Spectrum™ MediaDirector

Component Replacement Guide

Revision D

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DANGER: The Danger symbol indicates information that, if ignored, can cause physical harm to you.

CAUTION: The Caution symbol indicates information that, if ignored, can adversely affect the performance of your Harmonic product, or that can make a procedure needlessly difficult.

NOTE: The Note symbol indicates especially important information you need, or it may provide additional information that applies in only some carefully delineated circumstances.

IMPORTANT: The Important symbol indicates information that should stand out when you are reading product details and procedural information.

TIP: The Tip symbol indicates parenthetical information that is not necessary for performing a given procedure, but which, if followed, makes the procedure easier, smoother, or more efficient.

In addition to these symbols, this guide may use the following text conventions:

Convention	Explanation
`Typed Command`	Indicates the text that you type in at the keyboard prompt.
Ctrl, **Ctrl** + **Shift**	A key or key sequence to press.
http://www.harmonicinc.com	The italics in blue text to indicate Cross-references, and hyperlinked cross-references in online documents.
Bold	Indicates a button to click, or a menu item to select.
`Screen Output`	The text that is displayed on a computer screen.
Emphasis	The italics text used for emphasis and document references.

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Chapter 1

Introduction

This guide provides information to help you replace components in your Spectrum device or system. Make sure that you read all safety warnings and instructions, and that you have received a replacement component from Harmonic before you begin any of the procedures in this guide.

Chapter 2

MediaDirector 2252B/2251B component replacement

The following components may be replaced in the MediaDirector 2252B/2251B: bezel, fan, Ethernet card, SAS card, power supply unit, and boot drive.

- *Replacing the bezel*
- *Replacing a fan*
- *Replacing an Ethernet card*
- *Replacing a SAS card*
- *Replacing an optical 10GbE I/O module*
- *Replacing an SFP transceiver*
- *Replacing a power supply unit*
- *Replacing the boot drive*

Replacing the bezel

Over time, the bezel LEDs can wear out. Replacement bezels are available from Harmonic.

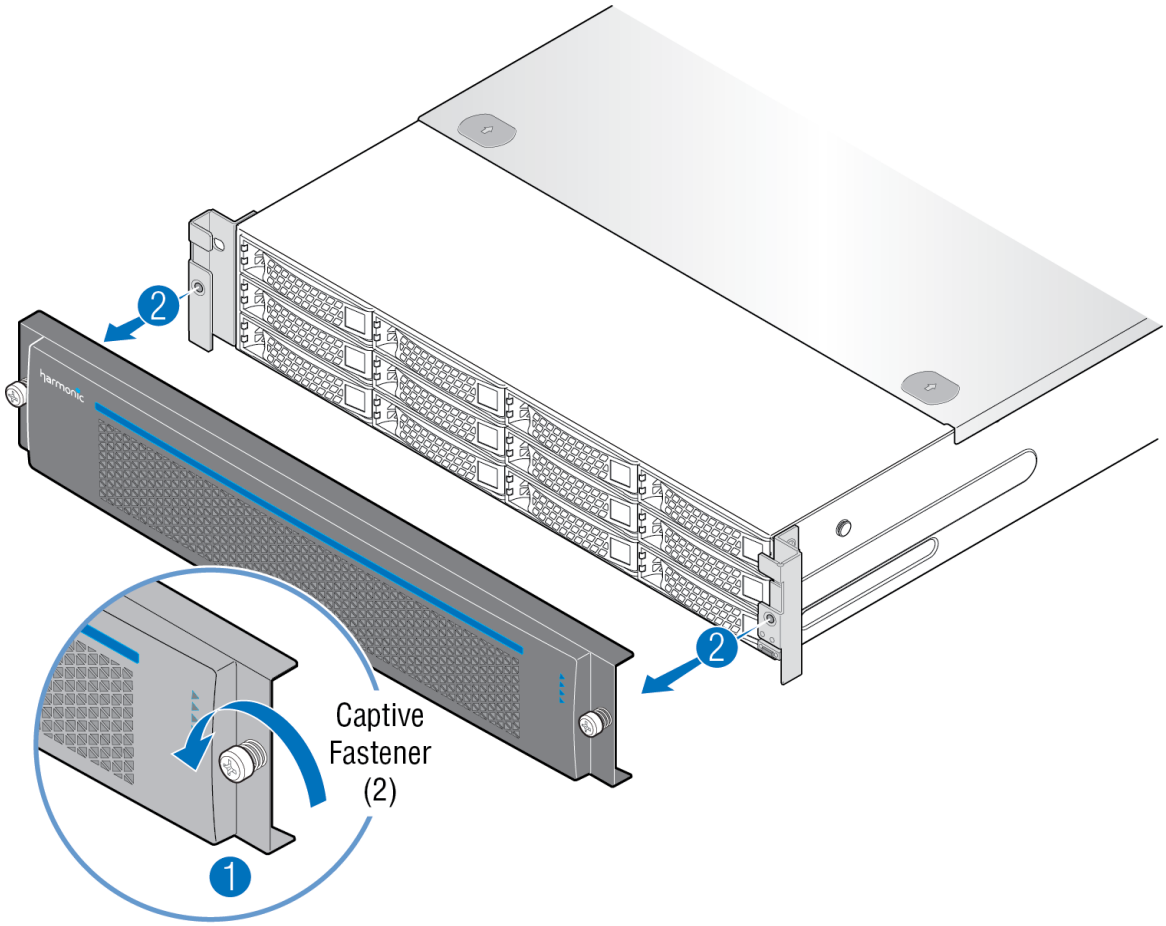
CAUTION: The front panel is susceptible to electrostatic discharge (ESD) when the bezel is removed. Wear the appropriate ESD protection when you remove the bezel.

Removing the bezel

The bezel may be removed during operation.

1. Unlock the bezel by loosening the two captive thumb screws.
2. Pull the bezel straight away from the chassis.

   Example:



Installing the bezel

Align the bezel in front of the chassis so that the Harmonic logo appears on the top left corner.

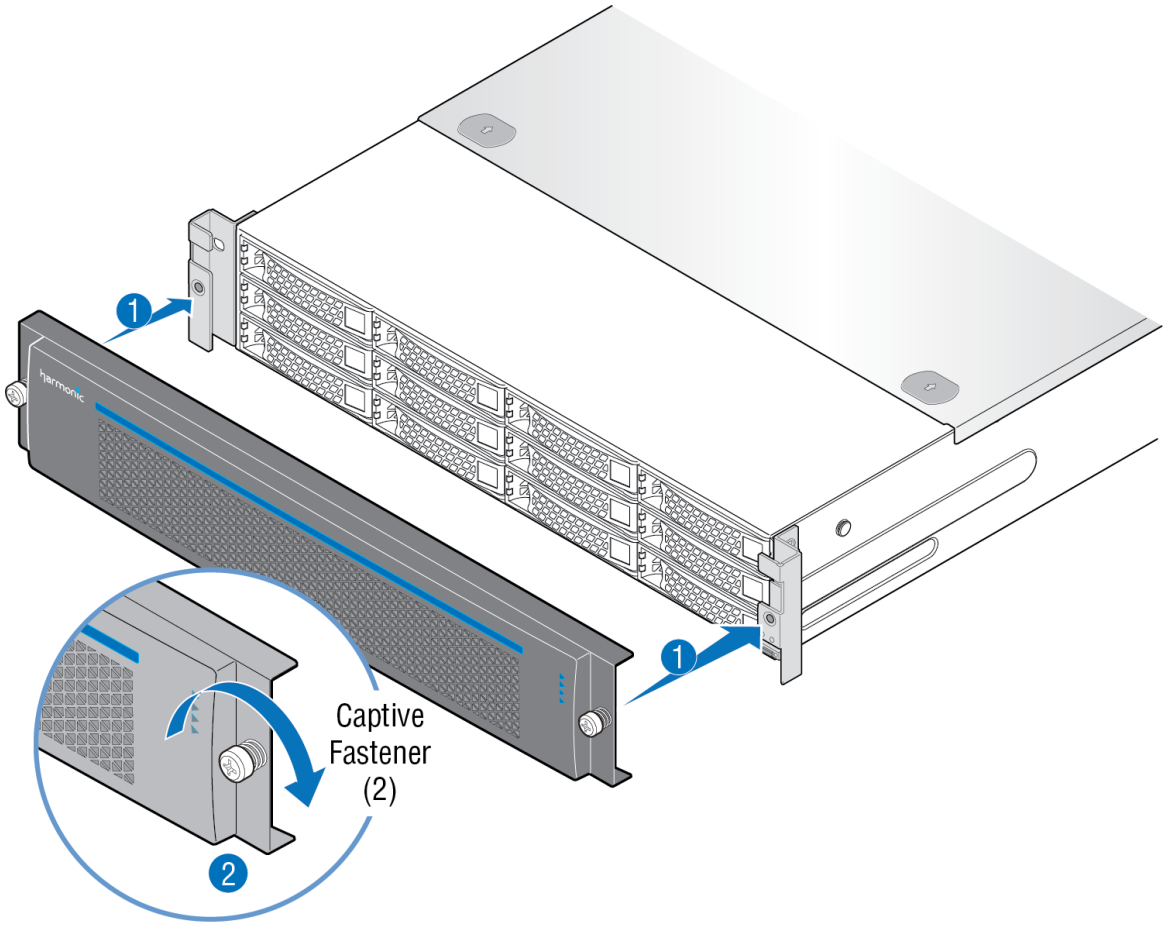
1. Keeping the corners aligned, press the bezel straight onto the chassis.

   NOTE: Ensure that the bezel is aligned correctly on the chassis. When the bezel sits correctly, the front panel LEDs will return to their previous state after about 30 seconds.

2. Hand-tighten the two captive thumb screws to secure the bezel in place.

   NOTE: Do not over-tighten the thumb screws.

   Example:



Replacing a fan

You must remove the system cover in order to replace a fan. Take care to not misplace any small parts while completing this procedure.

⚠ **DANGER:** Observe all conventional ESD precautions when handling Spectrum devices and components.

Removing the system cover

A non-skid surface may be needed to prevent the server system from sliding on your work surface.

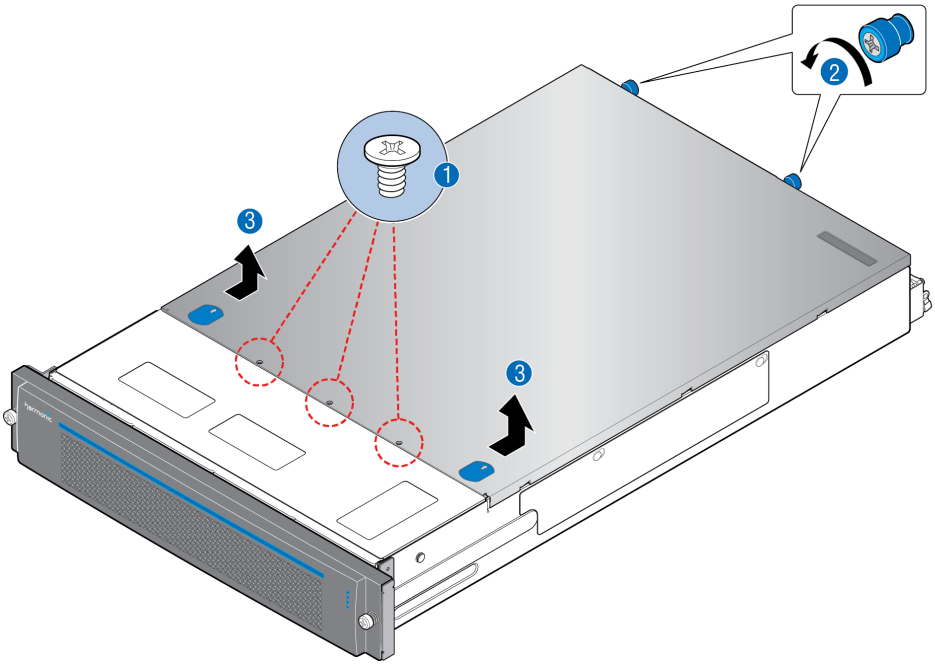
Before you begin

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support and do not continue with this procedure.

CAUTION: Power down the MediaDirector and unplug all peripheral devices and power cables.

1. Using a screwdriver, remove the top cover screw(s).
2. Loosen the two captive thumb screws located on the back edge of the system cover.
3. Slide the cover back and lift upward.

   Example:



Fan slot numbers

Fans are numbered from left to right when looking at the front panel. Be sure to correctly identify the failed fan before removing it from the chassis.

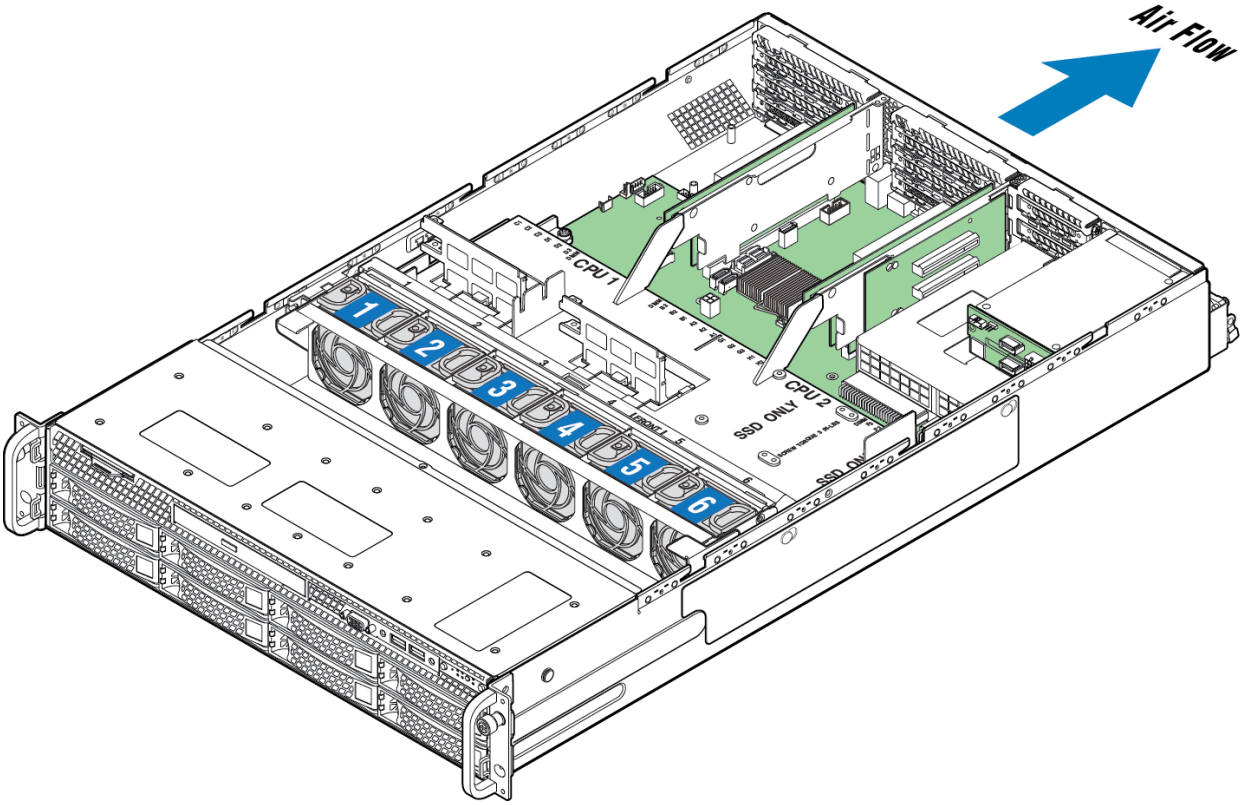


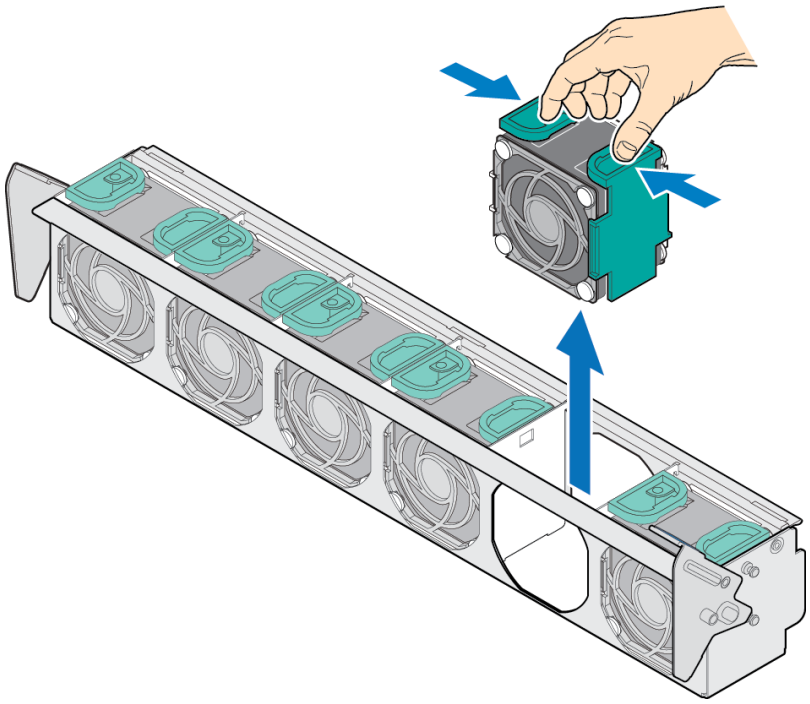
Figure 2-1: Fan slot numbers

Replacing a fan

Each fan is designed for tool-less removal and insertion.

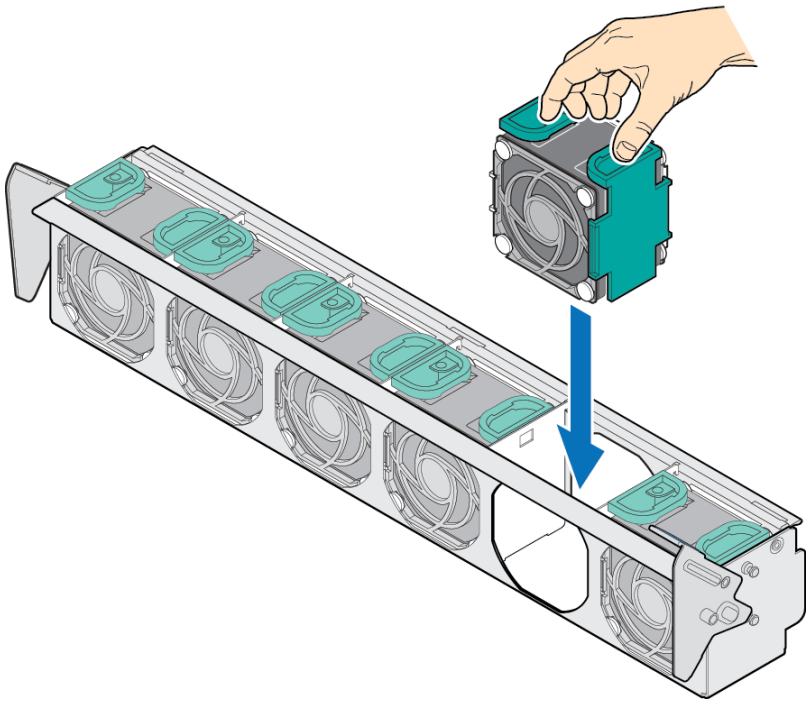
1. Squeeze the two loop handles on the top side of the fan, and pull straight up until it clears the fan assembly bracket.

   Example:



2. Orient the replacement fan so the arrow located on the top side of the fan points to the back of the system.
3. Insert the fan into the fan assembly bracket, pushing down until it is firmly seated into the server board connector.

   Example:

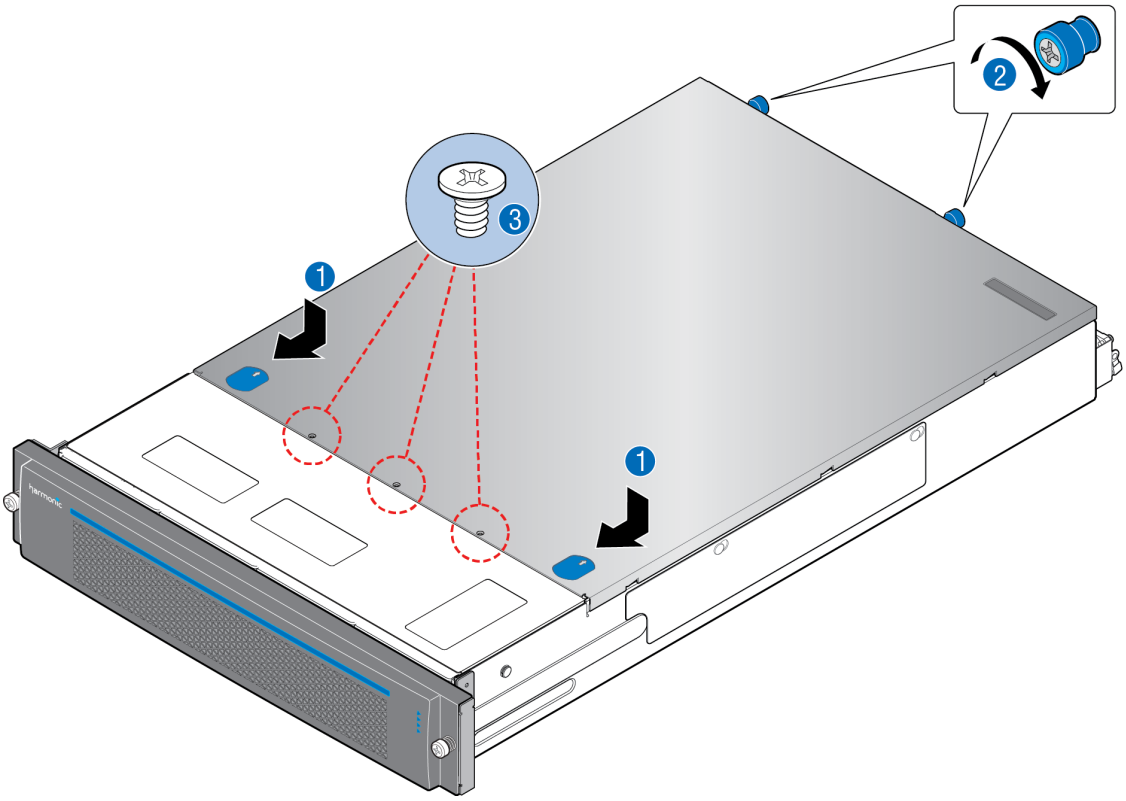


Installing the system cover

The server system must be operated with the system cover in place to ensure proper cooling.

1. Place the system cover onto the chassis and slide forward until the front edge of the system cover is pressed up against the back edge of the front drive bay.
2. Hand tighten the two captive thumb screws at the back of the chassis.
3. Using a screwdriver, install the top cover screw(s).

   Example:



What to do next

Follow instructions in the *Spectrum System Installation Guide* for reconnecting the MediaDirector to your Spectrum system and powering on the device.

Replacing an Ethernet card

After removing the system cover, be sure to follow instructions for replacing the Ethernet card in the correct PCI Riser. Take care to not misplace any small parts while completing this procedure.

⚠ **DANGER:** Observe all conventional ESD precautions when handling Spectrum devices and components.

Removing the system cover

A non-skid surface may be needed to prevent the server system from sliding on your work surface.

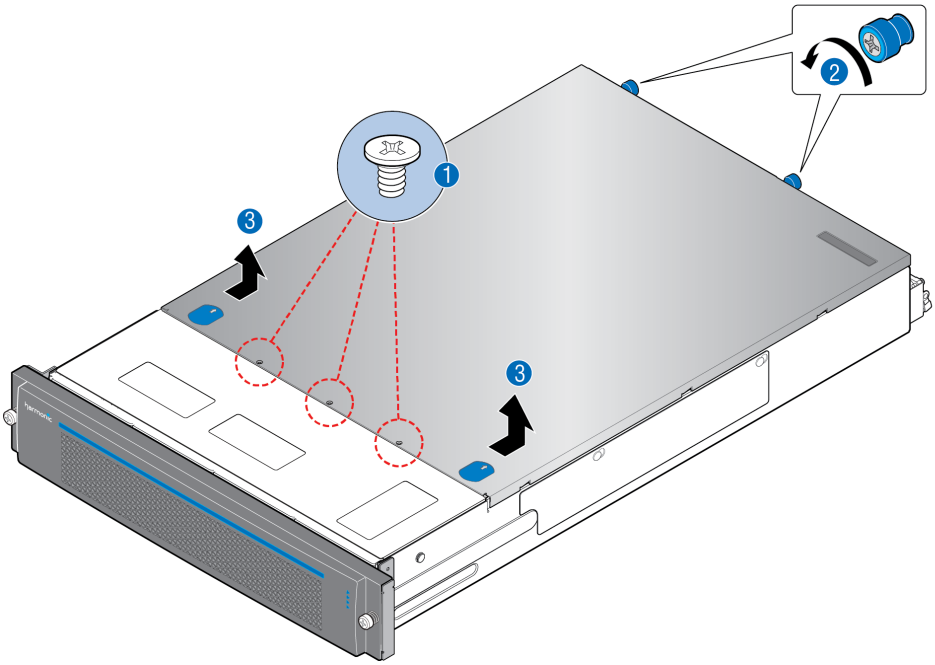
Before you begin

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support and do not continue with this procedure.

CAUTION: Power down the MediaDirector and unplug all peripheral devices and power cables.

1. Using a screwdriver, remove the top cover screw(s).
2. Loosen the two captive thumb screws located on the back edge of the system cover.
3. Slide the cover back and lift upward.

   Example:



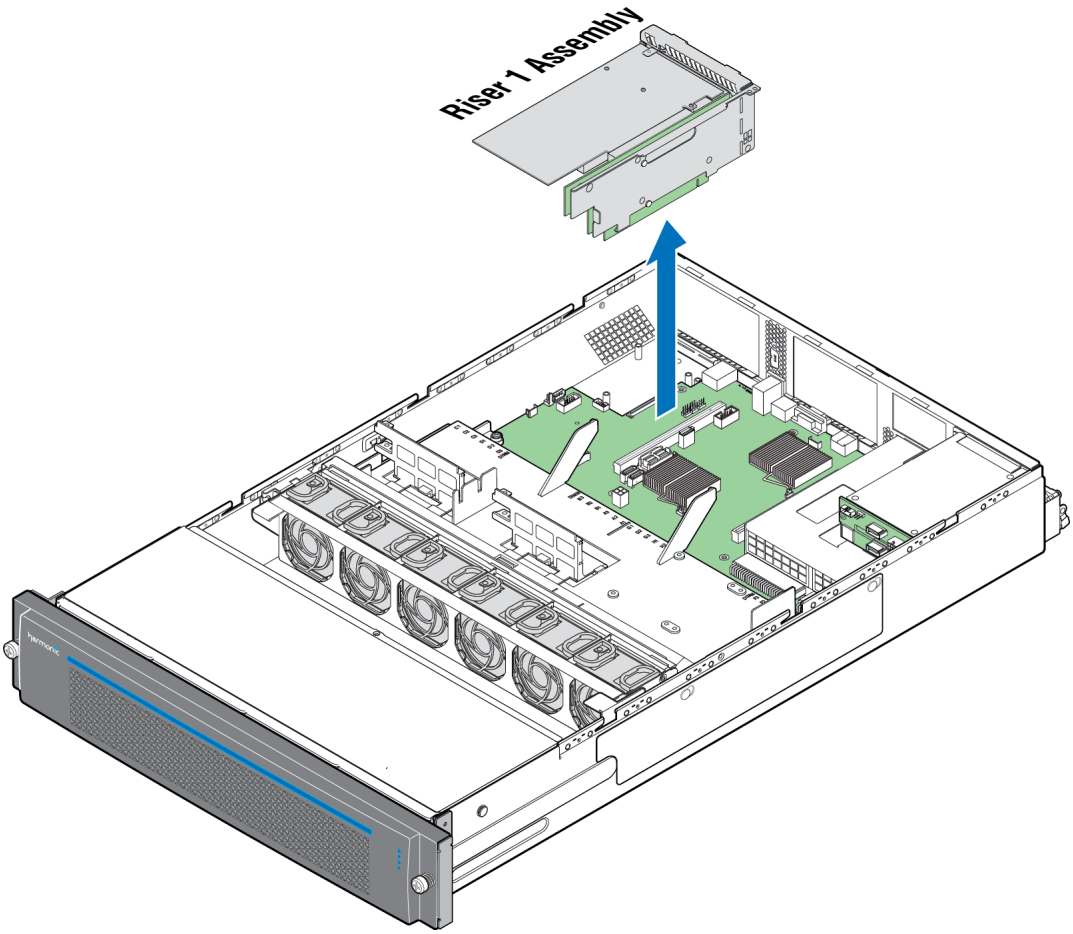
Replacing the Ethernet card in PCI Riser 1

When installing the riser assembly, be careful not to rock the riser assembly into place on the server board. Doing so can damage the contact pins within the riser slot.

NOTE: The specific card you are replacing may be in a different PCI slot position than that which is shown in the images in this section.

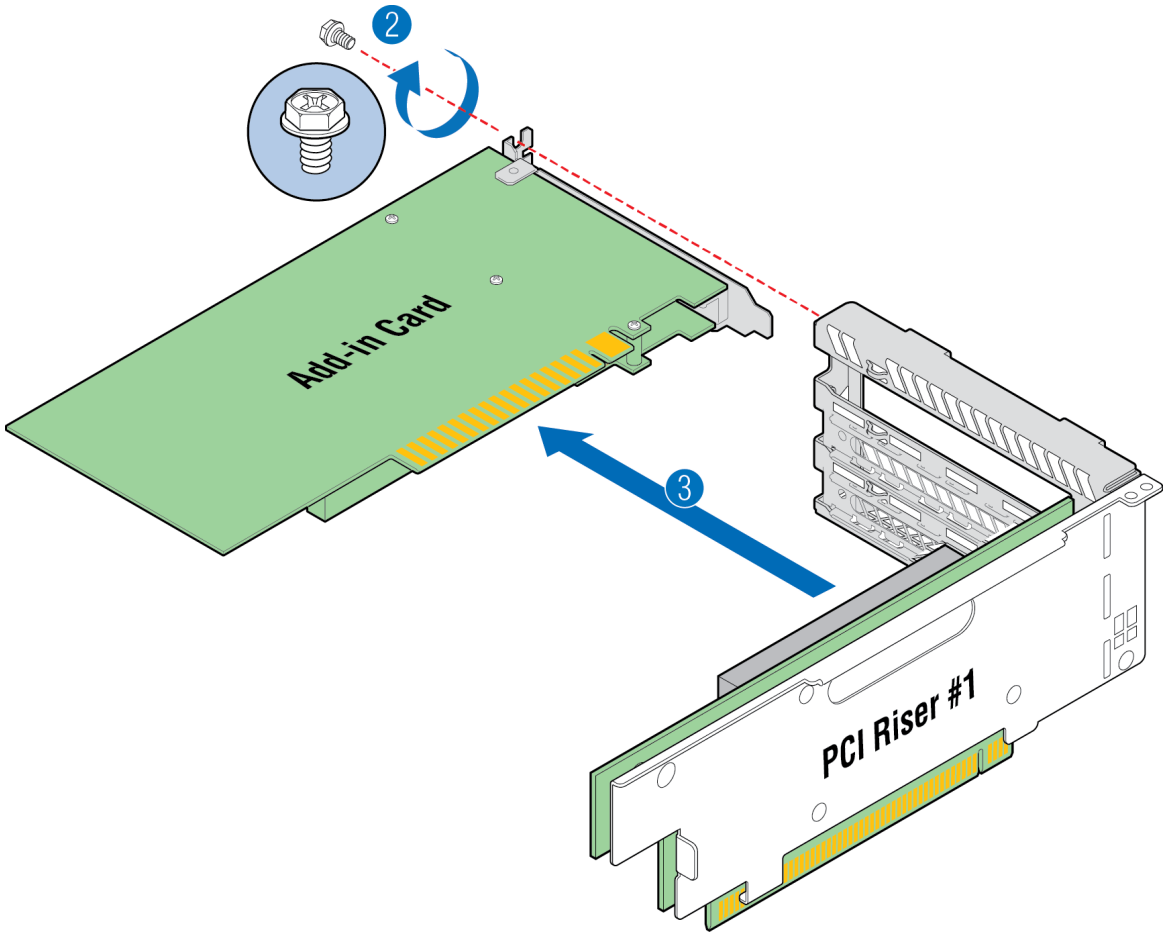
1. Remove PCI Riser 1 assembly as follows:
   a. From the outside of the chassis, press the riser assembly faceplate in and upward until the riser becomes dislodged.
   b. Gently push the tab on the plastic air duct away from the riser assembly, just until you can freely lift the riser assembly.
   c. Grasp the riser assembly with both hands and lift straight up.

      Example:



2. Remove the fastener screw that secures the card to the riser bracket.
3. Slide the card out of the riser bracket.

   Example:

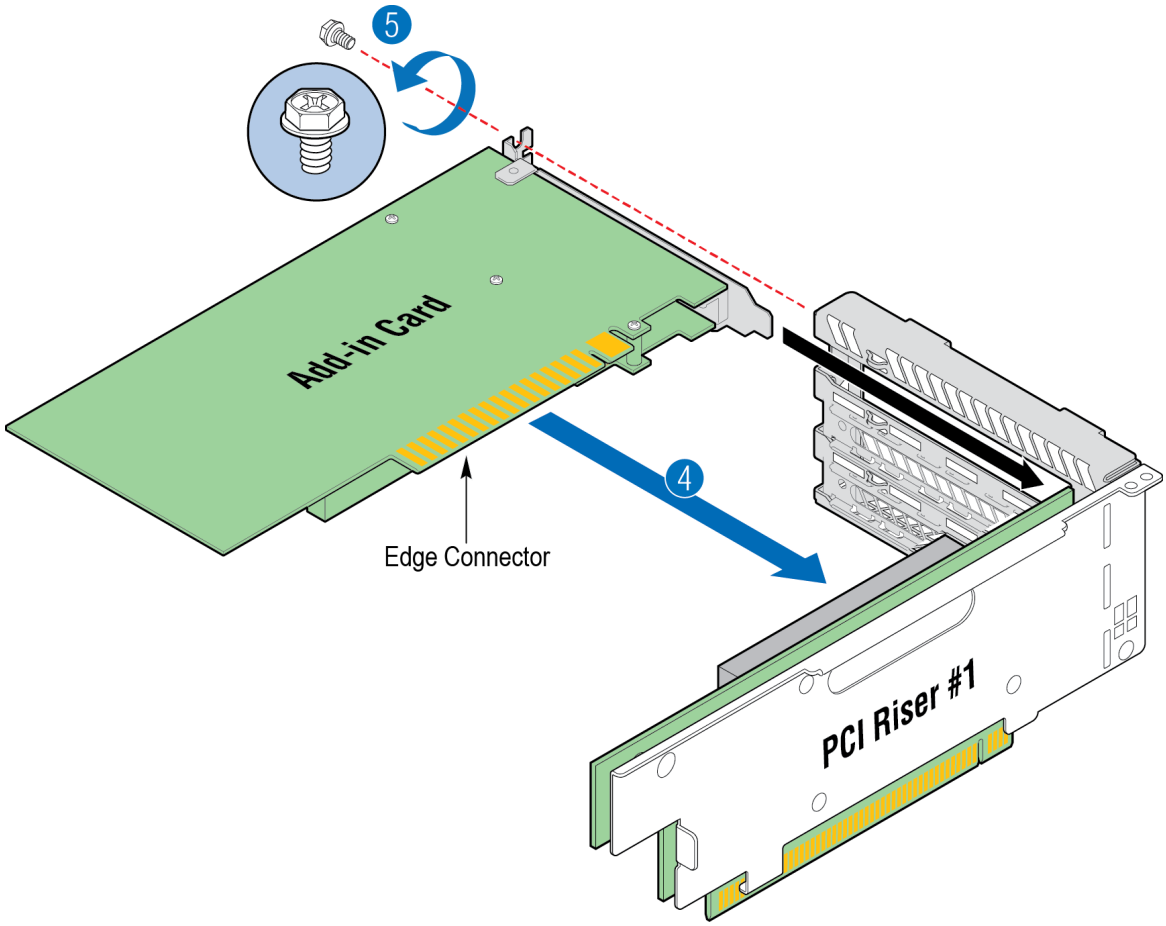


4. Insert the replacement card in the same PCI slot from you which you removed the failed card, ensuring that the edge connector is fully seated inside the PCI slot on the riser bracket.

   Warning: Each PCI add-in card is designed to work in a specific PCI slot. Installing the replacement card in a different PCI slot is not supported.

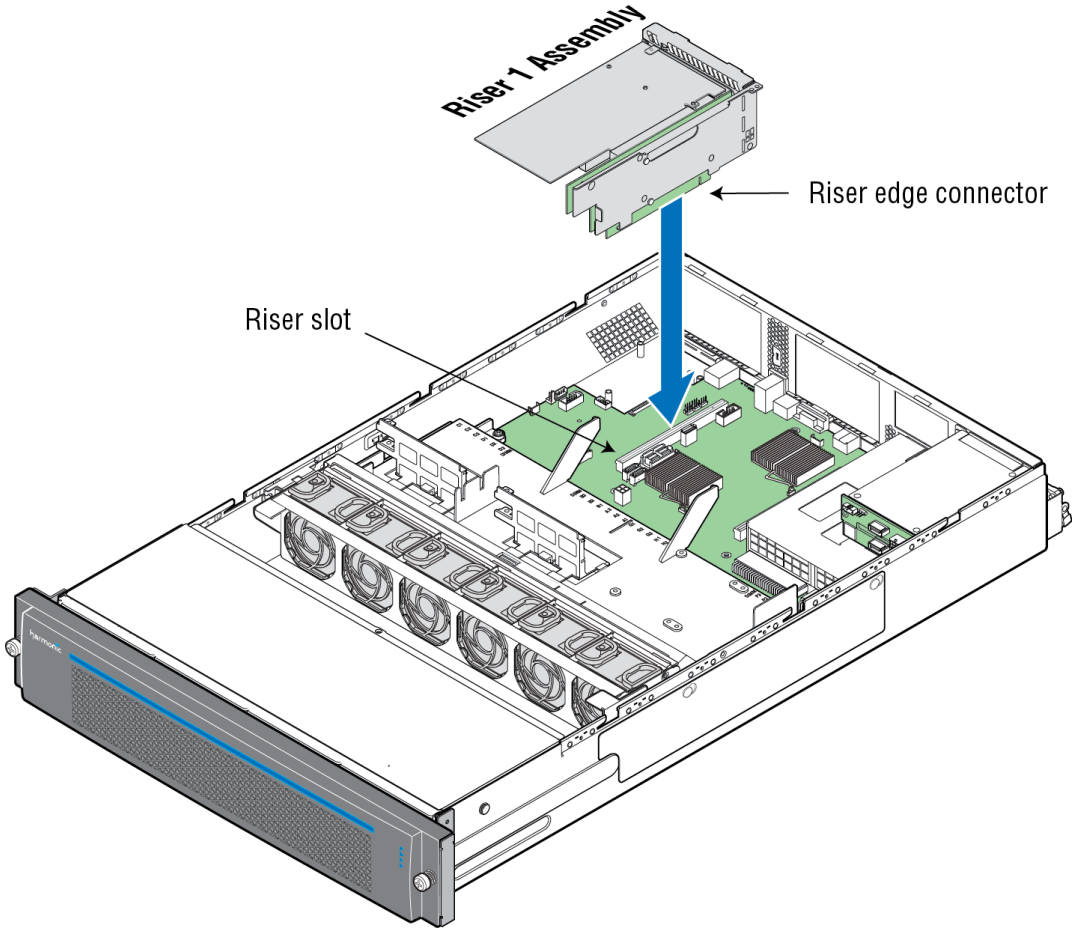
5. Secure the card to the riser bracket with the fastener screw.

   Example:



6. Install PCI Riser 1 assembly as follows:
   a. Grasp the riser assembly with both hands and lower the front end of the riser assembly first, aligning the riser edge connector with the corresponding riser slot on the server board.
   b. Lower the back end of the riser assembly, lining up the tabs on the faceplate with the holes on the back panel of the chassis.

      Example:



c. Press down on the riser assembly bracket and faceplate until firmly seated.

CAUTION: Do not rock the riser assembly into place. Doing so may damage the contact pins within the riser slot.

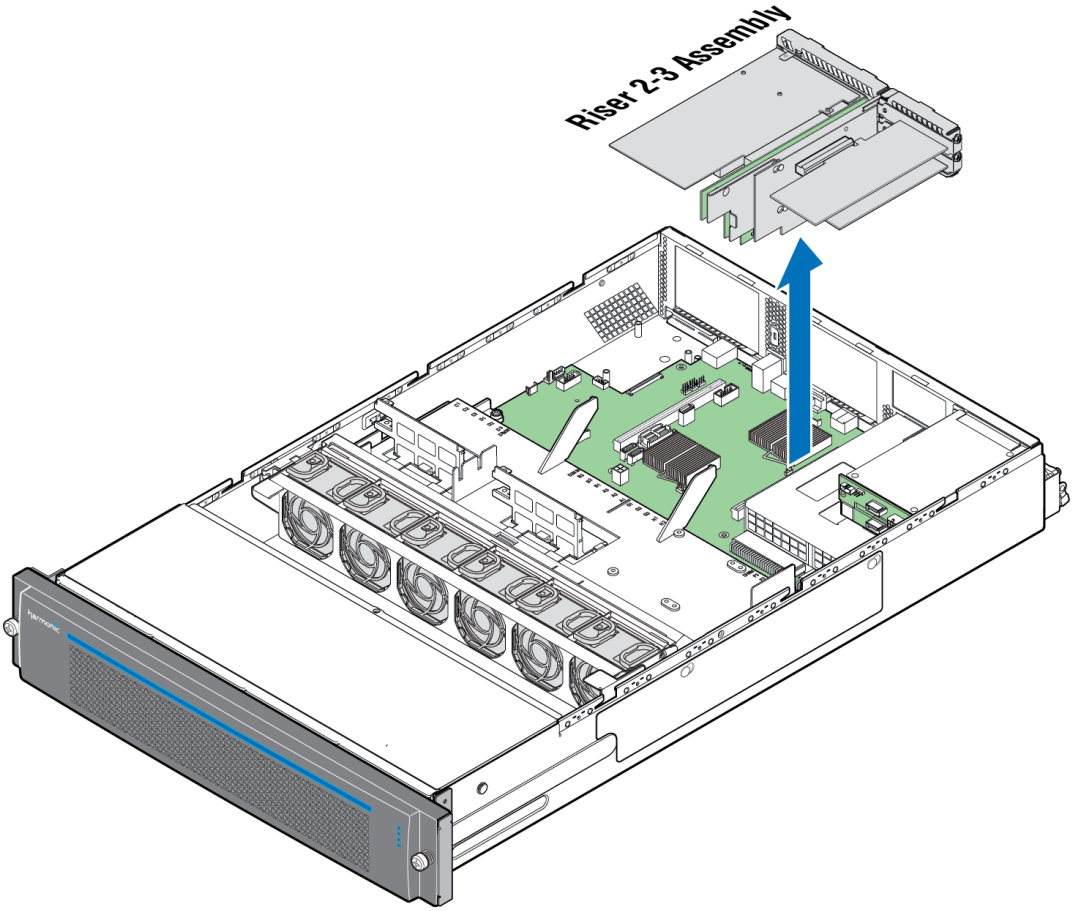
Replacing the Ethernet card in PCI Riser 2

When installing the riser assembly, be careful not to rock the riser assembly into place on the server board. Doing so can damage the contact pins within the riser slot.

NOTE: The specific card you are replacing may be in a different PCI slot position than that which is shown in the images in this section.

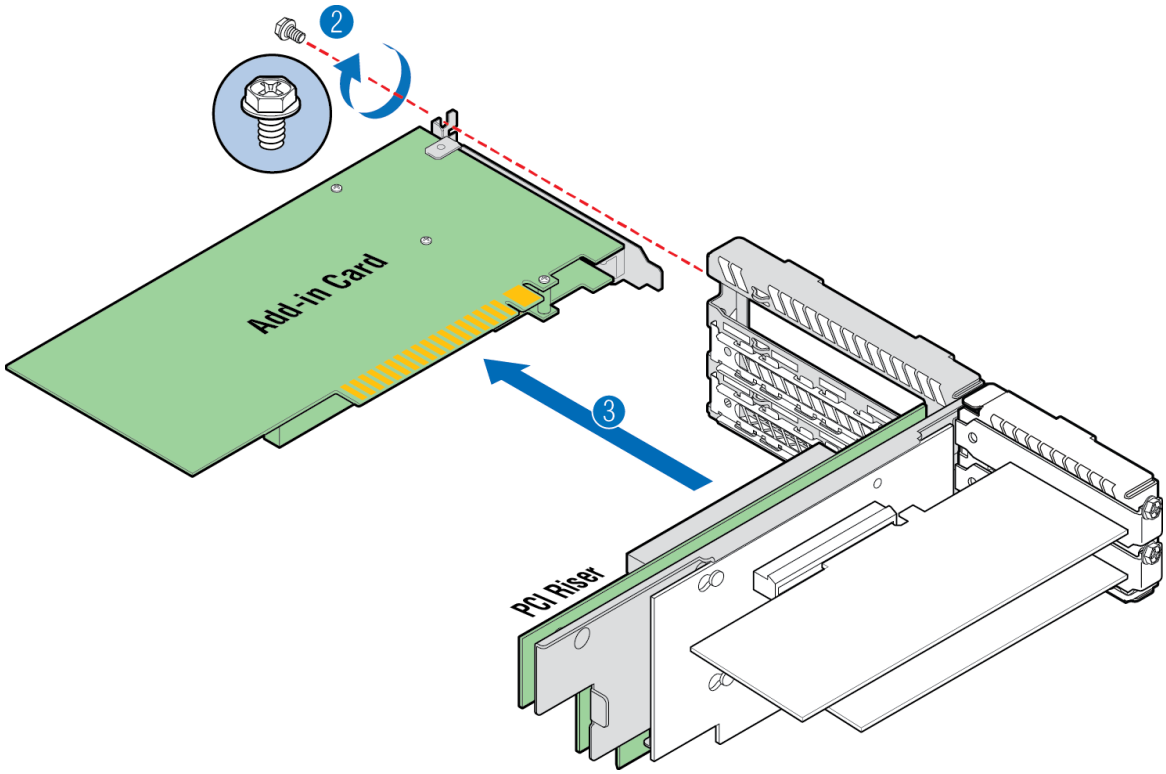
1. Remove PCI Riser 2-3 assembly as follows:
   a. Disconnect the internal cable from the front of the LTC card.
   b. Grasp PCI Riser 2-3 assembly with both hands and pull the riser assembly out of the riser slot, being careful to clear the LTC connector away from the rear panel before lifting up.

   Example:



2. Remove the fastener screw that secures the card to the riser bracket.
3. Slide the card out of the riser bracket.

   Example:

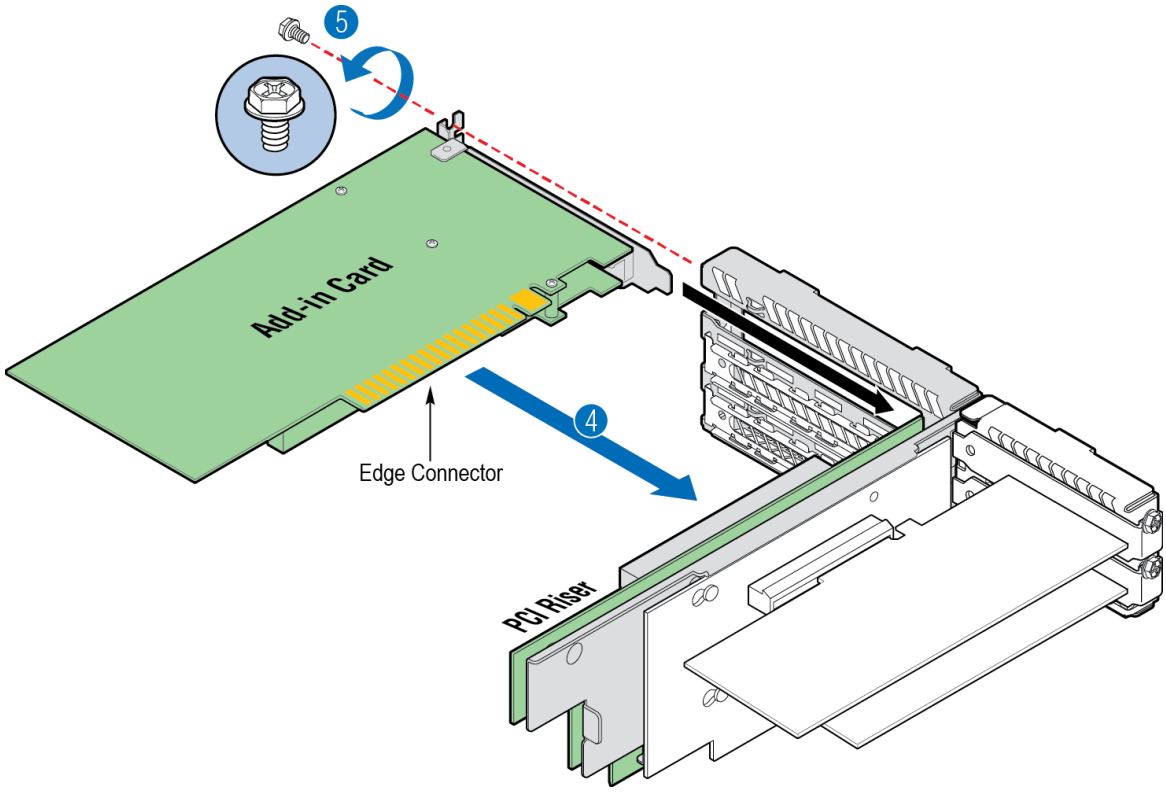


4. Insert the replacement card in the same PCI slot from you which you removed the failed card, ensuring that the edge connector is fully seated inside the PCI slot on the riser bracket.

   Warning: Each PCI add-in card is designed to work in a specific PCI slot. Installing the replacement card in a different PCI slot is not supported.

5. Secure the card to the riser bracket with the fastener screw.

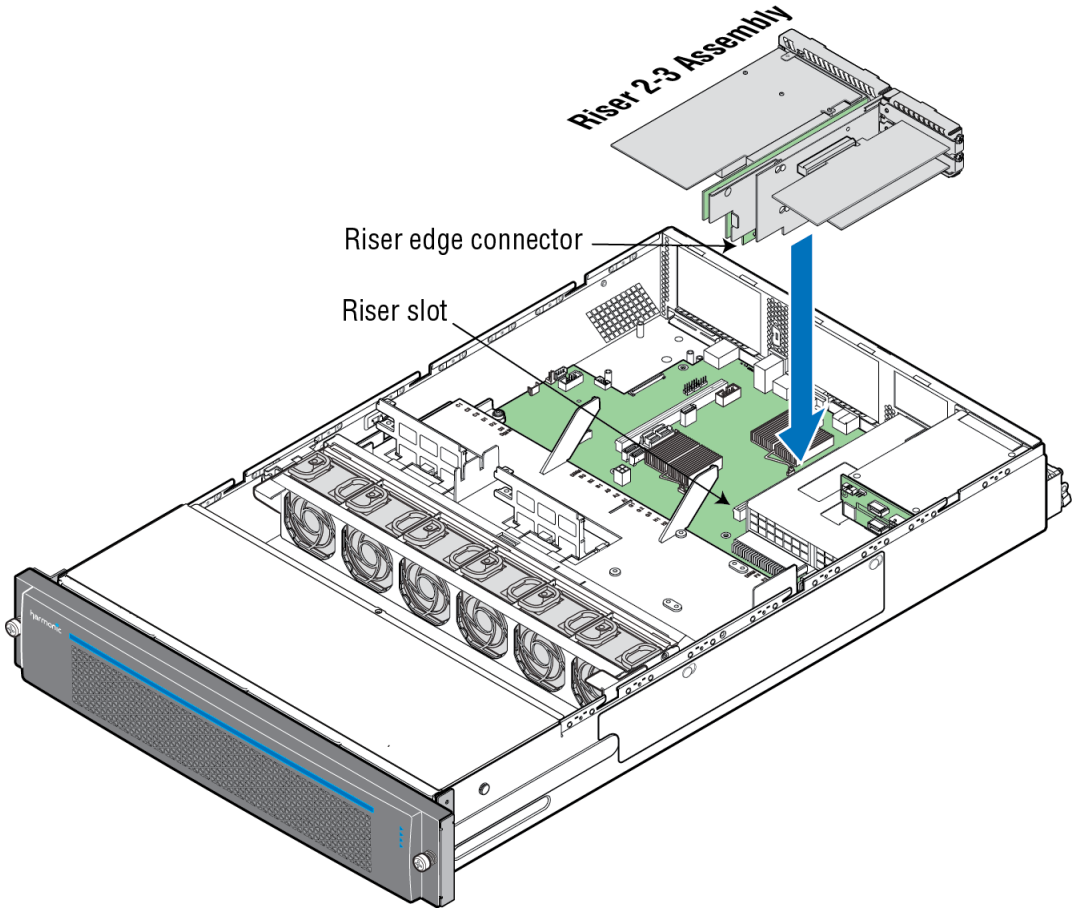
   Example:



6. Install PCI Riser 2-3 assembly as follows:
   a. Grasping the riser assembly with both hands, lower the back end of the riser assembly first, clearing the LTC connector from the rear panel as you position the riser assembly over the riser slot.
   b. Align the front end of the edge connector on PCI Riser 2 with the corresponding riser slot on the server board.

      NOTE: The add-in cards installed in PCI Riser 3 may obstruct your view, making it difficult to align its edge connector with the corresponding riser slot.

      Example:



c. Press gently on the back of the riser assembly first, then the front, until both edge connectors are firmly seated in their riser slots.

IMPORTANT: If the edge connectors are not aligned properly, lift up the assembly and attempt to install it again. Do not rock the riser assembly into position. Doing so may damage the contact pins within the riser slot.

d. Reconnect the internal cable to the front of the LTC card.

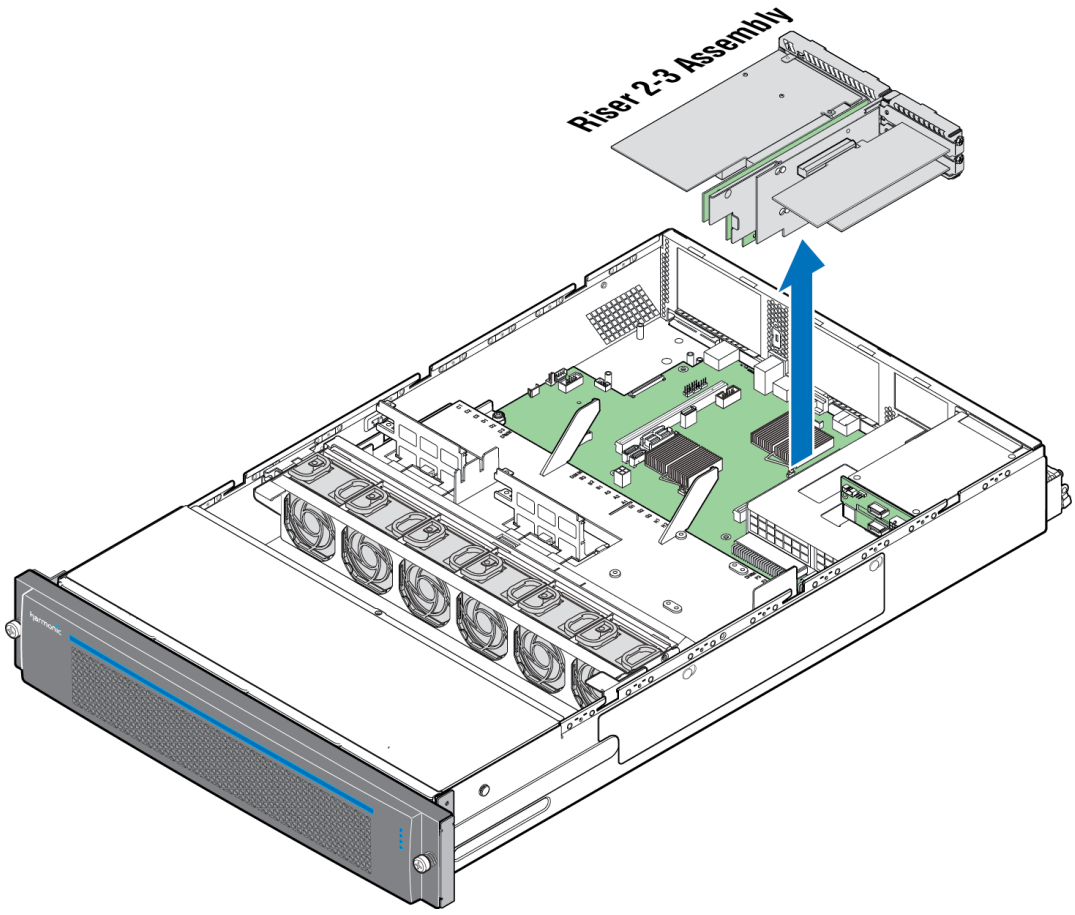
Replacing the Ethernet card in PCI Riser 3

When installing the riser assembly, be careful not to rock the riser assembly into place on the server board. Doing so can damage the contact pins within the riser slot.

NOTE: The specific card you are replacing may be in a different PCI slot position than that which is shown in the images in this section.

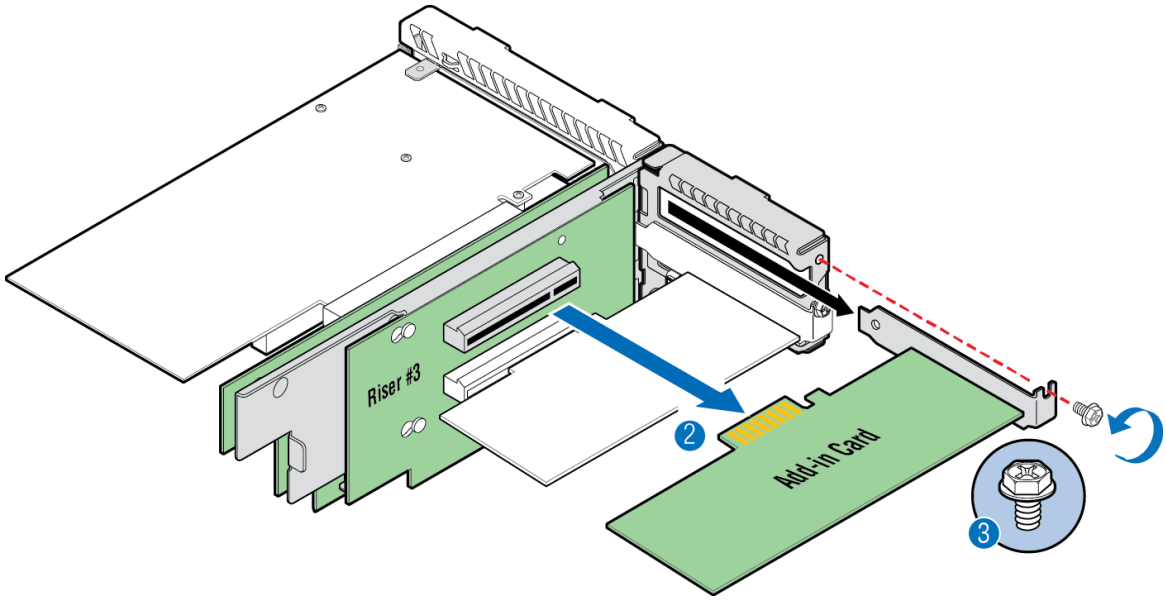
1. Remove PCI Riser 2-3 assembly as follows:
   a. Disconnect the internal cable from the front of the LTC card.
   b. Grasp PCI Riser 2-3 assembly with both hands and pull the riser assembly out of the riser slot, being careful to clear the LTC connector away from the rear panel before lifting up.

Example:



2. Remove the fastener screw that secures the card to the riser bracket.
3. Slide the card out of the riser bracket.

   Example:

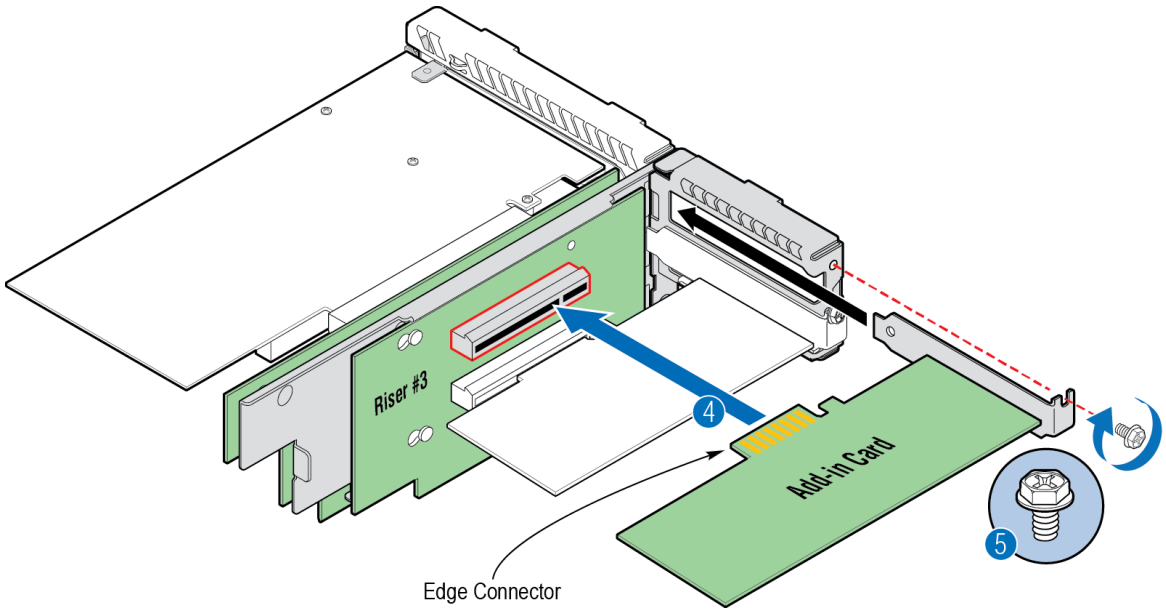


4. Insert the replacement card in the same PCI slot from you which you removed the failed card, ensuring that the edge connector is fully seated inside the PCI slot on the riser bracket.

   Warning: Each PCI add-in card is designed to work in a specific PCI slot. Installing the replacement card in a different PCI slot is not supported.

5. Secure the card to the riser bracket with the fastener screw.

   Example:

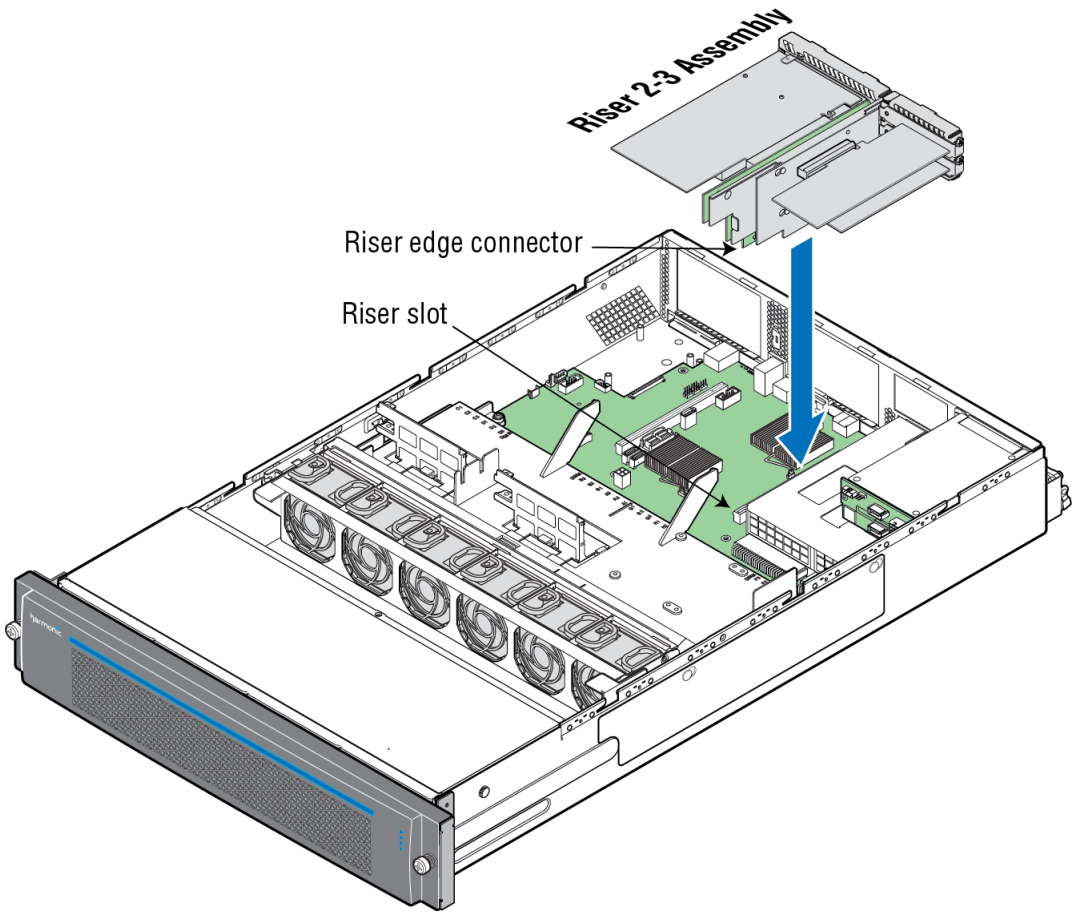


6. Install PCI Riser 2-3 assembly as follows:

a. Grasping the riser assembly with both hands, lower the back end of the riser assembly first, clearing the LTC connector from the rear panel as you position the riser assembly over the riser slot.
b. Align the front end of the edge connector on PCI Riser 2 with the corresponding riser slot on the server board.

NOTE: The add-in cards installed in PCI Riser 3 may obstruct your view, making it difficult to align its edge connector with the corresponding riser slot.

Example:



c. Press gently on the back of the riser assembly first, then the front, until both edge connectors are firmly seated in their riser slots.

IMPORTANT: If the edge connectors are not aligned properly, lift up the assembly and attempt to install it again. Do not rock the riser assembly into position. Doing so may damage the contact pins within the riser slot.

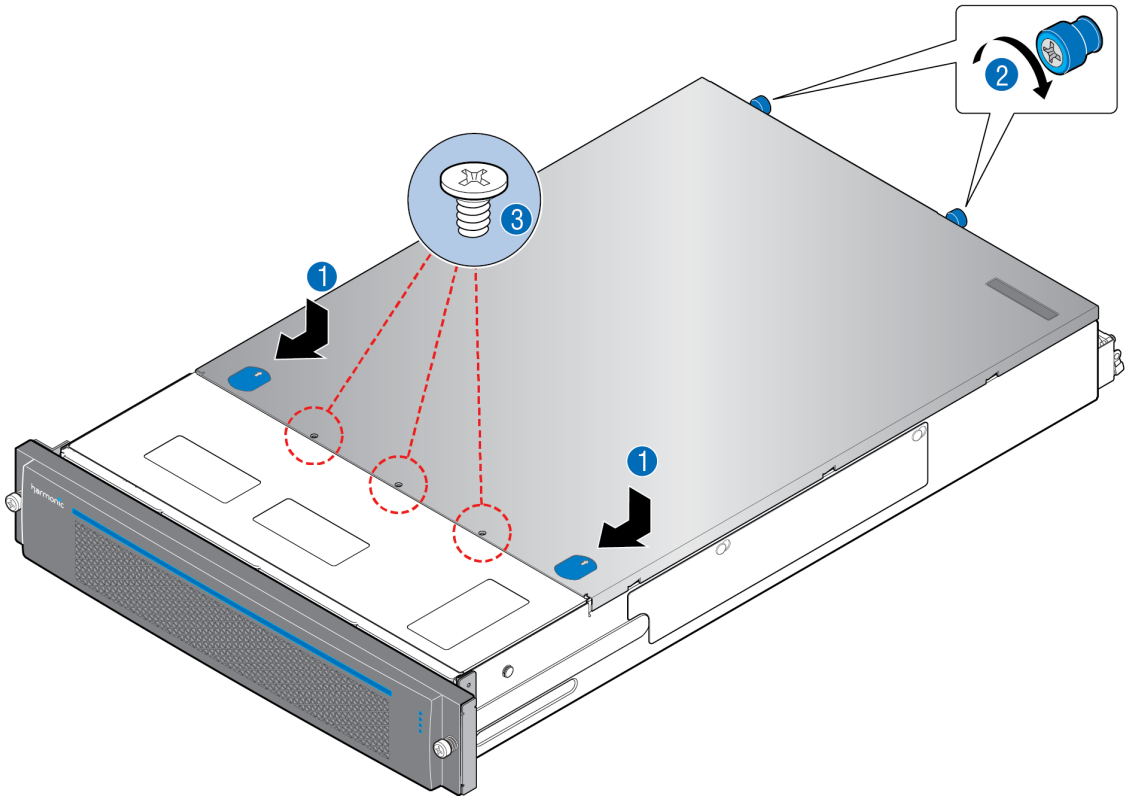
d. Reconnect the internal cable to the front of the LTC card.

Installing the system cover

The server system must be operated with the system cover in place to ensure proper cooling.

1. Place the system cover onto the chassis and slide forward until the front edge of the system cover is pressed up against the back edge of the front drive bay.
2. Hand tighten the two captive thumb screws at the back of the chassis.
3. Using a screwdriver, install the top cover screw(s).

   Example:



What to do next

Follow instructions in the *Spectrum System Installation Guide* for reconnecting the MediaDirector to your Spectrum system and powering on the device.

Replacing a SAS card

The serial-attached SCSI (SAS) card is installed in PCI riser assembly 2-3. In the event of a failure, replacement cards are available from Harmonic.

⚠ **DANGER:** Observe all conventional ESD precautions when handling Spectrum devices and components.

Removing the system cover

A non-skid surface may be needed to prevent the server system from sliding on your work surface.

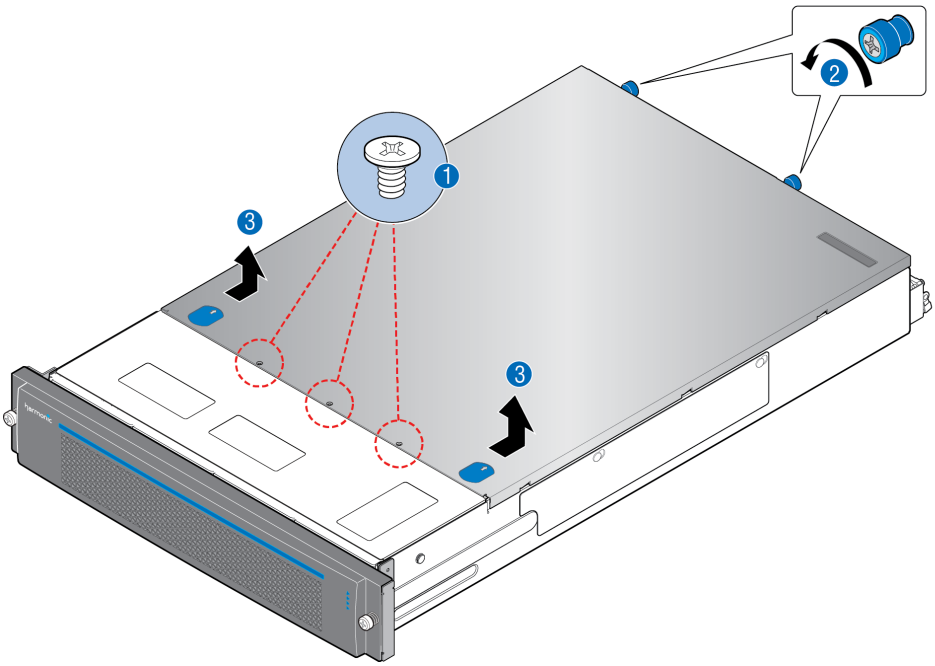
Before you begin

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support and do not continue with this procedure.

CAUTION: Power down the MediaDirector and unplug all peripheral devices and power cables.

1. Using a screwdriver, remove the top cover screw(s).
2. Loosen the two captive thumb screws located on the back edge of the system cover.
3. Slide the cover back and lift upward.

   Example:



Replacing the SAS card

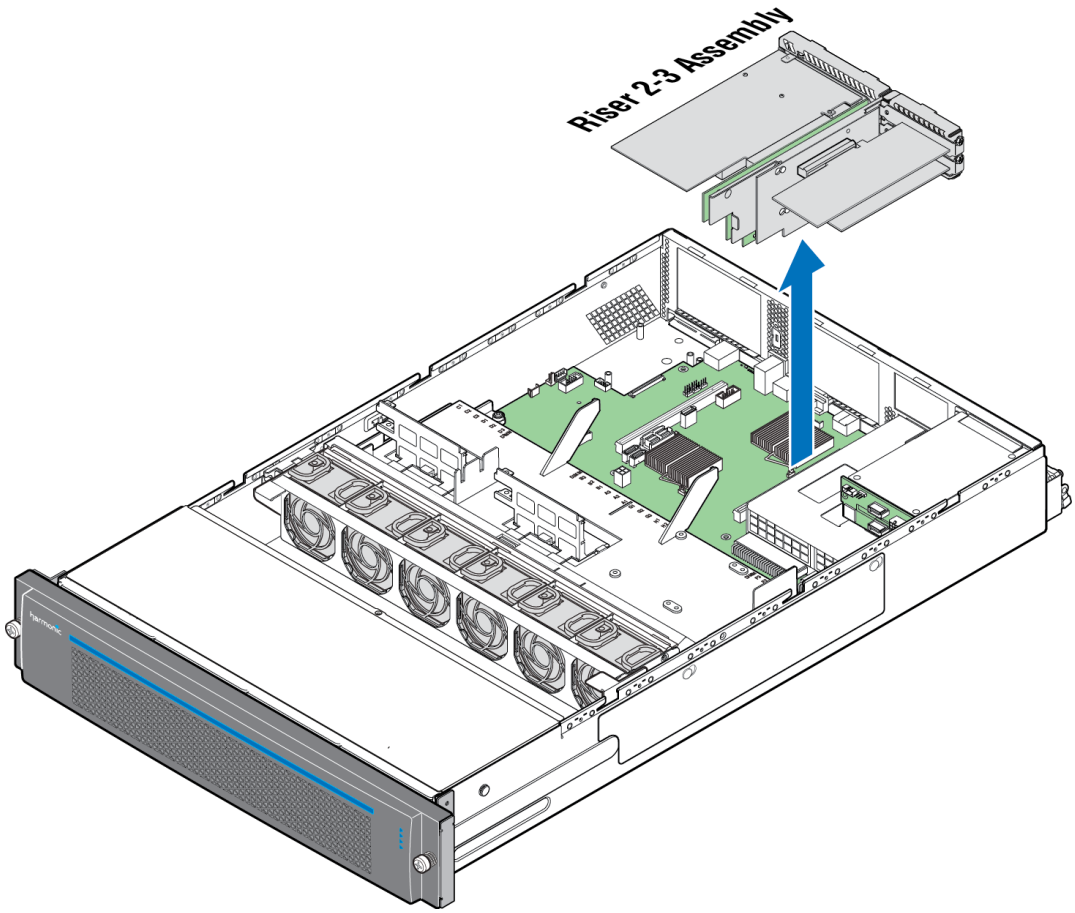
When installing the riser assembly, be careful not to rock the riser assembly into place on the server board. Doing so can damage the contact pins within the riser slot.

NOTE: The specific card you are replacing may be in a different PCI slot position than that which is shown in the images in this section.

1. Remove PCI Riser 2-3 assembly as follows:

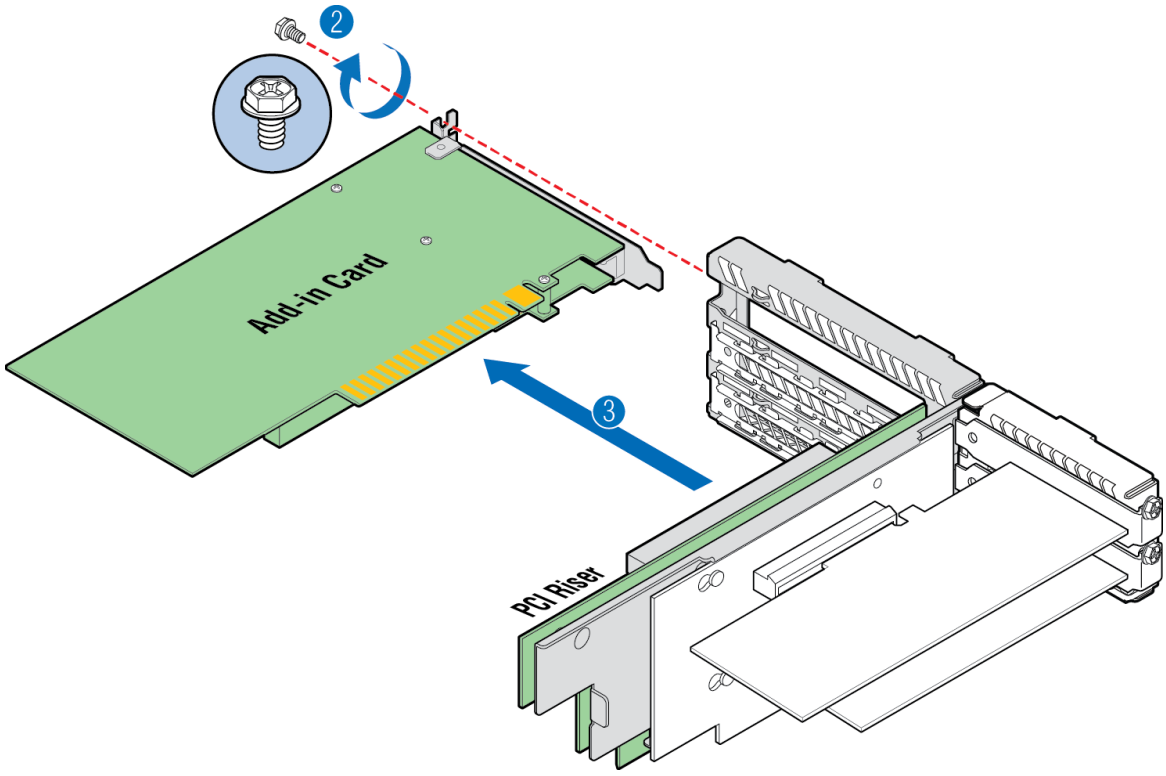
a. Disconnect the internal cable from the front of the LTC card.
b. Grasp PCI Riser 2-3 assembly with both hands and pull the riser assembly out of the riser slot, being careful to clear the LTC connector away from the rear panel before lifting up.

Example:



2. Remove the fastener screw that secures the card to the riser bracket.
3. Slide the card out of the riser bracket.

Example:

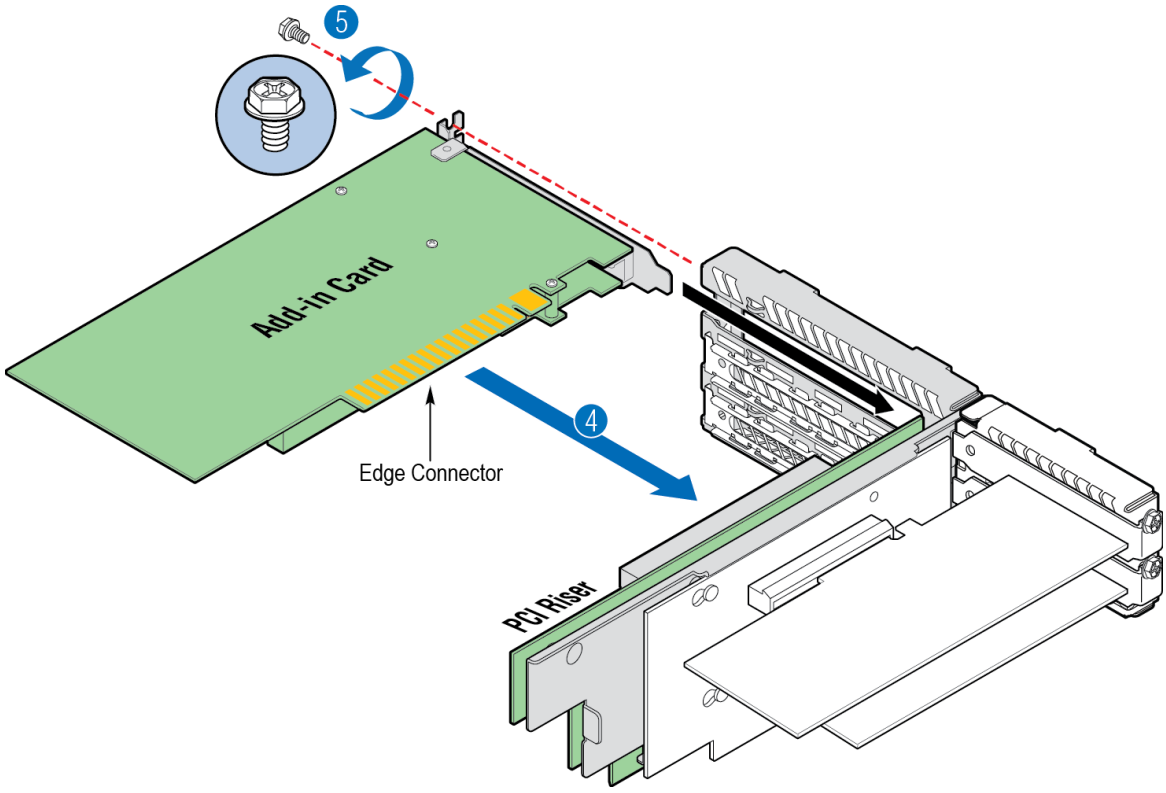


4. Insert the replacement card in the same PCI slot from you which you removed the failed card, ensuring that the edge connector is fully seated inside the PCI slot on the riser bracket.

   Warning: Each PCI add-in card is designed to work in a specific PCI slot. Installing the replacement card in a different PCI slot is not supported.

5. Secure the card to the riser bracket with the fastener screw.

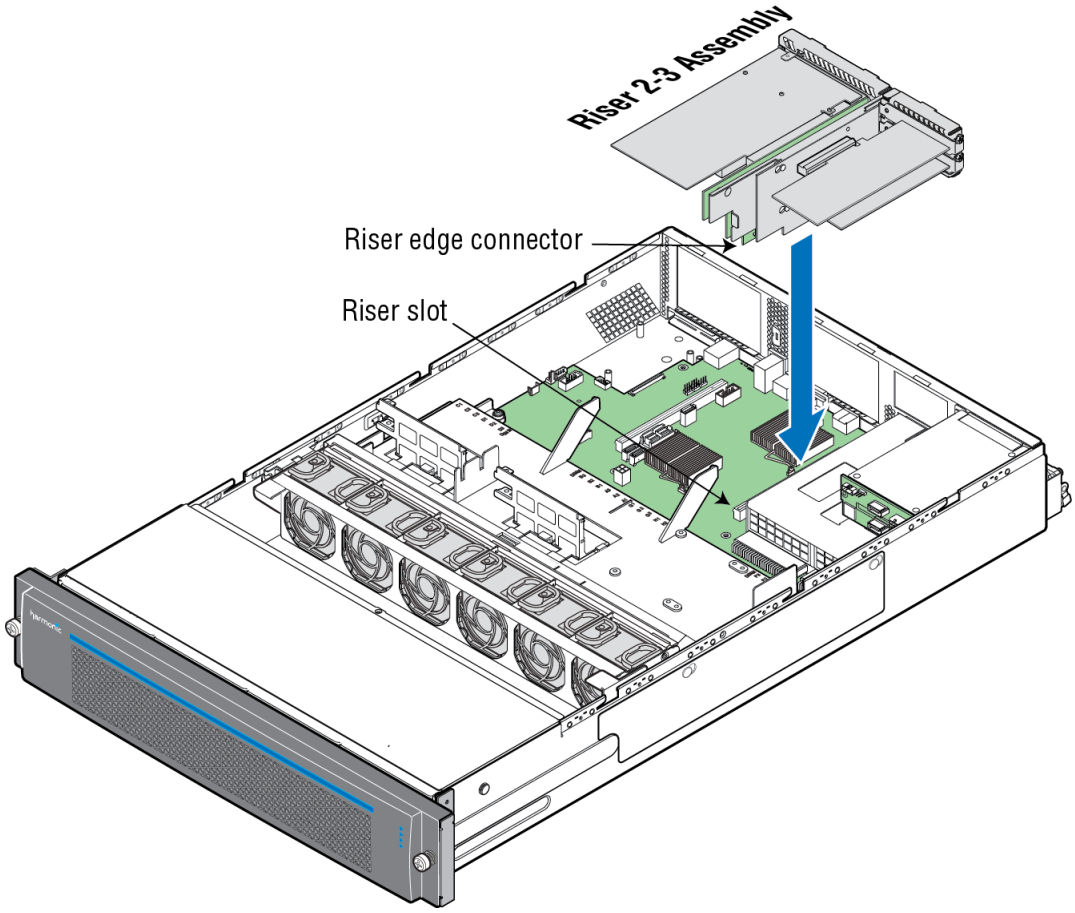
   Example:



6. Install PCI Riser 2-3 assembly as follows:
   a. Grasping the riser assembly with both hands, lower the back end of the riser assembly first, clearing the LTC connector from the rear panel as you position the riser assembly over the riser slot.
   b. Align the front end of the edge connector on PCI Riser 2 with the corresponding riser slot on the server board.

      NOTE: The add-in cards installed in PCI Riser 3 may obstruct your view, making it difficult to align its edge connector with the corresponding riser slot.

      Example:



c. Press gently on the back of the riser assembly first, then the front, until both edge connectors are firmly seated in their riser slots.

IMPORTANT: If the edge connectors are not aligned properly, lift up the assembly and attempt to install it again. Do not rock the riser assembly into position. Doing so may damage the contact pins within the riser slot.

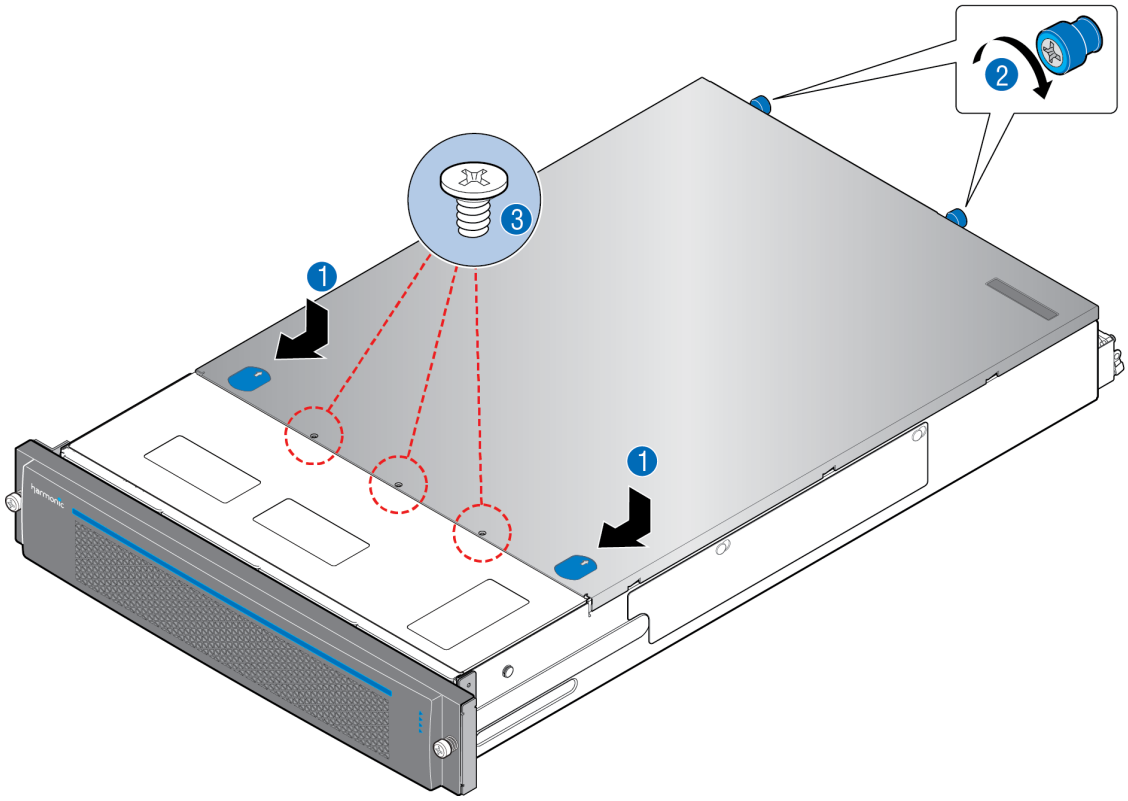
d. Reconnect the internal cable to the front of the LTC card.

Installing the system cover

The server system must be operated with the system cover in place to ensure proper cooling.

1. Place the system cover onto the chassis and slide forward until the front edge of the system cover is pressed up against the back edge of the front drive bay.
2. Hand tighten the two captive thumb screws at the back of the chassis.
3. Using a screwdriver, install the top cover screw(s).

   Example:



What to do next

Follow instructions in the *Spectrum System Installation Guide* for reconnecting the MediaDirector to your Spectrum system and powering on the device.

Replacing an optical 10GbE I/O module

Follow this procedure to replace the dual-port optical 10 GbE I/O module while keeping the existing SFP transceivers. If you are replacing an individual SFP transceiver, refer to "SFP transceiver replacement" instead.

DANGER: Observe all conventional ESD precautions when handling Spectrum devices and components.

Removing the SFP transceiver

If replacing an individual SFP transceiver, you may do so while the system is powered on.

CAUTION: When removing and installing SFP transceivers and fiber optic cables, damage can occur which results in the loss of loop noise immunity and possibly in the complete failure of the loop. To avoid damage, be sure to follow the removal and installation procedures in this section.

NOTE: SFP transceivers are dust-sensitive. Always keep protective caps installed when a fiber optic cable is unplugged, or when storing the SFP transceiver.

NOTE: SFP ports are numbered 0 and 1, from left to right.

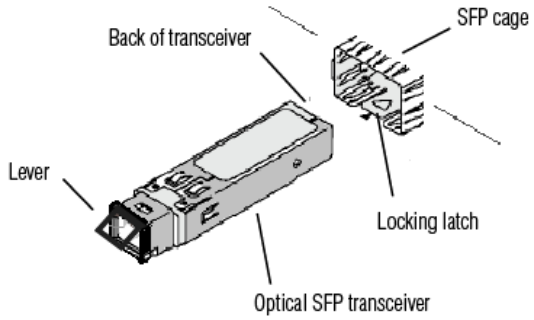


Figure 2-2: Optical SFP transceiver

Before you begin

Unpack the replacement component and visually inspect for damage. If the part is damaged, do not continue with this procedure.

1. Remove the fiber optic cable by depressing the latch underneath the connector and pulling the cable out.

   CAUTION: Ensure that the connector does not get damaged while the cable is disconnected.

2. Using your forefinger, lift the lever on the front of the SFP transceiver to the up position.
3. Grasping the lever, gently pull the SFP transceiver straight out of the SFP cage.

Removing the system cover

A non-skid surface may be needed to prevent the server system from sliding on your work surface.

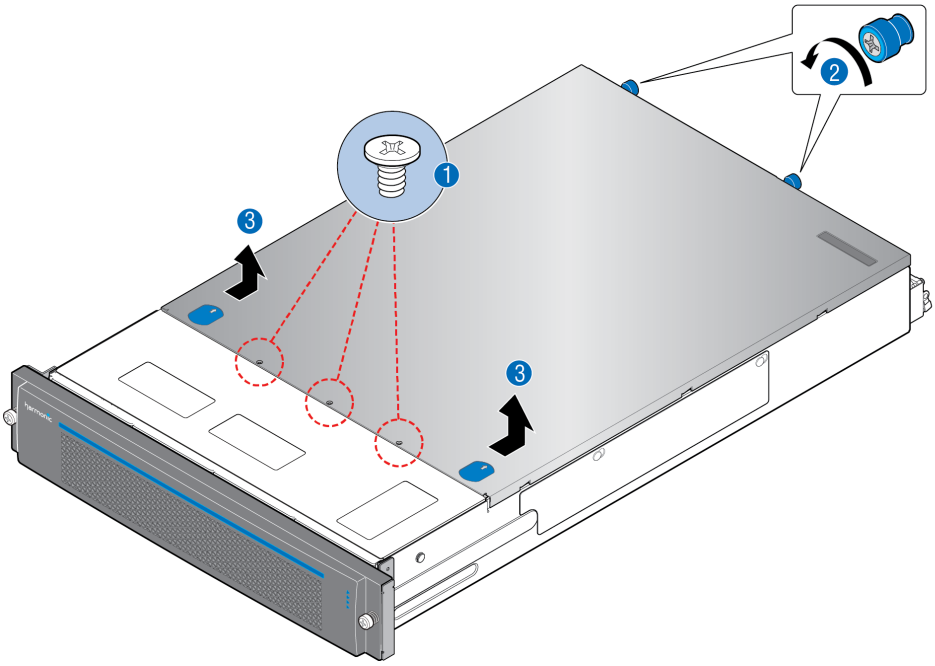
Before you begin

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support and do not continue with this procedure.

CAUTION: Power down the MediaDirector and unplug all peripheral devices and power cables.

1. Using a screwdriver, remove the top cover screw(s).
2. Loosen the two captive thumb screws located on the back edge of the system cover.
3. Slide the cover back and lift upward.

   Example:



Replacing the optical 10GbE I/O module

You must remove PCI Riser 1 assembly before you can remove the I/O module, which lies on the bottom of the server board.

1. Remove PCI Riser 1 assembly as follows:
   a. From the outside of the chassis, press the riser assembly faceplate in and upward until the riser becomes dislodged.
   b. Gently push the tab on the plastic air duct away from the riser assembly, just until you can freely lift the riser assembly.
   c. Grasp the riser assembly with both hands and lift straight up.
2. Remove the failed I/O module as follows:
   a. Remove the three screws securing the I/O module to the chassis.
   Keep them in a safe place so that you may use them to install the new I/O module.
   b. Remove the I/O module by pulling up the front end first, and then angling the I/O module up and out of the PCI slot.
3. Install the replacement I/O module as follows:
   a. Angle the I/O module downward and into the PCI slot opening until the faceplate is aligned with the back panel of the chassis.

      CAUTION: To avoid damage by the screw posts on the motherboard, do not slide the I/O module straight into the PCI slot.
   b. Lower the I/O module onto the motherboard, lining up the connector and three screw holes on the I/O module with the connector and three screw posts on the motherboard.
   c. Once the module is in place, press down on the connector until it is firmly seated.

d. Secure the module to the chassis using the three screws.

4. Install PCI Riser 1 assembly as follows:
   a. Grasp the riser assembly with both hands and lower the front end of the riser assembly first, aligning the riser edge connector with the corresponding riser slot on the server board.
   b. Lower the back end of the riser assembly, lining up the tabs on the faceplate with the holes on the back panel of the chassis.
   c. Press down on the riser assembly bracket and faceplate until firmly seated.

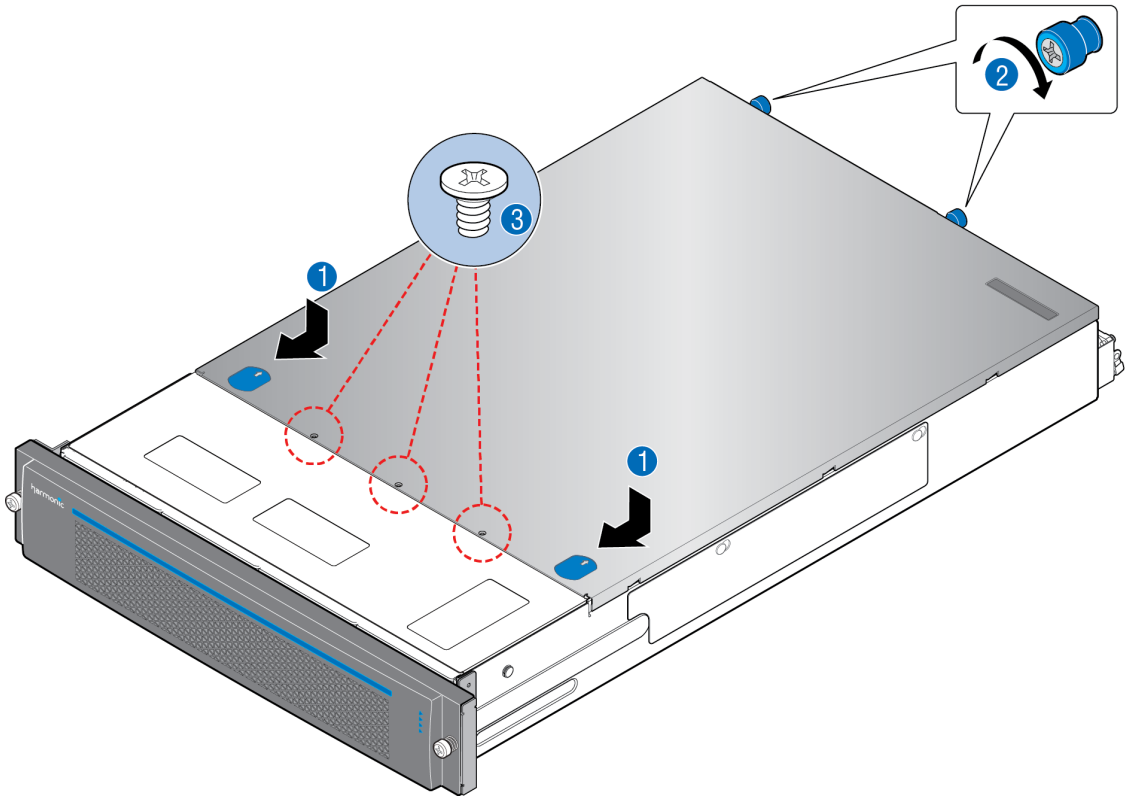
   CAUTION: Do not rock the riser assembly into place. Doing so may damage the contact pins within the riser slot.

Installing the system cover

The server system must be operated with the system cover in place to ensure proper cooling.

1. Place the system cover onto the chassis and slide forward until the front edge of the system cover is pressed up against the back edge of the front drive bay.
2. Hand tighten the two captive thumb screws at the back of the chassis.
3. Using a screwdriver, install the top cover screw(s).

   Example:



What to do next

Follow instructions in the *Spectrum System Installation Guide* for reconnecting the MediaDirector to your Spectrum system and powering on the device.

Installing the SFP transceiver

The SFP transceiver is designed to fit firmly in the SFP cage. A reasonable amount of friction is normal, especially with new I/O modules.

1. Remove the protective caps from the SFP cage, SFP transceiver, and fiber optic cable, and then store the caps in a safe place for later use.
2. Position the replacement SFP transceiver such that the label is on the bottom.

   CAUTION: You may damage the connector pins on the back of the transceiver if it is not oriented correctly during installation.
3. Raise the lever on the front of the SFP transceiver to the up position, and then slide the transceiver straight into the slot until the locking latch engages the transceiver.

   CAUTION: To avoid damage to the chassis assembly, do not force the transceiver to slide.
4. Once the transceiver is seated, lower the lever to the down position.
5. Orient the fiber optic cable so that the latch is on the bottom, and then connect it to the SFP transceiver.
   You will hear an audible click when the cable is secure.

Replacing an SFP transceiver

Use only Harmonic-supplied optical SFP transceivers in the dual-port optical 10 GbE IOM in the MediaDirector.

DANGER: Observe all conventional ESD precautions when handling Spectrum devices and components.

Removing the SFP transceiver

If replacing an individual SFP transceiver, you may do so while the system is powered on.

CAUTION: When removing and installing SFP transceivers and fiber optic cables, damage can occur which results in the loss of loop noise immunity and possibly in the complete failure of the loop. To avoid damage, be sure to follow the removal and installation procedures in this section.

NOTE: SFP transceivers are dust-sensitive. Always keep protective caps installed when a fiber optic cable is unplugged, or when storing the SFP transceiver.

NOTE: SFP ports are numbered 0 and 1, from left to right.

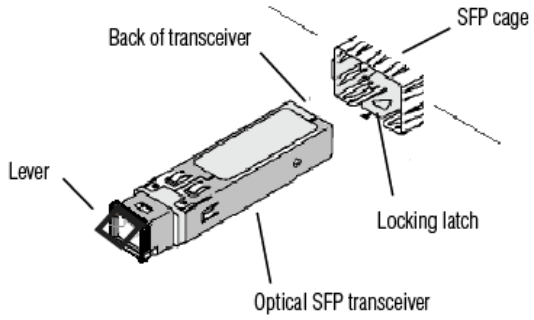


Figure 2-3: Optical SFP transceiver

Before you begin

Unpack the replacement component and visually inspect for damage. If the part is damaged, do not continue with this procedure.

1. Remove the fiber optic cable by depressing the latch underneath the connector and pulling the cable out.

   CAUTION: Ensure that the connector does not get damaged while the cable is disconnected.

2. Using your forefinger, lift the lever on the front of the SFP transceiver to the up position.
3. Grasping the lever, gently pull the SFP transceiver straight out of the SFP cage.

Installing the SFP transceiver

The SFP transceiver is designed to fit firmly in the SFP cage. A reasonable amount of friction is normal, especially with new I/O modules.

1. Remove the protective caps from the SFP cage, SFP transceiver, and fiber optic cable, and then store the caps in a safe place for later use.
2. Position the replacement SFP transceiver such that the label is on the bottom.

   CAUTION: You may damage the connector pins on the back of the transceiver if it is not oriented correctly during installation.

3. Raise the lever on the front of the SFP transceiver to the up position, and then slide the transceiver straight into the slot until the locking latch engages the transceiver.

   CAUTION: To avoid damage to the chassis assembly, do not force the transceiver to slide.

4. Once the transceiver is seated, lower the lever to the down position.
5. Orient the fiber optic cable so that the latch is on the bottom, and then connect it to the SFP transceiver.
   You will hear an audible click when the cable is secure.

Replacing a power supply unit

The MediaDirector is equipped with two hot-swappable power supplies, each with an independent AC connector. If one supply fails, the load is transferred to the remaining supply without interruption to service. To take full advantage of the redundant supplies, Harmonic recommends that you use separate, isolated power sources for each AC input.

DANGER: Observe all conventional ESD precautions when handling Spectrum devices and components.

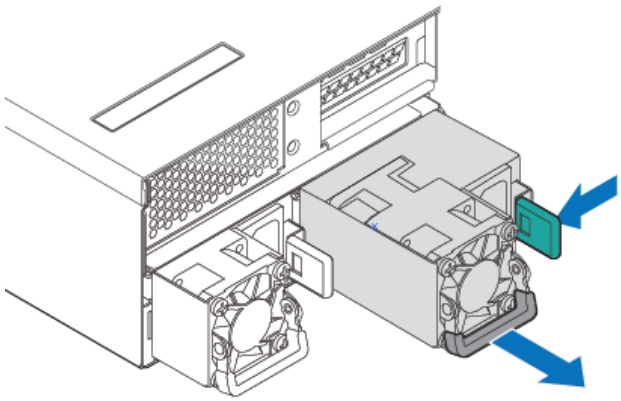
NOTE: To allow proper airflow, both power supply compartments should always have either a power supply module or a filler module installed.

NOTE: In systems with dual redundant power supplies, both power supplies must be of the same type and have the same maximum output power.

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support for assistance and do not continue with this procedure.

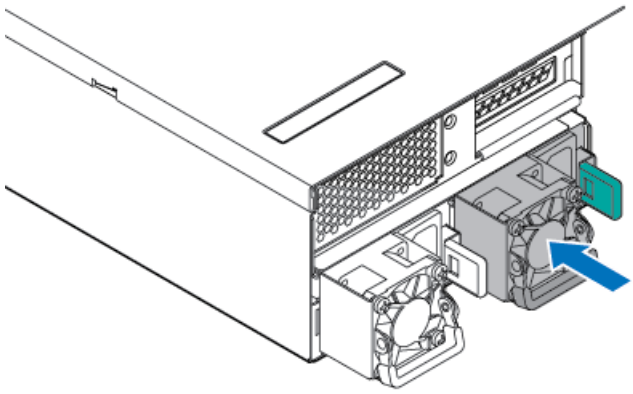
1. Disconnect the AC power cable from the failed power supply module.
2. Using the handle, pull the power supply module from the system while pushing the green latch in the direction shown.
   After you remove the power supply, the power supply LED remains lit for a short period of time.

   Example:



3. Insert the power supply module into the power supply bay.
4. Push the power supply module into the bay until it locks into place.

   Example:



5. Connect the AC power cable to the new power supply.

Replacing the boot drive

The MediaDirector contains one 2.5" boot drive on the back of the chassis. To replace a boot drive, complete the procedures in this section in order.

IMPORTANT: Before you begin this procedure, please contact Harmonic Technical Support to obtain a copy of the operating system and other required files which must be installed on the replacement boot drive. These files must be saved to a USB drive.

DANGER: Observe all conventional ESD precautions when handling Spectrum devices and components.

About replacement drives

Replacement drives must meet certain criteria. In the event of a drive failure, replacement drives are available from Harmonic.

IMPORTANT: Use ONLY Harmonic-supplied replacement drives. Drives from any other source will be excluded from coverage under the Harmonic product limited warranty and maintenance services programs. In addition, any errors or damages caused by the use of drives provided from any other source will cause the entire product to be excluded from coverage under the Harmonic product limited warranty and maintenance services programs.

NOTE: Replacement drives should have the same or greater drive capacity as those they are replacing, and their form factor must match the other drives in the enclosure.

If you wish to install a Harmonic-supplied drive model that is not supported by your current version of Spectrum firmware, you may need to install a "DDC" configuration file to your video server, which enables you to install and use the new drive. For details, see "Installing a DDC file" in the *Harmonic SystemManager User Guide.*

Be sure that you have a replacement drive on hand before removing the failed drive. You may wish to have more than one replacement drive on hand in case the first is not responsive.

Recording your MediaDirector settings

Navigate to the **Spectrum Server Properties** page to record system settings before replacing the boot drive.

1. Record the following settings:
   - **Host Name**: View the **Spectrum Server Properties** page to identify the **Host Name**.
   - **Network Settings**: From the **Network Settings** page, record all network settings for your Spectrum video server, including any Additional Routes and Ethernet Failover settings. Refer to “Configuring network settings” in the *Harmonic SystemManager User Guide* for information on viewing your network settings.
   - **Low Priority Bandwidth Settings**: Refer to “Changing network/file system performance settings” in the *Harmonic SystemManager User Guide* for information on viewing the Low Priority Bandwidth Limits on the **Network/Filesystem Performance Settings** page.
   - **Harmonic MediaGrid** Accounts: Refer to “Connecting to Harmonic MediaGrid from the Spectrum video server” in the *Harmonic SystemManager User Guide* for information on viewing your Harmonic MediaGrid Accounts.
   - **Access Control Settings**: Refer to “Configuring Access Control settings for video servers” in the *Harmonic SystemManager User Guide* for information on viewing your Access Control Settings.
   - **Audio Profile Groups**: Refer to "Creating an audio profile group" in the *Harmonic SystemManager User Guide* for information on viewing your **Audio Profile Groups List**.
   - **Configure DDC File**: If you have installed a DDC configuration file, you will need to reinstall the same file when configuring settings on the replacement MediaDirector. Refer to "Installing a DDC file" in the *Harmonic SystemManager User Guide* for information on viewing your DDC file configuration.
2. Copy the contents of the `filetypes.conf` file and save them to a separate text file.
   For information on accessing the `filetypes.conf` file, refer to “Editing the Filetypes.conf File” in the *Harmonic SystemManager User Guide*.

Replacing the boot drive

After installing the new drive, you must boot the video server to the USB device that you saved the operating system to earlier in this process. Contact Technical Support for assistance.

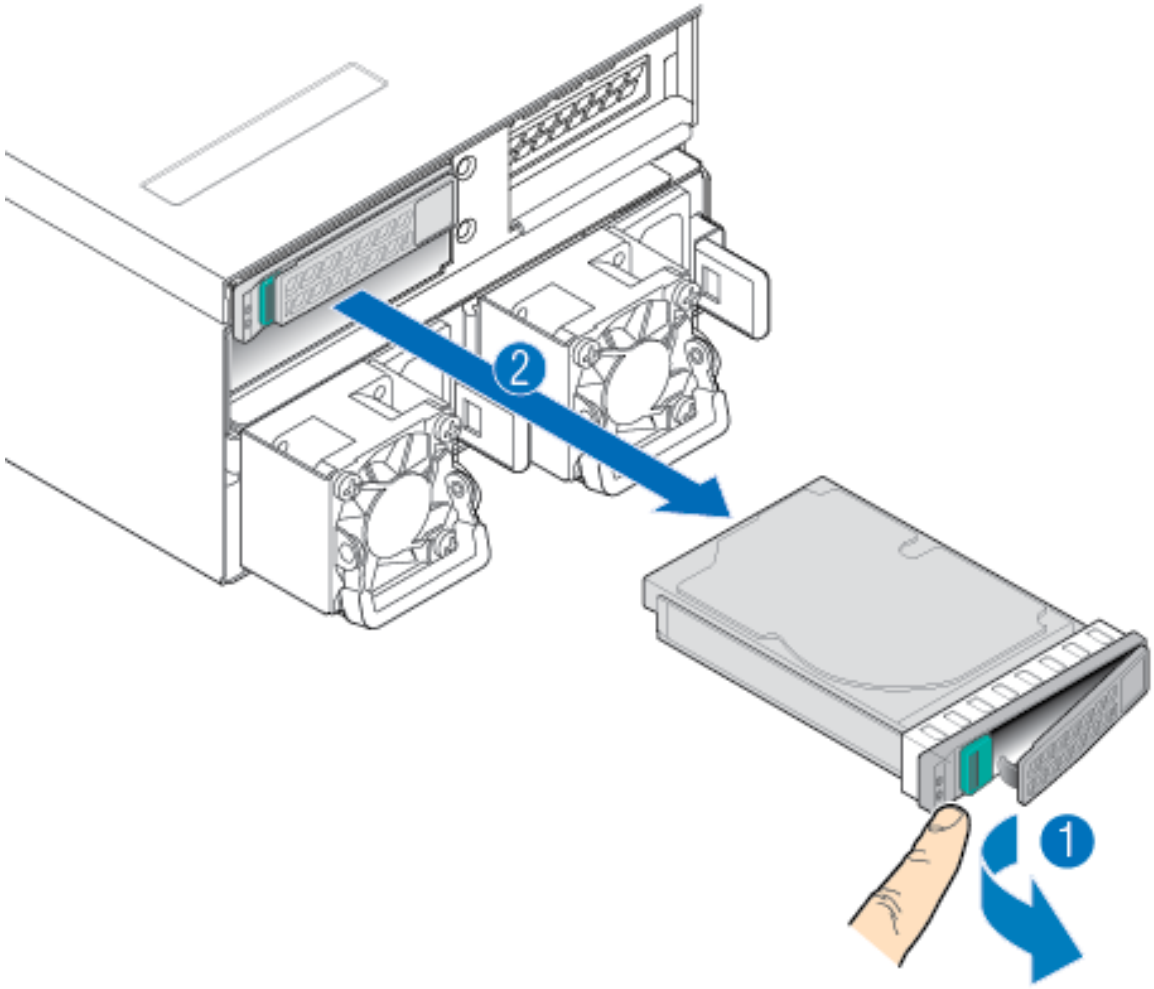
CAUTION: The MediaDirector must be powered down during this procedure.

Before you begin

Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support for assistance and do not continue with this procedure.

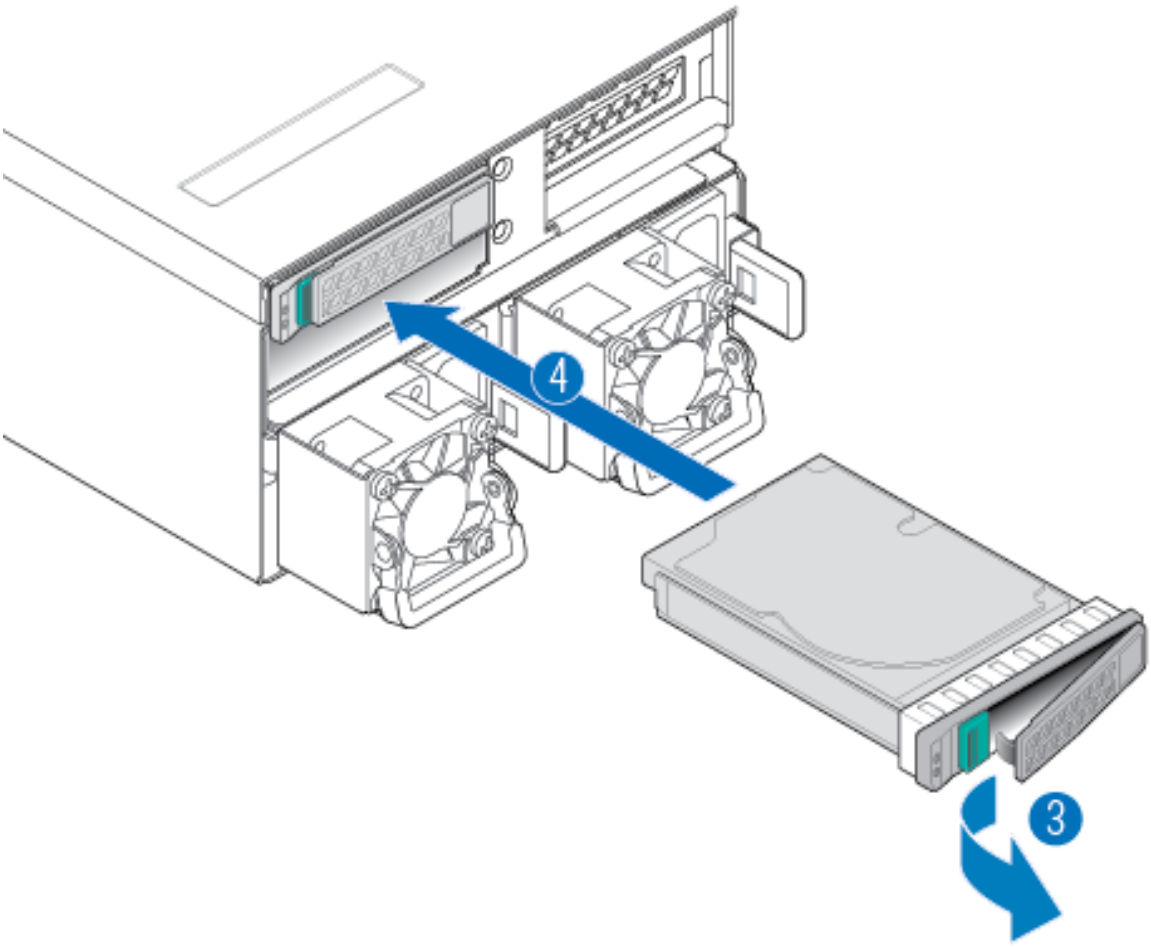
1. Press the green release button on the drive carrier and pull open the lever.
2. Slide the drive carrier out of the drive bay.

   Example:



3. Press the green release button on the replacement drive carrier to open the lever.
4. Insert the drive carrier into the bay, sliding the drive until it contacts the backplane.

   Example:



5. Close the drive carrier release handle to lock the drive into place.
6. Insert the USB device with the operating system into a USB port on the rear panel.

   IMPORTANT: Contact Technical Support for assistance with the following step.

7. Boot the MediaDirector to the USB device, as directed by Technical Support.
   The operating system is installed to the replacement boot drive, and the video server powers off when the installation is complete.
8. Remove the USB device from the rear panel.
9. Power on the MediaDirector by pressing the power button on the front panel.
10. From the **System Diagram** page in SystemManager, verify that the MediaDirector appears as **Connected**.
11. If any error alarms were created, click **ALARM**, and then acknowledge and delete the alarms.
12. Determine the firmware version that is running on the MediaDirector.

NOTE: All devices in a Spectrum system should be running the same firmware version.

13. If necessary, upgrade firmware on the MediaDirector to match that of the rest of your system, and then reboot the MediaDirector. Follow instructions in the *Spectrum System Installation Guide*.

Starting the file system

Use this procedure to start an existing File System that has been previously initialized. The procedure is typically used after performing maintenance on the File System, or when starting a File System in configurations with more than one MediaDirector.

IMPORTANT: After replacing a Spectrum server, the File System **Status** field might show **Started** or **Not Started** (depending on the software version). Even if the status shows **Started**, you must stop the File System and then start it again to ensure that the correct settings take effect.

1. From the **Configuration** tab, click the **Disk Utilities** icon in the lefthand column.
   The **Spectrum - Disk Utilities** page displays all video servers on the network and the status of their File Systems.
2. Click on the name of the Spectrum server with the File System you wish to start.
   The **Disk Utilities** page for the Spectrum server appears. There are two columns displayed, the **Physical View** and **Logical View**.
3. At the top of the **Logical View** column, click the link to the File System name.
   The **Filesystem Utilities** page displays.
4. If you are replacing a Spectrum server and the file system **Status** shows **Started**, click **Stop FS**.
   The button changes to **Start FS**.
5. Click **Start FS**.

   CAUTION: Do not click “Initialize FS”. This will wipe out the entire File System.

   The **Start Filesystem** page appears.
6. Ensure that the first option, **Use NVRAM Journaling for this filesystem**, is checked.

   NOTE: In most cases, you should not need to change the options from the default selections.
7. Click the **Start** button.

   The **Filesystem utilities** page appears, where the **Mode** field should indicate **Read/Write**, the **Sharing with other MediaDirectors** field should indicate **On** (if it does not, the MediaDirector needs to be rebooted), and the **Mountpoint** field should indicate /fs0.

   For a MediaDirector in EFS configuration only: the Expansion Ethernet LED on the front panel should indicate that the EFS is working.
8. From the **Configuration** tab, click the **Disk Utilities** icon and verify that the MediaDirector is shown as **Started** and **Shared**.

What to do next

NOTE: If replacing a MediaDirector: It is recommended that every MediaDirector sharing a File System (EFS) be rebooted after one MediaDirector has been replaced. This ensures that they are all in sync.

Configuring the MediaDirector

After replacing a Spectrum video server chassis or boot drive, you must configure the server settings. Refer to your record of the original settings in order to complete this procedure.

1. Configure network settings. Refer to “Configuring network settings” in the *Harmonic SystemManager User Guide* for information on configuring network settings including additional routes and Ethernet Failover settings.
2. Configure your Harmonic MediaGrid accounts. Refer to “Connecting to a Harmonic MediaGrid from the Spectrum video server” in the *Harmonic SystemManager User Guide* for information on configuring your Harmonic MediaGrid Accounts.
3. Configure your Access Control settings. Refer to “Configuring Access Control settings for video servers” in the *Harmonic SystemManager User Guide*.
4. If you had previously modified the Low Priority Bandwidth Settings, then configure these settings to match your original settings. Refer to “Changing Network/File System Performance settings” in the *Harmonic SystemManager User Guide* for information on configuring Low Priority Bandwidth Limits.
5. If you had modified the contents of the `filetypes.conf` file, configure these settings to match your original settings. For information on editing the `filetypes.conf` file, refer to “Editing the Filetypes.conf File” in the *Harmonic SystemManager User Guide*.
6. If you had previously configured audio profile groups, configure new audio profile groups to match your original settings. For instructions, refer to "Creating an audio profile group" in the *Harmonic SystemManager User Guide*.
7. If you had previously installed a DDC configuration file, install the same DDC file. Refer to "Installing a DDC file" in the *Harmonic SystemManager User Guide* for instructions.
8. Reboot the MediaDirector according to the instructions in “Rebooting the Spectrum video server” in the *Harmonic SystemManager User Guide*. Once the MediaDirector has rebooted, verify that all changes are correct.

Chapter 3

MediaDirector 2252/2251 component replacement

The following components may be replaced in the MediaDirector 2252/2251: the bezel and power supply units.

- *Replacing the bezel*
- *Replacing a power supply unit*

Replacing the bezel

Over time, the bezel LEDs can wear out. Replacement bezels are available from Harmonic.

CAUTION: The front panel is susceptible to electrostatic discharge (ESD) when the bezel is removed. Wear the appropriate ESD protection when you remove the bezel.

Removing the bezel

The bezel may be removed during operation.

1. Unlock the bezel by loosening the two captive thumb screws.

   NOTE: Keep the rack ears in place.

2. Pull the bezel straight away from the chassis.

Installing the bezel

Align the bezel in front of the chassis so that the Harmonic logo appears on the top left corner.

1. Keeping the corners aligned, press the bezel straight onto the chassis.
2. Hand-tighten the two captive thumb screws to secure the bezel in place.

   CAUTION: Do not over-tighten the thumb screws.

Replacing a power supply unit

The MediaDirector is equipped with two hot-swappable power supplies, each with an independent AC connector. If one supply fails, the load is transferred to the remaining supply without interruption to

service. To take full advantage of the redundant supplies, Harmonic recommends that you use separate, isolated power sources for each AC input.

⚠ **DANGER:** Observe all conventional ESD precautions when handling Spectrum devices and components.

Before you begin

Unpack the replacement component and visually inspect for damage. If it is damaged,call Harmonic Technical Support for assistance and do not continue with this procedure.

1. Disconnect the AC power cable.
2. Press the release lever to the right and pull the handle to remove the power supply.
3. Using the handle, slide the replacement power supply into the empty chassis slot.
   The release lever clicks to indicate that the unit is locked into place.

Chapter 4

MediaDirector chassis replacement

Follow these instructions when replacing a 2252B/2251B or 2252/2251 chassis. Please contact Technical Support for assistance.

1. *Recording your MediaDirector settings*
2. *Replacing the chassis*
3. *Starting the file system*
4. *Moving players from one Spectrum server to another*
5. *Removing a MediaDirector from SystemManager*
6. *Configuring the MediaDirector*
7. *Verifying functionality*

Recording your MediaDirector settings

Navigate to the **Spectrum Server Properties** page in SystemManager and record system settings before replacing the chassis.

The SystemManager uses IP addresses to uniquely identify the MediaDirector. If a MediaDirector is replaced (for example, because of unit failure), allow the new MediaDirector to assume different IP addresses from the replaced unit, if possible. This allows the SystemManager to simultaneously display both units, and allows you to move Players from the original unit to the new one, using the Move Player function.

IMPORTANT: If you need to replace a Spectrum video server that is configured for Polaris Play: Playlist Control, contact Harmonic Technical Support for assistance with saving all necessary settings so they can be moved to the replacement video server. Failure to save settings such as Playout Channel configuration, playlists, and schedules, as directed by Technical Support, before replacing a Spectrum video server could result in the loss of those settings.

1. Record the following settings:
   - **Host Name**: View the **Spectrum Server Properties** page to identify the **Host Name**.
   - **Network Settings**: From the **Network Settings** page, record all network settings for your Spectrum video server, including any Additional Routes and Ethernet Failover settings. Refer to “Configuring network settings” in the *Harmonic SystemManager User Guide* for information on viewing your network settings.

- **Low Priority Bandwidth Settings**: Refer to “Changing network/file system performance settings” in the *Harmonic SystemManager User Guide* for information on viewing the Low Priority Bandwidth Limits on the **Network/Filesystem Performance Settings** page.
- **Harmonic MediaGrid** Accounts: Refer to “Connecting to Harmonic MediaGrid from the Spectrum video server” in the *Harmonic SystemManager User Guide* for information on viewing your Harmonic MediaGrid Accounts.
- **Access Control Settings**: Refer to “Configuring Access Control settings for video servers” in the *Harmonic SystemManager User Guide* for information on viewing your Access Control Settings.
- **Audio Profile Groups**: Refer to "Creating an audio profile group" in the *Harmonic SystemManager User Guide* for information on viewing your **Audio Profile Groups List**.
- **Configure DDC File**: If you have installed a DDC configuration file, you will need to reinstall the same file when configuring settings on the replacement MediaDirector. Refer to "Installing a DDC file" in the *Harmonic SystemManager User Guide* for information on viewing your DDC file configuration.

2. Copy the contents of the `filetypes.conf` file and save them to a separate text file.
   For information on accessing the `filetypes.conf` file, refer to “Editing the Filetypes.conf File” in the *Harmonic SystemManager User Guide*.

Replacing the chassis

Refer to the *Spectrum System Installation Guide* for complete racking instructions.

1. Rack mount the new MediaDirector.
2. Connect the Ethernet cables to the Network Switch used for the Spectrum system.

   NOTE: If you are using a DHCP server, the DHCP server will assign new IP addresses to the public Ethernet interfaces on the MediaDirector. In SystemManager, you can configure the MediaDirector to use either DHCP or static IP addresses. After removing the original MediaDirector, you can configure the replacement to use the same IP addresses. If you do not have a DHCP server, contact Harmonic Technical Support for assistance.

3. Power up the replacement MediaDirector by plugging in both power cables.

   NOTE: Do not connect any MediaPort units at this time.

4. On the **System Diagram** page in SystemManager, verify that the new MediaDirector appears as **Connected**.
5. In SystemManager, view and clear any alarms that were created after the new MediaDirector was connected.
6. Determine the firmware version running on the replacement MediaDirector.

   NOTE: All devices in a Spectrum system should be running the same firmware version.

7. If necessary, upgrade firmware on the replacement MediaDirector to match that of the rest of your system, and then reboot the MediaDirector.

CAUTION: For EFS configurations, make sure each MediaDirector is running the same version of Spectrum software and each has an EFS license installed BEFORE continuing to the next step to connect EFS Ethernet or shared storage cables.

IMPORTANT: Do not deactivate any players on the original MediaDirector at this point.

8. Power down both the original and the replacement MediaDirector in order to transfer cables from one to the other.
9. Transfer cables from the original MediaDirector to the new MediaDirector as follows:
   a. Remove each SAS cable from the original MediaDirector and re-connect to the new MediaDirector, using the exact same connection slots.
   b. Remove each EFS Ethernet cable from the original MediaDirector and re-connect to the new MediaDirector, using the exact same connection slots.

      NOTE: Do not re-connect the SAS cables into different slots on the new MediaDirector. This will cause the system to be unstable and could cause the File System to become unusable. (A diagram provided by Harmonic should show the proper connections).
   c. Remove each Ethernet cable from the MediaPort Ethernet Array on the original MediaDirector and re-connect to the new MediaDirector, using the exact same connection ports.
   d. Power on the replacement MediaDirector by connecting both power cables. Leave the original MediaDirector powered off.
10. Once the new MediaDirector has powered on, check the front panel status LEDs to ensure that the system is operating normally.
    Refer to the hardware reference section in the *Spectrum System Installation Guide* for more information.

What to do next

Start the File System.

Powering down a Spectrum video server

Safely power down a Spectrum video server using SystemManager.

NOTE: In certain situations, powering down one MediaDirector in an EFS configuration may cause video disruption to channels on other MediaDirector notes in the system.

1. Click the **Configuration** tab to display the **Configuration** page and **System Diagram**.
2. Click a Spectrum video server icon to display the **Physical Configuration** page for the selected video server.
3. Click the video server's picture to display the **Properties** page.
4. Scroll to the bottom of the **General Properties** section and click **Shutdown Spectrum Server**.
   A confirmation dialog appears.
5. Click **OK**.
6. Verify that the video server's status changes to **Not Responding**.

Starting the file system

Use this procedure to start an existing File System that has been previously initialized. The procedure is typically used after performing maintenance on the File System, or when starting a File System in configurations with more than one MediaDirector.

IMPORTANT: After replacing a Spectrum server, the File System **Status** field might show **Started** or **Not Started** (depending on the software version). Even if the status shows **Started**, you must stop the File System and then start it again to ensure that the correct settings take effect.

1. From the **Configuration** tab, click the **Disk Utilities** icon in the lefthand column.
   The **Spectrum - Disk Utilities** page displays all video servers on the network and the status of their File Systems.
2. Click on the name of the Spectrum server with the File System you wish to start.
   The **Disk Utilities** page for the Spectrum server appears. There are two columns displayed, the **Physical View** and **Logical View**.
3. At the top of the **Logical View** column, click the link to the File System name.
   The **Filesystem Utilities** page displays.
4. If you are replacing a Spectrum server and the file system **Status** shows **Started**, click **Stop FS**.
   The button changes to **Start FS**.
5. Click **Start FS**.

   CAUTION: Do not click “Initialize FS”. This will wipe out the entire File System.

   The **Start Filesystem** page appears.
6. Ensure that the first option, **Use NVRAM Journaling for this filesystem**, is checked.

   NOTE: In most cases, you should not need to change the options from the default selections.
7. Click the **Start** button.

   The **Filesystem utilities** page appears, where the **Mode** field should indicate **Read/Write**, the **Sharing with other MediaDirectors** field should indicate **On** (if it does not, the MediaDirector needs to be rebooted), and the **Mountpoint** field should indicate /fs0.

   For a MediaDirector in EFS configuration only: the Expansion Ethernet LED on the front panel should indicate that the EFS is working.
8. From the **Configuration** tab, click the **Disk Utilities** icon and verify that the MediaDirector is shown as **Started** and **Shared**.

What to do next

NOTE: If replacing a MediaDirector: It is recommended that every MediaDirector sharing a File System (EFS) be rebooted after one MediaDirector has been replaced. This ensures that they are all in sync.

Moving players from one Spectrum server to another

This feature is useful when a MediaPort is “moved” between Spectrum servers, and when Spectrum servers need to be serviced. Players may be moved from Spectrum servers that are not responding.

NOTE: In this context, “moved” means physically removing a MediaPort or Spectrum X from the source Spectrum server's 1394 bus by disconnecting its IEEE 1394 cable, and then reconnecting its IEEE 1394 cable to the destination Spectrum server.

1. From the **Configuration** tab in SystemManager, click the **Player Configuration** icon on the left-hand column.
   If you have replaced a Spectrum server, the page should show 0 players configured for that server.
2. Select the destination Spectrum server.
   The **Player List** page appears.
3. On the **Player List** page, under **Move Players from another media server**, use the dropdown box to select the host of the original Spectrum server, which has the players you wish to move.
4. Click **Select Players**.
   The **Select Players** page appears, showing a list of those players that reside on the Spectrum server you chose.
5. Select the players that you wish to move by clicking the appropriate check boxes. Optionally, click **Select all Players**.
6. Click **Move** to perform the move function between Spectrum servers.
   The selected players will disappear from the list.
7. Click **Done** to complete the move.
8. Harmonic recommends you verify that the players are usable by recording or playing material using those players on their new Spectrum server.

Removing a MediaDirector from SystemManager

Remove a device that is no longer part of your Spectrum system.

1. From the **Diagnostics** tab, click the **Remove Device** icon in the left-hand column.
   The **Remove Device** page appears.
2. If the device you are removing is not responsive, find the device in the **Not Responding Devices** section, select it, and then click **Remove Not Responding Devices**.
   The device is removed (it has also been removed from the **System Diagram**), and this completes the procedure.

3. If you are removing a device that is responsive, follow these steps:
   a. Click **Stop Monitoring**.
      Once the "Current state of Device Monitoring" changes to **Not monitoring**, continue to the next step.

      NOTE: This may take a few minutes depending on the number of devices in your system.
   b. Select one or more devices from one of the sections on the page.
   c. Click **Remove** at the bottom of the section.
   d. Click **OK** to confirm.
      After a brief pause, a message appears indicating that the device has been removed (it has also been removed from the System Diagram).
   e. Click **Start Monitoring** to resume device monitoring, and then ensure that the “Current state of Device Monitoring” field changes to **monitoring**.

      NOTE: Device status may show **Not Responding** for a brief interval after monitoring has been turned back on.

Configuring the MediaDirector

After replacing a Spectrum video server chassis or boot drive, you must configure the server settings. Refer to your record of the original settings in order to complete this procedure.

1. Configure network settings. Refer to “Configuring network settings” in the *Harmonic SystemManager User Guide* for information on configuring network settings including additional routes and Ethernet Failover settings.
2. Configure your Harmonic MediaGrid accounts. Refer to “Connecting to a Harmonic MediaGrid from the Spectrum video server” in the *Harmonic SystemManager User Guide* for information on configuring your Harmonic MediaGrid Accounts.
3. Configure your Access Control settings. Refer to “Configuring Access Control settings for video servers” in the *Harmonic SystemManager User Guide*.
4. If you had previously modified the Low Priority Bandwidth Settings, then configure these settings to match your original settings. Refer to “Changing Network/File System Performance settings” in the *Harmonic SystemManager User Guide* for information on configuring Low Priority Bandwidth Limits.
5. If you had modified the contents of the `filetypes.conf` file, configure these settings to match your original settings. For information on editing the `filetypes.conf` file, refer to “Editing the Filetypes.conf File” in the *Harmonic SystemManager User Guide*.
6. If you had previously configured audio profile groups, configure new audio profile groups to match your original settings. For instructions, refer to "Creating an audio profile group" in the *Harmonic SystemManager User Guide*.
7. If you had previously installed a DDC configuration file, install the same DDC file. Refer to "Installing a DDC file" in the *Harmonic SystemManager User Guide* for instructions.
8. Reboot the MediaDirector according to the instructions in “Rebooting the Spectrum video server” in the *Harmonic SystemManager User Guide*. Once the MediaDirector has rebooted, verify that all changes are correct.

Verifying functionality

Harmonic recommends that you verify functionality of the replacement equipment in your Spectrum system before using it on air.

Appendix A

Harmonic Technical Assistance Center contact information

A list of phone numbers, e-mail addresses, and important links for the Harmonic Technical Assistance Center (TAC).

Table A-1: Technical Assistance Center phone numbers and email addresses

Region	Telephone Technical Support	Email
Americas	888.673.4896 (888.MPEG.TWO)408.490.6477	*support@harmonicinc.com*
Europe, the Middle East and Africa (EMEA)	+44.1252.555.450	*emeasupport@harmonicinc.com*
India	+91.120.498.3199	*apacsupport@harmonicinc.com*
Russia	+7.495.926.4608	*rusupport@harmonicinc.com*
China	+86.10.6569.5580	*chinasupport@harmonicinc.com*
Japan	+81.3.5565.6737	*japansupport@harmonicinc.com*
Asia Pacific (APAC) – Other Territories	+852.3184.0045 +65.6542.0050	*apacsupport@harmonicinc.com*

Report an issue online

http://www.harmonicinc.com/webform/report-issue-online

Harmonic support website

http://www.harmonicinc.com/content/technical-support

Software download location for Cable Edge products

ftp://ftp.harmonicinc.com

Contact Harmonic Technical Publications

techdocs@harmonicinc.com

- *Harmonic corporate contact information*

Harmonic corporate contact information

Phone numbers and addresses for the corporate office.

Harmonic corporate address

4300 North First Street
San Jose, CA 95134
U.S.A.

Harmonic corporate telephone numbers

Tel. 1.800.788.1330 (from the U.S. and Canada)
Tel. +1.408.542.2500 (outside the U.S. and Canada)
Fax.+1.408.542.2511

Appendix B

Safety and regulatory compliance information

Legal disclaimer: Information in this document is provided in connection with Harmonic products. Unless otherwise agreed in writing Harmonic products are not designed nor intended for any application in which the failure of the product could cause personal injury or death.

NOTE: The information in this appendix may apply to purchased products only.

- *Important safety instructions*
- *Safety symbols & safety, warning & caution instructions*
- *Symboles de sécurité de sécurité, d'avertissement et Attention Instructions*
- *Sicherheit Symbole und Sicherheit, Achtung & Vorsicht Anleitung*
- *Site preparation instructions*
- *Product end-of-life disassembly instructions*
- *Safety rules (English)*
- *Règles de sécurité*
- *EU manufacturer's Declaration of Conformity*
- *Electromagnetic compatibility notices – Class A*
- *Product regulatory compliance markings*
- *Product environmental compliance*
- *Compliance with country specific environmental, safety and EMC standards*

Important safety instructions

Review important safety guidelines for operators and service personnel.

Specific warnings and cautions are found throughout the guide where they apply, but may not appear here. Please read and follow the important safety information, noting especially those instructions related to risk of fire, electric shock or injury to persons. You must adhere to the guidelines in this document to ensure and maintain compliance with existing product certifications and approvals. In this document, we use "product," "equipment," and "unit" interchangeably.

This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if it is not installed and used in accordance with the instructions in this manual. Operation of this equipment in a residential area is likely to cause harmful interference If this occurs, the user will be required to correct the interference at his or her own expense.

In event of conflict between the information in this document and information provided with the product or on our website for a particular product, this product documentation takes precedence.

- *Safety symbols (English)*
- *Symboles de sécurité (français)*
- *Sicherheit symbole (Deutsch)*

Safety symbols & safety, warning & caution instructions

Understand the meaning of different safety symbols.

To avoid personal injury or property damage, before you begin installing or replacing the product, read, observe, and adhere to all the following safety instructions and information. Harmonic products and/or product packaging may be marked with the safety symbols used throughout this document, when it is necessary to alert operators, users, and service providers to pertinent safety instructions in the manuals.

Mark	Notes
 Warning	**Installing or replacing the product unit warning** • Only trained and qualified service personnel should be allowed to install, replace, or service this unit (refer AS/NZS 3260 Clause 1.2.14.3 Service Personnel). • Read the installation instructions before connecting the system to the power source. • When installing or replacing the unit, always make the ground connection first and disconnect it last. • Installation of the unit must comply with local and national electrical codes. • This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of special tool, lock and key or other means of security. • Use only specified replacement parts. • Do not use this unit in or near water. Disconnect all AC power before installing any options or servicing the unit unless instructed to do so by this manual.
 Warning	**Rack mount warning** To prevent bodily injury when mounting or servicing this unit in a rack, special precautions must be taken to ensure your safety and stability of system: • Conform to local occupational health and safety requirements when moving and lifting the equipment. • Ensure that mounting of the unit by mechanical loading tools should not induce hazardous conditions. • To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed on it.

Mark	Notes
 Warning	**Chassis warning** • Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit. • To prevent personal injury or damage to the chassis, lift the unit only by using handles that are an integral part of the chassis, or by holding the chassis underneath its lower edge. • Any instructions in this guide that require opening the chassis or removing a board should be performed by qualified service personnel only. • Slots and openings in the chassis are provided for ventilation. Do not block them. Leave the back of the frame clear for air exhaust cooling and to allow room for cabling - a minimum of 6 inches (15.24 cm) of clearance is recommended.
 Warning	**Electric shock warning** • This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit. • Before working on a chassis or working near power supplies, unplug the power cord on AC units. • Do not work on the system or connect or disconnect cables during periods of lightning activity. • This unit is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product input or outputs. • Route power cords and other cables so that they are not likely to be damaged. Disconnect power input to unit before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth to clean chassis. • Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected. • Never install an AC power module and a DC power module in the same chassis. • Do not wear hand jewelry or watch when troubleshooting high current circuits, such as the power supplies. • To avoid fire hazard, use only the specified correct type voltage and current ratings as referenced in the appropriate parts list for this unit. Always refer fuse replacement to qualified service personnel. • This unit relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors). • To avoid electrocution ensure that the rack has been correctly grounded before switching on the unit. When removing the unit remove the grounding connection only after the unit is switched off and unplugged.

Mark	Notes
 Caution	**Electrostatic Discharge (ESD) caution** • Follow static precaution at all times when handling this unit. • Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system. • Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins. • Place any removed component on an antistatic surface or in a static shielding bag. • Avoid contact between the cards and clothing. • Periodically check the resistance value of the antistatic strap. Recommended value is between 1 and 10 mega-ohms (Mohms).
 Warning	**Laser radiation warning** Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Never operate a unit with a broken fibre or with a separated fiber connector.
 Warning	**Lithium battery handling safety instructions** • CALIFORNIA PERCHLORATE ADVISORY: Some lithium batteries may contain perchlorate material. The following advisory is provided: "Perchlorate Material - special handling may apply, see: *http://www.dtsc.ca.gov/hazardouswaste/perchlorate/* for information."
 Caution	• Risk of explosion if battery is replaced incorrectly or with an incorrect type. • Dispose of used batteries according to the manufacturer's instructions. • There are no user-serviceable batteries inside Harmonic products. Refer to Harmonic qualified personnel only to service the replaceable batteries.

Symboles de sécurité de sécurité, d'avertissement et Attention Instructions

Comprendre la signification des différents symboles de sécurité .

Pour éviter des blessures ou des dommages matériels, avant de commencer l'installation ou le remplacement du produit, lire, observer, et de respecter toutes les instructions et informations de sécurité suivantes. Produits harmoniques et / ou l'emballage du produit peuvent être marqués avec les symboles

de sécurité utilisés dans le présent document, lorsque cela est nécessaire pour alerter les opérateurs, les utilisateurs et les fournisseurs de services de consignes de sécurité pertinentes dans les manuels.

Mark	Notes
 Avertissement	**Installation ou remplacement de l'unité de produit avertissement** • Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés. (voir AS / NZS 3260 article 1.2.14.3 du personnel de service). • Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation. • Lors de l'installation ou le remplacement de l'appareil, la mise à la terre doit toujours être connectée en premier et déconnectée en dernier. • L'équipement doit être installé conformément aux normes électriques nationales et locales. • Cet appareil est à installer dans des zones d'accès réservé. Ces dernières sont des zones auxquelles seul le personnel de service peut accéder en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité. • Utilisez uniquement des pièces de rechange spécifiées. • Ne pas utiliser ce produit dans l'eau ni à proximité de l'eau. Débrancher toutes les prises d'alimentation secteur avant d'installer des options ou d'effectuer l'entretien de l'unité, à moins d'instructions contraires dans le présent manuel.
 Avertissement	**Rack monture avertissement** Pour éviter les blessures corporelles lors du montage ou l'entretien de cet appareil dans un rack, des précautions particulières doivent être prises pour assurer votre sécurité et la stabilité du système: • Conformez-vous aux exigences de médecine du travail et de sécurité lorsque vous déplacez et soulevez le matériel. • Assurez-vous que le montage de l'appareil par des outils de chargement mécaniques ne doit pas induire des conditions dangereuses. • Pour éviter tout risque d'électrocution, le rack et chaque élément de l'équipement installé dans le rack doivent être correctement reliés à la terre.
 Avertissement	**Châssis avertissement** • Avant de connecter ou de déconnecter les câbles d'alimentation (pôles et terre) du châssis, vérifiez que le circuit de courant continu est hors tension. • Pour éviter toute blessure ou des dommages au châssis, soulevez l'unité uniquement par les poignées du châssis lui-même ou en portant celui-ci par le bord inférieur. • Toutes les opérations du présent guide nécessitant l'ouverture du châssis ou le retrait d'une carte doivent être uniquement effectuées par du personnel d'entretien qualifié. • Le châssis est muni de fentes et d'ouvertures d'aération. Ne pas les bloquer. Dégager l'arrière du cadre pour permettre le refroidissement de l'évacuation d'air et laisser de la place au câblage; un dégagement d'au moins 15.24 cm (6 po) est recommandé.

Mark	Notes
 Avertissement	**Choc électrique avertissement** • Il est possible que cette unité soit munie de plusieurs cordons d'alimentation. Pour éviter les risques d'électrocution, débrancher les deux cordons d'alimentation avant de réparer l'unité. • Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif. • Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage. • Ce unité est mis à la terre par le conducteur de protection intégré au cordon d'alimentation. Pour éviter les chocs électriques, brancher le cordon d'alimentation dans une prise correctement cable avant de raccorder les entrées ou sorties du unité. • Installer les cordons d'alimentation et autres cables de sorte qu'ils ne risquent pas d'être endommagés. Couper l'alimentation avant nettoyage. Ne pas utilizer de nettoyant liquide ou en aérosol; utiliser seulement un linge humide. • Des courants électriques dangereux circulent dans cet appareil. Afin d'éviter les lessures, ne pas toucher les connexions et composants exposés lorsque l'appareil est sous tension. Ne rien insérer dans l'une ou l'autre des cavités des prises de courant du système lorsque l'appareil est sous tension. • N'installez jamais un module d'alimentation AC et un module d'alimentation DC dans le même châssis. • Ne pas porter de bijoux aux mains ni de montre durant le dépannage des circuits à haute tension, comme les transformateurs. • Pour prévenir les risques d'incendie, n'utiliser que le type, la tension et le courant nominal spécifiés dans la nomenclature des pièces de ce unité. Toujours confier le remplacement des fusibles à du personnel d'entretien qualifié. • Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge). • Pour éviter l'électrocution, assurez-vous que le rack a bien été mis à la terre avant de mettre l'unité en marche. Lors du retrait de l'unité, retirer le raccordement de terre seulement après avoir mis l'unité à l'arrêt et l'avoir débranchée.

Mark	Notes
 Attention	**Les décharges électrostatiques (ESD) attention** • Respecter systématiquement les precautions relatives aux charges électrostatiques durant la manipulation de cet unité. • Portez toujours un poignet ou la cheville bracelet antistatique préventive lors de la manipulation des composants électroniques. Branchez une extrémité de la sangle à une prise ESD ou d'un composant métallique non peinte sur le système. • Manipulez les cartes en les faces avant et les bords seulement; éviter de toucher la carte de circuit imprimé et les broches du connecteur. • Placer un composant retiré sur une surface antistatique ou dans un sac de protection statique. • Éviter tout contact entre les cartes et les vêtements. • Vérifier périodiquement la valeur de résistance de la sangle antistatique. Valeur recommandée est comprise entre 1 et 10 méga-ohms (Mohms).
 Avertissement	**Rayonnement laser attention** Rayonnement laser invisible peut être émis à partir de fibres ou les connecteurs débranchés. Ne pas regarder en faisceaux ou regarder directement avec des instruments optiques. Ne jamais faire fonctionner une unité en cas de bris d'une fibre ou de séparation d'un connecteur de fibre.
 Avertissement	**Batterie au lithium manipulation instructions de sécurité** • Perchlorate pour la Californie Consultatif: Certaines batteries au lithium, peuvent contenir du perchlorate. le texte qui suit consultatif est prévu: "Présence de perchlorate - une manipulation spéciale peut s'appliquer, voir: *http://www.dtsc.ca.gov/hazardouswaste/perchlorate/* for information."
 Attention	• Il y a danger d'explosion si la batterie est remplacée de manière incorrecte ou par une batterie de type incorrect. • Mettre au rebut les batteries usagees conformement aux instructions du fabricant. • Les batteries des produits Harmonic ne peuvent pas être réparées ni entretenues par l'utilisateur. Ne confier l'entretien des batteries remplaçables qu'à du personnel compétent de Harmonic.

Sicherheit Symbole und Sicherheit, Achtung & Vorsicht Anleitung

Verstehen Sie die Bedeutung der verschiedenen Sicherheitssymbole .

Um Verletzungen oder Sachschäden zu vermeiden, bevor Sie mit der Installation oder Austausch des Produkts zu beginnen, zu lesen, zu beobachten, und sich an all den folgenden Sicherheitshinweise und Informationen. Harmonic Produkte und / oder Produktverpackungen können mit den Sicherheitssymbole

in diesem Dokument verwendet werden, markiert, wenn es notwendig ist für die Betreiber, Anwender und Dienstleister, um relevante Sicherheitsanweisungen in den Handbüchern zu alarmieren.

Mark	Notes
 Warnung	**Installation oder den Austausch des Produkts Einheit Warnung** • Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet warden (siehe AS / NZS 3260 Clause 1.2.14.3 Servicepersonal) • Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen. • Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden. • Die Installation der Geräte muss den Sicherheitsstandards entsprechen. • Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Ein Bereich mit beschränktem Zutritt ist ein Bereich, zu dem nur Wartungspersonal mit einem Spezialwerkzeugs, Schloß und Schlüssel oder anderer Sicherheitsvorkehrungen Zugang. • Verwenden Sie nur die angegebenen Ersatzteile • Das Gerät in oder in der Nähe von Wasser verwenden. Trennen Sie vor der Installation von Optionen oder Wartung des Gerätes, es sei denn, dies wurde von diesem Handbuch alle Netz.
 Warnung	**Rack-Montage-Warnung** Zur Vermeidung von Körperverletzung beim Anbringen oder Warten dieser Einheit in einem Gestell müssen Sie besondere Vorkehrungen treffen, um sicherzustellen, daß das System stabil bleibt: • Entsprechen den lokalen Arbeitsschutzanforderungen beim Bewegen und Heben der Ausrüstung. • Stellen Sie sicher, dass die Montage des Gerätes durch mechanische Belastung Werkzeuge sollten nicht gefährlichen Bedingungen zu induzieren. • Um das Risiko von möglichen elektrischen Schlag zu vermeiden, muss mit einer angemessenen Erdung für Rack und jedes Gerät installiert ist implementiert werden.

Mark	Notes
 Warnung	**Chassis Warnung** • Gleichstrom-Unterbrechung Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist. • Um Verletzungen und Beschädigung des Chassis zu vermeiden, sollten Sie das Chassis nicht an den Henkeln auf den Elementen (wie z.B. Stromanschlüsse, Kühlungen oder Karten) heben oder kippen; oder indem Sie es unterhalb der Unterkante packen. • Alle Hinweise in diesem Handbuch, die das Öffnen benötigen Sie das Gehäuse oder das Entfernen eines Board sollte nur von qualifiziertem Fachpersonal durchgeführt werden. • Für Schlitze und Öffnungen im Chassis vorgesehen. Blockieren Sie sie nicht. Lassen Sie die Rückseite des Rahmens frei für Abluftkühlung und um Platz für die Verkabelung ermöglichen - ein Minimum von 6 Zoll (15,24 cm) Abstand wird empfohlen

Mark	Notes
 Warnung	**Elektroschock-Warnung** • Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten. • Vor der Arbeit an einem Chassis für Arbeiten in der Nähe Stromversorgung, ziehen Sie das Netzkabel mit Netzeinheiten. • Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert. • Dieses Gerät ist über das Netzkabel Erdungsleiter geerdet. Um einen Stromschlag zu vermeiden, stecken Sie das Netzkabel in eine Steckdose richtig verdrahtet, bevor Sie das Produkt Eingang oder Ausgänge. • Verlegen Sie Netzkabel und andere Kabel, so dass sie wahrscheinlich nicht beschädigt werden. Trennen Eingangsleistung Einheit vor der Reinigung. Verwenden Sie keine flüssigen oder Aerosolreiniger; nur mit einem feuchten Tuch zu reinigen Chassis. • Gefährliche Spannungen vorhanden sind an mehreren Stellen in diesem Produkt. Um Verletzungen zu vermeiden, berühren Sie nicht freiliegenden Anschlüsse und Komponenten während schaltet ist. Sie keine Gegenstände in einem der beiden Stromversorgungs Hohlräume des Systems mit Strom verbunden einführen. • Ein Wechelstromsmodul und ein Gleichstrommodul dürfen niemals in demselben Chassis installiert werden. • Tragen Sie keine Hand Schmuck oder schauen Sie bei der Fehlersuche hohen Stromkreise, wie beispielsweise die Stromversorgung. • Um die Brandgefahr zu vermeiden, verwenden Sie nur den genannten richtige Art von Spannung und Strom Ratings als in der entsprechenden Stückliste für diese Einheit verwiesen. Beziehen sich immer auf Austausch der Sicherung von qualifiziertem Fachpersonal. • Dieses Produkt ist darauf angewiesen, daß im Gebäude ein Kurzschluß- bzw. Überstromschutz installiert ist. Stellen Sie sicher, daß eine Sicherung oder ein Unterbrecher von nicht mehr als 240 V Wechselstrom, 10 A (bzw. in den USA 120 V Wechselstrom, 15 A) an den Phasenleitern (allen stromführenden Leitern) verwendet wird. • Um einen Stromschlag zu vermeiden, sicherzustellen, dass die Zahnstange wurde korrekt vor dem Einschalten des Gerätes geerdet. Beim Entfernen der Einheit entfernen Sie die Masseverbindung nur, nachdem das Gerät ausgeschaltet und der Netzstecker gezogen.

Mark	Notes
 Vorsich	**Elektrostatische Entladung (ESD) Vorsicht** • Folgen Sie statische vorsorglich zu jeder Zeit beim Umgang mit diesem Gerät. • Tragen Sie immer einen ESD-präventive Handgelenk oder Knöchel-Riemen beim Umgang mit elektronischen Komponenten. Schließen Sie ein Ende des Bandes an einem ESD-Buchse oder ein unlackiertes Metallteil auf dem System. • Hand Karten nur durch die Faceplates und Kanten; Berühren Sie die bedruckte Leiterplatte und Steckerstifte. • Legen Sie alle entfernten Komponenten auf eine antistatische Oberfläche oder in einem Statik-Beutel. • Kontakt zwischen den Karten und Kleidung vermeiden. • Den Widerstandswert der gegen statische Gurt in regelmäßigen Abständen überprüfen. Empfohlener Wert ist zwischen 1 und 10 Mega-Ohm (MOhm).
 Warnung	**Laserstrahlungen Warnung.** Unsichtbare Laserstrahlung kann von getrennten Fasern oder Stecker emittiert werden. Nicht in die Strahlen blicken oder direkt mit optischen Instrumenten. Niemals ein Gerät mit einem gebrochenen Faser oder mit einem Glasfaseranschluss getrennt.
 Warnung	**Lithium-Batterie Handhabung Sicherheitshinweise** • CALIFORNIA PERCHLORATE ADVISORY: Einige Lithium-Batterien kann Perchlorat enthalten. Die folgende Beratungs gesetzt: "Perchlorat - Sonderbehandlung kann erforderlich sein, finden Sie unter: *http://www.dtsc.ca.gov/hazardouswaste/perchlorate/* for information."
 Vorsich	• Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr • Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers. • Es gibt keine zu wartenden Akkus im Harmonic Produkte. Siehe Harmonic qualifiziertes Personal, um die austauschbare Batterien Service

Site preparation instructions

Make the equipment site ready for installation and use.

NOTE: Only trained and qualified service personnel (as defined in IEC 60950 and AS/NZS 3260) should install, replace, or service the equipment. Install the system in accordance with the U.S. National Electric Code if you are in the United States.

1. Preparing & choosing a site for installation.
   - To ensure normal system operation, plan your site configuration and prepare the site before installation.
   - Install the unit in a restricted access area.
   - Choose a site with a dry, clean, well-ventilated and air-conditioned area.
   - Choose a site that maintains an ambient temperature of 32 to 104oF (0 to 40oC).
2. Creating a safe environment.
   - Connect AC-powered systems to grounded power outlets or as per local regulations.
   - Do not move or ship equipment unless it is correctly packed in its original wrapping and shipping containers.
   - Only allow Harmonic trained personnel to undertake equipment service and maintenance. Do not permit unqualified personnel to operate the unit.
   - Wear ear protection when working near an NSG Pro platform for a longer period of time.
3. Rack mounting the unit.
   - Install the system in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
   - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips). This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
   - When mounting this unit in the partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
   - If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
   - The rack must be anchored to an immovable support to prevent it from tipping when the unit is mounted on it. The rack must be installed according to the rack manufacturer’s instructions.
   - Disconnect all power and external cables before lifting the unit. Depending on the weight of the unit, more than one person might be required to lift it.
4. Power considerations

Option	Description
AC power	◦ Adding to the system a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulator) is highly recommended. ◦ Installing the main power supply by a qualified electrician, according to power authority regulations. Make sure all powering are wired with an earth leakage, according to local regulations.

Option	Description
	◦ It is recommended to install the encoder within 1.5m (approximately 5 feet) from an easily accessible grounded AC outlet. ◦ When the encoder is rack-mounted, ensure that the rack is correctly grounded.
DC power	◦ Ensure a suitable over-current device is in-line between the equipment and the power source. ◦ Connect DC-input power supplies only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in the UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, AS/NZS 60950-1, EN/IEC 60825-1, 21 CFR 1040, EN 60950-1, and IEC 60950-1 standards. ◦ Ensure that power is removed from the DC circuit before installing or removing power supplies.

5. Handling Fiber Channel cables
   - Always read and comply with the handling instructions on the shipping container.
   - Follow all ESD precautions and approved fiber cleaning procedures.
   - The fiber is made of a very pure, expensive glass and should be treated with great care. Handle fibers only in areas that are very clean and do not contain sharp objects.
   - Wear finger cots or gloves as dirt and oils can damage the fiber and contaminate connectors.
   - Do not allow kinks or knots to develop in the fiber. If tangles occur, carefully work out the tangles avoiding pulling or bending the fibre beyond its bend radius.
   - Always use the correct tools for stripping and cleaving the fiber. It will save time and reduce breakage caused by scratches.
   - If you must secure a bundle of fiber cables together, avoid plastic and metal tie wraps; secure with Velcro instead.
6. Disposing of the unit
   - Dispose of the unit and its components (including batteries) as specified by all national laws and regulations.

Product end-of-life disassembly instructions

Review guidance on responsible product disposal and recycling of a products.

For disassembly instructions, please call the technical support in order to remove components requiring selective treatment, as defined by the EU WEEE Directive (2012/19/EU). See *Harmonic Technical Assistance Center contact information on page 54*.

1. Disassemble equipment at a dedicated area only, gather the needed tools for disassembly.
2. Remove covers, housing, etc.
3. Remove and separate sub-assemblies (i.e. cables, metals, displays, fans, etc.).
4. Separate hazardous materials from the remainder of the material.

a. Sort hazardous materials into their different types (i.e., batteries, hazardous liquids, hazardous solids, fiberglass, etc.).
b. Proceed with hazardous waste management processes only.

5. Identify re-usable materials/sub-assemblies and separate these from the rest of the material.
6. Identify and separate recyclable materials as per below examples:
   a. Scrap material to be sent to smelter(s).
   b. E-waste such as displays, CPU's, cables and wires, hard drives, keyboards, etc.
   c. Metals such as steel, brass, and aluminum.
   d. Plastics such as fan casings, housings, covers, etc.
   e. Fiber optics and plastic tubing not containing electrical or data wiring.

Safety rules (English)

Observe the rules for safe product disposal and recycling.

Recycler personnel are to wear personal protective equipment including proper eye protection, proper hand protection, and proper breathing protection if needed.

Recycler personnel shall be experienced with using the proper tools required for disassembling equipment. Untrained personnel shall not disassemble Harmonic products. Unfamiliarity with tools can cause damage and injury.

Règles de sécurité

Respecter les règles d'élimination du produit en toute sécurité et le recyclage.

Le personnel du recycleur doit porter de l'équipement de protection individuelle, y compris des lunettes, des gants et un masque de protection appropriés au besoin.

Le personnel du recycleur doit avoir de l'expérience des outils de démontage de l'appareil. Les produits Harmonic ne doivent pas être démontés par du personnel non qualifié. Une mauvaise connaissance des outils peut causer des dommages et des blessures.

EU manufacturer's Declaration of Conformity

Learn more about Harmonic product regulatory compliance.

This equipment is in compliance with the essential requirements and other provisions of Directives 73/23/EEC and 89/336/EEC as amended by Directive 93/68/EEC.

NOTE: For specifics, about which standards have been applied, refer to the Declaration of Conformity of the product on Harmonic website at *Product Regulatory Compliance* or contact Harmonic Compliance Team at *regulatory.compliance@harmonicinc.com*.

Electromagnetic compatibility notices – Class A

Learn more about Harmonic product electromagnetic compatibility.

1. FCC verification statement (USA)

   This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

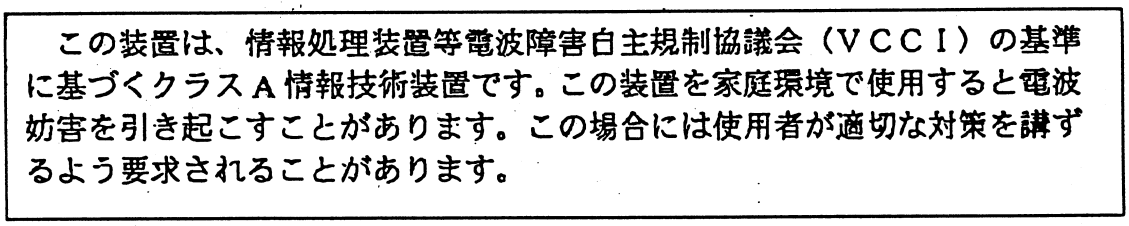
   This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

   Connections between the Harmonic equipment and other equipment must be made in a manner that is consistent with maintaining compliance with FCC radio frequency emission limits. Modifications to this equipment not expressly approved by Harmonic may void the authority granted to the user by the FCC to operate this equipment and you may be required to correct any interference to radio or television communications at your own expense.
2. ICES–003 statement (Canada)

   English: This Class A digital apparatus complies with Canadian ICES-003.

   French: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.
3. CE Declaration of Conformity (European Union)

   This product has been tested in accordance too, and complies with the Low Voltage Directive (2014/30/EU) and EMC Directive (2014/35/EU). The product has been marked with the CE Mark to illustrate its compliance.
4. VCCI Class A warning (Japan)

   English translation of the notice above: This is a Class A product based on the standard of the Voluntary Control Council for Interference (VCCI) from Information Technology Equipment. If this equipment is used in a domestic environment, it may cause radio interference. When such trouble occurs, the user may be required to take corrective actions.
5. BSMI EMC notice (Taiwan)

警告使用者：
這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策

English translation of the notice above: This is a Class A Information Product, when used in residential environment, it may cause radio frequency interference, under such circumstances, the user may be requested to take appropriate counter measures.

6. Class A warning (Korea)

주의 A급 기기 이 기기는 업무용으로 전자파 적합 등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

English translation of the notice above: This is a Class A device and is registered for EMC requirements for industrial use. The seller or buyer should be aware of this. If this was sold or purchased by mistake, it should be replaced with a residential-use type.

7. Class A statement (China)

中华人民共和国“A类”警告声明

声 明

此为A级产品，在生活环境中，该产品可能会造成无线电干扰。在这种情况下，可能需要用户对其干扰采取切实可行的措施。

English translation of the notice above: When labeled with the CCC marking, the product meets the applicable safety and EMC requirements for China. This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

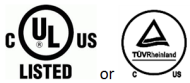
8. Class A warning – CISPR 22 (AS/NZS)

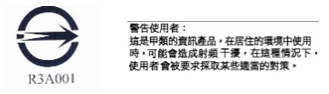
Warning (English) This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Attention (French) Il s'agit d'un produit de classe A. Dans un environnement local, ce produit peut entraîner des perturbations radioélectriques, auquel cas l'utilisateur devra éventuellement prendre des mesures adéquates.

Product regulatory compliance markings

Understand the meaning of different product regulatory compliance markings.

Country/ region	Testing standard/ specification	Certification type	Regulatory mark name	Product marks
USA/ Canada	EN 60950-1:2006 +A11:2009 +A1:2010 +A12:2011; CAN/CSA C22.2 No. 60950-1-07 +A1:2011/UL 60950-1:2011	Safety	NRTL (National Recognized Test Laboratory)	
USA/ Canada	FCC CFR 47 Part 15, Class A ICES-003: Issue 5, 2012; Class A	EMC	FCC Class A Statement	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
European Union	RoHS: EN 50581:2012; EN55022:2010/ CISPR 22:2008; EN55024:2010/ CISPR 24:2010; EN61000-3-2: 2006 +A1:2009 +A2:2009; EN61000-3-3: 2008; Class A	Safety and EMC	CE / Low Voltage Directive	
Germany	EN 60950-1; EN60825-1 (for laser)	Safety	GS	

Country/ region	Testing standard/ specification	Certification type	Regulatory mark name	Product marks
Mexico	NOM-019-SCFI-1998	Safety	NOM	
Taiwan	CNS 14336-1:2010 CNS 13438:2006; Class A	Safety and EMC	BSMI Certification (RPC) Number & Class A Warning	
Japan	VCCI V-3/2013.04; CISPR 22:2008, Class A	EMC	VCCI	
Australia and New Zealand	AS/NZS CISPR22:2009 +A1:2010; Class A	Safety	C-Tick	
Korea	KN22 Class A and KN 24	EMC	KC	
China	GB4943.1-2011 GB9254-2008 GB17625.1-2012	Safety and EMC	CCC	
India	IS 13252 (Part 1): 2010	Safety	BIS Compulsory Registration	"Self Declaration - Conforming to IS 13252 (Part 1):2010, R-XXXXXXXX"

Product environmental compliance

Harmonic manufactures high quality and innovative IT and telecommunications equipment, video delivery infrastructure solutions and services for its customers worldwide.

Harmonic is committed to providing our customers with safe and environmentally friendly products that are compliant with all relevant regulations, customer specifications, and environmental legislation, including the directives described below.

EU RoHS

Review the European Union's Restriction of Hazardous Substances Directive.

In July 2006, the European Union's (EU) Directive (2002/95/EC) on the Restriction of the use of certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) went into effect, and in July, 2011, the European Union's RoHS Recast Directive (2011/65/EU) also known as RoHS II entered into force.

Harmonic understands the environmental risks associated with the substances covered by the RoHS Directive and has committed to eliminating or reducing the use of these, as well as other environmentally sensitive substances in our products. Harmonic also continues to comply with the requirements under RoHS II.

For more information, please visit EU RoHS directive page at official EU website.

http://ec.europa.eu/environment/waste/rohs_eee/legis_en.htm

Restricted substance statement

Harmonic products contain less than the permitted limits for the six restricted substances except where exemptions published in the RoHS2 Directive are applicable. This statement is based on vendor-supplied analysis or material certifications, and/or lab test results of the component raw materials used in the manufacture of Harmonic products.

Table B-1: Restricted substances

Restricted substance	Permitted limit
Cadmium (Cd)	< 0.01%[1]
Lead (Pb)	< 0.1%
Chromium (VI) (Cr (VI))	< 0.1%
Mercury (Hg)	< 0.1%
Polybrominated biphenyls (PBBs)	< 0.1%
Polybrominated diphenyl ether (PBDE)	< 0.1%

[1] *Homogeneous material definition as per the EU Directive.*

EU REACH

REACH (Registration, Evaluation, Authorization and restriction of Chemicals) (EC 1907/2006) is a European Union regulation on chemicals and their safe use which came into force in June, 2007.

Harmonic supports the basic aim of REACH in improving the protection of human health and environment through the better and earlier identification of intrinsic properties of chemical substances. Harmonic products are considered “articles” under REACH; therefore, we are required to provide recipients of our products with information on Substance of Very High Concern (SVHC) present in concentration above 0.1% (w/w).

Substances in our products are not intended to be released under normal or reasonably foreseeable conditions of use; therefore, the registration requirement in REACH Article 7(1) does not apply to our products.

For more information, please visit REACH regulation page at official EU website.

http://ec.europa.eu/environment/chemicals/reach/reach_en.htm

China RoHS

Review China’s Restriction of Hazardous Substances Directive.

China’s regulation on restriction of the use of certain hazardous substances commonly (China RoHS), is applicable to all Electronic and Information Products (EIPs) and parts sold in China after March 01, 2007. China RoHS regulation restricts the use of the same six substances as the European Union’s ROHS, but has requirements for product labeling and regulated substance information disclosure.

Harmonic complies with China RoHS Phase I for labeling and information disclosure requirements and continues to monitor new developments in China RoHS Phase II towards substance restriction and certification program.

For more information, please visit China RoHS regulation page at official US export website.

http://www.export.gov/china/doingbizinchina/

China RoHS Disclosure report

Below table shows the presence of hazardous substances, or elements in Harmonic products, if the part is present.

该表显示哈雷公司产品中可能含有的有毒有害物质元配件的信息，除了来源于元配件供应商的物料成分资料，亦来自其它相关的机构与资料。哈雷产品不一定使用这些元配件。

This table shows those components where hazardous substances may be found in Harmonic products based on, among other things, material content information provided by third party suppliers. These components may or may not be part of the product.

除非特殊注明，哈雷公司产品的环保使用期限均为 20 年。该环保使用期限的有效条件为：必须遵循该产品使用手册的规定，对该产品进行使用或存储。

The Environmental Protective Use Period (EPUP) for Harmonic products is 20 years unless displayed otherwise on the product. The EPUP period is valid only when the products are operated or stored as per the conditions specified in the product manual.

部件名称 **(Part name)**	有毒有害物质或元素 **(Hazardous substance)**					
	铅 **(PB)**	汞 **(Hg)**	镉 **(Cd)**	六价铬 **(CrVI)**	多溴联苯 **(PBB)**	多溴二苯醚 **(PBDE)**
印刷线路板 (Printed circuit assemblies)	X	O	O	O	O	O
机械组件 (Mechanical subassemblies)	X	O	O	O	O	O
光学组件 (Optical subassemblies)	X	O	O	O	O	O
电源 (Power supplies)	X	O	O	O	O	O
缆线 / 线束 (Cables, harnesses)	X	O	O	O	O	O
屏幕 / 显示器 (Screens, monitors)	X	O	O	O	O	O
金属零件 (Metal parts)	X	O	O	O	O	O
塑料/ 发泡材料 (Plastics, foams)	O	O	O	O	O	O
电池 (Batteries)	O	O	O	O	O	O

O: 表示在该部件的所有均质材料中，此类有毒有害物质的含量均小于SJ/T11363-2006标准所规定的限量。

O: Indicates the content of the toxic and hazardous substances at the homogeneous material level of the parts is below the limit defined in SJ/T11363 2006 standard.

X: 表示至少在该部件的某一均质材料中，此类有毒有害物质的含量超出SJ/T11363-2006标准规定的限量。

X: Indicates that the content of the toxic and hazardous substances in at least one of the homogeneous materials of the parts is above the limit defined in SJ/T11363 2006 standard.

Other RoHS and REACH type regulations

Harmonic will comply with RoHS and REACH type regulations evolving in other countries, if they become relevant to our products or in markets where we sell our products.

Waste Electrical and Electronic Equipment (WEEE)

Review the European Union’s Waste Electrical and Electronic Equipment Directive.

European Parliament and the Council of the European Union’s WEEE Directive (2002/96/EC) came into force on August, 2005 and, were more recently amended in July, 2012. This directive encourages the reuse, recycling, and recovery of WEEE and to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, especially those dealing with WEEE.

Harmonic ensures that all requirements for registration, reporting, design and data tracking are complied with to meet the objectives of the WEEE directive.

For more information, please visit WEEE directive page at official EU website: *http://ec.europa.eu/environment/waste/weee/legis_en.htm*

Battery directive

Review the European Union legislation on waste batteries.

In September 2006, the European Union's Directive 2006/66/EC (Battery Directive) came into force with an aim to prohibit the sale of batteries and accumulators containing hazardous substances and to set rules and promote collection, treatment, recycling and disposal of waste batteries and accumulators. This directive applies to spent batteries collected together with WEEE and requires their removal and separate collection. Once removed from WEEE, spent batteries are governed by the Battery Directive. Harmonic uses lithium batteries in its products and our responsibility under the Battery Directive is taken care of under our WEEE Take-Back program.

For more information, please visit Batteries and Accumulators directive page at official EU website.

http://ec.europa.eu/environment/waste/batteries/

Harmonic is committed to manufacturing environmentally safe products for the community, and will make reasonable efforts and required adjustments to its practices, if necessary, to comply with various environmental directives and industry initiatives on the elimination of hazardous substances, labeling, marking, certification and registration as required in markets where we sell our products.

Download Harmonic Environmental Compliance Statement at the following location:

http://www.harmonicinc.com/content/green-policy

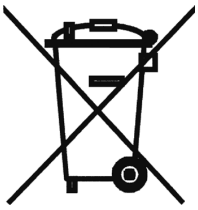
WEEE Take-Back Request Program

In order to assist EU member states to preserve, protect and improve the quality of the environment, protect human health and utilize natural resources prudently and rationally, Harmonic strives to recycle in compliance with the WEEE Directive any of its products that cannot be re-used.

Harmonic's customers should:

- Not discard equipment in household or office garbage
- Arrange proper recycling of unneeded equipment. For the take-back of Harmonic equipment, customers must:
  - Collect the information required to complete Harmonic's WEEE Take-Back Request form
  - Complete and submit the online WEEE Take-Back Request form. Please note that forms must be fully completed in order to prevent process delays
  - Receive instant online confirmation indicating the reference number
  - Receive the End of Life (EOL) asset return authorization number and instruction for EOL asset return
- Not ship EOL product to Harmonic without a Harmonic-provided EOL asset return authorization number

The crossed-out wheeled bin symbol on a Harmonic-branded commercial product indicates that the product should not be disposed of along with municipal waste, but invites our customers to return the product to us under Harmonic's WEEE Take-Back program for product disposal.



Harmonic will pay for the cost of shipping and will provide a Certificate of Recycling or a Certificate of Destruction upon request. For more information on collection, reuse and recycling or to initiate the WEEE take-back process, please complete the form at *http://www.harmonicinc.com/webform/weee-takeback-request* or contact *Harmonic Technical Assistance Center (TAC)* or email RMA team at *rma.emea@harmonicinc.com*.

Compliance with country specific environmental, safety and EMC standards

In addition to above listed standards and compliance regulations, Harmonic products may also be compliant with other country specific environmental, safety and EMC requirements.

Please contact Harmonic Compliance Team at *regulatory.compliance@harmonicinc.com* or your local sales representative for more information about compliance with particular country or standard.

www.harmonicinc.com
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