

## LS0 Lightbar Slim Linear

### PRODUCT DESCRIPTION

Ketra low-voltage, full-spectrum linear luminaires with a small profile.

### FEATURES

**High Def Palette**—covers a wide range of 16.7 million colors, including pastels, saturated colors and high CRI whites spanning from 1,400K to 10,000K.

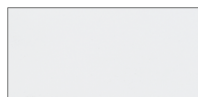
**Dynamic Spectrum**—precisely tunes the amount of energy across the visible spectrum to produce Natural Light, Natural Dimming and Vibrancy.

**TruBeam**—produces uniform color across any available beam angle.

**Color Lock**—maintains your desired color point at a one-step MacAdam Ellipse across all Ketra product families and over each product's lifetime.

**NOTE:** Compatible in HomeWorks 21.6 or greater (HomeWorks QSX) and Athena systems.

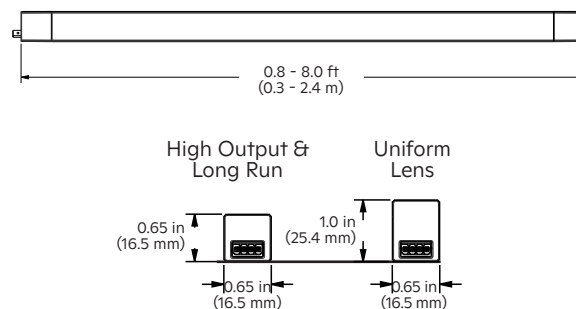
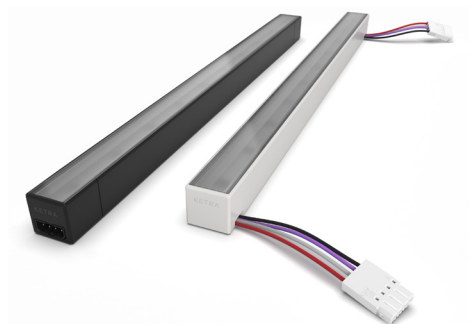
### Finish



Matte White



Matte Black



## SPECIFICATIONS<sup>1</sup>

### Optical Performance

<b>CRI (Ra)<sup>2</sup></b>	>90 (R9>90) from 2,700K to 5,000K
<b>Lumen Maintenance<sup>2</sup></b>	50,000 hours to L70 @ 25°C Ambient
<b>Color Point Maintenance<sup>2</sup></b>	One-step MacAdam Ellipse over product lifetime
<b>Color Point Range</b>	1400K - 10000K, Pastel and Saturated colors
<b>Dimming Range</b>	0.1-100%

### Environmental

<b>Ambient Temperature</b>	0 to 40 °C (32 to 104 °F) (operating temp)
<b>Storage Temperature</b>	-20 to 80 °C (-4 to 176 °F)
<b>Humidity</b>	0 - 95%, Non-condensing
<b>Certification</b>	UL, cUL, RoHS, FCC Class B, Title 24 [JA8], NOM
<b>Location</b>	UL Damp Location, IP20, not for use in outdoor applications

### Mechanical

<b>Mounting</b>	Product shall be mounted using a screw-in bracket. The bracket shall be screwed into the mounting surface, and the luminaire will snap onto it.
<b>Fixture Weight</b>	0.22 lbs/ft (0.33 kg/m)
<b>Housing Material</b>	Aluminum
<b>Lens Material</b>	UL F1 outdoor rating for UV and water contact PMMA

### Dimensions

<b>HW-LS0 Segment Length (Residential HomeWorks)</b>	Minimum length of 10.0 in (0.25 m) Maximum length of 8.0 ft (2.4 m)
<b>CM-LS0 Segment Length (Commercial Athena)</b>	Configurable lengths between max. length and min. length in 1.0 in (25.4 mm) increments
<b>Segment Width</b>	Only available in 1.0 ft (0.3 m), 2.0 ft (0.6 m), 4.0 ft (1.2 m), and 7.0 ft (2.1 m)
<b>Segment Height</b>	0.65 in (16.5 mm)
	0.65 in (16.5 mm) High Output & Long Run 1.0 in (25.4 mm) Uniform Lens

### Electrical

<b>Power Consumption</b>	Uniform Lens	5.45 W/ft
	High Output	5.45 W/ft
	Long Run	3.38 W/ft
<b>Voltage</b>	17-21 V=	
<b>Max number of segments per X96 power feed, regardless of length<sup>3</sup></b>	8 segments	
<b>Max length of segments per X96 power feed, regardless of the number of segments<sup>3</sup></b>	Uniform Lens	15.0 ft (4.6 m)
	High Output	15.0 ft (4.6 m)
	Long Run	24.0 ft (7.3 m)
<b>Emergency Lighting</b>	These models are designed for connection to X96 controllers which have been evaluated for use with LVS model LUT-SHUNT-A-TD in an emergency lighting system in accordance with the standards referenced in the test record	

<sup>1</sup> All performance measurements taken with fixture stabilized at 25° C (77 °F) ambient, 100% power input, unless otherwise stated, within CCT range of 2700 - 5000 K.

<sup>2</sup> Lumen maintenance values calculated in accordance to TM-21 procedures based on LM-80 compliant measurement data.

<sup>3</sup> High Output and Long Run configured segments should not be mixed with Uniform Lens segments on the same run.

## RESIDENTIAL ORDERING GUIDE

Please download this PDF to use the full functionality of the ordering guide. HW-LS0 can only be used with HW-X96-X-J2.

Order code: \_\_\_\_\_

HW-		LS0			N	
Product Line		Model	Lens	Finish	Fixture Length	
Product Line		Code	Finish	Code	Custom Ordering Option <sup>4</sup>	
Residential (HomeWorks compatible)		HW-	White	WH	- Also available to custom order in 1 in (25.4 mm) increments with straight and flexible connectors - Minimum Length 10 in (254 mm) - Maximum Length 96 in (2438 mm)	
			Black	BL		
Lens			Fixture Length			
Style	Lm/ft		Custom to the inch	N		Endcap
Uniform Lens <sup>1</sup>	250	UL250			- Straight connectors for end-to-end connections - Flexible connectors for corner or angled connections - End connector cover to terminate the last product	
High Output <sup>2</sup>	350	HO350				
Long Run <sup>2</sup>	200	LR200				

## COMMERCIAL ORDERING GUIDE

Please download this PDF to use the full functionality of the ordering guide. CM-LS0 can only be used with CM-X96-X-J2.

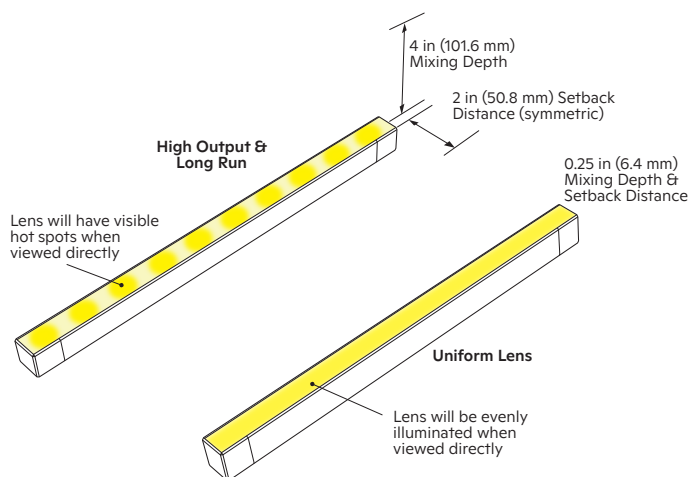
Order code: \_\_\_\_\_

CM-		LS0			
Product Line		Model	Lens	Finish	Fixture Length
Product Line		Code	Finish	Code	Endcap
Commercial (Athena compatible)		CM-	White	WH	<div>- Straight connectors for end-to-end connections</div> <div>- End connector cover to terminate the last product</div>
			Black	BL	
Lens			Fixture Length		
Style	Lm/ft				
Uniform Lens <sup>1</sup>	250	UL250	12.0 in (304.8 mm) segment	12	
			24.0 in (609.6 mm) segment	24	
High Output <sup>2</sup>	350	HO350	48.0 in (1219.2 mm) segment	48	
Long Run <sup>2</sup>	200	LR200	84.0 in (2133.6 mm) segment	84	

<sup>1</sup> Use Uniform Lens style for illuminating reflective surfaces (e.g., polished granite) and line of direct sight applications.

<sup>2</sup> Use Long Run or High Output style for applications where the light is hidden from view is acceptable.

## LUMINAIRE OPTIONS



UNIFORM LENS	
Width x Height	0.65 × 1.0 in (16.5 × 25.4 mm)
Lumen Output <sup>1</sup>	250 lm/ft
Delivered Output (Light Transmission)	45 lm/W
Power Consumption	5.45 W/ft
Maximum Run Length per X96 Controller	15.0 ft (4.6 m)

HIGH OUTPUT	
Width x Height	0.65 × 0.65 in (16.5 × 16.5 mm)
Lumen Output <sup>1</sup>	350 lm/ft
Delivered Output (Light Transmission)	64 lm/W
Power Consumption	5.45 W/ft
Maximum Run Length per X96 Controller	15.0 ft (4.6 m)

LONG RUN	
Width x Height	0.65 × 0.65 in (16.5 × 16.5 mm)
Lumen Output <sup>1</sup>	200 lm/ft
Delivered Output (Light Transmission)	59 lm/W
Power Consumption	3.38 W/ft
Maximum Run Length per X96 Controller	24.0 ft (7.3 m)

## ACCESSORIES

4-conductor cable to connect runs that are greater than a foot apart. Power conductors must be 16 AWG (1.5 mm<sup>2</sup>)

Athena Controller & Power Supply

Residential HomeWorks Controller & Power Supply

LSO Adapter Pair (includes 1 Type A Adapter + 1 Type B Adapter) available in black finish only <sup>3</sup>

4-Conductor Cable, non-plenum rated

4-Conductor Cable, plenum rated

**QSH-CBLP-M-500, QSH-CBL-M-500**  
Total max. cable length 50 ft (15.24 m)

**CM-X96-X-J2**<sup>2</sup>

**HW-X96-X-J2**<sup>2</sup>

**UN-LSO-ADPT-1**

**QSH-CBL-M-500**

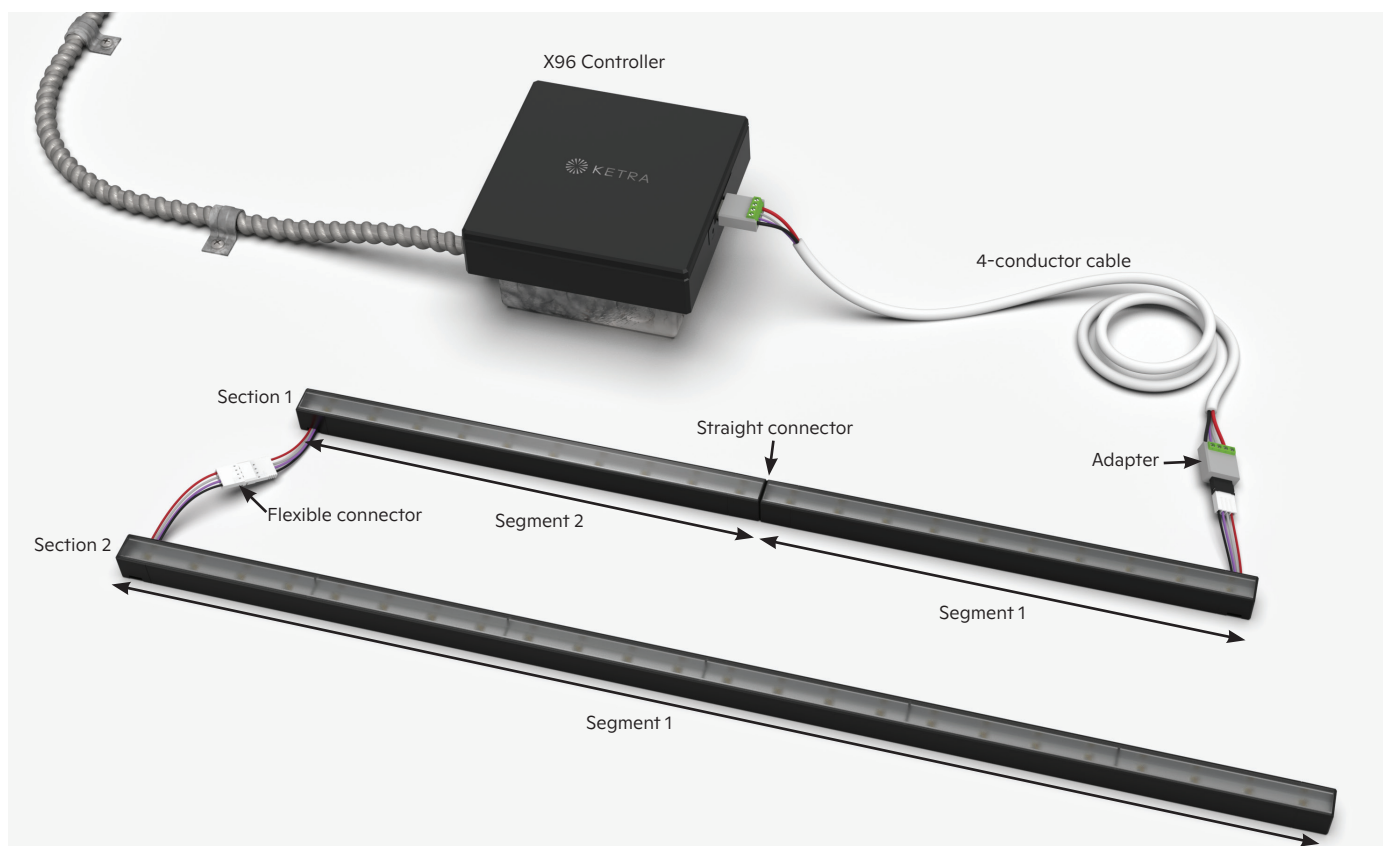
**QSH-CBLP-M-500**

<sup>1</sup> Lumen measurement complies with IES LM-79-08 testing procedures.

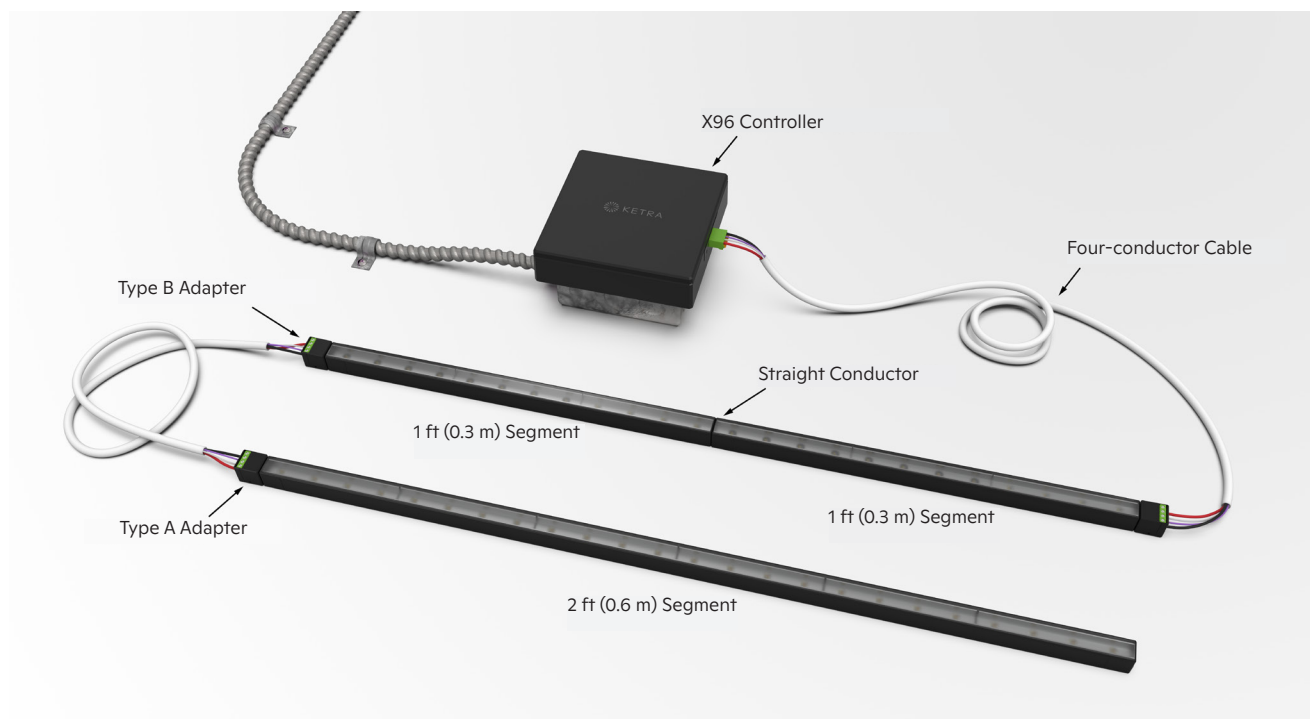
<sup>2</sup> X96-X-J2 is the second generation X96 Controller and compatible with all LSO Lightbar Slim High Output and Long Run configurations, and required for Uniform Lens configurations.

<sup>3</sup> HW-X96-X-J2 is delivered with one Type A Adapter to connect to first LSO luminaire. For luminaires farther than two flex connections (12 in [25.4 mm]) apart, UN-LSO-ADPT-1 must be ordered so that the wire can be routed between the luminaires. Each CM-LSO ships with (1) UN-LS-ADPT-1.

## EXAMPLE RESIDENTIAL HOMEWORKS DIAGRAM



## EXAMPLE COMMERCIAL ATHENA DIAGRAM

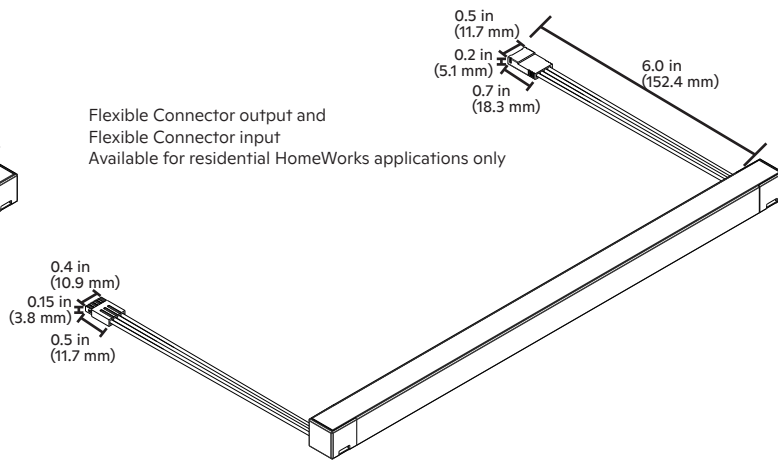
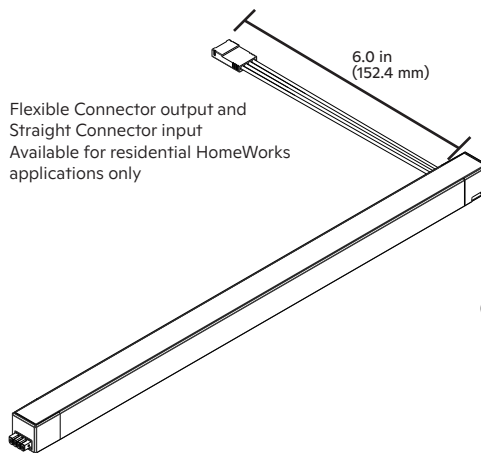
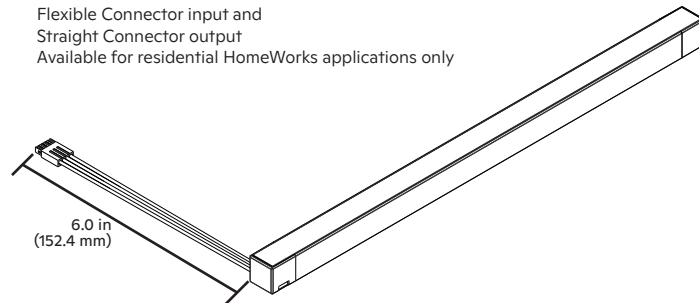
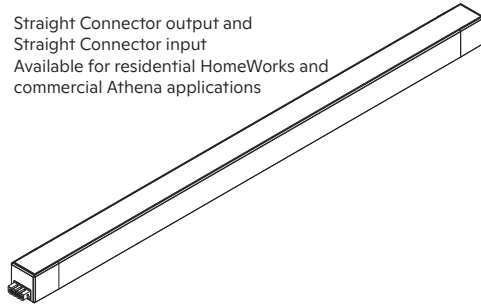


**Note:** Each CM-LSO segment is shipped with UN-LSO-ADPT-1 adapter pair.

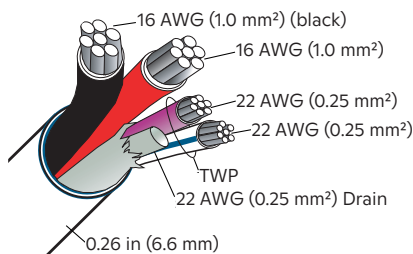
## ACCESSORIES (cont.)

### END CAP CONFIGURATIONS

Flexible connector length is 6 in (152.4 mm) long



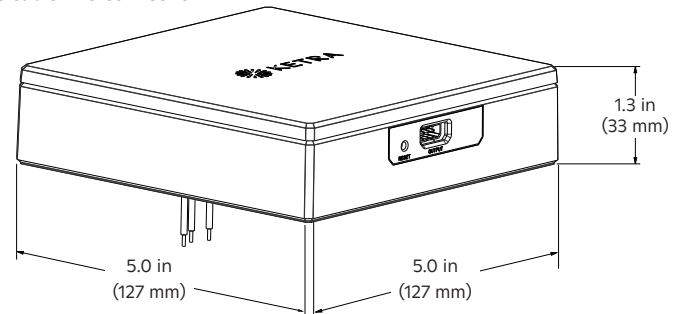
### CABLE QSH-CBL-M-500



- Four conductors:
  - Common – 16 AWG (1.5 mm²)
  - Power – 16 AWG (1.5 mm²)
  - MUX Data – 22 AWG (0.5 mm²)
  - MUX Data – 22 AWG (0.5 mm²)
- Total outer jacket diameter: 0.26 in (6.6 mm)
- Another 4-conductor cable with similar specification can be used
- For complete cable specifications, see P/N 369597 at [www.lutron.com](http://www.lutron.com)
- For plenum applications, QSH-CBLP-M-500 can be used (see P/N 369596 at [www.lutron.com](http://www.lutron.com)). Due to decreased wire gauge of the power conductors in this cable, total maximum cable length is 30 ft (9.1 m)

### CONTROLLER & POWER SUPPLY

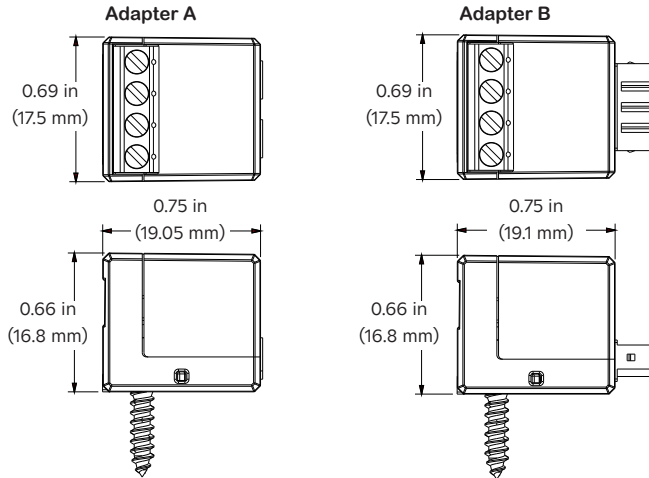
CM-X96-X-J2 & HW-X96-X-J2 (see controller datasheet)  
HW-X96-X-J2 ships with one (1) Type A Adapter for first luminaire to cable interconnection



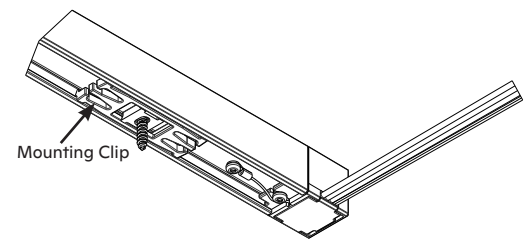
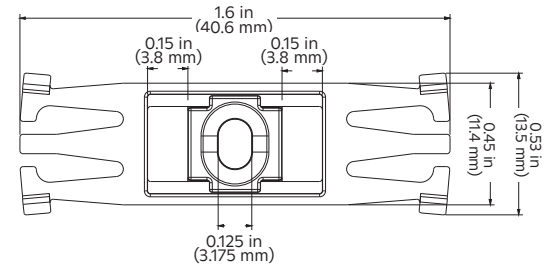
**Important Note:** The X96 (Ketra wireless controller) and the N3 satellite are not interchangeable. The N3 satellite cannot be used with an LS0, and an X96 cannot be used with a G2, L3I or L4R.

## PRODUCT DIMENSIONS

### UN-LSO-ADPT-1 ADAPTER PAIRS (AVAILABLE IN BLACK FINISH ONLY)

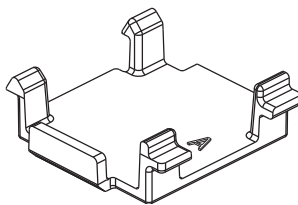


### FLAT MOUNTING CLIP

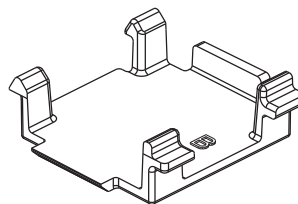


Bottom View of Flex Connector

### RIGHT-ANGLE END COVERS

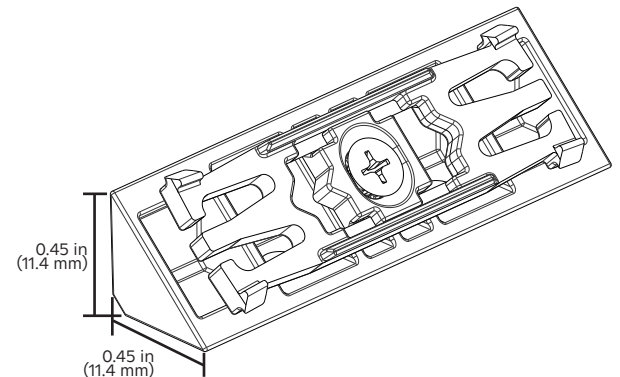
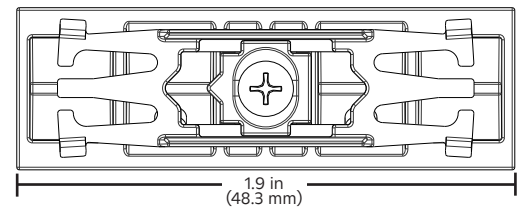


Type A



Type B

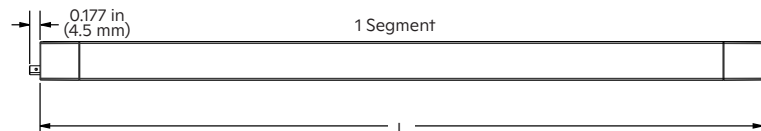
### FIXED 45° ANGLE-MOUNTING BRACKETS



**NOTE:** Flat mounting clips are provided with each LSO. Angle-mount bracket must be selected at ordering.

## PRODUCT DIMENSIONS (cont.)

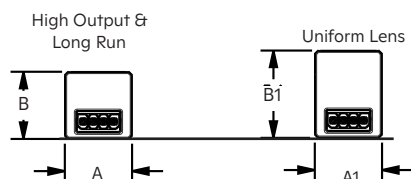
### LIGHTBAR SLIM LINEAR



Side View (Luminaire Only)

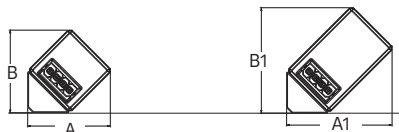
Example Fixture Length	L
in (mm)	
10 (254)	10.0 (254)
24 (610)	24.0 (610)
96 (2438)	96.0 (2438)

#### Flat Mounting



Straight Connector View

#### 45° Angle Mounting

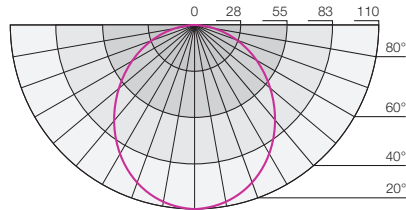


Mounting Method	High Output & Long Run		Uniform Lens	
	A	B	A1	B1
in (mm)				
Flat Mounting	0.65 (16.51)	0.65 (16.51)	0.65 (16.51)	1.00 (25.40)
Fixed 45° Angle Mounting	0.90 (22.86)	0.90 (22.86)	1.15 (29.21)	1.15 (29.21)



## PHOTOMETRIC DATA<sup>1</sup>

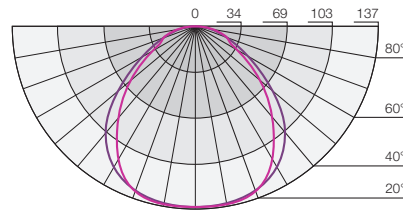
### UNIFORM LENS



— 0-180° (Parallel to fixture)  
— 90-270° (Perpendicular to fixture)

Foot-candles		Beam Dia.
448	0.5 ft	1.30 ft
112	1 ft	2.60 ft
28	2 ft	5.22 ft
12	3 ft	7.81 ft
7	4 ft	10.43 ft
Distance From Light		

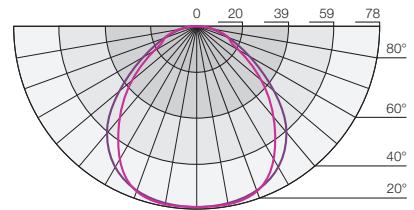
### HIGH OUTPUT



— 0-180° (Parallel to fixture)  
— 90-270° (Perpendicular to fixture)

Foot-candles		Beam Dia.
548	0.5 ft	1.09 ft   1.30 ft
137	1 ft	2.18 ft   2.60 ft
34	2 ft	4.36 ft   5.22 ft
15	3 ft	6.56 ft   7.81 ft
9	4 ft	8.73 ft   10.43 ft
Distance From Light		

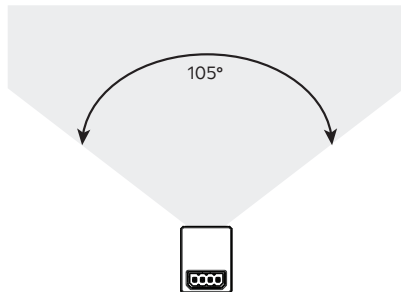
### LONG RUN



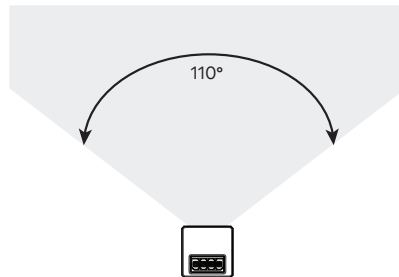
— 0-180° (Parallel to fixture)  
— 90-270° (Perpendicular to fixture)

Foot-candles		Beam Dia.
312	0.5 ft	1.09 ft   1.30 ft
78	1 ft	2.18 ft   2.60 ft
20	2 ft	4.36 ft   5.22 ft
9	3 ft	6.56 ft   7.81 ft
5	4 ft	8.73 ft   10.43 ft
Distance From Light		

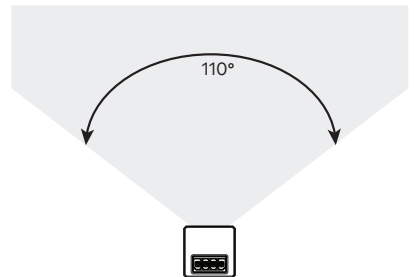
### UNIFORM LENS BEAM ANGLE 105° X 105°



### HIGH OUTPUT BEAM ANGLE 110° X 100°

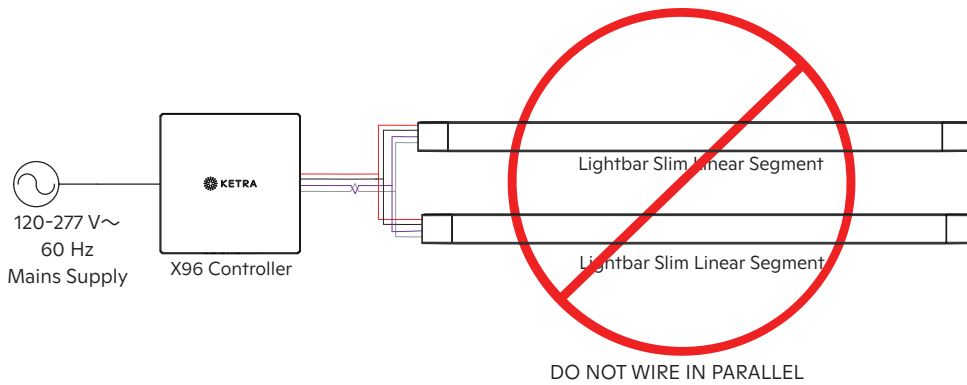
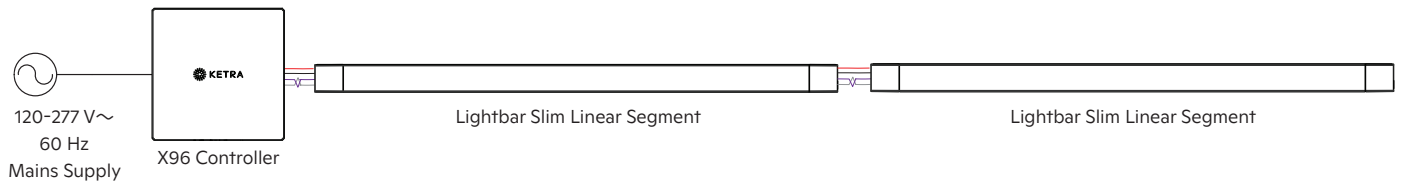


### LONG RUN BEAM ANGLE 110° X 100°

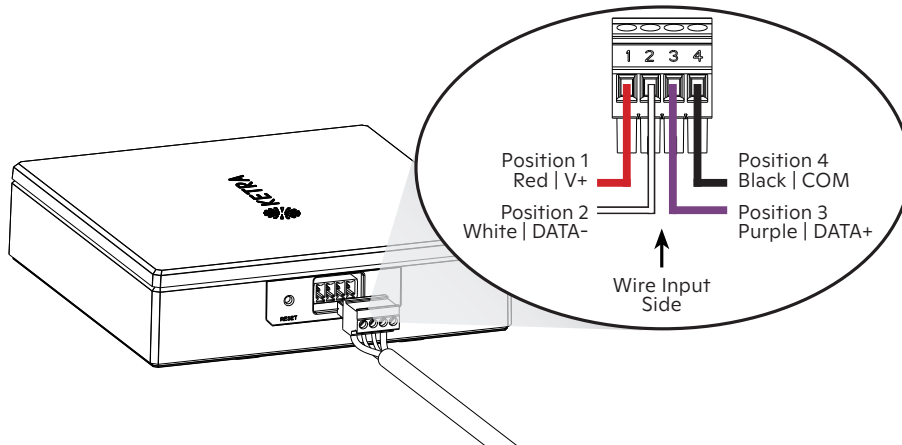


<sup>1</sup> All performance measurements taken with fixture stabilized at 25° C (77 °F) ambient, 100% power input, unless otherwise stated, within CCT range of 2700 - 5000 K.

## WIRING DIAGRAMS



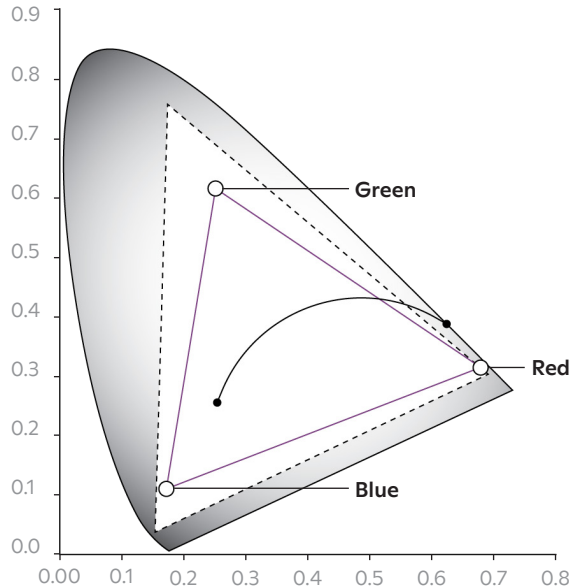
## CONNECTIONS



Note: Only accepts up to 16 AWG (1.5 mm<sup>2</sup>). 16 AWG (1.5 mm<sup>2</sup>) power conductors required for wire run length of 50 ft (15.2 m).

## WIDE GAMUT

### CIE 1931 Color Chart



Ketra's Lightbar Slim Linear can easily be commissioned into Lutron HomeWorks or Athena systems. The product can reproduce any color point within the triangle shaped gamut indicated in the chart to the left. With Ketra's Color Lock technology, the color point is maintained to an accuracy of one-step MacAdam Ellipse over the lifetime warranty of the product and across operating temperature range.

- **Color Lock**—Color point is maintained to an accuracy of one-step MacAdam Ellipse over the lifetime warranty of the product and across operating temperature range.
- **Expanded Gamut**—Color calibration is relaxed such that each product produces the most saturated color it is capable of.

## LSO General Specifications

**Color Point Maintenance:** Employs closed loop optical and thermal feedback capable of maintaining color point accuracy at a one-step MacAdam ellipse over product lifetime.

**Wireless Capability:** LSO communicates via a wired protocol to X96 controller. X96 controller shall have an integrated wireless control on board.

**Color Rendering Index (CRI):** Capable of CRI greater than 90 at any point along the Black Body Curve from 2,700K to 5,000K.

**Single Source Multi-Dye Modular Emitter/LED Module Design:** Employ a single source multi-dye modular emitter/LED module consisting of both monochromatic and phosphor converted blue LED dye.

**LED Estimated Useful Life:** Minimum of 50,000 hours at 70 percent lumen maintenance, calculated based on IES LM-80 test data.

**Warranty:** Ketra's light source is warrantied to be free from material defects in material and workmanship for five ( 5 ) years or 25,000 hours from date of shipment, whichever is less.

### Lighting System Capable of the Following Dynamic Functionality:

1. Automatically mimicking natural daylight by shifting Correlated Color Temperature (CCT) and intensity based on time-of-day.
2. Shifting from high CCT at high intensity to low CCT at low intensity, mimicking dimming curve of an incandescent lamp.
3. Changing intensity while maintaining full color spectrum or CCT.
4. Changing full color spectrum or CCT while maintaining intensity.

**Spectral Power Distribution Manipulation:** Light system capable of manipulating the Spectral Power Distribution (SPD) by automatically adjusting distributions of color intensity, also known as vibrancy, while maintaining the same Correlated Color Temperature (CCT).

**Dimming Range:** Dimmable from 100 to 0.1 percent measured luminous flux.

**Color Point Range:** Single light source capable of producing 16.7 million colors and whites from 1,400K to 10,000K Correlated Color Temperature (CCT).