CP2230

CHRISTIE®

CP2230

NOTICES

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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.

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.

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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!

Canadian manufacturing facility is ISO 9001 and 14001 certified.

GENERAL WARRANTY STATEMENTS

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. Cinema projector lamps (See Christie's separate lamp program policy).
   c. Damage caused by use of a cinema 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 product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of the product 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 product modification, if by other than a Christie authorized repair service provider.
   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 product. Please see the Maintenance section for specific maintenance items as they relate to your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty.

1: Introduction

2: Installation and Setup

3: Connect Devices to the cinema projector

4: Adjust the Image

1   Introduction

This manual is intended for professionally trained operators of Christie high-brightness projection systems. These operators are qualified to replace the lamp and air filter, but should not attempt to install or service the cinema projector.

Only accredited Christie technicians who are knowledgeable about the hazards associated with high-voltage, ultraviolet exposure, and the high temperatures generated by the cinema projector lamp are authorized to assemble, install, and service the cinema projector.

1.1   Labels and Markings

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

⚠ DANGER Danger symbols indicate a hazardous situation which, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

⚠ 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.

NOTICE: *Addresses practices not related to personal injury.*

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

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

1.2   General Precautions

⚠ WARNING Never look directly into the cinema projector lens or at the lamp. The extremely high brightness can cause permanent eye damage. For protection from ultraviolet radiation, keep all cinema 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 cinema projector must be operated in an environment that meets the operating range specifications.

1.3 AC / Power Precautions

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

⚠ **WARNING**

Disconnect cinema projector from AC before opening any enclosure.

⚠ **CAUTION**

- **DO NOT allow anything to rest on the power cord. Locate the cinema projector where the cord cannot be abused by persons walking on it or objects rolling over it. Never operate the cinema projector if the power cable appears damaged in any way.**
- **DO NOT overload power outlets and extension cords as this can result in fire or shock hazards.**
- **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.**

Power Cords and Attachments

⚠ **WARNING** **1) The North American rated line cord is provided with each cinema projector. Ensure that you are using a line cord, socket and power plug that meets the appropriate local rating standards. 2) Use only an AC power cord recommended by Christie. DO NOT attempt operation if the AC supply and cord are not within the specified voltage and power range.**

Use only the attachments and/or accessories recommended by Christie. Use of others may result in the risk of fire, shock or personal injury.

1.4 Lamp Precautions

Lamps used in the cinema projector are under high pressure and you must handle them with caution. Lamps can explode and cause serious personal injury if they are dropped or mishandled.

⚠ **DANGER** **EXPLOSION HAZARD! Wear authorized protective safety clothing whenever the lamp door is open!**

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. This equipment is included in included in the Christie Protective Clothing Safety Kit #598900-095.

⚠ **DANGER** **Lamp may explode causing bodily harm or death. 1) Always wear protective clothing whenever the lamp door is open or while handling the lamp. 2) Ensure those within the vicinity of the cinema projector are also equipped with protective clothing. 3) Never attempt to access the lamp while the lamp is on. Wait a minimum of 10 minutes after the lamp**

turns OFF turning the cinema projector off, disconnecting it from a power source, 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 or property damage.

1.5   Contacting Your Dealer

If you encounter a problem with your Christie cinema projector, contact your dealer. To assist with the servicing of your cinema projector, enter the information in the tables and keep this information with your records.

Table 1.1 Purchase Record

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

* The serial number can be found on the license label located on the front panel.

Table 1.2 Ethernet Settings

Default Gateway	
cinema projector IP Address	
Subnet Mask	

2 Installation and Setup

This section provides information and procedures for positioning and installing the cinema projector.

2.1 Site Requirements

To safely install and operate the CP2230 cinema projector, the installation location must meet these minimum requirements:

- **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 (ft ^{3}/min) external exhaust airflow to ensure adequate cooling of the 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 for measuring CFM, *see 2.9 Connect External Exhaust Ducting, on page 2-10.*
- **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.

2.2 Tools Required for Installation

You need these tools to install the CP2230 cinema projector:
- 12" screwdrivers: Phillips #2 (magnetic) and flat
- 19mm and 7/8" wrenches
- Assorted Allen keys (metric)
- Heat extractor
- Christie approved protective safety clothing if you are working with the lamp
- Lamp
- Lens cleaning tissue and solution

2.3 Cinema Projector Components
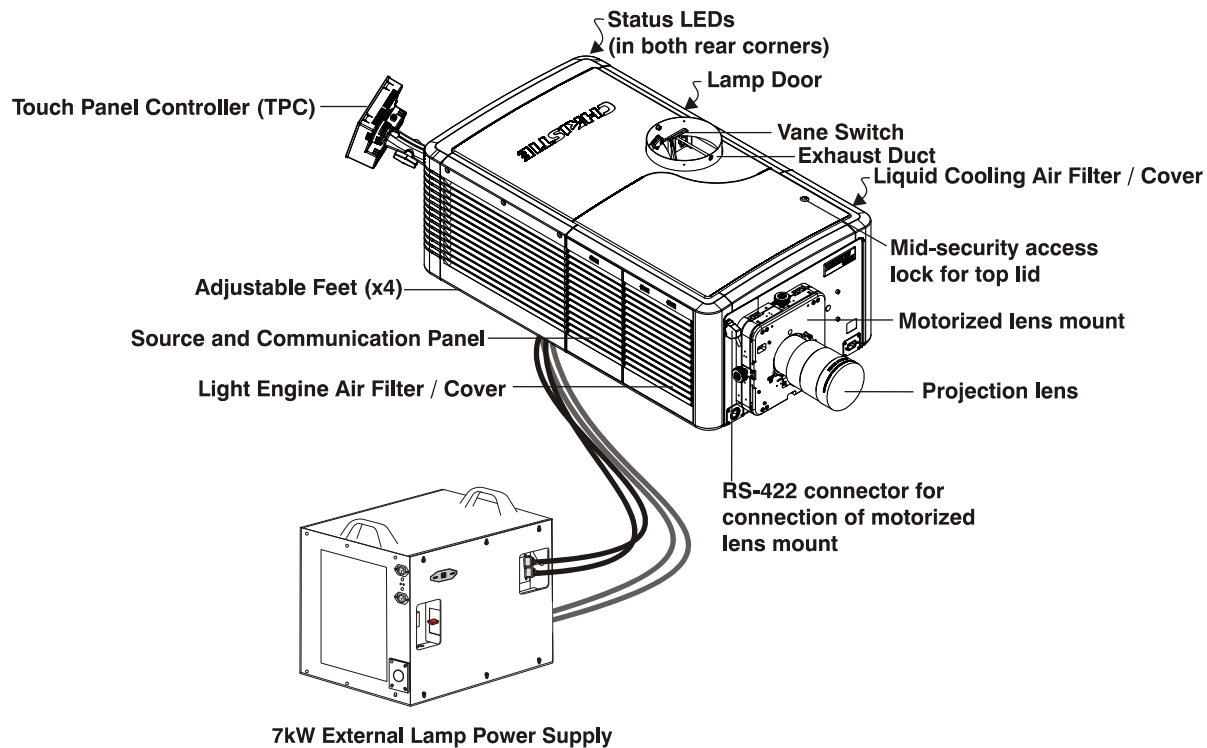
Figure 2-1 cinema projector Overview

Air Filter Cover and Air Filter

The air filter filters the intake air before it circulates in the front compartment to cool the main electronics.

Manual Douser Override

Closes the douser. Closing the douser rotates a shutter blade in front of the lamp and reduces lamp power to 2kW to conserve lamp life. The override switch is meant for emergency use only.

Exhaust Duct and Vane Switch

Extracts heated air from the lamp compartment. The vane switch inside the rigid port monitors the amount of airflow.

See *2.1 Site Requirements, on page 2-1* for airflow requirements of the external heat extraction system.

Adjustable Feet

Adjusts the tilting angle of the cinema projector.

Lamp Door and Lamps

Provides access to the lamp. The lamp door must remain closed and locked for normal operation. Lamp replacement should only be performed by qualified technicians.

The cinema projector is designed to operate with 2.0kW and 3.0kW lamps.

LED Status Indicators

Provide information about the status of the cinema projector.

Motorized Auxiliary Lens Mount (optional)

An optional auxiliary lens mount can be installed adjacent to the primary lens mount to provide motorized positioning of a 1.25x Anamorphic lens or a 1.26 Wide Converter lens in front of the primary lens. The Wide Converter lens "zooms" the image from flat to scope image formats. The Anamorphic lens horizontally spreads the image back into its wider 2.39:1 "scope" image and is most typically used in side-masking theatres or on larger screen sizes.

Projection Lens

A variety of lenses can be used with the CP2230 cinema projector.

RS-422 Connector

Connects the motorized lens mount to the cinema projector.

Security Locks

Prevent unauthorized access to cinema projector components.

Input Panel

The input panel connects the cinema projector to external devices:

- PIB Faceplate Connections:
  - **Ethernet:** Use the 10Base-T/100Base-TX Ethernet port for network connection to the cinema projector.
  - **GPIO:** Connect external I/O devices, such as the Christie ACT, for remote control of a limited number of cinema projector functions.
  - **DVI-A / DVI-B:** These are single-link ports for single-link cables/connectors only. The connectors can be used together as a twin-link DVI port.
  - **HD-SDI A/HD-SDI-B:** Connect a variety of high-definition cinema sources to these SMPTE 292M bit-serial standard interface BNCs. The connectors can be used together to deliver Dual Link HD-SDI following the SMPTE 372M standard.
  - **SCCI:** A Simple Contact Closure Interface (SCCI) port that provides the following functions upon a simple dry contact closure: Lamp On/Off and Douser Open/Closed.
  - **RS232 ICP:** For direct DLP communication. Trained users required.
  - **RS232 PIB:** Utilizes Christie-proprietary protocol and is intended for Christie accessories or third-party automation equipment.
  - **Marriage:** Marriage must be established to allow the cinema projector to play encrypted content. This means the security boundaries SPB1 and SPB2 are physically and electrically connected and that marriage is monitored 24/7. Marriage is initiated from a Wizard application on the TPC. A user with the appropriate credentials is prompted to press the marriage button to establish marriage. If the button is pressed any other time it is ignored. Marriage cannot be established remotely.
  - **Emergency Start:** This button is recessed into the faceplate to prevent accidental activation. It should only be used when the TPC has failed or is disconnected. When pressed, the cinema projector is powered on, the lamp is turned on and the douser is opened. When you press and hold this button, the douser is closed and the lamp is turned off, but power is still on.

- **Reset:** This button is slightly recessed into the faceplate to prevent accidental activation. Its main purpose is to reset the electronics of the cinema projector. After re-booting, the cinema projector returns to the Standby power mode, therefore the lamp will require manual striking.

- **3D:** Connect a variety of 3D products to this connector, such as MasterImage or Real D for polarizing and de-ghosting 3D content during projection.

- ICP Faceplate Connections

The ICP board provides the image processing electronics for the cinema projector. The ICP faceplate includes a number of LEDs that are only functional when the cinema projector is in full power mode.

- **REGEN:** (Regulators Enabled) This LED indicates the presence of the internal regulator enable signal. When illuminated BLUE the internal regulators are enabled. When OFF, not enabled.

- **SOFTST:** (Software State) This LED indicates the state of the software application. When OFF, in a Fail state (0). When RED, in a Fail state (1). When YELLOW, in a Fail state (2). When GREEN, status OK.

- **OSST:** (Operating System State) This LED indicates the state of the operating system. When OFF, in a Fail state (0). When RED, in a Fail state (1), When YELLOW, in a Fail state (2). When GREEN, status OK.

- **FMTST:** (FMT FPGA State) This LED indicates the configured state of the FMT FPGA. When RED, unable to configure FPGA with Main or Boot application. When YELLOW, in Boot application. When Green, in Main application.

- **ICPST:** (ICP FPGA State) This LED indicates the configured state of the ICP FPGA. When RED, unable to configure FPGA with Main or Boot application. When YELLOW, in Boot application. When Green, in Main application.

- **Port A / Port B:** Indicates the status of the ICP input port A or B. When OFF, no source is present. When GREEN, active source present.

Lamp Power Supply (LPS)

The Lamp Power Supply (LPS) (P/N 127-101103-01) is an optional accessory for the CP2230 cinema projector. To connect it to the cinema projector, you use two high-current lamp leads, a RS-232 serial cable and an Interlock (Lamp Enable) cable. You can install the LPS in the optional rack stand with the cinema projector.

The LPS provides DC power for 2.0, 3.0, 4.5 and 6.0kW lamps. A breaker on the side of the LPS acts as a power switch, and provides protection against over-current conditions of 50A or more. If a fault occurs or excessive voltage is detected, the breaker automatically switches OFF to prevent damage.

The LPS includes two AC power outlets that you can use to power cinema projector electronics or an approved extraction unit. Do not use these outlets to power other devices.

2.4   Installation Safety and Warning Guidelines

⚠ WARNING

- **QUALIFIED TECHNICIAN REQUIRED for all installations. This product must be installed in a restricted access location.**
- **Never operate the cinema projector without the covers in place.**
- **The cinema 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 when handling the lamp. Only qualified technicians should install cinema projector lamps.**
- **To prevent the cinema projector from tipping unexpectedly, you must install the safety strap on the rear of the cinema projector.**
- **Four or more people are required to safely lift and carry one projection head a short distance. Remove the lamp before transporting the cinema projector.**
- **Keep the cinema projector level when you lift or transport it. Avoid tilting the cinema projector to the right. This can introduce an air bubble into the coolant hoses that can result in an air lock and the overheating of the cinema projector.**
- **Perform an automatic LampLOC™ adjustment when you move, level, or install a new lamp in the cinema projector.**

2.5   Position the Cinema Projector

1. If you are installing the cinema projector in the optional rack stand (P/N 108-282101-02) follow the instructions provided with the rack stand to install it.

    NOTES: 1) *For better access, wire the LPS before installing it into the rack stand.* **2)** *Use the hold down clamp (P/N 116-100101-01) when securing the cinema projector to the rack stand.*

2. Position the cinema projector at an appropriate throw distance (cinema projector-to-screen distance) and vertical position. Ideally, center the cinema projector with the theatre screen. If space is limited, you can aim the cinema projector slightly off-center**.** This increases side keystoning, but reduces the horizontal lens offset required.
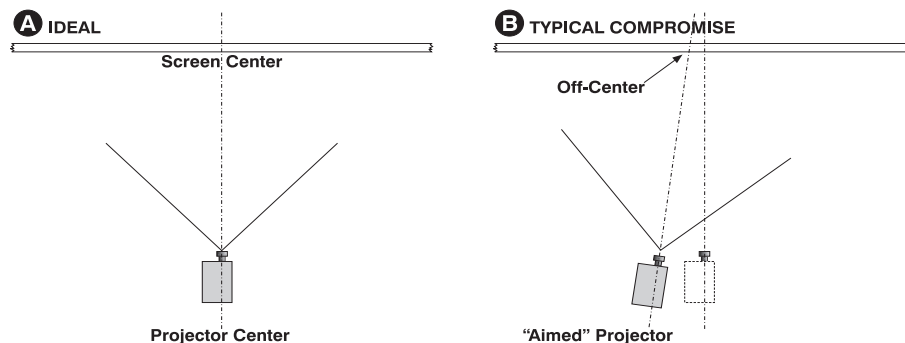
Figure 2-2 Position the cinema projector

NOTE*: Unlike film cinema projectors, it is best to keep the cinema 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.

3. Position the lamp power supply so that the cables reach the left side of the cinema projector.

4. Install and secure the lamp power supply (LPS) in the rack stand:

   a. Remove the right side panel of the rack stand.

   b. Remove the cross bar.
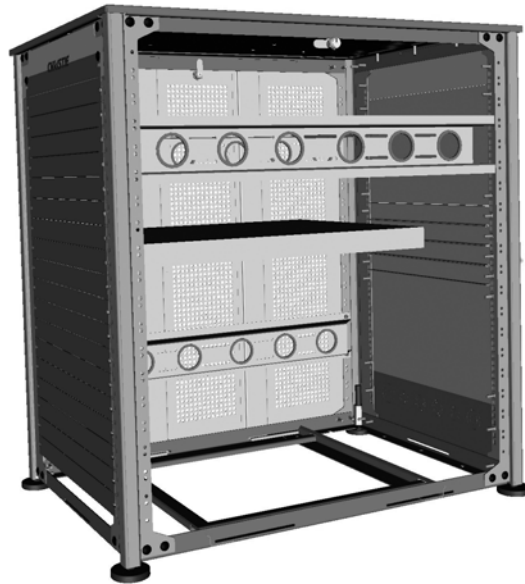
Figure 2-3 Side View of Rack Stand

Snap 3 piece airflow duct together using stand out pins

3.

2.

Lift LPS into frame

1. *Insert support frame*
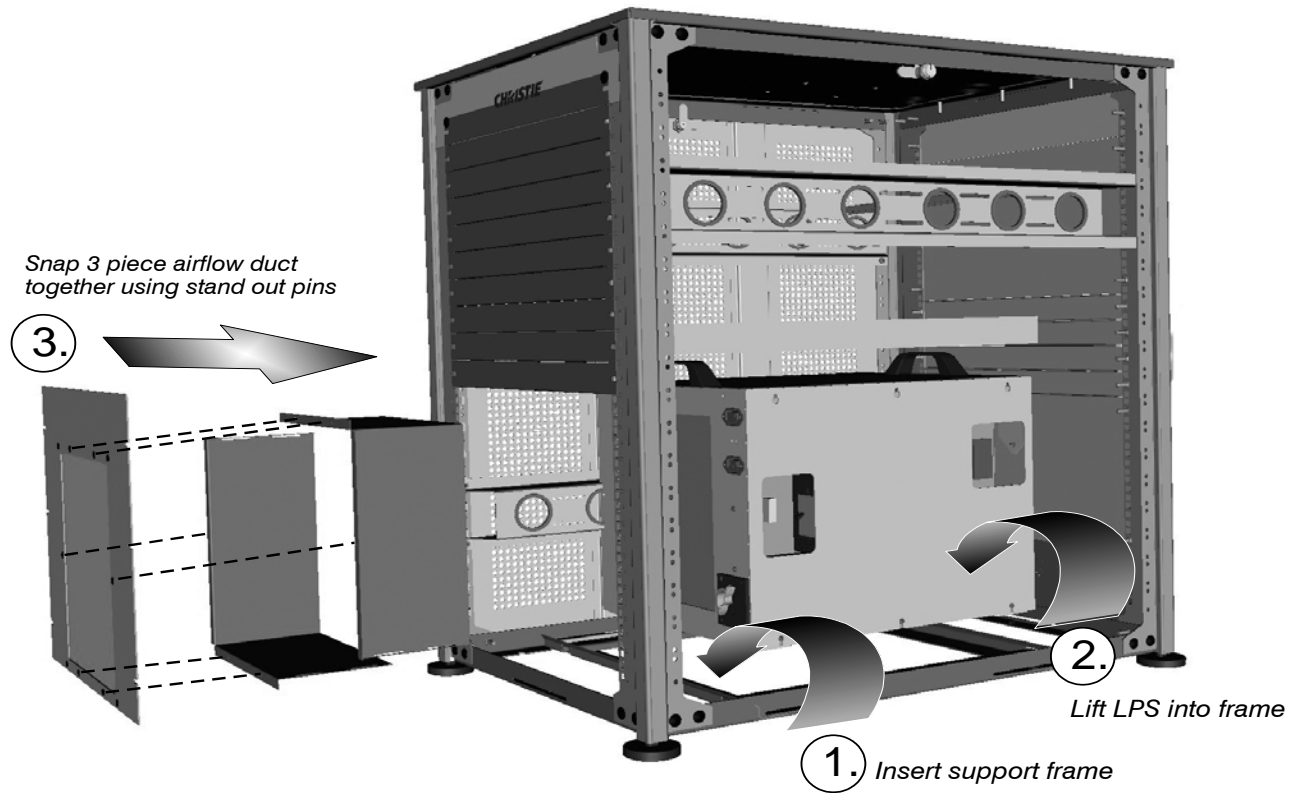
Figure 2-4 Steps to Installing LPS

c.   Insert the LPS support into the rack stand and align the pins with the holes.

d.   Lift the LPS into the frame.

e.   Remove the bottom 10 panels from the back of the rack stand.

f.   Assemble the three piece airflow duct supplied with the LPS. First, snap the 2 "L" shaped parts together, and then snap this into the 6 stand out pins of the third piece (flat panel).

g.   Position the airflow duct directly behind the LPS.
CAUTION! DO NOT install any components in front of the lamp power supply.

h.   Insert the airflow duct into the rack stand.

i.   Secure the airflow duct to the rack stand using the screws from the rack stand panels.

j.   Wire all of the components in the rack stand and replace the side panel.

2"

Keep Clear

Figure 2-5

2.6 Secure the Cinema Projector

⚠ **WARNING** Use of the cinema projector's rear safety strap is MANDATORY to prevent it from tipping. Secure the strap between the cinema projector and the optional rack stand or any other surface it is mounted to.
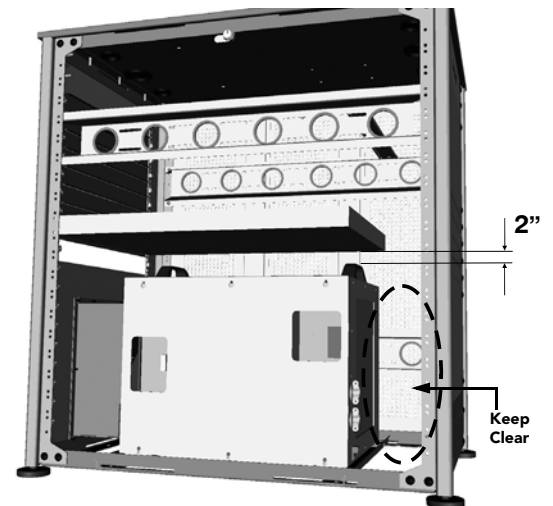
2.7 Adjust Tilt and Level the Cinema Projector

WARNING! The cinema projector's rear safety strap must be in place before you adjust the cinema projector's feet.

WARNING! DO NOT over-extend the feet. Make sure several threads are engaged into the cinema projector's baseplate.

The CP2230 lens should be centered and parallel with the screen. This orientation ensures optimum lens performance with minimal offset. If this position is not possible (such as when the cinema projector is significantly higher than the center of the screen), it is better to rely on offset rather than extra tilt.

Use a protractor to measure the degree of screen tilt and then extend or retract the cinema projector feet to match this angle.

NOTE: *The front-to-back tilt of the cinema projector must not exceed 15°. This limit ensures safe lamp operation and the proper positioning of the liquid cooling reservoir.*

To adjust the vertical or horizontal position of the cinema projector, extend or retract the adjustable feet on the bottom of the cinema projector by rotating them. Once the required adjustment is made, tighten the lock nut.

If you need to adjust the vertical or horizontal position of the cinema projector beyond what the standard feet allow, you can install two 6 inch extension rods to increase the amount of adjustment. To install the extension rods safely:

1. Prop the rear of the cinema projector up to access and remove the two rear feet. This can be done by one person holding the back end of the cinema projector up slightly so another person can unthread the feet OR by propping up the back of the cinema projector with a sturdy base (such as a phone book).

Figure 2-6 Adjust Feet

2. Add the extension rods to the standard feet.

3. Thread the extended feet into the cinema projector's baseplate. Adjust the feet until the desired tilt is achieved.

4. Lock the feet in place by turning each lock nut until it fits tight against the cinema projector.

2. *Remove rear feet*

1. *Prop up rear of projector*

19 mm wrench
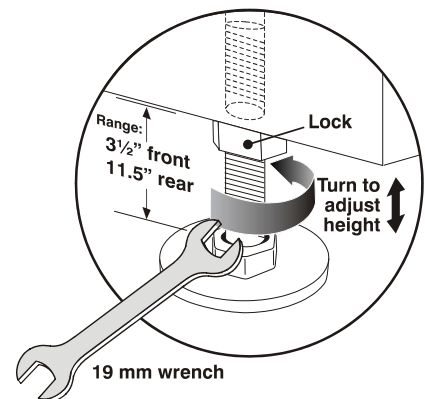
3. *Add foot extension rod*
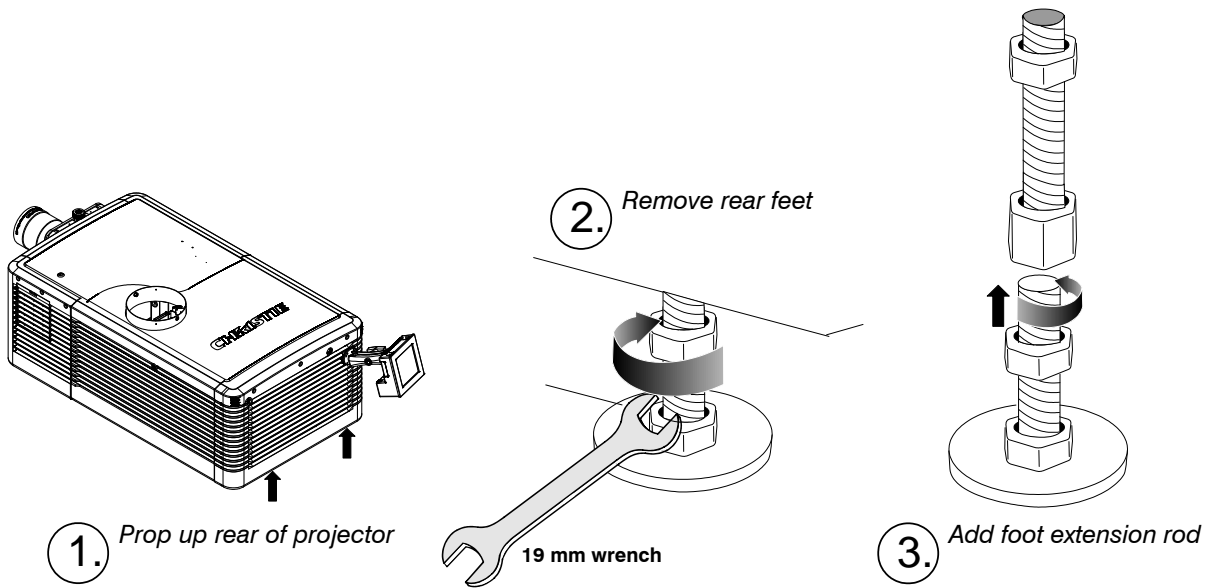
Figure 2-7 Using the Foot Extension Rods

2.8   Install the Touch Panel Controller (TPC)

1. Loosen the mounting arm so that the end fits over the ball joint located on the rear panel of the cinema projector.
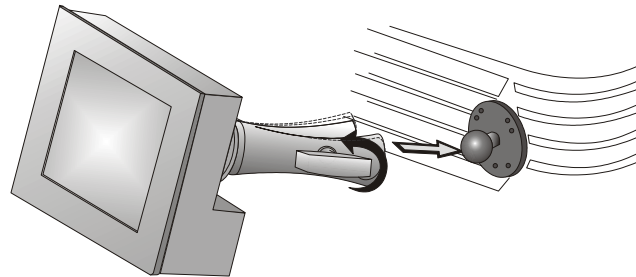

Figure 2-8

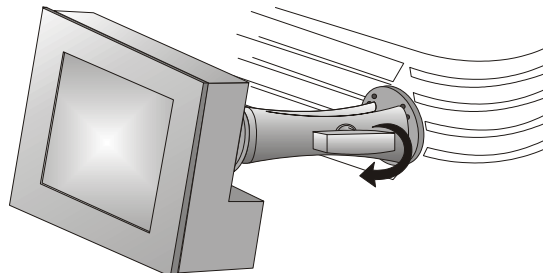2. Tighten the mounting arm until it fits tightly on the joint.

Figure 2-9

3. Connect the cable from the TPC to the connector on the rear panel of the cinema projector.

4. Adjust the angle of the TPC.

2.9 Connect External Exhaust Ducting

Connect the existing outside-venting ductwork to the 8 inch diameter exhaust port on the top of the cinema projector. Confirm that there are no obstructions or bends in the ducting, all air intakes are free of obstructions, and the vane switch at the exit duct moves freely.

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

Exhaust Duct to Outside

⚠ **450 or 600 CFM required***

⚠ WARNING

• ***600 CFM is required in projection rooms with an ambient temperature above 25°C or located at an elevation greater than 3000 feet above sea level.**

Figure 2-10 Connect Exhaust Ducting

• **At minimum, a 10" long, strong metal duct must be installed at the cinema projector to prevent glass shards from exiting the duct in the event of a lamp explosion.**

2.9.1 Determine the Cinema Projector Exhaust CFM Value

Use an airflow meter to measure the ft/min or ft/sec at the rigid end of the open exhaust duct that connects to the cinema projector. Take the measurement at the very end of the duct without the cinema projector connected. Use this formula to determine the CFM value for the cinema projector:

Measured linear ft/min x 0.35 = CFM

Default Weight Position 450 CFM
Weight Position 600 CFM
Vane Switch
Top View into Exhaust Duct

Table 2.1 Airflow Requirement

Lamp Type	Min. Airflow (CFM) Required
2.0 kW	450 CFM
3.0 kW	450 CFM
4.5 kW	600 CFM
6.0 kW	600 CFM

Figure 2-11 Exhaust Duct Vane Switch

Add an extractor or a booster if there is insufficient airflow. Do not mount the extractor on the cinema projector as this may introduce some vibration into the image. **NOTE:** *To prevent the cinema projector from overheating*

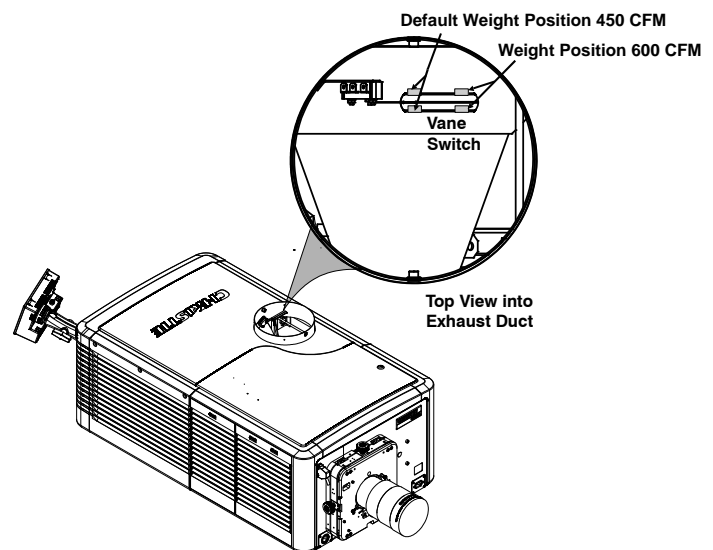*or becoming unsafe, an alarm sounds if the duct is obstructed or a fan fails. It is recommended that you regularly verify that the exhaust is functioning correctly.*

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

2.10 Install the Primary Lens

The lens seals the projection head, preventing contaminants from entering the main electronics area. Do not operate the cinema projector without a lens installed. Install a lens plug when you install or transport the cinema projector.

1. Verify the rear safety strap or rear hold down bracket is installed.

2. Rotate the lens clamp to the OPEN position.

Figure 2-12 Open Lens Clamp and Insert Lens
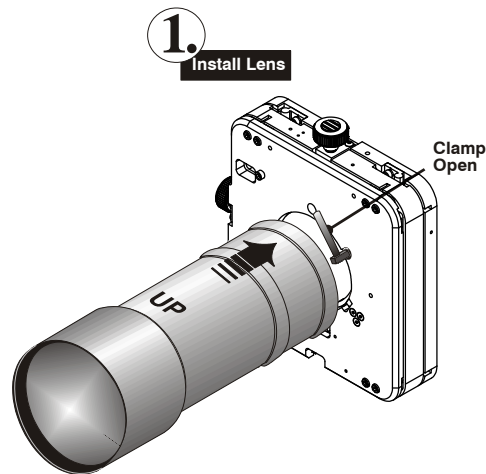
3. With the UP label facing up, insert the lens straight into the lens mount opening all the way back, without turning.

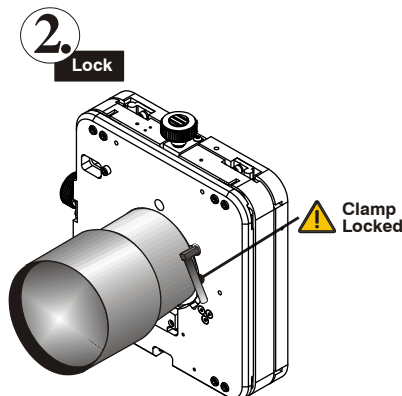4. Move the lens clamp to the DOWN position to lock the lens assembly.

Figure 2-13 Lock Lens In Place

5. Remove the front lens cap.

6. On the TPC, tap **Menu** > **Configuration** > **Diagnostics and Calibration**.

7. Tap **Reference Calibration.**

2.11 Install the Optional Anamorphic Lens

1. Install the M-MALM according to the instructions provided with the kit. Ensure the primary lens is optimized first for best optical alignment, offset and boresight.

2. Loosen the holding clamp on the auxiliary lens mount and adjust rotation of the whole anamorphic lens so the image remains perfectly square with anamorphic in and out.

3. Adjust location of anamorphic lens so the image does not shift left or right with the anamorphic lens IN and OUT.

4. Adjust location of anamorphic lens so the image passes through the center as much as possible without vignetting or reducing side or corner brightness, especially in wide angle projection.

5. With the anamorphic lens not in place, re-focus the primary lens. The goal is good focus at center and on all sides. Now add the anamorphic lens and check focus again.

6. If center-to-edge horizontal focus in the image needs improvement, rotate the focus barrel.

2.12 Install the Optional Wide Converter Lens

1. Install the Auxiliary Lens Mount and WCL according to the instructions provided with the kit. Ensure the primary lens is optimized first for best optical alignment, offset and boresight.

2. Adjust the vertical and horizontal position of the WCL to align it with the already adjusted prime lens.

3. Adjust pitch, either up or down to equalize the top and bottom clearance to the prime lens barrel.

4. Adjust yaw so the clearance between both lens barrels is equal from side-to-side.

2.13 Install the Lamp

⚠ DANGER This procedure should only be performed by a Christie accredited technician. High-pressure lamp may explode if improperly handled. Always wear approved protective safety clothing whenever lamp door is open or when handling the lamp.

1. If the cinema projector is operating, turn it off and allow it to cool a minimum of 10 minutes.

2. Turn the breaker switch for the cinema projector off.

3. Disconnect the cinema projector from AC power.

4. Put on your protective clothing and face shield.

5. Use the security key to open the lamp door and access the lamp cooling compartment. Do not place heavy objects on the open lamp door.

6. Install the anode yoke assembly. Use this table to determine the correct position of the anode yoke assembly:

Table 2.2 Lamp Types Available for CP2230 and Anode Yoke Position

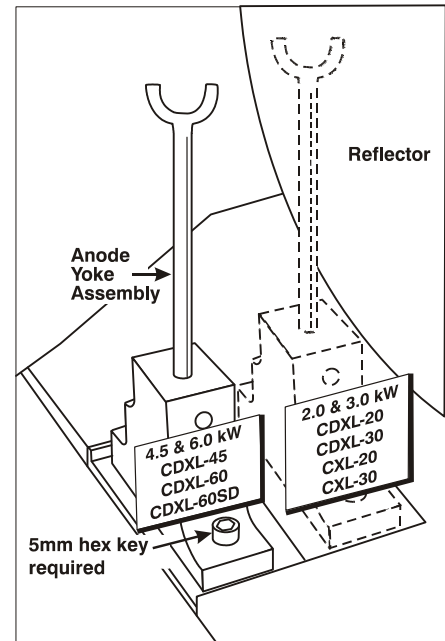| LAMP	TYPE	ANODE YOKE POSITION
2.0 kW and 3.0kW	CDXL-20 CDXL-30 CXL-20* CXL-30	Move the lamp cradle to the rear position, which is approximately 1" closer to the reflector. ***NOTE**: A lamp adapter kit must be used with the CXL-20 lamp.
4.5 and 6.0kW	CDXL-45 CDXL-60 CDXL-60SD	Move the lamp cradle as far forward as possible (position closest to igniter)

7. Install the lamp.

Figure 2-14 Anode Clamp Location

2.14 Connect the Lamp Power Supply (LPS)

⚠ WARNING

- **You must connect the LPS to the cinema projector before you connect it to AC power.**

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

- **Use an appropriate strain relief connector on the AC supply cable to prevent the cable from rubbing against the LPS knockout plate and becoming damaged.**
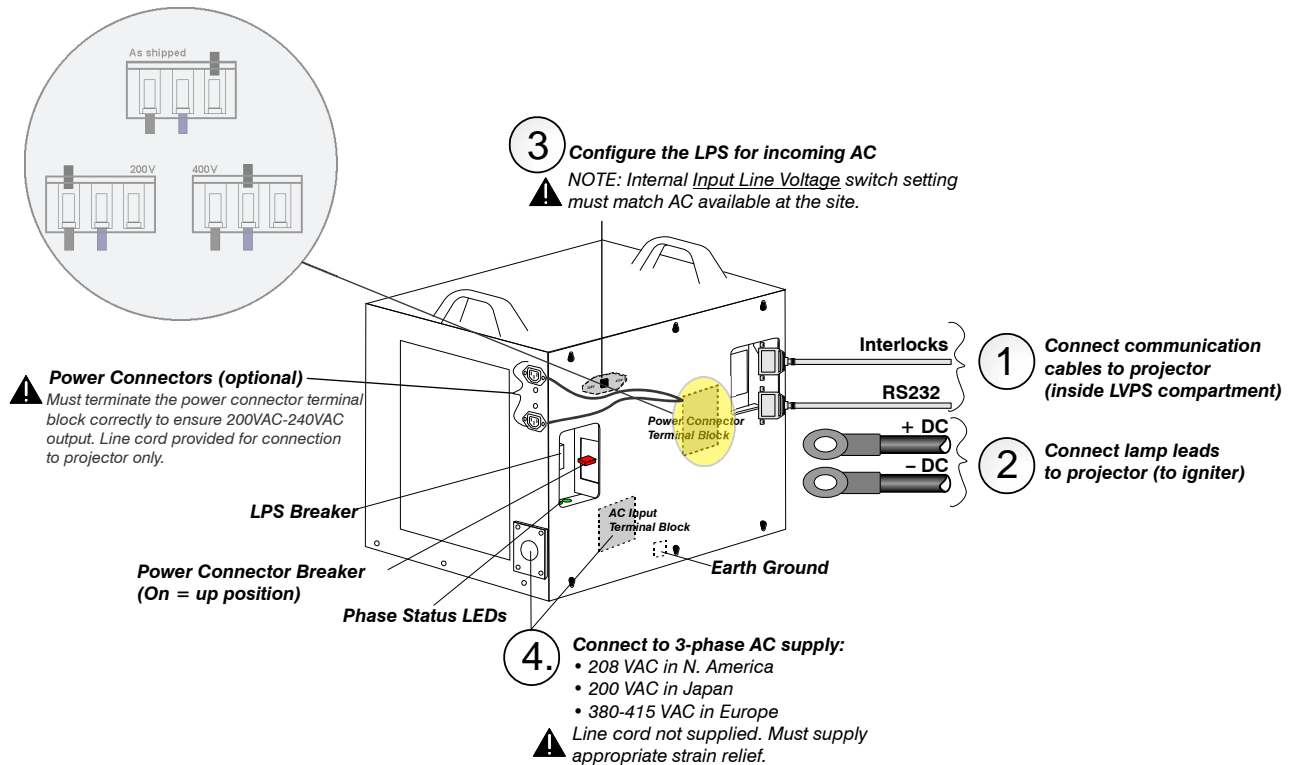
Figure 2-15 Connect LPS

1. Connect LPS Communication Cables:

   a. Remove the 2 cover plate (2 thumbscrews) from the cinema projector's baseplate in the LVPS compartment.

   b. Connect one end of the RS-232 cable to the port labeled **RS232**. Route the cable up through the opening in the cinema projector's baseplate into the LVPS compartment. Connect the other end of the RS-232 cable to the port labeled **RS232** in the LVPS compartment.

   c. Connect one end of the Interlock cable to the port on the LPS labeled **Interlocks**. Route the cable up through the opening in the cinema projector's baseplate that you routed the RS-232 cable. Connect the other end of the Interlock cable to the port labeled **Interlock** in the LVPS compartment.

2. Connect Lamp Leads:

⚠ **DANGER** **Fire Hazard! To avoid a fire hazard ensure the high current DC leads between the Lamp Power Supply (LPS) and the CP2230 cinema projector are correctly connected.**

 a. Open the LVPS access door and use a 3 mm driver to remove the four M4 hex head screws from the safety cage front panel. Lift the front panel over the igniter.

 b. Loosen the 6 screws to remove the LPS side panel.

 c. Route the cables through the strain reliefs in the LPS cover.

 d. Connect the positive (+) and negative (-) lamp leads to the terminals on the LPS. using a torque setting of 14ft/lbs (20N/m). **DANGER! In order to prevent a fire hazard ensure the DC leads are connected with the correct polarity and fastened to the torque setting specified.**

 e. Tighten the strain reliefs.

 f. Route the positive and negative leads from the LPS through the two strain reliefs in the cinema projector baseplate.

 g. Connect the negative (-) black lamp lead to the negative (-) igniter terminal, left terminal. Connect the positive (+) red lamp lead to the positive (+) igniter terminal, right terminal. **CAUTION! When tightening the positive and negative leads, DO NOT tighten to the point that the brackets start to bend.**

 h. Tighten the strain reliefs.

 i. Replace the igniter safety cage.

3. Move the AC Input Line Voltage switch in the upper-left corner of the LPS to the left if you are using a 200 VAC supply, or right if you are using a 400 VAC supply.

4. Use an AC Input Terminal Block that is correct for your region to connect the AC directly to the LPS. **CAUTION! Use an appropriately sized strain relief connector with the knockout plate provided to ensure adequate environmental sealing and to prevent the cable from accidentally being torn out.**

 • For North America, Japan and most of Central/South America (190-208 VAC):

  Wire Phase 1, 2, 3 and Ground

 • For Europe (380-415 VAC):

  Wire Phase 1, 2, 3, Neutral and Ground

5. Connect one end of the LPS power cord into the socket on the LPS labeled **CP2230/4230 cinema projector ONLY**. Connect the other end of the power cord into the socket on the front of the cinema projector.

WARNING! *If you use the power connectors to power the CP2230 cinema projector or the extraction unit, you must terminate the power connector terminal block correctly to ensure 200VAC-240VAC output.*

These connectors are controlled with the power connector breaker. For more information, see the Inter-connect Drawing provided with your cinema projector.
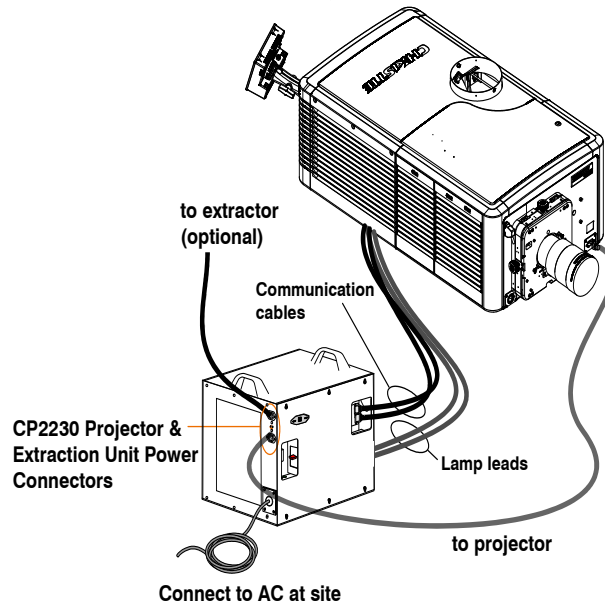

to extractor
(optional)

Communication
cables

CP2230 Projector &
Extraction Unit Power
Connectors

Lamp leads

to projector

Connect to AC at site

Figure 2-16

6. Turn the LPS Breaker ON.

7. If you are using the extraction unit and cinema projector power connectors, turn them on.

8. Connect the AC from the site to the socket located on the front bezel of the cinema projector.
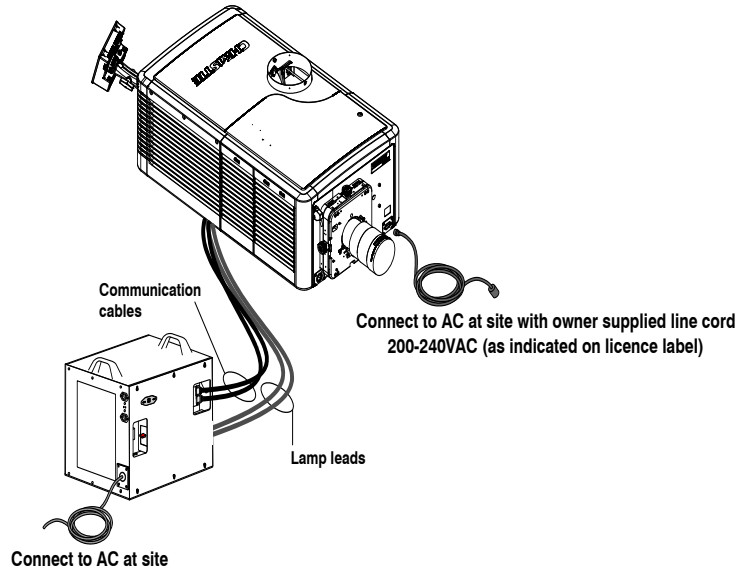

Communication
cables

Connect to AC at site with owner supplied line cord
200-240VAC (as indicated on licence label)

Lamp leads

Connect to AC at site

Figure 2-17

2.15 Connect the cinema projector to an Optional Uninterrupted Power Supply

A UPS allows the cinema projector head electronics to remain operable during a power failure.

Unplug the LVPS input connection from Main Power and connect it to the UPS input plug. Re-use the dummy plug from the UPS connection with the unused Main Power plug

2.16 Connect Sources and Turn the Cinema Projector On

After you install the lamp, you can connect external cinema servers and sources. Before you ignite the lamp for the first time, use this procedure to ensure successful communication with input devices.

1. Assign the cinema projector a unique IP address and enter a baud rate:
   - Tap **Menu** > **Administrator Setup** > **Communications Configuration**.
   - Enter the IP address for the cinema projector in the **IP Address** field.
   - Select a baud rate for the input device in the **Serial Speed (Baud)** list.
2. Enter lamp information:
   - Tap **Menu** > **Advanced Setup** > **Lamp History**.
   - Tap **Add Lamp**.
   - Complete the fields in the **Add Lamp** dialog.
   - Tap **Save**.
3. Tap and hold the green power button to turn the cinema projector on.
4. Complete a LampLOC™ alignment on the new lamp:
   - Tap **Menu** > **Advanced Setup** > **LampLOC™ Setup**.
   - Tap **Do Auto**.
5. Complete an optical alignment to optimize images displayed on screen.
6. Adjust optical components if required.

3   Connect Devices to the cinema projector

This section provides information and procedures for connecting input devices to the cinema projector. You connect input devices to the cinema projector Intelligence Board (PIB) located on side of the cinema projector.

These communication ports are accessible by removing the side source and communication access panel. When connecting devices, route all cables along the channels located on the bottom of the cinema projector and up through the opening in the frame to the communication connection port.

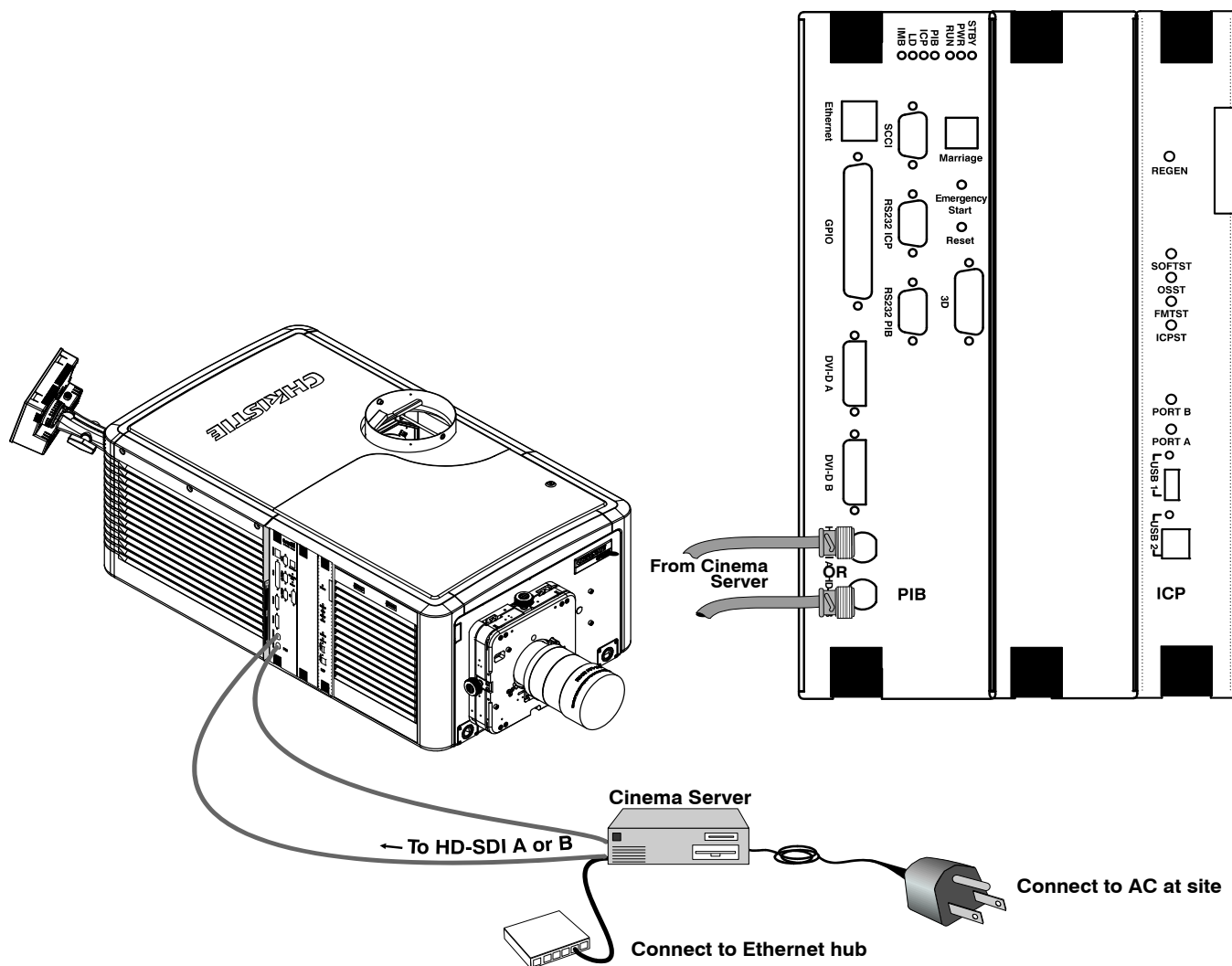Replace the access panel to ensure server and source connections remain secure.

Figure 3-1 Connecting Cinema Sources

3.1 Connect a Communication Device

To communicate with the cinema projector connect the equipment to an Ethernet hub or switch.

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.*
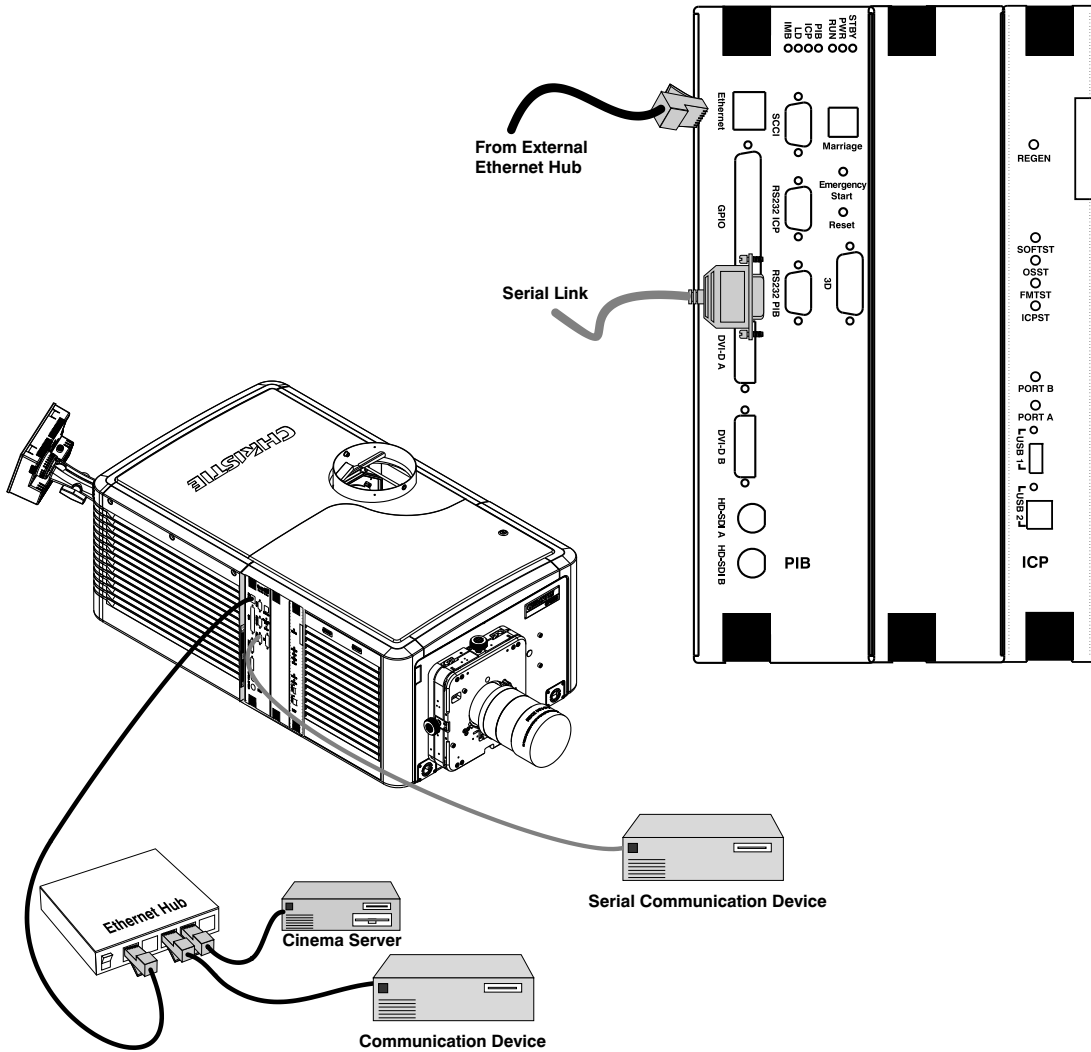
Figure 3-2 Connecting Communications

3.2 Connect Devices to the SCCI Port

The Simple Contact Closure Port (SCCI) port is a DB-9 (male) connector is located on the PIB input panel and is used to control a limited set of cinema projector functionality through contact closures. This table lists the control functions available through the SCCI:

Table 3.1 SCCI Connector Pinouts

PIN	SIGNAL NAME	DIRECTION	DESCRIPTION
1	+5V Standby	Out	Current limited 5VDC supply
2	Lamp ON	In	cinema projector at **Power On** mode, lamp is ON
3	+5V Standby	Out	Current limited 5VDC supply
4	Lamp OFF	In	cinema projector at full power, lamp is OFF
5	+5V Standby	Out	Current limited 5VDC supply
6	Douser Closed	In	Close douser
7	Douser Open	In	Douser open
8	Health Output	Out	Open Collector Low when one of the following interlocks is tripped or conditions present: • Lamp Door • Lamp Blower • Extractor • Tamper • Marriage • Ballast Communication The show will not be able to play. Open Collector High when all interlocks relevant to CineLink and Lamp are not tripped. The show is able to play.
9	Ground	Out	Ground

NOTE*: All SCCI inputs require a pulse input of 50ms to several seconds to operate reliably. Inputs are 5V resistor current limited LED's inside of optocouplers.*

A "Health Output" on this connector is also provided for locations that require a cinema projector Health Output. The output is an open-collector circuit which only draws power when the cinema projector is deemed to be "un-healthy". The primary use of the cinema projector Health Output is to ensure that patrons are not left in a dark theatre due to cinema projector fault. Therefore, any fault that results in the movie playback stopping should cause this circuit to draw power and indicate an un-healthy state. The cinema projector is always considered to be "healthy" in Standby Mode since there is no fear of cinema projector fault causing an impact to patrons, and there should be no patrons in the theatre at that time.

3.3   Connect Devices to the GPIO Port

The GPIO port is a 37-pin D-sub connector (female) located on the PIB input panel and provides 8 input and 7 output signals for connecting external devices to the cinema projector. To configure the pins on the connector, tap **Menu** > **Administrator Setup** > **GPIO Setup**.
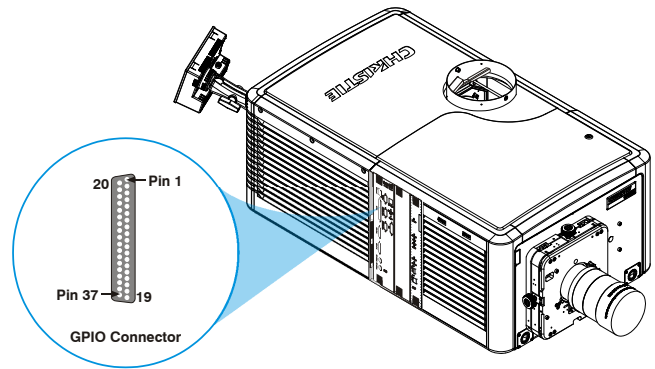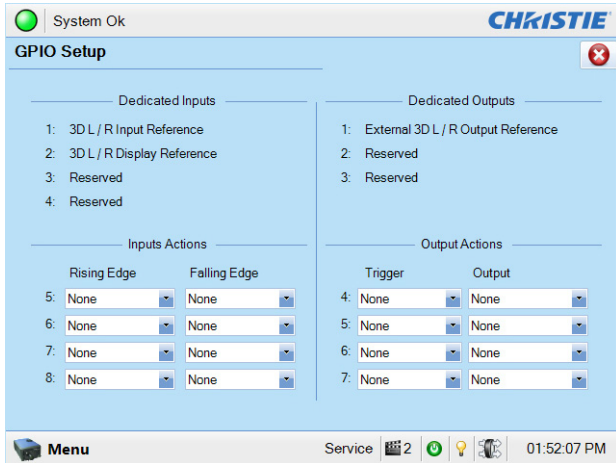

Figure 3-3 Admin: GPIO Setup Window and GPIO Port Location on cinema projector

As shown below, each available pairing of pins (+/–) is defined as either an ***input*** or ***output***. Four inputs and three outputs have already been predefined. Configure a pin as an input if you want the cinema projector to respond to an incoming signal, or as an output if you want an external device to respond to the cinema projector.

Inputs	Positive	Negative	Description
GPIN #1	Pin 1	Pin 20	3-D L/R Input Reference
GPIN #2	Pin 2	Pin 21	3-D L/R Display Reference
GPIN #3	Pin 3	Pin 22	Reserved
GPIN #4	Pin 4	Pin 23	Reserved
GPIN #5	Pin 5	Pin 24	Input
GPIN #6	Pin 6	Pin 25	Input
GPIN #7	Pin 7	Pin 26	Input
GPIN #8	Pin 8	Pin 27	Input

Outputs	Positive	Negative	Description
GPOUT #1	Pin 9	Pin 28	External 3-D L/R Output Reference
GPOUT #2	Pin 10	Pin 29	Reserved
GPOUT #3	Pin 11	Pin 30	Reserved
GPOUT #4	Pin 12	Pin 31	Output
GPOUT #5	Pin 13	Pin 32	Output
GPOUT #6	Pin 14	Pin 33	Output
GPOUT #7	Pin 15	Pin 34	Output
PROJ_GOOD	Pin 16	Pin 35	cinema projector Good

If you are wiring your own GPIO cable for use with a server or 3D device such as an IR emitter or a polarizer, follow the circuit diagram.
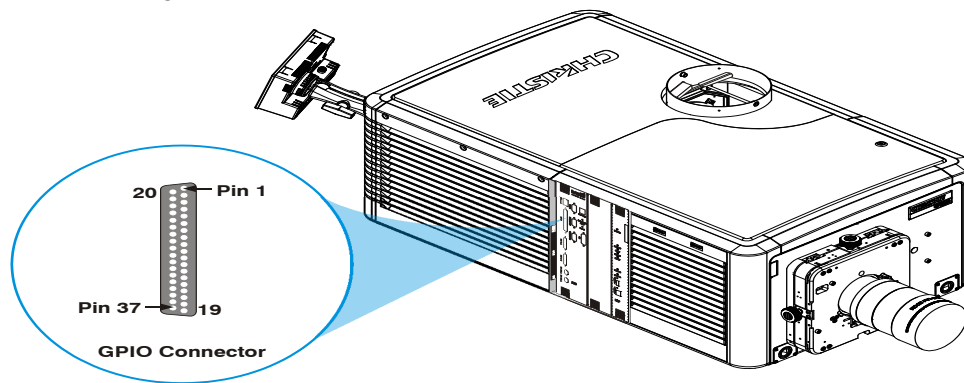

Figure 3-4 GPIO Circuit Diagram

3.4 Connect Devices to the 3D Connector

The 3D connector is a 15-pin D-sub connector (female) located on the PIB input panel. This table lists the control functions available through the 3D connector.

PIN	SIGNAL NAME	DIRECTION	DESCRIPTION
1	+12V	Out	Power to 3D device. Maximum 1A (total between both +12V pins).
2	GND	/	Ground
3	GND	/	Ground
4	RS232_RX	In	Data to cinema projector from 3D device. 1200 Baud, 8 bits, no parity. Currently unsupported.
5	RS232_TX	Out	Data to cinema projector from 3D device. 1200 Baud, 8 bits, no parity. Currently unsupported.
6	CONN_3D_MODE+	Out	SYNC from cinema projector. To cinema projector GPO collector. Compatible with current cinema projector GPIO requirements and restrictions. (24VDC max, 50mA max) 3D ON = Hi logic level = O/P transistor ON 3D OFF = Low logic level = O/P transistor OFF
7	CONN_SYNC+	Out	SYNC from cinema projector. To cinema projector GPO collector. Compatible with current cinema projector GPIO requirements and restrictions. (24VDC max, 50mA max)
8	3D_INPUT_REFRERENCE+	In	3D L/R Input Reference (P) (Voltage Limit: 1.4VDC to 12VDC)
9	+12V	Out	Power to 3D system. Maximum 1A (Total between both +12V pins)
10	3D_INPUT_REFRERENCE-	In	3D L/R Input Reference (N) (Voltage limit: 1.4VDC to 12VDC)
11	3D_DISPLAY_REFERENCE+	In	3D L/R Input Reference (P) (Voltage limit: 1.4VDC to 12VDC)
12	3D_DISPLAY_REFERENCE-	In	3D L/R Input Reference (P) (Voltage limit: 1.4VDC to 12VDC)
13	CONN_3D_MODE-	Out	3D mode state from cinema projector. From cinema projector GPO emitter. Compatible with current cinema projector GPIO requirements and restrictions. (24VDC max, 50mA max)
14	CONN_SYNC-	Out	SYNC from cinema projector. From cinema projector GPO emitter. Compatible with current cinema projector GPIO requirements and restrictions. (24DC max, 50mA max)
15	Not connected		

4 Adjust the Image

This section provides information and procedures for adjusting the cinema projector image.

4.1 Maximize Light Output

To ensure optimal operation and peak screen brightness, use LampLOC™ to adjust the lamp position whenever you install a new lamp. When you complete the LampLOC adjustment, the lamp is centered and is the correct distance from the illumination system. Before running LampLOC, verify that:

- The anode yoke is in the correct position for the lamp type.
- The lamp extension nut is installed when using a CDXL-30SD lamp. Remove the nut if you are not using a CDXL-30SD lamp.
- The lamp is on and the douser is open.

1. On the Touch Pad Controller, tap the **Test Patterns** icon.
2. Tap the **Full Screen White** test pattern.
3. Tap **Menu** > **Advanced Setup** > **LampLOC™ Setup**.
4. Tap **Do Auto**.

4.2 Calibrate Screen Brightness (fL)

1. On the Touch Pad Controller, tap **Menu** > **Administrator Setup** > **Foot Lamberts Calibration**.
2. Complete the **Foot Lamberts Calibration** wizard.

4.3 Basic Image Alignment

This procedure ensures that the image reflected from the digital micromirror device (DMD) is parallel and centered with the lens and screen. This procedure must be completed before you complete a boresight adjustment.

1. Verify the cinema projector is properly positioned relative to the screen. See 2.3 Position the cinema projector.
2. Display a test pattern that you can use to analyze image focus and geometry. The framing test pattern works well for this.
3. Perform a preliminary focus and (if available) a zoom adjustment with the primary lens. Focus the center of the image first.
4. Hold a piece of paper at the lens surface and adjust the offsets until the image is centered within the lens perimeter.
5. With the framing test pattern on screen, re-check cinema projector leveling so the top edge of the image is parallel to the top edge of the screen.

4.4 Adjust Offset

Project an image with the primary lens. Always adjust offset before boresight.

Select a framing test pattern and then adjust the horizontal and vertical offset to display a square image on the screen with minimal cinema projector aiming error. (**Figure 4-1)**

NOTES: 1) *For the best optical performance and minimize keystone error, use offset and not aiming to center the image in off axis installations.* **2)** *Avoid extreme tilts or offsets. Corner vignettes on a white test pattern indicate extreme offset that should be avoided using mechanical alignment.*

Figure 4-1 Standard Lens Mount

4.5 Adjust Offset with an ILS

Project an image with the primary lens. Always adjust offset before boresight. Ensure the correct lens is selected in the Advanced Setup: Lens Adjust window before calibration to ensure you remain within the applicable boundary of the installed lens.

1. Tap **Menu** > **Advanced Setup** > **Lens Setup**.

2. Tap **Enable Automatic ILS**. Enabling Automatic ILS overwrites the pre-defined settings for the channel.

3. Tap the Test Patterns icon and select a framing test pattern.

4. Tap **Menu** > **Advanced Setup** > **ILS File Setup**.

5. Tap the directional arrows in the **Offset** area. For best optical performance, make sure to minimize keystone error by using offset more than aiming to center the image in off axis installations. Avoid extreme tilts or offsets. Corner vignettes on a white test pattern indicates extreme offset that should be avoided using mechanical alignment.

4.6 Adjust Left and Right Boresight

When performing these adjustments the goal is to balance the tilt of the lens mount to compensate for screen to cinema projector tilt, but also to precisely maintain the original factory settings of the lens mount axial position.

1. Loosen the horizontal hold screw.
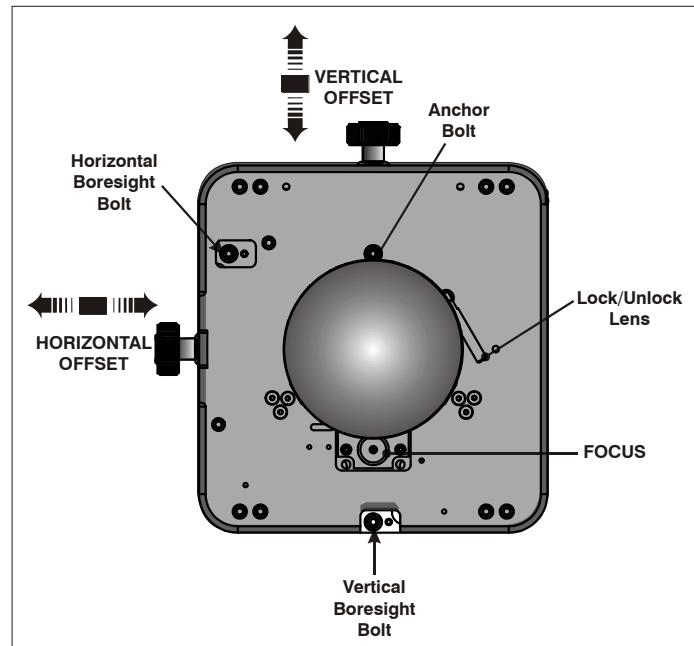
2. Extend the lens focus completely.

3. Adjust the **Focus** using the focus knob to retract the lens. (**Figure 4-2**) Watch the image at the left edge of the screen until it comes into focus. If the entire screen is in focus, proceed to step 7.
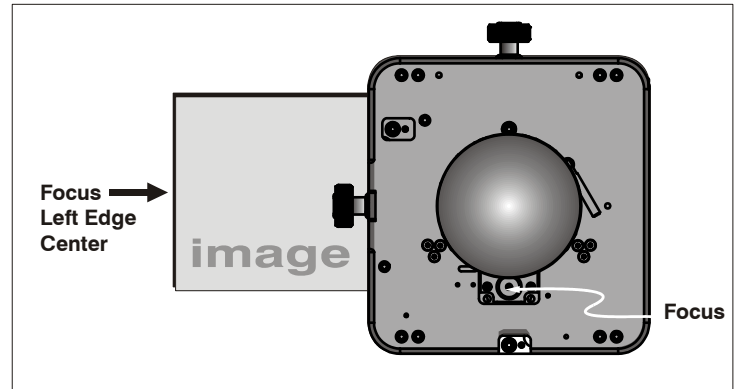

Figure 4-2 Adjust Focus

4. Continue retracting the lens.

   a. If the right side of the image comes into focus before the lens is completely retracted, adjust the horizontal boresight bolt to balance the left and right edges.

   b. If the right side of the image fails to come into focus, adjust the horizontal boresight bolt.

5. When both sides appear equally blurry, adjust the horizontal or vertical offset to re-center the image.
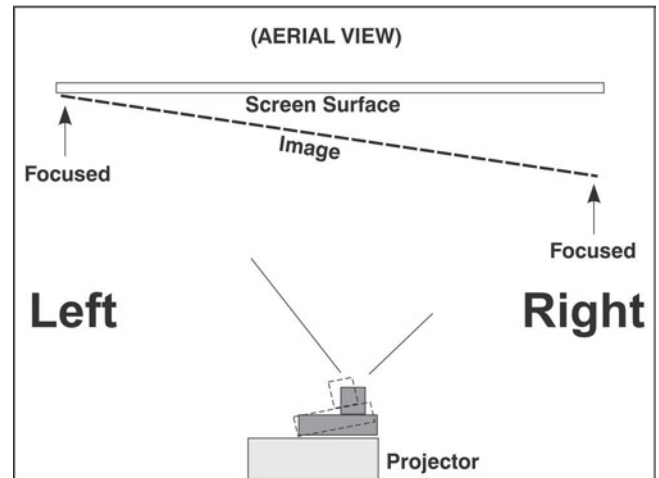
Figure 4-3 Aerial View Illustrating Misaligned Boresight

6. Repeat steps 1 - 5 until both sides of the image are focused.

7. Tighten the horizontal hold screw to maintain your adjustments.
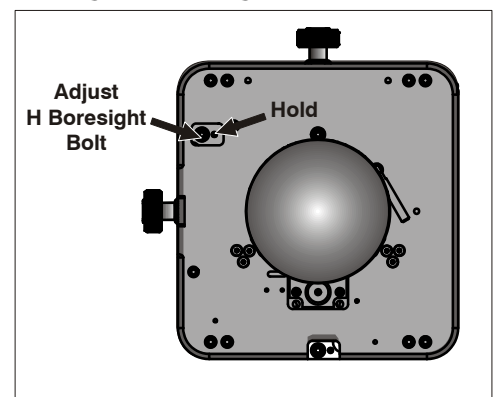
8. Check the boresight again.

Figure 4-4 Adjust Horizontal Boresight Bolt

4.7   Adjust Top and Bottom Boresight

1. 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** knob to retract the lens. Watch the image at the top edge of the screen until it comes into focus. If the entire screen is in focus, proceed to step 8.
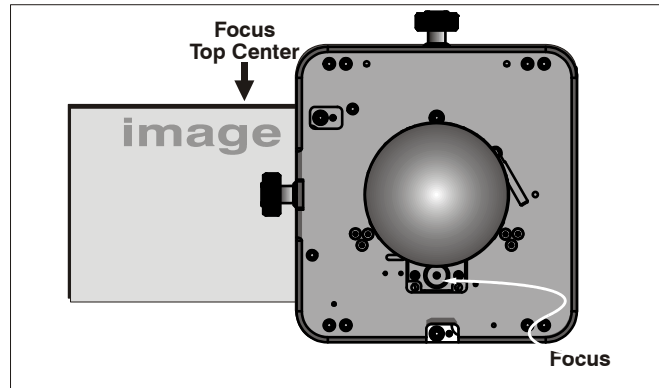

Figure 4-5 Focus Top Center of Screen

5. Continue retracting the lens.

   a. If the bottom edge of the image comes into focus before the lens is completely retracted, 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 is not in focus, adjust the vertical boresight bolt to direct or aim the lens mount toward 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. Re-focus the center of the image. The goal is for good focus at the center and on all sides.

9. Tighten the vertical hold screw to maintain your adjustments.
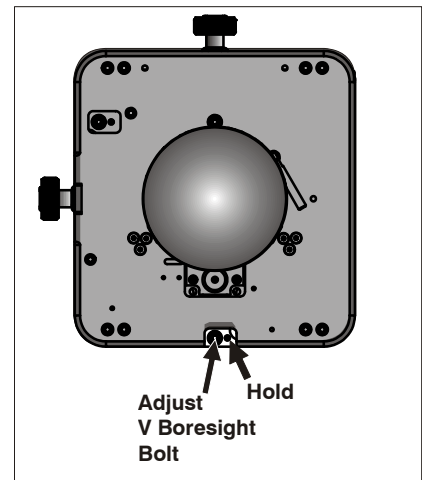
10. Check the boresight again.

Figure 4-6 Adjust Vertical Boresight Bolt

4.8 Adjust Top and Bottom Boresight with an ILS

1. Loosen the **Vertical Locking Screw**.

2. Extend the lens focus completely.

3. Adjust the Focus to retract the lens using the counter-clockwise button on the ILS Adjust window. 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 comes into focus, skip to step 8.

4. Continue retracting the lens.

   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.

5. When both sides appear equally blurry, tap **Menu** > **Advanced Setup** > **ILS File Setup** and tap the directional arrows in the **Offset** area to center the image on the screen.

6. Repeat Steps 2 - 5 until the top and bottom of the screen are both well-focused.

7. 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.

8. Adjust the **Vertical Locking Screw** to lock the lens mount in place and check boresight again.
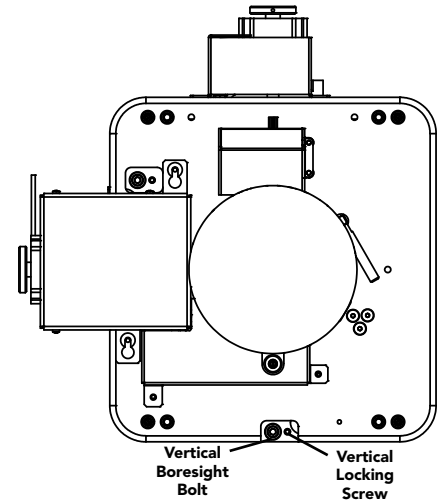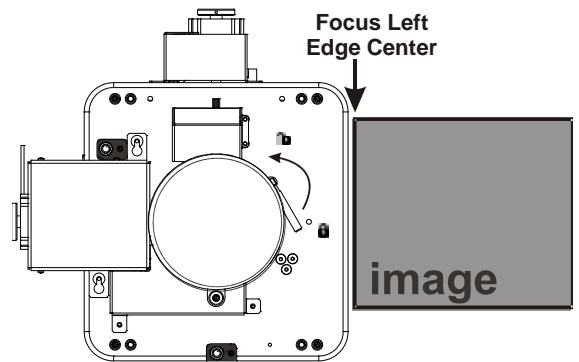

Vertical Boresight Bolt   Vertical Locking Screw

Figure 4-7 Vertical Boresight

Focus Left Edge Center

image

Figure 4-8 Adjust Vertical Boresight

4.9 Adjust DMD Convergence

⚠ **DANGER** UV EXPOSURE! Protective UV glasses must be worn when performing convergence adjustments.

A convergence problem occurs when one or more projected colors (red, green, blue) appears misaligned when examined with a convergence test pattern. Normally, the three colors should overlap precisely to form pure white lines throughout the image and one or more poorly converged individual colors may appear adjacent to some or all of the lines. Contact your Christie accredited service technician to correct DMD convergence issues.

4.10 Fold Mirror Adjustment

If a corner or edge of an image is missing, the fold mirror might be misaligned with the optical system. To correct this issue:

- Adjust the screw closest to the operator's side (right side, when facing screen) to raise or lower the image.

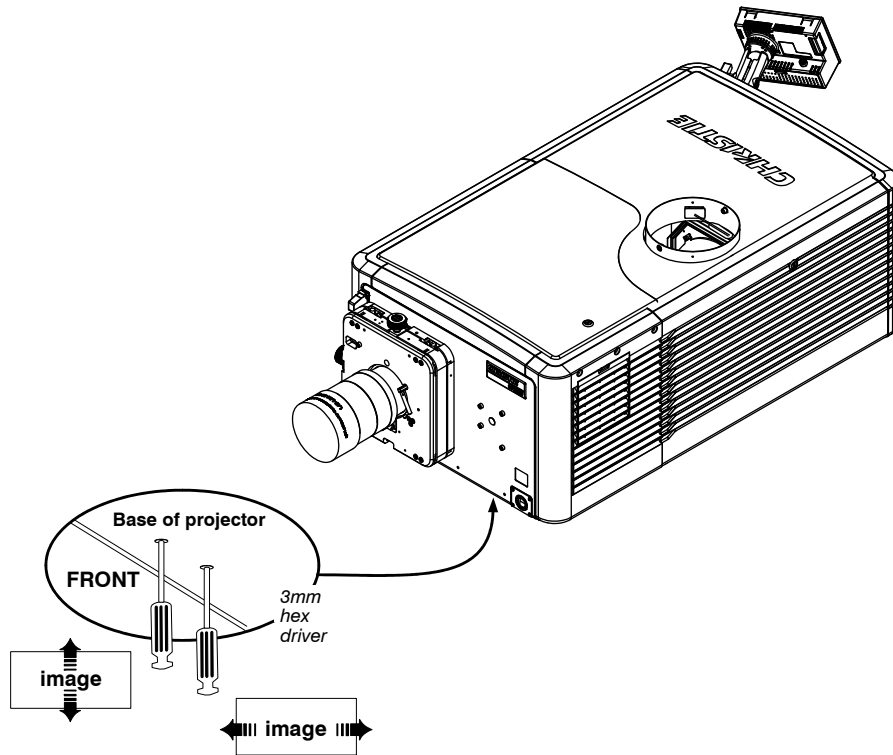- Adjust the screw on the left side to move the image left or right.

Figure 4-9 Fold Mirror Adjustment

4.11 Calibrate the System

Use the TPC to calibrate the image color performance and define 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 cinema projector and transmit information to and from the CP2230 via an Ethernet or RS-232 connection.

4.12 Color Calibration

To ensure an accurate color display:

1. Measure the colors displayed on the screen from the center of the audience viewing location to determine the Measured Color Gamut Data (MCGD) value.

2. On the Touch Pad Controller tap **Menu** > **Advanced Setup** > **MCGD File Setup** and enter the color values in the x and y fields for the different colors.

3. Tap **Save**. The software automatically determines the Target Color Gamut Data (TCGD) value. The TCGD value determines what corrections are needed to display the correct colors.

4.13 Electronic Screen Masking

You can use the masking tool to correct image edge blanking. The masking tool produces results that are similar to filing the aperture plate in a film cinema projector. After you create the Flat and Scope screen files you can use them in multiple channels.

4.14 Work with 3D

This section provides information and procedures for setting up and managing 3D presentations.

4.14.1 Display Requirements

To display 3D images with the CP2230 cinema projector, you require these items:

• Two HD-SDI cinema signals (left and right) connected to the cinema projector's SMPTE ports HD-SDI A and HD-SDI B.
• A 3D hardware system:
  • Pi-Cell polarizer for display on a screen that has a silver polarization-preserving surface for use with passive glasses (RealD).
  • Rotating polarizing wheel (external) with passive circular polarizing glasses (MasterImage). Requires a silver screen.
  • IR emitter for controlling the left eye/right eye gating (switching) of active glasses (Xpand).
  • Dual cinema projector 3D - passive glasses (circular or linear). Requires a silver screen.
• A 3D connection cable:
  • 3D sync output cable (GPIO).
  • 3D connector.
• Power supply for your sync output device.

4.14.2   Hardware Setup

Use an infrared emitter to control gating in active glasses, a polarizing Z-screen (Pi-cell) with passive glasses or filter wheel with passive glasses.
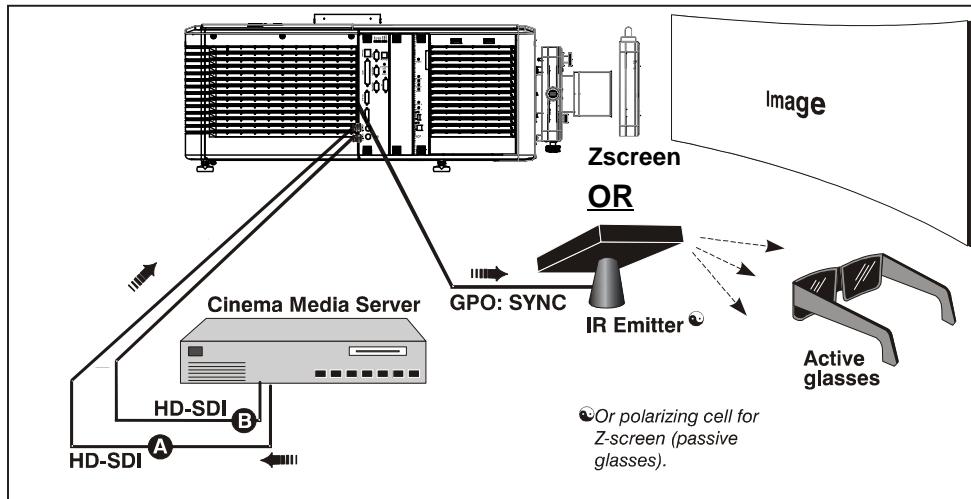

Figure 4-10 3D Hardware Setup

Table 4.1 3D Hardware Systems

	RealD Z-screen	RealD XL Box	Dolby Filter Wheel	Xpand	Master Image	Dual cinema projector
Installed/ Mounted Components	Z-screen mounted in front of the projection lens	XL box mounted in front of the projection lens	Installed filter wheel inside the cinema projector	None	Installed wheel in front of the cinema projector	Polarizing plates in front of lenses
Silver Screen	Yes	Yes	No	No	Yes	Yes
3D Glasses	Polarizing circular glasses	Polarizing circular glasses	Color filter glasses	Active glasses	Circular polarized glasses	Polarizing circular or linear glasses

4.14.3   Install a 3D Server with an YCxCz Interface

1. Install and connect your 3D hardware to the cinema projector.

2. Edit and apply the default 3D lamp file:

    a. Tap **Menu** > **Advanced Setup** > **Lamp Power/LiteLOC Setup**.

    b. Set the brightness percentage for the lamp in the **Power %** field.

    c. Tap **Save**.

    d. Repeat steps b and c for all remaining 3D channels.

3. Measure the color gamut and create a measured color file.

4. Edit the channel values for your theatre. The predefined 3D Channels are named: **3D Flat 1998x1080** and **3D Scope 2048x858**.

5. Run test patterns to verify the performance of the new 3D channel formats.

6. Run 3D content to verify correct left and right eye data.

4.14.4 Edit the Default 3D Lamp File

For 3D images to display correctly, you must edit the default 3D lamp file to match the specifications of your 3D hardware.

1. Tap **Menu** > **Advanced Setup** > **Lamp Power / LiteLOC™ Setup**.

2. Select **Default** in the **Current Lamp File** list.

3. Set the brightness percentage for the lamp in the **Power %** field.

4. Tap **Save**.

4.14.5 Define a Measured Color Gamut Data File

For 3D images to display correctly, you must define an MCGD file to match the specifications of your 3D hardware.

1. Tap **Menu** > **Advanced Setup > MCGD File Setup**.

2. Hold a pair of 3D glasses in front of the light meter to determine the new x and y color coordinates for Red, Green, Blue, and White. Use the same light path that you use to display a show.

3. Enter the x and y values in the **Red**, **Green**, **Blue** and **White** fields.

4. Tap **Save As**.

5. Enter **3D Onsite** in the **File Name** field.

6. Tap **Save**.

4.14.6 Edit the 3D Flat 1998 x 1080 Channel

1. Tap **Menu** > **Channel Setup**.

2. Select **3D Flat 1998x1080** in the **Channel Name** list.

3. Tap **Config 1** in the left pane and edit these settings:

   a. Select **292-Dual** in the **Input** list.

   b. Select **YCrCb 4:2:2 10 bits x2** in the **Data Format** list.

   c. Select **1998x1080 1.85 Flat** in the **Source File** list.

   d. Select **Flat** in the **Screen File** list.

4. Tap **Config 2** in the left pane and edit these settings:

   a. Select **3D Onsite** in the **Measured Color** list. If this option is not available, see Section 4.14.5: Define a Measured Color Gamut Data File.

   b. Select **DC28_DCIXYZE_314_351** in the **Target Color** list.

   c. Select **YCxCz Inverse ICT** in the **Color Space** list.

   d. Select **Gamma 2.6** in the **Gamma** list.

   e. Select **Linear_9x9x9** in the **LUT-CLUT** list.

5. Tap **3D Control** in the left pane and edit these settings:

  a. Select **Line Interleave** in the **3D Sync Input Mode** list.

  b. Select **6:2** in the **Frame Rate N:M** list.

  c. Select **Left (L1R1 L2R2)** in the **L/R Display Sequence** list.

  d. Select **True** in the **3D Sync Polarity** list.

  e. Enter **430** in the **Dark Time** field or enter a value appropriate for your 3D hardware.

  f. Enter **-120** in the **Output Delay** field or enter a value appropriate for your 3D hardware.

  g. Enter **0** in the **Phase Delay** field or enter a value appropriate for your 3D hardware.

4.14.7 Edit the 3D Scope 2048 x 858 Channel

1. Tap **Menu** > **Channel Setup**.

2. Select **3D Scope 2048x858** in the **Channel Name** list.

3. Tap **Config 1** in the left pane and edit these settings:

  a. Select **292-Dual** in the **Input** list.

  b. Select **YCrCb 4:2:2 10 bits x2** in the **Data Format** list.

  c. Select **2048x858 2.39 Scope** in the **Source File** list.

  d. Select **Scope** in the **Screen File** list.

4. Tap **Config 2** in the left pane and edit these settings:

  a. Select **3D Onsite** in the **Measured Color** list. If this option is not available, see Section 4.14.5: Define a Measured Color Gamut Data File.

  b. Select **DC28_DCIXYZE_314_351** in the **Target Color** list.

  c. Select **YCxCz Inverse ICT** in the **Color Space** list.

  d. Select **Gamma 2.6** in the **Gamma** list.

  e. Select **Linear_9x9x9** in the **LUT-CLUT** list.

5. Tap **3D Control** in the left pane and edit these settings:

  a. Select **Line Interleave** in the **3D Sync Input Mode** list.

  b. Select **6:2** in the **Frame Rate N:M** list.

  c. Select **Left (L1R1 L2R2)** in the **L/R Display Sequence** list.

  d. Select **True** in the **3D Sync Polarity** list.

  e. Enter **430** in the **Dark Time** field or enter a value appropriate for your 3D hardware.

  f. Enter **-120** in the **Output Delay** field or enter a value appropriate for your 3D hardware.

  g. Enter **0** in the **Phase Delay** field or enter a value appropriate for your 3D hardware.

4.14.8 Display 3D Diagnostic Test Patterns

You can use 3D test patterns to verify your 3D hardware is functioning correctly.

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Test Patterns**.

4. Tap a test pattern.

5. Put on a pair of 3D glasses.

6. Look at the on-screen image, and then close your left eye and look at the image through your right eye. Switch when the image alternates.

3D Test Pattern	Action
RGB-12bit -3D Dynamic Range	Alternates between 2 images shown in **Figure 4-11**.
RGB-12bit-3D Four Quadrant	Alternates between 2 images shown in **Figure 4-12**.
RGB-12bit-3D Full White	Alternates between 2 100% white images.
RGB-12bit-3D Half Descending	Alternates between 4 images shown in **Figure 4-13**.
RGB-12bit-3D Horizontal Ramp	Alternates between 2 horizontal ramp images.
RGB-12bit-3D L-Pattern	Alternates between 2 images shown in **Figure 4-14**.

100% black field with 100% white (TL), red (TR), green (BR), blue (BL) boxes
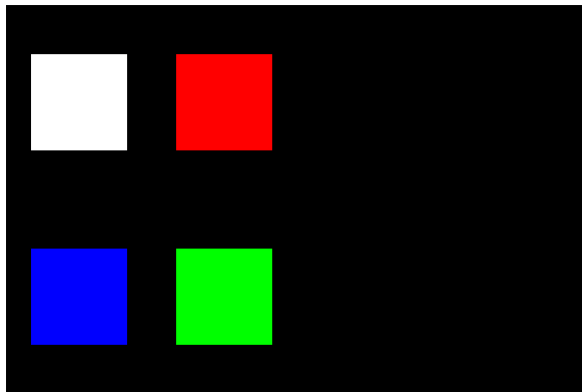
100% black field with 100% red (TL), white (TR), blue (BR), green (BL) boxes
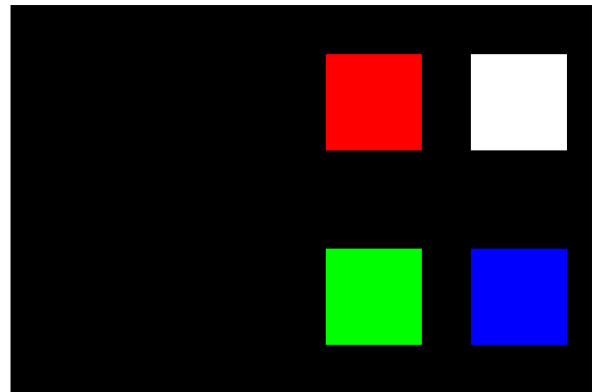
Figure 4-11 RGB-12 bit -3D Dynamic Range Test Pattern

FRAME 1 - 100% white field box in 100% black field
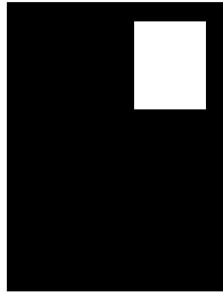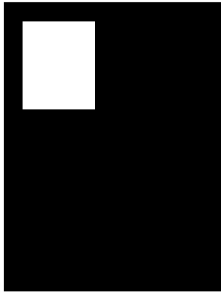
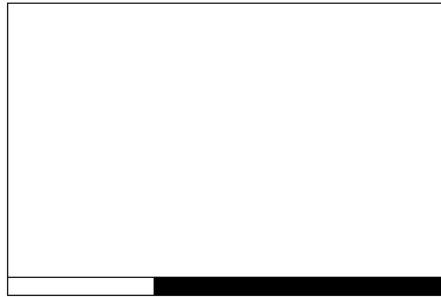**FRAME 2 - 100% white field box in**
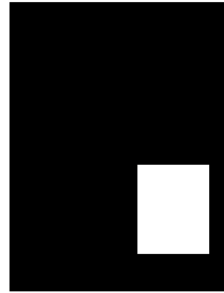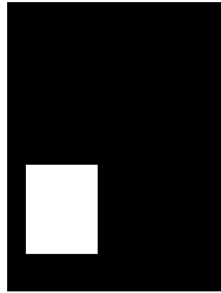
FRAME 3 - 100% white field box in 100% black field

FRAME 4 - 100% white field box in 100% black field
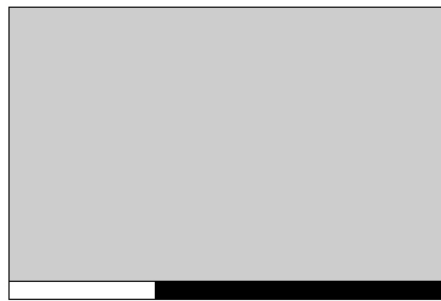
Figure 4-12 RGB-12bit-3D Four Quadrant Test Pattern

FRAME 1 - 100% white field with last lines 25% white and 75% black

FRAME 2 - 50% white field with last line 75% white and 25% black
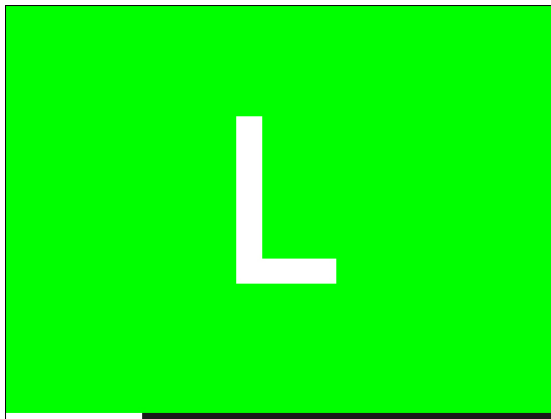
FRAME 3 - 25% white field with last line 25% white and 75% black

FRAME 4 - 12.5% white field with last line 75% white and 25% black

Figure 4-13 RGB-12bit-3D Half Descending Test Pattern

Green field with white "L" and last lines 25% white, 75% black

Magenta field with last lines 75% white, 25% black

Figure 4-14 RGB-12bit-3D L-Test Pattern

4.14.9   Verify 3D Cinema Content

1. Put on a pair of 3D glasses.

2. Play the 3D content.

3. Verify the left and right eye display correctly.

4. Put the 3D glasses on upside down.

5. If the image is reversed:

    a. Tap **Menu** > **Channel Setup** on the cinema projector Touch Pad Controller (TPC).

    b. Select a 3D channel in the **Channel Name** list.

    c. Select **Inverted** in the **3D Sync Polarity** list.

4.14.10 3D Troubleshooting

Reversed 3D Effect (Pseudo 3D)

1. Put your 3D glasses on upside down.

2. If the image is reversed:

    a. Tap **Menu** > **Channel Setup** on the cinema projector Touch Pad Controller (TPC).

    b. Select a 3D channel in the **Channel Name** list.

    c. Select **Inverted** or **True** in the **3D Sync Polarity** list.

Image Breakup

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Control** in the left pane.

4. Lower the **Dark Time** field value.

Image is Too Dark

The lamp power for 3D content is typically twice as high as for 2D content except when you are using a RealD XL device.

1. Tap **Menu** > **Advanced Setup** > **Lamp Power/LiteLOC™ Setup.**

2. Increase the value in the **Power %** field.

No 3D Effect

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Control** in the left pane.

4. Verify **Enable 3D** is selected.

Ghosting / Cross-talk

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Control** in the left pane.

4. Raise or lower the **Dark Time** field value.

5. Raise or lower the **Output Delay** field value.

Motion Artifacts

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Control** in the left pane.

4. Select **Left (L1R1 L2R2)** in the **L/R Display Sequence** list.

Disturbing Flashing in One Eye

1. Tap **Menu** > **Channel Setup**.

2. Select a 3D channel in the **Channel Name** list.

3. Tap **3D Control** in the left pane.

4. Select **Left (L1R1 L2R2)** in the **L/R Display Sequence** list.

5 Operation

This section provides information and procedures for operating the CP2230 cinema projector.

5.1 Turn the Cinema Projector On

WARNING! Do not attempt to turn the cinema projector on if the AC supply is not within the specified voltage range.

1. Turn the circuit breaker for the cinema projector on.

2. On the Touch Panel Controller (TPC), tap and hold the green power icon.

3. On the TPC, tap and hold the light bulb icon to ignite the lamp.

5.2 Turn the Cinema Projector Off

1. On the Touch Panel Controller (TPC), tap and hold the light bulb icon to turn the lamp off.

2. On the TPC, tap and hold the red power icon. The cinema projector enters a cool down mode and the fans and electronics stay on for 10 minutes. After this cool down period, the cinema projector enters standby mode.

3. If you are servicing the cinema projector, or removing the protective cover, disconnect AC and turn the breaker OFF.

5.3 The Touch Panel Controller (TPC)

The TPC is a touch-sensitive screen that you use to control the cinema projector. You can use the TPC to turn the cinema projector and lamp on or off, select channels, and view status information. The TPC is mounted on the rear of the cinema projector. You can tilt and turn the TPC to improve the viewing angle. There are two USB ports under a cover on the rear of the TPC that you can use to download log files and install software upgrades. You can disconnect the TPC from the cinema projector and an optional cable allows you to control the cinema projector from a maximum distance of 100 feet.

If the TPC fails or is disconnected, press the emergency start button that is recessed on the faceplate. This starts the cinema projector, turns the lamp on, and opens the douser.

6 Maintenance

This section provides information and procedures for performing cinema projector maintenance. You should read through this section in its entirety before performing maintenance activities. When you perform cinema projector maintenance, obey all warnings and precautions.

6.1 Inspect Ventilation

Vents and louvers in the cinema projector covers provide ventilation, both for intake and exhaust. Never block or cover these openings. Do not install the cinema projector near a radiator, heat register, or within an enclosure. To ensure adequate airflow around the cinema projector, keep a minimum clearance of 50cm (19.69") on the left, right, and rear sides of the cinema projector.

6.2 Fill the Coolant Reservoir

⚠ **DANGER** **HAZARDOUS SUBSTANCE! The coolant used in the cinema projector contains ethylene glycol. Use caution when handling. DO NOT ingest.**

⚠ **WARNING** **Only use coolant recommended by Christie in your cinema projector. Using unapproved coolant can result in cinema projector damage and voids the cinema projector warranty.**

The liquid cooler system sends and receives coolant from the digital micromirror device (DMD) heat sinks. Check the coolant level every 6 months, by removing the top cinema projector lid. The coolant level should always be above the minimum level indicator. If the liquid cooling system fails, an over-temperature alarm window appears in the Touch Pad Controller (TPC). The lamp turns off if the cinema projector enters an over-temperature state for longer than one minute.

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 (P/N: 003-001837-xx). When refilling, use caution not to spill or let any of the coolant drip on or near the electronics. After filling the reservoir, check the coolant hoses for kinks which may restrict fluid flow.

If coolant drips on electronics or other 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 removed. Then lightly moisten a new tissue with de-ionized water and blot the area again. Use a dry tissue to dry the area.

6.3 Inspect the Lamp

⚠ DANGER **Always disconnect the cinema projector from AC power and wear authorized protective safety gear.**

- Check the contact surfaces of the anode (positive) and the cathode (negative) connections for cleanliness.
- Clean electrical contact surfaces regularly to prevent contact resistance from scorching connectors. Use an approved contact cleaner.
- Verify that all electrical and lamp connections are secure.

6.4 Inspect and Clean Optics

Unnecessary cleaning of optics can increase the risk of degrading delicate coatings and surfaces. If you are not a qualified service technician, you can only inspect and clean the lens and lamp reflector. Do not perform maintenance on other optical components. Check these components periodically in a clean, dust-free environment using a high-intensity light source or flashlight. Clean them only when dust, dirt, oil, fingerprints or other marks are obvious. Never touch an optical surface with your bare hands. Always wear latex lab gloves.

These are the recommend tools for removing dust or grease:

- Soft camel-hair brush
- Dust-free blower - filtered dry nitrogen blown through an anti-static nozzle.
- Dust-free lens tissue, such as Melles Griot Kodak tissues (18LAB020), Opto-Wipes (18LAB022), Kim Wipes or equivalent.
- For the lens only - lens cleaning solution such as Melles Griot Optics Cleaning Fluid 18LAB011 or equivalent
- For the reflector only - Methanol.
- Cotton swabs with wooden stems.
- Lens cleaning cloth or microfiber such as Melles Griot 18LAB024 or equivalent.

6.4.1 Clean the Lens

A small amount of dust or dirt on the lens has minimal effect on image quality-to avoid the risk of scratching the lens, clean the lens only if absolutely required.

Remove Dust

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.
2. Fold a microfiber cloth and wipe the remaining dust particles off the lens with the smooth portion of the cloth that has no folds or creases. Do not apply pressure with your fingers. Instead, use the tension in the folded cloth to remove the dust.
3. If significant dust remains on the lens surface, dampen a clean microfiber cloth with lens cleaning solution and wipe gently until clean.

Remove Fingerprints, Smudges, or Oil

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.

2. Wrap a lens tissue around a swab and soak it in lens cleaning solution. The tissue should be damp but not dripping.

3. Gently wipe the surface using a figure eight motion. Repeat until the blemish is removed.

6.4.2 Clean the Lamp Reflector

Inspect the mirror surface (reflector) for cleanliness when you remove the lamp for replacement. Wear protective clothing while inspecting or cleaning. Color variations on the reflector are normal.

Remove Dust

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.

2. If some dust remains, leave it. Some dust is inevitable. Avoid unnecessary cleaning.

Remove Fingerprints, Smudges, or Oil

1. Brush most of the dust off with a camelhair brush or use a dust-free blower.

2. Fold a microfiber cloth and wipe the remaining dust particles off the lens with the smooth portion of the cloth that has no folds or creases. Do not apply pressure with your fingers. Instead, use the tension in the folded cloth to remove the dust.

6.5   Inspect and Clean the Lamp Blower

NOTICE! DO NOT bend the impeller blades or loosen the balancing weights.

A clogged lamp blower impeller or motor can reduce air flow leading to overheating and failure of the lamp.

1. Vacuum loose dirt from the lamp blower impeller.

2. If necessary, use a brush with hot water.

6.6   Replace the Lamp

⚠ DANGER 1)Lamp replacement must be performed by a qualified service technician. 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 cinema projector are also wearing protective safety clothing. 4) Never attempt to remove the lamp when it is hot. The lamp is under pressure when hot and may explode, causing personal injury, death, or property damage. Allow the lamp to cool completely before replacing it.

⚠ WARNING Improper installation of the lamp can damage the cinema projector.

1. Tap and hold the red power button on the TPC **Main** panel to turn the lamp and cinema projector off.

2. Allow the lamp to cool for a minimum of 10 minutes.

3. Unplug the cinema projector.

4. Put on your protective clothing and face shield.

5. Unlock and open the lamp door. Release the tethered latch mechanism to remove the door entirely.

6. Remove the old lamp and inspect the reflector:

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 cinema projector metal such as the reflector or firewall.*

c. Rest the anode (+) end of the lamp on the anode yoke and slip the positive lamp connector over the bulb end. (**Figure 6-2**) 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.**
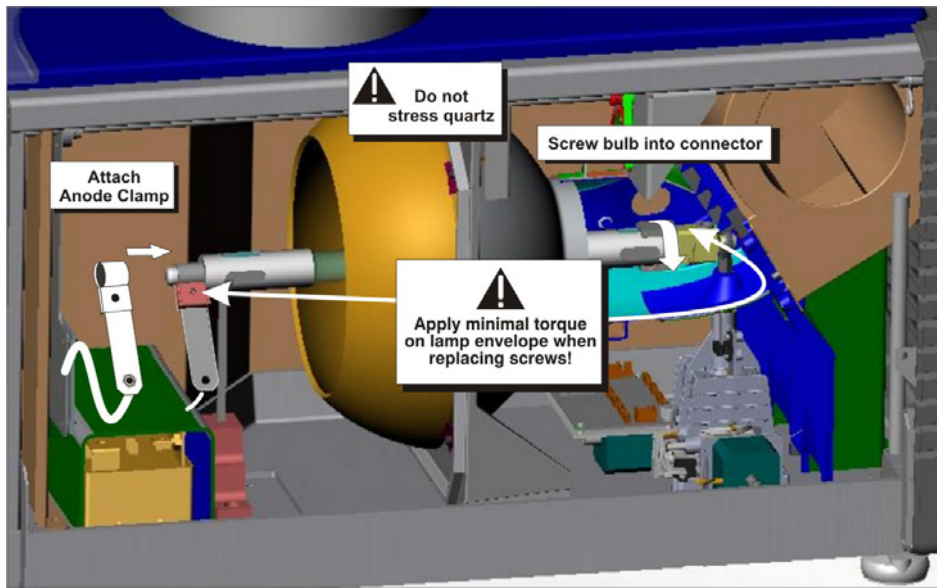
d. Tighten the anode and cathode set screws.

Figure 6-2 Install New Lamp

9. Re-install the front lamp duct. 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 6-3**) 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.

10. Close the internal lamp door and manually turn the 2 thumbscrews to lock it in place.

11. Turn the circuit breaker for the cinema projector on.

12. On the Touch Panel Controller (TPC), tap and hold the green power icon.

13. Record the new lamp information:

    a. Tap **Menu** > **Advanced Setup** > **Lamp History.**
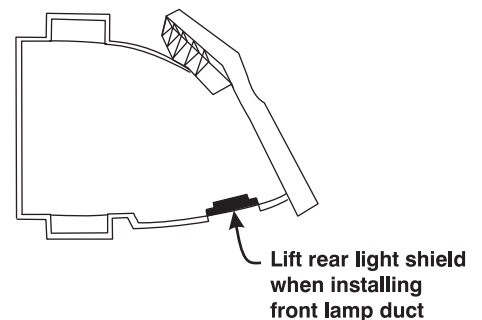
    b. Tap **Add Lamp**.

Figure 6-3 Light Shield on Front Lamp Duct

c. Complete the fields in the **Add Lamp** dialog.

d. Tap **Save**.

14. On the TPC, tap and hold the light bulb [icon] icon to ignite the lamp.

15. Run a LampLOC™ on the new lamp:

a. Tap **Menu** > **Advanced Setup** > **LampLOC™ Setup.**

b. Tap **Do Auto**.

6.7 Rotate the Lamp

⚠ **DANGER** **1) Lamp rotation 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 cinema projector are also wearing protective safety clothing. 4) Never attempt to remove the lamp when it is hot. The lamp is under pressure when hot and may explode, causing personal injury, death, or property damage. Allow the lamp to cool completely.**

When the operational life of the lamp reaches halfway, it is recommended that you rotate it 180° to ensure an even burn of the lamp, improve lamp performance, and extend the life of the lamp. An alarm window appears on the TPC after you complete the lamp rotation.

1. Tap and hold the red power button [icon] on the TPC **Main** panel to turn the lamp and cinema projector off.

2. Allow the lamp to cool for a minimum of 10 minutes.

3. Unplug the cinema projector.

4. Put on your protective clothing and face shield.

5. Unlock and open the lamp door. Release the tethered latch mechanism to remove the door entirely.

6. Remove the cathode cable and rotate the lamp 180°.

7. Replace the cathode cable.

8. Replace and lock the lamp door.

9. Remove your protective clothing and face shield.

10. Tap and hold the green power button to turn the cinema projector on.

11. Tap **Menu** > **Advanced Setup > Lamp History**.

12. Tap **Acknowledge Lamp Rotation**.

6.8 Replace the Light Engine Air Filter

⚠ **CAUTION** **Use only high efficiency Christie approved filters. Never operate the cinema projector without the filter installed. Always discard used air filters.**

You should check the condition of the light engine air filter monthly. Replace the light engine air filter when you replace the lamp module or sooner if you are operating the cinema projector in a dusty or dirty environment. The filter is located on the right side of the cinema projector behind the air filter cover.

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 cinema 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.

6.9 Replace the Liquid Cooling Air Filter

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

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 cinema 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.

6.10 Replace the Lens

1. Tap and hold the red power button ⏻ on the TPC **Main** panel to turn the lamp and cinema projector off.

2. Allow the lamp to cool for a minimum of 10 minutes.

3. Unplug the cinema projector

4. Turn the lens clamp to the OPEN/UP position.

5. Release the lens locking lever (UP position).

6. 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.*

7. Secure the lens with the lens locking lever (DOWN position).

8. Calibrate the lens.

7 Troubleshooting

This section provides information and procedures for resolving common cinema projector issues. If you cannot resolve a cinema projector issue, contact a Christie accredited service technician.

7.1 Cinema Projector Does Not Turn On

- Verify the wall circuit breaker is on. If there is a problem with the wall circuit breaker turning off, contact a certified electrician.
- Check the status of the LEDs on the rear corners of the cinema projector. (**Figure 7-1**).
- Verify the LVPS has power by looking through the non-operator's side front access panel. One LED should be present in the lower middle region. (**Figure 7-2**).
- On the TPC, verify in the **Operational Status** region of the **Main** panel does not indicate a PIB failure.
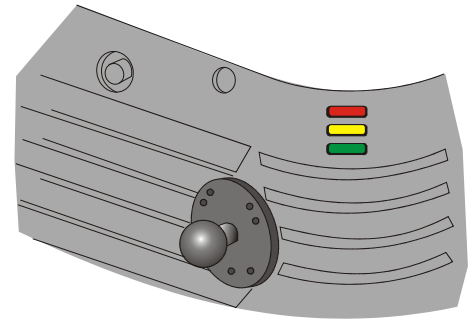

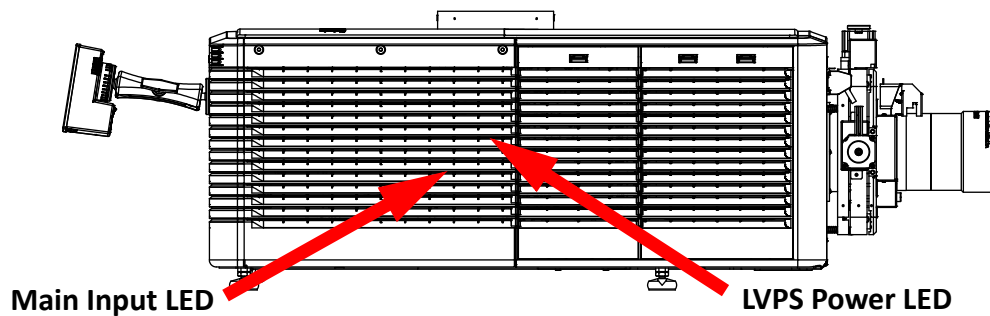**Figure 7-1 cinema projector Status**

Main Input LED   **LVPS Power LED**
Figure 7-2 View Power Status LEDs

7.2 Lamp Does Not Ignite

- Tap **Menu** > **Advanced Setup** > **Lamp History** and verify the number of hours the lamp has operated. Replace a lamp nearing the end of its operational life
- Tap **Menu** > **Status** and then **Interlocks** in the left pane. Check and correct all interlock failures.
- Tap **Menu** > **Status** and then **All Alarms** in the left pane. If a ballast communication error has occurred, restart the cinema projector and turn the lamp on.
- Tap **Menu** > **Status** and then **Temperatures** in the left pane. Verify if the DMD temperatures are too high. If the temperatures are too high, cool the cinema projector. Ensure the cinema projector is properly ventilated, the air filters are not blocked, and the liquid cooling reservoir has coolant.
- Listen for a clicking noise that indicates the ballast is attempting to strike the lamp. If you do not hear a clicking noise, there might be a problem a problem with the ballast. Contact a Christie accredited service technician to resolve the issue.
- If you hear a brief clicking noise, but the lamp does not ignite, replace the lamp.

7.3 Lamp Suddenly Turns Off

- Tap **Menu** > **Advanced Setup** > **Lamp Power/LiteLOC Setup**. Increase the lamp power.
- Tap **Menu** > **Status** and then **Interlocks** in the left pane. Review and correct all interlock failures.
- If EVB errors occur, check the door interlock.
- Tap **Menu** > **Status** and then **Temperatures** in the left pane. Verify if the DMD temperatures are too high. If the temperatures are too high, cool the cinema projector. Ensure the cinema projector is properly ventilated, the air filters are not blocked, and the liquid cooling reservoir has coolant.
- Replace the lamp.

7.4 Flicker, Shadows, Or Dimness

- Ensure the douser is open.
- Run a LampLOC™ adjustment.
- Verify that a LampLOC™ adjustment is not in progress.
- Tap **Menu** > **Advanced Setup** > **LampPower/LiteLOC™ Setup**. Monitor the Power % field to determine if the power is consistent or varying. Increase the lamp power. Lamps which are near end of service may not operate reliably at a lower power setting.
- Fold mirror misalignment. Contact your Christie accredited service technician to resolve the issue.
- Integrator rod misalignment. Contact your Christie accredited service technician to resolve the issue.

7.5 LampLOC™ Not Working

- If the **Do Auto** option is not working, tap **Menu** > **Advanced Setup** > **LampLOC™ Setup** and adjust the lamp position manually. Observe screen brightness by adjusting the XYZ values or use a light meter to check for changes in brightness.

7.6 LiteLOC™ Not Working

- Tap **Menu** > **Advanced Setup** > **LampPower/LiteLOC™ Setup.** Tap **Enable LiteLOC™**.
- If the lamp power is at the maximum setting to maintain a LiteLOC™ setting, LiteLOC™ is automatically disabled. Reduce the LiteLOC™ setting, or install a new lamp.

7.7 TPC

- If the TPC does not appear, restart the cinema projector.
- 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.
- If the button taps on are misinterpreted, the TPC screen may need recalibrating. Tap **Menu** > **Administrator Setup > Preferences**. Tap **Calibrate Screen** and follow the instructions on the screen.

7.8 Cannot Establish Communication with the Cinema Projector

Verify all input devices have the same subnet mask and unique IP addresses.

1. From the Desktop Launcher, **Administrator Setup**: **Communication Configuration** menu, check the **IP Address** and **Management IP** address with the **Subnet Mask address**. Ensure these belong to the same network.

7.9 Blank Screen, No Display of Cinema Image

- Ensure the lens cap is not on either end of the lens.
- Ensure the lamp is on.
- Confirm all power connections are connected correctly.
- Ensure the douser is open by verifying the state of the douser on **Main** screen.
- Ensure any test pattern other than the full black test pattern displays properly.
- Verify the correct display file is selected.
- For cinema connections, verify the correct port is selected.

7.10 Severe Motion Artifacts

Verify if there is a synchronization problem with reversed 3-2 pull-down in the 60Hz-to-24Hz film-to digital conversion and correct it at the source.

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

To regain full image width and proper proportions you may need to install an anamorphic lens. Open the Source File Setup window and verify the resolution and aspect ratio settings. Open the Screen File Setup window and verify the lens factor settings.

7.12 No Image, Just Pink Snow

This problem occurs when the correct cryptographic key is not available to decode encrypted cinema content..

- If the cinema projector security lid is unlocked or open, a warning appears on the Touch Panel Controller (TPC). Pause or stop the show on the server and then close and lock the lid. Press Play on the server and wait for the cinema projector to receive the decryption keys from the server. If the cinema projector does not recover after 30 seconds, pause or stop the show and try pressing Play again. If this solution does not work, reset the server. Check the Status window on the TPC for a tamper warning. If the lamp door is closed, the tamper switch may be faulty.
- Ensure the IP octets for the cinema projector and the server match. Change if necessary.
- Tap **Menu** > **Channel Setup**. Tap **Config 2** in the left pane and select **LD Bypass**.

7.13 Inaccurate Display Colors

Adjust the color, tint, color space, and color temperature settings of your input source. Tap **Menu** > **Channel Setup**. Tap **Config 1** in the left pane and verify the correct value is selected in the **PCF** list. Tap **Config 2** in the left pane and verify the correct value is selected in the **Color Space** field.

7.14   Display is Not Rectangular

- Verify the cinema projector is level and the lens surface and screen are parallel to one another.
- Adjust the vertical offset of the lens mount with the vertical offset knob or ILS.
- Check that the anamorphic lens is straight. Rotate to orient the aperture correctly.
- Tap **Menu** > **Advanced Setup** > **Screen File Setup** and verify the settings for the screen file are correct.

7.15   Display is Noisy

- Adjust the input source pixel tracking, phase, and filter.
- Verify the video input is terminated (75 ohms). If the device is the last device in a linked series, verify the video input is terminated at the last input source.
- Verify the cables connecting the input device to the cinema projector meet the minimum requirements.
- Add signal amplification or conditioning if the distance between the input device and the cinema projector exceeds 25 feet.

7.16   Display has Suddenly Frozen

Turn off the cinema projector and unplug the power cord from the power source. Plug the cinema projector power cord into a power source and turn the cinema projector on.

7.17   Data is Cropped from Edges

Reduce the image size to fill the display area, and then stretch the image vertically to fill the screen. Add an anamorphic lens to regain image width.

7.18   The Cinema Projector is On, but There is No Display

- Ensure AC power is connected.
- Make sure the lens cover is removed from the lens.
- Make sure the douser is open.
- Tap 💡 on the main TPC screen. If the lamp does not strike, see *7.2 Lamp Does Not Ignite, on page 7-1*.
- Tap **Menu** > **Channel Setup**. Verify the correct channel is selected and the settings are correct.
- Ensure an active source is connected properly. Check the cable connections and make sure the alternative source is selected.
- Verify you can select test patterns. If you can, check your source connections again.
- Ensure your Cinema server is running Series 2 compatible software.

7.19 The Display is Jittery or Unstable

- Verify that the input device is connected properly. If the input device is not connected properly, the cinema projector repeatedly attempts to display an image.
- The horizontal or vertical scan frequency of the input signal may be out of range for the cinema projector.
- The sync signal may be inadequate. Correct the source problem.

7.20 The Display is Faint

- Verify the input source is terminated only once.
- If the input is not a video source, use a different sync tip clamp location.

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

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

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

If you have resized the image, adjust the resizing settings until the entire image is visible and centered.

7.23 Display Appears Compressed (Vertically Stretched)

- Adjust the frequency of the pixel sampling clock for the input source.
- Verify the size and position settings are correct for the input source.
- Use an anamorphic lens for HDTV and anamorphic DVD input sources that have been re-sized and vertically stretched.

7.24 Inconsistent Picture Quality

- Verify the quality of the signal from the input source.
- Verify the H and V frequencies of the input source are correct.

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