

CHRISTIE®

Solaria™ Series

CP2220

SETUP GUIDE

020-100476-03

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020-100476-03

NOTICE

This equipment 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 equipment is operated in a commercial environment. This equipment 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 this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

The equipment 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 this equipment 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!

Copyright 2009-2010 Christie Digital Systems USA, Inc. All rights reserved. All brand names and products are trademarks, registered trademarks or trade names of their respective holders. Canadian manufacturing facility is ISO 9001 and 14001 certified. Performance specifications are typical, but may vary depending on conditions beyond Christie's control such as maintenance of the product in proper working conditions. Performance specifications are available at the time of printing. Every effort has been made to ensure accuracy, however in some cases changes in the products or availability could occur which may not be reflected in this document. Christie reserves the right to make changes without notice or obligation.

WARRANTY

For complete information about Christie's limited warranty, please contact your Christie Dealer. In addition to the other limitations that may be specified in Christie's limited warranty, the warranty does not cover:

- a. Damage occurring during shipment, in either direction.
- b. Projector lamps (See Christie's separate lamp program policy).
- c. Damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp supplied by a supplier other than Christie.
- d. Problems caused by combination of the equipment with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the equipment with any non-Christie interface device.
- e. Damage caused by misuse, improper power source, accident, fire, flood, lightning, earthquake or other natural disaster.
- f. Damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel.
- g. For LCD projectors, the warranty period specified applies only where the LCD projector is in "normal use." "Normal use" means the LCD projector is not used more than 8 hours a day, 5 days a week. For any LCD projector where "normal use" is exceeded, warranty coverage under this warranty terminates after 6000 hours of operation.
- h. Failure due to normal wear and tear.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your projector. Please see the Maintenance section for specific maintenance items as they relate to your projector and/or model. Failure to perform maintenance as required and in accordance with the maintenance schedule specified by Christie will void the warranty.

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1 Introduction

This manual is intended for trained users authorized to operate professional high-brightness projection systems. Only qualified Christie trained service technicians knowledgeable about all potential hazards associated with high voltage, ultraviolet exposure and high temperatures generated by the lamp and associated circuits are authorized to 1) assemble/install the projector and 2) perform service functions inside the projector.

1.1 Purchase Record and Service Contacts

Should a problem be encountered with any part of the projector, contact a dealer. If you have purchased the projector, complete the Purchase Record, below and keep with your records.

Table 1.1 Purchase Record

Dealer:
Dealer or Christie Sales/Service Contact Phone Number:
Projector Serial Number*:
Purchase Date:
Installation Date:

** The serial number can be found on the license label located on the back of the projector*

Table 1.2 .Ethernet Settings

Default Gateway	
DNS Server	
Projector DLP Address	
Projector Mgmt IP Address	
Subnet Mask	

1.2 Projector Overview

The CP2220 is a professional quality, easy-to-use DMD™ projector utilizing Digital Light Processing (DLP™) Cinema technology from Texas Instruments. It's all-in-one design integrates all components in a sleek projection head that can be table-top mounted or used with the optional rack stand. Integrating smoothly into traditional projection environments such as theatres and other wide screen exhibitor venues, the CP2220 offers stunning wide screen, high-resolution cinema images that remain flawless from first release to final show. CP2220 interfaces with local networks typical in theatres throughout the world, and can be expanded even further by connecting non-cinema DVI source material for multimedia presentations from a variety of formats.

1.2.1 Key Features

- 2048 x 1080 native pixel format
- CineBlack™ and CinePalette™ for deep film-like blacks and superior colorimetry
- 2.0 or 3.0 kW Xenon lamps available
- Supports theatre screens up to approximately 40 feet in width
- Touch Panel Controller (TPC) running Windows XP for main projector interface.
- Seamless switching between 292 and DVI inputs
- Capable of supporting an internal image media block
- One 10/100BaseT Ethernet port for connection to in-theatre Ethernet hub
- Two RS-232 ports for communication with Christie-supported peripherals (except Cine-IPM 2K)
- One GPIO port for connection of automation
- One Simple Contact Closure Input (SCCI) for automated Lamp Start and Douser operation
- Two DVI-D inputs for display of copy protected alternate content
- One USB port for direct laptop connection, useful during setup and local software downloads
- One 3D port for placement of a Dolby 3D system
- LiteLOC™ feature for constant image brightness
- LampLOC™ feature for motorized three-axis lamp alignment
- Electronically operated “quick” douser
- Motorizeable lens mount
- LED indicators on the rear corners of the projector for easy-to-read status indication
- Secure, encrypted communication protocol with multi-level password access
- High-security lock on SPB2 boundary for front electronics and content protection
- Low and medium-security locks or captive fasteners on access doors for internal maintenance
- Replaceable air filters (no tools required)
- Capability to split power supply for use of Uninterruptible Power Supply (UPS) to power head electronics
- Optional Rack Mount Stand
- Choice of field-interchangeable zoom lenses and anamorphic lenses
- Optional Motorized Auxiliary Lens Mount for anamorphic or auxiliary lenses

1.3 How the Projector Works

The CP2220 accepts a variety of cinema or DVI-compatible “non-cinema” signals for projection on front screens typical in commercial theatre or other large screen applications. High-brightness light is generated by a short arc Xenon lamp, then modulated by three Digital Micromirror Device (DMD) panels responding to incoming data streams of digitized red, green and blue color information. As these digital streams flow from the source, light from the responding “on” pixels of each panel is reflected, converged and then projected to the screen through one or more front lenses, where all pixel reflections are superimposed in sharp full-color images.

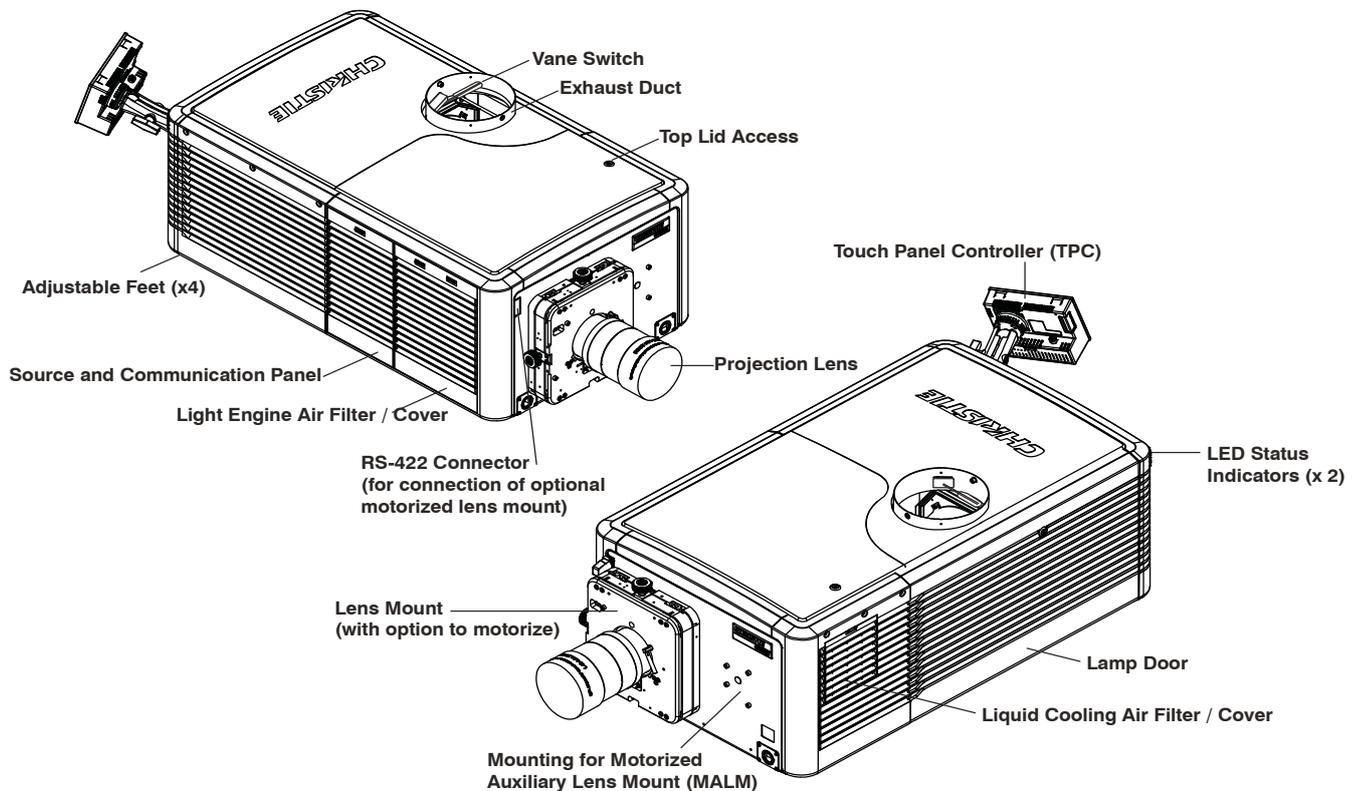


Figure 1-1 Projector Overview

1.3.1 Touch Panel Controller (TPC)

The Touch Panel Controller (TPC) is a portable, touch-sensitive screen used to control the projector. It is mounted to the rear of the projector and can be adjusted at any angle using the flexible double ball joint mount for convenient viewing and flexible operation in various installation configurations. In general, the TPC provides users with a means for monitoring operation and status of the projector. In general, users can turn the lamp on/off, select a specific source/input, and obtain basic status information.

Depending on the installation, the TPC can remain mounted to the projector or wall mounted anywhere else at the site. An optional extension cable is also available, which can be purchased separately to provide TPC access up to 100 feet away.

1.3.2 List of Components

Ensure the following components were received with the projector:

- Projector with Touch Panel Controller
- Lens plug *(required for shipping when lens is not installed to prevent contamination of critical optical components)*
- Nylon safety strap with clip *(required to secure projector to tabletop or optional rack mount)*
- Warranty Card
- Web Registration Form

1.3.3 Labels and Markings

⚠ DANGER Danger symbols indicate a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Warning symbols indicate a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION Caution symbols indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.

1.4 Typographical Notations

The following notations are used throughout this manual:

- Keypad commands and PC keystrokes appear in bold small caps, such as POWER, INPUT, ENTER etc.
- References to specific areas of the document appear italicized and underlined. When viewed online the text appears in blue indicating a direct link to that section. For example, [Section 2 Installation and Setup](#).
- References to other documents appear italicized and bold, such as ***Service Manual***.
- References to software windows and available options appear bold, such as **Main** panel, **Preferences** window.
- User input or messages that appear on screen, in status display units or other control modules appear in Courier font. For example. "No Signal Present", Login: christiedigital.
- Error codes, LED status appear in bold, e.g. LP, A1 etc.
- Operational states of modules appear capitalized, such as power ON/OFF.

2 Installation and Setup

This section explains how to install, connect and optimize the projector for delivery of superior image quality. **NOTE:** *Illustrations are graphical representations only and are provided to enhance the understanding of the written material.*

2.1 Site Requirements

The following site requirements are required for safe installation and operation of the CP2220:

Physical Operating Environment

- Maximum Ambient Temperature (operating) 35°C
- Minimum Ambient Temperature (operating) 10°C

External Exhaust Ducting

- The installation site must provide a minimum of 450 CFM (ft³/min) external exhaust airflow to ensure adequate cooling of the projector's Xenon arc lamp at less than or equal to 25°C ambient and less than 3,000 feet elevation. Above 25°C or 3,000 feet, 600 CFM is required. For detailed instructions on how to measure CFM refer to *STEP 5 - Connect External Exhaust Ducting, on page 2-4.*

Permanent Power Connection

- A **30-32A double pole, UL listed** wall circuit breaker is required. It must be part of the building installation and easily accessible.
- Single-phase 30A connection of AC supply to the terminal block.
- Protection from overcurrents, short circuits and earth faults must be part of the building installation. The disconnect device (double pole switch or circuit breaker with minimum 3mm contact gap) must be readily accessible within the projection room.

Refer to STEP 8 - Connect Power, on page 2-8 for detailed instructions.

2.2 Tools Required for Installation

Before you begin installation, it is important to fully understand all site requirements and characteristics, and that you have the following tools and components on hand.

- 12" screwdrivers: Phillips #2 (magnetic) and flat
- 19mm and 7/8" wrenches
- Assorted Allen keys (metric)
- Heat extractor
- Protective clothing/safety gear (required when handling the lamp)
- Lamp
- Lens cleaning tissue and solution

2.3 General Installation Safety and Warning Guidelines

⚠ WARNING QUALIFIED TECHNICIAN REQUIRED for all installations. This product must be installed in a restricted access location.

⚠ WARNING Never operate the projector without all of its covers in place.

⚠ WARNING Projector uses a high-pressure lamp that may explode if improperly handled. Always wear manufacturer approved protective safety clothing (gloves, jacket, face shield) whenever the lamp door is open or while handling the lamp. Lamp installation/replacement requires a qualified technician.

⚠ WARNING Use of the projector's rear safety strap is MANDATORY to prevent it from tipping.

⚠ WARNING Four or more people are required to safely lift and hand-carry one projection head a short distance. Recommend removing the lamp before transporting the projector.

⚠ CAUTION Keep the projector as level as possible when lifting or transporting. Avoid tilting the projector on the right side. This can introduce an air bubble within the coolant hoses that can lead to an air lock.

⚠ CAUTION Perform Auto LampLOC™ whenever the projector is physically moved or leveled or whenever a new lamp is installed.

2.4 Installation Instructions

STEP 1 - Position the Projector

1. An optional rack stand (P/N 108-282101-02) and hold down clamp (P/N 116-100101-01) are available for use with the projector. If you intend to use the rack stand as part of your installation, refer to the instructions provided with the rack stand before continuing with the remaining installation steps.
2. Position the projector at an appropriate throw distance (projector-to-screen distance) and vertical position. Ideally, center the projector with the theatre screen. If competing for space with an already present film projector, aim the projector slightly off-center as shown in **Figure 2-1**. This will slightly increase side keystoneing, but will minimize the horizontal lens offset required.

NOTE: *Unlike film projectors, it is best to keep the projector lens surface as parallel to the screen as possible, even if significantly above the screen center. When a particularly short throw distance combines with a very wide screen, you may have to forfeit some aim and stay more parallel to the screen. In such cases, some lens offset can reduce the keystone distortion.*

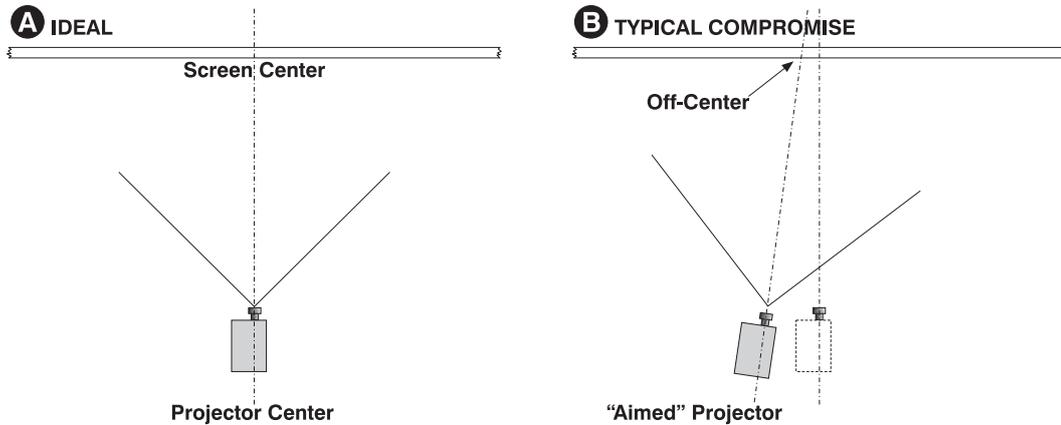


Figure 2-1 Position the Projector

STEP 2 - Secure the Projector

⚠ WARNING Use of the projector’s rear safety strap is **MANDATORY** to prevent it from tipping. Secure the strap between the projector and the optional rack-mount or any other surface it is mounted to.

Attach the supplied safety strap to the back of the projector and fasten it to its mounting surface. Use of the strap is mandatory to prevent the projector from tipping when a lens or auxiliary lens mount is installed.

NOTE: If you are using the optional rack stand, it is strongly recommended you use the hold down clamp (P/N 116-100101-01) in addition to the rear safety strap to firmly secure the projector’s rear feet.

STEP 3 - Adjust Tilt/Leveling

For an ideal installation, the CP2220 lens surface should be centered and parallel to the theatre screen. This orientation helps to ensure optimized lens performance with minimal offset. Choose a sturdy mounting surface that allows for this. If this position is not possible (such as when the projector is significantly higher than the center of the screen), it is better to rely on offset rather than extra tilt.

Check with theatre personnel for the degree of screen tilt or measure this incline with a protractor at the screen. Tilt the projector to match the screen tilt angle by extending or retracting the projector’s four adjustable feet.

NOTES: **1)** For best optical performance, avoid tilting the projector excessively. Use vertical offset of the lens instead. **2)** The front-to-back tilt of the projector must not exceed 15°. This limit ensures safe lamp operation and proper position of the liquid cooling reservoir in the projector.

Adjusting Feet/Leveling

To adjust the height or level of the projector, extend or retract the adjustable feet located on the bottom of the projector by rotating them. Once the required adjustment is made, tighten the lock nut. See **Figure 2-2**.

Warning! Make sure the projector’s rear safety strap is in place before adjusting the projector’s feet.

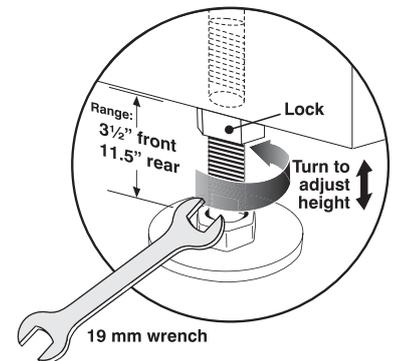


Figure 2-2 Adjust Feet

STEP 4 - Mount Touch Panel Controller (TPC)

The TPC comes pre-assembled with its base and mounting arm. It is shipped separately and must be mounted to the projector during installation.

When installing the TPC:

1. Loosen the mounting arm just enough for the end to fit over the ball joint located on the rear panel of the projector. **Figure 2-3**

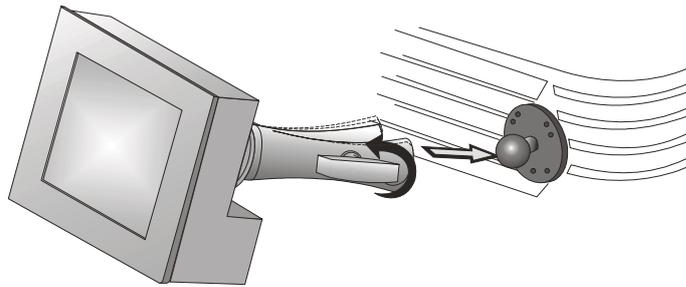


Figure 2-3

2. Tighten the mounting arm until it fits snug on the ball joint. **Figure 2-4**

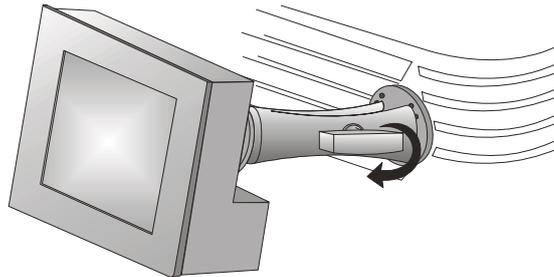


Figure 2-4

3. Connect the cable from the TPC to the connector located on the projector's rear panel.
4. Adjust the angle of the TPC as desired.

STEP 5 - Connect External Exhaust Ducting

The projector emits a constant stream of warm exhaust air, which must be vented to the outside of the building. Connect the site's pre-installed, outside-venting ductwork via the 8" diameter exhaust port on the top of the projector. Confirm that 1) there are no obstructions or "kinks" within the ducting, 2) all air intake areas of the projector are clear and exposed, 3) the vane switch at the exit duct is moving freely.

The site's pre-installed outside-venting duct should be rigid at the projector and must also include a heat extractor/blower that maintains a minimum of 450 CFM* when the projector is operating at less than or equal to 25°C ambient and less than 3,000 feet, while measured at the projector exhaust opening.

⚠ WARNING *600 CFM is required in projection rooms with ambient temperature above 25°C or elevation (above sea level) greater than 3000 feet.

⚠ WARNING At minimum, a 10" long, strong metal duct must be in place at the projector to prevent glass shards from exiting the duct in the event of a lamp explosion.

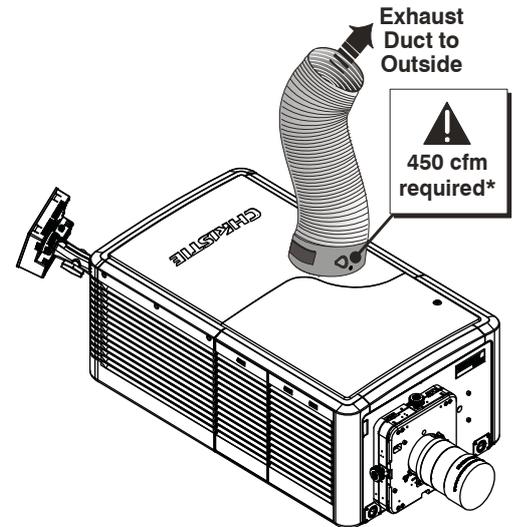


Figure 2-5 Connect Exhaust Ducting

How to Calculate CFM in the 8" diameter external exhaust duct:

Use an airflow meter to measure the ft/min or ft/sec at the rigid end of the open exhaust duct that will connect to the projector. Make sure the measurement is taken right at the very end without the projector connected. Then multiply the reading by the cross-sectional area of the 8" duct to calculate the cubic feet/min airflow. The formula is:

$$\text{Measured linear ft/min} \times 0.35 = \text{CFM}$$

Calculations should show 450 CFM airflow in the 8" exhaust duct if operation is at 25°C or lower and installation is at or below 3000 feet altitude (above sea level). Add an extractor/boosters as needed for your site, as the vane switch will prevent the projector from operating if there is insufficient airflow. Do not mount the extractor on the projector as this may introduce some vibration into the image. **NOTE:** *If the duct becomes significantly blocked - or if a fan fails - the projector should trigger an alarm before becoming overheated or unsafe. Regardless, check airflow regularly. For instructions refer to [Section 5 Troubleshooting](#).*

⚠ CAUTION Never disable the vane switch. Attempting to operate the projector with inadequate airflow can result in dangerous overheating of the projector.

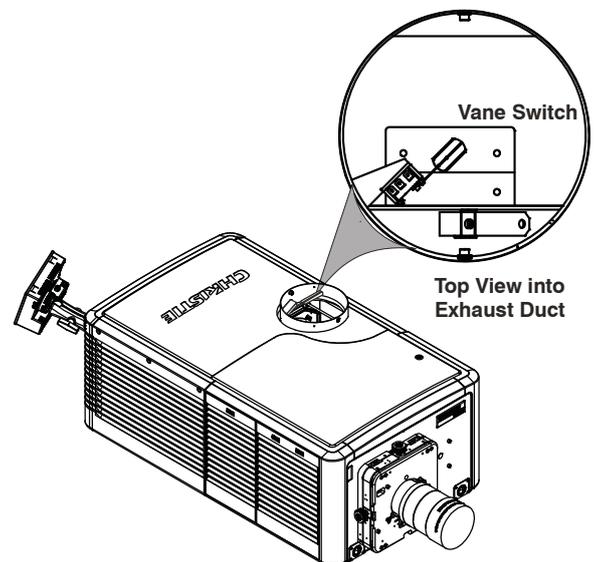


Figure 2-6 Exhaust Duct Vane Switch

STEP 6 - Install Lens

The lens seals the projector preventing contaminants from entering the area of the main front electronics.

Caution! *Never operate a projector without a lens installed.*

For Primary Zoom Lens Installation:

1. Ensure the projector's rear safety strap or rear hold down bracket is in place.
2. Turn the lens clamp to the OPEN position. See **Figure 2-7**.
3. Orient your high-contrast lens with its notches at the top. Fully insert the assembly straight into the lens mount opening without turning. When the lens is fully inserted it will seat properly within the lens mount and the aperture will be oriented correctly. **NOTE:** *Insert a high-brightness lens in the same manner, with the UP label at the top.*
4. Position the lens clamp DOWN to lock the lens assembly in place. See **Figure 2-8**.
5. Calibrate the lens. Refer to [2.8 Basic Image Alignment](#) for details.

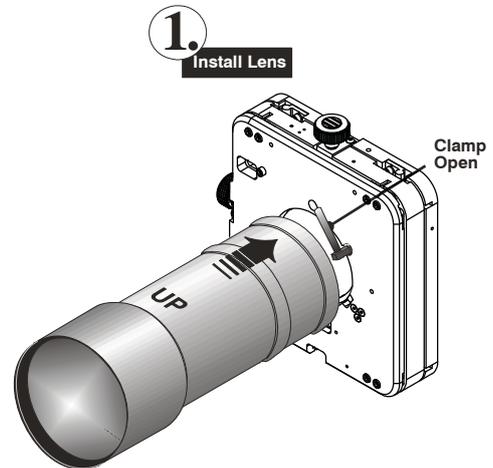


Figure 2-7 Open Lens Clamp and Insert Lens

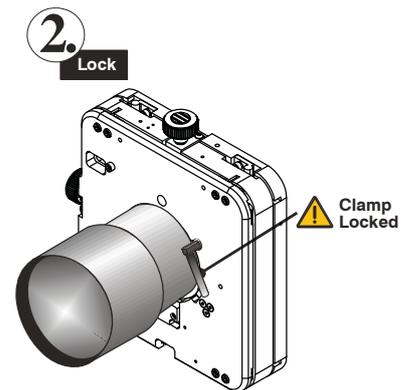


Figure 2-8 Lock Lens In Place

For Auxiliary Lens Installation (Optional):

To install a 1.26x Anamorphic lens or a 1.26x Wide Converter Lens (WCL) producing 2.39:1 “scope” images for large screens, install the auxiliary lens mount and lens to the projector using the hardware and instructions provided in the Auxiliary Lens Mount Kit (P/N 108-111101-xx, P/N 108-111102-xx).

Motorized Lens Mount Option

The lens mount on the projector is designed so that it can be motorized by installing the optional Motorized Lens Mount Motors Kit (P/N 127-102104-xx). This will give the lens mount motorized vertical, horizontal and focus travel as well as zoom control. Refer to the instructions provided in the kit for installation of the various stepper motors and motor control PCB.

STEP 7 - Install First Lamp

⚠ DANGER Qualified technician required! High-pressure lamp may explode if improperly handled. Always wear approved protective safety gear whenever lamp door is open or while handling the lamp.

- 1. Open lamp door.** Using the security key provided, open the lamp door and inspect the empty lamp cooling compartment. **Caution!** Do not place heavy objects on the open lamp door.
- 2. Position anode yoke assembly according to lamp type.** Check the position of the anode yoke assembly for the lamp type that will be used in the projector. Table 2.1 lists all available lamp types for the CP2220 and the position of the anode yoke assembly. (Figure 2-9)

Table 2.1 Lamp Types Available for CP2220 and Anode Yoke Position

LAMP	TYPE	ANODE YOKE POSITION
2.0 kW	CDXL-20	Move the lamp cradle as far forward as possible (position closest to igniter)
3.0 kW	CDXL-30	Move the lamp cradle to the rear position, which is approximately 1" closer to the reflector.
3.0 kW	CDXL-30SD (short arc)	
3.0 kW	CXL-30	

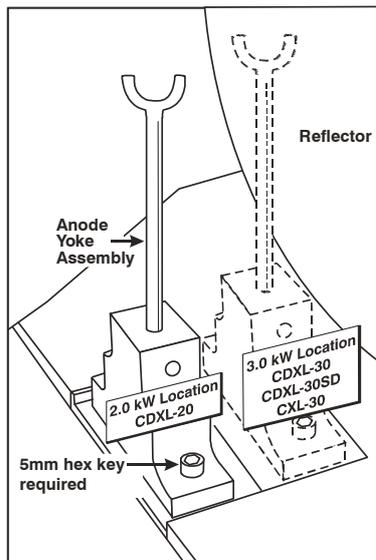


Figure 2-9 Anode Yoke Position

- 3. Install the lamp.** Refer to [Section 4.1 Lamp Replacement](#) for lamp replacement instructions. Observe all warnings, and wear protective safety gear.

Important! The projector is shipped with a lamp extension nut fastened to the cathode end of the lamp holder. Use this nut with **CDXL-30SD** lamps only. This will ensure proper placement of this lamp type. If you are installing any other lamp type, remove this nut and retain it for future lamp replacements by threading it onto a dedicated stud located on the baseplate in the lamp compartment (labeled). Leaving the extension nut on with the wrong lamp type can lead to extremely dim light output.

STEP 8 - Connect Power

CP2220 is designed as a permanently wired connection or pluggable type B connection. Connecting the projector to your AC supply can vary according to the country or state in which the projector is installed. For any installation, always follow the electrical code for your location.

⚠ WARNING 1) Certified electrician required. 2) Ground (earth) connection is necessary for safety. Never compromise safety by returning the current through the ground. 3) Connect ground **FIRST** to reduce shock hazard from high leakage.

⚠ CAUTION Use an appropriate strain relief connector on the AC supply cable to prevent the cable from rubbing against the projector knockout plate and becoming damaged.

Installing a Permanent Connection

Guidelines:

- ❑ A 30-32A double pole, UL listed wall circuit breaker is required. It must be part of the building installation and easily accessible.
 - ❑ Use 10AWG or 8AWG wiring: The distance between the wall circuit breaker and the projector must not exceed 20 metres using 10AWG cables or 30 metres using 8AWG cables.
 - ❑ For North American installations, use at least 10AWG copper wires for the connection of the main AC supply to the projector's ground lug.
 - ❑ Copper or aluminum are acceptable as conductor wiring material to the terminal block.
1. A small electrical access plate is located under the projector in the front right corner. Loosen the two screws and slide the plate forward to expose the terminal block underneath. See **Figure 2-10**.

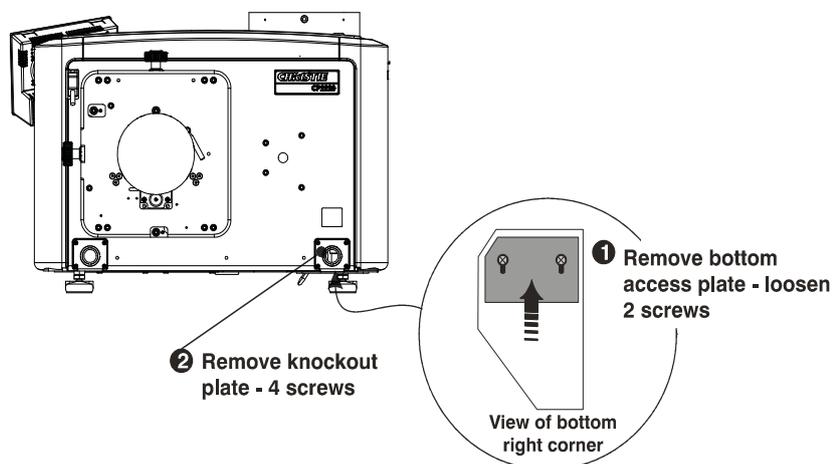


Figure 2-10

2. Remove the knockout plate located in the bottom right corner of the front bezel. The AC supply is routed to the terminal block through an appropriate strain relief mounted on this knockout plate.
3. Optional, remove the terminal block for easier wiring (thumbscrews).

- Connect the AC power source to the terminal block, beginning with the ground lead first. See **Figure 2-11** for wiring details. Use an appropriately sized strain relief connector with the knockout plate provided to ensure adequate environmental sealing and to prevent the cables from wear and accidentally being torn out. **NOTES: 1)** *The terminal block accommodates up to an 8 AWG wire.* **2)** *If desired, a 90° strain relief connector can be used to route the power cable in a downward direction.*

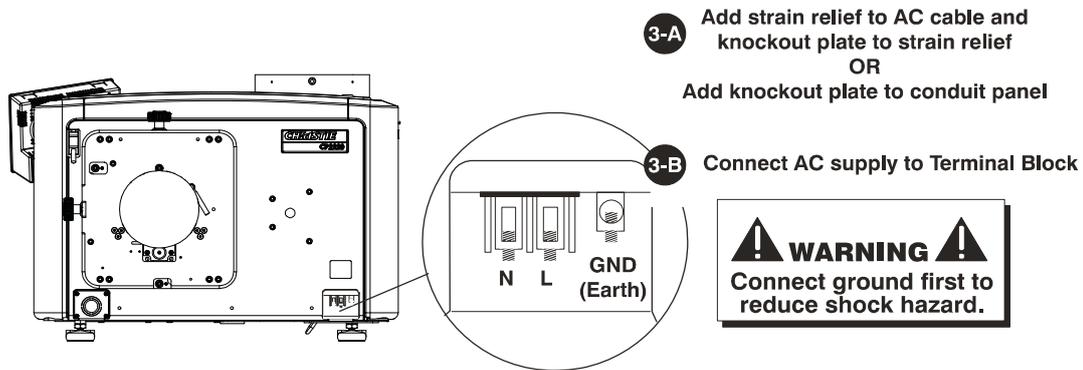


Figure 2-11

- Once all cables are connected, replace the knockout plate and the bottom access panel over the terminal block. (**Figure 2-12**)

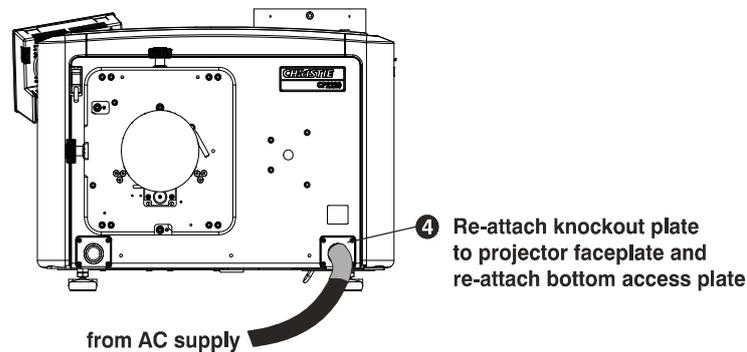


Figure 2-12

Installing a Pluggable Type B Connection

Guidelines:

- There must be easy access to the current protection device or breaker in the building.
- Use 10AWG or 8AWG wiring: the distance between the wall circuit breaker and the projector must not exceed 20 metres using 10AWG cables or 30 metres using 8AWG cables.
- The socket-outlet is installed near the equipment and is easily accessible.
- The plug can be used as the device disconnect and is near the unit and easily accessible.

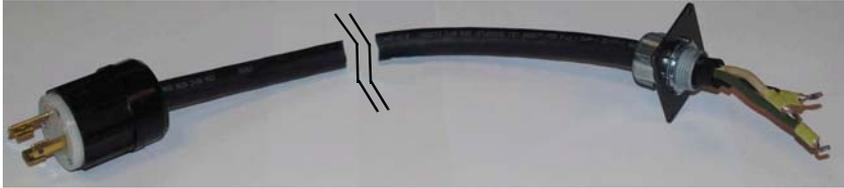


Figure 2-13 Nema-L630A 250V Male Power Plug (116-102104-01)
Actual Length 1.5 Meters

1. A small electrical access plate is located under the projector in the front right corner. Loosen the two screws and slide the plate forward to expose the terminal block underneath. **Figure 2-10**
2. Remove the knockout plate (four screws) located in the bottom right corner of the front bezel.
3. Optional, remove terminal block for easier wiring (thumbscrews).
4. Connect the AC power source to the terminal block, beginning with the ground lead first. See **Figure 2-11** for wiring details. Tighten screws securely.
5. Once all cables are connected, secure the knockout plate (four screws) and the bottom access panel (two screws) over the terminal block.

Configuring the Projector for Uninterrupted Power Supply (Optional)

Located in the power compartment of the projector is an IEC 320 outlet where a UPS can be connected. This allows the projection head electronics to remain operable during a power failure reducing the recovery period of the projector. Once power returns, all that is required is for the operator to turn the lamp on using the TPC.

1. To configure the projector for UPS, simply unplug the LVPS input connection from Main Power and connect it to the loose UPS input plug. Re-use the dummy plug from the UPS connection with the unused Main Power plug. **Figure 2-14**

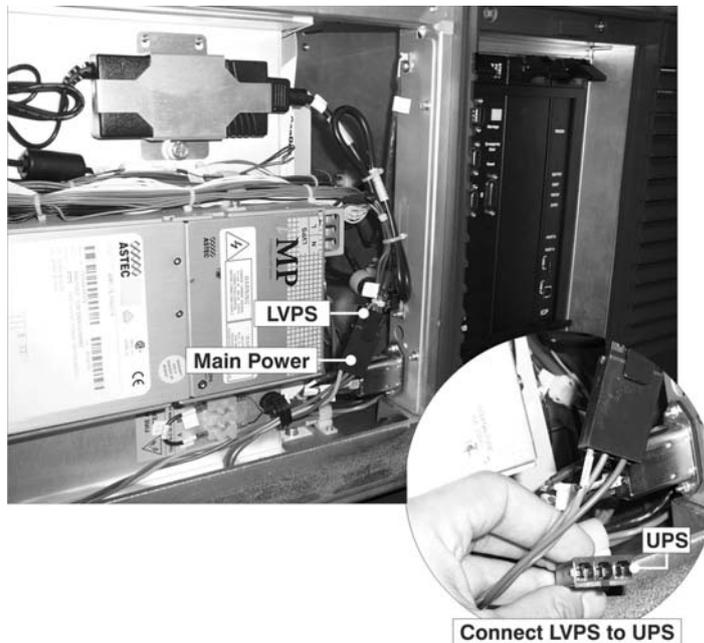


Figure 2-14

STEP 9 - Connect Sources and Initial Power Up

Once the lamp is installed, the projector is essentially ready for operation. Although an image is not required at this time, it is recommended that external cinema servers and sources be connected.

Before igniting the lamp for the first time, it is essential the following steps be completed to ensure successful communication.

1. **Assign the projector a unique IP address.** Each projector is given a default IP address, however if you are connecting the projector to an existing network you must give it a new IP address. For first time installations, assign the IP address in **Menu: Administrator Setup: Communications Configuration** window using the Touch Panel Controller.
2. **Set the baud rate.** Set the baud rate to match the external device connected (such as a server). The projector's default baud rate is 9600 Kbps.
3. **Enter Lamp information.** From the **Menu: Advanced Setup: Lamp History** window define the type of lamp installed, serial number and the number of hours currently logged on the lamp (if any).
4. **Power-up the projector.**
5. **Perform LampLOC™ alignment immediately on the newly installed lamp.** This will ensure the lamp is positioned correctly to achieve maximum light output. Access LampLOC™ features in **Menu: Advanced Setup: LampLOC Setup** window.
6. **Perform initial optical alignment in order to optimize images displayed on screen.** These adjustments must be done before boresight adjustments. Refer to [2.8 Basic Image Alignment, on page 2-16](#).
7. **Adjust optical components when needed.** In rare instances, the installer may have to adjust one or more optical components.

2.5 Connecting Sources

Cinema servers, such as digital media storage devices or non-cinema sources such as PCs reside outside the projector and are connected to one of the ports on the Projector Intelligence Board (PIB) located on the left (operator's) side of the projector.

These communication ports are accessible by first removing the side source and communication access panel. When connecting sources or servers, route all cables along the channel ways located on the bottom of the projector and up through the opening in the frame to the communication connection port.

Replace the access panel to ensure server and source connections remain secure.

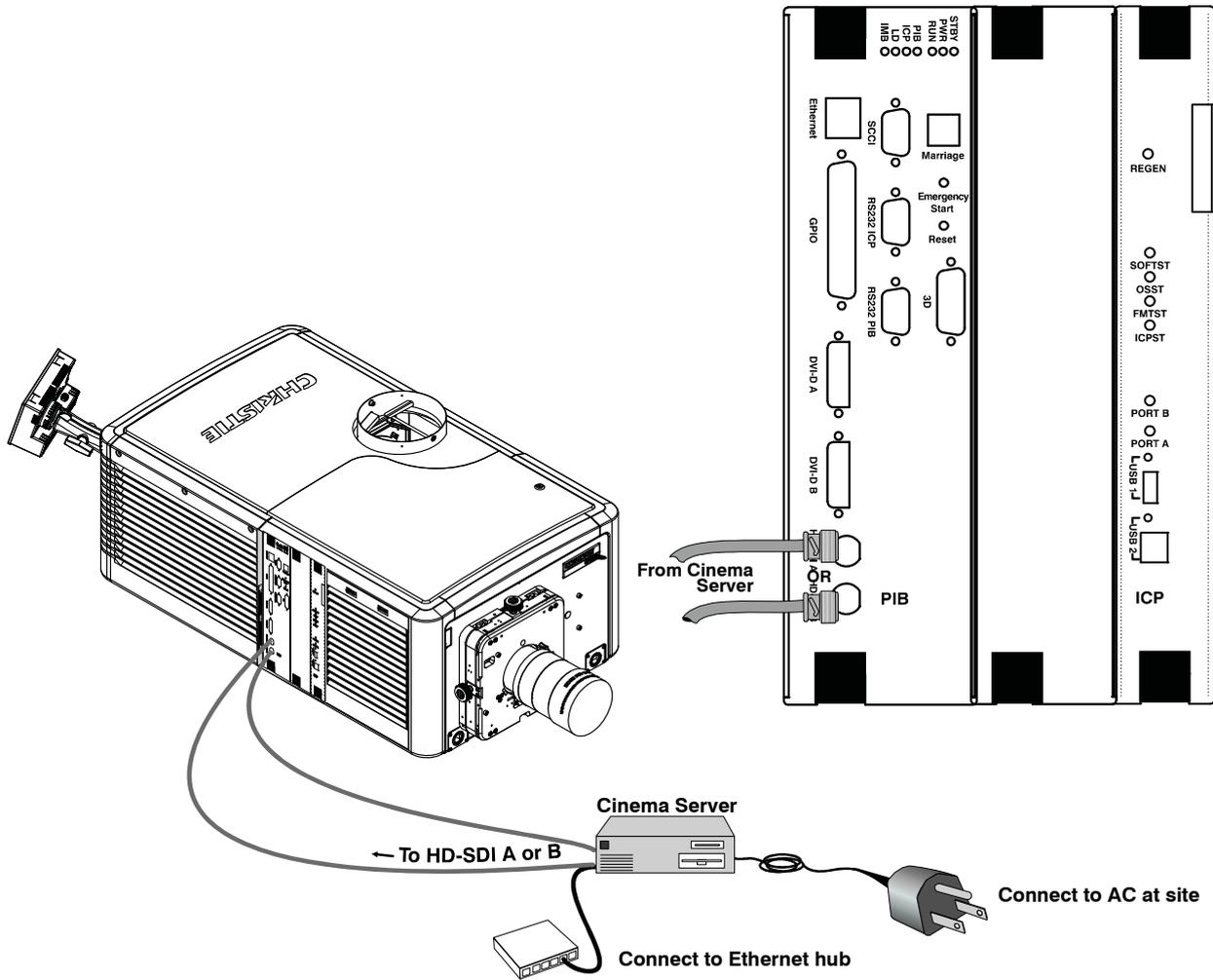


Figure 2-15 Connecting Cinema Sources

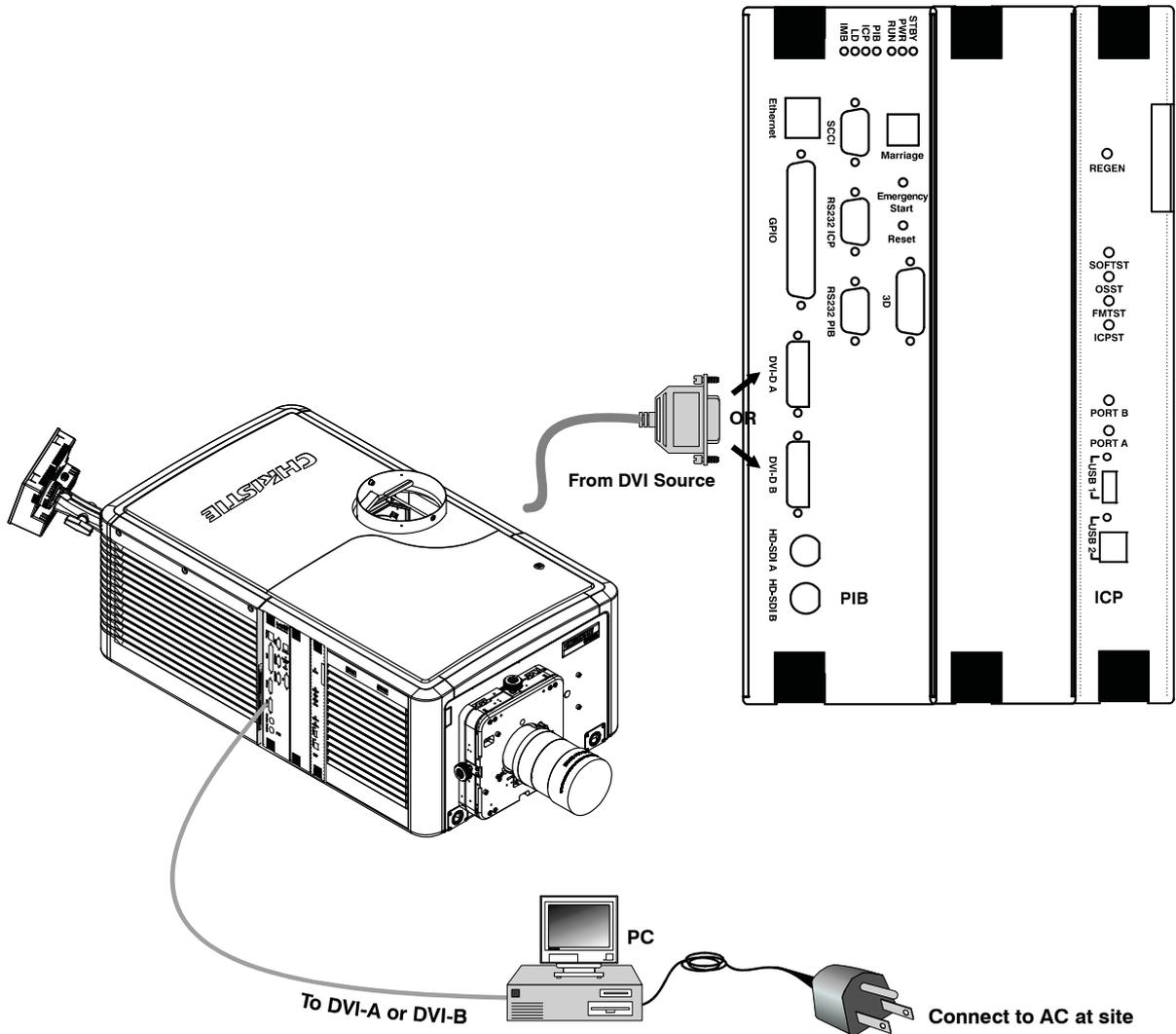


Figure 2-16 Connecting Non-Cinema Sources

Section 2: Installation and Setup

2.5.1 Connecting for Communications

Many communications with the projector are initiated on the Touch Panel Controller (TPC), which is mounted at the rear of the projector. Depending on the installation, you may also need certain other serial and/or Ethernet links to the CP2220, such as from a server or PC functioning as a controller, or from an existing on-site network including other equipment. For applications or equipment utilizing serial communications, use the Christie-proprietary serial protocol to connect to the RS232 PIB port on the PIB. When using Christie serial protocol over Ethernet connect to port 5000. **NOTICE:** The RS232 PIB port located on the PIB faceplate utilizes Christie-proprietary protocol and is intended for Christie accessories or automation controllers only. DO NOT connect other devices here.

PC/Laptop, Server or Network

To communicate with the projector from a computer, server or an existing network, connect the equipment to the Ethernet hub or switch at your site.

Display a white test pattern. This is recommended to allow you to view LampLOC™ progress on screen. To automatically adjust LampLOC™, do the following:

1. Using the TPC, select **Menu: Advanced Setup: LampLOC Setup**.
2. Click the **Do Auto** button to begin the auto LampLOC™ process.
3. LampLOC™ requires a few minutes to establish the best lamp position and optimize the light output. You will see 100% displayed on the screen when the operation is complete. **NOTE:** *LampLOC™ can also be adjusted manually using the directional arrows in the same window. For more information on the LampLOC™ window, refer to Section 3 - Operation of the CP2220 User Manual (P/N 020-100420-xx).*

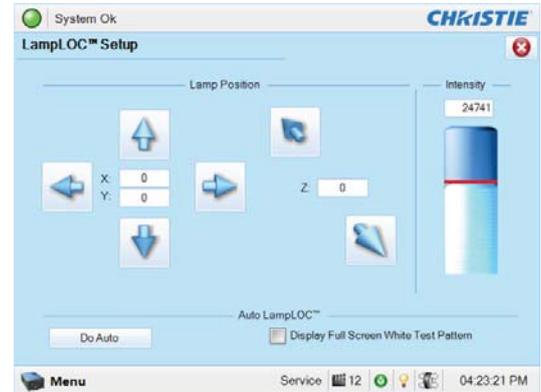


Figure 2-18 LampLOC Setup Window

2.7 Calibrating Screen Brightness (fL)

The projector software uses a Wizard application to calibrate screen brightness in footlamberts.

The process involves measuring the screen brightness at both extremes of the lamp power (minimum and maximum) for a given lamp type. These measurements establish a range (stored in memory) from which the projector can interpolate all other lamp power settings by converting them to approximate footlamberts for display in the windows. Repeat the calibration if you switch to a different lamp type/size.

- To access the screen brightness application wizard go to **Menu: Advanced Setup: Foot Lamberts Calibration**. Follow the steps outlined to complete the calibration. Refer to *Section 3 - Operation of the CP2220 User Manual (P/N 020-100420-xx)* for more information on other options available from this screen.

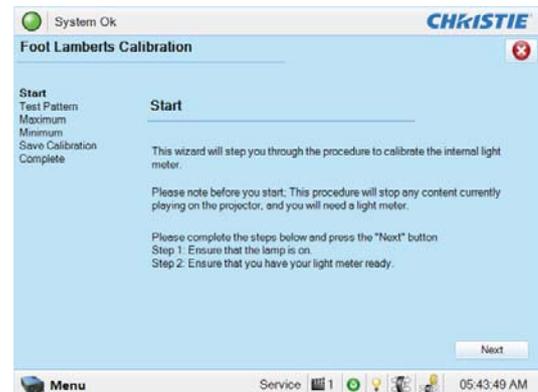


Figure 2-19 Footlamberts Calibration Wizard

2.8 Basic Image Alignment

NOTES: **1)** *Assumes projector is fully assembled and powered up in its final location.* **2)** *Projector in standard non-motorized lens mount configuration.* **3)** *For information on how to adjust the projector's displayed image using the motorized lens mount refer to Appendix A - Intelligent Lens System of the CP2220 User Manual (P/N 020-100420-xx).*

This procedure ensures that the image reflected from the DMDs is parallel to and well-centered with the lens and screen. This initial optical alignment is the foundation for optimizing images on the screen and must be completed before final boresight adjustments.

Ensure the CP2220 is properly positioned relative to the screen before you begin. Refer to [STEP 1 - Position the Projector, on page 2-2](#) in this section.

2.8.1 Basic Optical Alignment Procedure

1. Display a good test pattern appropriate for analyzing image focus and geometry, such as the “framing” test pattern showing the crosshair centered across the image.
2. **Course focus:** Perform a quick preliminary focus and (if available) zoom adjustment with the primary lens only. Focus the center of the image first, consistency across the image is not required at this point. *Refer to Section 3.7 Working with the Lenses in the CP2220 User Manual (P/N 020-100420-xx).*
3. **Center the image in the lens:** Holding a piece of paper at the lens surface, adjust the offsets as necessary until the image is centered within the lens perimeter. A full white field works best for this.
4. **Re-check side-to-side leveling:** With the framing test pattern on screen, re-check projector leveling (refer to [STEP 3 - Adjust Tilt/Leveling, on page 2-3](#) in this section) so the *top edge* of the image is parallel to the top edge of the screen.

2.9 Offset and Boresight Alignment

NOTES: **1)** Projector must be fully assembled and powered up in its final location. **2)** Install the auxiliary lens, if it will be used at the site. **3)** A 5mm Allen key is required for Boresight alignment.

To ensure proper offset for your site and consistent focus in all areas of the screen, a primary lens must be installed and its lens mount precisely adjusted in relation to internal optics as described below. If desired, an auxiliary lens can then be added to widen images for “scope” cinema displays.

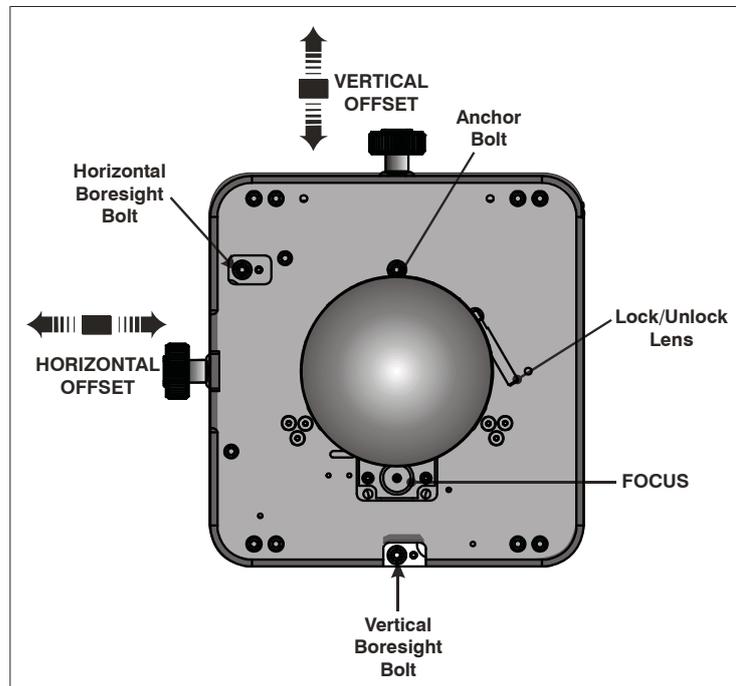


Figure 2-20 Standard Lens Mount

2.9.1 Adjust Offset

Project an image with the **primary lens only**. Always adjust offset before boresight. **Important!** Ensure the correct lens is selected in the **Menu: Advanced Setup: Lens Setup** window before calibration to ensure you will remain within the applicable boundary of the installed lens when adjusting.

- Using the framing test pattern, adjust horizontal and vertical **Offset** as necessary to display a square image on the screen with minimal projector aiming error. (**Figure 2-20**) **NOTES:** **1)** For best optical performance, make sure to minimize keystone error by using offset more than aiming to center the image in off axis installations. **2)** Avoid extreme tilts or offsets. Corner vignettes on a white test pattern indicates extreme offset that should be avoided using mechanical alignment.

2.9.2 Adjusting Left/Right Boresight

The goal for left/right boresight alignment is to adjust the lens mount until both sides of the image focus on the screen simultaneously. Projectors are aligned properly at the factory, but due to mechanical tolerances in the alignment between the projector and the screen, the left and right sides of the image come into focus at different times. By focusing on the left side of the screen, we need to determine if the right side of the image focuses in front or behind the screen relative to the left side. **NOTE:** Use a test pattern with a single pixel vertical and horizontal line and perimeter frame such as DC2K Framing or RGB Alignment.

1. The Horizontal Hold Screw acts as counter-resistance to hold the lens mount in place once set. Before adjusting the boresight, loosen the **Horizontal Hold Screw**.
2. Extend the lens focus completely.

3. Adjust the **Focus** using the focus knob to retract the lens. (**Figure 2-21**) Watch the image at the left edge of the screen until it comes into focus. If the image appears well-focused on the left edge but not on the right, we need to determine if the right side focuses in front of or behind the screen. If the entire screen come into focus, skip to step 7.

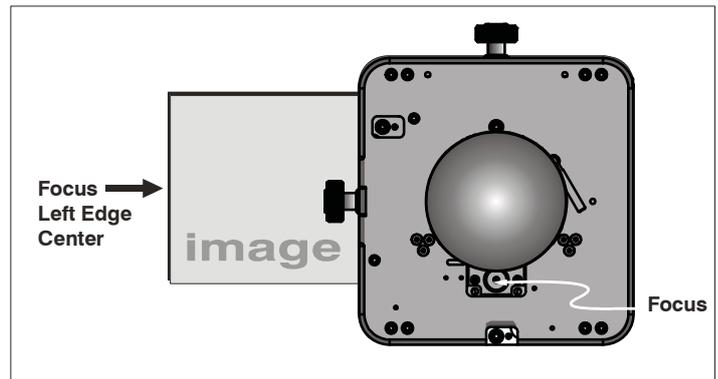


Figure 2-21 Adjust Focus

4. Continue retracting the lens.
 - a. If the right side of the image comes into focus before the lens is completely retracted, then the image focuses in front of the screen. See **Figure 2-22**. To correct this problem, adjust the **Horizontal Bore-sight Bolt** to direct or aim the lens mount towards the LEFT to balance out the left/right edges.
 - b. If the right side of the image fails to come into focus then the image focuses behind the screen. To correct this problem, direct the lens mount to the RIGHT by adjusting the **Horizontal Bore-sight Bolt** accordingly.
5. When both sides appear equally blurry, adjust horizontal and/or vertical **Offset** to re-center the image on the screen.
6. Repeat Steps 1 - 5 until both sides of the image are well focused.
7. Adjust the **Horizontal Hold Screw** to lock adjustments in place. Check boresight again.

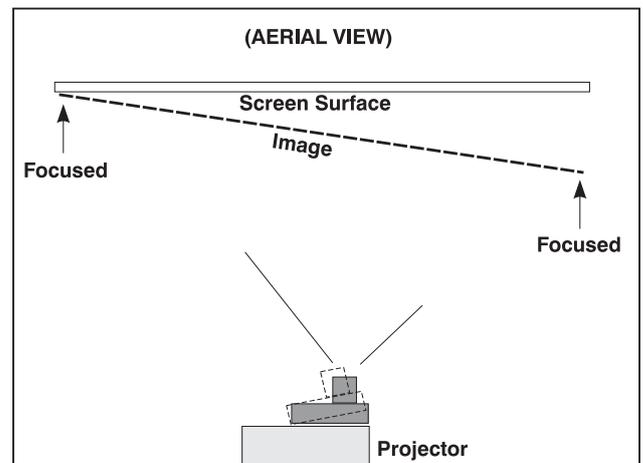


Figure 2-22 Aerial View Illustrating Misaligned Bore-sight

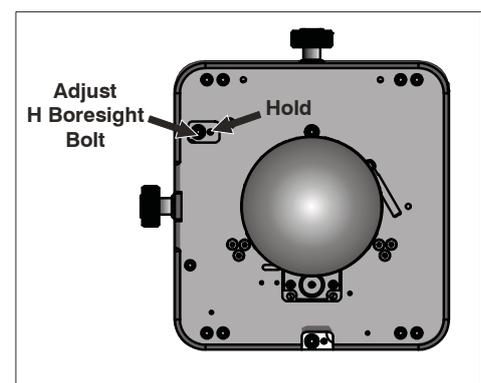


Figure 2-23 Adjust Horizontal Bore-sight Bolt

2.9.3 Adjust Top/Bottom Boresight

1. When the horizontal boresight is complete, focus the image at the top edge of the screen.
2. Loosen the **Vertical Hold Screw**.
3. Extend the lens focus completely.
4. Adjust the **Focus** using the focus knob to retract the lens. Watch the image at the top edge of the screen until it comes into focus. If the image appears well-focused on the top edge but not on the bottom, we need to determine if the bottom edge focuses in front of or behind the screen. If the entire screen come into focus, skip to step 8.
5. Continue retracting the lens.

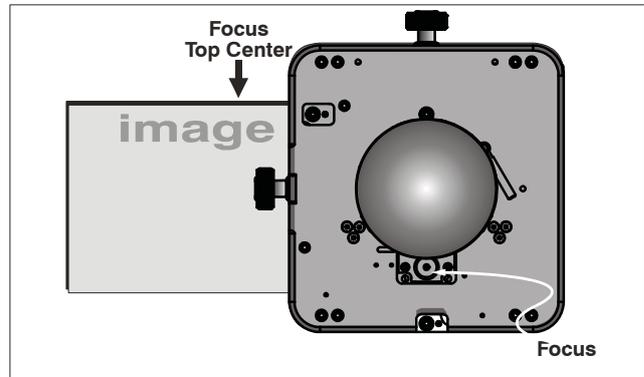


Figure 2-24 Focus Top Center of Screen

- a. If the bottom edge of the image comes into focus before the lens is completely retracted, then the image focuses in front of the screen. To correct this problem, adjust the **Vertical Boresight Bolt** to direct or aim the lens mount UP towards the top of the screen to balance out the top/bottom edges.
 - b. If the top edge of the image fails to come into focus then the image focuses behind the screen. To correct this problem, adjust the **Vertical Boresight Bolt** to direct or aim the lens mount DOWN towards the bottom of the screen.
6. When both sides appear equally blurry, adjust the horizontal and/or vertical **Offset** to re-center the image on the screen.
 7. Repeat Steps 2 - 5 until the top and bottom of the screen are both well-focused.
 8. **Refocus:** Although all sides of the image should now be in focus, the center of the image may be slightly blurry at this point. Re-focus the center of the image. The goal is for good focus at the center and on all sides.
 9. Adjust the **Vertical Hold Screw** to lock the lens mount in place and check boresight again.

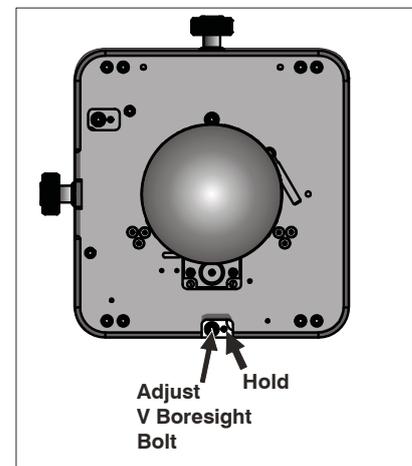


Figure 2-25 Adjust Vertical Boresight Bolt

2.9.4 Add Anamorphic Lens

1. Install the Auxiliary Lens Mount according to instructions provided in the kit. Make sure to optimize your primary lens first for best optical alignment, offset and boresight.
2. **Image geometry distortion:** Loosen the holding clamp on the auxiliary lens mount. Adjust the rotation of the anamorphic lens so the image remains perfectly square with anamorphic in and out.
3. **Image shift:** Adjust the location of the anamorphic lens so that the image does not shift left or right with the anamorphic lens in and out.
4. **Vignetting:** Adjust the location of the anamorphic lens so the image passes through the center as much as possible without vignetting, reducing side or corner brightness, especially in wide angle projection.

5. **Focus primary lens:** With the anamorphic lens **not** in place, re-focus the primary lens using the **FOCUS** knob. The goal is for good focus at the center and on all sides. Now add the anamorphic lens and check focus again.
6. **Focus anamorphic lens:** If center-to-edge horizontal focus in the image needs improvement, focus the anamorphic lens by rotating its focus barrel as needed.

2.9.5 Wide Converter Lens

1. Install the Auxiliary Lens Mount and Wide Converter Lens (WCL) according to instructions provided in the kit. Make sure to optimize your primary lens first for best optical alignment, offset and boresight.
2. **Image shift:** Adjust the vertical and horizontal position of the WCL to align it with the already adjusted prime lens.
3. **Pitch Adjustment:** Adjust pitch, either up or down to equalize the top and bottom clearance to the prime lens barrel.
4. **Yaw Adjustment:** Adjust yaw to make the clearance between both lens barrels equal from side-to-side.

2.10 Fold Mirror and Convergence Adjustments

In rare instances, shipping and handling may affect the precise factory alignments of one or more optical components. As a final step of installation, the installer may have to adjust the fold mirror and/or convergence of the DMDs.

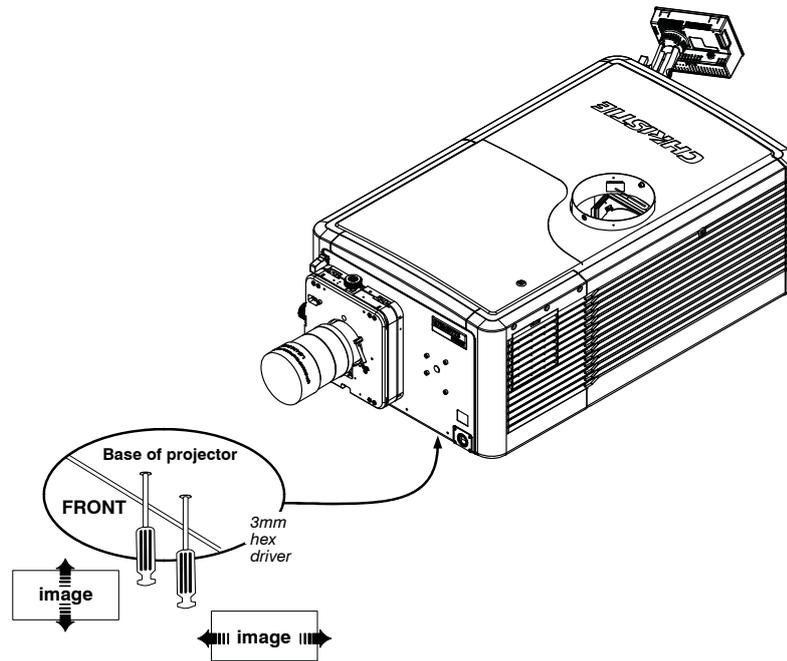
2.10.1 DMD Convergence

A convergence problem is evident when one or more projected colors (red/green/blue) appears mis-aligned when examined with a proper convergence test pattern. Normally, the three colors should overlap precisely to form pure white lines throughout the image. One or more poorly converged individual colors may appear adjacent to some of the lines. Qualified service technicians can correct the problem by following the instructions on the color label provided on the inside of the front top lid.

2.10.2 Fold Mirror Adjustment

If a corner or edge of the image is missing (after prime lens offset is ruled out), this may indicate the fold mirror has become misaligned with the rest of the optical system, resulting in cropping of data. To correct this issue, use the two adjustment screws that are accessible through the base of the projector. See **Figure 2-26**.

- To raise or lower the image, adjust the screw closest to the operator's side (right side, when facing screen).
- To move the image left or right, adjust the screw on the left side.


Figure 2-26 Fold Mirror Adjustment

2.11 Calibrating the System

Use the TPC interface for calibrating the image color performance and defining electronic screen masking. This is required in your particular installation for the creation of Source, Screen, MCGD and TCGD files necessary for proper display of incoming material. You can also define the system/network configuration for communication links to the projector and transmit information to and from the CP2220 via an Ethernet or RS-232 connection.

2.11.1 Color Calibration

After the CP2220 is installed and all components are mechanically aligned for optimized light output and geometry, its electronic system processing must be *calibrated* to ensure accurate color display in the new environment. In this one-time global calibration, the installer measures initial colors at the screen from the center of the viewing audience location, also called SMPTE seats, and enters this data—called **Measured Color Gamut Data (MCGD)**—into the TPC interface. The software then calculates precise corrections needed for regaining the desired color performance—called **Target Color Gamut Data (TCGD)**—and essentially compensates for the type of port window (if present), screen, lens, light output, ambient light and other current environmental factors that affect color performance. Results are defined in a file, activated, and downloaded to the projector memory to be used as a basis for all future displays.

If there are changes to the environment in the future (for example, a new screen is installed), the CP2220 should be re-calibrated. Also note that correction for proper color balance sometimes reduces overall light output.

NOTE: *Onsite MCGD files are not provided with the projector and must be created by the installer. Multiple gamut files can be saved for use in different situations, such as when an auxiliary lens is swapped on and off the projector. These saved gamut files are accessible in **Menu: Advanced Setup: MCGD File Setup**.*

2.11.2 Electronic Screen Masking

Image edge blanking can be corrected using the masking tool for precision cropping in **Menu: Advanced Setup: Screen File Setup** window. The effect is similar to aperture plate filing typically done for correcting images from film projectors. **NOTE:** *Screen files, once created, can be used for multiple channels. These saved screen formats are selectable from the Menu: Advanced Setup: Screen File Setup window.*

3 Basic Operation

3.1 Safety Warnings and Guidelines

3.1.1 Labels and Markings

Observe and follow any warnings and instructions marked on the projector.

The exclamation point within the equilateral triangle indicates related operating/maintenance instructions in the documentation accompanying the projector.

The lightning flash and arrowhead symbol within the equilateral triangle indicates non-insulated “dangerous voltage” within the projector's enclosure that may be of sufficient magnitude to constitute a risk of electric shock.

3.1.2 General Precautions

⚠ WARNING Never look directly into the projector lens or at the lamp. The extremely high brightness can cause permanent eye damage. For protection from ultraviolet radiation, keep all projector housings intact during operation. Protective safety gear and safety goggles are recommended when servicing.

⚠ WARNING FIRE HAZARD. Keep hands, clothes, and all combustible material away from the concentrated light beam of the lamp.

⚠ CAUTION Position all cables where they cannot contact hot surfaces or be pulled or tripped over.



⚠ CAUTION 1) The American Conference of Governmental Industrial Hygienists (ACGIH) recommends occupational UV exposure for an 8-hour day to be less than 0.1 microwatts per square centimeters of effective UV radiation. An evaluation of your workplace is advised to assure employees are not exposed to cumulative radiation levels exceeding the government guidelines for your area. 2) Be aware that some medications are known to increase sensitivity to UV radiation.

This projector must be operated in an environment that meets the operating range specification, as listed in *Section 6 - Specifications from the CP2220 User Manual*.

3.2 AC / Power Precautions

Installation of this projector requires that an electrician hard-wire (permanent-wire) a single-phase feed from the projector to the AC supply at the building site. Operate the projector at the specified voltage.

⚠ WARNING

- 1) Do not attempt operation if the AC supply is not within the specified voltage range.
- 2) This product does not include a built in AC breaker. A 30-32A double pole, UL listed wall circuit breaker is required. It must be part of the building installation and easily accessible.
- 3) Do not use a wall breaker greater than 32A. This could result in severe damage to the projector in the event of a failure.
- 4) Protection from over-currents, short circuits and earth faults must be part of the building installation. A disconnect device (double pole switch or circuit breaker with minimum 3 mm contact gap) must be readily accessible within the projection room.
- 5) Disconnect projector from AC before opening any enclosure.

⚠ CAUTION

- 1) Do not allow anything to rest on the power cord. Locate the projector where the cord cannot be abused by persons walking on it or objects rolling over it. Never operate the projector if the power cable appears damaged in any way.
- 2) Do not overload power outlets and extension cords as this can result in fire or shock hazards.
- 3) Note that only qualified service technicians are permitted to open any enclosure on the product and only if the AC has been fully disconnected from the product.

3.3 Lamp Precautions

Any lamp used in the CP2220 is under high pressure and must be handled with great care at all times. Lamps may explode if dropped or mishandled.

⚠ DANGER EXPLOSION HAZARD - Wear authorized protective safety gear whenever the lamp door is open!

3.3.1 Wear Protective Clothing

Never open the lamp door unless you are wearing authorized protective clothing such as that included in a Christie Protective Clothing Safety Kit #598900-095.

Recommended protective clothing includes, but may not be limited to a polycarbonate face shield, protective gloves, and a quilted ballistic nylon jacket or a welder's jacket.

NOTE: Christie's protective clothing recommendations are subject to change. Any local or federal specifications take precedence over Christie recommendations.

3.3.2 Cool the Lamp Completely

⚠ DANGER Lamp may explode causing bodily harm or death. 1) Always wear protective clothing whenever lamp door is open or while handling lamp. 2) Ensure those within the vicinity of the projector are also suited with protective clothing. 3) Never attempt to access the lamp while the lamp is on. Wait at least 10 minutes after the lamp turns OFF before powering down, disconnecting from AC and opening the lamp door.

The arc lamp operates at a high pressure that increases with temperature. Failure to allow the lamp to sufficiently cool prior to handling increases the potential for an explosion causing personal injury and/or property damage. After turning the lamp OFF, it is crucial that you ***wait at least 10 minutes*** before disconnecting AC and opening the lamp door. This provides enough time for the cooling fans to properly cool the lamp. Ensure the lamp is completely cooled before handling and ***always*** wear protective clothing!

For all other precautions critical for safe removal and replacement of the lamp, refer to [4.1 Lamp Replacement](#).

3.4 Maintaining Proper Cooling

The CP2220 high-intensity lamp and electronics rely on a variety of cooling components to reduce internal operating temperatures. Regular inspection and maintenance of the entire cooling system is critical to prevent overheating and sudden projector failure and helps to ensure reliable operation of all projector components over time.

3.4.1 Ventilation

Vents and louvers in the projector covers provide ventilation, both for intake and exhaust. Never block or cover these openings. Do not install the projector near a radiator, heat register or within an enclosure. To ensure adequate airflow around the projector, keep a minimum clearance of 0.5m (19.69”) on the left, right and rear sides of the projector from any walls or other obstructions.

3.4.2 Light Engine Air Filter

CHECK: Monthly

It is recommended the air filter (located on the right side of the projector near the input connection panel) is replaced whenever the lamp is replaced, or sooner in dusty or dirty environments. A clogged air filter reduces air flow and can lead to overheating and failure of the projector. Check monthly by inspecting its color through the side vent grille with a flashlight. A grey colored filter should be replaced. Refer to [4.2 Air Filter Replacement](#) for instructions.

3.4.3 Liquid Cooling Air Filter

CHECK: Monthly

Located on the left/front side of the projector there is an air filter related to the liquid cooling system. Inspect the filter routinely and replace if it appears greyish in color. Refer to [4.2 Air Filter Replacement](#) for instructions.

3.4.4 Liquid Cooler

CHECK: Every 6 months

The liquid cooler system circulates liquid to and from the DMD heatsinks in the CP2220 reducing the DMD operating temperature to an acceptable level. Check the coolant level every 6 months, by removing the top projector lid. Make sure the level of coolant remains above the minimum level indicator. If the liquid cooling system should fail, an over-temperature alarm window will display. If an over-temperature state remains for more than one minute, the lamp will turn OFF.

Filling the Coolant Reservoir

⚠ DANGER HAZARDOUS SUBSTANCE - The coolant used in this product contains ethylene glycol. Use caution when handling. Do not ingest.

⚠ WARNING Do not use coolants other than that specified by Christie with your projector. Using unapproved coolant can result in projector damage and will also void projector warranty.

Top up the coolant with the Christie approved coolant Jeffcool E105. Use the refill bottle (with the nozzle) provided in the Liquid Coolant Fill Service Kit (#003-001837-xx).

When refilling, use caution not to spill or let any of the coolant drip on or near the electronics. Do not allow the level of coolant to fall below the *Minimum Fill Line*. **NOTE:** After filling the reservoir, check the coolant hoses for kinks which may restrict fluid flow.

TIP: In the event coolant drips on any electronics or other nearby components, blot the affected area using a dust-free optical grade tissue. It is recommended you blot a few times, discard the tissue and use a new tissue to blot the area again. Keep repeating this cycle until the coolant is cleaned up. Then lightly moisten a new tissue with de-ionized water and blot the area again. Use a dry tissue to dry the area off. Repeatedly using clean tissue and blotting the area should successfully remove coolant spills.

3.4.5 Exhaust Duct and Lamp Fan Interlocks

CHECK: Every 6 months

Check and maintain the projector's two vane switches every 6 months. One is located in the exhaust duct and the other is near the lamp blower. Check operation as follows:

1. Turn power to the projector ON, but do not turn lamp on.
2. Turn OFF extractor fan.
3. Confirm that the extractor vane switch has indicated an extractor status light error on the TPC **Status** window. Turn extractor fan back on.
4. Block the air intake at the rear of the projector.
5. Confirm that the lamp blower vane switch has indicated a "blower error". Clear the air intake to correct the issue.

NOTE: If the exhaust duct becomes significantly blocked, or if a fan fails, the projector's airflow sensor should trigger a shutdown before the projector becomes overheated or unsafe. Regardless, **check the airflow periodically.**

3.5 Powering Up the Projector

This is a manual power-up procedure. Some cinema installations may include an automation system that controls lamp ignition in conjunction with other theatre variables such as house lights, audio and the start of the feature from a digital media storage device/server. **Warning!** Do not attempt operation if the AC supply is not within the specified voltage range. **NOTE:** All primary controls on the Main panel of the TPC require a positive and deliberate hold time of approx. 1/4 second to activate. A short tap will be ignored.

1. Ensure the projector’s wall circuit breaker is ON.
2. On the TPC, click and hold the **POWER ON** button for 1/4 second to fully power up the projector. This takes just under a minute to power ON the projector. **NOTE:** If “lamp ON” is selected while the projector is still in Standby mode, the power will be turned ON before the lamp.
3. On the TPC, click and hold the **LAMP ON** button for 1/4 second to ignite the lamp.

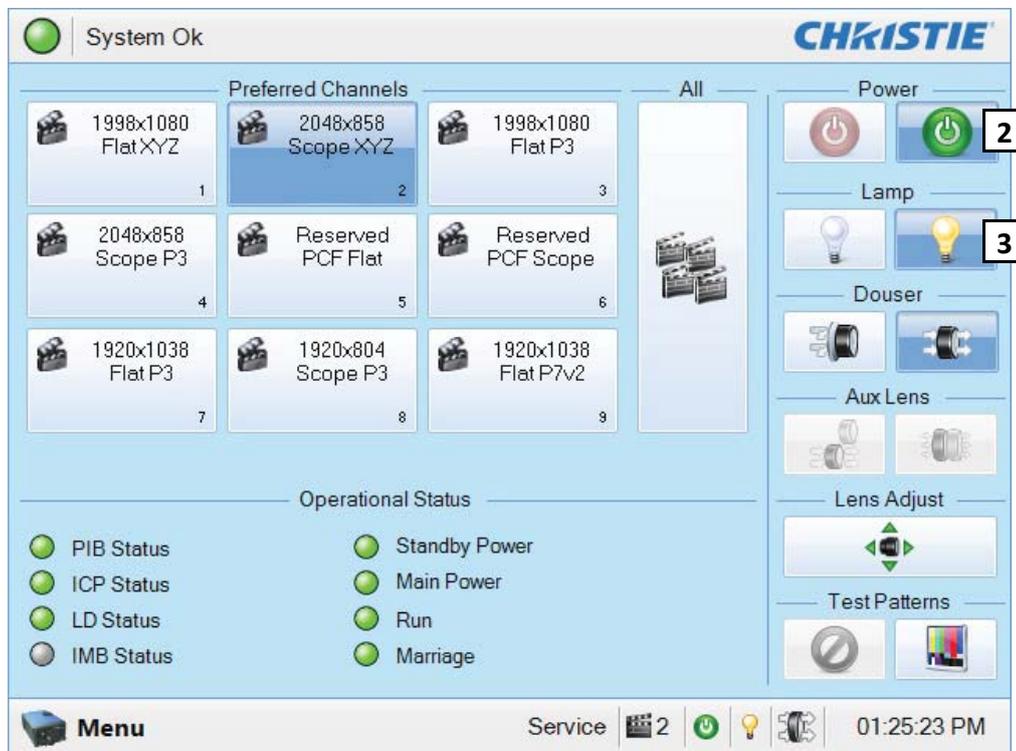


Figure 3-1 Power ON and Lamp ON buttons on the TPC

If the lamp fails to ignite:

- If a safety interlock switch is open (i.e., lamp door is open), the status LED located in the top, left corner of the TPC will illuminate solid red, and the lamp cannot be struck until the interlock problem is resolved.
- If the lamp fails to ignite even though the interlock system is ok, the projector will automatically re-try ignition using 100% of the maximum power acceptable for the installed lamp. If this re-try fails, the lamp file may be incorrect or missing. Verify the lamp file type in the **Menu: Advanced Setup: Lamp History** window. Finally, if the lamp type is correct and the re-try still fails, a new lamp is likely required.
- If your projector has been configured with a Uninterruptable Power Supply (UPS) and there is a power failure, simply turn the lamp ON using the TPC to continue operation.

3.6 Powering Down the Projector

1. On the TPC, click and hold the **LAMP OFF** button for 1/4 second. **NOTES: 1)** *The projector is still in “power on” mode, which allows for a fast lamp on response, if needed. 2)* *If you are turning off the power (going to Stand-by mode), there is no need to click the **Lamp OFF** button first. You can simply click the **Power OFF** button for the projector to turn the Lamp OFF and go into cool down mode.*
2. On the TPC, click and hold the **POWER OFF** button for 1/4 second. The lamp will power off first and then the projector automatically enters a cool down mode where the fans and electronics stay on for 10 minutes. After this cool down period, the projector enters standby mode where all fans and most electronics will power down.
3. If you will be servicing or removing any projector cover, disconnect AC.

3.7 Using the Touch Panel Controller (TPC)

The Touch Panel Controller (TPC) is a portable, touch-sensitive screen used to control the projector. At the TPC, users can turn the projector and lamp ON/OFF, select a specific channel defining the source/input as created by the installer, obtain status information, etc. The TPC is mounted to the rear of the projector in a simple, robust protective case which features an adjustable ball RAM mount to tilt it at different angles on the projector. Tilt/turn the TPC as desired for the best viewing angle. A USB port is located inside a flap on the rear, bottom region of the TPC to download log files. A single black connection cord allows the TPC to be mounted elsewhere from the projector, which is extendable via an accessory cable. The TPC can also be manually held by a user while looking through the port window.

4 Maintenance

4.1 Lamp Replacement

⚠ DANGER 1) Lamp replacement must be performed by a qualified service technician only. 2) **EXPLOSION HAZARD.** Wear authorized protective clothing whenever the lamp door is open and when handling the lamp. Never twist or bend the quartz lamp body. Use the correct wattage lamp supplied by Christie. 3) Ensure those within the vicinity of the projector are also wearing protective safety gear. 4) Never attempt to remove the lamp when it is hot. The lamp is under a great deal of pressure when hot and may explode, causing personal injury or death and/or property damage. Allow lamp to cool completely.

STEP 1: Turn OFF Main AC

Click  on the TPC **Main** panel to turn the lamp and main AC OFF. Allow the internal cooling fans to run for at least 10 minutes to cool the lamp.

STEP 2: Unplug the Projector

When the cooling fans stop, unplug the projector.

STEP 3: Open the Lamp Door

Wearing authorized protective safety gear, unlock and open the lamp door. If desired, release the latch mechanism to remove the door entirely.

STEP 4: Remove the Old Lamp and Inspect the Reflector

- a. Remove the front lamp duct to reveal the cathode end (-) of the lamp.

continued on next page.....

- b. Loosen set screws from negative/cathode and positive/anode lamp connectors. Make sure to apply minimal torque and DO NOT STRESS the quartz tube. (Figure 4-1).

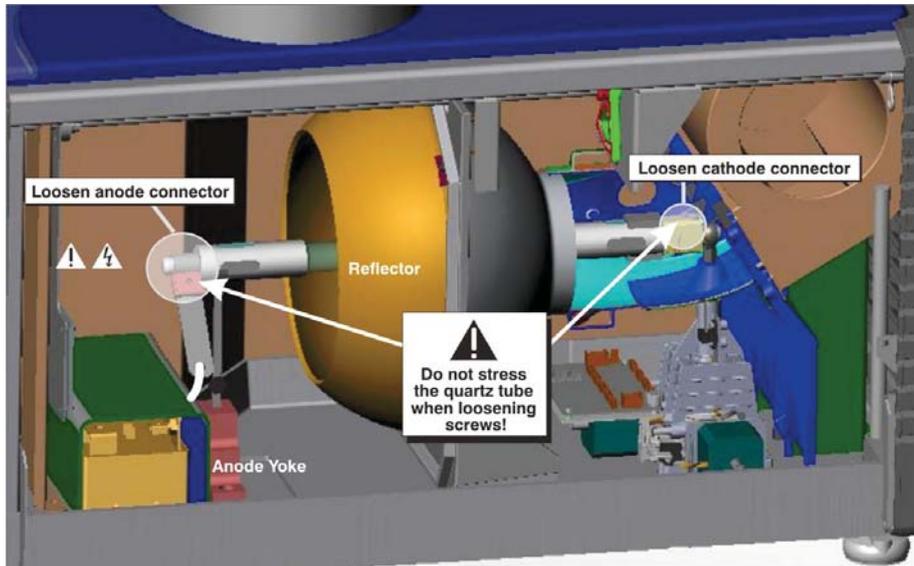


Figure 4-1 Remove Old Lamp

- c. Carefully slip the positive anode connector off the front of the lamp.
- d. Handling by the cathode end only, unscrew the lamp from the cathode connector. Carefully remove the lamp from the projector and immediately place it inside the protective cover or original packaging.
Caution! 1) Handle the lamp by the cathode/anode end shafts only, never the glass.
- e. Place the lamp on the floor where it cannot fall or be bumped. **Warning!** Handle box with extreme caution - the lamp is hazardous even when packaged. Dispose of lamp box according to safety regulations for your area.
- f. With the lamp removed, visually inspect the reflector for dust. Clean the reflector if necessary as described earlier in *Section 4.5.4 Cleaning the Lamp Reflector of the CP2220 User Manual (P/N 020-100420-xx)*.

STEP 5: Remove the Protective Cover from the New Lamp

Remove tape, knurled nut and locking star washer securing the lamp within its cover.

STEP 6: Install New Lamp

- a. If you are installing a different type of lamp from the original, ensure the correct position of the anode yoke. Refer to Step 7 Install First Lamp of [Section 3.4 Installation Instructions](#).
- b. If installing a 3.0 kW CDXL-30SD lamp, make sure the lamp extension nut supplied with the projector is installed on the cathode end connector. If you are installing any other lamp type make sure this extension nut is removed and threaded onto the unused stud located on the baseplate in the lamp compartment (labeled). *NOTE: The purpose of the extension nut is to correctly position the lamp for optimal light output.*
- c. Insert the threaded cathode (-) end of the lamp into the negative lamp connector nut located in the rear of the lamp compartment. (Figure 4-2) Using both hands, hand-tighten this end into the threaded nut.
Caution! 1) Handle the lamp by the cathode/anode end shafts only, never the glass. **DO NOT over-tighten. DO NOT stress the glass in any way. 2)** Check leads. Make sure the anode (+) lead between the lamp and igniter is well away from any projector metal such as the reflector or firewall.

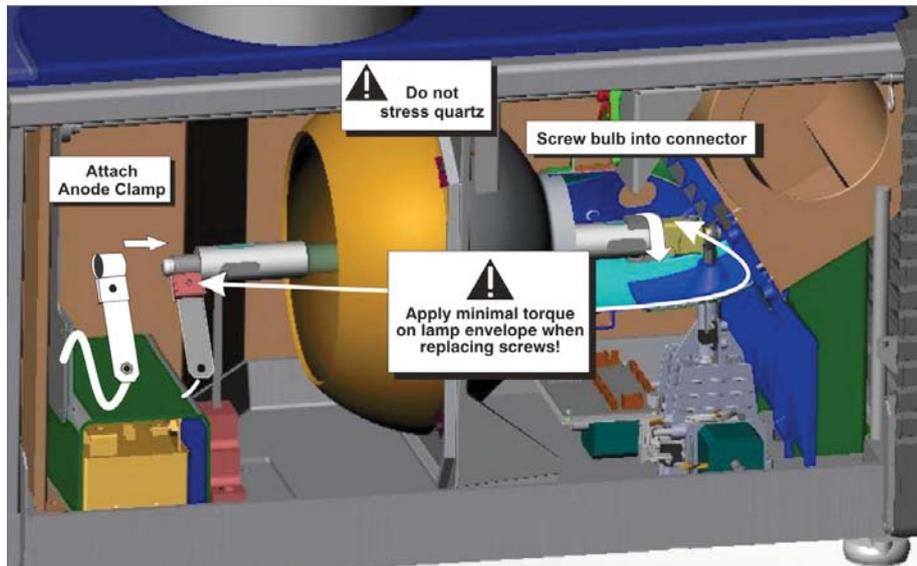


Figure 4-2 Install New Lamp

- d. Rest the anode (+) end of the lamp on the anode yoke and slip the positive lamp connector over the bulb end. **(Figure 4-2)** Using the 5mm Allen key, squeeze together with the anode clamp making sure not to place any torque on the lamp quartz tube. **Important!** For CDXL-30SD lamps, make sure the “flat” part of the anode end of the lamp (if applicable) is facing in the 10 or 2 o’clock position once the lamp finger is installed in the 14mm threads and the clamp screw is tightened. For all other lamp types, keep the “flat” part of the anode end of the lamp facing up. **Warning!** Explosion hazard - Do not apply torque to the anode end of the lamp.
- e. Tighten screws in both negative and positive lamp connectors. **Important!** Proper electrical contact prevents resistance in the lamp connectors. **Caution! 1)** Handle the lamp by the cathode/anode end shafts only, never the glass. **DO NOT** over-tighten. **DO NOT** stress the glass in any way. **2)** Check leads. Make sure the anode (+) lead between the lamp and igniter is well away from any projector metal such as the reflector or firewall.

STEP 7: Re-install the Front Lamp Duct

Critical! As you install the front lamp duct, lift the small light shield on the rear lamp duct cover so that it does not get jammed between the two pieces when they come together. **(Figure 4-3)** To ensure a good fit between the two pieces, squeeze the top and bottom cover snaps to ensure they are locked in place. The light shield should move freely to the touch.

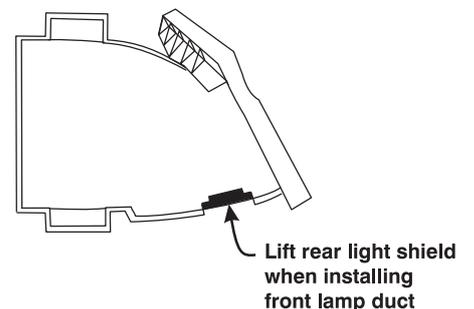


Figure 4-3 Light Shield on Front Lamp Duct

STEP 8: Close Lamp Door

STEP 9: Turn Wall Circuit ON

STEP 10: Software Adjustments

In the **Menu: Advanced Setup: Lamp History** window, click the **Add Lamp** button and record lamp type, serial number, reason for change and number of the hours logged on to the lamp. If the lamp has not been previously used, enter 0. Click **Save** to save the data entered. (Figure 4-4)

STEP 11: Turn Lamp ON

Click  on the TPC **Main** panel to turn the lamp on.

STEP 12: Adjust LampLOC™

Immediately adjust lamp position (LampLOC™) via **Menu: Advanced Setup: LampLOC Setup** window. By adjusting lamp position, you can achieve optimized light output by centering the lamp with the reflector and obtaining correct distancing from the center of the illumination system.

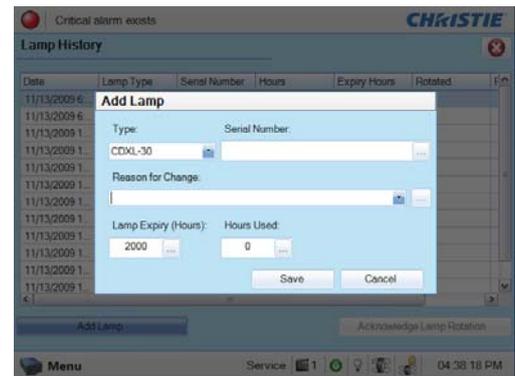


Figure 4-4 Add Lamp Window

4.2 Air Filter Replacement

⚠ CAUTION Use only special, high efficiency Christie approved filters. Never operate the projector without the filter installed.

⚠ CAUTION Always discard used air filters.

Light Engine Air Filter

Replace the light engine air filter whenever the lamp module is replaced or sooner if operating the projector in a dusty or dirty environment. Check monthly in all cases. The filter is located on the right side of the projector behind the air filter cover. To replace:

1. Release two tabs on the air filter cover and remove.
2. Slide the air filter out and discard. Insert the new air filter with the airflow indicator facing toward the projector. **NOTE:** *Never reuse an old air filter. The air filters in this product cannot be cleaned thoroughly enough for reuse and can lead to the contamination of optical components.*
3. Install the air filter cover by inserting the two bottom tabs into place and then snapping the door closed.

Liquid Cooling Air Filter Replacement

CHECK: Monthly

The radiator air filter is located on left/front side of the projector behind a small air filter cover. To replace:

1. Release a single tab on the air filter cover and remove.
2. Slide the air filter out and discard. Insert the new air filter with the air flow indicator facing toward the projector. **NOTE:** *Never reuse an old air filter. The air filters in this product cannot be cleaned thoroughly enough for reuse and can lead to the contamination of optical components.*
3. Install the air filter cover by inserting the bottom tabs into place and then snapping the door closed.

4.3 Lens Replacement

A variety of primary lenses can accommodate different throw distances and specific types of installations. These are listed in *Section 6 - Specifications of the CP2220 User Manual (P/N 020-100420-xx)*.

To replace a lens in the projector, do the following:

1. Turn the lens clamp to the OPEN/UP position.
2. Release the lens locking lever (UP position).
3. Pull out the lens and replace it with a different high-brightness lens. **NOTE:** *Always install the lens with “UP” label in the top position. This will assist in achieving consistent boresight alignment each time the lens is replaced. Refer to STEP 6 Install Lens of [Section 3.4 Installation Instructions](#).*
4. Secure the lens with the lens locking lever (DOWN position).
5. Calibrate the lens.

5 Troubleshooting

If the projector does not appear to be operating properly, note the symptoms and use this section as a guide. If the problem can not be resolved, contact your dealer for assistance. **NOTE:** A qualified service technician is required when opening an enclosure to diagnose any “probable cause”.

5.1 Power

5.1.1 Projector Does Not Power ON

1. Check the wall circuit breaker to see if it’s ON. If there is a problem with the wall circuit breaker “tripping” OFF, have a certified electrician investigate any electrical problem.
2. Check the status of the LEDs on the rear corners of the projector. (Figure 5-1). If there is no activity, see #3.
3. Verify power by looking through the rear, right side grill. One LED should be present in the upper right. This indicates the LVPS has power. Another LED should be seen in the lower left indicating Main input. (Figure 5-2)

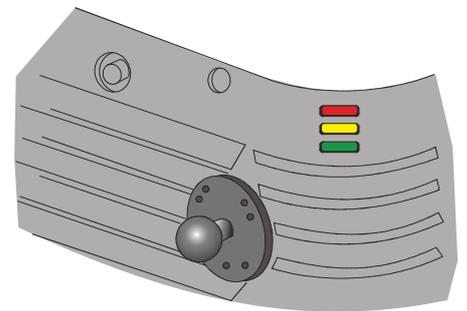


Figure 5-1 Projector Status LEDs

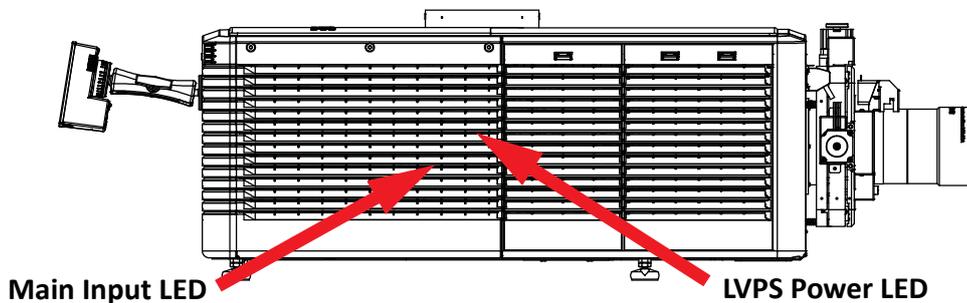


Figure 5-2 View Power Status LEDs

4. On the TPC, verify in the **Operational Status** region of the **Main** panel that there is no failure with PIB communication (PIB Status).

5.2 Lamp

5.2.1 Lamp Does Not Ignite

1. Verify the hours currently on the lamp. If the hours are close to the typical lamp life, replace the lamp.
2. Check for interlock failures. From the **Main** panel on the TPC, click the LED in the top, left corner to open the **Status** window. (**Figure 5-3**). Alternatively, click the **Menu** button and select **Status**. With the **Status** window open, click **Interlocks**. If a failure is shown, interlock needs to be cleared before the lamp will light.
3. If the **All Alarms** field of the **Status** window shows a ballast communication problem, re-boot the projector and try turning the lamp ON again.
4. Check for an alarm condition. From the **Main** panel, click the LED in the top, left corner to open the **Status** window. Click **Temperatures**. If a DMD temperature is too high, the lamp will not ignite. Cool the projector and try again. Ensure there is proper ventilation, air filters are not blocked and liquid cooling reservoir has coolant and is circulating.
5. Listen for a “clicking” noise to indicate the ballast is attempting to strike the lamp. If the lamp does not ignite after the second attempt, check the power level of the lamp in the **Menu: Advanced Setup: Lamp Power/LiteLOC Setup** window. The lamp power may be too low, especially if the bulb is old. If the lamp power is acceptable, replace the lamp. For more information, refer to [Section 4.1 Lamp Replacement](#). Alternatively, if you hear a brief “click”, but no light appears, the lamp likely needs replacement. If you do not hear anything, it may indicate a problem with the ballast (Christie-trained service required).

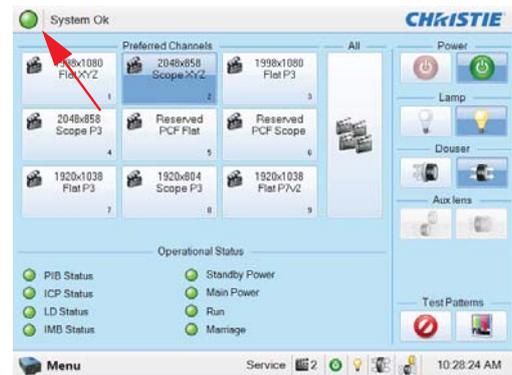


Figure 5-3 TPC LED

5.2.2 Lamp Suddenly Goes OFF

1. Check the lamp power in the **Menu: Advanced Setup: Lamp Power / LiteLOC Setup** window. Try increasing the lamp power. **NOTE:** Older lamps may not reliably operate at significantly lower than rated power.
2. An interlock may be interrupting lamp function. From the **Main** panel, click the LED in the top, left corner to open the **Status** window. Click **Interlocks**. If a failure is shown, interlock needs to be cleared before the lamp will light. Also, ensure that extractor fans are powered.
3. The DMDs may be overheated. Check for an alarm condition. From the **Main** panel, click the LED in the top, left corner to open the **Status** window. Click **Temperatures**. If a DMD temperature is too high, the lamp will not ignite. Cool the projector and try again. Ensure there is proper ventilation, air filters are not blocked and liquid cooling reservoir has coolant and is circulating.
4. Replace the lamp. For more information, refer to [Section 4.1 Lamp Replacement](#).

5.2.3 Flicker, Shadows Or Dimness

1. Ensure the douser is OPEN completely.
2. LampLOC™ may need re-adjustment.
3. LampLOC™ may be in the middle of its adjustment. Wait until LampLOC™ completes.
4. Adjust LampLOC™. In the **Menu: Advanced Setup: LampLOC Setup** window, click the **Do Auto** button.
5. Check the lamp power in the **Menu: Advanced Setup: Lamp Power / LiteLOC Setup** window to see if the power is consistent or varying. Try to increase lamp power, if possible. Lamps which are near end of life may not operate reliably at lowest power range.
6. Fold mirror misalignment (Christie service required).
7. Integrator rod misalignment (Christie service required).

5.2.4 LampLOC™ Does Not Seem to Work

1. If the **Do Auto** LampLOC™ function does not work in the **Menu: Advanced Setup: LampLOC Setup** window, try adjusting the lamp position manually by clicking the **up/down/left/right/in/out** buttons in the LampLOC region. Watch the light level for changes indicating lamp movement, both on the TPC readout and on screen with a white test pattern.
2. If the motors do not respond, you can position the lamp manually. **UV danger. Qualified service technician only.** Turn OFF and cool down the lamp completely. Open the door with the proper safety equipment and then manually adjust the motors to ensure that they are free and moving smoothly.
3. If the lamp runs dim or the image displays poor uniform brightness, do the following:

- Check that the anode yoke (lamp yoke) is in the correct position. (**Figure 5-4**)
- Check that the lamp extension nut is used with CDXL-30SD lamps only. You must remove the spacer nut for all other lamp types.

NOTE: *The spacer nut should be stored in the location provided.*

- Check that the flat part of the anode end of the lamp (if applicable) faces up in the anode yoke. For CDXL-30SD lamps, the flat part of the anode end of the lamp should be positioned at the 2 or 10 o'clock position.

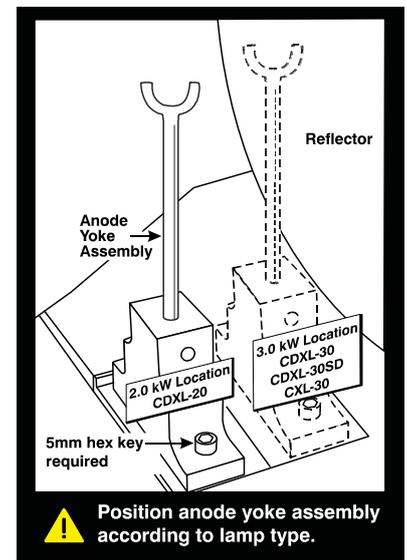


Figure 5-4 Lamp Yoke Position

5.2.5 LiteLOC™ Does Not Seem to Work

1. In the **Menu: Advanced Setup: Lamp Power/LiteLOC Setup** window, ensure LiteLOC™ is enabled.
2. If the lamp power has increased to its maximum in order to maintain a LiteLOC™ setting, LiteLOC™ is automatically terminated. If the values shown in the **Menu: Advanced Setup: Lamp Power/LiteLOC Setup** window indicate that the lamp power has reached this “over-drive” state, either reduce your LiteLOC™ setting or install a new lamp.

5.3 TPC

1. If the TPC fails to initialize, re-boot the projector.
2. A failed TPC usually indicates a system failure requiring service.
3. If the TPC display is blank, ensure the TPC is on by opening the flap at the back of the TPC and verify the grey button in the bottom left corner is ON.
4. If the locations of button presses on the screen seem to be misinterpreted, the TPC screen may need recalibrating. In the **Menu: Administrator Setup: Preferences** window, click the **Calibrate Screen** button and follow the onscreen instructions.

5.4 Ethernet

5.4.1 Trouble Establishing Communication with Projector

Ensure Ethernet settings are valid for the site. All devices should have the same subnet mask yet unique IP addresses.

5.5 Displays

Some of the following troubleshooting entries assume the use of a third-party input source for displaying alternative “non-cinema” material. Before proceeding, ensure to consult the documentation supplied with the external equipment.

5.5.1 Blank Screen, No Display of Cinema Image

1. Ensure the lens cap is not on either end of the lens.
2. Ensure the lamp is **ON**.
3. Confirm all power connections are still OK.
4. Ensure the douser is **OPEN** by verifying the state of the douser on **Main** panel as well as the state of the douser switch at the back of the projector in the top, left corner.
5. Ensure any test pattern other than the full black test pattern displays properly.
6. Is the correct display file selected?
7. Is the correct cinema port connected for this display file (i.e., 292-A or 292-B)?
Check connections.

5.5.2 Severe Motion Artifacts

Most likely there is a synchronization problem with reversed 3-2 pull-down in 60Hz-to-24Hz film-to-digital conversion in your source. The display file needs correction.

5.5.3 Image Appears Vertically Stretched or 'Squeezed' into Center of Screen

Source data converted from film and “pre-squeezed” for the CP2220 display format may require use of an anamorphic lens (or resizing) to regain full “scope” image width and proper proportions. Verify the Resolution and Aspect Ratio settings in the **Menu: Advanced Setup: Source File Setup** window as well as the Lens Factor in the **Menu: Advanced Setup: Screen File Setup** window.

5.5.4 No Image, Just Pink Snow

This problem is due to link encrypted cinema content not receiving the appropriate cryptographic key information from the source cinema server.

1. Ensure the projector’s security lid is not unlocked or opened. A warning will display on the TPC. In the event it is, close and lock the lid, and pause or stop the show on the server. Then, press **Play** on the server and wait several seconds for the projector to receive the set of decrypting keys (from the server). If after 30 seconds the projector does not recover, pause or stop the show and try playing again. If this doesn’t work, try resetting the server.
2. Check the **Status** window on the TPC for a tamper warning. If the lamp door is closed, the tamper switch may be faulty.
3. Ensure the IP octets for the projector and the server match. Change if necessary.
4. CineCanvas does not have the correct projector IP address. Check the IP address of the projector and server and change if necessary. They should match.

5.5.5 Colors in the Display are Inaccurate

The color, tint, color space and/or color temperature settings may require adjustment at your input source or in the **Menu: Channel Setup: Config 2** window. Ensure the correct **PCF**, **TCGD** and **Color Space** file for the source are used.

5.5.6 Display is Not Rectangular

1. Check the leveling of the projector. Ensure the lens surface and screen are parallel to one another.
2. Check the vertical offset. Adjust as necessary using the vertical offset knob or ILS.
3. Check that the anamorphic lens is straight. Rotate to orient aperture correctly.
4. Check the screen file. For more information, refer to *Section 3 - Operation of the CP2220 User Manual (P/N 020-100420-xx)*.

5.5.7 Display is “Noisy”

1. Display adjustment at your input source may be required. From a DVD player or an input module setting, adjust pixel tracking, phase and filter. Noise is particularly common on YPbPr signals from a DVD player.
2. The video input may not be terminated. Ensure the video input is terminated (75 ohms). If it is the last connection in a loop-through chain, the video input should be terminated at the last source input only.
3. The input signal and/or signal cables carrying the input signal may be of poor quality.
4. If the distance between the input source device and the projector is greater than 25 feet, signal amplification/conditioning may be required.
5. If the source is a VCR or off-air broadcast, detail may be set too high.

5.5.8 Display has Suddenly Frozen

If the screen blacks out inexplicably, it is possible that excessive voltage noise on the AC or ground input has interrupted the projector's ability to lock on to a signal. Power down the projector and then power back up again.

5.5.9 Data is Cropped from Edges

To display the missing material, reduce image size to fill the display area available in the projector, then stretch vertically to fill the screen from top to bottom. Add the anamorphic lens to regain image width. Cropping could also be due to the screen file selected that has cropping configured. In both scenarios, refer to *Section 3 - Operation of the CP2220 User Manual (P/N 020-100420-xx)* for more information.

5.5.10 The Projector is ON, but There is No Display

1. Ensure AC power is connected.
2. Make sure the lens cover is removed from the lens.
3. Make sure the douser is **OPEN**.
4. If the lamp is not ignited, click the **LAMP ON** button. If the lamp does not strike, refer to [Section 5.2.1 Lamp Does Not Ignite](#).
5. Ensure the correct channel is selected with the appropriate configurations in the **Menu: Channel Setup: Config 1** window.
6. Is an active source connected properly? Check the cable connections and make sure the alternative source is selected.
7. Can you access test patterns? If so, check your source connections again.

5.5.11 The Display is Jittery or Unstable

1. If the non-cinema display is jittery or blinking erratically, ensure that the source is properly connected and is offering adequate quality for detection. With a poor quality or improperly connected source, the projector will repeatedly attempt to display an image, however briefly.
2. The horizontal or vertical scan frequency of the input signal may be out of range for the projector. Refer to *Section 6 - Specifications of the CP2220 User Manual (P/N 020-100420-xx)* for scan frequency ranges.
3. The sync signal may be inadequate. Correct the source problem.

5.5.12 The Display is Faint

1. The source may be double terminated. Ensure the source is terminated only once.
2. The source (if non-video) may need sync tip clamping.

5.5.13 The Upper Portion of the Display is Waving, Tearing or Jittering

This can occur with video or VCR sources. Check your source.

5.5.14 Portions of the Display are Cut OFF or Warped to the Opposite Edge

Resizing may need adjustment. Adjust until entire image is visible and centered. For more information, refer to *Section 3 - Operation of the CP2220 User Manual (P/N 020-100420-xx)*.

5.5.15 Display Appears Compressed (Vertically Stretched)

1. The frequency of the pixel sampling clock is incorrect for the current source.
2. Sizing and positioning options may be adjusted poorly for the incoming source signal.
3. Use an anamorphic lens for typical HDTV and anamorphic DVD sources that have been re-sized and vertically stretched, via 3rd-party software.

5.5.16 Display Quality Appears to Drift from Good to Bad, Bad to Good

1. The source input signal may be of low quality.
2. The H or V frequency of the input may have changed at the source end.

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