

# Multi-Wavelength Fiber-Coupled LED Light Sources

(Part Numbers: WFC-xx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxx)

## FEATURES

- Up to 8 LED's combined into a single fiber output
- No moving parts in optical path
- Independent or simultaneous control of the LED's
- High efficiency dichroic beam combiners
- Wide range of available wavelengths: UV/VIS/NIR and white
- Cooling fan for maximum intensity stability
- Optional multi-channel LED controller
- Standard SMA connector

## APPLICATIONS

- General purpose light source
- Microscope illuminator
- Fast spectrum tuning

## PRODUCT DESCRIPTION

Mightex multi-wavelength fiber-coupled light sources are enabled by the latest LED technologies, and Mightex's proprietary beam combining and coupling optics. Up to eight (8) LEDs are coherently combined into a single multi-mode fiber with the highest efficiency practically possible. Each LED can be powered individually or simultaneously, making the WFC-series a new class of light sources with a tunable spectrum.

The light sources are offered in two configurations: the standard configuration and the high-power configuration. Neutral beam combiners are used in the standard configuration. The standard configuration has the advantage of low cost and the most flexible wavelength plans. Any wavelength and white color may be combined in the standard configuration. For applications that require the highest possible output power, however, one should choose the high-power configuration where high-efficiency dichroic beam splitters are used to combine different wavelengths. Because not all possible dichroic beamsplitters are in stock, some wavelength combinations may require customization. Please contact us with your detailed wavelength plan to obtain a quotation for custom higher-power configurations.

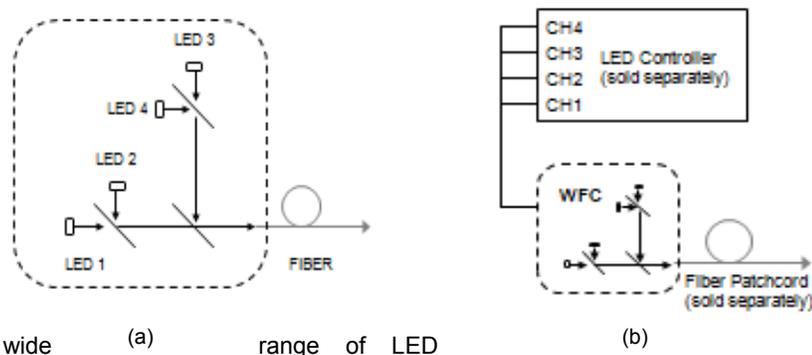


Figure 1. (a) Schematic diagram of a Mightex WFC-series multi-wavelength fiber coupled LED source; (b) Schematic diagram showing a WFC with a fiber patchcord (sold separately), powered by a Mightex multi-channel LED controller (sold separately).

wavelengths from 365nm to 940nm and white colors are available for users to choose from. The selected LEDs are installed in the light source chassis in the factory. Fiber coupling is through a standard SMA port, and hence customers may use different fibers with the LED source according to the specific requirements of their applications. SMA-connectorized fiber patchcords are available in various core diameters and numerical apertures.

A 4-channel light source includes a 5-ft electrical cable, and an 8-channel source includes two such cables. Each cable has an 8-pin locking connector on one end to be plugged into the light source, and four pairs of bare-wire terminals at the other end. Each pair of terminals should be connected to a separate channel of a LED controller. Users can drive the installed LEDs individually or simultaneously using a Mightex multi-channel LED controller or other constant current sources. A cooling fan with heat sinks is built into the light source. When two or more wavelengths are running at full power, the fan should be turned on to maintain low temperature of the LED junctions, in order to prevent LED damage due to over-heating. A separate power supply is included for driving the cooling fan.

Mightex 4-channel multi-wavelength light source can be ordered with 2, 3, and 4 wavelengths, and the 8-channel source can be ordered with 5, 6, 7 and 8 wavelengths. In the standard configuration (which is NOT supported by the 8-channel source due to low efficiency), output power of each wavelength decreases with the total number of wavelengths, while in the high-power configuration the output power does not change much with number of wavelengths.



(a) 4-channel WFC source.



Fiber ordered separately

(b) 8-channel WFC source.

# Multi-Wavelength Fiber-Coupled LED Light Sources

(Part Numbers: WFC-xx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxx)

## PERFORMANCE SPECIFICATIONS

### HIGH POWER CONFIGURATION

Wavelength Code	Wavelength (nm)	I <sub>op</sub> (mA)	V <sub>op</sub> (V)	Output Power <sup>1</sup> (mW)			
				2-wavelength	3-wavelength	4-wavelength	5-8 wavelength
0365	365	500	3.8	4.8(15.0)	4.6(14.4)	4.3(13.5)	3.9(12.2)
0380	380	1,000	3.2	2.3(4.6)	2.0(4.0)	1.9(3.8)	1.7(3.4)
0385	385	500	3.8	4.8(15.0)	4.6(14.4)	4.3(13.5)	3.9(12.2)
0390	390	1,000	3.1	4.8(9.6)	4.6(9.2)	4.3(8.6)	3.9(7.8)
0395	395	1,000	3.1	5.1(10.2)	4.6(9.2)	4.1(8.2)	3.7(7.4)
0400	400	1,000	3.8	4.4(13.8)	4.2(13.2)	4.0(12.6)	3.6(11.3)
0405	405	1,000	3.0	6.2(12.4)	5.6(11.2)	5.0(10.0)	4.5(9.0)
0410	410	1,000	3.0	6.2(12.4)	5.6(11.2)	5.0(10.0)	4.5(9.0)
0415	415	1,000	3.0	6.1(12.4)	5.5(11.0)	4.9(9.8)	4.4(8.8)
0420 (discontinued)	420	500	3.8	1.6(5.0)	1.5(4.7)	1.4(4.4)	1.3(4.1)
0420	420	1,000	3.8	4.1(8.2)	3.8(7.9)	3.4(6.8)	3.1(6.2)
0425	425	1,000	3.0	5.3(10.6)	4.8(9.6)	4.3(8.6)	3.8(7.6)
0455	455	1,000	3.9	5.6(17.6)	5.3(16.6)	5.1(16.0)	4.5(14.1)
0470	470	1,000	3.9	6.0(18.8)	5.7(17.9)	5.4(17.0)	4.9(15.4)
0490	490	700	3.7	2.2(4.4)	2.0(4.0)	1.8(3.6)	1.5(3.0)
0505	505	1,000	3.9	2.8(8.8)	2.6(8.2)	2.2(7.9)	1.7(5.3)
0530	530	1,000	3.9	2.4(7.5)	2.3(7.2)	2.2(6.9)	1.9(6.0)
0560	560	1,000	3.9	1.5(3.0)	1.4(2.8)	1.3(2.6)	1.0(2.0)
0590	590	1,000	3.9	1.3(4.1)	1.2(3.8)	1.2(3.8)	1.1(3.5)
0617	617	1,000	3.9	5.2(16.3)	4.9(15.4)	4.7(14.8)	4.2(13.2)
0625	625	1,000	3.9	6.1(19.2)	5.9(18.5)	5.5(17.3)	5.0(15.7)
0656	656	1,000	2.7	5.2(16.3)	4.9(15.4)	4.7(14.8)	4.2(13.2)
0680	680	600	2.7	1.0(2.0)	0.9(1.8)	0.8(1.6)	0.5(1.0)
0700	700	500	2.1	0.4(0.8)	0.3(0.6)	0.2(0.4)	90μW (180μW)
0720	720	600	2.2	0.6(1.2)	0.5(1.0)	0.4(0.8)	0.2(0.4)
0740	740	1,000	2.2	2.4(7.5)	2.3(7.2)	2.2(6.9)	1.9(6.0)
0780	780	800	2.5	1.6(3.2)	1.3(2.6)	1.1(2.2)	0.7(1.4)
0810	810	800	2.2	1.0(2.0)	0.9(1.8)	0.8(1.6)	0.5(1.0)
0850	850	1,000	2.1	3.2(10.0)	3.0(9.4)	2.9(9.1)	2.6(8.2)
0870	870	700	2.0	2.4(7.5)	2.3(7.2)	2.2(6.9)	1.9(6.0)
0940	940	1,000	2.1	3.2(10.0)	3.0(9.4)	2.9(9.1)	2.6(8.2)
0980	980	500	1.4	0.3(0.6)	0.2(0.4)	0.1(0.2)	80μW (160μW)
6500	glacier white 6,500K	1,000	3.6	-	-	-	-
5500	cool white 5,500K	1,000	3.9	-	-	-	-
4000	warm white 4,000K	1,000	3.9	-	-	-	-

Notes: (1) Measured with a 400micron-core 0.22 numerical aperture (NA) fiber. Output optical power scales approximately linearly with fiber core area and NA<sup>2</sup>. With a 400micron-core 0.39NA fiber, for example, the output power will be 3.14x of the measured values using a 400micron-core 0.22NA fiber, as shown by the numbers in the brackets in the table above

# Multi-Wavelength Fiber-Coupled LED Light Sources

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## PERFORMANCE SPECIFICATIONS

### STANDARD CONFIGURATION

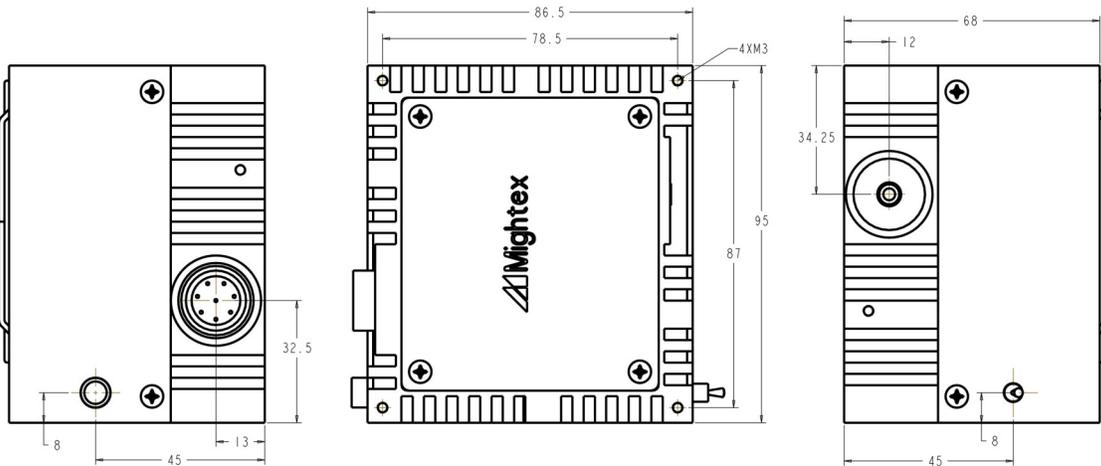
Wavelength Code	Wavelength (nm)	I <sub>op</sub> (mA)	V <sub>op</sub> (V)	Radiant Flux <sup>1</sup> (mW)		
				2-wavelength	3-wavelength	4-wavelength
0365	365	500	3.8	2.3	1.5	1.1
0380	380	1,000	3.2	1.1	0.5	0.4
0385	385	500	3.8	2.3	1.5	1.1
0390	390	1,000	3.1	2.1	1.0	0.8
0395	395	1,000	3.1	2.3	1.5	1.1
0400	400	1,000	3.8	1.1	0.8	0.5
0405	405	1,000	3.0	2.8	1.3	1.0
0410	410	1,000	3.0	2.8	1.3	1.0
0415	415	1,000	3.0	2.7	1.2	0.9
0420 (discontinued)	420	500	3.8	0.8	0.5	0.4
0420	420	1,000	3.8	1.8	0.8	0.5
0425	425	1,000	3.0	2.4	1.1	0.9
0455	455	1,000	3.9	2.7	1.8	1.3
0470	470	1,000	3.9	2.9	1.9	1.4
0490	490	700	3.7	1.0	0.5	0.3
0505	505	1,000	3.9	1.4	0.9	0.6
0530	530	1,000	3.9	0.8	0.5	0.4
0560	560	1,000	3.9	0.7	0.4	0.3
0590	590	1,000	3.9	0.6	0.4	0.3
0617	617	1,000	3.9	2.5	1.6	1.2
0625	625	1,000	3.9	2.5	1.6	1.2
0656	656	1,000	2.7	2.5	1.6	1.2
0680	680	600	2.7	0.5	0.3	0.2
0700	700	500	2.1	0.2	0.1	90μW
0720	720	600	2.2	0.3	0.2	0.1
0740	740	1,000	2.2	1.2	0.8	0.7
0780	780	800	2.5	0.7	0.4	0.3
0810	810	800	2.2	0.5	0.3	0.2
0850	850	1,000	2.1	1.5	1.0	0.7
0870	870	700	2.0	1.1	0.8	0.5
0940	940	1,000	2.1	1.5	1.0	0.7
0980	980	500	1.4	0.1	90μW	70μW
6500	glacier white 6,500K	1,000	3.6	1.2	0.8	0.6
5500	cool white 5,500K	1,000	3.9	1.2	0.8	0.6
4000	warm white 4,000K	1,000	3.9	1.2	0.8	0.6

1. Measured with a 400micron-core 0.22 numerical aperture (NA) fiber. Output optical power scales approximately linearly with fiber core area and NA<sup>2</sup>.

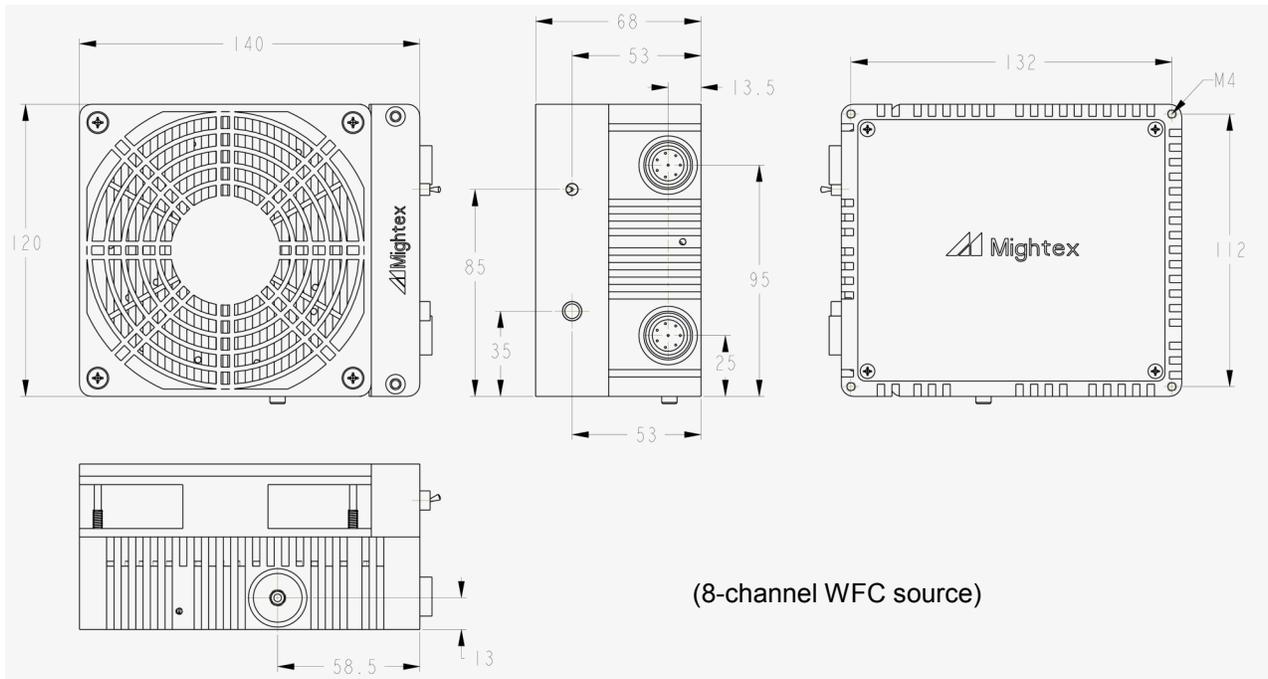
# Multi-Wavelength Fiber-Coupled LED Light Sources

(Part Numbers: WFC-xx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxxx-xxx)

## INSTALLATION DRAWINGS



(4-channel WFC source)



(8-channel WFC source)

## PART NUMBER AND ORDERING INFORMATION

WFC -	x	x -	xxxx -	xxxx -	...	xxxx -	xxx
	S - Standard configuration H - High-power configuration	Number of wavelengths	1st Wavelength code	2nd Wavelength code	... (repeat if applicable)	8th Wavelength code	Internal use

For example, WFC-H4-0400-0470-0530-0625-000 is a high-power configuration light source with 4 wavelengths of 400nm, 470nm, 530nm, and 625nm.

With a world-class OEM design team, Mightex offers a broad range of customized solutions in order to meet individual customer's unique requirements. Please call 1-416-840 4991 or email [sales@mightex.com](mailto:sales@mightex.com) for details.