CONTRACTOR'S SPECIFICATIONS

Leyard® DirectLight® X LED Video Wall System

This document is for an integrator, designer, consultant, or end user to develop specifications to a project utilizing a Leyard® DirectLight® X LED Video Wall System. Below you will find a table of product specifications for the Leyard DirectLight X and unique specifications that can be used when designing and writing specifications. The table lists the feature category and the detailed specs. There is also a description of the main benefit, which usually does not appear in the bid but offers background and explanation on the requirement purpose.

Leyard DirectLight X Bid Specifications

Leyard DirectLight X LED Display Cabinets		
Feature	**Requirement**	**Benefit**
Specification List: Applies to: DLX-0.7 DLX-0.9 DLX-1.2 DLX-1.5 DLX-1.8 DLX-2.5	Bezel width: Zero (seamless) LED type: Commercial grade 3-in-1 Black SMD LED display cabinet size: 600x337.5x95mm | 23.62x13.28x3.74in LED display cabinet diagonal: 688.5mm | 27.1in Total installed depth (max.): 4in | 101.6mm - ADA Compliant LED display cabinet weight: 6.6kg | 14.5lb Total install weight per LED cabinet and mount: 9.8kg | 21.5lb Brightness: >800 nits Brightness uniformity: ≥97% Color uniformity: ≥97% Color gamut: 100% NTSC Colors: 16.7 million Color temperature: 3200 – 9300 K, adjustable Color processing: 10 bits Contrast ratio: ≥6000:1 Viewing angle, horizontal: ≥ ±80° Viewing angle, vertical: ≥ ±70° Input frame rate: 50, 60Hz Adjustable mount: Leyard® EasyAlign™ mounting system included Installation and service: Front LED display cabinet adjustment: 6-axis integrated Mounting: Fixed, wall Protection: Leyard ERO-LED protective surface (optional) Regulatory: NRTL, FCC Class A, CE Class A, WEEE, EN60950, CISPER22/2010 Americans with Disability Act (ADA) compliance: Yes TAA compliance: Yes Power supply type: 1U and 1.5U rack mount Power redundancy: n+1 Redundant Power Supplies (optional) Hot swappable power supply: Yes Line voltage: 100-240 Volts AC, 50/60Hz auto switching Cabinet Video input type: 2xHDMI in, 2xHDMI out, HDCP Compliant. Cabinet Video input max./ resolution: 1920x1080 @ 60 Hz	

	Video signal extension: CAT6 (HDBaseT), Fiber Optic (optional) Video signal redundancy: Optional Video extension redundancy: Optional Display control: DirectLight® Control Software (included) Control input: RS232 or Ethernet	
Specification List: DLX-0.7	Pixel Pitch: 0.781mm Resolution: 768 x 432 Pixel Density: 1,638,400/sq m | 152,212/sq ft LED surround: Black Solder Mask	
Specification List: DLX-0.9	Pixel Pitch: 0.9375mm Resolution: 640 x 360 Pixel Density: 1,137,777/sq m | 105,703/sq ft LED surround: Black Solder Mask	
Specification List: DLX-1.2	Pixel Pitch: 1.25mm Resolution: 480 x 270 Pixel Density: 640,000/sq m | 59,458/sq ft LED surround: Black Solder Mask	
Specification List: DLX-1.5	Pixel Pitch: 1.5625mm Resolution: 384 x 216 Pixel Density: 409,600/sq m | 38,053/sq ft LED surround: Leyard® MicroGrid Shader™	
Specification List: DLX-1.8	Pixel Pitch: 1.875mm Resolution: 320 x 180 Pixel Density: 284,444/sq m | 26,426/sq ft LED surround: Leyard MicroGrid Shader	
Specification List: DLX-2.5	Pixel Pitch: 2.5mm Resolution: 240 x 135 Pixel Density: 160,000/sq m | 14,864/sq ft LED surround: Leyard MicroGrid Shader	
Architecture	The LED video wall product must be part of a family sharing one architecture but including pitches from 0.7 to 2.5mm. Cabinet size and architecture easily divisible into 16:9 walls and include slim LED display cabinets with an integrated video controller, mounting system, redundant off board power and distributed video connections.	This architecture allows customers to select wall size and vary pixel pitch depending on needs, get a perfectly aligned video wall, use less room, gain reliability and increase reliability while simplifying service.
Mounting System		
Mounting System	LED display cabinet must come standard with its own mounting system, designed exclusively for the LED video wall product.	Guaranteed exact compatibility and optimized design for the LED video wall.

Wall Mounting	LED display cabinet must mount directly to a wall without the need for additional mounting structure.	Simplifies installation. Eliminates time, cost and uncertainty associated with separately sourced mounting structure.
6-Axis Adjustable Mount	The LED display cabinet must include an integrated mounting system that allows for 6-axis of adjustments to achieve a perfectly aligned LED video wall.	Minute adjustments allow for precise alignment from cabinet to cabinet; particularly where the corners of four LED cabinets come together.
2 levels of Z-axis adjustment	The LED video wall must include 2 levels of Z-axis adjustment: • one at a larger adjustment level • one for fine-grain adjustments	Z-axis flatness is one of the most critical and difficult alignment challenges in LED video walls. 2 level Z adjustment facilitates this perfect alignment.
Installed Depth	The installed depth of the LED video wall must be less than 4 inches. The install depth must be compliant with the Americans with Disabilities Act (ADA) for protrusion under 4 inches.	Thin profile allows for legally compliant installations in US public spaces, reduces the real estate footprint and associated cost, allows for installations in space-constrained environments.
Front Installation	LED video wall must be able to fully install and align from the front with no need for rear access.	Allows for shallow, wall-mounted installations. Eliminates the need for 2 installers to work simultaneously on the installation of each LED cabinet.
Full Front Service	All replaceable LED video wall components including cabinets, modules, components, and cables must be accessible and replaceable from the front of the wall with no need for rear access, and no need to remove or move good panels.	Allows for slim, wall mounted video walls that can still be fully serviced. Reduces space, downtime, and risks of damage to good units.
Positive Locking	Must contain positive locking features that ensures the LED video wall never shifts and enables safe installations with forward tilt (up to 10°).	Prevents unexpected and undesirable removal of the individual cabinets.
Weight	The LED display cabinet must weigh less than: 6.6kg (14.5lb) or 32.6kg per m^2 The LED display cabinet with mounting structure must have combined weight less than: 9.8kg (21.5lb) or 48.4kg per m^2	Allows for easier handling, faster installation, less damage from installation and lower

		structural requirements for wall strength.
Curved Walls	The LED display cabinet mounting structure must be capable of supporting concave curved walls.	Allows for curved wall installation that is preferred In certain control room and conference room designs.
Corners Installation	Mounting frame must allow for 90° corner installations and faceted curved LED video walls with no more than a 15mm seam on a 90° corner without obstructing the ability to do front service.	Provides the AV designers more flexibility in installation of the walls. 90° corners are desirable in architectural displays.
Environmental		
Quiet operation	The LED video wall must operate without fans.	Fanless operation ensures less noise at the wall and in the room allowing for conference room or control room installations requiring a quiet environment.
Operating Temperature	The LED display cabinet must be able to operate in a -10 to 40°C (-14 to 104°F) environment.	The video wall operates properly in a range of environmental conditions.
Operating Humidity	The LED display cabinet must be able to operate in a 10-80% RH non-condensing environment.	The video wall operates properly in a range of environmental conditions.
Storage Temperature	The LED display cabinet must be able to be stored in a -20 to 60°C (-4 to 140°F).	The video wall will operate properly after storage in a range of environmental conditions.
Storage Humidity	The LED display cabinet must be able to be stored in a 10-85% RH non-condensing environment.	The video wall will operate properly after storage in a range of environmental conditions.
Protection	Meet or exceed IP30 protection standard. Leyard ERO-LED Protective Coating	Provides protection against foreign objects. Increased ruggedness, allows for surface cleaning

LED Display Cabinet		
Commercial grade LED display cabinet	The LED and LED display cabinet must be designed for 24/7 extended operation.	Provides around-the-clock operation with excellent visual performance.
Viewing angle	The LED video wall must support horizontal viewing angle ≥80° at ≥90% brightness, and vertical at ≥70° at ≥80% brightness.	Provides extended exposure in digital signage installations and more comfortable viewing in control rooms.
Consistent Display cabinet dimensions	All pitches in the family of LED display cabinet must have exactly the same physical dimensions.	Gives customer ability to define exact wall size and choose between 6 different pitch sizes later without impacting wall dimensions.
LED display cabinet serviceability	An LED display cabinet must be capable of being replaced without changing the power supply module or electronics module.	Makes service faster and easier
Low reflectance	The surface of the LED display cabinet must be low reflectance in well lit environments.	Provides better visual performance and perceived contrast in brightly lit environments.
Black LEDs	SMD LEDs in the LED display cabinet must be black variety.	Provides deeper blacks and higher perceived contrast.
Electronics and Image Processing		
Connectivity	The LED video wall must have the capability to inputting and displaying 4 HDMI 2.0 inputs and 1 DisplayPort 1.2 input	
High Bandwidth Input Capabilities	The LED cabinet must be able to accept multiple high bandwidth inputs with a pixel clock up to 660 Mhz and spread it across multiple displays	Higher resolution scaling provides better looking content and requires fewer PC outputs.
Seam correction software	The LED video wall must include seam correction software to electrically compensate for any visible mechanical dark or bright lines.	Corrects even very slight mechanical line imperfections so that the wall looks perfectly uniform.
Windows-based control software	Includes Windows®-based control software that allows the user to configure the LED video wall and optimize its visual performance. Software must be pre-loaded with test patterns and allow for adjustments of brightness, RGB and Gamma Gray scale.	Allows for fast set-up and image adjustment through an intuitive interface.
Setup and Control Software	The LED cabinet must come with setup and control software that allows you to configure and control the source position, sizing, and scaling on the video wall.	

Off-board Electronics and Power Supply modules	The electronics and power supplies for the LED Cabinet must be removed from the LED cabinet and placed in a rack mount location that is conveniently placed for service and installation. The electronics for the LED video wall must be co-located next to the content sources.	Off-board electronics significantly reduce the time and difficulty of servicing any of the parts in the LED video wall. It allows the critical electronics to be located in a secure, controlled environment away from the video wall, and prevents unsightly servicing at the wall.
HDCP 2.2 Compliance	The display must be HDCP 2.2 compatible and be capable of passing the licensing key to other displays in the array when looping the signal through (daisy-chaining).	Many prosumer and consumer devices require HDCP 2.2 to distribute content to the display.
IR Remote Control	The display must have IR remote control for access to command functions by an on-site operator through an on-screen menu.	This simplifies the installation and maintenance of the system. It provides a very simple control for an end-user, similar to the menu of a TV set.
Memory Slots	The display must contain a minimum of 256 preset memory slots in which a source configuration can be saved and recalled.	Recalling a saved setting is quick and helps ensure proper setup.
Auto Setup Options	The display must be able to automatically detect and sync to any incoming selected source within the specified operating range without user intervention.	This plug and play feature saves time and reduces labor requirements.
RS232	The display must be capable of accepting and passing through RS-232 control commands to an array of displays. The display must be capable of setting a unique unit identification number for acceptance of unit specific RS-232 commands and address the array globally.	This standard communication protocol provides the capability of controlling the entire wall with a single communication controller.
LAN Control	The LED video wall must have a built-in option for control via LAN.	Allows for programmatic control of the video wall over a network.
Color Temperature adjustments	The LED video wall must be able to be adjusted to a range of color temperatures between 3200 and 9300 K.	Allows for customers to hit color temperatures desirable for their environments.
Compatibility Mode Table	The display must be capable of accepting over 175 different mode timings and syncing without user intervention.	This prevents the need for and cost of a special timing programming.
Diagnostic LED's	The Power supply module and video controller electronics need to have diagnostic and status LED's that aid with setup and troubleshooting.	These indicators save time and labor cost.

Scaling Capabilities	The display must be capable of accepting input resolutions of VGA (640x480) to 4k (3840x2160) and scaling an image across various sections of an LED video wall, or an entire LED video wall up to 32x32 screens.	Built-in scaling prevents the cost and complexity of adding a third-party video processing solution.
Downscaling Capabilities	The display must be able to take any one of its inputs and down scale it in a window within a display.	Built-in scaling prevents the cost and complexity of adding a third-party video processing solution.
Genlock to external sync	The video wall must be able to genlock to an external sync such as a house sync	Critical to optimal performance in Broadcast and other environments
Genlock to source	Must be able to synchronize any size video wall to a single video source connected to the video wall	Genlock ensures full-wall video playback is synchronized with no tearing
Internal Cable connections	The display must have locking internal cable connections	Locking connections prevent cables from coming loose or coming out, resulting in image failure.
Redundant video cabling	The LED video wall must be configurable to support redundant video cabling.	Increases uptime for mission critical environments by eliminating potential failure point
Long Distance Signal transport	The display must incorporate a Cat 6 solution that allows the electronics and source to be placed up to 200ft away from the displays with no 3rd party extension devices.	Adding third-party extenders adds cost and complexity as well as points of failure, and can negatively impact signal quality.
Fiber Optic Video Extension	The display must incorporate a video transmission scheme that utilizes Fiber Optic cabling between the off-board electronics components and the display connectivity.	Provides a secure, longer distance option.
Fiber Optic Video Extension compatibility	The Fiber Optic video extension should use SPF+ Multimode Fiber transceivers with support for single mode as well.	Multi-mode transceivers are capable of extending video up to 1000 ft./ 300M and single-mode transceivers support up to 10kM.
Add/Remove/Change sources	The display must be capable of adding, removing, or changing source inputs without disrupting the LED video wall	Reduces costs and complexities in changing sources at the LED video wall location.
Power Supply		
Remote power module	The LED video wall must be powered by a remote power supply module at up to 200ft (61m) away from the wall.	Reduces weight, heat and points of failure at the video wall.

		Eliminates the need for power at the wall. Allows power supplies to be placed in well ventilated rack space for better cooling and reliability.
No AC power behind the displays	There can be no need for AC power requirement behind the video wall.	Simplifies and reduces the cost of video wall installation since there is no expensive electrical work required.
Redundant Power Supply Option	The LED video wall must have a redundant hot-swappable power supply module built in that will allow for continuous operation in the case of a power supply failure.	Ensures continuous operation in the case of a power supply failure.
Standby power	The power supply must have a low power standby mode that reduces the power consumption when the unit is not in use.	Reduces power consumption when the unit is not in use.
Diagnostics	The power supply must include diagnostic indicators	Allows for the operator to more quickly and accurately diagnose status of the power supplies.
Other		
24-hour advanced exchange policy	The display manufacturer must offer a service policy that allows a replacement LED display cabinet to be shipped out within 24 hours.	Allows the Leyard and Planar partner to be responsive to customer support needs.
Touch Capability	For applicable pitches, video wall must have an Leyard® LED MultiTouch option available which includes: • IR Touch sensor • Trim • Leyard® PLTS™ Technology	Allows user to interact with content. With 32 simultaneous touch points and excellent tactile feel.
5 year warranty	The video wall may be covered by warranty for up to 5 years including extensions. The extended warranty is optional.	The video wall is a significant investment and should offer warranty coverage beyond a standard 2 or 3 year coverage span.
Surface Protection	Leyard ERO-LED protective surface	Protects against contact, reduces ESD, can be cleaned