

M-D,T,Q-series BroadLighter. Benchtop Broadband Light Source with Extended Bandwidth.

Technical Product Specification



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Product Description

Superlum M-D,T,Q-series BroadLighters, the second generation of D,T,Q-series BroadLighter light sources, are high-power, extremely wide-spectrum, very low-coherent, AC-powered benchtop light sources. The M-series BroadLighter is based on a combination of spectrally shifted single mode fiber coupled superluminescent diode modules (SLDs). M-D-series BroadLighters have 2 SLDs inside, M-T-series BroadLighters have 3 SLDs combined, and there are 4 SLDs in M-Q-series devices. The most wide-spectrum D and T versions have a 3-dB spectrum width of up to 150-200 nm, and Q devices provide up to 300-nm-wide spectrum. Output power exceeds 15 mW in selected models.

The devices are optimized to provide the best combination of output power and spectrum width. Changing the power of just one of the combined SLDs may result in considerable change of output spectrum of the BroadLighter. For this reason, by default, changing the output power is not possible in M-D,T,Q-models, although this feature can be added on request. Some models can be equipped with a Variable Optical Attenuator (VOA), but it is subject to availability of a high-performance and broadband VOA at the corresponding spectral band.

Most models are offered in two versions, with and without an optical isolator. The high-power (HP) models without isolators may withstand optical feedback of -30...-25 dB (depending on the model). The models with isolators are designed for applications with optical feedback exceeding -25...-30 dB (they have the suffix “-I” in the model number). The medium-power (MP) models are much less sensitive to optical feedback and so they may be used without isolators in case of a stronger feedback (contact Superlum for details).

Note that UBB-series devices (ultra-broadband) are characterized by a 6-dB spectral width, while all other devices are characterized by a 3-dB spectral width (FWHM). The spectral flatness within the 6-dB bandwidth may exceed 3 dB but never exceeds 4 dB.

M-D-series Broadlighters. Optical Performance Parameters

Model number	Power, mW		Wavelength, nm	3 dB spectrum width, nm		Spectral ripple, %
	Min.	Typ.		Min.	Typ.	
M-D-810-HP*	10.0	12.0	810 ± 10	90	100	<5
M-D-840-HP*	12.0	15.0	840 ± 10	90	100	<5
M-D-840-HP-I*	9.0	10.0	840 ± 10	90	100	<5
M-D-880-MP	1.0	1.5	880 ± 10	190	200	<5
M-D-880-HP	8.0	10.0	880 ± 10	90	100	<5
M-D-880-HP-I	6.0	8.0	880 ± 10	90	100	<5
M-D-890-UBB-HP	8.0	10.0	890 ± 10	180 (6 dB)	190 (6 dB)	<5
M-D-980-HP1	4.0	6.0	980 ± 10	180	200	<5

*- available with VOA upon request

M-T,Q-series Broadlighters. Optical Performance Parameters

Model number	Power, mW		Wavelength, nm	3 dB spectrum width, nm		Spectral ripple, %
	Min.	Typ.		Min.	Typ.	
M-T-850-MP*	5.0	6.0	850 ± 10	155	165	<5
M-T-850-HP*	12.0	15.0	850 ± 10	155	165	<5
M-T-850-HP-I*	8.0	10.0	850 ± 10	155	165	<5
M-T-860-HP*	12.0	15.0	860 ± 10	125	135	<5
M-D-860-HP-I*	8.0	10.0	860 ± 10	125	135	<5
M-T-870-HP	6.0	7.0	875 ± 10	170	180	<5

(Table continues on the next page)

M-T,Q-series Broadlighters. Optical Performance Parameters (Continued)

Model number	Power, mW		Wavelength, nm	3 dB spectrum width, nm		Spectral ripple, %
M-Q-870-HP	6.0	7.0	870 ± 10	190	200	<5
M-Q-920-HP	3.0	4.0	920 ± 10	275	300	<5

*- available with VOA upon request

Physical Specifications

- Overall dimensions (WxHxD): 251x112x192 mm.
- Weight (max): 4 kg.

Electrical Power Specifications

- 100-240 V AC, 50/60 Hz, 40 VA MAX.

Environmental Specifications

- Operating temperature range: +5 °C to +35 °C.
- Storage temperature range: -30 °C to +70 °C.
- Operating relative humidity: < 80%, non-condensing.

Note: Operating and storage temperature may be different for different models. The ranges shown are valid for all standard models.

Stability

- Long-term (8 h): maximum drift 0.5%.
- Short term (15 min) : maximum drift 0.1%

Laser Safety Measures

All M-series Broadlighters of Superlum are Class 3R or Class 3B light sources according to IEC/EN 60825-1:2014. All M-D-series BroadLighter light sources are equipped with the master key control, remote interlock connection, visual/audible alarm (including a “beep” and 3-seconds delay of switching the emission on after pushing the ON button), and information and warning stickers.

Additionally, each M-series BroadLighter features a built-in protection against optical power overshoot. It is based on an output power monitor placed before the output FC/APC socket and an electrical circuit which immediately switches the emission off if the optical power exceeds the maximum value shown in the Acceptance Test Report (delivered with each device) by more than 30%.

Warranty

Superlum provides 2 years/10,000 operating hours (whichever happens first) warranty for every M-series Broadlighter including S-, D-, T- and Q- devices, except devices with output power exceeding 30 mW from SM-fiber and custom made instruments. For M-series BroadLighters with output power exceeding 30 mW, the warranty period is 2 years/7,500 operating hours unless otherwise specified in writing by Superlum. Operating hours are tracked by a built-in hour meter which records the total time the device emits light. Warranty may be extended to 2 years without limitation of operating hours for the most of S- and D- models, and for some T- models upon request. Custom made instruments have warranty of one year unless otherwise specified in the contract documents.

Service

SLD parameters degrade in time due to aging. Unexpected device failure may cause serious problems, especially in “sensitive” applications like a permanent use at manufacturing lines, permanent process monitoring systems,

and others. Superlum provides a unique service of monitoring the parameters of the SLDs installed in M-series BroadLighters. The customer may, at any time, generate a test file with the main parameters of SLDs, and e-mail the file to Superlum. Superlum will analyse the data, including the changes (if any) in the SLDs parameters with respect to initial values, and email comments (including recommendations regarding probability of failure in case of further use) within 2 working days upon receipt of the file. This service is extremely useful for applications at manufacturing floors, permanent tests during the manufacturing process, 24/7 sensing/monitoring systems, especially those used in sensitive applications, and others.

Acceptance Test Report

Each device is delivered with the Acceptance Test Report (ATR) showing at least optical power, spectral data and plot of spectrum at maximum output power, and some other relevant details. An example of ATR is presented in the end of this document.

Package Contents

- BroadLighter-M Broadband Light Source
- AC Power Cord.
- Master Key.
- Optical Patchcable.
- Quick Start Guide.
- Acceptance Test Report.
- CD-ROM with the companion software.
- USB Interface Cable.

ACCEPTANCE TEST REPORT (Example Only)

Date: 08.09.2015

Superlum BroadLighters
M-T-850-HP SM Fiber Light Source at 850 nm Serial No. M00015
Optical Performance Parameters

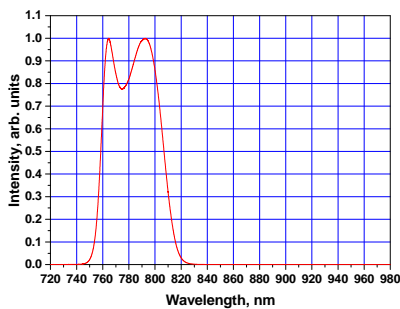
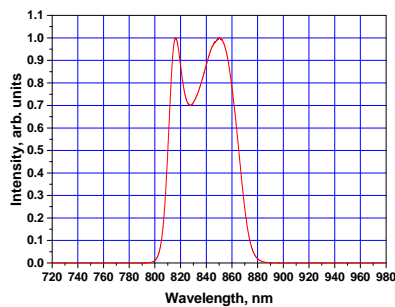
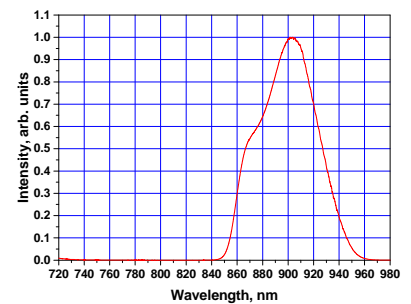
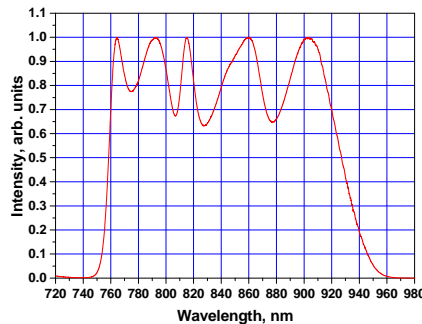
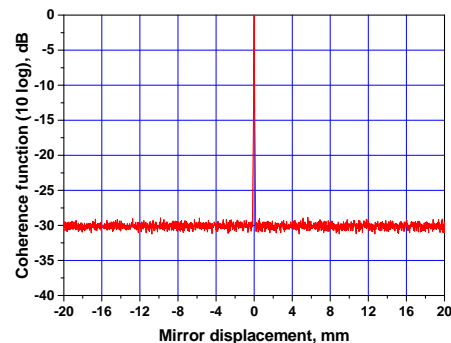
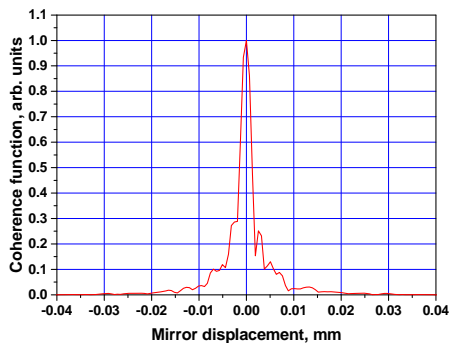
Parameter	Rated	Actual
SM fiber output power, mW	>12	16.2
Mean wavelength, nm	840	844.6
Spectrum width, nm	>155	168.7
Maximum spectral ripple, %	<5	0.8
Spectral flatness, %	=<45	37
Long-term stability, %*		<0.5
Short-term stability, %**		<0.1

* 8 h, measurements every minute 100 ms integration.

** 15 minutes, measurements every second, 100 ms integration. All measurements after 1 h warm-up. Ambient temperature 20±2 °C.

Other specifications

Operating temperature range, °C	+5...+35
Physical dimensions, mm:	251x112x192
Weight, kg	4
Optical Output	FC/APC socket
Fiber	Corning Pure-Mode HI 780

Optical Spectra
Channel #1

Channel #2

Channel #3

Combined Output

Coherence


A maximum optical feedback of 10^3 is allowed to run the BroadLighter safely at full power

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