



Installation and Setup Guide

020-103907-06

Cinema 2K-RBe

CP2406-RBe, CP2409-RBe, and CP2411-RBe

CHRISTIE®

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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, voids the warranty. For preventative maintenance schedules, refer to www.christiedigital.com.

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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.

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ENVIRONMENTAL



The product is designed and manufactured with high-quality materials and components some of which can be recycled and reused. This symbol  means 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, separate collection systems are 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!

Notation

Learn the hazard and information symbols used in the product documentation.



Danger messages indicate a hazardous situation which, if not avoided, results in death or serious injury.



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



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



Notice messages indicate a hazardous situation which, if not avoided, may result in equipment or property damage.



Information messages provide additional information, emphasize or provide a useful tip.

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Important safety guidelines

To prevent personal injury and to protect the device from damage, read and follow these safety precautions. This projector is intended for use in a cinema environment.

Important safety guidelines

Learn about the safety precautions related to the Christie Cinema 2K-RBe 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. Wait for the product to cool down before accessing the internal components for installation, service, or performing optical adjustments.
- 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.
- HAZARDOUS SUBSTANCE! Use caution when handling the product as it contains ethylene glycol. Do not ingest coolant. For information on safe handling, refer to the Safety Data Sheet (SDS) for the coolant.
- RADIATION HAZARD! Use of controls or adjustments, or performing procedures other than those specified may result in hazardous radiation exposure.
- 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 extreme 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 AC power cord must be inserted into an outlet with grounding.
SHOCK HAZARD! The 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.
- Always connect the ground or earth first to reduce shock hazard.
- A certified electrician must be present during installation to make sure the installation meets the local electrical code.



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

- Use an appropriately sized strain relief connector with the knockout plate provided, to make sure adequate environmental sealing and to prevent the AC supply cable from accidentally being torn out or rubbing against the knockout plate.
- **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

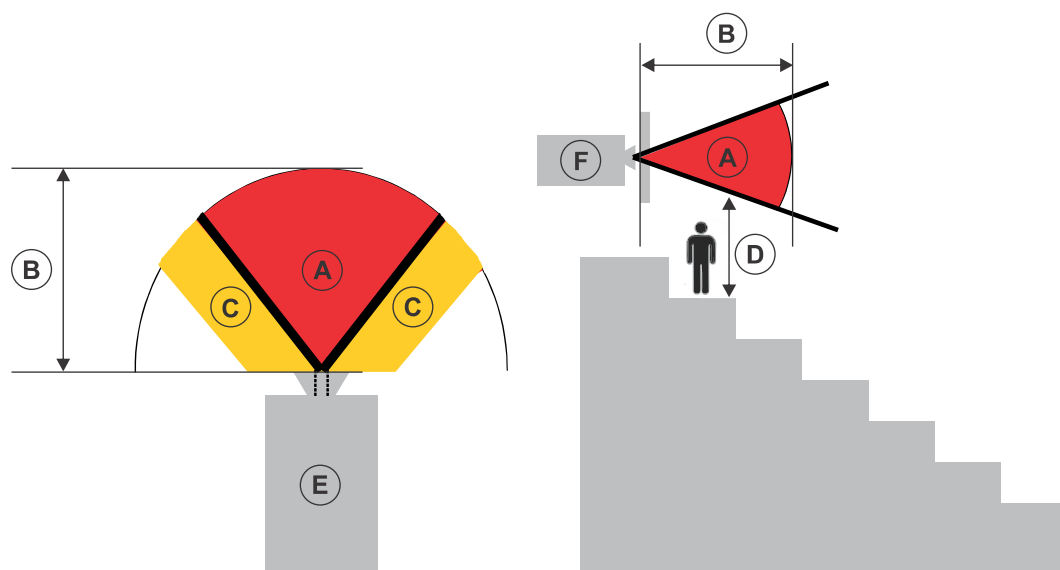
This projector has been classified as Risk Group 3 as per the IEC 62471-5:2015 standard due to possible hazardous optical and thermal radiation being emitted.



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 and no access zones are based on the type of venue the projector is installed in. For restrained environments, the hazard zone must be no lower than 2.5 meters/8.2 feet (US installations) or 2.0 meters/6.6 feet (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 (3.3 feet). For unrestrained environments, the hazard zone must be no lower than 3.0 meters (9.8 feet) above the floor and the horizontal clearance to the hazard zone must be a minimum 2.5 meters (8.2 feet).
- **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 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 their 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.** The no access zone must be followed based on the type of venue the projector is installed in.
 - For restrained environments like theaters and facilities where the audience is controlled with formal structures, supervision, or physical constraints, the no access zone must be no less than 1.0 meters (3.3 feet).

- For unrestrained environments like a concert venue or facility that has actions by individuals that are not controlled or guided by formal structures, supervision, or physical constraints and therefore may include unexpected actions that increase the likelihood of accidental hazardous exposure to optical radiation, the no access zone must be no less than 2.5 meters (8.2 feet).
- D—Vertical distance to hazard zone. The hazard zone above the floor must be followed based on the type of venue the projector is installed in.
 - For restrained environments like theaters and facilities where the audience is controlled with formal structures, supervision, or physical constraints, the hazard zone must be no lower than 2.5 meters/8.2 feet (US installations) or 2.0 meters/6.6 feet (global installations) above any surface upon which any persons are permitted to stand.
 - For unrestrained environments like a concert venue or facility that has actions by individuals that are not controlled or guided by formal structures, supervision, or physical constraints and therefore may include unexpected actions that increase the likelihood of accidental hazardous exposure to optical radiation, the hazard zone must be no lower than 3.0 meters (9.8 feet) above the floor.

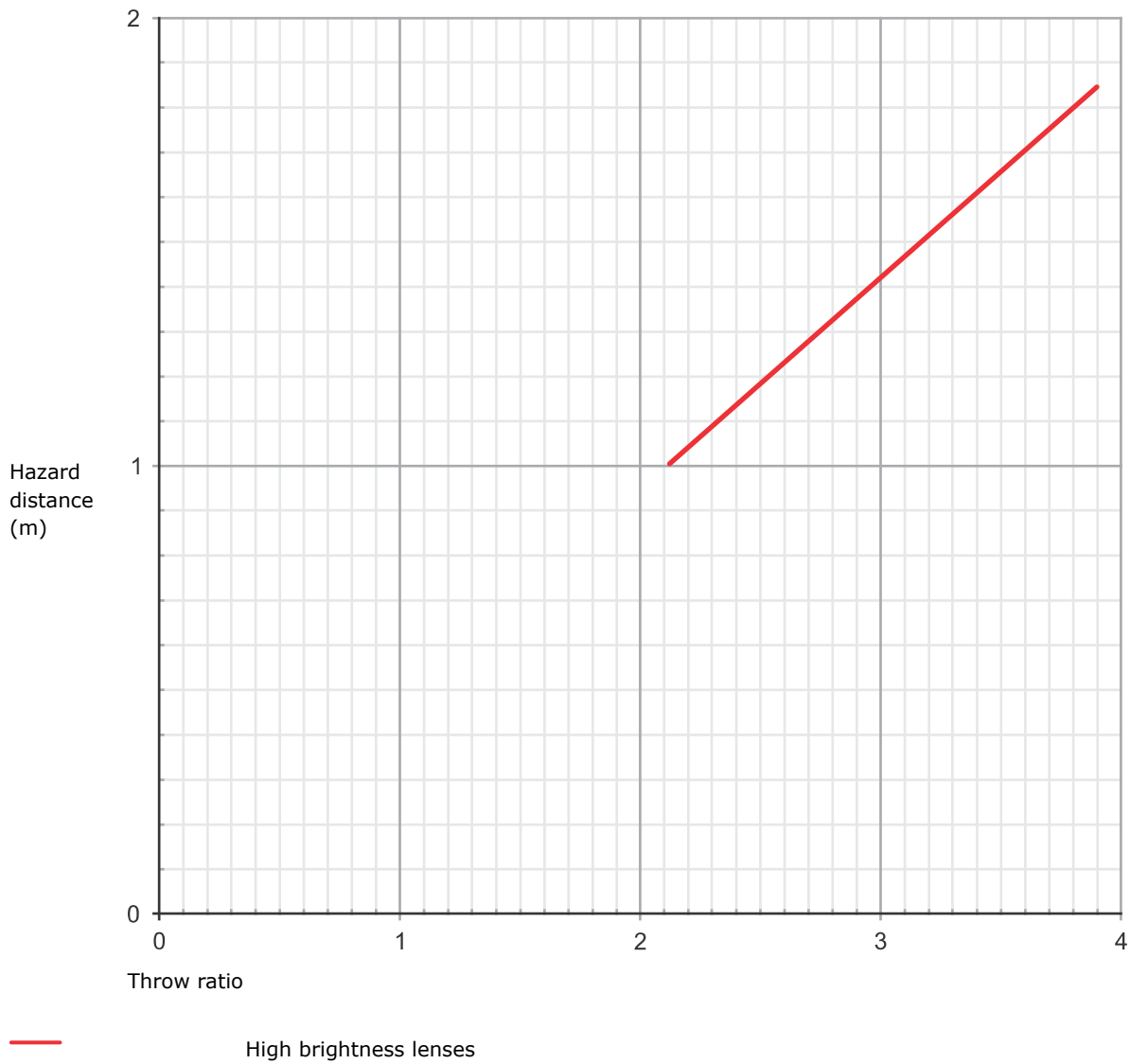
If the vertical distance to hazard zone requirement (Zone D) is satisfied, the horizontal clearance distance (Zone C) is not needed.

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

The following table lists the hazard distance for the Christie projector lens with the zoom adjusted to its most hazardous position.

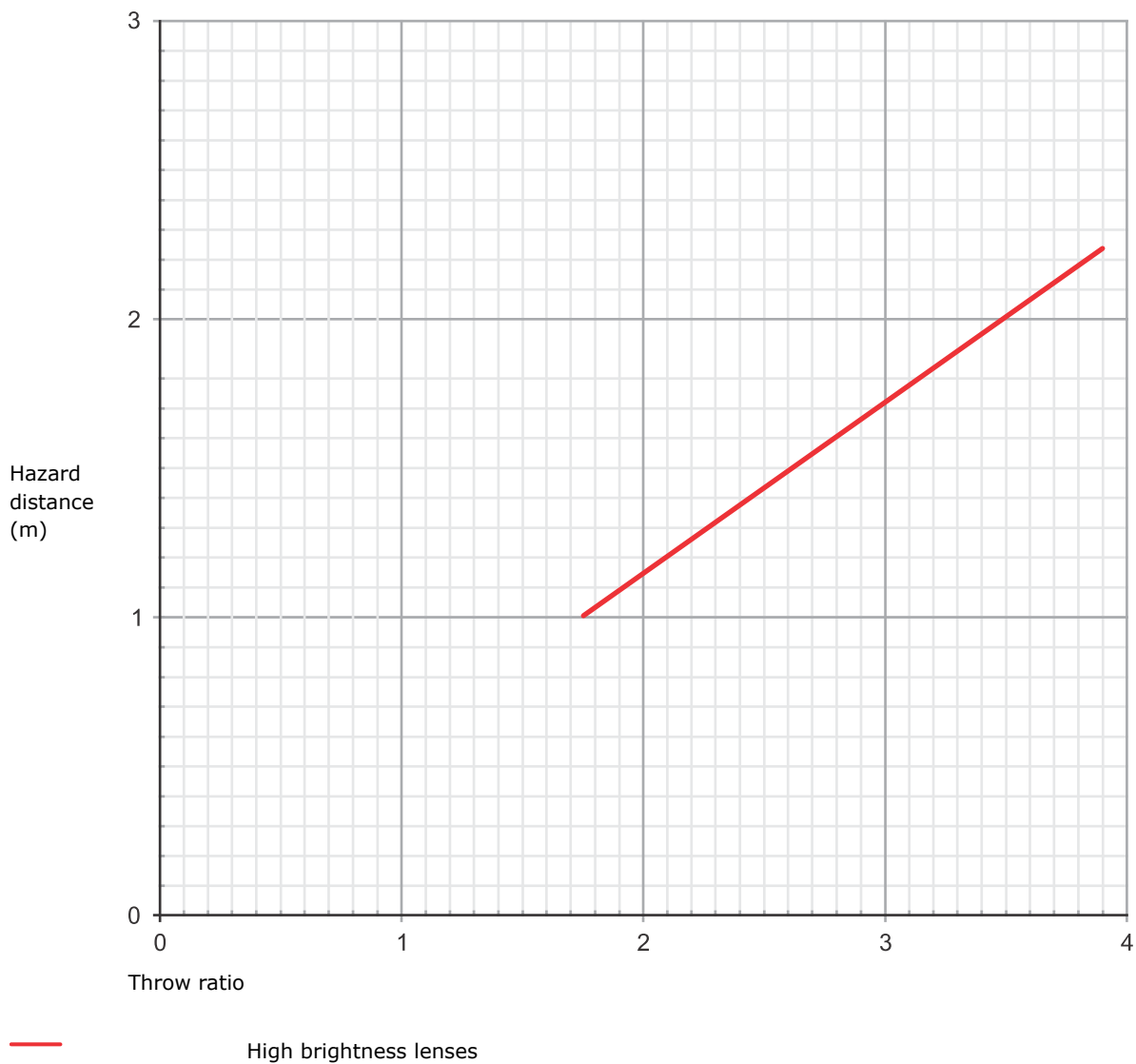
CP2406-RBe hazard distance table and graph

Projection lens	Part number	Hazard distance (m)	Category
0.83-1.2:1	108-498102-XX	N/A	RG2
1.2-1.72:1 DLP Cine zoom	108-494108-XX		
1.33-2.1:1 DLP Cine zoom	108-495109-XX		
1.62-2.7:1 DLP Cine zoom	108-496100-XX	See hazard distance graphs below	RG3
2.09-3.9:1 DLP Cine zoom	108-497101-XX		



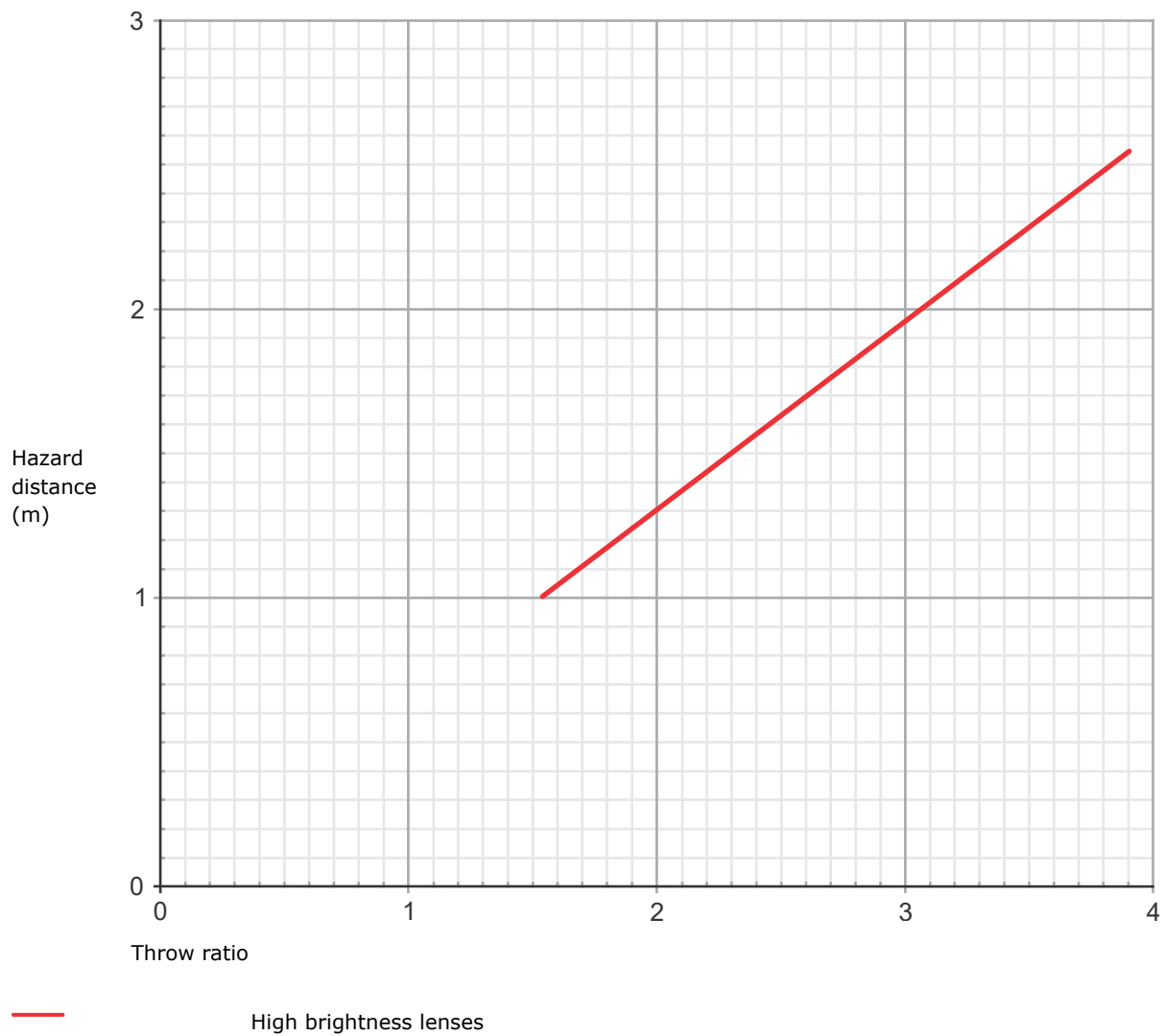
CP2409-RBe hazard distance table and graph

Projection lens	Part number	Hazard distance (m)	Category
0.83-1.2:1	108-498102-XX	N/A	RG2
1.2-1.72:1 DLP Cine zoom	108-494108-XX		
1.33-2.1:1 DLP Cine zoom	108-495109-XX	See hazard distance graphs below	RG3
1.62-2.7:1 DLP Cine zoom	108-496100-XX		
2.09-3.9:1 DLP Cine zoom	108-497101-XX		



CP2411-RBe hazard distance table and graph

Projection lens	Part number	Hazard distance (m)	Category
0.83-1.2:1	108-498102-XX	N/A	RG2
1.2-1.72:1 DLP Cine zoom	108-494108-XX	See hazard distance graphs below	RG3
1.33-2.1:1 DLP Cine zoom	108-495109-XX		
1.62-2.7:1 DLP Cine zoom	108-496100-XX		
2.09-3.9:1 DLP Cine zoom	108-497101-XX		



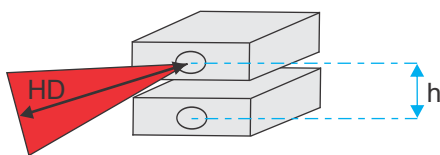
Stacking projectors

When two projectors are stacked (projecting on the same surface), due to the overlap of the images, a system hazard distance may need to be applied instead of a single projector hazard distance. When projectors are being stacked in two-dimension (for example 2x2), only projectors stacked along one axis (horizontal or vertical) should be considered, taking the stacking direction with the shortest lens distance (center-to-center distance) to reduce to separate two systems.

The following information is required:

HD	Hazard distance of a single projector with the given lens (center-to-center distance)
h	Distance between two adjacent projector lenses in the stack

1. Determine the hazard distance (HD) of a single projector with a given lens and the distance (h) between the adjacent lenses.



2. Determine the hazard distance for stacking two projectors:
 - If the single projector hazard distance is $HD \geq 9 \times h$, implement $1.15 \times HD$ for the hazard distance.
 - If the single projector hazard distance is $HD < 9 \times h$, keep the original hazard distance and risk zone as per the projector.

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 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.



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.



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



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



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



General hazard.



Not for household use.

Mandatory actions



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



Consult the service manual.



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.

Laser hazards



FDA laser variance (US projectors only)

This product is in conformity with performance standards for laser products under 21 CFR 1040, except with respect to those characteristics authorized by Variance Number 2016-V-1838 effective on December 4, 2018.



CLASS 1 LASER PRODUCT IEC 60825-1:2014

Wavelengths: 449 nm - 661 nm



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

Additional hazard labels



Indicates high leakage current. Earth or ground 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.

Introduction

This manual is intended for professionally trained operators of Christie high-brightness Cinema 2K-RBe projection systems.

Only trained Christie qualified technicians who are knowledgeable about the hazards associated with high-voltage, laser safety, and the high temperatures generated by the projector are authorized to assemble and install the projector. Only Christie qualified technicians are authorized to service the projector.

For complete product documentation and technical support, go to www.christiedigital.com.

What's new in the guide?

The following updates have been made to the guide.

- Updated *Site requirements* (on page 22) regarding operating altitudes.

Key features

Understand the important features of the projector.

- Three-chip 0.69 inch CFB DC2K light engine
- Christie CineLife+™ electronics
- LiteLOC™ color lock feature for constant image brightness and color
- Direct-coupled laser module integrated in the projector chassis
- Compact form to fit in existing projection booths

List of components

Verify all components were received with the projector.

- High security key

Accessories

Learn about accessories that are available for the Cinema 2K-RBe projector.

Projection lenses

Projection lens	Part number
0.83-1.2:1 DLP Cine zoom	108-498102-XX
1.2-1.72:1 DLP Cine zoom	108-494108-XX
1.33-2.1:1 DLP Cine zoom	108-495109-XX

Projection lens	Part number
1.62-2.7:1 DLP Cine zoom	108-496100-XX
2.09-3.9:1 DLP Cine zoom	108-497101-XX

Filters

Description	Part Number
Card cage air filter—washable	003-004655-XX
Light engine air filter—washable	003-004654-XX
Air filter 1	003-007541-XX
Air filter 2	003-007542-XX

UPS power cord (optional)

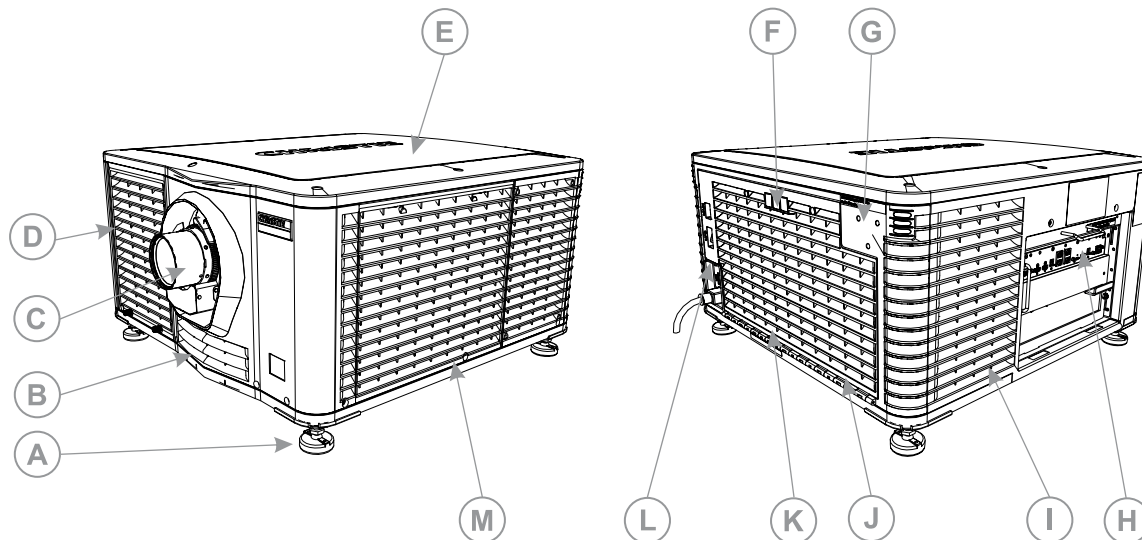
Description	Part Number
250 V/10 A C13 2.5 m—Australia	108-392105-XX
250 V/10 A C13 3.0 m—China	108-373104-XX
250 V/10 A C13 2.5 m—Europe	108-604101-XX
250 V/10 A C13 2.5 m—Europe and Korea	108-390103-XX
125 V/12 A C13 2.5 m—Japan	108-371102-XX
9.83 125 V/15 A black—North America	108-382104-XX
250 V/10 A C13L—South Africa	108-592107-XX
250 V/10 A C13L 3.1 m black—United Kingdom	108-589103-XX

Miscellaneous

Description	Part Number
Cover stacking cup—Included in product box	011-104349-XX
Locking stacking bracket—Included in product box	011-104470-XX
Rack stand	108-416102-XX
Extractor adapter	119-103105-XX
Touch panel	163-151108-XX

Projector components

Learn about the components on the front of the projector



A	Adjustable feet—Turn the adjustable feet to increase or decrease the projector height
B	Air filter intake
C	Projector lens
D	Air filter intake
E	Top cover
F	Status LED board
G	Touch panel mount location (optional)—A touch-sensitive screen used to control the projector
H	Card cage—Connect external devices and access the fire alarm interlock terminal
I	Air filter intake
J	Air filter intake
K	Rear service door
L	AC receptacle, AC circuit breakers
M	Side service door and air exhaust

Related documentation

Additional information on this product is available in the following documents.

- *Cinema 2K-RBe Series Service Guide (P/N: 020-103908-XX)*
- *CineLife+ 2K User Guide (P/N: 020-103949-XX)*
- *CineLife+ Serial Commands Guide (P/N: 020-103075-XX)*
- *CineLife+ 2K Supported Video Formats technical reference (P/N: 020-104092-XX)*

- *Cinema 2K-RBe Series Line Drawing (P/N: 020-103934-XX)*
- *Cinema 2K-RBe Series Interconnect drawing (P/N: 020-103885-XX)*

Accessing product documentation

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

1. Access the documentation from the Christie website:
 - Go to one of the following URLs:
 - <https://bit.ly/3vxrm4Y>
 - <https://www.christiedigital.com/products/cinema/projection/cinelife-plus-series/>
 - Scan the QR code using a QR code reader app on a smartphone or tablet.



2. To access service information, sign into the Partner Portal.
3. On the product page, select the model and switch to the **Downloads** tab.

Downloading interconnect 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 product dimensions and sizes for installation.

To download the latest interconnect diagram or line drawings:

1. Go to www.christiedigital.com.
2. Sign into the Partner Portal.
3. Navigate to your model.
4. Switch to the **Downloads** tab and expand **Line drawings** section.



If the interconnect diagram or line drawings are not available on the Christie website, contact Christie Technical Support.

Downloading preventative maintenance schedules

Preventative maintenance is an important part of the continued and proper operation of your product. Failure to perform maintenance as required and according to the maintenance schedule specified by Christie voids the warranty.

If you require more information, contact Christie Technical Support.

To download the latest preventative maintenance schedule:

1. Go to www.christiedigital.com.
2. Sign into the Partner Portal.

3. Navigate to your model.
4. Switch to the **Downloads** tab and expand **Service manual** section.

Cinema calculator tool

Use Christie's cinema calculator tool to determine the right projector, lens, and lamp based on the unique needs of your installation, as well as your preferred projector type, screen configuration, and brightness requirements.

To learn more and use the tool, go to <https://cinemaster.christiedigital.com/>.

Viewing Christie University product training videos

Christie University provides select product training videos that are helpful for understanding and using your product.

To view the available videos for your product:

1. Go to Christie University: <https://training.christiedigital.com>.
2. Select **I'm a Christie partner or customer**.
3. Log into your profile.
4. Select **Catalog**.
5. Select **Videos**.
6. Select **Product Training Videos**.
7. Navigate to the folder for your product.

Contact your dealer

Record the information about your installation and keep this information with your records to assist with any servicing of your product. If you encounter a problem, contact your dealer.

Purchase record
Dealer:
Dealer or Christie Sales/Service contact phone number:
Serial number: The serial number can be found on the license label.
Purchase date:
Installation date:

Technical support

Technical support for Christie Cinema products is available at:

- Support.cinema@christiedigital.com
- +1-877-334-4267

Installing and setting up

Learn how to position and install the projector.

Site requirements

To safely install and operate the Cinema 2K-RBe projector, the installation location must meet these minimum requirements.

Physical operating environment

- Ambient temperature (operating) 10 to 35°C (50 to 95°F) up to 1000 m (3280.8 feet)
- Humidity (non-condensing) 10% to 80%
- Operating altitude 0 to 3000 meters (0 to 9843 feet) at 10 to 25°C (50 to 77°F)

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: 119-103105-XX). Instructions for installing the exhaust duct are included with the accessory part.

The installation site must provide the following:

- For CP2406-RBe, an airflow 116 cubic feet per minute (CFM) at 1 to 1000 meters elevation, and must accommodate a heat load of 4092 BTU/hr
- For CP2409-RBe, an airflow 136 cubic feet per minute (CFM) at 1 to 1000 meters elevation, and must accommodate a heat load of 5155 BTU/hr
- For CP2411-RBe, an airflow 140 cubic feet per minute (CFM) at 1 to 1000 meters elevation, and must accommodate a heat load of 6138 BTU/hr



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.

Permanent power connection

The projector light source 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 20A maximum for the main input and up to 10A maximum for the UPS input.

Power specifications

Learn the power requirements for the projector.

CP2406-RBe

Parameter	Mains	UPS
Rated voltage	200-240 VAC	100-240 VAC
Line frequency	50/60 Hz	50/60 Hz
Rated power	1200 W maximum	400 W maximum
Rated current	6 A, 1Φ	4 A, 1Φ

CP2409-RBe

Parameter	Mains	UPS
Rated voltage	200-240 VAC	100-240 VAC
Line frequency	50/60 Hz	50/60 Hz
Rated power	1500 W maximum	400 W maximum
Rated current	7.5 A, 1Φ	4 A, 1Φ

CP2411-RBe

Parameter	Mains	UPS
Rated voltage	200-240 VAC	100-240 VAC
Line frequency	50/60 Hz	50/60 Hz
Rated power	1800 W maximum	400 W maximum
Rated current	9 A, 1Φ	4 A, 1Φ

Best practices when installing a projector

Christie recommends the following best practices when installing Cinema 2K-RBe projectors.

- Download and use the most recent version of the installation and setup guide for your projector from the Christie website.
- Review all available courses on Christie University pertaining to your projector model or safety information.
- Make sure the required tools are available.
- Partially thread screws into their holes to ensure they are properly aligned and positioned but do not fully tighten until all screws are in place.
- Use high caliber cables to ensure the quality of the content (signals). Poor quality cables can affect the performance of the cable and quality of the video.

- Make sure cables are properly strain relieved so they do not apply unnecessary force on the board connectors.
- Let the projector and its components acclimatize to the installation environment.

Preparing the installation site

Make sure the installation area is ready for the components.

1. Clear the installation area.
2. Post laser hazard warning signs at all entry doors.
3. Let the projector and its components acclimatize to the installation environment.
4. Place each component near its installation location.
5. Make sure the required tools are available.

Lifting and positioning the projector

Safely lift and position the projector in the location where it will be used.



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

- 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.

This product must be installed in a landscape orientation, with all four feet supported on a level surface. Do not install or operate the projector in an inverted position. If your site has any installation requirements other than a typical theater projection booth, contact Christie for assistance.



Before lifting and positioning the projector, refer to the light intensity hazard distances.

1. Position each person at the corners of the projector.
2. Place both hands under the corner, grasping the projector frame.
Do not lift the projector using any feature on the projector cover, such as the cover louvers or lens opening.
3. Lift up the projector and move it to the location where it will be used.
4. Position the projector so it is centered and parallel with the theater screen.
If space is limited, aim the projector slightly off-center and use lens offset to center the image on the screen.

Connecting to an uninterruptible power supply

An uninterruptible power supply (UPS) allows the cinema projector head electronics to remain operable during a power failure.



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

- SHOCK HAZARD! The AC power cord must be inserted into an outlet with grounding.
- SHOCK HAZARD! The UPS power cord must be inserted into an outlet with grounding.

The following table lists the part numbers for the optional UPS power cords for each region.

Description	Part Number
250 V/10 A C13 2.5 m–Australia	108-392105-XX
250 V/10 A C13 3.0 m–China	108-373104-XX
250 V/10 A C13 2.5 m–Europe	108-604101-XX
250 V/10 A C13 2.5 m–Europe and Korea	108-390103-XX
125 V/12 A C13 2.5 m–Japan	108-371102-XX
9.83 125 V/15 A black–North America	108-382104-XX
250 V/10 A C13L–South Africa	108-592107-XX
250 V/10 A C13L 3.1 m black–United Kingdom	108-589103-XX

1. Switch the AC inline for 12V power supply from the MAIN inline to the UPS inline.
2. Connect the line cord to the MAIN input.
3. Connect another line cord to the UPS input.
4. To turn on the projector, move the MAIN breaker switch to the on position and then move the UPS breaker switch to the on position.

If you do not want to connect to an uninterruptible power supply, connect the 12V AC inline to the MAIN line, connect the appropriate line cord to the Main input, and only move the MAIN breaker switch to the on position.

Installing the lens

The lens seals the projection head, preventing contaminants from entering the main electronics area.

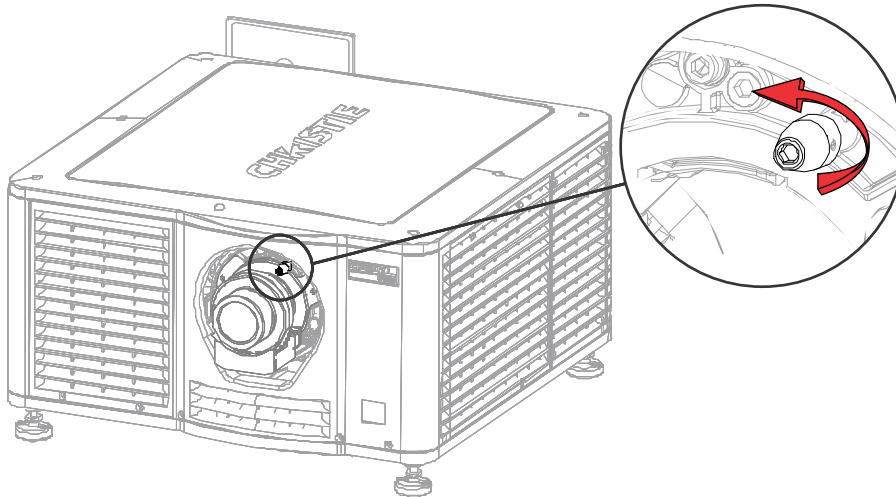


Notice. If not avoided, the following could result in property damage.

- Do not operate the product without a lens installed.
- Always use a lens plug when installing or moving the product. This prevents contaminants from entering the product.
- Do not insert the lens into the product at an angle. This can damage the lens and the optical components inside the product.
- Always place the lens cap onto the lens when moving the projector to avoid scratching the lens.
- Remove the lens cap before turning on the product to avoid damaging the lens.

1. Before installing the lens, make sure you turn off and unplug the projector.

2. Remove the lens surround.
3. Turn the lens clamp on the front of the projector to the open position.
The lens clamp can be turned manually but Christie recommends using a hex key to turn it to the correct position.

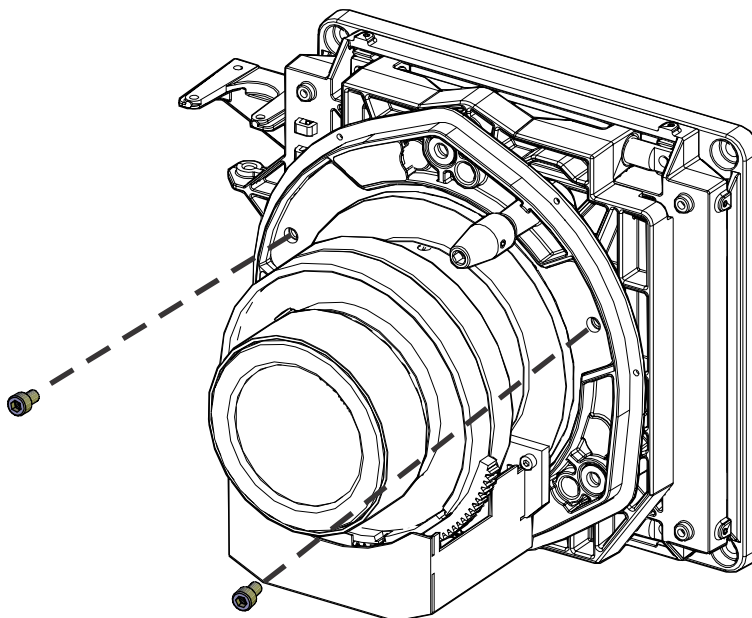


4. Position the lens so the lens retaining ring mounts align with the lens mount.
5. Remove the lens caps from the front and rear of the lens.



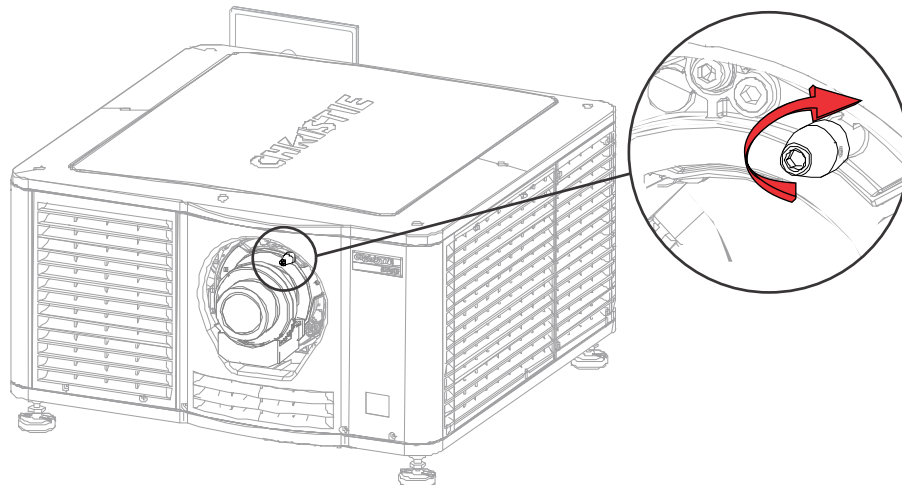
Lens caps must be removed or they can melt and damage the lens.

6. Insert the lens straight into the lens mount opening without turning.
Magnets inside the lens mount help position the lens.
7. Insert and tighten the two lens mount hex screws shipped separately with the projector.



8. Lock the lens assembly in place.

The lens clamp can be turned manually but Christie recommends using a hex key to turn it to the correct position.



9. Replace the lens surround.

Installing the touch panel

The touch panel controller (TPC) is an optional accessory and is sold separately.

For information on installing the touch panel control (TPC), refer to the *Christie Touch Panel Accessory Instructions* (P/N: 020-103409-XX) instruction sheet.

Projector power modes

The Cinema 2K-RBe projectors track laser operation hours for the light source.

The projector operates with the following power modes:

Mode	Description
Projector on	<ul style="list-style-type: none"> • CineLife+™ electronics and light engine are on • Light source is off • Integrated Media Block (IMB) is on
Light source on	<ul style="list-style-type: none"> • CineLife+™ electronics and light engine are on • Light source is on • Fans run at full speed • IMB is on
Standby	<ul style="list-style-type: none"> • CineLife+™ electronics remain on standby with the light engine off • Fans and light source are off • IMB is off—IMB automation does not function

Mode	Description
Hibernate	<ul style="list-style-type: none"> Ethernet PHY for Wake On LAN (WOL) magic packet and Hibernate Interface switch powered and enabled Other parts of the projector are off
IMB powered in Standby	<ul style="list-style-type: none"> Turns on the IMB Increases the air flow inside the projector to cool the card cage electronics

Using the web user interface (Web UI)

Use a web browser to use the web user interface (Web UI) to access projector functionality.




For optimal web user interface viewing, Christie recommends using a screen resolution of 1280 x 800 or higher, preferably with a widescreen aspect ratio such as 16:9 or 16:10.

1. In a web browser, enter the IP address of the projector.
The default IP address is 192.168.206.110.
2. Log into the Web UI.
3. To access the projector menu, select the left navigation menu.
4. To upload or download files from the projector, navigate to the feature.
5. If the projector has a GDC IMB SR-1000 installed and configured, access the GDC IMB Web UI by navigating to the left navigation menu and selecting **IMB**.

Turning on or off the projector

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

1. Determine if you are using an *uninterruptable power supply* (on page 25).
 2. Plug the projector into AC power.
 3. Turn on the breaker switch(es).
 - If connected to an uninterruptable power supply, move the MAIN breaker switch to the on position and then move the UPS breaker switch to the on position.
 - If not connected to an uninterruptable power supply, only move the MAIN breaker switch to the on position.
 4. 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 three-minute cool-down period.

Logging into the projector

Log into the projector to access projector menus.


1. Select **Login**.

If using the web user interface (Web UI), you do not need to select **Login**.

2. In the User list, select a username.
3. Enter the password.
4. Select **Login**.

Turning on or off the light source

Turn on the light source to display content or view test patterns. Turn off the light to extend the life of the light source.

- To turn on or off the light source, in the right toolbar, select and hold **Light**. 
- If turning on the light source when the projector power is off, power is turned on automatically. Allow the projector to cool down for three minutes after turning it off.

Selecting Integrated Media Block (IMB) preferences

Choose from the available options to set the type of Integrated Media Block (IMB).

1. In the left navigation menu, select **Service Setup > Preferences**.
2. Select **IMB**.
3. In the Type list, select the **Christie IMB** for the IMB-S4.
4. For the IMB to power on when the projector is in Standby mode, enable the **IMB Powered in Standby** slider.
Enable the **IMB Powered in Standby** option if content ingest should be done in off hours (when projector is in Standby mode) or disabled when power savings is a higher priority and content ingest is only done when the projector is in Power On mode
5. To determine the homepage content when logging in, select **Upcoming Events** if using the IMB-S4 scheduler or **Status** to see the projector status instead.
6. Enable or disable the **Enable IMB FTP Server Access via Projector Management port** option as required.
When enabled, the projector FTP server is accessible using the TCP port 2121 and the IMB FTP server is accessible using the TCP port 21. Christie recommends not performing an ingest while playback is underway.
7. When the system prompts you to reboot the projector, select **Reboot**.
8. After the projector has restarted, log in with your user account.

Activating marriage

After selecting the Integrated Media Block (IMB) type, you must install the IMB and complete marriage to display secure content and to comply with the Digital Cinema Initiatives (DCI) specification. You cannot complete marriage remotely.

For more information on installing the IMB, see the appropriate IMB installation documentation.

For more information on marriage, see *CineLife+ 2K User Guide (P/N: 020-103949-XX)*.

You cannot complete marriage remotely because you must select the **Marriage** button on the input panel during the marriage process.

1. Verify the marriage ring is installed correctly and an anti-tamper alarm does not appear on the touch panel.
2. In the left navigation menu, select **Service Setup > Marriage Setup**.
3. Select **Start** and complete the Marriage Setup wizard.
At the Arming stage, enter the Marriage password.
4. Select **Finish**.

Disposing of the product packaging

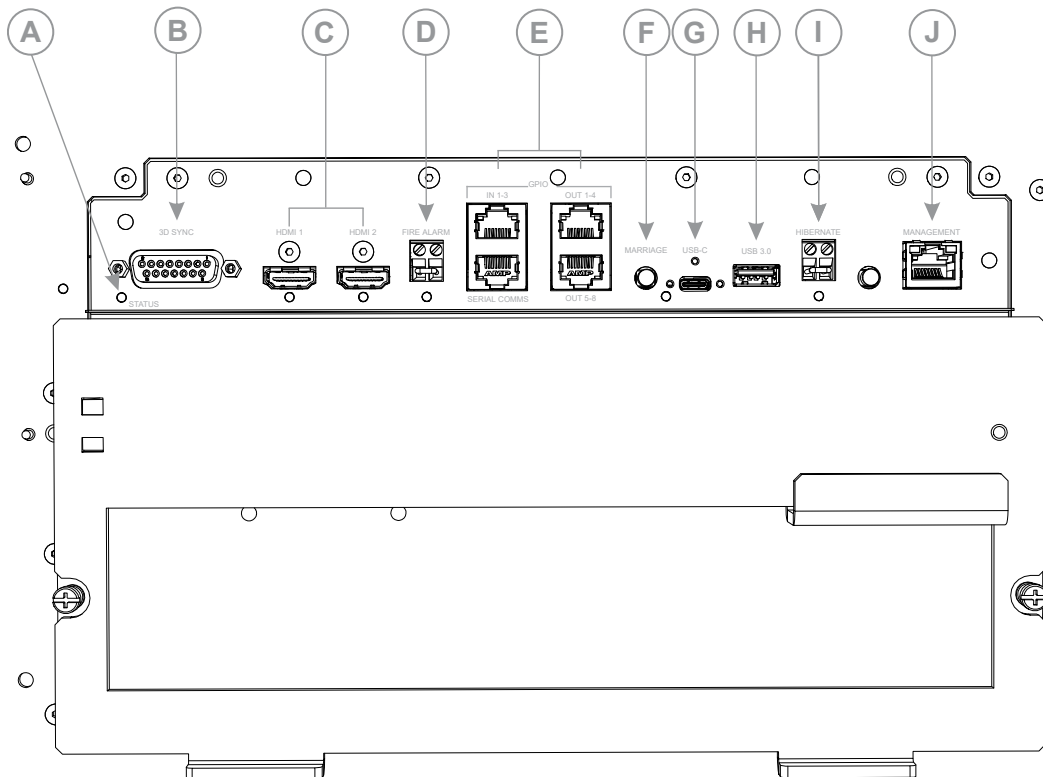
Once the product has been installed and set up, Christie recommends reusing or recycling the product packaging according to your local regulations.

Completing the installation checklist

Complete the provided installation checklist (P/N: 020-103137-XX) and return it to Christie.

Video Input panel

The Video Input panel, located on the projector side input panel (operator side), has a variety of ports that can supply alternative video content to the projector.



ID	Port	Description
A	Status	Provides a status indicator for the projector.
B	3D sync connector	Connects the projector to 3D devices.
C	HDMI input 1 and HDMI input 2	Type A connector Accepts digital video data from HDMI v2.0 input supporting EDID 1.3 with HDCP v1.4 and 2.2 support.
D	Fire alarm connection	Connects to the Theater Fire Management system for automatic shut down in emergency situations.
E	GPIO port	Connects the projector to external automation or automation devices.
F	Marriage button	Used during the Integrated Media Block (IMB) marriage setup process.

ID	Port	Description
		<ul style="list-style-type: none"> • Select and hold the button for 5 seconds to display the IP address and status information. • Select and hold the button for 30 seconds to reset the IP address to the default address of 192.168.206.110. <p>The marriage status LED indicator is located to the right of the Marriage button. In full power mode, a green LED indicates the projector is properly married and encrypted content can be displayed. A red LED indicates marriage is broken and encrypted content cannot be displayed.</p>
G	USB-C port	Connects the projector touch panel.
H	USB port	Connects to external memory device for import and export of projector software, configuration files, and status information.
I	Hibernate	Brings the projector out of Hibernate mode.
J	Management port	Connects to the local network and can send CineLife+™ serial commands and used for Web UI access.

HDMI video source

For the projector to accept digital video data from HDMI sources, plug the HDMI source directly into the Video Input panel.

The input configurations listed below are supported.

Input configuration	Description
Single-input	Accepts connection of one HDMI cable. Supports both 2D and 3D frame-packed, top and bottom. In this configuration, the HDMI input supplies the entire video raster.

For supported video formats for your projector model, see *CineLife+ 2K Supported Video Formats technical reference (P/N: 020-104092-XX)*.

Integrated Media Block (IMB) video source

Christie Series 4 projectors support both the legacy Series 2 (S2) and newer Series 4 (S4) HDRConnect™ IMB interfaces to send digital video data from an IMB to the projector.

Contact Christie Technical Support to learn which S2 and S4 IMB devices are compatible with Christie projectors.

For supported video formats for your projector model, see *CineLife+ 2K Supported Video Formats technical reference (P/N: 020-104092-XX)*.

HDMI video source connection from an Integrated Media Block (IMB)

The projector can accept digital video data from HDMI sources connected to applicable Integrated Media Block (IMB) devices. The input configurations supported are determined by the IMB device directly.

Contact Christie Technical Support to learn which IMB devices provide HDMI source selection from the projector user interface.

HDMI input selection directly from the IMB may also be possible using the IMB user interface. The input configurations supported are determined by the IMB make and model.

SDI video source connection from an Integrated Media Block (IMB)

The projector can accept digital video data from SDI sources connected to applicable Integrated Media Block (IMB) devices.

The input configurations supported are determined by the IMB device directly. Contact Christie Technical Support to learn which IMB devices provide SDI source selection from the projector user interface.

SDI input selection directly from the IMB may also be possible using the IMB user interface. The input configurations supported are determined by the IMB make and model.

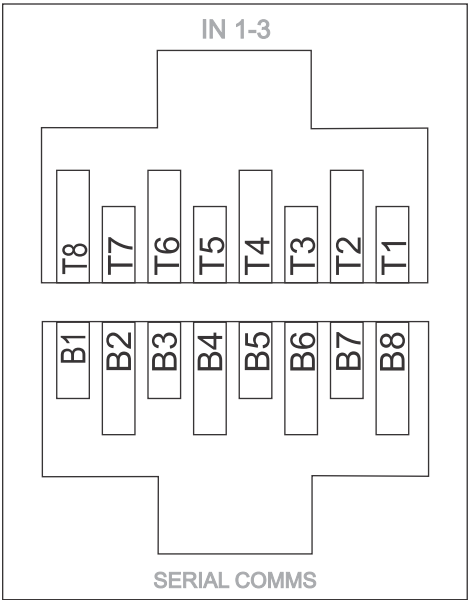
GPIO connector

The Generic Purpose Input Output (GPIO) connectors provide a flexible method of interfacing with the projector. There are three GPIO connectors with one connector reserved for serial communications.

The GPIO connectors are located on the input panel (*E in the Video Input panel image (on page 31)*).

Left-side GPI pins

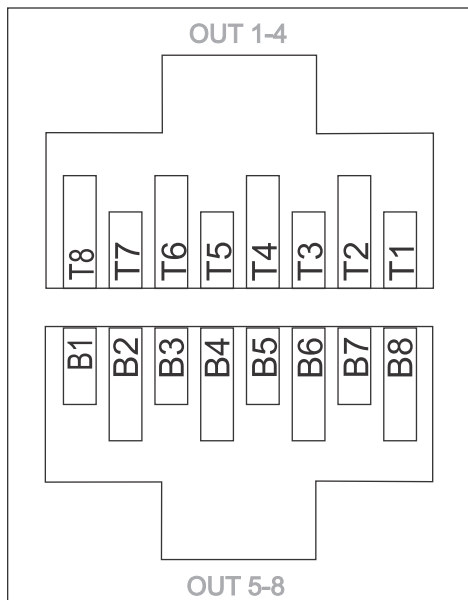
The top six GPI pins are available for inputs with the other two pins reserved for ground and power. The bottom pins are reserved for serial communications.



Pin number	Signal name	Direction
T1	+5V	—
T2	GND	—
T3	GPI1_POS	In
T4	GPI1_NEG	In
T5	GPI2_POS	In
T6	GPI2_NEG	In
T7	GPI3_POS	In
T8	GPI3_NEG	In
B1 to B8	Serial Communications Reserved for future use.	—

Right-side GPO pins

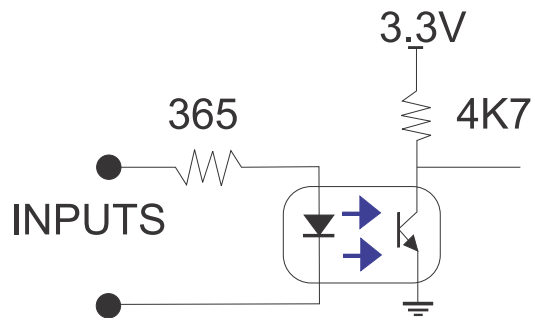
The 16 pins are available for output.



Pin number	Signal name	Direction
T1	GPO1_SRC	Out
T2	GPO1_RTN	Out
T3	GPO2_SRC	Out
T4	GPO2_RTN	Out
T5	GPO3_SRC	Out
T6	GPO3_RTN	Out
T7	GPO4_SRC	Out
T8	GPO4_RTN	Out
B1	GPO5_SRC	Out
B2	GPO5_RTN	Out
B3	GPO6_SRC	Out
B4	GPO6_RTN	Out
B5	GPO7_SRC	Out
B6	GPO7_RTN	Out
B7	Health_SRC	Out
B8	Health_RTN	Out

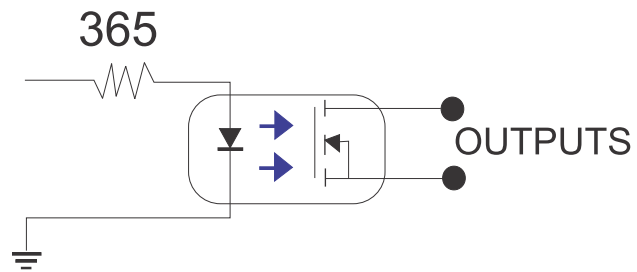
GPIO inputs

The 5 VDC (pin T1 and pin T2 in the left-hand GPI) is intended for use to supply the inputs.



GPIO outputs

Outputs are solid state relays with a 1 A AC/DC rating at up to 48 V.



Managing the light source

Learn how to configure a laser file and use the projector's LiteLOC™ feature.


Use the laser file to control the power settings of the lasers. The LiteLOC™ feature ensures that color and brightness are held at the level you set.

Create multiple laser files to manage varying screen sizes, brightness requirements, room temperatures in the projection booth, and types of content (such as 2D, 3D, and alternative content).


Creating a new laser file

Create a laser file to store the power settings for the RGB laser light source.

If you make significant change to the brightness level when refining the laser power settings, it takes a few minutes for the color and brightness to stabilize.

1. Log in as service.
2. Turn on the laser.
3. For systems upgraded to v1.5.0 and already using the calibration file, set a channel to use the appropriate calibration file and activate the channel.
For details on setting up and activating the channel, refer to the *CineLife+ 2K User Guide (P/N: 020-103949-XX)*.
4. Set up the color meter to aim at the center of the screen.
5. In the left navigation menu, select **Laser Settings > Laser Power/LiteLOC Setup**.
6. Select **Display White Test Pattern**.
7. To create a new laser file, select **Create**. 
8. In the Create dialog, enter a name for the new laser file and select **Create**.
9. In the White Coordinates dialog, set the required white point.
For a typical cinema setup, the white point is Digital Cinema Initiative (DCI) white $x=0.314$ and $y=0.351$.
10. Select **Apply**.
11. Adjust the brightness level until you achieve the required brightness at the specified white point.
12. If the laser file will be associated with a 3D channel, complete the following steps:
 - a) Engage the 3D system in the light path by enabling **3D Sync** when selecting the test pattern.
 - b) Mount a 3D glass or filter on the color meter to measure the brightness.
 - c) Select **3D Sync** on the LiteLOC™ setup page.


- d) Adjust the brightness level until you achieve the required brightness while the 3D system is engaged.

13. To save the new laser file, select **Save**. 

Modifying an existing laser file


Modify the settings in the laser file to change the laser power settings.

When refining the laser power settings, the amount of time required to re-stabilize the projector depends on the size of the adjustment. For small adjustments to the power settings, the projector requires only 1 or 2 minutes to re-stabilize. For larger adjustments, the projector may require up to 15 minutes to re-stabilize.

1. In the left navigation pane, select **Laser Settings > Laser Power/LiteLOC Setup**.
2. From the Laser File list, select the laser file to edit.
3. Select the **Display White Test Pattern**, if required.
4. Adjust the brightness slider as required.
5. To change the white point, select White coordinates box, modify the coordinates, and select **Apply**.
Selecting **Default** returns it to the Digital Cinema Initiative (DCI) white point.
6. Once the correct brightness is achieved and the projector has stabilized, to save the new settings select **Save**. 


Copying existing laser settings to a new file

Copy an existing laser file when you want to create a new file with similar settings.

1. In the left navigation pane, select **Laser Settings > Laser Power/LiteLOC Setup**.
2. From the Laser File list, select the file you want to copy.
3. To save the new laser file, select **Save As**. 
4. Enter a new name for the laser file and select **Save**.
5. Adjust the brightness and white settings as required for the new configuration.

Deleting a laser file

Delete a laser file when the configuration is no longer required.

1. In the left navigation menu, select **Laser Settings > Laser Power/LiteLOC Setup**.
2. In the Laser File list, select the file to delete.
3. Select **Delete**. 
4. To confirm the deletion, select **Delete**.

LiteLOC™ sensor-to-screen calibration

The LiteLOC™ sensor-to-screen 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 do not overwrite the factory calibration. Once satisfied, some scenarios may exist in which you may need to redo the calibration in the future.

Redoing this calibration is required if the following is replaced:

- Color sensor board

Christie recommends redoing this calibration if any of the following are replaced:

- Light engine
- Lens
- Light source
- Screen
- Port window
- Any other optical components in the optical path between the light source and the screen

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

LiteLOC™ sensor-to-screen calibration requires the following:


- Spectroradiometer
- Minimum of Installer level user access

The following is the recommended order for performing the sensor-to-screen calibration:

- *Create a new calibration file* (on page 39).
- *Add the calibration file to the Channel Setup* (on page 41).

Creating a new calibration file

The Sensor-to-screen Calibration wizard guides you through the steps required to create a new calibration file.

1. Set up a spectroradiometer to obtain screen measurements later in the process.
2. In the left navigation menu, select **Color Settings > Sensor-to-screen Calibration**.
3. To create a new calibration file, select **Create** .

The projector checks if the light source is on and the douser is open. If either condition is not met, a warning dialog is displayed prompting you to make sure these conditions are met before starting the wizard.

4. In the Create dialog, enter a name for the new calibration file and select **Create**.
5. In step 1 of the Sensor-to-screen Calibration wizard, select the calibration sectors.
 - a) Enable the **Display White Test Pattern** option.
 - b) Select the calibration sectors.

- c) Select **Next**.
A laser stabilization dialog appears to allow time for the laser to stabilize. The time displayed varies at each calibration stage.
6. In step 2 of the Sensor-to-screen Calibration wizard, measure and enter the screen values.
 - a) To trigger the measurement at a specific operating point, under Sensor to screen, select **Capture**.
The Capture button changes color to indicate the capture process is activated. Only one Capture button is active at a time.
The projector automatically sets the red, green, and blue output laser powers to the pre-determined settings calculated and displayed in the Drive Percentage (Calculated) area of the wizard.
A countdown timer begins to allow the projector white point and brightness to stabilize and no changes can be made. At the end of the countdown period, the Color Sensor values fields are automatically populated by the projector for the currently selected drive percentage value.
 - b) When the countdown ends, take x, y, and fL measurements using the spectroradiometer. Christie recommends taking meter readings from the center of the screen to obtain accurate screen measurements.
 - c) Under Measured Values, using the numeric keypad record the associated spectroradiometer values for x, y, and fL.
The projector holds the on-screen color and brightness level until the same or another Capture button is selected.
 - d) Repeat steps a to c for the remaining drive percentage set points until all x, y, and fL values are entered.
 - e) To redo all measurements, select **Restart Sector**.
 All values are erased, the Laser Stabilization dialog reappears, and the Sensor-to-screen Calibration restarts step 2.
 - f) Once all the color sensor and measured values are entered for all rows, select one of the following actions:
 - **Next**—this option appears if there are more sectors to complete. The Laser Stabilization warning dialog appears. Repeat steps a to d for the remaining sectors.
 - **Apply and Save**—this option appears when all sectors are complete.
7. Verify and complete the calibration.
 - a) Select a white point to measure by selecting either the **DCI**, **D65**, or **Custom** white point buttons.
 - b) Select a sector.
Once selected, the projector automatically enables LiteLOC™, selects a White test pattern with uncorrected colors at the white point specified, and sets the brightness to the value of the selected sector.
 - c) Using a spectroradiometer, measure screen x and y values at the center of the screen.
To verify the calibration has been successfully applied, the measured white point must be within the expected tolerance.
 - d) When complete, select **Close**.
The projector output is configured according to the currently selected calibration file and you are returned to the Sensor-to-screen Calibration menu.

Adding a calibration file to the Channel Setup

Select any of the available calibration files stored on the projector system by accessing the 2D Sensor-to-Screen Calibration File or 3D Sensor-to-Screen Calibration File list in the Channel Setup menu.

By default, the 2D and 3D sensor-to-screen calibration files are set to the factory or field calibration data identified as Default in the list. The Default selection references the factory calibration data as long as no field calibration data is available. If field calibration data is available, it is selected as the Default. When a 2D and 3D Sensor-to-screen Calibration file is selected in the Channel Setup, the active channel automatically applies the calibration data according to the 2D or 3D operation of the projector.

1. In the left navigation menu, select **Channel Setup**.
2. Select the channel you want to add the calibration file to.
3. From either the **2D Sensor-to-Screen Calibration File** or **3D Sensor-to-Screen Calibration File** list, select the calibration file.
4. Select **Save**.

Adjusting the image

Learn how to adjust image geometry so it displays correctly.

Calibrating the Intelligent Lens System

On Cinema 2K-RBe 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.

Correcting vignetting

An image that is brighter at the center than it is at the sides needs vignetting correction.

If your image suffers from vignetting, the lens has reached the end of its offset travel range.

If your installation does not allow the image to be centered with the center of the screen, move the entire projector in the direction of lens travel.

Adjusting tilt and leveling the projector

To ensure optimum performance, install the projector so it is centered and parallel with the screen.

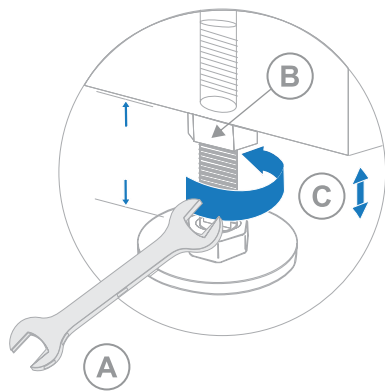
To compensate for tilt or offset, you can adjust the projector feet and the lens mount position.

This product must be installed in a landscape orientation, with all four feet supported on a level surface. Do not install or operate the projector in an inverted position. If your site has any installation requirements other than a typical theater projection booth, contact Christie for assistance.



The front-to-back tilt of the projector must not exceed 15° in a downward direction or 5° in an upward direction. The side-to-side tilt must be within +3° to -3° of level.

1. To adjust the height of the projector, loosen the lock nut on the adjustable feet on the bottom of the projector.



A	Wrench
B	Lock
C	Turn to adjust height

2. Extend or retract the feet.



Feet cannot be extended more than 228.6 mm (9 inches) from the projector bottom to the bottom of feet. A safety hazard exists if loosening more than this amount.

3. When the adjustment is correct, tighten the lock nut.

Correcting keystone effect

Keystone effect occurs when you project an image onto the screen at an angle. As a result, the image appears distorted and resembles a trapezoid.



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

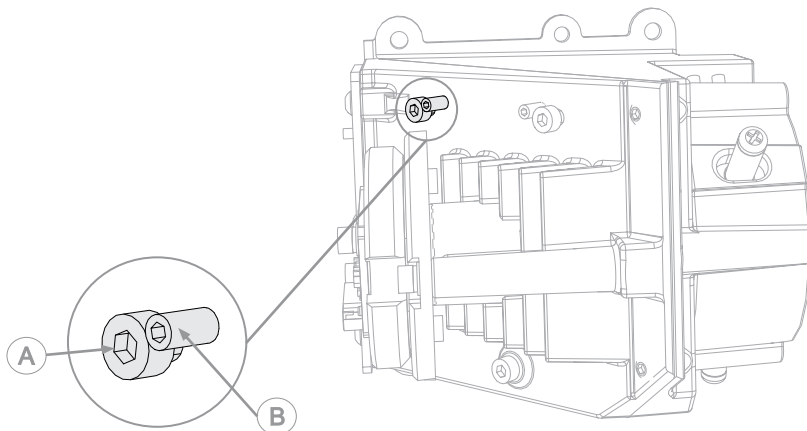
Horizontal keystone	Vertical keystone
A diagram illustrating horizontal keystone distortion. The top part shows a trapezoid representing the projected image. Below it, a projector icon is shown with a blue circular arrow indicating the adjustment needed to correct the horizontal skew.	A diagram illustrating vertical keystone distortion. The top part shows a trapezoid representing the projected image. Below it, a projector icon is shown with a blue curved arrow indicating the adjustment needed to correct the vertical tilt.
Projector skewed horizontally to the screen	Projector tilted vertically to the screen

1. If the image suffers from slight keystone effect, it can be corrected with electronic cropping.
2. If the keystone effect is severe, unevenly adjust the feet to compensate for projector tilt.
Christie recommends using the lens offset to align the center of the image to the center of the screen before correcting the keystone effect.
3. If one side of the image is longer than another, adjust the tilt and level of the projector.

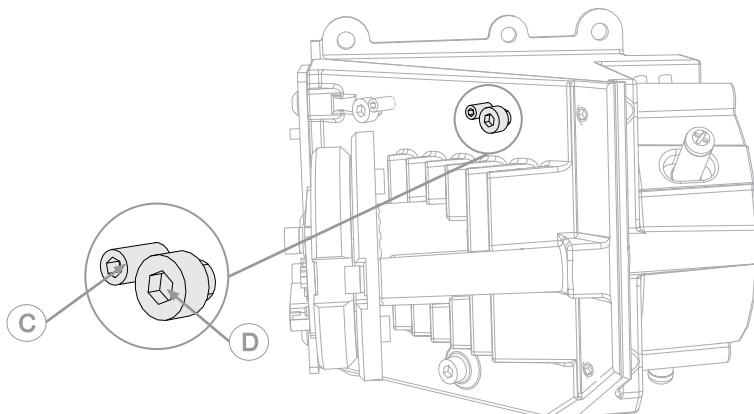
Adjusting the light engine fold mirror

Learn how to align the light engine fold mirror with the optical system to correct an image with missing or shadowy corners or edges.

1. Remove the top cover.
2. Display the **RGB-12bit-Full Screen White** test pattern.
3. Insert a hex driver in the first setscrew (A) and a hex driver in the first capscrew (B).




4. Equally turn the setscrew (A) and capscrew (B) in opposite directions until the black corner is removed.
5. If the black corner remains, insert a hex driver in the second setscrew (C) and a hex driver in the second capscrew (D).



6. Equally turn the setscrew (C) and capscrew (D) in opposite directions until the black corner is removed.
7. Replace the top cover.

Displaying a test pattern

Display a test pattern to refine and adjust the projected image or to diagnose and correct image issues.

1. In the right toolbar, select **Test Patterns**. 
2. Select **Full Screen**.
3. Select a test pattern.
When a test pattern is active, a blue bar appears below the test pattern icon in the right pane.
4. To display a 2D test pattern in 3D mode, select the **3D Sync** option.
The **3D Sync** option is selected automatically for 3D test patterns. 3D test patterns cannot be displayed in 2D mode.
5. To change the frame rate of the test pattern display, select from the available Frame Rate options:
 - For 2D test patterns, the available frame rates are 24, 30, 48, and 60 Frames Per Second (FPS). The default value is 24 FPS.
 - For 3D test patterns, the available frame rates are 48 and 60 FPS. The default value is 48 FPS.

Changing the frame rate of the display can assist with color measurement when working with corrected colors.

When changing the frame rate option, the option is applied to the next test pattern you select unless it is not available for that pattern. If a selected frame rate is not available, the default frame rate is applied for the test pattern display.

Aligning the boresight

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




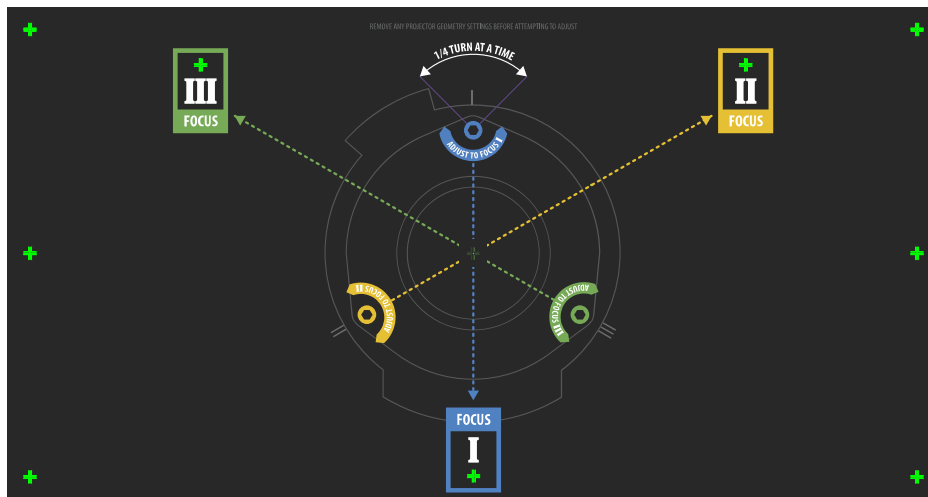
Caution! If not avoided, the following could result in minor or moderate injury.

- Do not look directly into the lens when the light source is on. The extreme high brightness can cause permanent eye damage.



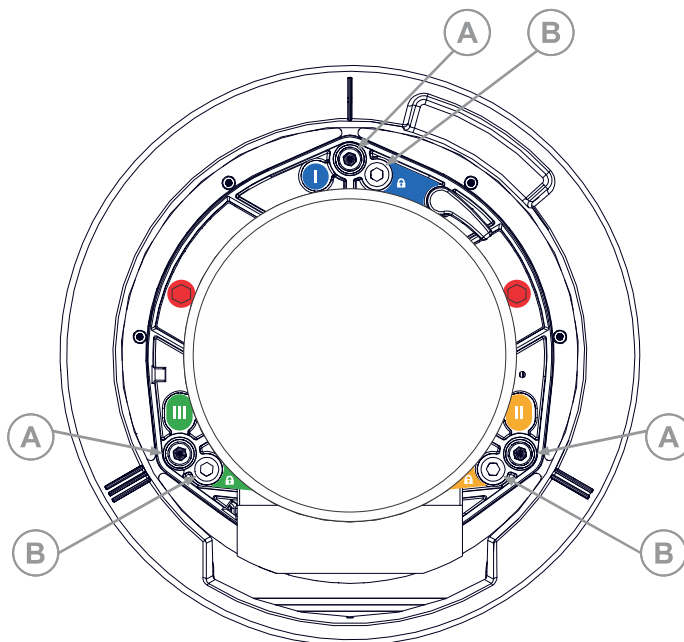
If doing excessive boresight adjustment, it may make the lens keep-out zones smaller.

1. Display the boresight test pattern.
 - a) In the right toolbar, select **Test Patterns**. 
 - b) Select the **RGB-2K-Boresight** pattern and display it full screen.

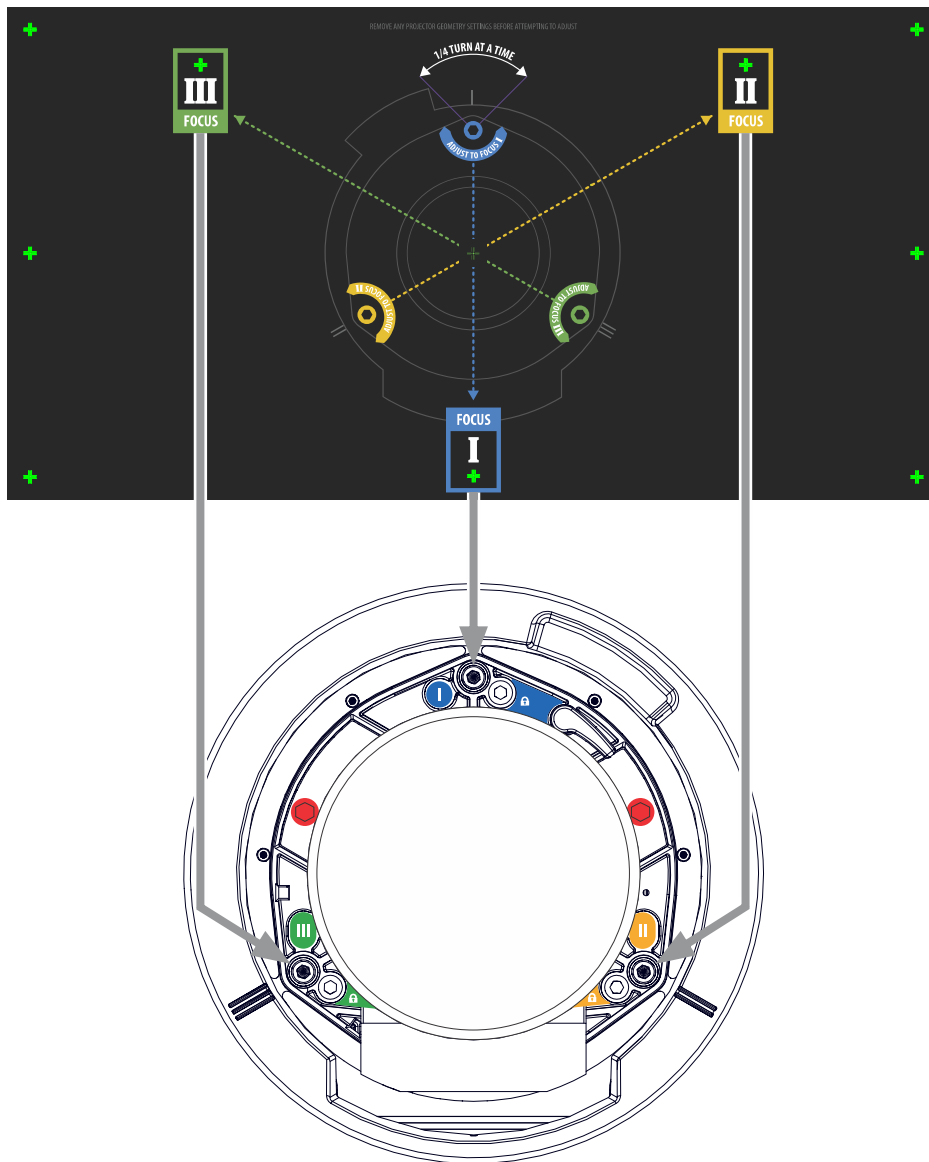


2. Focus the image on cross-hair image **I**.
3. Evaluate the focus on cross-hair image **II** and **III**.
 - If all three images are in focus, no further action is required.
 - If boresight is required, continue to step 4.

The adjustment screws (A) on the lens mount affects the corresponding cross-hairs on the test pattern.



4. To loosen the three setscrews (B) on the lens mount, use a 5 mm hex driver. The setscrews must be backed out several turns to avoid contact with the inner lens mount plate.
5. To fine tune the focus of cross-hair pattern **I**, adjust the appropriate adjustment screw (A) until the cross-hair image is in focus with minimal flare.



6. To fine tune cross-hair pattern **II**, adjust the appropriate adjustment screw until the cross-hair image is in focus with minimal flare.
7. To fine tune cross-hair pattern **III**, adjust the appropriate adjustment screw until the cross-hair image is in focus with minimal flare.
8. Repeat step 5 to 7 as required until all three cross-hair patterns are in equal sharp focus.
 - If the boresight is acceptable, proceed with step 11.
 - If the boresight does not appear to be converging to an acceptable level of image quality, or if the lens does not focus over the correct range of throw distances, proceed with step 9.
9. To approximately recover the original factory boresight, position the three setscrews flush with the front face of the lens mount plate and in contact with the inner lens mount plate. This may require adjusting both setscrews and adjustment screws.

10. If further action is required, repeat steps 2 to 9.
11. Lock the setscrews, and re-check the boresight quality.
Tighten the setscrews to 2.1 Nm (18 in-lb) to make sure they do not shift.

Mechanically adjusting digital micromirror device (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.



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


- This procedure must be performed by Christie qualified technicians.

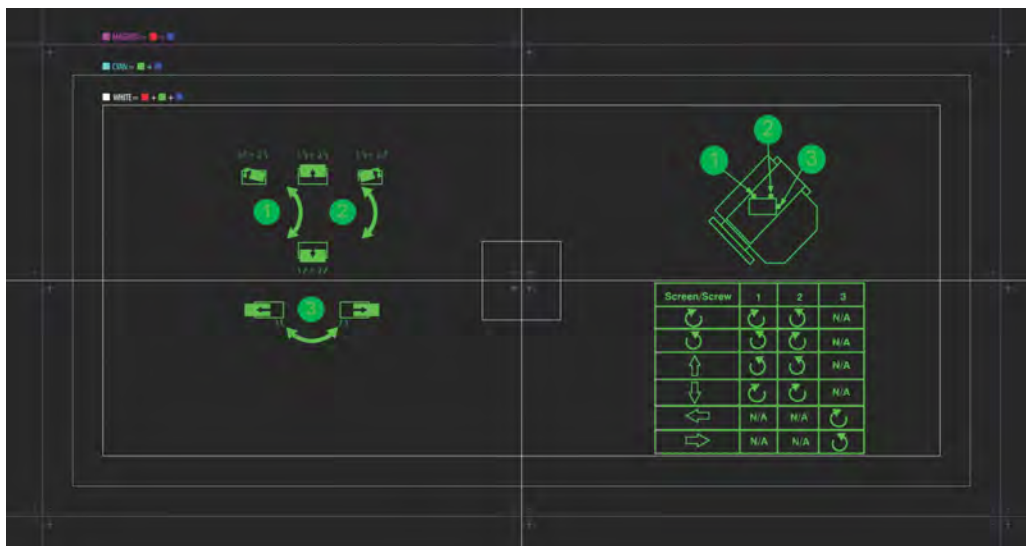
The physical layout of the green and blue formatter boards dictates the behavior of the twist and vertical adjustments:

- The adjustment of the two is more like a twist with the left-side of the screen as a sliding hinge point to allow vertical travel.
- The vertical adjustment screw and twist adjustment screw interact with each other so if one is turned in the opposite direction of the other, the twist is affected.
- If both screws are turned equal amounts in the same direction, the image moves vertically.

1. Before adjusting digital micromirror device (DMD) convergence, make sure the projector has reached a steady operational state.

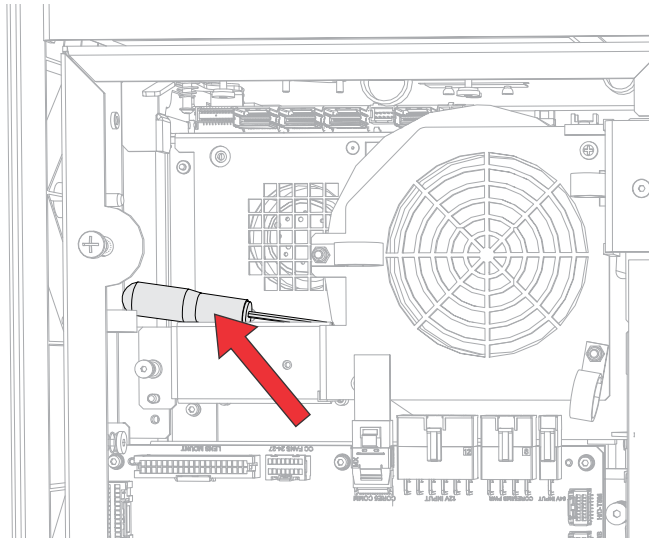
If switching from a white or bright test pattern to a dark convergence test pattern or if warming up the projector after a shutdown, allow 15 minutes for stabilization so the optics can reach a steady state.

2. In the right toolbar, select **Test Patterns**. 
3. Select the **RGB-2K-Convergence** test pattern and display it full screen.

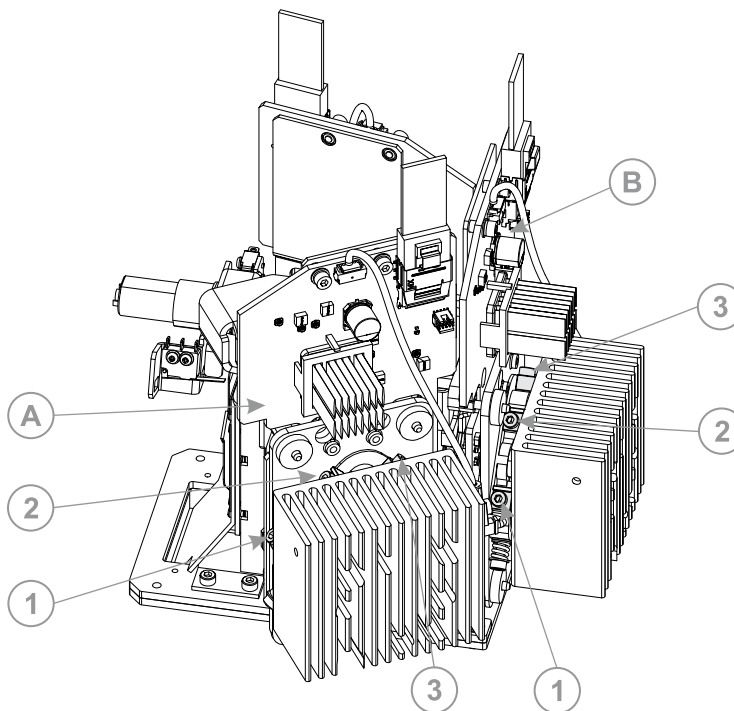


4. Remove the 2.5 mm screwdriver that is located under the light engine blower.

The 2.5 mm screwdriver is required for adjusting the green formatter board screw #3.



5. Access the screws on the light engine.



A Blue formatter board

B Green formatter board

















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

7. Locate the shorter blade 2.5 mm driver on adjusting screw #2 and use the longer blade 2.5 mm driver for screw #1 and horizontal (screw #3).

Do not apply excessive force on the adjustment screws. This can cause the convergence adjustment to become misaligned once you remove the adjustment tool.

8. Locate the twist adjustment screw with the 2.5 mm Allen driver and leave it in place, resting against the lens mount/formatter board.

You do not always have to turn the screws simultaneously; however, adjusting one at a time causes the need for an equal or equal and opposite turn on the other to prevent binding to achieve the required adjustment. If attempting to adjust the twist and increased resistance is encountered on the twist adjustment screw, do the following:

Screen/screw	1	2	3
			—
			—
			—
			—
	—	—	
	—	—	

9. Insert and remove a second driver to adjust the horizontal/twist adjustment screw or the vertical adjustment screw.
10. Replace the 2.5 mm screwdriver back in its storage location under the light engine blower.

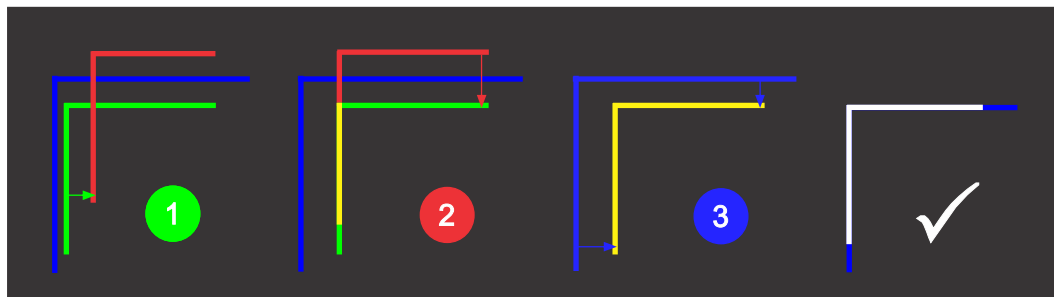
Electronic Color Correction (ECC)

A lateral convergence error occurs when the red, green, and blue (RGB) primary colors are not converged through projected lenses and is most noticeable at the edges of the screen. To address this, use ECC.

Electronic Color Correction (ECC) is accomplished by aligning a red, green, and blue sprite, which is displayed at the four corners of the displayed image. For electronic convergence all three colors can be adjusted.

Always align the color components of the sprite to the inner most line color (for each axis). When converged, the three colors should overlap to form white lines. Applying the sprite alignment settings to the screen results in the three colors overlapping to form white lines throughout the image.

One or more poorly converged individual colors may appear adjacent to some or all of the lines.



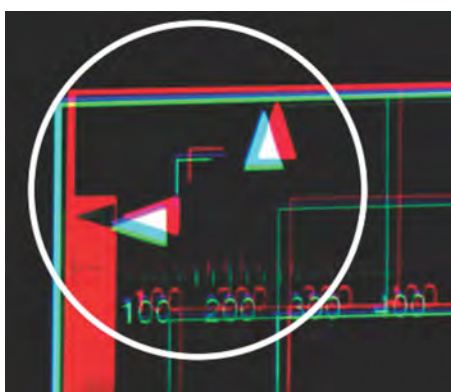


If you wear glasses with corrective lenses when performing this adjustment, make sure you are viewing the test pattern on a straight angle through the optical axis of your glasses and not from a tilted or angled perspective. This avoids a prismatic effect that can appear to shift convergence when viewing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

Electronically adjusting convergence

Use the electronic convergence feature in the menu to adjust convergence. Only perform electronic convergence when satisfied with the position of the image on the screen.

1. Let the projector warm up for 20 minutes before proceeding with the following steps.
2. In the left navigation menu, select **Image Settings > ILS File Setup**.
3. Select an ILS file to store the ECC settings.
4. On the ILS File Setup page, select **ECC**.
Each corner of the screen displays three separate sprites, one for each primary color. The user interface displays the Test Pattern controls.
5. Set the Screen Type to **Flat** or **Scope**.
This sets the test pattern and the location of the sprites on the screen. Each sprite appears as the letter L.
6. Set the Sprite Color to **Move** and **Show**.
When first opening the ECC, all Show and all Move colors are selected, so all three sprites are displayed and all three sprites are moved by the directional pad.
7. Select a **Step Size** to control the granularity of the steps from coarse (1/8 pixel per step) to fine (1/64 pixel per step) when using the directional pad.
Sprites can be moved a maximum of 20 pixels.
8. Choose a corner by selecting the circle at a corner of the dashed rectangle.
The selected corner is indicated by a green circle. The X/Y pixel offset (from no correction) displays in red, green, and blue text corresponding to each sprite.
9. Use the directional pad to move the sprites towards the center of the screen.
10. Adjust each sprite so they overlap to create a single white sprite.
In the example below, the red sprite (in image 1 below) was moved down and the blue sprite (in image 1 below) was moved to the right so they overlap to create the single white sprite (image 2 below).



1



2

11. To set the convergence for that corner of the screen, select **Apply**.



12. Repeat steps 7 to 10 for the remaining corners.
13. If necessary, reset the correction back to zero (no correction) or the previously saved correction by selecting **Reset**.
In the Reset dialog, reset the current corner or all four corners. When the locations and value are set, select **Reset**.
14. To save the current ECC settings, when the convergence is complete, select **Save** beside the ILS file named at the top of the panel.

Correcting on-screen color

After installation, further image adjustments may be required to correct color on the screen.

The next steps may include creating a Measured Color Gamut Data (MCDG) file and configuring a Pureformity Color™ Technology (PCT) file to achieve optimal color and brightness uniformity.

For more information on managing color settings, see the *CineLife+ 2K User Guide (P/N: 020-103949-XX)*.

Regulatory

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

Safety

- IEC 62368-1:2018 - Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
- BS EN 62368-1:2014 - Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
- UL 62368-1:2018 - Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
- CSA CAN/CSA-22.2 No. 62368-1:2018 - Audio/Video, Information And Communication Technology Equipment - Part 1: Safety Requirements
- IEC 62471-5:2015 - Photobiological Safety of Lamps and Lamp Systems - Part 5: Image projectors
- IEC 60825-1:2014 - Safety of Laser Products - Part 1: Equipment Classification and Requirements
- ANSI Z136.1:2014 - Safety of Lasers

Electro-magnetic compatibility

Emissions

- CAN ICES-003 (A)/NMB-003 (A) – Information Technology Equipment (Including Digital Apparatus) – Limits and Methods of Measurement
- CISPR 32/EN 55032, Class A – Electromagnetic Compatibility of Multimedia Equipment – Emission Requirements
- FCC CFR47, Part 15, Subpart B, Class A – Unintentional Radiators
- IEC 61000-3-2/EN61000-3-2: Limits for harmonic current emissions for equipment with input current ≤ 16 A
- IEC 61000-3-3/EN 61000-3-3: Limitations of Voltage Changes, Voltage Fluctuations, and Flicker input current ≤ 16 A per phase and not subject to conditional connection

Immunity

- CISPR 35/EN 55035 Electromagnetic compatibility of multimedia equipment - Immunity requirements

California law on security

- California Law Requiring Internet Connected Devices To Include Reasonable Security Features (California Civil Code Section 1798.91.04)

Environmental

- China Ministry of Information Industry (along with 7 other Government Agencies) Order No.32 (01/2016) on the control of pollution caused by electronic information products, hazardous substances concentration limits (GB/T 26572 - 2011), and the applicable product marking requirement (SJ/T 11364 - 2014).
- EU Directive (2011/65/EU) on the restriction of the uses of certain hazardous substances (RoHS) in electrical and electronic equipment and the applicable official amendment(s).
- EU Directive (2012/19/EU) on waste and electrical and electronic equipment (WEEE) and the applicable official amendment(s).
- Regulation (EC) No. 1907/2006 on the registration, evaluation, authorization and restriction of chemicals (REACH) and the applicable official amendment(s).

International packaging recycling mark requirements.

- EU Directive (2012/19/EU) on waste and electrical and electronic equipment (WEEE) and the applicable official amendment(s).
- EU Directive (94/62/EC) on packaging and packaging waste
- China packaging recycling mark standard (GB18455-2010)