Lighting Services Inc

Integrating Control Simplicity

American Alliance of Museums

AAM MuseumExpo 2023
Denver, CO   May 19 - 20

Integrating Control Simplicity

Thank you for visiting us at the AAM MuseumExpo 2023. We believe that being good stewards of our planet includes not using paper or creating waste, so we've eliminated printed literature.

The following pages feature Lighting Services Inc's new product introductions demonstrated at AAM MuseumExpo 2023.

A Commitment to Excellence

Lighting Services Inc (LSI) is the premier manufacturer of Track, Accent, and Display lighting systems. Since 1958, LSI has been dedicated to designing, engineering, and manufacturing the highest quality lighting systems.

During the last sixty-five years, Lighting Services Inc has been part of an extraordinary revolution in architectural lighting - not just in the technical aspects of the industry, but also in the expectations of people all over the world who experience the positive effects that exceptional lighting delivers.

Our reputation for creativity, innovative design, and leading technology, coupled with specification grade products and intelligent personalized service, has made us the manufacturer of choice among the most discriminating specifiers of lighting. It is the appreciation, respect, and continued support of our clients that we use to measure our success.

Our commitment for the future is to support the museum community, and the global markets that we touch. With the development of new technologies and sustainable manufacturing processes, we continue to reduce our impact on the environment, while at the same time, increasing the availability of high quality lighting solutions. We will also continue to support our allied industry partners including the American Alliance of Museums (AAM), and the Illuminating Engineering Society's Museum and Art Gallery Committees (IESNA) to foster awareness of excellence in museum lighting.

LP230 and LP260 Series

The LP230 and LP260 fixtures are integrated with powerful 4 degree COB sources for clean, unsurpassed optical performance up to 70,000 CBCP.

Quick Notes:
- LP230: 4° Optic produces 70,000 CBCP with 810 lumens up to 13 watts. Delivered lumens up to 370

  LP260: 4° Optic produces 26,000 CBCP with 270 lumens up to 4 watts. Delivered lumens up to 116

- Controls / dimming options: ELV, 0-10V, DMX, or Integral dimmer

- Accessory cartridge for any double combination of LSI filters and accessories

- Optional Cross Baffle eliminates frontal spill light and glare when used with spread gels

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Recipient of 2023 ADEX Platinum Award

**LP230 SERIES MORE INFO HERE ›› **   **LP260 SERIES MORE INFO HERE ›› **

INLine Linear

INLine Linear is a luminous track section available in 2 or 4 ft lengths, for seamless integration with any LSI CONTROLTrack or POWERTrack run, providing diffuse, wide angle light distribution.

Quick Notes:
- Uniform, diffuse 90° distribution of light

- Controls / dimming options: ELV, 0-10V, or DMX

- Patented 20 amp line voltage pass through eliminates extra feed points for a clean, seamless appearance

- Available with flat or curved optic

- System efficiency up to 105 lumens/watt, up to 48 watts

- Recipient of 2022 ADEX Platinum Award

**INLINE LINEAR MORE INFO HERE ›› **

LZ ZOOM Series

The LZ ZOOM is a compact, stemmed spotlight designed with zoom functionality enabling a broad range of distributions from a 5 degree narrow spot to a 50 degree flood with clean, uniform beam control.

Quick Notes:

- Adjustable 5° narrow spot - 50° flood optic produces up to 25,000 CBCP with 1,856 lumens up to 19 watts. Delivered lumens up to 830

- Controls / dimming options: ELV, TRIAC, 0-10V, DMX, or Integral dimmer

- Removable accessory cartridge for any combination of (2) size-ZM LSI accessories

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Recipient of 2020 ADEX Platinum Award

**LZ ZOOM SERIES
MORE INFO HERE** »

BPM Image Projector

At 12" in length, the BPM Series is the brightest image projector in its class with uncompromising optical projection quality.

Quick Notes:

- Locking zoom lens produces smooth, continuous change of beam size: 20° through 60°. Delivers up to 15,000 CBCP up to 19 watts

- Controls / dimming options: ELV, TRIAC, 0-10V, DMX, or Integral dimmer

- Integral drop-in accessory holder accepts industry standard size "E" Gobos, custom projection patterns and dichroic color filters

- Four cool-touch framing shutters on 3 planes for creating unlimited variations of geometric shapes, including true triangles

- Spring loaded front accessory holder for gel media

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Recipient of 2022 ADEX Platinum Award
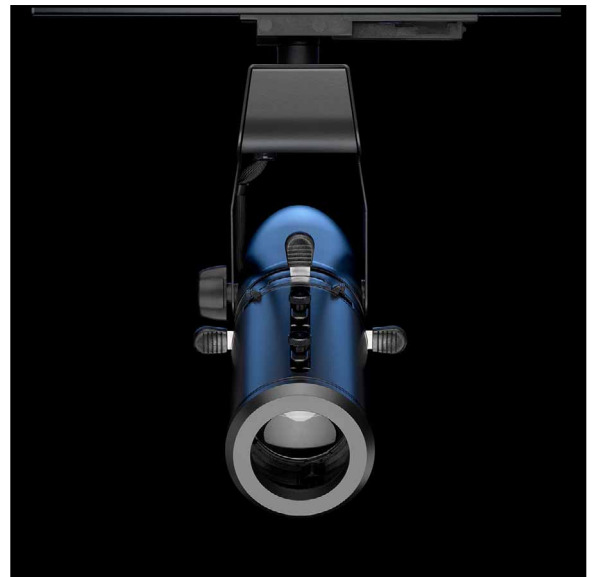
**BPM SERIES
MORE INFO HERE** »

LumeLEX Cylinder Series

The LumeLEX Cylinder Series are high performance, clean, elegant stem mounted fixtures with versatile optical capabilities for the most demanding applications of museum lighting.

Quick Notes:

- Designed for accent or general distribution applications, in static or tunable white and dim to warm color temperatures

- Controls / dimming options: ELV, 0-10V, DMX, or Integral dimmer

- Variety of optic choices from 4° to 62°

- Accessory holder accepts LSI filters and accessories

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Recipient of 2022 ADEX Platinum Award

CYLINDER SERIES MORE INFO HERE »

LX2044 Series

The LumeLEX 2044 Series is a high performance, clean, elegant stem mounted fixture with versatile optical capabilities for the most demanding applications of museum accent lighting.

Quick Notes:

- Designed for accent or general distribution applications, in static or tunable white and dim to warm color temperatures

- Controls / Dimming options: ELV, 0-10V, DMX, or Integral dimmer

- 20° Optic produces 8800 CBCP with 2700 lumens up to 28 watts, delivered lumens up to 2200

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Accessory holder accepts up to two size-AA LSI filters and accessories

- Recipient of 2022 ADEX Platinum Award

LX2044 SERIES MORE INFO HERE »

LPW8 Wall Wash Series

The LPW8 Series is an elegant, stem mounted wall wash fixture powered by COB technology.   Utilizing an asymmetric TIR optic, the LPW8 produces 2,725 lumens (38 watts) of seamless, even light for the most demanding applications of museum lighting.

Quick Notes:
- Asymmetric optic produces a wide flat field with 2,725 lumens up to 38 watts. Delivered lumens up to 1194

- Controls / dimming options: ELV, 0-10V, DMX or Integral dimmer

- Dark, quiet side walls help focus distribution, eliminate spill light

- Internal accessory clips accept LSI gels

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- Recipient of 2016 ADEX Platinum Award

LPW8 SERIES MORE INFO HERE »

LP1 & LP2 Series

The LP1 and LP2 SuperSPOT Series are powerful, tightly focused fixtures, specifically designed for long throw applications, to replace PAR lamps. These efficient fixtures produce a 4 degree beam with 97,776 CBCP and 195,000 CBCP respectively, which rivals the most powerful sealed beam technology. Also available with 12 and 25 degree beam spreads for maximum versatility.

Quick Notes:
- LP1: 4° optic produces 97,776 CBCP with 1,090 lumens up to 17 watts. Delivered lumens up to 727

  LP2: 4° optic produces 195,000 CBCP with 2,180 lumen up to 34 watts. Delivered lumens up to 1453.

- Controls/ dimming options: ELV, 0-10V, Lutron, DMX, Integral dimmer, TRIAC (LP1 only) available

- Internal multiple accessory clips accept LSI gels and accessories

- All modules are replaceable with LSI's Sustainable Upgrade Program (SUP kit)

- TM-30 available

- Recipient of 2016 ADEX Platinum Award
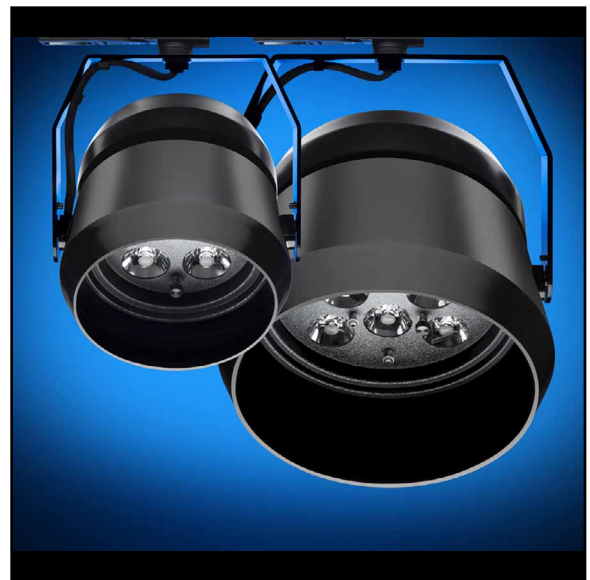
LP1 & LP2 SERIES MORE INFO HERE »

CONTROLTrack FAQ

SURFACE CONTROLTRACK INFO »   **RECESSED CONTROLTRACK INFO** »

1. **What protocols does CONTROLTrack support?**
   LSI currently supports 0-10V and DMX. Other protocols that can be transmitted over two or three conductors are also feasible as a custom option.

2. **Will my non-CONTROLTrack fixtures work with CONTROLTrack?**
   LE (Leading Edge) and TE (Trailing Edge) fixtures can be used on CONTROLTrack but will be "Switched" only, meaning that when CONTROLTrack has power, and the fixture power switch is ON, the fixture will illuminate to full brightness. The ONLY way to turn these fixtures OFF to turn the power switch OFF or to turn power off to the CONTROLTrack.

   ED (Integral Dimming) fixtures can be used on CONTROLTrack and can be dimmed locally at the fixture as they are with other types of LSI track.

3. **Can I intermingle 2-circuit POWERTrack with CONTROLTrack?**
   Please consult the factory before attempting to intermingle POWERTrack and CONTROLTrack.

4. **Can I intermingle protocols on CONTROLTrack?**
   It is possible to intermingle protocols by switching the control type at End Feeds, X, T, L or Straight Joiners, however, each section of track can only be ONE protocol at a time.

5. **Can the Gemini System incorporate CONTROLTrack?**
   Yes, the track in the Gemini System can be CONTROLTrack.

6. **Is there recessed CONTROLTrack?**
   Yes, recessed flangeless CONTROLTrack is available. Applications requiring recessed FLANGED track will require the use of a flanged recessed housing with Surface CONTROLTrack integrated into it.

7. **Can you use Dim to Warm on CONTROLTrack?**
   Yes, Dim to Warm fixtures can be used with CONTROLTrack using 0-10V. Tunable White fixtures specified as DMX can also act as a Dim to Warm option but will require specific programming to achieve this function. Programming is by-others.

8. **Can CONTROLTrack be vertically (wall) mounted?**
   Yes.

9. **Can I dim the track with phase dimming in addition to existing controls?**
   No, CONTROLTrack MUST be powered by switched power (Breaker or Relay ONLY). Powering CONTROLTrack via a dimmer of any kind (Even when set to "Switched" mode) will damage the fixtures on the track. To eliminate parasitic power draw when the fixtures are "off", the circuit powering the track must be switched off via a breaker or relay, by-others.
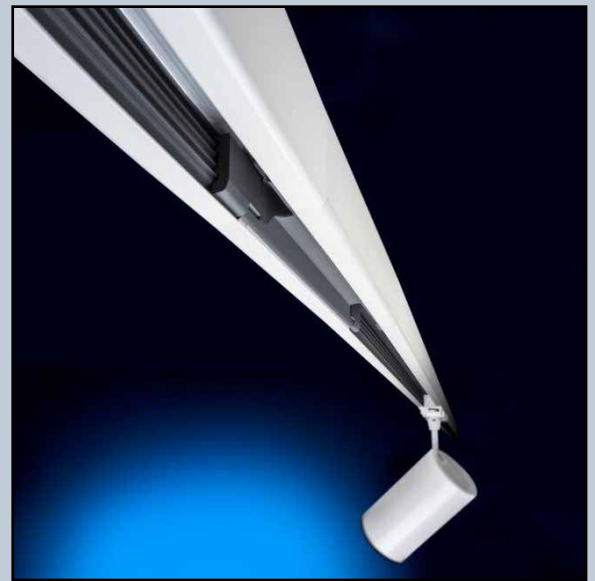
0-10V FAQ
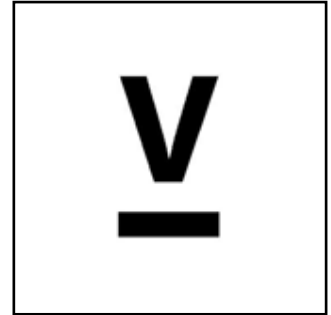
1. **How does 0-10V dimming work?**
   0-10V dimming is analog dimming done through two low voltage control wires from the dimmer to the LED driver. These control wires are typically purple and pink (see driver diagram). The DC voltage over the control wires varies between zero and ten volts to change the intensity of the LED. At ten volts, the light will be at its max intensity or 100%. At zero volts, the light will dim to its minimum light level.

2. **Do I need to commission 0-10V fixtures?**
   No, there is no commissioning or software needed when using 0-10V controllable fixtures.

3. **How many fixtures can I dim on a 0-10V control circuit?**
   In order to determine the number of fixtures that can be controlled on a 0-10V circuit, you must know the current rating of the controller, the ability of the controller to handle the inrush current of the total load, and the sink capabilities of the controller and drivers on the circuit. The total load must be lower than the rating of the 0-10V controller and the controller must be rated to handle the total inrush current of the load.

4. **How do I troubleshoot 0-10V?**
   Troubleshooting 0-10V is simple compared to other dimming protocols. The issue is either going to be a bad driver or wiring/dimmer issues. The first step would be to disconnect the purple and pink wires from the dimming circuit. Next, cause a short by touching the pink and purple wires together. If the driver is functioning properly, the fixture will dim to its lowest light output. If the driver is working, this means that there is a fault in the wiring or the dimmer is bad. If the fixture does not respond to the short with the control wires, this would mean that there is a driver issue. The solution would be a replacement driver. Note: 0-10V control wires are polarity sensitive.

5. **How many control groups does LSI CONTROLTrack allow in 0-10V mode?**
   LSI CONTROLTrack carries 3 conductors on the control side. This allows for (2) 0-10V control zones. Control zone can be selected on every 0-10V fixture via a discretely hidden switch.

6. **How far can the fixtures be from the 0-10V dimmer?**
   The distance between the fixtures and the 0-10V dimmer depends on a number of variables including the gauge of the wire, the allowable voltage drop, and the source rating of the drivers. As a general rule, keeping the voltage drop below 0.3V is good practice.

   The equation to determine the maximum distance between the fixtures and the dimmer is:

   $$d = \frac{V_D}{R \, x \, n \, x \, I}$$

   Where "d" is the distance of the wire run, "VD" is the voltage drop, "R" is the resistance of the wire per foot, "n" is the number of drivers, and "I" is the current sourced by each driver. It should be noted that this equation will give a recommended distance but other influences such as noise and inductance should be taken into account based on the site conditions.

DMX FAQ
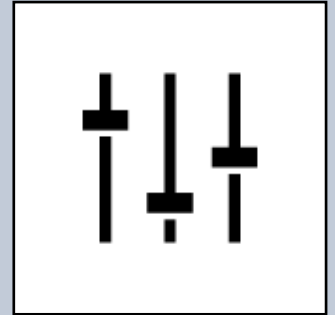
1. **What fixtures are compatible with DMX control?**
   Most of LSI's fixtures can be specified with DMX control. Please see the product catalog or ask your LSI Representative for information regarding DMX controlled fixtures.

2. **Can DMX be branched, spliced, or looped?**
   No, CONTROLTrack DMX layouts must be made in such a way that the DMX is in daisy chain topology. No splitting, looping, or splicing is allowed between track sections without proper DMX branching equipment. Additionally a terminator must be placed at the end of every DMX run.

3. **What are the limits on the number of fixtures and length of DMX run?**
   The DMX protocol supports a maximum of 512 addresses per Universe. LSI fixtures have a 1, 2, or 4 address profile depending on the fixture specified. Each section of DMX CONTROLTrack can support up to 32 devices, per the DMX protocol standard. The maximum recommended length of a single DMX CONTROLTrack run is 400'. Please consult the LSI factory for additional support for DMX layouts.

4. **How many universes per track layout?**
   The number of DMX universes per track layout is dependent on the quantity of fixtures and addresses required to control those fixtures.

5. **What DMX controller do I need?**
   LSI CONTROLTrack is Control System agnostic, if the controller outputs DMX and meets the needs of the project, any DMX Control System can be used with LSI CONTROLTrack.

6. **How do I set the DMX address on the fixture?**
   Fixtures are addressed via rotary or push-button encoders and on select models, can be set via RDM

7. **Are you developing any app-based controllers for use with the CONTROLTrack?**
   No, if an app-based controller is desired, there are various 3rd party app based DMX options that can be integrated with LSI CONTROLTrack.

8. **Can DMX be bypassed, or can a DMX fixture operate in "Stand alone mode"?**
   Yes, all non-RDM fixtures can be dimmed locally by setting the DMX address to 900-999 (0-100% respectively). When set to these addresses, the fixture will not respond to DMX.

9. **Can I control Non-LSI devices with CONTROLTrack?**
   Yes, there is a data takeoff fitting (TRK-SC-TO-120Z) that will provide a DMX jack and fused 120V outlet.

10. **What if my space is not wired for DMX?**
    LSI offers a wireless DMX solution which can get the DMX signal from your controller to CONTROLTrack and does not require additional DMX wiring. Please contact the factory for more information regarding wireless DMX solutions.

Notable Installations

Academy Museum of Motion Pictures, Los Angeles, CA   American Museum of Natural History, New York, NY   Asian Art Museum, San Francisco, CA   Audrain Museum, Newport, RI   Beaty Biodiversity Museum, Vancouver, BC   Buffalo Bill Museum, Cody, WY   California Museum, Sacramento, CA   Canada Science and Technology Museum, Ottawa, ON   Centre Culturel, Drummondville, QC   Children's Discovery Museum, San Jose, CA   Civil Rights Museum, Birmingham, AL   Columbus Museum of Art, Columbus, OH   Corning Museum of Glass, Corning, NY   DeWitt Wallace Gallery, Williamsburg, VA   Denver Art Museum, Denver, CO   Denver Museum of Nature and Science, Denver, CO   Field Museum, Chicago, IL   Gerald Ford Museum, Grand Rapids, MI   Gilder Center for Science at American Museum of Natural History, New York, NY   Grammy Museum Mississippi, Cleveland, MS   Grand Egyptian Museum, Giza Governorate, Egypt   Haggin Museum, Stockton, CA   Harley Davidson Museum, Milwaukee, WI   Hawaii State Museum, Honolulu, HI   Hood Museum of Art, Hanover, NH   Indian Heritage Center, Singapore   International Center for Photography, New York, NY   International Spy Museum, Washington DC   Kimbell Art Museum, Ft. Worth, TX   Kirkland Museum of Fine & Decorative Art, Denver, CO   LDS Church History Museum, Salt Lake City, UT   Marciano Art Foundation, Los Angels, CA   Metropolitan Museum of Art, New York, NY   Milwaukee Public Museum, Milwaukee, WI   Minnesota History Center, St. Paul, MN   Minnesota Museum of American Art, Minneapolis, MN   Mississippi's Arts + Entertainment Experience, Meridian, MS   Musee-Baie-St. Paul, Baie-Saint-Paul, QC   Museum of History and Industry, Seattle, WA   Museum of Mississippi History, Jackson, MS   Museum of the Bible, Washington DC   Museum of the Moving Image, New York, NY   Natural History Museum of Los Angeles County, Los Angeles, CA   National Blues Museum, St. Louis, MO   National September 11 Memorial Museum, New York, NY   National WWI Museum, Kansas City, MO   National WWII Museum, New Orleans, LA   New York State Museum, Albany, NY   Norton Simon Museum, Pasadena, CA   Pikes Peak Summit Visitor Center, Colorado Springs, CO   Pro Football Hall of Fame, Canton, OH   Royal Alberta Museum, Edmonton, AB   San Francisco Museum of Modern Art, San Francisco, CA   Smithsonian Institution Air and Space Museum, Washington, DC   Smithsonian Institution Museum of Natural History, Washington, DC   Smithsonian Institution National Museum of African American History and Culture, Washington, DC   Smithsonian Institution National Museum of the American Indian, Washington, DC   Smithsonian Institution National Portrait Gallery, Washington DC   Tennessee State Museum, Nashville, TN   United States Olympic & Paralympic Museum, Colorado Springs, CO   U.S. Capitol Visitor Center, Washington DC   Whitney Museum of American Art, New York, NY   Witte Museum, San Antonio, TX   Yale University Art Gallery New Haven, CT