Service Guide
020-102713-06

Cinema 4K-RGB

CP4315-RGB, CP4320-RGB, CP4325-RGB, CP4330-RGB

CHRISTIE®

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For the most current technical documentation and office contact information, visit *http://www.christiedigital.com*.

Warranty

Products are warranted under Christie's standard limited warranty, the details of which are available at *https://www.christiedigital.com/help-center/warranties/* or by contacting your Christie dealer or Christie.

PREVENTATIVE MAINTENANCE

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required, and in accordance with the maintenance schedule specified by Christie, will void the warranty. For preventative maintenance schedules, refer to *www.christiedigital.com*.

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. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment

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

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ENVIRONMENTAL

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

If printing this document, consider printing only the pages you need and select the double-sided option.

Please help us to conserve the environment we live in!

CHRISTIE

Content

Introduction

This document provides technical information for assisting Christie-qualified technicians in the servicing of the Cinema 4K-RGB projector.

Every effort has been made to make sure the information in this document is accurate and complete. However, due to continuing research, all information is subject to change without notice. Christie assumes no responsibility for omissions or inaccuracies.

Site requirements

To safely install and operate the Cinema 4K-RGB, the installation location must meet these minimum requirements.

Physical operating environment

- Ambient temperature (operating) 10 to 35°C (50 to 95°F)
- Humidity (non-condensing) 10% to 80%
- Operating altitude 0 to 3000 meters (0 to 9843 feet)

External exhaust ducting

Sufficient ventilation is required around the projector to regulate the temperature of the internal laser module. If necessary, air intake and exhaust HVAC ducts can be installed.

An exhaust duct is also available for purchase as an optional accessory (P/N: 163-102104-XX). Instructions for installing the exhaust duct are included with the accessory part.

The installation site must provide an airflow 450 cubic feet per minute (CFM) at 1 to 1000 meters (3280.8 feet) elevation, and must accommodate a heat load of 4 kW.

For each additional 1000 meters above sea level, increase the airflow (CFM) value by 15%. If an extraction duct is not used, the operating temperature range is restricted to 10 to 25°C (50 to 77°F) at a maximum altitude of 3000 meters (9842.5 feet).

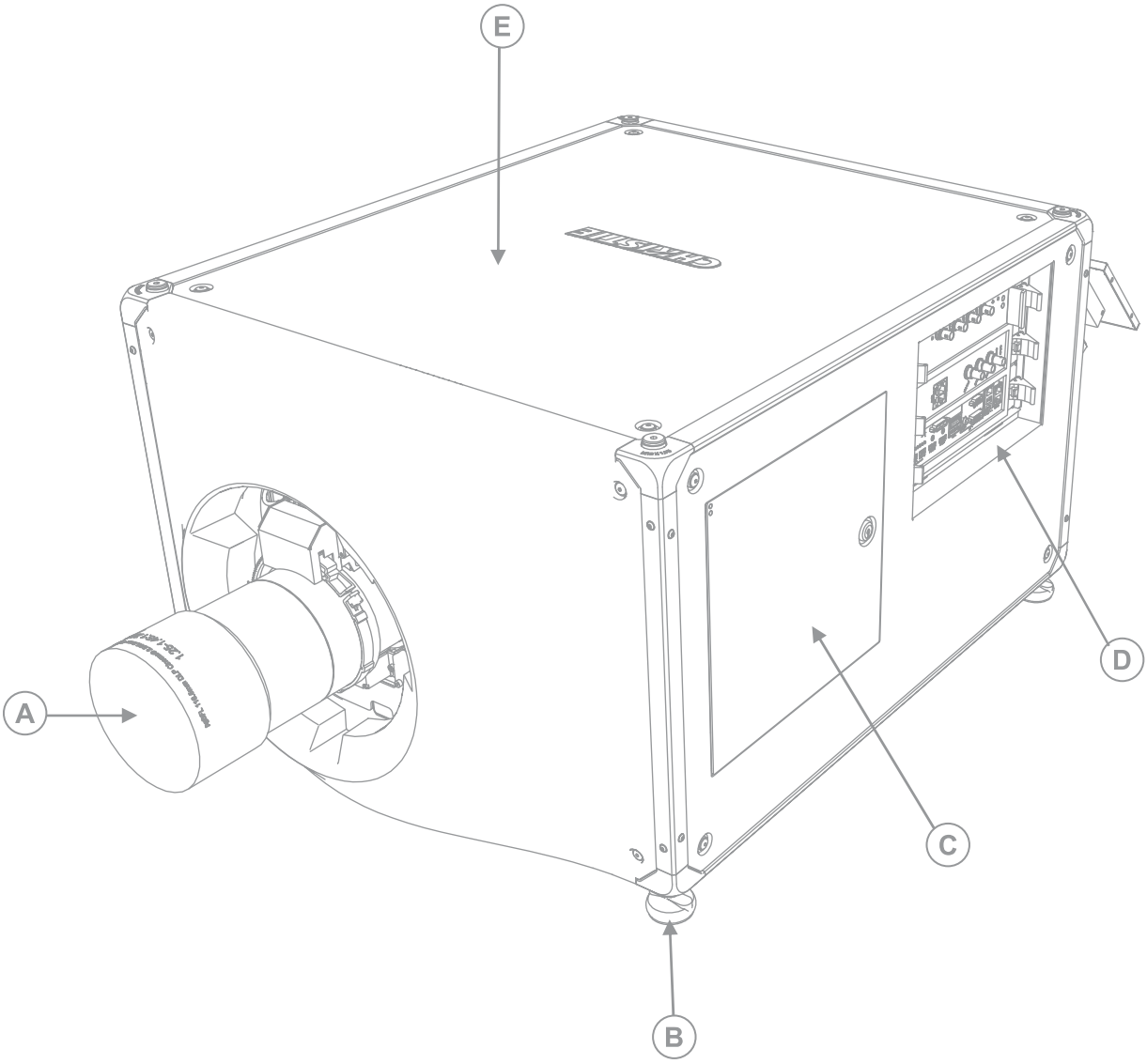
Permanent power connection

The projector must be connected to power using a hard-wired connection. The projector light source (main input) requires the permanent AC connection to operate. There is also an available connector for an uninterruptible power supply (UPS) to provide backup power for the projector electronics only.

Certified wall breakers are required as part of the installation. Breakers must be part of the building and easily accessible. The size of the breaker is determined from the power requirements of the projector and can be up to 30A maximum for the main input and up to 20A maximum for the UPS input.

Projector components (front)

Learn about the components on the front of the projector.

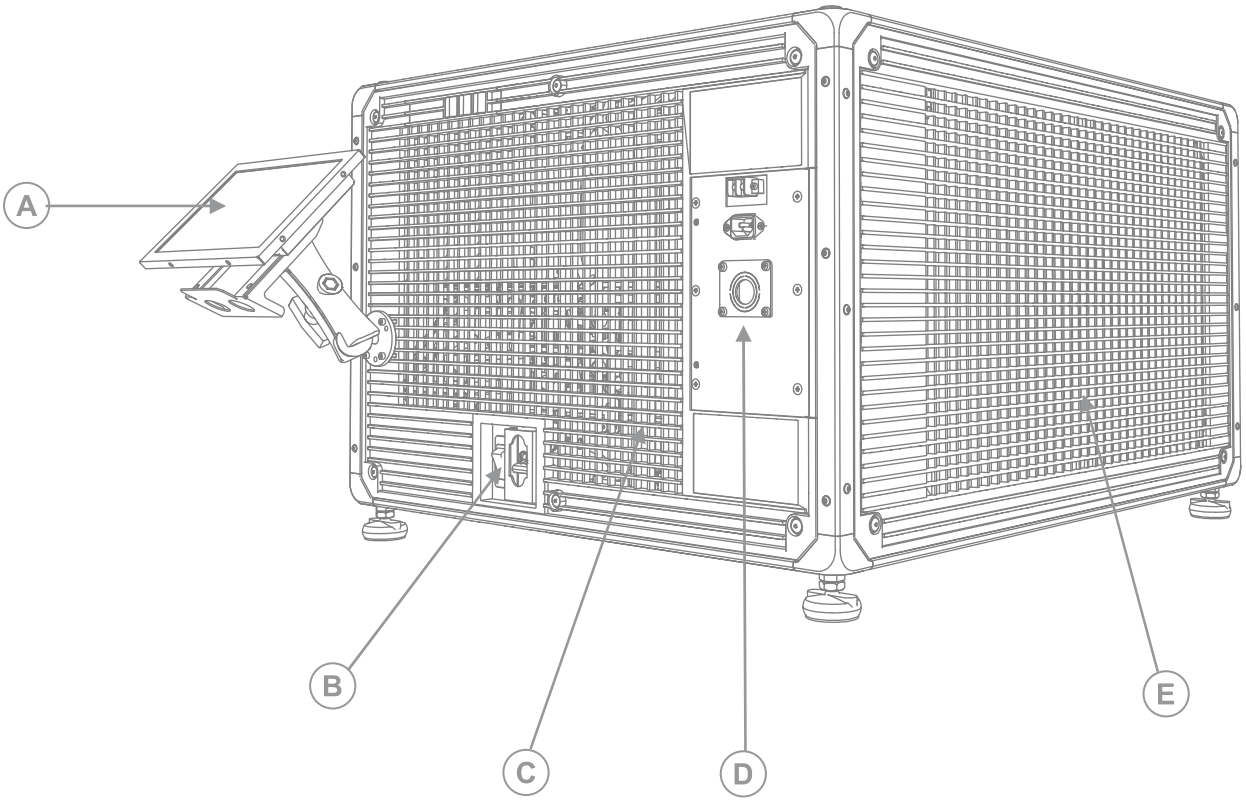


A	Projector lens A list of available lenses is available in the projector specifications. For more information, see the *Cinema 4K-RGB Specifications Guide (P/N: 020-102729-XX)*.
B	Adjustable feet Turn the adjustable feet to increase or decrease the projector height.
C	Service access door
D	Communications panel External devices are connected here.

E	Top cover

Projector components (rear)

Learn about the components on the rear of the projector.



A	Touch panel A touch-sensitive screen used to control the projector.
B	AC circuit breakers
C	Air exhaust
D	Power cord and AC receptacle
E	Air intake

Security roles

Only Christie authorized service technicians should perform field repair, marriage setup, and service to the unit.

Theater personnel should only perform diagnostic functions, such as running the projector interrogator. After performing a procedure mandating the use of the high-security key, theater personnel must ensure the security of the system is reestablished.

Product documentation

For installation, setup, and user information, see the product documentation available on the Christie website. Read all instructions before using or servicing this product.

1. Access the documentation from the Christie website:

   CP4315-RGB

   - Go to *https://bit.ly/2JIHhtJ* or *https://www.christiedigital.com/en-us/cinema/cinema-products/digital-cinema-projectors/christie-cp4315-rgb*
   - Scan the QR code using a QR code reader app on a smartphone or tablet.

   CP4320-RGB

   - Go to *https://bit.ly/3n5y11r* or *https://www.christiedigital.com/en-us/cinema/cinema-products/digital-cinema-projectors/christie-cp4320-rgb*
   - Scan the QR code using a QR code reader app on a smartphone or tablet.

   CP4325-RGB

   - Go to *http://bit.ly/2BjQLBq* or *https://www.christiedigital.com/en-us/cinema/cinema-products/digital-cinema-projectors/christie-cp4325-rgb*
   - Scan the QR code using a QR code reader app on a smartphone or tablet.

   CP4330-RGB

   - Go to *https://bit.ly/36PfbWj* or *https://www.christiedigital.com/en-us/cinema/cinema-products/digital-cinema-projectors/christie-cp4330-rgb*
   - Scan the QR code using a QR code reader app on a smartphone or tablet.

2. Switch to the **Downloads** tab.

Related documentation

Additional information on the projector is available in the following documents.

- *Cinema 4K-RGB Installation and Setup Guide (P/N: 020-102710-XX)*
- *Cinema 4K-RGB User Guide (P/N: 020-102712-XX)*
- *Cinema 4K-RGB Product Safety Guide (P/N: 020-102711-XX)*
- *CineLife Serial Commands Guide (P/N: 020-102714-XX)*
- *Cinema 4K-RGB Specifications Guide (P/N: 020-102729-XX)*

Technical support

Technical support for Christie Cinema products is available at:

- *Support.cinema@christiedigital.com*
- +1-877-334-4267
- Christie Professional Services: +1-800-550-3061 or *NOC@christiedigital.com*

Service guidelines

Review safety guidelines and information required for replacing modules.

Ordering parts

When ordering replacement parts, quote the part numbers of the items required. Quote the projector model number, serial number, and date of manufacture, as indicated on the license label.

Not all parts are available separately. In addition, some parts stocked as inventory are available only while the current supply lasts.

All part numbers are subject to change.

Replacing modules

To ensure you have the correct module, check the module markings and parts lists. To ensure you replace the projector module correctly, check the relevant disassembly and replacement procedures.

Replace components with exact equivalents or Christie-approved replacement parts. Failure to do so may result in unsafe operation.

Interconnection and line drawings

The interconnect diagram illustrates the path of electrical connections between modules. Manufacturer's part numbers are included. Part numbers are subject to change.

Line drawings provide projector dimensions and sizes for installation.

To download the latest interconnect diagram or line drawings, visit *www.christiedigital.com*.

Servicing live equipment

Only Christie accredited technicians who are knowledgeable about the hazards associated with hazardous voltage and high temperatures are authorized to assemble, install, and service Christie equipment.

To make sure you remain safe when servicing energized (live) Christie equipment:

- Locate the main AC power shut off prior to servicing the equipment. This will allow you to turn the power off quickly in an emergency.
- Disconnect the projector from the communication and management network so it cannot receive commands to turn the light source on, open the shutter, and move the lens.
- Familiarize yourself with all potential safety hazards prior to servicing the equipment. This includes, but is not limited to, the location and accessibility of hazardous voltages.

- Read and understand all written procedures prior to commencing a service procedure.
- Understand and follow all local safety codes and requirements when servicing energized (live) equipment.
- Perform equipment service in a location free of obstructions and other hazards. For example, you must have an unobstructed view of the area being serviced.

Wear personal protective equipment (PPE) clothing appropriate to the service you are performing. This includes, but is not limited to, protective (electrically insulated) footwear, safety glasses, and gloves rated for the working voltage of the equipment you are servicing.

Safety precautions

Learn about the safety precautions related to the Christie Cinema 4K-RGB projector. This projector is intended for use in a cinema environment.

General safety precautions

Read all safety and warning guidelines before installing or operating the projector.

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

- TRIP OR FIRE HAZARD! Position all cables where they cannot contact hot surfaces, be pulled, be tripped over, or damaged by persons walking on or objects rolling over the cables.
- This product must be installed within a restricted access location not accessible by the general public.
- Only personnel who are trained on the precautions for the restricted access location can be granted entry to the area.
- Install the product so users and the audience cannot enter the restricted area at eye level.
- ELECTRICAL and BURN HAZARD! Use caution when accessing internal components.
- High leakage current present when connected to IT power systems.
- FIRE AND SHOCK HAZARD! Use only the attachments, accessories, tools, and replacement parts specified by Christie.
- FIRE HAZARD! Do not use a power cord, harness, or cable that appears damaged.
- A minimum of four people or appropriately rated lift equipment is required to safely lift, install, or move the product.
- Do not install or operate the projector in any position that does not meet the stated product specifications for alignment and orientation.

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

- Only Christie qualified technicians are permitted to open product enclosures.

Laser safety precautions

Read all safety and warning guidelines before operating the projector laser.

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

- Do not operate the cinema projector without all of its covers in place.
- LASER RADIATION HAZARD! This projector has a built-in Class 4 laser module. Never attempt to disassemble or modify the laser module.
- Do not look directly into the lens when the light source is on. The extremely high brightness can cause permanent eye damage.
- Possible hazardous optical radiation emitted from this product. (Risk group 3)

AC power precautions

Read all safety and warning guidelines before connecting to AC power.

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

- SHOCK HAZARD! Only use the AC power cord provided with the product or recommended by Christie.
- FIRE AND SHOCK HAZARD! Do not attempt operation unless the power cord, power socket, and power plug meet the appropriate local rating standards.
- SHOCK HAZARD! Do not attempt operation if the AC supply is not within the specified voltage and current, as specified on the license label.
- SHOCK HAZARD! The optional UPS power cord must be inserted into an outlet with grounding.
- SHOCK HAZARD! A dedicated, protected ground or earth wire must be installed on the product by Christie qualified technicians or electricians before it can be connected to power.
- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
- Install the product near an easily accessible AC receptacle.

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

- FIRE HAZARD! Do not use a power cord, harness, or cable that appears damaged.
- FIRE OR SHOCK HAZARD! Do not overload power outlets and extension cords.
- SHOCK HAZARD! Power supply uses double pole/neutral fusing.

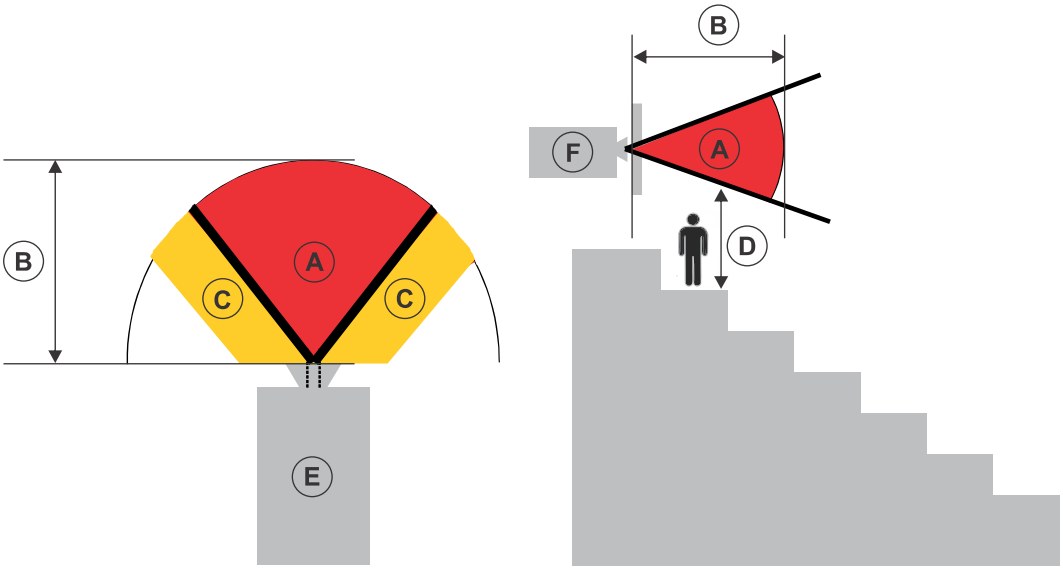
Light intensity hazard distance

This projector has been classified as Risk Group 3 as per the IEC 62471-5:2015 standard due to possible hazardous optical and thermal radiation being emitted.

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

- PERMANENT/TEMPORARY BLINDNESS HAZARD! No direct exposure to the beam must be permitted. Class 1 Laser Product - Risk Group 3 according to IEC 60825-1:2014 and IEC 62471-5:2015.
- PERMANENT/TEMPORARY BLINDNESS HAZARD! Operators must control access to the beam within the hazard distance or install the product at the height that prevents exposure of spectators' eyes within the hazard distance. The hazard zone must be no lower than 2.5 meters (US installations) or 2.0 meters (global installations) above any surface upon which any persons are permitted to stand and the horizontal clearance to the hazard zone must be a minimum 1.0 meters.
- EXTREME BRIGHTNESS! Do not place reflective objects in the product light path.

The following show the zones for ocular and skin hazard distances.



- A—Hazard zone. The region of space where the projection light from the laser-illuminated projector is above emission limits for Risk Group 2. The light intensity may cause eye damage after a momentary or brief exposure (before a person can avert his or her eyes away from the light source). The light may cause skin burns to occur.
- B—Hazard distance. Operators must control access to the beam within the hazard distance or install the product preventing potential exposure of the spectators' eyes from being in the hazard distance.
- C—No access zone. Horizontal clearance of the no access zone must be a minimum of 1.0 meters.
- D—Vertical distance to hazard zone. The hazard zone must be no lower than 2.5 meters (US installations) or 2.0 meters (global installations) above any surface upon which any persons are permitted to stand.

  If the vertical distance to hazard zone requirement (Zone D) is satisfied, the horizontal clearance distance (Zone C) is not needed.

- E—Represents the top view of the projector.
- F—Represents the side view of the projector.

For information detailing the hazard distance for each lens, refer to the *Cinema 4K-RGB Installation and Setup Guide (P/N: 020-102710-XX)*.

For Installations in the United States

The following must be in place for laser-illuminated projector installations in the United States:

- The projection room shall be clearly identified by the posting of laser warning and restricted access signs, and by restricting entry through physical means. The projection room sign must display the warning "No direct exposure to beam shall be permitted".
- The Christie Laser Projection System Installation Checklist must be fully completed after the installation and sent to *lasercompliance@christiedigital.com*. A copy can remain on-site. This checklist can be found as a separate document in the accessory box with the manual.
- Certain US states have additional laser regulatory requirements. Contact *lasercompliance@christiedigital.com* for additional regulatory requirements.

Product labels

Learn about the labels that may be used on the product. Labels on your product may be yellow or black and white.

General hazards

Hazard warnings also apply to accessories once they are installed in a Christie product that is connected to power.

Fire and Shock Hazard	
	To prevent fire or shock hazards, do not expose this product to rain or moisture. Do not alter the power plug, overload the power outlet, or use it with extension cords. Do not remove the product enclosure. Only Christie qualified technicians are authorized to service the product.

Electrical Hazard	
	Risk of electric shock. Do not remove the product enclosure. Only Christie qualified technicians are authorized to service the product.

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

Electric shock hazard. To avoid personal injury, disconnect all power sources before performing maintenance or service.

Electrocution hazard. To avoid personal injury, always disconnect all power sources before performing maintenance or service procedures.

Optical radiation hazard. To avoid personal injury, never look directly at the light source.

Voltage hazard. To avoid personal injury, always disconnect all power sources before performing maintenance or service procedures.

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

Hot surface hazard. To avoid personal injury, allow the product to cool for the recommended cool down time before touching or handling for maintenance or service.

Burn hazard. To avoid personal injury, allow the product to cool for the recommended cool down time before handling for maintenance or service.

Moving parts hazard. To avoid personal injury, keep hands clear and loose clothing tied back.

Moving fan blades. To avoid personal injury, keep hands clear and loose clothing tied back. Always disconnect all power sources before performing maintenance or service procedures.

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

General hazard.

Not for household use.

Mandatory action

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

Consult the service manual.

SHOCK HAZARD! Disconnect all power sources before performing maintenance or service procedures.

Electrical labels

Indicates the presence of a protective earth ground.

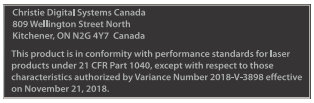
Indicates the presence of an earth ground.

Additional hazard labels

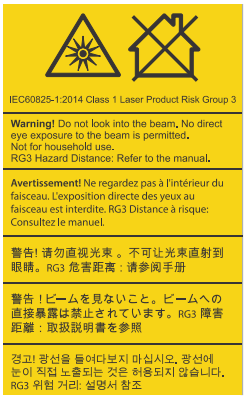
Indicates Class 4 laser radiation when open. Avoid eye or skin exposure to direct or scattered radiation.

CLASS 1 LASER PRODUCT IEC 60825-1:2014

CP4325-RGB FDA laser variance (US projectors only)



CP4330-RGB FDA laser variance (US projectors only)



Indicates a light hazard. Do not look directly into the lens. The extreme high brightness can cause permanent eye damage. Class 1 Laser Product - Risk Group 3 according to IEC 60825-1:2014 and IEC 62471-5:2015

Indicates high leakage current. Earth connection essential before connecting the power supply.

Indicates a light hazard. Do not look directly into the lens. The extreme high brightness can cause permanent eye damage.

Service setups

Understand the special internal hardware and software adjustments and related details that may require the attention of a qualified service technician, whether done periodically or after a specific module replacement.

Turning the projector on or off

Turn on the projector to display content or turn off the projector to conserve energy or service the projector.

To operate the projector, the circuit breakers must be in the ON position. If servicing the projector or removing the protective covers, ensure the MAIN and UPS circuit breakers are in the OFF position.

In the right toolbar, select and hold **Power**.

If the light source is on when turning off the projector, the light source automatically enters a ten-minute cool-down period.

Calibrating the Intelligent Lens System

On Cinema 4K-RGB projectors, the Intelligent Lens System (ILS) is activated by default.

Use the Auto Calibrate feature of the ILS to find and compensate for motor backlash, and to determine the movement range for the currently installed lens.

1. In the left navigation menu, select **Image Settings** > **ILS File Setup**.
2. From the ILS File list, select an available ILS file.
3. Select **Auto Calibrate**.
4. Select **Continue**.
   The system performs the lens calibration.

Adjusting boresight

A boresight adjustment balances the tilt of the lens mount to compensate for screen-to-projector tilt.

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

- Do not look directly into the lens when the light source is on. The extremely high brightness can cause permanent eye damage.
- FIRE HAZARD! Keep hands, clothes, and all combustible material away from the concentrated light beam of the projector.

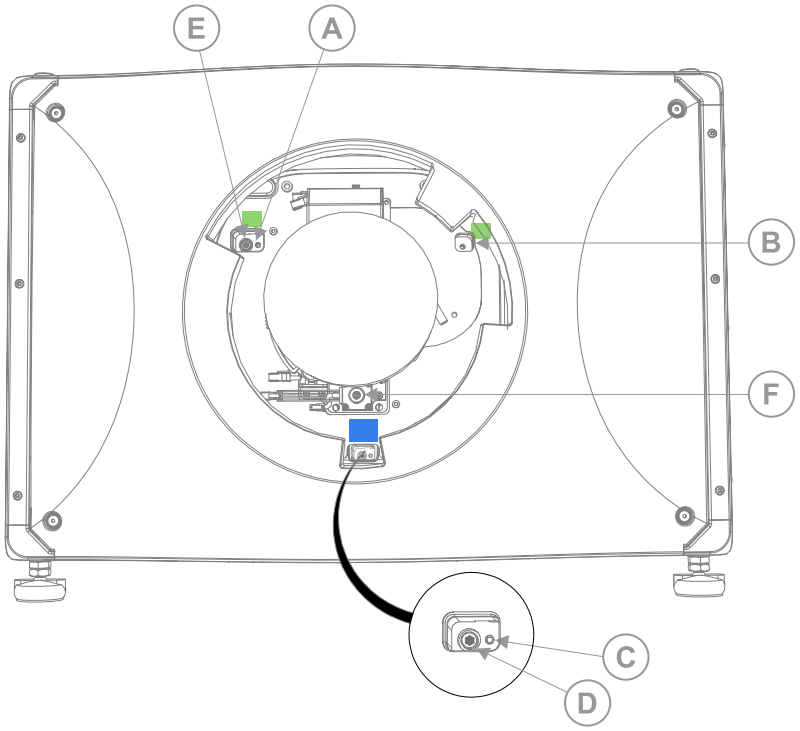
Caution! If not avoided, the following could result in minor or moderate injury.

- This procedure must be performed by Christie qualified technicians.

When making the adjustments, set the light source to minimum power.

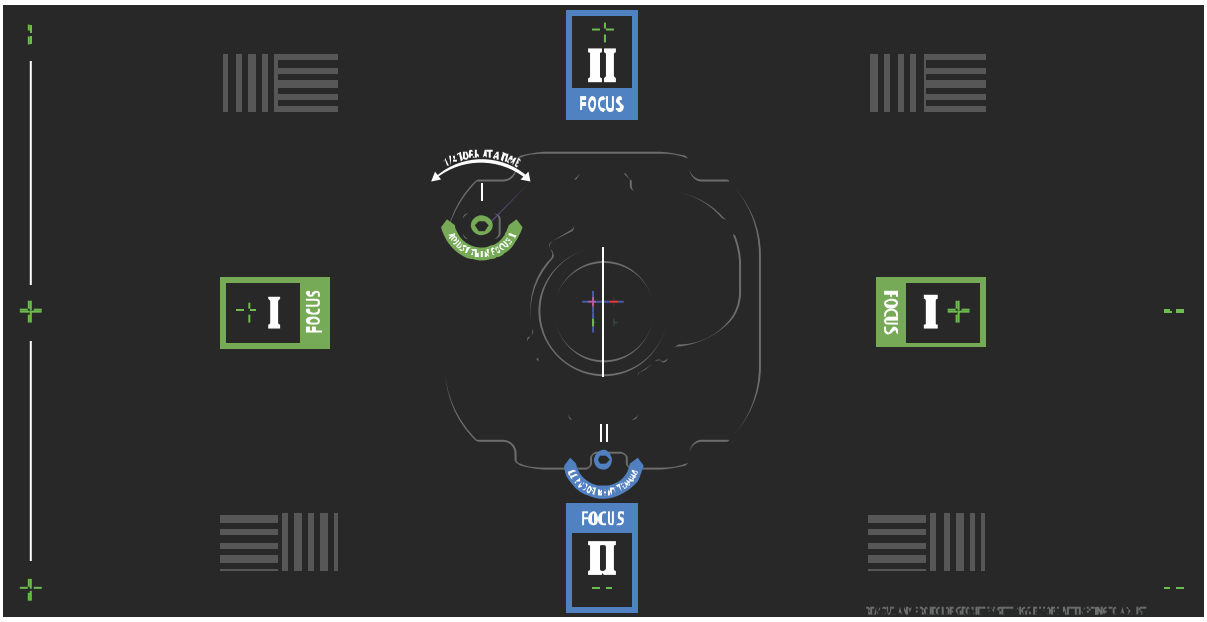
To following steps are intended to achieve the highest quality image distributed across the full screen.

1. Close the shutter on the projector to avoid accidental exposure to the projection beam when working in close proximity to the projection lens.
2. Unlock the horizontal and vertical lock screws (locks A, B, and C).



A	Horizontal lock screw (lock A)
B	Horizontal lock screw (lock B)
C	Vertical lock screw (lock C)
D	Vertical boresight screw
E	Horizontal boresight screw
F	Manual focus knob

3. Open the shutter on the projector.
4. In the right toolbar, select **Test Patterns** .
5. Select the **RGB-4K-Boresight** pattern and display it full screen.
   Make sure the **Uncorrected Color Box** option is selected.



When adjusting the boresight screws, ensure the shutter is closed to avoid accidental exposure to the projection beam when operating in close proximity to the projection lens. Only open the shutter to view the test pattern.

6. To start with the horizontal boresight adjustment, use the ILS controls to move the projection lens into the projector or turn the manual focus knob (F in the images in step 2) counterclockwise to slightly defocus the green cross-hair patterns (+) at the right and left edges of the test pattern.
7. Use the ILS controls or turn the focus knob (F in the images in step 2) clockwise to begin focusing the image.

   Watch for either the left or right cross-hair patterns (+) to come into focus.
8. If the left side comes into focus first, turn the horizontal boresight adjustment screw (E in the images in step 2) clockwise until the left and right are equally out of focus.

   If the right side comes into focus first, turn the horizontal boresight screw counterclockwise.
9. Repeat steps 6 to 8 as required to obtain an even focus at the right and left edges of the screen.
10. To perform the vertical boresight adjustment, use the ILS controls to move the projection lens into the projector, or turn the focus knob (F in the images in step 2) counterclockwise to slightly defocus the green cross-hair patterns (+) at the top and bottom of the screen.
11. Use the ILS controls or turn the focus knob (F in the images in step 2) clockwise to begin focusing the image.

    Watch for either the top or bottom cross-hair patterns (+) to come into focus.
12. If the bottom comes into focus first, turn the vertical boresight adjustment screw (D in the images in step 2) counterclockwise until the top and bottom are equally out of focus.

    If the top comes into focus first, turn the vertical boresight screw clockwise.
13. Repeat steps 10 to 12 as required to obtain an even focus at the top and bottom of the screen.
14. Once the correct focus has been achieved, lock the three lock screws.

    When locking the lock screws, start with the horizontal lock screws (locks A and B in the images in step 2) and turn them until they just touch the base.

Repeat for the vertical lock screw (lock C in the images in step 2).

Continue the gradual tightening of each screw, until all lock screws are tight.

When stabilizing image vibration, lock B may be left locked or unlocked at the discretion of the installer.

15. If you used the focus knob (F in the images in step 2) to make the adjustments manually, run an ILS auto calibration.
16. Fine tune the focus on cross-hair patterns **I** (horizontal) and **II** (vertical) using the ILS controls only.

    The goal is to obtain good focus at the center and on all sides of the screen, including the square patterns across the screen.

Adjusting the integrator rod and fold mirror

Understand how to adjust the integrator rod and fold mirror to control the illumination spot on the DMD.

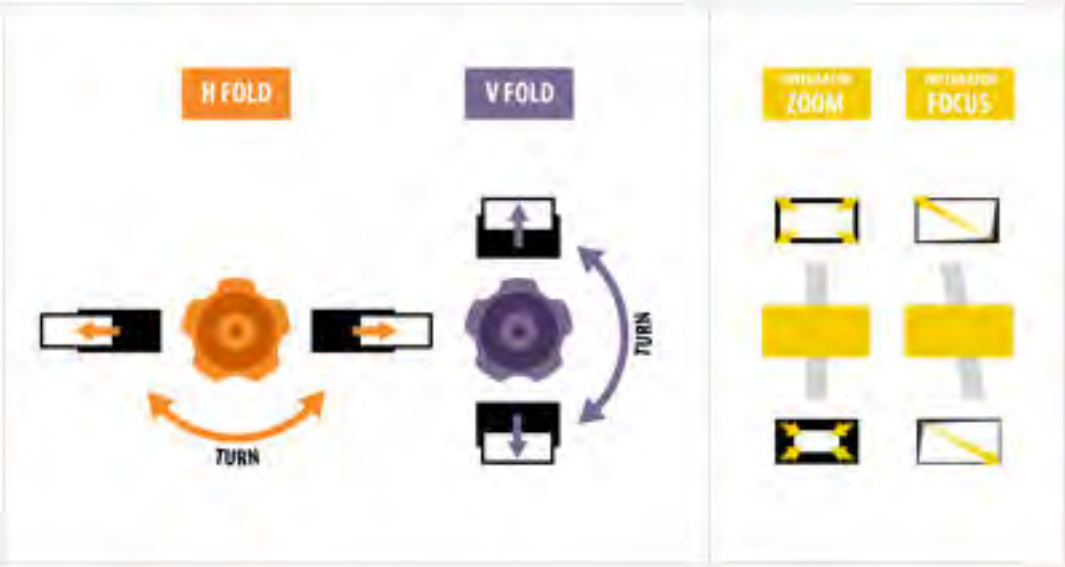
Extreme misalignment of projection optics can cause permanent damage to critical optical components. Only Christie qualified technicians can perform internal optical adjustments.

The integrator rod and fold mirror adjustments are set by Christie. Make adjustments only if screen shadows are visible.

When adjusting the fold mirror, set the light source to minimum power.

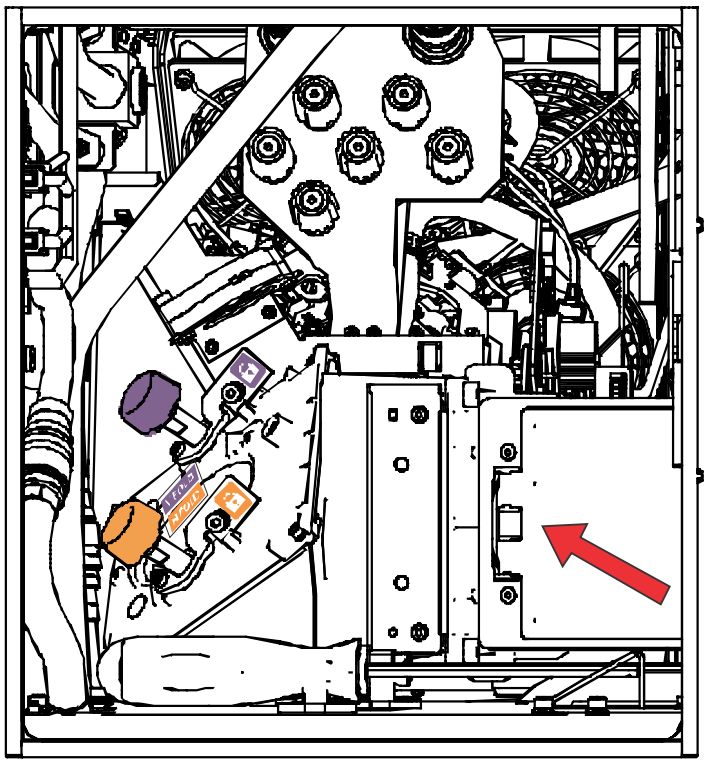
1. In the right toolbar, select **Test Patterns**.
2. Set the Red/Green/Blue power to less than 40%.

   High power and misalignment can damage the DMDs.
3. Select the **RGB-4K-Integrator Rod** test pattern and display it full screen.

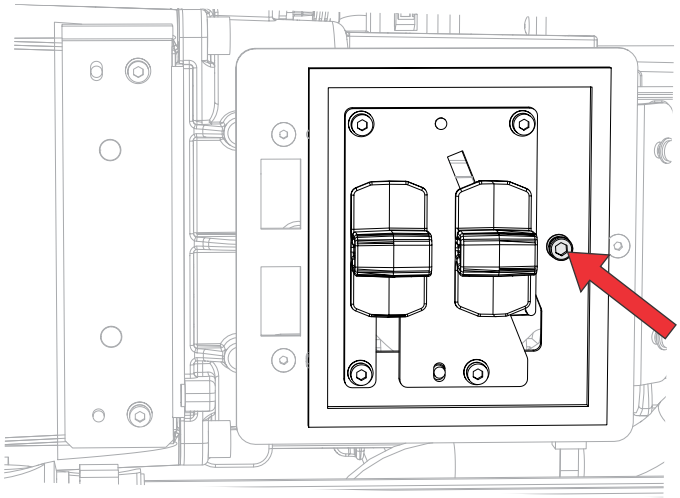


Refer to the test pattern for guidance on making the adjustments. The right panel of the test pattern provides information about the integrator zoom and focus adjustments. The left panel provides information about the fold mirror adjustments.

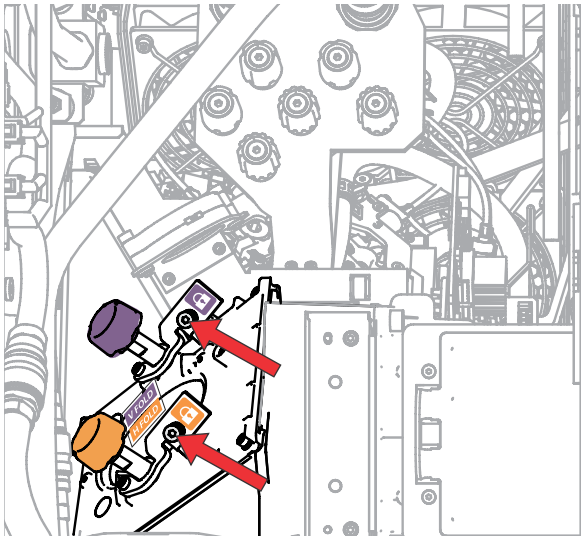
4. Open the Service door on the side of the projector.
5. To use the integrator rod optical controls, open the access door for the Zoom and Focus paddles.



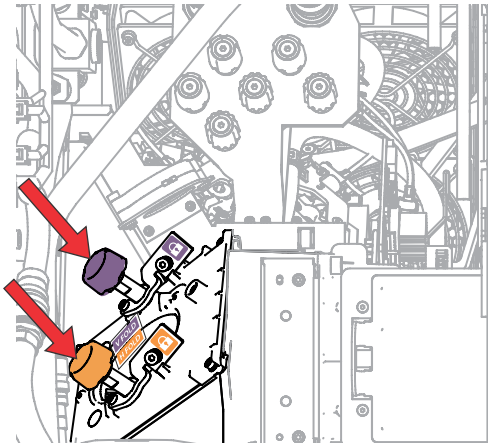
6. Loosen the lock screw for the Zoom and Focus paddles.



7. Set the integrator rod Zoom paddle to the minimum.
8. Loosen the fold mirror screws to unlock the fold mirror adjustment knobs.



9. To make horizontal adjustments on the fold mirror, use the orange adjustment knob.
   To make vertical adjustments on the fold mirror, use the purple adjustment knob.



10. Adjust the fold mirror until either the top left edge or the bottom right edge of the illumination spot becomes visible on the DMD.
11. Adjust the integrator rod Focus paddle to optimize focus for one of the following:
    - Along the top edge of the image, approximately one-third across the image from the left.
    - Along the bottom edge of the image, approximately one-third across the image from the right.
12. Adjust the fold mirror to center the image on the DMD array.
13. Use the integrator rod Zoom paddle to increase the zoom until the entire active area is filled, with no dark areas at the edges or corners.
    Ensure the overfill is minimized to improve DMD life and system optical efficiency for brightness.
14. Once the adjustments are complete, tighten the lock screw for the Zoom and Focus paddles and the two fold mirror screws.
15. Close the access door for the Zoom and Focus paddles.

Mechanically adjusting DMD convergence

A convergence problem can be identified when one or more projected colors (red, green, and blue) appears misaligned when examined with a convergence test pattern.

The three colors should overlap 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.

When adjusting the convergence, you are adjusting red and green to blue.

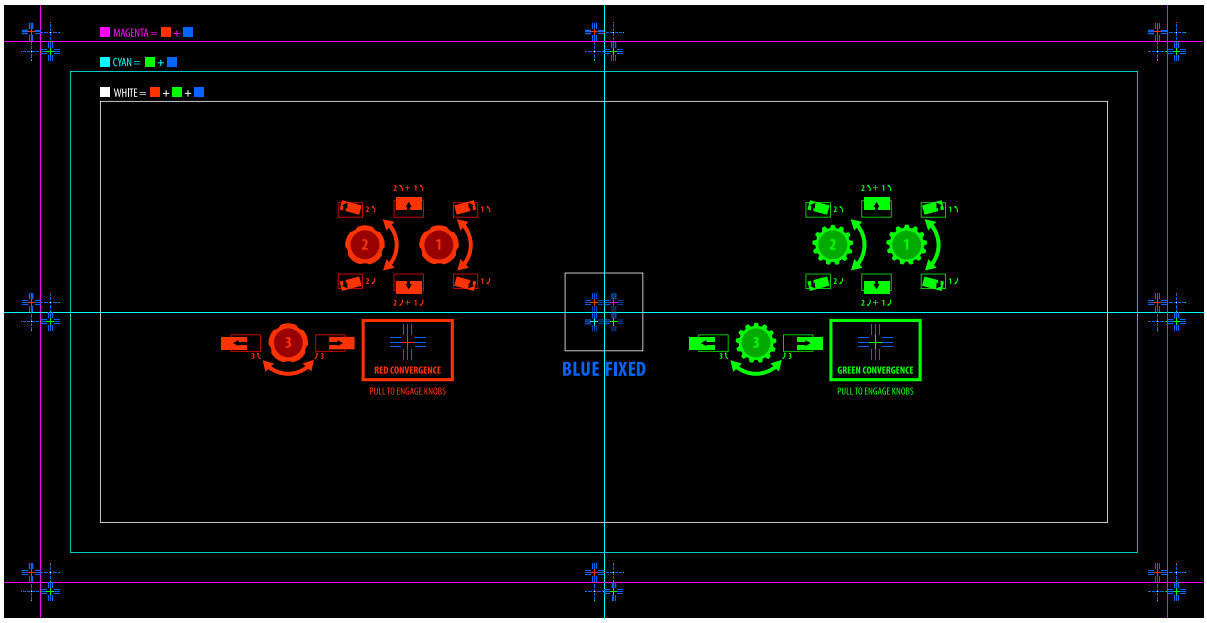
If you wear glasses with corrective lenses when performing this adjustment, ensure you are viewing the test pattern on a straight angle through the optical axis of your glasses and not from a tilted or angled perspective. This avoids a prismatic effect that can appear to shift convergence when viewing at an angle.

1. Before adjusting DMD convergence, make sure the projector has reached a steady operational state.

   If switching from a white or bright test pattern to a dark convergence test pattern or if warming up the projector after a shutdown, allow 15 minutes for stabilization so the optics can reach a steady state.

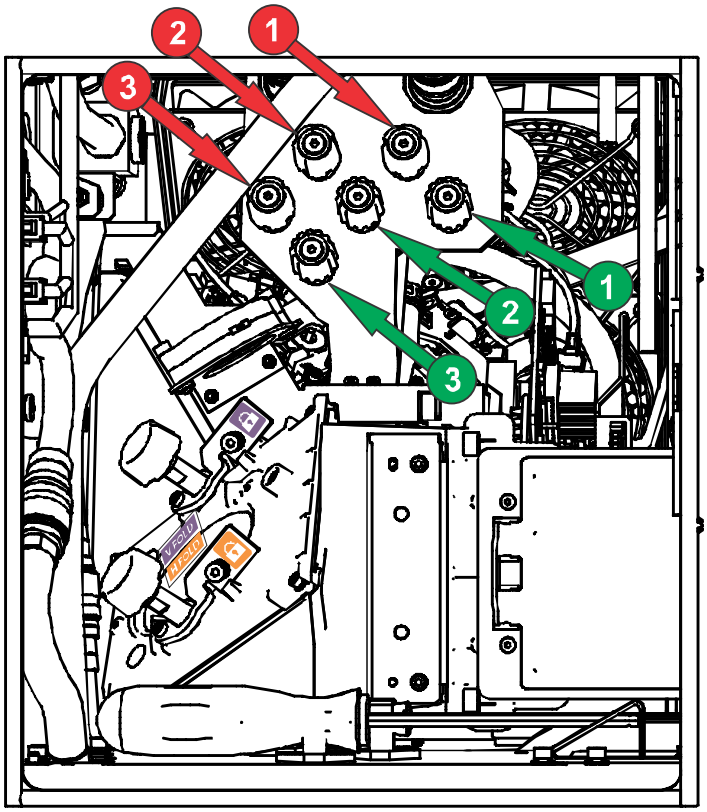
2. Make sure the electronic convergence (ECC) is defaulted before doing mechanical convergence.
3. In the right toolbar, select **Test Patterns**.
4. Select the **RGB-4K-Convergence** test pattern and display it full screen.

   Make sure the **Uncorrected Color Box** option is selected.



5. Open the Service door on the side of the projector.
6. To adjust the convergence knobs, use the 3 mm driver included with the projector.

   If adjusting by hand without using the tool, pull out the convergence adjustment knobs to engage them.



7. Use the Convergence test pattern to assist with adjusting the horizontal and vertical lines.

   Horizontal adjustments are controlled by adjusting knob 3.

   Vertical convergence and rotation are controlled by adjusting knobs 1 and 2. Christie recommends rotating a single knob a maximum of a quarter rotation before adjusting the second knob a quarter rotation. For example, if using one hand, turn the left knob a quarter rotation and then the right knob a quarter rotation, and so on. Adjusting a single knob for vertical or rotational adjustment to an extreme before adjusting the second knob may result in the convergence mechanism binding.

   For the best stability, Christie recommends setting convergence while rotating the knobs in a clockwise direction. This may require first adjusting convergence by turning the knobs counter-clockwise and finalizing the convergence with a clockwise approach. This applies to all knobs.

8. When complete, push in all the convergence adjustment knobs to disengage them.

Adjusting the LOS coupling mirrors

Learn how to adjust the Laser Optical Subsystem (LOS) coupling mirrors.

The LOS coupling mirrors can only be adjusted after replacing an optical module such as the LOS, integrator, and coupling mirror assembly. The coupling mirror screws are potted in position from production and not adjustable without replacing the mirror.

1. If the projector is equipped with LiteLOC, disable this feature so the RGB controls can be accessed.

2. On a tripod in front of the lens, set up an illuminance meter (such as the Konica Minolta T10 Illuminance Meter) positioned in the center of the projection beam sent to the screen.

   The illuminance meter must be facing the lens.
3. Navigate to the laser power setting page, and decrease the red laser power to low (30% to 40%).
4. Set the green and blue laser power levels to 0.
5. Turn on the light source.
6. Display a white test pattern on the screen.
7. Wait one minute for the lasers to stabilize.
8. Remove the electronics-side cover.
9. Adjust the LOS coupling mirrors independently to maximize the lux reading on the illuminance meter.

   Only small adjustments are necessary. You can use a small 2.5 mm flathead screwdriver bit.
10. Remove the illuminance meter from in front of the light beam and adjust the blue and green power levels to achieve a DCI white point, as measured by the color meter.

    Make sure the red laser power is still set to low.
11. Visually check for uniformity and fine tune the optical adjustments.
12. Once the adjustment is complete, adjust the laser power to the preferred level.
13. Re-install the electronics-side cover previously removed.
14. *Proceed to adjusting the integrator rod and fold mirror* (on page 22).

Refilling the coolant

Cinema 4K-RGB projectors rely on liquid coolant to maintain the laser optical subsystem at the required operating temperatures. The following provides service instructions and safety precautions for filling the reservoir unit and handling coolant.

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

- Use protective eye wear and gloves. Follow workplace guidelines for using personal protective equipment when installing, cleaning, and servicing the product.

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

- Do not attempt to fill the coolant reservoir when it is installed in the projector chassis.
- Fill the coolant to the recommended level only. Do not fill above the maximum level line shown on the reservoir unit.

1. *Remove the coolant reservoir* (on page 62).
2. Ensure the coolant reservoir unit is placed on a separate surface.
3. Use a flat-head screwdriver to open the top cap on the reservoir fill port.
4. Pour the required coolant (Koolance LIQ-740PR P/N: 003-005179-XX) into the fill port.

   Monitor the fill indicator on the reservoir and fill only to the recommended level.
5. Re-install the top cap on the reservoir fill port.
6. Tighten the top cap to seal it.
7. Use a soft cloth to wipe away any coolant that drips outside the reservoir.

8. Re-install the coolant reservoir in the projector.

Filtration

Filters help to prevent dust, smoke, fog, and other foreign materials from entering the projector.

In environments where dust, smog, dirt, and other contaminants are higher than normal, Christie strongly recommends replacing the air filter more frequently than your maintenance schedule indicates.

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

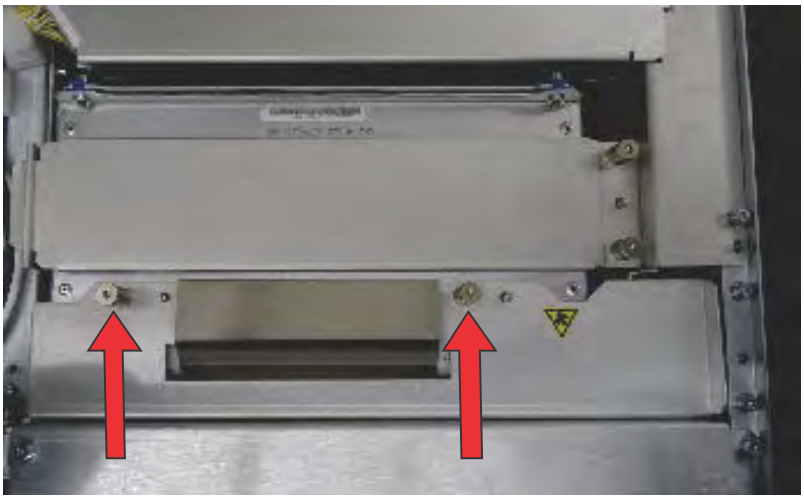
- Do not operate the product without the filter installed.
- Do not operate the product with an incorrectly installed filter.
- Do not reuse an old air filter.

Light engine compartment air filter

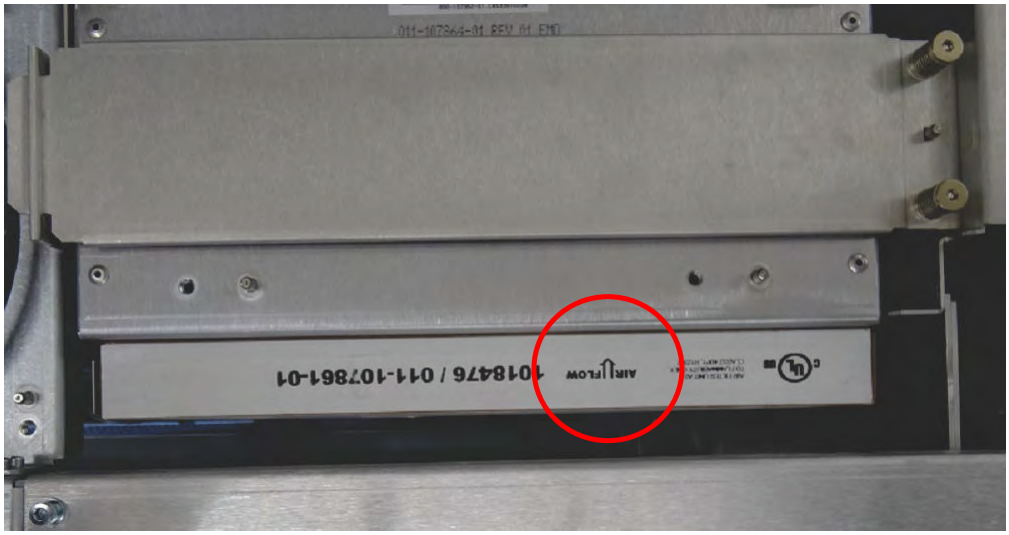
This air filter is located on the air intake side of the projector, behind the radiator.

These instructions detail accessing the air filter from the top of the projector. The filter can also be removed from the side of the projector by removing the radiator and *radiator fan pack* (on page 59).

1. *Remove the top cover* (on page 38).
2. Loosen the two screws on the air filter bracket and remove the bracket.



3. Lift the air filter out of the projector.
4. Replace the used air filter with a new one.
   The airflow indicator on the new filter must point towards the fan assembly.



5. Re-install the air filter bracket using the two locating pins and fasteners.
6. Re-install the top cover.

Main intake air filter

The main intake air filter is located behind the side-intake cover.

1. *Remove the side-intake cover* (on page 41).
2. Pull out the air filter from the projector.
3. Replace the used air filter with a new one.
4. Re-install the side cover.

Parts and module replacement

When ordering replacement parts, provide the following information found on the product license label:

- Projector model
- Projector serial number
- Manufacture date

Tools required for service

Before servicing the projector, ensure the following tools and components are available:

The projector toolbox is located inside the service compartment. On the left side of the projector, use the high security key to open the service access door and obtain the available tools.

- High security key
- Long and stubby neck ball drivers—2.5 mm, 3 mm, and 5 mm (provided in the projector toolbox)
- 2 mm and 6 mm hex drivers
- 8 mm deep socket nut driver
- 13 mm wrench or adjustable wrench (open jaw)
- Flat-head screwdriver
- Torque driver
- Needle nose pliers
- Magnetizer
- Side cutters and cable ties
- Electrostatic protective strap and pad
- Disposable lint-free gloves (included with optical components)
- Cloth wipes

Service prerequisites

Before servicing the projector, perform the following tasks.

- Always power down and disengage all power sources to the projector prior to servicing.
- Follow all service safety precautions.

- For a detailed breakdown of serviceable modules, see *Index of parts and modules* (on page 31).

Completing the maintenance

After servicing the projector, perform the following tasks.

- Check the card cage and top cover locking pins for engagement.
- Ensure all M3 screws are torqued to 8 in-lb.
- Ensure all M4 screws are torqued to 15 in-lb.
- Ensure the lock nut on the projector foot is torqued to 30 in-lb.
- When reconnecting the DC outputs, ensure all positive and negative terminal connections are torqued to 30 in-lb.

Index of parts and modules

The following table lists the parts and modules for Cinema 4K-RGB.

Description	Part number
Electronics	
12V power supply	003-121461-XX
48V power supply	003-121460-XX
AC breaker assembly	003-107755-XX
Printed circuit boards and sensors	
HUB-NX board	003-106802-XX
F-MAIN board	003-103914-XX
SCCB board	003-113483-XX
Housekeeping board 4.2 (HKBB)	003-113426-XX
Status LED board	003-006587-XX
HVCS board	003-113383-XX
LVCS board	003-113366-XX
LBP7 board	003-113451-XX
Diffuser control board 1.0 (DIB)	003-113605-XX
Color sensor board (CSBD)	003-113367-XX
Radiator temperature sensor	003-100618-XX
Dual temperature sensor module (DTSM)	003-111269-XX
Ventilation and cooling	
Radiator assembly	003-106874-XX
Relief tank module	003-107545-XX

Description	Part number
Pump module for CP4325-RGB	003-106875-XX
Pump module for CP4330-RGB	003-108521-XX
Radiator handle	003-107183-XX
Reservoir assembly for CP4325-RGB	003-107512-XX
Reservoir assembly for CP4330-RGB	003-108595-XX
Green/red light engine fan	003-112555-XX
Blue light engine fan	003-112556-XX
12V 0.50A 4WIR 120x25 fan assembly	003-121494-XX
12V 0.55A 4WIR 140x25 fan assembly	003-121493-XX
Card cage 120 mm fan	003-121677-XX
Harnesses	
F-MAIN to touch panel harness	003-112548-XX
SID harness	003-005668-XX
Light engine data cable (MiniSAS cable–500mm)	003-006406-XX
LVPS harness	003-006405-XX
Covers	
Front cover	003-107374-XX
Rear cover	003-107371-XX
Top cover	003-107334-XX
Bottom cover	003-107335-XX
Left cover (electronics-side)	003-107048-XX
Right cover (side-intake)	003-107373-XX
Optics	
Coupling fold mirror assembly	003-107231-XX
Light engine	• 003-107210-XX (for -01 projectors) • 003-109995-XX + 003-200640-XX (alternative for -01 projectors if the above is not in stock) • 003-109995-02 (for -02 projectors)
LOS assembly for CP4325-RGB	003-107107-XX
LOS assembly for CP4330-RGB	003-108628-XX
Shutter assembly	003-104955-XX
Integrator zoom/focus	003-107325-XX
Fold mirror adjustment assembly	003-107316-XX
Rotating diffuser assembly	003-107244-XX

Description	Part number
Illumination optics system (IOS) Rear CP4325-RGB	003-107230-XX
Illumination optics system (IOS) Rear CP4330-RGB	003-108603-XX
Coupling elbow with depolarizer	003-006597-XX
Lenses	
1.13-1.66:1 DLPCine HB zoom lens	108-342100-XX
1.31-1.85:1 DLPCine HB zoom lens	108-335102-XX
1.45-2.17:1 DLPCine HB zoom lens	108-336103-XX
1.63-2.71:1 DLPCine HB zoom lens	108-337104-XX
1.95-3.26:1 DLPCine HB zoom lens	108-338105-XX
2.71-3.89:1 DLPCine HB zoom lens	108-278101-XX
3.89-5.43:1 DLPCine HB zoom lens	108-279101-XX
1.13-1.66:1 DLPCine UHC zoom lens	163-103105-XX
1.31-1.85:1 DLPCine UHC zoom lens	163-104106-XX
1.45-2.17:1 DLPCine UHC zoom lens	163-105107-XX
1.63-2.71:1 DLPCine UHC zoom lens	163-106108-XX
1:1 R25K Roadie HB fixed lens	38-809071-XX
Zoom kit hardware	003-006556-XX
Motor lens mount assembly	003-003903-XX
Manual lens mount assembly	003-102333-XX
Focus motor	003-101194-XX
CFast Card 8G-FMain	003-006303-XX
Miscellaneous	
Touch screen monitor	003-121059-XX
Touch panel hardware	003-003326-XX
Coolant propylene glycol 740	003-005179-XX
Light engine air filter–six pack	003-006464-XX
Radiator filter–six pack	003-006463-XX
Leveling feet	003-005359-XX
High security lock	003-006472-XX

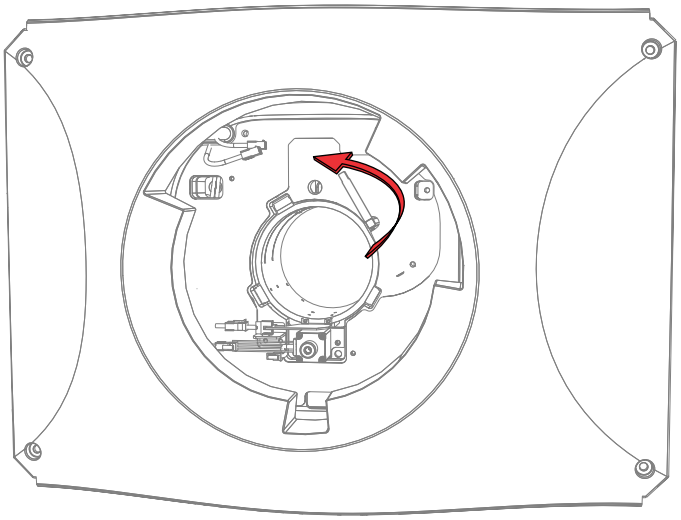
Lens mount components

The lens mount provides a means of securing a projection lens to the projector. Components include the lens boot, lens mount barrel, and the lens mount offset.

Projection lens

Use the correct method of removing the lens.

1. For motorized lens mounts, disconnect the lens zoom motor from the two zoom motor harness connectors.
2. Turn the clamp on the lens mount to unlock the projection lens.



3. Slide the lens straight out of the projector.

   If the lens does not slide out easily, reset the lens offset. Lock the lens before performing reset so that it does not fall out.
4. Attach the lens cap to avoid damage to the lens.
5. To re-install, follow these steps in reverse order.

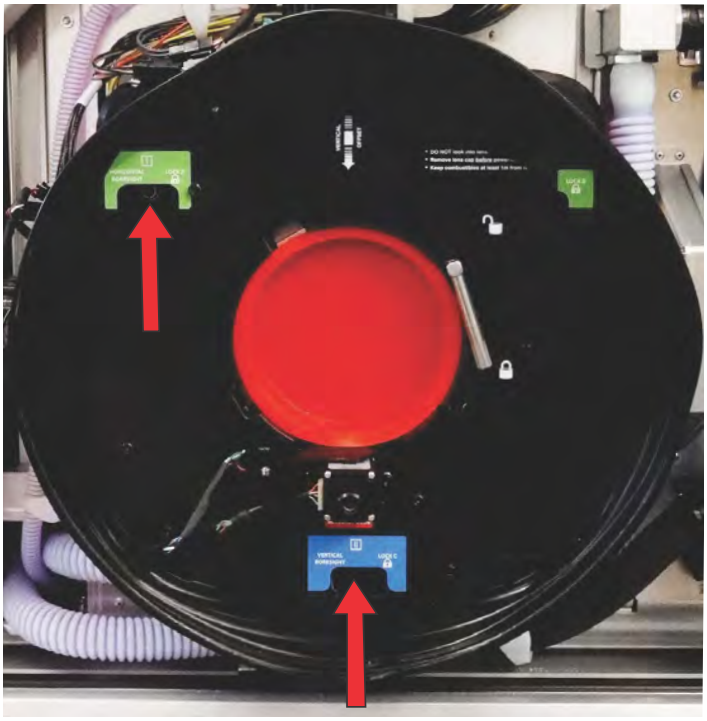
Lens mount

The lens mount, located at the front of the projector, is an assembly of mechanical and electrical components that securely holds and positions the projection lens.

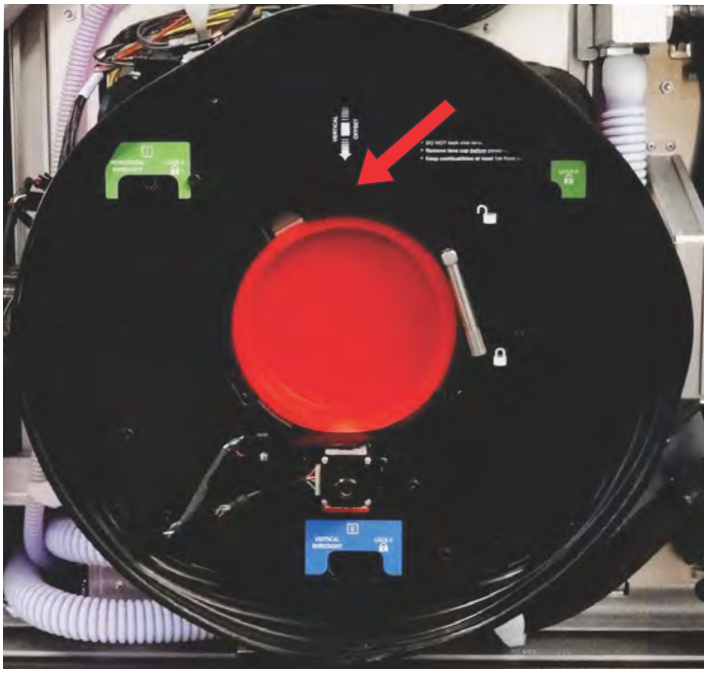
1. *Remove the projection lens* (on page 34).

2. *Remove the front cover* (on page 41).
3. Make sure the lens mount is centered vertically and horizontally.
4. Disconnect the lens mount harness.
5. Remove the harness cables from the four P-clips.
6. Loosen the two boresight alignment screws.

   Ensure the lens mount is supported while removing the screws as no pins are available to rest it on and it will fall off.

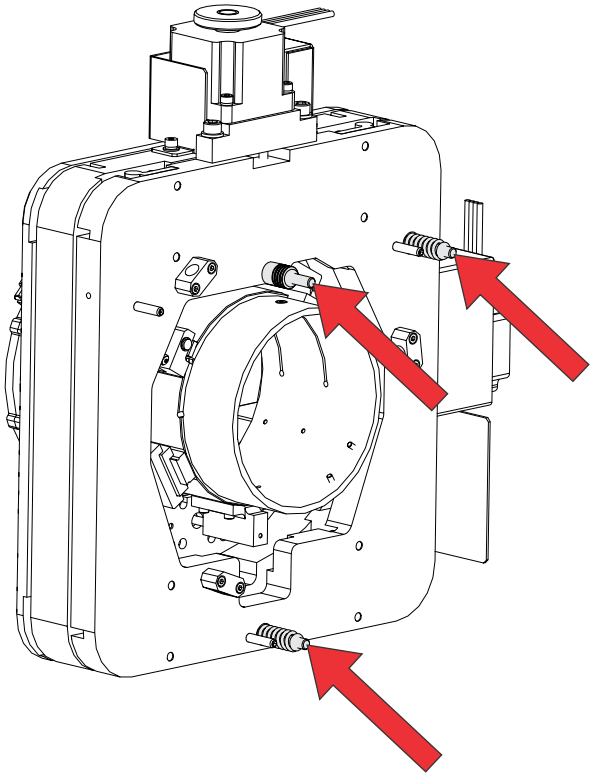


7. Loosen the pivot screw in the center of the lens mount.



8. Remove the lens mount from the projector head and carefully set it aside.
9. To re-install, follow these steps in reverse order.
   Make sure the springs are kept on the mounting screws when installing.

The new lens mount includes three post screws that set the required distance of the lens mount from the projector head. To avoid damaging the lens mount, do not adjust the post screws.



10. *Adjust the boresight* (on page 19) after replacing lens mount.

Projector covers and feet

Learn how to remove the covers and feet of the projector.

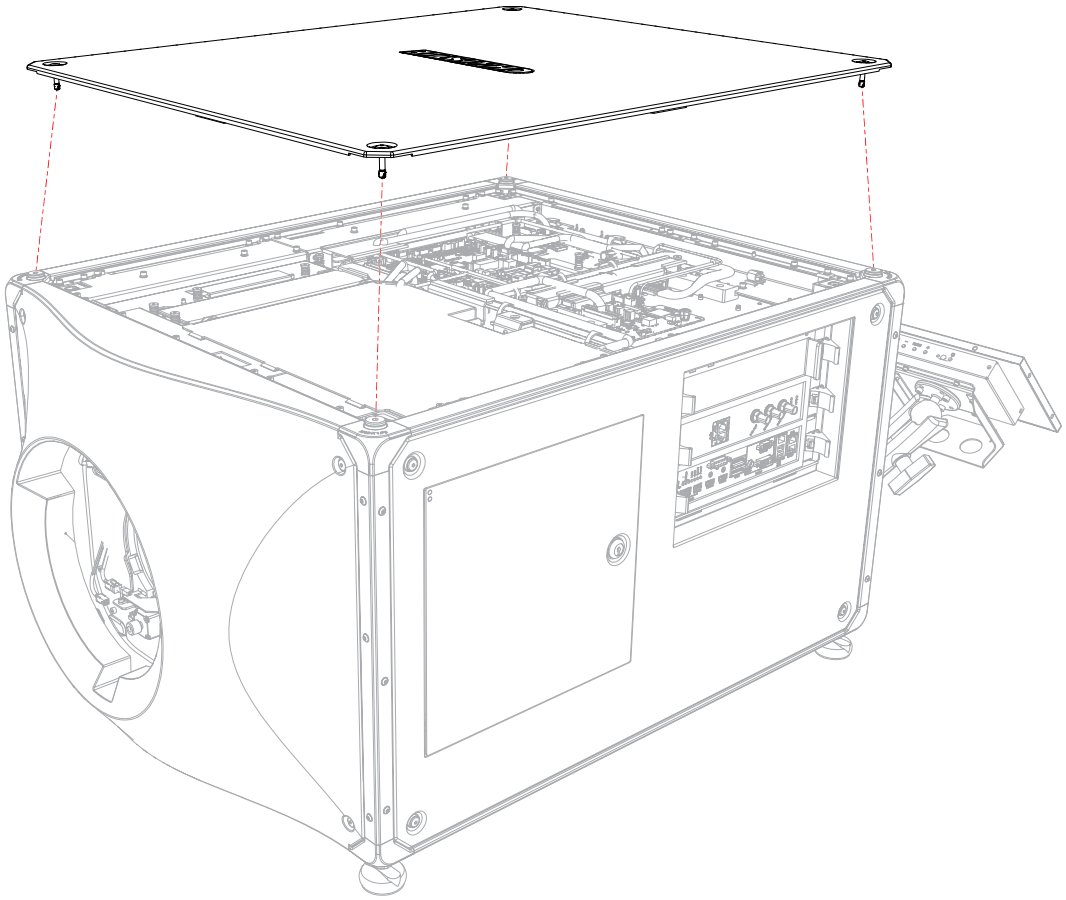
Caution! If not avoided, the following could result in minor or moderate injury.

- Prior to rigging the projector, inspect the quarter turn fasteners on the covers to ensure they are safely secured.

Top cover

The top cover provides access to the light engine, electronics, and various other internal components.

1. Loosen the four screws securing the top cover.



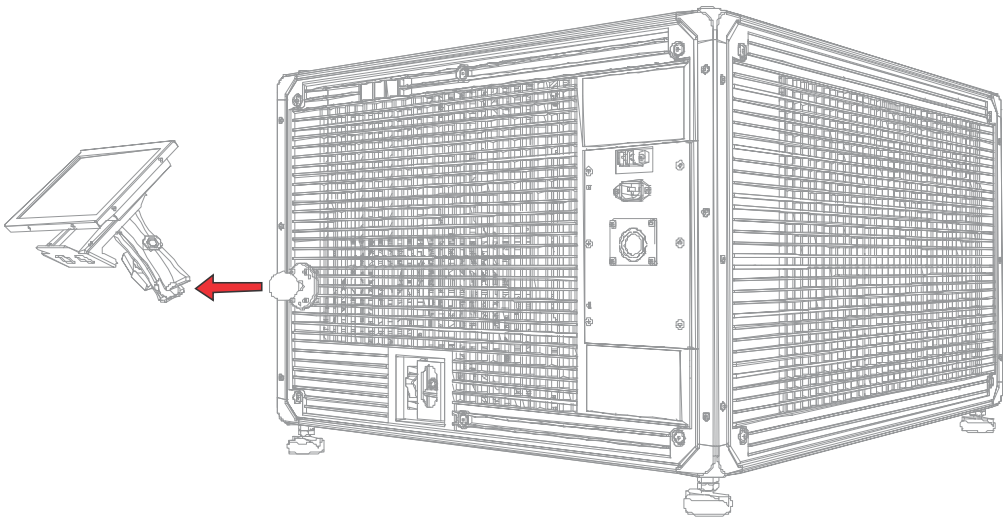
2. Use the high security key to open the projector service access door.

3. Disengage the top cover lock pin by pulling on the pin and lift up the top cover to remove it.
4. Replace the top cover, if required.
5. To re-install, follow these steps in reverse order.

Touch panel

The touch panel is a touch-sensitive screen used to control the projector, manage sources, adjust the display, and view status information.

1. Disconnect all harnesses from the card cage input panel.
2. Loosen the clamp knob.
3. Remove the touch panel from the projector.

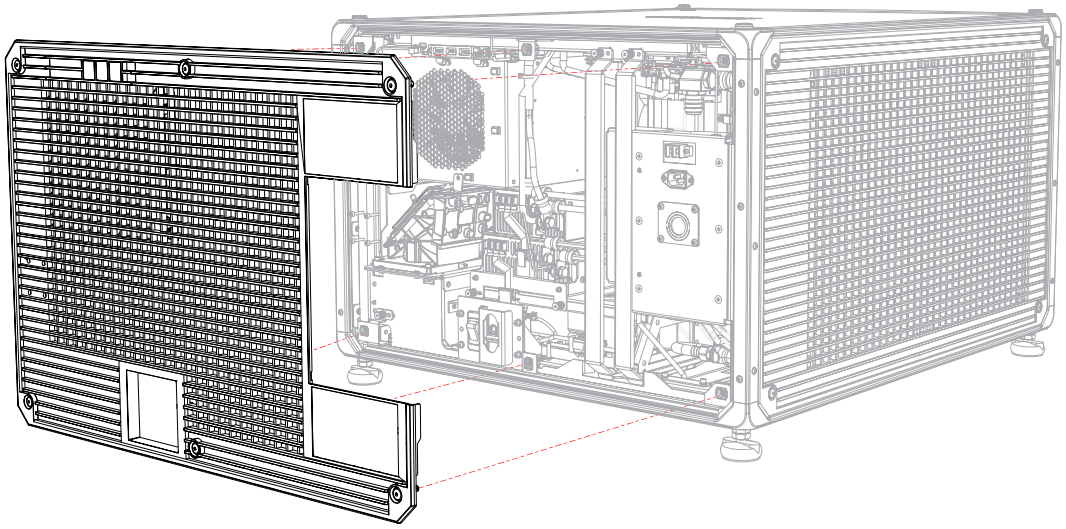


4. Replace the touch panel, if required.
5. To re-install, follow these steps in reverse order.

Rear cover

Removing the rear cover provides access to the power supplies and other components allowing removal of the integrator assembly.

1. Loosen the six screws securing the rear cover.
2. Remove the rear cover.

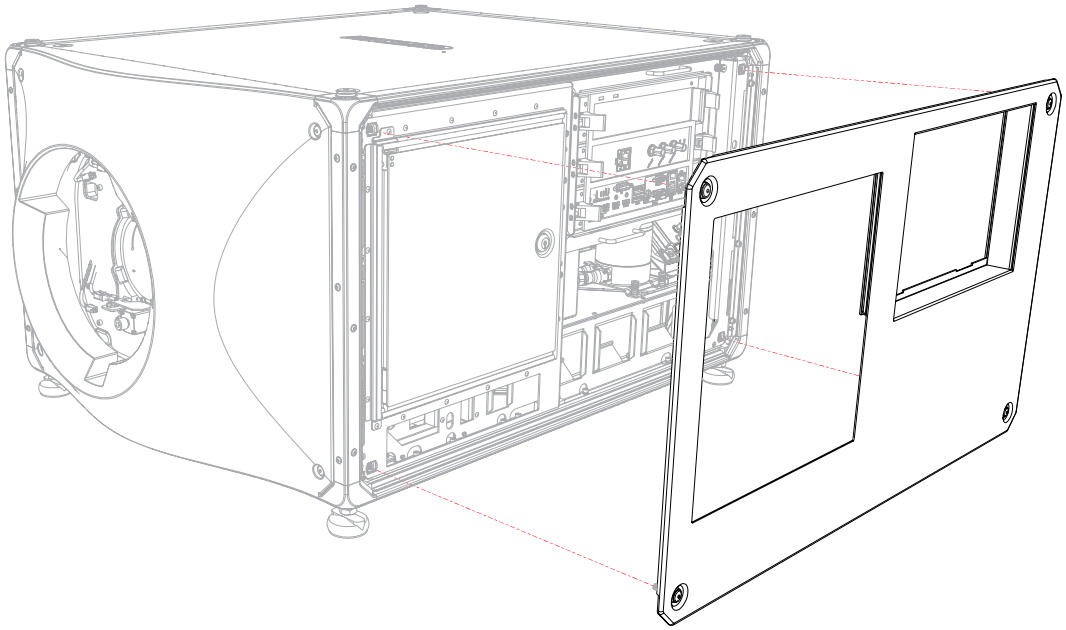


3. Replace the rear cover, if required.
4. To re-install, follow these steps in reverse order.

Electronics-side cover

The electronics-side cover provides access to the card cage, rear IOS, and reservoir module.

1. Loosen the four screws securing the electronics-side cover.

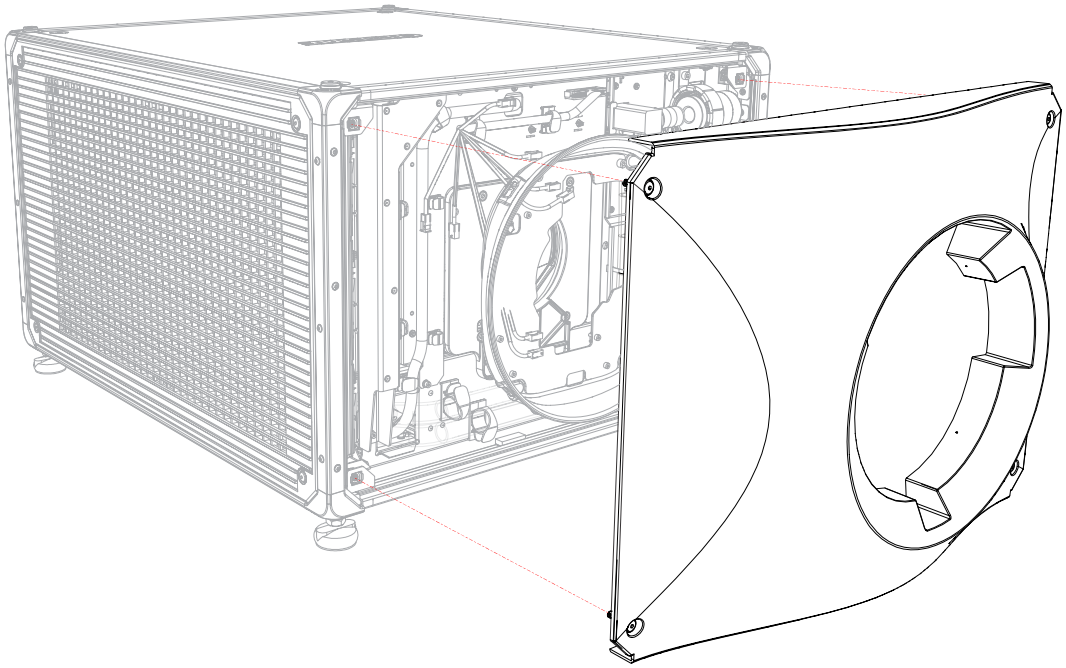


2. Remove the electronics-side cover.
3. Replace the electronics-side cover, if required.
4. To re-install, follow these steps in reverse order.

Front cover

The front cover provides access to the lens assembly.

1. Loosen the four screws securing the front cover.

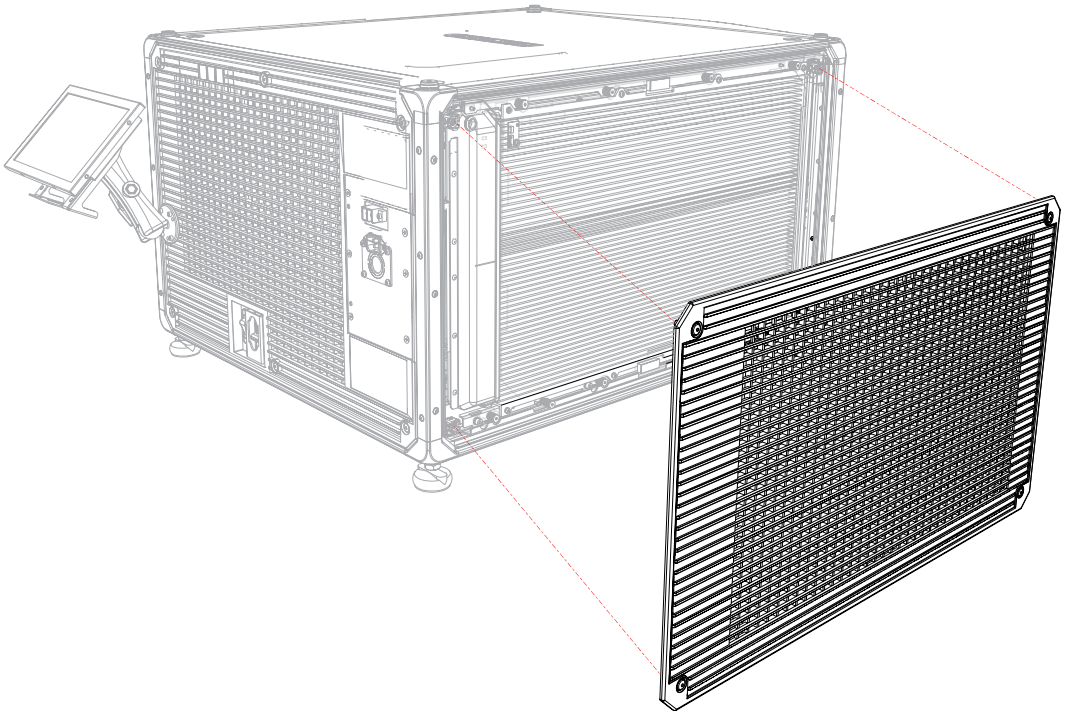


2. Remove the front cover.
3. Replace the front cover, if required.
4. To re-install, follow these steps in reverse order.
   Verify the lens boot is properly aligned and sealed against the front cover.

Side-intake cover

The side-intake cover provides access to the radiator, filter, and fans.

1. Loosen the four screws securing the side-intake cover.



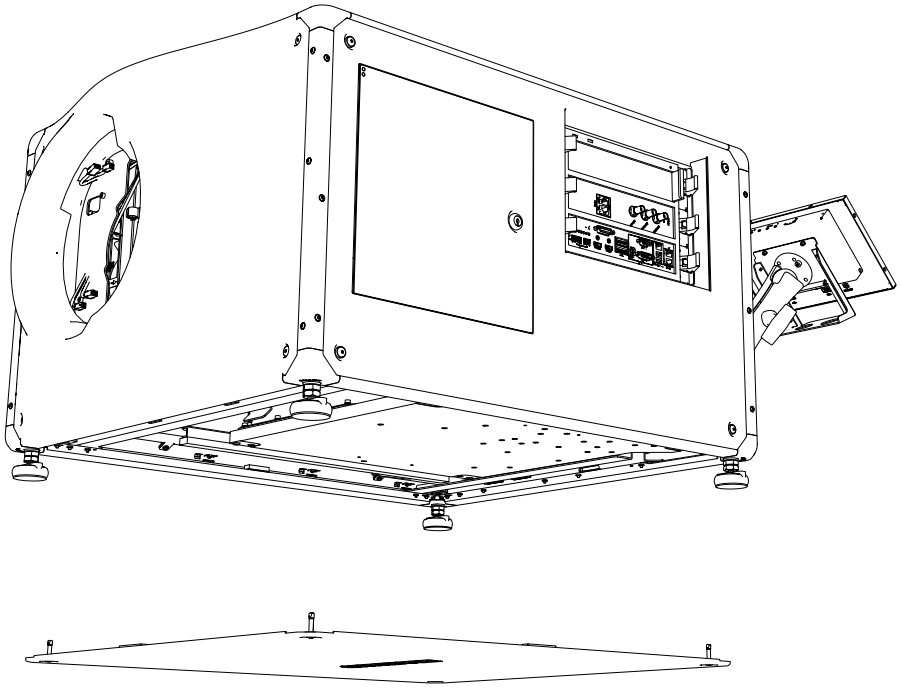
2. Remove the side-intake cover.
3. Replace the side-intake cover, if required.
4. To re-install, follow these steps in reverse order.

   Make sure to note the orientation of the cover and to position the large, unvented portion of the cover adjacent to the back of the projector.

Bottom cover

The bottom cover provides access to the laser optical subsystem (LOS) and color sensor.

1. Loosen the four screws securing the bottom cover.
2. Lower the cover from the projector and slide it out.



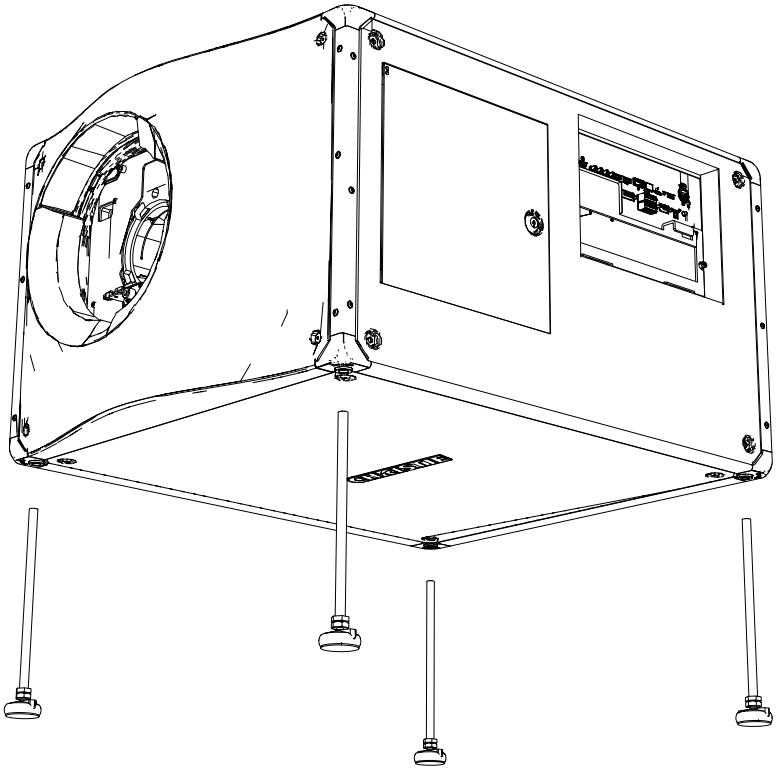
3. Replace the bottom cover, if required.
4. To re-install, follow these steps in reverse order.

Projector feet

The adjustable feet can be raised or lowered when positioning the projector to make sure it is level on all sides so the displayed image appears rectangular without any keystone.

1. Make sure the projector is in a secure position.

   Christie does not recommend having the projector overhang the supporting surface when replacing the feet, unless the projector is securely positioned.
2. Loosen the lock nut on the affected foot.



3. Unscrew the foot until it is no longer engaged in the baseplate.
4. Replace the foot.
5. To re-install, follow these steps in reverse order.
   Make sure the lock nut on the projector foot is torqued to 30 in-lb.

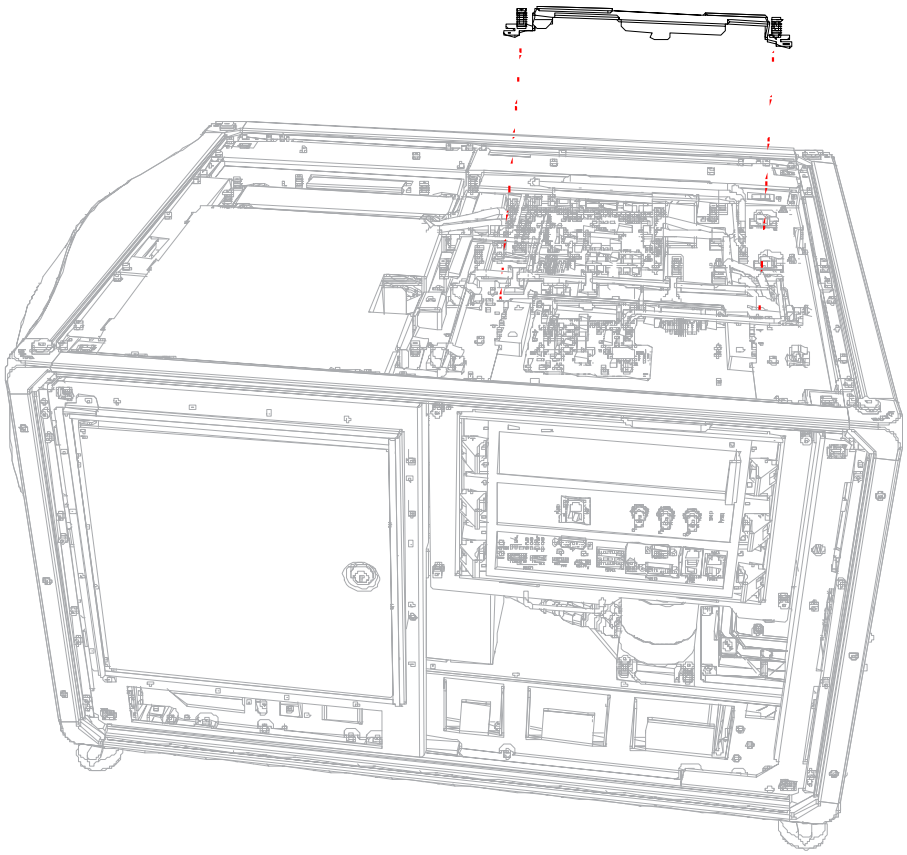
Electronics

Learn how to replace the boards, cards, and other electronic components in the projector.

Card cage

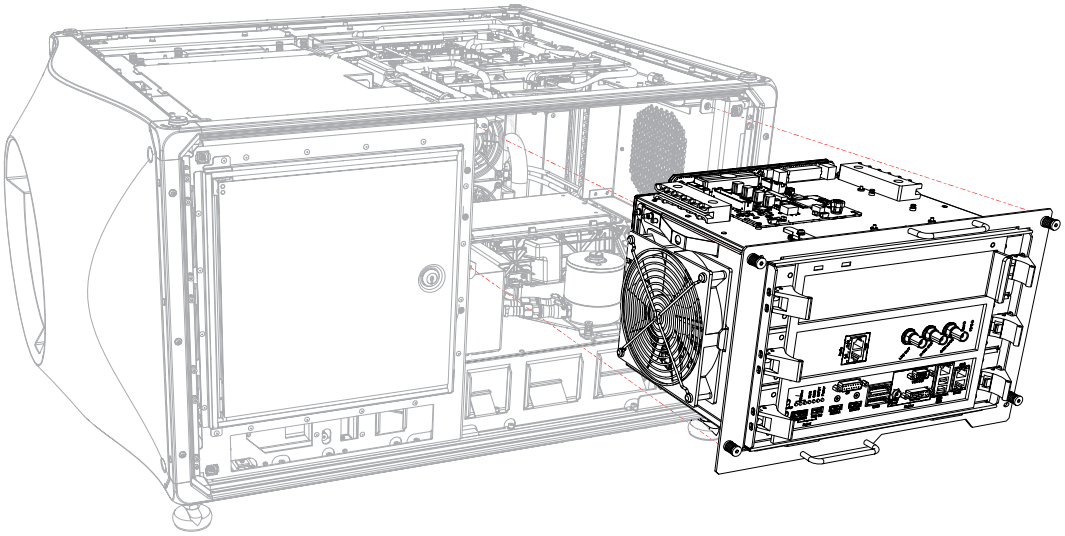
The card cage contains the slots for the F-Main electronics card.

1. *Remove the top cover* (on page 38).
2. *Remove the electronics-side cover* (on page 40).
3. Disconnect all external card cage connections and any input sources.
4. Remove the two screws securing the electronics bracket and remove bracket.



5. Disconnect the red, green, and blue mini-SAS harnesses from the card cage through the projector service access door.
6. Disconnect the three harnesses (J5, J7, J87) from the SSCB on top of the card cage.
7. Disconnect the two harnesses (J17, J18) from the backplane board.

8. Loosen the four screws securing the card cage.

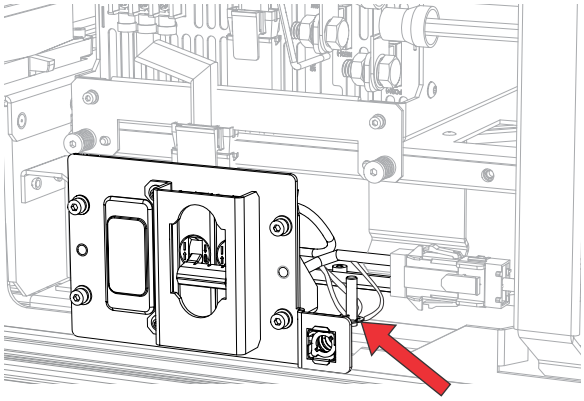


9. Pull on the locking pin located through the access door, above the card cage intake fan.
10. Slide the card cage out along the guides.
    To avoid possible damage, carefully place the card cage on a clean, flat surface.
11. To re-install, follow these steps in reverse order.

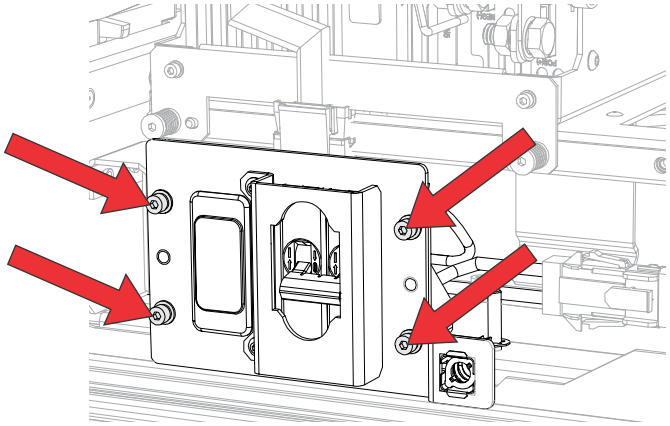
AC breaker

The AC breaker is located at the rear of the projector.

1. *Remove the rear cover* (on page 39).
2. Uninstall the ground harness ends.



3. Remove the four screws.



4. Disconnect the three AC breaker inline harnesses (MAIN/UPS connected to the 12V power supply, 48V power supply harness, and AC inlet).
5. Replace the AC breaker.
6. To re-install, follow these steps in reverse order.

Hi-Pot testing must be performed after removing and replacing the AC breaker.

Power supplies

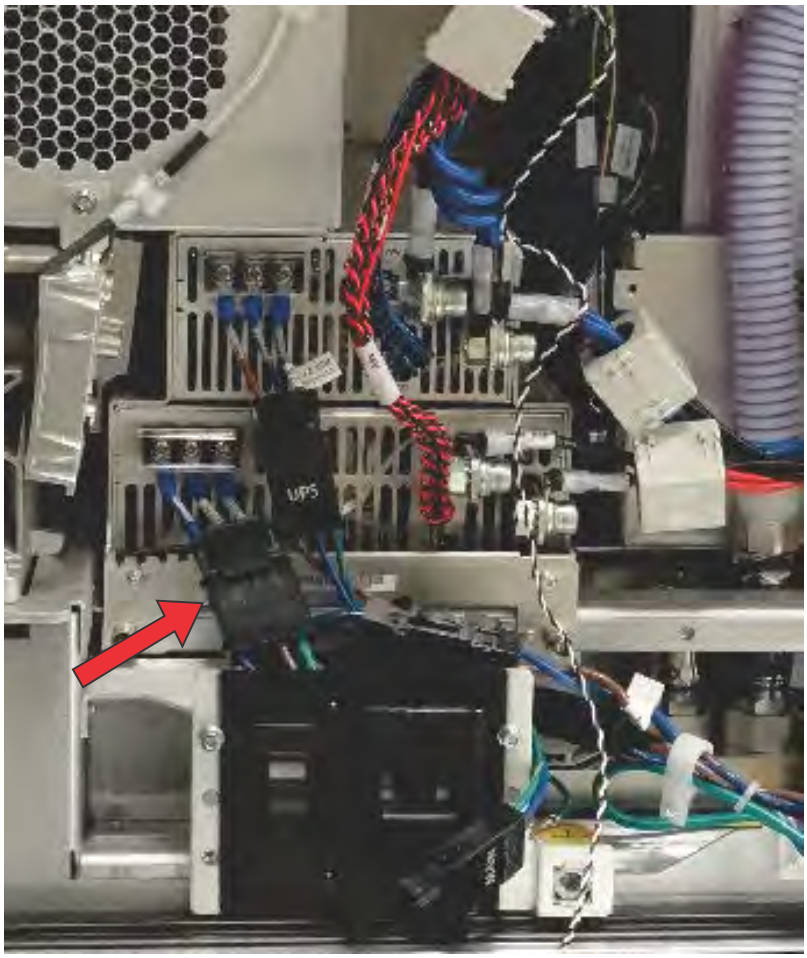
The Cinema 4K-RGB power supply assembly includes individual 12V and 48V power supply modules secured within a support bracket.

The 12V power supply module provides the required voltages for operating the electronics in the projector and for receiving a UPS connection (if installed).

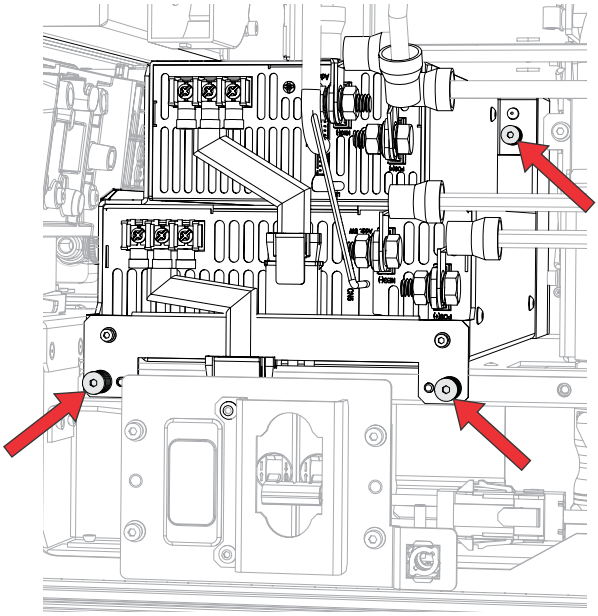
The 48V power supply module provides the required voltages for the lasers and pumps.

Before servicing, always carefully observe the original lead dress. Take extra precautions to secure all harnessing properly, especially in the high voltage circuitry areas. Replace any wire that appears to have damaged insulation.

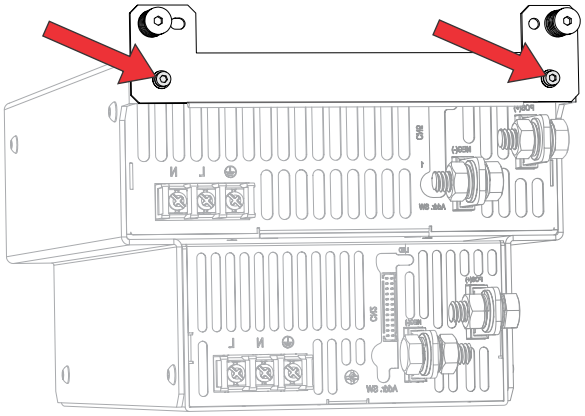
1. Shut down the projector and ensure it is disconnected from AC.
2. *Remove the rear cover* (on page 39).
3. Unplug the three-pin MAIN or UPS inline connector (whichever is already connected) from the 12V power supply module.
4. Unplug the 48V connector from the 48V power supply module.



5. For both power supply modules, disconnect the DC output cables from the positive and negative terminals using a 6 mm driver and 13 mm open-jaw wrench. Retain all screws, nuts, washers, and lock washers.
6. Loosen the three fasteners securing the power supply module to the projector system.



7. Slide the power supply assembly over the rails and out of the projector, and set it on a clean, level surface.
8. Remove the two screws securing the handle bracket to the power supply assembly.

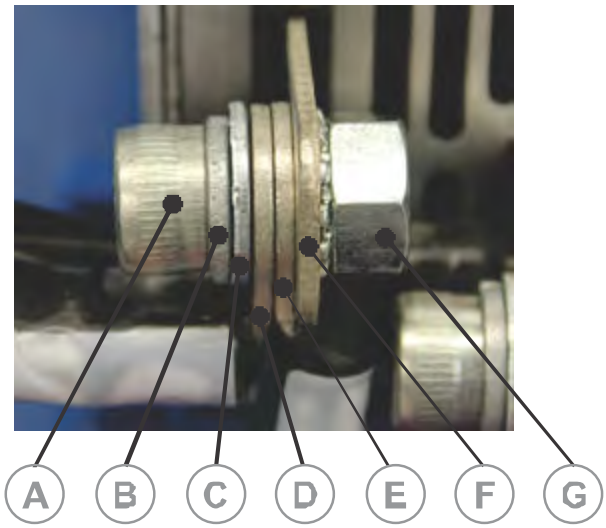


9. Remove the eight screws securing the support bracket around the power supply assembly.
10. Remove the affected power supply module.
11. Replace it with the new power supply module.
12. To re-install, follow these steps in reverse order.

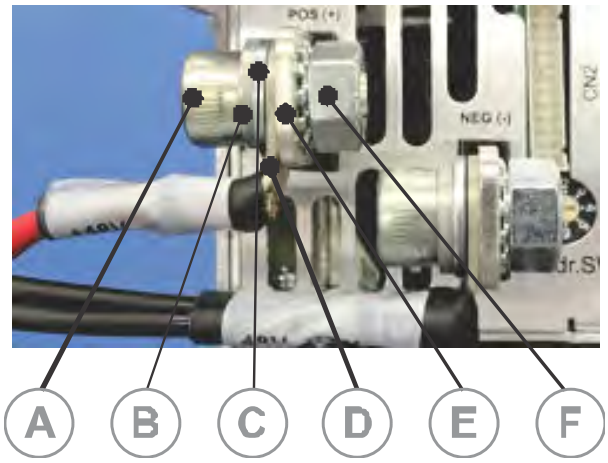
When reconnecting the DC outputs, ensure all positive and negative terminal connections are torqued to 30 in-lb.

Hardware on the positive and negative DC terminals must be re-installed as follows:

12V DC Output Terminals

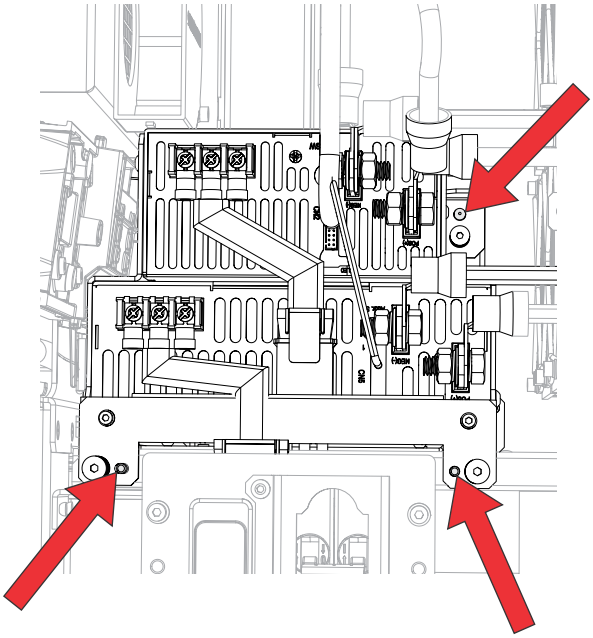


A Screw
B Lock washer
C Washer
D Harness LVPS to LBP7 12V +/-
E Harness LVPS to HKBB 12V +/-
F Bracket
G Nut



A Screw
B Lock washer
C Washer
D Harness LVPS to LBP7 48V +/-
E Bracket
F Nut

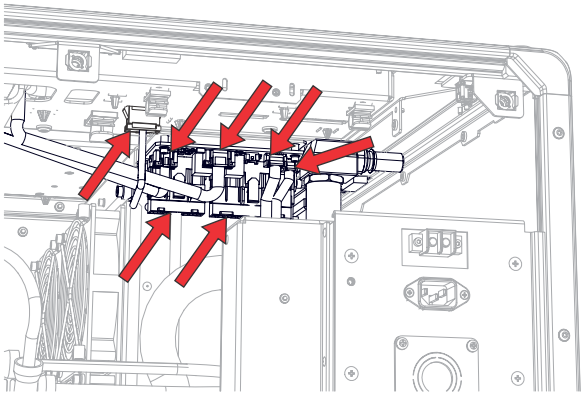
When correctly oriented in the projector, the 12V power supply is located at the top of the assembly, with the handle and support brackets fitting over the three locating pins.



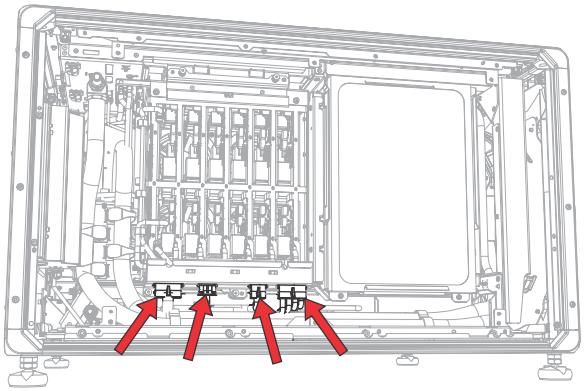
Laser driver card cage

The laser driver card cage contains the slots for the high voltage current source (HVCS) boards and low voltage current source (LVCS) board.

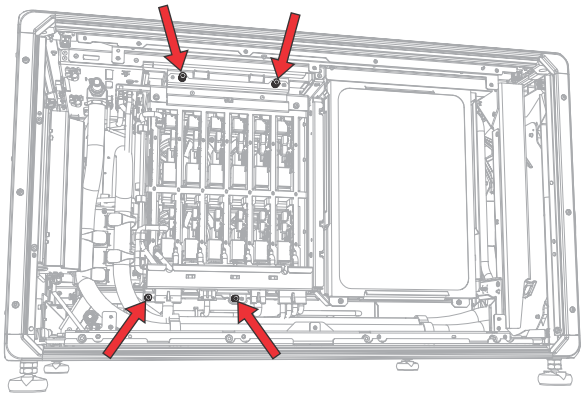
1. *Remove the radiator intake fans* (on page 59).
2. Disconnect the harness connectors J113, J111, J71, J70, J88, J128, and E panel harness (fan #21-24).



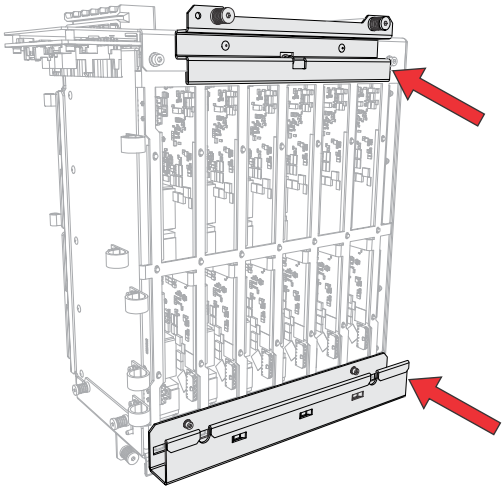
3. Disconnect the four panel harness connectors A, B, C, and D.



4. Loosen the four screws securing the LDCC module to the projector frame.



5. Using the metal flanges provided, pull the laser driver card cage out of the projector.

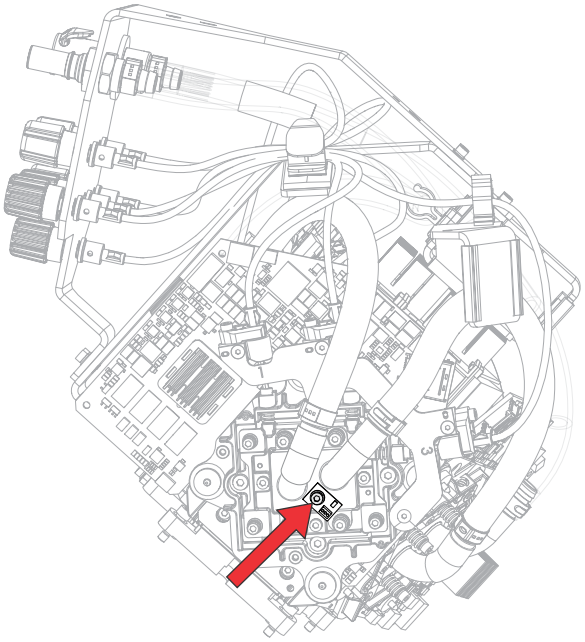


6. Replace the laser driver card cage.
7. To re-install, follow these steps in reverse order.

Light engine temperature sensor

The temperature sensor is located on the light engine.

1. *Remove the light engine* (on page 73).
2. Disconnect the connector to the temperature sensor.
3. Remove the screw securing the temperature sensor and remove it.



4. Replace the temperature sensor.
5. To re-install, follow these steps in reverse order.

SID harness

Learn how to replace the SID harness.

1. *Remove top cover* (on page 38).
2. Release the two cable clips retaining the SID harness.

   One end of the SID harness is fastened to the projector frame top structure and the other end is connected to the in-line connector on the harness (P/N: 001-113510-XX), which connects to P89 on the housekeeping board.
3. Gently separate the other cables in the same run away from the SID cable.
4. Remove the screw securing the SID harness to the projector.
5. Cut the zip tie restraining the SID harness to the near-by harness.
6. Unplug the SID harness at the in-line connector.
7. Remove the SID harness.
8. Replace the SID harness.
9. To re-install, follow these steps in reverse order.

Mini-SAS cables

The mini-SAS harnesses move data from the card cage to the light engine.

1. *Remove the top cover* (on page 38).
2. Take note of the routing of the mini-SAS cables.

   You must match the routing when you install the new cables.
3. Disconnect the red, green, and blue mini-SAS harnesses from the card cage through the projector service access door and from the top.
4. *Remove the light engine* (on page 73).
5. Disconnect the red, green, and blue mini-SAS harnesses from the light engine.
6. Replace the mini-SAS harnesses.
7. Reconnect the mini-SAS harnesses to the light engine.

   Make sure the access and bends are identical to what was installed or the harnesses do not route properly.
8. Re-install the light engine.
9. Reconnect the mini-SAS harnesses to the card cage.
10. Reconnect the shutter harness.

Ventilation and cooling

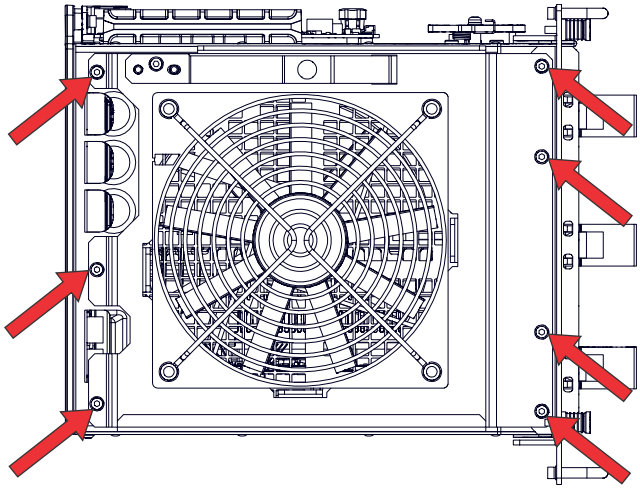
Vents and louvers provide ventilation, both for intake and exhaust, keeping the projector components within their operating temperature specifications.

When replacing fans, ensure you confirm the fan direction for airflow. The correct orientation of the fan also ensures that the fan harness reaches the connector.

Card cage intake fan (#1)

The card cage intake fan draws in air to assist with cooling.

1. *Remove the card cage* (on page 45).
2. Disconnect HUB 1 fan harness P2.
3. Remove the seven screws securing the intake fan.

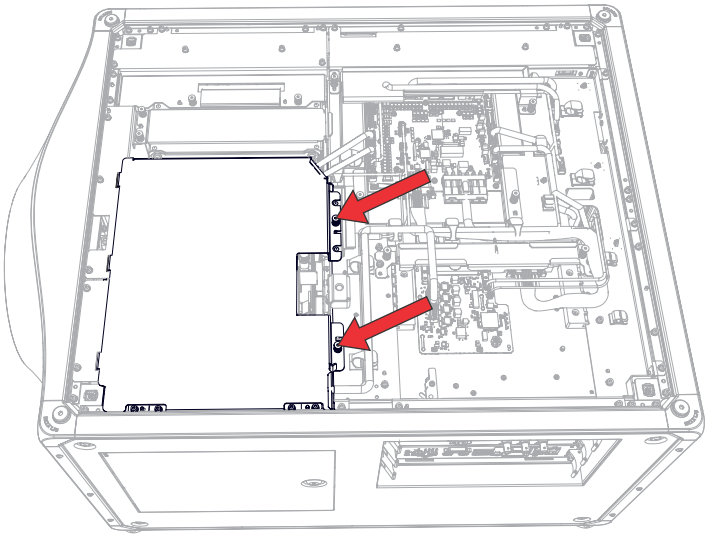


4. Replace the fan.
5. To re-install, follow these steps in reverse order.

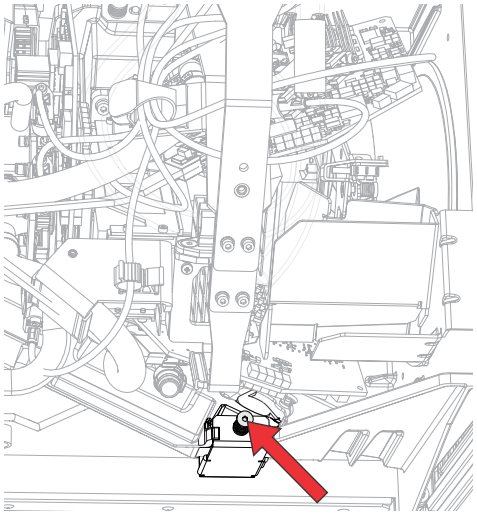
Blue formatter fan (#3)

The blue formatter fan provides cooling for the blue light engine formatter board.

1. *Remove the top cover* (on page 38).
2. To remove the light engine security cover, loosen the two screws.



3. *Remove the light engine intake fans* (on page 60).
4. Disconnect the fan #3 harness inline connector.
5. To remove the fan and bracket, loosen the screw.

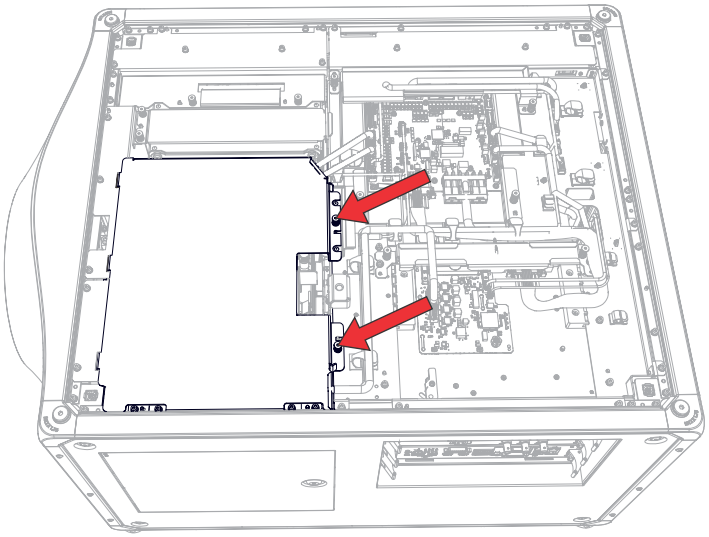


6. Remove the four screws securing the fan to the bracket.
7. Replace the fan, if required.
8. To re-install, follow these steps in reverse order.

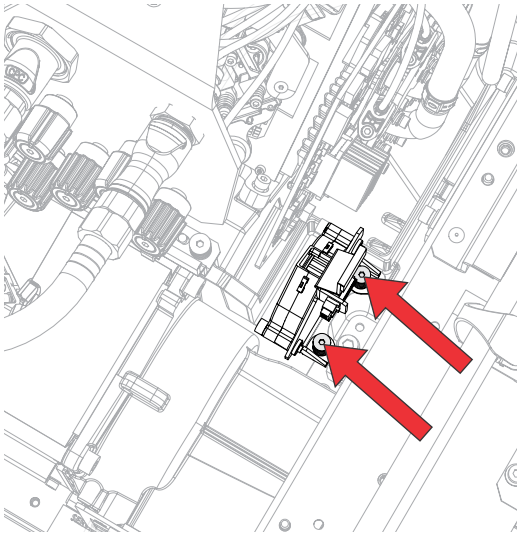
Green formatter fan (#4)

The green formatter fan provides cooling for the green light engine formatter board.

1. *Remove the top cover* (on page 38).
2. To remove the light engine security cover, loosen the two screws.



3. Disconnect the fan #4 harness inline connector.
4. To remove the fan, loosen the two screws.

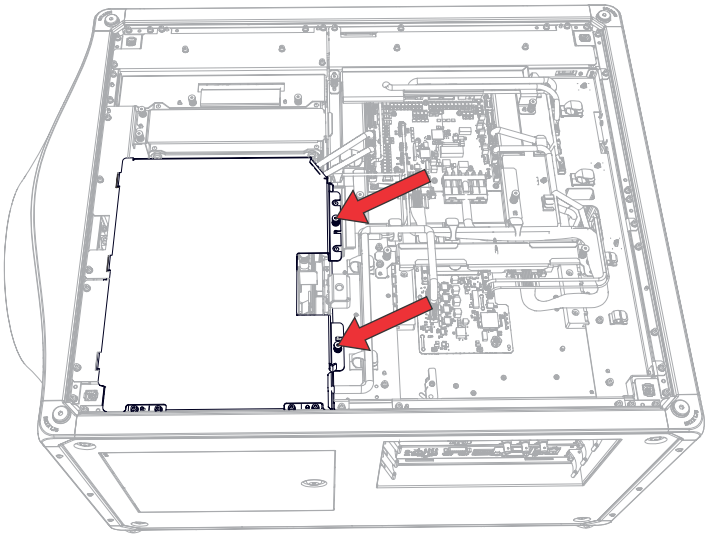


5. Replace the fan, if required.
6. To re-install, follow these steps in reverse order.

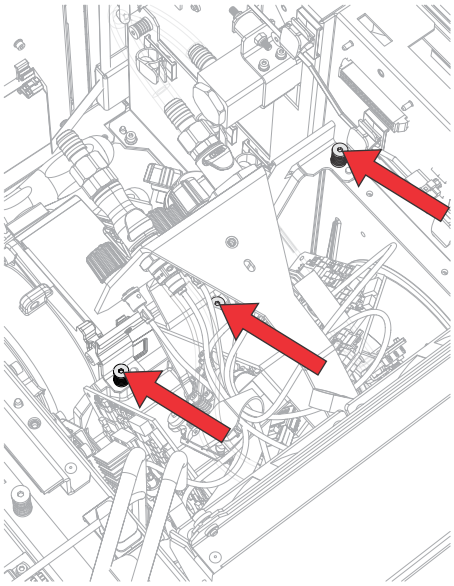
Red formatter fan (#5)

The red formatter fan provides cooling for the red light engine formatter board.

1. *Remove the top cover* (on page 38).
2. If the light engine coolant hoses are in the way, disconnect them.
3. Loosen the two screws securing the light engine security cover.



4. Disconnect the fan #5 harness inline connector.
5. To remove the fan with the bracket, loosen the three screws.

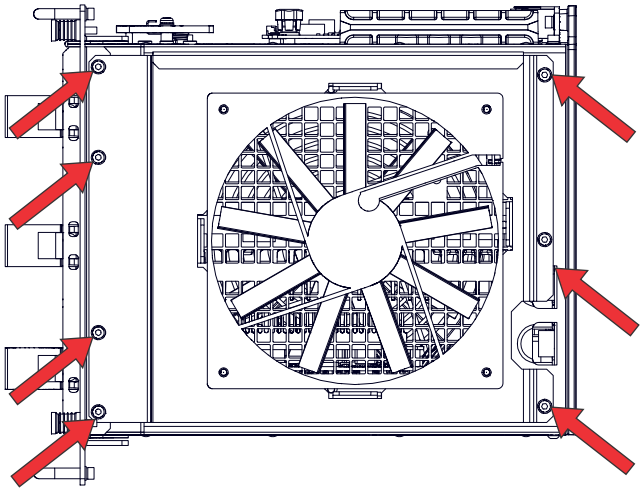


6. Remove the two screws securing the fan to the bracket.
7. Replace the fan, if required.
8. To re-install, follow these steps in reverse order.

Card cage exhaust fan (#4)

The card cage exhaust fan draws hot air away from the card cage.

1. *Remove the card cage* (on page 45).
2. Disconnect HUB 4 fan harness P29.
3. Remove the seven screws securing the exhaust fan.

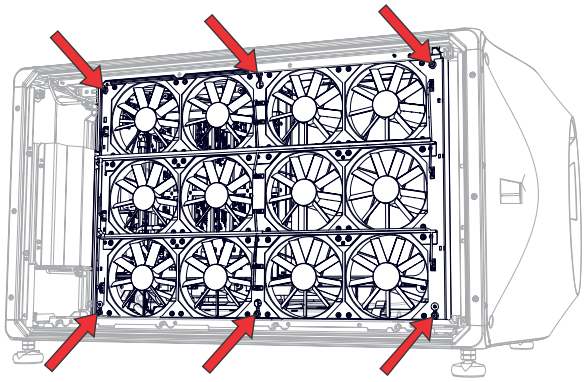


4. Replace the fan.
5. To re-install, follow these steps in reverse order.

Radiator intake fans (#6-17)

The radiator intake fans draw cool air in to assist in cooling the projector.

1. *Remove the radiator* (on page 62).
2. Disconnect the two fan harnesses G and H at rear of the projector (white/blue and white/red).
3. Remove the six screws securing the radiator intake fan assembly.



4. Swing the fan pack out from the bottom and then lower it down to remove from the projector.
5. Replace the radiator intake fan assembly, if required.
6. To re-install, follow these steps in reverse order.

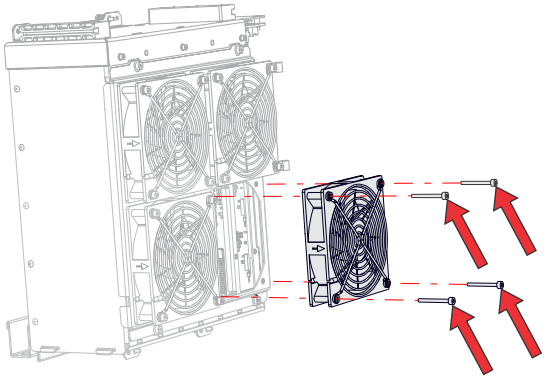
Laser driver card cage fans (#21-24)

The laser driver card cage fans pull fresh air into the laser driver card cage.

1. *Remove the laser driver card cage* (on page 51).

2. Remove the laser driver card cage A or laser driver card cage B.
3. Disconnect the inline harness connector for the affected fan.

   Note the harness routing prior to disconnecting and releasing the harness.
4. Remove the four screws securing the affected fan and remove it, along with any P-clips between the fan grill and fan chassis.



5. Replace the fan and install the harnesses into the P-clips.

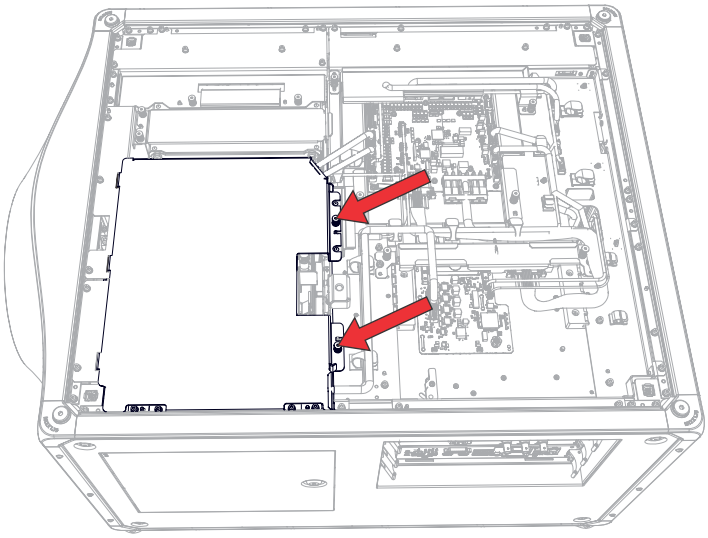
   Make sure the airflow direction label on top of the fan pack matches the airflow indicator on the replacement fan.
6. To re-install, follow these steps in reverse order.

Light engine intake fans (#25-30)

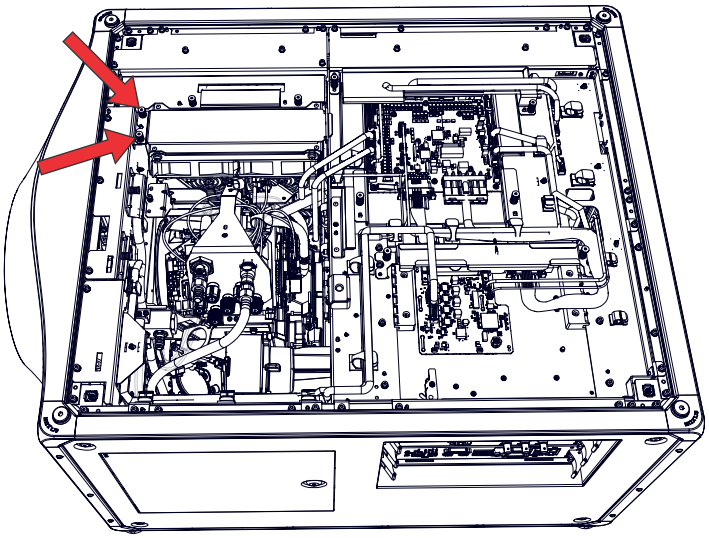
The light engine intake fans draw air into the projector to cool the light engine.

These instructions detail accessing the air filter from the top of the projector. The filter can also be removed from the side of the projector. Contact Christie Technical Support for more details.

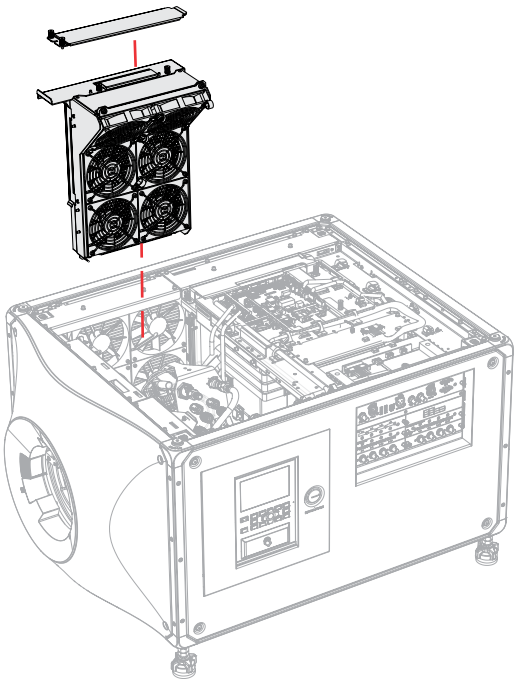
1. *Remove the top cover* (on page 38).
2. To remove the light engine security cover, loosen the two screws.



3. To remove the light engine intake fan cover, loosen the two screws and remove the plate over the fan pack.

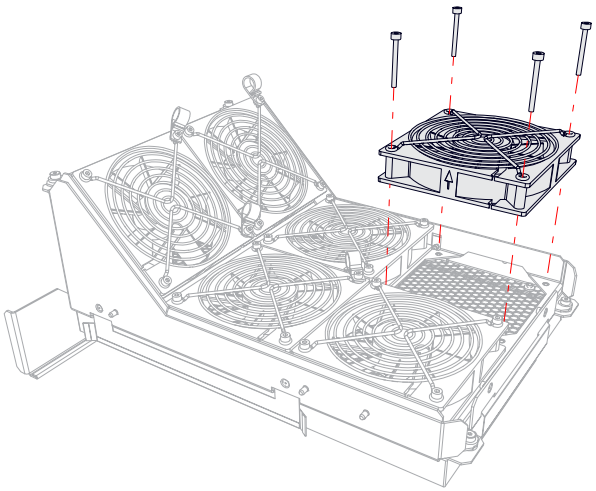


4. Disconnect the fan harness J105 from the housekeeping board.
5. Release the fan harness from the cable clips.
6. Pull the light engine intake fan assembly up out of the projector.



7. Disconnect the affected fan inline harness connection.

   Note the harness routing prior to disconnecting and releasing the harness.
8. Remove the four screws securing the affected fan and remove it, along with any P-clips between the fan grill and fan chassis.



9. Replace the fan and install the harnesses into the P-clips.

   Make sure the airflow direction label on top of the fan pack matches the airflow indicator on the replacement fan.

10. To re-install, follow these steps in reverse order.

Coolant reservoir

Before replacing or refilling the coolant, the coolant reservoir must be removed from the projector chassis.

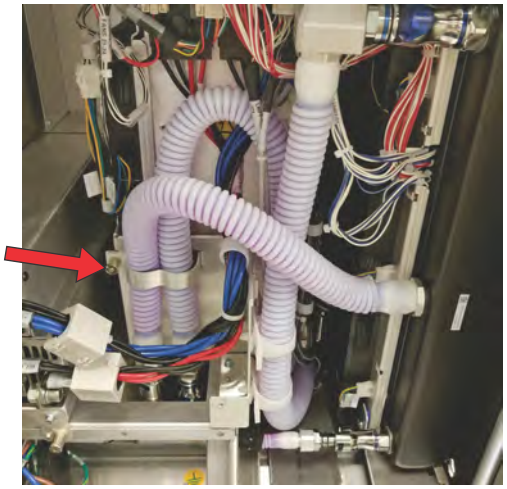
1. *Remove the electronics-side cover* (on page 40).
2. Locate the coolant reservoir below the communications panel and loosen the two screws at the base of the reservoir.
3. Tilt the reservoir slightly to unhook the rear tabs out of the plate and pull the unit partially out of the projector.
4. Disconnect the two quick disconnect hoses.
5. Once disconnected, remove the reservoir unit from the projector chassis and set it aside on a separate surface.
6. To replace the coolant reservoir, follow these steps in reverse order.

   Ensure screws are torqued to 15 in-lb.

Radiator

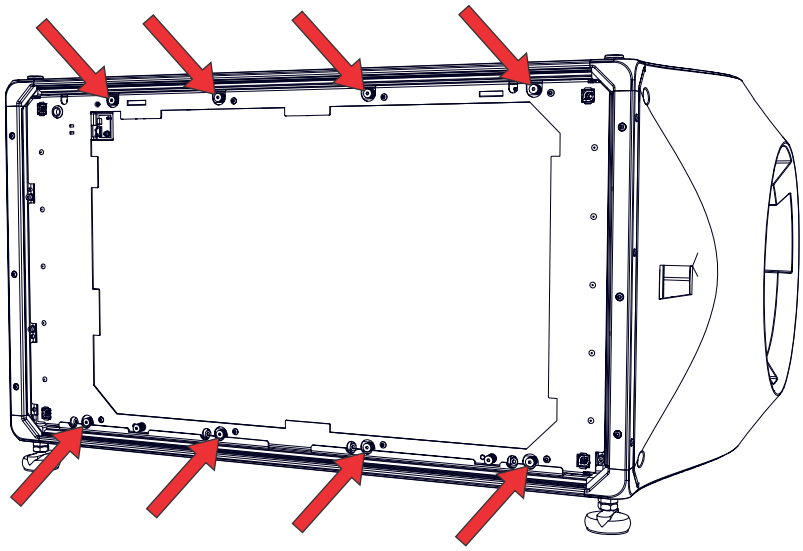
The radiator exchanges heat from the coolant in the liquid cooling system to the air.

1. *Remove the top cover* (on page 38).
2. *Remove the rear cover* (on page 39).
3. *Remove the side-intake cover* (on page 41).
4. At the panel mount, disconnect the dual temperature sensor module (DTSM) harness coming from the housekeeping board.
5. To remove the hose bracket securing the hoses, loosen the screw.



6. Place cloth wipes around the cooling hose connection points to capture any excess coolant that may drip upon disconnect.

7. Disconnect the three hose connectors.
8. Remove the two radiator handles from the back of the projector and attach them to the radiator.
9. Remove the radiator.
   a) Loosen the eight screws.



b) Swing the radiator out from the projector, being mindful of the middle coolant line attached to the laser optical subsystem (LOS).

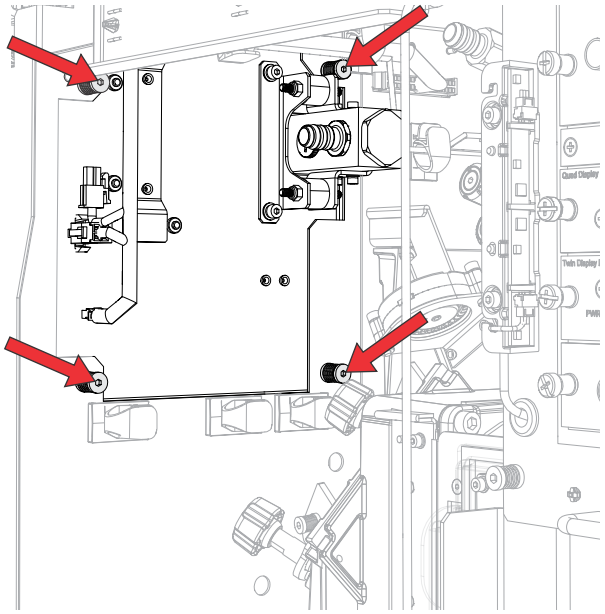
c) Lifting the radiator handles, remove the radiator.

10. Replace the radiator.
11. To re-install, follow these steps in reverse order.

Pump module

Learn how to remove the pump module.

1. *Remove the front cover* (on page 41).
2. *Remove the rear cover* (on page 39).
3. *Remove the radiator* (on page 62).
4. *Remove the radiator intake fan pack* (on page 59).
5. Disconnect the pump module coolant lines from both the LOS and light engine manifold plate.
6. If necessary, remove the one or two of metal retaining clips and release the coolant lines for the pump module, which run along the bottom, intake-side of the projector.
7. From the front of the projector, unclip the coolant lines along the bottom under the lens mount.
8. Pull the coolant lines through the baseplate opening and leave them hanging out the front of the projector.
9. From the optical access door, disconnect all electrical connections.
10. Loosen the four screws securing the pump module.



11. Remove the top of the pump module from the projector making sure the hoses clear the projector and lift up to free from the bottom tabs of the pump module from the projector chassis.
12. Replace the pump module.
13. To re-install, follow these steps in reverse order.

    Christie recommends fully securing the pump module before starting to reroute and connect the hoses.

    To avoid damage when re-routing the hoses, make sure care is taken to not kink the hoses.

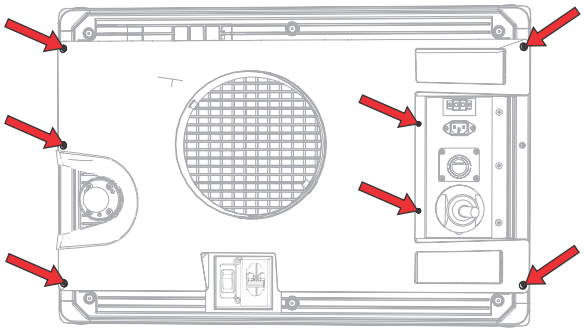
Relief tank

This topic is currently not available. For information on replacing the relief tank, contact Christie Technical Support.

Exhaust duct

Complete the following procedure to replace the exhaust duct.

1. Remove the heat extractor.
   - If using an alternate heat extractor, disconnect a standard Ø8” HVAC duct from the exhaust duct flange.
   - If using a Christie Heat Extractor kit (P/N: 38-814008-XX), disconnect it using a 5 mm hex driver, removing the M6 screws, and the two inserts on the metal sleeve.
2. Loosen the seven screws, including the five screws on the projector frame and the two screws on the AC receptacle.



3. Remove the exhaust duct from around the touch panel mount and AC receptacle.
4. Replace the exhaust duct, if required.
5. To re-install, follow these steps in reverse order.

Optics

Learn how to replace the light source, mirrors, and other optical components.

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

- The projector must be powered off and all components must be re-installed before powering on the projector for doing any optical alignment.

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

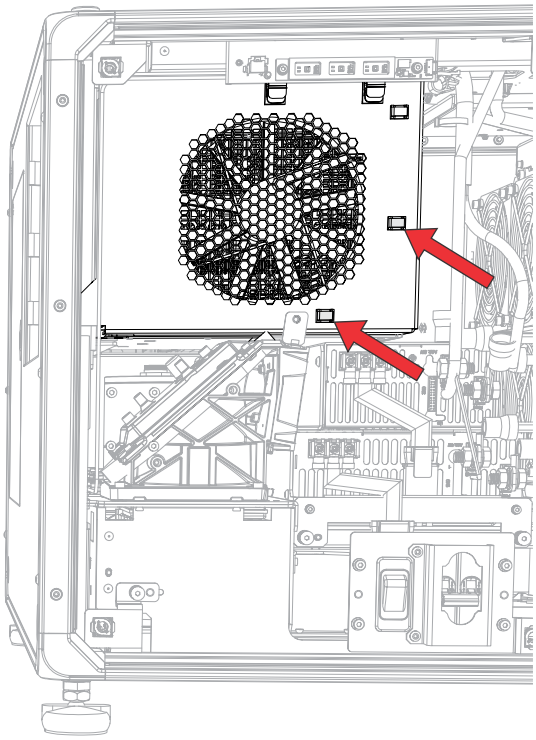
- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
- HOT SURFACE HAZARD! If light output is unexpectedly low, shut down and allow adequate time for potentially hot components to cool before performing any service operations.

- Always wear powder-free latex gloves when handling optical components.
- Wear an electrostatic discharge (ESD) strap and use insulated tools when replacing the light engine.

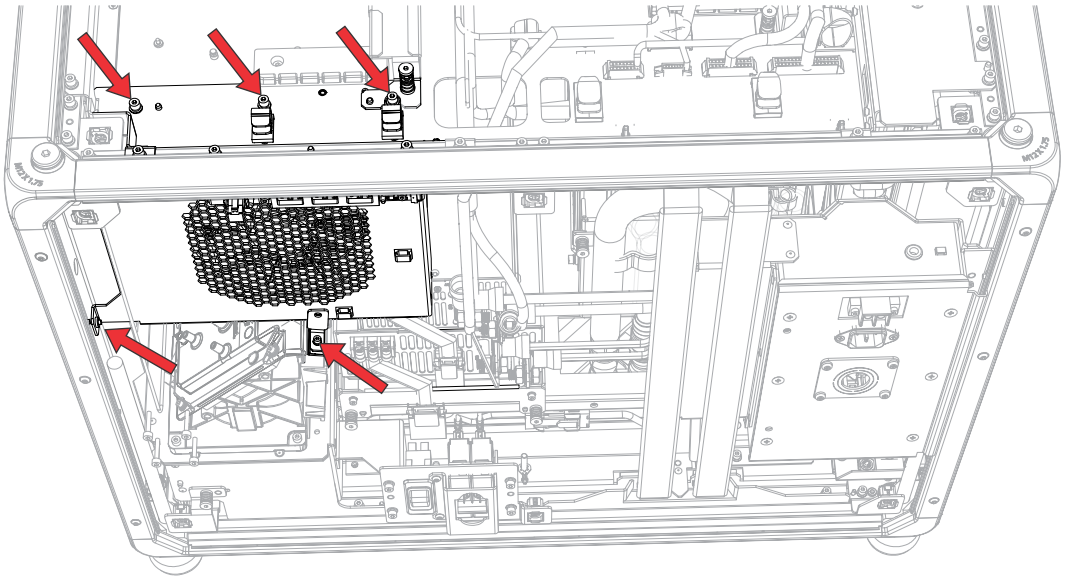
Integrator assembly

The integrator assembly captures light from the RGB laser source and combines it into a uniform rectangular light source for the light engine.

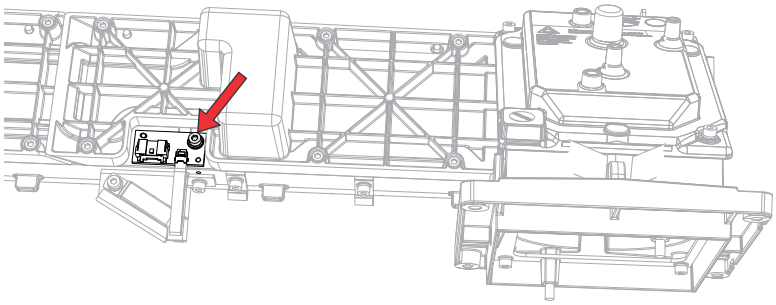
1. *Remove the rear cover* (on page 39).
2. *Remove the card cage* (on page 45).
3. *Remove the coolant reservoir* (on page 62).
4. If required, release the diffuser harness (J135) from the rear card cage security bracket clips.



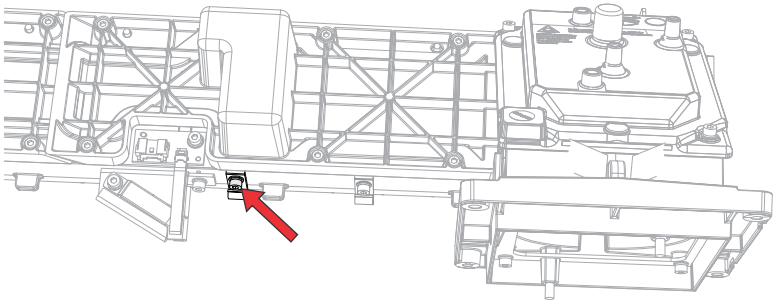
5. Remove the three top screws and lower left screw securing the rear card cage security bracket.



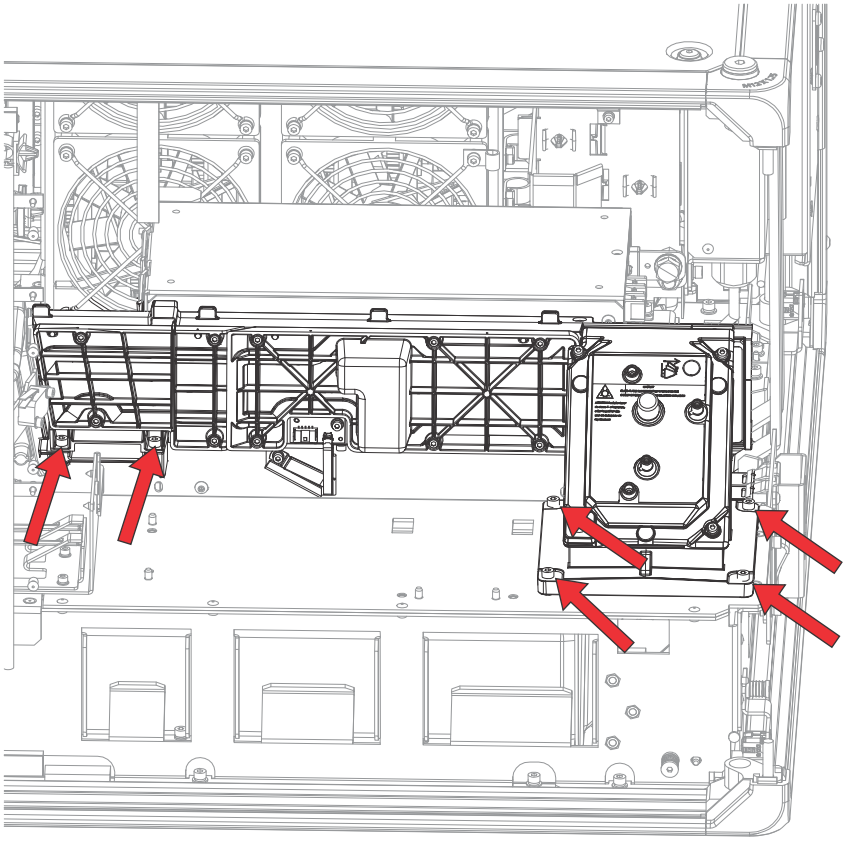
   Remove the lower right screw securing the rear card cage security bracket.
6. Remove the bracket.
7. Disconnect the diffuser harness (J135) from the diffuser interface board (DIB).



8. Remove the diffuser harness from the clip.



9. Remove the six screws securing the integrator assembly.



10. Pull out the integrator assembly through the back of the projector and place it on a clean, flat surface.

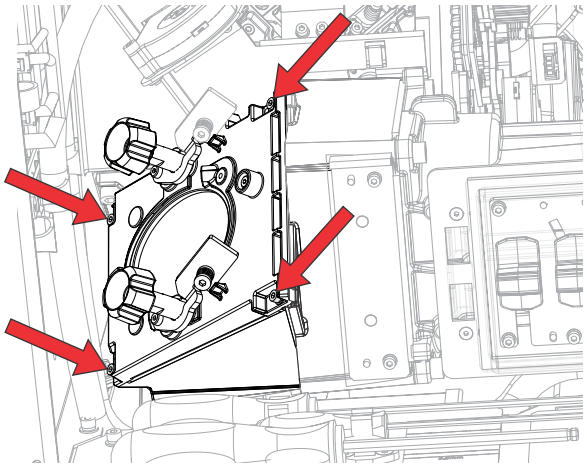
To keep out dust and other contaminant, Christie recommends covering the LOS opening with a lint-free cloth.

11. To re-install, follow these steps in reverse order.
12. After replacing the integrator assembly, perform the following tasks as described in the Cinema 4K-RGB User Guide (P/N: 020-102712-XX).
    - Perform a LOS coupling mirror alignment.
    - Perform a LiteLOC calibration.

Fold mirror adjustment assembly

The fold mirror directs light towards the light engine.

1. *Remove the top cover* (on page 38).
2. *Remove the electronics-side cover* (on page 40).
3. *Remove the front cover* (on page 41).
4. Unlock the service door and open the door.
5. Disconnect the left coolant hose to the light engine.
   This is the hose closest to the front of the projector.
6. Loosen the four screws securing the front laser optical subsystem (LOS) pump module.
7. Pull the LOS pump forward exposing the two access holes to the fold mirror.
8. Remove the four screws securing the fold mirror housing.

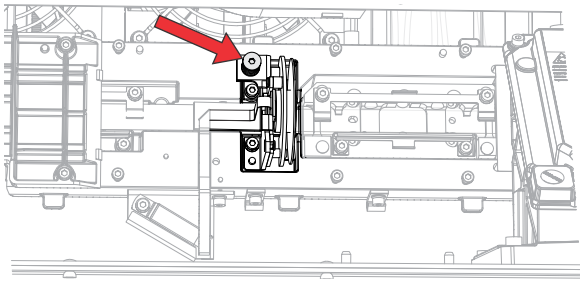


9. Remove the fold mirror adjustment assembly and replace.
10. To re-install, follow these steps in reverse order.
11. After the re-installation, follow the instructions in *Adjusting the integrator rod and fold mirror* (on page 22).

Rotating diffuser assembly

Learn how to remove the rotating diffuser.

1. *Remove the pump module* (on page 64).
2. Loosen the six screws securing the rotating diffuser cover.
3. *Remove the diffuser control board (DIB board)* (on page 94).
4. Loosen the screw to release the rotating diffuser and remove.



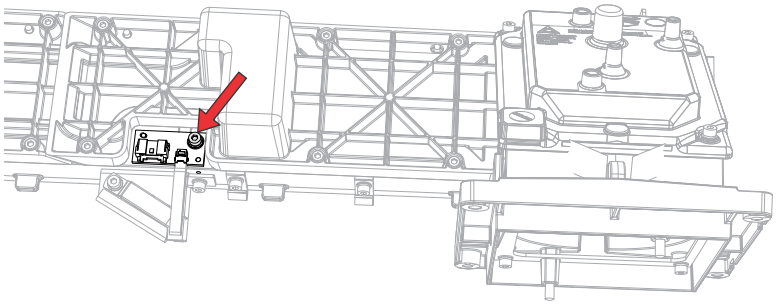
5. Replace the rotating diffuser.
6. To re-install, follow these steps in reverse order.

Rear illumination optic system (IOS)

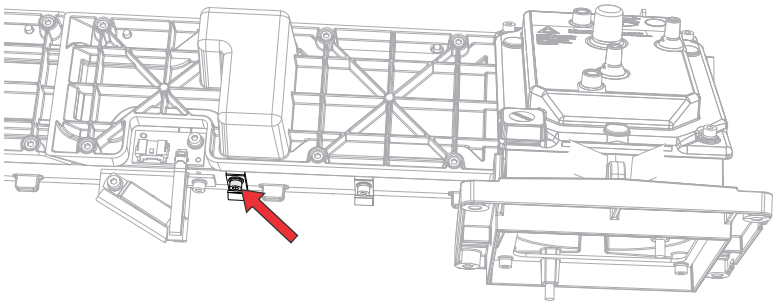
Learn how to replace the rear illumination optic system (IOS).

Always wear powder-free latex gloves when handling IOS components.

1. *Remove the top cover* (on page 38).
2. *Remove the electronics-side cover* (on page 40).
3. Remove the DCI boundary bracket.
4. *Remove the reservoir module* (on page 62).
5. *Remove the card cage* (on page 45).
6. *Remove the integrator assembly* (on page 67).
7. Disconnect the diffuser harness (J135) from the diffuser interface board (DIB).



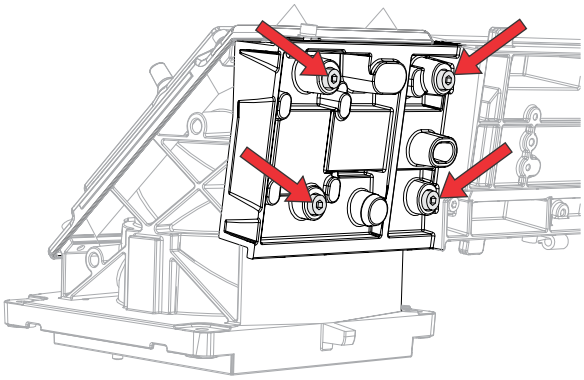
8. Remove the harness from the diffuser harness clip.



9. Vertically, pull out the integrator assembly and place on a flat surface.

   Christie recommends covering the LOS opening with a lint-free cloth to keep dust and other contaminants out.

10. Remove the four screws securing the coupling elbow.



11. Install the new coupling elbow on the integrator assembly.
12. To re-install these components (except the top and electronics-side covers), follow these steps in reverse order.

    Torque all M4 screws to 15 in-lb and all M3 screws to 8 in-lb. Ensure the card cage and top cover locking pins are engaged when re-installing.

    The optical access door must be removed to make integrator rod and fold mirror adjustments and the electronics-side cover must be removed for making LOS coupling mirror adjustments. For more information, refer to the *Cinema 4K-RGB User Guide (P/N: 020-102712-XX)*.

    The electronics-side cover must be removed for making LOS coupling mirror adjustments. For more information, refer to Aligning the image.

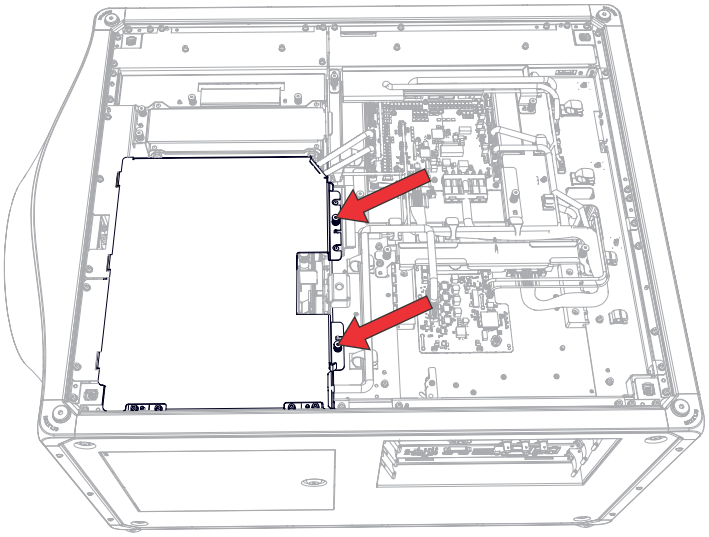
13. After re-installing the components, perform these tasks:
    a) Torque all M4 screws to 15 in-lb and all M3 screws to 8 in-lb.
    b) Make sure the card cage and top cover locking pins are engaged when re-installing.
    c) Perform a LiteLOC calibration.

Light dump

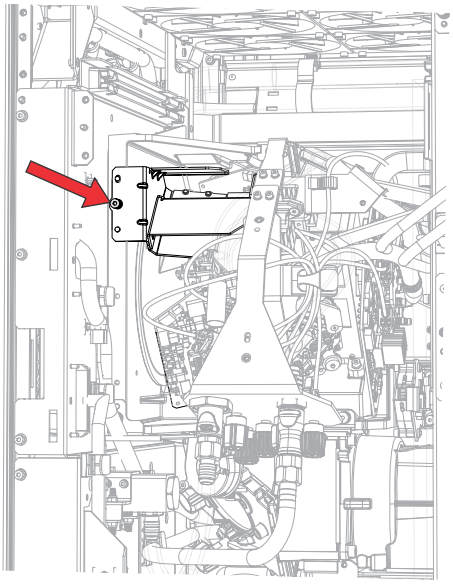
The light dump absorbs any off-state light from the light engine.

1. *Remove the top cover* (on page 38).
2. *Remove the light engine fan pack* (on page 60).

3. To remove the light engine security cover, loosen the two screws.



4. Loosen the screw securing the light dump and remove.



5. Replace the light dump.
6. To re-install, follow these steps in reverse order.

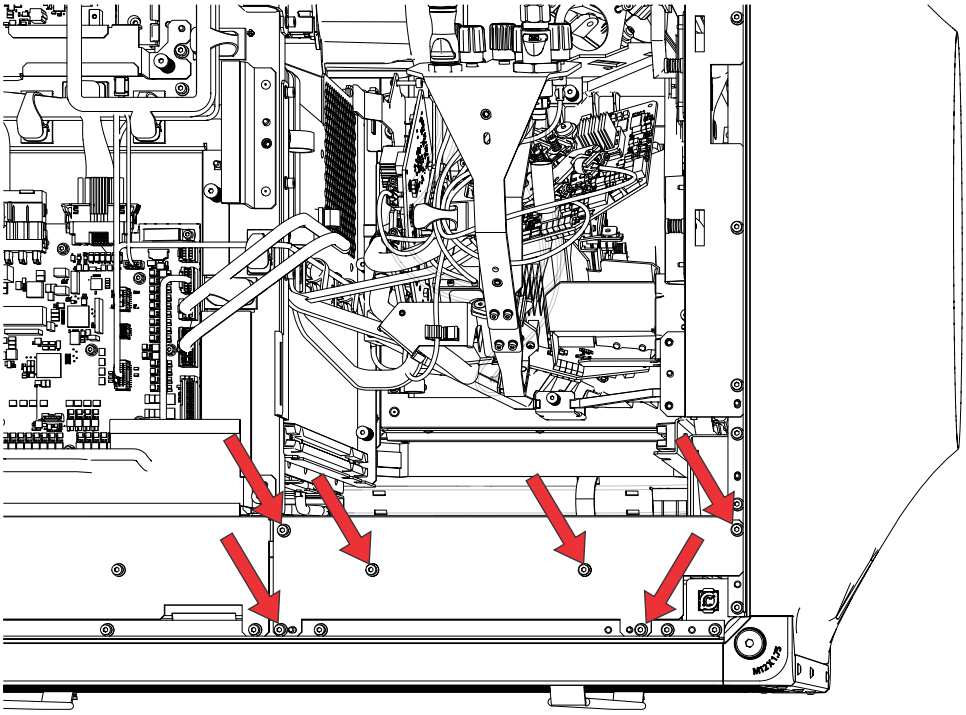
Light engine

The light engine modulates incoming light from the light source to create an image, which is projected to the screen.

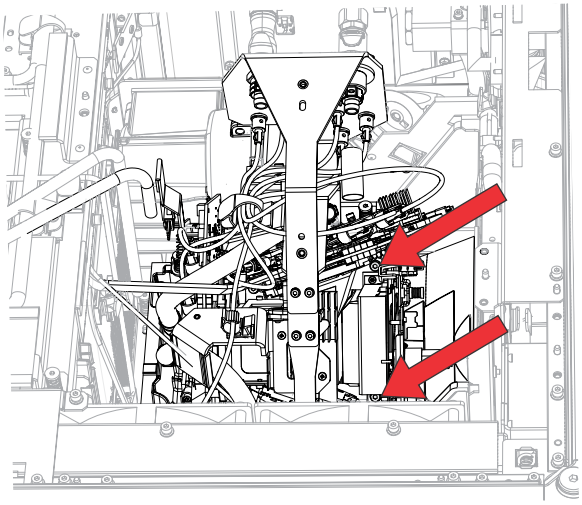
Always wear an electrostatic discharge (ESD) strap and use insulated tools when replacing the light engine.

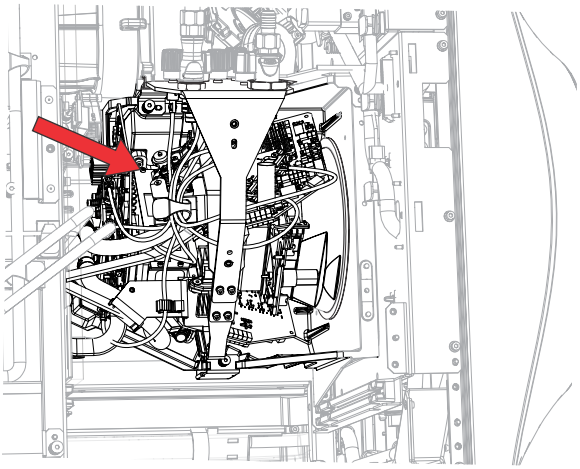
1. *Remove the lens* (on page 34).

2. *Remove the top cover* (on page 38).
3. *Remove the light engine fan pack* (on page 60).
4. *Remove the light dump* (on page 72).
5. If installing or removing a 003-109995-XX light engine, you must loosen the six screws securing the top bracket (P/N: 011-108314-XX) and remove the bracket.



6. Disconnect the three mini-SAS cables from the card cage.
7. Disconnect the two coolant hoses to the light engine.
8. Disconnect the J89 shutter harness from the housekeeping board (HKBB).
9. Loosen the three screws securing the light engine to the projector base.



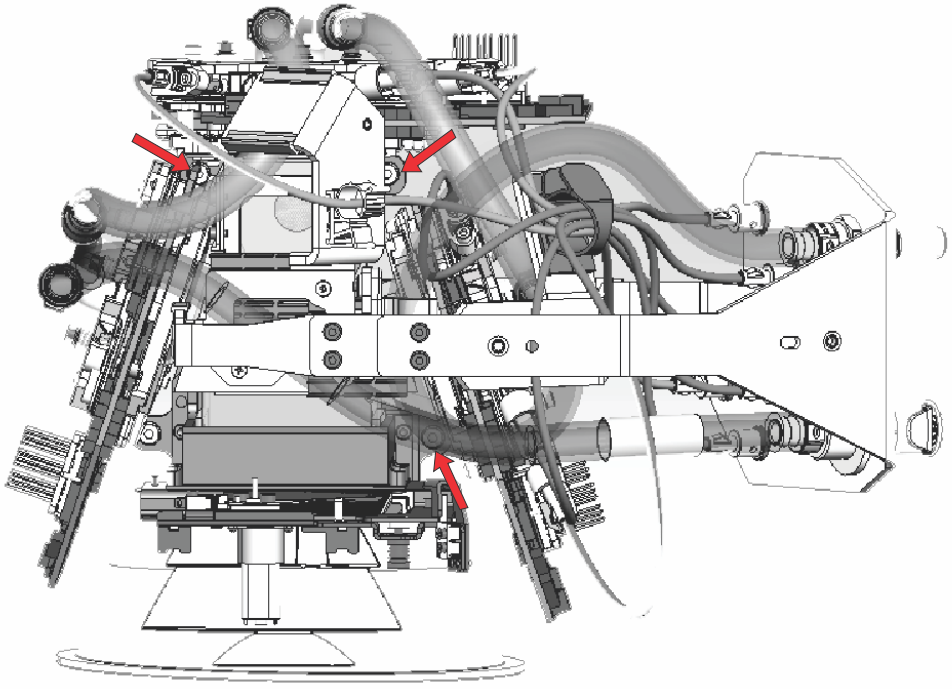


10. Remove the light engine from the projector.
11. Place the light engine on the light engine plate.
    If you do not have the light engine plate, place the light engine on the front light engine cover.
12. Replace the light engine.
13. To re-install, follow these steps in reverse order.

Packing the existing light engine

Use the shipping brackets, shipping plate, and hardware from the light engine packaging to prepare the existing light engine for return shipping.

1. Place the existing light engine onto the shipping base plate.
2. Tighten the three screws and attach the light engine to the base plate.

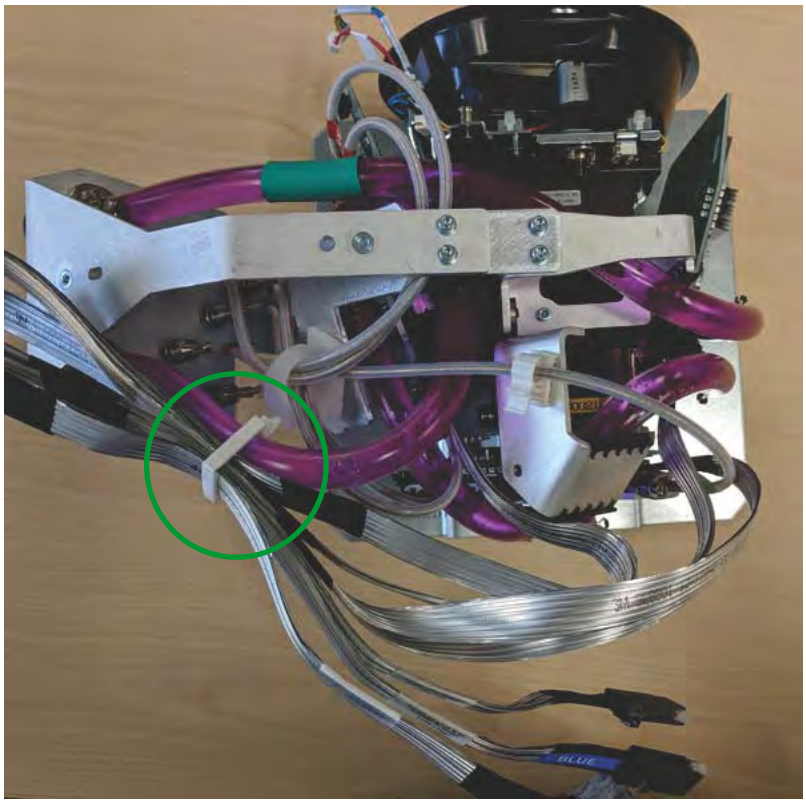


Tighten the screws to 15 in-lb to ensure the light engine does not become detached from the base plate during transportation.

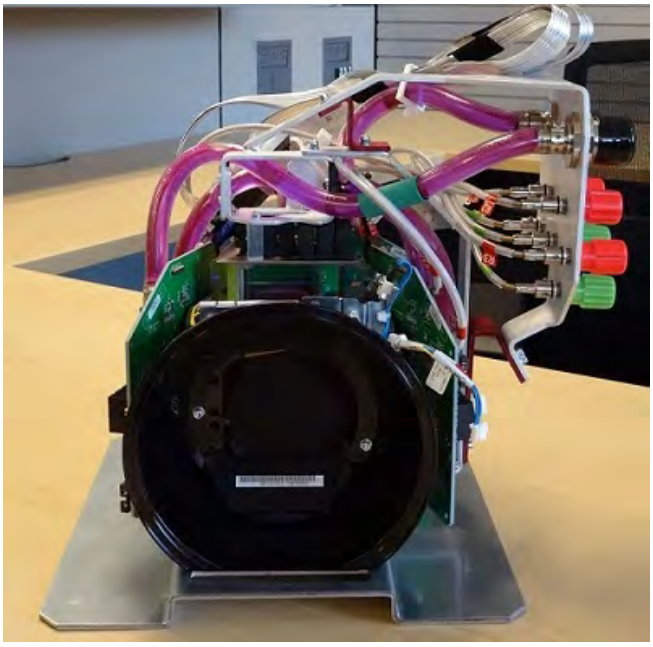
3. Remove the two screws from the top convergence plate bracket.
4. Remove the two screws from the side convergence plate bracket.
5. To stabilize the top convergence plate bracket, align the top shipping bracket (red) with the three empty screw holes.
6. To secure the top shipping bracket, insert three screws and tighten them.

   Tighten the screws to 8 in-lb.
7. To stabilize the side convergence plate bracket, align the side shipping bracket (red) with the four empty screw holes.
8. To secure the side shipping bracket, insert four screws and tighten them.

   Tighten the screws to 8 in-lb.
9. Attach a zip tie to secure the light engine coolant hose and mini SAS cables, making sure the hose and cables are not pinched against any part of the light engine or convergence plate.



When complete, the light engine should resemble the photograph below:



10. Place the light engine and shipping base plate assembly into the ESD bag.
11. Tape the ESD bag to seal it.
12. Place the sealed light engine into the packaging insert tray.

13. Insert the cardboard shipping sleeve into the box.

14. Place the sealed light engine and insert tray into the box.

15. Seal the box for shipment.
16. Return the packaged light engine to Christie.

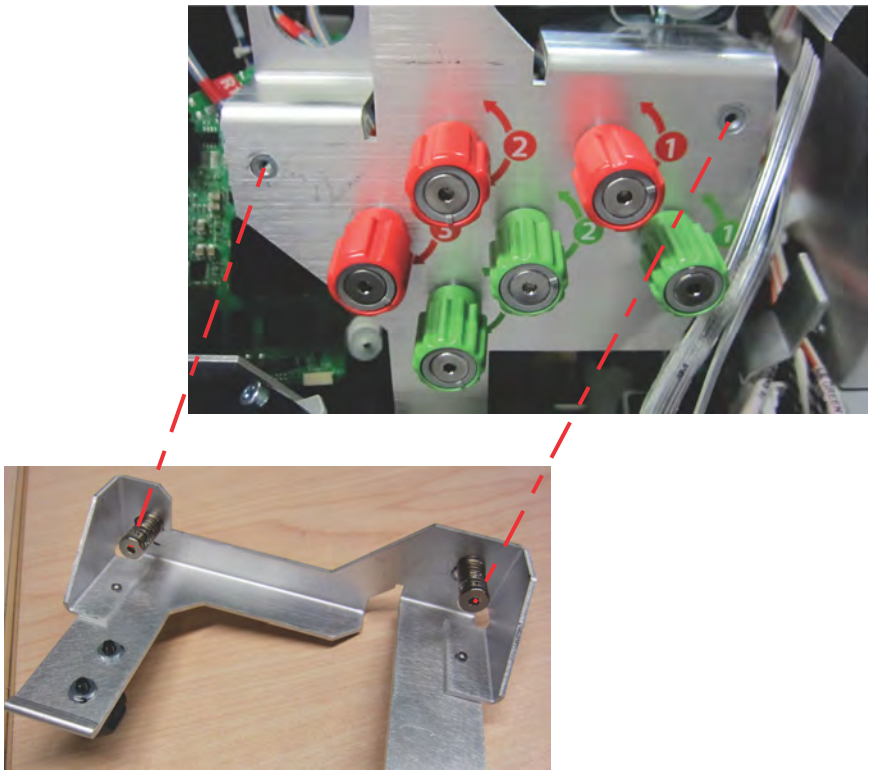
Light Engine Adapter kit

If replacing the light engine (P/N: 003-107210-XX) with the 003-109995-XX version, you must install the Light Engine Adapter kit (P/N: 003-200640-XX).

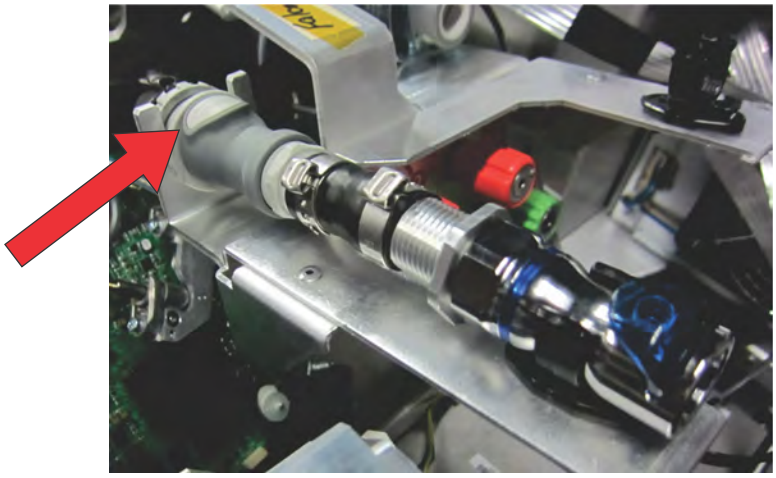
The Light Engine Adapter kit contains three components that must be installed to connect the new light engine to the existing radiator and pump module.

- Liquid cooling bracket mount (P/N: 000-200641-XX)
- QD-M connector (P/N: 000-200644-XX)
- QD-F connector (P/N: 000-200643-XX)

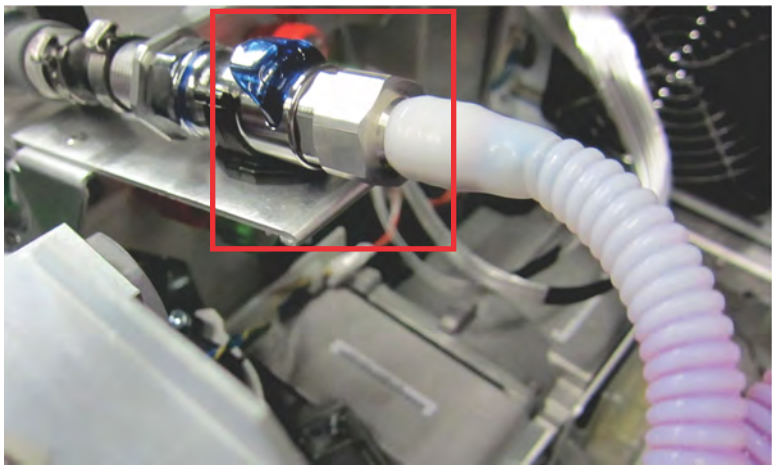
1. Ensure the 003-109995-XX light engine is installed.
2. Install the liquid cooling bracket mount (P/N: 000-200641-XX).
   a) Locate the two holes at the top of the light engine bracket.
   b) Align the screws of the liquid cooling bracket mount with the holes on the light engine bracket.



   c) Tighten the screws to secure the liquid cooling bracket mount.
3. Install the QD-M connector (P/N: 000-200644-XX).
   a) Connect the QD-M connector to the input on the DMD side of the light engine.
   Make sure the connector is held by the holder.

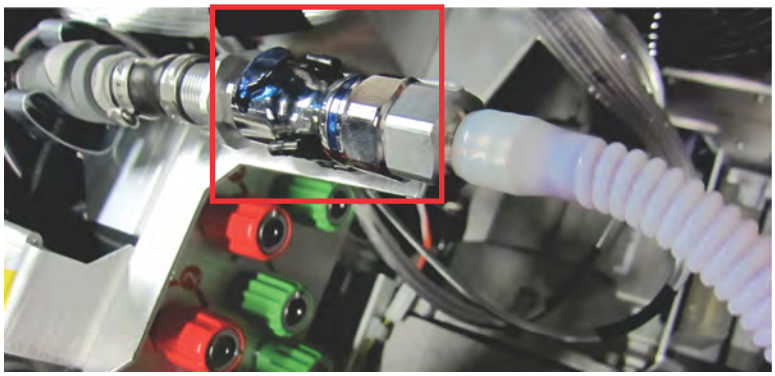


b) Connect the other end of the QD-M connector to the liquid cooling pump's output tube. Make sure the blue plug is aligned on the top.



4. Install the QD-F connector (P/N: 000-200643-XX).
   a) Connect the QD-F connector to the output on the DMD of the light engine. Make sure the connector fits into the plastic holder.

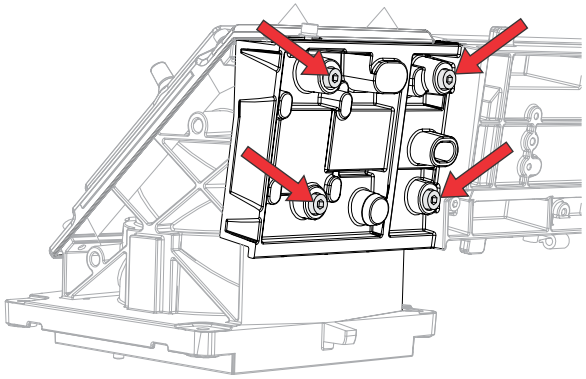
b) Connect the other end of the QD-F connector to the radiator's coolant output connector. Make sure the blue plug is aligned on the top.



LOS coupling elbow

These instructions provide details for replacing the projector LOS coupling elbow.

1. *Remove the integrator assembly* (on page 67).
2. Remove the four screws securing the coupling elbow.



3. Install the new coupling elbow on the integrator assembly.
4. To re-install these components (except the top and electronics-side covers), follow these steps in reverse order.

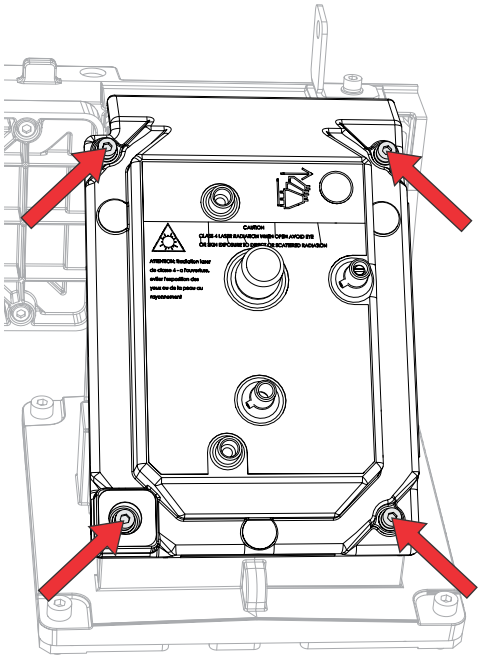
   Torque all M4 screws to 15 in-lb and all M3 screws to 8 in-lb. Make sure the card cage and top cover locking pins are engaged when re-installing.

   The optical access door must be opened to make integrator rod and fold mirror adjustments and the electronics-side cover must be removed for making LOS coupling mirror adjustments. For more information, refer to the projector documentation.
5. After re-installing the components, perform these tasks:
   a) Torque all M4 screws to 15 in-lb and all M3 screws to 8 in-lb.
   b) Ensure the card cage and top cover locking pins are engaged when re-installing.
   c) Perform a LiteLOC calibration.

Coupling elbow mirror

Learn how to replace the coupling elbow mirror.

1. *Remove the card cage* (on page 45).
2. Remove the screws securing the mirror.



3. Rotate the four spring clips clear of the mirror.
4. Replace the mirror assembly.
5. To re-install, follow these steps in reverse order.
6. After re-installing the assembly, perform optical adjustments and software calibration.

Laser optical subsystem (LOS)

Two methods are available to remove the LOS: flipping the unit on the side or using the H1 LOS service kit (P/N: 163-123107-XX) from the bottom of the projector.

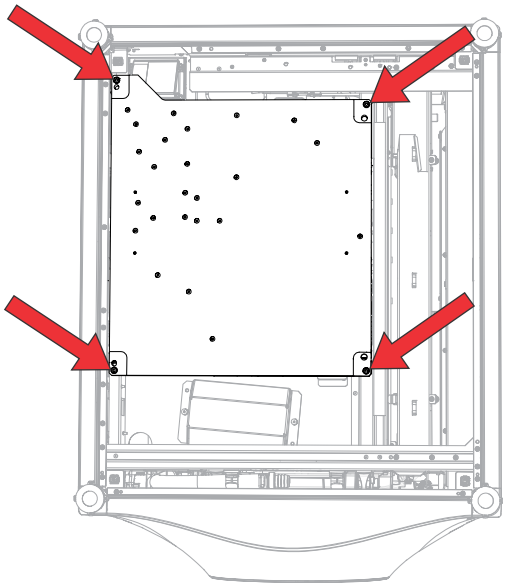
1. Remove the following covers from the projector: *top cover* (on page 38), *rear cover* (on page 39), *electronics-side cover* (on page 40), *side-intake cover* (on page 41), and *bottom cover* (on page 42).
2. *Remove the radiator* (on page 62).
3. *Remove the radiator intake fan pack* (on page 59).
4. Verify the two LOS liquid cooling hoses have been disconnected.
5. To remove the bottom-left cover connection bracket, loosen the two screws securing it.
6. Disconnect the harnesses from the LOS.

   J150, J151, J152, and J153 from the red board and J155, J156, J157, J158, and J159 from the green board.

If having problems accessing the harnesses, *remove the laser card cage* (on page 51).

7. Prepare to remove the LOS.
   - If using the H1 LOS service kit, place the jack under the center of the LOS on the bottom of the projector. Minimum height requirement is 250 mm (9.8 inches).
   - If not, flip the projector on its side.

     Christie recommends flipping the projector on the intake side.
8. Loosen the four screws on the bottom of the LOS.



9. Remove the LOS.
   - If the unit is flipped on its side, pull out the LOS.
   - If using the H1 LOS service kit, start to wind down the jack and remove the LOS.

   When handling the LOS, insert the ESD protection plugs into the connections of the LOS.
10. Replace the LOS.
11. To re-install, follow these steps in reverse order.
12. After re-installing the LOS, perform software calibration (LiteLOC™ v2 or *LiteLOC™ v1* (on page 100)).(See also *LiteLOC calibration for cinema projectors* (on page 103).)

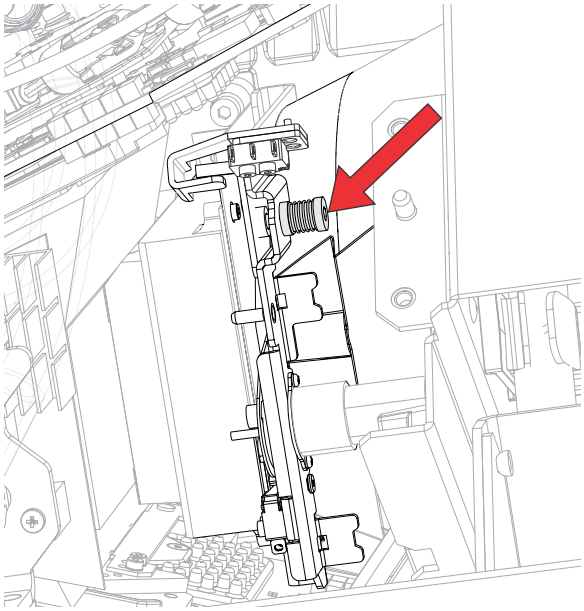
Shutter

The shutter blocks the light coming into the projector lens.

1. *Remove the top cover* (on page 38).
2. *Remove the light dump* (on page 72).
3. Disconnect the two inline harnesses cables on the shutter.
4. Loosen the screw securing the shutter.

   Christie recommends using a short, right-angle 3 mm Allen key.

   If a right-angle Allen key is unavailable, the engine can be removed for front access using the provided straight 3 mm ball driver.



5. Pull out the shutter.
6. Replace the shutter.
7. To re-install, follow these steps in reverse order.

Printed circuit boards and sensors

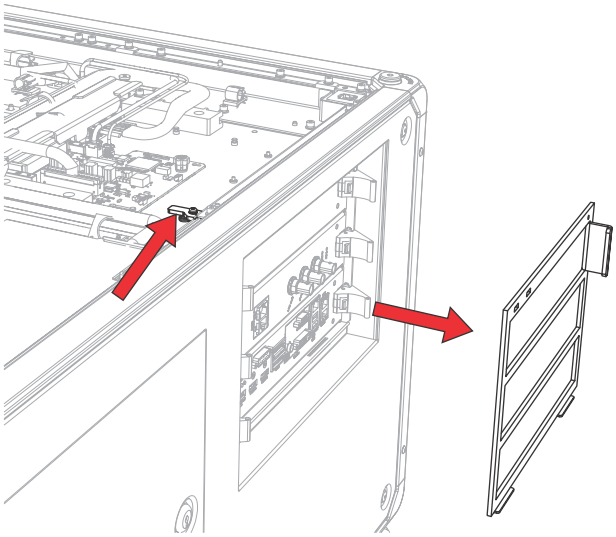
Printed circuit boards (PCB) mechanically support and electrically connect the projector components. Sensors convert information such as temperature, light, and communication into electrical signals.

Always wear an electrostatic discharge (ESD) strap and use insulated tools when replacing circuit boards.

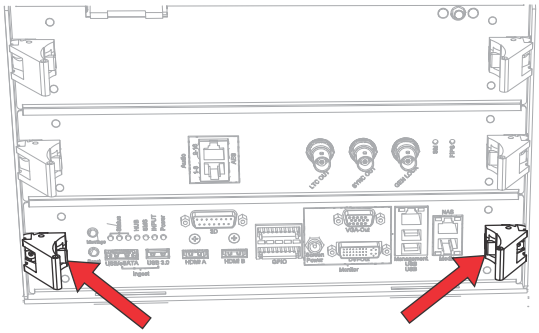
F-Main electronics card

The F-Main electronics card is the primary input panel that processes information and manages communication for the projector.

1. *Remove the top cover* (on page 38).
2. To remove the marriage ring, push the locking lever and pivot the marriage ring from the bottom to pull it out.



3. To remove the F-Main electronics card, press the two red locking tabs and pull the card out.

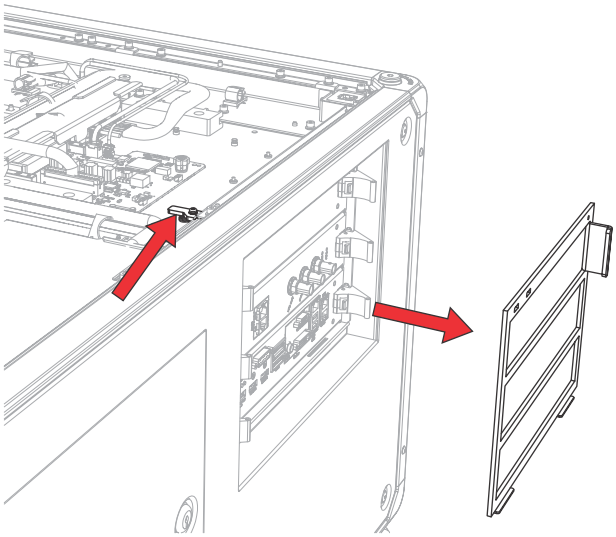


4. Replace the F-Main electronics card.
5. To re-install, follow these steps in reverse order.

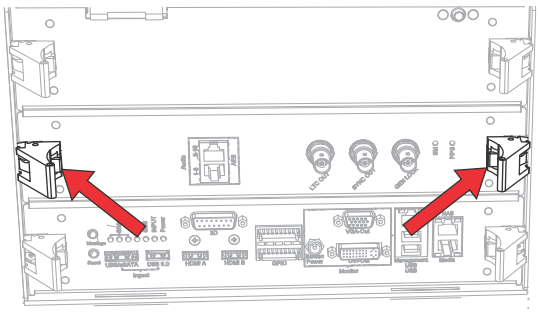
IMB

The integrated media block (IMB) decrypts and decodes feature-film (Hollywood) content and delivers it to the projector in a useable format.

1. *Remove the top cover* (on page 38).
2. To remove the marriage ring, push the locking lever and pivot the marriage ring from the bottom to pull it out.



3. To remove the IMB, press the two red locking tabs and pull the IMB out.

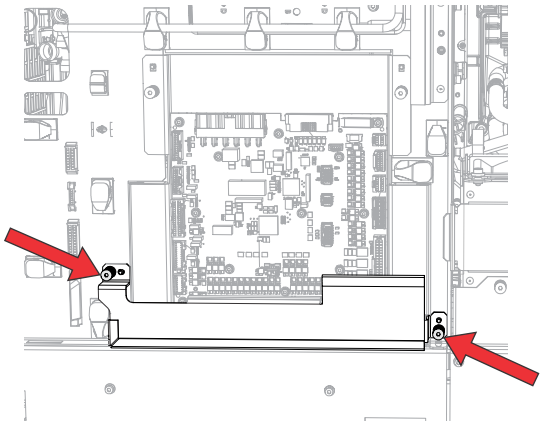


4. Replace the IMB.
5. To re-install, follow these steps in reverse order.

Housekeeping board (HKBB)

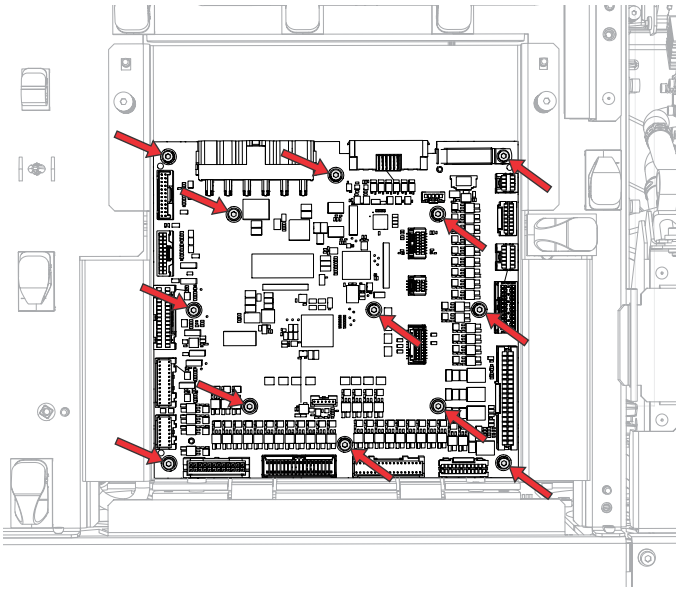
The housekeeping (HKBB) board acts as an interface board with the majority of the control devices feeding into it, including fans, power supply input, shutter, IR receivers, and so on.

1. *Remove the top cover* (on page 38).
2. Loosen the two screws securing the housekeeping bracket and remove the bracket.



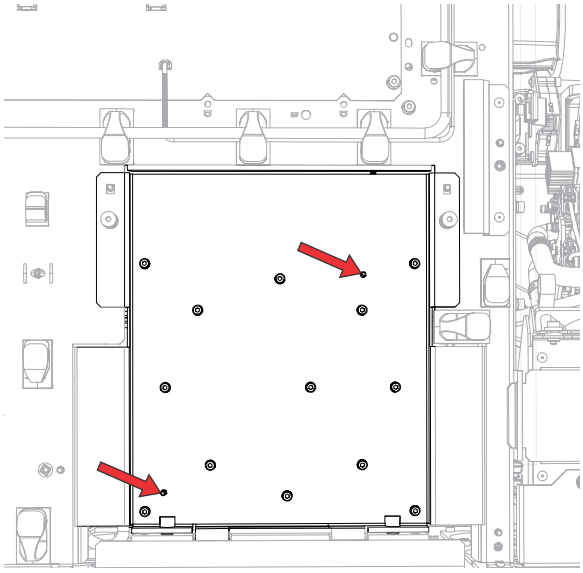
3. Disconnect the 12 harnesses from the housekeeping board.

   The harnesses to disconnect: J30, J81, J85, J89, J101, J102, J103, J104, J105, J110, J112, and J129.
4. Remove the bracket and housekeeping board from the projector.
5. Remove the 13 screws securing the housekeeping board.



6. Pull back the harnesses and remove the board.

7. Place the new board, making sure to align it with the two locating pins.

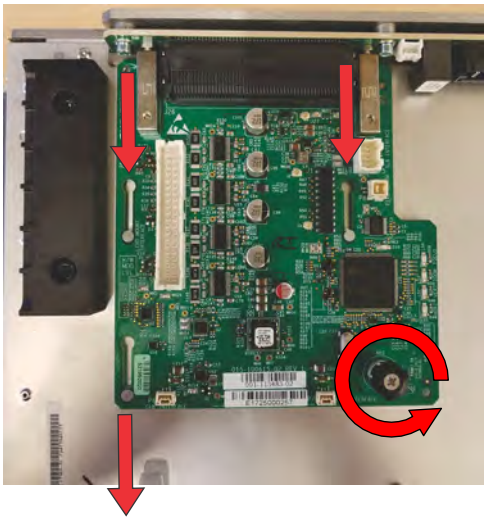


8. To re-install, follow these steps in reverse order.

System compatibility board (SCCB)

Learn how to remove the system compatibility board (SCCB).

1. *Remove the top cover* (on page 38).
2. Loosen the screw located on the SCCB.
3. Disconnect all harnesses from the board.
4. To disconnect the SCCB from the HUB-NX, slide the SCCB back and remove it.

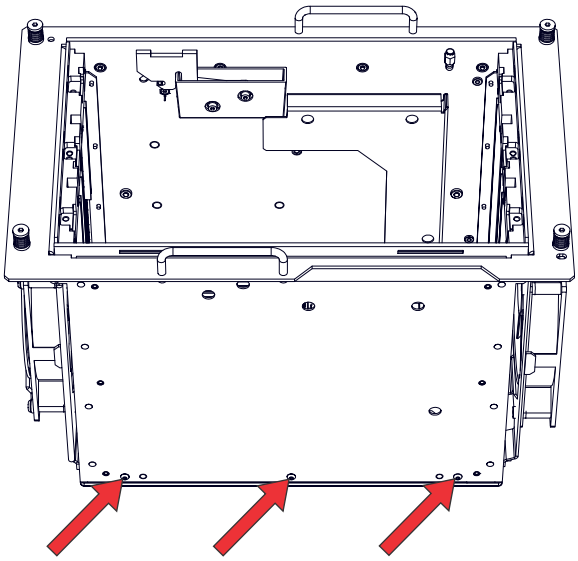


5. Replace the SCCB.
6. To re-install, follow these steps in reverse order.

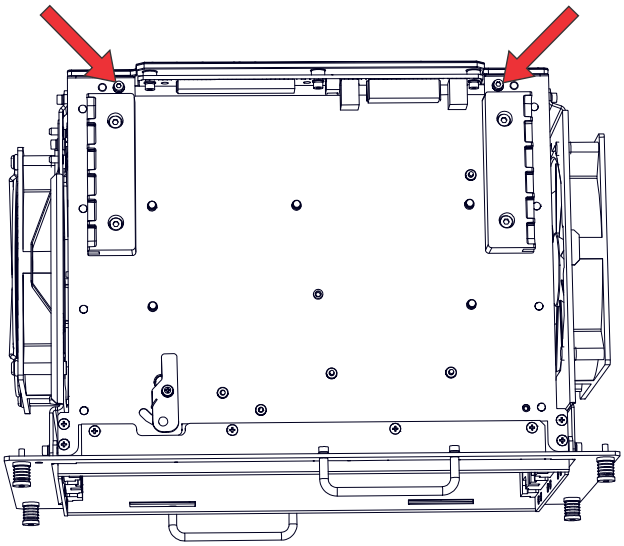
HUB-NX

Learn how to replace the HUB-NX.

1. *Remove the card cage* (on page 45).
2. *Remove the IMB* (on page 86).
3. *Remove the F-Main electronics card* (on page 85).
4. *Remove the SCCB* (on page 88).
5. Remove all option cards.
6. Remove the blank faceplate.
7. Disconnect fan 1 harness P2, fan 4 harness P29, and the marriage ring switch harness J4.
8. Remove the three screws securing the HUB-NX to the card cage, located at the bottom of the card cage.



9. Remove the two screws securing the HUB-NX to the card cage, located at the top of the card cage.

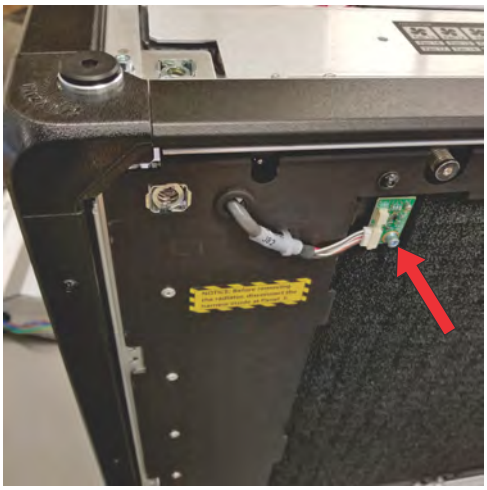


10. Remove and replace the HUB-NX.
11. To re-install, follow these steps in reverse order.

Dual temperature sensor module (DTSM)

The dual temperature sensor module (DTSM) monitors the ambient air temperature going into the projector.

1. *Remove the side-intake cover* (on page 41).
2. Disconnect the DTSM inline harness connector F and connector J82.
3. Remove the screw securing the DTSM.

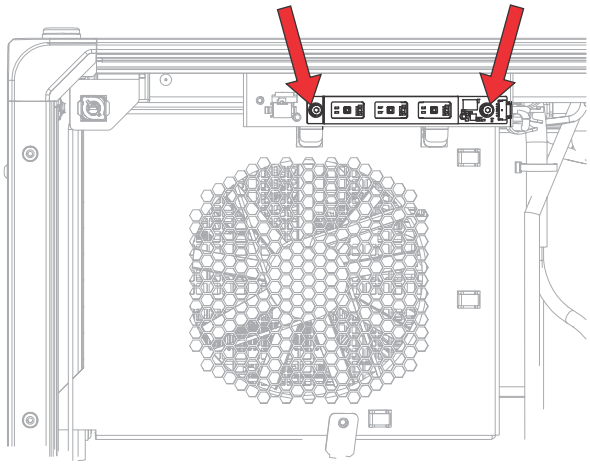


4. Replace the DTSM.
5. To re-install, follow these steps in reverse order.

Status LED board (SLB)

The status LED board (SLB) provides visual information about the operational state of the projector.

1. *Remove the rear cover* (on page 39).
2. Disconnect the SLB harness connector J1 from the SLB.
3. Remove the two screws securing the SLB and remove the board.

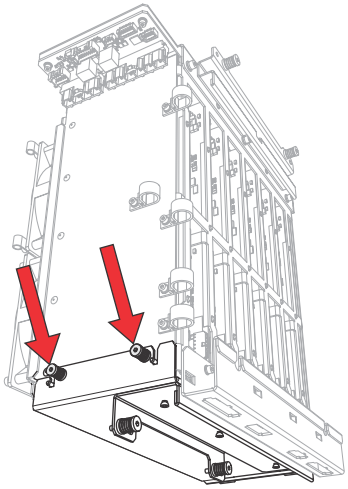


4. Replace the SLB assembly.
5. To re-install, follow these steps in reverse order.

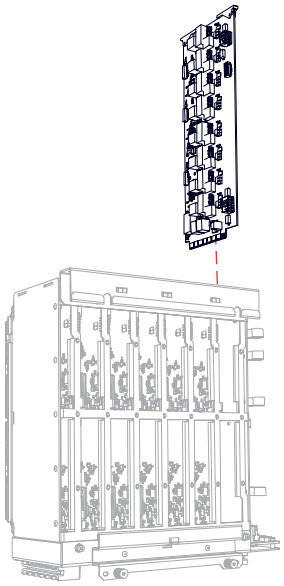
Low voltage current source (LVCS) board

Learn how to replace the low voltage current source (LVCS) board.

1. *Remove the laser driver card cage* (on page 51).
2. Loosen the two screws securing the bottom cover plate and pivot to remove it.



3. Disconnect the LVCS harness connectors J162, J163, and J164.
4. Release the locking tab to slide the LVCS out of the cage and remove it.

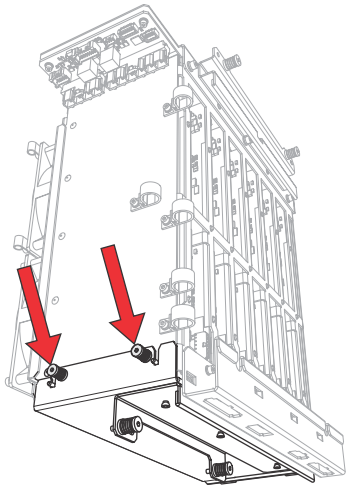


5. Replace the LVCS.
6. To re-install, follow these steps in reverse order.

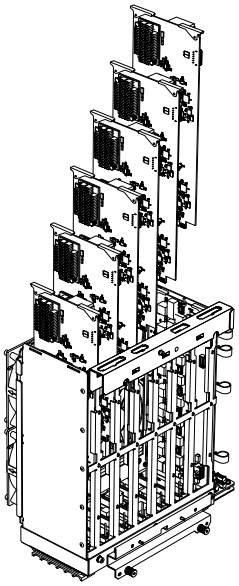
High voltage current source boards

Learn how to replace the HVCS-R, HVCS-G, and HVCS-B boards.

1. *Remove the laser driver card cage* (on page 51).
2. Loosen the two screws securing the bottom cover plate and pivot to remove it.



3. Disconnect the HVCS harness connectors J161 from the board being replaced.
4. Slide the HVCS board out of the cage and remove it.

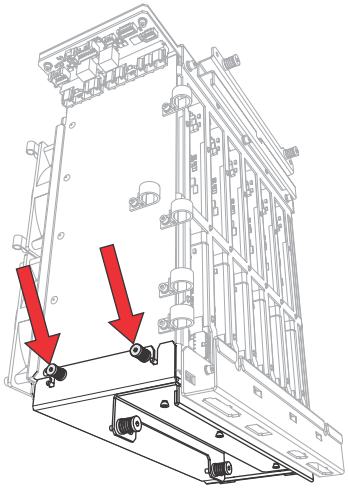


5. Replace the HVCS board.
6. To re-install, follow these steps in reverse order.

Laser backplane (LBP7) board

The laser backplane board (LBP7) provides the main interconnection for the laser boards.

1. *Remove the laser driver card cage* (on page 51).
2. Place the LDCC on level surface, resting on the plastic rails.
3. Loosen the two screws securing the bottom cover plate and pivot to remove it.



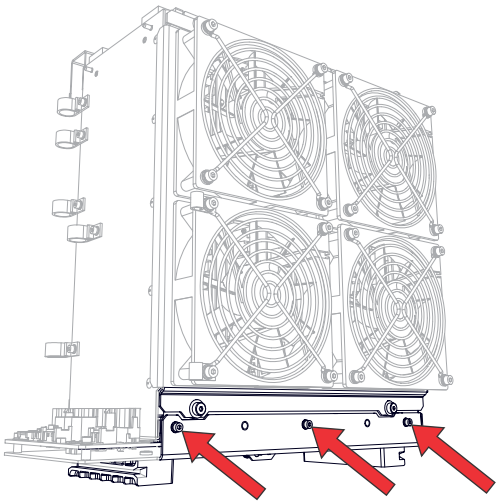
4. Remove all harnesses from the HVCS and LVCS boards.
5. Use the locking tabs located on each of the seven PCBs to disconnect them form the laser backplane board.

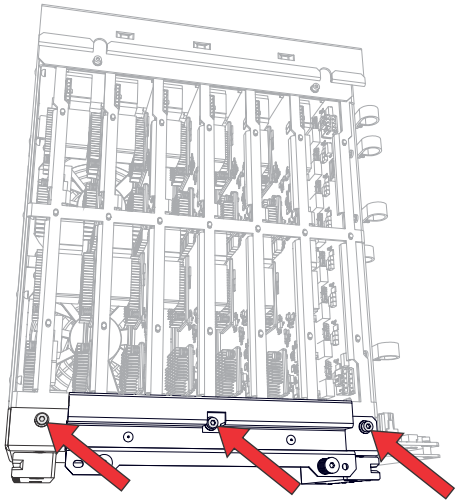
   The locking tabs are located on the bottom end of the LDCC.

6. Note the location of each board in the card cage and carefully remove all boards from the card cage.

   Set the boards on an ESD-safe surface.

7. Remove the six screws securing the laser backplane board bottom cover to the laser driver card cage housing.



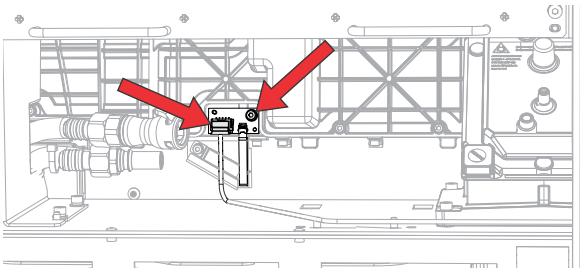


8. Remove bracket from the cage.
9. Remove the laser backplane board from the bracket and move the bracket to the new laser backplane board.
10. Replace the laser backplane board.
11. To re-install, follow these steps in reverse order.

Diffuser control board (DIB PCB)

Learn how to replace the diffuser control board (DIB).

1. *Remove the pump module* (on page 64).
2. Disconnect the J135 harness connector, the J136 harness connector, and the harness to the diffuser.



3. Remove the screw (the right arrow in the image in step 2) securing the board and remove the board.
4. Replace the board.
5. To re-install, follow these steps in reverse order.

Color sensor board

Remove the color sensor board and replace it with the upgraded board. A mechanical upgrade to the housing is also required.

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

- SHOCK HAZARD! Disconnect the product from AC before installing, moving, servicing, cleaning, removing components, or opening any enclosure.
- Always connect the ground or earth first to reduce shock hazard.
- Observe all electrostatic precautions. Use a grounded wrist strap and insulated tools when handling, servicing, or cleaning electronic assemblies.

1. Disconnect the projector from power.

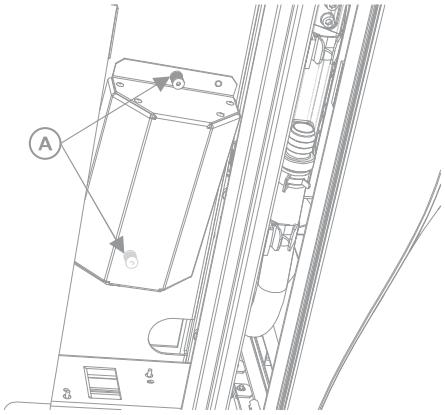
   Allow approximately 10 minutes for the projection system and mirror to cool-down before servicing.

2. Raise the projector feet to create a clearance under the projector of approximately 12 cm (4 ¾ inches).

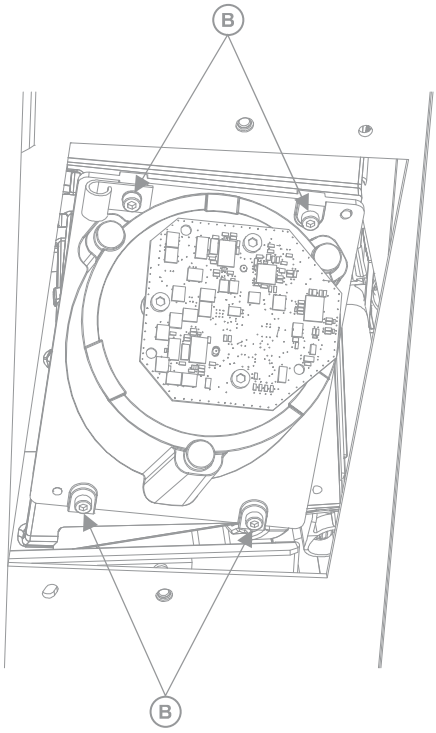
   Alternatively, tip the projector so it is resting on its side.

   Before performing the upgrade procedure on a CP4325-RGB projector, consider inverting the projector onto either its side or top-face for all service operations. If you cannot re-orient the projector due to environmental or logistical constraints, all service operations can be completed in landscape orientation: however an increased difficulty in component access, tool manipulation, and an increased risk in component damage exist if glass elements are not handled carefully.

3. Remove the bottom cover.
4. Loosen the two fasteners from the installed cover (A in the image below).



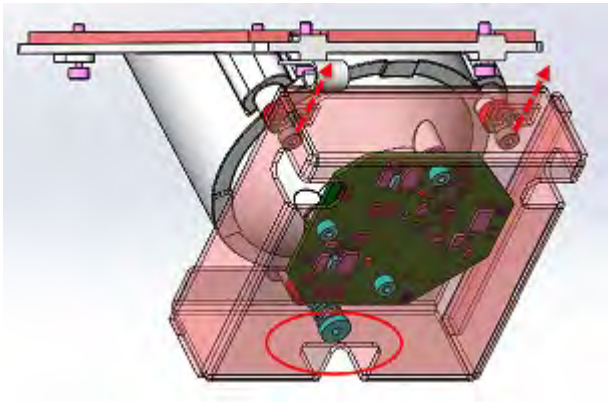
5. Remove the cover and set it aside.
6. Locate and loosen the four fasteners on the color sensor housing (B in the image below).



7. Gently pull the housing off the locating pins, allowing the assembly to hang by the harness.
8. Disconnect the harness from the PCB header and the harness retention clip.

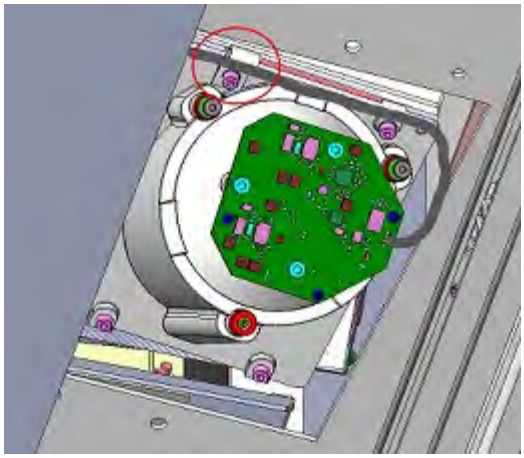
   The cover, housing, PCB, and fasteners can be discarded.
9. For CP4325-RGB only, *replace the coupling elbow mirror* (on page 82).

   The fold mirror, installed directly behind the color sensor housing, must be exchanged for the new version supplied in the upgrade kit. The surface of the legacy fold mirror is silver/reflective on both sides, while the surface of the new fold mirror is silver/reflective on one side and black with a pin-sized through-hole to allow partial light transmission on the other side.
10. On the new housing, locate and loosen the faster holding the metal guard to the housing.
11. Slide the metal guard from the shoulder screws holding it in place and discard the guard.



12. Remove the two screws securing the board to the housing and discard the screws.
13. Connect the harness to the new board.

14. Using the locating pins, position the PCB on the housing and re-install the three screws.
    Do not over-torque the screws.
15. Route the harness through the housing clip.

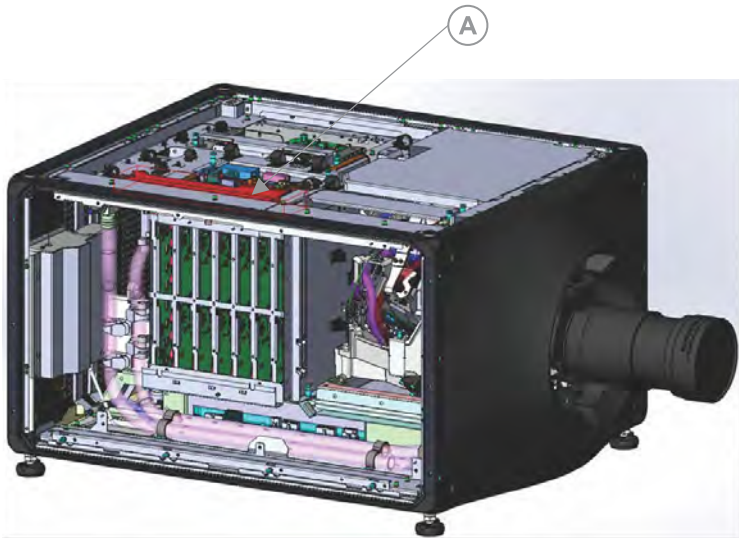


16. Install the new housing in the same position as the previous housing.
    You may need to use a flashlight to see the screw locations.
17. Perform a DAC and color sensor color calibration.
    Calibration of the color sensor board must be completed after replacing the LOS or the color sensor board. When replacing the LOS, only the color sensor color calibration is required.
18. Re-install the color sensor cover.
19. Re-install the bottom cover.

Color sensor board harness

If the color sensor board harness becomes damaged during installation, replace it with the enhanced harness included with the kit.

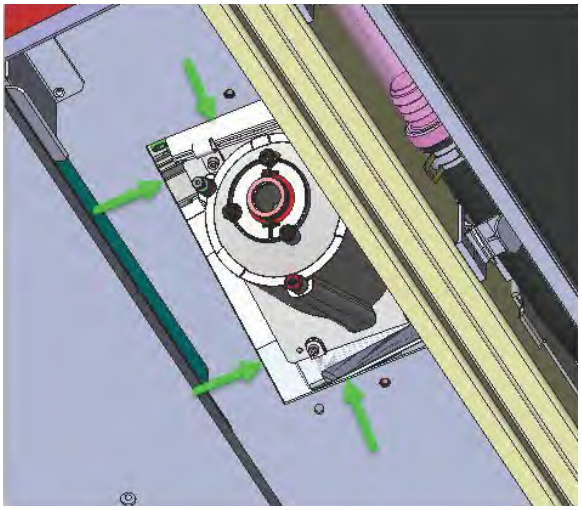
1. Remove the following system components:
    a. *Side intake cover* (on page 41)
    b. *Radiator module* (on page 62)
    c. *Radiator fan intake module* (on page 59)
    d. *Light engine fan intake module* (on page 60)
    e. Housekeeping board cover (A)



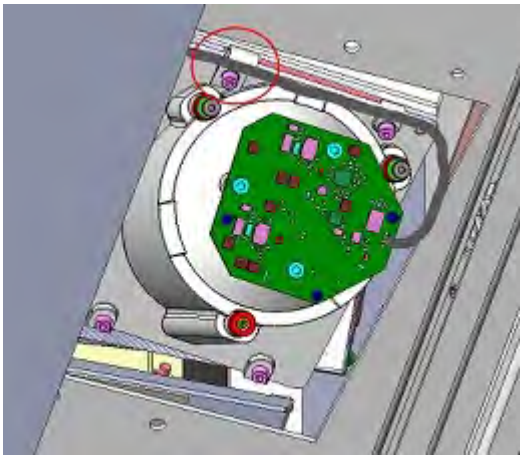
2. Detach the color sensor board from the housing and disconnect the harness and set the board aside.
3. Remove harnesses from clips on the color sensor housing.
4. Standing at the radiator-side of the projector, disconnect the color sensor board harness from the housekeeping board at J85.
5. Remove the color sensor board harness from routing clips starting near the housekeeping board and finishing at the P-clip fastened to the base plate in front of the IOS.

6. Gently pull the harness out from underneath the illumination optical system (IOS).

   Take care when removing the hose as a square hole is on the underside of the unit which may have sharp edges.



7. Install the new color sensor board harness (P/N: 001-113506-02) starting near the housekeeping board, routing through all routing clips and finishing at the lowest P-clip.



8. Gently route the color sensor board harness under the IOS and pull it into position at the underside of the projector.
9. Connect the harness to the color sensor board.
10. Re-install the color sensor board. modules, and covers previously removed.

Performing the DAC calibration

Calibrate the black levels for the new color sensor board.

1. Prepare the projector for DAC calibration:
   a) Turn off the laser light.
   b) Close the shutter.
   c) Install the lens cap.
      The lens cap minimizes any stray light entering through the lens and maximizes darkness around the sensor during the calibration.
2. Enable direct communication to photon controller.

a) Set the IP address of the projector and the IP address of the laptop to be on the same subnet.

   This connection can be a direct connection to the management port on the FMAIN through wired/wireless network.

b) Connect the laptop to the projector using Net Terminal or Kore Librarian, with port 5000.

c) Log in as the Service account.

d) To enable the communication to the photon controller, send the command `(CAL+PASS 1)`.

3. Connect the laptop to the photon controller using Net Terminal or Kore Librarian, with port 5103.
4. To start the DAC calibration, send the following command: `(ENG+CALB 0 0)`.

   This process takes approximately one minute. The system displays information on the start and finish of the calibration process. DAC calibration is only required after replacing the color sensor board.
5. Remove the lens cap.
6. To complete the calibration, power cycle the projector.

Performing the LiteLOC™ version 1 calibration

Due to the manufacturing tolerance of the color sensor board and the LOS system, calibrate the LiteLOC version 1 response to the light intensity as the temperature of the laser devices changes.

1. Contact Christie Technical Support for a copy of the Horizon Factory Calibration Procedure spreadsheet.
2. On the projector, display a framing test pattern.
3. Setup the color meter in the same manner as used for creating laser and MCGD files.
4. Log into the projector with Installer access or higher.
5. Navigate to **Laser Settings** > **Laser Power/LiteLOC Setup**.
6. Set the following values:
   - **Display White Test Pattern** is enabled
   - **LiteLOC** is disabled
   - Maximum Expected Room Temperature: 35 degrees Celsius
   - Red power level: 78.3%
   - Green power level: 63.2%
   - Blue power level: 66.4%
7. Wait 15 minutes for the laser devices to acclimatize to the new values.
8. Adjust the blue and green power levels to achieve an applicable white point, as measured by the color meter.

   Do not adjust the red value.

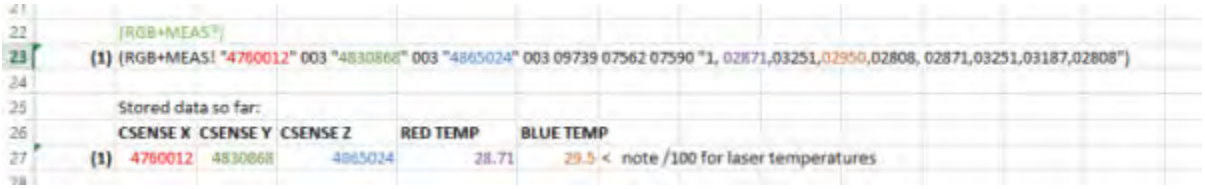
   - For CP43XX-RGB series projectors, the DCI white point is x=0.314 (+/- 0.006), y=0.351 (+/- 0.006).

   Wait a few minutes for the lasers to stabilize and make sure the white point is not shifting between measurements.
9. Re-establish the connection to the photon controller using NetTerminal or Kore 10-bit Librarian, on port 5103.

10. Send the command `(RGB + MEAS?)` to the photon controller.

    The current color sense X, Y and Z values are returned, showing the temperature of the different devices. For example:

    - Red: Color sense X value
    - Green: Color sense y value
    - Blue: Color sense Z value
    - Purple: Red devices temperature * 100
    - Brown: Blue devices temperature * 100



11. Enter the returned values into line 27 and line 63 of the spreadsheet.

    The temperature values reported in NetTerminal must be divided by 100 before being entered on line 27 and Line 63.

    All temperatures returned from serial commands are in degrees Celsius.

12. Use Kore Librarian to connect to the projector on port number 5000.
13. Login to the projector with Service access.
14. Switch to the Scripting tab.
15. To lower the fan speed and increases the internal temperature of the laser devices, use the script for the upgraded projector.

    Lowering the fan speed allows for another set of Color sensor measurements to be collected at a higher temperature without actually changing the room temperature.

    - **CP43XX-RGB series projectors**

      Kore Librarian must be used as NetTerminal is not capable of sending a script.

```
sub main()
proj.sendstring( "(CAL+FANS 5 45 )" )
proj.sendstring( "(CAL+FANS 6 45 )" )
proj.sendstring( "(CAL+FANS 7 45 )" )
proj.sendstring( "(CAL+FANS 8 45 )" )
proj.sendstring( "(CAL+FANS 9 45 )" )
proj.sendstring( "(CAL+FANS 10 45 )" )
proj.sendstring( "(CAL+FANS 11 45 )" )
proj.sendstring( "(CAL+FANS 12 45 )" )
proj.sendstring( "(CAL+FANS 13 45 )" )
proj.sendstring( "(CAL+FANS 14 45 )" )
proj.sendstring( "(CAL+FANS 15 45 )" )
proj.sendstring( "(CAL+FANS 16 45 )" )
proj.sendstring( "(CAL+FANS 17 45 )" )
proj.sendstring( "(CAL+FANS 18 45 )" )
proj.sendstring( "(CAL+FANS 19 45 )" )
proj.sendstring( "(CAL+FANS 20 45 )" )
proj.sendstring( "(CAL+FANS 21 45 )" )
proj.sendstring( "(CAL+FANS 22 45 )" )
proj.sendstring( "(CAL+FANS 23 45 )" )
proj.sendstring( "(CAL+FANS 24 45 )" )
proj.sendstring( "(CAL+FANS 25 45 )" )
proj.sendstring( "(CAL+FANS 26 45 )" )
```

```
proj.sendstring( "(CAL+FANS 27 45 )" )
proj.sendstring( "(CAL+FANS 28 45 )" )
proj.sendstring( "(CAL+FANS 29 45 )" )
end sub
```

16. To execute the script, click the red arrow.

    A confirmation the command has been executed is displayed, and the projector noise level goes down.

17. In the projector software, set the following values:
    - **Display White Test Pattern** is enabled
    - **LiteLOC** is disabled
    - Maximum Expected Room Temperature: 35 degrees Celsius
    - Red power level: 78.3%
    - Green power level: 66.3%
    - Blue power level: 70%
18. Wait 15 minutes for the laser devices to acclimatize to the new values.
19. Re-establish the connection to the photon controller using NetTerminal or Kore Librarian, on port 5103.
20. Send the command `(RGB + MEAS?)` to the photon controller.
21. Compare the new blue temperature to the original value.

    If the difference is less than eight degrees wait for a few more minutes and take another reading until the blue temperature is at least eight degrees higher than the original reading. You may need to modify the actual room temperature to achieve the target blue temperature.
22. Adjust the blue and green power levels to achieve a DCI white point, as measured by the color meter. Do not adjust the red value.
23. Send the command `(RGB + MEAS?)` to the photon controller.

    The system retrieves the color sensor X, Y and Z values, and the blue and red devices temperatures.
24. Verify line 63 of the spreadsheet has the values identified in step 10.
25. Enter the values returned in step 23 into line 64 of the spreadsheet.

    The spreadsheet automatically calculates the calibration data and populates line 96 on the calculator.

    The temperature values reported in NetTerminal must be divided by 100 before being entered on line 27 and Line 63.
26. Type the command on line 96 of the spreadsheet into NetTerminal or Kore Librarian and send it to the photon controller.

    The calibration data is saved to the color sensor board.
27. (CP43XX-RGB series projectors only) Close the LOS port.

    The port must be closed.

    a) To close the direct communication to Photon, connect the laptop to the projector using NetTerminal or Kore Librarian, with port 5000, and send the following command: `(CAL +PASS 0)`

    b) To verify the port is closed, connect to port 5103 and send the following command: `(SST?)`

    If a response is returned, the port is open and must be closed.

28. To reset all fans to the normal operating speed, reboot the projector.

LiteLOC™ calibration for cinema projectors

The LiteLOC calibration is performed in the factory under specific setup conditions which include the type of lens, screen, and the spectroradiometer used for measuring screen color and brightness.

Your projector's setup conditions may not match the factory setup which may result in a discrepancy in color accuracy. Upon first installation, check the accuracy of the color point and if unsatisfactory, perform this calibration. Doing this calibration captures all the variables of your setup and achieves the best results. By doing this calibration, you will not overwrite the factory calibration. Once satisfied, some scenarios may exist in which you may need to re-do the calibration in the future.

Re-doing this calibration is required if the following is replaced:

- Color sensor board

Re-doing this calibration is optional if any of the following are replaced:

- Light engine
- Lens
- LOS (laser optical subsystem)
- Screen
- Any other optical components in the optical path between the LOS and the screen

After replacing these components, check the accuracy of the color point and if unsatisfactory, re-do this calibration.