TABLE OF CONTENTS

LED LIGHT SOURCES

LASER SOURCES

LED CONTROLLERS

INDUSTRIAL CAMERAS

SPECTROMETERS

PATTERNED ILLUMINATION

LED LIGHT SOURCES

PRODUCT OVERVIEW

Mightex LED light sources come in a wide range of optical formats with an expansive wavelength portfolio to suit multiple applications and allowing users maximum flexibility when choosing the best LED light source solution for their needs.

Fiber-coupled LEDs

FCS Series
Types A, B, & H
High-power, SMA Connected

● *page* **8**

Multiwavelength Fiber-Coupled LEDs

WFC Series
Up to 8 LEDs
Standard and high-power

● *page* **11**

Lightguide-coupled LEDs

GCS Series
Types A, B, & H
High-power, multiple adaptors

● *page* **14**

Collimated LEDs

LCS Series
Types A, B, J & H
High-power, multiple apertures

● *page* **17**

Multiwavelength Collimated LEDs

Multiple LEDs
Different configurations

● *page* **22**

Low-Cost Spotlight LEDs

SLS Series
Compact & ready-to-use
High-power, integrated heat sinks

● *page* **23**

Precision Spotlight LEDs

PLS Series
High uniformity

● *page* **24**

WheeLED Switchable LEDs

Up to 10 LEDs
Manual and motorized

● *page* **31**

Cubic-S Spectrum Synthesizing Light Source

Arbitrary output spectrum
Solid state, high speed

● *page* **32**

LED Accessories

Multiple adaptors
Cables and mounts

● *page* **34**

LED LIGHT SOURCE SELECTION GUIDE

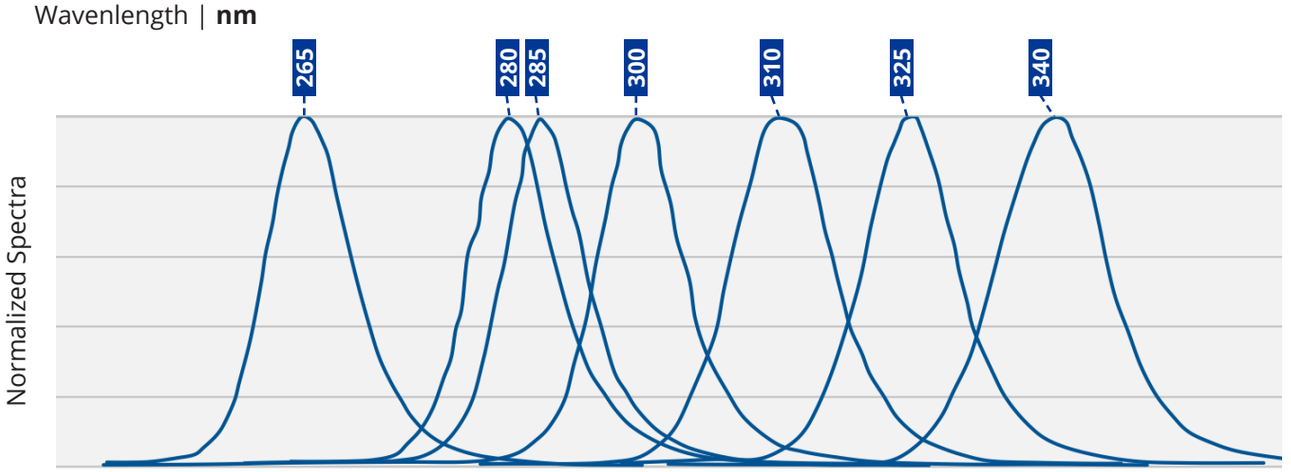
Mightex has developed the most comprehensive LED source solutions in the market. In order to make it easier for our customers to choose the best LED solutions for their specific applications, below is a brief LED source selection guide:

STEP 1 Choose your desired wavelengths based on the charts below

MIGHTEX LED WAVELENGTH PORTFOLIO

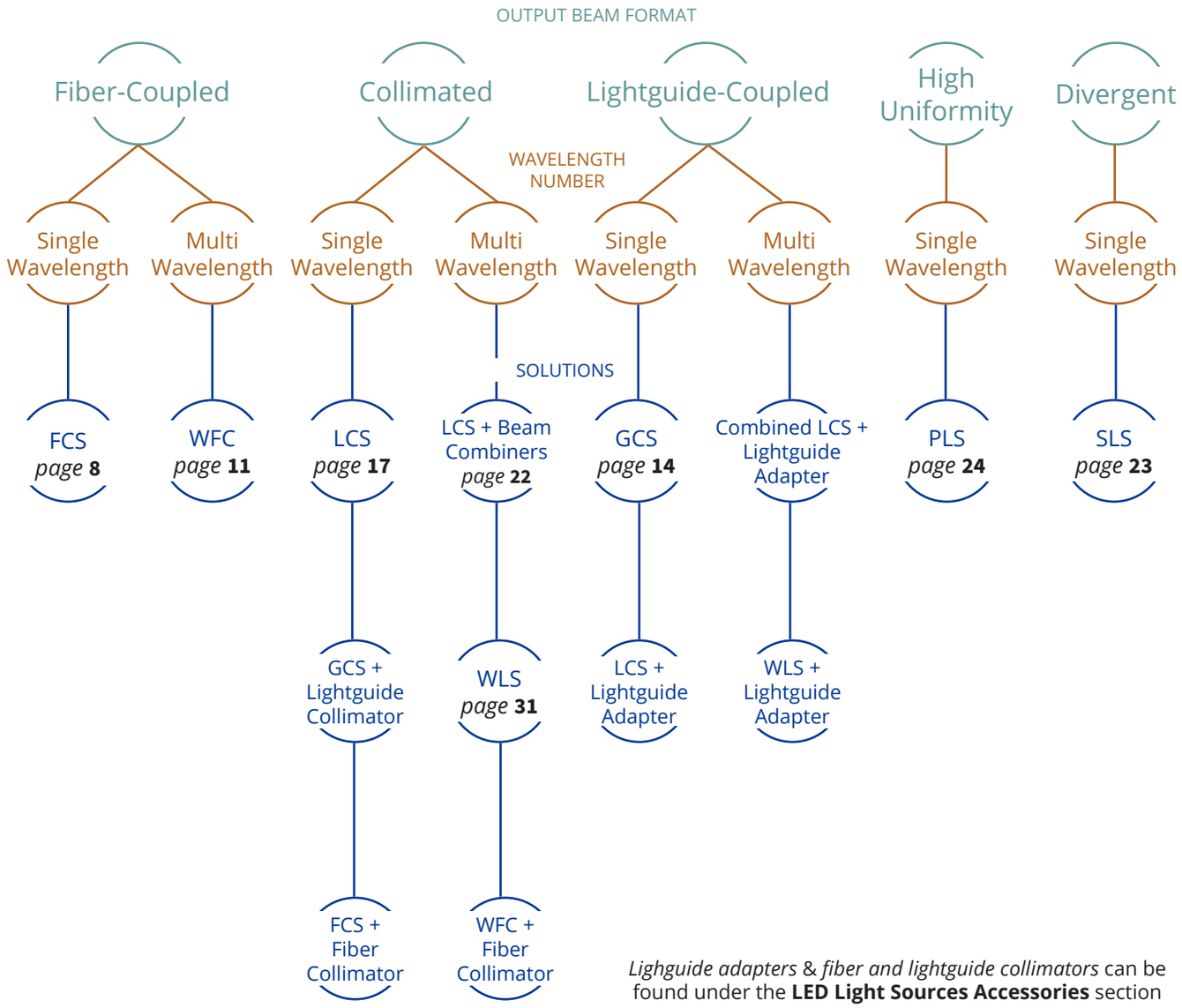
New LED wavelengths are continually added to the portfolio. Please visit **www.mightexsystems.com** for updated list.

MIGHTEX DUV LED WAVELENGTH PORTFOLIO



New LED wavelengths are continually added to the portfolio. Please visit **www.mightexsystems.com** for updated list.

STEP 2 Choose the best beam format for your application



Lighguide adapters & *fiber and lightguide collimators* can be found under the **LED Light Sources Accessories** section on *page* **37**

WARNING

1. LEDs can **only** be driven by a constant-current source and **not** by a voltage source, such as battery, AC/DC power supply, etc.
2. Please always verify the LED's current rating first before applying current to the LED.
3. Please always make sure **not** to apply current that is above the LED's current rating.

HIGH POWER FIBER-COUPLED LED LIGHT SOURCES

Mightex FCS-series fiber-coupled LED light sources employ the latest high-power LED technologies and a proprietary coupling optics to achieve maximum optical output power. Optical output is coupled into a fiber through a standard SMA fiber adaptor port (SMA fiber patch cords are sold separately). FCS series also features a locking electrical connector for secured connection. FCS series are designed as a universal light source for general lab use and OEM applications. The one-piece machined housing features multiple mounting holes. All Mightex LED drivers such as the SLC series or other LED drivers and current sources can be used to drive the light sources.

FEATURES

- High-power UV/VIS/NIR/white fiber-coupled LEDs
- Interchangeable fiber with SMA connector
- No moving parts in optical path
- Multiple mounting features for lab and OEM applications
- Optional LED controllers
- Compact, machined metal housing with integrated heat sink
- Locking electrical connector

PERFORMANCE SPECIFICATIONS

NOTE: Nominal wavelengths for LEDs in the visible spectrum indicate the wavelength at which the LED is most perceptive to the human eye and may differ from the peak wavelengths as measured by a spectrometer. Please contact a Mightex representative for further spectral information.

Type A FCS | *passive cooling*

Part Number	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW) With 400µm 0.22NA Fiber	Typical Radiant Flux (mW) With 400µm 0.39NA Fiber
FCS-0000-000	Cool White	5,500K	1000	3.9	3.2	6.4
FCS-0001-000	Warm White	4,000K	1000	3.9	3.2	6.4
FCS-0002-000	Glacier White	6,500K	1000	3.6	3.2	6.4
FCS-0003-000	Warm White	3,000K	1000	2.8	2.8	5.6
FCS-0265-001	Deep UV	265	350	6.3	400µW	N/A
FCS-0275-001	Deep UV	275	600	6	700µW	N/A
FCS-0280-002	Deep UV	280	800	6.5	600µW	N/A
FCS-0310-001	Deep UV	310	600	5.8	540µW	N/A
FCS-0325-002	Deep UV	325	600	4.7	350µW	N/A
FCS-0340-002	Deep UV	340	350	4.3	0.6	1.1
FCS-0365-001	UV 365nm	365	1000	3.65	4.3	8.6
FCS-0380-000	UV 380nm	380	1000	3.2	2.8	5.6
FCS-0385-001	UV 385nm	385	1000	3.65	5.8	11.6
FCS-0395-000	UV 395nm	395	1000	3.1	6.2	12.4
FCS-0400-002	UV400nm, 3W	400	1000	3.1	6.1	12.2
FCS-0405-000	UV405nm	405	1000	3	7.5	15
FCS-0410-000	UV410nm	410	1000	3	7.3	14.6
FCS-0415-000	UV415nm	415	1000	3	7.2	14.4
FCS-0430-000	430nm	430	500	3.8	2.9	5.8
FCS-0455-000	455nm	455	1000	3.9	7	22
FCS-0470-000	470nm	470	1000	3.9	7	14
FCS-0471-000	471m	471	350	3	2.1	4.2
FCS-0490-000	490nm	490	350	3.5	3.2	6.4
FCS-0505-000	505nm	505	1000	3.9	3.5	11

Type A FCS | *continued*

Part Number	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW) With 400µm 0.22NA Fiber	Typical Radiant Flux (mW) With 400µm 0.39NA Fiber
FCS-0530-000	530nm	530	1000	3.9	3.5	11
FCS-0560-000	560nm broadband	560	700	2.9	5.5	11
FCS-0590-000	590nm	590	1000	3.2	1.2	3.8
FCS-0617-001	617nm, 2W	617	1000	2.3	6.5	13
FCS-0625-000	625nm	625	1000	3	6.5	13
FCS-0656-000	656nm	656	1000	3.1	6.5	13
FCS-0680-000	680nm	680	600	2.7	1.4	4.4
FCS-0700-000	700nm	700	500	2.1	0.6	1.2
FCS-0720-000	720nm	720	600	2.2	0.9	1.8
FCS-0740-000	740nm	740	1000	2.9	3.6	7.2
FCS-0780-000	NIR 780nm	780	800	2.5	2.2	6.9
FCS-0810-000	NIR 810nm	810	800	2.2	1.5	3
FCS-0850-001	NIR 850nm, 3W	850	1000	3	6	12
FCS-0870-000	NIR 870nm	870	700	1.9	1.4	2.8
FCS-0910-000	NIR 910nm	910	1000	1.9	1.5	3
FCS-0940-000	NIR 940nm	940	1000	2.4	4	8

[1] Measured with a 400µm core 0.22 numerical aperture (NA) fiber. Output optical power scales approximately linearly with fiber core area and NA^2. For example, with a 400µm core 0.39NA fiber, the output power will be 3.14X for VIS/IR LEDs and 1.8X for DUV LEDs (due to smaller chip size), as shown in the last column above.
[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type B FCS | *fan cooling*

Part Number	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW) With 400µm 0.22NA Fiber	Typical Radiant Flux (mW) With 400µm 0.39NA Fiber
FCS-0470-101	Blue	470	3000	4.6	19	38
FCS-0530-100	Green	530	2400	4.9	8	15
FCS-0540-100	Broadband Green	540	3000	4.6	10	20
FCS-0625-100	Red	625	2400	2.9	9	18

[1] Measured with a 400µm core 0.22 numerical aperture (NA) fiber. Output optical power scales approximately linearly with fiber core area and NA^2. For example, with a 400µm core 0.39NA fiber, the output power will be 3.14X for VIS/IR LEDs and 1.8X for DUV LEDs (due to smaller chip size), as shown in the last column above.
[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type H FCS | super high-power, *fan cooling*

Part Number	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW) With 1000µm 0.22NA Fiber	Typical Radiant Flux (mW) With 1000µm 0.39NA Fiber
FCS-0365-201	UV	365	18	4.2	120	360
FCS-0405-200	UV	405	13	3.8	70	210
FCS-0415-200	Blue-Violet 415nm, 65W	415	18	3.6	275	350
FCS-0470-201	Blue, 60W	470	18	3.4	220	330
FCS-0470-202	Blue, 90W	470	27	3.4	260	390
FCS-0525-200	Green, 60W	525	13	4.6	50	160
FCS-0525-201	Green, 80W	525	18	4.4	120	190
FCS-0560-200	560 broadband, 70W	560	18	3.8	180	280
FCS-0625-200	Red, 38W	625	13	2.9	200	310
FCS-0625-201	Red, 42W	625	18	2.3	250	370
FCS-0730-200	NIR	730	18	5.9	110	170
FCS-0780-200	NIR	780	18	3.6	200	300
FCS-0850-200	NIR	850	18	3.75	220	340
FCS-6500-200	Glacier White, 30W	6500K	9	3.7	120	180
FCS-0650-201	Glacier White, 65W	6500K	18	3.75	190	280

[1] Measured with a 1000µm core 0.22 numerical aperture (NA) fiber. Output optical power scales approximately linearly with fiber core area and NA[2].

[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

MULTIWAVELENGTH FIBER-COUPLED LED LIGHT SOURCES

Mightex multiwavelength 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 possible. Each LED can be powered independently and simultaneously, making the WFC-series a new class of light sources with a tunable spectrum.

FEATURES

- Up to 8 LED's combined into a single fiber output
- No moving parts in optical path
- Interchangeable fiber with SMA connector
- Independent and 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

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, 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.

PERFORMANCE SPECIFICATIONS

WFC High Power Configuration |

Wavelength Code	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW)		
				2-Wavelength	4-Wavelength	6-8-Wavelength
				400μm 0.22NA fiber	400μm 0.22NA fiber	400μm 0.22NA fiber
365	365	1000	3.65	3.6 (7.2)	3.2 (6.4)	2.9 (5.8)
385	385	1000	3.65	4.8 (9.6)	4.3 (8.6)	3.9 (7.8)
395	395	1000	3.1	5.1 (10.2)	4.1 (8.2)	3.7 (7.4)
400	400	1000	3.8	4.4 (8.8)	4 (8.0)	2.0 (4.0)
405	405	1000	3	6.2 (12.4)	5.0 (10.0)	4.5 (9.0)
410	410	1000	3	6.2 (12.4)	5 (10.0)	4.5 (9.0)
415	415	1000	3	6.1 (12.2)	4.9 (9.8)	4.4 (8.8)
425	425	1000	3	5.3 (10.6)	4.3 (8.6)	3.8 (7.6)
430	430	500	3.8	2.2 (4.4)	2.1 (4.2)	1.9 (3.8)
455	455	1000	3	13 (26)	12 (24)	10 (20)
470	470	1000	3.9	6.0 (12.0)	5.4 (10.8)	4.9 (9.8)
490	490	350	3.5	2.5 (5.0)	2.4 (4.8)	2.2 (4.4)
505	505	1000	3.9	2.8 (5.6)	2.2 (2.2)	1.7 (3.4)
530	530	1000	2.85	5.6 (11)	5.3 (11)	5 (10)

High Power Configuration | *continued*

Wavelength Code	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW)					
				2-Wavelength		4-Wavelength		6-8-Wavelength	
				400µm 0.22NA fiber	400µm 0.39NA fiber	400µm 0.22NA fiber	400µm 0.39NA fiber	400µm 0.22NA fiber	400µm 0.39NA fiber
560	560	700	2.9	4.4	8.8	4.2	8.4	4	8
590	590	1000	3.9	1.3	4.1	1.2	3.8	1.1	3.5
617	617	1000	3.9	5.2	16.3	4.7	14.8	4.2	13.2
625	625	1000	3.9	6.1	19.2	5.5	17.3	5	15.7
656	656	1000	2.7	5.2	16.3	4.7	14.8	4.2	13.2
680	680	600	2.7	1	2	0.8	1.6	0.5	1
700	700	500	2.1	0.4	0.8	0.2	0.4	90µW	180µW
720	720	600	2.2	0.6	1.2	0.4	0.8	0.2	0.4
740	740	1000	2.9	2.4	7.5	2.2	6.9	1.9	6
780	780	800	2.5	1.6	3.2	1.1	2.2	0.7	1.4
810	810	800	2.2	1	2	0.8	1.6	0.5	1
850	850, 3W	1000	3	4.8	9.6	4.6	9.2	4.2	8.4
870	870	700	2	2.4	7.5	2.2	6.9	1.9	6
910	910	1000	1.9	1.2	2.4	1.1	2.2	0.9	1.8
940	940	1000	2.1	3.2	10	2.9	9.1	2.6	8.2
980	980	500	1.4	0.3	0.6	0.1	0.2	80µW	160µW
4000	warm white 4,000K	1000	3.9	-	-	-	-	-	-
5500	cool white 5,500K	1000	3.9	-	-	-	-	-	-
6500	glacier white 6,500K	1000	3.6	-	-	-	-	-	-

[1] Measured with a 400µm-core 0.22 numerical aperture (NA) fiber. Optical output power scales approximately linearly with fiber core area and NA^2. With a 400µm-core 0.39NA fiber, for example, the output power will be 3.14X of the measured values using a 400µm-core 0.22NA fiber.
[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

WFC Standard Configuration |

Wavelength Code	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1,2] (mW)	
				2-Wavelength	4-Wavelength
365	365	1000	3.65	1.7	0.8
380	380	1000	3.2	1.1	0.4
385	385	1000	3.65	2.3	1.1
390	390	1000	3.1	2.1	0.8
395	395	1000	3.1	2.3	1.1
400	400	1000	3.8	1.1	0.5
405	405	1000	3	2.8	1

Standard Configuration | *continued*

Wavelength Code	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[1] (mW)	
				2-Wavelength	4-Wavelength
410	410	1000	3	2.8	1
415	415	1000	3	2.7	0.9
420	420	1000	3.8	1.8	0.5
425	425	1000	3	2.4	0.9
455	455	1000	3.9	2.7	1.3
470	470	1000	3.9	2.9	1.4
490	490	700	3.7	1	0.3
505	505	1000	3.9	1.4	0.6
530	530	1000	3.9	0.8	0.4
560	560	700	3.9	0.7	0.3
590	590	1000	3.9	0.6	0.3
617	617	1000	3.9	2.5	1.2
625	625	1000	3.9	2.5	1.2
656	656	1000	2.7	2.5	1.2
680	680	600	2.7	0.5	0.2
700	700	500	2.1	0.2	90µW
720	720	600	2.2	0.3	0.1
740	740	1000	2.9	1.2	0.7
780	780	800	2.5	0.7	0.3
810	810	800	2.2	0.5	0.2
850	850	1000	2.1	1.5	0.7
870	870	700	2	1.1	0.5
940	940	1000	2.1	1.5	0.7
980	980	500	1.4	0.1	70µW
4000	warm white 4,000K	1000	3.9	1.2	0.6
5500	cool white 5,500K	1000	3.9	1.2	0.6
6500	glacier white 6,500K	1000	3.6	1.2	0.6

[1] Measured with a 400µm-core 0.22 numerical aperture (NA) fiber. Optical output power scales approximately linearly with fiber core area and NA[2].

[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

HIGH POWER LIQUID LIGHTGUIDE-COUPLED LED LIGHT SOURCES

Mightex GCS-series high power LED sources are designed for high-efficiency coupling of LED light into a liquid lightguide (LLG) or a fiber optic bundle. Virtually all lightguides with core diameters ranging from 3mm to 8mm can be used with the GCS series light source. Please note that lightguides and adapters are sold separately. GSC series also features a locking electrical connector for secured connections. GCS series are designed as a universal light source for general lab use and OEM applications. All Mightex LED drivers such as the SLC series or other LED drivers and current sources can be used to drive the GCS-series light sources. The one-piece machined aluminum alloy housing features integrated heatsinks and multiple mounting holes.

FEATURES

- High output power
- Broad wavelength selections in VIS, UV and NIR
- Interchangeable liquid lightguides or fiber bundles
- Compact, machined metal housing with integrated heat sink
- Multiple mounting features for lab and OEM applications
- Locking electrical connector

Multi-chip LED emitters have been added to the product portfolio (Type-B). Some of these 7W to 15W LEDs have total optical power exceeding 1W, quadrupling the power of a single-chip LED (Type-A). Models with higher powers (i.e. Type-B with 7W and higher) feature a cooling fan, and have a different form factor compared to other models. Power supply for the cooling fan is included in the piece of the LED sources. To drive a GCS LED source, one can use any one of the wide range of LED controllers Mightex has to offer.

PERFORMANCE SPECIFICATIONS

Type A GCS | *passive cooling*

Part Number[1]	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[2,3] (mW)
GCS-0310-03-xxxxx	DUV 310nm	310	600	5.8	2.4
GCS-0325-03-xxxxx	DUV 325nm	325	600	4.7	14
GCS-0340-02-xxxxx	DUV 340nm	340	350	4.3	12
GCS-0365-04-xxxxx	UV 365nm	365	1000	3.65	220
GCS-0380-03-xxxxx	UV 380nm, 3W	380	1000	3.2	80
GCS-0385-04-xxxxx	UV 385nm	385	1000	3.65	300
GCS-0390-03-xxxxx	UV 390nm	390	1000	3.1	165
GCS-0395-03-xxxxx	UV 395nm	395	1000	3.1	180
GCS-0400-03-xxxxx	UV 400nm, 3W	400	1000	3.1	175
GCS-0405-03-xxxxx	UV 405nm	405	1000	3	215
GCS-0410-03-xxxxx	UV 410nm	410	1000	3	210
GCS-0415-03-xxxxx	415nm	415	1000	3	210
GCS-0430-02-xxxxx	430nm	430	500	3.8	130
GCS-0455-03-xxxxx	Royal Blue	455	1000	3.0	300
GCS-0470-03-xxxxx	Blue	470	1000	3.2	130
GCS-0471-04-xxxxx	Blue	471	350	3	95
GCS-0490-01-xxxxx	490nm	490	350	3.5	85

Type A GCS | *continued*

Part Number[1]	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[2,3] (mW)
GCS-0505-04-xxxxx	Cyan	505	1000	3.9	30
GCS-0530-03-xxxxx	Green	530	1000	2.85	120
GCS-0560-02-xxxxx	560nm, broadband	560	700	2.9	120
GCS-0590-03-xxxxx	Amber	590	1000	3.2	35
GCS-0617-02-xxxxx	Red-Orange	617	700	2.3	100
GCS-0625-03-xxxxx	Red	625	1000	3	100
GCS-0700-01-xxxxx	700nm	700	500	2.1	35
GCS-0720-01-xxxxx	720nm	720	600	2.2	50
GCS-0740-03-xxxxx	740nm	740	1000	2.9	130
GCS-0810-02-xxxxx	810nm	810	800	2.2	80
GCS-0850-03-xxxxx	850nm	850	1000	3	150
GCS-0870-01-xxxxx	870nm	870	700	1.9	75
GCS-0910-2-xxxxx	910nm	910	1000	1.9	80
GCS-0940-02-xxxxx	940nm	940	1000	2.4	125
GCS-0980-1-xxxxx	980nm	980	500	1.4	20
GCS-3000-03-xxxxx	Warm White	3,000K	1000	2.8	80
GCS-4000-04-xxxxx	Warm White	4,000K	1000	3.9	95
GCS-5500-04-xxxxx	Cool White	5,500K	1000	3.9	95
GCS-6500-04-xxxxx	Glacier White	6,500K	1000	3.6	95

[1] xxxxx is the Lightguide Adapter code. Please see Table 2 on page 16.
[2] Measured at the exiting end of a 1 meter long, 3mm-core, 0.59 numerical aperture (NA) liquid lightguide.
[3] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type B GCS | *fan cooling*

Part Number[1]	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[2,3] (mW)
GCS-0365-13-xxxxx	UV 365nm, 13W	365	3500	3.85	950
GCS-0385-11-xxxxx	UV 385nm, 11W	385	700	15.5	410
GCS-0385-13-xxxxx	UV 385nm, 13W	385	3500	3.75	1180
GCS-0470-15-xxxxx	Blue, 15W	470	1000	15	400
GCS-0505-12-xxxxx	Cyan	505	1000	12.2	200
GCS-0530-15-xxxxx	Green, 15W	530	1000	15	180
GCS-0617-07-xxxxx	Red-Orange, 7W	617	700	9.6	175
GCS-0625-07-xxxxx	Red, 7W	625	700	9.6	200
GCS-3000-12-xxxxx	Warm White, 12W	3,000K	1000	12	240
GCS-5500-12-xxxxx	Cool White, 12W	5,500K	1000	12	300
GCS-6500-15-xxxxx	Glacier White, 15W	6,500K	1000	15	300

[1] xxxxx is the Lightguide Adapter code. Please see Table 2 on page 16.
[2] Measured at the exiting end of a 1 meter long, 3mm-core, 0.59 numerical aperture (NA) liquid lightguide.
[3] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.
* When ordering an LED controller for a Type-B LED, please make sure to upgrade the AC/DC power adapter from the standard 12V to 24V.

Type H GCS | *super high-power, fan cooling*

Part Number[1]	Description	Nominal Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Radiant Flux[2,3] (mW)
GCS-0365-76-xxxxx	UV 365nm, 80W	365	18	4.2	2600
GCS-0405-65-xxxxx	UV 405nm, 65W	405	18	3.6	1600
GCS-0415-65-xxxxx	Blu-Violet 415nm, 65W	415	18	3.6	1900
GCS-0470-50-xxxxx	Blue, 50W	470	13	3.8	2000
GCS-0470-61-xxxxx	Blue, 60W	470	18	3.4	2400
GCS-0525-60-xxxxx	Green, 60W	525	13	4.6	800
GCS-0525-79-xxxxx	Green, 80W	525	18	4.4	950
GCS-0560-68-xxxxx	560nm Broadband, 70W	560	18	3.8	1900
GCS-0625-38-xxxxx	Red, 38W	625	13	2.9	1700
GCS-0560-68-xxxxx	560nm Broadband, 70W	560	18	3.8	1900
GCS-0625-38-xxxxx	Red, 38W	625	13	2.9	1700
GCS-0625-42-xxxxx	Red, 42W	625	18	2.3	2100
GCS-0730-77-xxxxx	NIR, 80W	730	18	5.9	1100
GCS-0780-65-xxxxx	NIR, 65W	780	18	3.6	1400
GCS-0850-68-xxxxx	NIR, 70W	850	18	3.75	2100
GCS-6500-33-xxxxx	Glacier White, 30W	6,500K	9	3.7	1200
GCS-6500-65-xxxxx	Glacier White, 65W	6,500K	18	3.7	2200

[1] xxxxx is the Lightguide Adapter code. Please see Table 2 on page 16.
[2] Measured at the exiting end of a 1 meter long, 3mm-core, 0.59 numerical aperture (NA) liquid lightguide. Maximum CW output achievable with a BLS-13000-1E or BLS-18000-1 control module accordingly.
[3] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Table 2 | Liquid Lightguide Adapters (for type-A GCS LEDs only)

Adapter Code	Ferrule Diameter (mm)	Ferrule Length (mm)
A0510	5	≥10
A0610	6	≥10
A0710	7	≥10
A0810	8	≥10
A0815	8	≥15

HIGH POWER COLLIMATED LED SOURCES

An LED collimator consists of a collimating lens and an LED emitter. The LED emitter is placed at the focal plane of the collimating lens. The collimating lens thus images the LED emitter into infinity. Mightex LED collimators employ a high-NA aspherical collimating lens for precision collimation and high light throughput. LED collimators can be used as the light source in an illumination system. For example LED collimators can replace the standard lamp assembly in a microscope to provide stable, intense, and fast-modulated illumination. Typically the rest of the illumination optics will image the LED emitter onto the pupil of the imaging optics whereas the lens aperture on the collimator where intensity is uniform will be projected onto the object. In other illumination applications a similar arrangement should be made to produce uniform and efficient illumination.

FEATURES

- Interchangeable aspherical collimating lens
- High numerical aperture (NA)
- High power (up to 50W)
- Wide range of available wavelengths
- Adjustable focus
- Optional focusing module
- Optional lightguide adapter
- Multiple mounting features for lab and OEM applications
- Integrated heat sink
- Cooling fan for >7W models

APPLICATIONS

- Microscope illuminator
- General purpose light source
- Fiber coupling (with optional focusing module)

The LED emitters are mounted directly onto the metal base of the collimator which also features an integrated heat sink. This configuration minimizes thermal resistance between the LED emitter and the heat sink resulting in better heat dissipation. The collimating lens can be adjusted if needed for precise collimation. A locking ring fixes the lens position after adjustment. The collimators have been pre-adjusted in the factory.

Multi-chip LED emitters have been added to the product portfolio. Some of these 7W to 15W LEDs have total optical power exceeding 1W, quadrupling the power of a single-chip LED. Models with higher powers (7W and higher) feature a cooling fan, and have a different formfactor compared to other models. Please examine the installation drawings carefully. Power supply for the cooling fan is included in the price of the LED collimator sources.
The LED collimators include a 1.5-meter cable with two bare-wire terminals at the end.

The light sources can be driven by Mightex LED controllers or other LED controllers and current sources. An optional focusing module can be mounted on the front of the LED collimator to focus light into a tight spot which is an image of the LED emitter. One of the applications with the focusing module is coupling LED light into a fiber or a light guide.

Additional interchangeable collimating lenses are available to produce different beam sizes with the same light source.

PERFORMANCE SPECIFICATIONS

Type-A Deep UV LCS

Part Number	Nominal Wavelength (nm)	Beam Diameter (mm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
LCS-0265-02-23	265	23	1	350	6.3	20
LCS-0275-04-23	275	23	1	600	6	35
LCS-0280-03-23	280	23	1	500	5.8	30
LCS-0285-03-23	285	23	1	500	5.8	35
LCS-0295-03-23	295	23	1	600	5.8	25
LCS-0300-03-23	300	23	1	500	6	25
LCS-0310-03-23	310	23	1	350	5.8	30
LCS-0325-03-23	325	23	1	500	5.4	15
LCS-0340-02-22	340	22	1.7	500	4.3	23

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type-D Deep UV LCS

Part Number	Nominal Wavelength (nm)	Beam Diameter (mm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (µW)
LCS-0255-0020-20	255	20	0.6	30	6.5	150
LCS-0295-0015-20	295	20	0.6	30	5.5	250
LCS-0310-0015-20	310	20	0.6	30	5.5	300
LCS-0340-0200-20	340	20	0.6	500	4.3	17mW

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type A LCS | *passively cooled*

Part Number	Nominal Wavelength (nm)	Half Diverging Angle (deg.)				I_{op} (mA)	V_{op} (V)	Typical Output Power[2] (mW)
		φ11mm[1]	φ22mm[1]	φ38mm[1]	φ48mm[1]			
LCS-0365-04-xx	365	6.8	3.4	2	1.5	1000	3.65	350
LCS-0385-04-xx	385	6.8	3.4	2	1.5	500	15	500
LCS-0395-03-xx	395	3.4	1.7	1	0.75	1000	3.1	270
LCS-0400-01-xx	400	5	2.5	1.5	1.1	350	3.5	100
LCS-0400-03-xx	400	3.4	1.7	1	0.75	1000	3.1	265
LCS-0400-04-xx	400	3.4	1.7	1	0.75	1000	3.5	750
LCS-0405-03-xx	405	3.4	1.7	1	0.75	1000	3	325
LCS-0410-03-xx	410	3.4	1.7	1	0.75	1000	3	315

Type A LCS | *continued*

Part Number	Nominal Wavelength (nm)	Half Diverging Angle (deg.)				I_{op} (mA)	V_{op} (V)	Typical Output Power[2] (mW)
		φ11mm[1]	φ22mm[1]	φ38mm[1]	φ48mm[1]			
LCS-0415-03-xx	415	3.4	1.7	1	0.75	1000	3	310
LCS-0430-02-xx	430	3.4	1.7	1	0.75	500	3.8	190
LCS-0455-03-xx	455	3.4	1.7	1	0.75	1000	3.0	500
LCS-0470-03-xx	470	3.4	1.7	1	0.75	1000	3.9	200
LCS-0471-02-xx	471	3.4	1.7	1	0.75	350	3	140
LCS-0490-01-xx	490	3.4	1.7	1	0.75	350	3.5	140
LCS-0505-03-xx	505	3.4	1.7	1	0.75	1000	3.9	135
LCS-0530-03-xx	530	3.4	1.7	1	0.75	1000	3.9	100
LCS-0560-03-xx	560 broadband	4.4	2.2	1.3	1	1000	2.9	240
LCS-0585-03-xx	585 broadband	4.4	2.2	1.3	1	700	2.9	82
LCS-0590-03-xx	590	3.4	1.7	1	0.75	1000	3.9	65
LCS-0617-03-xx	617	3.4	1.7	1	0.75	1000	3.9	150
LCS-0625-03-xx	625	3.4	1.7	1	0.75	1000	3.9	280
LCS-0656-03-xx	656	3.4	1.7	1	0.75	1000	3.1	280
LCS-0657-01-xx	657	5	2.5	1.5	1.1	350	2.4	100
LCS-0680-02-x	680	3.4	1.7	1	0.75	600	2.7	75
LCS-0700-01-xx	700	3.4	1.7	1	0.75	500	2.1	51
LCS-0720-01-xx	720	3.4	1.7	1	0.75	600	2.2	73
LCS-0740-03-xx	740	5	2.5	1.5	1.1	1000	2.5	200
LCS-0780-02-xx	780	3.4	1.7	1	0.75	800	2.5	110
LCS-0810-02-xx	810	3.4	1.7	1	0.75	800	2.2	120
LCS-0850-02-xx	850	3.4	1.7	1	0.75	1000	2.1	240
LCS-0850-03-xx	850	3.4	1.7	1	0.75	1000	3	430
LCS-0870-01-xx	870	3.4	1.7	1	0.75	700	1.9	110
LCS-0910-02-xx	910	3.4	1.7	1	0.75	1000	1.9	120
LCS-0940-02-xx	940	3.4	1.7	1	0.75	1000	1.8	200
LCS-0980-01-xx	980	3.4	1.7	1	0.75	500	1.4	30
LCS-3000-03-xx	warm white 3,000K	3.4	1.7	1	0.75	1000	2.8	150
LCS-4000-03-xx	warm white 4,000K	3.4	1.7	1	0.75	1000	3.9	180
LCS-5500-03-xx	cool white 5,500K	3.4	1.7	1	0.75	1000	3.9	170
LCS-6500-03-xx	glacier white 6,500K	3.4	1.7	1	0.75	1000	3.6	180

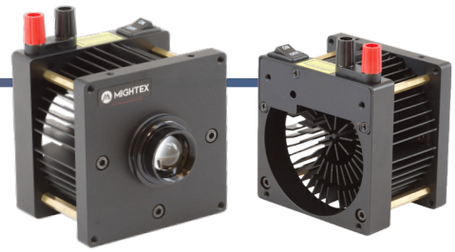
[1] Clear aperture diameter. Use these two-digit numbers to replace xx in the part number.
[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type B LCS | *fan cooling*

Part Number	Nominal Wavelength (nm)	Half Diverging Angle (deg.)				I_{op} (mA)	V_{op} (V)	Typical Output Power[2] (mW)
		φ11mm[1]	φ22mm[1]	φ38mm[1]	φ48mm[1]			
LCS-0365-13-xx	365	6.8	3.4	2	1.5	3500	3.85	1200
LCS-0380-13-xx	380	6.8	3.4	2	1.5	1000	12.8	360
LCS-0385-07-xx	385	6.8	3.4	2	1.5	500	15	500
LCS-0385-11-xx	385	6.8	3.4	2	1.5	700	15.5	625
LCS-0385-13-xx	385	6.8	3.4	2	1.5	3500	3.75	1500
LCS-0390-12-xx	390	6.8	3.4	2	1.5	1000	12.4	750
LCS-0395-12-xx	395	6.8	3.4	2	1.5	1000	12.4	810
LCS-0400-12-xx	400	6.8	3.4	2	1.5	1000	12.4	795
LCS-0400-17-xx	400	10	5	3	2.2	1000	16.5	810
LCS-0405-12-xx	405	6.8	3.4	2	1.5	1000	12	975
LCS-0410-12-xx	410	6.8	3.4	2	1.5	1000	12	945
LCS-0415-12-xx	415	6.8	3.4	2	1.5	1000	12	930
LCS-0420-12-xx	420	6.8	3.4	2	1.5	1000	12	930
LCS-0425-12-xx	425	6.8	3.4	2	1.5	1000	12	870
LCS-0470-14-xx	470	3.4	1.7	1	0.75	3000	4.6	860
LCS-0470-15-xx	470	6.8	3.4	2	1.5	1000	15	600
LCS-0505-12-xx	505	6.8	3.4	2	1.5	1000	12.2	250
LCS-0530-15-xx	530	6.8	3.4	2	1.5	1000	15	300
LCS-0540-14-xx	540 broadband	4.4	2.2	1.3	1	3000	4.6	500
LCS-0590-05-xx	590	10	5	3	2.2	500	9.5	190
LCS-0617-10-xx	617	6.8	3.4	2	1.5	1000	10.8	250
LCS-0625-07-xx	625	6.8	3.4	2	1.5	700	9.6	600
LCS-0656-07-xx	656	8.8	4.4	2.6	2	700	9.6	800
LCS-0740-10-xx	740	10	5	3	2.2	1000	9.5	600
LCS-3000-12-xx	warm white 3,000K	6.8	3.4	2	1.5	1000	12	430
LCS-5500-12-xx	cool white 5,500K	6.8	3.4	2	1.5	1000	12	540
LCS-6500-15-xx	glacier white 6,500K	6.8	3.4	2	1.5	1000	15	540

[1] Clear aperture diameter. Use these two-digit numbers to replace xx in the part number.
[2] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.
* When ordering an LED controller for a Type-B LED, please make sure to upgrade the AC/DC power adapter from the standard 12V to 24V.

Type J LCS | *high-power, passively cooled*



Part Number	Nominal Wavelength (nm)	Half Diverging Angle (deg.)				I_{op} (mA)	V_{op} (V)	Typical Output Power[2,3] (mW)
		φ11mm[1]	φ22mm[1]	φ38mm[1]	φ48mm[1]			
LCS-0365-13-22-J	365	NA	1.4	NA	NA	3500	3.85	1200
LCS-0470-14-22-J	470	NA	1.7	NA	NA	3000	4.6	860
LCS-0530-12-22-J	530	NA	1.4	NA	NA	2400	4.9	290
LCS-0540-14-22-J	540	NA	2.2	NA	NA	3000	4.6	500
LCS-0625-07-22-J	625	NA	1.4	NA	NA	2400	2.9	260

[1] Clear aperture diameter. Use these two-digit numbers to replace xx in the part number.
[2] Maximum CW output achievable with a BLS-3000-2 BioLED control module.
[3] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type H LCS | *super high-power, fan cooling*

Part Number	Nominal Wavelength (nm)				I_{op} (A)	V_{op} (V)	Typical Output Power[2,3] (mW)
		φ22mm[1]	φ38mm[1]	φ48mm[1]			
LCS-0365-76-xx	365	5	3	2.2	18	3.9	10000
LCS-0405-65-xx	405	5	3	2.2	18	3.6	8300
LCS-0405-89-xx	405	5	3	2.2	24	3.7	9900
LCS-0415-65-xx	415	5	3	2.2	18	3.6	6000
LCS-0470-50-xx	470	5	3	2.2	13	3.8	6300
LCS-0470-61-xx	470	5	3	2.2	18	3.4	7500
LCS-0470-92-xx	470	5	3	2.2	27	3.4	9000
LCS-0525-60-xx	525	5	3	2.2	13	4.6	1300
LCS-0525-79-xx	525	5	3	2.2	18	4.4	1560
LCS-0560-68-xx	560 Broadband	5	3	2.2	18	3.8	3500
LCS-0560-84-xx	560 Broadband	5	3	2.2	22	3.8	3800
LCS-0625-38-xx	625	5	3	2.2	13	2.9	1100
LCS-0625-42-xx	625	5	3	2.2	18	2.3	3300
LCS-0730-77-xx	730	5	3	2.2	18	5.9	3500
LCS-0780-65-xx	780	5	3	2.2	18	3.6	4400
LCS-0850-68-xx	850	5	3	2.2	18	3.75	5500
LCS-6500-33-xx	glacier white, 6,500K	5	3	2.2	9	3.7	2000
LCS-6500-65-xx	glacier white, 6,500K	5	3	2.2	18	3.7	3500

[1] Clear aperture diameter. Use these two-digit numbers to replace xx in the part number.
[2] Maximum CW output achievable with a matching BLS-13000-1E or a BLS-18000-1 BioLED control module accordingly.
[3] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

MULTIWAVELENGTH COLLIMATED LED SOURCES

Mightex multiwavelength collimated LED light sources are designed to be modular and allow end users the flexibility of building custom configurations that will best suit their application needs. Our LCS series LED light sources can be combined using Mightex's multiwavelength beam combiners and secured together using our connecting plates. Liquid lightguide or microscope adaptors can be added to the end of the exiting aperture to either change the output beam format or couple the system to a microscope respectively. Please see more information about our beam combiners, connecting plates, and adapters in our LED light sources Accessories section on page 34. Multiwavelength collimated LED sources can be largely categorized into two groups depending on configuration geometry:

FEATURES

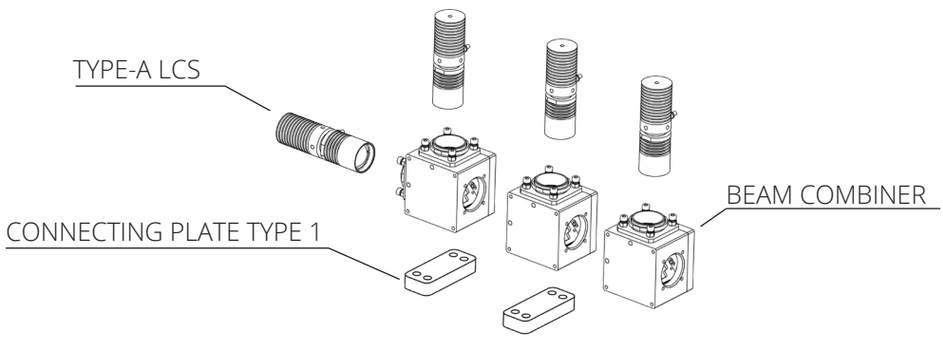
- Custom reconfigurable wavelengths and geometry
- 2 to 8 (or more) LED emitters, UV/VIS/NIR
- No moving parts
- Collimated beam, with optional lightguide adapter
- Optional microscope adapters

CONFIGURATIONS

Straight-through Configuration

Each additional LED/wavelength is added to the assembly in series, and hence the first LED/wavelength will have the longest optical path length while the last LED/wavelength will have the shortest.

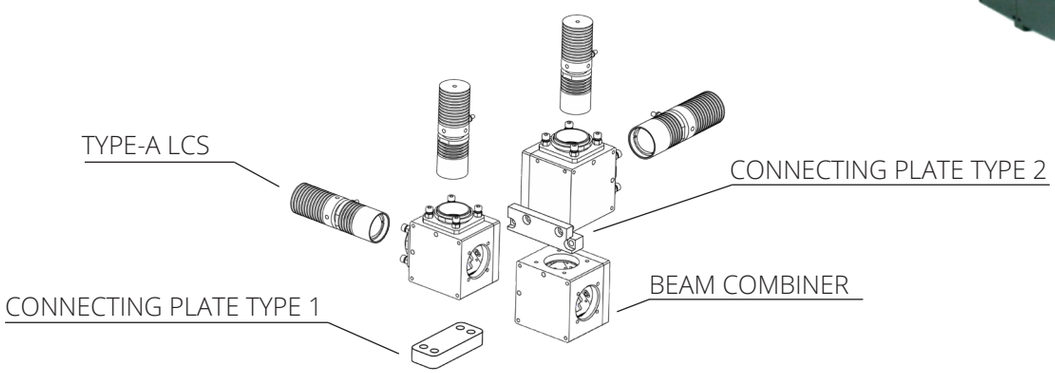
EXAMPLE



Equal-path Configuration

All LEDs/wavelengths have equal optical path length at the output.

EXAMPLE



LOW COST LED SPOTLIGHTS

High-power LEDs are a new class of light sources that have numerous applications in industrial, consumer, medical, and scientific fields. However, engineers and scientists often find that they have to design, fabricate heat sinks, optical mounts and solder electrical contacts before they can light up a high-power LED. Mightex provides ready-to-use high-power LED light sources with integrated heat sinks and mounted collecting optics. SiriusTM compact high-power light sources are designed as a universal light source for general lab use and OEM applications. The mechanical housing features multiple mounting holes compatible to common opto-mechanical mounts. SiriusTM light sources can be driven by Mightex's SiriusTM SLC-series multi-channel LED drivers or other LED drivers and current sources.

FEATURES

- 1W and 3W high-power emitters
- High-efficiency collecting optics
- Precision machined aluminum housing
- Multiple mounting features for lab and OEM applications
- Round and oval illumination profiles

PERFORMANCE SPECIFICATIONS

SLS Series LED |

Part Number	Wavelength (nm)	Description	I_{op} (mA)	V_{op} (V)	Typical Luminous Flux[4] (lm)
SLS-0109-X[1]	395 ~ 410	1W UV	350	3.5	180 mW
SLS-0300-X	5,500K	3W White LED	1000	3.9	80
SLS-0309-X[2]	395 ~ 410	3W UV	700	3.5	350 mW
SLS-0301-X	455	W Royal Blue	1000	3.9	450 mW
SLS-0302-X	470	3W Blue	1000	3.9	30
SLS-0303-X	505	3W Cyan	1000	3.9	80
SLS-0304-X	530	3W Green	1000	3.9	80
SLS-0305-X	590	3W Amber	1000	3	80
SLS-0306-X	617	3W Red-Orange	1000	3	90
SLS-0307-X	625	3W Red	1000	3	80
SLS-0310-X	657	3W Deep Red	1000	3.1	280 mW
SLS-0208-X[3]	850	2.4W Near Infrared	1000	1.8 ~ 2.4	375 mW
SLS-0300-X	5,500K	3W White LED	1000	3.9	80

[1] x represents the lens code. Please see table 3 below for the lens code description.
[2] Emitter consists of two dies. Divergence angle approximately doubles along one direction when used with collecting optics.
[3] Without collecting optics, this LED emits light from a 1mm x 1mm area onto a 60 degree cone.
[4] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Table 3 | Collecting Optics Specifications

Lens Code	Description	Clear Aperture (mm)	X-Half Angle (degree)	Y-Half Angle (degree)	Efficiency (%)
A	Narrow Beam	19	5	5	85
B	Medium Beam	19	15	15	85
C	Wide Beam	19	25	25	85
D	Oval Beam	19	5	20	85
E[1]	Fiber Bundle Coupling	19	7mm Full Field	7mm Full Field	85

[1] Focuses light into a spot approximately 12 mm in front of the lens. Ideal for coupling light into fiber bundles, liquid lightguides and integrators.

PRECISION LED SPOTLIGHTS WITH UNIFORM ILLUMINATION

Mightex precision LED spotlight consists of a state-of-the-art high-power LED emitter and a proprietary high-NA multi-element aspherical optical system. The result is a high-power, uniform illumination spot with a highly-delineated edge.

FEATURES

- Uniform illumination spot with a highly delineated edge
- High output power
- Multi-element aspherical optics
- Wide range of available wavelengths
- Adjustable focus
- Multiple mounting features for lab and OEM applications
- Integrated heatsink

Mightex PLS-series precision LED spotlights are a general-purpose light source that can be used where uniform and high-intensity illumination is required. The projection lens at the front of the spotlight can be slid and locked to focus the illumination pattern at different working distances. With the standard projection lens the spot diameter is linearly proportional to the working distance.

The LED emitters are mounted directly on the metal base of the light source which also features an integrated heatsink. This configuration minimizes thermal resistance between the LED emitter and the heatsink resulting in better heat dissipation.

Multi-chip LED emitters (i.e. Type-B) have been added to the product portfolio. Some of these 7W to 15W LEDs have total optical power exceeding 500mW, doubling the power of a single-chip LED. Such Type-B models with higher powers (7W and higher) feature a cooling fan, and have a different form factor compared to Type-A models. Please examine the installation drawings carefully. Power supply for the cooling fan is included in the price of the Type-B precision LED spotlights.

The precision LED spotlight includes a 2-meter cable with two bare-wire terminals at the end. The light sources can be driven by Mightex's LED controllers, or other LED controllers and current sources.

PLS STANDARD RANGE

PLS high-uniformity, precision standard range LEDs have a minimum working distance of 100mm, being able to produce a 30mm diameter spot at such distance. Spot diameter scales linearly with working distance.

Key Features

- **100mm minimum working distance**

PERFORMANCE SPECIFICATIONS

Type A PLS Standard | *passively cooled*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0340-030-02-S	340	500	4.3	11
PLS-0365-030-04-S	365	1000	3.65	250
PLS-0380-030-03-S	380	1000	3.2	65
PLS-0385-030-04-S	385	1000	3.65	250
PLS-0390-030-03-S	390	1000	3.1	140

Type A PLS Standard | *continued*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0395-030-03-S	395	1000	3.1	150
PLS-0400-030-S	400	350	3.5	50
PLS-0400-030-03-S	400	1000	3.1	150
PLS-0400-030-04-S	400	350	3.5	50
PLS-0405-030-03-S	405	1000	3	180
PLS-0410-030-03-S	410	1000	3	175
PLS-0415-030-03-S	415	1000	3	120
PLS-0430-030-02-S	430	500	3.8	100
PLS-0455-030-S	455	1000	3.9	150
PLS-0470-030-S	470	1000	3.9	110
PLS-0471-030-02-S	471	350	3	75
PLS-0490-030-01-S	490	350	3.5	80
PLS-0505-030-S	505	1000	3.9	65
PLS-0530-030-S	530	1000	3.9	50
PLS-0560-030-02-S	560 broadband	700	2.9	95
PLS-0590-030-S	590	1000	3.9	35
PLS-0617-030-S	617	1000	3.9	80
PLS-0625-030-S	625	1000	3.9	150
PLS-0656-030-S	656	1000	3.9	180
PLS-0680-030-S	680	600	2.7	20
PLS-0700-030-01-S	700	500	2.1	27
PLS-0720-030-01-S	720	600	2.2	39
PLS-0740-030-03-S	740	1000	2.5	100
PLS-0780-030-S	780	800	2.5	60
PLS-0810-030-02-S	810	800	2.2	65
PLS-0850-030-S	850	1000	2.1	85
PLS-0870-030-01-S	870	700	1.9	60
PLS-0910-030-02-S	910	1000	1.9	60
PLS-0940-030-S	940	700	1.5	50
PLS-0980-030-01-S	980	500	1.4	16
PLS-3000-030-S	Warm white 3,000K	1000	2.8	70
PLS-4000-030-S	Warm white 4,000K	1000	3.9	85
PLS-5500-030-S	Cool white 5,500K	1000	3.9	85
PLS-6500-030-S	Glacier white 6,500K	1000	3.6	100

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type B PLS Standard | *fan cooling*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0365-030-13-S	365	3500	3.85	720
PLS-0385-030-07-S	385	500	15	300
PLS-0385-030-11-S	385	700	15.5	375
PLS-0385-030-13-S	385	3500	3.75	900
PLS-0400-030-17-S	400	1000	16.6	400
PLS-0470-030-14-S	470	3000	4.6	650
PLS-0470-030-15-S	470	1000	15	450
PLS-0505-030-12-S	505	1000	12.2	185
PLS-0530-030-15-S	530	1000	15	200
PLS-0540-030-14-S	540 broadband	3000	4.6	260
PLS-0590-030-05-S	590	500	9.5	130
PLS-0617-030-10-S	617	1000	10.8	200
PLS-0625-030-07-S	625	700	9.6	315
PLS-0656-030-07-S	656	700	9.6	420
PLS-0740-030-10-S	740	1000	9.5	300
PLS-3000-030-12-S	Warm white 3,000K	1000	12	320
PLS-5500-030-12-S	Cool white 5,500K	1000	12	400
PLS-6500-030-15-S	Glacier white 6,500K	1000	15	400

* When ordering an LED controller for a Type-B LED, please make sure to upgrade the AC/DC power adapter from the standard 12V to 24V.

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type H PLS Standard | *super high-power, fan cooling*

Part Number	Wavelength (nm)	I_{op} (A)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0365-030-76-S	365	18	4.2	2200
PLS-0405-030-65-S	405	13	3.6	1400
PLS-0405-030-89-S	405	18	3.7	1700
PLS-0415-030-65-S	415	13	3.8	1700
PLS-0470-030-50-S	470	13	3.8	1850
PLS-0470-030-61-S	470	18	3.4	2150
PLS-0470-030-92-S	470	27	3.4	2500
PLS-0525-030-60-S	525	13	4.6	715
PLS-0525-030-79-S	525	18	4.3	850
PLS-0560-030-68-S	560 Broadband	18	3.8	1800
PLS-0560-030-84-S	560 Broadband	22	3.8	3100
PLS-0625-030-38-S	625	13	2.9	605
PLS-0625-030-42-S	625	18	2.3	1800
PLS-0730-030-77-S	730	18	5.9	1900
PLS-0780-030-65-S	780	18	3.6	1250
PLS-0850-030-68-S	850	18	3.75	4400
PLS-6500-030-33-S	6,500K, 30W	9	3.7	1100
PLS-6500-030-65-S	6,500K, 65W	18	3.7	2000

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

PLS CLOSE RANGE

PLS high-uniformity, precision close range LEDs have a minimum working distance of 75mm, being able to produce a 10mm diameter spot at such distance. These LEDs also have a maximum working distance of 100mm, producing a spot 17mm in diameter.

Key Features

- **75mm minimum working distance**
- **100mm maximum working distance**

PERFORMANCE SPECIFICATIONS

Type A PLS Close Range | *passively cooled*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0340-010-02-C	340	500	4.3	11
PLS-0365-010-04-C	365	1000	3.65	180
PLS-0380-010-03-C	380	1000	3.2	65
PLS-0385-010-04-C	385	1000	3.65	250
PLS-0390-010-03-C	390	1000	3.1	140
PLS-0395-010-03-C	395	1000	3.1	150
PLS-0400-010-03-C	400	1000	3.1	150
PLS-0400-010-04-C	400	1000	3.5	380
PLS-0405-010-03-C	405	1000	3.1	180
PLS-0410-010-03-C	410	1000	3.1	175
PLS-0415-010-03-C	415	1000	3.1	120
PLS-0430-010-02-C	430	500	3.8	100
PLS-0455-010-C	455	1000	3.9	150
PLS-0470-010-C	470	1000	3.9	110
PLS-0471-010-02-C	471	350	3	75
PLS-0490-010-01-C	490	350	3.5	80
PLS-0505-010-C	505	1000	3.9	65
PLS-0530-010-C	530	1000	3.9	50
PLS-0560-010-02-C	560 broadband	700	2.9	95
PLS-0590-010-C	590	1000	3.9	35
PLS-0617-010-C	617	1000	3.9	80
PLS-0625-010-C	625	1000	3.9	90
PLS-0656-010-C	656	1000	3.9	180
LS-0680-010-02-	680	600	2.7	20
PLS-0700-010-01-C	700	500	2.1	27
PLS-0720-010-01-C	720	600	2.2	39
PLS-0740-010-03-C	740	1000	2.5	100
PLS-0780-010-C	780	800	2.5	60
PLS-0810-010-02-C	810	800	2.2	65
PLS-0850-010-C	850	1000	2.1	85
PLS-0870-010-01-C	870	700	1.9	60
PLS-0910-010-02-C	910	1000	1.9	60
PLS-0940-010-C	940	700	1.5	50

Type A PLS Close Range | *continued*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0980-010-01-C	980	500	1.4	16
PLS-3000-010-C	Warm white 3,000K	1000	2.8	70
PLS-4000-010-C	Warm white 4,000K	1000	3.9	85
PLS-5500-010-C	Cool white 5,500K	1000	3.9	85
PLS-6500-010-C	Glacier white 6,500	1000	3.6	100

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type B PLS Close Range | *fan cooling*

Part Number	Wavelength (nm)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0365-010-13-C	365	3500	3.85	720
PLS-0385-010-07-C	385	500	15	300
PLS-0385-010-11-C	385	700	15.5	375
PLS-0385-010-13-C	385	3500	3.75	900
PLS-0400-010-17-C	400	1000	16.6	400
PLS-0470-010-14-C	470	3000	4.6	650
PLS-0470-010-15-C	470	1000	15	450
PLS-0505-010-12-C	505	1000	12.2	185
PLS-0530-010-15-C	530	1000	15	200
PLS-0540-010-14-C	540 broadband	3000	4.6	260
PLS-0590-010-05-C	590	500	9.5	130
PLS-0617-010-10-C	617	1000	10.8	200
PLS-0625-010-07-C	625	700	9.6	155
PLS-0656-010-07-C	656	700	9.6	420
PLS-0740-010-10-C	740	1000	9.5	300
PLS-3000-010-12-C	Warm white 3,000K	1000	12	320
PLS-5500-010-12-C	Cool white 5,500K	1000	12	400
PLS-6500-010-15-C	Glacier white 6,500K	1000	15	400

* When ordering an LED controller for a Type-B LED, please make sure to upgrade the AC/DC power adapter from the standard 12V to 24V.
[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

Type H PLS Close Range | *super high-power, fan cooling*

Part Number	Wavelength (nm)	I_{op} (A)	V_{op} (V)	Typical Output Power[1] (mW)
PLS-0365-010-76-C	365	18	4.2	640
PLS-0405-010-65-C	405	18	3.6	420
PLS-0405-010-89-C	405	24	3.7	500
PLS-0415-010-65-C	415	18	3.6	600
PLS-0470-010-50-C	470	13	3.8	630
PLS-0470-010-61-C	470	18	3.4	750
PLS-0470-010-92-C	470	27	3.4	900
PLS-0525-010-60-C	525	13	4.6	240
PLS-0525-010-79-C	525	18	4.4	280
PLS-0560-010-68-C	560 broadband	18	3.8	950
PLS-0560--010-84-C	560 broadband	22	3.8	1000
PLS-0625-010-38-C	625	13	2.9	200
PLS-0730-010-77-C	730	18	5.9	650
PLS-0780-010-65-C	780	18	3.6	440
PLS-6500-010-33-C	Glacier White 6,500K	9	3.7	400
PLS-6500-010-65-C	Glacier white 6,500K	18	3.7	680

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

WHEELED™ WAVELENGTH-SWITCHABLE LED SOURCES

Many applications require wavelength-switchable sources. For example, in vision applications, different types of objects may require different illumination wavelengths for optimized contrast. Mightex WHEELED™ wavelength-switchable LED sources let users switch between a selection of LED sources with different wavelengths and/or white LEDs. A wide range of wavelengths and white LEDs are available for users to choose from. The selected LEDs are installed in the light source chassis during assembly. Users can then choose between 2 LED switching options: manually turning a hand wheel or via software with a motorized carrier.

FEATURES

- Up to 10 LED emitters
- Wide range of available wavelengths: UV/VIS/NIR and white
- Standard 22mm-diameter collimating optics
- Optional focusing module
- Optional fiber-coupling optics
- Optional lightguide-coupling optics
- Optional LED controllers

A high-NA aspherical collimating optics is included for precision collimation and high light throughput. The clear aperture of the optics is 22mm in diameter. Other optional optics may be added for fiber/lightguide coupling and other functions. Over-current protection is built into the light source to prevent potential damage during switching. An optional focusing module can be mounted on the front of the LED collimator to focus light into a tight spot (which is an image of the LED emitter). One of the applications of the focusing module is coupling LED light into a fiber or a lightguide.

MANUAL SWITCHING

This WLS-series WHEELED™ mounts up to 9 LEDs of different wavelengths on a hand wheel which can be manually turned to switch from LED to LED. The light source includes a 5-ft electrical cable with a connector on one end to be plugged into the light source, and two bare-wire terminals at the other end. The light sources can be driven by Mightex LED controllers or other LED controllers and current sources. Only a single driving channel is required because at any time only one wavelength is powered up.

Key Features

- **Up to 9 LED emitters**
- **Wide range of available wavelengths: UV/VIS/NIR and white**
- **Standard 22mm-diameter collimating optics**
- **Optional focusing module**
- **Optional fiber-coupling optics**
- **Optional lightguide-coupling optics**
- **Optional LED controllers**

PERFORMANCE SPECIFICATIONS

WLS Series LED |

WLS-22-A | Chassis for WheeLED Source

Part Number	Wavelength (nm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
WLS-LED-0340-02	340	3.4	350	4.3	23
WLS-LED-0365-04	365	3.4	1000	3.65	350
WLS-LED-0385-04	385	3.4	1000	3.65	500
WLS-LED-0400-01	400	2.5	350	3.5	100

PERFORMANCE SPECIFICATIONS | *continued*

Part Number	Wavelength (nm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
WLS-LED-0400-04	400	1.7	1000	3.5	750
WLS-LED-0405-03	405	1.7	1000	3	325
WLS-LED-0410-03	410	1.7	1000	3	315
WLS-LED-0415-03	415	1.7	1000	3	310
WLS-LED-0420-03	420	1.7	1000	3	310
WLS-LED-0425-03	425	1.7	1000	3	290
WLS-LED-0656-03	656	1.7	1000	2.7	280
WLS-LED-0680-02	680	1.7	600	2.7	75
WLS-LED-0740-03	740	2.5	1000	2.5	200
WLS-LED-0780-02	780	1.7	800	2.5	110
WLS-LED-0810-02	810	1.7	800	2.2	120
WLS-LED-0850-03	850, 3W	1.7	1000	3	430
WLS-LED-0455-03	455	1.7	1000	3.9	280
WLS-LED-0470-03	470	1.7	1000	3.9	200
WLS-LED-0490-01	490	1.7	350	3.5	140
WLS-LED-0505-03	505	1.7	1000	3.9	135
WLS-LED-0530-03	530	1.7	1000	3.9	100
WLS-LED-0560-02	560 broadband	1.7	700	2.9	180
WLS-LED-0560-03	560 broadband	2.2	1000	2.9	240
WLS-LED-0590-03	590	1.7	1000	3.9	65
WLS-LED-0617-03	617	1.7	1000	3.9	280
WLS-LED-0625-03	625	1.7	1000	3.9	280
WLS-LED-0656-03	656	1.7	1000	2.7	280
WLS-LED-0680-02	680	1.7	600	2.7	75
WLS-LED-0740-03	740	2.5	1000	2.5	200
WLS-LED-0780-02	780	1.7	800	2.5	110
WLS-LED-0810-02	810	1.7	800	2.2	120
WLS-LED-0850-03	850, 3W	1.7	1000	3	430
WLS-LED-0870-01	870	1.7	700	1.9	110
WLS-LED-0940-01	940	1.7	700	1.5	100
WLS-LED-0940-02	940	1.7	1000	1.8	200
WLS-LED-0980-01	980	1.7	500	1.4	30
WLS-LED-4000-03	warm white 4,000K	1.7	1000	3.9	180
WLS-LED-5500-03	cool white 5,500K	1.7	1000	3.9	170
WLS-LED-6500-03	glacier white 6,500K	1.7	1000	3.6	180

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

MOTORIZED SWITCHING

This WLS-series WHEELED™ mounts up to 10 LEDs of different wavelengths on a motorized wheel which can be turned electronically via software. The motorized WheeLEDTM has a built-in LED driver that provides the necessary current for each emitter. LED intensity can be modulated via a 0-5V external analog trigger via a BNC connector port.

Key Features

- **Up to 10 LED emitters**
- **Wide range of available wavelengths: UV/VIS/NIR and white**
- **Standard 22mm-diameter collimating optics**
- **Switch wavelength by PC software GUI or by SDK**
- **Control output intensity by PC software GUI, by SDK, or by external 0-5V analog voltage input**
- **Optional focusing module**
- **Optional lightguide-coupling optics**
- **Optional fiber-coupling optics**

PERFORMANCE SPECIFICATIONS

WLS Series LED |

WLS-22-M | Chassis for Motorized WheeLED Source

Part Number	Wavelength (nm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
WLS-LED-0340-02	340	3.4	350	4.3	23
WLS-LED-0365-04	365	3.4	1000	3.65	350
WLS-LED-0385-04	385	3.4	1000	3.65	500
WLS-LED-0400-01	400	2.5	350	3.5	100
WLS-LED-0400-04	400	1.7	1000	3.5	750
WLS-LED-0405-03	405	1.7	1000	3	325
WLS-LED-0410-03	410	1.7	1000	3	315
WLS-LED-0415-03	415	1.7	1000	3	310
WLS-LED-0420-03	420	1.7	1000	3	310
WLS-LED-0425-03	425	1.7	1000	3	290
WLS-LED-0455-03	455	1.7	1000	3.9	280
WLS-LED-0470-03	470	1.7	1000	3.9	200
WLS-LED-0490-01	490	1.7	350	3.5	140
WLS-LED-0505-03	505	1.7	1000	3.9	135
WLS-LED-0530-03	530	1.7	1000	3.9	100
WLS-LED-0560-02	560 broadband	1.7	700	2.9	180
WLS-LED-0560-03	560 broadband	2.2	1000	2.9	240
WLS-LED-0590-03	590	1.7	1000	3.9	65
WLS-LED-0617-03	617	1.7	1000	3.9	280
WLS-LED-0625-03	625	1.7	1000	3.9	280

WLS Series LED | *continued*

Part Number	Wavelength (nm)	Half Diverging Angle (deg.)	I_{op} (mA)	V_{op} (V)	Typical Output Power[1] (mW)
WLS-LED-0870-01	870	1.7	700	1.9	110
WLS-LED-0940-01	940	1.7	700	1.5	100
WLS-LED-0940-02	940	1.7	1000	1.8	200
WLS-LED-0980-01	980	1.7	500	1.4	30
WLS-LED-4000-03	warm white 4,000K	1.7	1000	3.9	180
WLS-LED-5500-03	cool white 5,500K	1.7	1000	3.9	170
WLS-LED-6500-03	glacier white 6,500K	1.7	1000	3.6	180

[1] Due to variations in the manufacturing process and operating parameters such as temperature and current, the actual output of any given LED may vary. Specifications are intended to be used as a guideline.

CUBIC-S SPECTRUM SYNTHESIZING SOURCE

Multi-spectral imaging, LCD display characterization, detector calibration, and many other applications can benefit tremendously from a light source with an arbitrary programmable optical spectrum. As opposed to conventional tunable lasers, which only produce a single wavelength at a time, Mightex's Cubic-S Optical Spectrum Synthesizing Source is capable of dynamically generating any custom-specified target spectrum across the entire spectral range.

FEATURES

- Arbitrary output spectrum
- Software controlled
- Solid state, high-speed
- Dynamically programmable
- High stability
- Excellent extinction ratio

Mightex Cubic-S is composed of the following modules:
1. An Optical Core Module;
2. A Controller Electronic Module;
3. An optional Spectrum Monitor; and
4. Control Software in the computer.

The Optical Core Module consists of 19 wavelength bands approximately evenly spaced between 395nm and 700nm. Light from different wavelength bands are combined into a single output. The intensity of each band can be individually controlled to generate any custom-specified spectrum. Tuning resolution is 10-bit and response time is 20ms.

The 'spectrum tailored' light is output from a 1,000 micron-core, 0.22NA multimode fiber. Total output power can be as high as 10mW. Various optical adaptors (optional) are provided, which can be used to couple the output light into fiber-optic or liquid lightguides.

Mightex Cubic-S is controlled through a powerful PC-based user interface. A software development kit (SDK) is also included so that users may integrate the light source into their own applications.

Also available is a spectrum monitoring option that allows users to monitor and control the output spectrum in real time.

MODELS

Cubic-S Optical Spectrum Synthesizing Source

CBS-VS19-U

POLYGON DMD ILLUMINATOR

FEATURES

SIMULTANEOUS MULTI REGION ILLUMINATION

Illuminate multiple regions of interest simultaneously with no scanning delay.

MULTIWAVELENGTH

Choose between models that have built-in LEDs or models that accept an external light source input.

ANY SHAPE OR SIZE

Control the shape and size of the light mask, giving maximum flexibility of the patterned illumination.

COMPLETE TIMING CONTROL

Reaching a pattern switching speed of up to 6600 fps, create dynamic pattern sequences with our easy-to-use software.

APPLICATIONS

- Photolithography
- Micropatterning
- Cellular microenvironments
- Optogenetics
- Uncaging

For detailed performance information
please turn to our Patterned Illumination section on *page* **91**

LED LIGHT SOURCES ACCESSORIES

FIBER-COUPLED LED ACCESSORIES

Part Number	Description
ACC-FCS-C05	Cable for (1) FCS-series fiber-coupled LED light sources; (2) WLS-series WheeLED Wavelength-Switchable LED Sources; (3) FFC-series Fiber-Coupled LED Light Sources; and (4) GCS-series Lightguide Coupled LED Sources.
ACC-FCS-C05-BLS	Cable for FCS-, FFC-, GCS-, and WLS-series LED light sources. With push-pull connectors on both ends for connecting to BLS-controllers.
ACC-WFC4-C05	Cable for 4-channel WFC-series LED sources.
ACC-WFC4-C05-ADP	Adapter cable for converting bare wire connectors to push-pull connectors used for connecting to BLS-controller.
ACC-WFC4-C05-BLS	Cable for 4-channel WFC-light sources. With 4 push-pull connectors for connecting to BLS-controllers.
ACC-WFC4-C05-BLS-ADP	Adapter cable for converting push-pull connectors used for connecting to BLS-controller to bare wire connectors.

MULTIMODE FIBER PATCHCORDS

Part Number	Description
FPC-0200-22-02SMA	Multimode Fiber Patchcord, 0.22 NA, 200µm Core SMA Connectors, 2 meters in length
FPC-0200-37-02SMA	Multimode Fiber Patchcord, 0.37 NA, 200µm Core SMA Connectors, 2 meters in length
FPC-0300-37-02SMA	Multimode Fiber Patchcord, 0.37 NA, 300µm Core SMA Connectors, 2 meters in length
FPC-0400-22-02SMA	Multimode Fiber Patchcord, 0.22 NA, 400µm Core SMA Connectors, 2 meters in length
FPC-0400-37-02SMA	Multimode Fiber Patchcord, 0.37 NA, 400µm Core SMA Connectors, 2 meters in length
FPC-1000-22-02SMA	Multimode Fiber Patchcord, 0.22 NA, 1000µm Core SMA Connectors, 2 meters in length
FPC-1000-37-02SMA	Multimode Fiber Patchcord, 0.37 NA, 1000µm Core SMA Connectors, 2 meters in length
FPC-0400-22-01SMA-FC	Multimode Fiber Patchcord, 0.22NA, 400µm Core, SMA Connector one end, FC connector the other end, 1 meter in length
FPC-0200-22-02SMA-BP	Multimode Fiber Patchcord, 0.22 NA, 200 µm Core SMA Connector on one end, polished bare fiber on the other end, 2 meters in length
FPC-0200-37-02SMA-BP	Multimode Fiber Patchcord, 0.37 NA, 200 µm Core SMA Connector on one end, polished bare fiber on the other end, 2 meters in length
FPC-0400-22-02SMA-BP	Multimode Fiber Patchcord, 0.22 NA, 400 µm Core SMA Connector on one end, polished bare fiber on the other end, 2 meters in length
FPC-0400-37-02SMA-BP	Multimode Fiber Patchcord, 0.37 NA, 400 µm Core SMA Connector on one end, polished bare fiber on the other end, 2 meters in length

FURCATED FIBER BUNDLES

Part Number	Description
FFB-02-0105-22-00SMA	Furcated fiber bundle, 2x 0.22NA 105µm core fiber, 1 meter each, total length 2 meters, SMA connectors.
FFB-02-0200-22-00SMA	Furcated fiber bundle, 2x 0.22NA 200µm core fiber, 0.5 meter each, SMA connectors.
FFB-03-0400-22-00SMA-1Q	Furcated fiber bundle, 3x 0.22NA 400µm core fiber, 0.5 meter each leg, 1.5 meter total length, SMA connectors on split ends, 1/4" stainless steel ferrule on common end.

MULTIMODE FIBER-OPTIC COLLIMATORS

Key Features

- **BK7 lens, 350nm to 2,000nm**
- **UV fused silica, 185 to 2,100nm**
- **Adjustable focus**
- **Stainless steel construction**
- **Multiple mounting**
- **features for lab and OEM applications**
- **SMA fiber connector**

Fiber optic collimators are used to either couple light from free space into an optical fiber or collimate light from a fiber to form a collimated (parallel) optical beam. Fiber collimators are key components with numerous applications. For example, in spectroscopy, a fiber collimator can collect light in a narrow field of view into a fiber which is in turn connected to a spectrometer. In another example one fiber collimator is connected to a light source and the collimated beam passes through a cuvette. On the other side of cuvette a second fiber collimator collects light and sends it to the spectrometer.

To maximize transmission wavelength range, Mightex fiber collimators feature a single BK7 lens without optical coating. In the UV collimators, a UV fused silica lens is used instead. The collimators have a stainless housing for maximum durability. Fiber patchcords with fiber core diameter of up to 1500μm can be connected to the fiber collimator through the SMA connector. The M12x0.5 external thread or the 13mm-diameter barrel can be used to mount the fiber collimators in a system setup.

The full field of view (FOV) or full divergence angle can be calculated as FOV = 2atan(D/2f) where D is the fiber core diameter and f is the focal length of the lens. Alternatively, the linear field of view on an object placed a distance L away from the collimator is D(L/f).

MODELS

Fiber-optic Collimators |

FOC-010-006-U | UV
FOC-010-006-V | Visible
FOC-050-023-U | UV

PERFORMANCE SPECIFICATIONS

Part Number	Focal Length | **mm**	Clear Aperture | **mm**	F#/NA	Lens Material	Wavelength Range | **nm**	Connector
FOC-010-006-V	10	6	1.7/0/29	BK7	350-2,000	SMA
FOC-010-006-U	10	6	1.7/0.29	UV fused silica	185-2,100	SMA
FOC-050-023-U	50	23	1.7/0.29	UV fused silica	185-2,100	SMA

FOCUSING MODULES FOR FIBER-OPTIC COLLIMATORS

Focusing Modules |

ACC-FOC-FM010-V | BK7, 350-2000nm, focal length 10mm
ACC-FOC-FM010-U | UV fused silica, 185-2100nm, focal length 10mm

FIBER ADAPTERS

Part Number	Description
FPC-ADP-SMA-SMA	SMA-to-SMA fiber adapter for connecting two SMA connectorized fibers.
FPC-ADP-C-SMA	C-to-SMA fiber adapter for connecting a SMA connectorized fiber to a C-mount lens or a microscope.
FPC-PRB-C-SMA-U	Spectroscopy probe for C-mount camera ports on microscopes. Field of view 4mm in diameter at 1X magnification. Accepts SMA-connectorized fiber. Wavelength range 185nm - 2100nm.
FPC-PRB-C-SMA-V	Spectroscopy probe for C-mount camera ports on microscopes. Field of view 4mm in diameter at 1X magnification. Accepts SMA-connectorized fiber. Wavelength range 350nm - 2000nm
SMA adapter	SMA adapter for FCS Type-H sources

BEAM COMBINERS FOR COLLIMATED LEDS

Mightex beam combiners combine two LED collimators of different wavelengths into a single collimated beam. Multiple combiners can be cascaded to combine more than two LED collimator sources. At the heart of the beam combiner is a high-performance dichroic beam splitter that combines two wavelengths with >95% efficiency. A neutral beam splitter is also available as a lower-cost solution for applications where maximum light throughput is not required.

Each input port features a fine 2-axis tilt adjustment to allow precise alignment of the LED collimator sources relative to system optical axis. A robust locking mechanism is also provided to maintain alignment over time. A filter well is integrated into each input port so that a φ1" or φ25mm optical filter can be inserted in between the LED source and the beam splitter. Narrowband filters and polarizers may be used to clean up LED spectrum or change the polarization state of the output beam.

Key Features

- **Cascadable for more than 2 sources**
- **Precision locking tilt adjustment on each port**
- **High effciency dichroic beam splitters**
- **Low-cost neutral beam splitters available**
- **Integrated filter well for each beam**
- **Multiple mounting features for lab and OEM applications**
- **Microscope adapters available**

The beam combiner includes multiple mounting holes and threads so that it can be easily integrated into a system. Additionally, adapters are also available for major brands of microscopes. Beam combiners are characterized by the edge wavelengths of their dichroic beam splitters. Please use the following table to select the correct beam combiner for intended LED collimator source.

Currently, Mightex's beam combiners can only be used to directly combine 22mm-diameter Collimated LED Sources. For 11mm-diameter collimated LED sources, a mechanical adapter (P/N: ACC-BC25-011) can be used to attach the LED sources to the beam combiners, before the 11mm-diameter collimated LED sources can be combined.

MODELS

Beam Combiners for Collimated LEDs |

LCS-BC25-xxxx

PERFORMANCE SPECIFICATIONS

Part Number	Reflection Port (LED center wavelength)	%R	Transmission Port (LED center wavelength)	%T
LCS-BC25-0350	255 - 325nm	>95	365 - 780nm	>95
LCS-BC25-0365	255 - 340nm	>95	380 - 505nm	>95
LCS-BC25-0375	325-365nm	>95	380 - 950nm	>93
LCS-BC25-0390	365 - 375nm	>95	400 - 500nm	>95
LCS-BC25-0400	340 - 385nm	>95	455 - 940nm	>95
LCS-BC25-0409	340 - 400nm	>95	415 - 940nm	>95
LCS-BC25-0410	365 - 400nm	>95	420 - 850nm	>95
LCS-BC25-0425	365 - 415nm	>95	455 - 850nm	>95
LCS-BC25-0435	325 - 425nm	>95	455 - 850nm	>95
LCS-BC25-0440	365 - 425nm	>95	470 - 740nm	>95
LCS-BC25-0460	400 - 425nm	>95	470 - 657nm	>95
LCS-BC25-0480	340 - 470nm	>95	505 - 850nm	>95
LCS-BC25-0495	400 - 470nm	>95	530 - 657nm	>95
LCS-BC25-0505	420 - 470nm	>95	530 - 740nm	>95
LCS-BC25-0506	365 - 490nm	>95	530 - 940nm	>95
LCS-BC25-0515	365 - 505nm	>95	530 - 850nm	>95
LCS-BC25-0520	455 - 505nm	>95	590 - 740nm	>95
LCS-BC25-0550	365 - 530nm	>95	590 - 850nm	>95
LCS-BC25-0560	470 - 530nm	>95	590 - 740nm	>95
LCS-BC25-0595	505 - 530nm	>95	617 - 850nm	>95
LCS-BC25-0605	365 - 590nm	>95	617 - 850nm	>95
LCS-BC25-0635	470 - 625nm	>95	657 - 940nm	>95
LCS-BC25-0660	590 - 630nm	>95	680 - 850nm	>95
LCS-BC25-0685	590 - 657nm	>95	700 - 850nm	>95
LCS-BC25-0700	530 - 680nm	>95	720 - 810nm	>95
LCS-BC25-0760	455 - 740nm	>95	780 - 980nm	>95
LCS-BC25-0800	455 - 780nm	>95	850 - 980nm	>95
LCS-BC25-0810	740, 780nm	>95	850, 940, 980nm	>95
LCS-BC25-0875	350-850 nm	>95	940-1600 nm	>95
LCS-BC25-0000	400 - 657nm, white	~50	400 - 657nm, white	~50
LCS-BC25-0001	340 - 940nm, white	~50	340 - 940nm, white	~50
LCS-BC25-0002	250 - 450nm	~50	250 - 450nm	~50
LCS-BC25-0070	400 - 657nm, white	~30	400 - 657nm, white	~70
LCS-BC25-9999	Mechanical holder only. No dichronic beam splitter.	N/A	Mechanical holder only. No dichronic beam splitter.	N/A

CONNECTING PLATES FOR BEAM COMBINERS

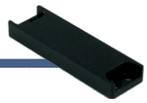
Connecting Plate 1 |

ACC-BC25-CP-01

Connecting Plate 2 |

ACC-BC25-CP-02

Connecting Plate 3 |



ACC-BC25-CP-03

PUSH-PULL ADJUSTABLE MOUNT FOR BEAM COMBINERS

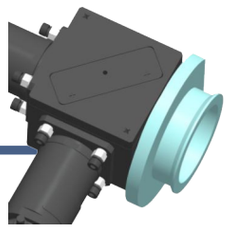
Push-Pull Adjustable Mount |

ACC-LCS-BC25-PPM

MICROSCOPE ADAPTERS

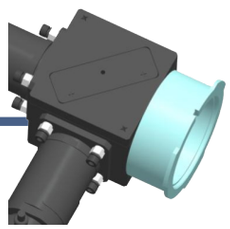
MODELS

Adapter for Leica DMI microscope |



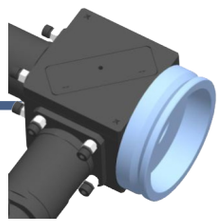
ACC-BC25-LC1

Adapter for Nikon Eclipse microscope |



ACC-BC25-NK1

Adapters for Olympus IX & BX microscopes |



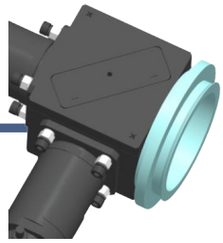
ACC-BC25-OL1 | Adapter to connect LCS-BC25

Adapter for Olympus MLS products |

ACC-BC25-OL2

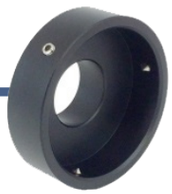
Adapter for Zeiss Axioskop microscope |

ACC-BC25-NK1



Adapter for transmission port of Nikon Eclipse & Nikon LV-UEPI/2/A illuminators |

ACC-BC25-NK-LV-UEPI



COLLIMATED LED FOCUSING MODULES

Part Number	Description
ACC-LCS-F-11	Focusing Module for 11mm-clear-aperture LED Collimator Sources, Working Distance ~5mm.
ACC-LCS-F-22	Focusing Module for 22mm-clear-aperture LED Collimator Sources, Working Distance ~10mm.
ACC-LCS-F-22-50	Focusing Module for 22mm-clear-aperture LED Collimator Sources, Working Distance ~50mm.
ACC-LCS-F-22-100	Focusing Module for 22mm-clear-aperture LED Collimator Sources, Working Distance ~100mm.
ACC-LCS-F-38	Focusing Module for 38mm-clear-aperture LED Collimator Sources, Working Distance ~20mm.
ACC-LCS-F-48	Focusing Module for 48mm-clear-aperture LED Collimator Sources, Working Distance ~30mm.

INTERCHANGEABLE COLLIMATING LENSES

Part Number	Description
ACC-LCS-C-11	Additional interchangeable collimating lens with barrel, clear aperture 11mm.
ACC-LCS-C-11-B	Additional interchangeable collimating lens with barrel, clear aperture 11mm, for type-B light sources.
ACC-LCS-C-22	Additional interchangeable collimating lens with barrel, clear aperture 22mm.
ACC-LCS-C-22-B	Additional interchangeable collimating lens with barrel, clear aperture 22mm, for type-B light sources.
ACC-LCS-C-38	Additional interchangeable collimating lens with barrel, clear aperture 38mm.
ACC-LCS-C-38-B	Additional interchangeable collimating lens with barrel, clear aperture 38mm, for type-B light sources.
ACC-LCS-C-48	Additional interchangeable collimating lens with barrel, clear aperture 48mm.
ACC-LCS-C-48-B	Additional interchangeable collimating lens with barrel, clear aperture 48mm, for type-B light sources.

EMPTY FILTER/OPTICS HOLDER FOR LCS SOURCES

Part Number	Description
ACC-LCS-H-22	Empty filter/optics holder for 22mm-clear-aperture LED Collimator Sources, accepts 1" and 25mm-diameter filters or optics with thickness of 5mm of less.

COLLIMATED LED CONNECTOR TUBES

Part Number	Description
ACC-LCS-CMM	Male to Male C-Mount connector with inner threads.
ACC-LCS-CFF	Female to Female C-Mount connector with outer threads.
ACC-LCS-22-T15	15mm extension tube for 22-mm clear-aperture LCS light sources.

LIGHTGUIDE COLLIMATORS

Key Features

Aspherical lens
Adjustable focus with locking ring
Accepts various ferrule diameters

Lightguide collimators are used to either couple light from free space into a lightguide or collimate light from a lightguide to form a collimated (parallel) optical beam. Lightguide collimators are key components with numerous applications. For example, a lightguide collimator can project light from a lightguide into a uniform spot in free space.

High-numerical-aperture aspherical lenses are used for precise collimation and maximum light throughput. The collimator features adjustable focus from 100mm to infinity. Various lightguide ferrule diameters are supported. Customization is available for other ferrule diameters.

The full field of view (FOV) or full divergence angle can be calculated as FOV = 2atan(D/2f), where D is the lightguide core diameter and f is the focal length of the lens. Alternatively, the linear field of view on an object placed at a distance L away from the collimator is D(L/f).

MODELS

Lightguide Collimators |

LGC-019-022-05-V
LGC-019-022-07-V
LGC-019-022-11-V
LGC-019-022-1Q-V
LGC-019-023-05-U

PERFORMANCE SPECIFICATIONS

Part Number	Focal Length | **mm**	Clear Aperture | **mm**	F# / NA	Lens Material	Wavelength Range | **nm**	Lightguide Ferrule, OD1
LGC-019-022-05-V	19	22	0.86 / 0.5	B270	350 ~ 2,000	5mm
LGC-019-022-07-V	19	22	0.86 / 0.5	B270	350 ~ 2,000	7mm
LGC-019-022-11-V	19	22	0.86 / 0.5	B270	350 ~ 2,000	11mm
LGC-019-022-1Q-V	19	22	0.86 / 0.5	B270	350 ~ 2,000	6.35mm
LGC-019-023-05-U	19	23	0.83 / 0.6	Fused Silica	200 ~ 2,200	5mm

LIGHTGUIDE-COUPLED LED ACCESSORIES

Part Number	Description
ACC-GCS-A0510	Adapter for a lightguide with ferrule diameter of 5mm and ferrule length of 10mm or greater.
ACC-GCS-A0610	Adapter for a lightguide with ferrule diameter of 6mm and ferrule length of 10mm or greater.
ACC-GCS-A0710	Adapter for a lightguide with ferrule diameter of 7mm and ferrule length of 10mm or greater.
ACC-GCS-A0810	Adapter for a lightguide with ferrule diameter of 8mm and ferrule length of 10mm or greater.
ACC-GCS-A0515	Adapter for lightguide with ferrule diameter of 5mm and ferrule length of 15mm or greater, for Type-B GCS only.
ACC-GCS-A0715	Adapter for lightguide with ferrule diameter of 7mm and ferrule length of 15mm or greater, for Type-B GCS only.
ACC-GCS-A0815	Adapter for lightguide with ferrule diameter of 8mm and ferrule length of 15mm or greater, for Type-B GCS only.
ACC-GCS-A1015	Adapter for lightguide with ferrule diameter of 10mm and ferrule length of 15mm or greater, for Type-B GCS only.

LIQUID LIGHTGUIDES

Part Number	Description
LLG-03-59-300-0650-1	Liquid lightguide, 3mm core, 0.59NA, 300 - 650nm, 1 meter. (Ferrule diameter: 5mm)
LLG-03-59-300-0650-2	Liquid lightguide, 3mm core, 0.59NA, 300 - 650nm, 2 meters. (Ferrule diameter: 5mm)
LLG-03-59-340-0800-1	Liquid lightguide, 3mm core, 0.59NA, 340 - 800nm, 1 meter. (Ferrule diameter: 5mm)
LLG-03-59-340-0800-2	Liquid lightguide, 3mm core, 0.59NA, 340 - 800nm, 2 meters. (Ferrule diameter: 5mm)
LLG-03-59-420-2000-1	Liquid lightguide, 3mm core, 0.59NA, 420 - 2,000nm, 1 meter. (Ferrule diameter: 5mm)
LLG-03-59-420-2000-2	Liquid lightguide, 3mm core, 0.59NA, 420 - 2,000nm, 2 meters. (Ferrule diameter: 5mm)
LLG-05-59-340-0800-1	Liquid lightguide, 5mm core, 0.59NA, 340 - 800nm, 1 meter. (Ferrule diameter: 7mm)
LLG-05-59-420-2000-1	Liquid lightguide, 5mm core, 0.59NA, 420 - 2,000nm, 1 meter. (Ferrule diameter: 7mm)

LIGHTGUIDE ADAPTERS FOR LED SOURCES

Part Number	Description
LCS-LGA23-0515	Lightguide adapter for 23mm-diameter DUV LED collimator source. For light guide with ferrule diameter of 5mm (typical 3mm-core light guide) and ferrule length of 15mm or more. Transmission range 200nm – 2200nm.
LCS-LGA22-0715	Lightguide adapter for 22mm-diameter LED collimator source and beam combiner. For lightguide with ferrule diameter of 7mm (typical 5mm-core lightguide) and ferrule length of 15mm or greater.
LCS-LGA22-0515	Lightguide adapter for 22mm-diameter LED collimator source and beam combiner. For lightguide with ferrule diameter of 5mm (typical 3mm-core lightguide) and ferrule length of 15mm or greater.
LCS-LGA22-0715	Lightguide adapter for 22mm-diameter LED collimator source and beam combiner. For lightguide with ferrule diameter of 7mm (typical 5mm-core lightguide) and ferrule length of 15mm or greater.
LCS-LGA22-0Q15	Lightguide adapter for 22mm LED collimator source and beam combiner. For lightguide with ferrule diameter of 0.25”(6.35mm) and ferrule length of 15mm or greater.
LCS-LGA22-1115	Lightguide adapter for 22mm LED collimator source and beam combiner. For lightguide with ferrule diameter of 11.1mm and ferrule length of 15mm or greater.

LIQUID LIGHTGUIDE HEAT SINKS

Part Number	Description
ACC-LLG-HS-03	Heatsink for 3mm core liquid lightguides.

SLS SPOTLIGHTS HEAT SINKS

Part Number	Description
ACC-SLS-HS	This is an accessory for Mightex’s LED Spotlights, used to assist heat dissipation in order to avoid overheat.

LASER SOURCES

PRODUCT OVERVIEW

Mightex's fiber-coupled laser sources are designed to produce high power and high intensity output of illumination through an optical fiber patchcord and are available in either an ultra high power model or compact model.

Ultra-High Power Laser Sources

Manual and analog input control modes
Up to 2 wavelengths

LSR-040-0405
405nm

LSR-040-0463
463nm

LSR-040-0635
635nm

LSR-040-0405-0463
405nm & 463nm

LSR-040-0405-0635
405nm & 635nm

LSR-040-0463-0635
463nm &635nm

Compact Laser Sources

Single way blend
200nm max

LSR-SMA-XXXX-000

405nm & 635nm

LSR-SMA-0450-000

450nm &635nm

Manual and Analog Laser Controller

Compact Universal USB LED Controller

BLS-0280-2

ULTRA-HIGH POWER LASER SOURCES

Mightex ultra high power (up to 4W) laser sources are configurable to contain up to 2 different wavelengths that share the same fiber-optic output. Laser intensity can be controlled in two different modes:

1. **Manual Knob Control Mode:** 10-turn dial knobs are present for each wavelength channel.

2. **Analog Input mode:** each channel can be controlled with 0-5V signal. Maximum modulation frequency achieved in this mode is 100 kHz.

FEATURES

- Dual control modes: manual or analog input
- Up to 2 wavelengths per fiber-optic output
- Maximum modulation frequency of 100 kHz in analog mode
- Multiple safety features
- USB port for firmware and configuration upgrade

With many safety features, including a power switch, key switch, emergency switch and interlock, Mightex's laser sources are optimal for high intensity illumination applications.

MODELS

Ultra-High Power Laser Sources

LSR-040-xxxx

PERFORMANCE SPECIFICATIONS

Part number	Output Power | **mW**					
	405nm	463nm	465nm	520nm	635nm	637nm
LSR-040-0405	500	-	-	-	-	-
LSR-040-0463	-	2200	-	-	-	-
LSR-040-0465 [1]	-	-	3200	-	-	-
LSR-040-0520	-	-	-	500	-	-
LSR-040-0635	-	-	-	-	850	-
LSR-040-0637	-	-	-	-	-	4000
LSR-040-0405-0463	450	2000	-	-	-	-
LSR-040-0405-0635	450	-	-	-	750	-
LSR-040-0463-0635	-	2000	-	-	750	-

[1] LSR-040-0465 and LSR-040-0637 are only available as single-channel lasers. They cannot be combined with other wavelengths.

DIMENSIONS

Models	Weight | **kg**	Size (lxwxh) | **mm**
LSR series	9.98	483x436x132

FIBER COUPLED COMPACT LASER MODULES

Mightex compact laser sources are single channel laser sources that offer higher power optical illumination through an optical fiber. The compact size allows allows the laser module to be easily incorporated into a variety of different settings and applications. The user can control the laser illumination wavelength through a software via a separately available laser driver.

FEATURES

- Dual control modes: manual or analog input
- Up to 2 wavelengths per fiber-optic output
- Maximum modulation frequency of 100 kHz in analog mode
- Multiple safety features
- USB port for firmware and configuration upgrade

MODELS

Compact Laser Sources

LSR-SMA-XXXX-000

SPECIFICATIONS

Optical Fiber Connector	SMA
Optical Power	See Table
Maximum Current	See Table
Electrical Connection	2 meter length cable with 2-pin BLS Connector
Laser Safety	Class 3B
Dimensions	4 x 3 x 3 inches
Weight	1 lbs

POWER TABLE

Wavelength (nm)	Bandwidth (nm)	Threshold Current (mA)	Maximum Current (mA)	Optical Power* (mW)
520	<3	40	280	100
638	<3	75	280	150

[1] Power measured out of a 200um, 0.37NA fiber.

MANUAL AND ANALOG LASER CONTROLLER

Mightex offers a manual and analog controller to be used with our compact fiber-coupled laser sources. This controller features a linear design that eliminates light intensity ripples and oscillations often observed with buckpuck nonlinear drivers. This unit is also capable of achieving extremely fast modulation frequencies, reaching a maximum modulation frequency of 100kHz in analog mode. When the controller is set to "trigger" mode, the output current is fully controlled by the user's analog control signal (0-5V). The output current can also be controlled with high-precision manual knobs. The control mode is selected with a slide switch on the front panel. The controller also provides maximum current selection DIP switches on the rear panel which allows the user to set the maximum current of the channel to 3 different settings.

MODELS

Compact Universal USB LED controllers |

BLS-0280-2

PERFORMANCE SPECIFICATIONS

Models	BLS-0280-2
Current Accuracy | mA	±3%
Number of Channels	2
Power Supply Input Voltage (V_{dc}) | V	9-12[a]
Power Supply Input Current (I_{dc}) | A	> Total/combined channel current[b]
Maximum Output Voltage (V_{max}) | V	V_{dc} - 4.5V
Maximum Per Channel Output Current (I_{max}) | mA	280
Maximum Per Channel Output Power (P_{max}) | W	20
Max Modulation Frequency | KHz	100
External Analog Input[c] | V	0-5

[a] When forward voltage of LED load is greater than 8V, 24V DC input might be used.
[b] External analog voltage source should have 8+ mA of current driving capability.
[c] The input current should be greater than the combined output current of the two channels.

DIMENSIONS

Models	Weight |**g**	Size (lxwxh) |**mm**
BLS-0280-2	600	160x157x68

LED CONTROLLERS

PRODUCT OVERVIEW

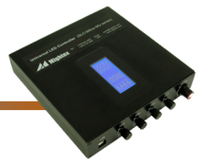
Mightex LED controllers provide constant-current supply to drive LED light sources. Our ample selection of LED controllers come in a variety of designs to provide customers a multitude of features including multi-channel control, up to 4 operational modes (manual, analog input, software, and external trigger), forward-voltage monitoring, current display, arbitrary waveform, and more.

Manual & Analog LED Controllers

SLA, SLB, and BLS Series
Manual and analog input control modes
Tiered maximum current settings

● *page* **50**

Manual & Software LED Controllers



SLC-CA04-MU and SLC-MA04-MU
4 channels
Current resolution options

● *page* **56**

USB/RS232 Software LED Controllers

Up to 3 control modes
Forward voltage monitoring available
Arbitrary waveform available

Software Control

SLC-MA01 | SLC-MA02 |
SLC-MA/CA12 | SLC-MA/CA16
Normal and Strobe modes

● *page* **52**

Software Control & External Trigger

SLC-AA/AV | SLC-SA/SV |
SLC-FA/FV |SLC-XA/XV |
SLC-HA/HV
Normal, Strobe and Trigger modes

● *page* **54**

LED Controllers Accessories

Power adaptors
Electrical power plug adapters
BLS series control module

● *page* **58**

MANUAL & ANALOG LED CONTROLLERS

Mightex's manual and analog-input LED controllers are designed to drive a broad range of LED light sources. These LED drivers have two operational modes:

1. **Manual Knob Control Mode:** the current output of each channel can be adjusted manually;

2. **Analog Input Control Mode:** the current output of each channel can be controlled via 0 ~ 5V analog input

The control mode is set via a DIP switch, and the factory default setting is "Manual Knob Control Mode". The drivers also have a Maximum Current Setting DIP Switch, which allows user to set the maximum current to specific intervals depending on the model. When the Maximum Current Setting DIP Switch is set at a smaller value (e.g. 350mA), the LED driver has a finer resolution for the output current.

FEATURES

- Dual control modes: manual or analog input
- Universal - suitable for any LED
- Tiered maximum output current settings to prevent overdrive
- Capable of driving variable loads

APPLICATIONS

- Microscopy
- Lighting
- Machine vision
- Display
- Semiconductor equipment
- Testing instruments
- Medical instruments

When the driver is set to "Analog Input Control Mode", the output current is proportional to the voltage of the analog input signal. For the 2-channel models, the operational mode and the current limit of each channel can be set independently from each other.

MODELS

Manual & Analog-input Universal LED driver | *Current Display*

SLB-1200-1

Manual & Analog-Input Universal LED driver |

SLA-0100-2 | 100mA I_{max}
SLA-1000-2 | 1000mA I_{max}
SLA-1200-2 | 1200mA I_{max}

BLS Series Manual & Analog-Input LED driver |

BLS-13000-1E | 13000mA I_{max}
BLS-18000-1 | 18000mA I_{max}
BLS-27000-1 | 27000mA I_{max}

PERFORMANCE SPECIFICATIONS | SLA & SLB SERIES

Models	SLA-0100-2	SLA-1000-2	SLA-1200-2	SLB-1200-1
Current Display	No			Yes
Number of Channels	2			1
Power Supply Input Voltage (V_{dc}) | V	9 ~ 24			
Maximum Output Voltage (V_{max})[1] | V	V_{dc} - 3.0V			
Maximum Per Channel Output Current (I_{max})[2] | mA	100	1,000	1,200	1,200
Maximum Per Channel Output Power (P_{max}) | W	2	10		
Max Modulation Frequency | KHz	50	1		
Tiered Max. Current Settings | mA	30 50 100	350 500 1,000	350 750 1,200	

[1] Maximum output voltage is 3V less than the Power Supply Input Voltage (V_{dc}). For instance, with a Power Supply Input Voltage of V_{dc} = 24V, the Maximum Output Voltage V_{max} would be 21V.
[2] If the channel output voltage is V_d and the output current is I_d, they must simultaneously satisfy: (a) $V_d \le V_{max}$; (b) $I_d \le I_{max}$; and (c) $V_d * I_d \le P_{max}$.

PERFORMANCE SPECIFICATIONS | BLS SERIES

Models	BLS-13000-1E[d]	BLS-18000-1	BLS-27000-1
Current Accuracy | mA	±3%		
Number of Channels	1		
Power Supply Input Voltage (V_{dc}) | V	48	12	12
Power Supply Input Current (I_{dc}) | A	2.5	13.75	16A
Maximum Output Voltage (V_{max}) | V	5.5	7.5	5.0V
Maximum Per Channel Output Current (I_{max}) | mA	13000	18000	27000
Maximum Per Channel Output Power (P_{max}) | W	72	135	135
Max Modulation Frequency | KHz	3		
External Analog Input[c] | V	**0 ~ 5**		

[a] When forward voltage of LED load is greater than 8V, 24V DC input might be used.
[b] External analog voltage source should have 8+ mA of current driving capability.
[c] The input current should be greater than the combined output current of the two channels.
[d] Spec for legacy support. BLS-13000-1 has been discontinued and replaced by BLS-13000-1E.

DIMENSIONS

Models	Weight | **g**	Size (lxwxh) | **mm**
SLA series	60	80x64.3x23.7
SLB series	250	150x106x55
BLS-1000-2 | BLS-3000-2	600	160x157x68
BLS-13000-1E | BLS-18000-1 | BLS-27000-1	1300	221x156x96

USB/RS232 SOFTWARE LED CONTROLLERS

Mightex's USB/RS232 software-controlled universal LED drivers are designed to drive a broad range of LED light sources. Each unit comes with a powerful PC-based software with a user-friendly GUI, which enables users to drive LEDs without the need to write any code. In addition, a full-featured SDK is provided, in order for users to write their own software and to integrate Mightex's LED drivers into their own systems. A Linux driver is also available upon request. Furthermore, the drivers have a built-in protection feature, allowing users to limit LED driving current and voltage.

Channels can be individually configured to work under one of the following 3 modes:

1. **Normal Mode (or DC Mode):** The output current is a constant, which can be adjusted (using software) from 0 mA to 1,000 mA, through the USB interface.

FEATURES

- Computer controlled
- Universal - suitable for any LED
- User-friendly application software with GUI
- Full-featured SDK
- Capable of driving variable loads

APPLICATIONS

- Microscopy
- Lighting
- Machine vision
- Display
- Semiconductor equipment
- Testing instruments
- Medical instruments

2. **Strobe Mode:** A Pulse-Width-Modulated (or PWM) periodic strobe pattern is output from the channel, which can be turned on by a software trigger. The strobe pattern may last indefinitely or for a preset number of cycles. In addition, each channel can be individually DISABLED and ENABLED. No voltage or current is output from a DISABLED channel.

3. **External trigger mode:** An external trigger signal could be used to turn on each individual channel, generating driving current with any user-defined waveform. Alternatively, each output channel can work under the "Follower" mode, in which the current output follows the waveform of the trigger input.

SOFTWARE CONTROL

LED controllers within this category allow users dual software control of individual LED channels, normal mode and strobe mode. These models are solely software-controlled. User-friendly application software and SDK are provided.

Key Definitions

Normal and Strobe Modes
Universal

No external trigger

MODELS

Compact Universal USB LED controllers |

SLC-MA01-U | 1 channel, 1mA current resolution
SLC-MA02-U | 2 channels, 1mA current resolution

Universal 12-Channel LED Controllers |

SLC-MA12-U | USB, 1mA current resolution
SLC-MA12-S | RS232, 1mA current resolution
SLC-CA12-U | USB, 5mA current resolution
SLC-CA12-S | RS232, 5mA current resolution

Universal 16-Channel LED Controllers |

SLC-MA16-U | USB, 1mA current resolution
SLC-MA16-S | RS232, 1mA current resolution
SLC-CA16-U | USB, 5mA current resolution
SLC-CA16-S | RS232, 5mA current resolution

PERFORMANCE SPECIFICATIONS

Models[1]	SLC-MA01-U SLC-MA02-U	SLC-MA12-U SLC-MA12-S SLC-MA16-U SLC-MA16-S	SLC-CA12-U SLC-CA12-S SLC-CA16-U SLC-CA16-S
Power Supply Input Voltage (V_{dc}) | V	9 ~ 24		
Maximum Output Voltage (V_{max})[2] | V	(Vdc- 3)		
Maximum Per Channel Output Current (I_{max}) | mA	1,000		
Maximum Per Channel Output Power (P_{max})[3] | W	10		
Output Current Resolution | mA	1		5
Output Current Accuracy | mA	±5 mA or ±1.0%, whichever is larger		±10 mA or ±1.0% whichever is larger
Output Current Repeatability | mA	±2 mA or ±0.5%, whichever is larger		±5 mA or ±0.5% whichever is larger
PWM Timing Resolution[4] | µs	100		
PWM Timing Minimum Step Size[4] | µs	1,000		
Interface	USB	USB (-U) or RS232 (-S)	

[1] For SLC-MA12, SLC-MA16, SLC-CA12, and SLC-CA16 models, proper heat dissipation should be provided to the LED controller in order to prevent overheating, which may lead to self-shutdown by the LED controller for protection purposes. In addition, the total output current of all channels should not exceed the capacity of the power adapter.
[2]Maximum Output Voltage V_{max} is 3V less than the Power Supply Input Voltage (V_{dc}). For instance, with a Power Supply Input Voltage of V_{dc} = 24V, the Maximum Output Voltage V_{max} would be 21V.
[3] If the channel output voltage is V_d and the output current is I_d, they must simultaneously satisfy: (a) $V_d \le V_{max}$; (b) $I_d \le I_{max}$; and (c) $V_d * I_d \le P_{max}$.
[4] Each period of a PWM square wave comprises of ON time and OFF time, i.e., two (2) 'steps'. The minimum value for each step is 1,000µs and the minimum increment is 100µs.

DIMENSIONS

Models	Weight | **g**	Size (lxwxh) | **mm**
SLC-MA01 | SLC-MA02	60	80x64.3x23.7
SLC-MA12 | SLC-MA16 **SLC-CA12 | SLC-CA16**	400	180.5x180x34.5

SOFTWARE & EXTERNAL TRIGGER

LED controllers within this category allow users dual software control of individual LED channels - normal mode and strobe mode - plus external TTL trigger control mode. User-friendly application software and SDK are provided and models come with USB and RS232 interfaces. For models with arbitrary waveform, one can use up to 128 pairs of data points [current (mA), duration (us)] to define the shape of the waveform and consequently the LED's optical output. Models with forward voltage monitoring capability have an accuracy of ±10mV. A Linux driver is also available upon request.

Key Definitions

- **Normal, Strobe & Trigger modes**
- **Universal**
- **External trigger**
- **Arbitrary waveform**
- **Forward voltage monitoring**

MODELS

Universal 4-Channel LED controllers |

SLC-AA04-US | Arbitrary waveform
SLC-AV04-US | Arbitrary waveform, forward voltage monitoring
SLC-SA04-US |ON/OFF definition
SLC-SV04-US |ON/OFF definition, forward voltage monitoring

High-Precision Universal 4-Channel LED controllers |

SLC-XA04-US | Arbitrary waveform
SLC-XV04-US | Arbitrary waveform, forward voltage monitoring
SLC-FA04-US |ON/OFF definition
SLC-FV04-US |ON/OFF definition, forward voltage monitoring

High-Current Universal 2-Channel LED controllers |

SLC-HA02-US | Arbitrary waveform
SLC-HV02-US | Arbitrary waveform, forward voltage monitoring

PERFORMANCE SPECIFICATIONS

Models[1]	SLC-AA04-US SLC-AV04-US	SLC-SA04-US SLC-SV04-US	SLC-XA04-US SLC-XV04-US	SLC-FA04-US SLC-FV04-US	SLC-HA02-US SLC-HV02-US
Power Supply Input Voltage, V_{dc} | V	9 ~ 24				9 ~ 12
Power Supply Input Current | mA	< 4,000				4,000
Per Channel Driving Voltage (V_{max})[2] | V	V_{dc} - 0.5				
Per Channel Driving Current | mA	0 ~ 1,000[a] 0 ~ 3,500[b]		0 ~ 100[a] 0 ~ 350[b]		0~2,000[a] 0~3,500[b]
Output Current Resolution | mA	12		0.1		1
Output Current Linearity | mA	+/-4 (or +/-0.5%)				
Output Current Repeatability | mA	+/-1 (or +/-0.2%)				
Trigger Input High Level | V	3.3 ~ 10.0				
Trigger Input Low Level | V	0.8 (Max.)				
Timing Resolution | µs	20				
# of Data Points for Waveform Definition	128	2	128	2	
Trigger Pulse Width | µs	100 (Minimum)				
Max Trigger Delay | µs	25				

[1] Proper heat dissipation should be provided to the LED controller in order to prevent overheating, which may lead to self-shutdown by the LED controller for protection purposes. In addition, the total output current of all channels should not exceed the capacity of the power adapter.
[2]Maximum Output Voltage V_{max} is 0.5V less than the Power Supply Input Voltage (V_{dc}). For instance, with a Power Supply Input Voltage of V_{dc} = 24V, the Maximum Output Voltage V_{max} would be 23.5V.
[a] Under normal mode.
[b] Under strobe or trigger mode.

DIMENSIONS

Models	Weight | **g**	Size (lxwxh) | **mm**
SLC-AA | SLC-AV **SLC-SA | SLC-SV** **SLC-XA | SLC-XV** **SLC-FA | SLC-FV** **SLC-HA | SLC-HV**	600	201x147x40

MANUAL & SOFTWARE LED CONTROLLERS

Mightex's 4-channel SLC/MU-series universal LED controllers offer the flexibility for users to operate each LED channel independently.

The device has two control modes:

1. **Manual Control:** Each of the four channels can be operated manually in CW mode using a knob, and each knob is operated independently to control the output current of a specific channel. A fifth Global knob is available for the user to control all channels at the same time while keeping the relative outputs among channels constant, as in:

I_{out} = Global_Knob_Reading(0-1)·Channel_Knob_Reading(0-1)·I_{max}.

2. **Software Control:** The LED controller can also be operated via a Windows-based application software, provided with the device. Each channel can be individually configured by the software to operate in one of the following three modes:

- Disable Mode: The channel is disabled.
- Normal Mode: The output current is constant.
- Strobe Mode: A Pulse-Width-Modulated (PWM) periodic strobe pattern is output from the channel.

FEATURES

- Software/manual controlled
- Universal - suitable for any LED
- Current monitoring display
- User-friendly application software with GUI
- Full-featured SDK
- Capable of driving variable loads
- Up to 1200mA output current
- High precision with 1mA current resolution

APPLICATIONS

- Microscopy
- Lighting
- Machine vision
- Display
- Semiconductor equipment
- Testing instruments
- Medical instruments

The LED controller also has a DC output used to control a cooling fan, usually used to cool down a high-power LED. The LED controller's software allows one to control the speed of the cooling fan through a designated variable PWM signal output.

MODELS

Dual-Mode (Manual/Software) LED controllers |

SLC-CA04-MU | 5mA current resolution
SLC-MA04-MU | 1mA current resolution

PERFORMANCE SPECIFICATIONS

Models	SLC-CA04-MU	SLC-MA04-MU
Power Supply Input Voltage (V_{dc}) | V	12 ~ 24	
Maximum Output Voltage (V_{max}) | V	V_{dc} - 3.0	
Maximum Per Channel Output Current (I_{max}) | mA	1,200	
Maximum Per Channel Output Power (P_{max}) | W	18	
Output Current Resolution | mA	5	1
Output Current Accuracy | mA	±5 mA or ±1.0%, whichever is larger	
Output Current Repeatability | mA	±2 mA or ±0.5%, whichever is larger	
PWM Timing Resolution | µs	100	
PWM Timing Minimum Step Size | µs	1,000	
Interface	USB	

[1] Maximum output voltage is 3V less than the Power Supply Input Voltage (V_{dc}). For instance, with a Power Supply Input Voltage of V_{dc} = 24V, the Maximum Output Voltage V_{max} would be 21V.
[2] If the channel output voltage is V_d and the output current is I_d, they must simultaneously satisfy: (a) $V_d \le V_{max}$; (b) $I_d \le I_{max}$; and (c) $V_d * I_d \le P_{max}$.

DIMENSIONS

Models	Weight | **g**	Size (lxwxh) | **mm**
SLC-CA04-MU **SLC-MA04-MU**	400	180.5x180x34.5

LED CONTROLLERS ACCESSORIES

POWER ADAPTORS

Part Number	Description
ACC-SLC-12V5A	Replacement Power Adaptor. 12V 5A AC-DC.
ACC-SLC-24V	24V AC-DC Power Adaptor for SLC-series LED drivers.
ACC-SLC-24VU	Upgrade from 12V to 24V AC-DC Power Adaptor for SLC-series LED drivers. [Note: If you already received the 12V adapter and would like to upgrade to 24V, please return the 12V adapter to Mightex, or order the stand-alone 24V adapter ACC-SLC-24V.]
ACC-SLC-7V	7.5V 6A AC-DC Power Adaptor for SLC-series LED drivers.
ACC-SLC-7VU	Upgrade from 12V to 7.5V/6A AC-DC Power Adaptor for SLC-series LED drivers. [Note: If you already received the 12V adapter and would like to upgrade to 7.5V/6A, please return the 12V adapter to Mightex, or order the stand-alone 7.5V adapter ACC-SLC-7V.]

ELECTRICAL POWER PLUG ADAPTORS

Part Number	Description
ACC-PLUG-EU	American To European German Outlet Plug Adapter.
ACC-PLUG-UK	American To United Kingdom Outlet Plug Adapter.
ACC-PLUG-AUS	American To Australian Outlet Plug Adapter.
ACC-PLUG-SUI	American To Swiss Outlet Plug Adapter.

BLS I/O CONTROL MODULE

Mightex's Analog and Digital I/O Control Module is a system-level control solution to be used in conjunction with the BLS series Manual/Analog Controlled LED Controllers and with the Polygon DMD Illuminator.

The I/O Control Module features four (4) independent channels. Each channel has an external trigger input (TTL), an analog voltage output (0-5V) and a digital output (Standard TTL). All I/O connectors are BNC-type to work seamlessly with laboratory equipments. Intensity waveform of up to four (4) high-power LED light sources is controlled by the I/O Control Module, each can output light at a different wavelength (i.e. color). Up to thirty-two (32) different waveforms can be programmed onto the I/O Control Module via USB or RS232. Each waveform can be associated with any one of the four LED's to form a catalog of up to 128 unique Color/Waveform pairs.

Key Definitions

- **Four (4) independent channels**
- **One TTL input, one analog voltage output (0-5V) and one digital output (LVTTL) per channel**
- **All I/O are BNC-connectorized**
- **0.1% Output voltage resolution**
- **20µs time resolution**
- **25µs maximum trigger delay**
- **Up to 1024 color/waveform pairs in a sequence**

MODELS

BLS Analog & Digital I/O Control Module

BLS-IO04-US

INDUSTRIAL CAMERAS

PRODUCT OVERVIEW

Our camera portfolio offer a variety of models, each uniquely designed to be used in multiple industrial applications ranging from machine-vision to digital microscopy. Offering a variety of sensors, pixel resolution, and sensitivity, our cameras perform to the highest standard at a low cost. We also offer different accessories including mounting brackets, optical filters, and lens mount adapters to easily integrate our cameras into your current setup.

USB3.0 CMOS Cameras

Enclosed and board level
1.2MP and 5.0MP options
Monochrome and colour options

● *page* **60**

USB2.0 CCD Line Cameras

1024, 2048, & 3648 pixel
Silicon Linear CCD arrays
8-, 12-, & 16-Bit A/D converters

● *page* **77**

USB2.0 Area Cameras

Digital Output
External and Software Trigger

S-Series

Ultra-Compact
CMOS 752x480, 1.3MP, 3.0MP

● *page* **64**

B-Series

Buffered CMOS
752x480, 1.3MP, 3.0MP & 5.0MP

● *page* **66**

C-Series

CCD Image Sensor
High Sensitivity

● *page* **70**

M-Series

Unbuffered CMOS
Optional Built-In LED Drivers

● *page* **72**

W-Series

Windowless CMOS
UV sensitivity

● *page* **74**

Camera Accessories

Cables & Brackets
Optical Filters
Lens mount adapters & more!

● *page* **80**

USB3.0 CMOS CAMERAS

Mightex's ultrafast USB 3.0 cameras are designed for applications that require high-speed and/or multiple cameras. These cameras are equipped with a super-speed USB3.0 interface that can deliver a transfer rate of up to 400 Mbytes per second, which is 10 times the USB2.0 speed, 3.5 times GigE speed and 6 times Firewire-800 speed. With fast and high-definition Aptina CMOS image sensors that can offer up to 5 megapixel in full resolution and up to 350fps using ROI mode, Mightex USB3.0 cameras are suited for industrial applications that require a great amount of data to be processed and transferred from the camera to the PC. These ultra-compact cameras have external trigger-in, strobe-out, and a powerful software engine that supports multiple camera operations. In addition to all these outstanding features, a user-friendly GUI based application software and an SDK are provided for custom software development.

FEATURES

- Super-speed USB3.0 interface (5Gb/s)
- Support simultaneous image capturing from multiple cameras
- Ultra compact
- 4-pin GPIOs
- Digital output, no need for frame grabber
- Custom programmable with SDK provided
- DirectShow / TWAIN driver
- External and software trigger
- Strobe output for external flash
- ROI & pixel skipping/ binning
- No need for external power supply
- OEM versions available

MODELS

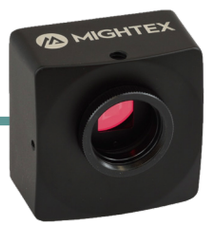
USB3.0 5MP CMOS Camera (8 or 12bits) | *Enclosed*

SME-B050-U | Monochrome
SME-C050-U | Colour

USB3.0 5MP CMOS Camera (8 or 12bits) | *Board Level*

SMN-B050-U | Monochrome
SMN-C050-U | Colour

USB3.0 1.2MP CMOS Camera (8 or 12bits) | *Enclosed*

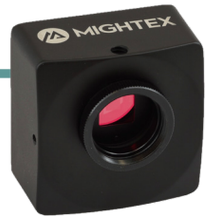


SME-B012-U | Monochrome
SME-C012-U | Colour

USB3.0 1.2MP CMOS Camera (8 or 12bits) | *Board Level*

SMN-B012-U | Monochrome
SMN-C012-U | Colour

USB3.0 1.5MP CMOS Camera (8 or 12bits) | *Enclosed*



SBE-C015-U | Monochrome
SBE-B015-U | Colour

USB3.0 1.5MP CMOS Camera (8 or 12bits) | *Board-level*

SBN-C015-U | Monochrome
SBN-B015-U | Colour

PERFORMANCE SPECIFICATIONS

Models	SMN-C050-U SMN-B050-U	SME-C050-U SME-B050-U	SMN-C012-U SMN-B012-U	SME-C012-U SME-B012-U
Number of GPIOs	4	4	4	4
Resolution	2,560 x 1,920		1,280 x 960	
CMOS Image Sensor	Aptina Micron MT9P031, Rolling Shutter (ERS or GRR)		Aptina MT9M031, Global Shutter	
Pixel Size | µm	2.2 x 2.2		3.75 x 3.75	
Scanning System	Progressive			
Dynamic Range | dB	70		64	
Sensor SNR | dB	38			
Bit Depth | bit	Color: 24 (R/G/B) B/W: 8 or 12 (Switchable)			
Responsivity | V/lux-sec	1.4		6.1/5.3	
Frame Rates*[1] | fps	14 @2560 x1920 20 @2048 x1536 31 @1536 x1216 41 @1280 x1024 60 @1024 x 768 105 @768 x 480 114 @640 x 480 240 @320 x 240 350 @192 x 128		60 @1280x960 70 @1024x768 110 @768x480 110 @640x480 200 @320x240 325 @192x128 380 @64x64	
Sub Resolutions	Support Arbitrary ROI (Nx, Ny), with Nx and Ny multiples of 64 and 16			
Shutter Speed (Exposure Time) | ms	0.05 ~ 750			
Hardware Gains	1x ~ 16x		1x ~ 8x	
Trigger Mode	With external trigger (Trigger delay < 200µs)			
Trigger Cable	ACC-CAM-DIN8			
Strobe Out	Yes			
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)			
Built-in Filters	IR-cut (factory standard) or custom			
Power Consumption | W	< 2.0			

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.
[1] SMN/SME 5MP models measured @96MHz clock. SMN/SME 1.2MP models measured @74MHz clock.

DIMENSIONS

Models	Weight (excluding lens) |**g**	Size (hxwxd) |**mm**	
		CS-mount	C-mount
SME series	150	58x58x34	58x58x39
SMN series	80	51x51x29	51x51x34

RECOMMENDED CONFIGURATIONS

Processor	Dual-core Intel CPU 1.8GHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	1GB or greater for 5MP models| 2GB or greater for 1.2MP models
Hard Disk Space	40MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB3.0 Host Controller	Intel Integrated USB3.0 Host Controller is recommended

PERFORMANCE SPECIFICATIONS

Models	SBN-C015-U SBN-B015-U	SBE-C015-U SBE-B015-U
Number of GPIOs	4	4
Resolution	1408x 1088	
CMOS Image Sensor	Sony IMX273, Glogal shutter	
Pixel Size | µm	3.45 x 3.45	
Scanning System	Progressive	
Dynamic Range | dB	~60	
Sensor SNR | dB	TBD	
Gray level | bit	8/12	
Frame Rates*[1] | fps	250/150 @1408x1088 450/270 @1408x544 496/270 @704x544	
Sub Resolutions	Support arbitrary ROI (Nx x Ny), with Nx is always 1408, Ny multiples of 32	
Shutter Speed (Exposure Time) | ms	0.05~750	
Hardware Gains	0 – 48	
Trigger Mode	With external trigger (Trigger delay < 80us)	
Strobe Out	Yes	
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)	
Built-in Filters	IR-cut (standard) or custom	
Power Consumption | W	<3.0(USB3.0), < 2.5(USB2.0)	

*The actual achievable frame rate depends on exposure time and working mode, as well as resources available from the PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
SBN series	80	51x51x29	51x51x34
SBE series	150	58x58x34	58x58x39

RECOMMENDED CONFIGURATIONS

Processor	Dual-core Intel CPU 1.8GHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, 10 and 11
RAM	4G or greater
Hard Disk Space	100M for software installation, plus additional space for storing captured images
USB3.0 Host Controller	Intel Integrated USB3.0 Host Controller is recommended

USB2.0 AREA CAMERAS

Mightex USB 2.0 cameras are designed for a wide variety of applications (such as industrial inspections, digital microscopy and medical imaging), which require good quality cameras that are easy to use and cost-effective. With a USB2.0 interface and powerful PC software, the camera delivers excellent quality images. In addition, a user-friendly GUI based application software and a SDK are provided for custom software development. The cameras have 4-pin GPIOs and a DirectShow driver and a TWAIN driver are provided to easily link the cameras with users' applications.

FEATURES

- 4-pin GPIOs
- High-speed USB2.0 (480Mb/s)
- Digital output, no need for frame grabber
- DirectShow and TWAIN driver
- External and Software trigger
- Strobe output for external flash
- ROI & pixel skipping/ binning
- No need for external power supply
- OEM versions available

S-SERIES

Mightex S-series compact USB 2.0 cameras are ultra-compact, optimized for machine-vision applications, and they can also be used for a wide variety of other applications where quality, ease of use, and cost-effectiveness are crucial. These cameras have external trigger-in and strobe-out. A USB command set protocol is provided for non-Windows based applications. A Linux driver is also available upon request.

Key Definitions

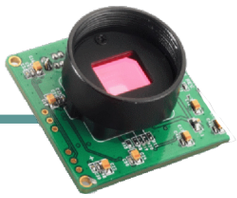
- **Ultra-Compact**
- **CMOS 752x480, 1.3MP, 3.0MP**
- **Monochrome & Colour**
- **Global & Rolling Shutter**

MODELS

Ultra-compact USB2.0 752x480 CMOS | *Enclosed*

SCE-BG04-U | Monochrome
SCE-CG04-U | Colour

Ultra-Compact USB2.0 752x480 CMOS | *Board Level*



SCN-BG04-U | Monochrome
SCN-CG04-U | Colour

Ultra-Compact USB2.0 1.3MP CMOS | *Enclosed*

SCE-B013-U | Monochrome

Ultra-Compact USB2.0 1.3MP CMOS | *Board Level*

SCN-B013-U | Monochrome

Ultra-Compact USB2.0 3.0MP CMOS | *Enclosed*

SCE-C030-U | Colour

Ultra-Compact USB2.0 3.0MP CMOS | *Board Level*

SCN-C030-U | Colour

PERFORMANCE SPECIFICATIONS

Models	SCE-BG04-U SCN-BG04-U	SCE-CG04-U SCN-CG04-U	SCE-B013-U SCN-B013-U	SCE-C030-U SCN-C030-U
Number of GPIOs	4	4	4	4
Resolution	752 x 480		1,280 x 1,024	2,048 x 1,536
CMOS Chip	1/3" Micron MT9V032, Global Shutter (Micron TrueSNAP)		½" (5:4) Micron MT9M001, Rolling Shutter	½" (5:4) Micron MT9T001, Rolling Shutter
Pixel Size | µm	6.0 x 6.0		5.2 x 5.2	3.2 x 3.2
Active Imager Size | mm	4.51 x 2.88		6.66 x 5.32	
Scanning System	Progressive			
Dynamic Range | dB	> 55		68	61
Sensor SNR | dB	N/A		45	43
Gray Level | bit	8			
Responsivity | V/lux-sec	4.8		2.1	
Frame Rates* (@24MHz Clock)/ (@48MHz Clock) | fps	38 @752 x 480 40 @640 x 480 82 @320 x 240 130 @160 x 120 170 @64 x 64		20 @1280 x 1024 31 @1024 x 768 45 @800 x 600 52 @752 x 480 52 @640 x 480 120 @320 x 240	6 @2048 x 1536 10 @1600 x 1200 12 @1280 x 1024 20 @1024 x 768 26 @800 x 600 32 @752 x 480 35 @640 x 480 64 @320 x 240
Sub Resolutions	Support Arbitrary ROI (Nx, Ny), with Nx and Ny multiples of 4			
Shutter Speed (Exposure Time) | ms	0.05 ~ 750		1 ~ 750	
Hardware Gains	1x ~ 4x		0.125x ~ 8x	
Trigger Mode	With external trigger			
Trigger Cable	ACC-CAM-CON8			
Strobe Out	Yes			
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)			
Built-in Filters	IR-cut (factory standard), No filter, or IR-pass			
Power Consumption | W	< 1.0			

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
SCE series	120	45x45x23	45x45x28
SCN series	60	40x40x25	40x40x30

RECOMMENDED CONFIGURATIONS

Processor	Pentium III 900 MHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	256MB or greater
Hard Disk Space	30MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB2.0 Host Controller	Intel Integrated USB2.0 Host Controller is recommended

B-SERIES

Mightex USB 2.0 cameras with frame buffers are optimized for machine-vision applications, and they can also be used for a wide variety of other applications such as digital microscopy and medical imaging, where quality, ease of use, and cost-effectiveness are crucial. These cameras have built-in frame buffers, external trigger-in, strobe-out, and a powerful camera engine that supports multiple cameras. A USB command set protocol is also provided for non-Windows based applications. A Linux driver is also available upon request.

Key Definitions

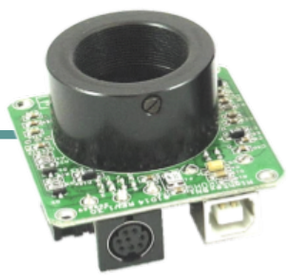
- **Buffered**
- **CMOS 752x480, 1.3MP, 3.0MP & 5.0MP**
- **Monochrome & Colour**
- **8bit, 10bit &12bit**
- **Global & Rolling Shutter**

MODELS

Buffered USB2.0 752x480 CMOS | *Enclosed*

BCE-BG04-U | Monochrome, 8 bit
BCE-CG04-U | Colour, 8 bit
BTE-BG04-U | Monochrome, 10 bit

Buffered USB2.0 752x480 CMOS | *Board Level*

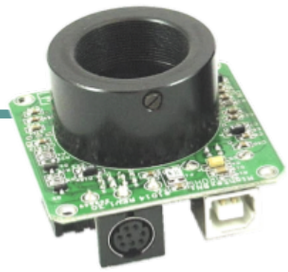


BCN-BG04-U | Monochrome, 8 bit
BCN-CG04-U | Colour
BTN-BG04-U | Monochrome, 10 bit

Buffered USB2.0 1.3MP CMOS | *Enclosed*

BCE-B013-U | Monochrome, 8 bit
BTE-B013-U | Monochrome, 10 bit

Buffered USB2.0 1.3MP CMOS | *Board Level*



BCN-B013-U | Monochrome, 8 bit
BTN-B013-U | Monochrome, 10 bit

Buffered USB2.0 3.0MP CMOS | *Enclosed*

BCE-C030-U | Colour, 8 bit

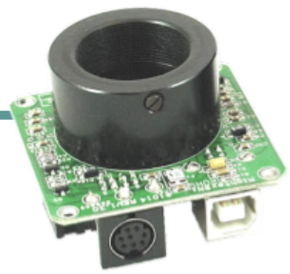
Buffered USB2.0 3.0MP CMOS | *Board Level*

BCN-C030-U | Colour, 8 bit

Buffered USB2.0 5.0MP CMOS | *Enclosed*

BCE-B050-U | Monochrome, 8 bit
BCE-C050-U | Colour, 8 bit
BTE-B050-U | Monochrome, 12 bit

Buffered USB2.0 5.0MP CMOS | *Board Level*



BCN-B050-U | Monochrome, 8 bit
BCN-C050-U | Colour, 8 bit
BTN-B050-U | Monochrome, 12 bit

PERFORMANCE SPECIFICATIONS | 752 X 480 MODELS

Models	BCE-CG04-U BCN-CG04-U	BCN-BG04-U BCE-BG04-U BCE-BG04-US BCN-BG04-US	BTN-BG04-U BTE-BG04-U BTE-BG04-US BTN-BG04-US
Number of GPIOs	4	4	4
Resolution	752 x 480		
CMOS Chip	1/3" Micron MT9V032, Global Shutter (Micron TrueSNAP)		
Pixel Size | µm	6.0 x 6.0		
Active Imager Size | mm	N/A		
Scanning System	Progressive		
Dynamic Range | dB	> 55		
Sensor SNR | dB	N/A		
Gray Level | bit	8		10
Responsivity | V/lux-sec	2.1	4.8	
On-Board Memory | MB	32		
Frame Rates* (@26MHz Clock) | fps	60@752x480 65@640x480 130@320x240 220@160x120 310@64x64		10-bit Operation 36@752x480 44@640x480 130@320x240 220@160x120 310@64 x 64
Sub Resolution	Support Arbitrary ROI (Nx, Ny), with Nx and Ny multiples of 4		
Shutter Speed (Exposure Time) | ms	0.05 ~ 750		
Hardware Gains | dB	1x ~ 4x		
Trigger Mode	With external trigger		
Trigger Cable	ACC-CAM-DIN8		
Strobe Out	Yes		
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)		
Built-in Filters	IR-cut (factory standard), or IR-pas, or no filter		
Power Consumption | W	< 1.8		

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

PERFORMANCE SPECIFICATIONS | 1.3MP, 3.0MP & 5.0MP

	1.3MP		3.0MP	5.0MP	
Models	BCE-B013-U BCN-B013-U BCE-B013-US BCN-B013-US	BTE-B013-U BTN-B013-U	BCN-C030-U BCE-C030-U BCE-C030-US BCN-C030-US	BCN-B050-U BCE-B050-U BTE-B050-U BTN-B050-U	BCE-C050-U BCN-C050-U
Number of GPIOs	4	4	4	4	4
Resolution	1,280 x 1,024		2,048 x 1,536	2,592 x 1,944	
CMOS Chip	½" (5:4) Micron MT9M001, Rolling Shutter		½" (5:4) Micron MT9T001, Rolling Shutter	1/2.5" (5:4) Micron MT9P031, Rolling Shutter	
Pixel Size | µm	5.2 x 5.2		3.2 x 3.2	2.2 x 2.2	
Active Imager Size | mm	6.66 x 5.32		N/A		
Scanning System	Progressive				
Dynamic Range | dB	68		61	70	
Sensor SNR | dB	45		43	38	
Gray Level | bit	8	10	8	8 or 12	8
Responsivity | V/lux-sec	2.1			1.4	
On-Board Memory | MB	32				
Frame Rates* (@48MHz Clock) | fps	25 @1280x1024 35 @1024x768 50 @800x600 55 @752x480 65 @640x480 140 @320x240	12 @1280 × 1024 18 @1024 × 768 25 @800 × 600 28 @752 × 480 33 @640 × 480 70 @320 × 240	11 @2048x1536 16 @1600x1200 28 @1280x1024 42 @1024x768 64 @800x600 82 @752x480 90 @640x480 240 @320x240	**12 bit:** 3 @2592x1944, 5 @2048x1536 7 @1600x1200 12 @1280x1024 21 @1024x768 33 @800x600 43 @752x480 51 @640x480 100 @320x240	6 @2592 x 1944 9 @2048 x 1536 13 @1600 x 1200 18 @1280 x 1024 28 @1024 x 768 40 @800 x 600 50 @752 x 480 56 @640 x 480 100 @320 x 240
Sub Resolutions	Support Arbitrary ROI, (X, Y) with X and Y multiples of 4				
Shutter Speed (Exposure Time) | ms	0.05 ~ 750				
Hardware Gains | dB	0.125x ~ 8x			1x ~ 16x	
Trigger Mode	With external trigger				
Trigger Cable	ACC-CAM-DIN8				
Strobe Out	Yes				
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)				
Built-in Filters	IR-cut (factory standard), or IR-pass, or no filter			IR-cut (factory standard) or custom	
Power Consumption | W	< 1.8				

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
BCE | BTE series	150	58x58x34	58x58x39
BCN | BTN series	80	51x51x29	51x51x34

RECOMMENDED CONFIGURATIONS

Processor	Pentium III 900 MHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	256MB or greater
Hard Disk Space	30MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB2.0 Host Controller	Intel Integrated USB2.0 Host Controller is recommended

C-SERIES

Mightex C-series CCD USB 2.0 area cameras provide higher sensitivity than CMOS cameras. They are are optimized for machine-vision applications, and they can also be used for a wide variety of other applications where quality, ease of use, and cost-effectiveness are crucial. These cameras have external trigger-in and strobe-out. A USB command set protocol is provided for non-Windows based applications. A Linux driver is also available upon request.

Key Definitions

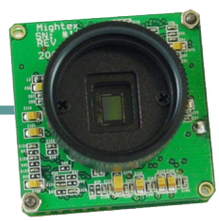
- **CCD Image Sensor**
- **High Sensitivity**
- **Monochrome & Colour**
- **Global Shutter**

MODELS

Buffered USB2.0 1280x960 1/3” CCD | *Enclosed*

CGE-B013-U | Monochrome
CGE-C013-U | Colour

Buffered USB2.0 1280x960 1/3” CCD | *Board Level*



CGN-B013-U | Monochrome
CGN-C013-U | Colour

Buffered USB2.0 1392x1040 1/2” CCD | *Enclosed*

CCE-B013-U | Monochrome
CCE-C013-U | Colour

Buffered USB2.0 1392x1040 1/2” CCD | *Board Level*

CCN-B013-U | Monochrome
CCN-C013-U | Colour

Buffered USB2.0 1392x1040 2/3" CCD | *Enclosed*

CXE-B013-U | Monochrome
CXE-C013-U | Colour

PERFORMANCE SPECIFICATIONS

Models	CXE-B013-U	CXE-C013-U	CCE-B013-U CCN-B013-U	CCE-C013-U CCN-C013-U	CGE-B013-U CGN-B013-U	CGE-C013-U CGN-C013-U
Number of GPIOs	4	4	4	4	4	4
Resolution	1,392 x1,040				1,280 x 960	
CCD Chip	2/3" Sony ICX285AL Global Shutter	2/3" Sony ICX285AQ Global Shutter	½" Sony ICX205AL Global Shutter	½" Sony ICX205AK Global Shutter	1/3" Sony ICX445AL Global Shutter	1/3" Sony ICX445AK Global Shutter
Bit | bit	8 or 12					
Pixel Size | µm	6.45 x 6.45		4.65 x 4.65		3.75 x 3.75	
Active Imager Size | mm	(Diagonal) 11.0		7.60 x 6.20		6.26 x 5.01	
Scanning System	Progressive					
On-Board Memory | MB	N/A		32			
Frame Rates* (@28MHz Clock) | fps	15 @1392 x 1040 29 @696 x 520 (2x2 Bin) 37 @464 x 344 (3x3 Bin) 49 @348 x 256 (4x4 Bin) 49 @348 x 256 (1:4 Skip)				20 @1280 x 960 38 @640 x 480 (2x2 Bin) 53 @424 x 320 (3x3 Bin) 66 @320 x 240 (4x4 Bin) 66 @320 x 240 (4x4 Bin2)	
Sub Resolutions	696 x 520(2x2 Bin) 464 x 344 (3x3 Bin) 348 x 256 (4x4 Bin) 348 x 256 (1:4 Skip)				640 x 480(2x2 Bin) 424 x 320(3x3 Bin) 320 x 240(4x4 Bin) 320 x 240 (1:4 Bin2)**	
Shutter Speed (Exposure time) | ms	0.05~200,000					
Hardware Gains | dB	6 ~ 43				6 ~ 41	
Trigger Mode	With external trigger					
Trigger Cable	ACC-CAM-DIN8				ACC-CAM-CON8	
Trigger Delay | µs	< 25					
Strobe Out	Yes					
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)					
Built-in Filters	IR-cut (factory standard), or IR-pass, or no filter					
Power Consumption | W	< 1.8					

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
CGE series	115	45x45x30.5	45x45x35.5
CGN series	29	40x40x31	40x40x36
CCE | CXE series	150	95x70x38.5	95x70x43.5
CCN series	80	89x64x34	89x64x39

RECOMMENDED CONFIGURATIONS

Processor	Pentium III 900 MHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	256MB or greater
Hard Disk Space	30MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB2.0 Host Controller	Intel Integrated USB2.0 Host Controller is recommended

M-SERIES

Our unbuffered monochrome cameras often exhibit 20% higher spatial resolution than their color counterparts because no pixel interpolation is necessary. Without a Bayer color filter on the sensor, monochrome cameras are also more sensitive than color sensors especially in near IR and UV regions. Frame rate can be as high as 24 fps at full resolution and up to 600 fps using ROI mode. Our unbuffered colour camera delivers excellent quality images, and the frame rate can be as high as 8 fps at full resolution and up to 175 fps using ROI mode. All cameras have 4-pin GPIOs and optional built-in LED drivers

Key Definitions

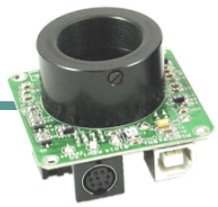
- **Unbuffered**
- **CMOS 1.3MP & 3.0MP**
- **Optional Built-in LED drivers**
- **Monochrome & Colour**
- **Rolling Shutter**

MODELS

Unbuffered USB2.0 1.3MP CMOS | *Enclosed*

MCE-B013-U | Monochrome
MLE-B013-U | Monochrome

Unbuffered USB2.0 1.3MP CMOS | *Board Level*



MCN-B013-U | Monochrome
GLN-B013-U | Monochrome

Unbuffered USB2.0 3MP CMOS | *Enclosed*

MCE-C030-U | Colour
MLE-C030-U | Colour

Unbuffered USB2.0 3MP CMOS | *Board Level*

MCN-C030-U | Colour
GLN-C030-U | Colour

PERFORMANCE SPECIFICATIONS

Models	1.3MP		3MP	
	MCN-B013-U MCE-B013-U	GLN-B013-U MLE-B013-U	MCN-C030-U MCE-C030-U	GLN-C030-U MLE-C030-U
Number of GPIOs	4	No	4	4 (GLN model only)
Built-in LED Drivers	No	Yes	No	Yes
Resolution	1,280 x 1,024		2,048 x 1,536	
CMOS Chip	½" (5:4) Micron MT9M001, Rolling Shutter		½" Micron MT9T001, Rolling Shutter	
Pixel Size | µm	5.2 x 5.2		3.2 x 3.2	
Active Imager Size | mm	6.66 x 5.32			
Scanning System	Progressive			
Dynamic Range | dB	68		61	
Sensor SNR | dB	45		43	
Gray Level | bit	8			
Responsivity | V/lux-sec	2.1			
Frame Rates* (@48MHz Clock) | fps	24 @1280x1024 32 @1024x768 50 @800x600 70 @640x480 180 @320x240 300 @160x120 450 @64x64 600 @32x32		8 @2048x1536 11 @1600x1200 16 @1280x1024 26 @1024x768 35 @800x600 50 @640x480 80 @320x240 130 @160x120 175 @64x64	
Sub Resolutions	1024x768 800x600 640x480 320x240 160x120 64x64 32x32		1600x1200 1280 x 1024 1024x768 800x600 640x480 320x240 160x120 64x64	
Shutter Speed (Exposure Time) | ms	0.04 ~ 750			
Hardware Gains | dB	12			
Trigger Mode	With external trigger			
Trigger Cable	ACC-CAM-DIN8			
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)			
Built-in Filters	IR-cut (factory standard), No filter, or IR-pass			
Power Consumption | W	< 1.0 (excluding LED drivers, if applicable)			
Number of LED Driver Channels	N.A.	4	N.A.	4
LED Driver Max. Output Voltage | V	N.A.	5	N.A.	5
LED Driver Max. Output Current (total) | mA	N.A.	250	N.A.	250

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
MCE | MLE series	150	58x58x34	58x58x39
MCN | GLN series	48	51x51x29	51x51x34

RECOMMENDED CONFIGURATIONS

Processor	Pentium III 900 MHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	256MB or greater
Hard Disk Space	30MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB2.0 Host Controller	Intel Integrated USB2.0 Host Controller is recommended

W-SERIES

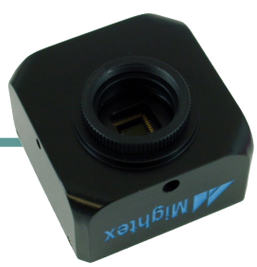
Mightex W-series windowless cameras are particularly useful for applications that are sensitive to interference fringes resulting from multiple reflections due to the existence of the glass window in front of the CMOS sensor. One example of such an application is laser beam profiling. In addition, windowless cameras are usually more sensitive to UV than their windowed counterpart, and hence the former might be useful for acquiring UV images.

Key Definitions

- **Windowless**
- **Unbuffered or Buffered**
- **Monochrome**
- **Rolling Shutter**

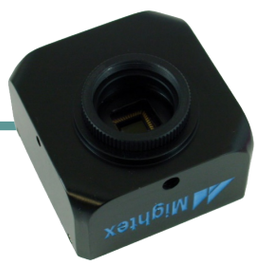
MODELS

Windowless Unbuffered USB2.0 1.3MP CMOS | *Enclosed*



MCE-B013-UW | Monochrome, 8 bit, C-mount
MCE-B013-UWS | Monochrome, 8 bit, CS-mount

Windowless Buffered USB2.0 1.3MP CMOS | *Enclosed*



BTE-B013-UW | Monochrome, 10 bit, C-mount
BTE-B013-UWS | Monochrome, 10 bit, CS-mount

PERFORMANCE SPECIFICATIONS

Models	MCE-B013-UW MCE-B013-UWS	BTE-B013-UW BTE-B013-UWS
Number of GPIOs	4	4
Built-in LED Drivers	No	
Resolution	1,280 x 1,024 Monochrome	
CMOS Chip	½" (5:4) Micron MT9M001, Rolling Shutter	½" (5:4) Micron MT9M001
Pixel Size | µm	5.2 x 5.2	
Active Imager Size | mm	6.66 x 5.32	
Scanning System	Progressive	
Dynamic Range | dB	68	
Sensor SNR | dB	45	
Gray Level | bit	8	10
Responsivity | V/lux-sec	2.1	
Frame Rates* (@48MHz Clock) | fps	24 @1280x1024 32 @1024x768 50 @800x600 70 @640x480 180 @320x240 300 @160x120 450 @64x64 600 @32x32	12 @1280x1024 18 @1024x768 25 @800x600 28 @752x480 33 @640x480 70 @320x240
Sub Resolutions	1024x768 800x600 640x480 320x240 160x120 64x64 32x32	Support arbitrary ROI, (X, Y) with X and Y multiples of 4
Shutter Speed (Exposure Time) | ms	0.04 ~ 750	
Hardware Gains | dB	12	0.125x ~ 8x
Trigger Mode	With external trigger	
Trigger Cable	ACC-CAM-DIN8	
Lens Mount	C– mount or CS-mount (M12.5-mount or custom-defined lens mount supported)	
Built-in Filters	No filter, IR-cut (standard), or IR-pass	None
Power Consumption | W	< 1.0 (excluding LED drivers, if applicable)	< 1.8

* Actual achievable frame rate depends on exposure time, as well as available resources of the host PC system.

DIMENSIONS

Models	Weight (excluding lens) | **g**	Size (hxwxd) | **mm**	
		CS-mount	C-mount
MCE | BTE series	150	58x58x34	58x58x39

RECOMMENDED CONFIGURATIONS

Processor	Pentium III 900 MHz or better, or a compatible processor
Operating System	Windows XP, Vista, 7, 8, and 10
RAM	256MB or greater
Hard Disk Space	30MB for software installation, plus additional space for storing captured images
Display	24 bit True Colour
USB2.0 Host Controller	Intel Integrated USB2.0 Host Controller is recommended

USB2.0 CCD LINE CAMERAS

Mightex's CCD line cameras are cost-effective & high-performance based on a single-line, CCD chip with USB2.0 (480 Mb/s) interface. CCD line cameras have several advantages over their area-array counterparts, including high optical linear resolution that allows systems developers to use the cameras to capture two-dimensional (2-D) images by moving the object or the CCD perpendicularly to the scan line. Line cameras are ideal for a variety of OEM applications such as industry process control, optical spectroscopy and bio-medical imaging. Setting up the line camera is very easy: one simply needs to install the camera's application software into any PC, and then connect the line camera to the PC using a USB cable. There is no need to install a DAC card or to use an external power supply. A Linux driver is also available upon request.

FEATURES

- USB2.0 interface
- No external power supply required
- Adjustable optical integration time
- 1024, 2048, & 3648 pixel silicon linear CCD arrays
- 8-, 12-, & 16-Bit A/D converters
- External trigger capability
- 4 GPIOs
- SDK for user applications
- Demo software with GUI

MODELS

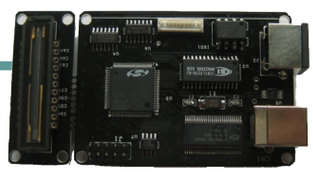
USB2.0 1024-Pixel 8/12bit | *Enclosed*

TCE-1024-U | Glass Window
TCE-1024-UF | Fused Silica Window

USB2.0 2048-Pixel 12bit | *Enclosed*

TCE-1209-U | Glass Window

USB2.0 2048-Pixel 12bit | *Board Level*



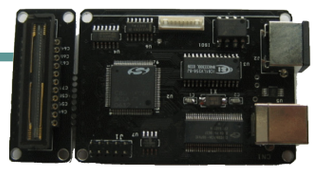
TCN-1209-U | Glass Window

USB2.0 3648-Pixel 16bit | *Enclosed*

TCE-1304-U | Glass Window
TCE-1304-UW | Windowless

USB2.0 3648-Pixel 16bit | *Board Level*

TCN-1304-U | Glass Window
TCN-1304-UW | Windowless



PERFORMANCE SPECIFICATIONS

Models	TCE-1024-U TCE-1024-UF	TCE-1209-U TCN-1209-U	TCE-1304-U TCE-1304-UW TCN-1304-U TCN-1304-UW
CCD	High performance CCD sensor	Toshiba TCD1209	Toshiba TCD1304DG
Number of Pixels	1,024	2,048	3,648
Pixel Size | µm	14 x 14		8 x 200
Spectral Range | nm	TCE-1024-U 300-1,000 TCE-1024-UF 200-1,000	300-1,000	TCE-1304-U: 350-1,000 TCE-1304-UW: 200-1,000
Pixel Output Clock | MHz	32	8	0.5
Frame Buffers on Camera	16,384 frames 8bit 8,192 frames 12bit	64 frames	4 Frames
ADC Resolution	8 or 12 bits	12 bits	16 bits
External Trigger	Yes		
Trigger Cable	ACC-CAM-DIN8		
Exposure Time Range | ms	0.04 ~ 655	0.3 ~ 3,300	0.1~ 6,500
Gain | dB	6 ~ 42	N/A	
GPIO	Yes (4 programmable I/O's)		
Scan Rate | scans/second	25,000 8bit 10,000 12bit in NORMAL mode[a] >11,000 8bit & 12bit in TRIGGER mode[b]	3,300[c]	138[d]
Lens Mount (Optional)	N/A	F mount	N/A
Host Interface	USB 2.0		

[a] Actual scan rate depends on exposure time, as well as available resources of the host PC system.
[b] In Trigger Burst mode the scan rate can reach 25,000 scans/second (8bit) or 10,000 scans/second (12bit)
[c] Scan rate achievable when exposure time is set at 0.3ms in Continuous mode.
[d] Scan rate achievable when exposure time is set at 0.1ms in Continuous mode.

SDK FEATURES

Operating System	Windowns 2000, XP, Vista, 7, 8, and 10
RAM	64MB or greater
Hard Disk Space	10MB for software installation, plus additional space for storing captured images
USB Port	USB2.0
Multiple Cameras	Supported
Plug & Play	Not recommended
Device Driver	Yes
Demo Application	Yes
Library Files	Yes (DLL files and Static Library files)
Example Codes	Yes (VC++ and Delphi)
Frame Attributes*	Exposure time, Time Stamp, Trigger Event Count, Over exposure detection

* SDK will provide call back, which will send the user Frame data and the related attributes of each frame.

INDUSTRIAL CAMERA ACCESSORIES

CABLES AND BRACKETS

Part Number	Description
ACC-USB-2M	6-foot-long USB A-B cable
ACC-USB-5M	Extra-length (15 feet long) USB A-B cable
ACC-USB-M2M	6-foot-long USB A-miniB cable
ACC-USB-M5M	Extra-length (15 feet long) USB A-miniB cable
ACC-CAM-DIN8	Mightex's M-series, B-series, CCD (except CGx-series) and USB3.0 camera trigger cable with an 8-pin DIN connector. For GPIOs and external triggers. Length: 80cm
ACC-CAM-CON8	Mightex's Con8 cable for S-series and CGx-series CCD cameras. For GPIOs and external triggers
ACC-CAM-BRKT	USB connector holding bracket for Mightex's MCE- and BCE- CMOS cameras
ACC-USB-M2M-S	6-foot-long USB A-miniB cable with locking screws, for S-series enclosed cameras only

OPTICAL FILTERS

Part Number	Description
ACC-CAM-IRC	IR-cut filter. Dimensions: 18mm in diameter, and 1mm in thickness.
ACC-CAM-IRPxxx	Various IR-pass filters. Dimensions: 15(L) x 13(W) x 2(T) mm.
ACC-CAM-PGP	Plain glass plates for Mightex's cameras. Dimensions: 18mm in diameter, and 1mm in thickness.

Please note that, while ACC-CAM-IRC and ACC-CAM-PGP can be used as drop-in replacements, ACC-CAM-IRPxxx will have to be glued to the camera using epoxy due to its 2mm thickness.

LENS MOUNT ADAPTERS

Part Number	Description
ACC-CAM-CSC	CS-mount to C-mount lens adapter.
ACC-CAM-CM12	C-mount to M12x.5 adapter.
ACC-CAM-C23	C-mount to 23mm adapter (for microscope eyepiece tube).
ACC-CAM-C1Q	C-mount to 1.25" adapter for cameras (for telescope 1.25" eyepiece tube).
ACC-CAM-M12	Stand-alone M12 lens mount for MCN-, BCN-, SCE-, SCN-series cameras, IR-Cut filter not included.
ACC-CAM-CS	Stand-alone CS lens mount for MCN- and BCN- series cameras, IR-Cut filter not included.

CCD LINE CAMERA ACCESSORIES

Part Number	Description
ACC-LCM-F	F-mount lens adapter for TCN-1304-U line camera.
ACC-LCE-F	F-mount lens adapter for TCE-1024-U(F), TCE-1304-U, TCN-1209-U and TCE-1209-U line camera.
ACC-1304-120	Daughter-board/motherboard connection cable for TCN-1304-U line camera, 120mm long.
ACC-1304-200	Daughter-board/motherboard connection cable for TCN-1304-U line camera, 200mm long.
ACC-LCE-C	Mechanical adapter for CCD Line Camera TCE-1024-U(F), TCE-1304-U, TCN-1209-U and TCE-1209-U, with C-type lens mount.

SPECTROMETERS

PRODUCT OVERVIEW

Spectromers are used in a variety of applications to measure different optical properties of light, including wavelength spectra and intensity. Mightex uses high-sensitivity sensors to collect light efficiently through a SMA connected fiber. We also offer a wide range of slit widths and wavelength sensitivity. Together with an easy-to-use software package, our spectrometers offer a complete solution to meet your application needs.

High Resolution High Stability CCD Spectromers

HRS Series
UV/VIS/NIR (200-1050nm)
Sub-nm resolution

HRS-BD1-xxx
300nm-1070nm

HRS-IR1-xxx
700nm-870nm

HRS-NIR-xxx
600nm-1000nm

HRS-UV1-xxx
200nm-400nm

HRS-VIS-xxx
390nm-780nm

● *page* **82**

Optical Spectrometer Sensor Engine

SSE Series
Silicon linear CCD array
8μm x 200μm pixel size

● *page* **87**

Spectrometer Accessories

Cuvette holders
Cosine corrector
Direct Coupling Collimators & more!

● *page* **89**

Multi Channel CCD Spectrometers

Multiple (6) spectral channels
High spectral resolution
High throughput

● *page* **84**

HIGH-RESOLUTION HIGH-STABILITY CCD SPECTROMETERS

Compact CCD spectrometers are widely used in process control, environment monitoring, and scientific research applications. Mightex HRS series compact CCD spectrometers features a high-resolution 100mm Czerny-Turner optical platform coupled with a Toshiba 3648-element CCD array. The optimized optical path yields both high spectral resolution and high light collec- tion efficiency.

FEATURES

- Superb temperature and long-term stability
- Interchangeable slit by customers
- Fiber input with SMA connector
- UV/VIS/NIR (200-1050nm), sub-nm resolution
- External trigger and GPIOs
- Full-featured SDK for OEM
- USB2.0 for both data and power
- LabView Support
- Low-level USB protocol for embedded system

Wavelength and amplitude stability is often a critical requirement for many spectrometer applications. All optical components in the HRS series spectrometers are mounted directly on a single-piece base without using screws. A box enclosure structure further increases stiffness of the base. The proprietary mounting method ensures high stability over time and temperature change.

The spectrometer takes input through an SMA connector port. Usually a fiber patch cord is used to transmit light into the spectrometer. However, it's also possible to send the input light directly into the spectrometer through the input slit. Input ports are interchangeable so that ports with different slit size (or without slit) can be used. Note that wavelength calibration is necessary after changing the input port.

A 16-bit DAC is used to convert the analog signal from the CCD array into a digital stream. The electronics hardware also includes trigger input and four programmable digital I/Os for interfacing with other equipment, such as a light source. The spectrometer is controlled through a USB2.0 interface which also supplies all the electric power needed to operate the spectrometer. The standard software package includes a full-featured PC software as well as a software development kit (SDK) for further software development.

MODELS

HRS Series CCD Spectrometers

HRS-BD1-xxx | 300-1070nm
HRS-IR1-xxx | 700-870nm
HRS-NIR-xxx | 600-1000nm
HRS-UV1-xxx | 200-400nm
HRS-VIS-xxx | 390-780nm

PERFORMANCE SPECIFICATIONS

Model[1]	HRS-UV1-xxx	HRS-VIS-xxx	HRS-NIR-xxx	HRS-IR1-xxx	HRS-BD1-xxx
Optical Platform	f/4, Czerny-Turner				
Focal Length | mm	100				
Wavelength Range | nm	200 ~ 400	390 ~ 780	600 ~ 1,000	700 ~ 870	300 ~ 1,050
Order Sorting Filter	Longpass	Longpass	Longpass	Longpass	Spatially Variable Filter
Entrance Slit | µm	5, 10, 25, 50, 100, 200 or no slit				
Input Fiber Connector	SMA 905				
Input Fiber NA	0.22				
Detector	Toshiba TCD1304AP Linear CCD Array				
Pixel Number	3648				
Pixel Size | µm	8 x 200				
Pixel Well Depth | electron	100,000				
Signal-to-noise Ratio	1,000:1 (at full scale)				
A/D Resolution | bit	16				
Integration Time | ms	0.1 to 6,500				
Frame Rate | fps	up to 138				
GPIO	4 programmable digital I/Os				
Trigger Input	Yes				
Trigger/GPIO Interface	DIN8				

[1] xxx is the code for the entrance slit size of choice: 005, 010, 025, 050, 100, and 200.

SPECTRAL RESOLUTION VS. SLIT WIDTH

Slit Width | **µm**	Spectral Resolution | FWHM, **nm**				
	HRS-UV1-xxx	HRS-VIS-xxx	HRS-NIR-xxx	HRS-IR1-xxx	HRS-BD1-xxx
5	0.15	0.25	0.25	0.12	0.5
10	0.2	0.3	0.3	0.15	0.6
25	0.25	0.4	0.5	0.2	0.9
50	0.45	0.8	0.9	0.38	1.7
100	0.85	2	2.1	0.9	4.1
200	1.65	4.8	4.9	2.1	9.7

DIMENSIONS

Models	Weight | **g**	Size (hxwxd) | **mm**
HRS series	550	138x108x37

RECOMMENDED CONFIGURATIONS

Processor	Pentium 4 1.8 GHz or higher
Operating System	Windows 2000, XP, Vista, 7, 8, and 10
RAM	512MB or greater
Hard Disk Space	50MB for software installation, plus additional space for storing captured images
Power Consumption	300 mA at 5V
USB2.0 Host Controller	USB2.0 Enhanced Controller, which supports USB2.0 High-Speed (480Mbps)

MULTI-CHANNEL CCD SPECTROMETERS

Multi-channel spectrometers are used to monitor or measure multiple samples or sources simultaneously. Traditionally, multi-channel imaging spectrometers have been expensive and bulky instruments used only in demanding laboratory and industrial applications. Mightex has leveraged the state-of-the-art optics and CCD cameras to bring to the market a compact and low-cost multi-channel fiber spectrometer that features high spectral resolution and high light throughput.

FEATURES

- Multiple (6) spectral channels in one compact package
- No moving parts
- High spectral resolution
- High throughput
- USB2.0 interface
- No external power required
- Trigger input
- Full-featured SDK
- GPIOs for interfacing with other equipment

At the heart of Mightex multi-channel spectrometers is a high-throughput flat-field imaging spectrograph. Multiple input fibers, each represents an independent signal channel, are aligned along the input slit of the imaging spectrograph. Spectrum of each channel is dispersed by a high-efficiency diffraction grating and then imaged on to a 2D CCD sensor. Light from each channel occupies different rows on the CCD sensor. All channels are exposed simultaneously, then rows associated with each channel are binned together to produce a spectrum for the channel. Fiber channels are spaced out properly to essentially eliminate crosstalk between adjacent channels.

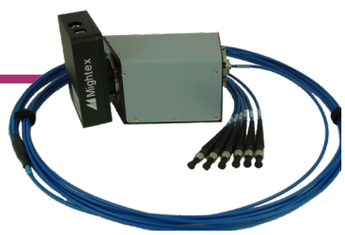
The standard CCD camera features a ½" 1.3MP Sony ICX205 imager with a 12-bit ADC. Exposure time (integrating time) can be varied between 50μs and 200s. The electronics hardware also includes trigger input and four programmable digital I/Os for interfacing with other equipment, such as a light source. The spectrometer is controlled through a USB2.0 interface which also supplies all the electric power needed to operate the spectrometer. Mightex also integrates other cameras to build custom multi-channel spectrometers.

Input ends of the fibers are connectorized with SMA905 connectors. Sleeves are available to connect the fibers to other SMA connectors. Standard software package includes a full-featured multi-channel spectrometer PC software as well as a software development kit (SDK) for further software development. The software also supports radiometric calibration and photometric calculations.

MODELS

ISP Series CCD Spectrometers

ISP-VIS-MC006-A |
ISP-VIS-MC006-A-CAL | individual channel irradiance calibration



PERFORMANCE SPECIFICATIONS

Model[1]	ISP-VIS-MC006-A-xxx
Number of Channel	6
Optical Platform	F/2 High-resolution flat-field imaging spectrograph
Wavelength Range | nm	380 ~ 780
Order Sorting Filter	Long-pass
Entrance Slit | µm	5, 10, 25, 50, 100, 200 or no slit
Input Fiber Connectors	SMA 905
Input Fiber NA	0.22
Detector	Sony ICX205AL
Pixel Number	1,392 x 1,040
Pixel Size | µm	4.65 x 4.65
Effective Pixel Well Depth[2] | electron	200,000
Signal-to-noise Ratio	1,000:1(at full scale)
A/D Resolution | bit	12
Integration Time | ms	0.05 to 200,000
Frame Rate | fps	15 @ 8bit, 9 @ 12bit
Hardware Gain | dB	6 ~ 43
GPIO	4 programmable digital I/Os
Trigger Input	Yes
Trigger Delay | µs	< 25
Trigger/GPIO Interface	DIN8

[1] xxx is the code for the entrance slit size of choice: 005, 010, 025, 050, 100, and 200.
[2] After binning.

SPECTRAL RESOLUTION VS. SLIT WIDTH

Slit Width | **µm**	Spectral Resolution | FWHM, **nm**
	ISP-VIS-MC006-A-xxx
5	1.1
10	1.2
25	1.7
50	2.4
100	4.0
200	7.1

DIMENSIONS

Models	Weight | **g**
ISP series	840

RECOMMENDED CONFIGURATIONS

Processor	Pentium 4 1.8 GHz or higher
Operating System	Windows 2000, XP, Vista, 7, 8, and 10
RAM	512MB or greater
Hard Disk Space	50MB for software installation, plus additional space for storing captured images
Power Consumption	1.8W
USB2.0 Host Controller	USB2.0 Enhanced Controller, which supports USB2.0 High-Speed (480Mbps)

OPTICAL SPECTROMETER SENSOR ENGINE

Mightex's Optical Spectrometer Sensor Engine includes a cost-effective high-performance B/W board-level line camera, based on a single-line, 3648-pixel CCD chip with USB2.0 (480 Mb/s) interface. Setting up the Optical Spectrometer is very easy: the user simply installs the Mightex spectrometer software onto any desktop or notebook PC and then connects the USB cable from the line camera to the PC. There is no need for installing a DAC card, or using an external power supply. The spectrometer sensor also comes with a line camera SDK for further development by the user.

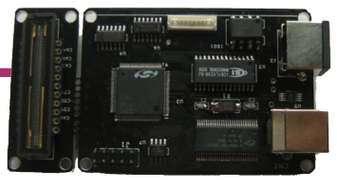
FEATURES

- USB2.0 compatible
- Board-level camera, ideal for OEM applications
- No external power supply required
- Optical integration time-adjustable from 100ms to 6.5s
- 3648 pixel silicon linear CCD array
- 8µm x 200µm pixel size
- 16-bit A/D converter for high intensity resolution
- High scan rate
- External trigger capability
- 4 GPIOs pins

The 'window-less' version of the spectrometer sensor engine has the glass plate in front of the image sensor removed, and hence it is more sensitive to UV and is also more suitable for applications where coherent light sources such as lasers are used.

MODELS

SSE Series Spectrometer Sensor Engine



SSE-1304-U | Board-level
SSE-1304-UE | Enclosed
SSE-1304-UW | Board-level, windowless
SSE-1304-UWE | Enclosed, windowless

PERFORMANCE SPECIFICATIONS

Models	SSE-1304-U SSE-1304-UE	SSE-1304-UW SSE-1304-UWE
CCD	Toshiba TCD1304DG	
Number of Pixels	3,648	
Pixel Size | µm	8 x 200	
Spectral Range | nm	350 ~ 1,000	200 ~ 1,000
Pixel Output Clock | MHz	0.5	
Data Storage On board | frame	4	
ADC Resolution | bit	16	
External Trigger	Yes	
Exposure Time Range | ms	0.1 ~ 6,500	
GPIO	Yes (4 Programmable I/O's)	
Frame Rate[1] | scans/second	138	
Host Interface	USB 2.0	

[1] Frame rate is dependent on exposure time. Value shown when exposure time is set to 0.1ms.

SDK FEATURES

Operating System	Windowns 2000, XP, Vista, 7, 8, and 10
RAM	64MB or greater
Hard Disk Space	10MB for software installation, plus additional space for storing captured images
USB Port	USB2.0
Multiple Cameras	Supported
Device Driver	Yes
Demo Application	Yes
Library Files	Yes (DLL files and Static Library files)
Example Codes	Yes (VC++ and Delphi)
Frame Attributes*	Exposure time, Time Stamp, Trigger Event Count, Over exposure detection

* SDK will provide call back, which will send the user Frame data and the related attributes of each frame.

SPECTROMETER ACCESSORIES

CUVETTE HOLDERS

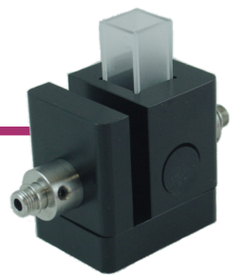
The SPC-CVH-10-xx Cuvette Holders accept a standard 10-mm path length cuvette for liquid or powder samples. SMA-terminated optical fibers are used to couple light sources and spectrometers to the device. The Cuvette Holder is compatible with Mightex's fiber coupled LED sources, Mightex's spectrometers, as well as any other light sources or spectrometers with SMA termination. The standard configuration of a SPC-CVH-10-xx Cuvette Holder comes with two SMA fiber collimators, with the option of adding up to a total of four (4) SMA fiber collimators. This compact design can easily be inserted into a lab setup, and there is a filter slot on the holder which is perfect for fluorescence applications.

Key Features

- **Designed for 10-mm path length cuvettes**
- **Up to four (4) SMA ports**
- **Filter slot accepts filters up to 5mm in thickness**
- **M4 and 8-32 mounting holes**

MODELS

SPC Cuvette Holders



SPC-CVH-10-00 | No fiber optic collimators
SPC-CVH-10-2V | 2 fiber optic collimators, 350-2000nm
SPC-CVH-10-3V | 3 fiber optic collimators, 350-2000nm
SPC-CVH-10-4V | 4 fiber optic collimators, 350-2000nm
SPC-CVH-10-2U | 2 fiber optic collimators, 185-2100nm
SPC-CVH-10-3U | 3 fiber optic collimators, 185-2100nm
SPC-CVH-10-4U | 4 fiber optic collimators, 185-2100nm

SPECTROMETER SLITS AND INPUT ADAPTER

Part Number	Description
ACC-SPC-ADP-0000	SMA fiber input adapter for spectrometers without an entrance slit.
ACC-SPC-ADP-0005	Additional spectrometer input adapter with 5um slit.
ACC-SPC-ADP-0010	Additional spectrometer input adapter with 10um slit.
ACC-SPC-ADP-0025	Additional spectrometer input adapter with 25um slit.
ACC-SPC-ADP-0050	Additional spectrometer input adapter with 50um slit.
ACC-SPC-ADP-0100	Additional spectrometer input adapter with 100um slit.
ACC-SPC-ADP-0200	Additional spectrometer input adapter with 200um slit.

Please note that one only needs to order the adapters if one needs an additional input slit, as the original spectrometer already includes a slit. For customers who require spectrometers without an input slit, an input adapter (ACC-SPC- ADP-0000) is required.

WHITE REFLECTION STANDARD

Part Number	Description
WRS-001	White reflectance standard, 1" in diameter

COSINE CORRECTOR

Part Number	Description
ACC-SPC-COS1	Cosine corrector for light collection and radiometric/photometric measurement, transmission range: 220nm - 2500nm, SMA connector.

MECHANICAL HOLDERS FOR FIBER OPTIC COLIMMATORS

Part Number	Description
ACC-FOC-045-100	Mechanical Holder for Holding Two Collimators at 45 Degrees.

DIRECT-COUPLING COLLIMATORS

Direct-coupling collimators are used to either coupling light from free space into a spectrometer or collimating light from a point light source to form a collimated (parallel) optical beam. Direct-coupling collimators are key components with numerous applications. For example, in spectroscopy, a direct coupling collimator can collect light in a narrow field of view into a spectrometer. In another example, one collimator is connected to a point light source and the collimated beam passes through a cuvette. On the other side of the cuvette a second collimator couples light directly into a spectrometer.

Key Features

- **BK7 lens, 350nm to 2000nm**
- **UV fused silica lens, 185nm to 2100nm**
- **Adjustable focus**
- **Aluminum alloy construction**
- **Internal SMA thread**

To maximize transmission wavelength range Mightex direct-coupling collimators feature a single BK7 or UV fused silica lens without optical coating. The collimator housing is machined from aluminum alloy for maximum durability. The collimator features an internal SMA thread for direct connecting to spectrometers with popular SMA input ports.

When installed on a spectrometer, the full field of view (FOV) or full divergence angle can be calculated as FOV = 2atan(W/2f) where W is the width of the entrance slit of the spectrometer and f is the focal length of the lens. Alternatively, the linear field of view on an object placed a distance L away from the collimator is W(L/f). Focusing of the collimator is adjustable for object distance between 50mm to infinity.

MODELS

DCC Collimators | 10mm focal length, 5mm clear aperture

DCC-010-005-U | UV fused silica, 185-2100nm
DCC-010-005-V | BK7, 350-2000nm

PATTERNED ILLUMINATION

PRODUCT OVERVIEW

Whether in the life science field or for industrial applications, Mightex offers a select number of solutions designed with microscopy and imaging in mind. Mightex provides intuitive and efficient illumination solutions that are designed to be easily integrated into multiple setups based on microscope configurations and illumination requirements. We also offer our FilterReader spectrophotometer to test the spectrum specifications of filters and beam splitters, often integral parts of microscopic imaging.

Polygon
DMD Illuminator

Targeted stimulation
Multiwavelengh
Easy microscope integration

● *page* **91**

POLYGON DMD ILLUMINATOR

Mightex's Polygon DMD illuminator integrates state-of-the-art spatial light modulators and high-power LEDs using a proprietary Etendue-preserving optical design to deliver high-intensity illumination patterns with diffraction-limited resolution. A Texas Instruments' DLP spatial light modulator is used to display a user defined image pattern. At the heart of the Polygon is a unique optical system that carefully delivers light from LED sources to the DLP panel and then through a microscope to the specimen plane. Such a systematic approach makes it possible to achieve maximum optical intensity while maintaining diffraction-limited imaging performance.

FEATURES

- Programmable multiwavelength patterned illumination
- Arbitrary shape/size of illumination pattern
- Simultaneous illumination of multiple regions of interest
- No cooling fan, no vibration
- Widerange of available LED wavelengths
- Pattern swithcing up to 6600 frames per second
- Built-in LEDs, or external light sources through a fiber/ lightguide
- Adapters for various microscopes
- USB2.0/USB3.0 interface, TTL trigger
- Diffraction-limited projection
- High-throughput Etendue-preserving design
- Intuitive software for spatial/temporal/spectral control

Temporal performance is key to many intended applications for Polygon. With a frame rate of up to 6,600 fps and fast-switching LEDs, Mightex Polygon can deliver illumination patterns with micro-second precision. A dedicated software allows users to generate illumination patterns as well as control illumination intensity and timing. The software also supports alignment between illumination patterns and images acquired through any digital cameras on a microscope.

Mightex Polygon is designed to be easily inserted into the infinity path of a microscope. For inverted microscopes, the preferred inserting point is usually the back port of the microscope where a fluorescence attachment is commonly placed. A filter cube is required to fold the Polygon light path into the microscope. The filter cubes used for fluorescence observation serves this purpose well. For upright microscopes we provide a beam combiner cube to be inserted below the binocular/trinocular unit. The dichroic or mirror in the beam combiner directs the Polygon beam into the microscope light path.

MODELS

Polygon1000-G

DSI-K2-000 | 3mm-core liquid lightguide input, 350nm-1000nm

Polygon1000-DL

DSI-K2-L20 | SMA fiber optic input, 400nm-1000nm

Polygon1000-DI

DSI-K2-DI20, DSI-K3-DI20 | lightguide input 350nm-1000nm
SMA fiber optic input, 400nm-1000nm

Polygon-UHC

DSI-K3-UHC-000 | SMA fiber optic input, 400nm-1000nm

PERFORMANCE SPECIFICATIONS

ILLUMINATION PROJECTION AREAS & RESOLUTION

Polygon1000-G

Field of View	Projection Area Dimensions	Commercial Microscope (1X Objective)[a]			
		Leica	Nikon	Olympus	Zeiss
Standard	**Height | mm**	6.2	6.2	5.5	5.1
	Width | mm	9.9	9.9	8.9	8.1
	Diagonal | mm	11.6	11.6	10.5	9.6
	Pixel Size | µm	7.6	7.6	6.9	6.3
Large[c]	**Height | mm**	12.4	12.4	11	10.2
	Width | mm	19.8	19.8	17.8	16.2
	Diagonal | mm	23.2	23.2	21	19.2
	Pixel Size | µm	15.2	15.2	13.8	12.6

[a] To calculate illumination field-of-view and pixel resolution at the specimen, simply divide the above numbers by the magnification of the objective.
[c] Requires large field-of-view front tube lens. Sold separately.

Polygon1000-DL

Field of View	Projection Area Dimensions	Commercial Microscope (1X Objective)[a]			
		Leica	Nikon	Olympus	Zeiss
Standard	**Diameter[b] | mm**	12.4	12.4	11	10.2
	Pixel Size | µm	15.2	15.2	13.8	12.6

[a] To calculate illumination field-of-view and pixel resolution at the specimen, simply divide the above numbers by the magnification of the objective.
[b] Polygon1000-DL has a circular illumination field-of-view.

Polygon1000-DI

Optical Input	Field of View	Projection Area Dimensions	Commercial Microscope (1X Objective)[a]			
			Leica	Nikon	Olympus	Zeiss
Liquid Light guide	**Standard**	**Height | mm**	6.2	6.2	5.5	5.1
		Width | mm	9.9	9.9	8.9	8.1
		Diagonal | mm	11.6	11.6	10.5	9.6
		Pixel Size | µm	7.6	7.6	6.9	6.3
	Large[c]	**Height | mm**	12.4	12.4	11	10.2
		Width | mm	19.8	19.8	17.8	16.2
		Diagonal | mm	23.2	23.2	21	19.2
		Pixel Size | µm	15.2	15.2	13.8	12.6
Multimode fiber	**Standard**	**Diameter[b] | mm**	12.4	12.4	11	10.2
		Pixel Size | µm	15.2	15.2	13.8	12.6

[a] To calculate illumination field-of-view and pixel resolution at the specimen, simply divide the above numbers by the magnification of the objective. [c] Requires large field-of-view front tube lens. Sold separately.

Polygon-UHC

Model	Field of View	Projection Area Dimensions	Commercial Microscope (1X Objective)[a]			
			Leica	Nikon	Olympus	Zeiss
POLYGON1000-UHC	**Standard**	**Diameter[d] | mm**	12.4	12.4	11	10.2
		Pixel Size | µm	15.2	15.2	13.8	12.6

[a] To calculate illumination field-of-view and pixel resolution at the specimen, simply divide the above numbers by the magnification of the objective.
[c] Requires large field-of-view front tube lens. Sold separately.

CONTROL & TIMING

Maximum Frame Rate | fps*	up to 6,600
Input Trigger	TTL, BNC connector
Input Trigger Delay | µs	50
Output Trigger	TTL, BNC connector
Output Trigger Delay	User Programmable

* Values at 1bit depth. For grayscale features please contact Mightex for more information.

* Applicable to all models

SOFTWARE COMPATIBILITY

Mightex	PolyScan4 software included free of charge
3rd Party Support	Nikon's NIS Elements
	Micro-Manager Open Source Microscopy Software

SYSTEM & COMMUNICATION

Operating System	Windows XP, Vista, 7, 8, 10 and 11
Interface	USB2.0 and USB3.0
Power Supply	5Vdc 3A input power
Screen Resolution	1,366x768 or higher