WLS27 Pro LED Strip Light with IO-Link

Instruction Manual

Banner's WLS27 Pro LED Strip Light with IO-Link has a sturdy aluminum housing and is encased in a shatterproof, UV stabilized, copolyester shell, making it ideal for harsh indoor and outdoor applications.

- High quality illumination and indication from RGBW LEDs
- Six white color temperatures for comfort and compatibility
- 13 color options for varied indication and inspection uses
- IO-Link gives full access to individual LED control, color, flashing, intensity, and animation settings, as well as advanced operating modes for displaying distance, count, time and position
- Available in six lengths from 145 mm to 1130 mm
- Rugged, water-resistant IP69K per DIN 40050-9 rating

Important: Read the following instructions before operating the light. Please download the complete WLS27 Pro LED Strip Light with IO-Link technical documentation, available in multiple languages, from www.bannerengineering.com for details on the proper use, applications, Warnings, and installation instructions of this device.

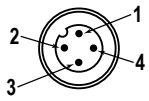
Important: Lea el siguiente instructivo antes de operar el luminario. Por favor descargue desde www.bannerengineering.com toda la documentación técnica de los WLS27 Pro LED Strip Light with IO-Link, disponibles en múltiples idiomas, para detalles del uso adecuado, aplicaciones, advertencias, y las instrucciones de instalación de estos dispositivos.

Important: Lisez les instructions suivantes avant d'utiliser le luminaire. Veuillez télécharger la documentation technique complète des WLS27 Pro LED Strip Light with IO-Link sur notre site www.bannerengineering.com pour les détails sur leur utilisation correcte, les applications, les notes de sécurité et les instructions de montage.

Models

Family	Style	Cascadable	Color	Lighted Length (mm)	Window	Construction	Control	Connection
WLS27	P	X	RGBW	285	D	S	K	Q
	P = Pro	X = Non-cascadable	RGBW = RGBW Multicolor	145 285 430 570 850 1130	D = Diffused H = Heavy Diffused	S = Sealed	K = IO-Link	Q = Integral 4-pin M12 QD

Wiring Diagrams

Male	Pin	Wire Color	Description
	1	Brown	18 V DC to 30 V DC
	2	White	Not used
	3	Blue	DC common
	4	Black	IO-Link Communication

IO-Link Process Data Out (Master to Device)

IO-Link® is a point-to-point communication link between a master device and a sensor and/or light. It can be used to automatically parameterize sensors or lights and to transmit process data. For the latest IO-LINK protocol and specifications, please visit www.io-link.com.

For the latest IODD files, please refer to the Banner Engineering Corp website at: www.bannerengineering.com.

Segment Mode

Configure the light to have up to 10 segments which scale in size automatically with the length of the light or select Manual Segment Configuration which allows each segment to have a custom LED width and LED offset from the beginning of each segment to the beginning of the light.

Use process data to set each segment to off, solid on, flash, or animation mode. Use parameter data to change segment number and configuration, color, intensity, flash speed, direction, background, and select animation type.

Animation	Description
Off	Segment is off
Steady	Color 1 is solid on at defined intensity
Flash	Color 1 flashes at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Shift	Color 1 and Color 2 flash alternately on adjacent LEDs at defined speed and color intensities
Ends Steady	Color 1 is solid on in the center of the segment as defined by Percent Width of Color 1 at defined color intensity while Color 2 is solid on for half of the remaining percentage on each end of the segment at defined color intensity
Ends Flash	Color 1 is solid on in the center of the segment as defined by Percent Width of Color 1 at defined color intensity while Color 2 flashes on for half of the remaining percentage on each end of the segment at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Scroll	Color 1 fills the segment as defined by Percent Width of Color 1 and moves in one direction up or down against the background of Color 2 at the defined speed, color intensities, style, and direction
Center Scroll	Color 1 fills the segment as defined by Percent Width of Color 1 and moves in or out from the center of the segment against the background of Color 2 at the defined speed, color intensities, style, and direction
Bounce	Color 1 fills the segment as defined by Percent Width of Color 1 and moves up and down against the background of Color 2 at the defined speed, color intensities, and style
Center Bounce	Color 1 fills the segment as defined by Percent Width of Color 1 and moves in and out from the center of the segment against the background of Color 2 at the defined speed, color intensities, and style
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity
Two Color Sweep	Color 1 and Color 2 define the end values of a line across the color gamut. The segment continuously displays a color by moving along the line at the defined speed and color intensities
Spectrum	The segment scrolls through the 13 predefined colors with a different color on each LED at the defined speed, Color 1 intensity, and direction

Run Mode

Use process data to control entire light and select color, intensity, flash, direction, and animations. Use parameter data to create custom colors, intensity, and flash speeds.

Animation	Description
Off	Light is off
Steady	Color 1 is solid on at defined intensity
Flash	Color 1 flashes at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flash alternately at defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Shift	Color 1 and Color 2 flash alternately on adjacent LEDs at defined speed and color intensities
Ends Steady	Color 1 is solid on in the center of the light as defined by Percent Width of Color 1 at defined color intensity while Color 2 is solid on for half of the remaining percentage on each end of the light at defined color intensity
Ends Flash	Color 1 is solid on in the center of the light as defined by Percent Width of Color 1 at defined color intensity while Color 2 flashes on for half of the remaining percentage on each end of the light at defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Scroll	Color 1 fills the light as defined by Percent Width of Color 1 and moves in one direction up or down against the background of Color 2 at the defined speed, color intensities, style, and direction
Center Scroll	Color 1 fills the light as defined by Percent Width of Color 1 and moves in or out from the center of the light against the background of Color 2 at the defined speed, color intensities, style, and direction
Bounce	Color 1 fills the light as defined by Percent Width of Color 1 and moves up and down against the background of Color 2 at the defined speed, color intensities, and style
Center Bounce	Color 1 fills the light as defined by Percent Width of Color 1 and moves in and out from the center of the light against the background of Color 2 at the defined speed, color intensities, and style
Intensity Sweep	Color 1 repeatedly increases and decreases intensity between 0% to 100% at defined speed and color intensity
Two Color Sweep	Color 1 and Color 2 define the end values of a line across the color gamut. The light continuously displays a color by moving along the line at the defined speed and color intensities

Animation	Description
Spectrum	The light scrolls through the 13 predefined colors with a different color on each LED at the defined speed, Color 1 intensity, and direction

Level Mode

Use process data to set the level value. Use parameter data to set range, thresholds, colors, intensities, flash speeds, background, and animation types.

General Settings	Description
Level Mode Value	Value of the level of the light (between 0 to 65,535)
Full Scale Value	Set the upper limit of the Level Mode Value (between 0 to 65,535)
Background Color and Intensity	A defined color and intensity is displayed on LEDs that are not active
Dominance	Dominant: The entire light displays the active threshold color Non-Dominant: LEDs displays their defined threshold colors
Sub-Segment Style	If Level Mode Value is a partial percentage of an LED, select if segment will be on steady or analog dimmed to the partial percentage
Filtering	Smooths the input signal by varying the sample size None: There is no filtering Low: The sample size is short and changes to the input signal are more noticeable High: The sample size is long and changes to the input signal are less noticeable
Hysteresis	Determines the signal value change needed to transition between thresholds and to prevent chatter None: The value follows the input signal High: A large value change is needed to transition between thresholds

Base and Threshold 1-4 Settings	Description
Threshold Type: Base	A defined animation state is displayed on LEDs that are not defined within a threshold
Threshold Type: 1-4	Level Mode Values that conform to Threshold Comparison Type ≤ or ≥ and the Threshold Value Percent are displayed on LEDs as defined by the threshold color, intensity, flash speeds, and run mode animation types

Dim and Blend Mode

Dim and blend mode uses the light to finely adjust the intensity of one color, or blend between two or three colors.
Use process data to set the dim and blend mode value. Use parameter data to set number of colors, range, colors, and intensities.

General Settings	Description
Dim and Blend Mode Value	Value of the intensity of the light in 1 Color mode or value of the blend between colors in 2 and 3 Color mode (between 0 to 65,535)
Full Scale Value	Set the upper limit of the Dim and Blend Mode Value (between 0 to 65,535)
Number of Colors	1: Color 1 is solid on at intensity defined by the percentage of Dim and Blend Mode Value to the Full Scale Value when Color 1 Intensity is set to high 2: Color 1 and Color 2 define the end values of a line across the color gamut. The light displays a blended color and moves along the line as defined by the Dim and Blend Mode Value and color intensities 3: Color 1 and Color 2 define the beginning and end value of one line across the color gamut. Color 2 and Color 3 define the beginning and end value of a second line across the color gamut. The light displays a blended color and moves along the two lines as defined by the Dim and Blend Mode Value and color intensities
Filtering	Smooths the input signal by varying the sample size None: There is no filtering Low: The sample size is short and changes to the input signal are more noticeable High: The sample size is long and changes to the input signal are less noticeable

Gauge Mode

Gauge mode uses the light to display a colored band of LEDs in a position proportional to the gauge mode value.
Use process data to set the gauge mode value. Use parameter data to set range, thresholds, colors, intensities, flash speeds, background, and animation types.

General Settings	Description
Gauge Mode Value	Value of the band position within the light (between 0 to 65,535)
Full Scale Value	Set the upper limit of the Gauge Mode Value (between 0 to 65,535)
Filtering	Smooths the input signal by varying the sample size None: There is no filtering Low: The sample size is short and changes to the input signal are more noticeable High: The sample size is long and changes to the input signal are less noticeable
Hysteresis	Determines the signal value change needed to transition between thresholds and to prevent chatter None: The value follows the input signal High: A large value change is needed to transition between thresholds

Center, Threshold 1, and Threshold 2 Settings	Description
Threshold Type: Center	Gauge Mode Values not in Threshold 1 or Threshold 2 are positioned on a band of LEDs as defined by the center threshold color, intensity, flash speeds, backgrounds, band size percent width, and run mode animation types
Threshold Type: 1 & 2	Gauge Mode Values that conform to Threshold Comparison Type ≤ or ≥ and the Threshold Value Percent are positioned on a band of LEDs as defined by the threshold color, intensity, flash speeds, backgrounds, band size percent width, and run mode animation types

LED Mode

Use process data to turn on and select a color for each individual LED. Use parameter to set global intensity.

General Settings	Description
LED 1-64 Color	Set chosen LED to off or to defined color
LED Mode Intensity	Defines intensity of all LEDs turned on

Demo Mode

Demo sequence cycles through 15 different configurations to highlight example applications.

Specifications

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

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

Mounting
Bracket LMBWLS27EC included (2 for lights up to 570 mm or 3 for lights 850 mm and longer)

Construction
Clear anodized aluminum inner housing and FDA-grade copolyester outer housing

Connections
Integral 4-pin M12 male quick-disconnect connector

Environmental Rating
Rated IP66, IP67, and IP69K per DIN 40050-9

Vibration and Mechanical Shock
Vibration: 10 Hz to 55 Hz, 1.0 mm peak-to-peak amplitude per IEC 60068-2-6
Shock: 15G 11 ms duration, half sine wave per IEC 60068-2-27

Input Response Time
45 ms maximum

Operating Temperature
–40 °C to +50 °C (–40 °F to +122 °F)
Storage Temperature: –40 °C to +70 °C (–40 °F to +158 °F)

Supply Voltage
18 V DC to 30 V DC
Use only with suitable Class 2 power supply (UL) or a SELV power supply (CE)

Light Length	Typical Current			Maximum Current
	18 V DC	24 V DC	30 V DC	A
145 mm	0.240	0.180	0.150	0.275
285 mm	0.480	0.360	0.300	0.550
430 mm	0.720	0.540	0.450	0.825
570 mm	0.960	0.720	0.600	1.100
850 mm	1.440	1.080	0.900	1.650
1130 mm	1.920	1.440	1.200	2.200

Note: Different IO-Link masters have different maximum current limits. Use CSB-M1251FM1251M splitter cable and external power supply if needed. See Accessories.

Light Characteristics

RGBW LED PWM Frequency: 2kHz

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	CRI	Color Coordinates [1]		Lumens at Specified Length (Typical at 25 °C) [2]					
			X	Y	145 mm	285 mm	430 mm	570 mm	850 mm	1130 mm
Daylight White	5000K	82	0.345	0.352	160	320	480	640	960	1280
Incandescent White	2700K	55	0.460	0.411	110	220	330	440	660	880
Warm White	3000K	65	0.440	0.404	110	220	330	440	660	880
Fluorescent White	4100K	90	0.376	0.374	145	290	435	580	870	1160
Neutral White	5700K	82	0.328	0.337	160	320	480	640	960	1280
Cool White	6500K	82	0.314	0.324	160	320	480	640	960	1280
Green	522	-	0.153	0.704	145	290	435	580	870	1160
Red	620	-	0.688	0.310	55	110	165	220	330	440
Yellow	574	-	0.447	0.488	95	190	285	380	570	760
Blue	467	-	0.140	0.061	40	80	120	160	240	320
Magenta	-	-	0.348	0.155	50	100	150	200	300	400
Cyan	490	-	0.146	0.308	110	220	330	440	660	880
Amber	589	-	0.542	0.417	80	160	240	320	480	640
Rose	-	-	0.486	0.217	50	100	150	200	300	400
Lime Green	562	-	0.376	0.538	110	220	330	440	660	880
Orange	599	-	0.605	0.371	70	140	210	280	420	560
Sky Blue	483	-	0.143	0.213	90	180	270	360	540	720
Violet	-	-	0.223	0.097	45	90	135	180	270	360
Spring Green	505	-	0.150	0.518	130	260	390	520	780	1040

Certifications

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

Turck Banner LTD Blenheim House, Blenheim Court, Wickford, Essex SS11 8YT, Great Britain

Performance

Optical data shown below is for diffused daylight white models only. To get lux and candela values for other colors, multiply the values shown on the charts by the following factors:

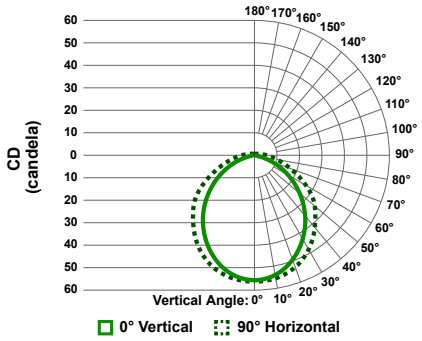
Incandescent White: 0.688
Warm White: 0.688
Fluorescent White: 0.906
Neutral White: 1.000
Cool White: 1.000
Green: 0.906
Red: 0.344
Yellow: 0.594
Blue: 0.250
Magenta: 0.313
Cyan: 0.688
Amber: 0.500
Rose: 0.313
Lime Green: 0.688
Orange: 0.438
Sky Blue: 0.563
Violet: 0.281
Spring Green: 0.813

For models with heavy diffused housing, multiply lux and candela values by an additional 0.550.

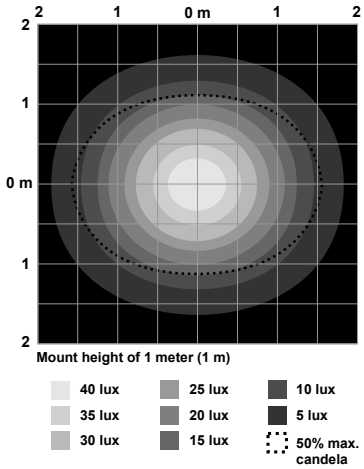
[1] Refer to the CIE 1931 (x,y) Chromaticity Diagram to show equivalent color with indicated color coordinates. Actual coordinates may differ ± 5%.
[2] Lumen values shown apply to diffused models only. Heavy diffused models are 30% lower.

145 mm Models

Polar Candela Distribution



Isolux Pattern



Illuminance at a Distance

	Center Beam (lux)	Beam Width (m)	
0.17 m	1458 lux	0.37 m	0.53 m
0.33 m	440 lux	0.74 m	1.05 m
0.50 m	198 lux	1.11 m	1.59 m
0.67 m	112 lux	1.48 m	2.12 m
0.83 m	74 lux	1.85 m	2.64 m
1.00 m	52 lux	2.22 m	3.17 m

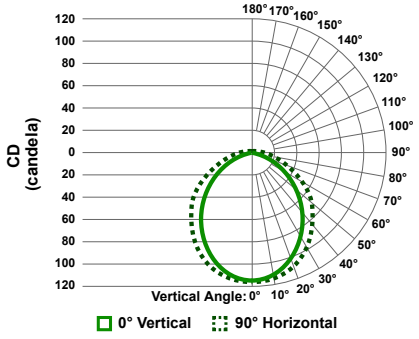
Vert. Horiz.

Vertical Spread: 95.1°

Horizontal Spread: 115.0°

285 mm Models

Polar Candela Distribution



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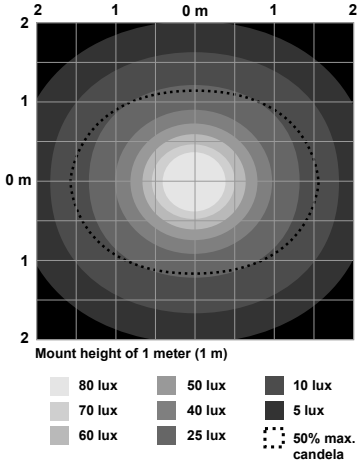


Illuminance at a Distance

	Center Beam (lux)	Beam Width (m)	
0.17 m	2512 lux	0.38 m	0.52 m
0.33 m	902 lux	0.76 m	1.04 m
0.50 m	426 lux	1.14 m	1.56 m
0.67 m	246 lux	1.53 m	2.09 m
0.83 m	164 lux	1.91 m	2.60 m
1.00 m	116 lux	2.29 m	3.12 m

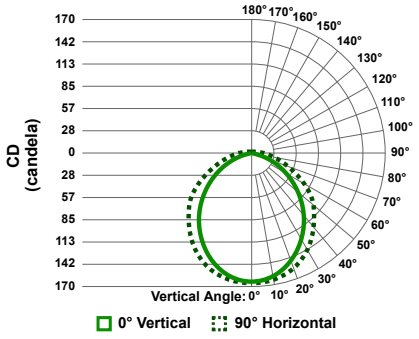
Vert. Horiz.

Vertical Spread: 97.8°

Horizontal Spread: 115.0°

430 mm Models

Polar Candela Distribution



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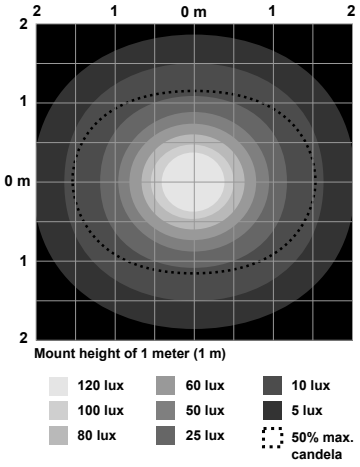


Illuminance at a Distance

	Center Beam (lux)	Beam Width (m)	
0.17 m	2912 lux	0.39 m	0.51 m
0.33 m	1198 lux	0.77 m	1.02 m
0.50 m	606 lux	1.16 m	1.53 m
0.67 m	364 lux	1.54 m	2.05 m
0.83 m	244 lux	1.92 m	2.55 m
1.00 m	174 lux	2.31 m	3.07 m

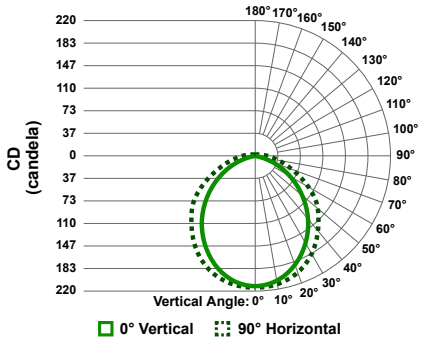
Vert. Horiz.

Vertical Spread: 98.2°

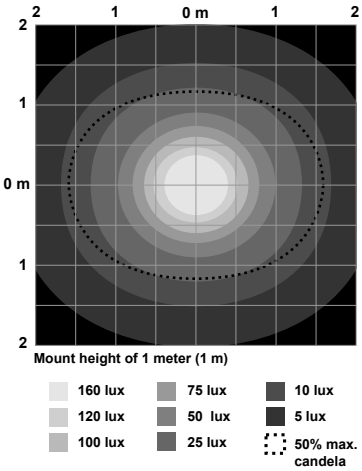
Horizontal Spread: 113.8°

570 mm Models

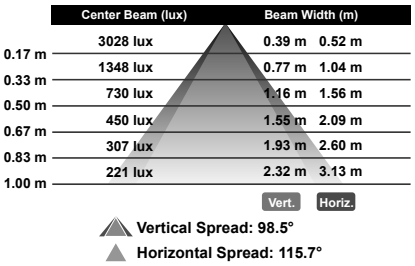
Polar Candela Distribution



Isolux Pattern

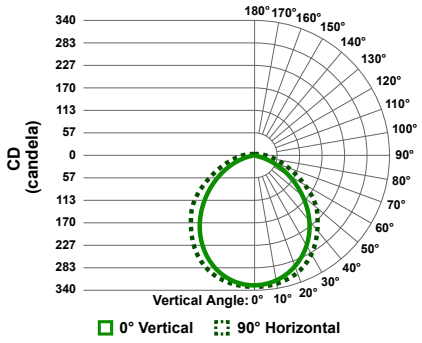


Illuminance at a Distance

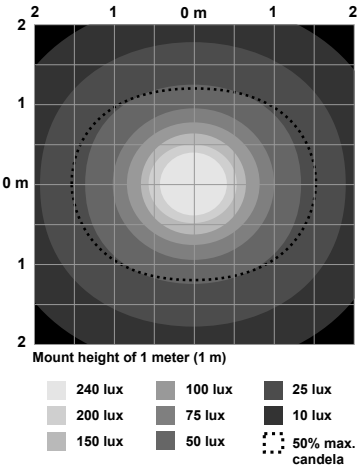


850 mm Models

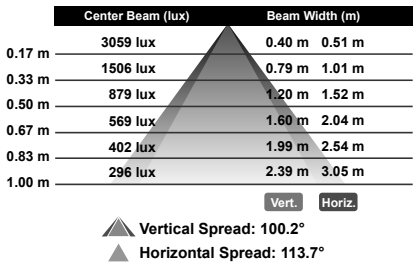
Polar Candela Distribution



Isolux Pattern

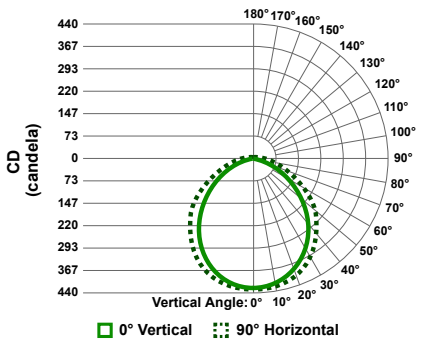


Illuminance at a Distance

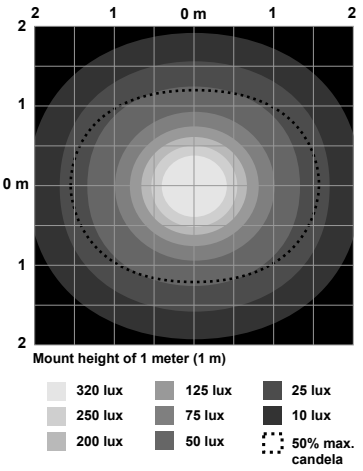


1130 mm Models

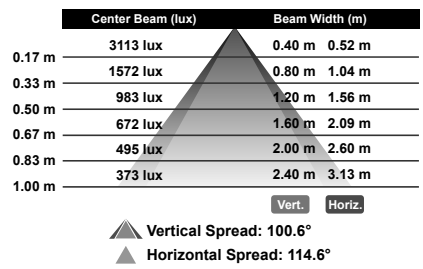
Polar Candela Distribution



Isolux Pattern

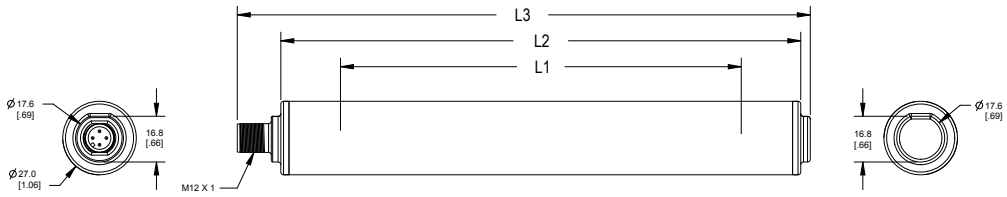


Illuminance at a Distance



Dimensions

Figure 1. Quick Disconnect Models



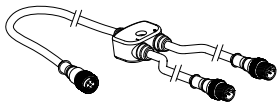
Models	L1	L2	L3
WLS27..145..	145 mm (5.7 in)	191 mm (7.5 in)	210.5 mm (8.3 in)
WLS27..285..	286 mm (11.3 in)	332 mm (13.1 in)	351.5 mm (13.8 in)
WLS27..430..	427 mm (16.8 in)	473 mm (18.6 in)	492.5 mm (19.4 in)
WLS27..570..	568 mm (22.4 in)	614 mm (24.2 in)	633.5 mm (24.9 in)
WLS27..850..	850 mm (33.5 in)	896 mm (35.3 in)	915.5 mm (36 in)
WLS27..1130..	1132 mm (44.6 in)	1178 mm (46.4 in)	1197.5 mm (47.1 in)

Accessories

Cordsets

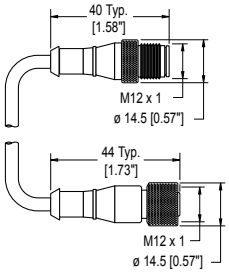
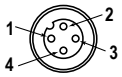
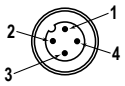
CSB-M1251FM1251M

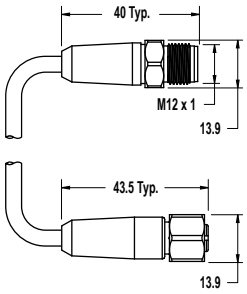
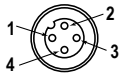
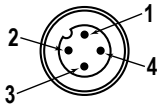
- 5-pin parallel Y splitter (Male-Male-Female)
- For full Pro Editor preview capability
- Requires external power supply, sold separately



PSD-24-4

- 90 to 264 V AC 50/60 Hz input
- Includes a 1.8 m (6 ft) US style 5-15P input plug
- 24 V DC UL Listed Class 2 M12 connector output
- 4 A total current

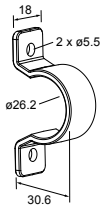
4-Pin Threaded M12 Cordsets—Double Ended				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-401SS	0.31 m (1 ft)	Male Straight/ Female Straight		Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
MQDEC-403SS	0.91 m (2.99 ft)			
MQDEC-406SS	1.83 m (6 ft)			
MQDEC-412SS	3.66 m (12 ft)			
MQDEC-420SS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

4-Pin Threaded M12 Cordsets—Double Ended, Washdown, Stainless Steel				
Model	**Length**	**Style**	**Dimensions**	**Pinout**
MQDEC-WDSS-401SS	0.31 m (1 ft)	Male Straight/ Female Straight		Female  Male  1 = Brown 2 = White 3 = Blue 4 = Black
MQDEC-WDSS-403SS	0.91 m (2.99 ft)			
MQDEC-WDSS-406SS	1.83 m (6 ft)			
MQDEC-WDSS-412SS	3.66 m (12 ft)			

Brackets

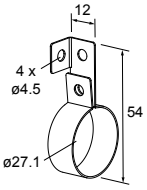
LMBWLS27EC

- Clear copolyester
- Clearance for M5 or #10 hardware



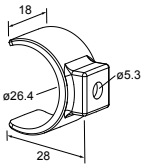
LMBWLS27H

- 300 series stainless steel mounting brackets
- M4 stainless steel hardware included



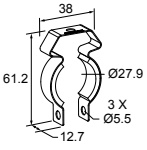
LMBWLS27SP

- Clear copolyester
- Clearance for M5 or #10 hardware
- Snap bracket for light duty applications



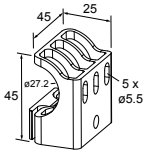
LMBWLS27T

- Stainless steel mounting brackets with rubber grips
- M5 stainless steel hardware included
- Clearance for M5 or #10 hardware



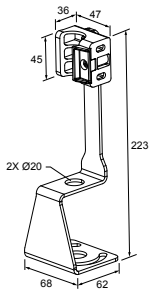
LMBWLS27U

- Clear copolyester
- Clearance for M5 or #10 hardware
- Clamps securely around the light body



LMBWLS27V

- Clamp with base mount for vertical installations
- Mounting hole and clamp for WLS27
- Clearance for M6 (¼ in) hardware
- 304 stainless steel with copolyester clamp



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FCC Part 15 Class 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:

- 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.

Industry Canada

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.

Mexican Importer

Banner Engineering de Mèxico, S. de R.L. de C.V.
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San Pedro Garza Garcia Nuevo Leòn, C. P. 66269

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