into, provided with or loaded onto the Products in object code format, but does not include, and this Agreement does not address, any third-party or free or open source software separately licensed to you ("Third Party Software"). If you do not agree to this Agreement, you shall promptly return the System with a dated receipt to the seller for a full refund.

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rights or remedies, we shall be entitled to injunctive and other equitable relief, without posting bond or other security, to prevent any material
breach of this Agreement. We may change the terms, conditions and pricing relating to the future licensing of our Systems and other intellectual
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in a writing signed on behalf of the party against whom the waiver is asserted. If any part of this Agreement is found unenforceable, the remaining
parts will be enforced to the maximum extent permitted. There are no third-party beneficiaries to this Agreement. We are not bound by additional
and/or conflicting provisions in any order, acceptance, or other correspondence unless we expressly agree in writing. This Agreement is the
complete and exclusive statement of agreement between the parties as to its subject matter and supersedes all proposals or prior agreements,
verbal or written, advertising, representations or communications concerning the System. Every reasonable attempt has been made to comply
with all licensing requirements for all components used in the system. Any oversight is unintentional and will be remedied if brought to the
attention of Harmonic at support@harmonicinc.com.

Documentation conventions
In Harmonic documents, special symbols and fonts to call your attention to important information.

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

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

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

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

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

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

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<th>Convention</th>
<th>Explanation</th>
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<td><strong>Typed Command</strong></td>
<td>Indicates the text that you type in at the keyboard prompt.</td>
</tr>
<tr>
<td><code>&lt;Ctrl&gt;</code>, <code>&lt;Ctrl&gt;++&lt;Shift&gt;</code></td>
<td>A key or key sequence to press.</td>
</tr>
<tr>
<td><strong><a href="http://www.harmonicinc.com">http://www.harmonicinc.com</a></strong></td>
<td>The italics in blue text to indicate Cross-references, and hyperlinked cross-references in online documents.</td>
</tr>
<tr>
<td><strong>Bold</strong></td>
<td>Indicates a button to click, or a menu item to select.</td>
</tr>
<tr>
<td><strong>Screen Output</strong></td>
<td>The text that is displayed on a computer screen.</td>
</tr>
<tr>
<td><strong>Emphasis</strong></td>
<td>The italics text used for emphasis and document references.</td>
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Chapter 1

Useful information for Technical Support

In order to expedite diagnosis and remediation, please gather helpful information about your Spectrum system as well as your SystemManager platform when contacting Technical Support.

- Information about the SystemManager client PC
- Information about your Spectrum System

Information about the SystemManager client PC

Please gather information about the SystemManager client PC as well as the SystemManager database file before contacting Technical Support.

Technical Support may request the following information:

- SystemManager version
  You can find the version here: Help > Server Software.
- Windows operating system installed on the SystemManager client PC
  The run command `winver` shows the Windows operating system running on the client PC.
- Amount of memory installed on the SystemManager platform
  Open the System Properties dialog on the client PC to find the amount of memory installed.
- The SystemManager database file from the SystemManager platform or client PC
  This file is located on the SystemManager platform at `D:\Omneon\Manager\omdb\manager.oda`. Or, if you are using a client PC with a single C: partition, it will be in the same directory on the C: drive.

Information about your Spectrum System

In the event of a component or device failure, please gather the following information about your Spectrum System before contacting Technical Support.

Technical Support may request the following information:

- What is the model and serial number of the hardware involved?
  For Spectrum and MediaDeck devices: from the Home tab in SystemManager, click the Upgrade Firmware icon in the left-hand column to display the Upgrade Firmware page. Both
MediaDirectors and MediaDecks are listed in the MediaDirectors section. Find the Model Numbers and Serial Numbers listed in their respective columns.

Scroll down to the MediaPorts section to view the Model Numbers and Serial Numbers for MediaPorts and MediaDeck Modules.

- **What is the name of the Player that is being used?**
  From SystemManager, click the Player Configuration link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The Player List page for that device appears. The names and status of all players are listed.

- **What file format and bit rate is the Player configured for? (for example, MPEG, DV, or IMX?)**
  From SystemManager, click the Player Configuration link in the left-hand column, and then click the name of the MediaDirector or MediaDeck. The Player List page for that device appears. From the player list, click the Properties link to view all the details for a player.

- **If the problem is related to Ingest or Playout of a clip, what is the Clip ID involved?**
  The clip name or clip ID should be indicated by whatever software application you are using to play or record video. For ClipTool, clip names are displayed in the clip management area of the ClipTool main window.

- **What brand of Automation, if any, is being used for control?**
- **Is the Automation using VDCP or API for communication control?**
Chapter 2

Power cooling module replacement

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

- **Replacing a power cooling module**

Replacing a power cooling module

Make sure that you have correctly identified the faulty power cooling module before beginning this procedure.

- **CAUTION:** Observe all conventional ESD precautions when handling MediaStore components.

- **CAUTION:** Do not remove the faulty power supply unless you have a replacement of the correct type ready for installation. Do not leave a PCM slot empty for more than ten minutes. Doing so will cause the MediaStore to overheat, which will result in component failure.

- **CAUTION:** Handle the module carefully and avoid damaging the connector pins. Do not install the module if any pins appear to be bent.

1. Switch off and disconnect the power supply cord.
2. Squeeze the latch and the side of the PCM handle between thumb and forefinger to release the PCM.
3. Gently pull the module from the chassis, as shown in the following figure.

4. Unpack the replacement PCM and inspect for damage, especially damage to the rear power supply connector.

5. With the PCM handle in the open position, slide the new PCM into the chassis until the latches engage and secure the module.

6. Connect the AC power cable.
When replacing an I/O module, the entire Spectrum System must be shut down. Please read each of the following sections and perform their steps in the order given.

- *Replacing an I/O module*

**Replacing an I/O module**

Harmonic suggests that you label the SAS cables as you remove them from the I/O module. This will ensure the cables are correctly assigned in the new module.

1. Power down the Spectrum System.  
   Refer to “Powering down a Spectrum System” in the *Spectrum System Installation Guide* for complete instructions.
2. Remove the Serial-attached SCSI (SAS) cables.
3. Grip the module latch between thumb and forefinger, and squeeze them together to release the latch.
4. Pull the latch out to release the module from the MediaStore chassis.
5. Grip the latch handles, and gently remove the module.

6. Pull the I/O module from the slot.
7. Ensure the latch on the replacement module is open, and slide the module into the slot until the latch engages.
8. Close the latch to secure the module.
9. Replace the SAS cables.
10. Power up the Spectrum System.
    Refer to "Powering up a Spectrum System" in the Spectrum System Installation Guide for complete instructions.
Chapter 4
Disk drive replacement

The MediaStore contains high-performance disk drives that can be hot-swapped during operation.

NOTE:
The procedures in this section apply to SystemManager version 6.3. If you are running a different version of SystemManager, some steps may vary. Refer to the SystemManager Release Notes for instructions on upgrading SystemManager.

• Gathering drive failure information
• About replacement drives
• Removing a disk drive
• Installing a disk drive

Gathering drive failure information
To assist in drive problem diagnosis and remediation, please gather the requested information before contacting Technical Support.

1. Provide the following general details about the drive failure:
   ◦ Site Location
   ◦ Server Name
   ◦ Date of Failure
   ◦ Time of Failure
   ◦ Description of Failure

2. Collect the following information from the Spectrum Server Properties page:
   TIP: To view the Spectrum Server Properties page, from the System Diagram page of the Configuration tab, click the icon for your Spectrum video server. Then, from the Physical Configuration tab, click the icon for your Spectrum.
   ◦ Firmware Version
   ◦ Host Name
   ◦ Serial Number

3. Collect the following information from the Drive Properties page:
   TIP: To view Drive Properties, from the Configuration tab, click Disk Utilities, then click the icon for your MediaDirector. From the second Disk Utilities page, click the icon for the drive that has failed.
• Disk GUID
• Disk Serial Number
• Disk Size (GB)

4. From your SystemManager Platform or client PC running SystemManager, use Windows Explorer to navigate to the following directory:
   ```\IPADDR\FSNAME\om(serial_number_of_director)\logs```
   • IPADDR = IP address or host name if using DNS
   • FSNAME = file system name

5. Locate the following log file(s):
   - `Badblockhistory.txt` (for all directors if EFS system)

Once you obtain a Return Authorization Number (RA) from Harmonic Technical Support, email a copy of the requested file(s) to Technical Support and quote the RA number in the email.

**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.

**Removing a disk drive**

When replacing a failed disk drive, it is critical that you identify the correct drive. Also, you must remove the failed drive from the RAID set before removing it from the enclosure. Failure to do so may result in audio/video disruption.

There are certain disk failures that prevent system software from correctly determining the physical location of a drive. The only means of ensuring that the drive is the correct one is by comparing the serial number on the disk drive to the serial number displayed in SystemManager. Winking a drive and following physical information (enclosure, slot) is not always reliable.

⚠️ **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.

⚠️ **CAUTION:**
Observe all conventional ESD precautions when handling MediaStore components.

1. Ensure that you have a replacement drive from Harmonic on hand.
2. View the **Disk Utilities** page for the MediaStore to verify that the drive state is reported as **Dead**, **Failed**.
3. From the **Disk Utilities** page, find the physical location of the drive and note the state of the LEDs for this drive as follows:
   - The Drive 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.
   - The Drive Status LED should be in Fast Flash Mode (refer to the “MediaStore 5000 Series Reference” chapter for information on LED states).
4. 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 to the next step.
   - 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.
5. Wait 30 seconds before unlatching the drive at the physical location indicated in Step 3.
   - On MediaStore 5000 Series units, the latch is located on the top of the drive carrier, as shown in the following figure.

6. Wait an *additional* 30 seconds, then remove the drive from the MediaStore enclosure.
7. On the **Add/Remove Drives** screen, click **Remove** next to the drive to "hide" the drive from view on the **Disk Utilities** screen in the future.

💡 **TIP:**
To find each drive view: From the **Configuration** tab, click the **Disk Utilities** icon on the left to access the **Disk Utilities** screen. Click on the MediaDirector with the required disk drive(s) to display the associated drive views.

**NOTE:**
You must click the **Remove** button associated with the disk for each of the directors in an EFS.

### Installing a disk drive

Verify that the new drive is reported as alive by each MediaDirector in your Spectrum System.

**NOTE:**
Observe all conventional ESD precautions when handling MediaStore components.

1. Unpack the replacement drive.
2. Insert the replacement drive by gently sliding the carrier all the way into the enclosure, until the camming lever on the bottom of the carrier stops it.
3. Gently push the camming lever towards the enclosure until it clicks into a closed position.

**NOTE:**
Keep in mind that the handle should always open from the bottom.

Within three minutes, the new drive should appear on the **Disk Utilities** screen on the SystemManager application.

If the system does not recognize the drive, the Drive Status LED blinks at a slow rate: one second on, three seconds off. Contact Technical Support in this event.

4. Verify that each MediaDirector reports the drive as **Alive**.
   
   If it is reported as **Alive** by all MediaDirectors, continue to the next step.
   
   If the drive is not reported as **Alive**, bypass the drive. Follow the instructions in "Removing a disk drive" to bypass the drive. If another drive is available, repeat steps 1-4 using this drive. If successful, continue to the next step. If unsuccessful, contact Technical Support for assistance.
   
   If you do not have another drive available, contact Technical Support.
   
   If you have a hot spare available, an automatic rebuild commences on this drive. Skip to Step 6.

5. If there is another drive that is available to configure as a hot spare, decide which drive should be used as the RAID rebuild target. Configure this drive as a Local Hot Spare for the RAID set.

   **NOTE:**
   Before configuring a drive as a hot spare, ensure that the drive has the correct firmware version as determined by the SystemManager and displayed on the **Upgrade Firmware** screen. If the drive does not have the correct version, contact Technical Support for assistance.
   
   Refer to “Making a local hot spare drive” in the *Harmonic SystemManager User Guide* for instructions.
   Once a drive is configured as a Local Hot Spare, an automatic rebuild commences on this drive.

6. On the **RAID Utilities** screen, monitor the status for the RAID set.
The status should change from **Compromised** to **Rebuilding** immediately. If it does not, start the rebuild manually by clicking on **Start Rebuild**.

7. Reconfigure all other hot spare drives as desired.
8. Periodically monitor the rebuild until complete. Once complete, RAID set status will change to **Normal, Attached, Viable**.

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 repack the failed drive and return it promptly to Harmonic for analysis. Contact Technical Support for a Return Authorization Number (RA) before shipping the drive.
MediaStore 5000 Series chassis replacement

When replacing a MediaStore, the entire Spectrum System must be shut down.

- Replacing the chassis
- Verifying functionality

Replacing the chassis

The SAS cables, disk drives, and I/O modules must be removed from the original MediaStore and installed in the replacement MediaStore in the same corresponding positions. As such, Harmonic recommends that you label each component as you remove it from the chassis.

⚠️ IMPORTANT:

When replacing a MediaStore, the entire Spectrum System must be shut down. Please read each of the following sections and perform their steps in the order given.

⚠️ CAUTION:

Observe all conventional ESD precautions when handling MediaStore components.

1. Power down the Spectrum System.
   Refer to "Powering down a Spectrum System" in the Spectrum System Installation Guide for complete instructions.
2. Label the SAS cables and remove them.
3. Note the drive bay assignments of the drives, and then remove them from the original MediaStore.
   Refer to "Removing a disk drive" in this guide for instructions.
4. Remove the original MediaStore from the rack.
5. Note the slot assignments of the I/O modules.
6. Remove the I/O modules from the original MediaStore and then install them in the new MediaStore, using the same corresponding slots that were used in the original chassis.
   Refer to "Replacing an I/O module" in this guide for instructions.
7. Remove the power cooling modules from the original MediaStore and install them in the new MediaStore.
   Refer to "Replacing a power cooling module" in this guide for instructions.
8. Rack mount the new MediaStore.
   For details, refer to "Rack mounting instructions" in the Spectrum System Installation Guide.
9. Install the disk drives in the new MediaStore in the same order and drive bay slot assignments as they had in the original MediaStore.
For details, refer to "Installing a disk drive" in this guide.

10. Cable the new MediaStore to the MediaDirector.
   Refer to "Connecting MediaDirectors and MediaStores using SAS" in the Spectrum System Installation Guide for complete instructions.

11. Power up the Spectrum System.
   Refer to "Powering up" in the Spectrum System Installation Guide for complete instructions.

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

<table>
<thead>
<tr>
<th>Region</th>
<th>Telephone Technical Support</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Americas</td>
<td>888.673.4896 (888.MPEG.TWO) 408.490.6477</td>
<td><a href="mailto:support@harmonicinc.com">support@harmonicinc.com</a></td>
</tr>
<tr>
<td>Europe, the Middle East and Africa (EMEA)</td>
<td>+44.1252.555.450</td>
<td><a href="mailto:emeasupport@harmonicinc.com">emeasupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>India</td>
<td>+91.120.498.3199</td>
<td><a href="mailto:apacsupport@harmonicinc.com">apacsupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Russia</td>
<td>+7.495.926.4608</td>
<td><a href="mailto:rusupport@harmonicinc.com">rusupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Mainland China</td>
<td>+86.10.6569.5580</td>
<td><a href="mailto:chinasupport@harmonicinc.com">chinasupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Japan</td>
<td>+81.3.5565.6737</td>
<td><a href="mailto:japansupport@harmonicinc.com">japansupport@harmonicinc.com</a></td>
</tr>
<tr>
<td>Asia Pacific (APAC) – Other Territories</td>
<td>+852.3184.0045 +65.6542.0050</td>
<td><a href="mailto:apacsupport@harmonicinc.com">apacsupport@harmonicinc.com</a></td>
</tr>
</tbody>
</table>

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

Harmonic Inc. support website
http://www.harmonicinc.com/content/technical-support

Harmonic Inc. Distribution and Delivery Product Software Downloads Site
ftp://ftp.harmonicinc.com

Harmonic Inc. Playout and Production Software Downloads Site

• Harmonic corporate contact information
Harmonic corporate contact information

Phone numbers and addresses for the corporate office.

Harmonic Inc. corporate address

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

Harmonic Inc. corporate telephone numbers

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

Safety and regulatory compliance information

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

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

- Important safety instructions
- Safety symbols and translated safety, warning, and 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 and translated safety, warning, and 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.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
</table>
| ![Warning](Image) | **Installing or replacing the product unit warning**  
- Only trained and qualified service personnel should be allowed to install, replace, or service this unit (refer AS/NZS 3260 Clause 1.2.14.3 Service Personnel).  
- Read the installation instructions before connecting the system to the power source.  
- When installing or replacing the unit, always make the ground connection first and disconnect it last.  
- Installation of the unit must comply with local and national electrical codes.  
- This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of special tool, lock and key or other means of security.  
- Use only specified replacement parts.  
- Do not use this unit in or near water. Disconnect all AC power before installing any options or servicing the unit unless instructed to do so by this manual. |
| ![Warning](Image) | **Rack mount warning**  
To prevent bodily injury when mounting or servicing this unit in a rack, special precautions must be taken to ensure your safety and stability of system:  
- Conform to local occupational health and safety requirements when moving and lifting the equipment.  
- Ensure that mounting of the unit by mechanical loading tools should not induce hazardous conditions.  
- To avoid risk of potential electric shock, a proper safety ground must be implemented for the rack and each piece of equipment installed on it. |
<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
</table>
| **Warning** | **Chassis warning**  
  - Before connecting or disconnecting ground or power wires to the chassis, ensure that power is removed from the DC circuit.  
  - To prevent personal injury or damage to the chassis, lift the unit only by using handles that are an integral part of the chassis, or by holding the chassis underneath its lower edge.  
  - Any instructions in this guide that require opening the chassis or removing a board should be performed by qualified service personnel only.  
  - Slots and openings in the chassis are provided for ventilation. Do not block them. Leave the back of the frame clear for air exhaust cooling and to allow room for cabling - a minimum of 6 inches (15.24 cm) of clearance is recommended. |
| **Warning** | **Electric shock warning**  
  - This unit might have more than one power cord. To reduce the risk of electric shock, disconnect the two power supply cords before servicing the unit.  
  - Before working on a chassis or working near power supplies, unplug the power cord on AC units.  
  - Do not work on the system or connect or disconnect cables during periods of lightning activity.  
  - This unit is grounded through the power cord grounding conductor. To avoid electric shock, plug the power cord into a properly wired receptacle before connecting the product input or outputs.  
  - Route power cords and other cables so that they are not likely to be damaged. Disconnect power input to unit before cleaning. Do not use liquid or aerosol cleaners; use only a damp cloth to clean chassis.  
  - Dangerous voltages exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Do not insert anything into either of the system's two power supply cavities with power connected  
  - Never install an AC power module and a DC power module in the same chassis.  
  - Do not wear hand jewelry or watch when troubleshooting high current circuits, such as the power supplies.  
  - To avoid fire hazard, use only the specified correct type voltage and current ratings as referenced in the appropriate parts list for this unit. Always refer fuse replacement to qualified service personnel.  
  - This unit relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a fuse or circuit breaker no larger than 120 VAC, 15A U.S. (240 VAC, 10A international) is used on the phase conductors (all current-carrying conductors).  
  - To avoid electrocution ensure that the rack has been correctly grounded before switching on the unit. When removing the unit remove the grounding connection only after the unit is switched off and unplugged. |
### Electrostatic Discharge (ESD) caution

- Follow static precaution at all times when handling this unit.
- Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system.
- Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins.
- Place any removed component on an antistatic surface or in a static shielding bag.
- Avoid contact between the cards and clothing.
- Periodically check the resistance value of the antistatic strap. Recommended value is between 1 and 10 mega-ohms (Mohms).

### Laser radiation warning

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Never operate a unit with a broken fibre or with a separated fiber connector.

### Lithium battery handling safety instructions

- CALIFORNIA PERCHLORATE ADVISORY: Some lithium batteries may contain perchlorate material. The following advisory is provided: "Perchlorate Material - special handling may apply, see: [http://www.dtsc.ca.gov/hazardouswaste/perchlorate/](http://www.dtsc.ca.gov/hazardouswaste/perchlorate/) for information."

### 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

---

**Mark** | **Notes**
---|---
Caution | **Electrostatic Discharge (ESD) caution**
- Follow static precaution at all times when handling this unit.
- Always wear an ESD-preventive wrist or ankle strap when handling electronic components. Connect one end of the strap to an ESD jack or an unpainted metal component on the system.
- Handle cards by the faceplates and edges only; avoid touching the printed circuit board and connector pins.
- Place any removed component on an antistatic surface or in a static shielding bag.
- Avoid contact between the cards and clothing.
- Periodically check the resistance value of the antistatic strap. Recommended value is between 1 and 10 mega-ohms (Mohms).

Warning | **Laser radiation warning**
Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Never operate a unit with a broken fibre or with a separated fiber connector.

Warning | **Lithium battery handling safety instructions**
- CALIFORNIA PERCHLORATE ADVISORY: Some lithium batteries may contain perchlorate material. The following advisory is provided: "Perchlorate Material - special handling may apply, see: [http://www.dtsc.ca.gov/hazardouswaste/perchlorate/](http://www.dtsc.ca.gov/hazardouswaste/perchlorate/) for information."

Caution | - Risk of explosion if battery is replaced incorrectly or with an incorrect type
- Dispose of used batteries according to the manufacturer's instructions
- There are no user-serviceable batteries inside Harmonic products. Refer to Harmonic qualified personnel only to service the replaceable batteries
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.

<table>
<thead>
<tr>
<th>Avertissement</th>
<th>Installation ou remplacement de l'unité de produit avertissement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 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).</td>
</tr>
<tr>
<td></td>
<td>• Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• L'équipement doit être installé conformément aux normes électriques nationales et locales.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• Utilisez uniquement des pièces de rechange spécifiées.</td>
</tr>
<tr>
<td></td>
<td>• Ne pas utiliser ce produit dans l'eau ni à proximité de l'eau. Débranchez 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Avertissement</th>
<th>Rack monture avertissement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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:</td>
</tr>
<tr>
<td></td>
<td>• Conformez-vous aux exigences de médecine du travail et de sécurité lorsque vous déplacez et soulevez le matériel.</td>
</tr>
<tr>
<td></td>
<td>• Assurez-vous que le montage de l'appareil par des outils de chargement mécaniques ne doit pas induire des conditions dangereuses.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Avertissement</th>
<th>Châssis avertissement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td>Mark</td>
<td>Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| Avertissement | **Choc électrique avertissement**  
- Il est possible que cette unité soit munie de plusieurs cordons d'alimentation. Pour éviter les risques d'électrocution, débrancher les deux cordons d'alimentation avant de réparer l'unité.  
- Avant de travailler sur un châssis ou à proximité d'une alimentation électrique, débrancher le cordon d'alimentation des unités en courant alternatif.  
- Ne pas travailler sur le système ni brancher ou débrancher les câbles pendant un orage.  
- Ce unité est mis à la terre par le conducteur de protection intégré au cordon d'alimentation. Pour éviter les chocs électriques, brancher le cordon d'alimentation dans une prise correctement câble avant de raccorder les entrées ou sorties du unité.  
- Installer les cordons d'alimentation et autres câbles 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.  
- Des courants électriques dangereux circulent dans cet appareil. Afin d'éviter les lessures, ne pas toucher les connexions et composants exposés lorsque l'appareil est sous tension. Ne rien insérer dans l'une ou l'autre des cavités des prises de courant du système lorsque l'appareil est sous tension.  
- N'installez jamais un module d'alimentation AC et un module d'alimentation DC dans le même châssis.  
- Ne pas porter de bijoux aux mains ni de montre durant le dépannage des circuits à haute tension, comme les transformateurs.  
- Pour prévenir les risques d'incendie, n'utiliser que le type, la tension et le courant nominal spécifiés dans la nomenclature des pièces de ce unité. Toujours confier le remplacement des fusibles à du personnel d'entretien qualifié.  
- Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifier qu'un fusible ou qu'un disjoncteur de 120 V alt., 15 A U.S. maximum (240 V alt., 10 A international) est utilisé sur les conducteurs de phase (conducteurs de charge).  
- Pour éviter l'électrocution, assurez-vous que le rack a bien été mis à la terre avant de mettre l'unité en marche. Lors du retrait de l'unité, retirer le raccordement de terre seulement après avoir mis l'unité à l'arrêt et l'avoir débranchée. |
<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention</td>
<td><strong>Les décharges électrostatiques (ESD) attention</strong></td>
</tr>
<tr>
<td></td>
<td>• Respecter systématiquement les precautions relatives aux charges</td>
</tr>
<tr>
<td></td>
<td>électrostatiques durant la manipulation de cet unité.</td>
</tr>
<tr>
<td></td>
<td>• Portez toujours un poignet ou la cheville bracelet antistatique</td>
</tr>
<tr>
<td></td>
<td>préventive lors de la manipulation des composants électroniques.</td>
</tr>
<tr>
<td></td>
<td>Branchez une extrémité de la sangle à une prise ESD ou d'un</td>
</tr>
<tr>
<td></td>
<td>composant métallique non peinte sur le système.</td>
</tr>
<tr>
<td></td>
<td>• Manipulez les cartes en les faces avant et les bords seulement;</td>
</tr>
<tr>
<td></td>
<td>éviter de toucher la carte de circuit imprimé et les broches du</td>
</tr>
<tr>
<td></td>
<td>connecteur.</td>
</tr>
<tr>
<td></td>
<td>• Placer un composant retiré sur une surface antistatique ou dans</td>
</tr>
<tr>
<td></td>
<td>un sac de protection statique.</td>
</tr>
<tr>
<td></td>
<td>• Éviter tout contact entre les cartes et les vêtements.</td>
</tr>
<tr>
<td></td>
<td>• Vérifier périodiquement la valeur de résistance de la sangle</td>
</tr>
<tr>
<td></td>
<td>antistatique. Valeur recommandée est comprise entre 1 et 10</td>
</tr>
<tr>
<td></td>
<td>méga-ohms (Mohms).</td>
</tr>
<tr>
<td>Avertissement</td>
<td><strong>Rayonnement laser attention</strong></td>
</tr>
<tr>
<td></td>
<td>Rayonnement laser invisible peut être émis à partir de fibres ou</td>
</tr>
<tr>
<td></td>
<td>les connecteurs débranchés. Ne pas regarder en faisceaux ou</td>
</tr>
<tr>
<td></td>
<td>regarder directement avec des instruments optiques. Ne jamais</td>
</tr>
<tr>
<td></td>
<td>faire fonctionner une unité en cas de bris d'une fibre ou de</td>
</tr>
<tr>
<td></td>
<td>séparation d'un connecteur de fibre.</td>
</tr>
<tr>
<td>Avertissement</td>
<td><strong>Batterie au lithium manipulation instructions de sécurité</strong></td>
</tr>
<tr>
<td></td>
<td>• Perchlorate pour la Californie Consultatif: Certaines batteries</td>
</tr>
<tr>
<td></td>
<td>au lithium, peuvent contenir du perchlorate. Le texte qui suit</td>
</tr>
<tr>
<td></td>
<td>consultatif est prévu: &quot;Présence de perchlorate - une</td>
</tr>
<tr>
<td></td>
<td>manipulation spéciale peut s'appliquer, voir:</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.dtsc.ca.gov/hazardouswaste/perchlorate/">http://www.dtsc.ca.gov/hazardouswaste/perchlorate/</a> for</td>
</tr>
<tr>
<td></td>
<td>information.&quot;</td>
</tr>
<tr>
<td>Attention</td>
<td>• Il y a danger d'explosion si la batterie est remplacée de</td>
</tr>
<tr>
<td></td>
<td>manière incorrecte ou par une batterie de type incorrect.</td>
</tr>
<tr>
<td></td>
<td>• Mettre au rebut les batteries usagées conformément aux</td>
</tr>
<tr>
<td></td>
<td>instructions du fabricant.</td>
</tr>
<tr>
<td></td>
<td>• Les batteries des produits Harmonic ne peuvent pas être</td>
</tr>
<tr>
<td></td>
<td>réparées ni entretenues par l'utilisateur. Ne confier l'entretien</td>
</tr>
<tr>
<td></td>
<td>des batteries remplaçables qu'à du personnel compétent de</td>
</tr>
<tr>
<td></td>
<td>Harmonic.</td>
</tr>
</tbody>
</table>

**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.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td><strong>Installation oder den Austausch des Produkts Einheit Warnung</strong></td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet warden (siehe AS / NZS 3260 Clause 1.2.14.3 Servicepersonal)</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Lesen Sie die Installationsanweisungen, bevor Sie das System an die Stromquelle anschließen.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Der Erdanschluß muß bei der Installation der Einheit immer zuerst hergestellt und zuletzt abgetrennt werden.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Die Installation der Geräte muss den Sicherheitsstandards entsprechen.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• 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.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Verwenden Sie nur die angegebenen Ersatzteile</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• 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.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td><strong>Rack-Montage-Warnung</strong></td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>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:</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Entsprechen den lokalen Arbeitsschutzanforderungen beim Bewegen und Heben der Ausrüstung.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Stellen Sie sicher, dass die Montage des Gerätes durch mechanische Belastung Werkzeuge sollten nicht gefährlichen Bedingungen zu induzieren.</td>
</tr>
<tr>
<td><img src="image" alt="Warnung" /></td>
<td>• Um das Risiko von möglichen elektrischen Schlag zu vermeiden, muss mit einer angemessenen Erdung für Rack und jedes Gerät installiert ist implementiert werden.</td>
</tr>
<tr>
<td>Mark</td>
<td>Notes</td>
</tr>
<tr>
<td>------</td>
<td>-------</td>
</tr>
</tbody>
</table>
| ![](image) | **Chassis Warnung**  
  - Gleichstrom-Unterbrechung: Bevor Sie Erdungs- oder Stromkabel an das Chassis anschließen oder von ihm abtrennen, ist sicherzustellen, daß der Gleichstrom-Stromkreis unterbrochen ist.  
  - Um Verletzungen und Beschädigung des Chassis zu vermeiden, sollten Sie das Chassis nicht an den Henkeln auf den Elementen (wie z.B. Stromanschlüsse, Kühlungen oder Karten) heben oder kippen; oder indem Sie es unterhalb der Unterkante packen.  
  - Alle Hinweise in diesem Handbuch, die das Öffnen benötigen Sie das Gehäuse oder das Entfernen eines Board sollte nur von qualifiziertem Fachpersonal durchgeführt werden.  
### Elektroschock-Warnung

- Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten.
- Vor der Arbeit an einem Chassis für Arbeiten in der Nähe Stromversorgung, ziehen Sie das Netzkabel mit Netzeinheiten.
- Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert.
- Dieses Gerät ist über das Netzkabel Erdungsleiter geerdet. Um einen Stromschlag zu vermeiden, stecken Sie das Netzkabel in eine Steckdose richtig verdrahtet, bevor Sie das Produkt Eingang oder Ausgänge.
- Verlegen Sie Netzkabel und andere Kabel, so dass sie wahrscheinlich nicht beschädigt werden. Trennen Eingangsleistung Einheit vor der Reinigung. Verwenden Sie keine flüssigen oder Aerosolreiniger; nur mit einem feuchten Tuch zu reinigen Chassis.
- Ein Wechselstromsmodule 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.
- 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.
### Elektrostatische Entladung (ESD) Vorsicht
- Folgen Sie statische vorsorglich zu jeder Zeit beim Umgang mit diesem Gerät.
- Hand Karten nur durch die Faceplates und Kanten; Berühren Sie die bedruckte Leiterplatte und Steckerstifte.
- Legen Sie alle entfernten Komponenten auf eine antistatische Oberfläche oder in einem Statik-Beutel.
- Kontakt zwischen den Karten und Kleidung vermeiden.
- Den Widerstandswert der gegen statische Gurt in regelmäßigen Abständen überprüfen. Empfohlener Wert ist zwischen 1 und 10 Mega-Ohm (MOhm).

### Laserstrahlungen Warnung.

### Lithium-Batterie Handhabung Sicherheitshinweise

### Site preparation instructions
Make the equipment site ready for installation and use.

**NOTE:** Only trained and qualified service personnel (as defined in IEC 60950 and AS/NZS 3260) should install, replace, or service the equipment. Install the system in accordance with the U.S. National Electric Code if you are in the United States.
1. Preparing & choosing a site for installation
   ◦ To ensure normal system operation, plan your site configuration and prepare the site before installation.
   ◦ Install the unit in a restricted access area.
   ◦ Choose a site with a dry, clean, well-ventilated and air-conditioned area.
   ◦ Choose a site that maintains an ambient temperature of 32 to 104oF (0 to 40oC)

2. Creating a safe environment
   ◦ Connect AC-powered systems to grounded power outlets or as per local regulations.
   ◦ Do not move or ship equipment unless it is correctly packed in its original wrapping and shipping containers.
   ◦ Only allow Harmonic trained personnel to undertake equipment service and maintenance. Do not permit unqualified personnel to operate the unit.
   ◦ Wear ear protection when working near an NSG Pro platform for a longer period of time.

3. Rack mounting the unit
   ◦ Install the system in an open rack whenever possible. If installation in an enclosed rack is unavoidable, ensure that the rack has adequate ventilation.
   ◦ Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips). This unit should be mounted at the bottom of the rack if it is the only unit in the rack.
   ◦ When mounting this unit in the partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.
   ◦ If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.
   ◦ The rack must be anchored to an immovable support to prevent it from tipping when the unit is mounted on it. The rack must be installed according to the rack manufacturer’s instructions.
   ◦ Disconnect all power and external cables before lifting the unit. Depending on the weight of the unit, more than one person might be required to lift it.

4. Power considerations
   **Option** | **Description**
   --- | ---
   **AC power**
   ◦ Adding to the system a UPS (Uninterrupted Power Supply) and an AVR (Automated Voltage Regulator) is highly recommended.
   ◦ Installing the main power supply by a qualified electrician, according to power authority regulations. Make sure all powering are wired with an earth leakage, according to local regulations.
   ◦ It is recommended to install the encoder within 1.5m (approximately 5 feet) from an easily accessible grounded AC outlet.
   ◦ When the encoder is rack-mounted, ensure that the rack is correctly grounded.
   **DC power**
   ◦ Ensure a suitable overcurrent device is in-line between the equipment and the power source.
Option | Description
--- | ---
- | Connect DC-input power supplies only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in the UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, AS/NZS 60950-1, EN/IEC 60825-1, 21 CFR 1040, EN 60950-1, and IEC 60950-1 standards.
- | Ensure that power is removed from the DC circuit before installing or removing power supplies.

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

6. Disposing of the unit
- Dispose of the unit and its components (including batteries) as specified by all national laws and regulations.

Product end-of-life disassembly instructions

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 14.

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干扰。在这种情况下，可能需要用户采取措施，以减少干扰。

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

<table>
<thead>
<tr>
<th>Country/region</th>
<th>Testing standard/specification</th>
<th>Certification type</th>
<th>Regulatory mark name</th>
<th>Product marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country/region</td>
<td>Testing standard/specification</td>
<td>Certification type</td>
<td>Regulatory mark name</td>
<td>Product marks</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------</td>
<td>--------------------</td>
<td>----------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>USA/Canada</td>
<td>FCC CFR 47 Part 15, Class A</td>
<td>EMC</td>
<td>FCC Class A Statement</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ICES-003: Issue 5, 2012; Class A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>EN 60950-1; EN60825-1 (for laser)</td>
<td>Safety</td>
<td>GS</td>
<td>![GS]</td>
</tr>
<tr>
<td>Mexico</td>
<td>NOM-019-SCFI-1998</td>
<td>Safety</td>
<td>NOM</td>
<td>![NOM]</td>
</tr>
<tr>
<td>Taiwan</td>
<td>CNS 14336-1:2010 CNS 13438:2006; Class A</td>
<td>Safety and EMC</td>
<td>BSMI Certification (RPC) Number &amp; Class A Warning</td>
<td>![BSMI]</td>
</tr>
<tr>
<td>Japan</td>
<td>VCCI V-3/2013.04; CISPR 22:2008, Class A</td>
<td>EMC</td>
<td>VCCI</td>
<td>![VCCI]</td>
</tr>
</tbody>
</table>

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.
<table>
<thead>
<tr>
<th>Country/region</th>
<th>Testing standard/specification</th>
<th>Certification type</th>
<th>Regulatory mark name</th>
<th>Product marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia and New Zealand</td>
<td>AS/NZS CISPR22:2009 +A1.2010; Class A</td>
<td>Safety</td>
<td>C-Tick</td>
<td><img src="image1.png" alt="C-Tick" /></td>
</tr>
<tr>
<td>Korea</td>
<td>KN22 Class A and KN 24</td>
<td>EMC</td>
<td>KC</td>
<td><img src="image2.png" alt="KC" /></td>
</tr>
<tr>
<td>China</td>
<td>GB4943.1-2011 GB9254-2008 GB17625.1-2012</td>
<td>Safety and EMC</td>
<td>CCC</td>
<td><img src="image3.png" alt="CCC" /></td>
</tr>
</tbody>
</table>

**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.

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

<table>
<thead>
<tr>
<th>Restricted substance</th>
<th>Permitted limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium (Cd)</td>
<td>&lt; 0.01%</td>
</tr>
<tr>
<td>Lead (Pb)</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Chromium (VI) (Cr (VI))</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Mercury (Hg)</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Polybrominated biphenyls (PBBs)</td>
<td>&lt; 0.1%</td>
</tr>
<tr>
<td>Polybrominated diphenyl ether (PBDE)</td>
<td>&lt; 0.1%</td>
</tr>
</tbody>
</table>

EU REACH


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

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

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

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

China RoHS

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/

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1 Homogeneous material definition as per the EU Directive.
China RoHS Disclosure report

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

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.

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.

<table>
<thead>
<tr>
<th>部件名称 (Part name)</th>
<th>有毒有害物质或元素 (Hazardous substance)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>铅 (PB)</td>
</tr>
<tr>
<td>印刷线路板 (Printed circuit assemblies)</td>
<td>X</td>
</tr>
<tr>
<td>机械组件 (Mechanical subassemblies)</td>
<td>X</td>
</tr>
<tr>
<td>光学组件 (Optical subassemblies)</td>
<td>X</td>
</tr>
<tr>
<td>电源 (Power supplies)</td>
<td>X</td>
</tr>
<tr>
<td>缆线/线束 (Cables, harnesses)</td>
<td>X</td>
</tr>
<tr>
<td>屏幕/显示器 (Screens, monitors)</td>
<td>X</td>
</tr>
<tr>
<td>金属零件 (Metal parts)</td>
<td>X</td>
</tr>
<tr>
<td>塑料/发泡材料 (Plastics, foams)</td>
<td>O</td>
</tr>
<tr>
<td>电池 (Batteries)</td>
<td>O</td>
</tr>
</tbody>
</table>

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](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.