

# Installation and Setup Guide

020-002152-02

# Remote Power Rack Shelf



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

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

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



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

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

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



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# Introduction

This document provides overview, installation, commissioning, and maintenance information for the DC power system. Make sure the product is used in environments meeting its design specifications to avoid damaging components and voiding the warranty.

The illustrations in this document are for representation only and may not depict your product exactly. Read all instructions and cautionary markings before installing and using the remote power rack shelf.

## **Product documentation**



https://www.christiedigital.com/products/all-accessories/remote-power/remote-power-rack-shelf

**Caution!** Review all user documentation and safety precautions before installing to avoid injury. Visit the Christie website and on the product page, select the model and switch to the Downloads tab.

**Attention !** Avant de procéder à l'installation du produit, consultez toute la documentation utilisateur et toutes les consignes de sécurité afin d'éviter les blessures. Rendez-vous sur le site Web de Christie, accédez à la page du produit, sélectionnez le modèle souhaité, puis cliquez sur l'onglet Downloads (Téléchargements).

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## **General safety precautions**

Read all safety and warning guidelines before installing the remote power rack shelf.

## **Electrical safety**

Read all safety and warning guidelines before powering on the remote power rack shelf.

### **Operational requirements**



- Warning! If not avoided, the following could result in death or serious injury.
- HIGH VOLTAGE HAZARD! Avoid direct contact or indirect contact with the power supply using wet object.
- FIRE AND ELECTRIC SHOCK HAZARD! Irregular and incorrect operation can cause accidents.
- HIGH LEAKAGE CURRENT! Potential touch current: 13.6mA

Note the following operational requirements.

- A IEC 60320 C19 Line cord must be rated to 90°C (194 °F). A C21 line cord can be used as these are all rated for > 90°C (194 °F).
- This equipment is intended for installation in a restricted access area.
- Do not install this equipment over combustible surfaces.
- Follow all national and local rules and regulations when making field connections.



- Compression connectors
  - U. S. or Canada installations: use listed/certified compression connectors to terminate listed/certified field-wire conductors.
  - All installations: apply the appropriate connector to the correct size conductor as specified by the connector manufacturer, using only the connector manufacturer's recommended or approved tooling for that connector.
- Electrical connection securing: torque to the values specified on labels or in the product documentation.
- Cable dress: dress to avoid damage to the conductors and undue stress on the connectors.
- Circuit breakers and fuses
  - Use only those specified in the equipment ordering guide.
  - Size as required by the National Electric Code (NEC) and/or local codes.
  - Safety Tested Limits: refer to the equipment ratings to assure current does not exceed the following:
     Continuous Load (List 1) 80% of protector rating
- Field-wired conductors: follow all National Electric Code (NEC) and local rules and regulations.
  - Insulation rating: 90°C (194°F) minimum; 105°C (221°F) minimum if internal to enclosed equipment cabinets.
  - Size AC field-wired conductors with 75°C (167°F) ampacity (NEC) equal to or greater than their panel board circuit breaker rating.
- AC and DC input disconnect/protection: provide accessible devices to remove input power in an emergency.
- Alarm signals: provide external current limiting protection. Rating 60 V, 0.5 A unless otherwise noted.
- Grounding: connect the equipment chassis directly to ground using a minimum 10 AWG bonding conductor size. In the enclosed equipment cabinets connect to the cabinet AC service ground bus. In huts, vaults, and central offices connect to the system bonding network.
- Do not place combustible materials directly above or below equipment.
- This equipment is not suitable for installation in locations that are accessible to children.



Note: Proper grounding of AC supply receptacles must be verified by qualified personnel.



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

• Potential touch current: 13.6 mA.

### Installation precautions

Note the following installation precautions:

- Install, service, and operate equipment only by professional, skilled and qualified personnel who have the necessary knowledge and practical experience with electrical equipment and who understand the hazards that can arise when working on this type of equipment.
- Do not disconnect permanent bonding connections unless all power inputs are disconnected.



- Verify that equipment is properly safety earth grounded before connecting power. High leakage currents may be possible.
- Exercise care and follow all safety warnings and practices when servicing this equipment. Hazardous energy and voltages are present in the unit and on the interface cables that can shock or cause serious injury.
- Use the following precautions in addition to proper job training and safety procedures:
  - Use only properly insulated tools.
  - o Remove all metallic objects (key chains, glasses, rings, watches, or other jewelry).
  - Follow Lock Out Tag Out (LOTO) procedures: customer specified, site specific, or general as appropriate. Disconnect all power input before servicing the equipment. Check for multiple power inputs.
  - o Wear safety glasses.
  - Follow personal protective equipment (PPE) requirements: customer specified, site specific, or general as appropriate.
  - Test circuits before touching.
  - Be aware of potential hazards before servicing equipment.
  - o Identify exposed hazardous electrical potentials on connectors, wiring, and other related items.
  - Avoid contacting circuits when removing or replacing covers.
  - Use a personal electrostatic discharge (ESD) strap when accessing or removing electronic components.
- Personnel with electronic medical devices need to be aware that proximity to DC power and distribution systems, including batteries and cables, typically found in telecommunications utility rooms, can affect medical electronic devices, such as pacemakers. Effects decrease with distance.



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

Install only on concrete or other non-combustible surface.

## **Product overview**

The remote power rack shelf is an embedded power supply system, which supplies power to communication equipment of +48V DC series. The maximum output current is 184 A.

Maximum ambient temperature for no power derating is 45°C (113°F).

Power de-rating from 45 to 55°C (113 to 131°F) at 0.6% per °C.

## **System features**

Understand the important features of the remote power rack shelf.

- Wide range of AC input voltage from 100-120 VAC/208-240 VAC
- Network design provides the LAN interface



• Hot plug support rectifier module

## **Product operation workflow**

Learn how the product operates.



- 1. AC power enters the rectifiers through the AC input terminals.
- 2. The rectifiers convert AC power input into 54.0 VDC power output, which is directed by the DC output terminals to DC loads along different routes.
- 3. When the AC power is normal, the rectifiers power the DC loads.
- 4. When the AC power is absent, the rectifiers stop working and the load does not work.

The rectifiers output 54.0V to supply power to the load only when the mains power is restored to normal.

- 5. The controlling unit controls the running state of each component of the power supply system in real time and carries out the corresponding intelligent control.
- 6. When detecting a fault, the controller generates an alarm.

## **Components**

The product has the following components:

- Interior structure
- Power distribution
- Rectifier
- Controller



### **Interior structure**

Learn about the interior structure of the power supply system.



### **Power distribution**

Learn about the DC distribution unit of the power supply system. Four input connectors and 16 output terminals are behind the system and the maximum current of each input is 16 A. Each output terminal has two outputs, and the total current has a maximum of 24 A.



Item	Description
AC power distribution	Four input connectors, maximum 16 A for each input
DC power distribution	LOAD: 184 A maximum (16 output terminals)



### Rectifier

Learn about the rectifier of the power supply system. Four indicators are on the panel, which are used to reflect the operation status of the rectifier.



Item	Description
1	Handle
-	
2	Locking latch
3	AC OK indicator
4	DC OK indicator
5	Service LED
6	Fault indicator

### Controller

Learn about the controller of the power system.



Item	Description
1	System or Severity LED
2	Alarm LED



LED	LED color	Status	Condition
System or Severity	Green	Normal	Normal operation, no alarms, inputs and outputs are in their normal range.
	🔆 Red	Critical Alarm	Highest severity. Generally assigned to alarm to indicate a power affecting condition. Immediate attention required.
	🔆 Red	Major Alarm	High severity. Generally assigned to alarms to indicate a power affecting condition. Immediate attention required.
	🔆 Amber	Minor Alarm	Medium severity. Generally assigned to alarm to indicate a non-power affecting condition. Attention eventually required.
Alarm	BD	Not Illuminated	System above configured Battery on Discharge (BD) threshold.
		🔆 Amber	This state is not assigned by the present default configuration.
		Red	System equal to or below configured Battery on Discharge (BD) threshold.

# **Technical specifications**

Due to continuing research, specifications are subject to change without notice.

# **Electrical specifications**

This section describes the electrical specifications.

Item	Specification	Min	Тур	Max	Unit
AC input	Operating Voltage Range				
	Low-line configuration		100-120	132	VAC
	High-line configuration	185	200-240	264	
	Input frequency	47	60	66	Hz
	Input Current				
	At 89.2 V, 60 Hz			15.9	
	At 100.2 V, 60 Hz			15.9	
	At 121.5 V, 60 Hz			14.4	
	At 132.8 V, 60 Hz			13.2	A
	At 188.0 V, 60 Hz			15.9	
	At 207.5 V, 60 Hz			16	
	At 251.4 V, 60 Hz			12.8	
	At 277.6 V, 60 Hz			11.7	
	Power factor (50-100% load)	.96	0.995		
	Efficiency [30-80% of FL, 240 VAC @ 25°C (77°F)]	94.5	95.6		%
DC output	System max output power: @ low line input 100-120 VAC @ high line input 200-264 VAC Output current does not exceed 184 A	5,600 12,000			W
	Output voltage set range	44	54	58	VDC
	Output current				
	@ 1400 W (100-120 VAC) – 54V	1		25.9	A
	@ 3000 W (200-240 VAC) – 54V	1		55.5	
AC input protection	20A breaker for 100-120 VAC or 200-240 VAC				
DC output protection	Overvoltage	>65		<65	VDC
Rectifier module	Output power				
	@ low line input 100-120 VAC	1400			WDC
	@ high line input 200-264 VAC	3000			
Other					

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# **System installation**

This section describes the installation requirements, cable connection, and installation instructions.

## **Installation requirements**



Warning! If not avoided, the following could result in death or serious injury.Only trained and qualified personnel can perform the installation.

# **Required tools**

The following lists the tools required for installing the product.

- Torque wrench (0-65 in-lb or 0-10Nm)
- #1 Phillips screwdriver
- 5/16" and 7/16" socket driver
- Wire cutters and strippers may be required

## Mounting the remote power rack shelf

This section provides information for mounting the system into a rack.

### **Check for deliveries**

Verify the box contains the following components.

- Power system-controller and breakers are pre-installed (quantity 1)
- Bag of thread-knurling 12-24 mounting screws (quantity 1)
- System grounding kit (quantity 1), includes the following:
  - DC reference ground lug adapter right angle bus bar (quantity 1)
  - Inter-shelf bus connection plate (quantity 1)
  - o <sup>1</sup>/<sub>4</sub>" 20 hex nuts (quantity 4)
  - M5 x 8mm hex/slot screw (quantity 2)



### Installing into the rack



**Note:** For systems with multiple remote power rack shelves, position the power shelves in the rack with no space between them so the return buses may be connected together with bus bar links.

- 1. Position system(s) into the required mounting location for installation.
- 2. Starting with the bottom-most shelf, screw in one mounting screw per side of the shelf for each shelf in the system while not applying torque to any screws.
- 3. Position system(s) horizontally in the middle of the mounting location to ensure centering of the system in the frame.
- 4. With the system centered, apply torque to 35 in-lb (4Nm) to each of the mounting screws using a 5/16" socket.
- 5. Add screws to remaining mounting holes (8 total in system) and apply torque to 35 in-lb (4Nm) to each remaining screws.

### **Grounding the chassis**

Lug landing is for M5 lug with 5/8" centers (lug not provided) 10 AWG (6mm).

Some applications may rely on frame mounting screws for shelf ground omitting the shelf ground cable.

For the M5 screws used to attach ground lug, torque to 35 in-lb (4Nm) with 5/16" (8mm) socket driver.

When installing multiple remote power rack shelves, the chassis of each power shelf must be connected to earth ground using the lug landing shown.





## Link return buses of multiple remote power rack shelves

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To connect the return buses of multiple remote power rack shelves used in a system, complete the following steps:

1. Position the remote power rack shelves adjacent to each other in the cabinet rack as shown in the image below.



- 2. Remove the return bus covers at the rear of the remote power rack shelf.
- 3. Connect between adjacent remote power rack shelves' return buses using the inter-shelf bus connection plate shown below with four 1/4"-20 hex nuts.

Torque the connection nuts to 65 in-lb (7.3 Nm) – 7/16" socket.



- To link the return bus bars together, the insulator flap between shelves must be folded back or cut
  off. For more details, see the drawing below. The insulator flap on the top remote power rack shelf
  must not be cut off.
- Do not link the +48V power buses as the power regulators have independent control and must remain unconnected.





### **Connect system DC reference ground**

The return bus must have one connection to the system DC reference ground which should be Earth Ground.

- 1. Attach the right-angle lug adapter to the unused return bus landings of the top or bottom shelf (lug adapter is provided).
  - Lug landing: 1/4" holes on 5/8" centers (hardware provided, lug not provided).
  - Torque all hardware to 65 in-lb (7.3 Nm) 7/16" socket.
- 2. Attach a minimum 10 AWG (6mm<sup>2</sup>) wire with lug to the lug adapter landing and connect to earth ground.

A common place to make the DC reference ground connection is near the connection used to ground the frame in which the remote power rack shelf equipment resides in the case of installation in a rack.

Drawings below show lug location when using the top shelf return bus landing locations for a single shelf without the inter-shelf bus connection plate present.







### Verify system connections

Verify shelf-to-shelf communication cable connections are firmly seated. Connections must be made from the distribution data port daisy chained down through the rectifier shelf RS-485 ports as shown below.



## **Making AC connections**

This section provides details on making AC connections.



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

• The AC power inlet for this equipment may reach temperatures up to 90°C (194°F) in normal operation. To reduce risk of fire, this equipment must be used only with an AC supply cord with the following ratings: rated for a minimum temperature of 90°C (194°F) (not just cord jacket temperature marking), minimum cord length 1.5 m (5 feet), minimum 14 AWG (1.5mm<sup>2</sup>) conductor size and plug types 5-20P, 6-20P or L6-20P only.



20 A protection recommended for each AC input circuit.

- 1. Make a connection to each rectifier IEC input in the rear of each rectifier shelf.
- 2. Verify the cables are seated properly and secure cables to the shelf AC input cable support bracket using either tie straps or lacing thread.
- 3. Continue the process until all rectifier positions are made and secured.



### **Connect Snapak circuit breaker loads**

This section provides details on making DC connections load connections.

- 1. Verify the breaker is off.
- 2. Remove the detachable terminal block from its mate.
- 3. For load/return wires (max 8AWG), do one of the following:
  - If ferrules are present, insert wires into terminal block.
  - If ferrules are absent, cut and strip wire 10 mm (0.4 inches) and insert wires into terminal block.
- 4. Torque terminal block screw to 6.5 in-lb (0.75 Nm.)
- 5. Pull wires to verify they are properly secured in the terminal block.
- 6. Fully reinsert detachable terminal block back into its mate.

Breakers have a maximum 600 A short circuit current interrupt rating.



Breaker numbers (1 to 8) are printed on the front side cover of the distribution panel and linked to a detachable terminal block located at the rear chassis.



## **Installing rectifiers**

This section describes how to install rectifiers in the remote power rack shelf.

- 1. Remove the rectifier from its shipping box and anti-static bag.
- 2. Slowly slide the rectifier into the left rectifier position of the top rectifier shelf.
- 3. With the rectifier partially inserted, open the latch on front of the rectifier and continue to insert until it has firmly seated into the shelf.
- 4. Close the rectifier latch to ensure it is retained completely in the shelf.



5. Repeat steps 1 to 4 with remaining rectifiers, continuing left to right.

## **Powering the system**

This section provides information for properly powering up the system.



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

- Incorrect polarity to some loads and improper grounding can cause irreparable damage to customer equipment.
- This system is a +48VDC system. The (-) return is referenced to ground.



- Verify the system ground is firmly attached to the return bus and secured to site grounding as defined by customer installation standards.
- Verify polarity of load connections are made as defined by customer installation standards.
- 1. Starting with the left position of the upper remote power rack shelf, turn on the breaker for the first rectifier. The rectifier and controller will cycle through the start-up sequence which takes approximately 10 seconds.
- 2. Once the start-up sequence has completed, use a voltmeter at the rear bus bars to verify proper system polarity and voltage.



- System should provide +54.0VDC +/- 0.5VDC.
- o If polarity is incorrect, stop immediately and re-check system connections.
- If connections are correct and system voltage is not correct, the voltage may be set from the web page (see <u>Controller setup and web user interface</u> section of this document.)
- 3. Continue powering up each rectifier in the first shelf, left to right.





# **Controller setup and web user interface**

The controller is factory-configured. However, if any settings need to be adjusted, this section explains how to modify the settings and access the web user interface (UI) of the remote power rack shelf

## **Default configuration**

The default IP Configuration is the following:

- IP Address: 192.168.2.1
- Subnet Mask: 255.255.255.0

The Web user interface (UI) login is the following:

- Username is not required by default
- Password: administrator

## Lan port setup

Setting the LAN port to local (server) make it generally easier to access and configure the controller

- Do not connect LAN port to a network when jumper is set to local (server).
- Local (server) is a temporary setting, once configuration is complete move the jumper back to network (client) mode.



### How to access default IP address when system settings have been changed

If the system IP address has been changed from the default settings, you can access the default settings by adjusting a jumper on the side of the controller.





The controller is capable of hot swap, so the following steps may be performed without removing power from remote power rack shelf.

- 1. Remove the controller from the remote power rack shelf.
  - a. Pull the latch on the controller down.



- b. Pull the controller straight out to remove.
- 2. Set the jumper to Local.



- 3. Reinstall the controller in the remote power rack shelf.
- 4. The controller will now have the default IP address configuration.
- 5. Connect to the web user interface (UI.)
- 6. Change IP address.
- 7. Set the jumper back to **Network (Client)** by following steps 1 to 3 but in step 2 set the jumper to **Network (Client)**.



### **Adjusting settings**

Login to the web user interface (UI) using the default password administrator to change any of the default settings.

### **Changing the IP address**

To change the IP address, do the following:

- 1. Select the Settings tab.
- 2. Under the Communication heading select Network.
- 3. Adjust network settings.
- 4. Select Submit.

# **Service guidelines**

This section provides information for servicing, troubleshooting, and replacing equipment.

## Parts and module replacement

Replacement parts are listed in this table.

Part number
003-007551-XX
003-007550-XX
161-152109-XX

### **Replacing the controller module**

The controller module is located on the front of the power rack shelf, on the left hand side.

1. Open the faceplate by pulling down the tab from the top of the controller module.



2. Pull the controller module straight out of the power rack shelf.

### **Replacing a rectifier**

The rectifiers are hot swappable.

- 1. Open the faceplate by adjusting the latch on the left-hand side of the rectifier.
- 2. Swing the faceplate open (swings open to the right).





3. Pull the rectifier straight out from the power rack shelf.



# **Troubleshooting and status indicators**

Learn about the status indicators on the controller and possible solutions.

## **Status indicators**

Controller SYS LED	Web page alarm	Rectifier LED	Possible problem(s)	Possible solution(s)
Amber	MIN, AC Fail	None	<ul><li>Single rectifier is not receiving AC power.</li><li>AC input circuit breaker has opened.</li><li>AC input voltage is out of range.</li></ul>	<ul> <li>Verify AC power to the rectifier is available.</li> <li>Verify the rectifier input circuit breaker is closed.</li> <li>If the problem is not corrected, replace the rectifier.</li> </ul>
Red	MIN, AC Fail MAJ, Multiple AC Fail MAJ, Battery on Discharge	None	<ul> <li>Multiple rectifiers not receiving AC power.</li> <li>AC input circuit breakers have opened.</li> <li>AC input voltage is out of range.</li> <li>Internal rectifier fault</li> </ul>	<ul> <li>Verify AC power to the rectifiers is available.</li> <li>Verify the rectifier input circuit breakers are closed.</li> <li>If the problem is not corrected, replace the appropriate rectifiers.</li> </ul>
Amber, Red, or None	MIN, AC Fail MAJ, Multiple AC Fail	None	One rectifier, multiple rectifiers, or the entire system has lost AC and one or more rectifiers have been removed from the system while under this condition.	<ul> <li>Verify AC power to the rectifiers is available.</li> <li>Verify the rectifiers all report good AC.</li> <li>Issue Clear missing devices under the web page Maintenance tab menu for any rectifier that may have been removed during the AC fail.</li> </ul>
Red	MAJ, Battery on Discharge	AC OK DC OK	Rectifier output voltage has fallen below the battery on discharge threshold set by the user.	<ul> <li>If commercial AC power is present but the system voltage remains low, call Christie Technical Support.</li> <li>Login using LAN Port and investigate other alarms that may be present</li> </ul>
Amber	MIN, Rectifier Fail	AC OK Alarm <sup>1</sup>	Rectifier output has dropped below 36V and rectifier has entered hiccup mode. While in hiccup mode, the rectifier attempts to restart every 10 seconds for a maximum of three times.	Replace the rectifier.

<sup>1</sup> DC OK Blinking on some rectifiers



Controller SYS LED	Web page alarm	Rectifier LED	Possible problem(s)	Possible solution(s)
Red	MAJ, Rectifier Fail	AC OK Alarm	All rectifier outputs have dropped below 36V and all rectifiers have entered hiccup mode. While in hiccup mode, the rectifier(s) attempts to restart every 10 seconds for a maximum of three times. Defective controller.	Remove the controller; if output voltage does not go to set-point previously set by user, call Christie Technical Support.
None	No response	Red (Blinking)	Controller failure, all devices on the communication bus reporting loss of communication with controller.	<ul> <li>Check the controller to ensure it is properly inserted into its slot. If so, perform the following steps:</li> <li>1. Remove the controller board for 1 minute and then reinstall.</li> <li>2. If the problem persists, replace the controller with a new controller board.</li> <li>3. If the problem persists, call Christie Technical Support.</li> </ul>
Green	No alarm	AC OK (Blinking)	AC present, not within operating limits	<ul> <li>Verify the AC input voltage. If AC is within operating limits, then do the following:</li> <li>1. Reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing the rectifier.</li> <li>2. If the problem persists, replace the rectifier.</li> <li>3. If the problem persists, call Christie Technical Support.</li> </ul>
Green	No alarm	AC OK DC OK (Blinking)	Rectifier Overload – Current or Power	<ul> <li>Verify there is enough rectifier capacity to support the load. If the rectifier capacity is sufficient, do the following:</li> <li>1. If the problem persists, reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing the rectifier.</li> <li>2. If the problem persists, replace the rectifier.</li> <li>3. If the problem persists, call Christie Technical Support.</li> </ul>





Controller SYS LED	Web page alarm	Rectifier LED	Possible problem(s)	Possible solution(s)
Green	No alarm	AC OK	Rectifier Standby (Normal during some conditions depending on controller settings)	<ul> <li>Verify controller settings, and if the problem persists:</li> <li>1. Reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing the rectifier.</li> <li>2. If the problem persists, replace the rectifier.</li> <li>3. If the problem persists, call Christie Technical Support.</li> </ul>
Red	MAJ, Fuse Major	AC OK DC OK	One or more of the output circuit breakers are tripped or off.	Reset circuit breakers. Breakers must be on even if no load is connected.
Amber	MIN, Rectifier fail	AC OK Alarm	<ul><li>Single rectifier thermal alarm:</li><li>Excessive ambient temperature</li><li>Multiple rectifier failure</li></ul>	<ul> <li>Verify there is no obstruction of the airflow path.</li> </ul>
Amber	MIN, Rectifier fail	AC OK Alarm (Blinking)	<ul><li>Single rectifier thermal alarm:</li><li>Excessive ambient temperature</li><li>Multiple rectifier failure</li></ul>	<ul> <li>Reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing the rectifier.</li> </ul>
Red	MIN, Rectifier fail MAJ, Multiple Rectifier fail	AC OK Alarm	<ul><li>Multiple rectifier thermal alarm:</li><li>Excessive ambient temperature</li><li>Multiple rectifier failure</li></ul>	<ul> <li>If the problem persists, replace the rectifier.</li> <li>If the problem persists, call Christie Technical Support.</li> </ul>
Amber	MIN, Rectifier fail	AC OK Alarm (Blinking)	Communication failure from rectifier module to controller	<ul> <li>Verify the communication cable connection.</li> <li>Verify the Shelf ID.</li> <li>If the problem persists: <ol> <li>Reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing it back</li> </ol> </li> <li>If the problem persists, replace the controller</li> <li>If the problem persists, call Christie Technical Support.</li> </ul>



Controller SYS LED	Web page alarm	Rectifier LED	Possible problem(s)	Possible solution(s)
Red	MAJ, High Voltage	AC OK Alarm	High output voltage from rectifier(s) Rectifier(s) high voltage shutdown Internal rectifier(s) failure	<ul> <li>Reset the rectifier(s) by removing the rectifier(s), waiting approximately 30 seconds and replacing the rectifier(s).</li> <li>If the problem persists, replace the rectifier.</li> <li>If the problem persists, call Christie Technical Support.</li> </ul>
Amber	MIN, Clock Battery low	AC OK DC OK	Internal Lithium battery is low.	<ul> <li>Replace the battery from the controller.</li> <li>To prevent loss of information, obtain all required information such as alarm history, statistics, and any field configuration that is different than the standard.</li> </ul>
Amber	MIN, Minor communication fail	Red (Blinking) Single rectifier	Rectifier lost communication with the controller.	<ul> <li>If a rectifier has been removed from an installed/operational system, go to the Maintenance tab on the web page and execute Clear missing devices.</li> <li>Reset the rectifier by removing the rectifier, waiting approximately 30 seconds, and replacing.</li> <li>If the problem persists, replace the rectifier.</li> <li>If the problem persists, call Christie Technical Support.</li> </ul>