 °C.

Standard models have FC/APC (narrow key) mating sleeve. Other connectors are available upon request. Models with a fiber pigtail terminated with an FC/APC connector or with other angled connectors are also available upon request.

This specification describes standard models offered by Superlum. However, the flexible design of the light source and a great number of different SLD modules available for integration allow a lot of customized light sources to be designed, including sources with non-overlapped SLDs' spectra.

Applications

- OCT, including Ultra High Resolution systems
- Fiber Optic Sensing
- Optical Metrology
- Testing of Optical Components
- Biomedical Imaging
- Low-Coherence Interferometry

Features

- High optical power
- Very wide emission spectra
- Coherence length* of 4.5 μm and less (in air)
- Easy use - just apply DC voltage
- Miniature design
- Excellent stability
- Low noise
- RS-232 and TTL control
- USB upon request
- +5V DC supply
- Operating temperature range 0 to +55 °C

*coherence length is defined as full width at half maximum of the coherence function plotted versus mirror displacement.

Mechanical specification

Mechanical drawing of a BLM2-D light source module is shown in Figure 1.

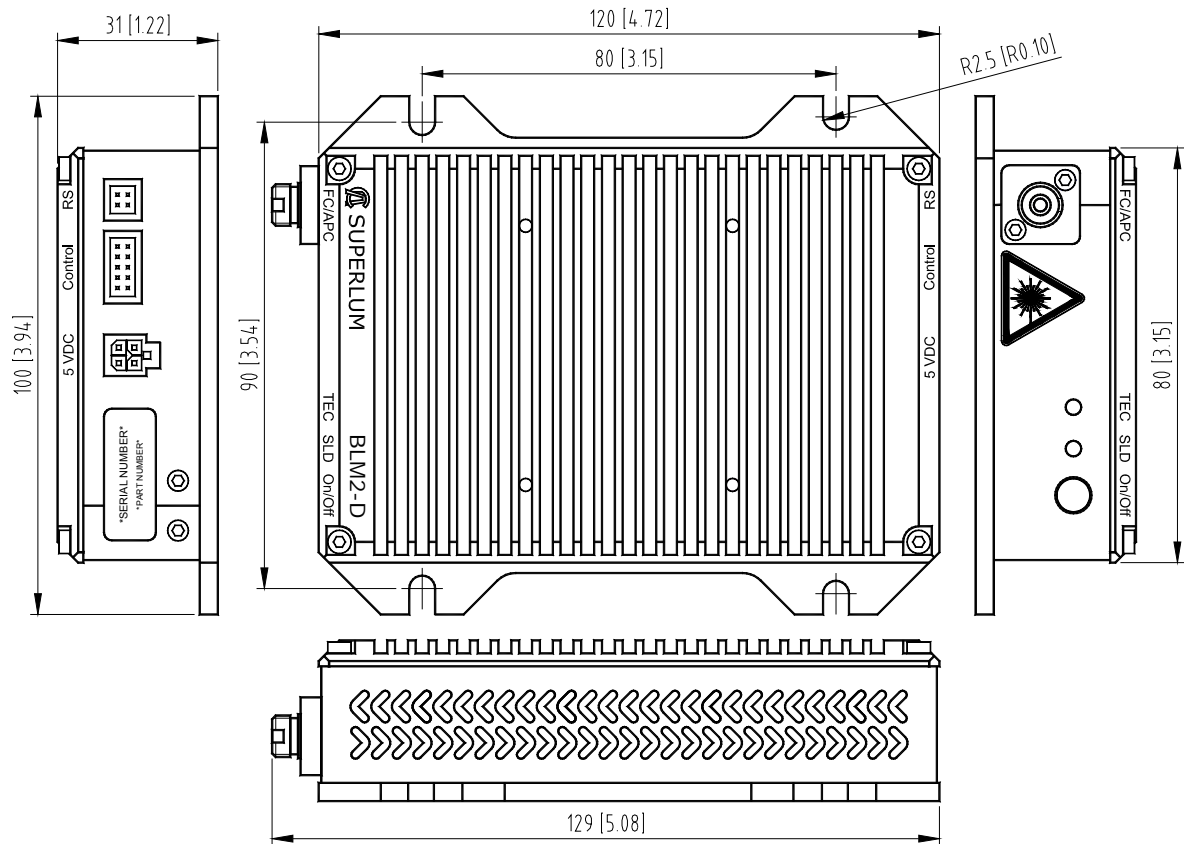
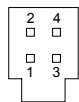


Figure 1. Drawing of the BLM2-D light source module. Dimensions are in millimeters [inches]. TEC, SLD – BLM2-D status LED. ON/OFF – emission on/off switching button.

Electrical Connections

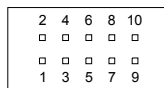
Electrical connections of a standard BLM2-D light source are shown on the Figure 2 (a) and Figure 2 (b) (see below). Electrical Inputs/Outputs are described in Table 1. There are separate connectors for 5V DC power input, for remote control and external switching of SLDs on and off by TTL, and for RS-232 (or USB) interface. The DC power input accepts +5 V / 3.5 A (max) from an external power supply unit.

5 VDC



4-pin MOLEX: 43045-0407
Counterpart: 0430250400
Contact: 0430300002

CONTROL

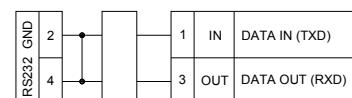
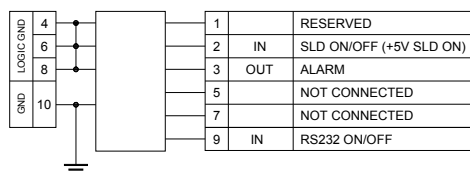
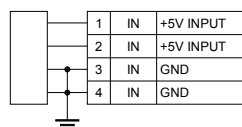


10-pin MOLEX: 87833-1031
Counterpart: 87568-1073
Contact: -

RS



4-pin MOLEX: 87833-0431
Counterpart: 51110-0460
Contact: 050394-8400



ATTENTION:
it is not recommended to connect "RS232 GND" and "GND"

Figure 2 (a). Pin-outs of BLM2-D connectors.

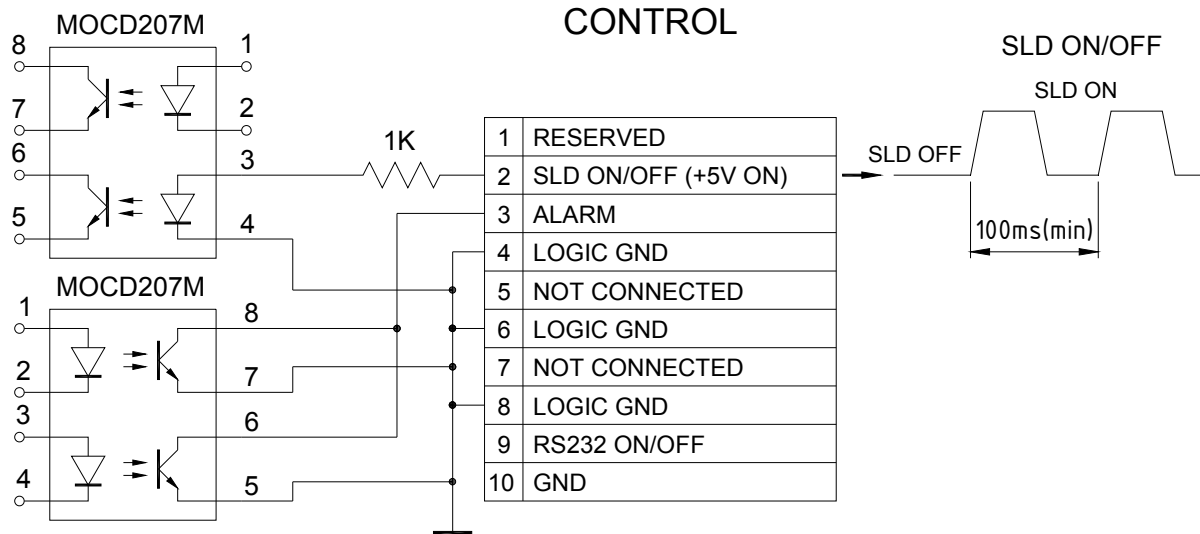


Figure 2 (b). Structure of electrical outputs—"Control" output.

Table 1. Pin function descriptions.

Pin number	Name	IN/OUT	Description/structure
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DC power input, 5V DC:

4 pin MOLEX Connector P/N 43045 0407 (counterpart P/N 0430250400)

1,2	+5 V	IN	+5 V DC
3,4	GND	IN	Power ground

Attention: Power ground and the case of BLM2-D light sources are connected inside the device. It is recommended to connect Logic ground to Power ground.

RS:

4 pin MOLEX Connector P/N 87833 0431 (counterpart P/N 511100460)

1	TXD	IN	DATA IN
3	RXD	OUT	DATA OUT
2,4	RS-232 GND	OUT	RS-232 ground

Attention: it is **NOT** recommended to connect RS-232 ground to either Power ground or Logic ground.

"CONTROL":

10 pin MOLEX Connector P/N 87568 1031 (counterpart P/N 87568 1073)

1	RESERVED		Reserved for future use.
2	SLD ON/OFF	IN	Allows switching SLDs on and off by applying TTL signals (+5 V switches SLD on). 1kΩ and LED optocoupler in series.
3	ALARM	OUT	Open collector. Goes to low impedance state in case of a fatal error; works in intermittent mode (alternates between low and high impedance states at a rate of 1 Hz) if service is required.
4	LOGIC GND		Logic ground.
5	N/C		Not connected.
6	LOGIC GND		Logic ground.
7	N/C		Not connected.
8	LOGIC GND		Logic ground.
9	RS232 ON/OFF	IN	Shortening to Power ground (pin 10) disables the RS-232 interface.
10	GND		Power ground. Shortening pin 9 to pin 10 disables the RS-232 interface.

Attention: It is recommended to connect Logic ground to Power ground.

Every BLM2-D is delivered with companion software for remote control of the light source from a PC via the RS-232 (USB) port. The companion software can be also used to enable/disable TTL control in the PROGRAM mode, and to diagnose the status of each SLD.

Absolute Maximum Ratings

Table 2 (see below) presents absolute maximum ratings of BLM2-D light sources.

Table 2. Absolute maximum ratings*.

Parameter	Condition	Min	Typ	Max	Unit
Storage temperature		-20	-	+80	°C
Operating temperature	BLM2-D mounted on a heatsink dissipating 15 W	0	-	+55 [†]	°C
Humidity, non-condensing		-	-	75	% RH
DC supply voltage		4.75	5.00	5.25	V
DC supply current [‡]		2.0	-	3.5	A
DC supply ripple and noise	1 kHz to 200 kHz frequency range	-	-	20	mV
“INTERNAL MODE SWITCH” input	Pin 1 connector “Control”	4	5	30	V
“SLD ON/OFF” input	Pin 2 connector “Control”	4	5	30	V
ALARM output	Pin 3 connector “Control”; open collector	-	-	150	mA

* NOTICE: Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

[†] Light source modules must be fixed onto an appropriate heatsink in order to achieve the widest possible operating temperature range. However, it is also possible to use BLM2-D without a heatsink, although in a limited range of ambient temperatures. The highest operating temperature without heatsinking is +40 °C in the case of a free air circulation around the package.

[‡] DC power supply should be capable to produce up to 3.5A. A less powerful power supply may be used, but it will limit the operating temperature range. It is prohibited to use a power supply with a maximum current of less than 2.0 A.

Electrical and Optical Characteristics

Main optical parameters of standard BLM2-D light source modules are presented in Table 3 (see below). Please note that the flexible design of the light source and the great number of different SLD modules available to choose from allow a variety of light sources to be designed to meet a custom specification of optical parameters. Other electro-optical parameters of light sources are shown in Table 4. The weight of the standard light source module is 400 grams.

Table 3. Standard BLM2-D models– optical parameters.

Model number	Power, mW		Wavelength, nm	3 dB spectrum width, nm		Ripple, %		Spectral flatness, %
	Min.	Typ.		Min.	Typ.	Typ.	Max.	
BLM2-D-810-B-5	5.0	7.0	810 ± 10	90	100	2.0	5.0	≤ 45
BLM2-D-840-B-10	10.0	12.0	840 ± 10	90	100	2.0	5.0	≤ 45
BLM2-D-860-G-5	5.0	7.0	860 ± 10	70	80	2.0	5.0	Bell-shaped
BLM2-D-880-B-10	8.0	10.0	880 ± 10	90	100	2.0	5.0	≤ 30
BLM2-D-880-B-MP	1.0	1.5	880 ± 10	190	200	0.5	2.0	≤ 45

Table 4. Standard BLM2-D models– other electro-optical parameters

Parameter	Condition	Min	Typ	Max	Unit
Temperature dependent optical drift	0 to +40 °C	–	75	-	ppm/°C
Relative Intensity Noise (RIN)	10 kHz to 2 MHz	–	-130	-125	dB/Hz
Long-term optical power stability	8 h after 60 min warming up	–	–	4000	ppm
“Ready-to-work” time	After DC power supplied	–	–	7	s
Cold start settling time (system warm-up)		20*	–	60 [†]	min
Rise time of optical signal		30	50	100	ms
Fall time of optical signal		1	–	3	µs

* At +25 °C.

† At high and low extremes of operating temperature range.

Fiber and Optical Connector Specifications

Table 5 (see below) describes fiber and connectors used in standard BLM2-D models.

Table 5. Fibers and connectors.

	Type	Comments
Fiber type	SM	Corning HI780 fiber
Mode field diameter / Numerical Aperture (NA)	5 µm / 0.14	
Connector type	FC/APC	A fiber pigtailed output with an FC/APC connector is available upon request.
Connector key type	Tight-fit/narrow	

Mounting / Heatsinking

Light sources should be mounted to an appropriate heatsink capable of dissipating up to 15 W. Free air circulation around the top cover is required. A light source may be used without a heatsink, but it will limit the maximum operating temperature to +40 °C or even less (depending on P/N). Free air circulation around BLM2-D is absolutely required when it is used without a heatsink.

Laser Safety Considerations

The product emits invisible light that may have a potential hazard associated with CLASSES 3R-3B of IEC 60825-1 (Edition 2.0; 2007-03), depending on a particular P/N.

The BLM2-D light source is designed for use as a component for integration into photonics equipment and it is, therefore, out of scope of applicable standards related to laser safety, such as IEC 60825-1. Note that any equipment incorporating this component may be subject to these standards. BLM2-D modules do not have **ALL** the laser safety features (like remote interlock, key operated master control, warning signals and labels). However, these features can be easily implemented using “Control” or RS-232 or USB interfaces.

Please contact Superlum for more details about laser safety issues for each particular model of BLM2-D light source modules.