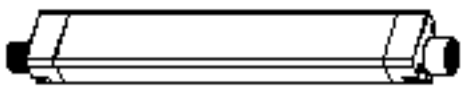
WLS28 Pro LED Strip Light

Instruction Manual

Banner's WLS28 Pro 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.



- 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
- Programmable using Banner's Pro Editor software and Pro Converter Cable
- Pro Editor software configurtion and three discrete inputs gives access to color, flshing 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
- Lensed models or choice of clear or diffuse window

Important: Read the following instructions before operating the light. Please download the complete WLS28 Pro LED Strip Light 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 Pro LED Strip Light, 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 Pro LED Strip Light 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	Connection
WLS28	P	X	RGBW	285	D	X	Q
	P = Pro	X = Non cascadable	RGBW = RGBW Multicolor	145 285 430 570 850 LL30	Blank = Clear D = Diffused L25 = 25° Lensed Window L25D = 25° Diffused Lensed Window	X = 1050	Q = Integral 4 pin M12 QD

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Pro Editor

Use Banner's Pro Editor software and Pro Converter Cable to create custom configurtions by selecting different colors, flsh patterns, and animations.
For more information visit www.bannerengineering.com/proeditor.

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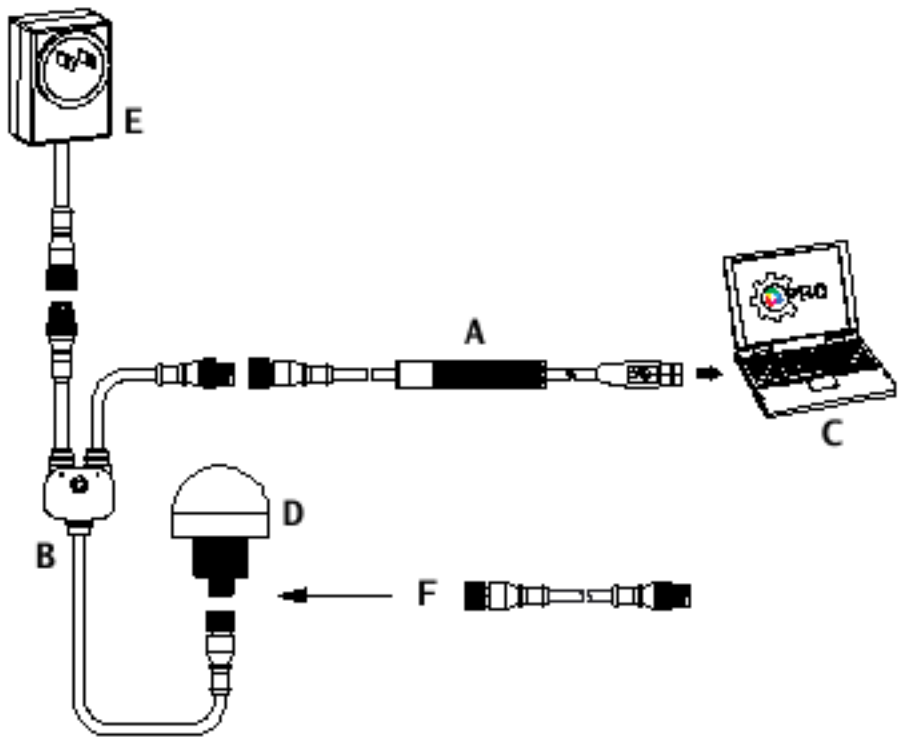
Full Preview Connection (Required)

The full preview connection must be used for the TL50 Pro Tower Light and for Pro-series Strip Lights, and is optional but recommended for other Pro-series enabled devices.



A = Pro Converter Cable (MQDC-506-USB)
B = Splitter (CSB-M1251FM1251M)
C = PC running Pro Editor software
D = Any Banner Pro Series-enabled device (K50 shown)
E = Power Supply (PSW-24-1 or PSD-24-4)
F = 8-Pin to 5-Pin Double-Ended Cordset (MQDC-801-5M-PRO), required for 8-Pin models

Wiring Diagrams

Male	Pin	Wire Color	Description [1]
	1	Brown	Input 1
	2	White	Input 3
	3	Blue	DC common
	4	Black	Input 2

7 Color Binary Control (Binary input state controls color, default configuration)			
Input 1: Pin 1 Brown Wire	Input 2: Pin 4 Black Wire	Input 3: Pin 2 White Wire	LED Color
—	—	—	Light OFF
18 V DC to 30 V DC	—	—	Daylight White
—	18 V DC to 30 V DC	—	Green
—	—	18 V DC to 30 V DC	Red
18 V DC to 30 V DC	18 V DC to 30 V DC	—	Yellow
18 V DC to 30 V DC	—	18 V DC to 30 V DC	Blue Bounce with Daylight White Background
—	18 V DC to 30 V DC	18 V DC to 30 V DC	Daylight White with Red Ends Flash
18 V DC to 30 V DC	18 V DC to 30 V DC	18 V DC to 30 V DC	Warm White

Pro Editor onurton for the WLS28 Pro

Banner's Pro Editor software offers an easy way to configure Pro Series-enabled touch and indicator devices, allowing users full control of device states. The easy-to-use configurtion software provides a variety of tools and capabilities to solve a wide range of applications. onfigure any Pro Series-enabled device using the free Pro Editor software, available for download at www.bannerengineering.com/proeditor.

Machine and Work Cell—Choose colors and animations to create up to seven discretely controlled illumination and status states. Spans functionality from single segment to two-colored animations.

Single Segment—The single segment option shows the WLS28 Pro in one solid color. The input wires are used to change colors. Flashing and intensity options are available. Presets are available for common configurtions which can be adjusted as desired.

End Status—The end status option shows the inside section of the WLS28 Pro in one color and the ends of the light in another. The size of the two sections are customizable. The input wires are used to change color states. Flashing and intensity options are available.

Process Visualization—The process visualization option enables a choice of colors, animations, speeds, and intensities to provide visual information that corresponds to equipment or process status. Single color illumination states are also available.

Tower Light—Choose colors, intensities, and animations to create a discretely controlled two or three segment indicator. The segments are controlled independently with input wires.

Timer—The timer option uses the WLS28 Pro as a timer, counting up or counting down. Set the total time and choose up to four thresholds to change the visual appearance of the light as time advances. The timer starts when 18 V DC to 30 V DC is applied to the timer run input wire, and paused when left floting or tied to ground. The timer resets when 18 V DC to 30 V DC is applied to the reset wire. The timer automatically resets when it reaches the finl count. A steady global background can be applied, from which color and intensity can be defined

1 Input functionality can change depending on configuration created with Pro Editor.

Counter—The counter option counts up or down by converting input pulses into movement of LEDs along the length of the light based on up to four thresholds that define colors, intensity, and flshing When the rising edge of an 18 V DC to 30 V DC pulse is applied to the counter input wire, the count changes by one. The counter resets when 18 V DC to 30 V DC is applied to the reset wire. The counter automatically resets when it reaches the finl count. A steady global background can be applied, from which color and intensity can also be defined

Distance—The distance mode uses the light to display colored LEDs proportional to a PFM (pulse frequency modulation) or PWM (pulse width modulation) input and set range. The light adjusts position and color continuously based on the input value and defined color, flsh and intensity in up to four thresholds while maintaining an optional steady background for LEDs outside the active threshold range. The PFM signal frequency range can be from 100 to 10,000 Hz. The PWM duty cycle range can be from 0 to 100%.

Gauge—The gauge option controls the color and position of a band of LEDs based on a defined PFM or PWM input value and range. The width of the band is defined as a percentage of total lighted length. The light adjusts the position and color of the band and background continuously based on the input signal and defined color, flsh intensities, and animations in upper, lower, and center thresholds. The PFM signal frequency range can be from 100 to 10,000 Hz. The PWM duty cycle range can be from 0 to 100%.

Animation Settings

Animation	Description
Off	Device OFF, no animation displays
Steady	Color 1 is solid ON at the defined intensity
Flash	Color 1 flshes at the defined speed, color intensity, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Flash	Color 1 and Color 2 flsh alternately at the defined speed, color intensities, and pattern (normal, strobe, three pulse, SOS, or random)
Two Color Shift	Color 1 and Color 2 flsh alternately on adjacent LEDs at defined speed and color intensities
Ends Steady	Color 1 defines the center 75% of the light.. Color 2 defines the 12.5% of the light on each end. Center and ends are on steady. Center proportion can be defined in End Status mode
Ends Flash	Color 1 defines the center 75% of the light.. Color 2 defines the 12.5% of the light on each end. The ends will flsh at defined speed and pattern. Center proportion can be defined in End Status mode
Scroll	Color 1 defines a band 20% of the length of the light that moves in one direction up or down against the background of Color 2 at the defined speed and color intensities
Center Scroll	Color 1 defines a band 10% the length of the light that moves from the center of the light to the ends against the background of Color 2 at the defined speed and color intensity
Bounce	Color 1 defines a band 20% of the length of the light that moves up and down between the top and bottom of the light against the background of Color 2 at the defined speed and color intensities
Center Bounce	Color 1 defines a band 10% the length of the light that moves from the center of the light to the ends and back against the background of Color 2 at the defined speed and color intensity
Intensity Sweep	Color 1 continuously 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 intensity
Color 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

By default, when the sub-applications for Machine and Work Cell are selected, Pro Editor opens I/O State configurtion in Advanced. Three I/O states are available:

I/O State onfguraton Settings	Description
Basic	onfgurons made in this state assign one wire to one state, with the following override control: • Pin 4 (Black) overrides Pin 1 (Brown) • Pin 2 (White) overrides Pins 1 and 4 (Brown and Black)
Advanced	I/O state with full seven state options for maximum configuraton onfgurons made in Advanced assign binary wiring combinations of all valid inputs to each state.
I/O Block	Three state control for use with I/O block. onfgurons made in I/O Block assign states to the black, white, and combination of black and white wires for use with I/O blocks for which power (brown) and common (blue) are always on for five pin connections.

ptons

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 VDC	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

Supply Protection Circuitry
Protected against reverse polarity and transient voltages

Input Rating
Leakage Current Immunity: 400 µA
Indicator On/Off Response Time: 300 ms (maximum)
PWM Duty Cycle Range: 0 to 100%
PFM Frequency Range: 100 to 10000 Hz

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

Construction
Housing: Clear anodized aluminum
End Caps: Painted zinc
Polycarbonate window on clear and diffuse plastic models, acrylic window on L25 models
Brackets: Zinc plated steel

Connections
Integral 4-pin M12 male quick disconnect

Environmental Rating
Rated IEC IP50

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

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

evlcons

Light Characteristics
RGBW LED PWM Frequency: 2kHz

Color	Dominant Wavelength (nm) or Color Temperature (CCT)	CRI	Color Coordinates[2]		Lumens at [illegible] Length (Typical at 25 °C)[3]					
			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

Photometric Data

Photometric data shown below is for standard clear, and 25° clear window 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

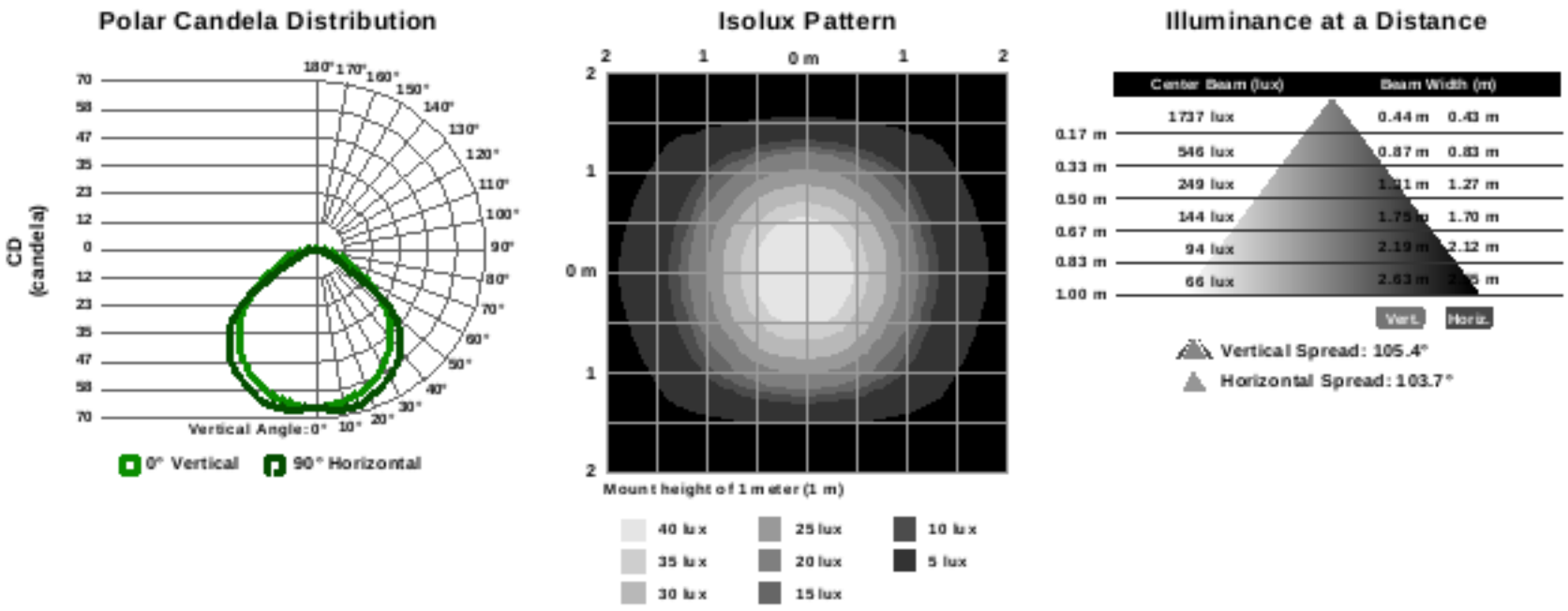
Red: 0.344
Yellow: 0.594
Blue: 0.250
Magenta: 0.313
Cyan: 0.688
Amber: 0.500

Rose: 0.313
Lime Green: 0.688
Orange: 0.438
Sky Blue: 0.563
Violet: 0.281
Spring Green: 0.813

For models with a standard diffused window, multiply lux and candela values by an additional 0.750. Photometric data for 25° diffused lensed models is not shown.

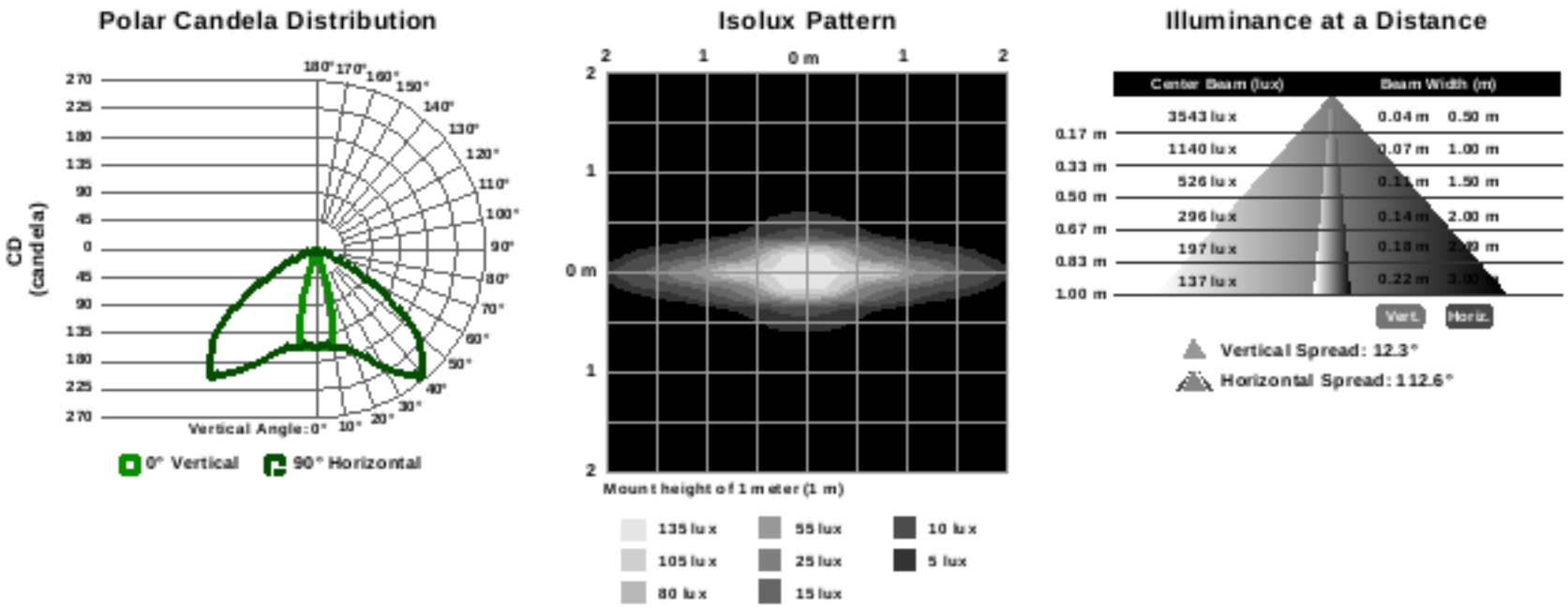
145 mm Models

Figure 1. Clear Window



[2] Refer to the CIE 1931 (x,y) Chromaticity Diagram to show equivalent color with indicated color coordinates. Actual coordinates may differ ± 5%.
[3] Lumen values shown apply to standard clear models only. Standard diffused and 25° clear lensed models are 25% lower, and 25° diffused lensed models are 60% lower.

Figure 2. L25 Window



285 mm Models

Figure 3. Clear Window

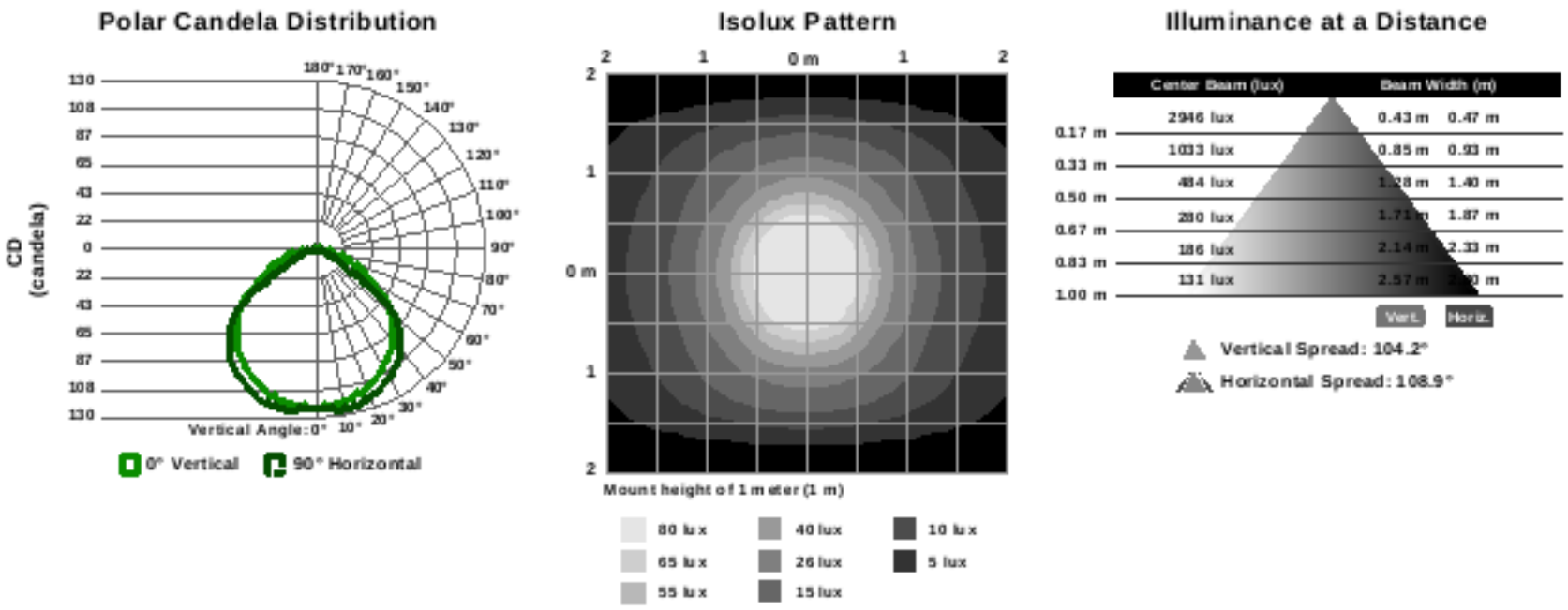
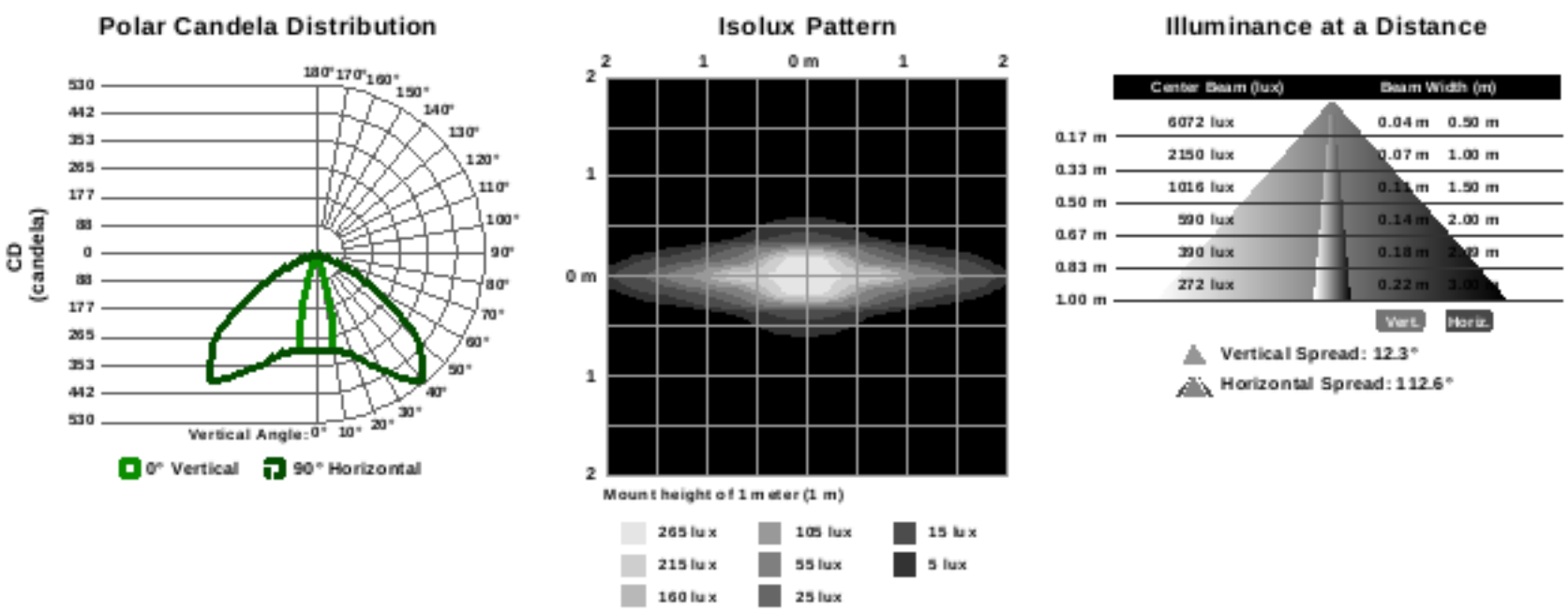


Figure 4. L25 Window



430 mm Models

Figure 5. Clear Window

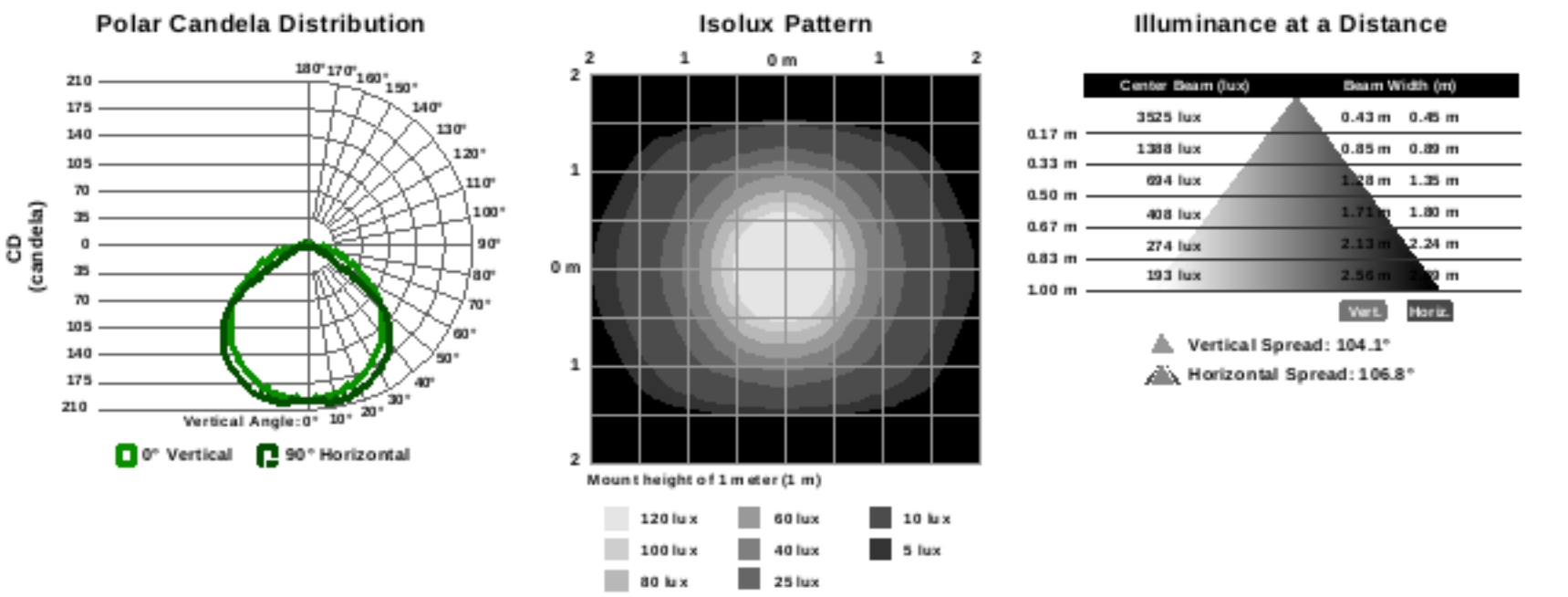
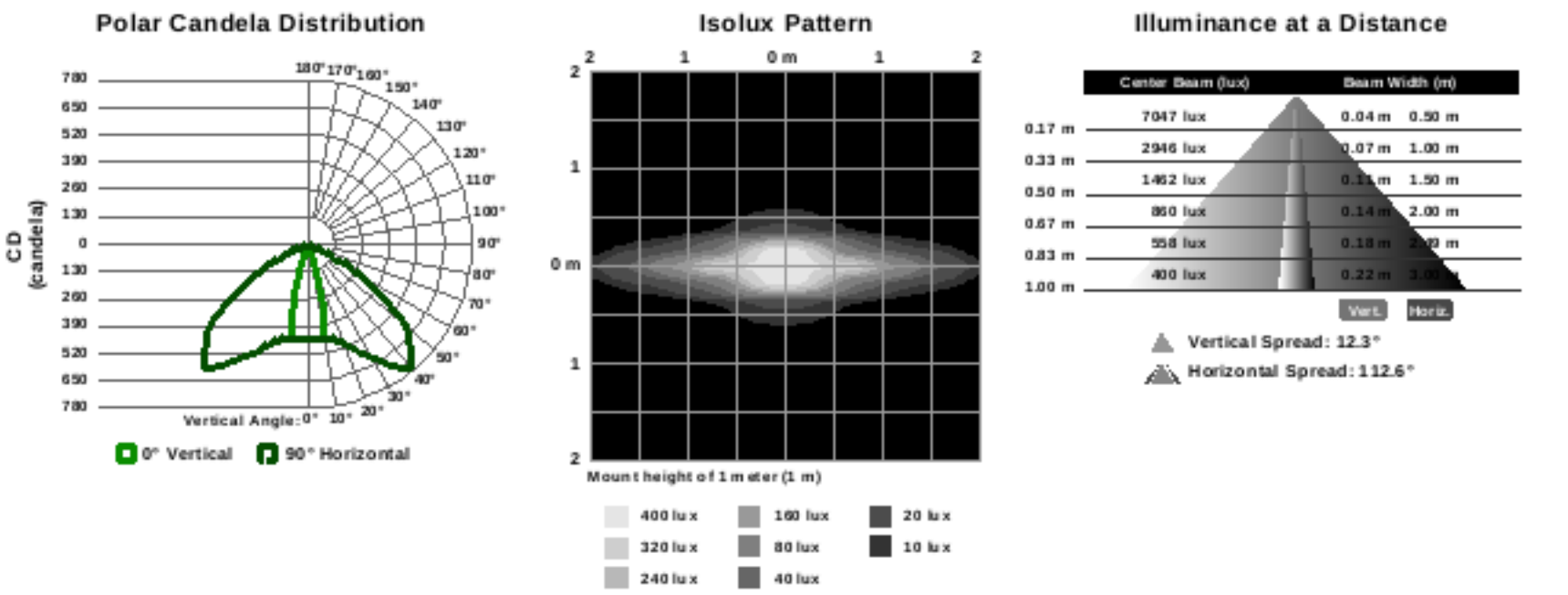


Figure 6. L25 Window



570 mm Models

Figure 7. Clear Window

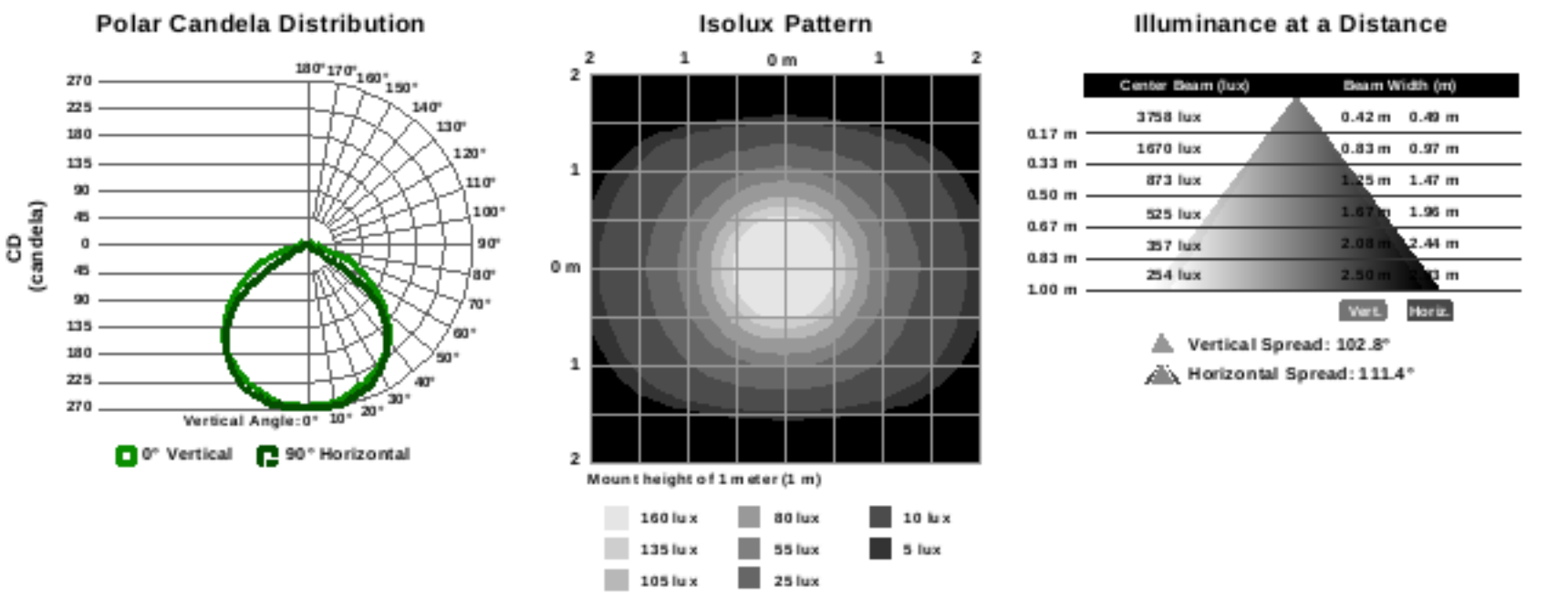
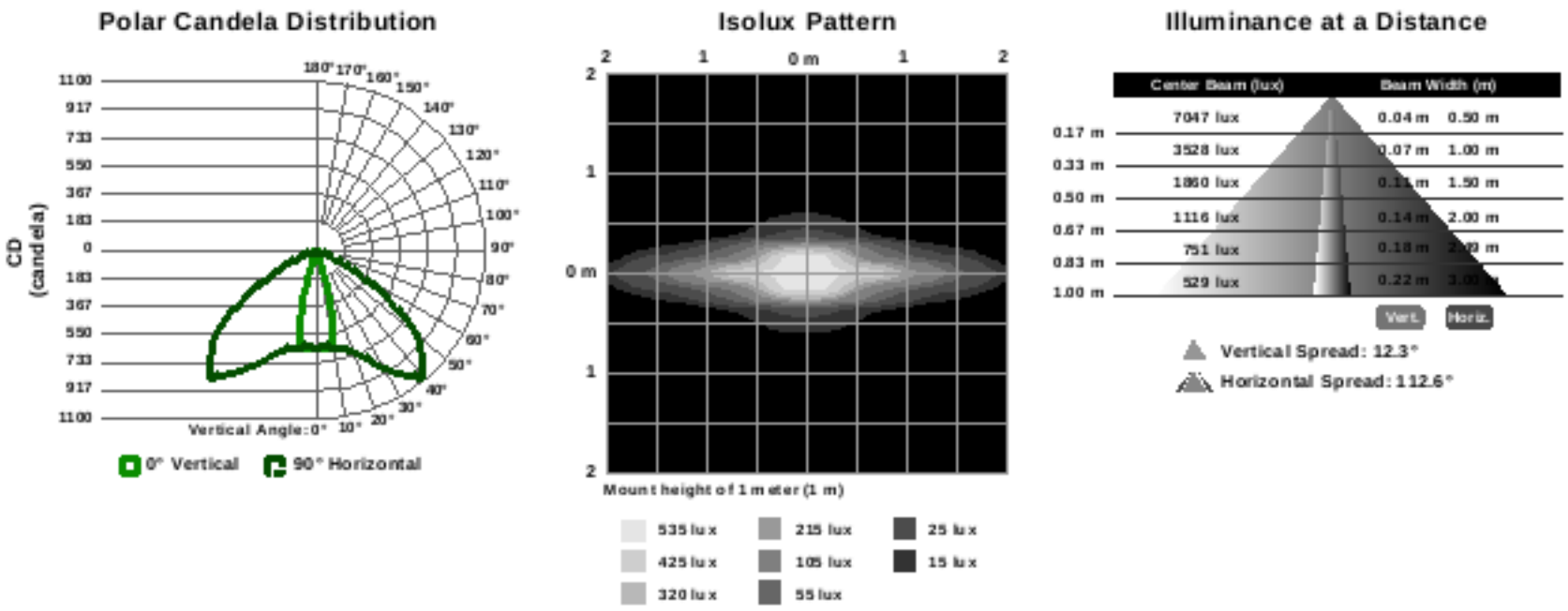


Figure 8. L25 Window



850 mm Models

Figure 9. Clear Window

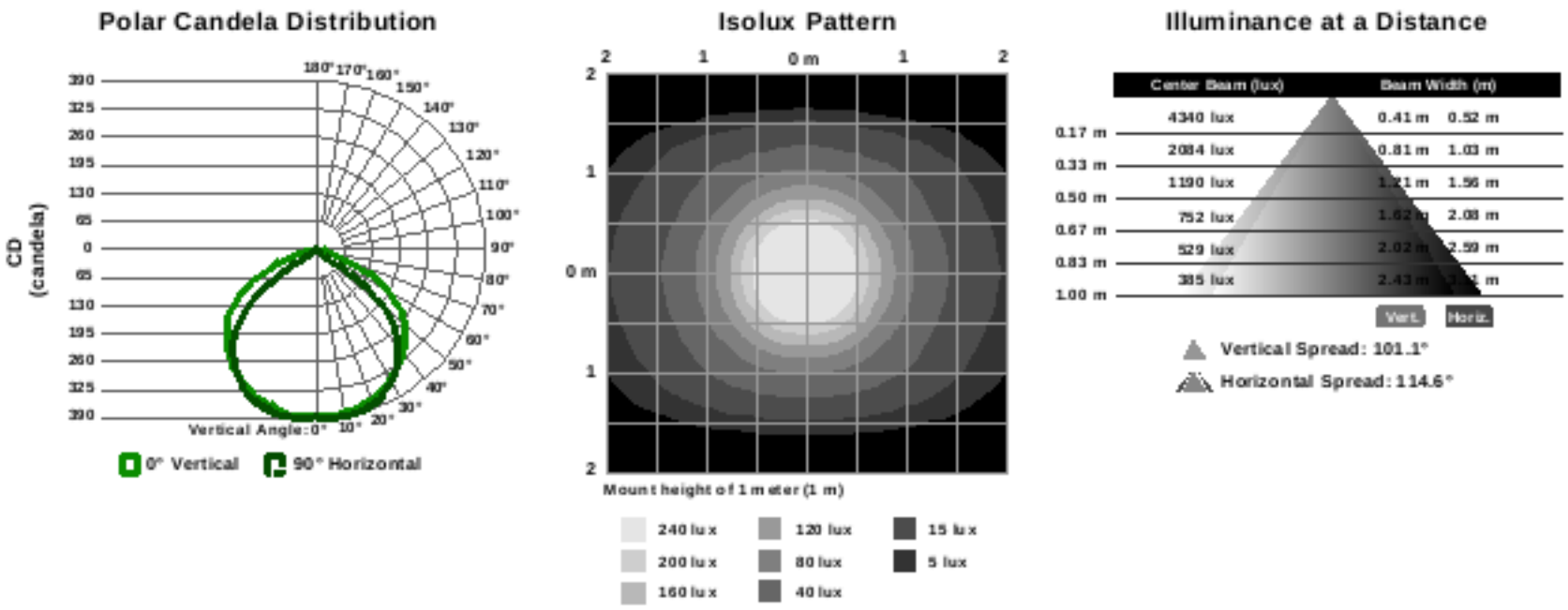
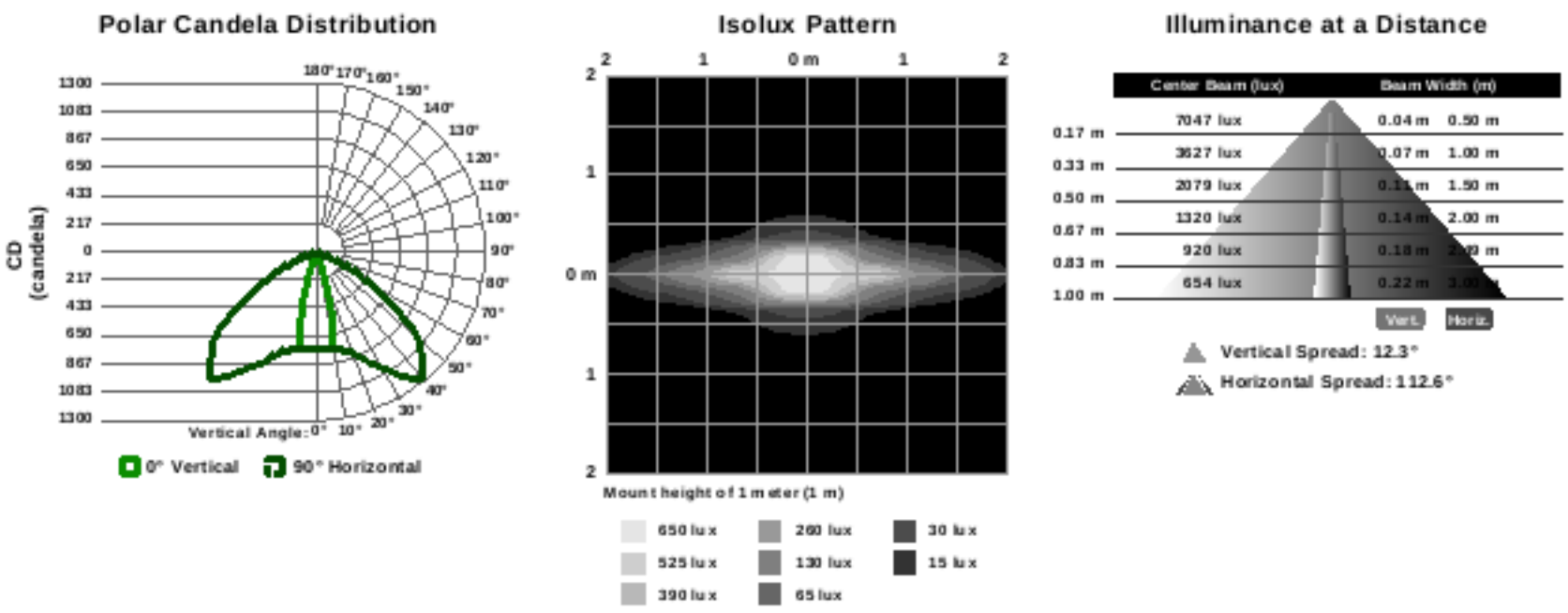


Figure 10. L25 Window



1130 mm Models

Figure 11. Clear Window

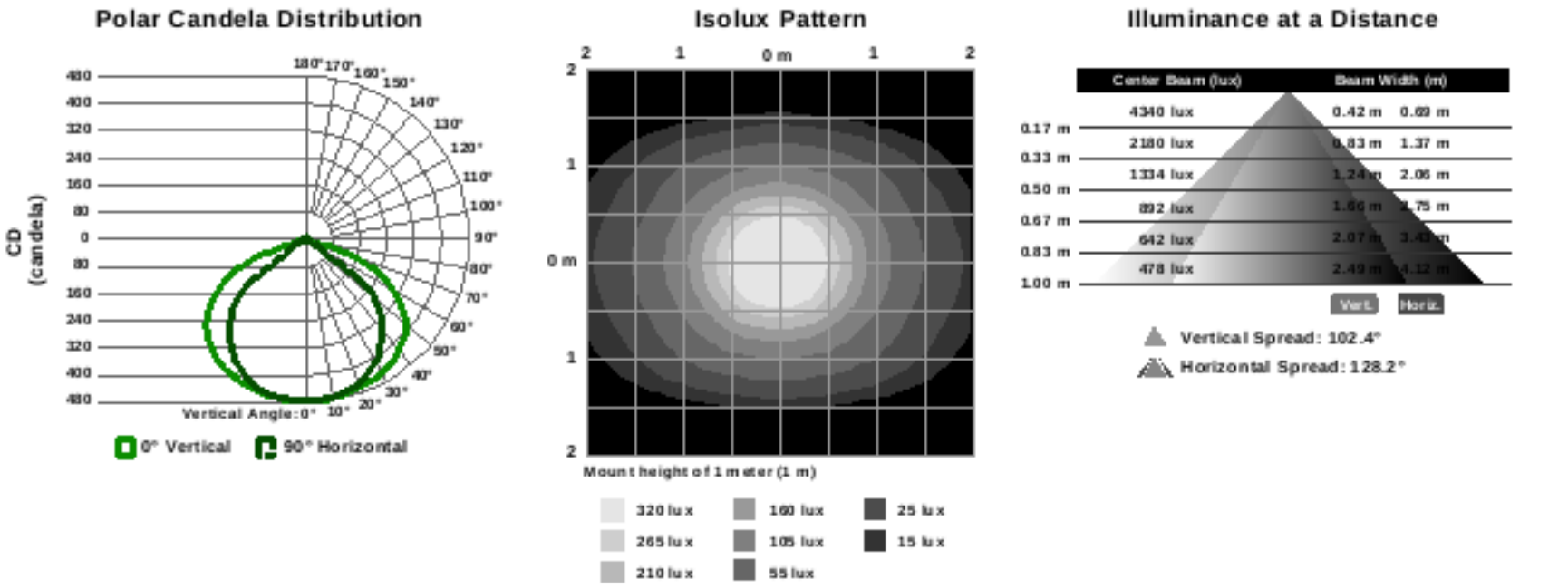
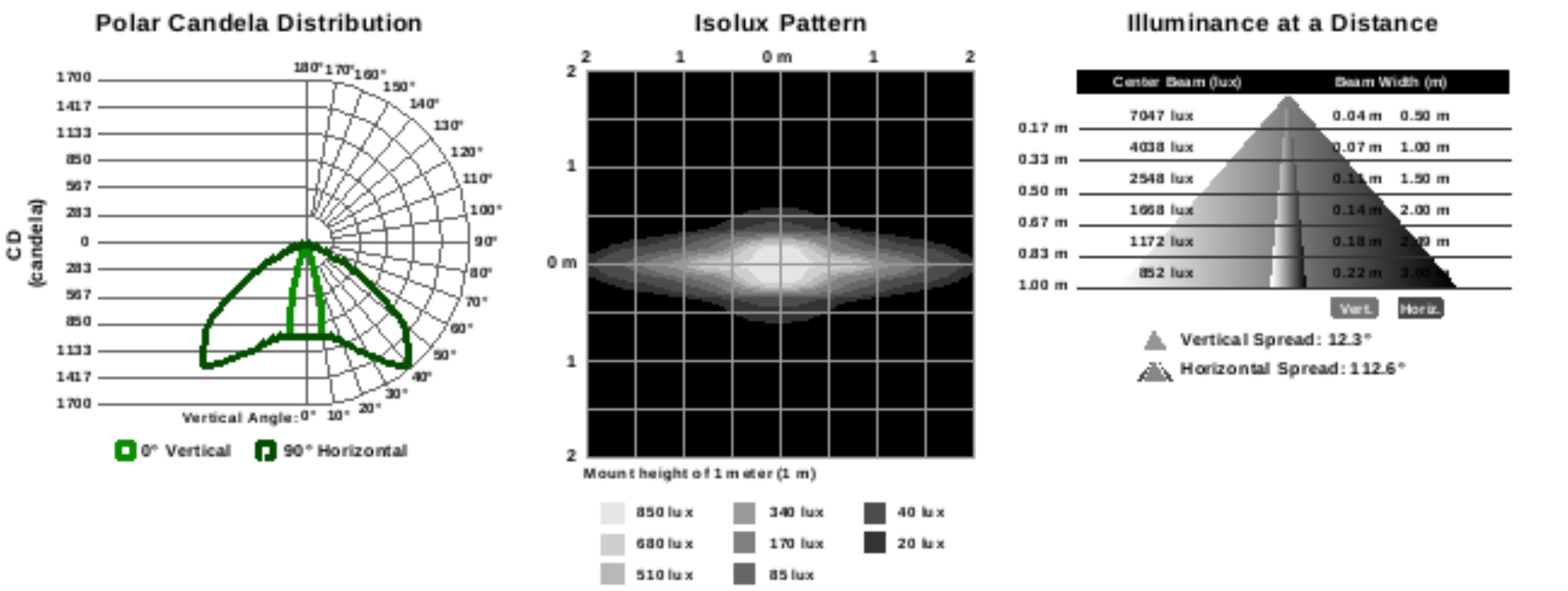


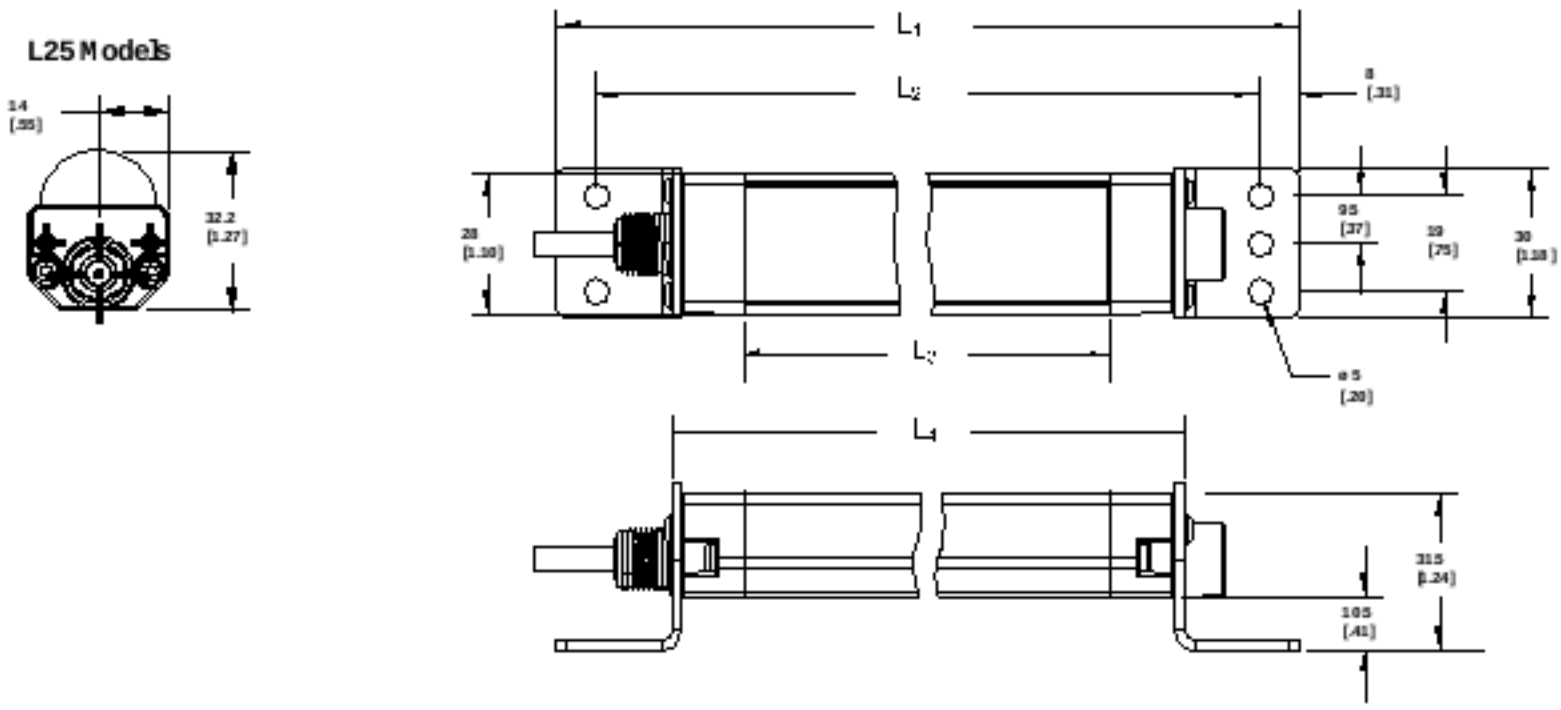
Figure 12. L25 Window



Dimensions

Dimensions are shown with the included SMBWLS28RA bracket.

L25 Models



Models	L1	L2	L3	L4
WLS28..145..	221 mm (8.7 in)	205 mm (8.1 in)	145 mm (5.71 in)	175 mm (6.9 in)
WLS28..285..	362 mm (14.3 in)	346 mm (13.6 in)	286 mm (11.26 in)	316 mm (12.4 in)
WLS28..430..	503 mm (19.8 in)	487 mm (19.2 in)	427 mm (16.81 in)	457 mm (18.0 in)
WLS28..570..	644 mm (25.4 in)	628 mm (24.7 in)	568 mm (22.36 in)	598 mm (23.5 in)
WLS28..850..	926 mm (36.5 in)	910 mm (35.8 in)	850 mm (33.46 in)	880 mm (34.6 in)
WLS28..1130..	1208 mm (47.6 in)	1192 mm (46.9 in)	1132 mm (44.57 in)	1162 mm (45.7 in)

Accessories

Cordsets

PRO-KIT

Includes:

- Pro Converter Cable (MQDC-506-USB)
- Splitter (CSB-M1251FM1251M)
- Power Supply (PSW-24-1)

MQDC-506-USB

- Pro Converter Cable
- 1.83 m (6 ft) M12/Euro-style quick disconnect to Device and USB to PC
- Required for connection to Pro Editor

CSB-M1251FM1251M

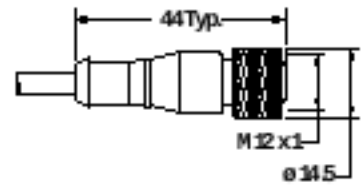
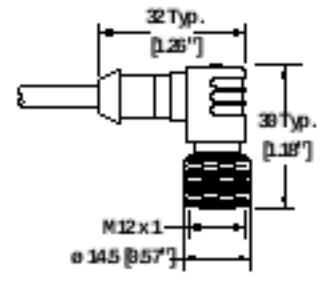
- 5-pin parallel Y splitter (Male-Male-Female)
- For full Pro Editor preview capability
- Requires external power supply, sold separately

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/ Euro-style connector output
- 4 A total current

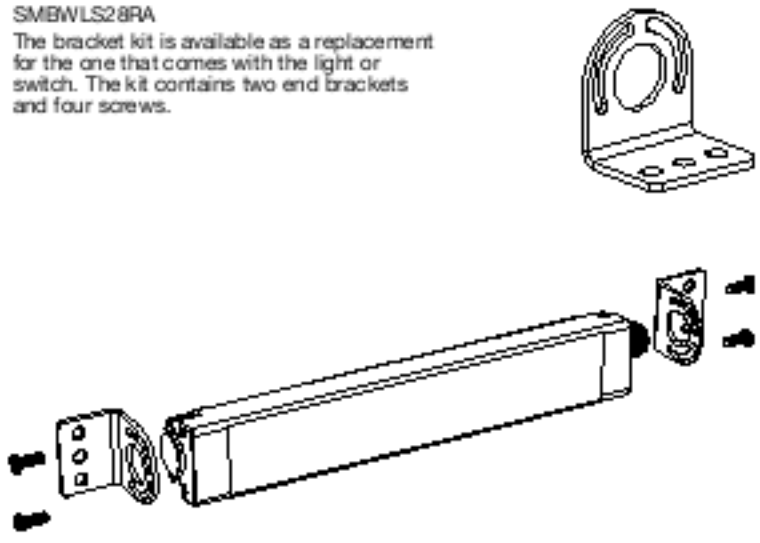
LC28PB2-3Q

- In-line switch with M12 connectors
- Rugged metal housing
- Perfect for dc-powered task lights, indicators, and tower lights
- Rated for up to 30 V dc

4-Pin Threaded M12 Cordsets—Single Ended				
Model	Length	Style	Dimensions	Pinout (Female)
MQDC-406	2 m (6.56 ft)	Straight		 1 = Brown 2 = White 3 = Blue 4 = Black
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)			

Brackets

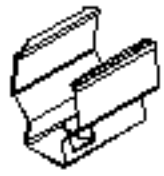
SMBWLS28RA
The bracket kit is available as a replacement for the one that comes with the light or switch. The kit contains two end brackets and four screws.

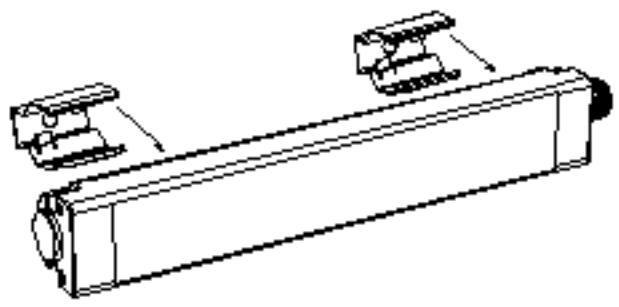


SMBWLS28SM
This kit allows the light or switch to be mounted at a right angle to the mounting surface. The kit contains two end brackets and four screws.

SMBWLS28SP

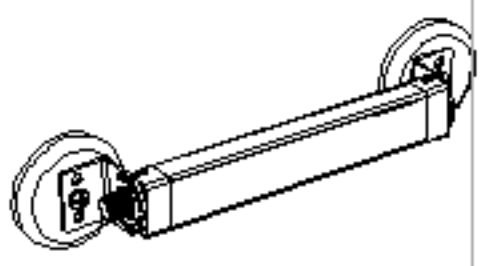
- Stainless steel snap bracket kit
- Includes two brackets





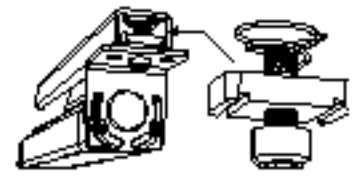
SMBWLSMAG
Magnetic mounting bracket for easy attachment to steel surfaces

SMBWLSMAGR
Protective cover also available to prevent scratches to painted surfaces



SMBH1316
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)



Banner Engineering Corp. Limited Warranty

Banner Engineering Corp. warrants its products to be free from defects in material and workmanship for one year following the date of shipment. Banner Engineering Corp. will repair or replace, free of charge, any product of its manufacture which, at the time it is returned to the factory, is found to have been defective during the warranty period. This warranty does not cover damage or liability for misuse, abuse, or the improper application or installation of the Banner product.

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FCC Part 15 and CAN ICES-3 (B)/NMB-3(B)

This device complies with part 15 of the FCC Rules and 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.

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 and CAN ICES-3 (B)/NMB-3(B). 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 manufacturer.

Mexican Importer

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