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WLS28-2 LED Strip Light - PWM Dimmable

Features

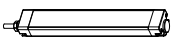


Banner's LED Strip Lights have sturdy aluminum housings, shatterproof windows, and impressive environmental ratings, making them an ideal general-purpose LED light for machine, enclosure, or other industrial lighting applications.

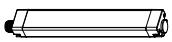
- Intensity can be controlled from 0 to 100% using Pulse Width Modulation (PWM) on an input control wire
- Low-profile, space-saving design
- Rugged, water-resistant IP69K option
- Available in eight lengths from 145 mm to 1130 mm
- Lensed models or choice of clear or diffuse window
- Daisy chain power to multiple lights to control intensity simultaneously
- Optional snap clips for easy installation and repositioning
- Automatic temperature protection built into the unit. Above 50 °C, the light dims to manage heat and protect product lifetime



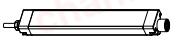
For PWM dimming, use with the LC65 Dimmer Module. For more information, refer to the LC65 LED Dimmer Module datasheet, p/n 177086.



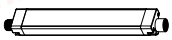
Stand-Alone Light—cable



Stand-Alone Light or End Light in a Cascade—QD



First Light in a Cascade—cable



First or Middle of a Cascade—QD

WLS28-2 Work Light Strips are available as either stand-alone models, or as cascade models that can be "daisy-chained" together for a continuous length of lighting, with a minimum of wiring.

Stand-alone models have cable or male QD fitting at one end for power connection, no connections at opposite end. A stand-alone model may be used as the last in the cascade series.

Cascade models have cable or male QD fitting at one end for power connection, female QD fitting at opposite end for connection to other lights in the cascade. Cascade models with cable end can only be used as the first light in the cascade series. A double-ended accessory cordset must be used between each pair of lights in a cascade.

IMPORTANT: Read the following instructions before operating the light. Please download the complete WLS28-2 LED Strip Light - PWM Dimmable technical documentation, available in multiple languages, from www.bannerengineering.com for details on the proper use, applications, Warnings, and installation instructions of this device.

IMPORTANT: Lea el siguiente instructivo antes de operar el luminario. Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los WLS28-2 LED Strip Light - PWM Dimmable, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.

IMPORTANT: Lisez les instructions suivantes avant d'utiliser le luminaire. Veuillez télécharger la documentation technique complète des WLS28-2 LED Strip Light - PWM Dimmable sur notre site www.bannerengineering.com pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

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179493
p/n: 179493 Rev. H

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Models

Family	Cascadable	LED Color	Lighted Length (mm)	Window	Construction	Control	Connector[1]
WLS28-2	**C**	**W**	**145**	**D**	**X**	**PWM**	**Q**
	C = Cascadable X = Non-cascadeble	W = Cool white WW = Warm white R = Red G = Green B = Blue Y = Yellow	145 285 430 570 710 850 990 1130	Blank = Clear plastic D = Diffused plastic L25 = 25° lensed window	X = Not sealed S = Sealed[2]	PWM = Pulse Width Modulation dimming	Blank = 2 m (6.5 ft) integral PVC-jacketed cable Q = Integral 4-pin M12 male quick-disconnect connector

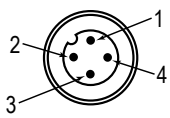
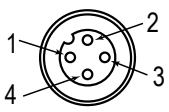
IP50 Models

Stand-Alone[3]	Cascade[3]	Lighted Length	Power Connector
WLS28-2XW145XPWM	WLS28-2CW145XPWM	145 mm	2 m cable
WLS28-2XW285XPWM	WLS28-2CW285XPWM	285 mm	
WLS28-2XW430XPWM	WLS28-2CW430XPWM	430 mm	
WLS28-2XW570XPWM	WLS28-2CW570XPWM	570 mm	
WLS28-2XW710XPWM	WLS28-2CW710XPWM	710 mm	
WLS28-2XW850XPWM	WLS28-2CW850XPWM	850 mm	
WLS28-2XW990XPWM	WLS28-2CW990XPWM	990 mm	
WLS28-2XW1130XPWM	WLS28-2CW1130XPWM	1130 mm	

IP67/IP69K Models

Stand-Alone[3]	Cascade[3]	Lighted Length	Power Connector
WLS28-2XW145SPWM	WLS28-2CW145SPWM	145 mm	2 m cable
WLS28-2XW285SPWM	WLS28-2CW285SPWM	285 mm	
WLS28-2XW430SPWM	WLS28-2CW430SPWM	430 mm	
WLS28-2XW570SPWM	WLS28-2CW570SPWM	570 mm	
WLS28-2XW710SPWM	WLS28-2CW710SPWM	710 mm	
WLS28-2XW850SPWM	WLS28-2CW850SPWM	850 mm	
WLS28-2XW990SPWM	WLS28-2CW990SPWM	990 mm	
WLS28-2XW1130SPWM	WLS28-2CW1130SPWM	1130 mm	

Wiring

Male	Female	Pin	Wire Color	Connection
		1	brown	12 V DC to 30 V DC
		3	blue	DC common
		4	black	Pulse width modulation (PWM) input. For maximum intensity, leave the black wire floating or connected to common. Connecting to 12 V DC to 30 V DC causes LEDs to shut off.
		2	white	Not used

(1) Models with a quick-disconnect connector require a mating cordset.
(2) Sealed models are not available with the On/Off switch.
(3) Integral 2 m (6.5 ft) unterminated cable models are listed. To order the 4-pin M12 integral quick disconnect model, add the suffix "Q" to the model number. For example, WLS28-2XW285XPWMQ.

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Specifications

Supply Voltage and Current

12 V DC to 30 V DC

Use only with a suitable Class 2 power supply (UL) or SELV power supply (CE)

Supply Protection Circuitry

Protected against reverse polarity and transient voltages

Light Characteristics

Cool White

Color Temperature (CCT): 6500K (+500K, -400K)
Lumen output: 800 (± 5%) per foot, typical at 25 °C (77 °F)
Luminous efficacy: 110 lumens/Watt typical at 24 V dc at 25 °C (77 °F)
CRI: 85, typical

Warm white: 3000K (+200K, -100K)

Green: 525 nm

Red: 618 nm

Yellow: 590 nm

Blue: 460 nm

LED Lifetime

Lumen Maintenance - L_{70}

When operating within specifications, output will decrease less than 30% after 75,000 hours.

Construction

Clear anodized aluminum housing; painted zinc end caps; polycarbonate window on clear and diffuse plastic models; acrylic window on L25 models; zinc plated steel brackets

Mounting

(2) swivel brackets SMBWLS28RA included and (4) screws

Connections

Integral 4-pin M12 male quick-disconnect connector (4-pin connecting cordset required), or 2 m (6.5 ft) integral PVC-jacketed cable

Do not spray cable with high-pressure sprayer, or cable damage will result.

Pulse Width Modulation (PWM)

Frequency: Up to 1000 Hz

Voltage: 8 V dc to 30 V dc

Current: 4 mA max. per foot

Environmental Rating

IP50 (non-sealed models) or IP65, IP67, IP69K per ISO 20653 (sealed models)

Vibration and Mechanical Shock

Vibration 10-55 Hz 1.0 mm p-p amplitude per IEC 60068-2-6

Shock 15G 11 ms duration, half sine wave per IEC 60068-2-27

Operating Temperature

–40 °C to +70 °C (–40 °F to +158 °F)

Light output begins to decrease above 50 °C (122 °F) and will be approximately 65% of max intensity at 60 °C (140 °F) and 30% of max intensity at 70 °C (158 °F)

Storage Temperature

–40 °C to +70 °C (–40 °F to +158 °F)

Certifications

Banner Engineering BV
Park Lane, Culliganlaan 2F bus 3
1831 Diegem, BELGIUM

Sealed models only

Application Note

When connecting cascadable lights in series it is important not to exceed maximum current limitations:

Maximum length of light at 12 V dc: 1.4 m (4.6 ft)

Maximum length of light at 24 V dc: 3.0 m (9.8 ft)

Maximum length of light at 30 V dc: 3.1 m (10.2 ft)

Typical Current

Light Length	Typical Current			Max. Current	Lumens [4] (Typical at 25 °C)					
	12 V DC	24 V DC	30 V DC	A	Cool White	Warm White	Green	Red	Yellow	Blue
145 mm	0.33 A	0.15 A	0.12 A	0.4	400	400	180	55	50	40
285 mm	0.66 A	0.3 A	0.24 A	0.8	800	800	360	110	100	80
430 mm	1.01 A	0.46 A	0.36 A	1.2	1200	1200	540	165	150	120
570 mm	1.36 A	0.61 A	0.48 A	1.6	1600	1600	720	220	200	160
710 mm	1.75 A	0.77 A	0.6 A	2	2000	2000	900	275	250	200
850 mm	2.13 A	0.92 A	0.73 A	2.4	2400	2400	1080	330	300	240
990 mm	2.59 A	1.08 A	0.85 A	2.8	2800	2800	1260	385	350	280
1130 mm	3.04 A	1.24 A	0.97 A	3.2	3200	3200	1440	440	400	320

FCC Part 15 Class B for Unintentional Radiators

(Part 15.105(b)) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

[4] Lumen values lowered by 25% on diffused window and 25° lensed models.

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- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(Part 15.21) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

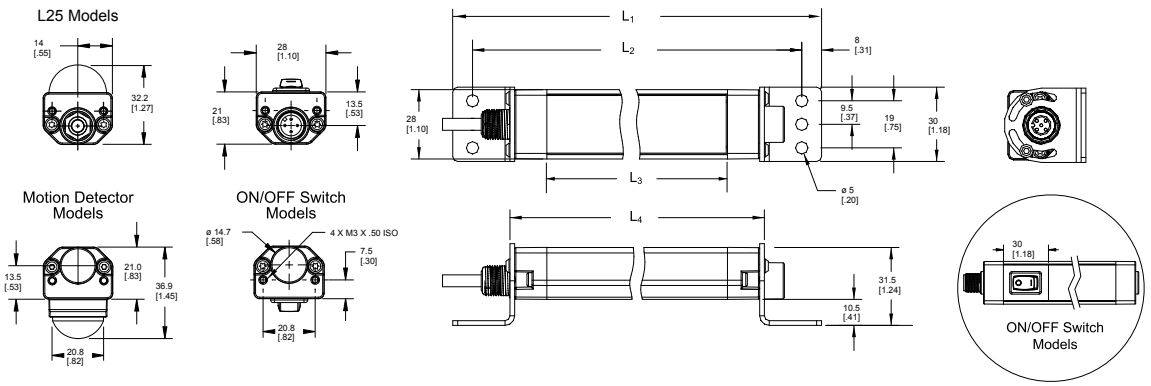
Industry Canada ICES-003(B)

This device complies with CAN ICES-3 (B)/NMB-3(B). Operation is subject to the following two conditions: 1) This device may not cause harmful interference; and 2) This device must accept any interference received, including interference that may cause undesired operation.

Cet appareil est conforme à la norme NMB-3(B). Le fonctionnement est soumis aux deux conditions suivantes : (1) ce dispositif ne peut pas occasionner d'interférences, et (2) il doit tolérer toute interférence, y compris celles susceptibles de provoquer un fonctionnement non souhaité du dispositif.

Dimensions

All measurements are listed in millimeters [inches], unless noted otherwise. The measurements provided are subject to change.



Dimensions are shown with the included SMBWLS28RA bracket.

IP50 Models	IP67/IP69K Models	L_1	L_2	L_3	L_4
WLS28-2..145XPWM	WLS28-2..145SPWM	221 mm (8.7 in)	205 mm (8.1 in)	145 mm (5.71 in)	175 mm (6.9 in)
WLS28-2..285XPWM	WLS28-2..285SPWM	362 mm (14.3 in)	346 mm (13.6 in)	286 mm (11.26 in)	316 mm (12.4 in)
WLS28-2..430XPWM	WLS28-2..430SPWM	503 mm (19.8 in)	487 mm (19.2 in)	427 mm (16.81 in)	457 mm (18.0 in)
WLS28-2..570XPWM	WLS28-2..570SPWM	644 mm (25.4 in)	628 mm (24.7 in)	568 mm (22.36 in)	598 mm (23.5 in)
WLS28-2..710XPWM	WLS28-2..710SPWM	785 mm (30.9 in)	769 mm (30.3 in)	709 mm (27.91 in)	739 mm (29.1 in)
WLS28-2..850XPWM	WLS28-2..850SPWM	926 mm (36.5 in)	910 mm (35.8 in)	850 mm (33.46 in)	880 mm (34.6 in)
WLS28-2..990XPWM	WLS28-2..990SPWM	1067 mm (42 in)	1051 mm (41.4 in)	991 mm (39.02 in)	1021 mm (40.2 in)
WLS28-2..1130XPWM	WLS28-2..1130SPWM	1208 mm (47.6 in)	1192 mm (46.9 in)	1132 mm (44.57 in)	1162 mm (45.7 in)

Light Characteristics

Optical data shown below are for cool white models with a clear window only. To get lux and cendela values for models with a diffuse window and/or other colors, multiply the values shown on the charts by the following factors:

Diffuse Window	Warm White	Green	Red	Yellow	Blue
0.75	1	0.45	0.138	0.125	0.1

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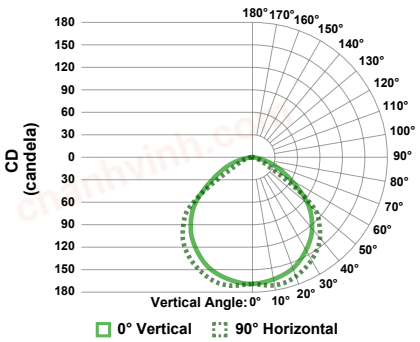
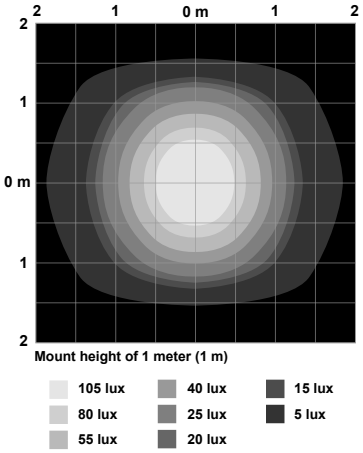
145 mm Models

Clear Window

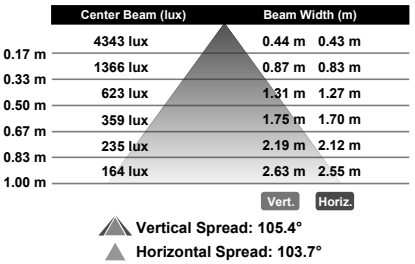
Polar Candela Distribution



Isolux Pattern

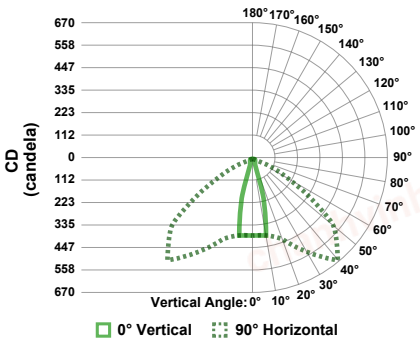


Illuminance at a Distance



L25 Window

Polar Candela Distribution



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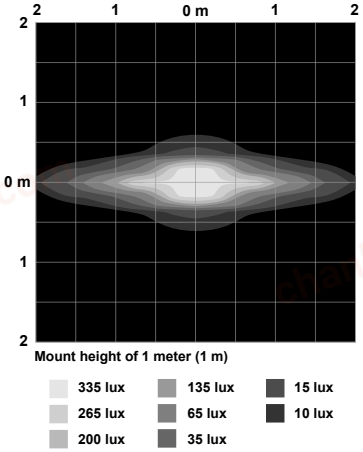

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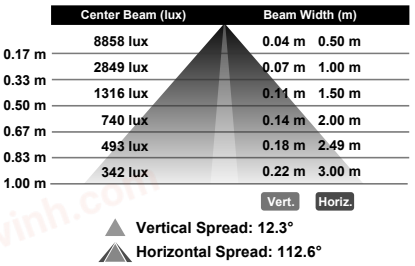
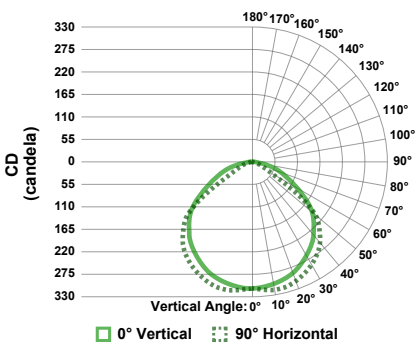


285 mm Models

Clear Window

Polar Candela Distribution



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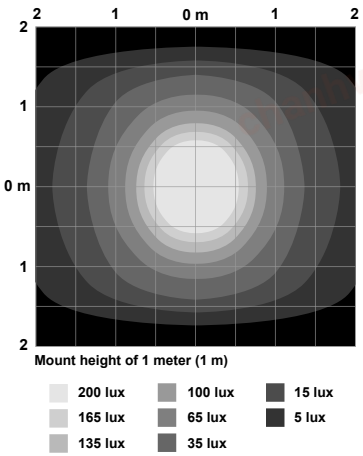
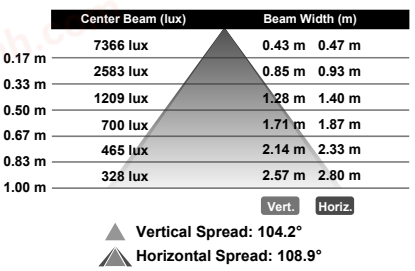


Illuminance at a Distance



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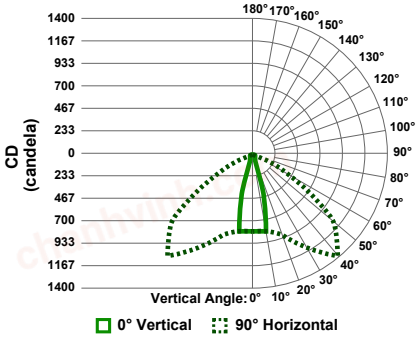
WLS28-2 LED Strip Light - PWM Dimmable

L25 Window

Polar Candela Distribution



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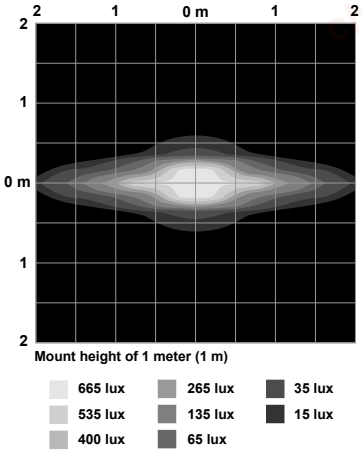

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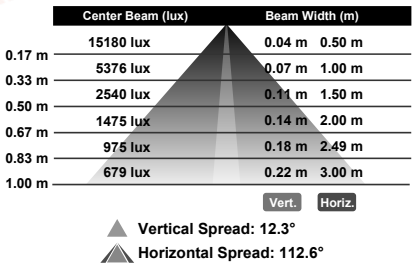
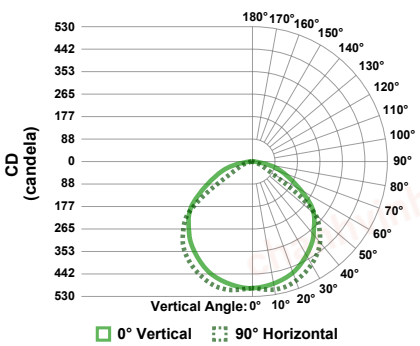


430 mm Models

Clear Window

Polar Candela Distribution



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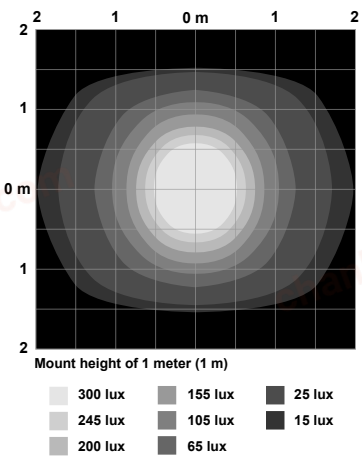

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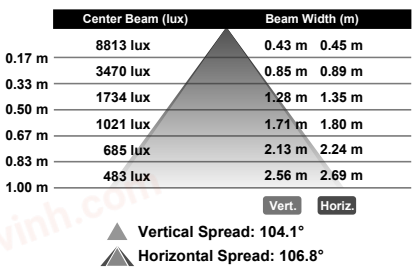
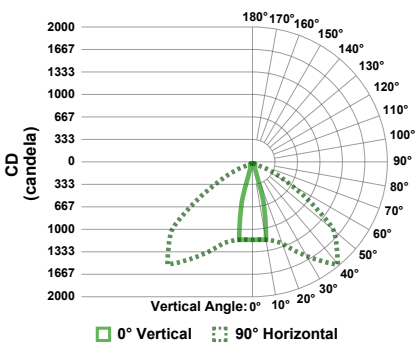


L25 Window

Polar Candela Distribution



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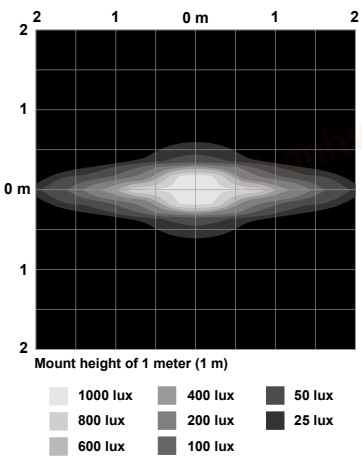
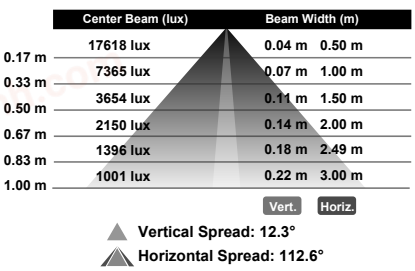


Illuminance at a Distance



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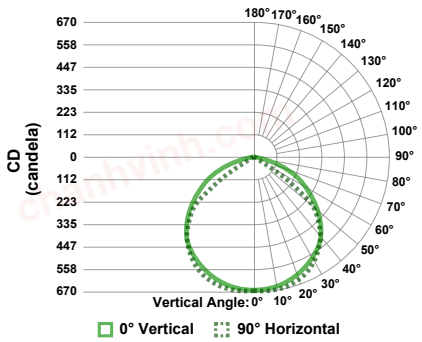
570 mm Models

Clear Window

Polar Candela Distribution



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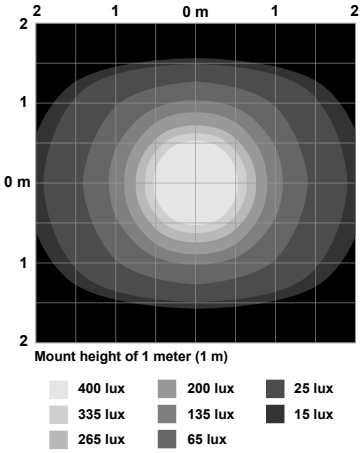
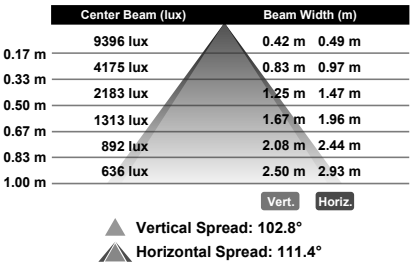


Illuminance at a Distance



L25 Window

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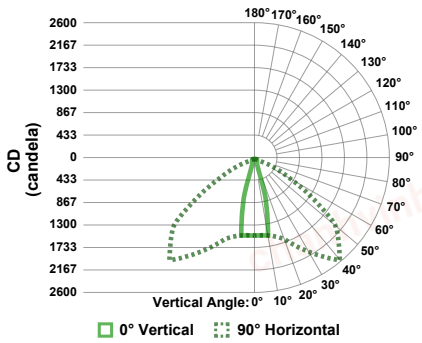

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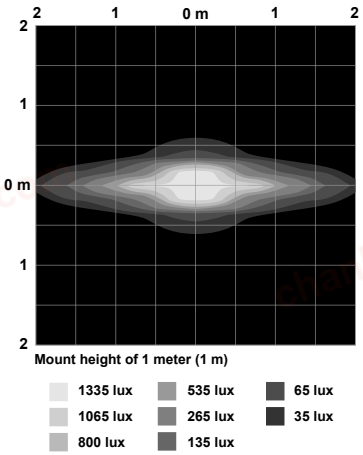

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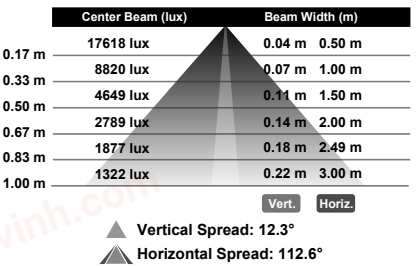
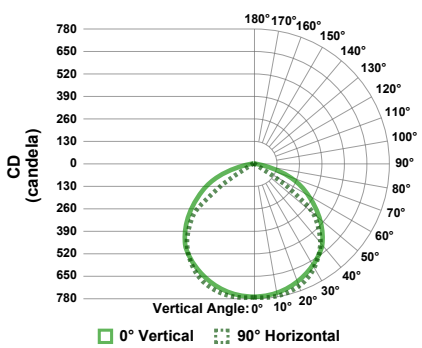


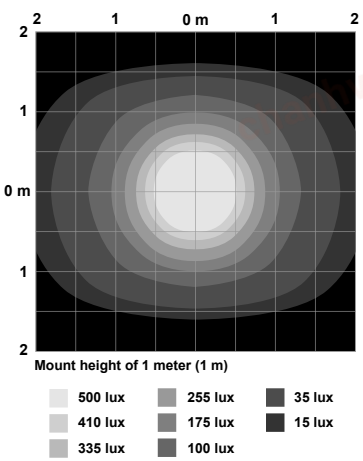
710 mm Models

Clear Window

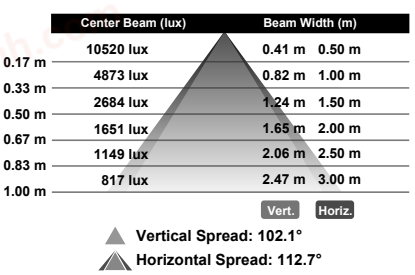
Polar Candela Distribution



Isolux Pattern



Illuminance at a Distance



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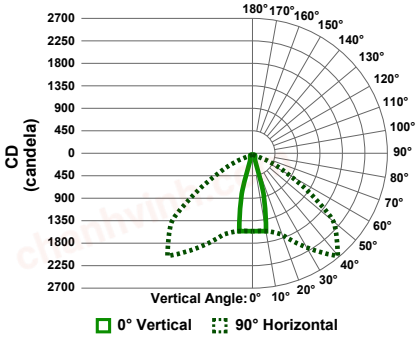
WLS28-2 LED Strip Light - PWM Dimmable

L25 Window

Polar Candela Distribution



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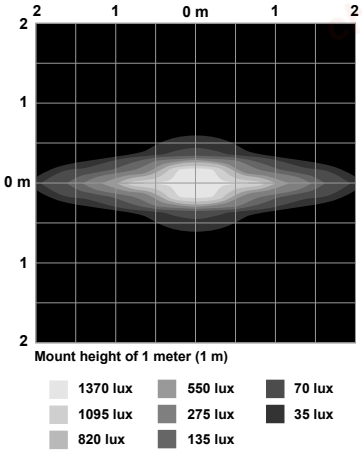

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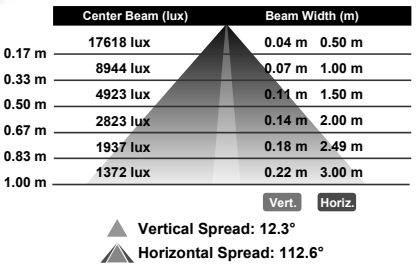
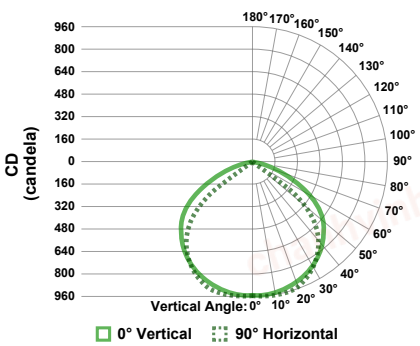


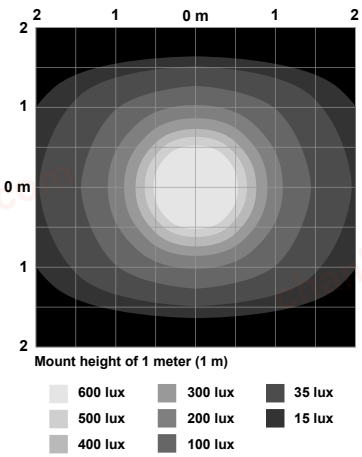
850 mm Models

Clear Window

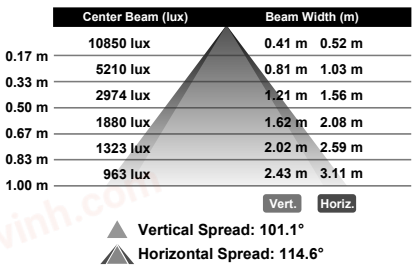
Polar Candela Distribution



Isolux Pattern

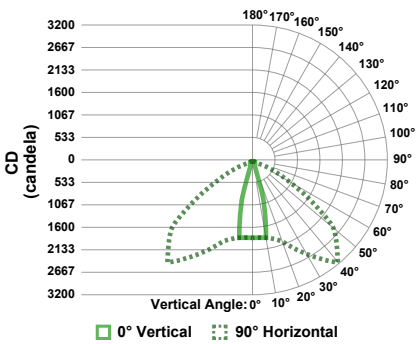


Illuminance at a Distance



L25 Window

Polar Candela Distribution



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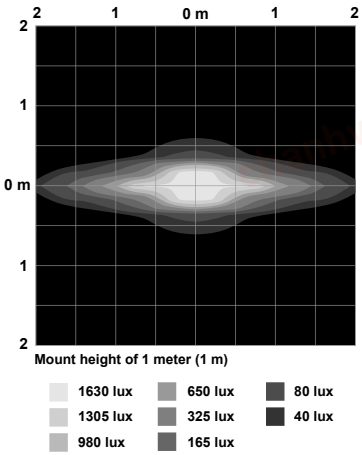

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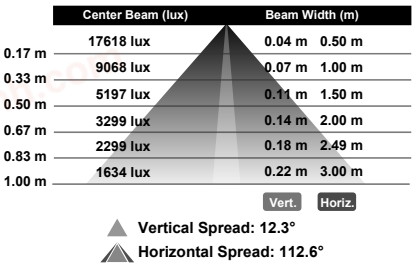

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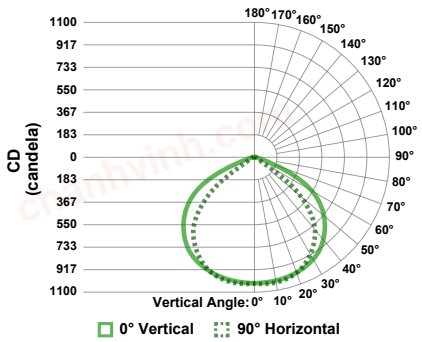
990 mm Models

Clear Window

Polar Candela Distribution



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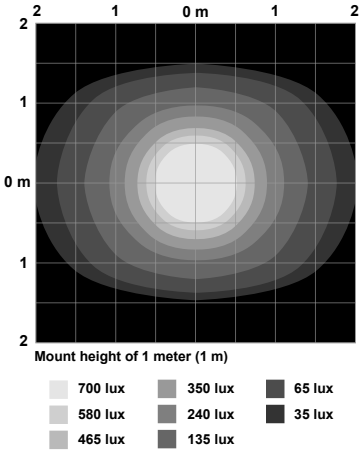

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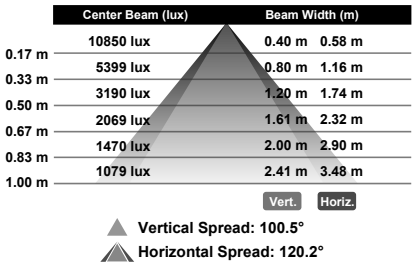
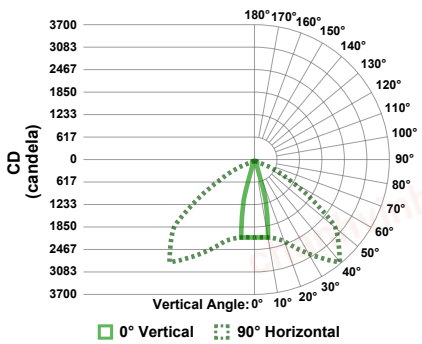


L25 Window

Polar Candela Distribution



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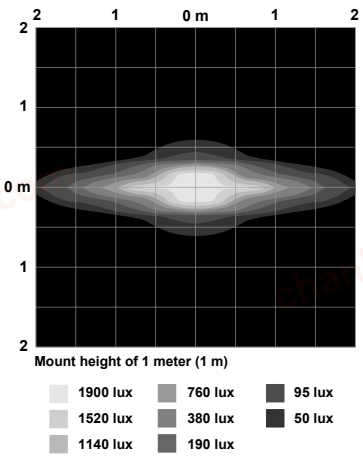
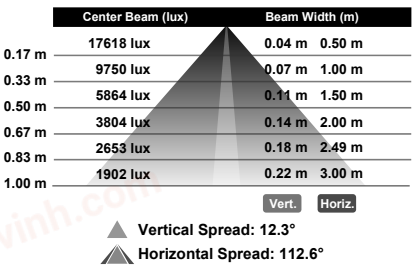


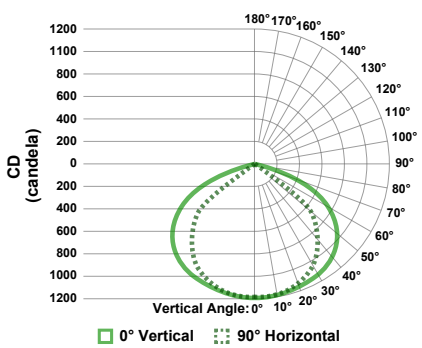
Illuminance at a Distance



1130 mm Models

Clear Window

Polar Candela Distribution



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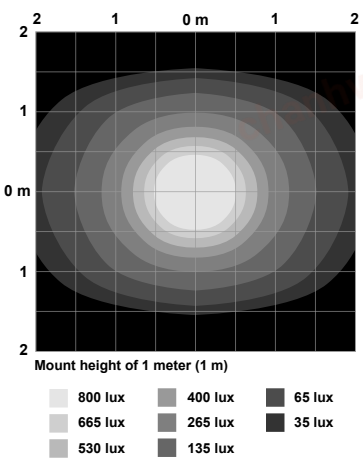

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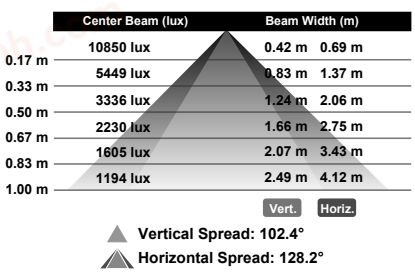

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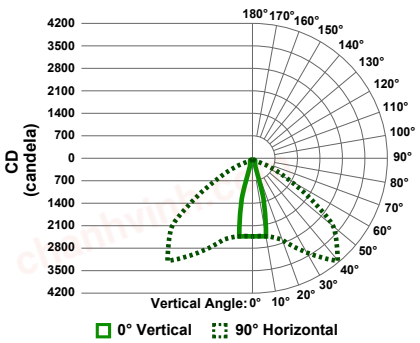
WLS28-2 LED Strip Light - PWM Dimmable

L25 Window

Polar Candela Distribution



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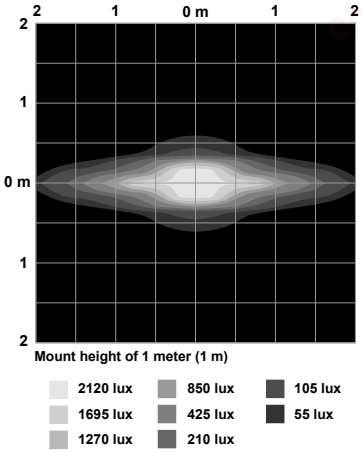
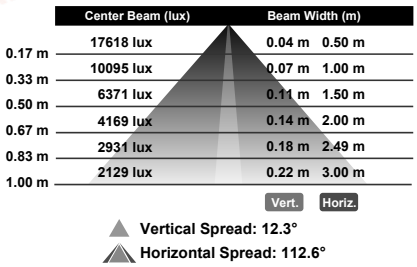


Illuminance at a Distance

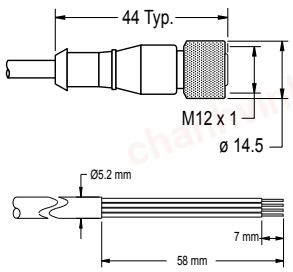
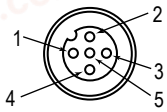
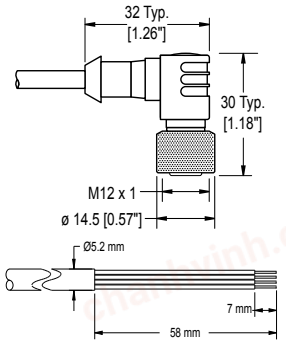
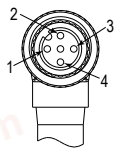


Accessories

Cordsets

Use single-ended cordsets between the power source and the QD connection of a stand-alone light or the first light in a cascade. Use double-ended cordsets between lights in a cascade.

4-Pin Single-Ended M12 Female Cordsets

Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	2 m (6.56 ft)	Straight		
MQDC-415	5 m (16.4 ft)			
MQDC-430	9 m (29.5 ft)			
MQDC-450	15 m (49.2 ft)			
MQDC-406RA	2 m (6.56 ft)	Right-Angle		
MQDC-415RA	5 m (16.4 ft)			
MQDC-430RA	9 m (29.5 ft)			
MQDC-450RA	15 m (49.2 ft)			

1 = Brown
2 = White
3 = Blue
4 = Black
5 = Not used

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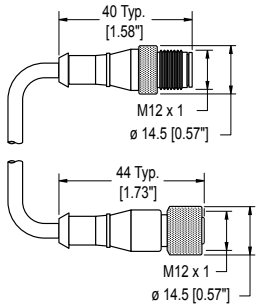
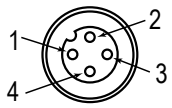
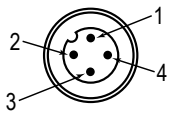
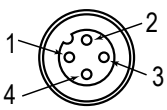
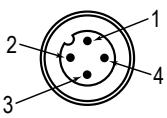
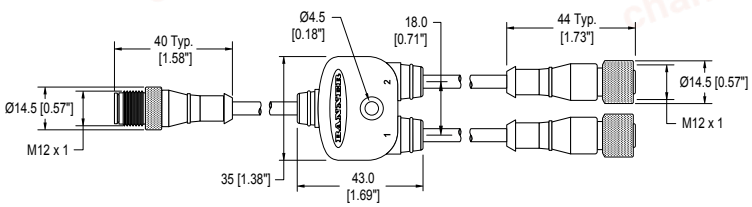
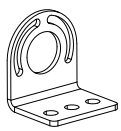
4-Pin Double-Ended M12 Female to M12 Male Cordsets				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-401SS	0.31 m (1 ft)	Male Straight/Female Straight		Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
MQDEC-403SS	0.91 m (2.99 ft)			
MQDEC-406SS	1.83 m (6 ft)			
MQDEC-412SS	3.66 m (12 ft)			
MQDEC-415SS	4.58 m (15 ft)			
MQDEC-420SS	6.10 m (20 ft)			
MQDEC-430SS	9.14 m (30.2 ft)			
MQDEC-450SS	15.2 m (49.9 ft)			

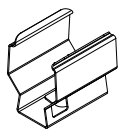
4-Pin Flat Junction M12 Female Branch to M12 MaleTrunk Splitter Cordsets			
Model	**Branches (Female)**	**Trunk (Male)**	**Pinout**
CSB-M1240M1240	No branch	No trunk	Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
CSB-M1240M1241	2 × 0.3 m (1 ft)	No trunk	
CSB-M1241M1241		0.31 m (1 ft)	
CSB-M1248M1241		2.44 m (8 ft)	
CSB-M12415M1241		4.57 m (15 ft)	
CSB-M12425M1241		7.60 m (25 ft)	
CSB-UNT425M1241		7.60 m (25 ft) Unterminated	
CSB-M1243M1243	2 × 1 m (3.28 ft)	1 m (3.28 ft)	
			

Brackets

SMBWLS28RA
- Replacement end bracket kit
- 1.8 mm (14 gage) cold rolled steel with zinc plate, clear chromate finish
- Kit contains two end brackets and four screws



SMBWLS28SP
- Stainless steel snap bracket kit
- Includes two brackets



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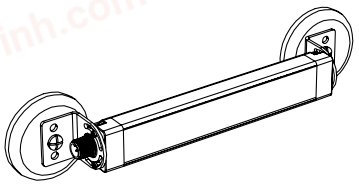
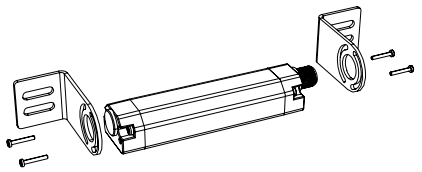
SMBWLSMAG
- Magnetic mounting bracket for easy attachment to steel surfaces

SMBWLSMAGR
- Protective cover also available to prevent scratches to painted surfaces

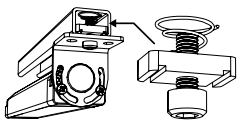


SMBWLS28SM
- End bracket kit
- Cold Rolled Steel with a clear zinc finish
- Allows the light or switch to be mounted at a right angle to the mounting surface
- Kit contains two end brackets and four screws



SMH1316
This kit allows the light or switch to be mounted to a 13/16-inch Unistrut channel. Light is shown. The kit includes:

- #10-32 spring nuts (qty 2)
- #10-32 socket head cap screws (qty 2)
- #10 lock washers (qty 2)



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