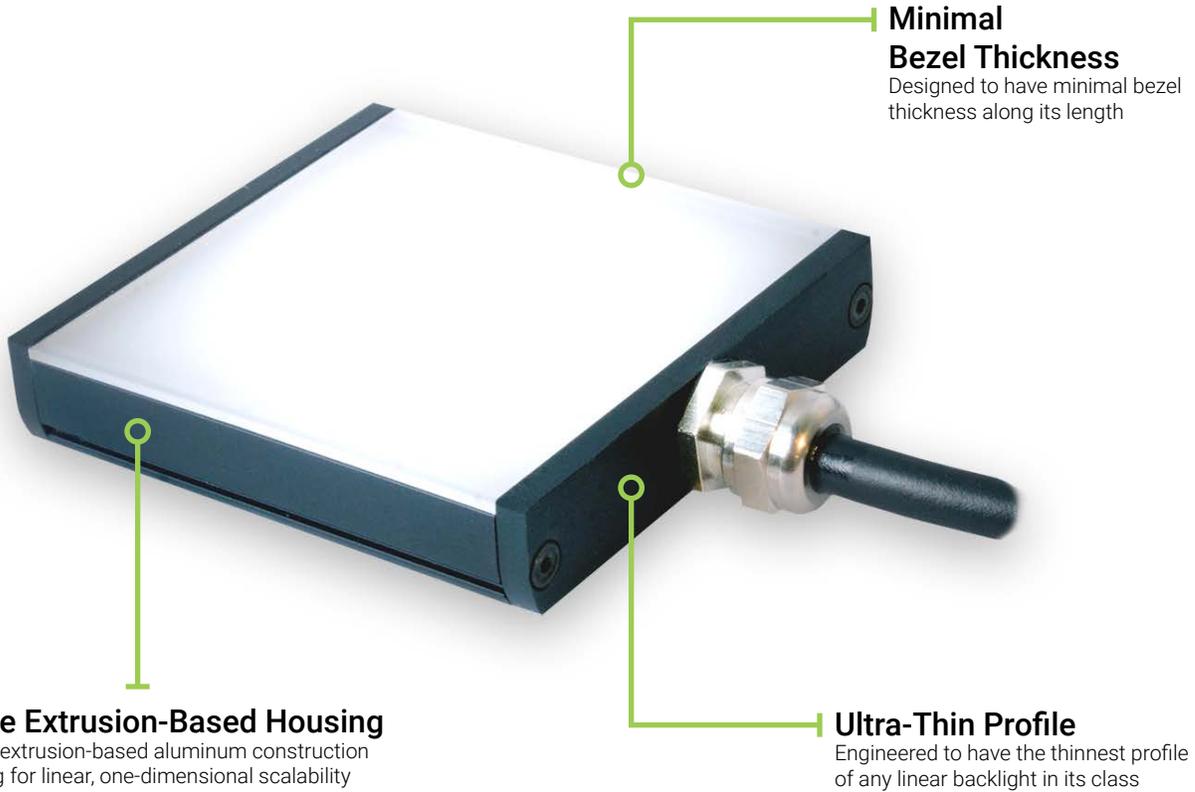


BL128 Series

Compact Linear Backlights | Product Datasheet



BL128 Series Description

The BL128 Series provides a compact linear backlight solution ideal for space-constrained line scan applications.

Its ultra-thin profile (less than 1/2") minimizes vertical footprint, and bezel-free design along the length allows for placement of its emitting window right up to adjacent surfaces.

While optimized for line scan setups, the BL128's versatility extends to general-purpose machine vision lighting as a non-directional, highly diffuse bar light illuminator when needed.

As with all Advanced illumination products, this series is built for customizability while maintaining best-in-class build-to-order lead times of only one to two weeks



High Intensity



Compact



Scalable Design



5 Wavelengths Available



1-2 Week BTO Lead Times

General Information

General Specifications

Category	Specification	Detail		
Optical	Available Wavelengths	White, 470 nm, 520 nm, 660 nm, 880 nm		
	Available Lensing	No Lenses		
	Available Light Conditioning	None		
Electrical	Power Consumption Info	See Power Requirements on Page 11		
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain		
Mechanical	Sizing Info	Standard	Length 1.99"(50.6mm) to 14.99"(380.8mm)	See Page 9 for More Details
			Width 2.31"(58.7mm)	
			Height .48"(12.2mm)	
	Sealed		Length 2.06"(52.3mm) to 15.06"(382.5mm)	
			Width 2.31"(58.7mm)	
			Height .50"(12.7mm)	
		Weight Info (Standard)	~ 0.50 lbs (~226 g) per 2" Unit Length	
	Mounting Info	#4 Mounting Screw Bracket		
	Material Info	Anodized Aluminum Housing, Acrylic Window, Nickel Plated Brass Strain Relief, PVC Cable Jacket, Steel Black Oxide Fasteners, Optional: Silicone Sealant, Neoprene Gasket		
Thermal	Operating Case Temperatures	25 °C to 60 °C		
	Operating Ambient Temperatures	0 °C to 35 °C		
Certification	Compliance	CE, RoHS, IEC 62471		
	IP Rating	IP50 or IP64		
	Lumen Maintenance - White Only	L70 (50,000 Hours)		

General Information - Continued

Part Number Key

Model	-	Emitting Length (in)	Peak Wavelength	Connector/Control	Washdown Option	-	Alternative Connector
BL128	-	XX	XXX	XX	W (IP64)	-	XXX
BL128		1" Increments from 1" to 46"	470 (blue)	C1			M12 ¹
			520 (green)	C5			M8 ¹
			660 (red)	IC			
			880 (IR)	I3			
			WHI (white)	I3S			
more information on page		9	5	11			13

Example Part Numbers:

BL12806-470C5W
BL12808-660I3-M12

¹ Only available with IC, I3, and I3S configurations

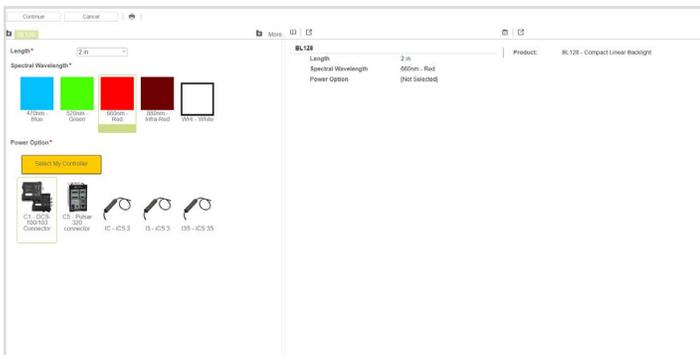
In Stock

BL128-WHIIC

Lead Times

Stock products ship within three days.
Build-to-Order custom products ship within one to two weeks.

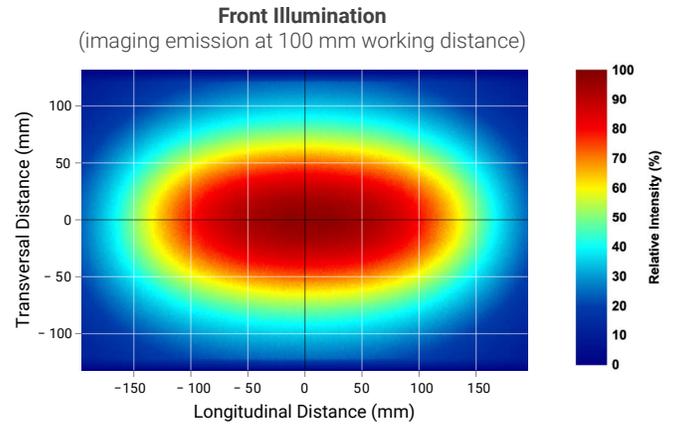
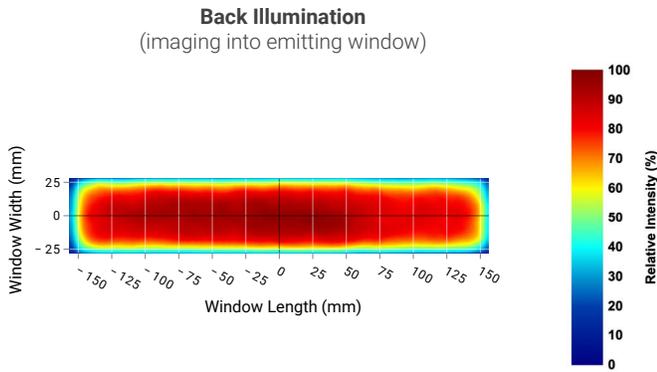
Configurator



Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL128 Compact Linear Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

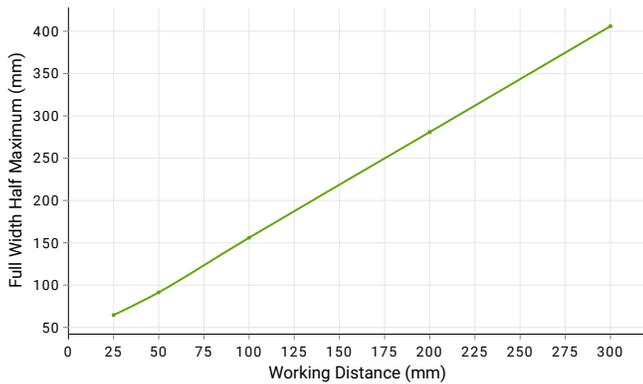
Intensity Distribution



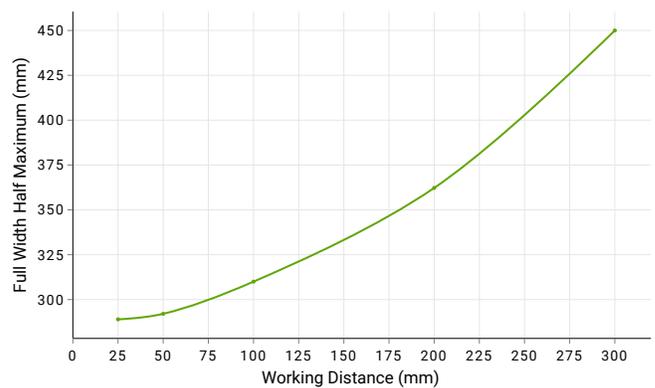
Both intensity distribution images shown above have been taken using a 12-inch white BL128 unit.

FWHM vs Working Distance

Transversal FWHM vs Working Distance



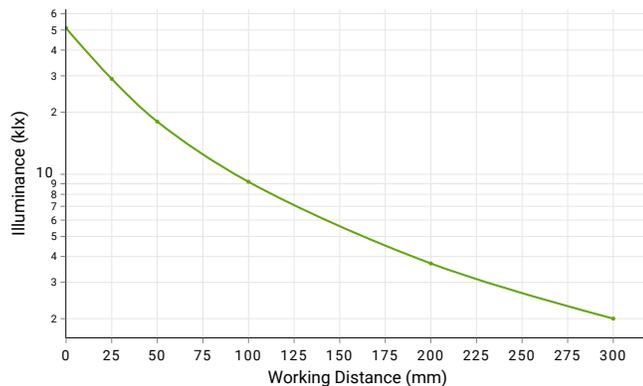
Longitudinal FWHM vs Working Distance



Both Full Width Half Maximum (FWHM) vs Working Distance plots shown above have been measured using a 12-inch white BL128 unit.

Intensity vs Working Distance

Illuminance vs Working Distance

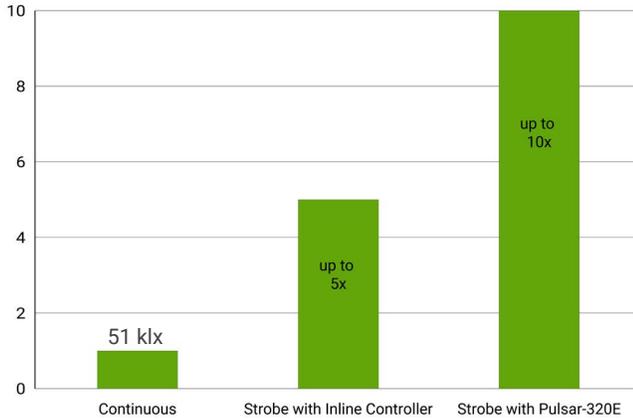


Linear Backlights, while typically oriented behind the object of interest, can also be used for highly diffuse front illumination at short to medium working distances. The chart to the left shows the BL128's intensity as it's distance from the inspection surface changes.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

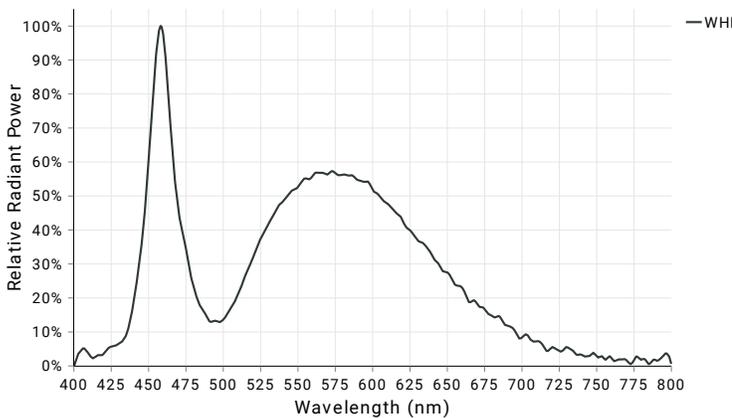
Optical Information - Continued

Continuous vs Pulsed Intensity



Under continuous operation, a 12-inch white BL128 unit will output an **illuminance of 51 klx** and an **irradiance of 173 W/m²** at the emitting surface. For applications that require higher output, the BL128 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BL128 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a BL128 can be strobed up-to 10X continuous intensity levels.

White Spectral Profile

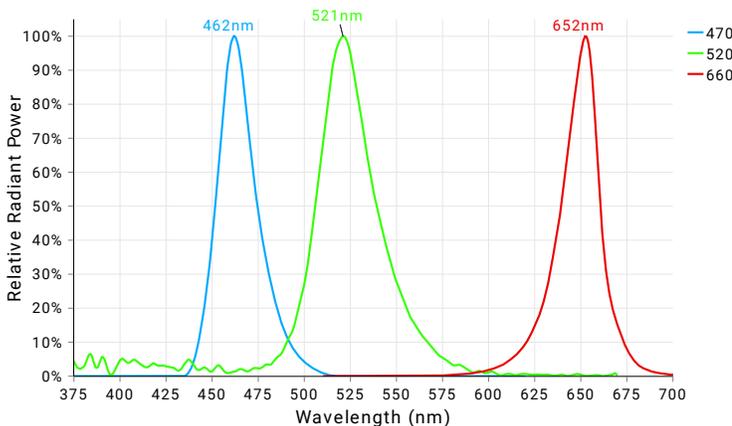


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, [white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems](#), specifically when matching white light sources.

The BL128 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles



Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following; like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces. The

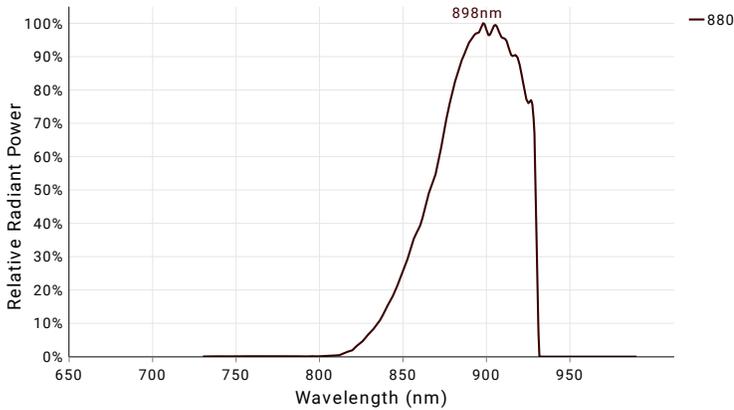
BL128 is available in **470nm, 520nm, and 660nm** visible color configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BL128 Series is available in an **880nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	880 nm
Group 1	No Photobiological hazard under normal behavioral limitations	470 nm, 520 nm, 660 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL128 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

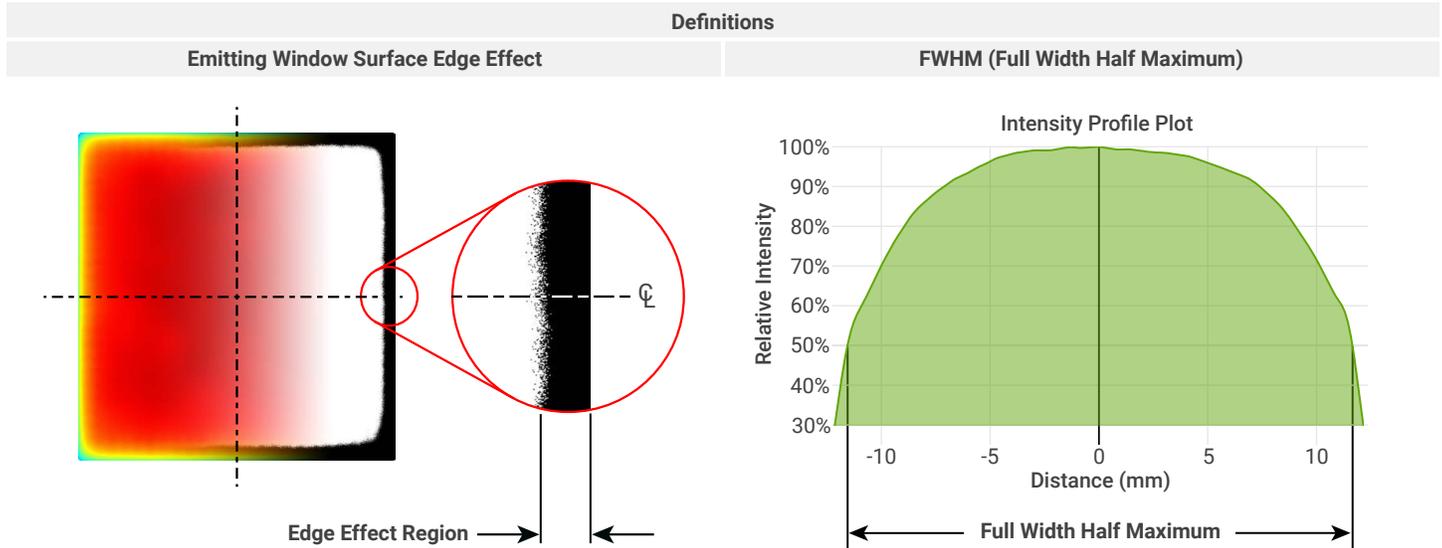
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

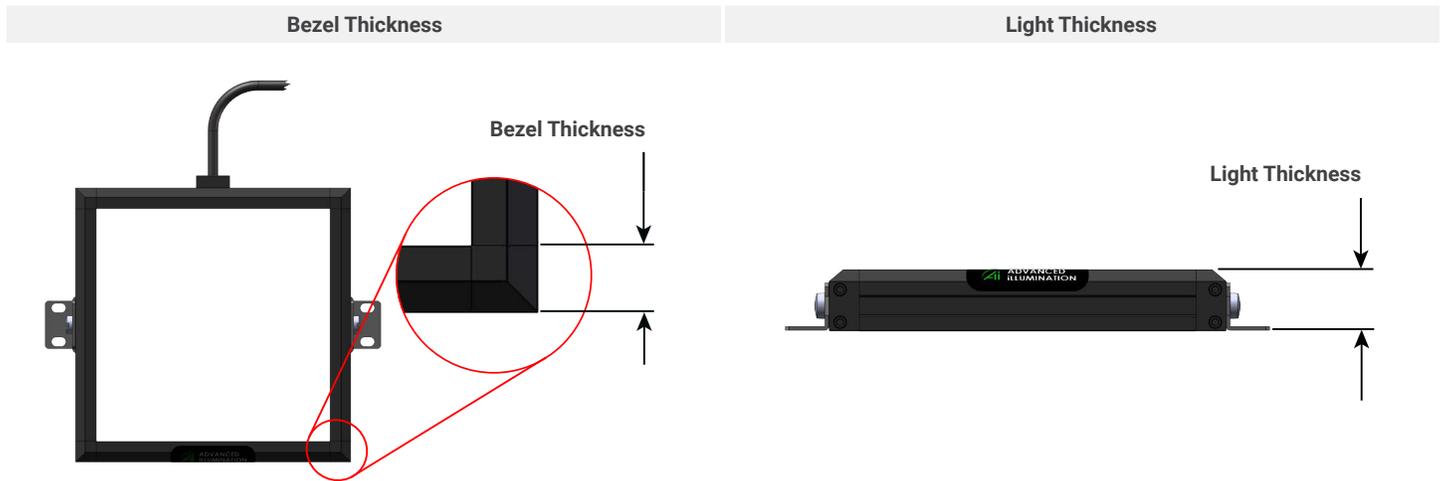
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

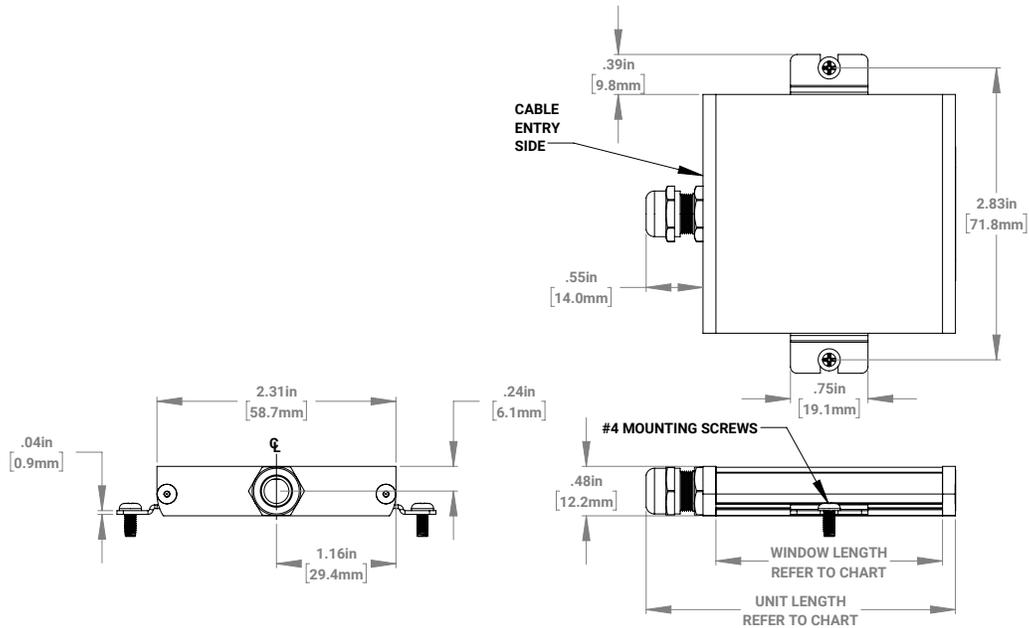
Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

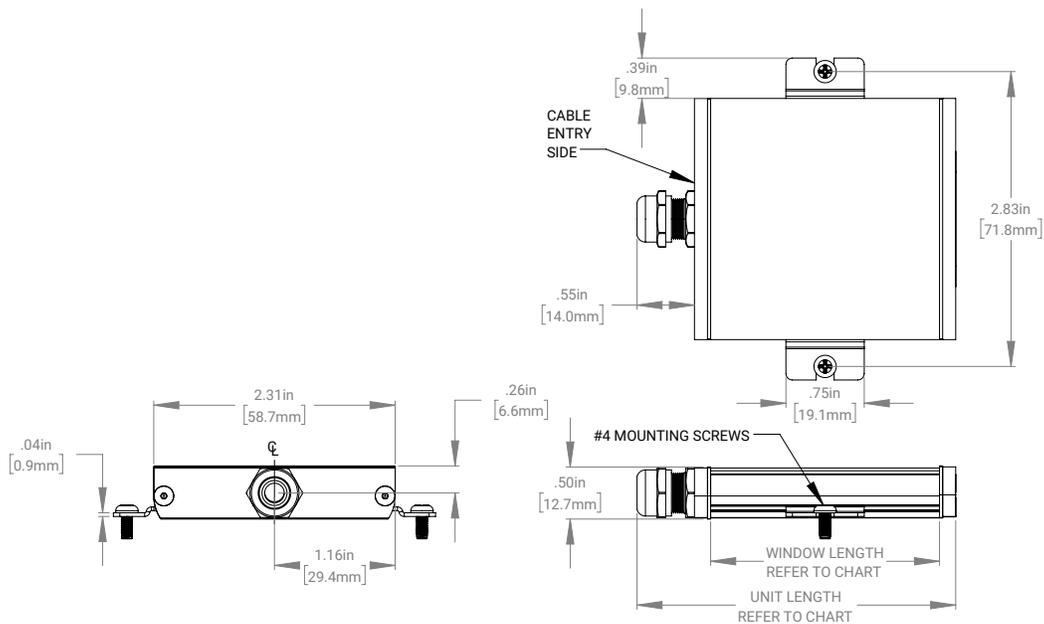
Installation Drawings

Non-Sealed Configuration



For full installation drawings and complete CAD models of this sealed configuration, please visit the [downloads](#) section of the product webpage.

Sealed Configuration



For full installation drawings and complete CAD models of this sealed configuration, please visit the [downloads](#) section of the product webpage.

Mechanical Information - Continued

Sizing Chart

Part Number	Length (Inches)				Length (Millimeters)			
	Non-Washdown		Washdown		Non-Washdown		Washdown	
	Unit	Window	Unit	Window	Unit	Window	Unit	Window
BL12801	1.99	1.19	2.06	1.19	50.55	30.28	52.32	30.28
BL12802	2.99	2.19	3.06	2.19	75.95	55.68	77.72	55.68
BL12803	3.99	3.19	4.06	3.19	101.35	81.08	103.12	81.08
BL12804	4.99	4.19	5.06	4.19	126.75	106.48	128.52	106.48
BL12805	5.99	5.19	6.06	5.19	152.15	131.88	153.92	131.88
BL12806	6.99	6.19	7.06	6.19	177.55	157.28	179.32	157.28
BL12807	7.99	7.19	8.06	7.19	202.95	182.68	204.72	182.68
BL12808	8.99	8.19	9.06	8.19	228.35	208.08	230.12	208.08
BL12809	9.99	9.19	10.06	9.19	253.75	233.48	255.52	233.48
BL12810	10.99	10.19	11.06	10.19	279.15	258.88	280.92	258.88
BL12811	11.99	11.19	12.06	11.19	304.55	284.28	306.32	284.28
BL12812	12.99	12.19	13.06	12.19	329.95	309.68	331.72	309.68
BL12813	13.99	13.19	14.06	13.19	355.35	335.08	357.12	335.08
BL12814	14.99	14.19	15.06	14.19	380.75	360.48	382.52	360.48

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Wavelengths	Configured w/ Standard Controller (IC, I3, I3S, C1, C5) or Voltage Drive (24)
WHI	0.080A per linear inch
470 nm	0.080A per linear inch
520 nm	0.080A per linear inch
660 nm	0.100A per linear inch
880 nm	0.100A per linear inch

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	

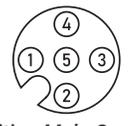
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	

Electrical Information - Continued

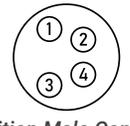
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BL128 series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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BL138 Series

High Intensity Linear Backlights | Product Datasheet



Ultra-High Power LEDs
Equipped with leading industrial grade LEDs capable of ultra-high output strobe and continuous operation

Uniformity Balancing
Designed with optional uniformity balancing every six inches, useful for linear backlight applications longer than 24" in length

Scalable Extrusion-Based Housing
Built with extrusion-based aluminum construction allowing for linear, one-dimensional scalability, while maintaining structural rigidity and durability



M6 Mounting Channels
Engineered with two M6 mounting channels on each side, allowing for highly adjustable positioning

Passive Thermal Design
Features a passively cooled finned heatsink design for optimal thermal dissipation without the need for active cooling fans

BL138 Series Description

The BL138 Series delivers a high-intensity linear backlight solution for demanding machine vision applications. It excels in high-speed web material imaging with line scan cameras and serves as a powerful general-purpose bar light when highly diffuse front illumination is required.

Equipped with ultra-high power industrial-grade LEDs, the BL138 Series can operate in both exceptionally bright strobe and continuous modes, depending on the control configuration. Its passive finned heatsink design optimizes thermal dissipation without active cooling fans. For applications exceeding 24 inches, optional uniformity balancing every six inches ensures consistent exposure across the entire active area.



High Intensity



Scalable Design



Uniformity Control Optional



RGB Available



Passively Cooled

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White, 455 nm, 530 nm, 625 nm, 850 nm, RGB			
	Available Lensing	No Lenses			
	Available Light Conditioning	None			
Electrical	Power Consumption Info	See Power Requirements on Page 10			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	3.26"(82.8mm) to 96.26"(2445.0mm)	See Page 9 for More Details
		Width	1.98"(50.2mm)		
		Height	3.73"(94.8mm)		
	Weight Info (Standard)	~ 1.70 lbs (~771 g) per 6" Unit Length			
	Mounting Info	M6 Mounting Nut Channel			
	Material Info	Anodized Aluminum Housing, Acrylic Window, Nickel Plated Brass Strain Relief, PVC Cable Jacket, Steel Black Oxide and Zinc Plated Steel Fasteners, Optional Silicone Sealant			
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
	Compliance	CE, RoHS, IEC 62471			
Certification	IP Rating	IP50			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	Emitting Length (in)	-	Peak Wavelength	Connector/Control
BL138	XX	-	XXX	XXX
BL138	06" increments from 06" to 96"		455 (royal blue)	C1
	03" model also available		530 (green)	C5
			625 (red-orange)	IC ²
			850 (IR)	24
			RGB (all colors) ¹	
			WHI (white)	
more information on page	9		5	10

Example Part Numbers:

BL13806-455C1
BL13824-625IC

¹ Not available in IC
² IC option not available with 03" model

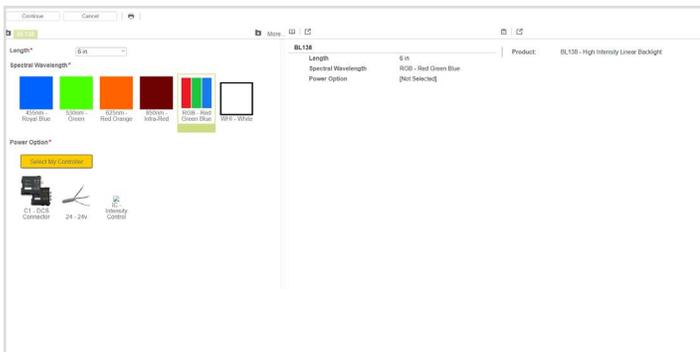
In Stock

Unavailable

Lead Times

Build-to-Order custom products ship within one to two weeks (typical).

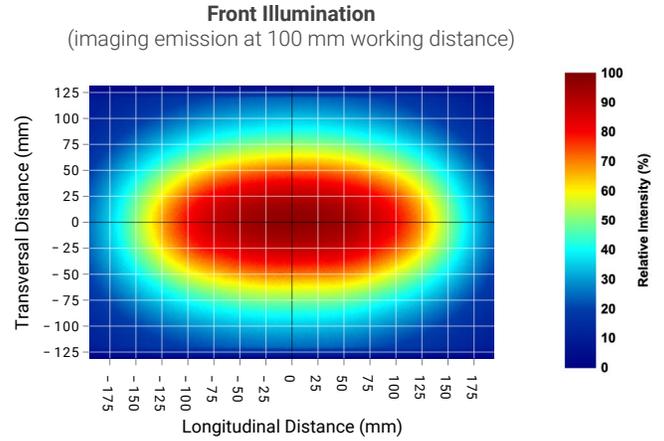
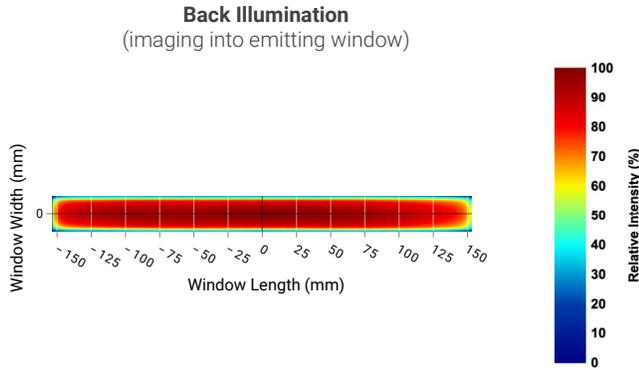
Configurator



Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL138 High Intensity Linear Backlight Series to your specific needs. For a guided configuration, visit our [online configurator](#).

Optical Information

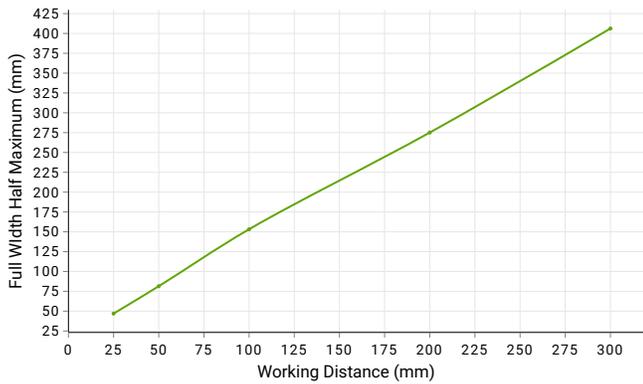
Intensity Distribution



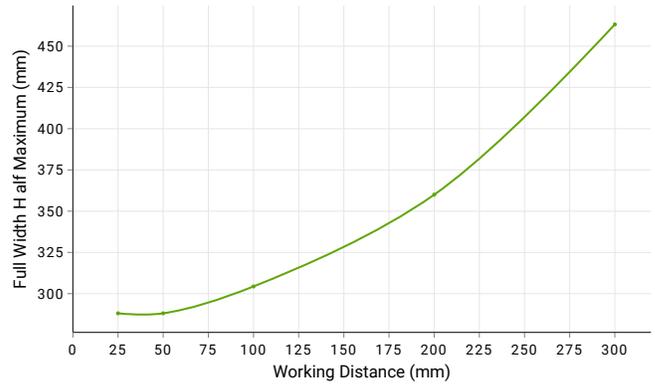
Both intensity distribution images shown above have been taken using a 12-inch white BL138 unit.

FWHM vs Working Distance

Transversal FWHM vs Working Distance



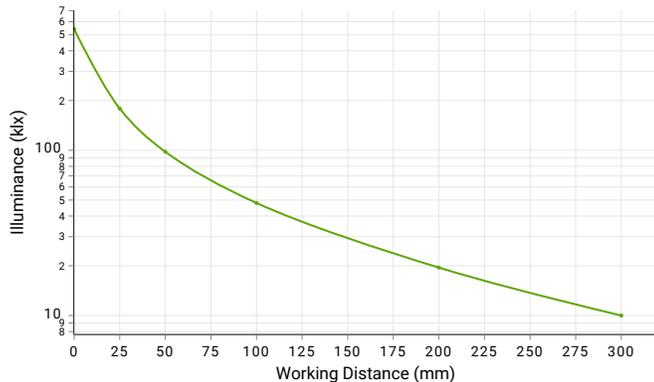
Longitudinal FWHM vs Working Distance



Both Full Width Half Maximum (FWHM) vs Working Distance plots shown above have been measured using a 12-inch white BL138 unit.

Intensity vs Working Distance

Illuminance vs Working Distance

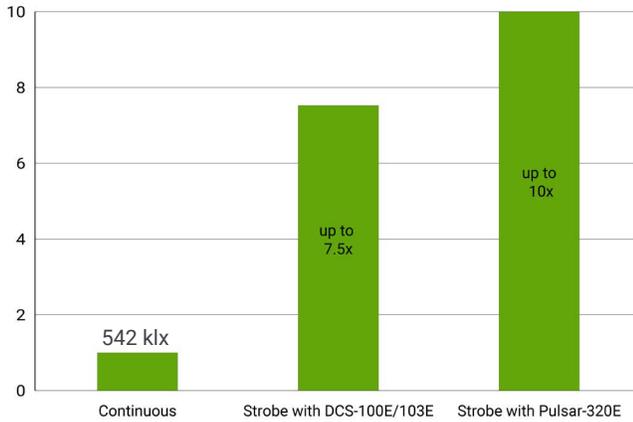


Linear Backlights, while typically oriented behind the object of interest, can also be used for highly diffuse front illumination at short to medium working distances. The chart to the left shows the BL138's intensity as it's distance from the inspection surface changes.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

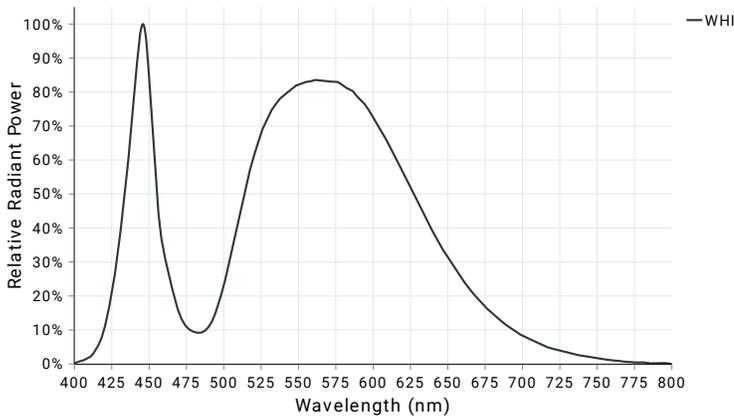
Optical Information - Continued

Continuous vs Pulsed Intensity



Under continuous operation, a 12-inch white BL138 unit will output an **illuminance of 542 klx** and an **irradiance of 1,642 W/m²** at the emitting surface. For applications that require higher output, the BL138 Series has been engineered to be overdrive strobe capable. When configured with a C1 connector, compatible with a DCS-100E or DCS-103E Controller, the BL138 is capable of outputting up-to 7.5X continuous levels when strobed. When configured with a C5 connector, compatible with AI's Pulsar 320, a BL138 can be strobed up-to 10X continuous intensity levels.

White Spectral Profile

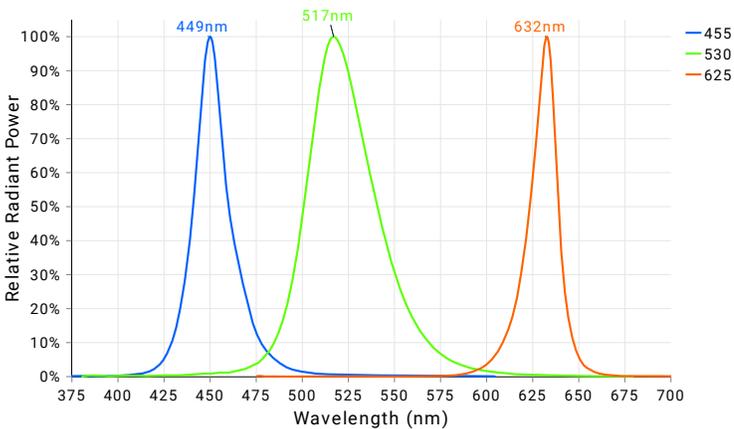


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, [white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems](#), specifically when matching white light sources.

The BL138 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles



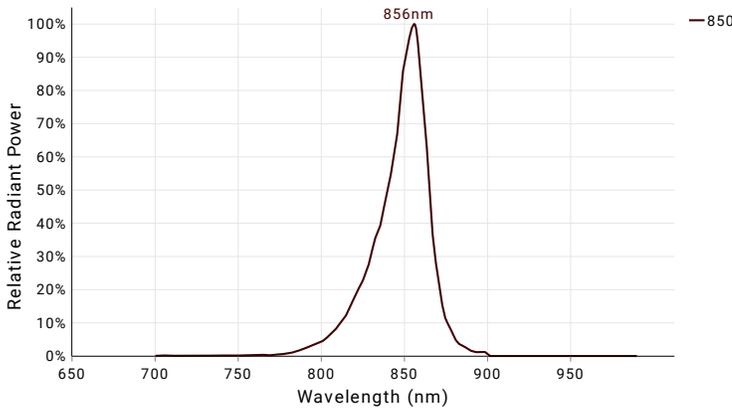
Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following; like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces. The BL138 is available in **455nm, 530nm, and 625nm** visible color configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BL138 Series is available in an **850nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	850 nm
Group 1	No Photobiological hazard under normal behavioral limitations	455 nm, 530 nm, 625 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL138 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

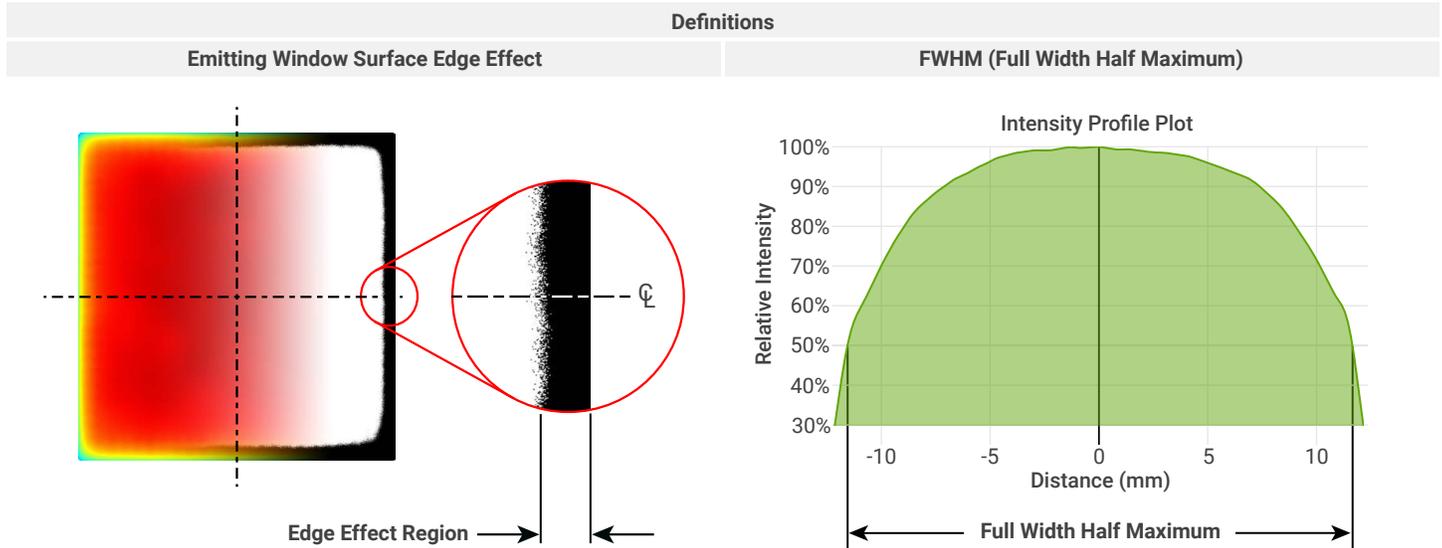
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

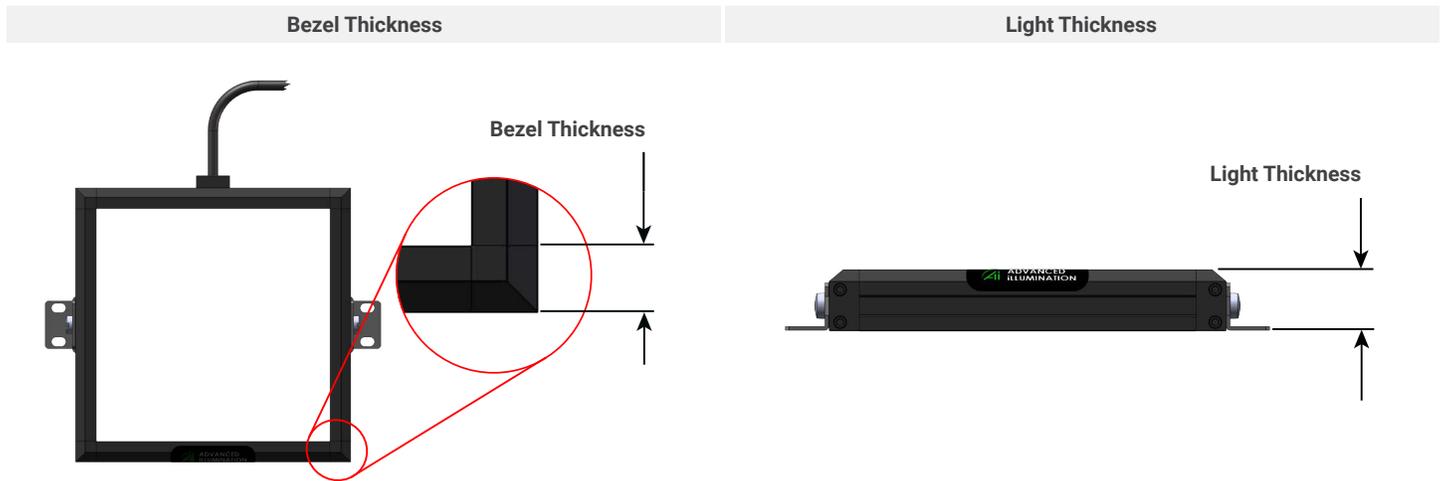
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



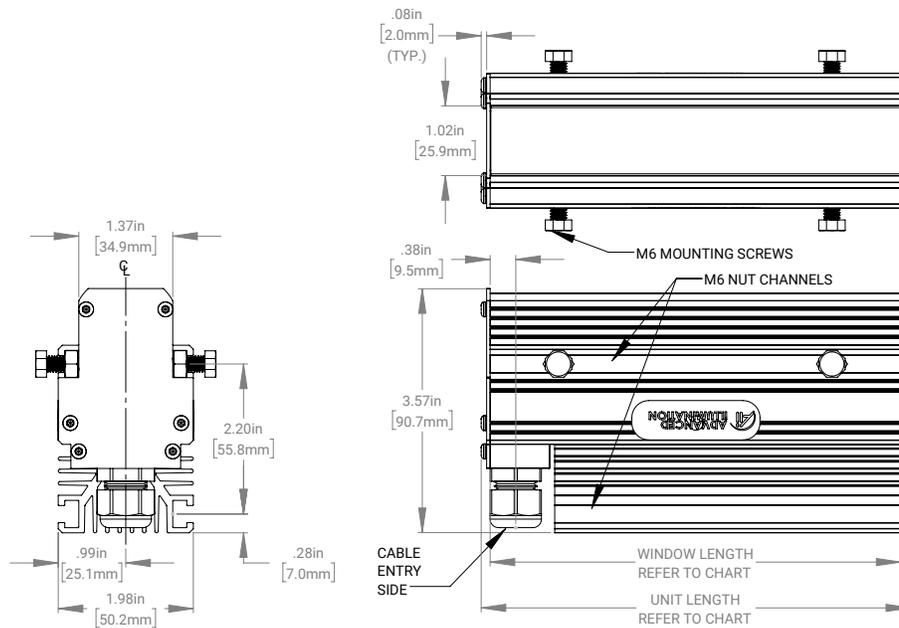
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For full installation drawings and complete CAD models of this configuration, please visit the [downloads section of the product webpage](#).

Sizing Chart

Part Number	Length (Inches)		Length (Millimeters)	
	Unit	Window	Unit	Window
BL13803	3.26	3.04	82.80	77.22
BL13806	6.26	6.00	159.00	152.40
BL13812	12.26	12.00	311.40	304.80
BL13818	18.26	18.00	463.80	457.20
BL13824	24.26	24.00	616.20	609.60
BL13830	30.26	30.00	768.60	762.00
BL13836	36.26	35.95	921.00	913.13
BL13842	42.26	41.95	1073.40	1065.53
BL13848	48.26	47.94	1225.80	1217.68
BL13854	54.26	53.93	1378.20	1369.82
BL13860	60.26	59.92	1530.60	1521.97
BL13866	66.26	65.91	1683.00	1674.11
BL13872	72.26	71.91	1835.40	1826.51
BL13878	78.26	77.90	1987.80	1978.66
BL13884	84.26	83.89	2140.20	2130.81
BL13890	90.26	89.88	2292.60	2282.95
BL13896	96.26	95.87	2445.00	2435.10

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Wavelengths	Configured w/ Voltage Drive (24)	Configured w/ Other Control Options (IC, C1, C5)
WHI	0.750A per 6 inches	1.000A per 6 inches
455 nm	0.750A per 6 inches	1.000A per 6 inches
530 nm	0.750A per 6 inches	1.000A per 6 inches
625 nm	0.640A per 6 inches	1.000A per 6 inches
850 nm	0.640A per 6 inches	1.000A per 6 inches
RGB	0.640A per 6 inches	1.000A per 6 inches

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total)

Control Options

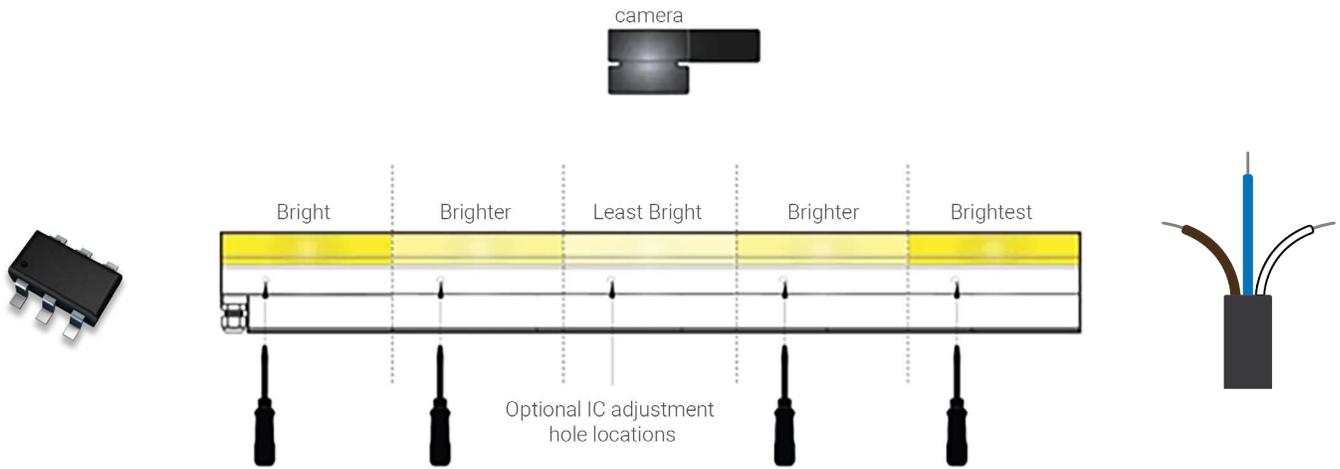
Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	

Electrical Information - Continued

Controller Image	Controller Details	Connector Image
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BL138 Embedded Controller - Continuous Only - IC Configurations
PN: N/A

The IC on the BL168 and BL138 are embedded controllers which allow for control of light intensity per 6" (152 mm) segment. Each segment is adjusted using a potentiometer located on each 6" segment. See the figure below for illustration:



Controlling each 6" (152mm) section independently and making the center of the line less bright and the outside of the immediate camera viewing radius brighter ultimately results in better imaging.

Better imaging occurs because the camera can see very well in its area of focus, but outside that area the camera doesn't focus as well without brighter illumination.

We recommend using this control option for BL138 and BL168 lights over 24" (610mm) in length.

	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	
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Electrical Information - Continued

24V Option Wiring Information

Flying Lead Functions

Wire Color	24V Functions
BROWN	24V DC
WHITE	0 - 10V Analog Control
BLUE	DC GND
BLACK	N/A
GRAY	N/A

The functions above are only applicable when ordering a 24V power configuration.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BL138 series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

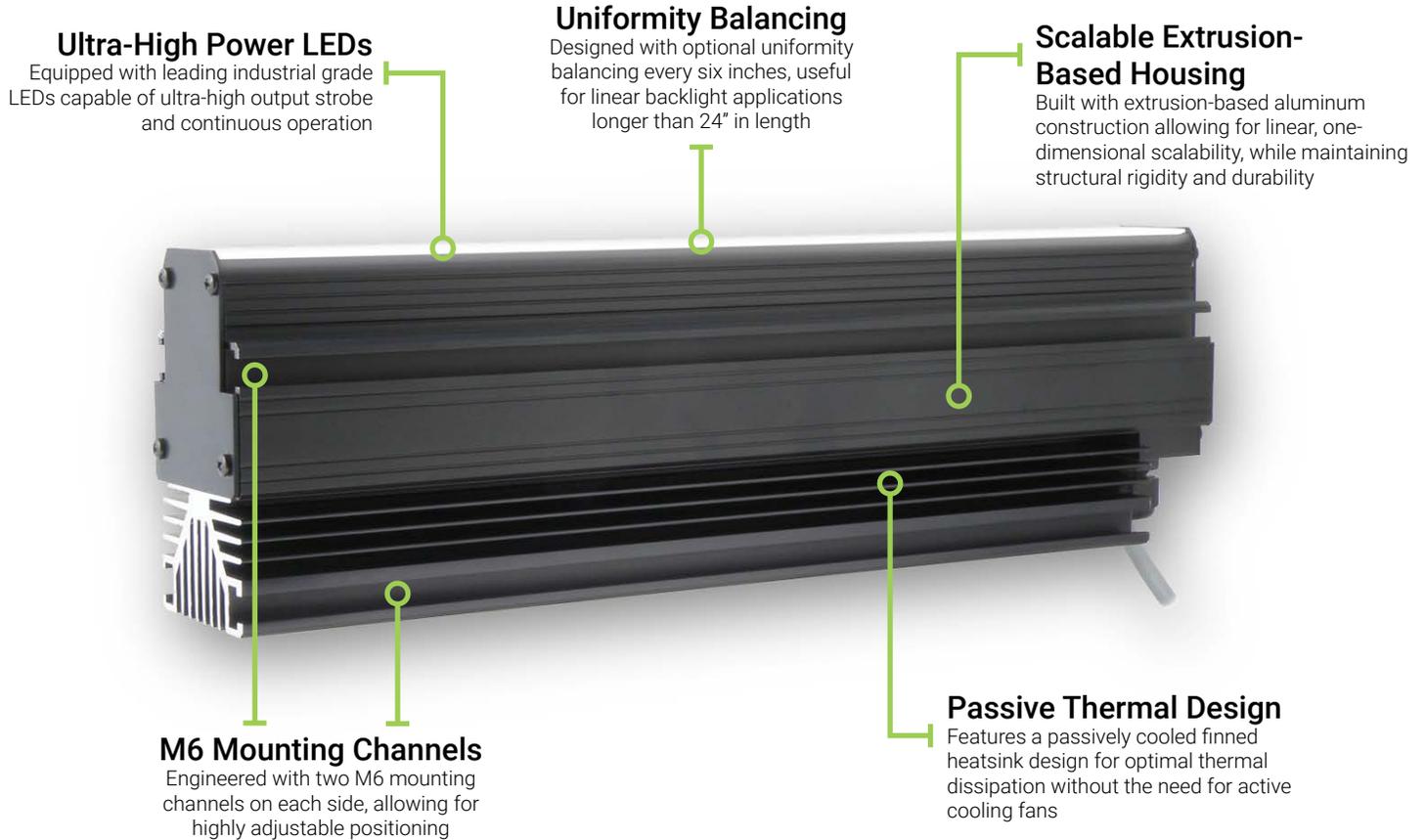
For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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BL168 Series

White High Intensity Back-Lit Backlights Product Datasheet



BL168 Series Description

The BL168 Series delivers a high-intensity, single-color white linear backlight solution for demanding machine vision applications. Ideal for applications where consistent, high-powered white illumination is crucial, the BL168 excels in high-speed web material imaging with line scan cameras and serves as a powerful general-purpose bar light when highly diffuse front illumination is required.

Unlike the BL138 Series, which offers multiple wavelengths, the BL168 only offers white light output. The BL168 Series can operate in both exceptionally bright strobe and continuous modes, depending on the control configuration. For applications exceeding 24 inches, optional uniformity balancing every six inches ensures consistent exposure across the entire active area.



High Intensity



Scalable Design



Uniformity Control



Passively Cooled

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White			
	Available Lensing	No Lenses			
	Available Light Conditioning	None			
Electrical	Power Consumption Info	See Power Requirements on Page 10			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	3.26"(82.8mm) to 96.26"(2445.0mm)	See Page 9 For More Details
		Width	1.98"(50.2mm)		
		Height	3.57"(90.7mm)		
	Weight Info (Standard)	~ 1.40 lbs (~635 g) per 6" Unit Length			
	Mounting Info	M6 Mounting Nut Channel			
	Material Info	Anodized Aluminum Housing, Acrylic Window, Nylon Strain Relief, PVC Cable Jacket, Steel Black Oxide and Zinc Plated Steel Fasteners			
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
	Compliance	CE, RoHS, IEC 62471			
Certification	IP Rating	Not Rated			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	Emitting Length (in)	-	Peak Wavelength	Connector/Control
BL168	XX	-	XXX	XXX
BL168	06" increments from 06" to 96"		WHI (white)	C1 ¹
				IC
				24
more information on page	9		5	10

Example Part Numbers:

BL16806-WHIC1
BL16824-WHIC1

¹ C1 connector not available over 12" in emitting length

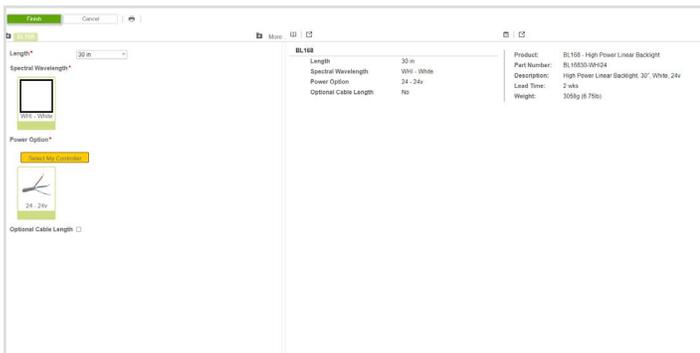
In Stock

Unavailable

Lead Times

Build-to-Order custom products ship within one to three weeks.

Configurator

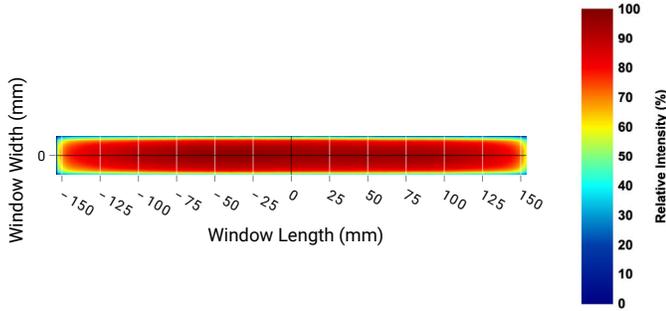


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL168 White High Intensity Linear Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

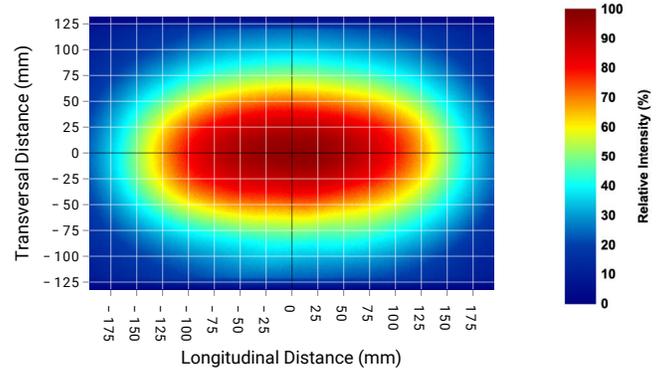
Optical Information

Intensity Distribution

Back Illumination
(imaging into emitting window)



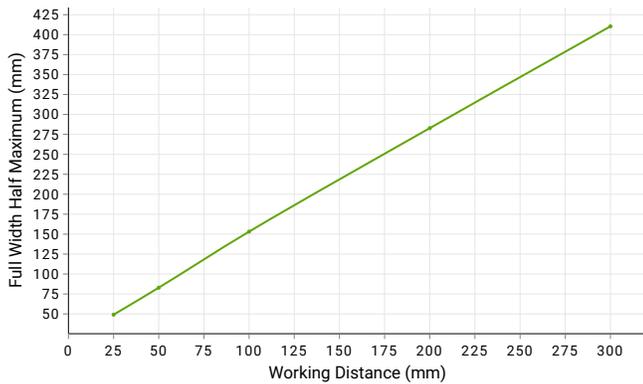
Front Illumination
(imaging emission at 100 mm working distance)



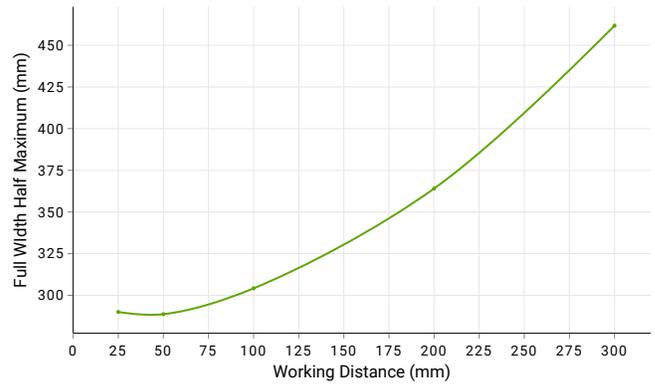
Both intensity distribution images shown above have been taken using a 12-inch white BL168 unit.

FWHM vs Working Distance

Transversal FWHM vs Working Distance



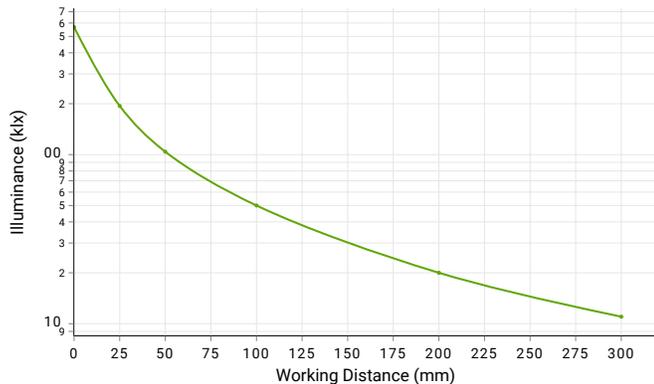
Longitudinal FWHM vs Working Distance



Both Full Width Half Maximum (FWHM) vs Working Distance plots shown above have been measured using a 12-inch white BL168 unit.

Intensity vs Working Distance

Illuminance vs Working Distance

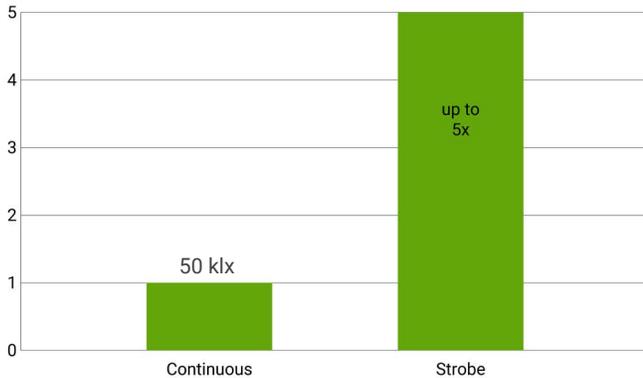


Linear Backlights, while typically oriented behind the object of interest, can also be used for highly diffuse front illumination at short to medium working distances. The chart to the left shows the BL168's intensity as it's distance from the inspection surface changes.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

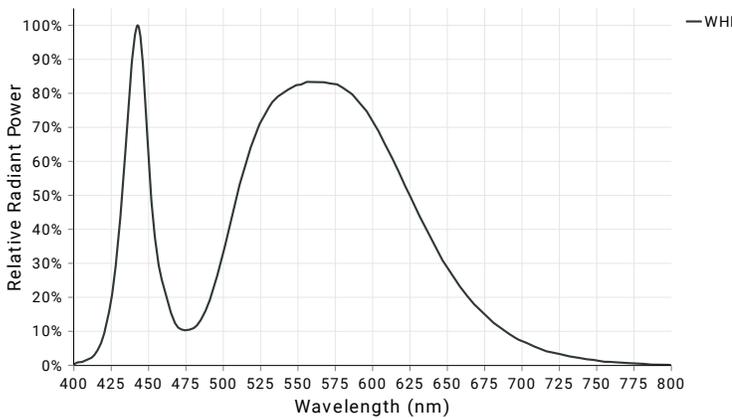
Optical Information - Continued

Continuous vs Strobe Intensity



Under continuous operation, a 12 inch white BL168 unit will output an **illuminance of 50 klx** and an **irradiance of 164 W/m²** at a 100 mm working distance. For applications that require higher output, the BL168 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled DCS-100E or DCS-103E controller, the BL168 is capable of outputting up-to 5X continuous levels.

White Spectral Profile



White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, **white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems**, specifically when matching white light sources.

The BL168 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	N/A
Group 1	No Photobiological hazard under normal behavioral limitations	N/A
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Optical Information - Continued

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL168 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX/CX	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	35 klx (200 mm x 200 mm unit)	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	105 W/m ² (200 mm x 200 mm unit)	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.265 in (32.1 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	576	3	144	10	17	17	14	80
Visible Wavelengths Available	4	4	4	4	6	4	1	4	4
IR Wavelengths Available	1	1	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

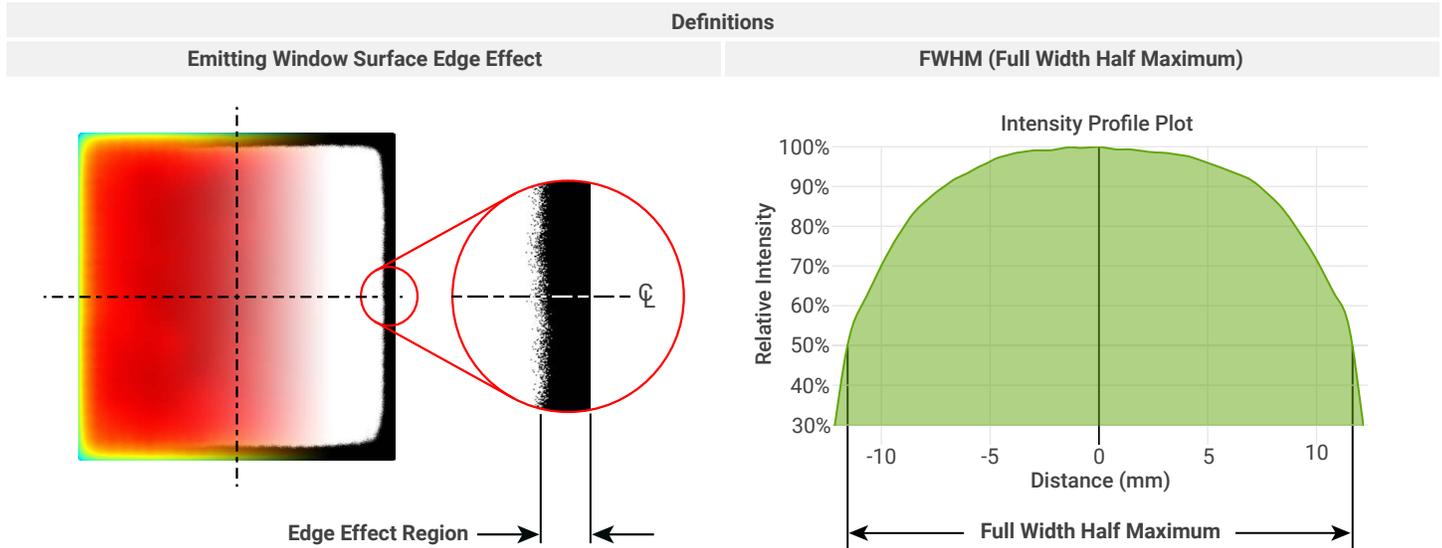
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

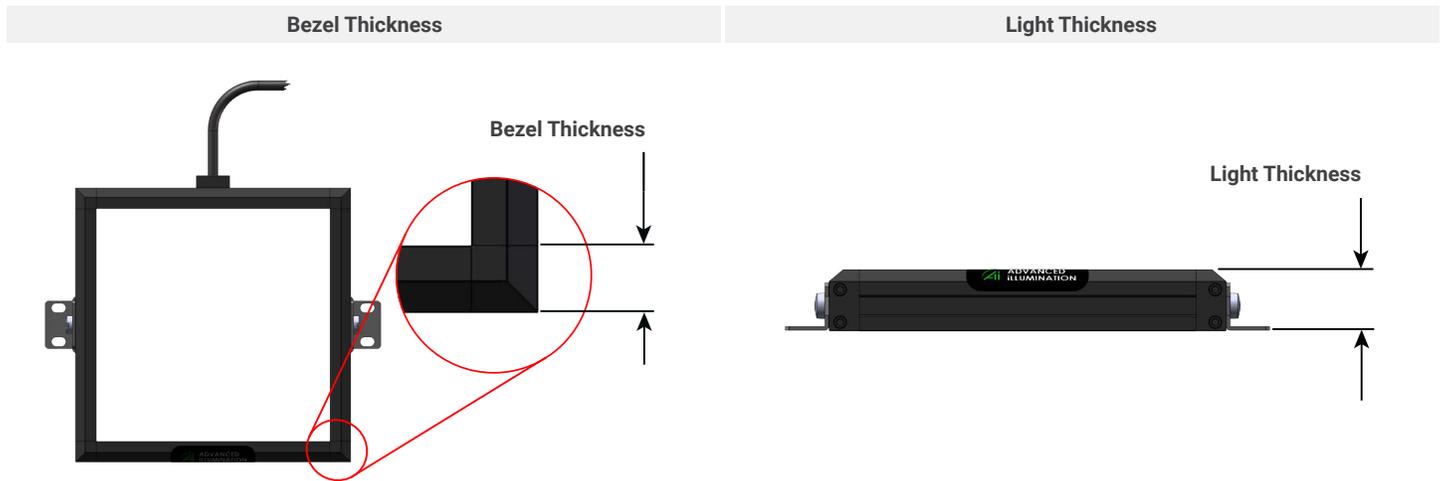
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



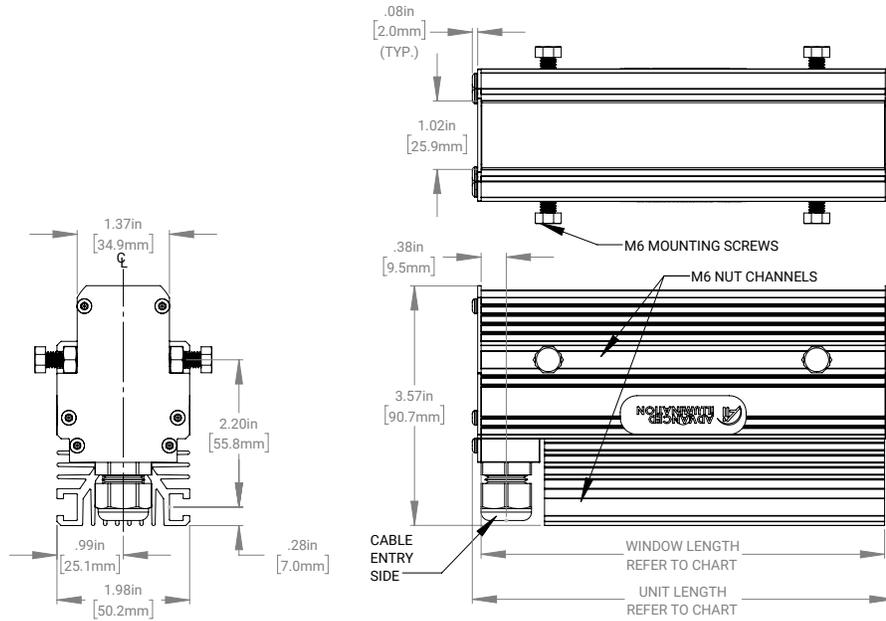
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For full installation drawings and complete CAD models of this non-sealed configuration, please visit the [downloads section of the product webpage](#).

Sizing Chart

Part Number	Length (Inches)		Length (Millimeters)	
	Unit	Window	Unit	Window
BL16803	3.26	3.04	82.80	77.22
BL16806	6.26	6.00	159.00	152.40
BL16812	12.26	12.00	311.40	304.80
BL16818	18.26	18.00	463.80	457.20
BL16824	24.26	24.00	616.20	609.60
BL16830	30.26	30.00	768.60	762.00
BL16836	36.26	35.95	921.00	913.13
BL16842	42.26	41.95	1073.40	1065.53
BL16848	48.26	47.94	1225.80	1217.68
BL16854	54.26	53.93	1378.20	1369.82
BL16860	60.26	59.92	1530.60	1521.97
BL16866	66.26	65.91	1683.00	1674.11
BL16872	72.26	71.91	1835.40	1826.51
BL16878	78.26	77.90	1987.80	1978.66
BL16884	84.26	83.89	2140.20	2130.81
BL16890	90.26	89.88	2292.60	2282.95
BL16896	96.26	95.87	2445.00	2435.10

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Wavelengths	Configured w/ Voltage Drive (24)	Configured w/ Other Control Options (IC, C1, C5)
WHI	0.750 A per 6 inches	1.000 A per 6 inches

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

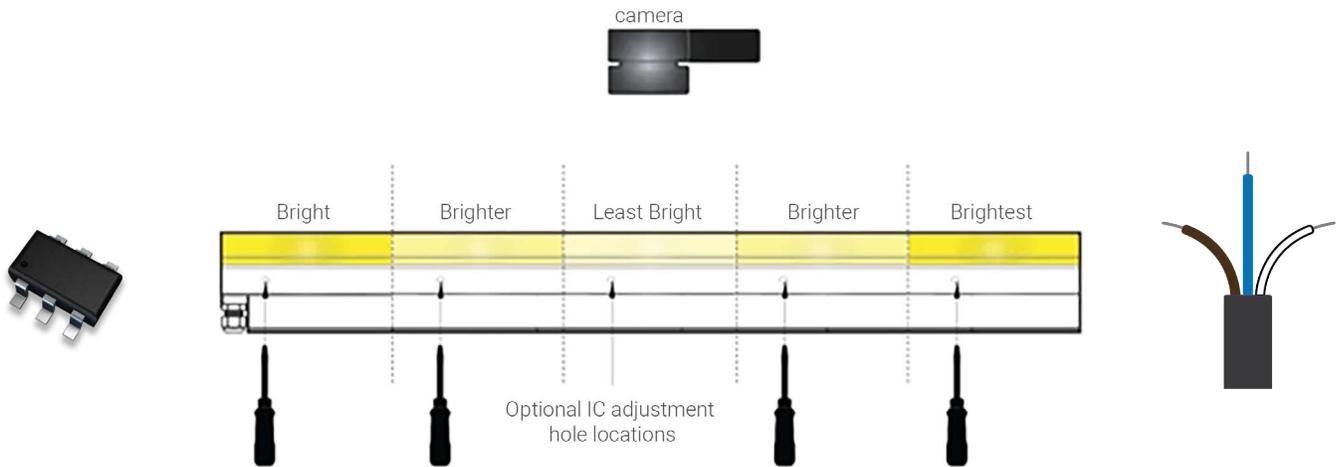
Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5 A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5 A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	

Electrical Information - Continued

Controller Image	Controller Details	Connector Image
------------------	--------------------	-----------------

BL168 Embedded Controller - Continuous Only - IC Configurations
PN: N/A

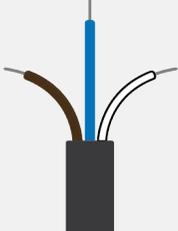
The IC on the BL168 and BL138 are embedded controllers which allow for control of light intensity per 6" (152 mm) segment of each backlight. Each segment is adjusted using a radial potentiometer located on each 6" segment. See the figure below for illustration:



Controlling each 6" (152mm) section independently and making the center of the line less bright and the outside of the immediate camera viewing radius brighter ultimately results in better imaging.

Better imaging occurs because the camera can see very well in its area of focus, but outside that area the camera doesn't focus as well without brighter illumination.

We recommend using this control option for BL138 and BL168 lights over 24" (610mm) in length.

	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	
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Electrical Information - Continued

Inline Control Option Wiring Information

Flying Lead Functions

Wire Color	24V Functions
BROWN	24V DC
WHITE	0 - 10V Analog Control
BLUE	DC GND
BLACK	N/A
GRAY	N/A

The functions above are only applicable when ordering a 24V power configuration.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BL138 series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

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Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

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Web: advancedillumination.com
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BL193 Series

Standard Intensity Linear Backlights Product Datasheet

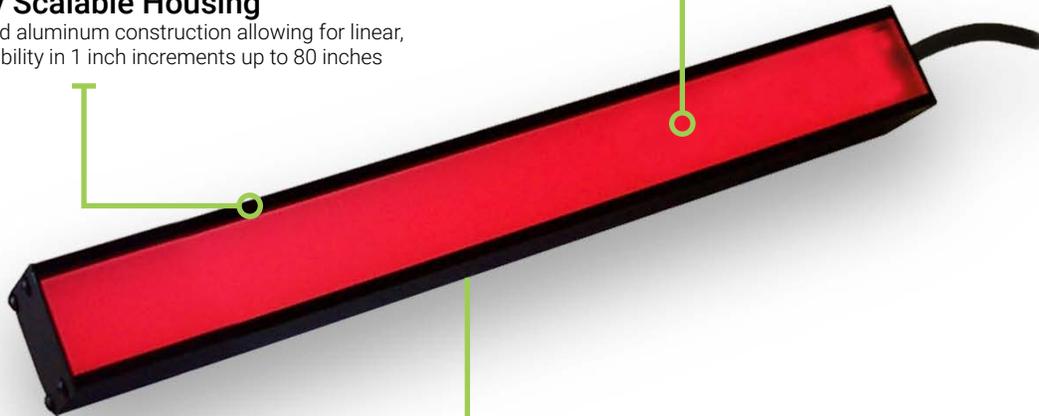


Standard Industrial Grade LEDs

Utilizes industrial grade standard intensity LEDs at a low price point for applications requiring uniform diffuse backlight illumination but don't require high intensity output

Highly Scalable Housing

Built with extrusion-based aluminum construction allowing for linear, one-dimensional scalability in 1 inch increments up to 80 inches



M6 Mounting Channel

Engineered with an M6 mounting channel on its underside, allowing for highly adjustable positioning

BL193 Series Description

The BL193 Series offers a reliable and low price point linear backlight solution for machine vision applications where high-intensity illumination isn't essential.

A legacy field-proven design from Advanced illumination, the BL193 Series boasts exceptional scalability with 80 available size configurations. Like most Ai products, the BL193 features optional overdrive strobe capability for short bursts of increased intensity.

True to our commitment to customization and fast delivery, the BL193 series offers tailored solutions with industry-leading build-to-order lead times of just one to two weeks for most configurations.



Legacy Product



Scalable Design



5 Wavelengths Available



Multiple Control Options



1-2 Week BTO Lead Times Typical

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White, 470 nm, 520 nm, 660nm, 880 nm			
	Available Lensing	No Lenses			
	Available Light Conditioning	None			
Electrical	Power Consumption Info	See Power Requirements on Page 12			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	1.86"(47.2mm) to 80.86"(2053.8mm)	See Page 9 for More Details
		Width	1.18"(30.0mm)		
		Height	1.33"(33.8mm)		
	Weight Info (Standard)	~ 1.01 lbs (~458 g) per 12" Unit Length			
	Mounting Info	M6 Mounting Nut Channel			
	Material Info	Anodized Aluminum Housing, Acrylic Window, Nylon Strain Relief, PVC Cable Jacket, Steel Black Oxide and Zinc Plated Steel fasteners			
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
Certification	Compliance	CE, RoHS, IEC 62471			
	IP Rating	IP50			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	Emitting Length (in)	-	Peak Wavelength	Connector/Control	-	Alternative Connector
BL193	XX	-	XXX	XX	-	XXX
BL193	01" increments from 01" to 80"		470 (blue)	C1		M8 ¹
			520 (green)	C5		M12 ¹
			660 (red)	IC		
			880 (IR)	I3		
			WHI (white)	I3S		
				I4		
				24		
more information on page	9		5	12		14

Example Part Numbers:

BL19306-470C5
BL19324-660I3-M12

¹ Available with IC, I3, I3S, I4 and 24

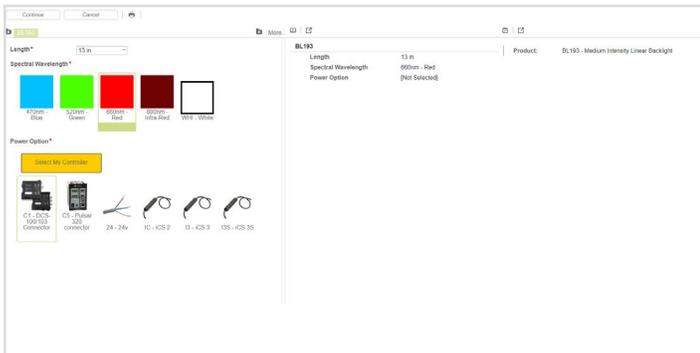
In Stock

Unavailable

Lead Times

Build-to-Order custom products ship within one to two weeks (typical).

Configurator

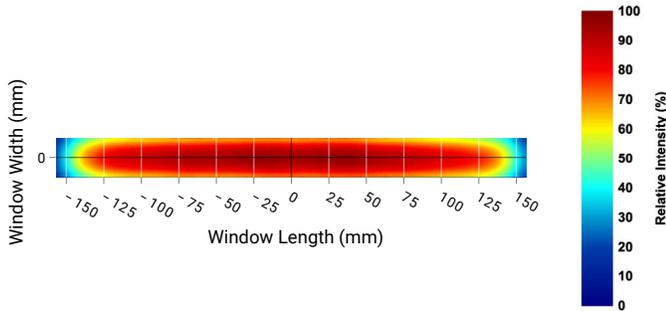


Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL193 Standard Intensity Linear Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

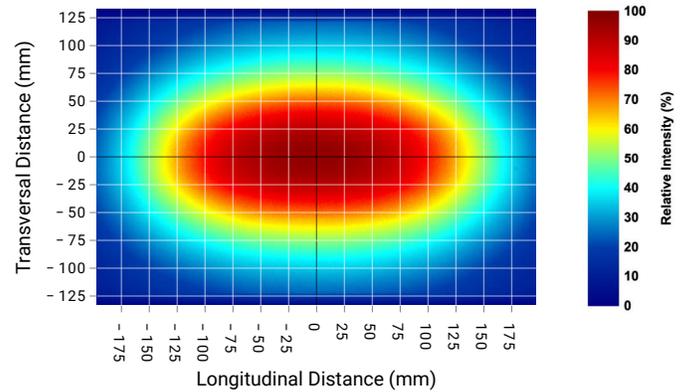
Optical Information

Intensity Distribution

Back Illumination
(imaging into emitting window)



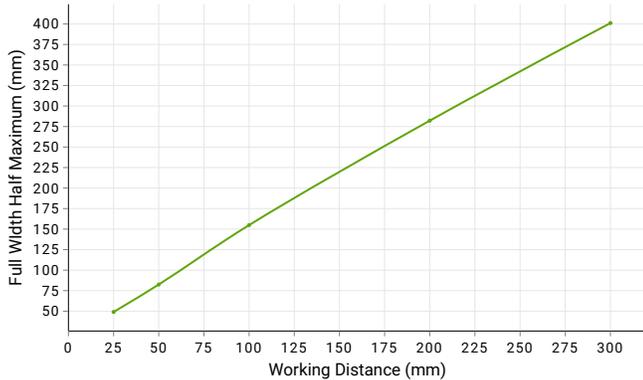
Front Illumination
(imaging emission at 100 mm working distance)



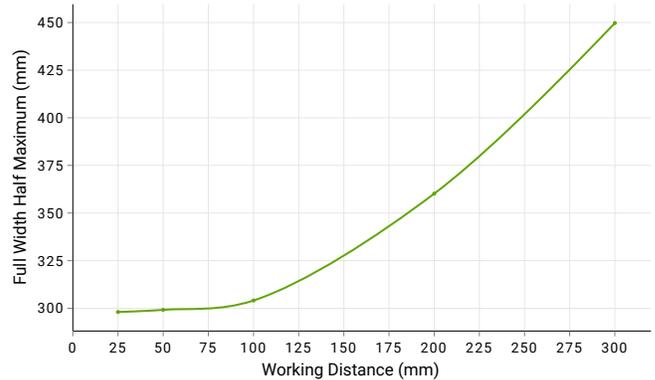
Both intensity distribution images shown above have been taken using a 12-inch white BL193 unit.

FWHM vs Working Distance

Transversal FWHM vs Working Distance



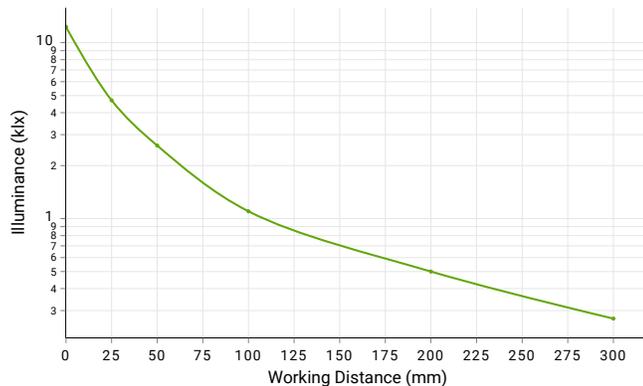
Longitudinal FWHM vs Working Distance



Both Full Width Half Maximum (FWHM) vs Working Distance plots shown above have been measured using a 12-inch white BL193 unit.

Intensity vs Working Distance

Illuminance vs Working Distance

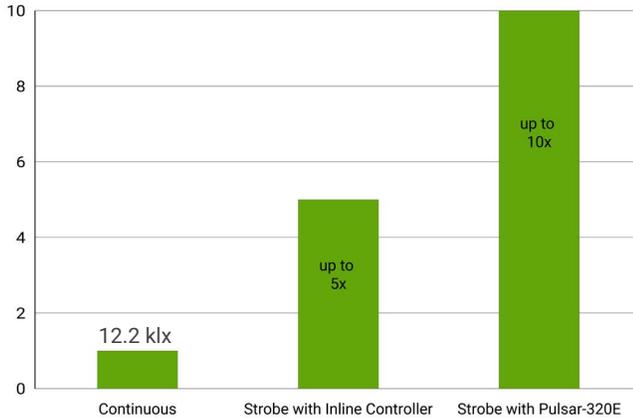


Linear Backlights, while typically oriented behind the object of interest, can also be used for highly diffuse front illumination at short to medium working distances. The chart to the left shows the BL193's intensity as it's distance from the inspection surface changes.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

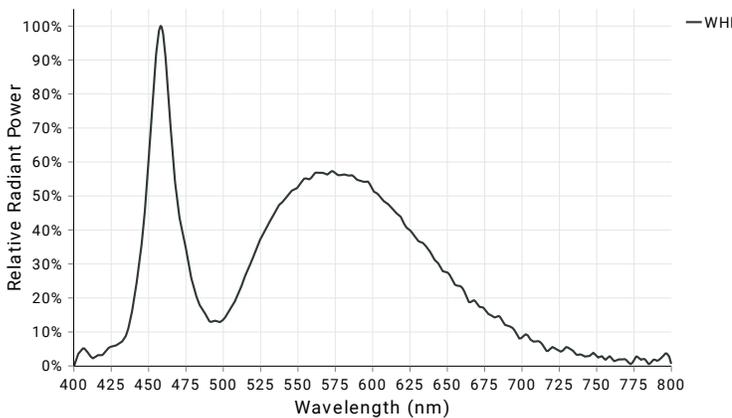
Optical Information - Continued

Continuous vs Pulsed Intensity



Under continuous operation, a 12-inch white BL193 unit will output an **illuminance of 12.2 klx** and an **irradiance of 41 W/m²** at the emitting surface. For applications that require higher output, the BL193 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BL193 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a BL193 can be strobed up-to 10X continuous intensity levels.

White Spectral Profile

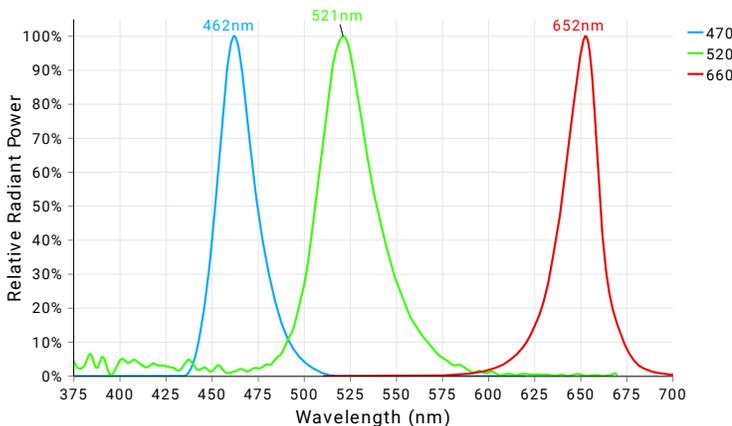


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, [white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems](#), specifically when matching white light sources.

The BL193 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles

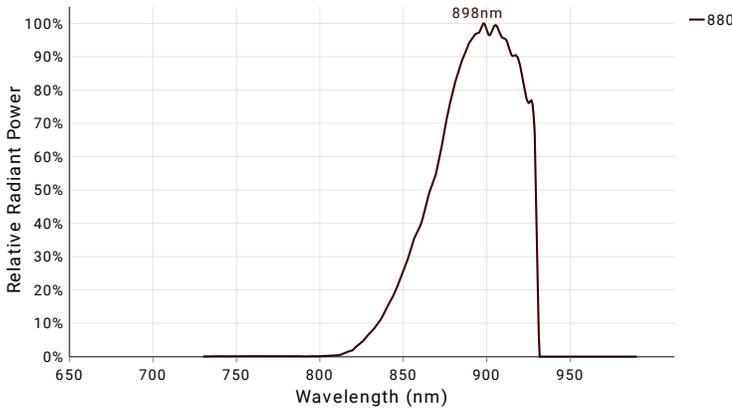


Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following; like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces. The BL193 is available in **470nm, 520nm, and 660nm** visible color configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Optical Information - Continued

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BL193 Series is available in an **880nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	850 nm,
Group 1	No Photobiological hazard under normal behavioral limitations	470 nm, 520 nm, 590 nm, 660 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL193 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

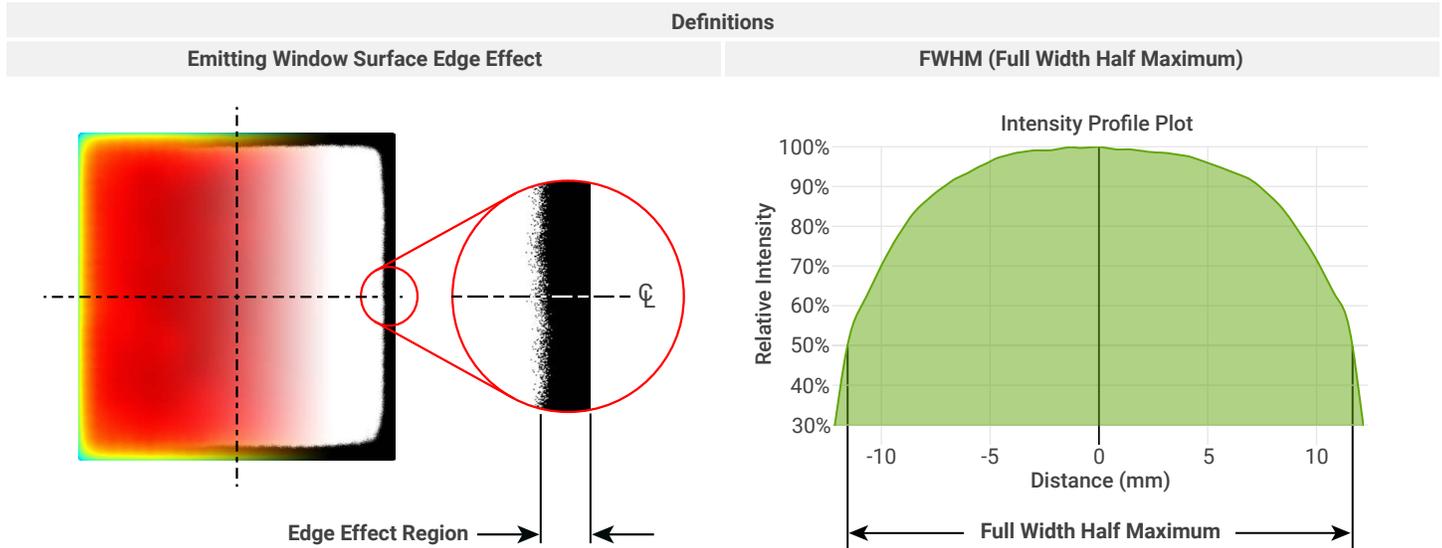
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

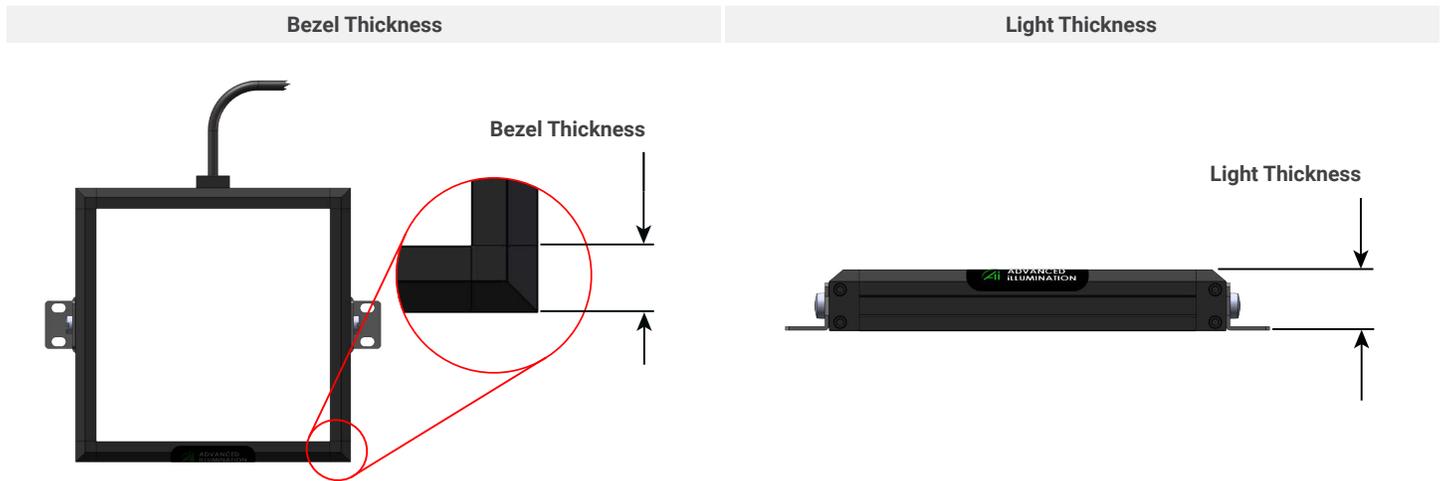
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



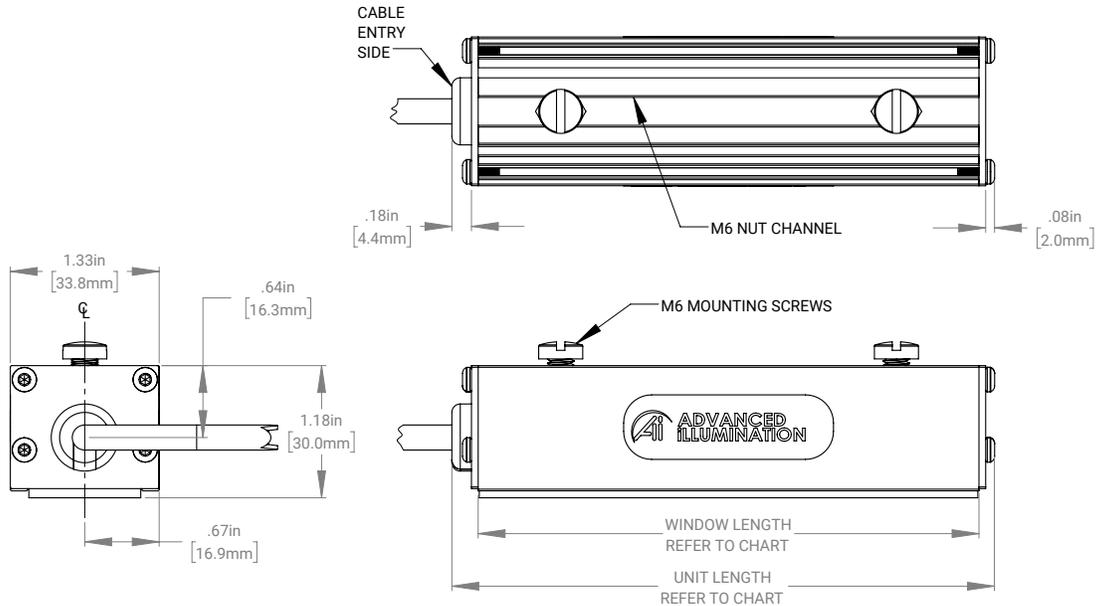
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For full installation drawings and complete CAD models of this configuration, please visit the [downloads section of the product webpage](#).

Sizing Chart

Part Number	Length (Inches)		Length (Millimeters)	
	Unit	Window	Unit	Window
BL19301	1.86	1.46	47.24	37.084
BL19302	2.86	2.46	72.64	62.484
BL19303	3.86	3.46	98.04	87.884
BL19304	4.86	4.46	123.44	113.284
BL19305	5.86	5.46	148.84	138.684
BL19306	6.86	6.46	174.24	164.084
BL19307	7.86	7.46	199.64	189.484
BL19308	8.86	8.46	225.04	214.884
BL19309	9.86	9.46	250.44	240.284
BL19310	10.86	10.46	275.84	265.684
BL19311	11.86	11.46	301.24	291.084
BL19312	12.86	12.46	326.64	316.484
BL19313	13.86	13.46	352.04	341.884
BL19314	14.86	14.46	377.44	367.284
BL19315	15.86	15.46	402.84	392.684
BL19316	16.86	16.46	428.24	418.084
BL19317	17.86	17.46	453.64	443.484

Mechanical Information - Continued

Sizing Chart - Continued

Part Number	Length (Inches)		Length (Millimeters)	
	Unit	Window	Unit	Window
BL19318	18.86	18.46	479.04	468.884
BL19319	19.86	19.46	504.44	494.284
BL19320	20.86	20.46	529.84	519.684
BL19321	21.86	21.46	555.24	545.084
BL19322	22.86	22.46	580.64	570.484
BL19323	23.86	23.46	606.04	595.884
BL19324	24.86	24.46	631.44	621.284
BL19325	25.86	25.46	656.84	646.684
BL19326	26.86	26.46	682.24	672.084
BL19327	27.86	27.46	707.64	697.484
BL19328	28.86	28.46	733.04	722.884
BL19329	29.86	29.46	758.44	748.284
BL19330	30.86	30.46	783.84	773.684
BL19331	31.86	31.46	809.24	799.084
BL19332	32.86	32.46	834.64	824.484
BL19333	33.86	33.46	860.04	849.884
BL19334	34.86	34.46	885.44	875.284
BL19335	35.86	35.46	910.84	900.684
BL19336	36.86	36.46	936.24	926.084
BL19337	37.86	37.46	961.64	951.484
BL19338	38.86	38.46	987.04	976.884
BL19339	39.86	39.46	1012.44	1002.284
BL19340	40.86	40.46	1037.84	1027.684
BL19341	41.86	41.46	1063.24	1053.084
BL19342	42.86	42.46	1088.64	1078.484
BL19343	43.86	43.46	1114.04	1103.884
BL19344	44.86	44.46	1139.44	1129.284
BL19345	45.86	45.46	1164.84	1154.684
BL19346	46.86	46.46	1190.24	1180.084
BL19347	47.86	47.46	1215.64	1205.484
BL19348	48.86	48.46	1241.04	1230.884
BL19349	49.86	49.46	1266.44	1256.284
BL19350	50.86	50.46	1291.84	1281.684
BL19351	51.86	51.46	1317.24	1307.084
BL19352	52.86	52.46	1342.64	1332.484
BL19353	53.86	53.46	1368.04	1357.884
BL19354	54.86	54.46	1393.44	1383.284

Mechanical Information - Continued

Sizing Chart - Continued

Part Number	Length (Inches)		Length (Millimeters)	
	Unit	Window	Unit	Window
BL19355	55.86	55.46	1418.84	1408.684
BL19356	56.86	56.46	1444.24	1434.084
BL19357	57.86	57.46	1469.64	1459.484
BL19358	58.86	58.46	1495.04	1484.884
BL19359	59.86	59.46	1520.44	1510.284
BL19360	60.86	60.46	1545.84	1535.684
BL19361	61.86	61.46	1571.24	1561.084
BL19362	62.86	62.46	1596.64	1586.484
BL19363	63.86	63.46	1622.04	1611.884
BL19364	64.86	64.46	1647.44	1637.284
BL19365	65.86	65.46	1672.84	1662.684
BL19366	66.86	66.46	1698.24	1688.084
BL19367	67.86	67.46	1723.64	1713.484
BL19368	68.86	68.46	1749.04	1738.884
BL19369	69.86	69.46	1774.44	1764.284
BL19370	70.86	70.46	1799.84	1789.684
BL19371	71.86	71.46	1825.24	1815.084
BL19372	72.86	72.46	1850.64	1840.484
BL19373	73.86	73.46	1876.04	1865.884
BL19374	74.86	74.46	1901.44	1891.284
BL19375	75.86	75.46	1926.84	1916.684
BL19376	76.86	76.46	1952.24	1942.084
BL19377	77.86	77.46	1977.64	1967.484
BL19378	78.86	78.46	2003.04	1992.884
BL19379	79.86	79.46	2028.44	2018.284
BL19380	80.86	80.46	2053.84	2043.684

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

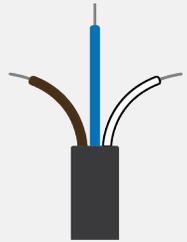
Wavelengths	Configured w/ Voltage Drive (24)	Configured w/ Standard Controller (IC, I3, I3S, I4, C1, C5)
WHI	0.020A per linear inch	0.030A per linear inch
470 nm	0.020A per linear inch	0.030A per linear inch
520 nm	0.020A per linear inch	0.030A per linear inch
660 nm	0.030A per linear inch	0.030A per linear inch
850 nm	0.030A per linear inch	0.030A per linear inch

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	

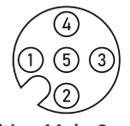
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	
	<p>Inline Controller - Continuous Only - I4 Configurations <i>PN: N/A</i></p> <p>The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal.</p> <p>Output Power: 50 W Max Continuous, 150 W Max Pulsed Output Current: 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	

Electrical Information - Continued

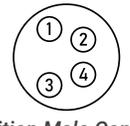
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BL193 series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

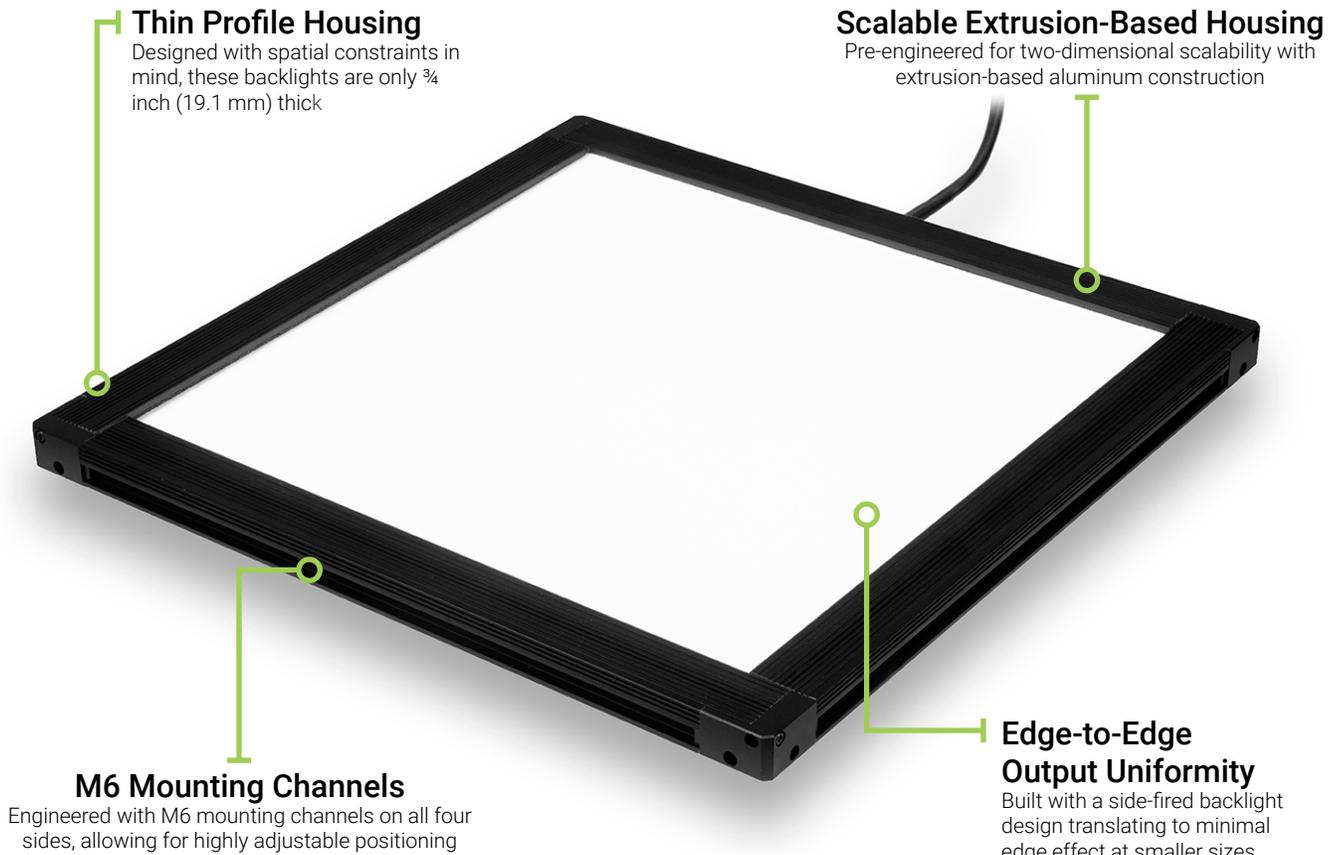
For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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BX2 Series

Edge-lit Backlights | Product Datasheet



BX2 Series Description

The BX2 Series of edge-lit backlights provides a highly diffuse source of illumination, packed within a thin and thermally efficient housing.

The BX2 allows for configuration with polarization or collimation. A backlight configured with collimation is best suited for applications requiring a higher degree of edge clarity when imaging object silhouettes.

This second edition of our edge-lit backlight series is more than twice as bright as previous BX and CX models.

As with most planar backlight designs, this product is useful for edge detection, part location & orientation identification, presence & absence, hole detection and object gauging.



High Intensity



Scalable Design



11 Wavelengths Available



Collimation or Polarization Optional



1-2 Week BTO Lead Times Typical

General Information

General Specifications

Category	Specification	Detail
Optical	Available Wavelengths	White, 455 nm, 470 nm, 505 nm, 530 nm, 590 nm, 625 nm, 660 nm, 730 nm, 850 nm, 940 nm
	Available Lensing	No Lenses
	Available Light Conditioning	Collimation, Polarization
Electrical	Power Consumption Info	See Power Requirements on Page 11
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), -105 °C Rated, Foil Shield w/ Drain
Mechanical	Sizing Info	Standard
		Length
		Width
	Height	
	Weight Info (Standard)	4.73 lb (2.14 kg) per 300 mm x 300 mm Unit
Mounting Info	M6 Mounting Nut Channel, See Page 10 for More Details	
Material Info	Anodized Aluminum Housing, Acrylic Window, Acrylic Strain Relief, PVC Cable Jacket, Steel Black Oxide and Zinc Plated Steel Fasteners	
Thermal	Operating Case Temperatures	25 °C to 60 °C
	Operating Ambient Temperatures	0 °C to 35 °C
Certification	Compliance	CE, RoHS, IEC 62471
	IP Rating	IP50
	Lumen Maintenance - White Only	L70 (50,000 Hours)

General Information - Continued

Part Number Key

Model	-	Emitting Length (in)	Emitting Width (in)	Peak Wavelength	Connector/Control	Light Conditioning Option	-	Alternative Connector
XXX	-	XXXX	XXXX	XXX	XXX	X	-	XXX
BX2		25 mm increments from 50 mm to 600 mm	25 mm increments from 50 mm to 600mm	455 (royal-blue)	C1	P (Polarization) ^{2,3}		M12 ¹
	470 (blue)			C5	C (Collimation) ²	M8 ¹		
	505 (cyan)			IC				
	530 (green)			I3				
	590 (amber)			I3S				
	625 (red-orange)			I4				
	660 (red)			24				
	730 (IR)							
	850 (IR)							
			940 (IR)					
			WHI (white)					
more information on page		10	10	5	11	6		13

Example Part Numbers:
BX2-01500150455C1
BX2-00500050625ICC-M12

¹ Available with 24, IC, I3, I3S, and I4 only
² Maximum size of 400 mm x 400 mm
³ 455 (royal-blue) will reduce the life of the polarizer if selected

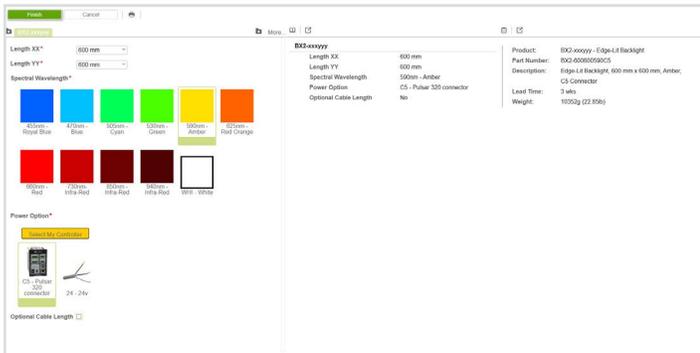
In Stock

Lead Times

Unavailable

Build-to-Order products ship within one to two weeks (typical).

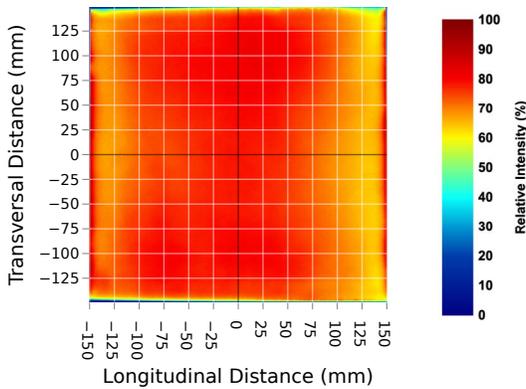
Configurator



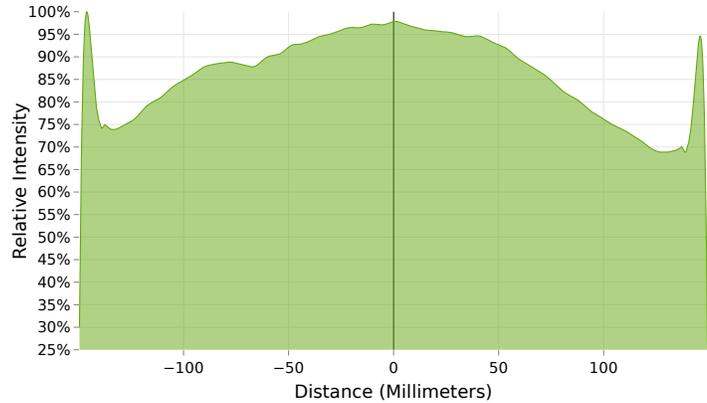
Need a build-to-order lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BX2 Edge-lit Backlights to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

Intensity Distribution



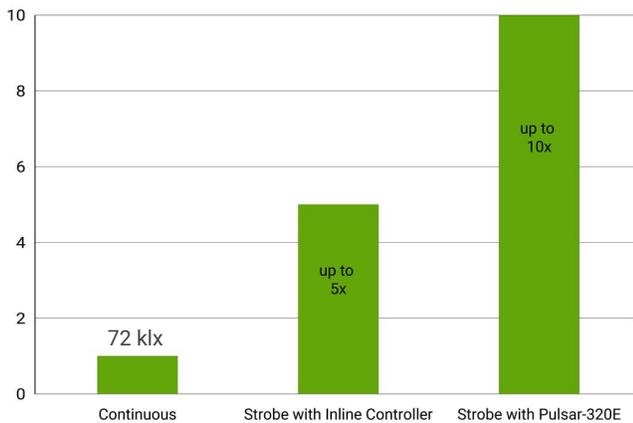
Uniformity Profile Plot



The BX2 Series' uniformity is dependent on the size configured. Models with an emitting length greater than 200mm have a uniformity of +/- 15%, while those with an emitting length less than 200mm achieve +/- 10% uniformity within the optical area.

Note: The optical data shown above has been sampled from a 300 mm x 300 mm white BX2 unit (BX2-03000300WHI4) at the emitting surface.

Continuous vs Strobe Intensity

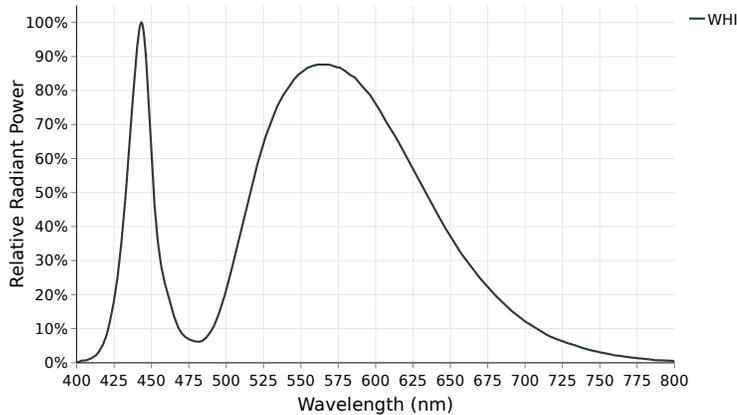


Under continuous operation, an 300 mm white BX2 unit will output a **maximum illuminance of 72 klx** and a **maximum irradiance of 229 W/m²** at the emitting surface. For applications that require higher output, the BX2 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BX2 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320E, a BX2 can be strobed up-to 10X continuous intensity levels.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

White Spectral Profile

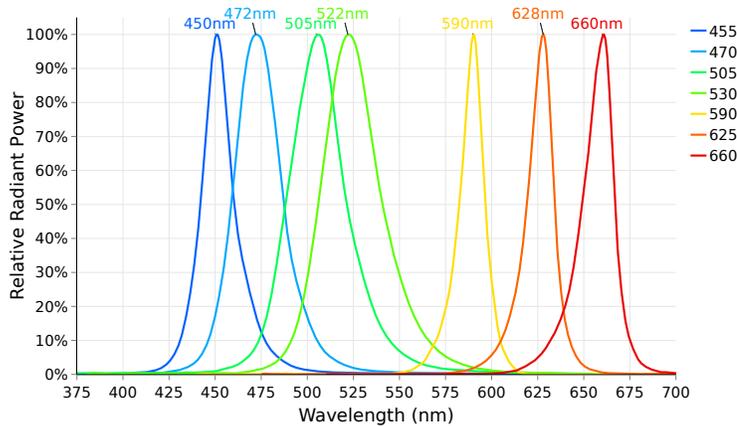


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, **white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems**, specifically when matching white light sources.

The BX2 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles

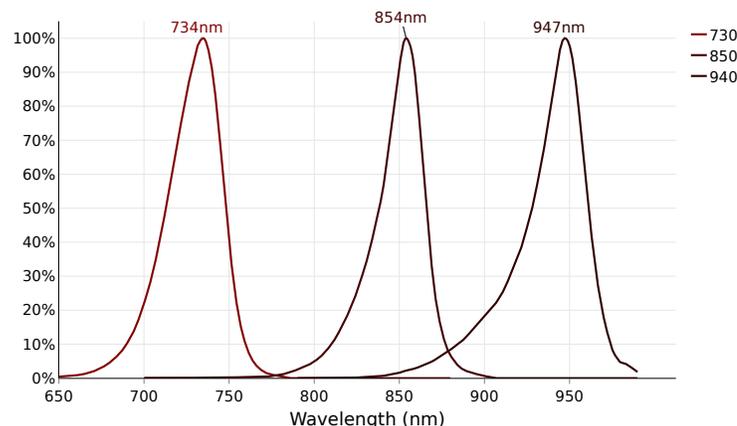


Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following: like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

The BX2 Series is available in **455 nm, 470 nm, 505 nm, 530nm, 590 nm, 625 nm, 660 nm** configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BX2 Series is available in an **730 nm, 850 nm, and 940 nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

BX2 Series Polarization Option

Non-polarized



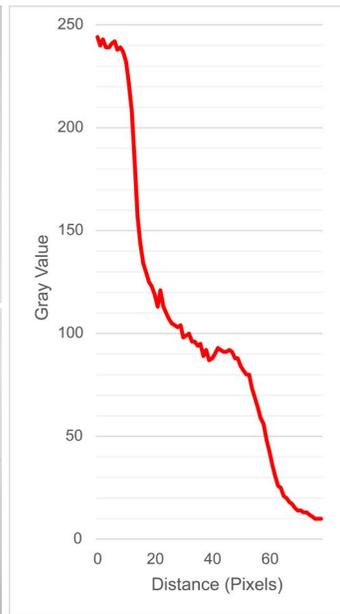
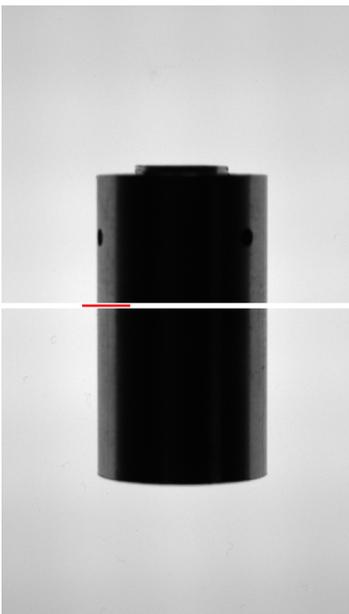
Cross Polarized



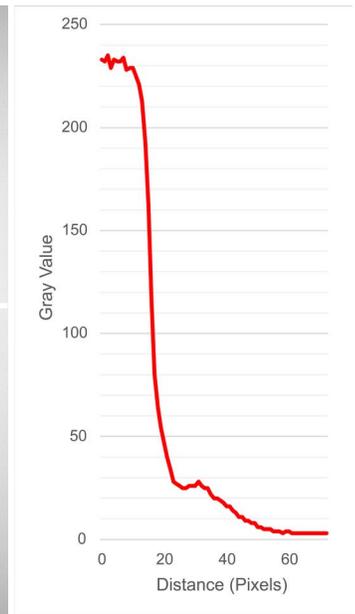
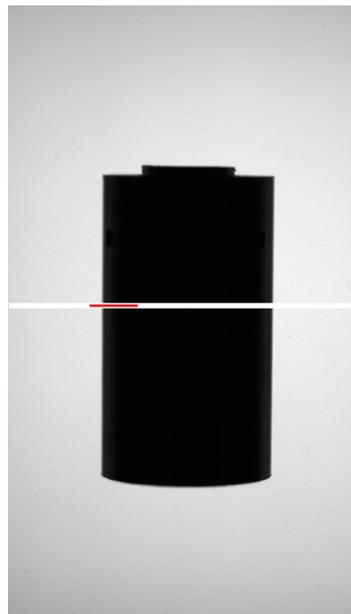
Our BX2 Series is pre-engineered with the option to add a polarization film. Polarization can be used in a variety of ways, such as to reduce glare on specular surfaces or to increase edge clarity of transparent injection-molded objects, as shown above. This is known as cross-polarization. When unpolarized light passes through two cross-polarized filters (oriented 90 degrees perpendicular to each other), it is completely blocked. However, if the light is already polarized, it will only be blocked if its polarization is perpendicular to the axis of the second polarizer, creating the cross-polarization effect shown above.

BX2 Series Collimation

Non-collimated



Collimated



Our BX2 Series is pre-engineered to allow for a collimation option. This light conditioning allows for **greater edge clarity** by collimating photons to travel parallel with the surface normal of the emitting window, diminishing dispersion, and creating a cleaner silhouette. This especially becomes useful when backlighting curved specular objects like the one shown above. On the left side, the edge clarity of the curved object (shown with a profile plot) is insufficient due to the highly diffuse nature of the backlight. On the right side, the edge clarity shows significant improvement with the addition of the collimated light conditioning.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	730 nm, 850 nm, 940 nm
Group 1	No Photobiological hazard under normal behavioral limitations	455 nm, 470 nm, 505 nm, 530 nm, 590 nm, 625 nm, 660 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BX2 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

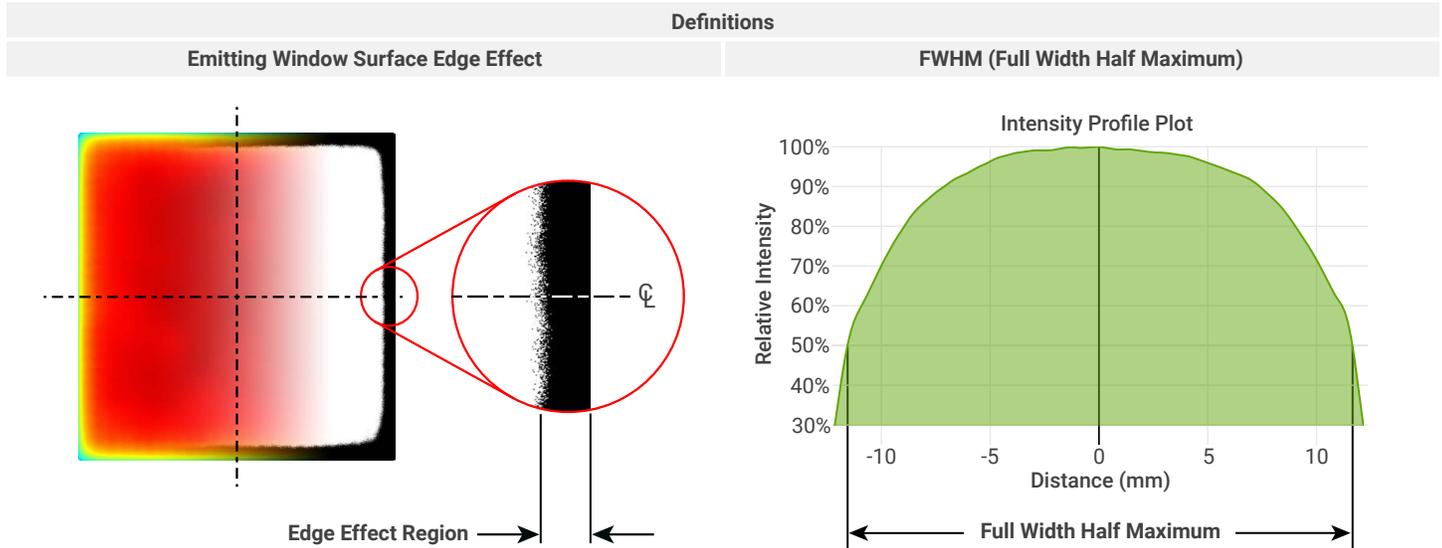
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

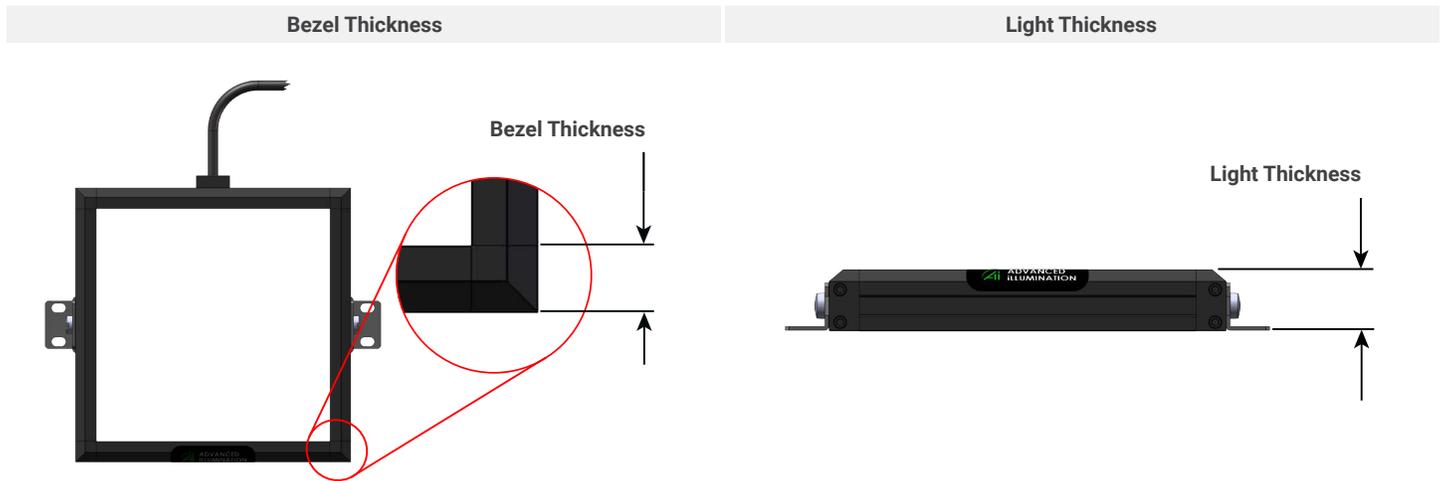
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



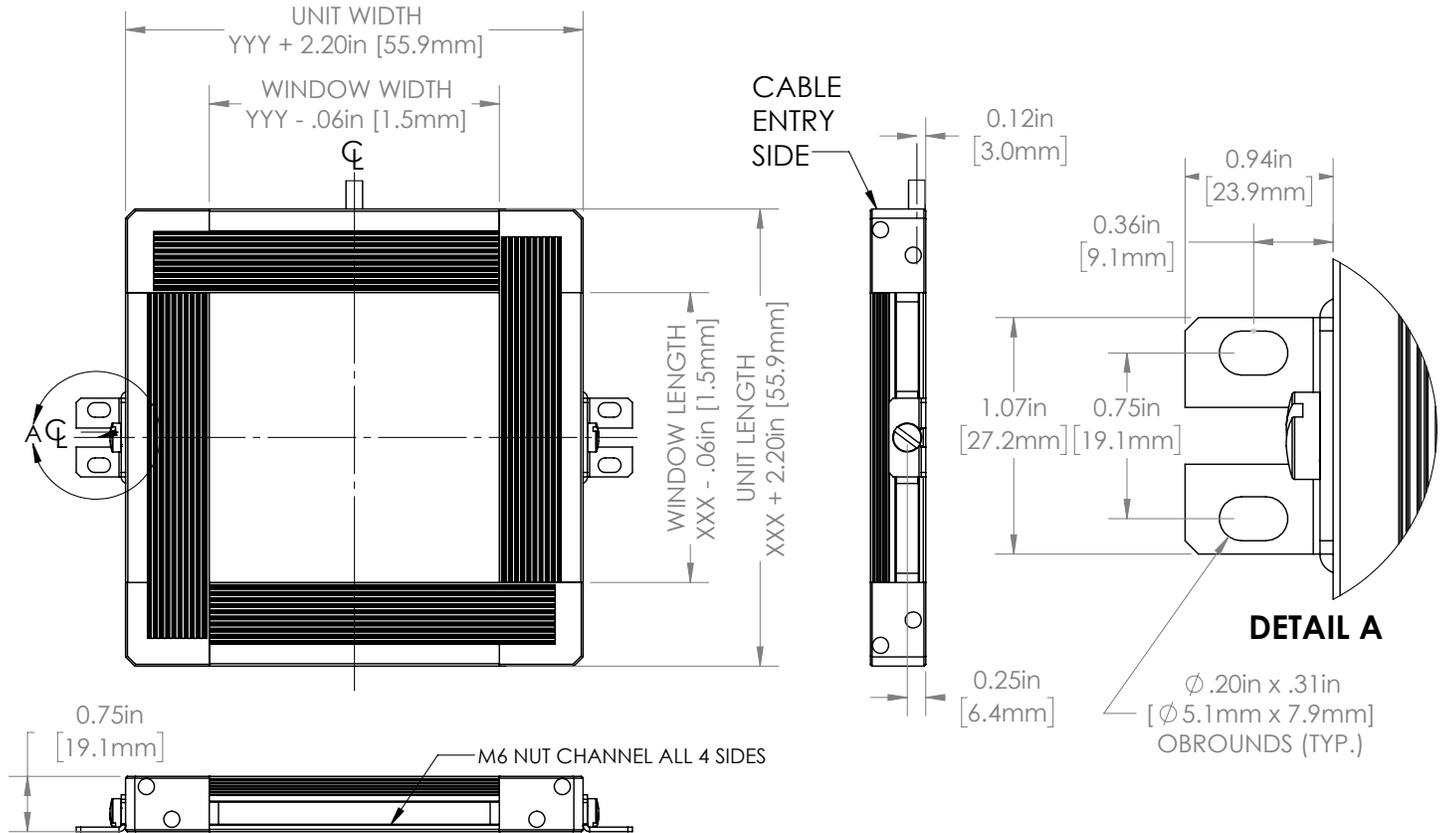
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For full installation drawings and complete CAD models of this non-sealed configuration, please visit the [downloads](#) section of the product webpage.

Sizing Information

Our edge-lit backlights are scalable to your specific sizing requirements.

We can manufacture our BX2 backlights in 25 mm increments up to a 0.36m² emitting window, from a small 50 mm x 50 mm backlight to a large-format 600 mm x 600 mm backlight.

All BX2 backlight configurations are built-to-order with the majority shipping with only two week lead times.

For assistance configuring a backlight to meet your specific needs, please visit our online configurator by selecting the "configure" button on our product webpage.

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

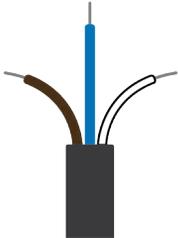
Wavelengths	Configured with Voltage Drive (24)	Configured with Standard Controller (IC, I3, I3S, I4, C1, C5)
WHI	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
455 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
505 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
530 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
590 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
625 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
660 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
730 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)
850 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)
940 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	

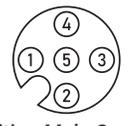
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration <i>PN: Pulsar 320E</i></p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I4 Configurations <i>PN: N/A</i></p> <p>The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal.</p> <p>Output Power: 50 W Max Continuous, 150 W Max Pulsed Output Current: 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	

Electrical Information - Continued

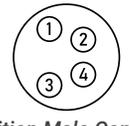
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BX2 Series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3 and I3s PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC or I3/I3S Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>
Mounting Brackets		<p>Mounting Brackets PN: LB</p> <p>Fastens to the M6 mounting channel for simplified mounting. Included in product purchase.</p> <p>For more information about our Mounting Brackets, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

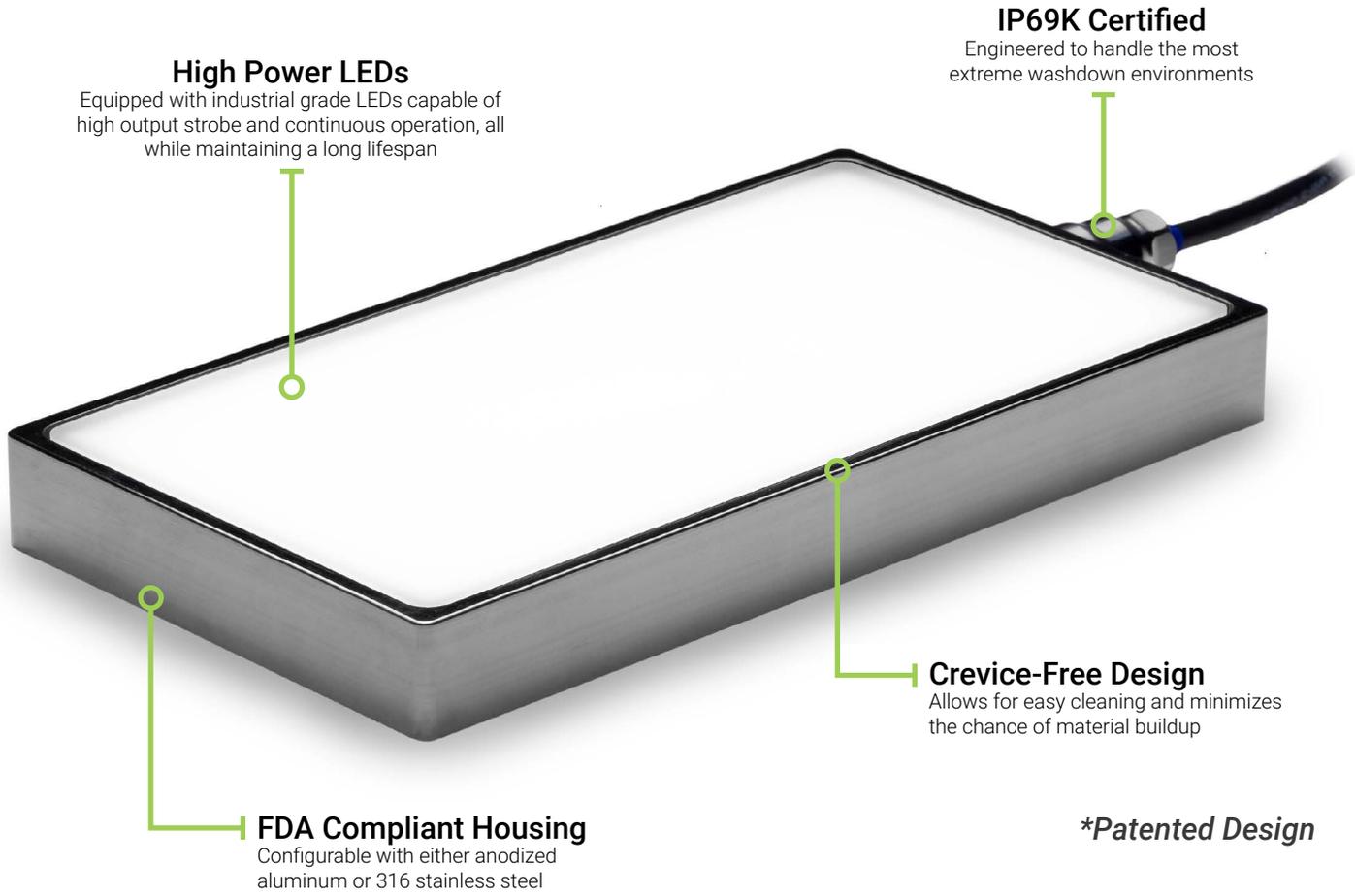
For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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BL245 Series

UltraSeal Backlights | Product Datasheet



High Power LEDs
Equipped with industrial grade LEDs capable of high output strobe and continuous operation, all while maintaining a long lifespan

IP69K Certified
Engineered to handle the most extreme washdown environments

Crevice-Free Design
Allows for easy cleaning and minimizes the chance of material buildup

FDA Compliant Housing
Configurable with either anodized aluminum or 316 stainless steel

**Patented Design*

BL245 Series Description

The BL245 Series, otherwise known as our UltraSeal™ Backlight Series, provides a ruggedized solution for the most demanding washdown applications.

UltraSeal lights are IP69K certified, ensuring complete protection against dust ingress and high-pressure steam.

This patented design is virtually crevice-free, engineered without the use of exposed fasteners, greatly reducing the chance of food, dust, dirt or other debris getting caught on its surface.

As with most planar backlight designs, this product is useful for edge detection, part location & orientation identification, presence & absence, hole detection and object gauging.

-  **IP69K Certified**
-  **Crevice Free Design**
-  **High Intensity**
-  **5 Wavelengths Available**
-  **1-2 Week Lead Times Typical**

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White, 470 nm, 520 nm, 660 nm, 880 nm			
	Available Lensing	No Lenses			
	Available Light Conditioning	None			
Electrical	Power Consumption Info	See Power Requirements on Page 10			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	4.18"(106.2mm) to 14.18"(360.2mm)	See Page 9 for More Details
			Width	2.81"(71.4mm) to 12.81"(325.4mm)	
			Height	.95"(24.0mm)	
Mechanical	Weight Info (Standard)	~ .85 lbs (~385 g) per 4x4" Unit			
	Mounting Info	M4 Mounting Holes			
	Material Info	Anodized Aluminum or Stainless Steel Housing, Acrylic Window, Stainless Steel Strain Relief, PVC Cable Jacket, 18-8 Stainless Steel Fasteners, Rubberized Epoxy			
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
Certification	Compliance	CE, RoHS, IEC 62471			
	IP Rating	IP69K Certified			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	-	Emitting Length (in)	Emitting Width (in)	Peak Wavelength	Connector/Control	Housing Material	-	Alternative Connector
BL245	-	XX	YY	XXX	XX	XX	-	XXX
BL245		01" increments from 02" to 12"	01" increments from 02" to 12"	470 (blue)	C1	AL (Anodized Aluminum)		M12 ¹
				520 (green)	C5	SS (Stainless Steel)		M8 ¹
				660 (red)	IC			
				880 (IR)	I3			
				WHI (white)	I3S			
					I4			
					24			
more information on page		9	9	5	10			12

Example Part Numbers:
BL245-0412WHI3-M12
BL245-1212660C1

¹ Available with IC, I3, I3S, and I4

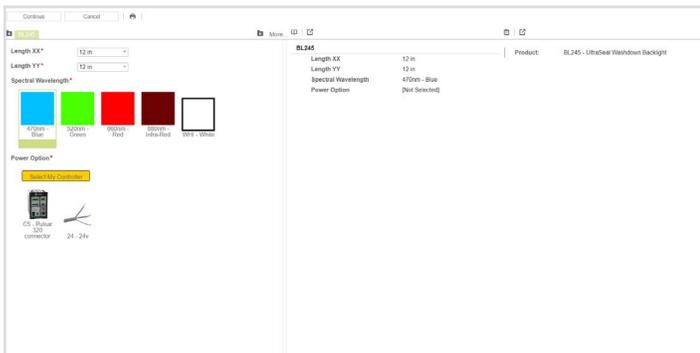
In Stock

Unavailable

Lead Times

Build-to-Order custom products ship within one to two weeks (typical).

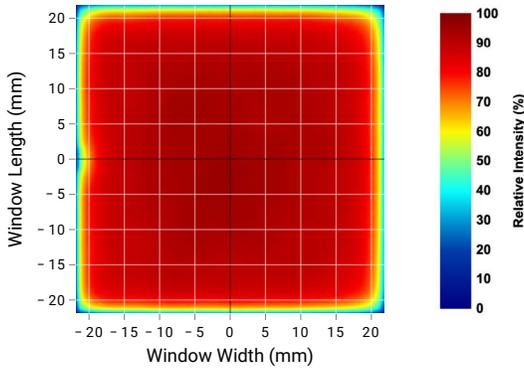
Configurator



Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL245 UltraSeal Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

Intensity Distribution



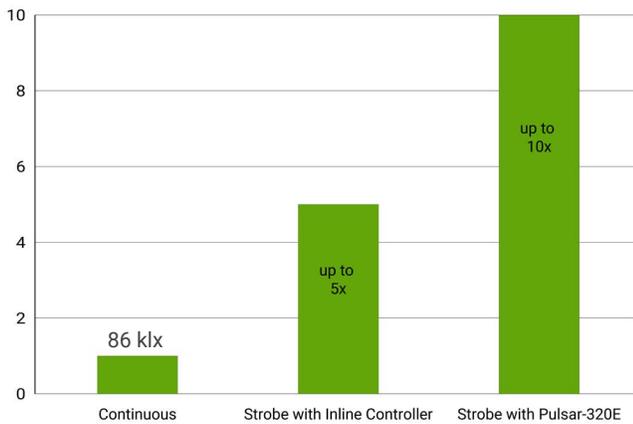
Uniformity Profile Plot



The BL245 Series provides a highly uniform output across its emitting window with an edge effect of only 18.4mm, and a uniformity of +/- 10% within the optical area.

Note: The optical data shown above has been sampled from a 12-inch x 12-inch white BL245 unit (BL245-1212WHIIC) at the emitting surface.

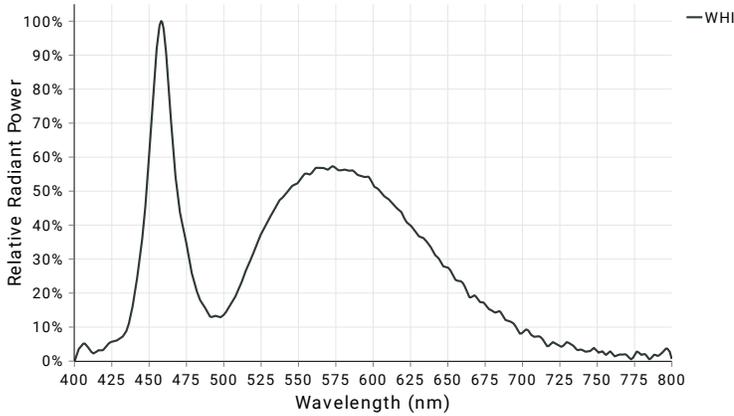
Continuous vs Strobe Intensity



Under continuous operation, a 12-inch white BL245 unit will output an **illuminance of 86 klx** and an **irradiance of 249 W/m²** at the emitting surface. For applications that require higher output, the BL245 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BL245 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a BL245 can be strobed up-to 10X continuous intensity levels.

Optical Information - Continued

White Spectral Profile

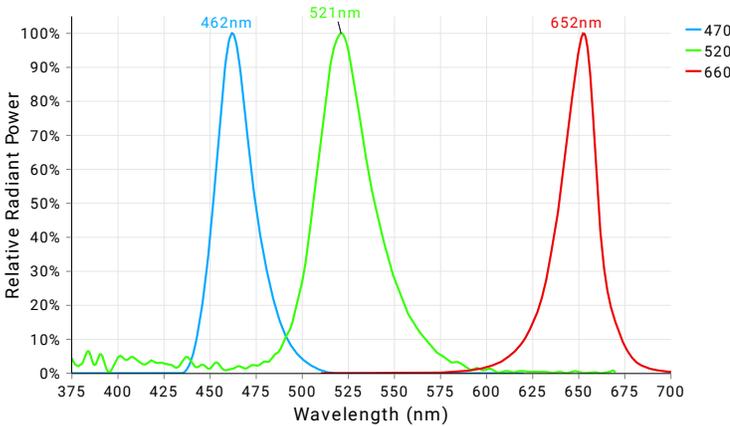


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, [white LEDs can vary in color temperature between different lighting families](#), which can impact machine vision systems, specifically when matching white light sources.

The BL245 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles

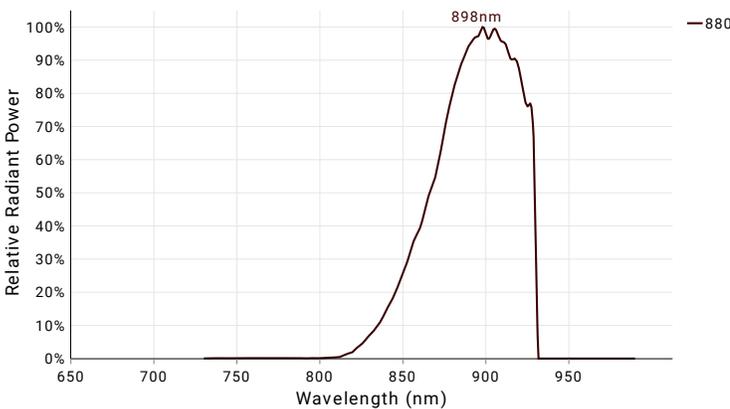


Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following; like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

The BL245 Series is available in **470nm, 530nm, and 660nm** visible color configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BL245 Series is available in an **880nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	880 nm
Group 1	No Photobiological hazard under normal behavioral limitations	470 nm, 530 nm, 660 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL245 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

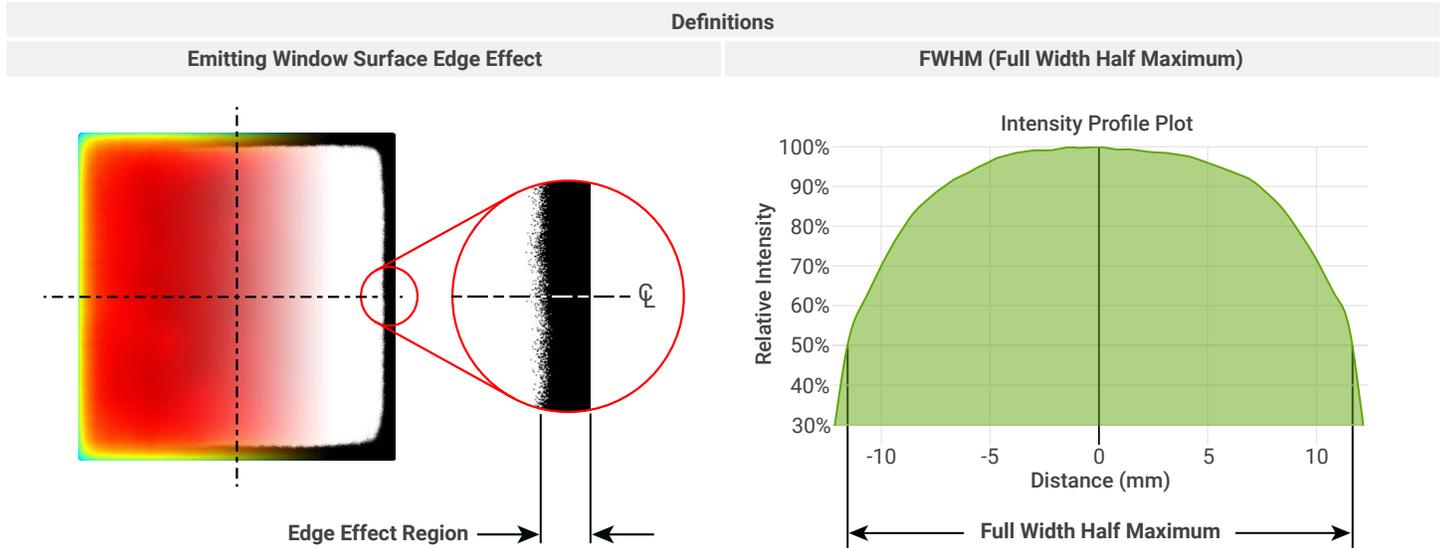
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

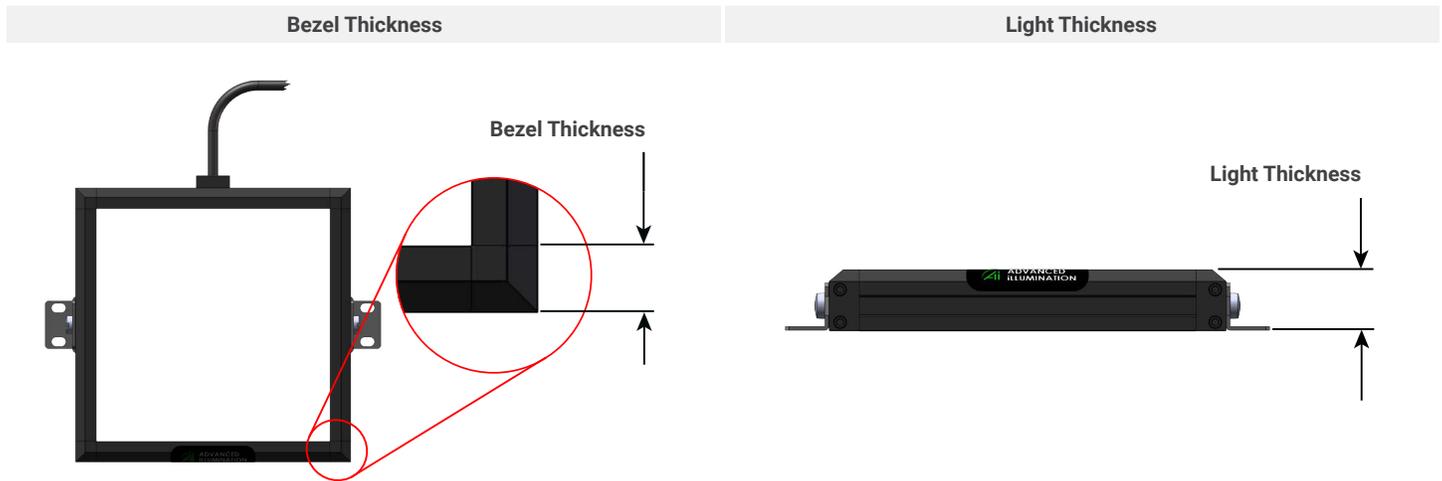
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



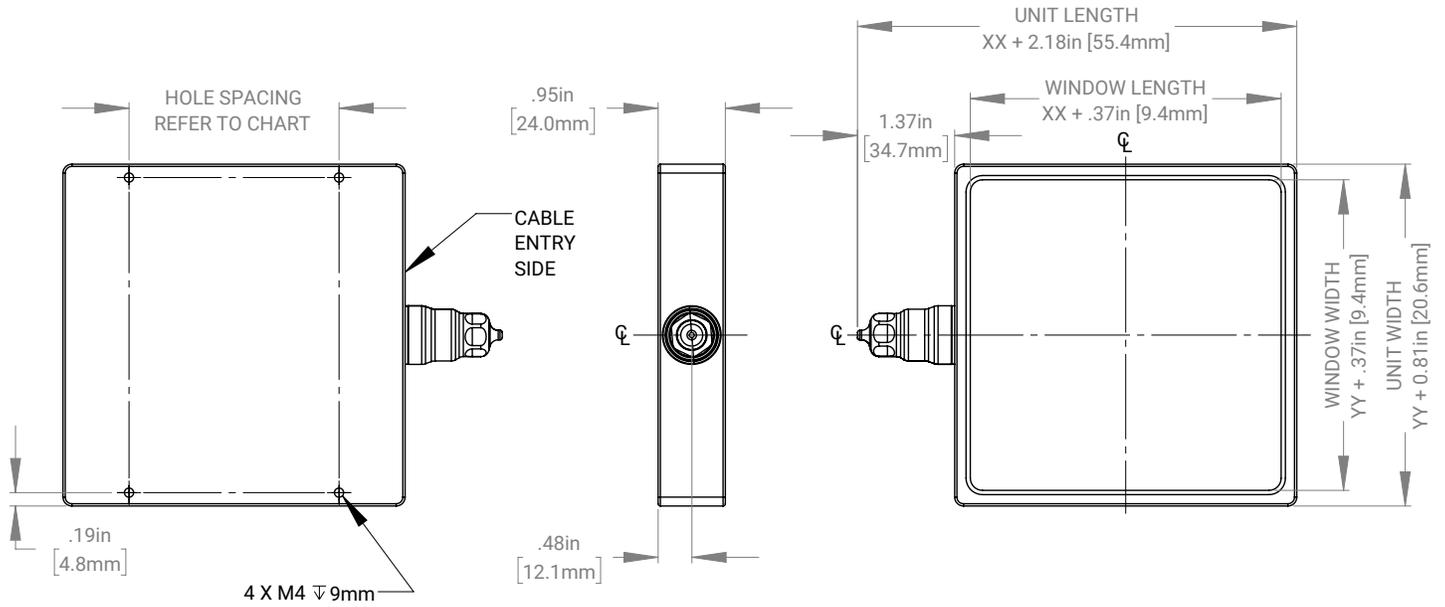
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For XX and YY dimensions refer to Part Number Key.

For full installation drawings and complete CAD models of this non-sealed configuration, please visit the [downloads](#) section of the product webpage.

Sizing Information

Our UltraSeal backlights are scalable to your specific sizing requirements. We can manufacture our BL245 backlights in 1" increments up to a 144 sq. inch emitting window, from a small 2" x 2" backlight to a large-format 12" x 12" backlight, all with short lead times.

For assistance configuring a backlight to meet your specific needs, please visit our [online configurator](#).

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

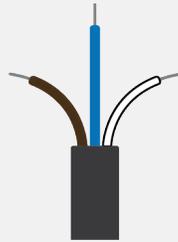
Wavelengths	Configured w/ Voltage Drive (24)	Configured with Standard Controller (IC, I3, I3S, I4, C1, C5)
WHI	0.015A per sq. inch	0.030A per sq. inch
470 nm	0.015A per sq. inch	0.030A per sq. inch
530 nm	0.015A per sq. inch	0.030A per sq. inch
625 nm	0.015A per sq. inch	0.018A per sq. inch
850 nm	0.015A per sq. inch	0.018A per sq. inch

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	

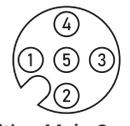
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I4 Configurations <i>PN: N/A</i></p> <p>The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal.</p> <p>Output Power: 50 W Max Continuous, 150 W Max Pulsed Output Current: 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	

Electrical Information - Continued

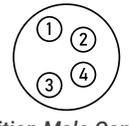
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BL245 series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>
Mounting Brackets		<p>Mounting Brackets PN: LB</p> <p>Fastens to the M6 mounting channel for simplified mounting. Included in product purchase.</p> <p>For more information about our Mounting Brackets, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

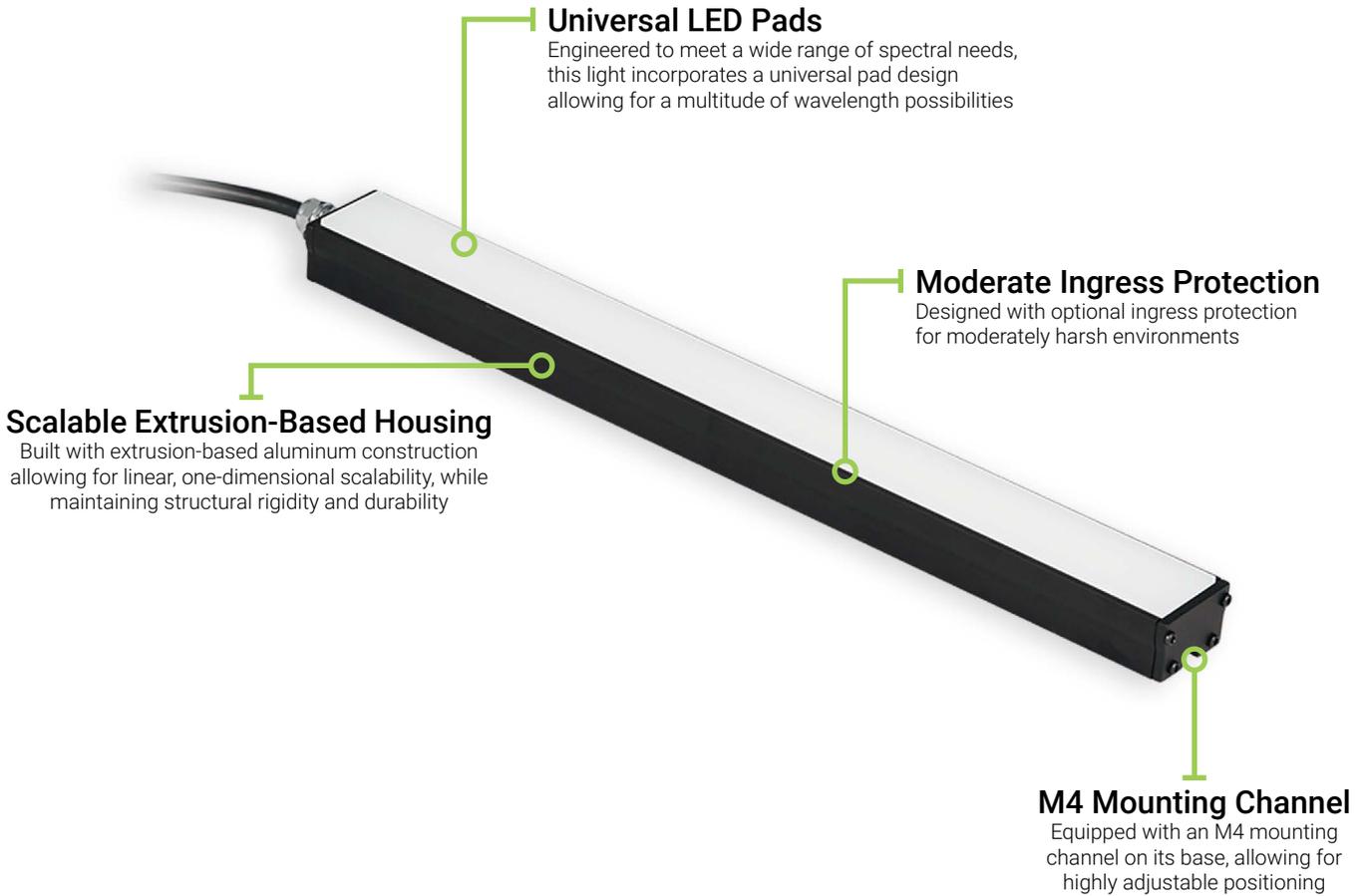
For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

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BL313 Series

Medium Intensity Linear Backlights Product Datasheet



BL313 Series Description

The BL313 Series is a group of versatile linear light sources capable of producing highly diffuse illumination for a wide range of applications.

These uniform backlights can be used behind the object of interest for line scan applications or as non-directional bar light illuminators for more diffuse general-purpose machine vision lighting.

As with all Advanced illumination products, this series is built for customizability while maintaining best-in-class build-to-order lead times of only one to two weeks.



Medium Intensity



Scalable Design



8 Available Wavelengths



Multiple Control Options



1-2 Week BTO Lead Times Typical

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White, 455 nm, 470 nm, 530 nm, 590 nm, 625 nm, 850 nm, 940 nm			
	Available Lensing	No Lenses			
	Available Light Conditioning	None			
Electrical	Power Consumption Info	See Power Requirements on Page 10			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	3.15"(80.1mm) to 21.15"(537.2mm)	See Page 8 for More Details
		Sealed	Width	1.27"(32.2mm)	
			Height	.85"(21.7mm)	
	Length		3.31"(84.1mm) to 21.31"(541.3mm)		
	Sealed	Width	1.27"(32.2mm)		
		Height	.85"(21.7mm)		
Weight Info (Standard)		~ 0.47 lbs (~213 g) per 4" Unit Length			
Mounting Info	M4 Mounting Nut Channel				
Material Info	Anodized Aluminum Housing, Acrylic Window, Nickel Plated Brass Strain Relief, PVC Cable Jacket, Steel Black Oxide, Optional: Silicone Sealant, Neoprene Gasket/ Buna-N Rubber O-Rings				
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
Certification	Compliance	CE, RoHS, IEC 62471			
	IP Rating	IP50 and IP65			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	Emitting Length (in)	-	Peak Wavelength	Connector/Control	Washdown Option	-	Alternative Connector
BL313	XX	-	XXX	XX	X	-	XXX
BL313	02" increments from 02" to 20"		455 (royal-blue)	C1	W (IP65)		M8 ¹
			470 (blue)	C5			M12 ¹
			530 (green)	IC			
			590 (amber)	I3			
			625 (red-orange)	I3S			
			850 (IR)	I4			
			940 (IR)	24			
			WHI (white)				
more information on page	8		5	10			12

Example Part Numbers:

BL31312-530IC-M12
BL31308-WHIC1W

¹ Available with IC, I3, I3S, I4 and 24 V

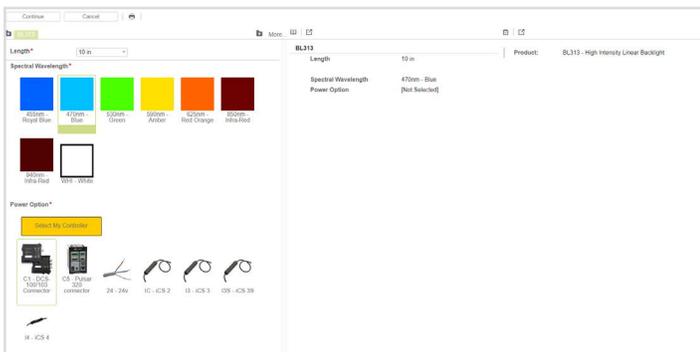
In Stock

Unavailable

Lead Times

Build-to-Order products ship within one to two weeks (typical).

Configurator



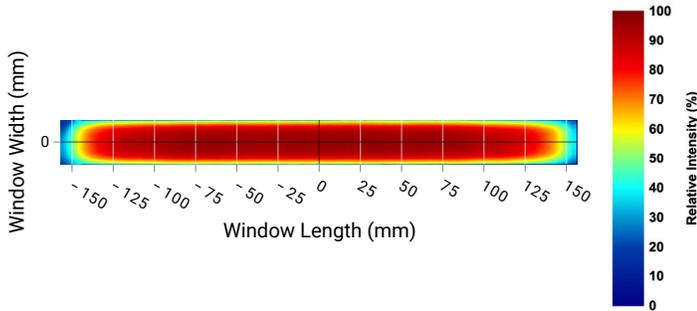
Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BL313 Medium Intensity Linear Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

Intensity Distribution

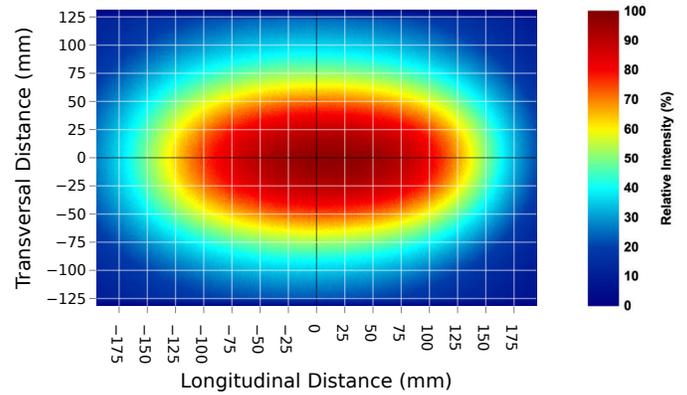
Back Illumination

(imaging into emitting window)



Front Illumination

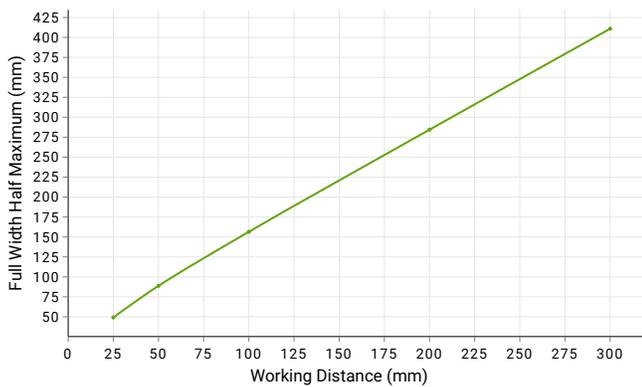
(imaging emission at 100 mm working distance)



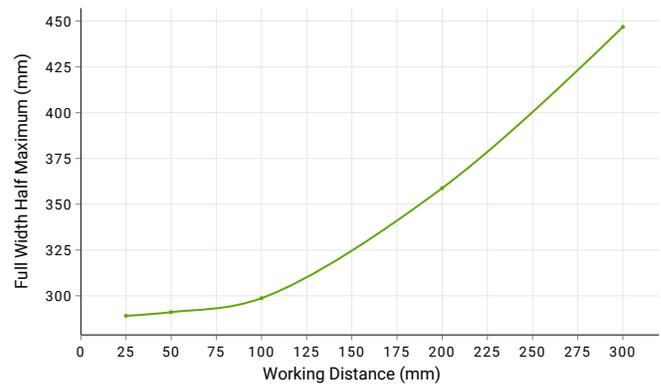
Both intensity distribution images shown above have been taken using a 12-inch white BL313 unit (BL31312-WHIIC).

FWHM vs Working Distance

Transversal FWHM vs Working Distance



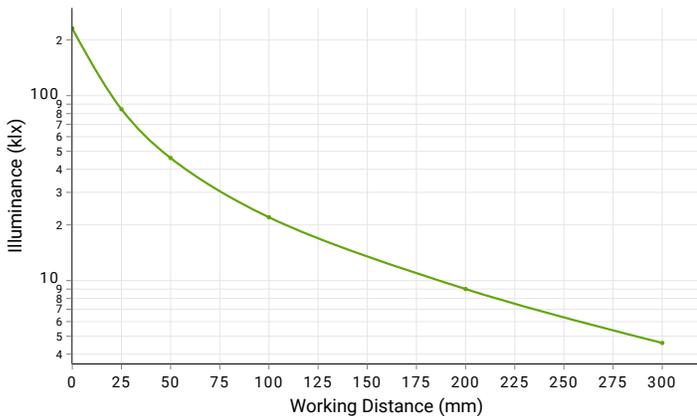
Longitudinal FWHM vs Working Distance



Both Full Width Half Maximum (FWHM) vs Working Distance plots shown above have been measured using a 12-inch white BL313 unit (BL31312-WHIIC).

Intensity vs Working Distance

Illuminance vs Working Distance

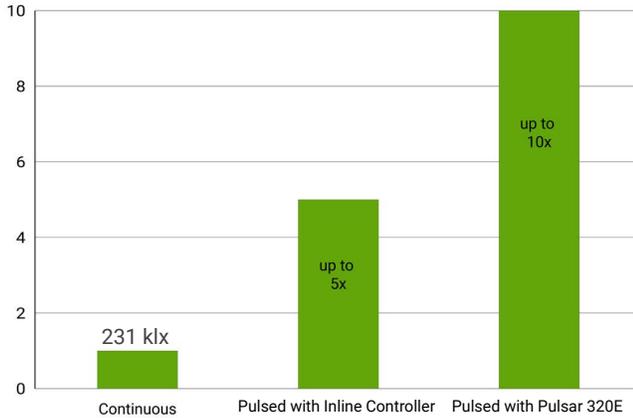


Linear Backlights, while typically oriented behind the object of interest, can also be used for highly diffuse front illumination at short to medium working distances. The chart to the left shows the BL313's intensity as it's distance from the inspection surface changes.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

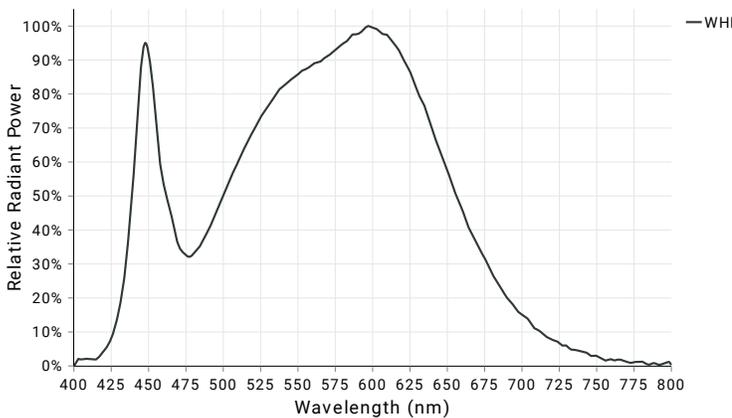
Optical Information - Continued

Continuous vs Pulsed Intensity



Under continuous operation, a 12-inch white BL313 unit will output an **illuminance of 231 klx** and an **irradiance of 735 W/m²** at the emitting surface. For applications that require higher output, the BL313 Series has been engineered to be overdrive strobe capable, otherwise known as pulsed mode. When configured with AI's strobe enabled Inline Controller (IC, I3 or I3S), the BL313 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320, a BL313 can be strobed up-to 10X continuous intensity levels.

White Spectral Profile

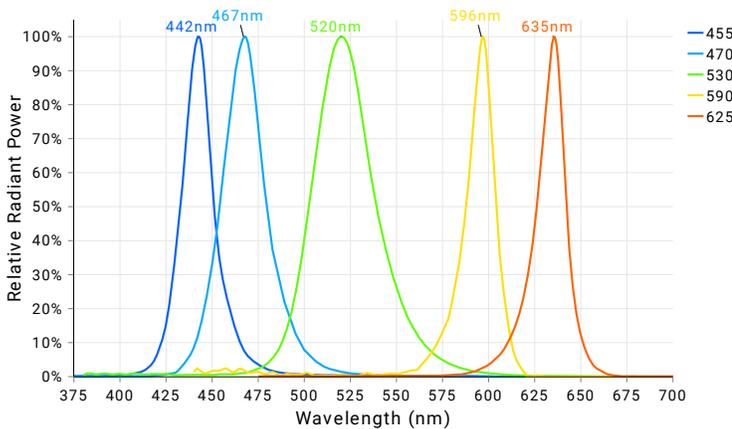


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, [white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems](#), specifically when matching white light sources.

The BL313 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500 K**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Color Spectral Profiles



Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following: like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

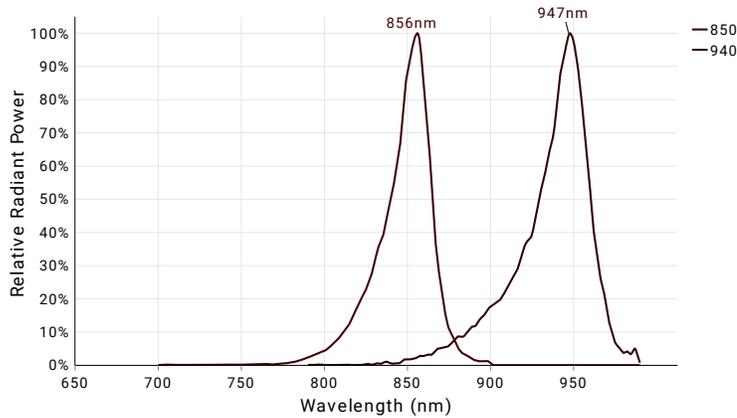
The BL313 Series is available in **455 nm, 470 nm, 530 nm, 590 nm, and 625 nm** configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BL313 Series is available in **850 nm and 940 nm** configurations.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	850 nm, 940 nm
Group 1	No Photobiological hazard under normal behavioral limitations	455 nm, 470 nm, 530 nm, 590 nm, 625 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BL313 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

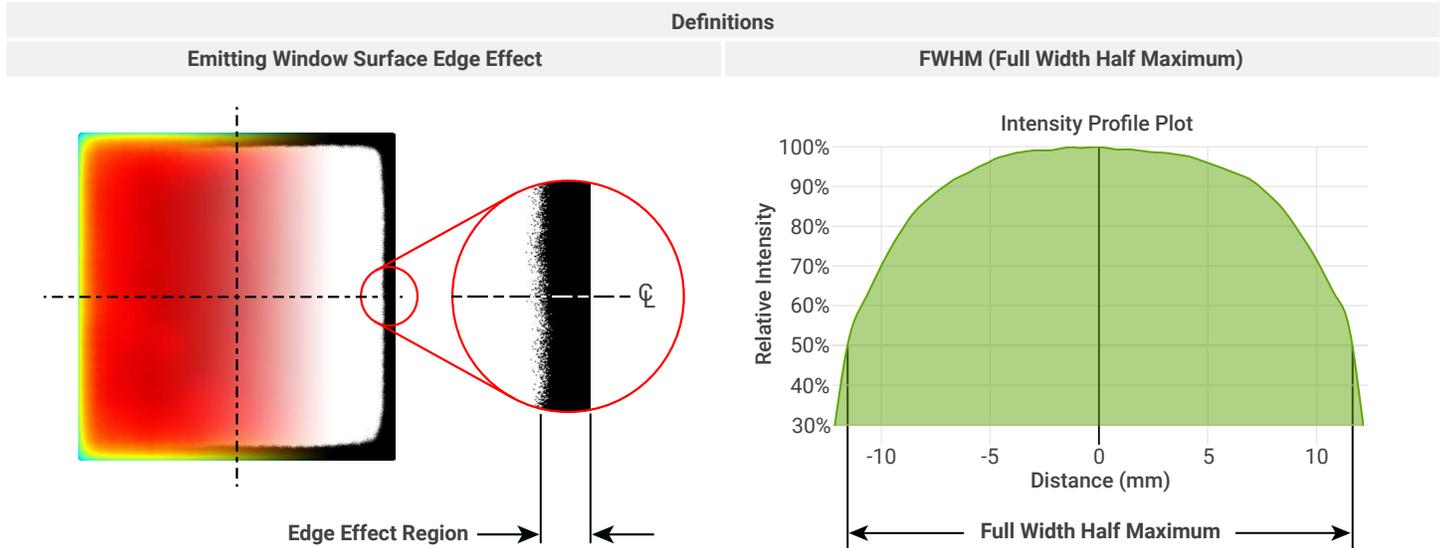
Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

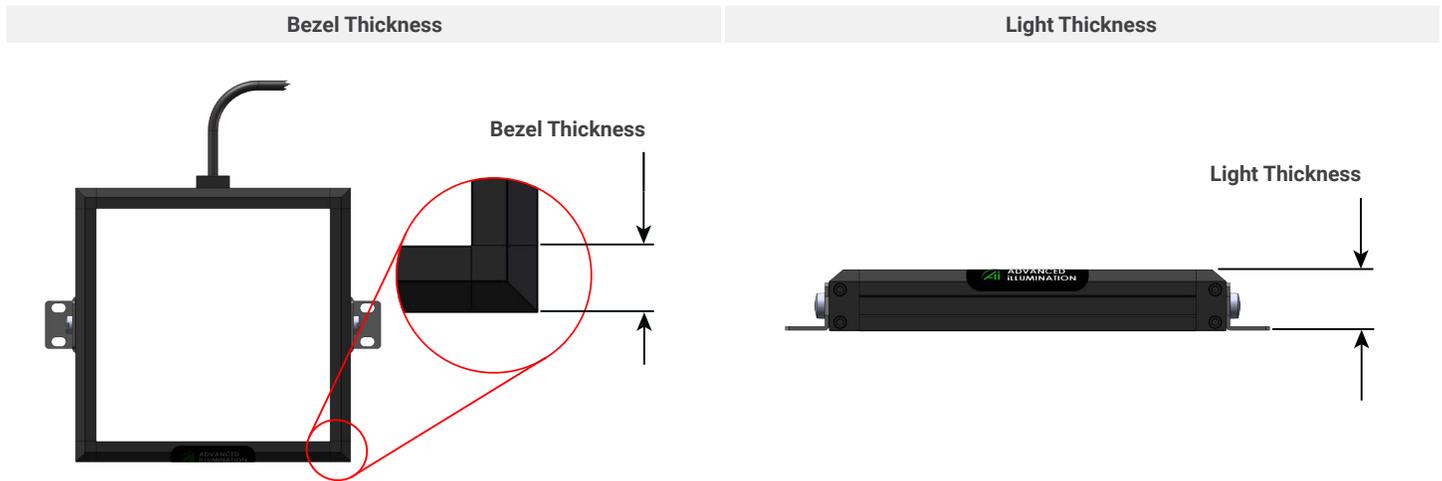
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

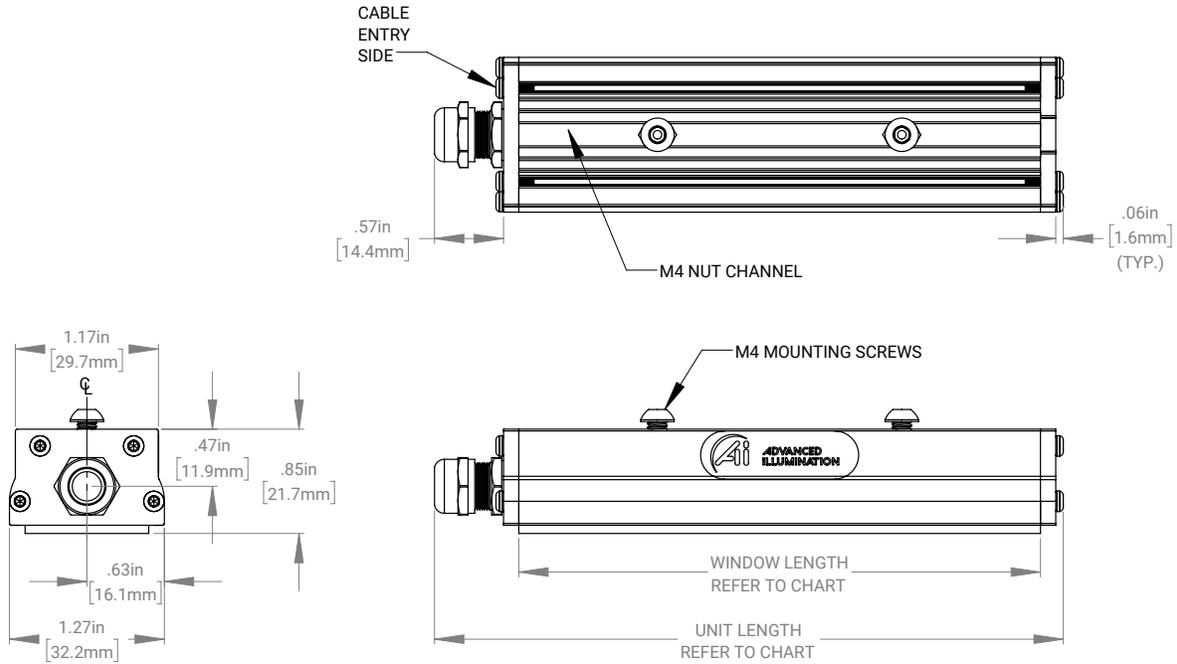
Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

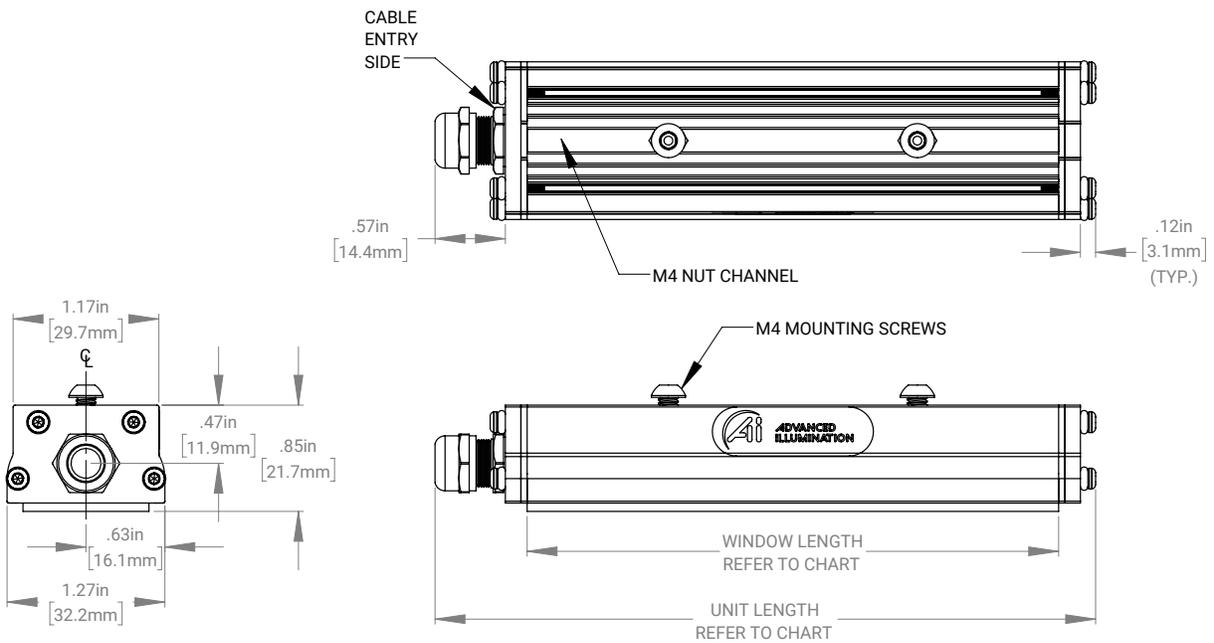
Mechanical Information

Installation Drawings

Non-Sealed Configuration



Sealed Configuration



For full installation drawings and complete CAD models of this sealed configuration, please visit the [downloads section of the product webpage](#).

Mechanical Information - Continued

Sizing Chart

Part Number	Length (Inches)				Length (Millimeters)			
	Non-Washdown		Washdown		Non-Washdown		Washdown	
	Unit	Window	Unit	Window	Unit	Window	Unit	Window
BL13802	3.15	2.27	3.31	2.27	80.01	57.658	84.07	57.658
BL13804	5.15	4.27	5.31	4.27	130.81	108.458	134.87	108.458
BL13806	7.15	6.27	7.31	6.27	181.61	159.258	185.67	159.258
BL13808	9.15	8.27	9.31	8.27	232.41	210.058	236.47	210.058
BL13810	11.15	10.27	11.32	10.27	283.21	260.858	287.27	260.858
BL13812	13.15	12.27	13.31	12.27	334.01	311.658	338.07	311.658
BL13814	15.15	14.27	15.31	14.27	384.81	362.458	388.87	362.458
BL13816	17.15	16.27	17.33	16.27	435.61	413.258	439.67	413.258
BL13818	19.15	18.27	19.31	18.27	486.41	464.058	490.47	464.058
BL13820	21.15	20.27	21.31	20.27	537.21	514.858	541.27	514.858

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

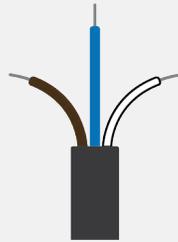
Wavelengths	Unit Size	Configured w/ Voltage Drive (24)	Configured w/ Standard Controller (IC, I3, I3S, I4, C1, C5)
WHI, 455 nm, 470 nm, 530 nm, 590 nm, 625 nm, 850 nm, 940 nm	1" to 12"	0.120 A per linear inch	0.240 A per linear inch
WHI, 455 nm, 470 nm, 530 nm, 590 nm, 625 nm, 850 nm, 940 nm	13" or Longer	0.090 A per linear inch	0.180 A per linear inch

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	

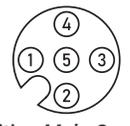
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I4 Configurations <i>PN: N/A</i></p> <p>The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal.</p> <p>Output Power: 50 W Max Continuous, 150 W Max Pulsed Output Current: 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>24V Driver - Continuous Only - 24 Configurations <i>PN: N/A</i></p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	

Electrical Information - Continued

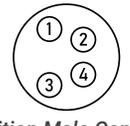
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 5-Position Male Connector
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 4-Position Male Connector
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BX and CX Series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3 and I3s PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC or I3/I3S Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliance documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: +1 (802) 767 3830
Fax: +1 (802) 767 2636
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Product Highlights

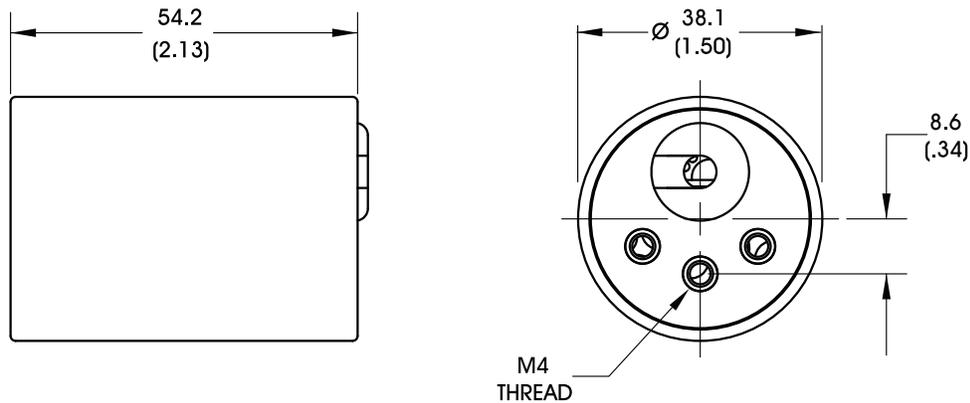
- Available in 4mm or 20mm spot sizes
- Can be used as a diffuse light source



General Specifications

Electrical Specifications	Color	24v Current	All Other Controls
	625, 880	0.12 A	0.05 A Max
	395, 470, 520, WHI	0.08 A	0.03 A Max
Normal Operating Temperature	0 - 60°C		
Weight (g)	70.76g (2.5oz)		
Standard Cable Information	Up to 2 meters (80") long - 105°C rated PVC jacket, foil shield with drain.		
Photobiological Risk Factor IEC 62471	Exempt Applicable Wavelengths: 880 Group 1 (Low-Risk) Applicable Wavelengths: 470, 520, 625, WHI Group 2 (Medium-Risk) Applicable Wavelengths: 395		
Compliance			
IP Rating	IP50		
Lumen Maintenance	L70 = 50,000 hours		

Mechanical Specifications



DIMENSIONS ARE IN MILLIMETERS (INCHES)

Part Number Key

Model	—	Spectral Wavelength	Field of View (mm)	Connector/Control	—	Alternative Connector
BL5420	—	XXX	XX	XX	—	XXX
BL5420		(UV) 395 (blue) 470 (green) 520 (red) 625 (white) WHI (infra-red) 880	04 20	C1 C5 IC I3 I3S 24		M12 ¹
Ex: BL5420-47004C1 BL5420-62520I3-M12				¹ Available with IC, I3, I3S and 24v options only		

Stock Product: *shipped next day*
None

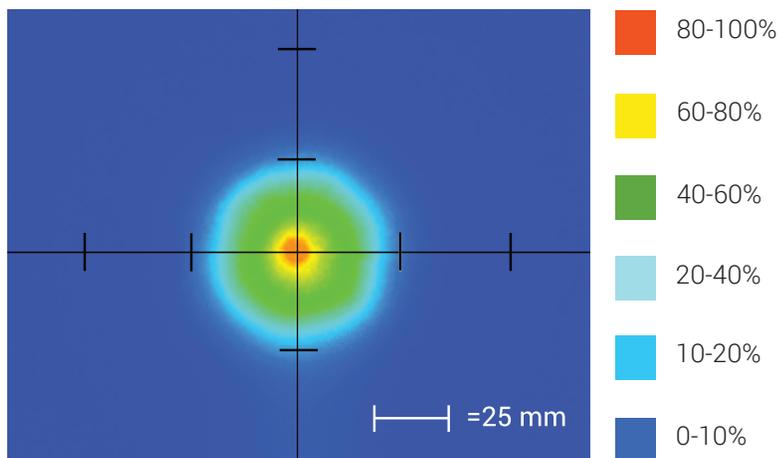
Build to Order: *shipped within two weeks*

Connector | Control Options

C1 Connector	C5 Connector	ICS 2 (IC)	ICS 3 (I3)	ICS 3S (I3S)	24
For use with: DCS Series Controllers	For use with: Pulsar 320 Strobe Controller.	Continous in-line controller Powered with: 24V power supply	Combination strobe/continous in-line controller Powered with: 24V power supply	Default-OFF strobe/continous in-line controller Powered with: 24V power supply	Flying/tinned leads Powered with: 24V power supply

Optical Performance

Intensity Distribution



Optical measurement taken using BL5420-660IC Full Width/Half Max

Area of Illuminance & Intensity

Working Area (FWHM)
@ Working Distance

Light Output

6.86 DIA (mm)
@surface

Irradiance (W/M²): Min 76.5; Typ 90
Illuminance (kLux): Min 7.1; Typ 8.4



Operation and Wiring

ICS 2 (IC)

Pin (M12)	Function	Wire Color
1	+24 VDC	Brown
2	0-10 VDC Analog Control	White
3	DCGND	Blue
4	GLO	Black

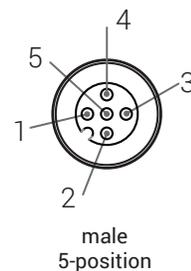
ICS 3 (I3 and I3S)

Pin (M12)	Function	Wire Color
1	+24 VDC	Brown
2	Reserved	White
3	GND	Blue
4	PNP/Active High Trigger	Black
5	0-10 VDC Analog Control	Gray

24 Volt

Pin (M12)	Function	Wire Color
1	+24 VDC	Brown
2	N/A	White
3	GND	Blue
4	N/A	Black

Optional M12 Pinout



Warranty Information

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of two years from the original date of purchase. Should a defect develop during this period, please contact Ai Customer Service or your Ai distributor for a Return Merchandise Authorization (RMA), and return the complete product, freight prepaid, to Ai. If a defect is found, Ai will - at our discretion - repair or replace the product without charge. Ai claims no liability for any implied warranties, including "merchantability" and "fitness for a specific purpose."

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm, EST or send an email to orders@advill.com.

Company Information

Advanced Illumination

440 State Garage Road, Rochester VT. 05767

Phone: 802.767.3830

Fax: 802.767.3831

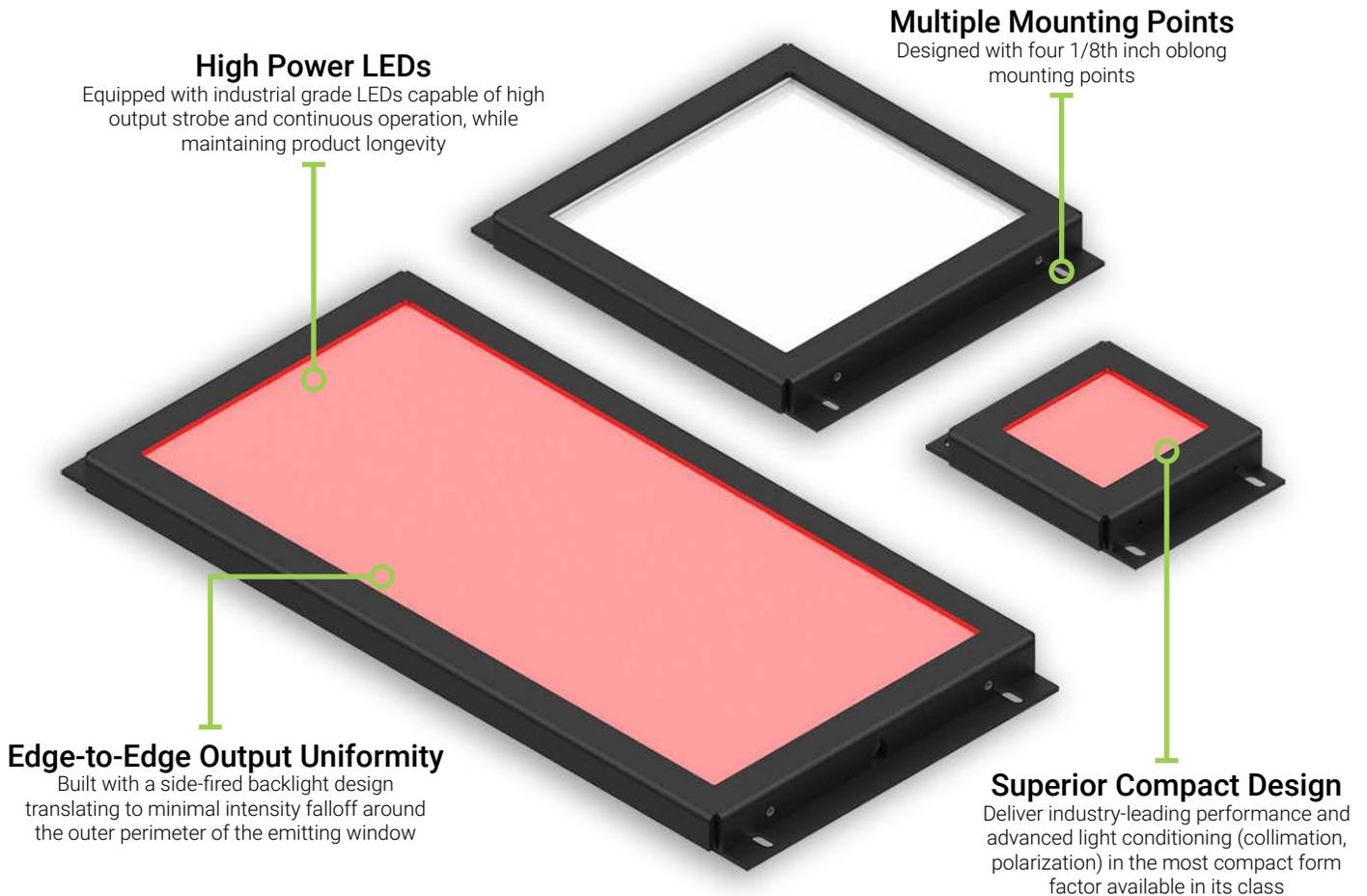
Email: info@advancedillumination.com

Web: advancedillumination.com

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BT Series

MicroBrite™ Backlights | Product Datasheet



BT Series Description

The BT Series, otherwise known as our MicroBrite™ Backlight Series, is specifically engineered to be extremely compact, while maintaining a high output intensity.

MicroBrite Backlights share a design similar to Ai's BX/CX series, utilizing light guide technology for edge-to-edge uniformity in a thin package. However, they are best suited for smaller backlight inspections due to their limited emitting window size availability.

As with most planar backlight designs, this product is useful for edge detection, part location & orientation identification, presence & absence, hole detection and object gauging.



Compact



High Intensity



5 Wavelengths Available



Collimation and Polarization Available



1-2 Week BTO Lead Times

General Information

General Specifications

Category	Specification	Detail			
Optical	Available Wavelengths	White, 455 nm, 530 nm, 625 nm, 850 nm			
	Available Lensing	No Lenses			
	Available Light Conditioning	Collimation, Polarizer			
Electrical	Power Consumption Info	See Power Requirements on Page 12			
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), 105 °C Rated, Foil Shield w/ Drain			
Mechanical	Sizing Info	Standard	Length	050050 - 2.76" (70.0 mm); 100100 - 4.53" (120.0 mm); 200100 - 8.66" (220.0 mm);	See Page 10 for More Details
			Width	050050 - 2.15" (54.7 mm); 100100 - 4.12" (104.6 mm); 200100 - 4.12" (104.6 mm);	
			Height	0.43" (10.9mm)	
	Weight Info (Standard)	~ 0.12 lbs (~54 g) per 50x50mm" Unit, ~ 0.43 lbs (~195 g) per 100x100mm" Unit, ~ 0.69 lbs (~313 g) per 200x100mm" Unit,			
	Mounting Info	4x Ø.13" (Ø3.2mm) x .25" (6.4mm) OBROUNDS			
	Material Info	Anodized Aluminum Housing, Acrylic Window, PVC Cable Jacket, Steel Black Oxide Fasteners			
Thermal	Operating Case Temperatures	25 °C to 60 °C			
	Operating Ambient Temperatures	0 °C to 35 °C			
Certification	Compliance	CE, RoHS, IEC 62471			
	IP Rating	IP50			
	Lumen Maintenance - White Only	L70 (50,000 Hours)			

General Information - Continued

Part Number Key

Model	Model Extension	-	Peak Wavelength	Connector/ Control	Light Conditioning Option	-	Alternative Connector
BT	XXXXXX	-	XXX	XX	X	-	XXX
BT	050050		455 (royal-blue)	C1	C (Collimation)		M12 ¹
	100100		530 (green)	C5	P (Polarization) ²		M8 ¹
	200100		625 (red-orange)	IC			
			850 (IR)	I3			
			WHI (white)	I3S			
more information on page	10		5	11	6		13

Example Part Numbers:

BT050050-WHIC1
BT200100-625IC

¹ Available with IC, I3, and I3S

² 455 (royal-blue) will reduce the life of the polarizer if selected

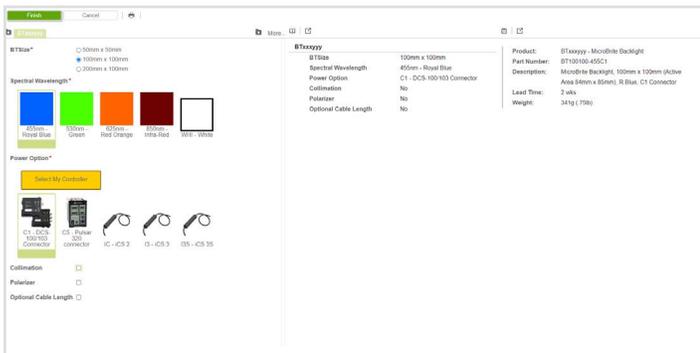
In Stock

Unavailable

Lead Times

Build-to-Order custom products ship within one to two weeks.

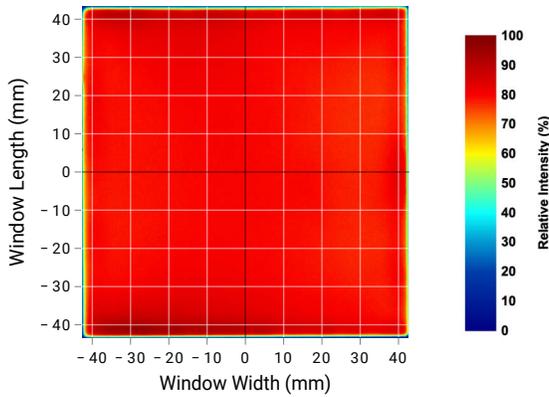
Configurator



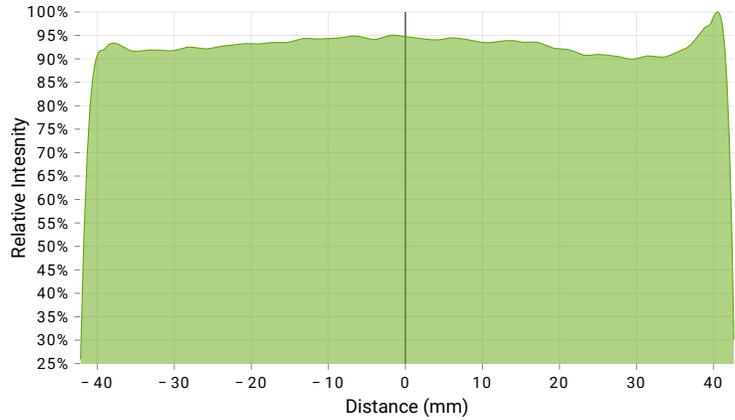
Need a build-to-order custom lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BT MicroBrite Backlight Series to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

Intensity Distribution



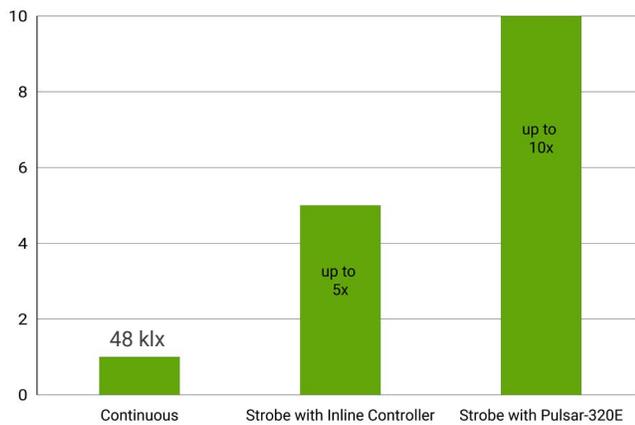
Uniformity Profile Plot



The BT Series provides a highly uniform output across its emitting window with practically no edge effect, and a uniformity of +/- 10% within the optical area.

Note: The optical data shown above has been sampled from a 100mm x 100mm white BT unit (BT1001000-WHIC) at the emitting surface.

Continuous vs Strobe Intensity

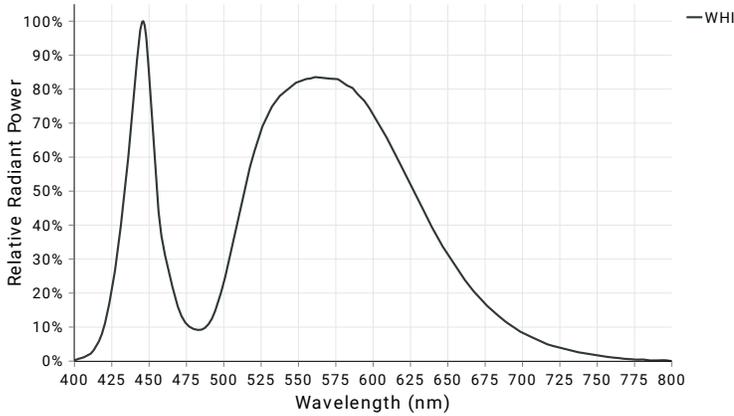


Under continuous operation, a 100mm x 100mm white BT unit will output an **illuminance of 48 klx** and an **irradiance of 137 W/m²** at the emitting surface. For applications that require higher output, the BT Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BT is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320E, a BT can be strobed up-to 10X continuous intensity levels.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

White Spectral Profile

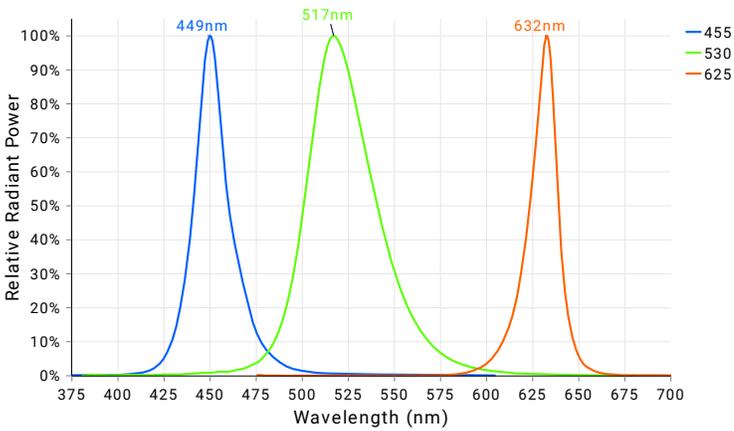


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, **white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems**, specifically when matching white light sources.

The BT Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles

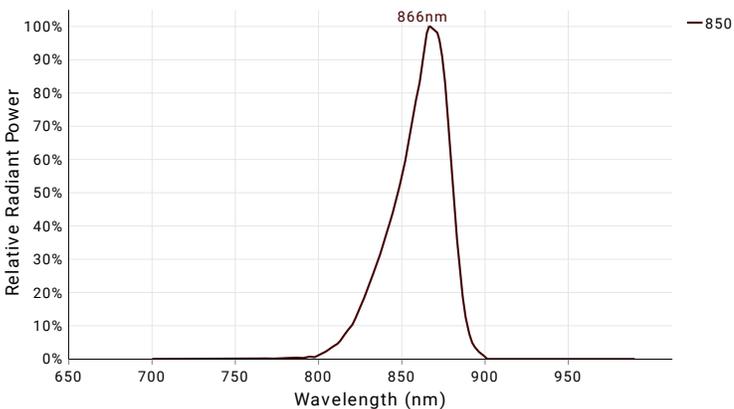


Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following: like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

The BT Series is available in **455nm, 530nm, and 625nm** configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BT Series is available in an **850nm** configuration.

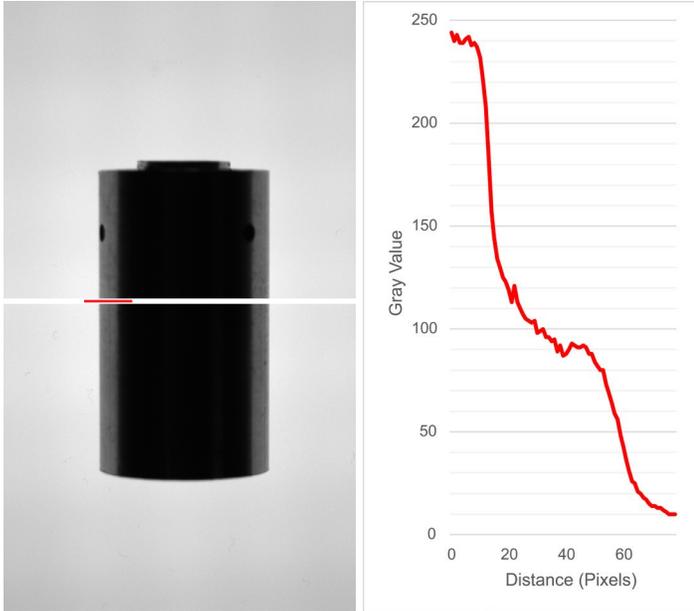
For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

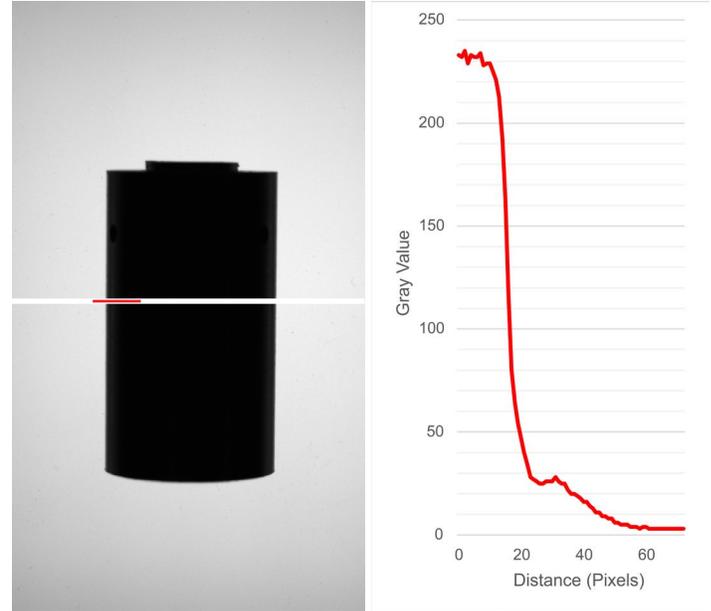
Optical Information - Continued

Collimation Option Detail

Non-collimated



Collimated



The BT Series is available for configuration with collimation as an option. This light conditioning option allows for **greater edge clarity** by collimating photons to travel parallel with the surface normal of the emitting window, diminishing dispersion, and creating a cleaner silhouette. This especially becomes useful when backlighting curved specular objects like the one shown above. On the left side, the edge clarity of the curved object (shown with a profile plot) is insufficient due to the highly diffuse nature of the backlight. On the right side, the edge clarity shows significant improvement with the addition of the collimated light conditioning.

Polarization Option Detail

Non-polarized



Cross Polarized



The BT Series also comes with the option for configuration with a polarization film. Polarization can be used in a variety of ways, such as reducing glare on specular surfaces or increasing edge clarity of transparent injection-molded objects, as shown above, also known as cross-polarization. When unpolarized light passes through two cross-polarized filters (oriented 90 degrees perpendicular to each other), it is completely blocked. However, if the light is already polarized, it will only be blocked if its polarization is perpendicular to the axis of the second polarizer, creating the cross-polarization effect shown above.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	850 nm
Group 1	No Photobiological hazard under normal behavioral limitations	470 nm, 530 nm, 625 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BT Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

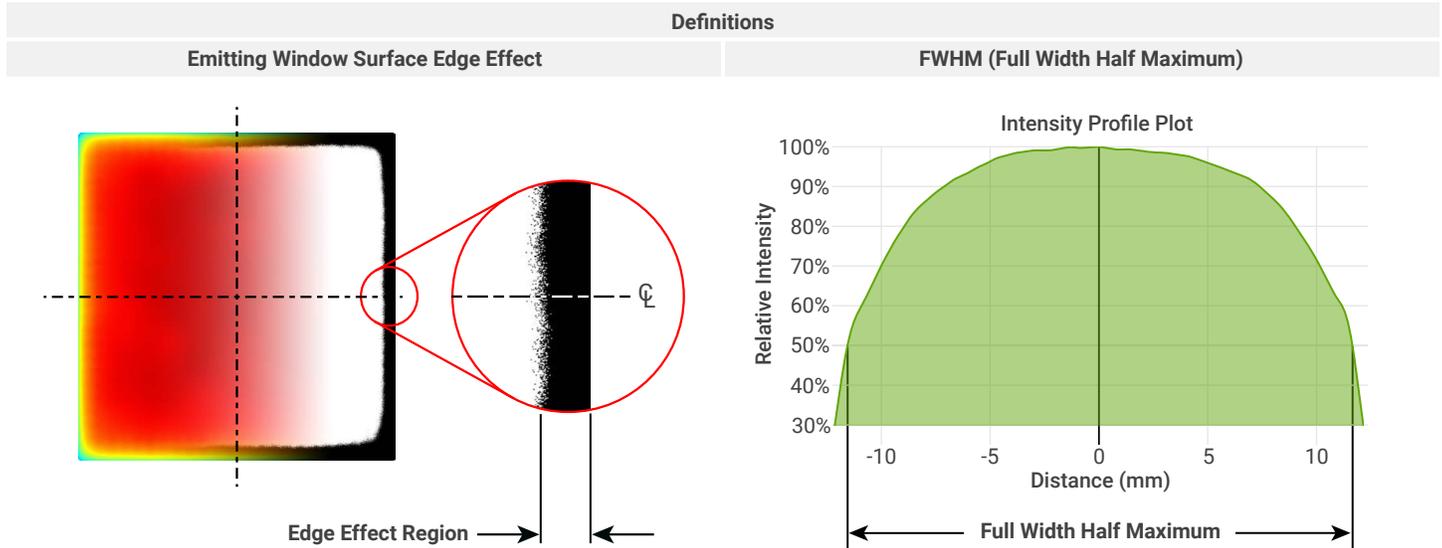
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

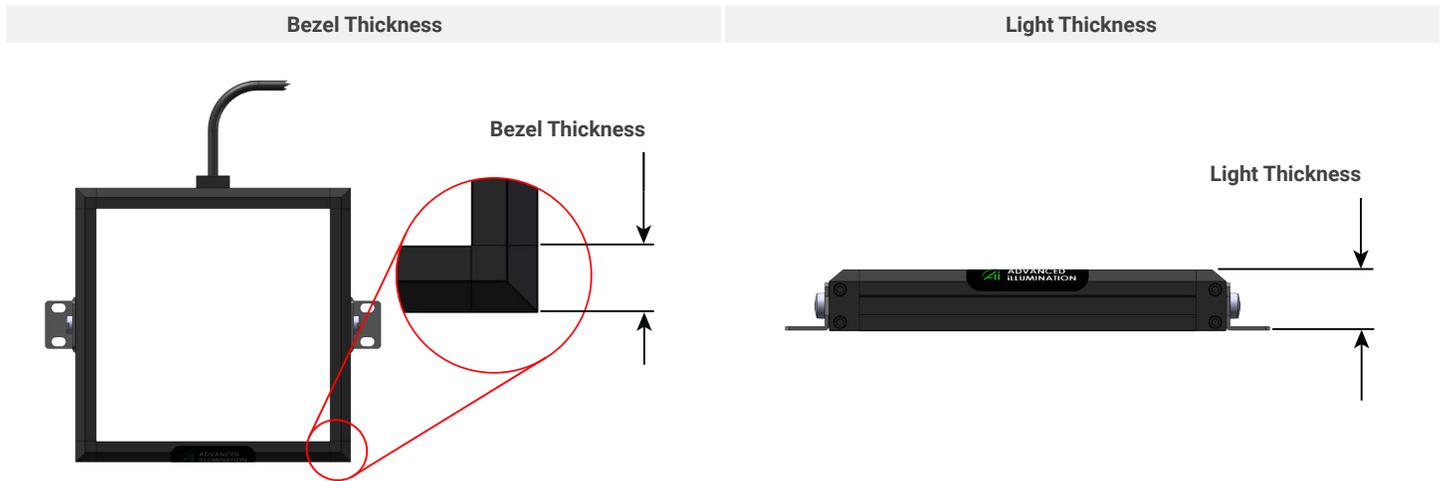
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

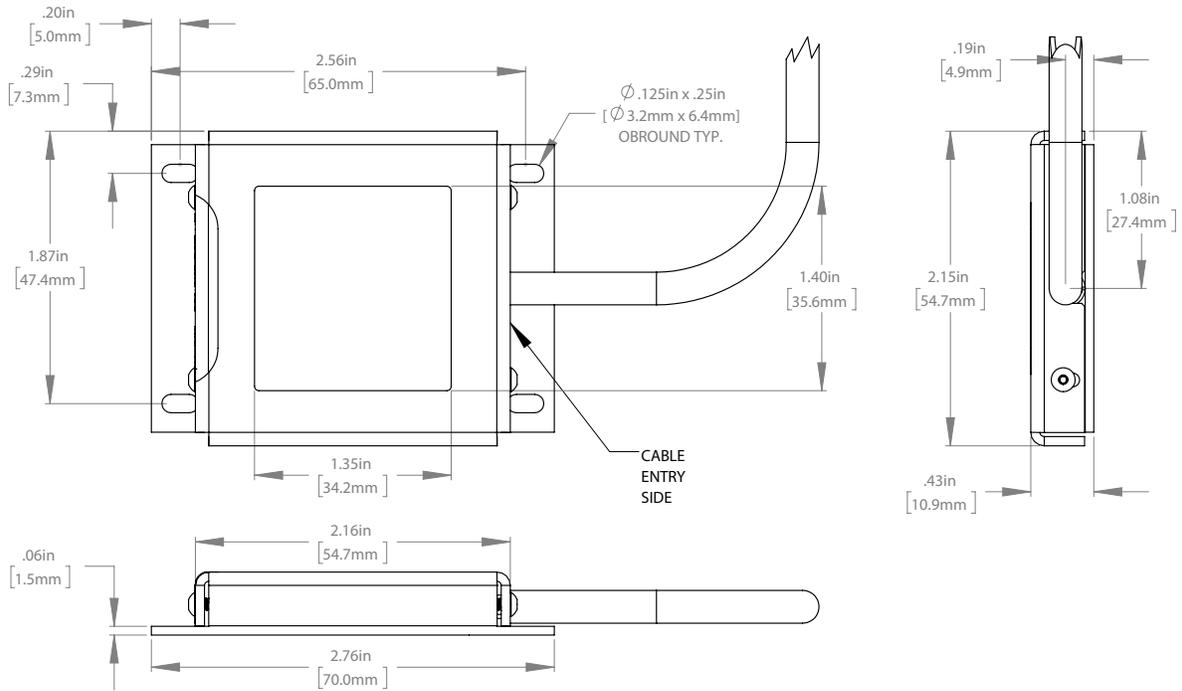
Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

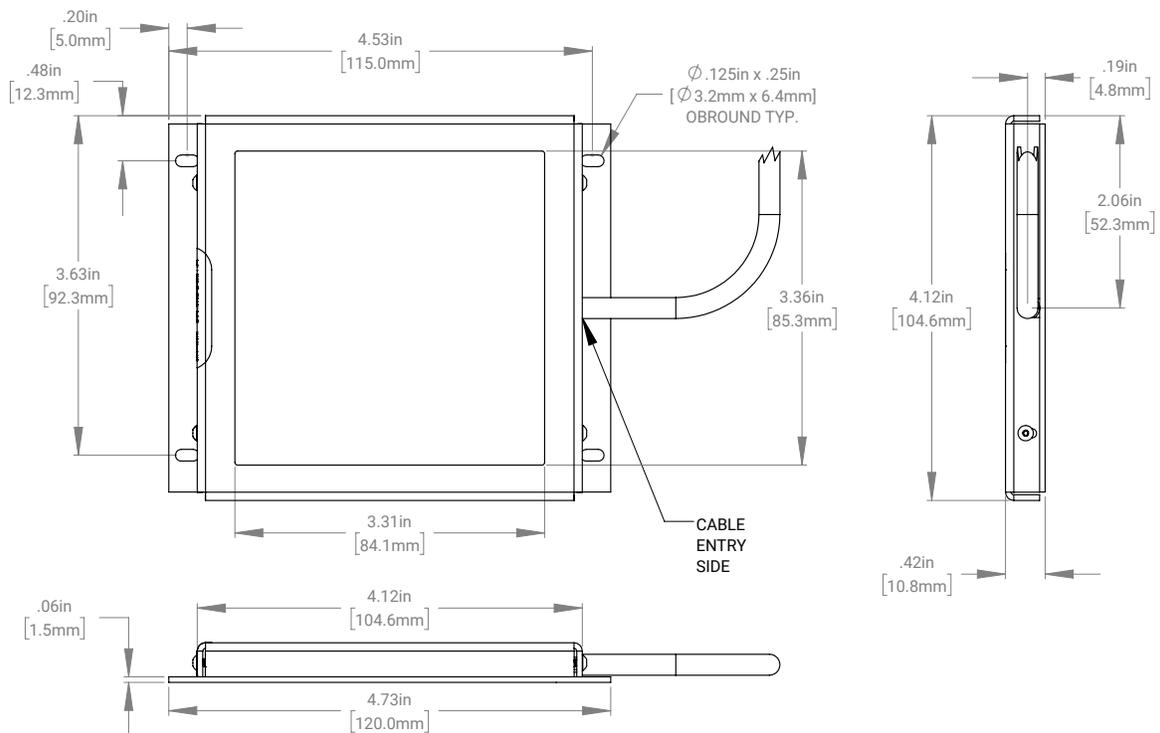
Mechanical Information

Installation Drawings

BT050050 Configuration



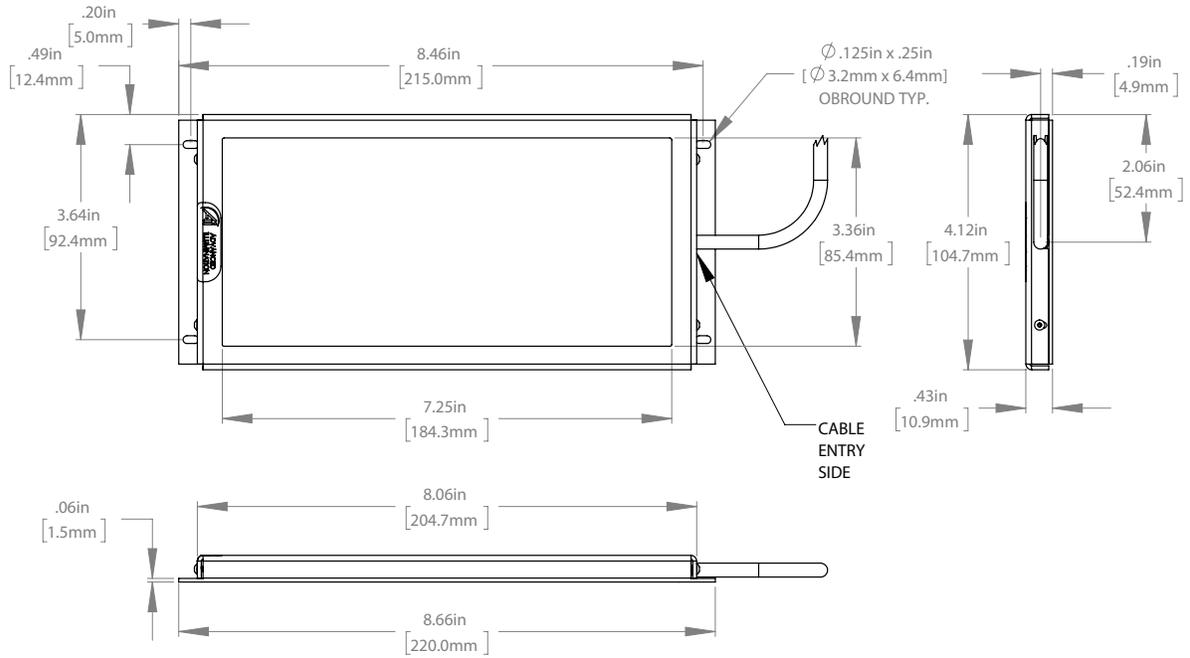
BT100100 Configuration



Mechanical Information - Continued

Installation Drawings - Continued

BT200100 Configuration



For full installation drawings and complete CAD models of this non-sealed configuration, please visit the [downloads](#) section of the product webpage.

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

Unit	Wavelengths	Configured with Standard Controller (IC, I3, I3S, C1, C5)
BT050050	WHI, 455 nm, 530nm, 625 nm	0.340A
BT050050	850 nm	0.150A
BT100100	WHI, 455 nm, 530nm, 625 nm	0.680A
BT100100	850 nm	0.300A
BT200100	WHI, 455 nm, 530nm, 625 nm	1.020A
BT200100	850 nm	0.500A

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	

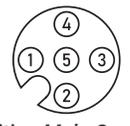
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration <i>PN: Pulsar 320E</i></p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	
	<p>Inline Controller - Continuous Only - IC Configurations <i>PN: N/A</i></p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations <i>PN: N/A</i></p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	

Electrical Information - Continued

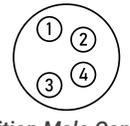
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an EC power configuration.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BT series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3, I3s and I4 PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC, I3/I3S or I4 Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

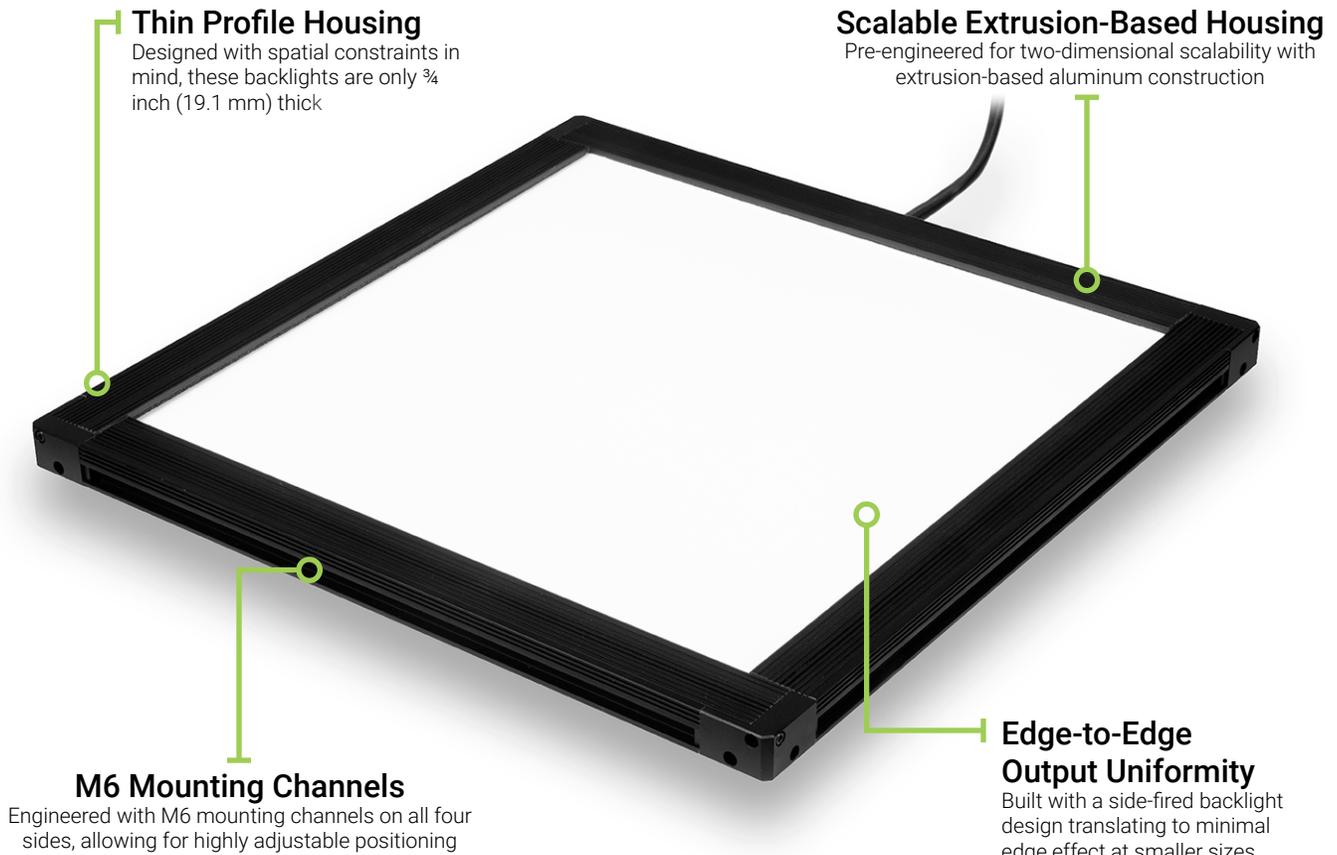
For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

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BX2 Series

Edge-lit Backlights | Product Datasheet



BX2 Series Description

The BX2 Series of edge-lit backlights provides a highly diffuse source of illumination, packed within a thin and thermally efficient housing.

The BX2 allows for configuration with polarization or collimation. A backlight configured with collimation is best suited for applications requiring a higher degree of edge clarity when imaging object silhouettes.

This second edition of our edge-lit backlight series is more than twice as bright as previous BX and CX models.

As with most planar backlight designs, this product is useful for edge detection, part location & orientation identification, presence & absence, hole detection and object gauging.



High Intensity



Scalable Design



11 Wavelengths Available



Collimation or Polarization Optional



1-2 Week BTO Lead Times Typical

General Information

General Specifications

Category	Specification	Detail
Optical	Available Wavelengths	White, 455 nm, 470 nm, 505 nm, 530 nm, 590 nm, 625 nm, 660 nm, 730 nm, 850 nm, 940 nm
	Available Lensing	No Lenses
	Available Light Conditioning	Collimation, Polarization
Electrical	Power Consumption Info	See Power Requirements on Page 11
	Cable Info	80" -0/+6" Long (2 m -0/+150 mm), -105 °C Rated, Foil Shield w/ Drain
Mechanical	Sizing Info	Standard
		Length
		Width
	Height	
	Weight Info (Standard)	4.73 lb (2.14 kg) per 300 mm x 300 mm Unit
Mounting Info	M6 Mounting Nut Channel, See Page 10 for More Details	
Material Info	Anodized Aluminum Housing, Acrylic Window, Acrylic Strain Relief, PVC Cable Jacket, Steel Black Oxide and Zinc Plated Steel Fasteners	
Thermal	Operating Case Temperatures	25 °C to 60 °C
	Operating Ambient Temperatures	0 °C to 35 °C
Certification	Compliance	CE, RoHS, IEC 62471
	IP Rating	IP50
	Lumen Maintenance - White Only	L70 (50,000 Hours)

General Information - Continued

Part Number Key

Model	-	Emitting Length (in)	Emitting Width (in)	Peak Wavelength	Connector/Control	Light Conditioning Option	-	Alternative Connector
XXX	-	XXXX	XXXX	XXX	XXX	X	-	XXX
BX2		25 mm increments from 50 mm to 600 mm	25 mm increments from 50 mm to 600mm	455 (royal-blue)	C1	P (Polarization) ^{2,3}		M12 ¹
	470 (blue)			C5	C (Collimation) ²		M8 ¹	
	505 (cyan)			IC				
	530 (green)			I3				
	590 (amber)			I3S				
	625 (red-orange)			I4				
	660 (red)			24				
	730 (IR)							
			850 (IR)					
			940 (IR)					
			WHI (white)					
more information on page		10	10	5	11	6		13

Example Part Numbers:
BX2-01500150455C1
BX2-00500050625ICC-M12

¹ Available with 24, IC, I3, I3S, and I4 only
² Maximum size of 400 mm x 400 mm
³ 455 (royal-blue) will reduce the life of the polarizer if selected

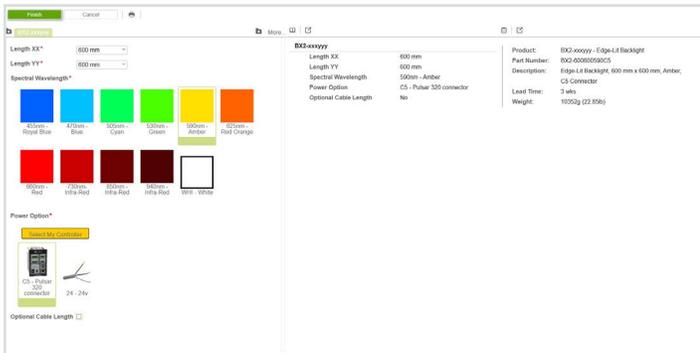
In Stock

Lead Times

Unavailable

Build-to-Order products ship within one to two weeks (typical).

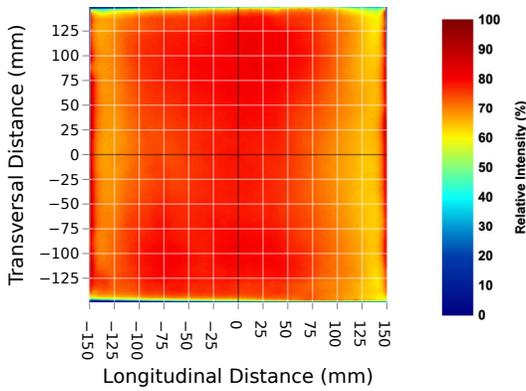
Configurator



Need a build-to-order lighting solution in 2 weeks or less? Advanced Illumination's online configurator helps you tailor our BX2 Edge-lit Backlights to your specific needs. For a guided configuration, [visit our online configurator](#).

Optical Information

Intensity Distribution



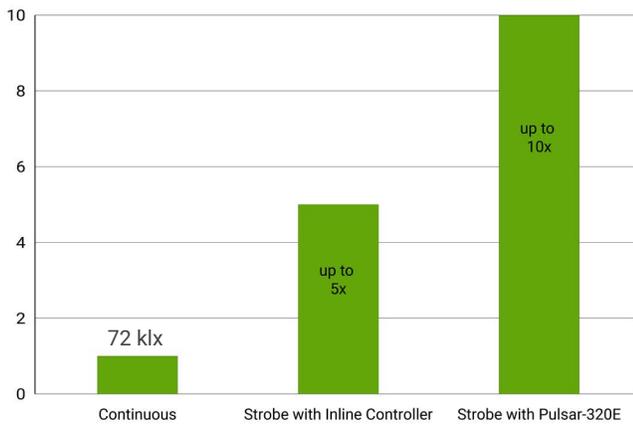
Uniformity Profile Plot



The BX2 Series' uniformity is dependent on the size configured. Models with an emitting length greater than 200mm have a uniformity of +/- 15%, while those with an emitting length less than 200mm achieve +/- 10% uniformity within the optical area.

Note: The optical data shown above has been sampled from a 300 mm x 300 mm white BX2 unit (BX2-03000300WHI4) at the emitting surface.

Continuous vs Strobe Intensity

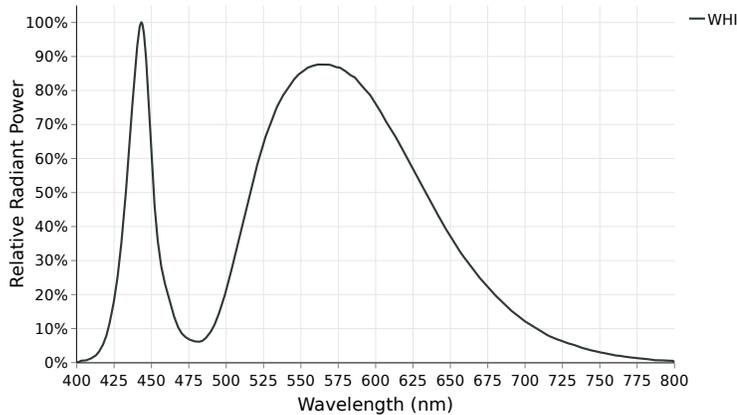


Under continuous operation, an 300 mm white BX2 unit will output a **maximum illuminance of 72 klx** and a **maximum irradiance of 229 W/m²** at the emitting surface. For applications that require higher output, the BX2 Series has been engineered to be overdrive strobe capable. When configured with AI's strobe enabled Inline Controller (I3, I3S, and I4), the BX2 is capable of outputting up-to 5X continuous levels. When configured with a C5 connector, compatible with AI's Pulsar 320E, a BX2 can be strobed up-to 10X continuous intensity levels.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

White Spectral Profile

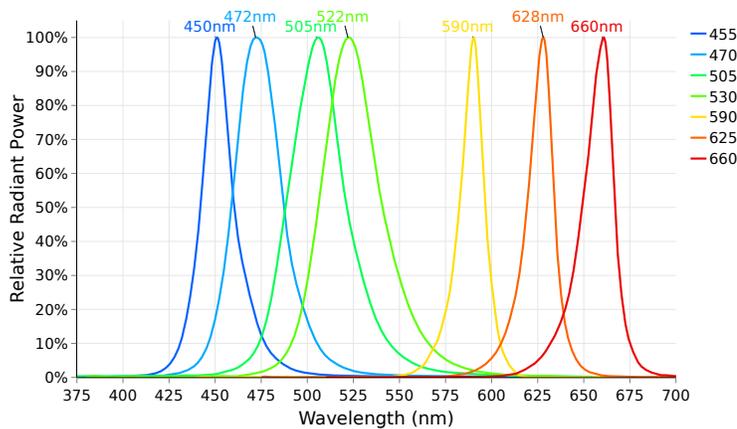


White LED illumination is the most commonly used machine vision lighting configuration. It is often the default choice when specific features of interest do not require color-based highlighting. However, **white LEDs can vary in color temperature between different lighting families, which can impact machine vision systems**, specifically when matching white light sources.

The BX2 Series white LEDs have a relatively neutral color correlated temperature (CCT) of **5500k**.

For a more detailed look at the white spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Visible Spectral Profiles

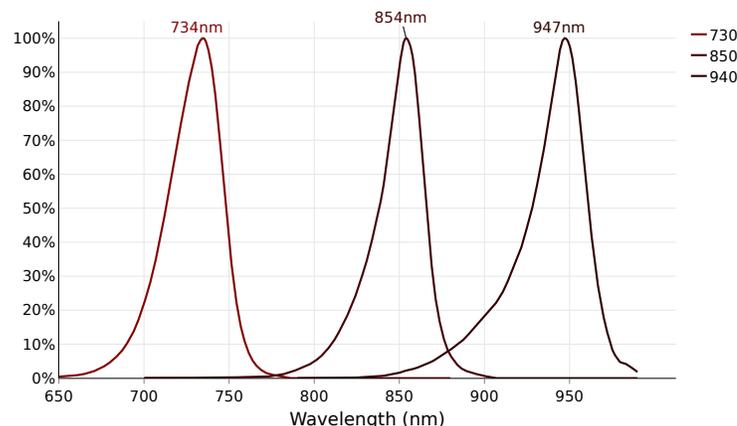


Visible color illumination consists of using wavelengths between 400-700 nm to either create or eliminate contrast on an inspection subject based on differences in a features color hue. When referring to a color wheel, simply remember the following: like colors reflect and brighten surfaces; conversely, opposing colors absorb and darken surfaces.

The BX2 Series is available in **455 nm, 470 nm, 505 nm, 530nm, 590 nm, 625 nm, 660 nm** configurations.

For a more detailed look at the visible color spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Non-Visible Spectral Profiles



Near-infrared (NIR) imaging is a machine vision technique using longer wavelengths of 700-1000 nm to penetrate specific materials that are otherwise opaque to under the visible spectrum. When paired with a NIR camera, a NIR light can be ideal for applications such as fill level inspection, circuit board inspection, food safety inspection, and medical imaging.

The BX2 Series is available in an **730 nm, 850 nm, and 940 nm** configuration.

For a more detailed look at the NIR spectral data, download the [csv file of the raw spectral values](#) and refer to our [Product Spectra Distribution Charts PDF](#).

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

BX2 Series Polarization Option

Non-polarized



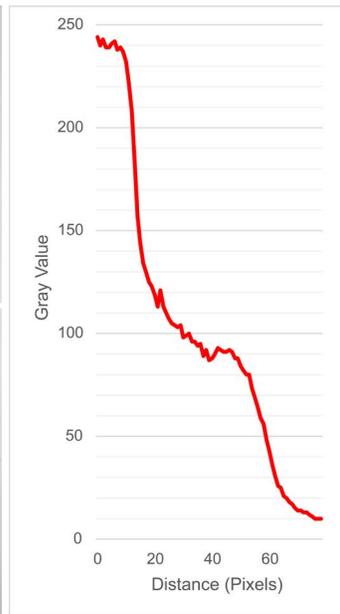
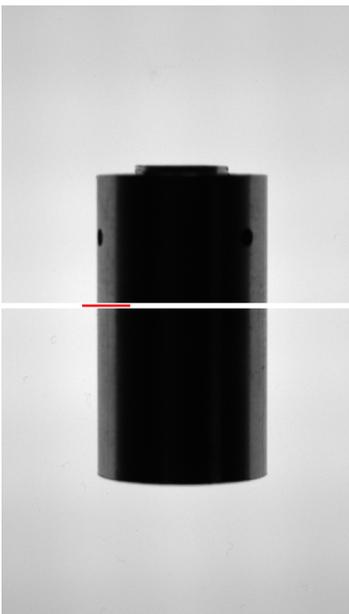
Cross Polarized



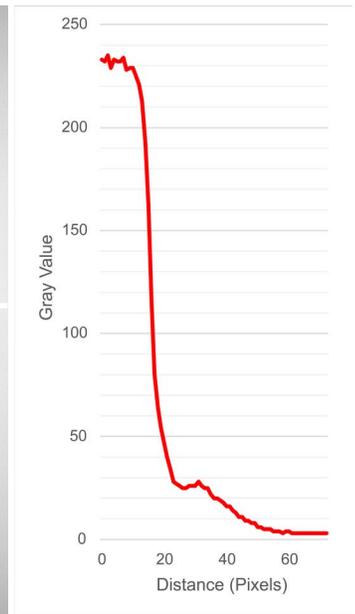
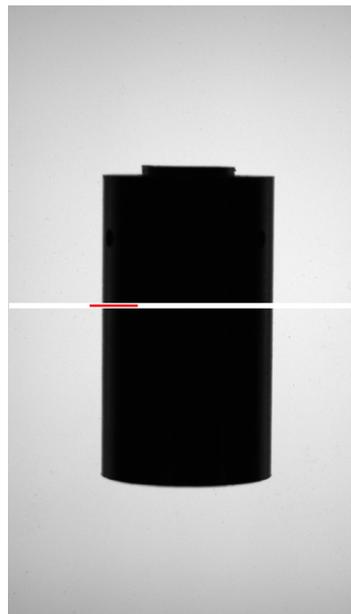
Our BX2 Series is pre-engineered with the option to add a polarization film. Polarization can be used in a variety of ways, such as to reduce glare on specular surfaces or to increase edge clarity of transparent injection-molded objects, as shown above. This is known as cross-polarization. When unpolarized light passes through two cross-polarized filters (oriented 90 degrees perpendicular to each other), it is completely blocked. However, if the light is already polarized, it will only be blocked if its polarization is perpendicular to the axis of the second polarizer, creating the cross-polarization effect shown above.

BX2 Series Collimation

Non-collimated



Collimated



Our BX2 Series is pre-engineered to allow for a collimation option. This light conditioning allows for **greater edge clarity** by collimating photons to travel parallel with the surface normal of the emitting window, diminishing dispersion, and creating a cleaner silhouette. This especially becomes useful when backlighting curved specular objects like the one shown above. On the left side, the edge clarity of the curved object (shown with a profile plot) is insufficient due to the highly diffuse nature of the backlight. On the right side, the edge clarity shows significant improvement with the addition of the collimated light conditioning.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Optical Information - Continued

Photobiological Risk Factors

Group	Description	Affected Wavelengths
Exempt	No Photobiological Hazard	730 nm, 850 nm, 940 nm
Group 1	No Photobiological hazard under normal behavioral limitations	455 nm, 470 nm, 505 nm, 530 nm, 590 nm, 625 nm, 660 nm
Group 2	Does not pose a hazard due to aversion response to bright light or thermal discomfort	White

Advanced Illumination's lighting products have been tested and classified to IEC standards by accredited testing services. For more information on photobiological risk factors, please view the following PDF: <https://www.advancedillumination.com/wp-content/uploads/2019/04/IEC-040119.pdf>

Cleaning Guidelines



To clean our light's optics, it is best to only clean when necessary. Dusting is always the first step in cleaning your optics. Wiping a dusty optic is like cleaning it with sandpaper. So always dust with a canned air duster or compressed and filtered air before wiping any optic. If the dusted optic has no visible stains after you dust it, then remember: "If it's not dirty, don't clean it." Avoid wiping optics when possible.

If dusting did not clean the lens or the lens has stains, use only de-ionized water and mild dish soap with a low lint cloth designed for optics to avoid damage to the optic by any harsh chemicals.

Polarizers, beam splitters and collimated films should never be wiped with any type of cloth or solvent, only use the air dusting method to clean these types of optics.

The aluminum housing can be wiped down when dusting is not a sufficient means to thoroughly clean.

Backlight Comparison Matrix

Not finding the optical specifications you are looking for with the BX2 Series? Refer to the backlight comparison matrix below to compare and contrast Advanced Illumination's comprehensive product offering:

Attributes	Planar Backlights				Linear Backlights / High Diffusion Bar Lights				
	BL2	BX2	BT	BL245	BL313	BL138	BL168	BL128	BL193
Emitting Window Surface Intensity	86 klx	72 klx	48 klx (100 mm x 100 mm unit)	86 klx	231 klx	542 klx	567 klx	51 klx	12 klx
	249 W/m ²	229 W/m ²	137 W/m ² (100 mm x 100 mm unit)	249 W/m ²	735 W/m ²	1,642 W/m ²	1,760 W/m ²	173 W/m ²	41 W/m ²
Emitting Window Surface Edge Effect	0.681 in (17.3 mm)	0 in (0mm) (smaller models)	0 in (0mm)	0.724in (18.4mm)	0.987in (25.1mm)	0.343in (8.7mm)	0.429in (10.9mm)	0.634in (16.1mm)	1.524in (38.7mm)
100 mm Working Distance Intensity	N/A	N/A	N/A	N/A	22 klx	48 klx	50 klx	9 klx	1 klx
					74 W/m ²	153 W/m ²	164 W/m ²	32 W/m ²	4 W/m ²
100 mm Working Distance FWHM	Longitudinal: ~12 in (~300 mm) Transversal: ~6 in (~150 mm)								
Minimum Bezel Thickness	0.465 in (11.8 mm)	1.07 in (27.2 mm)	0.380 in (9.65 mm)	0.215 in (5.46 mm)	0.125 in (3.18 mm)	0.050 in (1.27 mm)	0.050 in (1.27 mm)	0.00 in (0.00 mm)	0.065 in (1.65 mm)
Maximum Light Thickness	0.940 in (23.9 mm)	0.75 in (19.0 mm)	0.420 in (10.7 mm)	0.950 in (24.1 mm)	0.850 in (21.6 mm)	3.570 in (90.7 mm)	3.570 in (90.7 mm)	0.480 in (12.2 mm)	1.180 in (30.0 mm)
Largest Possible Emitting Window Length	46 in (1168 mm)	24 in (610 mm)	8 in (204 mm)	12 in (305 mm)	20 in (508 mm)	96 in (2438 mm)	96 in (2438 mm)	14 in (356 mm)	80 in (2032 mm)
Sizes Available	736	484	3	144	10	17	17	14	80
Visible Wavelengths Available	4	8	4	4	6	4	1	4	4
IR Wavelengths Available	1	3	1	1	2	1	0	1	1
RGB Available	No	No	No	No	No	Yes	No	No	No
Collimation Available	Yes	Yes	Yes	No	No	No	No	No	No
Polarization Available	Yes	Yes	Yes	No	No	No	No	No	No
IP Rating	IP50	IP50	IP50	IP69K Certified	IP50	IP50	IP50	IP50	IP50
Price	\$\$\$	\$\$	\$\$\$	\$\$\$\$	\$\$	\$\$\$	\$\$\$	\$\$\$	\$

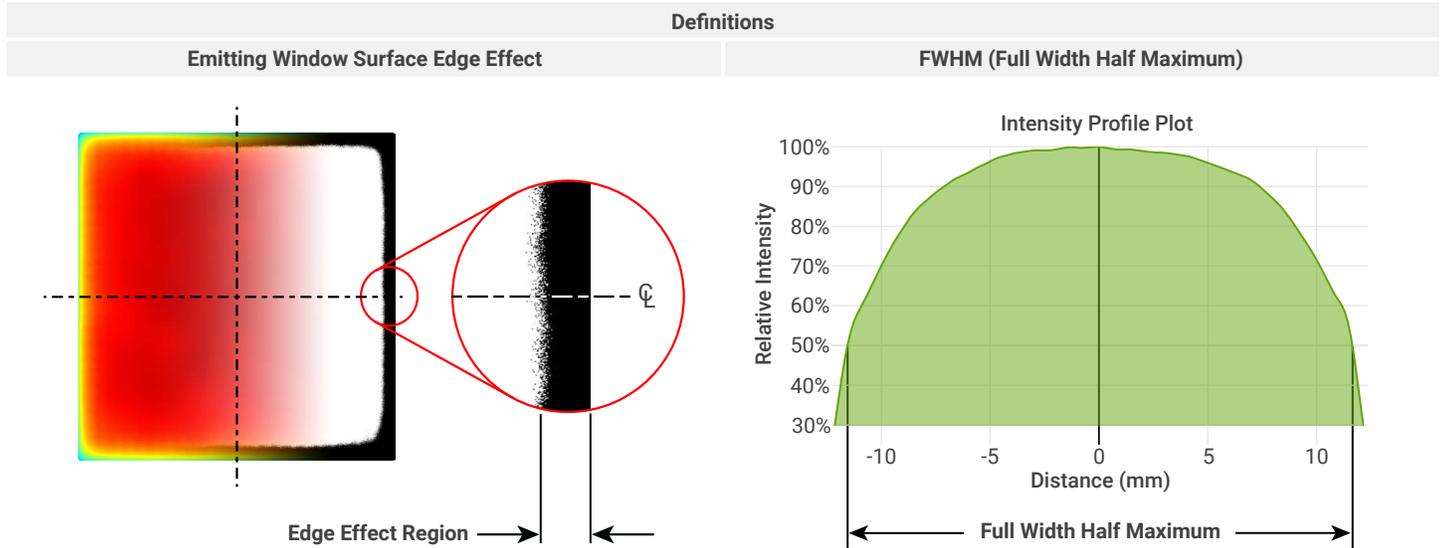
To ensure consistent comparisons, all data presented above is based on 12-inch white LED models unless explicitly stated otherwise. This corresponds to 12 inches by 12 inches (300 mm x 300 mm) in length as well as width for planar backlights and 12 inches in length for linear backlights. Additionally, all measurements provided above are derived from "standard" configurations, excluding sealed models if available as optional.

If you are still not finding the optical specifications needed for your application, [inquire](#) about our semi-custom and full-custom capabilities.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

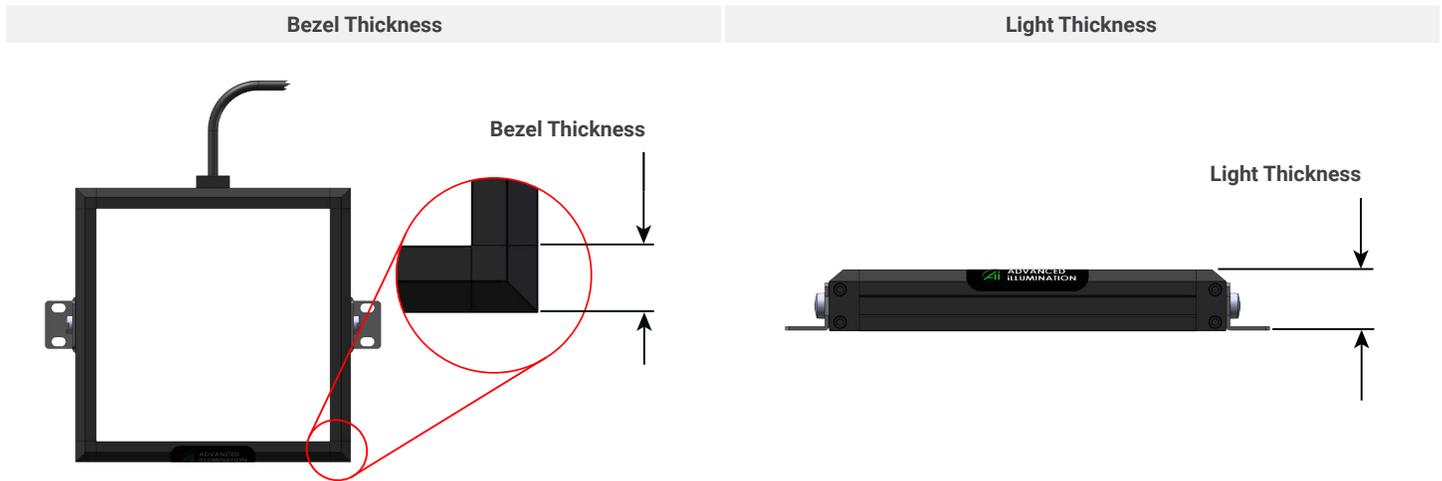
Backlight Comparison Matrix - Definitions

For definitions on the terminology used on the previous page, please refer to the table below:



Edge Effect refers to the decrease in light intensity along the outer perimeter of a backlight's emitting surface. It's characterized by the region where the intensity falls below 80% of the peak value. For linear backlights, edge effect is measured along the length of the light. We recommend users avoid this region when sizing a backlight for their application.

FWHM (Full Width Half Maximum) is a measure of the width of a light source's intensity distribution. Specifically, it defines the distance between the points on the intensity profile where the light intensity drops to 50% of its peak value. This FWHM distance is often used to determine the usable FOV (Field of View) when aiming a light at a surface for inspection.



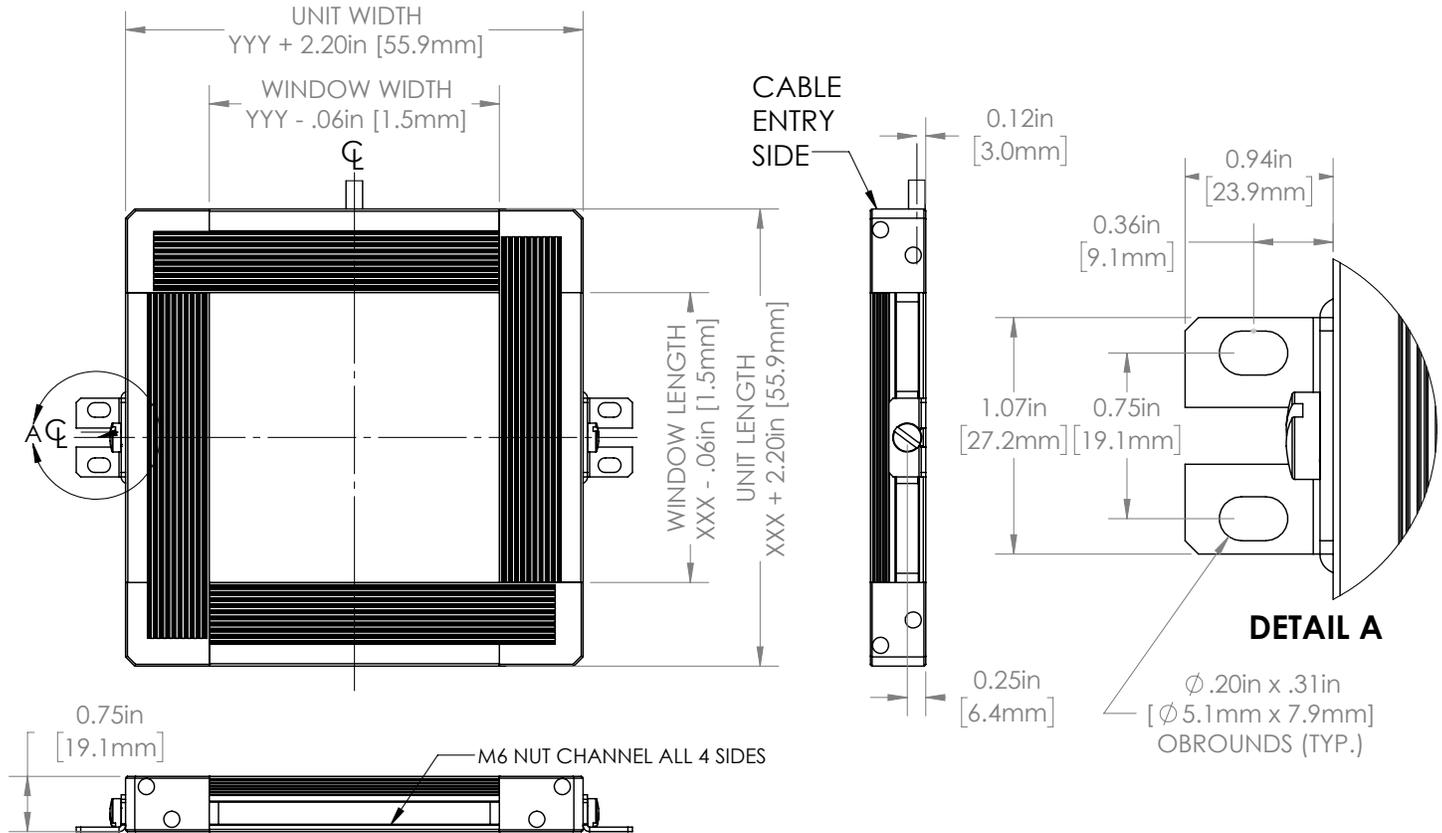
Bezel Thickness refers to the width of the non-illuminated border or frame surrounding the light-emitting surface of a machine vision backlight. Bezel thickness is an important consideration when integrating a backlight into a tight space, as it directly affects how close you can place the light-emitting surface to an object on its side.

Light Thickness refers to the overall depth of a machine vision backlight, measured from the back of the unit to the front of the light-emitting surface. A thinner light thickness is critical in applications with limited space constraints, allowing flexible integration into tight machine vision setups.

Disclaimer: The measurements provided above are for approximations only and may vary depending on the method of measurement and the specific configuration being measured.

Mechanical Information

Installation Drawings



For full installation drawings and complete CAD models of this non-sealed configuration, please visit the [downloads](#) section of the product webpage.

Sizing Information

Our edge-lit backlights are scalable to your specific sizing requirements.

We can manufacture our BX2 backlights in 25 mm increments up to a 0.36m² emitting window, from a small 50 mm x 50 mm backlight to a large-format 600 mm x 600 mm backlight.

All BX2 backlight configurations are built-to-order with the majority shipping with only two week lead times.

For assistance configuring a backlight to meet your specific needs, please visit our online configurator by selecting the "configure" button on our product webpage.

Electrical Information

Power Requirements

Current Required for Power Supply Sizing

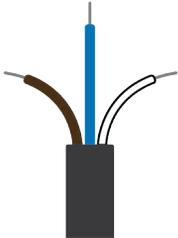
Wavelengths	Configured with Voltage Drive (24)	Configured with Standard Controller (IC, I3, I3S, I4, C1, C5)
WHI	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
455 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
505 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
530 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.250 A per 25 mm of illuminated length (XX dimension)
590 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
625 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
660 nm	0.100 A per 25 mm of illuminated length (XX dimension)	0.167 A per 25 mm of illuminated length (XX dimension)
730 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)
850 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)
940 nm	0.150 A per 25 mm of illuminated length (XX dimension)	0.100 A per 25 mm of illuminated length (XX dimension)

Note: All Advanced Illumination lights and controllers are nominally powered by 24V DC unless otherwise noted. Strobe overdriving with controller based models may require more current and voltage overhead. The values above do not include background current draw from the controller (~100 mA total).

Control Options

Controller Image	Controller Details	Connector Image
	<p>DCS Single Output Controller - Compatible with C1 Configurations PN: DCS-100E</p> <p>The DCS-100E is a compact, din-rail mounted general-purpose external controller with one C1 output connector, wired with three channels. Capable of providing single channel control or multi-channel control for RGB compatible lights.</p> <p>Output Power: 90 W Max Continuous, 540 W Max Pulsed (Overdrive Strobe) Output Current: 4.5A Max Continuous, 15 A Max Pulsed I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-100E, please visit the controller product page.</p>	
	<p>DCS Triple Output Controller - Compatible with C1 Configurations PN: DCS-103E</p> <p>The DCS-103E is a din-rail mounted general-purpose multi-light controller with three C1 output connectors. Capable of driving three lights in sync or asynchronously.</p> <p>Output Power: 30 W Max Continuous / Output, 180 W Max Pulsed / Output Output Current: 1.5A Max Continuous / Output, 5 A Max Pulsed / Output I/Os: 3 External Trigger Inputs Interface: 10/100 Ethernet with Software and browser-based GUIs. SDKs are also available.</p> <p>For more information about our DCS-103E, please visit the controller product page.</p>	

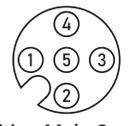
Electrical Information - Continued

Controller Image	Controller Details	Connector Image
	<p>Pulsar 320E High Current Controller - Compatible with C5 Configuration PN: Pulsar 320E</p> <p>The Pulsar 320E is a high-power, dual output, pulse-only controller geared for overdriving driving lights at very short flash durations with very high current.</p> <p>Output Power: 2500 W Max Pulsed / Output Output Current: 50 A Max Pulsed / Output I/Os: 2 External Trigger Inputs Interface: 10/100 Ethernet with Software GUI. SDKs are also available.</p> <p>For more information about our Pulsar 320E, please visit the controller product page.</p>	
	<p>Inline Controller - Continuous Only - IC Configurations PN: N/A</p> <p>The IC is an inline, cable-mounted continuous-only controller configured/wired directly for the ordered light head.</p> <p>Output Power: 25 W Max Continuous Output Current: 1.25 A Max Continuous I/O: 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I3 & I3S Configurations PN: N/A</p> <p>The I3 and I3S are inline, cable-mounted continuous and pulse (overdrive strobe) capable controllers configured/wired directly for the ordered light head. When operated in pulsed mode, the I3 is a default-on device on power up, whereas the I3S is default-off, requiring a trigger to illuminate.</p> <p>Output Power: 25 W Max Continuous, 125 W Max Pulsed Output Current: 1.25 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our I3/I3S Controller, please visit the controller product page.</p>	
	<p>Inline Controller - Strobe and Continuous - I4 Configurations PN: N/A</p> <p>The I4 is an inline, cable-mounted continuous and pulse (overdrive strobe) capable controller configured/wired directly for the ordered light head. The I4 can either be operated with a PNP or NPN trigger signal.</p> <p>Output Power: 50 W Max Continuous, 150 W Max Pulsed Output Current: 2.1 A Max Continuous, 8 A Max Pulsed (Load Dependent) I/Os: 1 Gated Trigger Signal, 1 0-10 V Analog Dimming Input Interface: Direct Cable (flying leads or optional connector)</p> <p>For more information about our IC Controller please visit the controller product page.</p>	
	<p>24V Driver - Continuous Only - 24 Configurations PN: N/A</p> <p>24V option allows lights to operate continuous output with 24V connection and no additional controllers.</p> <p>Modes: Continuous, can be wired to some 3rd party controllers or external relays for gated operation Interface: Direct cable (flying leads or connector options)</p>	

Electrical Information - Continued

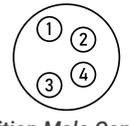
Inline Control Option Wiring Information

Standard Flying Lead and Optional M12 Connector Pinout Functions

Pin (M12)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M12 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>5-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	NPN/Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	PNP/Active High Trigger	PNP/Active High Trigger	
5	GRAY	N/A	N/A	0-10V Analog Control	0-10 V Analog Dimming	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M12 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Optional M8 Connector Pinout Functions

Pin (M8)	Wire Color	24V Functions	IC Functions	I3/I3S Functions	I4 Functions	M8 Pinout
1	BROWN	24V DC	24V DC	24V DC	24 V DC	 <p>4-Position Male Connector</p>
2	WHITE	N/A	0-10V Analog Control	Reserved	Active Low Trigger	
3	BLUE	DC GND	DC GND	DC GND	DC GND	
4	BLACK	N/A	Gate Low	Active High Trigger	Active High Trigger	

The functions above are only applicable when ordering an 24, IC, I3, I3s, or I4 power configuration with our without an M8 connector. For more wiring information pertaining to strobing and dimming functionality, please download the controller manuals and datasheets.

Accessories

Advanced Illumination offers a variety of accessories designed to pair with our lighting and control products. Below you will find a table of accessories which are compatible with many configurations of the BX2 Series.

Category	Accessory Image	Accessory Detail
Power Supply		<p>24 Volt DC Power Supply PN: PS24-TL</p> <p>This convenient power source is a universal AC input switching power supply with a regulated output DC current. The power supply comes with an LED Power Indicator, tinned leads marked Positive (+) and Negative (-) and 2 WAGO connectors for simplified assembly.</p> <p>For more information about our 24 Volt DC Power Supply, please visit this webpage.</p>
Dimmer		<p>Manual Dimming Accessory for the IC, I3 and I3s PN: DCS-MP</p> <p>The DCS-MP is a 30-position potentiometer, detented for precision level control and provides repeatable dimming with cable inline controllers. Features include DIN-rail mountable, a flip up cover to prevent accidental adjustments, spring clamp wiring terminal for flying leads or an M12 connector for use with the IC or I3/I3S Inline Controllers.</p> <p>For more information about our Manual Dimming Accessory please visit this webpage.</p>

Electrical Information - Continued

Category	Accessory Image	Accessory Detail
Dimmer		<p>Manual Dimming Accessory for the IC PN: MP-ICS</p> <p>The MP-ICS is a dimmer which is designed for use on lights with the IC Inline Controller. This unit provides for 0 – 100% intensity control. It is NOT COMPATIBLE with LLI37, BLI38, LLI67, and BLI68 "IC" Lights or lights built with the "24v controller" option.</p> <p>For more information about our Manual Dimming Accessory, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Single Light Power Cable - C1 Configuration PN: LC-XX-S</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female 7 pin locking connector (C1) and can be purchased in 3 - 15-meter lengths.</p> <p>For more information about our DCS-100E/103E Extension Cable, Single Output, please visit this webpage.</p>
Extension Cable		<p>DCS-100E/103E Extension Cable, Dual Light Power Cable - C1 Configuration PN: LC-XX-Y</p> <p>This extension cable was designed for applications requiring two identical lights to be powered through a single controller. These Y cables feature a single male and dual female 7 pin locking connectors (C1) and can be purchased in 3 - 15-meter lengths. See attached spec sheet for compatible light configuration.</p> <p>For more information about our DCS-100E/103E Extension Cable, Split Output, please visit this webpage.</p>
Extension Cable		<p>Pulsar 320E Extension Cable - C5 Configuration PN: LC-XX-S-C5</p> <p>This extension cable was designed for applications requiring power cables longer than the standard 2 meters provided with Ai lights. This single light cable features a single male and single female Pulsar 320 connector (C5) and can be purchased in 3 - 15 meter lengths.</p> <p>For more information about our Pulsar 320E Extension Cable, please visit this webpage.</p>
Adaptor Cable		<p>Cognex Gen2 Inline Controller Adaptor Cable PN: AD-I3-CGX2</p> <p>This cable adaptor is for connecting I3/I3S configured lights with Cognex Gen2 Cameras, and comes with a male to female M12 connectors.</p> <p>For more information about our Cognex Gen2 Inline Controller Adaptor Cable, please visit this webpage.</p>
Filters		<p>Camera Lens Band Pass Filters PN: BPXXX-YYY</p> <p>Eliminating all but a narrow band of light (+/- 40nm) centered on the specified wavelength, band pass filters are used to enhance colors, or to stop unwanted ambient light from reaching the camera. Filtering can replace existing shrouds, simplifying the physical set up of an inspection site. Ai offers 635nm and 660nm band pass filters to fit several different lens sizes.</p> <p>For more information about our Camera Lens Band Pass Filters, please visit this webpage.</p>
Mounting Brackets		<p>Mounting Brackets PN: LB</p> <p>Fastens to the M6 mounting channel for simplified mounting. Included in product purchase.</p> <p>For more information about our Mounting Brackets, please visit this webpage.</p>

Additional Information

Warranty

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty. No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Compliance

Our lighting products are designed and tested to meet CE, RoHS, and IEC standards. As a global ISO 9001 certified company, we understand the importance of compliance and perform accelerated testing on every product before shipment. For more information on our compliance standards, please see our compliancy documentation here: <https://www.advancedillumination.com/services/compliance-statements/>

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Customer Service

For information on existing orders, or to make an order adjustment, contact us Monday through Friday 8:00 am to 5:00 pm ET or send an email to orders@advancedillumination.com.

Company Information

Advanced Illumination
440 State Garage Road, Rochester, VT 05767
Phone: +1 (802) 767 3830
Fax: +1 (802) 767 2636
Email: info@advancedillumination.com
Web: advancedillumination.com
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Product Highlights

- This small EuroBrite™ backlight provides high-intensity illumination at a competitive price point.



General Specifications

	Color	Current	All Other Controls
Electrical Specifications	455, 470, 505, 530, 590, 625, 660, 730, 850, 940, WHI	~0.27A	N/A
Input Voltage Range	24V nom. (min 22/max 28)		
Maximum Input Current	0.42-0.49A		
Strobe/On-Off Control	Up to 5X overdrive, active high		
Analog Intensity Control	Analog 0.7-10V; 0.7V=10% 10V=100%		
Trigger-to-Pulse Latency	10µsec		
Normal Operating Temperature	0 - 60°C		
Weight	92.53g (3.27oz)		
Standard Cable Information	No cable included; see part number LC2-M12-5-FX or use standard coded 5-pin M12.		

Photobiological Risk Factor	Exempt Applicable Wavelengths: 850, 940 Group 1 (Low-Risk) Applicable Wavelengths: 455, 470, 505, 530, 590, 625, 660, 730, WHI
Compliance	CE, RoHS, IEC 62471
IP Rating	IP67
Lumen Maintenance	L70 = 50,000 Hours

Part Number Key

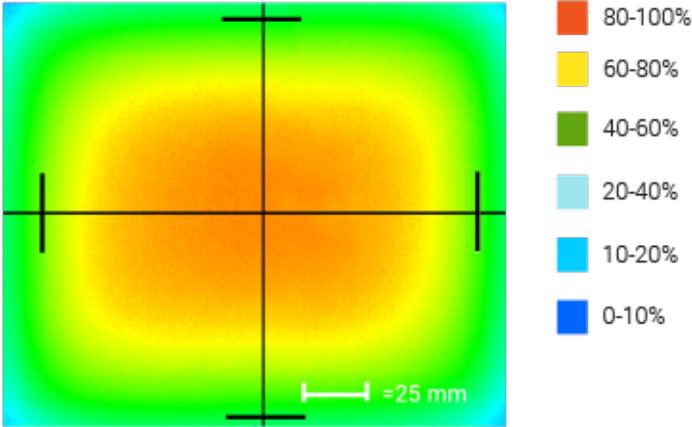
Model	—	Control	Emitting Width (in)	Emitting Length (Cable Side) (in)	—	Peak Wavelength
BL	-	X	XXX	XXX	-	XXX
BL		S (strobe)	050	075		455 (royal blue) 470 (blue) 505 (cyan) 530 (green) 590 (amber) 625 (red orange) 660 (red) 730 (IR) 850 (IR) 940 (IR) WHI (white)
EX: BL-S050075-WHI BL-S050075-470						

See website product page for in-stock product numbers.

Shipping:
 Stock Products: within three days
 Build-to-Order Products: within two weeks

Optical Specs

Intensity Distribution



Optical measurement taken using BL-S050075-WHI

Electrical Specs

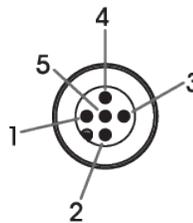
Modes of Operation

Continuous	Strobe	Thermal Foldback	Factory Reset
<p>To enable output: Tie Trigger+ (black) HIGH to >0.5V.</p> <p>The light remains ON as long as Trigger+ is high</p> <p>Analog dimming is available during continuous mode operation: pin 5, gray</p>	<p>EuroBrite™ S-version uses Adaptive Overdrive™ to produce overdrive pulses while the Trigger+ is HIGH.</p> <p>Overdrive period occurs for all trigger pulses, but only during the first 5 mSec for those pulse widths longer than 5 mSec; light output can be increased by as much as 5x.</p> <p>Overdriving does not occur when pulses exceed 5 mSec.</p> <p>Analog dimming is available during strobe mode operation: pin 5, gray</p>	<p>To engage Thermal Foldback: Before turning the light on, tie pin 2 (white) to pin 3 (GND, blue).</p> <p>Onboard thermistor is sampled for 5 minutes. Light intensity will automatically adjust based on the case temperature during the training period.</p> <p>The beginning of training is signified by a series of rapid flashes. While training, the light will blink every two seconds. A few slower blinks signal the end of the training period</p>	<p>To engage Factory Reset: Before turning the light on, tie pin2 (white) to pin 3 (blue).</p> <p>For factory reset to occur, the light must be trained for thermal foldback first.</p> <p>Light will appear dim for 3-5 seconds then brightness will be set to factory default.</p> <p>After factory reset is complete disconnect white wire from blue wire for normal operation (before turning light back on).</p> <p>Tying pin 2 (white) to pin 3 (blue) will alternate between factory reset and thermal foldback modes.</p>

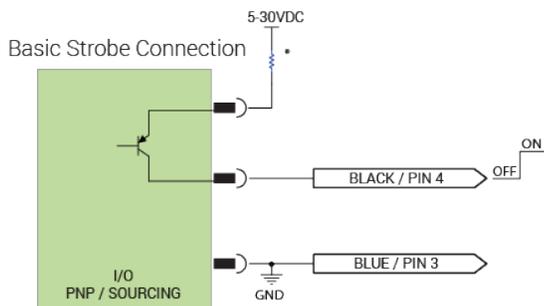
Standard Wiring Information

Pin	Function	Wire Color	Type
1	24VDC	Brown	Power
2	Thermal Foldback	White	Input
3	GND	Blue	Power
4	Trigger +	Black	Input
5	Analog	Gray	Input

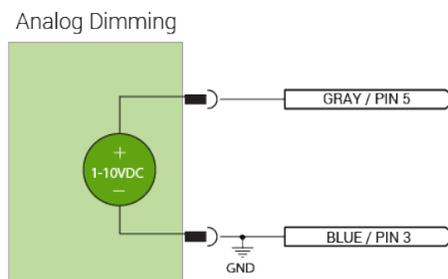
Male 5-Position



Wiring Diagrams



*External resistors may not be needed
Check documentation on I/O for recommendations and voltage limits

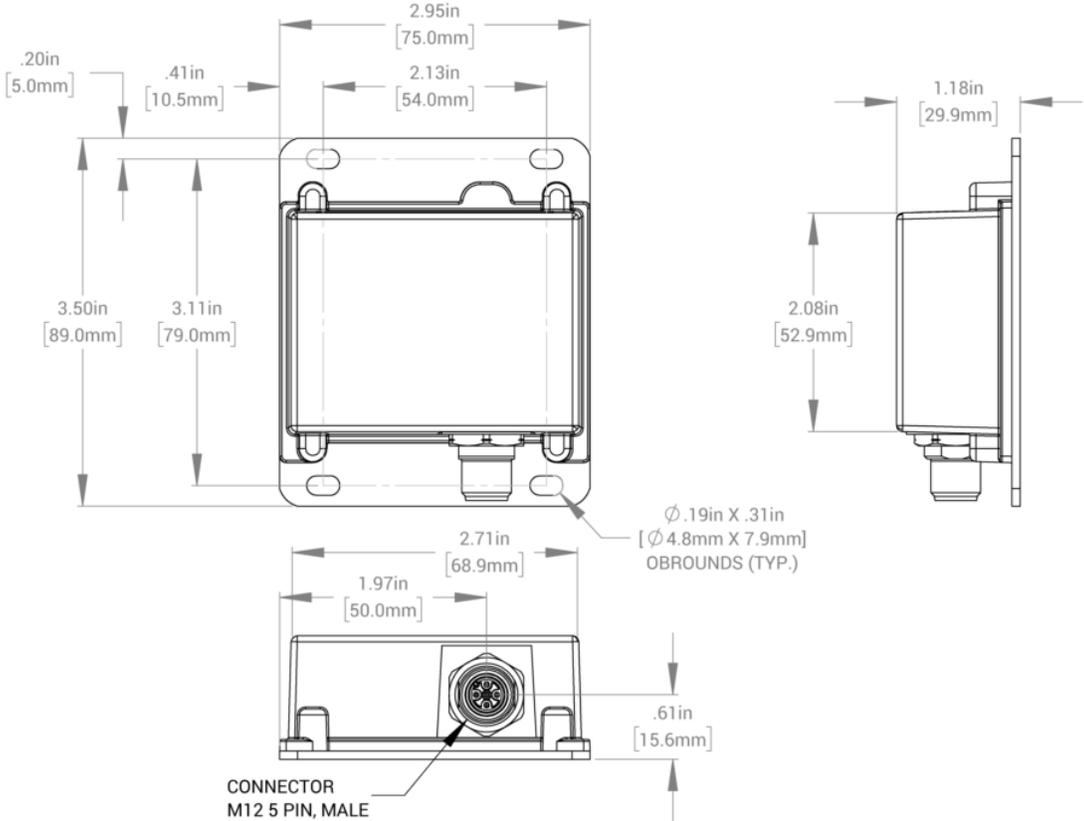


Analog dimming works in both strobe and continuous

Control Specs

On-board controller: See Operation/Wiring

Mechanical Specs



Warranty Information

Every Advanced illumination, Inc. (Ai) product is thoroughly inspected and tested before leaving the factory. Products are warranted to be free of defects in workmanship and materials for a period of FIVE YEARS from the original date of purchase. Should a defect develop during this period, customers may return the complete product, freight prepaid, to one of Ai's distributors or to the Ai factory. All product warranty returns require a Return Merchandise Authorization (RMA) number which is obtained from Customer Service. The RMA number must be clearly marked on the outside of the package. Ai will inspect the unit, and if a defect is found will, at our option, repair or replace the product without charge. Ai disclaims liability for any implied warranties, including implied warranties of "merchantability" and "fitness for a specific purpose." For products under warranty that have since been discontinued, Ai will make an effort to replace with equivalent parts; for circumstances that do not allow for equivalent replacement, Ai reserves the right to repair or replace these products with an updated version. Ai cannot be held responsible for the unauthorized or inappropriate use of its products. Any unauthorized repair or modifications will result in a voided warranty.

No Liability for Consequential Damages: In no event shall Ai be liable for any consequential, special, incidental, or indirect damages of any kind arising from the sale or use of the products.

Electromagnetic Compatibility

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) as stated in the product specifications. These requirements and limits are designed to provide reasonable protection against harmful interference only when the product is operated in its intended industrial electromagnetic environment. To minimize the potential for electromagnetic interference or unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

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Product Highlights

- This large EuroBrite™ backlight provides high-intensity illumination at a competitive price point.



General Specifications

	Color	Current	All Other Controls
Electrical Specifications	455, 470, 505, 530, 590, 625, 660, 730, 850, 940, WHI	~.08A	N/A
Input Voltage Range	24V nom. (min 22/max 28)		
Maximum Input Current	0.42-0.49A		
Strobe/On-Off Control	Up to 5X overdrive, active high		
Analog Intensity Control	Analog 0.7-10V; 0.7V=10% 10V=100%		
Trigger-to-Pulse Latency	10μsec		
Normal Operating Temperature	0 - 60°C		
Weight	254.1g (8.96oz)		
Standard Cable Information	No cable included; see part number LC2-M12-5-FX and LC.5-M12-5-FM or use standard coded 5-pin M12.		

Exempt Applicable Wavelengths: 850, 940

Photobiological Risk Factor Group 1 (Low-Risk) Applicable Wavelengths: 455, 470, 505, 530, 590, 625, 660, 730, WHI

Compliance	CE, RoHS, IEC 62471
IP Rating	IP67
Lumen Maintenance	L70 = 50,000 Hours

Part Number Key

Model	—	Control	Emitting Width (in)	Emitting Length (Cable Side) (in)	—	Peak Wavelength
BL	-	X	XXX	XXX	-	XXX
BL		S (strobe)	100	150		455 (royal blue) 470 (blue) 505 (cyan) 530 (green) 590 (amber) 625 (red orange) 660 (red) 730 (IR) 850 (IR) 940 (IR) WHI (white)
EX: BL-S100150-WHI BL-S100150-470						

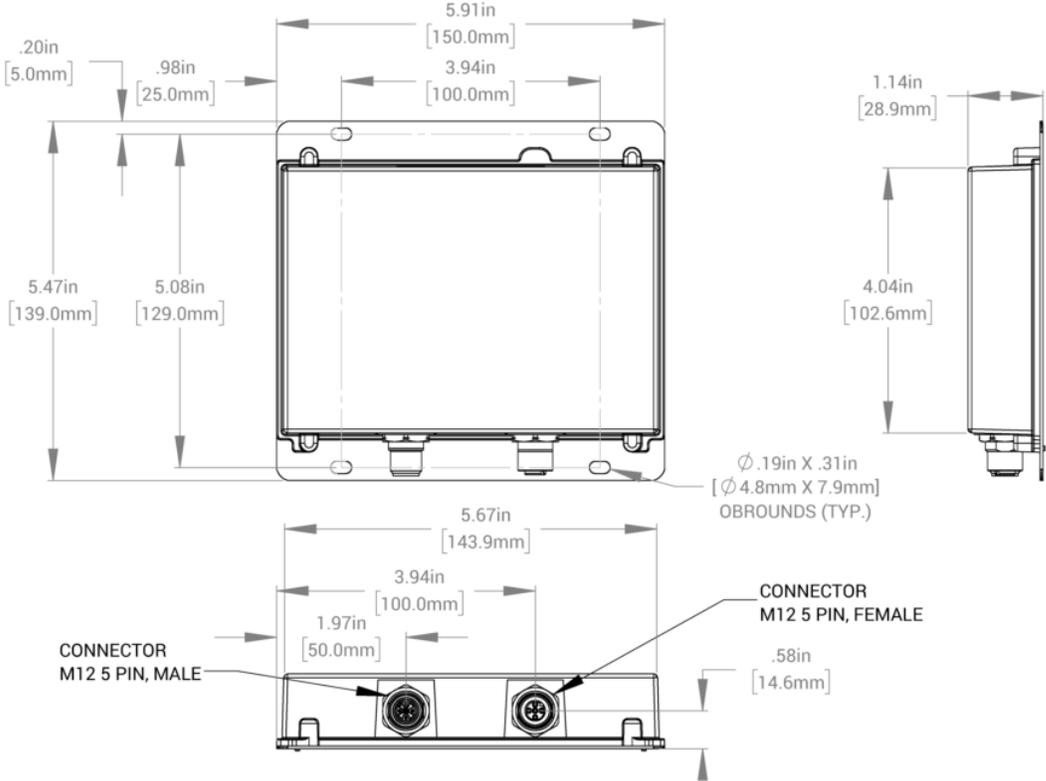
See website product page for in-stock product numbers.

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Stock Products: within three days

Build-to-Order Products: within two weeks

Mechanical Specs



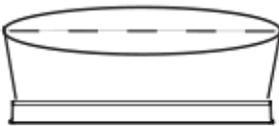
Optical Specs

Area of Illuminance & Intensity

Working Area (FWHM)
@ Working Distance

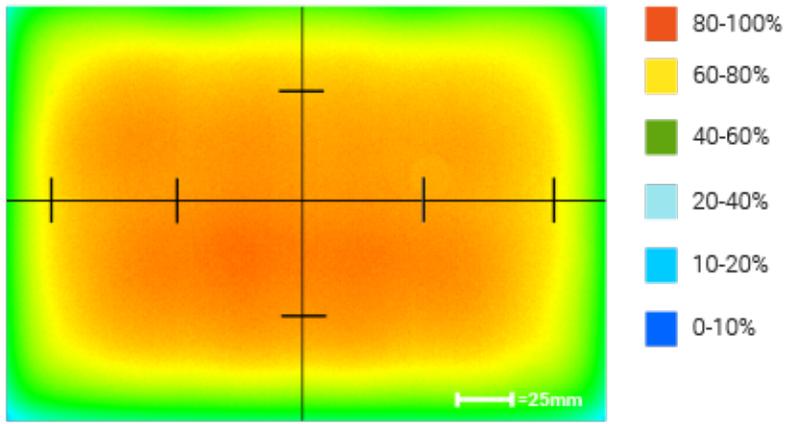
Light Output

134.6 x 94 (mm)
@surface



Irradiance (W/M²): Min 156.4; Typ 184.0
Illuminance (kLux): Min 55.7; Typ 65.5

Intensity Distribution



Optical measurement taken using BL-S100150-WHI

Electrical Specs

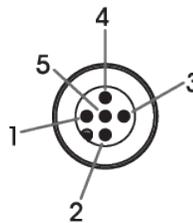
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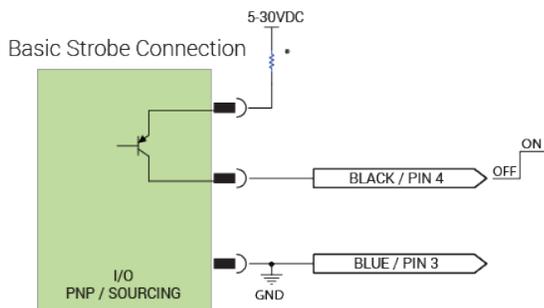
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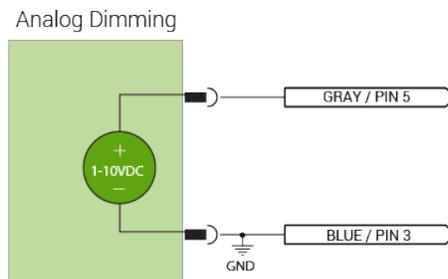
Male 5-Position



Wiring Diagrams



*External resistors may not be needed
Check documentation on I/O for recommendations and voltage limits



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