

Spectrum™

Spectrum X

Component Replacement Guide



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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.
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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.
<i>Emphasis</i>	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.

Spectrum X component replacement

The following components may be replaced in the Spectrum X: the bezel, hard drive, fan assembly, SDI card, and power supply.

- [Bezel replacement](#)
- [Drive replacement](#)
- [Fan replacement](#)
- [SDI I/O card replacement](#)
- [Power supply unit replacement](#)

Bezel replacement

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



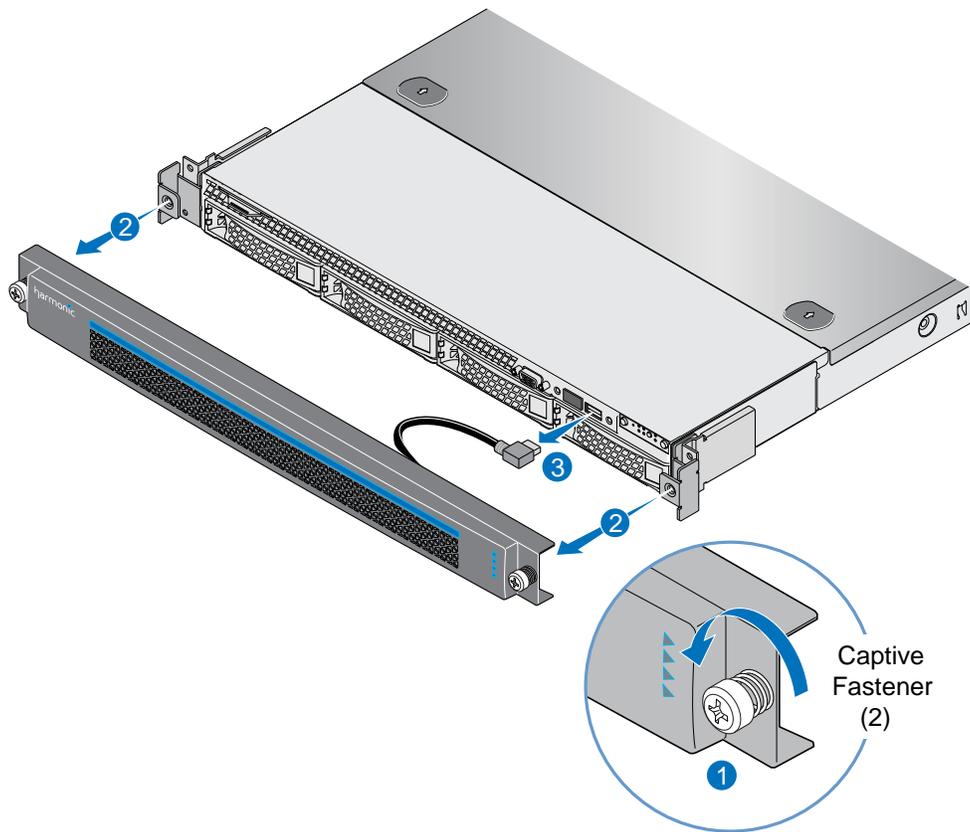
CAUTION: The front panel is susceptible to electrostatic discharge (ESD) when the bezel is removed. Wear the appropriate ESD protection when you remove the bezel.

Removing the Spectrum X 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.

3. Disconnect the USB cable.



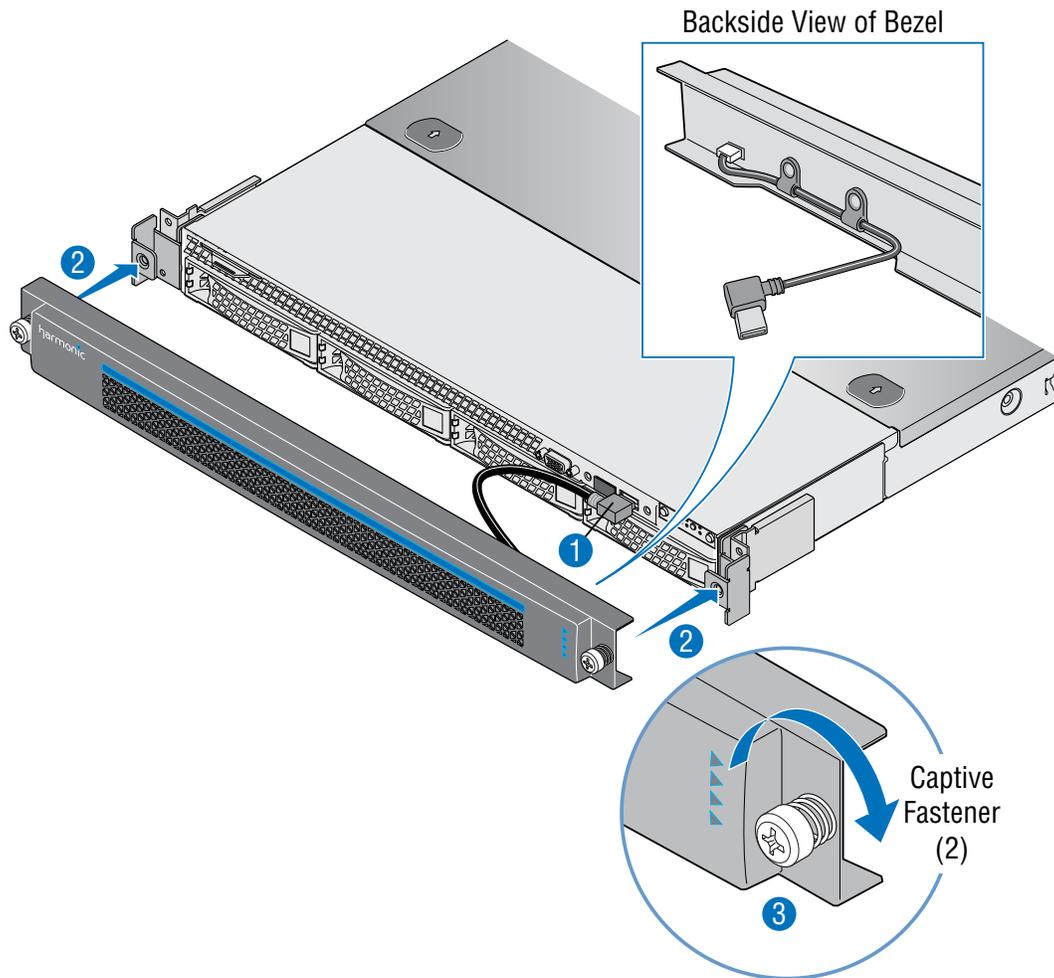
Installing the Spectrum X bezel

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

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

1. Connect the USB cable inside the bezel to the right-hand USB port on the front panel. (The other USB port is covered.)
2. Keeping the corners aligned, press the bezel straight onto the chassis. The USB cable will form a loop that fits inside the metal panel of the bezel.
3. Hand-tighten the two captive thumb screws to secure the bezel in place.

NOTE: After installing the bezel, it may take up to 30 seconds for the front panel LEDs to return to their previous state.



Drive replacement

A Spectrum X operating in internal storage mode has four hot swappable drives. If a drive fails, replacement drives are available from Harmonic. Each drive is shipped pre-installed in the drive carrier.

About replacement drives

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

- ⚠ **IMPORTANT:** Use ONLY Harmonic-supplied replacement disk drives. Disk 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 disk 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.

Drive numbering

Drives are numbered from left to right beginning with the number 1.

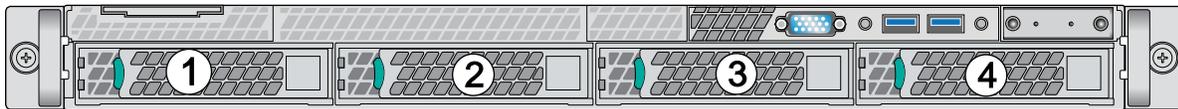


Figure 2-1: Drive numbering in the Spectrum X

Failing a drive

Fail a drive that is experiencing a loss of data to remove it from a RAID set. This procedure is a prerequisite to replacing a drive and is performed on the **Drive Properties** page in SystemManager.

1. From the **Configuration** tab, click the **Disk Utilities** icon.
The **Disk Utilities** page displays.
2. Click the icon for the Spectrum server that contains the drive you wish to fail.
The **Disk utilities** page for that server appears.
3. Click the **Disk Drive** icon (or hyperlink).
The **Drive Properties** page displays.
4. At the bottom of the page, click **Fail Drive**.
A confirmation dialog appears.
5. Click **OK**.
6. Navigate to the Spectrum server **Disk utilities** page to verify that the drive state is reported as **Dead, Failed**.

Verifying which drive to remove

When replacing a failed drive, it is critical that you identify which drive to remove by identifying the slot number in SystemManager and then noting the Activity LED on the physical drive.

1. From the **Drive Properties** page, identify the **MediaStore Slot Number** of the failed drive.
2. Find the physical location of the drive and note the state of the activity LED for this drive.
The Activity LED should be off, indicating that the drive is not being actively used. If it is blinking, this is the wrong drive to remove.

3. If you identify the correct drive, remove the drive according to the instructions in "Removing a failed drive".

 **CAUTION:** Wait 30 seconds before unlatching the drive.

4. If you do not identify the correct drive, call Harmonic Technical Support and do not continue with this procedure.

Removing a failed drive

It is critical that you identify the correct drive. Comparing the serial number on the disk drive to the serial number displayed in SystemManager is the best way to do this.

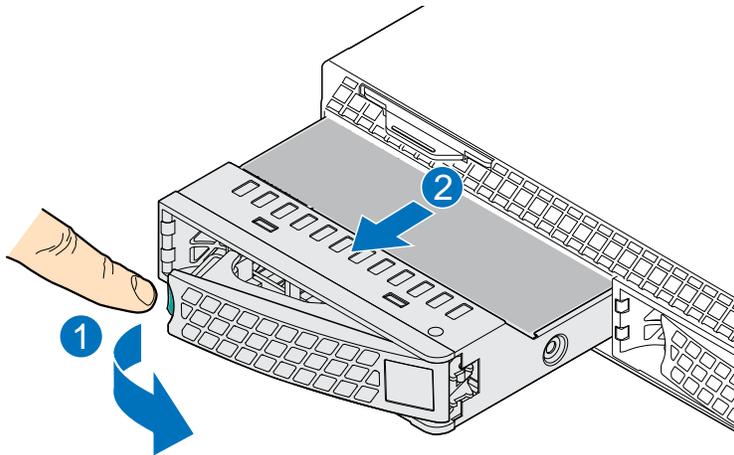
 **CAUTION:** Drive spin-down. Damage can occur to a drive if it is removed while still spinning. We recommend that you perform all steps in the following procedure. Before removing a drive from an enclosure, wait 30 seconds to ensure that the drive has stopped spinning.

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

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. With the bezel removed, press the green release button on the drive carrier and pull open the lever.
2. Slide the drive carrier out of the drive bay.



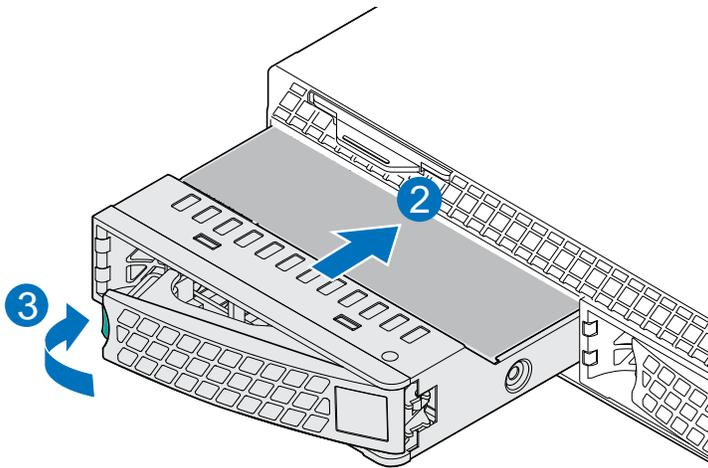
3. Compare the serial number found on the top of the drive with the serial number found on the **Drive Properties** page.
 - If the serial numbers match, continue with installing the new drive.
 - If the serial numbers do not match, wait at least 15 seconds after removal, then reinsert the drive. Call Harmonic Technical Support immediately, and do not continue with this procedure.

Installing a replacement drive

Verify that the new drive is reported as **Alive** and monitor the progress of the RAID rebuild after installing it.

- 📄 **NOTE:** When installing a drive, ensure that the adjacent drive is fully installed. Inserting a drive carrier and attempting to lock its handle next to a partially installed carrier can damage the partially installed carrier's shield spring and make it unusable.
- 📄 **NOTE:** To maintain proper system cooling, all externally accessible drive bays must be populated with a drive carrier.

1. Press the green release button on the replacement drive carrier to open the lever.
2. Insert the drive carrier into the bay, sliding the drive until it contacts the backplane.
3. Close the drive carrier release handle to lock the drive into place.



Within three minutes, the new drive should appear on the **Disk Utilities** page.

4. From the **Disk Utilities** page, verify that the drive is reported as **Alive** by the MediaCenter.
 - If it is reported as **Alive**, you may continue to the next step.
 - If the drive is not reported as **Alive** and another drive is available, bypass the first drive. Follow instructions in "Removing a failed drive", then repeat Step 1 through Step 4 using the second drive. If successful, continue to the next step. If unsuccessful, contact Technical Support for assistance.
 - If the drive is not reported as **Alive** and you do not have another drive available, contact Technical Support.
5. On the **RAID Utilities** page, monitor the status of the RAID set. The status should change from **Compromised** to **Rebuilding** immediately. If it does not, start the rebuild manually by clicking **Start Rebuild**.
6. Periodically monitor the rebuild until complete. Once complete, the RAID status changes to **Normal, Attached, Viable**.

What to do next

If you replaced a failed drive with a new drive from Harmonic, use the packaging materials (carton, cushion, and electrostatic sensitive bag) from the replacement disk drive to carefully repackage the failed drive and return it promptly for analysis. Contact Technical Support for a Return Authorization Number (RA) before shipping the drive back to Harmonic.

Fan replacement

The Spectrum X contains two fan assemblies, each with three individual fans. In the event of a fan failure, you must replace the fan assembly.

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

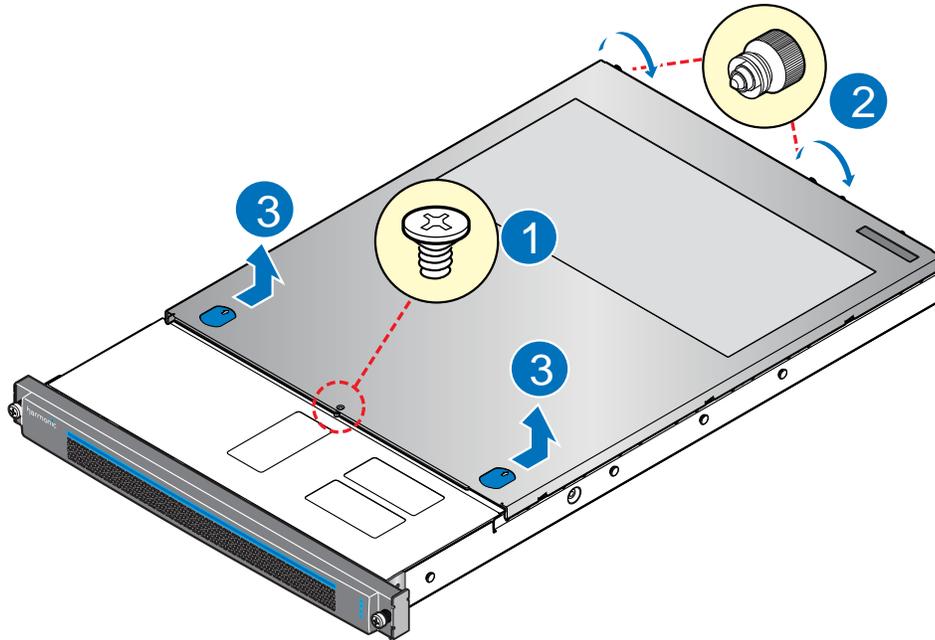
Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support and do not continue with this procedure.



CAUTION: Power down the Spectrum X 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.

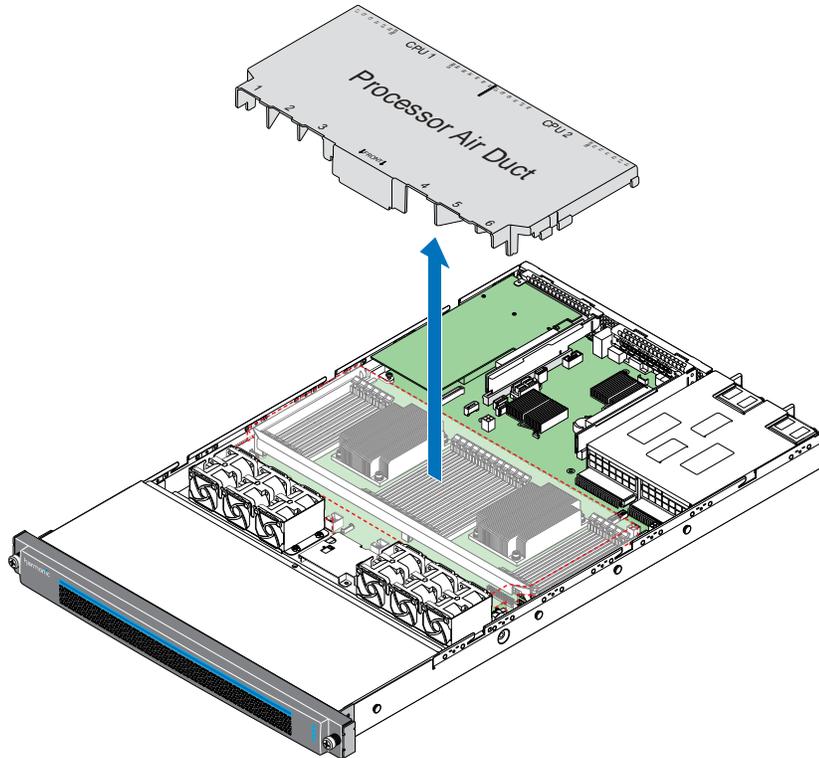


Removing the air duct

You must remove the air duct in order to access the fan connector pins on the server board.

- CAUTION:** The air duct is required for proper air flow within the server system. Always operate your system with the air duct cover in place.

Remove the air duct by lifting it straight up.

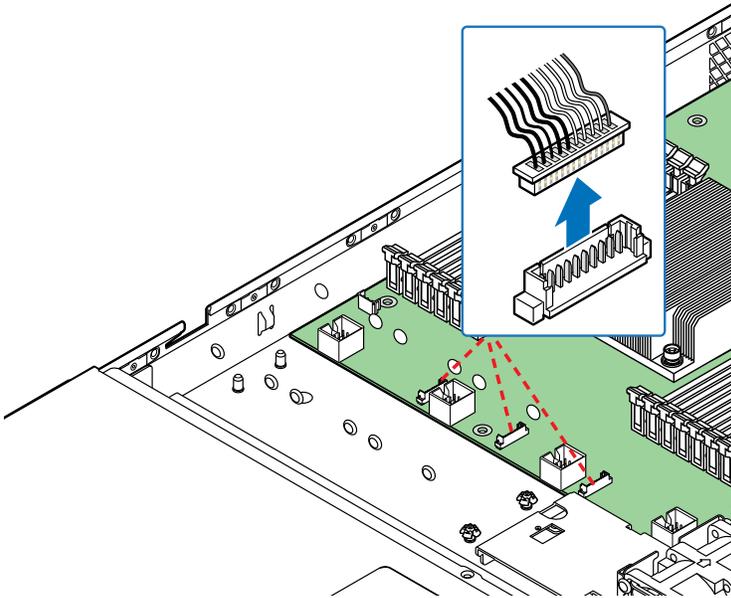


Replacing a fan assembly

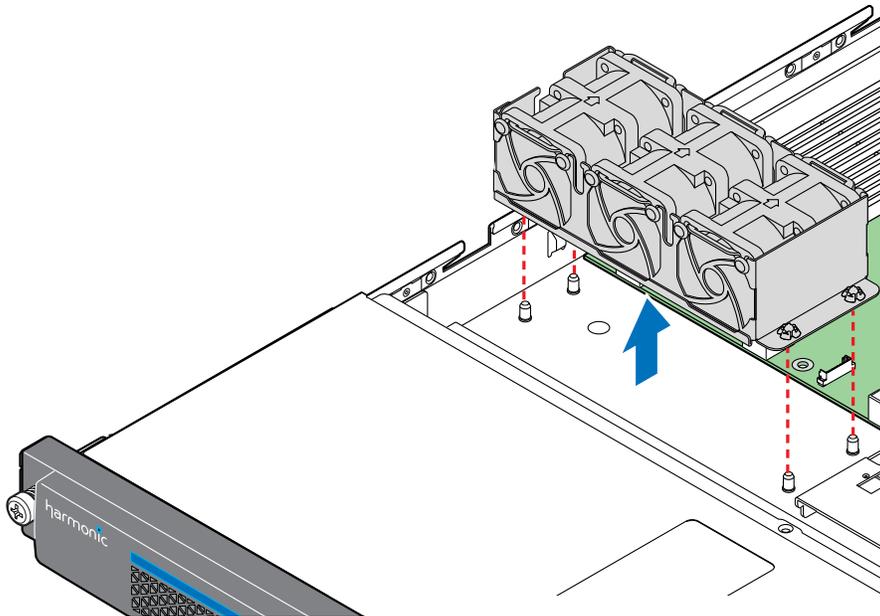
Each fan assembly is designed for tool-less removal and installation.

1. Disconnect the three 10-pin fan connectors from the server board.

-  **NOTE:** For the purpose of showing the fan connectors, which are behind the fan assembly, the following figure shows the fan assembly removed. However, the failed fan assembly should still be installed at this time.

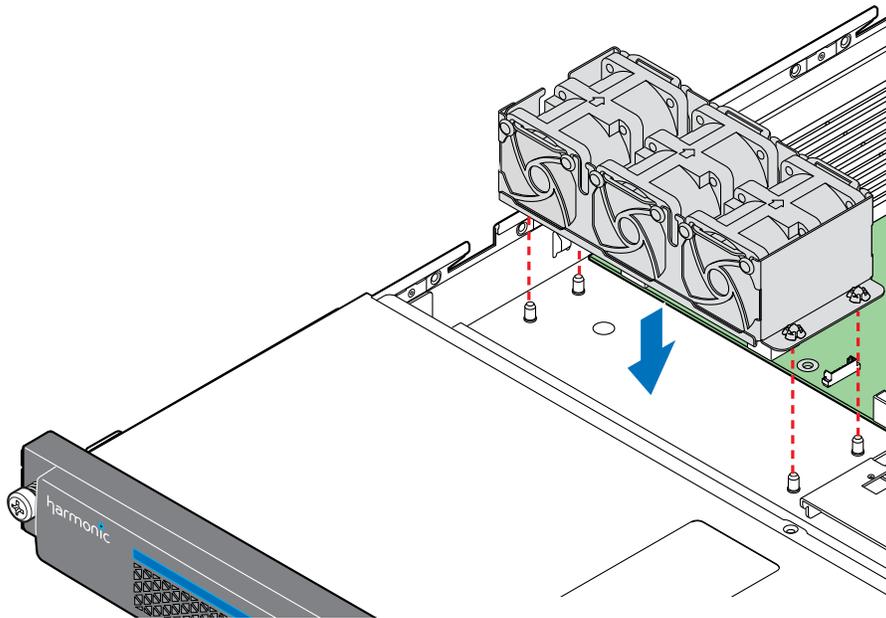


2. Lift up the fan assembly from the chassis.

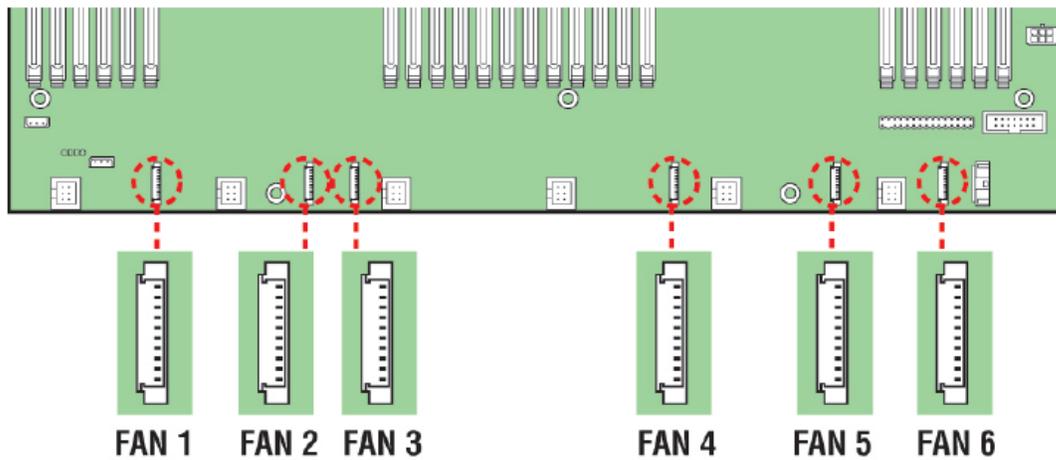


3. Align the replacement fan assembly with the mounting pins on the chassis base.

4. Ensure that no fan cables are trapped beneath the fan assembly, and then push down until firmly seated.



5. Connect the three fan cables to the fan connectors on the server board in numerical order.



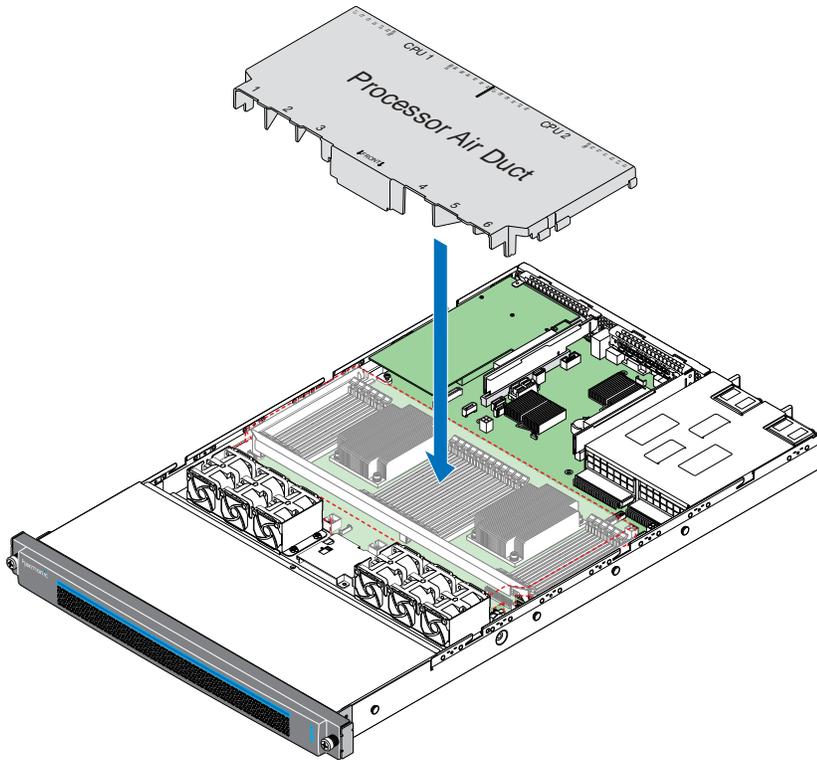
Installing the air duct

If placed correctly, the air duct should sit flat and securely in place.

CAUTION: The air duct is required for proper air flow within the server system. Always operate your system with the air duct cover in place.

1. Position the air duct in front of the system fans and over the processors and memory.

2. Carefully lower the air duct into place.

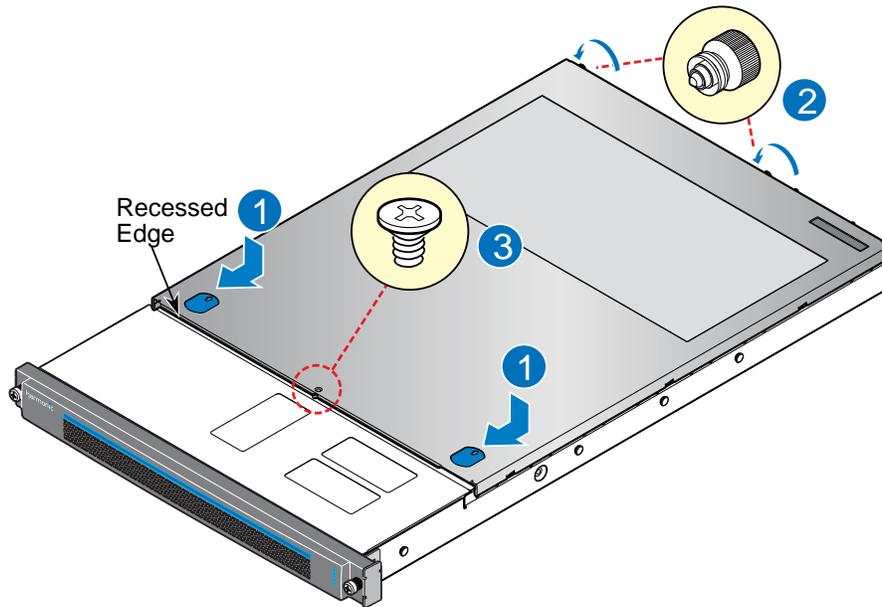


Installing the system cover

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).



What to do next

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

SDI I/O card replacement

Be sure to complete the procedures in this section in order.

Deactivating players

Deactivate a player when you do not want an automation system to be able to automatically enable the player for play and record.

 **NOTE:** In SystemManager, a MediaPort 7000 series appears as two separate MIP-7XXX or CPT-8XXX devices, and a Spectrum X appears as two separate MIP-9XXX devices.

1. Click the **Player Configuration** button in the left-hand column.
The **Player Configuration** page appears.
2. Click the icon for the Spectrum server on which the players reside.
The **Player List** page appears.

3. Check the box for each Player that you wish to deactivate.
 -  **NOTE:** If replacing a Spectrum server or I/O module, be sure to select all active Players associated with the server or module.
4. Click **Deactivate Selected**.

Detaching an I/O module from players

Detach a device from players when you wish to replace a MediaPort, ChannelPort, or SDI I/O module.

1. From the **Configuration** tab, click the **Player Configuration** button in the left-hand column. The **Player Configuration** window displays.
2. Click the icon for the Spectrum server on which the players reside. The **Player List** page appears.
3. Find a player associated with the I/O module you wish to replace and click **Edit**. The **Edit Player** page appears.
4. In the **Track** section of the page, click **Attached Devices**. The **Attach Devices** page appears.
5. In the **Attach** column, de-select each device you wish to detach from the player.
6. Click **Done**. The system returns you to **Edit Player** page.
7. Repeat Steps 4-6 to detach devices from another track of the Player associated with the module you are replacing.
8. Repeat this process to detach devices from another Player associated with the module you are replacing.

Winking the Spectrum X

In a system with more than one Spectrum X, the wink function can help you identify the Spectrum X that needs to be serviced.

On the Spectrum X, the wink function activates the light bar on the front panel.

1. From SystemManager, click the **Configuration** tab to display the **Configuration** page and **System Diagram**.
2. Click the icon for the component you wish to wink. The **Properties** page appears.
3. From the **General Information** section of the page, view the **Wink State**.
 - If currently **Off**, click **Wink On**.
 - If currently **On**, click **Wink Off**.

SDI I/O card slot positions

If your system has more than one SDI I/O card, confirm the slot position before removing the failed card. When facing the rear panel, slot 1 is the left-hand SDI I/O card, and slot 2 is the right-hand SDI I/O card.

SystemManager displays the SDI I/O card slot position in three places:

- On the **System Diagram** page

When viewing a Spectrum X, the SDI card in slot 1 is always shown as the top-most I/O module, as shown below:



- On the **I/O Module Properties** page

The **Slot** field displays **1** or **2** to show the position of the corresponding SDI I/O card, as shown below:

- If you have attached the SDI I/O card to a player, the **Attach Devices** page displays the slot position in the **Device** column, as shown below:

Device	Type	Status	Players (tracks) Attached	Attach	Channel
MIP-9XXX_01009 Slot : 1	SD/HD-MPEG-2/DV-PLAY/PRORES/AVC-PLAY	Connected	PlayertestPlayer TestCopyPlayer (track:1) TestCopyPlayer (track:2) P_Test1 P27 nbanu_d13_p1 TestFrameG nbanu_d13_p2 nbanu_d13_p3 nbanu_d13_p4 nbanu_d13_p5 nbanu_d13_p6 nbanu_d13_p7 nbanu_d13_p8 nbanu_d13_p9 ** nbanu_d13_p10 ** nbanu_d13_p11 nbanu_d13_p12 nbanu_d13_p13 nbanu_d13_p14 nbanu_d13_p15 nbanu_d13_p16 nbanu_d13_p20	<input checked="" type="checkbox"/>	A ▾
MIP-9XXX_01004 Slot : 2	SD/HD-MPEG-2/DV-PLAY/PRORES/AVC-PLAY	Connected	TestSmPlayer TestFrameG nbanu_d13_p17 nbanu_d13_p18 nbanu_d13_p19 nbanu_d13_p21 nbanu_d13_p22 nbanu_d13_p23 nbanu_d13_p24 ** nbanu_d13_p29 nbanu_d13_p30 testGA7	<input type="checkbox"/>	

Removing the system cover

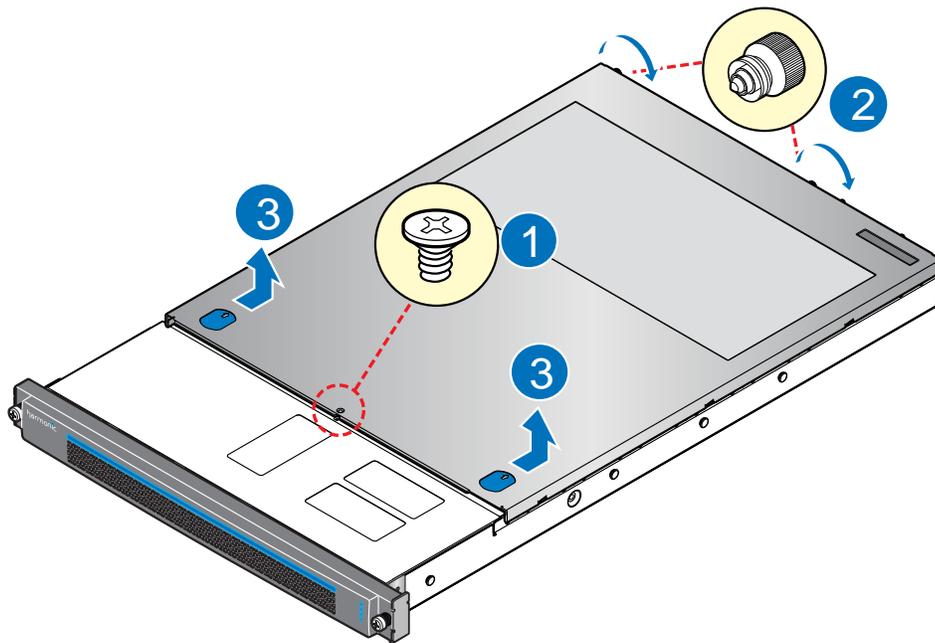
A non-skid surface may be needed to prevent the server system from sliding on your work surface.

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 Spectrum X 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.

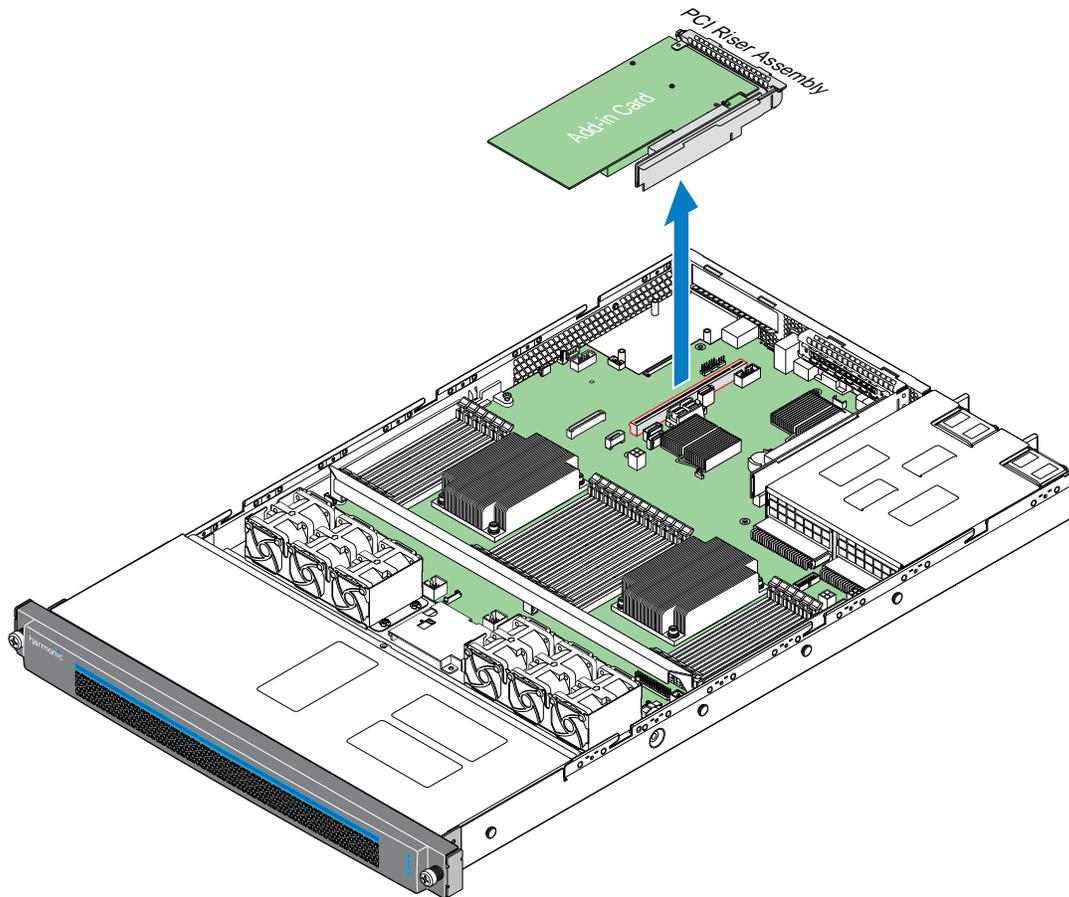


Removing an SDI I/O card

For a Spectrum X with two SDI I/O cards, be sure that you have identified the slot position of the failed card.

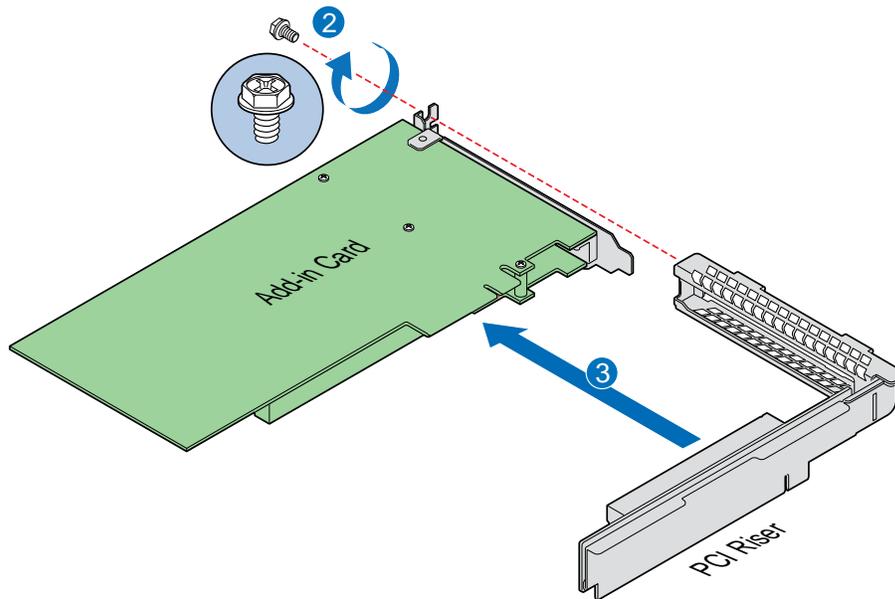
1. Using both hands, grasp the riser assembly that contains the failed SDI card and pull straight up to remove it from the system.

 **NOTE:** The image below shows the removal of an SDI I/O card from PCI Riser 1. The card you are replacing may be in PCI Riser 2.



2. Remove the fastener screw that secures the card to the riser bracket.

- Slide the card out of the riser bracket.



Deleting an I/O module from SystemManager

Once you have removed the module from the chassis, delete the corresponding I/O module from SystemManager.

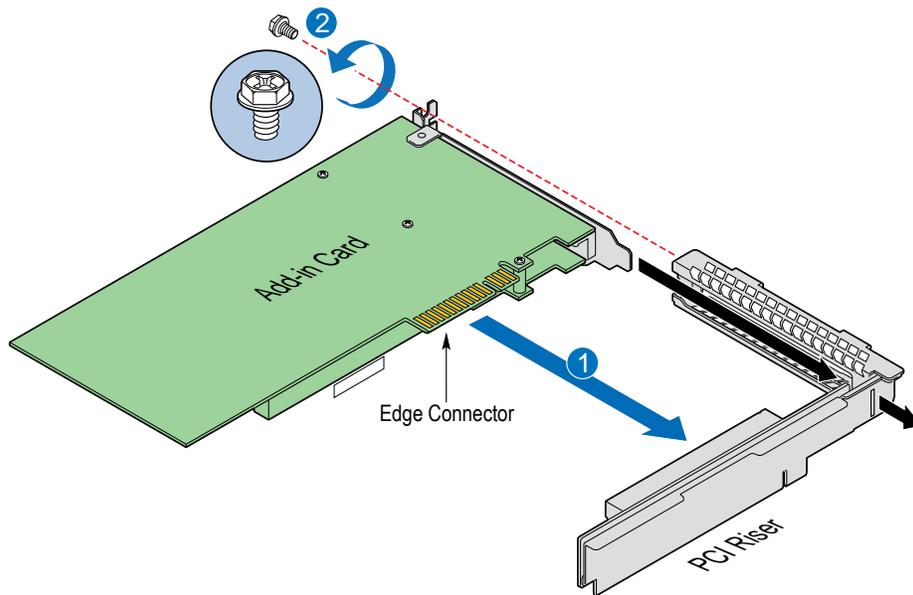
- Click the **Diagnostics** tab to display the **Diagnostics** page.
- From the **Device Maintenance** section in the left-hand column, click the **Remove Device** icon to display the **Remove Device** page.
- Scroll to the **I/O Modules** section of the page and locate the module you wish to remove.
- From the **Select** column, check the box for the I/O module you wish to remove, and then click **Remove**.
A confirmation message appears.
- Click **OK**.
After a brief pause, a message appears indicating that the device has been removed (it has also been removed from the **System Diagram**).
- Click **OK** to return to the **Remove Device** page.

Installing the replacement SDI I/O card

When installing the PCI riser assembly, do not rock the riser assembly into place. Doing so can damage the contact pins within the riser slot.

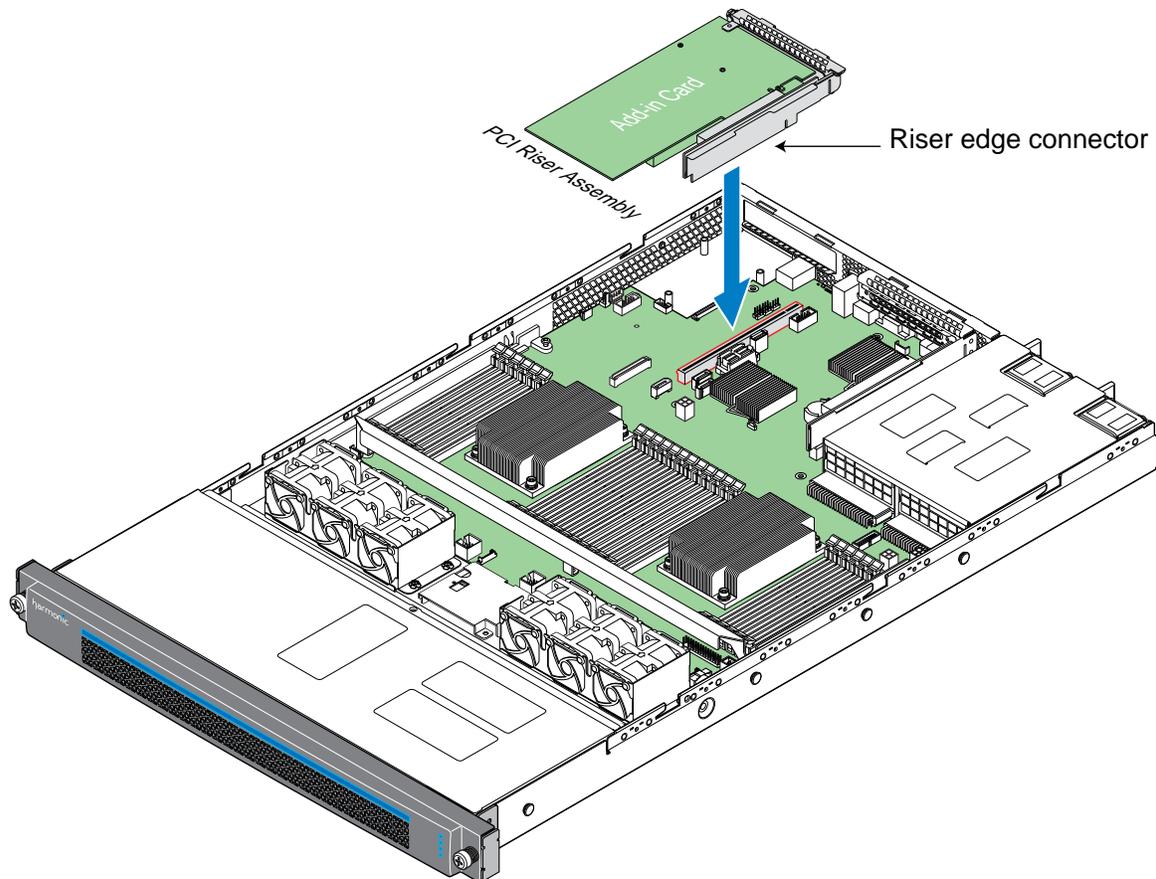
- Insert the replacement card in the same PCI slot from you which you removed the failed card, ensuring that the edge connector is fully seated inside the PCI slot on the riser card.
 - Warning:** Each PCI add-in card is designed to work in a specific PCI slot. Installing the replacement card in a different PCI slot is not supported.

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



3. Grasp the riser assembly with both hands and position the riser assembly over the server board, aligning the riser edge connector with the corresponding riser slot.

-  **NOTE:** The image below shows the installation of PCI Riser 1. The card you are replacing may be in PCI Riser 2.



- Once aligned, lower the riser assembly straight down into the riser slot, pressing gently until firmly seated.

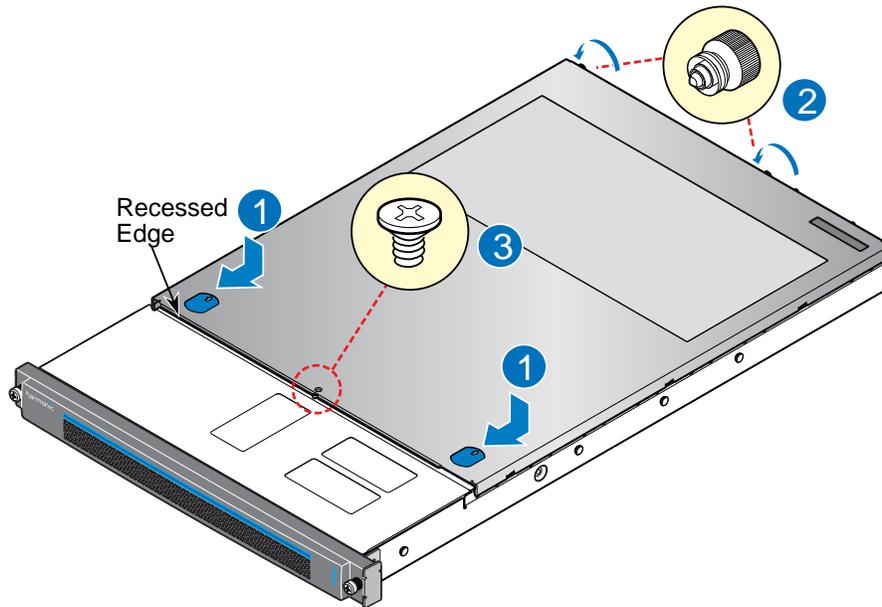
-  **CAUTION:** Do not rock the riser assembly into place. Doing so may damage the contact pins within the riser slot.

Installing the system cover

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

- 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.
- Hand tighten the two captive thumb screws at the back of the chassis.

- Using a screwdriver, install the top cover screw(s).



What to do next

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

Changing an I/O module name

Renaming can help you identify a MediaPort, ChannelPort, or Spectrum X module while navigating the SystemManager application.

After replacing a Spectrum X, the new device appears in SystemManager with the default name.

 **NOTE:** For information about proper naming conventions, please refer to "About Naming Files and System Elements" in the *Harmonic SystemManager User Guide*.

- From the **System Diagram**, click the icon for the Spectrum X that you wish to rename. The **Properties** page appears.
- At the top of the page, click **Change Name**. The **Change I/O Module Name** page appears.
- Type the new name in the field provided.
- Click **Save**.

The new name now appears in the **System Diagram**, in various page titles and fields throughout the application.

5. Repeat this procedure to rename another I/O module.

Attaching an I/O module to existing players

Use the Attach Devices feature in SystemManager to attach a replacement MediaPort, ChannelPort, or SDI I/O module to existing players.

1. From the **Configuration** tab, click the **Player Configuration** icon in the left-hand column. The **Player Configuration** page appears.
2. Click the icon for the Spectrum server on which the players reside. The **Player List** page appears.
3. Click the **Edit** link for any player that will use the new module.
4. Within the **Track** section, click the **Attach Devices** button. The **Attach Devices** page appears.
5. In the **Attach** column, click the check box for the device that you wish to connect.
6. Click **Done**.

The **Edit Player** page appears. The ID of the new module will appear (in the following format: MIP-7XXX-NNNNN, CPT-8XXX-NNNNN, or MIP-9XXX-NNNNN) next to the attached tracks.

 **TIP:** For help with modifying settings on either the **Edit Player** page or the **Attach Devices** page, refer to “Creating a player” in the *Harmonic SystemManager User Guide*.

7. Click **Done** to return to the **Player List** page.
8. Repeat this procedure for each player that will use the new module.

Activating players

You may activate Players from the **Player List** page or from the **Edit Player** page.

 **NOTE:** Only one player can be enabled per Playout Channel at a time. If a Player cannot be enabled, an error message appears that details the reasons.

1. From the **Configuration** tab, click the **Player Configuration** button in the left-hand column. The **Player Configuration** page displays.
2. From the **Player Configuration** page, click the icon for the Spectrum server on which the players reside. The **Player List** window appears, showing a list of players that reside on the selected device and their status.
3. To activate a player from the **Player List** page, check the player(s) you wish to activate, and then select one of the following:

Option	Description
Activate as disabled	Sends the player definition to the Spectrum device. This may be useful if you are using an automation system to automatically enable different players at different times.
Enable	Activates and enables the selected player(s).

4. To activate a player from the **Edit Player** page, do the following:

- a. For the player you wish to activate, click **Edit**.
The **Edit Player** page appears.
- b. To activate the player as disabled, select **Activate as disabled**.
- c. To activate and enable the player, select **Activate and Enable**.

Verifying functionality

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

Power supply unit replacement

The Spectrum X 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.

Replacing a power supply unit

Systems with a single power supply or systems with two power supplies operating in a non-redundant configuration must be powered off before beginning this procedure.

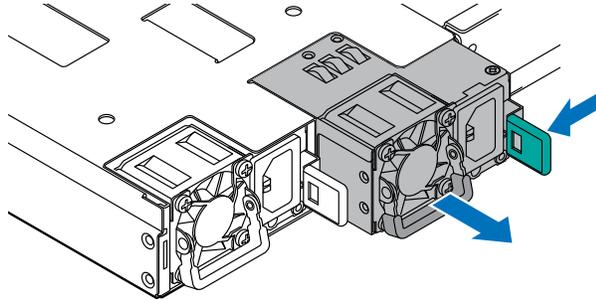
-  **DANGER:** Observe all conventional ESD precautions when handling Spectrum devices and components.
-  **NOTE:** To allow proper airflow, both power supply compartments should always have either a power supply module or a filler module installed.
-  **NOTE:** In systems with dual redundant power supplies, both power supplies must be of the same type and have the same maximum output power.

Before you begin

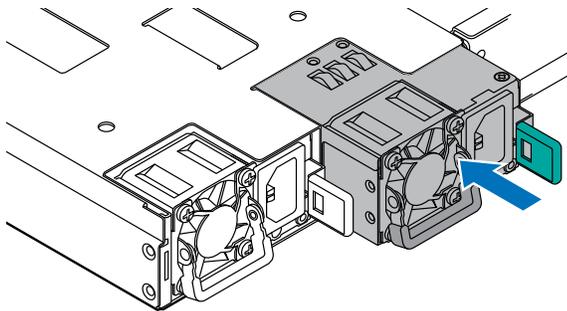
Unpack the replacement component and visually inspect for any damage. If it is damaged, call Harmonic Technical Support for assistance and do not continue with this procedure.

1. Detach the power cord from the power supply to be removed.
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.



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.



Spectrum X chassis replacement

Instructions for replacing a Spectrum X vary according to whether the device is operating in internal storage mode or shared storage mode.

- [Replacing a Spectrum X in internal storage mode: Overview](#)
- [Replacing a Spectrum X in shared storage mode: Overview](#)

Replacing a Spectrum X in internal storage mode: Overview

When replacing a Spectrum X in internal storage mode, complete each of the following procedures in order.

Recording your Spectrum X settings

It is important that you record all settings on the original Spectrum X before removing it.

The SystemManager uses IP addresses to uniquely identify the Spectrum X. If a Spectrum X is replaced (for example, because of unit failure), allow the new Spectrum X 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.

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 Spectrum X. Refer to "Installing a DDC file" in the *Harmonic SystemManager User Guide* for information on viewing your DDC file configuration.

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 nodes 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**.

Replacing the chassis

For complete racking instructions, refer to the *Spectrum System Installation Guide*.

1. Remove power from the original Spectrum X by disconnecting each of the attached AC cords from their power sources.
2. Remove the bezel from the original Spectrum X. Refer to "Bezel replacement" in this guide.
3. Remove the drives from the original Spectrum X and install each drive in the same order (with the same corresponding drive bay) into the new Spectrum X. Refer to "Drive replacement" in this guide.
4. Disconnect all other peripheral devices and unrack the original chassis.
5. Remove the power supply units from the original Spectrum X and install them in the replacement Spectrum X. Refer to "Power supply unit replacement" in this guide.
6. Remove the fan assemblies from the original Spectrum X and install them in the replacement Spectrum X. Refer to "Fan replacement" in this guide.
7. Remove the SDI I/O modules from the original Spectrum X and install them in the replacement Spectrum X. Refer to "SDI I/O card replacement" in this guide.
8. Rack mount the new Spectrum X according to the instructions in the *Spectrum System Installation Guide*.
9. Install the bezel from the original Spectrum X onto the replacement Spectrum X. Refer to "Installing the Spectrum X bezel" in this guide.

- Using Gigabit Ethernet cables, connect the Gigabit Ethernet ports on the Spectrum X to the network switch. For detailed instructions, refer to “Connecting to your Ethernet network” in the *Spectrum System Installation Guide*.

 **NOTE:** If you are using a DHCP server, the DHCP server will assign new IP addresses to the public Ethernet interfaces on the Spectrum X. In SystemManager, you can configure the Spectrum X to use either DHCP or static IP addresses. After removing the original Spectrum X, 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.

- Power up the Spectrum X by plugging in both power cables.
- On the **System Diagram** page in SystemManager, verify that the new Spectrum X appears as **Connected**.
- In SystemManager, view and clear any alarms that were created after the new Spectrum X was connected.
- Determine the firmware version running on the replacement Spectrum X.

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

- If necessary, upgrade firmware on the replacement Spectrum X to match that of the rest of your system, and then reboot the Spectrum X.

 **IMPORTANT:** Do not deactivate any players on the original Spectrum X at this point.

- Check the status LEDs on the front panel to ensure that the system is operating normally.

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.

- 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.
- 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**.
- At the top of the **Logical View** column, click the link to the File System name. The **Filesystem Utilities** page displays.
- If you are replacing a Spectrum server and the file system **Status** shows **Started**, click **Stop FS**. The button changes to **Start FS**.
- 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 Spectrum X 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 Spectrum X 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 Spectrum X

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 Spectrum X according to the instructions in “Rebooting the Spectrum video server” in the *Harmonic SystemManager User Guide*. Once the Spectrum X 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.

Replacing a Spectrum X in shared storage mode: Overview

When replacing a Spectrum X in shared storage mode, complete each of the following procedures in order.

Deactivating players

Deactivate a player when you do not want an automation system to be able to automatically enable the player for play and record.

 **NOTE:** In SystemManager, a MediaPort 7000 series appears as two separate MIP-7XXX or CPT-8XXX devices, and a Spectrum X appears as two separate MIP-9XXX devices.

1. Click the **Player Configuration** button in the left-hand column.
The **Player Configuration** page appears.
2. Click the icon for the Spectrum server on which the players reside.
The **Player List** page appears.
3. Check the box for each Player that you wish to deactivate.

 **NOTE:** If replacing a Spectrum server or I/O module, be sure to select all active Players associated with the server or module.

4. Click **Deactivate Selected**.

Removing a Spectrum X 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.

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 nodes 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**.

Replacing the chassis

When replacing the chassis, transfer all replaceable components from the original Spectrum X to the new Spectrum X. Refer to the *Spectrum System Installation Guide* for complete racking instructions.

Before you begin

Make sure the original Spectrum X is powered down.

1. Disconnect any cables from the original Spectrum X.
2. Remove the bezel. Refer to "Bezel replacement" in this guide for instructions.
3. Remove the power supplies from the original chassis and install them in the replacement chassis. Refer to "Power supply unit replacement" for instructions.
4. Remove the Spectrum X from the rack.
5. Remove the fan assemblies from the original chassis and install them in the new chassis. Refer to "Fan replacement" in this guide for instructions.
6. Remove the SDI I/O cards from the original chassis and install them in the replacement chassis. Refer to "SDI I/O card replacement" in this guide for instructions.
7. Rack mount the replacement Spectrum X. Refer to "Rack mounting instructions" in the *Spectrum System Installation Guide*.

8. Install the bezel on the replacement chassis. Refer to "Bezel replacement" in this guide for instructions.
9. Connect any necessary cables to the Spectrum X. Refer to the *Spectrum System Installation Guide* for complete instructions.

 **IMPORTANT:** Before connecting a device to SystemManager, make sure that device monitoring is on. To check device monitoring, click the **Home** tab to open the **Options** page, and view the "Current state of Device Monitoring" field at the top of the page. If the "Current state of Device Monitoring" field displays **NOT monitoring**, then click **Start Monitoring** and wait for the state to change to monitoring before continuing to connect the device. This may take a few minutes depending on the number of devices in your system. Also, note the status of devices may show **Not Responding** for a brief interval after monitoring has been turned on.

10. Power up the Spectrum X by plugging in both power cables.
11. On the **System Diagram** page in SystemManager, verify that the new Spectrum X appears as **Connected**.
12. In SystemManager, view and clear any alarms that were created after the new Spectrum X was connected.
The replacement Spectrum X will appear in SystemManager with the default name. For instructions on changing the name, refer to "Changing an I/O module name" in this guide.
13. Determine the firmware version running on the replacement Spectrum X.

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

14. If necessary, upgrade firmware on the replacement Spectrum X to match that of the rest of your system, and then reboot the Spectrum X.
15. Check the status LEDs on the front panel to ensure that the system is operating normally.

What to do next

Activate players on the replacement Spectrum X.

Changing an I/O module name

Renaming can help you identify a MediaPort, ChannelPort, or Spectrum X module while navigating the SystemManager application.

After replacing a Spectrum X, the new device appears in SystemManager with the default name.

 **NOTE:** For information about proper naming conventions, please refer to "About Naming Files and System Elements" in the *Harmonic SystemManager User Guide*.

1. From the **System Diagram**, click the icon for the Spectrum X that you wish to rename. The **Properties** page appears.
2. At the top of the page, click **Change Name**. The **Change I/O Module Name** page appears.
3. Type the new name in the field provided.
4. Click **Save**.
The new name now appears in the **System Diagram**, in various page titles and fields throughout the application.
5. Repeat this procedure to rename another I/O module.

Activating players

You may activate Players from the **Player List** page or from the **Edit Player** page.



NOTE: Only one player can be enabled per Playout Channel at a time. If a Player cannot be enabled, an error message appears that details the reasons.

1. From the **Configuration** tab, click the **Player Configuration** button in the left-hand column. The **Player Configuration** page displays.
2. From the **Player Configuration** page, click the icon for the Spectrum server on which the players reside. The **Player List** window appears, showing a list of players that reside on the selected device and their status.
3. To activate a player from the **Player List** page, check the player(s) you wish to activate, and then select one of the following:

Option	Description
Activate as disabled	Sends the player definition to the Spectrum device. This may be useful if you are using an automation system to automatically enable different players at different times.
Enable	Activates and enables the selected player(s).

4. To activate a player from the **Edit Player** page, do the following:
 - a. For the player you wish to activate, click **Edit**. The **Edit Player** page appears.
 - b. To activate the player as disabled, select **Activate as disabled**.
 - c. To activate and enable the player, select **Activate and Enable**.

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

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 & translated safety, warning & caution instructions \(English\)](#)
- [Symboles de sécurité et traduits de sécurité, d'avertissement et Attention Instructions \(français\)](#)
- [Sicherheit Symbole und übersetzt Sicherheit, Achtung & Vorsicht Anleitung \(Deutsch\)](#)
- [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 additional country specific environmental, safety and EMC standards:](#)

Important safety instructions

This section provides 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 & translated safety, warning & caution instructions (English)

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
 <p data-bbox="215 942 318 974">Warning</p>	<p data-bbox="464 739 1057 770">Installing or replacing the product unit warning</p> <ul data-bbox="464 787 1393 1283" style="list-style-type: none"> • 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.
 <p data-bbox="215 1516 318 1547">Warning</p>	<p data-bbox="464 1312 727 1344">Rack mount warning</p> <p data-bbox="464 1360 1373 1423">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:</p> <ul data-bbox="464 1440 1386 1633" style="list-style-type: none"> • 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
 <p data-bbox="215 489 318 520">Warning</p>	<p data-bbox="464 285 678 317">Chassis warning</p> <ul data-bbox="464 331 1398 688" style="list-style-type: none"> • 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.
 <p data-bbox="215 924 318 955">Warning</p>	<p data-bbox="464 720 756 751">Electric shock warning</p> <ul data-bbox="464 766 1406 1791" style="list-style-type: none"> • 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
 <p>Caution</p>	<p>Electrostatic Discharge (ESD) caution</p> <ul style="list-style-type: none"> • 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).
 <p>Warning</p>	<p>Laser radiation warning</p> <p>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.</p>
 <p>Warning</p>	<p>Lithium battery handling safety instructions</p> <ul style="list-style-type: none"> • 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."
 <p>Caution</p>	<ul style="list-style-type: none"> • 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 et traduits de sécurité, d'avertissement et Attention Instructions (français)

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
 <p data-bbox="215 569 386 596">Avertissement</p>	<p data-bbox="464 363 1279 390">Installation ou remplacement de l'unité de produit avertissement</p> <ul data-bbox="464 411 1398 1003" style="list-style-type: none"> • 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.
 <p data-bbox="215 1241 386 1268">Avertissement</p>	<p data-bbox="464 1035 829 1062">Rack monture avertissement</p> <p data-bbox="464 1083 1357 1173">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:</p> <ul data-bbox="464 1194 1390 1388" style="list-style-type: none"> • 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.
 <p data-bbox="215 1625 386 1652">Avertissement</p>	<p data-bbox="464 1419 756 1446">Châssis avertissement</p> <ul data-bbox="464 1467 1398 1850" style="list-style-type: none"> • 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
 <p data-bbox="215 489 386 514">Avertissement</p>	<p data-bbox="467 283 850 308">Choc électrique avertissement</p> <ul data-bbox="467 331 1403 1539" style="list-style-type: none"><li data-bbox="467 331 1403 422">• 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.<li data-bbox="467 432 1403 522">• Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.<li data-bbox="467 533 1403 590">• Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.<li data-bbox="467 600 1403 720">• 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.<li data-bbox="467 730 1403 850">• 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 utiliser de nettoyant liquide ou en aérosol; utiliser seulement un linge humide.<li data-bbox="467 861 1403 980">• 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.<li data-bbox="467 991 1403 1047">• N'installez jamais un module d'alimentation AC et un module d'alimentation DC dans le même châssis.<li data-bbox="467 1058 1403 1115">• Ne pas porter de bijoux aux mains ni de montre durant le dépannage des circuits à haute tension, comme les transformateurs.<li data-bbox="467 1125 1403 1245">• 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.<li data-bbox="467 1255 1403 1409">• 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).<li data-bbox="467 1419 1403 1539">• 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
 <p data-bbox="215 489 321 516">Attention</p>	<p data-bbox="464 285 1062 312">Les décharges électrostatiques (ESD) attention</p> <ul data-bbox="464 331 1398 758" style="list-style-type: none"> • Respecter systématiquement les précautions 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).
 <p data-bbox="215 993 386 1020">Avertissement</p>	<p data-bbox="464 789 829 816">Rayonnement laser attention</p> <p data-bbox="464 835 1403 961">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.</p>
 <p data-bbox="215 1260 386 1287">Avertissement</p>	<p data-bbox="464 1056 1175 1083">Batterie au lithium manipulation instructions de sécurité</p> <ul data-bbox="464 1102 1393 1228" style="list-style-type: none"> • 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."
 <p data-bbox="215 1526 321 1554">Attention</p>	<ul data-bbox="464 1331 1403 1556" style="list-style-type: none"> • 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 usagées conformément 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 übersetzt Sicherheit, Achtung & Vorsicht Anleitung (Deutsch)

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
 <p data-bbox="215 600 326 632">Warnung</p>	<p data-bbox="464 394 1260 426">Installation oder den Austausch des Produkts Einheit Warnung</p> <ul data-bbox="464 443 1393 968" style="list-style-type: none"> • Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden (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.
 <p data-bbox="215 1205 326 1236">Warnung</p>	<p data-bbox="464 999 773 1031">Rack-Montage-Warnung</p> <p data-bbox="464 1050 1344 1142">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:</p> <ul data-bbox="464 1161 1398 1388" style="list-style-type: none"> • 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
 <p data-bbox="215 489 326 520">Warnung</p>	<p data-bbox="464 285 691 317">Chassis Warnung</p> <ul data-bbox="464 331 1393 789" style="list-style-type: none"><li data-bbox="464 331 1393 426">• Gleichstrom-Unterbrechung Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist.<li data-bbox="464 432 1393 558">• 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.<li data-bbox="464 564 1393 659">• Alle Hinweise in diesem Handbuch, die das Öffnen benötigen Sie das Gehäuse oder das Entfernen eines Board sollte nur von qualifiziertem Fachpersonal durchgeführt werden.<li data-bbox="464 665 1393 789">• 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
 <p data-bbox="215 489 326 520">Warnung</p>	<p data-bbox="467 285 773 317">Elektroschock-Warnung</p> <ul data-bbox="467 331 1398 1516" style="list-style-type: none"> • 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 Wechselstromsmodul 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
 <p>Vorsich</p>	<p>Elektrostatische Entladung (ESD) Vorsicht</p> <ul style="list-style-type: none"> • 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 (MΩ).
 <p>Warnung</p>	<p>Laserstrahlungen Warnung.</p> <p>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.</p>
 <p>Warnung</p>	<p>Lithium-Batterie Handhabung Sicherheitshinweise</p> <ul style="list-style-type: none"> • CALIFORNIA PERCHLORATE ADVISORY: Einige Lithium-Batterien kann Perchlorat enthalten. Die folgende Beratungs gesetz: "Perchlorat - Sonderbehandlung kann erforderlich sein, finden Sie unter: http://www.dtsc.ca.gov/hazardouswaste/perchlorate/ for information."
 <p>Vorsich</p>	<ul style="list-style-type: none"> • 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

AC power

Description

- 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
DC power	<ul style="list-style-type: none"> ◦ 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. <ul style="list-style-type: none"> ◦ Ensure a suitable overcurrent 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	<ul style="list-style-type: none"> ◦ 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	<ul style="list-style-type: none"> ◦ Dispose of the unit and its components (including batteries) as specified by all national laws and regulations.

Product end-of-life disassembly instructions

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 39.

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)

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

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

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

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)

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

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 기기이
오니 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

Table B-1: 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	<div style="border: 1px solid black; padding: 2px; font-size: 8px;">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.</div>
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	 R3A001 警告使用者： 此類甲類的資訊產品，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。
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	 NXXXXX
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-XXXXXXXXX"

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

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-2: 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%

EU REACH

REACH (Registration, Evaluation, Authorization and restriction of Chemicals) (EC 1907/2006) is a European Union's 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.

¹ Homogeneous material definition as per the EU Directive.

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

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

China RoHS

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

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)
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)

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

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 additional 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.

