Velvet LED Display System

Apex Series

CHRISTIE®

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GENERAL

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WARRANTY

Products are warranted under Christie's standard limited warranty, the complete details of which are available by contacting your Christie dealer or Christie. In addition to the other limitations that may be specified in Christie's standard limited warranty and, to the extent relevant or applicable to your product, the warranty does not cover:

a. Problems or damage occurring during shipment, in either direction.

b. Problems or damage caused by combination of a product with non-Christie equipment, such as distribution systems, cameras, DVD players, etc., or use of a product with any non-Christie interface device.

c. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake, or other natural disaster.

d. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.

e. Problems or damage caused by use of a product on a motion platform or other movable device where such product has not been designed, modified or approved by Christie for such use.

f. Except where the product is designed for outdoor use, problems or damage caused by use of the product outdoors unless such product is protected from precipitation or other adverse weather or environmental conditions and the ambient temperature is within the recommended ambient temperature set forth in the specifications for such product.

g. Defects caused by normal wear and tear or otherwise due to normal aging of a product.

The warranty does not apply to any product where the serial number has been removed or obliterated. The warranty also does not apply to any product sold by a reseller to an end user outside of the country where the reseller is located unless (i) Christie has an office in the country where the end user is located or (ii) the required international warranty fee has been paid.

The warranty does not obligate Christie to provide any on site warranty service at the product site location.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

REGULATORY

The product has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the product is operated in a commercial environment. The product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of the product in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense.

CAN ICES-3 (A) / NMB-3 (A)

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ENVIRONMENTAL

The product is designed and manufactured with high-quality materials and components that can be recycled and reused. This symbol ⌦ means that electrical and electronic equipment, at their end-of-life, should be disposed of separately from regular waste. Please dispose of the product appropriately and according to local regulations. In the European Union, there are separate collection systems for used electrical and electronic products. Please help us to conserve the environment we live in!

Content

Product overview

Christie Velvet LED Display System tiles are modular, high-quality image display units that can be configured to achieve an HD display, depending on the pixel pitch of the tile being installed.

Each Christie E500 LED Display Controller can support a maximum number of tiles, which varies depending on the pixel pitch of the tiles in the array. The configuration to achieve an HD display differs by the pixel pitch of the tile, as outlined in the table below.

Pixel pitch	Array size	Maximum number of tiles per controller
0.96 mm	3 x 3	9 tiles
1.2 mm	4 x 4	16 tiles
1.6 mm	5 x 5	25 tiles
1.9 mm	6 x 6	36 tiles
2.5 mm	8 x 8	64 tiles

Important safeguards

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.

General safety precautions

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.

Warning! If not avoided, the following could result in death or serious injury.

- Observe all electrostatic precautions. Use a grounded wrist strap and insulated tools when handling, servicing, or cleaning electronic assemblies.
- A minimum of two people or appropriately rated lift equipment is required to safely lift, install, or move the product.
- A certified electrician must be present during installation to ensure the installation meets the local electrical code.
- Motors and fans may start without warning.

Notice. If not avoided, the following could result in property damage.

- Always wear clean, lint-free gloves when handling the product.

Power precautions

Ensure all power precautions are understood before installing the product.

Warning! If not avoided, the following could result in death or serious injury.

- After the replacement of the power supply, hi-pot and ground/earth bond tests must be performed. Only Christie qualified technicians who are familiar with the necessary precautions can perform these tests.
- A certified electrician must be present during installation to ensure the installation meets the local electrical code.
- Always connect the ground or earth first to reduce shock hazard.
- Do not return the current through the ground or earth.
- SHOCK HAZARD! The line cord has a maximum power carrying capability. For the maximum number of tiles that may be connected per daisy chain when connecting to the power supply, refer to the product specifications.
- SHOCK HAZARD! A permanent single-phase connection must be installed between the LED tile system and the AC power supply.
- FIRE AND SHOCK HAZARD! Do not operate the system unless certified power connections, providing the recommended voltage, are used.
- HIGH TOUCH CURRENT HAZARD! To ensure reliable grounding, the power connection must be made by using an industrial plug (pluggable type B), or be provided by a permanent connection.
- A 13-20 A double pole mains circuit breaker, certified for the applicable local regulations, is required. It must be part of the building installation and easily accessible.
- Do not use a wall breaker greater than 20 A. This could result in severe damage to the tile system in the event of a failure.

Caution! If not avoided, the following could result in minor or moderate injury.

- SHOCK HAZARD! The line cord has a maximum power carrying capability. For the maximum number of tiles that may be connected per daisy chain when connecting to the power supply, refer to the product specifications.
- SHOCK HAZARD! Only use the AC power cord provided with the product or recommended by Christie.
- TRIP OR FIRE HAZARD! Position all cables where they cannot contact hot surfaces, be pulled, be tripped over, or damaged by persons walking on or objects rolling over the cables.
- FIRE HAZARD! Do not use a power cord, harness, or cable that appears damaged.
- FIRE OR SHOCK HAZARD! Do not overload power outlets and extension cords.
- Only Christie qualified technicians are permitted to open product enclosures.

Remote Power Supply Rack Shelf safety warnings

To prevent personal injury and to protect the device from damage, read and follow these safety precautions.

⚠️ **Warning!** If not avoided, the following could result in death or serious injury.

- This product must be installed within a restricted access location not accessible by the general public.

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.

- A minimum of two people or appropriately rated lift equipment is required to safely lift, install, or move the product.

- A certified electrician must be present during installation to ensure the installation meets the local electrical code.

- Install the product near an easily accessible AC receptacle.

- Hazardous voltages are present at power system inputs. The DC output, though not dangerous in voltage, has a high short-circuit current capacity that may cause severe burns and electrical arcing.

- SHOCK HAZARD! Power supply uses double pole/neutral fusing. Disconnect all power sources before opening the product.

- Fuses are present in active and neutral lines of the Remote Power Supply Rack Shelf.

  F1—Rated 15 A, 250 VAC

  F2—Rated 15 A, 250 VAC

- Before working with live power systems, remove all metallic jewelry (such as watches, rings, metal rimmed glasses, or necklaces) and wear safety glasses with side shields at all times during the installation.

- Motors and fans may start without warning.

- Use insulated hand tools while working on live power systems.

Terminology

Learn about the components of the LED display system.

Term	Definition
Tile	A cabinet that contains several LED modules.
Array	A group of connected tiles that form a larger display.
Controller	Controls the LED display system array and video input source. Sometimes referred to as the control unit.
Pixel	A group of one red, one green, and one blue dot.
Subpixel	A pixel is comprised of three subpixels, one for each color: red, green, and blue. Each subpixel in LED display technology is an LED chip.
Pixel pitch	Specifies the distance from the center of one pixel to the center of the next pixel.
SMD package size	A technical supplier specification related to the pixel size, and denotes the size of the surface-mounted diode (SMD) itself.

Term	Definition
Fill factor	Indicates the ratio between the area covered by pixels and the area not covered by pixels.

Required components

Ensure the necessary components are available before installing the LED panels.

- Remote Power Supply Rack Shelf
- Christie E500 LED Display Controller
- Main power cables (from the Remote Power Supply Rack Shelf to the cabinet trunk harness) Available in 6 m, 15 m, 30 m, 50 m, and 75 m lengths, and a 160 m spool.
- Cabinet trunk harnesses
- Cabinet to cabinet data cables
- Cabinet to Christie E500 LED Display Controller data cable

Required tools

Make sure the following tools are available during the installation.

Tile installation tools and hardware

- Torque driver
- M6 screwdriver
- 8 mm wrench
- Magnetic LED module removal tool (P/N: 003-005735-XX)
- Mounting block template (P/N: 003-005736-XX and 003-006156-XX)
- Screws appropriate for the mounting surface. These screws are not provided by Christie.

Remote Power Supply Rack Shelf installation tools

- Screwdrivers
- Molex Crimping Tool (P/N: 154-124108-XX)

  If the power cord supplied with your product is not long enough to connect the first display panel in an array to the Remote Power Supply Rack Shelf module, you must purchase a power cord of an adequate length. Christie recommends one of the pre-terminated power cables offered as Christie accessories, or that you create a custom cable using the Christie Main Power Cable Spool (P/N 154-122106-XX), Connector Kit (P/N 154-125109-XX), and Molex Crimping Tool (P/N 154-124108-XX). For more information on the Molex Crimping Tool, see the Molex documentation.

Related documentation

Additional information on the Christie Velvet LED Display System is available in the following documents.

- *Christie Velvet LED Display Control System Apex Series Product Safety Guide* (P/N: 020-102212-XX)
- *Christie E500 LED Display Control System Software User Manual* (P/N: 020-102222-xx)
- *Christie E500 LED Display Control System Serial Commands Technical Reference* (P/N: 020-102458-xx)
- *Monitoring the Remote Power Supply Rack Shelf* (P/N: 020-000850-01)

Typical LED solution

A typical LED display system installation contains a variety of components.
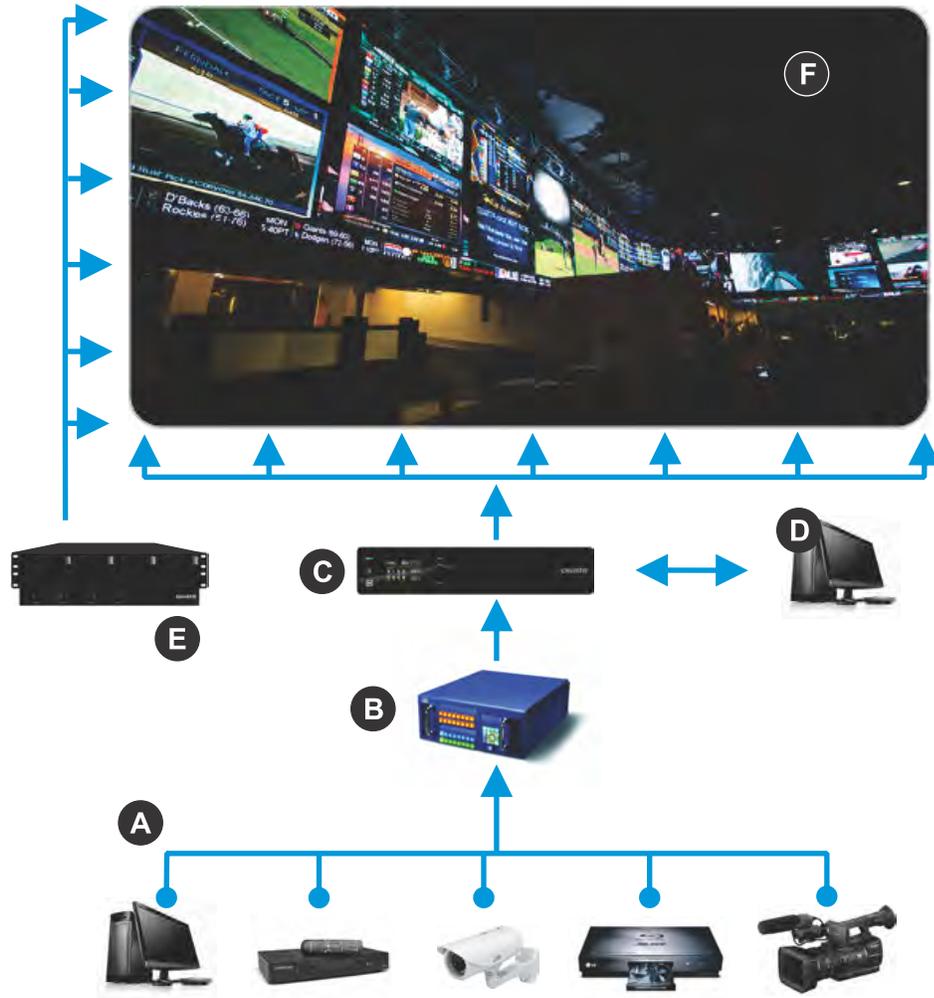
A	Media sources

B	Video matrix switch and splicing video processor
C	Christie E500 LED Display Controller
D	Control computer
E	Remote Power Supply Rack Shelf
F	LED display

Cable and controller layout and design

Before an array is constructed, you must plan the design layout of the tiles to make sure that the controller placement and the cabling layout support the overall tile design objectives.

The LED display system offers considerable flexibility in terms of the number of media sources that can be displayed and the overall resolution. Color and brightness matching, as well as other functions, may be performed across an entire array.

The video source connections between the cabinets are represented by the blue line, and the backup source connections are represented by the purple line. The power connections between the cabinets are represented by the red line.
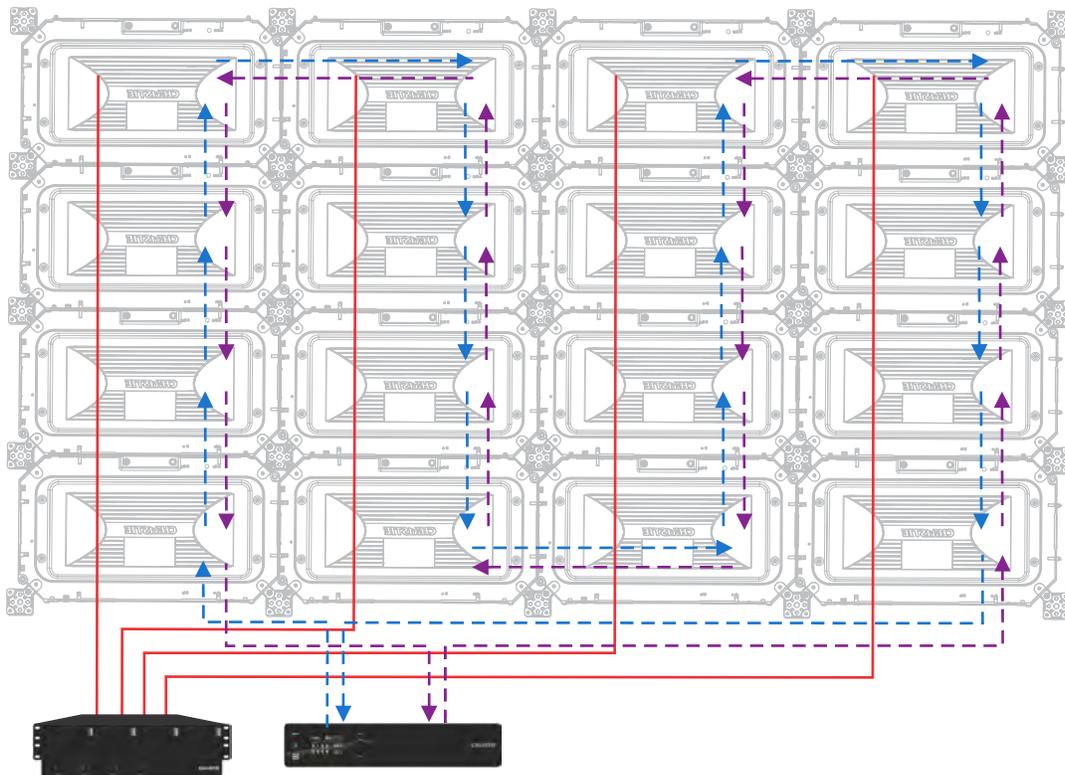
When installing the cables from tile to tile, installing a primary data cable (blue) and a backup data cable (purple) creates redundancy.

Each Christie E500 LED Display Controller can support a maximum number of tiles, which varies depending on the pixel pitch of the tiles in the array. The configuration to achieve an HD display differs by the pixel pitch of the tile, as outlined in the table below.

Pixel pitch	Array size	Maximum number of tiles per controller
0.96 mm	3 x 3	9 tiles
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1.6 mm	5 x 5	25 tiles
1.9 mm	6 x 6	36 tiles
2.5 mm	8 x 8	64 tiles

Christie E500 LED Display Controller interface and ports

Learn about the interface and physical ports on the Christie E500 LED Display Controller.

Front
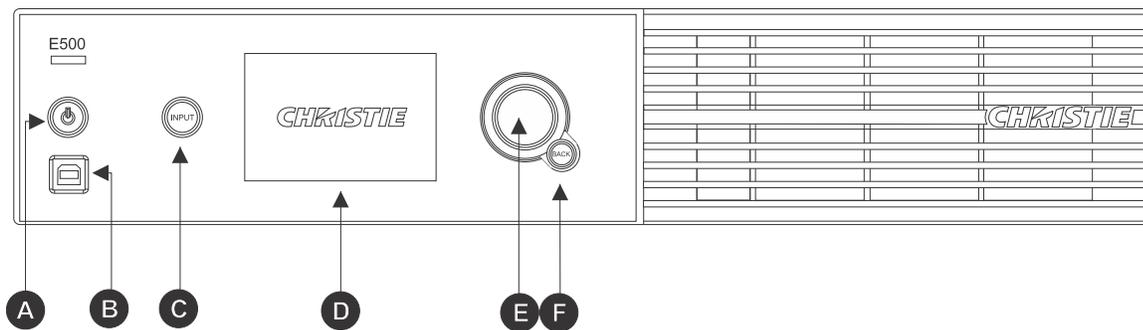
A	Power button
B	USB interface for communication with a computer
C	Input selector
D	LCD screen
E	Menu dial for interacting with the menu
F	Back button for exiting from the current operation or option in the menu

Rear
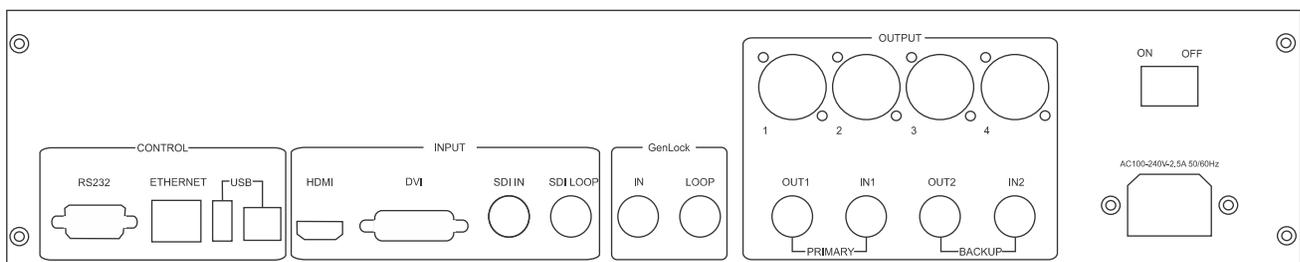
Inputs/Outputs		Description
Inputs	DVI	Single-link DVI, user-definable resolution • Horizontal resolution maximum: 3840 pixels • Vertical resolution maximum 1920 pixels
	HDMI	Standard HDMI 1.3 input Supports 8 bit and 12 bit; for • 8 bit—RGB 4:4:4 1080P • 12 bit—YCbCr 4:2:2 1080P
	SDI	Supports 3G-SDI progressive input in standard format
	SDI Loop	
Outputs	BNC (Qty. 4)	Supports 2-channel output and 2-channel input, with each channel supporting up to 3.125G bandwidth. The loading capacity of one channel is up to 1920 x 1080 at 60hz. Of the two output channels, one is primary and the other is secondary. Supports low latency. The maximum transmission distance of coaxial cable is 100m.
	RJ45 (Qty. 4)	4-channel Gigabit Ethernet interface, with each channel supporting up to 1G bandwidth Total loading capacity: 2.3 million pixels Low latency is not supported
Genlock	BNC (Qty. 2)	Support Genlock IN & LOOP
Control		DB9 COM, USB, RJ45 (with SNMP support), USB cascading, and baud rate 115200 bps
Power		Power switch Power supply port: AC 100-240V~ 50/60hz

Installation and setup

The configuration of an array depends on the installation. Use the following instructions as a guideline only. Before you install an LED array, you must fully understand all site requirements and characteristics.

Installing an LED array

Perform the following steps when you install an LED array.
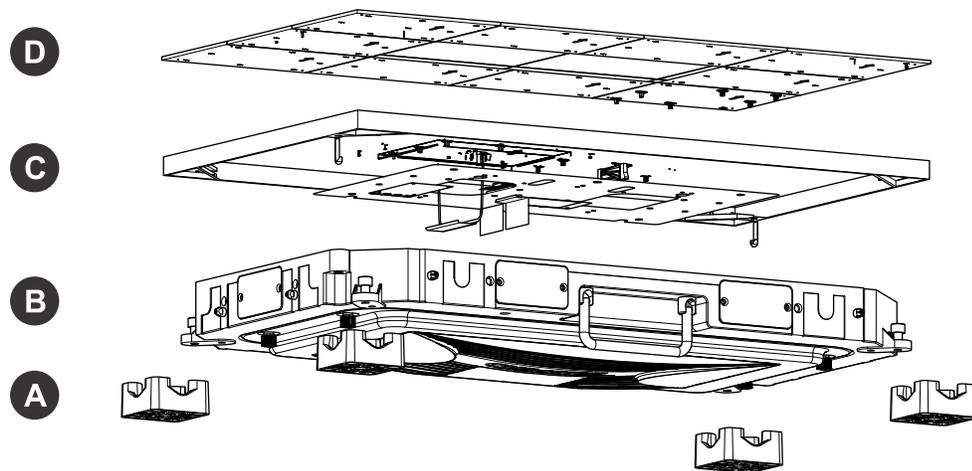
A	Mounting blocks
B	Chassis
C	Carrier assembly
D	LED modules

1. *Install the mounting blocks (A)* (on page 14).
2. *Mount the tiles (B)* (on page 16).
3. *Install the carrier assemblies (C)* (on page 17).
4. *Connect the data cables* (on page 18).
5. *Reinstall the LED modules (D)* (on page 20).
6. *Install and configure the Remote Power Supply Rack Shelf* (on page 20)
7. *Connect the tile power cables to the Remote Power Supply Rack Shelf* (on page 21).
8. *Connect the data cables to the video sources* (on page 23).
9. *Power on the array* (on page 24).
10. *Install the controller software* (on page 24).

Installing the mounting blocks

If the tiles are being installed onto a flat wall surface, determine where the mounting blocks should be installed, and attach them to the support structure.

⚠ **Warning!** If not avoided, the following could result in death or serious injury.

- External support for a display wall must be designed and implemented by a Christie qualified installer and must comply with local area regulations and safety standards.
- All display walls must have permanent external supports. The amount of external support required depends on the size of the display wall.
- A minimum of two people or appropriately rated lift equipment is required to safely lift, install, or move the product.

The mounting blocks are available in three different configurations:

Corner blocks with one hole   Exterior edge blocks with two holes   Interior blocks with four holes

1. If the tiles are being mounted on an external support structure, ensure the external support structure is anchored to the wall and/or to the floor.

   The design and anchoring of the LED display structure is not the responsibility of Christie Digital Systems USA Inc. Contact a Christie representative for structure design options.

2. Determine where the mounting blocks should be installed.

   a) Find the center of the bottom of the display area.

   b) Position the mounting template with the bottom left template hole centered on the point identified in step 2a.

   c) Level and hang the mounting template on the support structure.

3. Insert the springs into the mounting blocks.

4. Install the mounting blocks.

   a) Place the mounting blocks inside the template holes, and secure them to the support structure.

      For installation onto a steel structure, tighten the M6 screws to a torque of 3.55 Nm (31.42 lbs.in).

      For installation onto a wooden surface:

      • M8 wood screws—Tighten to a torque of 11.5 Nm (101.8 lbs.in)

      • 5/16-18 wood screws—Tighten to a torque of 10.5 Nm (93 lbs.in)

   b) Install any exterior edge or corner mounting blocks in the proper location inside the template holes, pushing the blocks as close to the edge of the template holes as possible.

      For example, install the mounting bracket for the top left corner tile in the bottom right corner of the template hole.

The corners and sides of the tiles should line up with the center of the mounting blocks.

5. Remove the template from the mounting blocks.

6. To install the remaining mounting blocks for the array, place the template over already installed mounting blocks so three of the template holes have mounting blocks, and the remaining holes are empty. Repeat steps 2 to 4 for all other rows in the array.

Mounting the tiles

Install the tiles in the array row by row. Do not attempt to construct the array column by column.

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- External support for a display wall must be designed and implemented by a Christie qualified installer and must comply with local area regulations and safety standards.

- All display walls must have permanent external supports. The amount of external support required depends on the size of the display wall.

- A minimum of two people or appropriately rated lift equipment is required to safely lift, install, or move the product.

1. If present, remove the metal plates that cover all the external pass-through holes in the tile chassis.

2. Place the tile face down on a protected surface and remove the rear cover.

3. Loosen the four thumb screws on the back of the carrier assembly.

   The rear thumb screws secure the carrier assembly to the tile chassis. Leave the rear thumb screws loose to allow the carrier assembly to be removed from the front.

4. Reinstall the rear cover.

5. Using the magnetic tool, remove the LED modules from each corner of the tile and set them on a padded surface.

Make note of the carrier assembly that the LED module came from, and ensure it is reinstalled on the same carrier assembly and in the same position on the carrier assembly.

6. Loosen the four thumb screws, one in each corner of the tile (A).

7. Remove the carrier assembly from the tile chassis, and set it face down on a padded surface.

8. Ensure all adjustment screws are flush with the outside of the tile chassis.

9. Slide the spring onto the M6 bolts so it sits on the shoulder of the bolt.

10. Attach the chassis of the first tile in the center of the bottom row to the mounting blocks in the four mounting points.

    Ensure the M6 bolts have at least three full thread engaged into the tile and are torqued to 3.55 Nm (31.42 lb.in).

11. Repeat steps 1 to 7 to install the chassis of the second tile in the row.

12. To lock the tile chassis together, push in the connection pins and tighten them by hand.

13. Use the connection pins to adjust the spacing between the tile chassis, and ensure there are minimal gaps between the LED modules of each tile.

    To determine if adjustments are needed between the chassis, or to see how close the LED modules are, it may be necessary to fully *install the carrier assemblies* (on page 17).

    If the surface edges of the LED modules are not smooth, adjust the tightness of the bolts *attaching the chassis to the mounting blocks* (on page 16).

14. Repeat steps 1 to 10 for all the remaining tiles in the bottom row.

15. After the bottom row is installed and the gaps are adjusted, repeat steps 1 to 11 for the remaining rows.

16. Reinstall the metal plates only onto the cable pass-through holes on the side and top exterior edge of the chassis.

    To allow for cable access, do not install plates along the bottom exterior edge of the array.

Installing the carrier assemblies

After the power cables are installed in the chassis, secure the carrier assembly to the chassis.

⚠️ **Caution!** If not avoided, the following could result in minor or moderate injury.

  • SHOCK HAZARD! The line cord has a maximum power carrying capability. For the maximum number of tiles that may be connected per daisy chain when connecting to the power supply, refer to the product specifications.

1. Install the carrier assembly rods onto the chassis.

2. Hang the carrier assembly on the rods, leaving as much space as possible between the carrier assembly and the chassis.

3. Feed the power cables through the pass-through holes.

4. Connect the power cable to the power cable of the tiles above and below the new tile.

5. *Connect the data cables between the tiles* (on page 18), ensuring the cables in the Out port on one tile connect to the In port on the next tile.

   When looking at the back of the carrier assembly, the Out ports are on the right, and the In ports are on the left.

6. Slide the carrier assembly back onto the chassis.

   Do not put pressure on the LED modules when moving the carrier assembly into place.

7. Secure the carrier assembly to the chassis by tightening the thumb screws to a torque value of 0.6 Nm (5.5 lbs.in).

8. Repeat steps 1 to 6 for all tiles in the array.

Connecting the data source cables

Connect the primary data cable and backup data cables between the tiles in the array.

There are two types of data cables: a cable with DIN 1.0/2.3 connectors on each end, and cables with a DIN 1.0/2.3 connector on one end and a BNC connector on the other end.

DIN 1.0/2.3 connector

BNC connector

The BNC port on the controller can support a resolution of 1920 x 1080 at 24bits per pixel.

Each Christie E500 LED Display Controller can support a maximum number of tiles, which varies depending on the pixel pitch of the tiles in the array. The configuration to achieve an HD display differs by the pixel pitch of the tile, as outlined in the table below.

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1. Locate the two cables with a DIN 1.0/2.3 connector on one end and a BNC connector on the other end.

2. Holding the BNC ends, feed the DIN 1.0/2.3 ends through the bottom cable pass-through hole for the first tile in the array.

3. Connect the DIN 1.0/2.3 end of the primary cable to the IN1 connector on the left side of the panel.
   This cable will be connected to the Christie E500 LED Display Controller.

4. Connect the DIN 1.0/2.3 end of the backup cable to the IN2 connector on the panel.

5. Locate the cables with DIN 1.0/2.3 connectors on each end.

6. Loop two cables through each of the pass-through holes for tiles following the cable layout design.

7. Daisy chain the primary and backup data cables from one tile to the next, ensuring the cables are not crossed. OUT1 must be connected to IN1, and OUT2 must be connected to IN2.
   You do not need to make a complete loop between the Christie E500 LED Display Controller and the tiles.

8. Daisy chain the backup data cable from one tile to the next.

9. Connect the USB cable from the controller to the computer that will be directly connected to the Christie E500 LED Display Controller.

Reinstalling the LED modules

Replace the LED modules removed while installing the tiles.

1. Connect all the carrier assembly cables onto the LED module.

2. Line up the LED module with the alignment pins in the carrier assembly, ensuring the arrow on the back of the LED module is pointing up.

3. Set the LED module into place on the carrier assembly.

   If the LED module does not fit back into place, or there is a gap between the LED modules of two tiles, *adjust the spacing between the tiles* (on page 20).

Adjusting the spacing between tiles

If there are gaps between the LED modules of different tiles, or the LED modules cannot be reinstalled, adjust the spacing between the tile chassis.

> To ensure the modules are at the same level across all tiles, adjust the depth of each tile using the z adjustment screws on the backside of the tile.

1. Remove the LED modules from the four corners of the tile.

2. To adjust the spacing between the tile chassis, use the connection pins. Ensure there are minimal gaps between the LED modules of each tile.

3. To make additional space between the tile chassis, loosen the connection pins and adjust the jack screws to push the tiles apart.

4. If the surface edges of the LED modules are not smooth, adjust the depth of the panel by changing the tightness of the screws *attaching the chassis to the mounting blocks* (on page 16).

5. To test the spacing between tiles, *replace the LED modules* (on page 20).

Installing and configuring the Remote Power Supply Rack Shelf

Use the following instructions to install and configure the Remote Power Supply Rack Shelf external power supply.

Mounting the Remote Power Supply Rack Shelf

The power system must be mounted in a clean and dry environment. Sufficient free space must be provided at the front and rear of the power system.

> ⚠ **Warning!** If not avoided, the following could result in death or serious injury.
> • This product must be installed within a restricted access location not accessible by the general public.

1. Find a location in the rack for a 3U device.

2. Attach the Remote Power Supply Rack Shelf to the rack.

To ensure a proper electrical bond between the system chassis and the relay rack use thread-forming mounting screws and star washers.

Inserting the power modules into the Remote Power Supply Rack Shelf

The power modules, or rectifiers, convert an AC power source into the DC current required by the product.

1. Remove the cover from the rectifier slot.
2. Slide the power module into the front of the chassis until it clicks into place.
3. To lock the power module, lift the handle and snap it into place.
4. Repeat steps 1 to 3 for each rectifier in the Remote Power Supply Rack Shelf.

Connecting the LED tile power cables to the Remote Power Supply Rack Shelf

To power the Christie Velvet LED Display System tiles, connect the cables between the tiles and the Remote Power Supply Rack Shelf.

1. Connect the main power cable to the Remote Power Supply Rack Shelf.
2. Connect the cabinet power cable to the main power cable.

   If the power cord supplied with your product is not long enough to connect the first display panel in an array to the Remote Power Supply Rack Shelf module, you must purchase a power cord of an adequate length. Christie recommends one of the pre-terminated power cables offered as Christie accessories, or that you create a custom cable using the Christie Main Power Cable Spool (P/N 154-122106-XX), Connector Kit (P/N 154-125109-XX), and Molex Crimping Tool (P/N 154-124108-XX). For more information on the Molex Crimping Tool, see the Molex documentation.
3. Plug the Remote Power Supply Rack Shelf into the building outlets in the wall or the floor.

Logging in to the Remote Power Supply Rack Shelf web interface

To make changes to the Remote Power Supply Rack Shelf, use Internet Explorer.

1. Connect a computer to the Remote Power Supply Rack Shelf with a network crossover cable.
2. To access the web interface, in the Control Panel, change the IP address and subnet mask of the computer to be on the same subnet as the Remote Power Supply Rack Shelf.

   If the IP address and subnet mask on the Remote Power Supply Rack Shelf have not been changed from the default, use the following values on the computer:

   • IP address: 10.10.10.202
   • Subnet mask: 255.255.255.0
3. Turn off any browser pop-up blockers.
4. In the browser address bar, type the IP address of the Remote Power Supply Rack Shelf device.

   The default IP address is 10.10.10.201.

If you have changed the IP address of the Remote Power Supply Rack Shelf, the IP address and subnet mask of the computer must also be changed.

The IP address for the web interface is one digit higher than the IP address of the device. For example, when the IP address of the device is 10.10.10.201, the address of the web interface is 10.10.10.202.

5. If prompted, run the MSXML add-on.

6. Log in to the Remote Power Supply Rack Shelf with your username and password.

   The default username is **Admin**, and the default password is **1234**.

Changing the IP address of the Remote Power Supply Rack Shelf

In an environment where there are multiple Remote Power Supply Rack Shelf devices, you must have a unique IP address for each device.

1. Select **Communications** > **Configure Communication Parameters**.

2. Set the new IP address for the Remote Power Supply Rack Shelf.

3. Click **Submit Changes**.

   After the IP address has been changed from the web interface, close the browser window and then open it using the new IP address.

   If you have changed the IP address of the Remote Power Supply Rack Shelf, the IP address and subnet mask of the computer must also be changed.

Resetting the Remote Power Supply Rack Shelf IP address

The Remote Power Supply Rack Shelf IP address ensures local access with a laptop and a standard network crossover cable.

   Press and hold the front panel reset button (RST) for three seconds.

   The Remote Power Supply Rack Shelf beeps three times, the IP address is reset to 10.10.10.201, and DHCP is disabled.

Changing the time on the Remote Power Supply Rack Shelf

Configure the time on the Remote Power Supply Rack Shelf.

The date and time is a dynamic field, and as changes are made to the values on the screen the internal values are also changed. An event is added to the event log detailing the changes made.

1. *Log in to the Remote Power Supply Rack Shelf web interface* (on page 21).

2. Select **Controller** > **Date and Time**.

3. Set the date and time for the Remote Power Supply Rack Shelf.

   • Manually enter the date and time for the Remote Power Supply Rack Shelf to use.

   • Automatically retrieve the date and time from a server.

      a. Select **Enable SNTP Service**.

      b. Type the IP address of the SNTP source.

      c. In the **Time Zone Adjustment** field, select the time zone adjustment for the location of the Remote Power Supply Rack Shelf.

4. Click **Save**.

5. If the time is set by an SNTP service, click **Get Time Now**.

Setting the temperature units

Change the units used when reporting the temperature.

1. *Log in to the Remote Power Supply Rack Shelf web interface* (on page 21).
2. Select **Controller** > **Temperature Units**.
3. Select whether the display units are Celsius or Fahrenheit.
4. Click **Save**.

Resetting the breakers

When too many panels are connected or too much power is sent through the Remote Power Supply Rack Shelf, the breakers may interrupt the current flow. Reset the breakers to resume operation.

If the breakers disconnect the current, the On button is released for the affected Output.

1. Reduce the number of panels connected to the input or the amount of power going through the input.
2. Push the **On** button back into place.
   The current is reconnected and the output is powered.

Connecting the LED tile power cables to the Remote Power Supply Rack Shelf

To power the Christie Velvet LED Display System tiles, connect the cables between the tiles and the Remote Power Supply Rack Shelf.

1. Connect the main power cable to the Remote Power Supply Rack Shelf.
2. Connect the cabinet power cable to the main power cable.
   If the power cord supplied with your product is not long enough to connect the first display panel in an array to the Remote Power Supply Rack Shelf module, you must purchase a power cord of an adequate length. Christie recommends one of the pre-terminated power cables offered as Christie accessories, or that you create a custom cable using the Christie Main Power Cable Spool (P/N 154-122106-XX), Connector Kit (P/N 154-125109-XX), and Molex Crimping Tool (P/N 154-124108-XX). For more information on the Molex Crimping Tool, see the Molex documentation.
3. Plug the Remote Power Supply Rack Shelf into the building outlets in the wall or the floor.

Connecting to video sources

A Christie Velvet LED Display System array requires a Christie E500 LED Display Controller to display an image using a source.

Ensure that the display controller is connected with an HDMI or a DVI cable, and that the video signal is properly displayed across the entire array.

After the Christie E500 LED Display Controller is connected and powered up, the video content is available as long as the video source is connected.

1. Connect the data cable from the first tile in the array to the Christie E500 LED Display Controller.

2. Connect the HDMI or DVI output from the video source (computer or media player) to the appropriate input port on the Christie E500 LED Display Controller.

3. Power on the array.

Powering the array on and off

Turn on each component in the array in the order below.

If directed to power cycle the array, power off the controller and then the rectifier, and power on all components as described below.

1. Start the computer that is the video source.

2. Turn on each rectifier in the Remote Power Supply Rack Shelf.

3. Turn on the Christie E500 LED Display Controller.

   a) On the rear of the controller, turn the power switch to **On**.

   b) On the front of the controller, press the **Power** button.

4. To power off the array, repeat these steps in reverse order.

Installing the Christie E500 LED Display Controller software

The Christie E500 LED Display Controller software controls the configuration of the array.

1. Disable the firewall.

2. Insert the Christie E500 LED Display Controller software USB flash drive into the computer.

3. Follow the on-screen instructions and install the Christie E500 LED Display Controller software.

Logging in to the controller software

To access the configuration features of the controller software, log in to the system.

1. Ensure the computer running the controller software is on the same network at the controller.

2. Connect a USB cable between the controller and the computer running the Christie E500 LED Display Controller software.

3. Launch the Christie E500 LED Display Controller software and log in as the administrator.

   a) Click **User** > **Advanced User Login**.

   b) Login with the password **admin**.

Setting the output mode

Ensure the Christie E500 LED Display Controller is configured to use the correct output mode.

When the incorrect output mode is selected, the tiles are not recognized by the controller.

1. On the front of the controller, press the menu dial.

   When using the menu dial, rotate the dial to move through the items in the menu. To select a menu item or to set a value, push in the menu dial.

   To return to the previous menu, press the button to the bottom right of the menu dial.

2. Select **Screen Settings** > **Output Modes** > **Ports**.

   Use **SerDes** mode when connecting over RS232.

Adjusting the initial picture coordinates

Adjust the initial coordinates of the pictures on the screen.

1. On the front of the controller, press the menu dial.

   When using the menu dial, rotate the dial to move through the items in the menu. To select a menu item or to set a value, push in the menu dial.

   To return to the previous menu, press the button to the bottom right of the menu dial.

2. Select **Advanced Settings** > **Image Offset**.

3. Select **Start X** and push the menu dial.

4. Rotate the dial and set the horizontal offset.

5. Select **Start Y** and push the menu dial.

6. Rotate the dial and set the vertical offset.

Testing the communication between the controller and tiles

Verify that the array is connected to and recognized by the Christie E500 LED Display Controller.

1. Connect the USB cable between the controller and the computer running the Christie E500 LED Display Controller software.

2. Launch the Christie E500 LED Display Controller software and log in as the administrator.

   a) Click **User** > **Advanced User Login**.

   b) Login with the password **admin**.

3. To confirm the display is connected to and recognized by the controller, in the Local System Info area, ensure **Control System** has a value of **1**.

   If the controller is not recognizing the tiles, select **System** > **Reconnect**.

4. If the Monitor Information area reports that there is no screen, verify that the *output mode is set to Ports* (on page 24) and in the Christie E500 LED Display Controller software select **System** > **Reconnect**.

5. Switch to the **Screen Control** tab.

6. To confirm the controller is communicating with all tiles, select a color from the **Self Test** list and click **Send**.

   If the controller is communicating with all the tiles, each display changes to the selected color.

7. Reset the Self Test to **Normal** and click **Send**.

8. Close the **Screen Control** dialog.

Reviewing the tile configuration

Review the tile configuration reported in the Christie E500 LED Display Controller software.

1. In the Christie E500 LED Display Controller software, click **Screen Configuration**.
2. Select **Configure Screen** and click **Next**.
3. Switch to the **Screen Connection** tab.
4. Click **Read from HW**.
5. Review the configuration of the tiles in the array, and modify as needed.
   The cable layout for the tiles in the array is identified with an **S** where the first cable starts, and the green line shows the path of the daisy chain of cables. **E** identifies the end of the daisy chain.

Setting the input resolution

Set the resolution for the home page display of interface, which must be consistent with the output resolution of the video source.

1. Log into the Christie E500 LED Display Controller software.
2. Click **Screen Configuration**.
3. Select **Configure Screen** and click **Next**.
4. Switch to the **Sending Card** tab.
5. In the Set the Sending Card Display Mode section, select the resolution of the video source from the **Resolution** list.

Tile	Native resolution
LED009	640 px by 360 px
LED012	480 px by 270 px
LED016	384 px by 216 px
LED019	320 px by 180 px
LED025	240 px by 135 px

6. Click **Save**.

Locking the controller

Disable the ability to navigate the menu and modify the settings from the front of the controller.

1. To disable access to the controller menu, press and hold the menu dial and back button until the controller screen flashes.
2. To re-enable access to the controller menu, press and hold the menu dial and back button for approximately 15 seconds.
3. Test if the controller is unlocked by using the menu dial to navigate the menu.
   If the controller is still locked, press and hold the menu dial and back button for a longer period of time.

Maintaining the LED panels

Learn the information and procedures for performing maintenance on the Christie Velvet LED Display System.

Cleaning the LED panels

Learn how to clean the Christie Velvet LED Display System panel.

> **Notice.** If not avoided, the following could result in property damage.
>
> • Always wear clean, lint-free gloves when handling the product.

To avoid the risk of damaging the LEDs, clean the panel only if absolutely necessary.

1. To clean the LED panels use a dry, clean, soft cloth with a low lint count or a paint brush to remove any particles.
2. To remove loose particles between the LEDs, use filtered compressed air.

   Ensure the air compressor does not spray oil or condensation.

Do not use the following products when cleaning the panels:

• Compressed air cans
• Liquids
• Abrasive cloths

Specifications

Learn about the product specifications. Due to continuing research, specifications are subject to change without notice.

Physical specifications

Learn the physical specifications for the tiles and the power supply.

Christie Velvet LED Display System

	LED009-AL	LED012-AP	LED012-AL	LED016-AL	LED019-AL	LED025-AL
Tile dimensions (W x H x D)	614.4 mm x 345.6 mm x 95.0 mm (24.19 in x 13.61 in x 3.74 in)					
Tile resolution (W x H)	230,400 pixels 640 px x360 px 9:16 aspect ratio	129,600 pixels 270 px x 480 px 9:16 aspect ratio	129,600 pixels 480 px x 270 px 16:9 aspect ratio	82,944 pixels 384 px x 216 px 16:9 aspect ratio	57,600 pixels 320 px x 180 px 16:9 aspect ratio	32,400 pixels 240 px x 135 px 16:9 aspect ratio
Tile weight	8.3 kg (18.3 lb)					
Service access	Front					
LED module dimensions (W x H)	153.6 mm x 115.20 mm (6.05 in x 4.54 in)					
LED module resolution	160 px x 120 px	90 px x 120 px	120 px x 90 px	96 px x 72 px	80 px x 60 px	60 px x 45 px

Remote Power Supply Rack Shelf

Description	Details
Dimensions (W x H x D)	485 mm x 133 mm x 395 mm (19.09 in x 5.24 in x 15.55 in)
Weight	Shelf: 11.5 kg (30.8 lbs) Rectifiers: 2.5 kg (6.7 lbs) per unit, four units maximum

Power requirements

Learn the power requirements for the tiles and the power supply.

Input ratings and power consumption for LED tiles

Input ratings	
LED009-AL	48 VDC, 4A (maximum 7 tiles) Typical: 67 W per panel, Max: 200 W per panel
LED012-AP	48 VDC, 5.2A (maximum 5 tiles)
LED012-AL	Typical: 70 W per panel, Max: 208 W per panel
LED016-AL	48 VDC, 5.2A (maximum 5 tiles) Typical: 74 W per panel, Max: 220 W per panel
LED019-AL	48 VDC, 5.2A (maximum 5 tiles) Typical: 74 W per panel, Max: 220 W per panel
LED025-AL	48 VDC, 3A (maximum 9 tiles) Typical: 47 W per panel, Max: 140 W per panel

Power consumption	
LED009-AP	Typical: 67 W per panel, Max: 200 W per panel
LED012-AP	Typical: 70 W per panel, Max: 208 W per panel
LED012-AL	
LED016-AL	Typical: 74 W per panel, Max: 220 W per panel
LED019-AL	Typical: 74 W per panel, Max: 220 W per panel
LED025-AL	Typical: 47 W per panel, Max: 140 W per panel

Input rating for the Christie E500 LED Display Controller

Input rating
100-250 V~, 50-60 Hz, 1.5A, 75 watts

Power ratings for the Remote Power Supply Rack Shelf

Description	Details
Input voltage	120-230 VAC, 50/60 Hz 12A at 120VAC - 9.5A @ 230 VAC per rectifier (maximum four rectifiers installed)
Output	52 VDC (max), 30A per output (with maximum four rectifiers installed)

The number of displays that can be powered by a single Remote Power Supply Rack Shelf depends on the voltage range of the input and the number of rectifiers. Please consult your local Christie representative for further details.

	PSU modules	Max power AC input: 187-312 V	De-rated power AC input: 120 V	AC input: 176 V
Total output power (no redundancy)	1	2000W	1200W	1800W
	2	4000W	2400W	3600W
	3	5760W	3600W	5400W
	4	5760W	4800W	5760W

	PSU modules	Max power AC input: 187-312 V	De-rated power AC input: 120 V	AC input: 176 V
Total output power (n+1 redundancy)	2	2000W	1200W	1800W
	3	4000W	2400W	3600W
	4	5760W	3600W	5400W

Environment requirements

Learn about the environment requirements for the product while operating and not operating.

Non-operating environment

Item	Description
Tile temperature	-10°C to 50°C (14°F to 122°F)
Tile humidity (non-condensing)	10% to 90%

Operating environment

Item	Description
Tile temperature	0°C to 40°C (32°F to 104°F)
Tile humidity (non-condensing)	10% to 90%
Altitude	0 to 3000 meters
Control unit temperature	-20°C to 60°C (-4°F to 140°F)
Control unit humidity	10% to 90%

Remote Power Supply Rack Shelf

Description	Details
Temperature	Operating: -10 to 35°C (14°F to 95°F)

Description	Details
	Storage: -40 to 85°C (-40 to 185°F)
Humidity (non-condensing)	Operating: 0% to 93% Non-operating: 0% to 95%
Elevation	-60 to 2000 m (-198 to 6600 ft)
Heat dissipation	<2196 BTU per hour (four PSU modules)
Acoustic	Max 66dB (four PSU modules)

Display specifications

	LED009-AL	LED012-AP	LED012-AL	LED016-AL	LED019-AL	LED025-AL
Pixel pitch	0.96 mm	1.28 mm	1.28 mm	1.6 mm	1.92 mm	2.56 mm
Pixel size	0.6 mm x 0.6 mm	0.8 mm x 0.8 mm	0.8 mm x 0.8 mm	1 mm x 1 mm	1 mm x 1 mm	2 mm x 2 mm
Pixel configuration	1R 1G 1B					

Regulatory

This product conforms to the latest regulations and standards related to product safety, environmental requirements and electromagnetic compatibility (EMC).

Safety

- CAN/CSA C22.2 No. 60950-1
- ANSI/UL 60950-1 - Information Technology Equipment – Safety – Part 1: General Requirements
- IEC 60950-1 IEC/EN 60950-1 - Information Technology Equipment – Safety – Part 1: General Requirements
- EN 60950-1
- IEC 62471-1 - Photobiological safety of lamps and lamp systems

Electro-magnetic compatibility

Emissions

- FCC CFR47, Part 15, Subpart B, Class A - Unintentional Radiators
- CAN ICES-003 (A)/NMB-003 (A) - Information Technology Equipment (Including Digital Apparatus) - Limits and Methods of Measurement
- CISPR 32/EN 55032, Class A
- IEC 61000-3-2/EN61000-3-2: Limits for Harmonic Current Emissions

Immunity

- IEC 61000-3-3/EN61000-3-3
- IEC/EN61000
- IEC 61000-4-2/EN61000-4-2
- IEC 61000-4-3/EN61000-4-3
- IEC 61000-4-4/EN61000-4-4
- IEC 61000-4-5/EN61000-4-5
- IEC 61000-4-6/EN61000-4-6
- IEC 61000-4-8/EN61000-4-8
- IEC 61000-4-11/EN61000-4-11

Environmental

EU Directive (2011/65/EU) on the restriction of the uses of certain hazardous substances (RoHS) in electrical and electronic equipment and the applicable official amendment(s).

EU Regulation (EC) No. 1907/2006 on the registration, evaluation, authorization and restriction of chemicals (REACH) and the applicable official amendment(s).

EU Directive (2012/19/EU) on waste and electrical and electronic equipment (WEEE) and the applicable official amendment(s).

For the most current technical documentation, visit www.christiedigital.com.