Service Manual

020-001054-02

# **GS Series** DHD700-GS, DWU700-GS, DHD850-GS, DWU850-GS



#### NOTICES

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#### **GENERAL WARRANTY STATEMENTS**

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

- a. Problems or damage occurring during shipment, in either direction.
- b. Projector lamps (See Christie's separate lamp program policy).
- c. Problems or damage caused by use of a projector lamp beyond the recommended lamp life, or use of a lamp supplied by a supplier other than Christie.
- d. Problems or damage caused by combination of a Product with non-Christie equipment, such as distribution systems, cameras, video tape recorders, etc., or use of a Product with any non-Christie interface device.
- e. Problems or damage caused by the use of any lamp, replacement part or component purchased or obtained from an unauthorized distributor of Christie lamps, replacement parts or components including, without limitation, any distributor offering Christie lamps, replacement parts or components through the internet (confirmation of authorized distributors may be obtained from Christie).
- f. Problems or damage caused by misuse, improper power source, accident, fire, flood, lightening, earthquake or other natural disaster.
- g. Problems or damage caused by improper installation/alignment, or by equipment modification, if by other than Christie service personnel or a Christie authorized repair service provider.
- h. Problems or damage caused by use of a Product on a motion platform or other movable device where such Product has not been designed, modified or approved by Christie for such use.
- i. Problems or damage caused by use of a projector in the presence of an oil-based fog machine.
- j. For LCD projectors, the warranty period specified applies only where the LCD projector is in "normal use." "Normal use" means the LCD projector is not used more than 8 hours a day, 5 days a week. For any LCD projector where "normal use" is exceeded, warranty coverage under this warranty terminates after 6000 hours of operation.
- k. Image retention on LCD flat panels.
- I. Failure due to normal wear and tear.

#### **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.

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### **CH**kiSTIE<sup>®</sup>

# Introduction

This document provides technical information for assisting Christie qualified technicians in the servicing of the Christie GS Series 700-850 projectors.

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.

# **Affected products**

The following products are affected:

- Christie DHD700-GS
- Christie DWU700-GS
- Christie DHD850-GS
- Christie DWU850-GS

### Site requirements

To safely install and operate the projector, the installation location must have restricted access for authorized personnel only and meet these minimum requirements.



Notice. Failure to comply with the following may result in property damage.

• Replacement of optical light engine parts must be done in a clean room.

### **Projector components**

Identify the main components of the projector.



#### **Front view**

Identify the main components on the front of the projector.



ID	Part name	Description
1	Front IR sensors	Receives signals from the IR remote keypad. Keep the signal path to the sensor unobstructed for uninterrupted communication with the projector.
2	Projection lens	Allows automated lens control and adjustment: vertical and horizontal offsets, zoom, and focus.
3	Adjustable feet	Raises or lowers the feet to level the projector.

#### **Rear view**

Identify the main components on the rear of the projector.



ID	Part name	Description
1	Rear IR sensor	Receives signals from the IR remote keypad. Keep the signal path unobstructed for uninterrupted communication with the projector.
2	Input/Output (I/O) panel	Connects the projector to external devices.
3	Built-in keypad	Controls the projector.
4	AC input	Connects to the supplied power adapter.
5	Power button	Powers the projector on or off.
6	Kensington Security slot	Secures the projector to help prevent theft or unauthorized removal.



#### Left view

Identify the main components on the left side of the projector.



ID	Part name	Description
1	Cooling air vents (intake)	Provides cooling to the projector. Keep these vents unobstructed to prevent the projector from overheating.

#### **Right view**

Identify the main component on the right side of the projector.



ID	Part name	Description
1	Cooling air vents (intake)	Provides cooling to the projector. Keep these vents unobstructed to prevent the projector from overheating.

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# 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 until the current supply lasts.



All part numbers are subject-to-change.

# **Replacing modules**

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

Components must be replaced with exact equivalents. Failure to do so may result in unsafe operation.

# Servicing live equipment

Only Christie accredited technicians who are knowledgeable about the hazards associated with hazardous voltage, ultraviolet exposure, 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 lamp on, open the douser, 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 and warning guidelines

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

This projector must be operated in an environment that meets the operating range specification. Use only the attachments and/or accessories recommended by Christie. Use of others may result in the risk of fire, shock, or personal injury.

- Warning! Failure to comply with the following could result in death or serious injury.
- Observe all electrostatic precautions. Use a grounded wrist strap and insulated tools when handling, servicing, or cleaning electronic assemblies.
- Do not look into the projector lens when the laser 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.
- UV EXPOSURE! Protective UV safety glasses with side shields and Christie approved protective safety clothing must be worn when performing optical adjustments or servicing the product.
- SHOCK HAZARD! Do not attempt operation if the AC supply is not within the specified voltage and power range, as specified on the license label.



Caution! Failure to comply with the following could result in minor or moderate injury.

- SHOCK HAZARD! Disconnect the product from AC before moving, servicing, cleaning, removing components, or opening any enclosure.
- SHOCK HAZARD! Only use the AC power cord provided with the product or recommended by Christie.
- Christie products must be installed and serviced by Christie qualified technicians.
- 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.



Notice. Failure to comply with the following may result in property damage.

- SHOCK HAZARD! All harnessing must be properly routed and secured as originally installed, especially in high voltage areas.
- If the product is not being used for an extended period of time, disconnect the power plug from the AC outlet.
- FIRE HAZARD! Do not use a power cord or harness that appears damaged.
- Always use a lens plug when installing or moving the product. This prevents contaminants from entering the product.
- Do not use abrasive cleaners, waxes, or solvents to clean the projector.
- Always provide proper ventilation for the product to prevent overheating.
- Do not expose the product to moisture.

# Laser safety warnings

This product is classified as CLASS 1 LASER PRODUCT - RISK GROUP 2 according to IEC 60825-1:2014 and IEC 62471:2006. Complies with FDA regulations 21 CFR 1040.10 and 1040.11 as a Risk Group 2 LIP (Laser Illuminated Projector) as defined in IEC 62471:2006 except for deviations pursuant to Laser Notice No. 50, dated June 24, 2007.

	es with 21 CFR 1040.10 and 1040.1 for deviations pursuant to Laser N	1 as a Risk Group 2, LIP (I otice No. 50, dated June	aser <b>B</b> uminated Projector ) a 24, 2007	s defined in IEC 62471:2006
IEC 60825-1:2014 CLASS 1 LASER PRODUCT RISK GROUP 2	IEC 60825-1:2014 PRODUIT LASER DE CLASSE 1 GROUPE DE RISQUE 2	IEC 60825-1:2014 1美激光产品 危险组2	EC 60825-1:2014 1등급 레이저 제품 위험 그룹 2	IEC 60825-1:2014 クラス1レーザー製品 リスクグループ 2
CAUTION	AVERTISSEMENT	注意	주의	注意
Possibly hazardous optical radiation emitted from this product. Do not stare at beam. May be harmful to the eye.	Radiation optique à danger potentiel émise parceproduit. Ne regardez pasdirectement le faisceau laser. Ceci pourrait être nocif pour votre cell.	此产品可能会产生危 致光辐射。请勿直视 操作光束,以免对眼 晴损害。	이 제품으로부터 인체에 위해한 광선이 방사될 수 있음, 광원을 정면으로 바라보지 마시오. 눈에 심각한 손상을 입을 수 있음.	本製品より危険となり うる光放射あり。ピー ムをのぞき込まないこ と。 眼に有害となる可 能性あり。



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
- Any operation or adjustment not specifically instructed in the User manual creates the risk of hazardous laser radiation exposure.
- Only Christie qualified technicians who are knowledgeable about the hazards associated with laser use, high-voltage, and high temperatures generated by the product are authorized to assemble, install, and service the Christie Laser Projection System.
- Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.
- When turning on the projector, make sure no one within projection range is looking at the lens.
- Follow the control, adjustment, or operation procedures to avoid damage or injury from exposure of laser radiation.
- The instructions for the assembly, operation, and maintenance include clear warnings concerning precautions to avoid possible exposure to hazardous laser radiation.

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# **Service setups**

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

# **Required equipment for testing**

The equipment required for testing after service is listed below.

- PC or laptop with WUXGA/1080p resolution
- DVD player with Multi-system, equipped Component, S Video, Composite, and HDMI
- HDTV Source (480P, 720P, 1080P)
- Quantum Data 802B or CHROMA2327 (Color Video Signal and Pattern Generator)
- CL200
- HDBaseT extender (CH-506TX)
- · Voltage test meter
- VGA cable, power cord, component cable, audio cable, HDMI cable, RJ45 cable, and RS232 cable
- Phillips #1 screwdriver
- Flathead screwdriver

### **Service modes**

The GS Series 700-850 projects contain two kinds of modes: Factory and Service.

#### **Entering Factory mode**

Learn how to enter the Factory mode.

- 1. Turn on the projector.
- 2. On the remote or keypad, press the Auto, left, left, left buttons sequentially.

#### **Entering Service mode**

Learn how to enter the Service mode.



- 1. Turn on the projector.
- 2. Press Menu.
- 3. Select Configuration and press Enter.
- 4. Select Service and press Enter.
- 5. On the IR remote keypad, press **4**, **7**, **5**, **3** buttons sequentially, or on the keypad press **left**, **down**, **right**, **input** sequentially.
- 6. Select OK and press Enter.

# **Performing** a factory reset

Erase all end-user settings and restore the default on-screen display setting.

1. Enter Service mode.

See Entering Service mode on page 13.

2. Select Factory Reset.

# **Test inspection**

Complete the required update according to the table below for part replacements indicated by X.

	Parts replaced								
Update	Main board	IO board	LD module	Cooling module	Color wheel	Firmware	DMD board	DMD	Light engine
Firmware update	x								
Color wheel index	x		х	x	x	х			
Phosphor wheel index	x		x	x					
Factory reset	х					х			
ABC calibration	x		x	x					x
DMR adjustment			x	x					
DMB adjustment			x	x					
Focus adjustment							x	x	x
ROD adjustment			x	x					x
Lens calibration									x
ADC calibration	x					х			
Network test		x							
HDBaseT function test	x								



# PC mode

Warning! Failure to comply with the following could result in death or serious injury.

• Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

When performing a functional test, to optimize the image before testing, adjust the zoom and focus.

- 1080P: Analog 1920 x 1080 @60Hz
- WUXGA: Analog 1920 x 1200 @60Hz

# **Frequency and tracking boundary**

ID	Part name	Description
1	Test equipment	Video generator
2	Test signal	<ul> <li>1080P: Analog 1920 x 1080 @60Hz</li> <li>WUXGA: Analog 1920 x 1200 @60Hz</li> </ul>
3	Test pattern	General-1 or Master
4	Inspection items	<ul><li>Eliminate visual wavy noise by adjusting the Resync Frequency or Tracking.</li><li>Check if noise exists on the screen.</li><li>Adjust the horizontal and vertical position of the video to fit the screen frame.</li></ul>
5	Criteria	<ul> <li>If noise is on the screen, to adjust the phase, press Menu &gt; Size &amp; Position &gt; Pixel Phase.</li> <li>PC mode must include supported formats with frequency and auto detection.</li> </ul>

#### Adjusting the frequency and tracking boundary

To perform the frequency and tracking boundary adjustment, complete the steps below.

- 1. If the image is not sharp, re-adjust using the following steps:
  - a. Select Menu > Size & Position > Size Presets > Full Size.
  - b. Select Menu > Input Switching & PIP > Timing Detection Mode > OFF.
  - c. Select Menu > Size & Position > Pixel Track.
  - d. Use the right and left arrow keys to minimize video flicker.
- 2. Select Menu > Size & Position.
- 3. Adjust Horz Position and Vert Position to the inner screen.

# **Adjusting color performance**

Use the HDTV (408p, 720p, 1080p) source to complete the test. The color does not turn purple and blue.



Warning! Failure to comply with the following could result in death or serious injury.

• Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

ID	Part name	Description
1	Test equipment	Video generator
2	Test signal	480p, 720p, 1080p
3	Test pattern	Master, 64 Gray RGBW or SMPTE BAR, 256 Gray
4	Inspection items	<ul> <li>Check if the color level is supersaturated.</li> <li>If the color level is supersaturated, the 64 Gray RGBW test pattern appears blurred and fuzzy.</li> </ul>
5	Criteria	<ul><li>Colors in 64 Gray RGBW test pattern appear sharp and clear.</li><li>No noise is visible on the screen.</li></ul>

- 1. If the image is noisy, press Menu > Size & Position > Pixel Phase and adjust the phase.
- 2. If blue color appears abnormal under the 64 Gray RGBW pattern, to complete a Phosphor Index adjustment, enter **Service mode**.

See Adjusting the phosphor index on page 24.

3. If the color appears abnormal under the 256 Gray pattern, to do a Filter Index adjustment, enter **Service mode**.

See Adjusting the color index on page 25.

### **Performing an ABC calibration**

Always perform an ABC calibration after repairing the main board, the combiner, or replacing the light engine.



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
- Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.
- 1. Remove the top cover before during the adjustment.

See Removing the top cover on page 57.

- 2. To power on with the top cover removed, firmly hold the interlock switch on the left cover.
- 3. Enter Factory mode.

See Entering Factory mode on page 13.



- 4. Select ABC Feedback.
- 5. On the IR remote, press the **Right** button.
- 6. To confirm whether the max value of **LS** (light sensor) is within specification, refer to the image below.
  - DHD850-GS and DWU850-GS: 400 to 500 kHz
  - DHD700-GS and DWU700-GS: 430 to 480 kHz

No CL200; 1920 × 1080 Size=287; 99-00	
PWM[R/G/B/Y/RId] = 820, 820, 580, 820, 784	
BLD1[Amax/Amin/LDTemp] = 334/327/58 (unit:10mA/10mA/C)	
BLD2[Amax/Amin/LDTemp] = 325/321/55 (unit:10mA/10mA/C)	
RLD [Amax/Amin/LDTemp] = 288/286/33 (unit:10mA/10mA/C)	
LS[W/R/G/B/Y] = 336.4 / 308.9 / 336.5 / 187.1 / 474.1 (kHz)	
Sensor Data R 1571, G 1017, B 1329, Y 1037	
	The max valu

- 7. If the value is out of specification, adjust the ABC adjustment bar (indicated by the arrows in the image in step 8) with a Phillips #1 screwdriver, until the value is within specification.
- 8. After completing the adjustment, tighten the screw (indicated by the arrows in the image below).



9. To lock the screw, use Loctite 222 or green glue (BONBOND LOCK BB-2100).

# **Calibrating the lens**

Always perform a lens calibration after repairing the main board or replacing the light engine.



Warning! Failure to comply with the following could result in death or serious injury.

• Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

ID	Part name	Description
1	Inspection item	Check if the lens shift is moving smoothly.



ID	Part name	Description
2	Criteria	The lens shift is moving smoothly.

- 1. Place the projector on a clean horizontal surface.
- 2. On the IR remote or keypad, press Menu > Configuration > Lens Setting.
- 3. Select Lens Calibration.
- 4. Press Enter.

### **ADC** calibration

If the color appears abnormal after upgrading the scalar firmware, perform an ADC calibration.



- Warning! Failure to comply with the following could result in death or serious injury.
- Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

#### **Performing a PC calibration**

To perform the PC calibration, complete the steps below.

ID	Part name	Description
1	Test equipment	Video generator (output level: 700 mv)
2	Test signal	Timing: 800 x 600 @60Hz
3	Test pattern	16 Gray
4	Inspection item	Check if the ADC calibration status has changed from <b>Doing</b> to <b>Done</b> .

- 1. On the IR remote keypad, press Menu > Size & Position > Size Presets > Full Size.
- 2. Enter Factory mode.

See Entering Factory mode on page 13.

3. Select ADC Calibration > Help.



After a few seconds, the ADC calibration status changes from **Doing** to **Done**.





#### Performing a video calibration

To perform the video calibration, complete the steps below.

ID	Part name	Description
1	Test equipment	Video generator (output level: 700 mv)
2	Test signal	<ul> <li>1080P: Analog 1920 x 1080 @60Hz</li> <li>WUXGA: Analog 1920 x 1200 @60Hz</li> </ul>
3	Test pattern	SMPTE BAR
4	Inspection items	Check if the ADC calibration status has changed from <b>Doing</b> to <b>Done</b> .

- 1. On the IR remote keypad, press Menu > Size & Position > Size Presets > Full Size.
- 2. Enter Factory mode.

See Entering Factory mode on page 13.

3. Select ADC Calibration > Help.

After a few seconds, the ADC calibration status changes from **Doing** to **Done**.



# Adjusting the ROD assembly

Avoid over-adjusting the ROD to prevent damage.



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
  - Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.
- 1. Remove the top cover.

See Removing the top cover on page 57.

- 2. To power on with the top cover removed, firmly hold the interlock switch on the left-side cover.
- 3. Project an image of 100 inches in a dark environment (< 2 Lux).
- 4. Enter Service mode.

See Entering Service mode on page 13.

- 5. Click Test Pattern, select the White Screen test pattern.
- 6. To adjust the ROD assembly on the engine module, tighten or loosen the two M3 screws (shown below).



- 7. Adjust the ROD until the yellow or blue image artifacts disappear.
- 8. To fix the screws, use Loctite 222 or green glue (BONBOND LOCK BB-2100).

# **Adjusting the focus**

If the projected image appears fuzzy with the unbalance over 50 cm, perform adjusting the focus.



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
- Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.



ID	Part name	Description
1	Test equipment	<ul> <li>Optional lens 0.75~0.95</li> <li>Tapeline</li> <li>M4 allen key</li> </ul>
2	Environment of adjustment	<ul><li>Projects an image of 100 inches.</li><li>Must be done in a dark environment (&lt; 2 Lux ).</li></ul>
3	Criteria	The image is clear, crisp, and sharp.

#### Adjusting the back focus

To set up for the back focus adjustment, follow the steps below.

- 1. Use the PC to project a Full Screen test pattern.
- 2. Adjust the lens zoom to its widest position.
- 3. Adjust the focus to make the picture as fuzzy as possible.
- 4. Measure the minimum imaging distance.
- 5. Confirm whether the distance values differ less than 3 cm from the lens specification values.
  - If the value does not meet the lens specification within 3 cm, adjust the three set screws with a M4 allen key.



• If the value does meet the lens specification within 3 cm, do a boresight adjustment.



#### **Adjusting boresight**



Notice. Failure to comply with the following may result in property damage.

• Do not adjust the set screws beyond two full turns in the clockwise direction to avoid equipment damage.

Adjust the three set screws with a M4 allen key to make the image clear, crisp, and sharp.

- To tighten the set screws, turn counterclockwise.
- To loosen the set screws, turn clockwise.

To adjust boresight, complete the following steps.

- 1. To adjust the focus to position 1 on the screen, click Focus.
- Once position 1 is in focus, check position 2. If position 2 is not in focus, use the focus Up or Down key to bring position 2 into focus on the screen.
  - If pressing the focus **Up** key results in position 2 coming into focus, adjust set screw B clockwise.
  - If pressing the **Down** key results in position 2 coming into focus, adjust set screw B counterclockwise.
- 3. Refocus position 1 and check if position 2 is also in focus. If not, repeat steps 1 and 2.
- 4. If the projector is still not in focus, reset the set screw position:
  - a. Turn the set screws counterclockwise until tight.
  - b. Turn the set screws 1.5 turns in the clockwise direction back to their factory default setting.
  - c. Check that the alignment of the set screws matches what is shown in the image above.

### **Adjusting the DMR**



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
- Protective glasses are required for laser safety when adjusting the DMR.



For DHD850-GS, DWU850-GS only.

After replacing the combiner, and red LD bank, adjusting the DMR must be done.

- 1. Project an image of 100 inches in a dark environment (< 2 Lux).
- 2. Put a CL200 on the screen center of position 5 (P5).
- 3. Enter Service mode.

See Entering Service mode on page 13.

4. Click Test pattern.



5. Select Red.



6. To tune the brightness of P5, use a flathead screwdriver to adjust right DMR screw.



Stop adjusting the DMR screw when the brightness of P5 is at its maximum.

7. To fix the DMR screws, use Loctite 222 or green glue (BONBOND LOCK BB-2100).

# **Adjusting the DMB**



Warning! Failure to comply with the following could result in death or serious injury.

- This projector has built-in Class 4 laser module. Never attempt to operate the projector without all covers properly installed unless instructed to do so in this manual for service.
- Protective glasses are required for laser safety when adjusting the DMB.

After replacing the combiner and blue LD bank, adjust the DMB.

- 1. Project an image of 100 inches in a dark environment (< 2 Lux).
- 2. Put a CL200 in the center of P5.
- 3. Enter Service mode.

See Entering Service mode on page 13.

4. Click Test pattern.



5. Select the White.



- 6. To tune the color temperature of P5 to between 7400 K to 8000 K, adjust the right DMB screw.
- 7. To tune the color uniformity, adjust the left DMB screw.

Stop adjusting the DMB screws when the projector is in the following standard range:

- a. The brightness of P5 is at its maximum.
- b. Color temperature of P4, P5, and P6: Max-Min </= 200K.



8. To fix the DMB screws, use Loctite 222 or green glue (BONBOND LOCK BB-2100).

# Adjusting the phosphor index

After replacing main board, combiner, LD bank, and upgrading firmware, adjusting the phosphor index must be done.



Warning! Failure to comply with the following could result in death or serious injury.

• Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

ID	Part name	Description
1	Test equipment	Video generator
2	Test timming	• 1080P: 1920 x 1080 @60Hz • WUXGA: 1920 x 1200 @60Hz
3	Test pattern	64 Gray RGBW



ID	Part name	Description
4	Inspection items	<ul> <li>Check if the blue color level is supersaturated.</li> <li>If the blue color level is supersaturated, the 64 Gray RGBW test pattern appears blurred and fuzzy.</li> </ul>
5	Criteria	<ul><li>Blue colors in 64 Gray RGBW test pattern appear sharp and clear.</li><li>No noise is visible on the screen.</li></ul>

1. Project the 64 Gray RGBW test pattern.





2. Enter Service mode.

See Entering Service mode on page 13.

- 3. Click Wheel Index (3x) or select Wheel Index (2x).
- 4. Click Phosphor Index.
- 5. Set up for the phosphor index value.

Only confirm the blue color as the other color levels are not taken into account.

- a. Adjust the index upwards until blue does not appear smooth.
- b. Record the a index value.
- c. Adjust the index downwards until blue does not appear smooth.
- d. Record the b index value.
- e. Set the index value to (a+b)/2.

# Adjusting the color index

After replacing main board, combiner, color wheel, and upgrading firmware, adjust the color index.



- Warning! Failure to comply with the following could result in death or serious injury.
- Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.



ID	Part name	Description
1	Test equipment	Video generator
2	Test timming	• 1080P: 1920 x 1080 @60Hz • WUXGA: 1920 x 1200 @60Hz
3	Test pattern	64 Gray RGBW, 256 Gray
4	Inspection items	<ul> <li>Check if the color level is supersaturated.</li> <li>If the color level is supersaturated, the 64 Gray RGBW and 256 Gray test patterns appear blurred and fuzzy.</li> </ul>
5	Criteria	<ul><li>Colors in 64 Gray RGBW and 256 Gray test patterns appear sharp and clear.</li><li>No noise is visible on the screen.</li></ul>

1. Project the 64 Gray RGBW pattern.



#### 64 Gray RGBW

#### 2. Enter Service mode.

See Entering Service mode on page 13.

- 3. Click Wheel Index (3x) or select Wheel Index (2x).
- 4. Click Filter Index.
- 5. Set up for the color index value.

Only confirm the red color level as the other color levels are not taken into account.

- a. Adjust the index upwards until red does not appear smooth.
- b. Record the a index value.
- c. Adjust the index downwards until red does not appear smooth.
- d. Record the b index value.
- e. Set the index value to (a+b)/2.



6. Project the 256 Gray pattern.





7. To ensure normal and sufficient color levels, set up the color index value by pressing the **Left** or **Right** button.

# I/O port function test

Always perform the I/O port function test after repairing the main board, the light engine, or upgrading the scalar firmware. If performance is not normal, replace the main board or I/O board (see *Replacing the main board and I/O board* on page 78).

#### **Running a VGA port performance test**

ID	Part name	Description
1	Test equipment	Video generator
2	Test signal	1920 x 1200 @60Hz General-1
3	Inspection item	VGA port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the VGA port performance test, complete the following steps.

- 1. Connect the projector and video generator using a VGA cable.
- 2. Select the signal source VGA.

The image of video generator is projected.

#### **Running a HDMI port performance test**

ID	Part name	Description
1	Test equipment	DVD player with HDMI output set to 16:9
2	Test signal	480p, 720p, 1080p
3	Inspection item	HDMI port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the HDMI port performance test, complete the following steps.

- 1. Connect the projector and DVD player using a HDMI cable.
- 2. Select the signal source HDMI.

The image of DVD player is projected.

#### **Running a DVI port performance test**

ID	Part name	Description
1	Test equipment	Video generator
2	Test signal	General-1,1024 x 768 @60Hz
3	Inspection item	DVI port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the DVI port performance test, complete the following steps.

- 1. Connect the projector and video generator using a DVI cable.
- 2. Select the signal source DVI.

The image of video generator is projected.

#### Running a 3G-SDI port performance test

ID	Part name	Description
1	Test equipment	DVD player
2	Test signal	720p, 1080p, 1080i
3	Inspection item	3G-SDI port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the 3G-SDI port performance test, complete the following steps.

- 1. Connect the projector and DVD player using a toaxil cable.
- 2. Select the signal source **3G-SDI**.

The image of DVD player generator is projected.

#### **Running a 3D SYNC out port performance test**

ID	Part name	Description
1	Test equipment	3D RF glasses, RF emitter
2	Test signal	1080p@60Hz
3	Inspection item	3D SYNC out port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the 3D SYNC out port performance test, complete the following steps.

- 1. Connect the projector and RF emitter using a BNC cable.
- 2. Wear the 3D RF glasses.
- 3. Select the signal source **3D SYNC**.

The 3D image is projected.

#### Running a remote port performance test

ID	Part name	Description
1	Test equipment	Remote controller
2	Test signal	None
3	Inspection item	Wired remote port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal line distortion or noise exist on the screen

To perform the remote port performance test, complete the following steps.

- 1. Connect the projector and remote controller using a audio cable.
- 2. On the IR remote, press Menu.

The image of on-screen display menu is projected.

#### **Running a USB A port performance test**

ID	Part name	Description
1	Test equipment	U disk
2	Test signal	64 Gray
3	Inspection item	USB A port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the USB A port performance test, complete the following steps.

- 1. Connect a U disk to the projector over the USB A port.
- 2. Select the signal source Card reader.

The data of U disk is projected.

#### Running a mini USB port performance test

ID	Part name	Description
1	Test equipment	Video generator
2	Test signal	64 Gray RGBW
3	Inspection item	Mini USB port performance test
4	Inspection distance	1.8 to 2.2 m
5	Criteria	No abnormal color performance, line distortion, or noise exist on the screen

To perform the video performance test by mini USB port, complete the following steps.

- 1. Connect the projector and PC using a USB cable.
- 2. Select the signal source Mini USB.
- 3. From My Computer, execute the **Projector Autorun.exe**.

The image of PC is projected.

# **Completing a PIP/PBP function test**

Always perform the PIP/PBP function test after repairing the main board, or upgrading the scalar firmware. If the performance is not normal, replace the main board (see *Replacing the main board and I/O board* on page 78).

- 1. On the IR remote keypad, press Menu > Input Switching > PIP Menu.
- 2. Set PIP/PBP Enable to On.
- 3. Ensure each item is functioning normally.

# Performing a network function test on the network port

The following browsers are supported for this test:

- Internet Explorer: IE8 for WinXP, IE9 or higher for Win7, and IE11 for Win8.1 or Win10 is required.
- Chrome: Version 49 or higher is required.
- Firefox: Version 46 or higher is required.
- Safari: Not supported.

To perform the network function test, complete the following steps.

- 1. Record the projector IP address.
  - a. Plug in the power cord to the projector.



- b. Connect PC and projector using a RJ45 cable.
- c. Turn on the projector.
- d. On the IR remote keypad, select Menu > Configuration > Communications > LAN.
- e. Make sure **DHCP** is disabled.
- f. Write down the following information:
  - The IP address: 192.168.0.100 (default)
  - The Subnet Mask: 255.255.255.0 (default)
- 2. In Network settings, set the projector IP address.
  - a. On the PC, double-click the Local Area Connection.
  - b. Click Properties.
  - c. Select Internet Protocol (TCP/IP).
  - d. Click Properties.
  - e. Set the IP Address to 192.168.0.240.
  - f. Set the Subnet Mask to 255.255.255.0.

The Host ID (192.168.0.XXX) of the PC IP Address must be different from the projector IP address.

- g. Click OK.
- h. Click Close.
- 3. Read the projector information.
  - a. Connect the PC and the projector Ethernet Port with a RJ45 cable.
  - b. Use Internet Explorer to navigate to http://192.168.0.100.
  - c. For the Access type, select Administrator.
  - d. Enter the password admin.
  - e. Click Login.

# Performing a network function test on HDBaseT port

The following browsers are supported for this test:

- Internet Explorer: IE8 for WinXP, IE9 or higher for Win7, and IE11 for Win8.1 or Win10 is required.
- Chrome: Version 49 or higher is required.
- Firefox: Version 46 or higher is required.
- Safari: Not supported.

To perform the network function test, complete the following steps.



- 1. Write down the projector IP.
  - a. Plug in the power cord to the projector.
  - b. Connect the PC and projector using a RJ45 cable.
  - c. Turn on the projector.
  - d. On the IR remote keypad, select Menu > Configuration > Communications > LAN.
  - e. Make sure **DHCP** is disabled.
  - f. Write down the following information:
    - The IP address: 192.168.0.100 (default)
    - The Subnet Mask: 255.255.255.0 (default)
- 2. In Network settings, set the projector IP address.

See Performing a network function test on the network port on page 31.

3. Read the projector information.

See Performing a network function test on the network port on page 31.

# Performing a RS232 and video function test on HDBaseT port

To perform the RS232 and video function test, complete the following steps.

- 1. Connect the CH-506TX, projector and PC as shown in step 5.
- 2. Select the signal source HDBaseT.
- 3. On the IR remote keypad, press Menu > Configuration > Communications> Serial port > HDBaseT.
- 4. Set the PC Baud Rate to 115200.
- 5. Input the RS232 command (SYS?).

The projector returns (SYSx).



# **Performing a wireless function test**

Before performing the wireless function test, a USB dongle must connect the projector and PC Host directly. When the connection is made, the PC shows a USB device disk.

The following browsers are supported for this test:

- Internet Explorer: IE8 for WinXP, IE9 or higher for Win7, and IE11 for Win8.1 or Win10 is required.
- Chrome: Version 49 or higher is required.
- Firefox: Version 46 or higher is required.
- Safari: Not supported.

To perform a wireless function test, complete the following steps.

- 1. Connect to the wireless SSID.
  - Insert the WiFi USB dongle (1DWUSB-BGN) into the USB port on the projector input panel.
  - b. Power on the projector.
  - c. Obtain the WiFi SSID from the on-screen display menu Main Menu > Configuration > Communications > WLAN.
  - d. Connect your PC device to the wireless SSID for the selected projector.

For example: Christie@0111000123.

- 2. Download Christie Presenter.
  - a. Use Internet Explorer to navigate to http://192.168.1.100.
  - b. For the Access type, select Administrator.
  - c. Enter the password admin.
  - d. Click Login.
  - e. Click Download.
  - f. Click Save.
- 3. Install the Christie Presenter.
  - a. Double-click Christie Presenter.
  - b. Click OK.
  - c. Click Next.
  - d. Click I Agree.
  - e. Click Next.
  - f. Click Next.
  - g. Enter the name and click Next.
  - h. Click Install.
  - i. Select I want to manually reboot later.



- j. Click Finish.
- 4. Perform wireless testing.
  - a. Select Christie Presenter.
  - b. Select Search.
  - c. Click OK.
  - d. Enter the password what you want to set.
  - e. Click OK.

# **On-screen display functionality inspection**

ID	Check item	Check point
1	General	All on-screen display functions must be checked for functionality. When the on- screen display menu is displayed, no visible peaking, ringing, streaking, or smearing artifacts appear on the screen.
2	Factory default	The factory settings (with appropriate centering, size, geometry distortion, and so on) are displayed when Factory Reset is selected from the on-screen display menu.
3	Display size	All preset modes shall expand to full screen size using on-screen display Horizontal and Vertical Size controls.
4	Display data channel	The purpose of the DDC test is to verify the DDC, DDC1/DDC2B operation of the projector and to verify Plug & Play function.
5	Acoustic	High pitch sounds from cooling fans and color wheel are unacceptable.

# **Check external appearance**

ID	Check item	Check point
1	Labels	Missing letters and blurry print are unacceptable.
2	Exterior surfaces and covers	Dirt, scrapes, and uneven color are unacceptable.
3	Logo	Missing logo, missing letters and blurry print are not acceptable.
4	Screws	All screws should be properly installed and the correct type.
5	Safety or warning labels	All safety and warning labels must be visible.
6	Connectors	All interface connectors must be installed and functional.



# **Firmware**

Use this chapter for the firmware upgrade processes.

# System firmware upgrade



The firmware upgrade procedure is the same for DWU850-GS, DHD850-GS, DWU700-GS, and DHD700-GS. DWU850-GS is used as the example.

Equipment needed	
Software	OPFU: One package firmware upgrade
Hardware	<ul> <li>Projector</li> <li>Power cord, provided with the projector and appropriately rated for you region</li> <li>RJ45 cable (CAT-5e)</li> <li>PC or laptop with Windows XP, Windows 7, Windows 8, and Windows 10, 32 or 64-bit.</li> </ul>

#### **Updating the Windows setting**

To update the firmware on your projector, you must first set up your PC.

- 1. Close all firewalls.
- 2. Set the HDD sleep timer to greater than two hours.


3. If using Windows 7, run as administrator.



#### Installing the firmware upgrade utility

To update the firmware on your projector, install the firmware update utility on your PC.

- 1. Download the latest firmware program file from the Christie website (www.christiedigital.com).
- 2. Unzip the file to the desktop and open the folder created.
- 3. Execute Wizard OPFU.EXE.

#### Upgrading the firmware



Examples shown in the instructions may have minor differences compared to the firmware update for your specific projector model. Where applicable, these instructions note important differences between models.

To complete the firmware upgrade process, complete the following steps.

- 1. Double-click Wizard OPFU.EXE.
- 2. On the Update Details tab, select Please check firewall has been closed.
- 3. Click Next.
- 4. Connect the projector to AC and power it on.
- 5. When the source message is displayed on the bottom left of the projected image, click Next.
- 6. Connect the projector to the computer with an RJ45 cable.
  - a. Set the Default Gateway and Subnet Mask of the computer to match the projector.
  - b. Set the IP address of the computer to match the first three numbers of the projector.

For example, if the projector IP address is 192.168.000.100, set the computer IP address to 192.168.000.xxx, where xxx is not 100.

c. On the Connect Projector to Computer tab, type the IP address of the projector.



d. Click Next.

Update Details				
Connect Projector to Computer		RJ-45		a
	Enter the proj	ia storie ID address in t	he haves he	low :
Prepare to Update Projector	00 168 Connected IE	000 100	19.71	ka ka C
Prepare to Update Projector Updating Projector	00 168 Connected IF	000 100	19.71	
Prepare to Update Projector Updating Projector Update Result	00 [168 Connected IF	000 100 100	19.71	

- 7. Click Next.
- 8. On the Prepare to Update Projector tab, select your projector model name. Click Next.
- 9. Choose the firmware version that you want to upgrade to. Click Next.
- 10. When the firmware upgrade is complete, to verify the firmware version, enter **Service Mode** and select **Projector Info**.
- 11. Click Exit.

#### **Performing** a firmware recovery



If the upgrade fails, select **Restore**. The upgrade resumes based on your last selection of firmware and displays upgrade in progress.

To perform a firmware recovery, complete the following steps.

- 1. Repeat steps 1 through 9 in the firmware upgrade process, see *Upgrading the firmware* on page 37.
- 2. If the model name, serial number, and firmware version are not detected automatically, on the Update Details tab, select **Restore (Continue to the last update state)**.
- 3. Click Next.
- 4. When the firmware upgrade is complete, to verify the firmware version, enter **Service mode** and select **Projector Info**.
- 5. Click Exit.

#### **Recovering when the LAN firmware upgrade fails**

If the firmware recovery did not work, complete the following steps to recover the local area network.

- 1. Connect AC power and turn the power switch to on position.
- 2. Press the **UP** key followed by the **Power** key.
- 3. When the Ethernet LED flashes twice, to power on the projector, press Power.
- 4. Connect the projector to the PC with a mini USB cable.
- 5. Download the latest firmware program file from the Christie website (www.christiedigital.com).
  - a. Unzip the firmware file and save it to the desktop.
  - b. Double-click the firmware folder.
  - c. Choose the upgrade file based on the capability of the PC.
    - 64-bit system execute FlashUpgrader\_x64.exe
    - 32-bit system execute FlashUpgrader\_x32.exe
- 6. To execute the FlashUpgrader setup, click FlashUpgrader.exe.
- 7. Choose USB 2.0.
- 8. To start the firmware upgrade, click Flash.

The upgrade takes about eight minutes. The screen appears frozen during this time. Do not force shut down.

Programming is completed once the LAN firmware upgrade finished successfully.

9. After the upgrade has finished, remove the power cord.

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# Troubleshooting

Use this section for troubleshooting process.

#### **LED status indicators**

The LED indicators are located on the front and rear of the projector.

#### **Status LED**

Identify the status LED colors and meaning.

LED	State		Description
Blue	Solid	Standby	AC has been applied, projector is in standby mode. Projector status is OK.
	Flashing	Cool down	Projector is cooling down.
Green	Solid	Projector on	Lamp is on. Projector status is OK.
	Flashing	Startup	Projector is in startup or cool down mode.
Yellow	Solid	Warning in standby	Projector is turning off while it is in a warning state.
	Flashing	Warning with lamp on	A problem exists with the projector that does not cause it to shut down.
			Examples of warnings include: filter needs changing, one of the pumps are damaged, or a fan is operating at full speed due to over temperature of LD driver.
Red	Solid	Error in standby	The projector is turning off while it is in an error state.
	Flashing	Error with lamp on	An error with the projector exists that has caused or may inevitably cause it to shut down.
			Error examples include: fan failure, over temperature, wrongly installed filter, CW failure.
White	Flashing	Update	Projector is in flash (LAN) update state.
Off		AC off	AC power is off (without AC plug in).



#### **Shutter LED**

Identify the shutter LED state colors and meaning.

LED	State	Description
Magenta (solid)	Shutter closed	Projector is on, the image is blank, and the shutter is closed.
Off	Shutter open	Projector is on, an image is displayed, and the shutter is open.

#### Main procedure



#### Verify power connection



## Verify power functionality



#### Verify power functionality



## **Verify PIN protection**



#### Verity image pertormance



#### Verify image performance



# Verify image performance



# Verify image performance



# Verify IR remote keypad operation



#### Verify the network connection



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# 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

#### **Maintenance 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 guidelines.
- For detailed breakdown of serviceable modules, see Index of parts and modules.

#### **Tools required for service**

The tools required for service are listed below.

- Phillips #1 screwdriver
- Phillips Jewelers screwdriver
- M4 allen key
- M3 socket driver
- M6 socket driver
- M14 socket driver
- Side cutters

# Index of parts and modules

The following table lists the parts and modules for GS series 700-850.

Description	Part number
Fans	
Combiner cooling fan (#6)	003-005960-XX
Engine cooling fan (#4, 10)	003-005959-XX
System cooling fan (#1, 2, 3, 5, 7)	003-005624-XX
Cooling	·
TEC chip	003-005936-XX
Electronics	
Fuse 15A 250V 5*20	003-005675-XX
Motor stepping DC 8V	003-005121-XX
Switch interlock 800mm	003-005990-XX
AC inlet switch	003-005955-XX
Thermal switch	003-005954-XX
Power supply	003-005989-XX
Optics	
Color wheel (DWU850-GS, DHD850-GS)	003-005978-XX
Color wheel (DWU700-GS, DHD700-GS)	003-006023-XX
DMD chip (DWU850-GS, DWU700-GS)	003-005957-XX
DMD chip (DHD850-GS, DHD700-GS)	003-005958-XX
Light engine (DHD850-GS, DHD700-GS)	003-005970-XX
Light engine (DWU850-GS, DWU700-GS)	003-005985-XX
Cooling module (DWU850-GS, DHD850-GS)	003-005971-XX
Cooling module (DWU700-GS, DHD700-GS)	003-006022-XX
Red LD (DWU850-GS, DHD850-GS)	003-005973-XX
Front LD	003-005976-XX
Back LD	003-005977-XX
Printed circuit boards and sensors	
Photo sensor printed circuit board	003-006001-XX
Focus printed circuit board	003-004492-XX
LED printed circuit board	003-006000-XX
Driver printed circuit board (DWU850-GS, DHD850-GS)	003-005998-XX
Driver printed circuit board (DWU700-GS, DHD700-GS)	003-006026-XX



Description	Part number
I/O printed circuit board	003-005997-XX
IR printed circuit board	003-005996-XX
DMD printed circuit board	003-005995-XX
HDMI printed circuit board	003-005999-XX
Keypad printed circuit board	003-005636-XX
Main printed circuit board (DHD850-GS)	003-005993-XX
Main printed circuit board (DWU850-GS)	003-005994-XX
Main printed circuit board (DHD700-GS)	003-006024-XX
Main printed circuit board (DWU700-GS)	003-006025-XX
Mechanical	
Front cover—black	003-005961-XX
Front cover-white	003-005962-XX
Rear card cage cover—black	003-005963-XX
Rear card cage cover—white	003-005964-XX
Bottom cover—black	003-005965-XX
Bottom cover-white	003-005966-XX
Keypad holder—black	003-005967-XX
Keypad holder—white	003-006003-XX
Keypad button PC—black	003-005281-XX
Keypad button PC—white	003-005968-XX
Rear cover-white	003-005982-XX
Rear cover—black	003-005979-XX
Right cover—black	003-005980-XX
Right cover—white	003-005983-XX
Left cover—black	003-005981-XX
Left cover-white	003-005984-XX
Top cover—black	003-005986-XX
Top cover—white	003-006004-XX
RLD cover—black	003-005987-XX
RLD cover—white	003-006005-XX
BLD cover—black	003-005988-XX
BLD cover—white	003-006006-XX
GS series packaging kit	003-006007-XX
Foot adjust	003-005709-XX



Description	Part number
HDMI cover	003-005630-XX
Keypad enter key—white	003-005345-XX
Keypad enter key—black	003-005282-XX
PE bag	013-103404-XX
Carton	013-103408-XX
Top cushion	013-103407-XX
Bottom cushion	013-103406-XX
EPE bag	013-103405-XX
Harnesses	·
Power cord (China)	003-004152-XX
Power cord (JP)	003-004151-XX
Power cord (UK)	003-004150-XX
Power cord (EU)	003-004149-XX
Power cord (US)	003-004148-XX
Accessories	·
Remote control	003-005238-XX
Optional lens (TR: 0.95 ~ 1.22)	140-101103-XX
Optional lens (TR: 1.52 ~ 2.89)	140-102104-XX
Standard lens (TR: 1.22 ~ 1.52)	140-100102-XX
Standard lens (TR: 1.22 ~ 1.52) for DHD850-GS and DWU850-GS	140-131106-XX
Optional lens (TR: 2.9 ~ 5.5)	140-107109-XX
Optional lens (TR: 0.75 ~ 0.95)	140-119102-XX
Ultra short throw lens (TR: 0.36)	140-133108-XX

#### **CH**kiSTIE<sup>®</sup>

# Projector covers and feet

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

#### Removing the top cover

The top cover and top shielding provide access to the main board and other components.

1. Loosen the eight captive M3 screws on the top cover.





2. Slide the top cover towards the front of the projector and lift it.



3. Remove the 15 M3 screws securing the top shielding.



- 4. If required, replace the top cover.
- 5. To re-install the top cover, follow these steps in reverse order.

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#### **Removing the rear cover**

To remove the rear cover, complete the following steps.

1. Remove the top cover.

See *Removing the top cover* on page 57.

2. Remove the three M3 screws securing the fuse holder.



3. Loosen the five captive M3 screws securing the rear cover module.





4. Unplug the two cables.



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

#### **Removing the front cover**

To remove the front cover, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.



2. Remove the two M3 screws.



3. Unplug the two connectors securing the LED board.



4. Loosen the six captive M3 screws securing the front cover module.



5. Loosen the four captive M3 screws securing the dust cover module.



- 6. Transfer the dust cover module to the new front cover.
- 7. Replace the front cover.
- 8. To re-install, follow these steps in reverse order.

#### Removing the right-side cover

The right side of the projector is determined by facing forward from rear of the projector.

1. Remove the top cover.

See *Removing the top cover* on page 57.



2. Remove the front cover.

See Removing the front cover on page 58.

3. Remove the rear cover.

See *Removing the rear cover* on page 58.

4. Loosen the four captive M3 screws.



5. At both ends of the cover, remove the four M3 screws securing the right-side cover module.



6. To separate the right-side cover from fans 1, 2, and 3, remove the 12 M3 screws.



- 7. Transfer the fans to the new right-side cover.
- 8. Replace the right-side cover.
- 9. To re-install, follow these steps in reverse order.

#### **Removing the left-side cover**

The left side of the projector is determined by facing forward from rear of the projector. left-side from the back

1. Remove the top cover.

See *Removing the top cover* on page 57.

2. Remove the front cover.

See Removing the front cover on page 58.

3. Remove the rear cover.

See *Removing the rear cover* on page 58.



4. Loosen the four captive M3 screws.



5. At both ends of the projector, remove the four M3 screws securing the left cover module.



6. To separate the interlock switch from the left-side cover, remove the two M3 screws.



- 7. Transfer the interlock switch to the new left-side cover.
- 8. Replace the left-side cover.
- 9. To re-install, follow these steps in reverse order.

#### Removing the bottom cover

To remove the bottom cover, complete the following steps.

1. Remove all covers from the projector.

See *Removing the top cover* on page 57, *Removing the rear cover* on page 58, *Removing the front cover* on page 58, *Removing the right-side cover* on page 59, and *Removing the left-side cover* on page 60.

2. Remove the main board and I/O board.

See *Replacing the main board and I/O board* on page 78.

3. Remove fans 1, 2, 3, 5, and 7.

See *Replacing fans 1, 2, and 3* on page 64 and *Replacing fans 5 and 7* on page 65.

4. Remove the power supply.

See *Removing the power supply* on page 68.



5. Remove the light engine.

See Replacing the light engine, and combiner on page 73.

6. Remove the LD banks.

See *Replacing the right laser driver bank* on page 76 and *Replacing the front LD bank and rear LD bank* on page 77.

7. Remove the 10 M3 screws securing fans 4 and 10.



8. Unlock the three nuts with an M6 socket driver and remove the one mylar.



- 9. Remove the elevator feet from the bottom cover.
- 10. Remove the four M3 screws securing the blue LD cover and red LD cover.



11. Remove the 19 M3 screws securing the bottom cover.





- 12. Replace the bottom cover.
- 13. To re-install, follow these steps in reverse order.

# Replacing a projector's foot

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. Ensure the projector is in a secure position.

Christie does not recommend having the projector overhang when replacing the feet, unless the projector is securely positioned.

- 2. Loosen the screw and remove the foot.
- 3. Replace the foot.
- 4. Repeat steps 2 and 3 for any additional feet that need to be replaced.
- 5. To re-install, follow these steps in reverse order.

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# Ventilation and cooling

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

Do not install the projector near a radiator, heat register, or within an enclosure. To ensure adequate airflow, follow the requirements specified in the line drawing (P/N: 020-001122-XX) and never block or cover the vents.

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.

## Replacing fans 1, 2, and 3

To replace fans 1, 2, or 3 complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the right-side cover.

See *Removing the right-side cover* on page 59.

3. To separate the affected fan from the right-side cover, remove the corresponding four M3 screws.



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

#### **Replacing fans 4 and 10**

To replace fans 4 and 10 complete the following steps.

1. Remove all covers from the projector.



See *Removing the top cover* on page 57, *Removing the rear cover* on page 58, *Removing the front cover* on page 58, *Removing the right-side cover* on page 59, and *Removing the left-side cover* on page 60.

2. Remove the main board and I/O board.

See Replacing the main board and I/O board on page 78.

3. Remove fans 1, 2, 3, 5, and 7.

See Replacing fans 1, 2, and 3 on page 64 and Replacing fans 5 and 7 on page 65.

4. Remove the power supply.

See *Removing the power supply* on page 68.

5. Remove the light engine and combiner.

See *Replacing the light engine, and combiner* on page 73.

6. Remove the LD banks.

See *Replacing the right laser driver bank* on page 76 and *Replacing the front LD bank and rear LD bank* on page 77.

7. To remove fan 10, remove the four M3 screws securing the fan.



8. To remove fan 4, remove the six M3 screws securing the fan.



- 9. Replace the affected fan.
- 10. To re-install, follow these steps in reverse order.

#### **Replacing fans 5 and 7**

To replace fans 5 and 7, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the main board and I/O board.



See Replacing the main board and I/O board on page 78.

3. Remove the eight M3 screws securing the shielding.



4. Loosen the four captive M3 screws securing the fan modules (fan 7 and fan 5).



5. Replace the affected fan.



6. To re-install the fan modules, follow these steps in reverse order.

#### **Replacing fan 6**

To replace fan 6, complete the following steps.

1. Remove the front and rear LD banks.

See Replacing the front LD bank and rear LD bank on page 77.

2. Remove the four M3 screws securing fan 6.



- 3. Replace fan 6.
- 4. To re-install, follow these steps in reverse order.

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# **Electronics**

Learn how to replace the electronic components in the projector.

# Removing and installing the fuse

To remove and install the fuse, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the screw on the fuse.



3. Release the fuse.



- 4. Replace the fuse with a new one, tightening the screw attached.
- 5. To re-install, follow these steps in reverse order.

#### Removing the top cover interlock switch

The top cover interlock switch prevents the projector from operating when the top cover is off the projector.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the left-side cover.

See *Removing the left-side cover* on page 60.



3. To separate the right cover and interlock switch, remove the two M3 screws.



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

#### Removing the AC inlet and keypad

Remove the AC inlet and keypad from the rear cover.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the rear cover.

See *Removing the rear cover* on page 58.

3. To separate the AC inlet from the rear cover, remove the two M3 screws.



4. To separate the keypad and the rear cover, remove the two M3 screws with a Phillips #1 screwdriver.



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

#### **Removing the power supply**

To remove the power supply, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the main board and I/O board.



See Replacing the main board and I/O board on page 78.

3. Loosen the five captive M3 screws.



4. Remove the 3M tape.



5. Unplug the connector for the thermal switch cable.



6. Unplug the four connectors.





7. Remove the two M3 screws.



8. Separate the cable and fuse holder.



9. Remove the bracket securing the AC inlet.



10. Remove the seven M3 screws securing the power supply.



- 11. Replace the power supply.
- 12. To re-install, follow these steps in reverse order.



# Optics

Learn how to replace optical components.

# Removing and installing the lens



Warning! Failure to comply with the following could result in death or serious injury.

• Do not look into the projector lens when the laser is on. The extremely high brightness can cause permanent eye damage.

Before installing the lens, if a lens plug is inserted in the opening of the projector, remove the plug from the lens opening.

- 1. Center the lens.
  - a. Ensure the projector is on.
  - b. Ensure the lens is at or near its center position.

Attempting to remove the lens when at a large offset may cause damage to the lens assembly.

- c. To center the lens, press the Lens Horizontal or Lens Vertical button.
- d. Press Enter.
- 2. Turn off the projector and disconnect it from AC power.
- 3. Remove the lens.
  - a. To remove the lens, press the **Lens Release** button and rotate the lens counterclockwise by a quarter to release the lock.
  - b. Remove the lens through the front of the projector.



4. Install the new lens.



- a. Fully insert the lens assembly straight into the lens mount.
- b. To lock the lens in place, rotate the lens cap clockwise.



# **Replacing the color wheel**



Replacing the color wheel must be done in a clean room.

To remove the color wheel, complete the following steps.

1. Remove the top cover.

See *Removing the top cover* on page 57.

- Remove the HDMI extender board.
  See *Replacing the HDMI extender board* on page 78.
- 3. Remove the main board.

See Replacing the main board and I/O board on page 78.

4. To disassemble the sealing cover, remove the rubber and five M3 screws.



5. To replace the color wheel module, remove the three M3 screws.



6. To re-install, follow these steps in reverse order.
### Replacing the light engine, and combiner

To remove the light engine, and combiner module, complete the following steps.

- Remove the top cover.
   See *Removing the top cover* on page 57.
- 2. Remove the HDMI extender board.

See Replacing the HDMI extender board on page 78.

3. Remove the main board.

See Replacing the main board and I/O board on page 78.

- Remove the power supply.
   See *Removing the power supply* on page 68.
- 5. Remove the 11 M3 screws securing the engine module.



6. Unplug the six connectors from the blue LD bank.



7. Remove the cables from cable tie.



8. Remove the color wheel.

See Replacing the color wheel on page 72.

9. Replace the combiner module.



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

# **Replacing the TEC module**



For DHD850-GS and DWU850-GS only.

To remove the TEC module, complete the following steps.

1. Remove the light engine, and combiner.

See *Replacing the light engine, and combiner* on page 73.

2. Remove the three M3 screws securing the sealing bottom cover.



3. Remove the four M3 screws securing the DMD holder module.



4. Separate the TEC from the heatsink.



5. Replace the TEC module.

When replacing the TEC module ensure the thermal grease is spread evenly.

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

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# Replacing the DMD, DMD board, and optical engine board



Replacing the DMD module must be done in a clean room.

To remove the DMD and DMD board, complete the following steps.

1. Remove the light engine, and combiner.

See Replacing the light engine, and combiner on page 73.

2. Remove the TEC module.

See *Replacing the TEC module* on page 74.

3. To separate the DMD board from the DMD module, remove the six M3 screws.



4. Remove the DMD module.



5. Remove the four screws with a Phillips Jewelers screwdriver securing the heatsink.





6. Remove the two screws with a Phillips Jewelers screwdriver securing the optical engine board.



7. Replace the DMD, DMD board, and/or the optical engine board.

When replacing the DMD module ensure that the new thermal pad is applied evenly.

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

# **Replacing the right laser driver bank**



- For DHD850-GS and DWU850-GS only.
- Replacing the laser driver bank must be done in a clean room.

To remove the right laser driver (R-LD) bank, complete the following steps.

1. Remove the light engine, and combiner.

See Replacing the light engine, and combiner on page 73.

2. Remove the mylar and six screws with a Phillips Jewelers screwdriver securing the right laser driver bank.





3. Remove the cable from the right laser driver bank.



- 4. Replace the right laser driver bank.
- 5. To re-install, follow these steps in reverse order.

# Replacing the front LD bank and rear LD bank



Replacing the LD bank must be done in a clean room.

To remove the front laser driver (LD) bank and rear laser driver (LD) bank, complete the following steps.

1. Remove the light engine, and combiner.

See Replacing the light engine, and combiner on page 73.

2. Remove the screw with a Phillips Jewelers screwdriver securing thermal sensor.



3. Remove the four screws with a Phillips Jewelers screwdriver securing the front LD bank.



4. Remove the four screws with a Phillips Jewelers screwdriver securing the rear LD bank.



- 5. Replace the front LD bank and/or the rear LD bank.
- 6. To re-install, follow these steps in reverse order.

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# Printed circuit boards and sensors

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

### **Replacing the HDMI extender board**

To remove the main board and I/O board, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the two M3 screws and one hex screw.



- 3. Replace the HDMI extender board.
- 4. To re-install, follow these steps in reverse order.

### Replacing the main board and I/O board

To remove the main board and I/O board, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the HDMI extender board.

See *Replacing the HDMI extender board* on page 78.





3. Disconnect the 26 connectors on the top side of the main board, indicated by the arrows in the image below.

See the table below for descriptions of each connector.



Item	Male connector on connector board	Description	Figure
A	J8 FRONT IR	Composed of red, black, and white wires, a green connector, and a black wire tube (three pin)	
В	J5 MB TO KEYPAD CONN	White connector (30 pin)	



Item	Male connector on connector board	Description	Figure
С	J35 FAN10	Composed of black, blue, and red wires, a white connector, and a black wire tube (three pin)	
D/E	J33 FAN9/ J32 FAN8	Composed of black, green, gray, and red wires, a white connector, and a black wire tube (four pin)	
F	J23 FPC	FPC cable (eight pin)	
G	J36 FAN7	Composed of black, blue, gray, and brown wires, a white connector, and a black wire tube (four pin)	
H	J37 FAN5	Composed of black, green, gray, and red wires, a white connector, and a black wire tube (four pin)	
I	J24 PW SENSOR CONN	Composed of black, blue, gray, and brown wires, a white connector, and a black wire tube (four pin)	
J	J34 FAN4	Composed of white, black, and red wires, a red connector, and a black wire tube (three pin)	
К	J25 F/W MOTOR	Composed of black, blue, gray, and red wires, a white connector, and a black wire tube (four pin)	
L	J22 F/W SENSOR	Composed of white, black, and red wires, a red connector (three pin)	Man



Item	Male connector on connector board	Description	Figure
M/N	J44 H SENSOR L/J47 V SENSOR B	Composed of two white wires, a white connector, and a black wire tube (two pin)	
0	J14 LIGHT SENSOR 2	Composed of white, yellow, pink, brown, black, and red wires, a white connector (six pin)	
P	J48 MB TO LD BD	Composed of a white connector, and a black wire tube (20 pin)	
Q	J46 V SENSOR T	Composed of two blue wires, a white connector, and a black wire tube (two pin)	-
R	J43 H SENSOR R	Composed of two red wires, a white connector, and a black wire tube (two pin)	
S/T	J45 V POWER/J42 H POWER	Composed of yellow, white, red, and blue wires, a white connector, and a black wire tube (four pin)	
U	J39 ZOOM/FOCUS	Composed of white, yellow, pink, brown, black, and red wires, a white connector (six pin)	
V	J9 LIGHT SENSOR 1	Composed of black, yellow, and red wires, a white connector, and a black wire tube (six pin)	
W	J1 MB TO LVPS CONN	Composed of a white connector, and a black wire tube (22 pin)	
X/Y/Z	J31 FAN3/J30 FAN2/J29 FAN1	Composed of black, blue, gray, and brown wires, a white connector, and a black wire tube (four pin)	



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  - 4. Remove the harnesses from the clips.
  - 5. On the main board, remove the nine M3 screws and on the I/O cover.



6. Remove the four M3 screws.



7. On the I/O cover, remove the eight hex screws with an M3 socket driver.



8. On the I/O cover, remove the four nuts with an M14 socket driver.



9. To disassemble the I/O board, remove the three screws with a Phillips #1 screwdriver.





10. Remove the mylar.



11. Remove the three standoff screws with an M3 socket driver from the main board and lift off the main board.



12. Remove the four M3 screws securing the shielding to the right cover.



13. Remove the five M3 screws securing the main board to the bottom shielding.



- 14. If replacing the main board, transfer the three standoff screws to the new board.
- 15. Replace the main board and/or the I/O board.
- 16. To re-install, follow these steps in reverse order.

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# **Replacing the front IR sensor board**

The front IR sensor board receives command codes from the IR remote to control projector operation.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the front cover.

See *Removing the front cover* on page 58.

3. Remove the two M3 screws securing the IR sensor board to the front cover.



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

# **Replacing the rear IR sensor board**

The rear IR sensor board receives command codes from the IR remote to control projector operation.

1. Remove the top cover.

See Removing the top cover on page 57.

2. Remove the main board and I/O board.

See *Removing the top cover* on page 57.

3. Remove the rear IR sensor board.



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

## **Replacing the LD driver board**

To remove the LD driver board, complete the following steps.

1. Remove the top cover.

See Removing the top cover on page 57.



- Remove the HDMI extender board.
   See *Replacing the HDMI extender board* on page 78.
- Remove the main board and I/O board.
   See *Replacing the main board and I/O board* on page 78.
- 4. Disconnected the six cables on the LD driver board.



5. Remove the six M3 screws securing the LD driver module.



6. To separate the LD driver board from the heat sink, remove the five M3 screws.



- 7. Replace the LD driver board.
- 8. To re-install, follow these steps in reverse order.

## Removing the keypad board

To remove the keypad board, complete the following steps.

1. Remove the top cover.

See *Removing the top cover* on page 57.

2. Remove the rear cover.

See *Removing the rear cover* on page 58.



3. Remove the mylar.



4. Remove the six M3 screws securing the keypad board.



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

### **Replacing the photo sensor board**

To remove the photo sensor board, complete the following steps.

1. Remove the color wheel.

See *Replacing the color wheel* on page 72.

2. Remove the one screw with a Phillips Jewelers screwdriver securing the photo sensor board.



- 3. Replace the photo sensor board.
- 4. To re-install, follow these steps in reverse order.

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