

## M385L2-C4 - August 5, 2024

Item # M385L2-C4 was discontinued on August 5, 2024. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

### COLLIMATED LED LIGHT SOURCES FOR MICROSCOPY

- ▶ UV, Visible, and IR LEDs
- ▶ Mounted LED with Adjustable Collimation Optic
- ▶ Compatible with Epi-Illumination Port on Olympus, Leica, Nikon, and Zeiss Microscopes



**M625L4-C1**  
For Olympus  
BX/IX Microscopes



**M405LP1-C2**  
For Leica DMI  
Microscopes

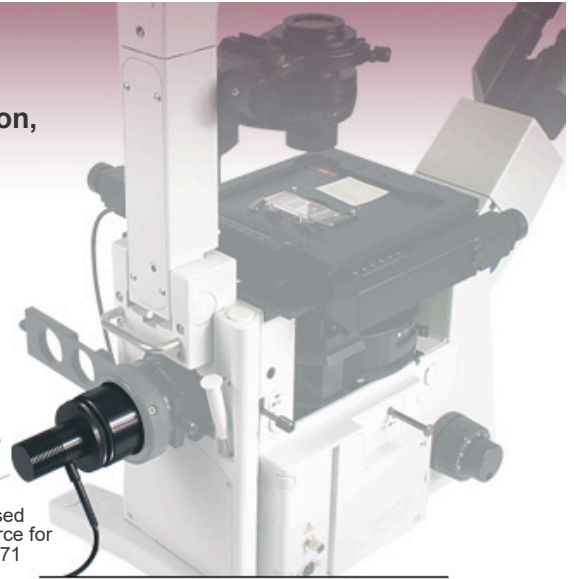


**M590L4-C5**  
For Nikon Eclipse  
Microscopes



**M850L3-C4**  
For Zeiss Axioskop  
Microscopes

**M505L4-C1** Used  
as a Light Source for  
an Olympus IX71



## OVERVIEW

### Features

- Illumination Source for Microscope Epi-Illumination Ports, Projectors, and Custom Imaging Systems
- Optimized Thermal Management Provides Output Intensity Stability
- Adjustable Aspheric Collimation Optic with Low  $f/\#$  (Approximately 0.8)
- Integrated Identification Chip (EEPROM) Stores LED Operating Parameters
- Higher Power LEDs Mounted to Larger Heat Sink with  $\varnothing 57.0$  mm Plastic Housing (See the Tables Below for Details)
- 4-Pin Female Mating Connector for Custom Power Supplies can be Purchased Separately
- Custom Adapters Available - Contact Tech Support for Details

Quick Links
<a href="#">LEDs for Olympus Microscopes</a>
<a href="#">LEDs for Leica Microscopes</a>
<a href="#">LEDs for Zeiss Microscopes</a>
<a href="#">LEDs for Nikon Microscopes</a>
<a href="#">Mounted LED Mating Connector</a>

Thorlabs' collimated LED assemblies can be easily connected to standard and epi-illumination ports on most readily available commercial microscopes, including Olympus, Leica, Nikon, and Zeiss. Each collimated LED consists of a mounted LED and a lamphouse-port-compatible housing that contains an AR-coated aspheric collimation optic (see the *Specs* tab for details). If the wavelength or output power you require is not sold on this page, our mounted LEDs and Solis<sup>®</sup> High-Power LEDs are available in additional wavelengths and output powers.

Note: Please ensure your microscope is configured to directly accept an external light source. Some microscope assemblies have a permanently installed illuminator or may be otherwise incompatible with the LED light sources below.

The collimation of the beam can be adjusted by changing the position of the aspheric lens with respect to the LED. Interchanging LEDs is easy; simply unscrew one LED from the housing and replace it with a different mounted LED (sold separately). We also offer collimation packages, which can be purchased separately from these LEDs.

The approximate total beam power through the collimation adapter is given in the tables below and on the *Specs* tab. The actual power at the sample plane will be lower due to losses specific to the optical set up of the microscope. If you wish to measure the power at the sample plane for your particular microscope setup, Thorlabs also offers a microscope slide power meter sensor.

Like our mounted LEDs, the package of these collimated LEDs is in direct contact with the heat sink to provide excellent thermal management. This minimizes the degradation of optical output power caused by increased LED temperatures. Please see the *Stability* tab for information on the stable output intensity of these collimated LEDs. Additionally, our M365LP1, M385LP1, and M405LP1 LEDs feature a higher power output and are mounted to a larger  $\varnothing 57.0$  mm heat sink to increase heat dissipation and thermal stability.

For microscope applications requiring compatibility with SM1 (1.035"-40) threading, our mounted LEDs (sold separately) can be collimated using a  $\varnothing 1"$  lens and lens tubes. This collimation method also allows for a smaller beam size than the collimators on this page. Please see the *Collimation* tab on our Mounted LEDs presentation for a detailed item list and instructions.

### Driver Options

Thorlabs offers six drivers compatible with these LEDs: LEDD1B, UPLED, DC40, DC2200, DC4100, and DC4104 (the latter two require the DC4100-HUB). The UPLED, DC40, DC2200, DC4100, and DC4104 drivers are capable of reading the current limit from the EEPROM chip of the connected LED and automatically adjusting the maximum current setting to protect the LED. See the *LED Drivers* tab for specifications and comparison between the drivers.

**SPECS**

**Common LED Specifications<sup>a</sup>**

**Legend**

LED Mounted to a Heat Sink in a Ø57.0 mm Red Housing

LED Mounted to a Heat Sink in a Ø30.5 mm Black Housing

The section of the housing that holds the collimation optics is the same size for all LEDs that share the same item # suffix, regardless of the size of the heat sink.

Item # Prefix	Nominal Wavelength <sup>b,c</sup>	Color <sup>b</sup>	Min LED Power <sup>b,d</sup>	Typ. LED Power <sup>b,d</sup>	Max Drive Current (CW)	Forward Voltage (Typ.)	Irradiance (Typical) <sup>d</sup>	Electrical Power	Typical Lifetime	Emitter Size
M365L3 <sup>e</sup>	365 nm	UV	880 mW	1290 mW	1000 mA	3.85 V	14.4 µW/mm <sup>2</sup>	3.850 W	>10 000 h	2.5 mm x 2.5 mm
M365LP1 <sup>e,f</sup>	365 nm	UV	1350 mW	2000 mW	1700 mA	4.0 V	21.0 µW/mm <sup>2</sup>	6.800 W	>10 000 h	2.5 mm x 2.5 mm
M385L2 <sup>e</sup>	385 nm	UV	270 mW	430 mW	700 mA	4.3 V	11.8 µW/mm <sup>2</sup>	3.010 W	>10 000 h	1 mm x 1 mm
M385L3 <sup>e</sup>	385 nm	UV	1240 mW	1780 mW	1000 mA	3.7 V	19.9 µW/mm <sup>2</sup>	3.700 W	>10 000 h	2.5 mm x 2.5 mm
M385LP1 <sup>e,f</sup>	385 nm	UV	1650 mW	1830 mW	1700 mA	3.9 V	23.3 µW/mm <sup>2</sup>	6.630 W	>10 000 h	1.4 mm x 1.4 mm
M405L4 <sup>e</sup>	405 nm	UV	1000 mW	1300 mW	1000 mA	3.4 V	14.53 µW/mm <sup>2</sup>	3.400 W	> 1 000 h	1.4 mm x 1.4 mm
M405LP1 <sup>e,f</sup>	405 nm	UV	1500 mW	1700 mW	1400 mA	3.45 V	24.6 µW/mm <sup>2</sup>	4.830 W	>10 000 h	1.4 mm x 1.4 mm
M455L4	455 nm	Royal Blue	1150 mW	1445 mW	1000 mA	3.25 V	32 µW/mm <sup>2</sup>	1.900 W	>100 000 h	1 mm x 1 mm
M470L5	470 nm <sup>g,h</sup>	Blue	809 mW <sup>g,h</sup>	1161.7 mW <sup>g,h</sup>	1000 mA <sup>g</sup>	3.8 V	21.4 <sup>g,h,i</sup> µW/mm <sup>2</sup>	3.820 W <sup>g,h</sup>	>100 000 h <sup>g</sup>	1 mm x 1 mm
M505L4	505 nm	Cyan	400 mW	520 mW	1000 mA	3.5 V	5.94 µW/mm <sup>2</sup>	3.500 mW	>100 000 h	1 mm x 1 mm
M530L4	530 nm	Green	370 mW	480 mW	1000 mA	3.6 V	9.46 µW/mm <sup>2</sup>	3.600 W	>100 000 h	1 mm x 1 mm
M590L4	590 nm	Amber	230 mW	300 mW	1000 mA	2.5 V	6.0 µW/mm <sup>2</sup>	2.500 W	>100 000 h	1 mm x 1 mm
M617L5	617 nm	Orange	737.4 mW <sup>g,h</sup>	1006.2 mW <sup>g,h</sup>	1000 mA <sup>g</sup>	2.9 V <sup>g,h</sup>	19.4 µW/mm <sup>2</sup> <sub>g,h,i</sub>	2.915 W <sup>g</sup>	>100 000 h <sup>g</sup>	1 mm x 1 mm
M625L4	625 nm	Red	700 mW	920 mW	1000 mA	2.5 V	21.9 µW/mm <sup>2</sup>	2.500 W	100 000 h	1 mm x 1 mm
M660L4	660 nm	Deep Red	940 mW	1050 mW	1200 mA	2.6 V	20.88 µW/mm <sup>2</sup>	3.120 W	>10 000 h	1.5 mm x 1.5 mm
M780L3	780 nm	IR	200 mW	300 mW	800 mA	2.0 V	47.3 µW/mm <sup>2</sup>	1.600 W	>10 000 h	1 mm x 1 mm
M850L3	850 nm	IR	900 mW	1100 mW	1200 mA	2.95 V	22.9 µW/mm <sup>2</sup>	3.540 W	100 000 h	1 mm x 1 mm
M940L3	940 nm	IR	800 mW	1000 mW	1000 mA	2.75 V	19.1 µW/mm <sup>2</sup>	2.750 W	100 000 h	1 mm x 1 mm
MCWHL8	N/A <sup>j</sup>	Cold White	1300.9 mW <sup>g,h</sup>	1882.0 mW <sup>g,h</sup>	1400 mA <sup>g</sup>	3.6 V <sup>g,h</sup>	22.5 µW/mm <sup>2</sup> <sub>g,h,i</sub>	5040 mW <sup>g</sup>	>100 000 h <sup>g</sup>	Ø3 mm

- a. Specifications for the LEDs without collimating adapters are given in this table. Please see the second table on this tab for specifications pertaining to the LED with the collimating adapter attached.
- b. Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual spectral output of any given LED will vary. Output plots and nominal wavelength specs are only intended to be used as a guideline.
- c. For LEDs in the visible spectrum, the nominal wavelength indicates the wavelength at which the LED appears brightest to the human eye. For UV and IR LEDs, the nominal wavelength corresponds to the peak wavelength. The nominal wavelength for visible LEDs may not correspond to the peak wavelength as measured by a spectrograph.
- d. For the bare LED. See the table below for total beam power with the collimation package.
- e. Our 365 nm to 405 nm LEDs radiate intense UV light during operation. Precautions must be taken to prevent looking directly at the UV light and UV light protective glasses must be worn to avoid eye damage. Exposure of the skin and other body parts to the UV light should be avoided.
- f. These LEDs have a higher output power (see tables below for total beam power) and are mounted to a Ø57.0 mm heat sink for increased heat dissipation.
- g. Measured at 25 °C.
- h. When driven with the maximum current.
- i. Measured at a distance of 200 mm.
- j. Correlated Color Temperature of 6500 K

## Specifications for LED with Collimating Microscope Adapter Attached

### Legend

LED Mounted to a Heat Sink in a Ø57.0 mm Red Housing

LED Mounted to a Heat Sink in a Ø30.5 mm Black Housing

The section of the housing that holds the collimation optics is the same size for all LEDs that share the same item # suffix, regardless of the size of the heat sink.

Item # Suffix		-C1	-C2	-C4	-C5
<b>Compatible Microscope<sup>a</sup></b>		Olympus BX and IX	Leica DMI	Zeiss Axioskop and Examiner <sup>b</sup>	Nikon Eclipse (Bayonet Mount)
<b>Beam Diameter<sup>c,d</sup></b>		50 mm	37 mm	44 mm	43 mm
<b>Beam Area<sup>c</sup></b>		1960 mm <sup>2</sup>	1080 mm <sup>2</sup>	1520 mm <sup>2</sup>	1450 mm <sup>2</sup>
Item # Prefix	Included Collimation Lens	Total Beam Power <sup>c,d</sup>			
<b>M365L3</b>	ACL5040U-A	520 mW	320 mW	430 mW	320 mW
<b>M365LP1</b>	ACL5040U-A	745 mW	435 mW	615 mW	435 mW
<b>M385L2</b>	ACL5040U-A	170 mW	90 mW	110 mW	120 mW
<b>M385L3</b>	ACL5040U-A	680 mW	450 mW	570 mW	410 mW
<b>M385LP1</b>	ACL5040U-A	795 mW	520 mW	660 mW	630 mW
<b>M405L4</b>	ACL5040U-A	510 mW	310 mW	410 mW	380 mW
<b>M405LP1</b>	ACL5040U-A	750 mW	450 mW	580 mW	570 mW
<b>M455L4</b>	ACL5040U-A	630 mW	490 mW	690 mW	630 mW
<b>M470L5</b>	ACL5040U-A	487 mW	402 mW	521 mW	487 mW
<b>M505L4</b>	ACL5040U-A	220 mW	170 mW	240 mW	220 mW
<b>M530L4</b>	ACL5040U-A	200 mW	160 mW	220 mW	200 mW
<b>M590L4</b>	ACL5040U-A	130 mW	100 mW	140 mW	130 mW
<b>M617L5</b>	ACL5040U-A	484 mW <sup>e</sup>	362 mW <sup>e</sup>	474 mW <sup>e</sup>	441 mW <sup>e</sup>
<b>M625L4</b>	ACL5040U-A	630 mW	490 mW	690 mW	630 mW
<b>M660L4</b>	ACL5040U-A	590 mW	400 mW	570 mW	520 mW
<b>M780L3</b>	ACL5040U-B	210 mW	130 mW	180 mW	170 mW
<b>M850L3</b>	ACL5040U-B	480 mW	330 mW	400 mW	370 mW
<b>M940L3</b>	ACL5040U-B	430 mW	320 mW	380 mW	340 mW
<b>MCWHL8</b>	ACL5040U-A	658 mW <sup>f</sup>	419 mW <sup>f</sup>	596 mW <sup>f</sup>	549 mW <sup>f</sup>

a. Standard or Epi-Illumination Port Required.

b. These adapters are compatible with any Zeiss microscopes that use the same dovetail as the Zeiss Axioskop and Examiner microscopes.

c. Due to variations in the manufacturing process and operating parameters such as temperature and current, the total beam power, beam diameter, and beam area of any given LED will vary.

d. At the output aperture of the collimation package.

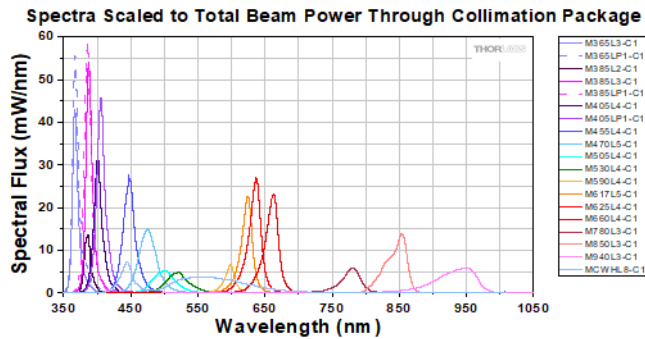
e. Measured at the Maximum Current

f. Measured at 25 °C

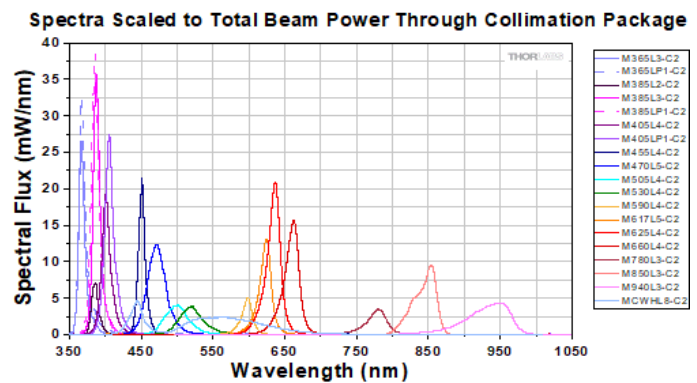
## RELATIVE POWER

The actual spectral output and total output power of any given LED will vary due to variations in the manufacturing process and operating parameters, such as temperature and current. The typical total beam power of each collimated LED is specified to help you select an LED that suits your needs. In order to provide a point of comparison for the relative powers of LEDs with different nominal wavelengths, the spectra in the plots below have been scaled to the typical total beam power of each collimated LED. This data is representative, not absolute. An Excel file containing the normalized and scaled spectra for each collimation package can be downloaded using the link below each plot.

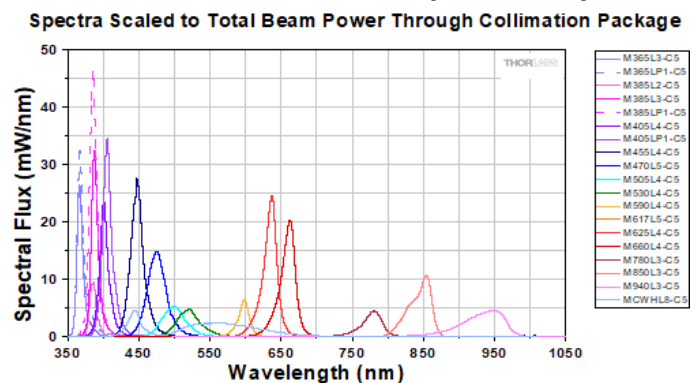
### Collimated LEDs for Olympus BX and IX Microscopes



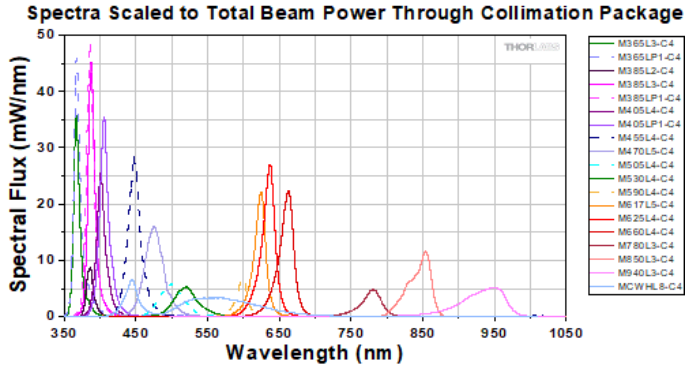
### Collimated LEDs for Leica DMI Microscopes



### Collimated LEDs for Nikon Eclipse Microscopes



## Collimated LEDs for Zeiss Axioskop and Examiner Microscopes



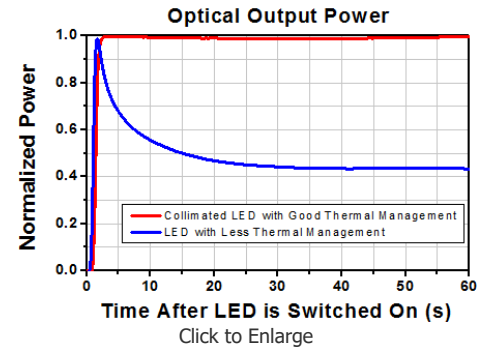
## STABILITY

### LED Lifetime and Long-Term Power Stability

One characteristic of LEDs is that they naturally exhibit power degradation with time. Often this power degradation is slow, but there are also instances where large, rapid drops in power, or even complete LED failure, occur. LED lifetimes are defined as the time it takes a specified percentage of a type of LED to fall below some power level. The parameters for the lifetime measurement can be written using the notation  $B_{XX}/L_{YY}$ , where XX is the percentage of that type of LED that will provide less than YY percent of the specified output power after the lifetime has elapsed. Thorlabs defines the lifetime of our LEDs as  $B_{50}/L_{50}$ , meaning that 50% of the LEDs with a given Item # will fall below 50% of the initial optical power at the end of the specified lifetime. For example, if a batch of 100 LEDs is rated for 150 mW of output power, 50 of these LEDs can be expected to produce an output power of  $\leq 75$  mW after the specified LED lifetime has elapsed.

### Optimized Thermal Management

The thermal dissipation performance of these collimated LEDs has been optimized for stable power output. The heat sink is directly mounted to the LED mount so as to provide optimal thermal contact. By doing so, the degradation of optical output power that can be attributed to increased LED junction temperature is minimized (see the graph to the right).



## PIN DIAGRAM

### Pin Connection - Male







The diagram to the right shows the male connector of the collimated LED assembly. It is a standard M8 x 1 sensor circular connector. Pins 1 and 2 are the connection to the LED. Pin 3 and 4 are used for the internal EEPROM in these LEDs. If using an LED driver that was not purchased from Thorlabs, be careful that the appropriate connections are made to Pin 1 and Pin 2 and that you do not attempt to drive the LED through the EEPROM pins.



Pin	Specification	Color
1	LED Anode	Brown
2	LED Cathode	White
3	EEPROM GND	Black
4	EEPROM IO	Blue

## LED DRIVERS

To fully support the max optical power of the LED you intend to drive, ensure that the max voltage and max current of the driver are equal to or greater than those of the LED.

Compatible Drivers	LEDD1B	UPLED <sup>a</sup>	DC40 <sup>a</sup>	DC2200 <sup>a</sup>	DC4100 <sup>a,b</sup>	DC4104 <sup>a,b</sup>
Click Photos to Enlarge						
<b>LED Driver Current Output (Max)<sup>c</sup></b>	1.2 A	1.2 A	4.0 A <sup>d</sup>	LED1 Terminal: 10.0 A LED2 Terminal: 2.0 A <sup>e</sup>	1.0 A per Channel	1.0 A per Channel
<b>LED Driver Forward Voltage (Max)<sup>f</sup></b>	12 V	8 V	14.0 V <sup>d</sup>	50 V	5 V	5 V
<b>Modulation Frequency Using External Input (Max)</b>	5 kHz	-	5 kHz	250 kHz <sup>g,h</sup>	100 kHz <sup>h</sup> (Simultaneous Across all Channels)	100 kHz <sup>h</sup> (Independently Controlled Channels)
<b>External Control Interface(s)</b>	Analog (BNC)	USB 2.0	USB 2.0, TTL, and Analog (BNC)	USB 2.0 and Analog (BNC)	USB 2.0 and Analog (BNC)	USB 2.0 and Analog (8-Pin)
<b>Main Driver Features</b>	Very Compact Footprint 60 mm x 73 mm x 104 mm (W x H x D)	USB-Controlled	Driver Current Up to 4.0 A, Manual and USB-Controlled	Touchscreen Interface with Internal and External Options for Pulsed and Modulated LED Operation	4 Channels <sup>b</sup>	4 Channels <sup>b</sup>
<b>EEPROM Compatible: Reads Out LED Data for LED Settings</b>	-	✓	✓	✓	✓	✓
<b>LCD Display</b>	-	-	-	✓	✓	✓

a. Automatically limits to LED's max current via EEPROM readout.

b. The DC4100 and DC4104 can power and control up to four LEDs simultaneously when used with the DC4100-HUB. The LEDs on this page all require the DC4100-HUB when used with the DC4100 or DC4104.

c. LEDs with maximum current ratings higher than the driver's maximum current output can be driven, but will not reach full power. See the *Specs* tab for the maximum current rating of each LED.

d. The DC40 LED Driver is designed to automatically select the appropriate current/voltage combination for the LED on this page. Please note that the maximum current and forward voltage are interdependent; the DC40 driver cannot drive an LED with a 14.0 V forward voltage at 4.0 A. Please see the full web presentation for more information.

e. The collimated LEDs sold below are compatible with the LED2 Terminal.

f. LEDs with forward voltage greater than the driver's maximum forward voltage cannot be driven. See the *Specs* tab for the forward voltage specification of each LED.

g. Small Signal Bandwidth: Modulation not exceeding 20% of full scale current. The driver accepts other waveforms, but the maximum frequency will be reduced.

h. The MCWHL8-C LEDs may not turn off completely when modulated at frequencies above 5 kHz, as the white light is produced by optically stimulating emission from phosphor.

## LED SELECTION GUIDE

This tab includes all LEDs sold by Thorlabs. Click on *More [+]* to view all available wavelengths for each type of LED pictured below.

Light Emitting Diode (LED) Selection Guide						More [+]
Click Photo to Enlarge (Representative; Not to Scale)						
Type	Unmounted LEDs	Pigtailed LEDs	LEDs in SMT Packages	LED Arrays	LED Ring Light	Cage-Compatible Diffuse Backlight LED
Light Emitting Diode (LED) Selection Guide						More [+]
Click Photo to Enlarge (Representative; Not to Scale)						
Type	PCB-Mounted LEDs	Heatsink-Mounted LEDs	Collimated LEDs for Microscopy <sup>b</sup>	Fiber-Coupled LEDs <sup>c</sup>	High-Power LEDs for Microscopy	Multi-Wavelength LED Source Options <sup>d</sup>

a. Measured at 25 °C

b. These Collimated LEDs are compatible with the standard and epi-illumination ports on the following microscopes: Olympus BX/IX (Item # Suffix: -C1), Leica DMI (Item # Suffix: -C2), Zeiss Axioskop (Item # Suffix: -C4), and Nikon Eclipse (Bayonet Mount, Item # Suffix: -C5).

c. Typical power when used with MM Fiber with Ø400 µm core, 0.39 NA.

d. Our Multi-Wavelength LED Sources are available with select combinations of the LEDs at these wavelengths.

e. Typical power for LEDs with the Leica DMI collimation package (Item # Suffix: -C2).

f. Minimum power for the collimated output of these LEDs. The collimation lens is installed with each LED.

g. Typical power for LEDs with the Olympus BX and IX collimation package (Item # Suffix: -C1).

h. Typical power for LEDs with the Zeiss Axioskop collimation package (Item # Suffix: -C4).

i. Percentage of LED intensity that emits in the blue portion of the spectrum, from 400 nm to 525 nm.



## Collimated LED Light Sources for Olympus BX and IX Microscopes



- ▶ Approximate Beam Diameter: 50 mm
- ▶ Approximate Beam Area: 1960 mm<sup>2</sup>
- ▶ AR-Coated Aspheric Collimation Lens (EFL: 40 mm)
- ▶ See the Specs Tab for a Complete List of Specifications
- ▶ Cable Length: 2 m

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M365L3-C1	UV		520 mW
M365LP1-C1 <sup>c</sup>	UV		745 mW
M385L2-C1	UV		170 mW
M385L3-C1	UV		680 mW
M385LP1-C1 <sup>c</sup>	UV		795 mW
M405L4-C1	UV		510 mW
M405LP1-C1 <sup>c</sup>	UV		750 mW
M455L4-C1	Royal Blue		630 mW
M470L5-C1	Blue		487 mW
M505L4-C1	Cyan		220 mW

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M530L4-C1	Green		200 mW
M590L4-C1	Amber		130 mW
M617L5-C1	Orange		484 mW <sup>d</sup>
M625L4-C1	Red		630 mW
M660L4-C1	Deep Red		590 mW
M780L3-C1	IR		210 mW
M850L3-C1	IR		480 mW
M940L3-C1	IR		430 mW
MCWHL8-C1	Cold White		658 mW <sup>e</sup>

- a. Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual spectral output of any given LED will vary. Output plots are only intended to be used as a guideline.
- b. After collimation package. Due to variations in the manufacturing process and operating parameters such as temperature and current, the total beam power of any given LED will vary.
- c. These LEDs have a higher output power and are mounted to a Ø57.0 mm heat sink for increased heat dissipation.
- d. Measured at the Maximum Current
- e. Measured at 25 °C



Click to Enlarge

Part Number	Description	Price	Availability
M365L3-C1	365 nm, 520 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$612.20	Today
M365LP1-C1	365 nm, 745 mW (Typ.) Collimated LED for Olympus BX & IX, 1700 mA	\$717.59	Today
M385L2-C1	385 nm, 170 mW (Typ.) Collimated LED for Olympus BX & IX, 700 mA	\$494.00	7-10 Days
M385L3-C1	385 nm, 680 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$634.36	Today
M385LP1-C1	385 nm, 795 mW (Typ.) Collimated LED for Olympus BX & IX, 1700 mA	\$646.24	Lead Time
M405L4-C1	405 nm, 510 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$544.07	Today
M405LP1-C1	405 nm, 750 mW (Typ.) Collimated LED for Olympus BX & IX, 1400 mA	\$646.24	Today
M455L4-C1	455 nm, 630 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$634.36	Today
M470L5-C1	470 nm, 487 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$557.58	Today
M505L4-C1	505 nm, 220 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$634.36	7-10 Days
M530L4-C1	530 nm, 200 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$634.36	7-10 Days
M590L4-C1	590 nm, 130 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$544.07	7-10 Days
M617L5-C1	617 nm, 484 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$478.61	7-10 Days
M625L4-C1	625 nm, 630 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$525.78	Today
M660L4-C1	660 nm, 590 mW (Typ.) Collimated LED for Olympus BX & IX, 1200 mA	\$544.07	Today
M780L3-C1	780 nm, 210 mW (Typ.) Collimated LED for Olympus BX & IX, 800 mA	\$602.28	Today
M850L3-C1	850 nm, 480 mW (Typ.) Collimated LED for Olympus BX & IX, 1200 mA	\$602.28	Today
M940L3-C1	940 nm, 430 mW (Typ.) Collimated LED for Olympus BX & IX, 1000 mA	\$602.28	Today
MCWHL8-C1	6500 K, 658 mW (Typ.) Collimated LED for Olympus BX & IX, 1400 mA	\$533.61	Today

## Collimated LED Light Sources for Leica DMI Microscopes



- ▶ Approximate Beam Diameter: 37 mm
- ▶ Approximate Beam Area: 1080 mm<sup>2</sup>
- ▶ AR-Coated Aspheric Collimation Lens (EFL = 40 mm)
- ▶ See the Specs Tab for a Complete List of Specifications
- ▶ Cable Length: 2 m

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M365L3-C2	UV		320 mW
M365LP1-C2 <sup>c</sup>	UV		435 mW
M385L2-C2	UV		90 mW
M385L3-C2	UV		450 mW
M385LP1-C2 <sup>c</sup>	UV		520 mW
M405L4-C2	UV		310 mW
M405LP1-C2 <sup>c</sup>	UV		450 mW
M455L4-C2	Royal Blue		490 mW
M470L5-C2	Blue		402 mW
M505L4-C2	Cyan		170 mW

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M530L4-C2	Green		160 mW
M590L4-C2	Amber		100 mW
M617L5-C2	Orange		362 mW <sup>d</sup>
M625L4-C2	Red		490 mW
M660L4-C2	Deep Red		400 mW
M780L3-C2	IR		130 mW
M850L3-C2	IR		330 mW
M940L3-C2	IR		320 mW
MCWHL8-C2	Cold White		419 mW <sup>e</sup>

- a. Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual spectral output of any given LED will vary. Output plots are only intended to be used as a guideline.
- b. After collimation package. Due to variations in the manufacturing process and operating parameters such as temperature and current, the total beam power of any given LED will vary.
- c. These LEDs have a higher output power and are mounted to a Ø57.0 mm heat sink for increased heat dissipation.
- d. Measured at the Maximum Current
- e. Measured at 25 °C



Click to Enlarge

Part Number	Description	Price	Availability
M365L3-C2	365 nm, 320 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$612.20	7-10 Days
M365LP1-C2	365 nm, 435 mW (Typ.) Collimated LED for Leica DMI, 1700 mA	\$744.91	Lead Time
M385L2-C2	385 nm, 90 mW (Typ.) Collimated LED for Leica DMI, 700 mA	\$494.00	7-10 Days
M385L3-C2	375 nm, 450 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$634.36	Today
M385LP1-C2	385 nm, 520 mW (Typ.) Collimated LED for Leica DMI, 1700 mA	\$673.56	Today
M405L4-C2	405 nm, 310 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$544.07	7-10 Days
M405LP1-C2	405 nm, 450 mW (Typ.) Collimated LED for Leica DMI, 1400 mA	\$673.56	Lead Time
M455L4-C2	455 nm, 490 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$634.36	7-10 Days
M470L5-C2	470 nm, 402 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$557.58	Today
M505L4-C2	505 nm, 170 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$634.36	Today
M530L4-C2	530 nm, 160 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$634.36	Today
M590L4-C2	590 nm, 100 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$544.07	7-10 Days
M617L5-C2	617 nm, 362 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$478.61	7-10 Days
M625L4-C2	625 nm, 490 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$525.78	Lead Time
M660L4-C2	660 nm, 400 mW (Typ.) Collimated LED for Leica DMI, 1200 mA	\$544.07	Today
M780L3-C2	780 nm, 130 mW (Typ.) Collimated LED for Leica DMI, 800 mA	\$602.28	Lead Time
M850L3-C2	850 nm, 330 mW (Typ.) Collimated LED for Leica DMI, 1200 mA	\$602.28	Lead Time
M940L3-C2	940 nm, 320 mW (Typ.) Collimated LED for Leica DMI, 1000 mA	\$602.28	Lead Time
MCWHL8-C2	6500 K, 419 mW (Typ.) Collimated LED for Leica DMI, 1400 mA	\$533.61	7-10 Days

## Collimated LED Light Sources for Zeiss Axioskop and Examiner Microscopes



- ▶ Approximate Beam Diameter: 44 mm
- ▶ Approximate Beam Area: 1520 mm<sup>2</sup>
- ▶ Compatible with Dovetail Used in Zeiss Axioskop and Examiner Microscopes
- ▶ AR-Coated Aspheric Collimation Lens (EFL: 40 mm)
- ▶ See the *Specs Tab* for a Complete List of Specifications
- ▶ Cable Length: 2 m

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M365L3-C4	UV		430 mW
M365LP1-C4 <sup>c</sup>	UV		615 mW
M385L2-C4	UV		110 mW
M385L3-C4	UV		570 mW
M385LP1-C4 <sup>c</sup>	UV		630 mW
M405L4-C4	UV		410 mW
M405LP1-C4 <sup>c</sup>	UV		570 mW
M455L4-C4	Royal Blue		690 mW
M470L5-C4	Blue		521 mW
M505L4-C4	Cyan		240 mW

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M530L4-C4	Green		220 mW
M590L4-C4	Amber		140 mW
M617L5-C4	Orange		474 mW <sup>d</sup>
M625L4-C4	Red		690 mW
M660L4-C4	Deep Red		570 mW
M780L3-C4	IR		180 mW
M850L3-C4	IR		400 mW
M940L3-C4	IR		380 mW
MCWHL8-C4	Cold White		596 mW <sup>e</sup>

- a. Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual spectral output of any given LED will vary. Output plots are only intended to be used as a guideline.
- b. After collimation package. Due to variations in the manufacturing process and operating parameters such as temperature and current, the total beam power of any given LED will vary.
- c. These LEDs have a higher output power and are mounted to a Ø57.0 mm heat sink for increased heat dissipation.
- d. Measured at the Maximum Current
- e. Measured at 25 °C



Click to Enlarge

Part Number	Description	Price	Availability
M365L3-C4	365 nm, 430 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$612.20	Lead Time
M365LP1-C4	365 nm, 615 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1700 mA	\$744.91	Lead Time
M385L3-C4	385 nm, 570 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$634.36	Today
M385LP1-C4	385 nm, 660 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1700 mA	\$673.56	Lead Time
M405L4-C4	405 nm, 410 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$544.07	Lead Time
M405LP1-C4	405 nm, 580 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1400 mA	\$673.56	Lead Time
M455L4-C4	455 nm, 690 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$634.36	7-10 Days
M470L5-C4	470 nm, 521 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$557.58	Today
M505L4-C4	505 nm, 240 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$634.36	Lead Time
M530L4-C4	530 nm, 220 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$634.36	Today
M590L4-C4	590 nm, 140 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$544.07	7-10 Days
M617L5-C4	617 nm, 474 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$478.61	7-10 Days
M625L4-C4	625 nm, 690 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$525.78	7-10 Days
M660L4-C4	660 nm, 570 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1200 mA	\$584.47	Lead Time
M780L3-C4	780 nm, 180 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 800 mA	\$602.28	Lead Time
M850L3-C4	850 nm, 400 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1200 mA	\$602.28	Lead Time
M940L3-C4	940 nm, 380 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1000 mA	\$602.28	Lead Time
MCWHL8-C4	6500 K, 596 mW (Typ.) Collimated LED for Zeiss Axioskop & Examiner, 1400 mA	\$533.61	Today

## Collimated LED Light Sources for Nikon Eclipse (Bayonet Mount) Microscopes



- ▶ Approximate Beam Diameter: 43 mm
- ▶ Approximate Beam Area: 1450 mm<sup>2</sup>
- ▶ AR-Coated Aspheric Collimation Lens (EFL: 40 mm)
- ▶ See the Specs Tab for a Complete List of Specifications
- ▶ Cable Length: 2 m

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M365L3-C5	UV		320 mW
M365LP1-C5 <sup>c</sup>	UV		435 mW
M385L2-C5	UV		120 mW
M385L3-C5	UV		410 mW
M385LP1-C5 <sup>c</sup>	UV		660 mW
M405L4-C5	UV		380 mW
M405LP1-C5 <sup>c</sup>	UV		580 mW
M455L4-C5	Royal Blue		630 mW
M470L5-C5	Blue		487 mW
M505L4-C5	Cyan		220 mW

Item #	Color <sup>a</sup>	Housing	Total Beam Power <sup>b</sup>
M530L4-C5	Green		200 mW
M590L4-C5	Amber		130 mW
M617L5-C5	Orange		441 mW <sup>d</sup>
M625L4-C5	Red		630 mW
M660L4-C5	Deep Red		520 mW
M780L3-C5	IR		170 mW
M850L3-C5	IR		370 mW
M940L3-C5	IR		340 mW
MCWHL8-C5	Cold White		549 mW <sup>e</sup>

- a. Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual spectral output of any given LED will vary. Output plots are only intended to be used as a guideline.
- b. After collimation package. Due to variations in the manufacturing process and operating parameters such as temperature and current, the total beam power of any given LED will vary.
- c. These LEDs have a higher output power and are mounted to a Ø57.0 mm heat sink for increased heat dissipation.
- d. Measured at the Maximum Current
- e. Measured at 25 °C



Click to Enlarge

Part Number	Description	Price	Availability
M365L3-C5	365 nm, 320 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$652.80	7-10 Days
M365LP1-C5	365 nm, 435 mW (Typ.) Collimated LED for Nikon Eclipse, 1700 mA	\$798.36	Today
M385L2-C5	385 nm, 120 mW (Typ.) Collimated LED for Nikon Eclipse, 700 mA	\$537.91	Today
M385L3-C5	385 nm, 410 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$674.75	Today
M385LP1-C5	385 nm, 630 mW (Typ.) Collimated LED for Nikon Eclipse, 1700 mA	\$727.02	Lead Time
M405L4-C5	405 nm, 380 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$587.59	7-10 Days
M405LP1-C5	405 nm, 570 mW (Typ.) Collimated LED for Nikon Eclipse, 1400 mA	\$727.02	7-10 Days
M455L4-C5	455 nm, 630 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$674.75	Lead Time
M470L5-C5	470 nm, 487 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$605.74	7-10 Days
M505L4-C5	505 nm, 220 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$674.75	Lead Time
M530L4-C5	530 nm, 200 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$674.75	7-10 Days
M590L4-C5	590 nm, 130 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$584.47	Today
M617L5-C5	617 nm, 441 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$500.21	7-10 Days
M625L4-C5	625 nm, 630 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$576.66	Lead Time
M660L4-C5	660 nm, 520 mW (Typ.) Collimated LED for Nikon Eclipse, 1200 mA	\$544.07	Today
M780L3-C5	780 nm, 170 mW (Typ.) Collimated LED for Nikon Eclipse, 800 mA	\$648.61	Lead Time
M850L3-C5	850 nm, 370 mW (Typ.) Collimated LED for Nikon Eclipse, 1200 mA	\$648.61	Lead Time
M940L3-C5	940 nm, 340 mW (Typ.) Collimated LED for Nikon Eclipse, 1000 mA	\$648.61	Lead Time
MCWHL8-C5	6500 K, 549 mW (Typ.) Collimated LED for Nikon Eclipse, 1400 mA	\$577.78	7-10 Days

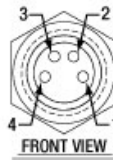
## Mounted LED Mating Connector



- ▶ Female 4-Pin Pico (M8) Receptacle
- ▶ M8 x 1 Thread for Connection to Mounted LED Power Cable
- ▶ M8 x 0.5 Panel-Mount Thread for Custom Housings
- ▶ 0.5 m Long, 24 AWG Wires
- ▶ IP 67 and NEMA 6P Rated

The CON8ML-4 connector can be used to mate mounted LEDs featured on this page to user-supplied power supplies. We also offer a male 4-Pin M8 connector cable (item # CAB-LEDD1).

Pin	Color	Specification
1	Brown	LED Anode
2	White	LED Cathode
3	Black	EEPROM GND
4	Blue	EEPROM IO



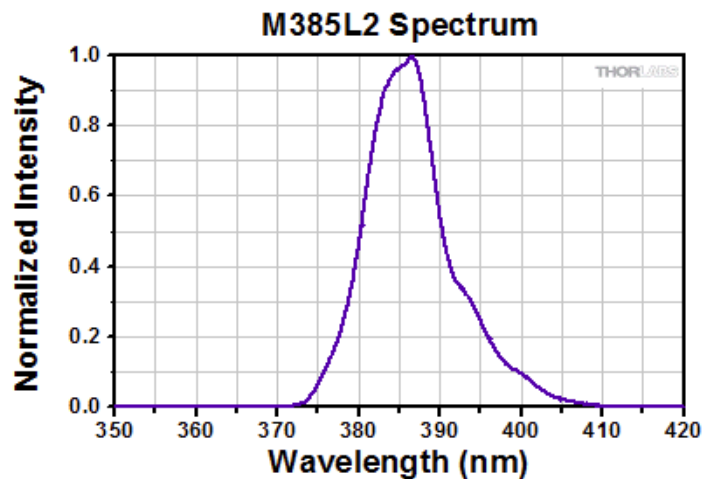
CON8ML-4 Shown Connected to the 4-Pin M8 Plug of Mounted LED

Part Number	Description	Price	Availability
CON8ML-4	4-Pin Female Mating Connector for Mounted LEDs	\$36.54	Today

## 385 nm Collimated LEDs, 700 mA



### Spectrum



The M385L2-C Collimated LEDs each use an M385L2 Mounted LED attached to a microscope-port-compatible collimation package. The spectrum shown here is for the bare (uncollimated) LED.