SystemManager

Release 6.9

Installation Guide

harmonic

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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*.

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In Harmonic documents, special symbols and fonts 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:

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

Table of Contents

Chapter 1

Introduction

The SystemManager application provides management capabilities for the Spectrum™, the Harmonic MediaGrid, and the Media Application Server the (MAS) systems.

The SystemManager acts as the administrative hub of an Spectrum media server installation. Its streamlined and intuitive browser-based user interface allows users to make rapid adjustments to system configurations, integrate additional components and identify fault conditions.

The SystemManager's fault reporting and alerting capabilities can head off issues before they become critical. The SystemManager provides facility wide control, as well as active monitoring and alerting.

- *SystemManager documentation suite*

SystemManager documentation suite

SystemManager documentation and software updates are available from the Harmonic website.

Contact Harmonic technical support for login information.

Documents are available in .pdf, and are packaged in the **SystemManager-v<version#>-Documentation.exe** file.

Adobe Acrobat* is needed to view the product documentation. Download this for free from

http://www.adobe.com

This document...	Provides this information...
SystemManager User Guide and Online Help System	• system configuration procedures • system operation procedures
SystemManager Installation Guide	• platform and software installation, and upgrade details
SystemManager Release Notes	• new features in the SystemManager release • last minute information regarding a product release

⚠️ **IMPORTANT:** To find instructions for configuring legacy Spectrum video servers including MediaDirector 2100 and 2200 series, ProXchange, ProBrowse, and using ClipTool, refer to the 6.4 version of the *SystemManager User Guide*.

About SystemManager platform documentation

A full documentation set for all SystemManager Platforms is shipped on a CD with each unit.

In addition, the same documentation is available on-line. You can download platform documentation from the Dell website as follows:

1. Use your web browser to navigate to the Dell* website.
2. Search for the Dell PowerEdge R230 page, and download the desired document(s).

For information on connecting to a Spectrum system, refer to the *Spectrum System Installation Guide*.

For information on connecting to an Harmonic MediaGrid, refer to the *Harmonic MediaGrid Installation Guide*.

SystemManager platform reference

SystemManager is available in a platform or a software-only configuration.

- *SystemManager platform overview*
- *SystemManager NSM-2017 and NSM-2017K platform reference*
- *SystemManager NSM-2017K keyboard/monitor tray*
- *SystemManager NSM-2017SW (software only) system requirements*
- *About anti-virus and Windows updates*
- *About the FLEXlm License Server*
- *About the web browser*

SystemManager platform overview

Find an overview of SystemManager platform options.

Table 2-1: SystemManager platform options

Model	Hardware components	Software components
NSM-2017	- Dell* PowerEdge* R230 XL - Intel* Xeon E3-1220v5 series processor 3.0 GHz, 8M Cache 8 GB DDR4 - Two 500 GB 7200 rpm SATA Hard drives - Two integrated 10/100/1000 Mbps network interface controllers (NICs)	- Windows Server 2012 R2 - SystemManager Application - FLEXlm License Server - vDHCP (Spectrum systems) - Microsoft Internet Explorer - NTP for Windows - Adobe® Reader®
NSM-2017K	Same hardware components as NSM-2017 with the addition of: 17-inch flat panel monitor - Keyboard - Mouse - Combination video/USB cable	Same software components as NSM-2017

Model	Hardware components	Software components
NSM-2017SW	This is a software only configuration.	• SystemManager Application • FLEXlm License Server • vDHCP (Spectrum systems) • NTP for Windows

SystemManager NSM-2017 and NSM-2017K platform reference

Find hardware and software reference details for SystemManager platforms.

About the NSM-2017 and NSM-2017K platforms

The NSM-2017 and NSM-2017 SystemManager Platforms are composed of both hardware and software components.

The SystemManager's hardware platform is a 1 RU Windows Server 2012 platform that features an Intel Xeon microprocessor with 8 GB of memory and two integrated 10/100/1000 Mbps network interface controllers (NICs).

In addition, the NSM-2017K is packaged with a 17" USB KMM (keyboard, mouse, and monitor) with a combination video/USB cable providing keyboard and mouse functions.

The SystemManager application is factory-installed on the platform. The application communicates with a Spectrum or Harmonic MediaGrid system over Ethernet, providing software update capability, network management, configuration, security, and fault monitoring services. The application also provides services such as DHCP and NTP.

The following applications are also factory-installed on the SystemManager platform:

- **FLEXlm License Server**: Hands out licenses found in the license folder to the SystemManager application and MediaTools. Refer to About the FLEXlm License Server for additional information.
- **vDHCP** (Spectrum systems): Used to auto configure IP addresses for units on a network.
- **Microsoft Internet Explorer** browser.
- **NTP for Windows** (Harmonic MediaGrid systems): Ensures a common time reference across components in a Harmonic MediaGrid system.
- **Acrobat® Reader®**: Allows you to view PDF documents on the Platform.

Depending on your system, you may also need to install:

- **ClipTool**: packaged with Spectrum software.
- **ContentManager** (Harmonic MediaGrid systems): packaged with Harmonic MediaGrid software.
- **Win FSD** (Harmonic MediaGrid systems): Refer to the "Software Installation" section in the *Harmonic MediaGrid Installation Guide* for detailed instructions.

📝 **NOTE:** Harmonic MediaGrid does not support the installation of any other applications not mentioned above.

Related information

SystemManager platform front panel components

The SystemManager front panel provides access to the monitor connector and other components.
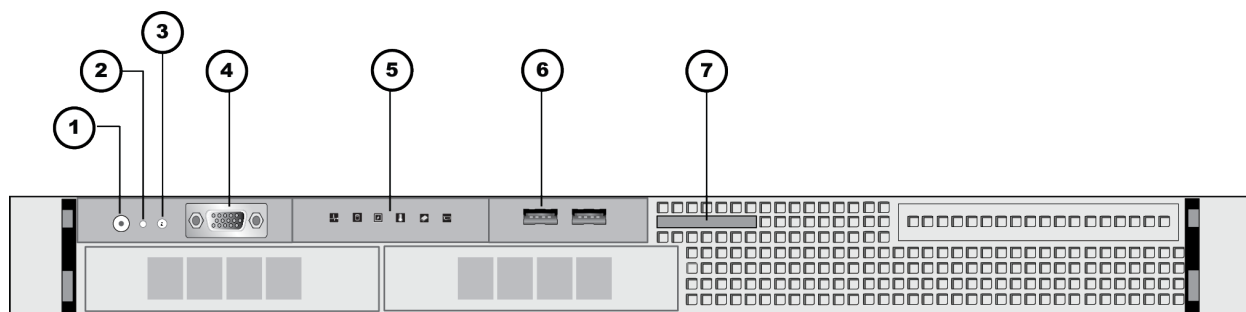
Figure 2-1: SystemManager front panel components

Key	Component	Description
1	Power on Indicator/ Power Button	The power-on indicator lights when the system power is on.
		The power button controls the DC power supply output to the system. When the system bezel is installed, the power button is not accessible.
		Note:
		• When powering on the system, the video monitor can take from several seconds to over two minutes to display an image, depending on the amount of memory installed in the system.
		• On ACPI-compliant operating systems, turning off the system using the power button causes the system to perform a graceful shutdown before power to the system is turned off.
2	NMI Button	Used to troubleshoot software and device driver errors when using certain operating systems. This button can be pressed using the end of a paper clip.
		Use this button only if directed to do so by qualified support personnel or by the operating system's documentation.
3	System Identification Button	The system identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of the buttons is pushed, the system status indicators on the front and back panels light blue until one of the buttons is pushed again.
4	Video Connector	Connects a monitor to the system.
5	Diagnostic Indicator Lights	The diagnostic indicator lights provide diagnostic information to help with troubleshooting.

Key	Component	Description
6	USB Connectors (2)	Connects USB devices to the system. The ports are USB 2.0-compliant.
7	System Identification Panel	A slide-out panel for system information including the Express Service Tag, embedded NIC MAC address, and iDRAC6 Enterprise card MAC address. Space is provided for an additional label.

SystemManager front panel diagnostic indicators

The diagnostic indicator lights on the front panel of the SystemManager platform provide diagnostic information to help with troubleshooting.

Table 2-2: Diagnostic indicators

Component	Description
Health indicator	If the system is on, and in good health, the indicator lights solid blue. The indicator blinks amber if the system is on or in standby, and any error exists (for example, a failed fan or hard drive).
Hard drive indicator	The indicator blinks green to indicate hard-drive activity
Electrical indicator	The indicator blinks amber if the system experiences an electrical error (for example, voltage out of range, or a failed power supply or voltage regulator). See the system log or system messages for the specific issue. Re-seat the power supply by removing and reinstalling it.
Temperature indicator	The indicator blinks amber if the system experiences a thermal error (for example, a temperature out of range or fan failure). Ensure that none of the following conditions exist: • A cooling fan is removed or has failed. • System cover, cooling shroud, EMI filler panel, memory-module blank, or back-filler bracket is removed. • Ambient temperature is too high. • External airflow is obstructed.

Component	Description
Memory indicator	The indicator flashes amber if a memory error occurs.
	If this occurs, check the system event log or system messages for the location of the failed memory. Re-seat the memory module.
PCI indicator	The indicator flashes amber if a PCIe card experiences an error.
	If this occurs, restart the system. Update any required drivers for the PCIe card. Reinstall the card.

SystemManager platform rear panel components

The SystemManager rear panel provides access to connectors and the power supply.
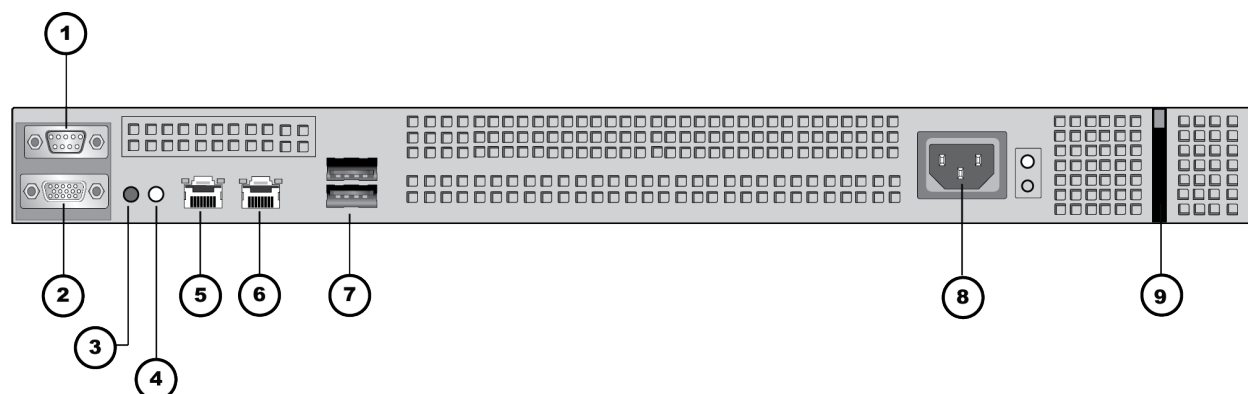
Figure 2-2: SystemManager rear panel

Key	Component	Description
1	Serial Connector	Connects a serial device to the system.
2	Video Connector	Connects a VGA display to the system.
3	System Identification Button	The system identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of the buttons is pushed, the system status indicators on the front and back panels light blue until one of the buttons is pushed again.
4	System identification connector	Connects the system status indicator assembly through the cable management arm.
5	NIC Connector 1	Embedded 10/100/1000 NIC connector

Key	Component	Description
6	NIC Connector 2	Embedded 10/100/1000 NIC connector
7	USB Connectors (2)	Connects USB devices to the system. The ports are USB 2.0-compliant.
8	Power Supply	250 W AC power supply unit
9	Retention Clip	Secures the power cable.

NIC indicators

The NIC indicators provide status information for the Ethernet connectors on the SystemManager platform.
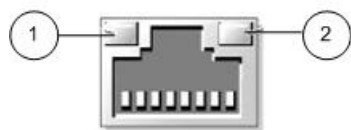
Figure 2-3: NIC indicator codes

LED	Color	Indicates
1. Link indicator	Green	The NIC is connected to a valid network at its maximum port speed (1 Gbps)
	Amber	The NIC is connected to a valid network at less than its maximum port speed.
2. Activity	Blinking Green	Data is being sent or received over the network.
Both Link and Activity Indicators are off		NIC is not connected to the network.

SystemManager NSM-2017K keyboard/monitor tray

The keyboard/monitor tray is an integrated 1 RU chassis that includes a flat-panel LCD monitor, keyboard, and touch-pad mouse.

NSM-2017K SystemManager Platforms are packaged with a 17 inch monitor. The entire tray slides out for convenient storage and operation within the equipment rack and the adjustable monitor tilts-up into place for operation.
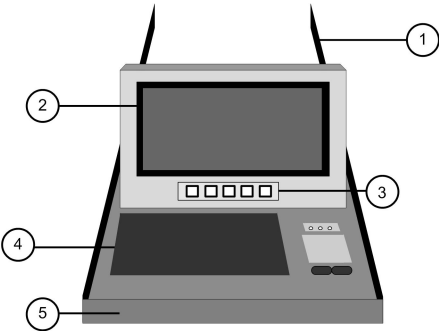
Figure 2-4: Keyboard/monitor tray components

Key	Component	Description
1	Rack rails	Two locking Rack Rails secure the Keyboard/Monitor Tray in your rack. Do not put additional weight on the tray when the Rack Rails are extended and the keyboard is in use.
2	Tilt-up LCD monitor	The Tilt-up LCD monitor provides the standard Windows user interface. The monitor is adjustable to the desired viewing angle.
3	LCD monitor controls	A set of LCD monitor controls (such as brightness, contrast, and power) is provided on the front of the Monitor case.
4	Keyboard	Provides function keys, keypad, and a touch-pad (in place of a mouse).
5	Keyboard/Monitor tray	Houses all components and cable harnesses.

SystemManager NSM-2017K keyboard/monitor unit rear panel components

Find connector descriptions for the NSM-2017K keyboard/monitor rear panel.

Figure 2-5: NSM-2017K keyboard/monitor unit rear panel components

Key	Component	Description
1	Power on/off switch	Use to power on/off the system.
2	AC In	One AC IN connector is available on the unit.

Key	Component	Description
3	Video connector	• One 15-pin "D" connector (Video/Keyboard/ Mouse) is provided for Keyboard, Monitor and Mouse functionality. Connect the Video/USB cable here. • Connections to the USB keyboard and mouse split from a single USB cable.

SystemManager NSM-2017SW (software only) system requirements

The NSM-2017SW is the software-only version of the SystemManager application, which can run on a customer-supplied client computer. Note the system requirements.

Minimum hardware requirements

The following table includes requirements for the customer-supplied client that runs SystemManager.

Operating system	Windows Server 2012 R2, Windows Server 2008 R2 Service Pack 1, Windows 7 and Adobe Flash Player* installed on a client PC
Processor	2 GHz or faster
RAM requirements	4 GB or more
Disk space	150 MB baseline, plus 20 MB more per device being monitored.
Monitor size	1024 x 768 (1280 x 1024 recommended)

📝 **NOTE:** Windows 10 is not supported at this time.

📝 **NOTE:** A Microsoft SNMP Agent must be available on your computer for system monitoring and configuration purposes. If an SNMP Agent is not found by the SystemManager installer, a warning appears and you will be unable to continue with the installation process. (See *Installing a Windows SNMP agent on page 26* for installation details.)To configure the SNMP service, refer to the Windows Help system. SystemManager will work with SNMP versions 1, 2c, and 3.

Network ports

SystemManager requires that the following network ports be available on the computer on which it is installed.

• 80
• 8080
• 162
• 111
• 27000

About anti-virus and Windows updates

Note the Harmonic guidelines for anti-virus software and Windows updates on the SystemManager platform.

The SystemManager platform is shipped with Windows Firewall turned off and with notifications for Windows Firewall disabled. In most circumstances, Windows Firewall should not be turned back on. It must not be turned on if the Harmonic MediaGrid Windows FSD product will be installed as it blocks many services and can impact the normal operation and usage of SystemManager.

Windows Updates are also turned off and notifications are disabled by default as this function needs to be managed.

As there is no anti-virus package included in the SystemManager platform software, notifications for "no anti-virus package" are also disabled. Harmonic recommends that customers routinely schedule and maintain current Windows Updates and install a basic anti-virus package to protect the system. Harmonic does not recommend installing larger anti-virus Internet security.

About the FLEXlm License Server

Macrovision's FLEXlm Manager is a Web-based software license management system that enables organizations to centrally track and manage license usage across an organization

FLEXlm allows the SystemManager application to acquire licenses to operate. It works by handing out licenses found in the license folder to each application or on a first-come-first-served basis. After all licenses are handed out, no more licenses are issued until an application or functionality is shut down and the license returned.

The FLEXlm License Server is factory-installed on the NSM-2017 and NSM-2017K. It is also installed as part of the SystemManager application installation for NSM-2017SW software-only configurations. License Files with a ".omlic" extension are emailed to customers by Harmonic on receipt of orders for applications and functionality managed by the License Server.

- Two licenses are required for a Primary and Secondary SystemManager setup; one for each SystemManager.
- Harmonic provides different types of License Files depending on the application or functionality:

  ◦ **Demo**: Available for free and allows you to use a particular MediaTool for 7 days. (The License File has a "-d" in its name.) Provided only for MediaTools.
  ◦ **Normal**: Granted by purchasing an application or functionality. The license is "floating" and allows the application or functionality to be used on any network attached PC. (The License File has a "-n" in its name.) Provided for all licensed applications and functionality.
  ◦ **Upgrade**: Allows you to upgrade from an older version of an application or functionality to a newer version. (The License File has a "-u" in its name.) Provided for all licensed applications and functionality.
- Installing a license on the SystemManager Platform does not grant support for running the application on the Platform itself. The only applications which should be installed on the NSM-2017 SystemManager Platform are:

  ◦ ClipTool (not ClipTool Pro)
  ◦ Windows FSD
  ◦ ContentManager (provided a license is available)

- Further information, including troubleshooting suggestions for FLEXlm can be found in the FLEXlm user manual available in the FLEXlm Start menu. For more information on the operation of the FLEXlm License Server, visit: *http://www.macrovision.com*.

Related information

Obtaining and installing a SystemManager License File *on page 23*

Configuring FLEXlm License Server Data using the SystemManager *on page 31*

About the web browser

The User Interface portion of SystemManager consists of a set of dynamic HTML pages which display in a web browser running on the SystemManager Platform, client PC, or on another system in the network. The SystemManager is qualified for use with the Internet Explorer versions included with the Windows operating systems listed in "SystemManager NSM-2017SW (software only) system requirements".

📝　**NOTE:** With other web browsers, most of SystemManager's features are available and usable, though some drawing and alignment issues may occur. SystemManager's UI is not supported with web browsers that do not support compatible standards for DOM, Java script, and HTML.

The User Interface is displayed in a web browser that runs on any PC connected to the SystemManager via TCP/IP, usually over Ethernet. The web browser may also be run directly on the SystemManager.

Refer to *www.microsoft.com* for installation information, user documentation, and technical support.

Installing the SystemManager platform

Install the SystemManager platform hardware.

Network configuration guidelines

Review the network guidelines before adding a SystemManager platform or client PC to a network.

Before adding a SystemManager Platform or client PC to a network, ensure network switches are in place, if needed.

⚠ **IMPORTANT:** For Harmonic MediaGrid systems: To avoid IP address conflicts, do not connect or use SystemManager, or any third-party devices, within the Harmonic MediaGrid subnets until after theHarmonic MediaGrid Configuration Assistant has completed.

Port usage

The SystemManager Platform is shipped with both network ports enabled as follows:

Port 1 = DHCP server (vDHCP) with a static IP address.

Port 2 = DHCP client.

📝 **NOTE:** If Port 2 is used, it should be connected to a different IP network than that connected to Port 1.

Before using vDHCP, configure a static IP address for the SystemManager Platform or client PC. In a Harmonic MediaGrid system, ensure that dual DHCP servers are working cooperatively so address conflicts are avoided. Refer to the Harmonic MediaGrid Installation Guide for detailed instructions on DHCP configuration.

Note the following guidelines for port usage:

- For a Spectrum-only system, use the vDHCP port (Port 1) to connect to an IP network. For a MediaDeck 7000, Harmonic recommends the use of the vDHCP service where the first port (NIC) on the SystemManager PC (platform or customer-supplied PC) has a static IP address.

- For a Harmonic MediaGrid-only network, configure the first port to be a DHCP client. Disable vDHCP and then connect Port 1 and Port 2 respectively to the switches for the A and B networks of a Harmonic MediaGrid.
- For a Harmonic MediaGrid and Spectrum network, use the vDHCP port (Port 1) to connect to an IP network. Add the Harmonic MediaGrid to the SystemManager managing the Spectrum network by connecting to a ContentDirector in theHarmonic MediaGrid system. Refer to "Connecting a Device from a Different IP Network" in the *SystemManager User Guide* for instructions.

Verify network connectivity of the SystemManager by pinging the gateway IP address.

Configuration options

Note the following options for network configuration:

- Configure the NTP service and modify vDHCP's options to pass the time service IP address on to DHCP clients.
- If not in a Windows domain, you can set the time accurately, or configure NTP to get its time reference from some other trusted time source. In a Windows domain, the Domain Controller can provide this time source.
- In a Harmonic MediaGrid network, the time reference of the ContentDirectors should come from the SystemManager, or it should come from the same place where the SystemManager gets its time reference.
- If desired, add the SystemManager to a Windows Domain.
- If desired, configure Windows Remote Desktop. Follow the instructions on the Microsoft *website*.
- For remote access by Technical Support, configure pcAnywhere. Refer to the Symantec *website* for configuration information.

Unpacking and inspecting the SystemManager platform

When you receive your SystemManager platform components, inspect the shipping cartons for signs of physical damage.

Contact your local Harmonic representative and the shipper immediately if you suspect any damage has occurred during shipping. Using the packing list, check the contents of each box to be sure that all parts are included. If any items are missing, contact your local Harmonic representative immediately.

📝 **NOTE:** When inspecting the SystemManager platform, note the service number on the service tag label located on the top of the unit or back of the units for newer models. You will need this number to access specific product information on the Dell web site.

Installation prerequisites

Review the prerequisites before installing the SystemManager platform.

Environmental

The SystemManager platform is designed to operate in normal "control room" conditions.

Power

Consult the Dell documentation CD which ships with the platform for power requirements.

When connecting each SystemManager, care must be taken to avoid power lines that are subject to noise and voltage spikes. Do not install the units on a power circuit that is common to such equipment as air conditioners and refrigeration units. An AC noise filter and surge protector are recommended if unstable power conditions are present

Site

The platform is a rack-mountable unit. Mounting holes on the front panel are set to RETMA standard spacing and will fit into any standard equipment rack with 4.45 cm (1.75 inches) of available vertical space per unit.

Installing and powering on the SystemManager platform

Follow the installation steps to install and power on the SystemManager platform.

The following diagram shows SystemManager connector names and system components.
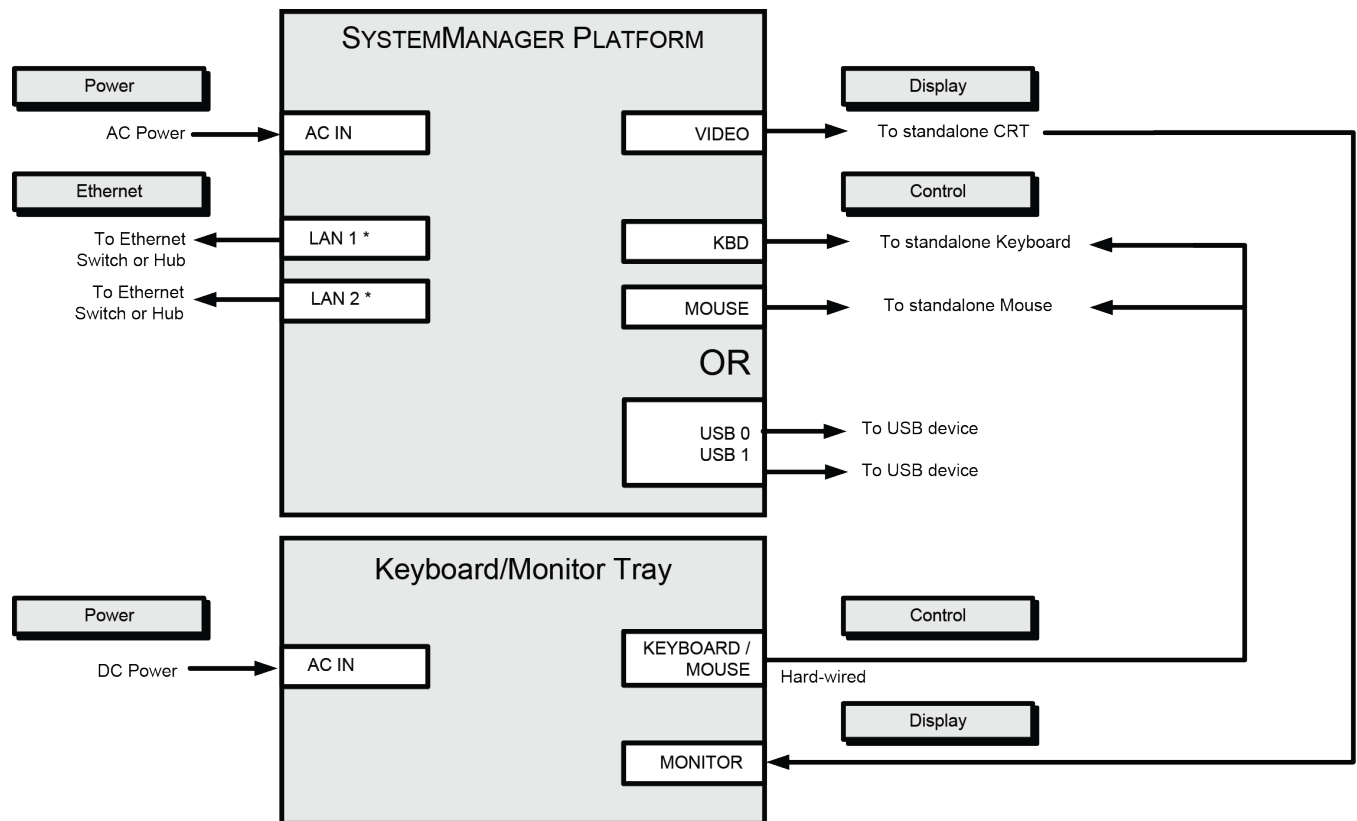

Figure 3-1: Installation block diagram

⚠ **CAUTION:** Please observe all static discharge precautions. Avoid handling the SystemManager Platform in high static environments such as carpeted areas and when synthetic fibre clothing is worn. Exercise proper grounding precautions at all times.

📝 **NOTE:** To provide optimum airflow, do not obstruct the unit's air passages.

1. Connect the Keyboard, Mouse (trackpad) and Monitor (KMM) cable to the Video connector on the rear panel of the Platform

2. Plug in the single USB cable which controls the keyboard and trackpad.

   📝 **NOTE:** Harmonic does not recommend the use of a Keyboard, Monitor, Mouse (KMM) during initial deployment or setup.

3. Turn on the Power switch(es) on the KMM unit.

4. Turn on the Power switch on the front of the SystemManager Platform (behind the front bezel).
   If the green Power LEDs do not come on (on the front of the unit), re-check all power connections.

5. Ensure that the Windows operating system boots up properly. In the Welcome to Windows dialog, press **CTRL + ALT + DEL** to continue

6. Review the EULA screen and click **Approve**.

7. Log in by typing **Administrator** as the user name and **omneon** as the password. Both entries are case sensitive. Press **Enter** to log on.

   📝 **NOTE:** Harmonic recommends you change the password from the default.

8. Modify the display resolution to 1280 x 1024 (recommended).

9. As necessary, double-click on the time in the lower right hand corner to access the Date and Time Control Panel and modify the time zone if required. The time zone is GMT by default.

10. If you have more than one SystemManager Platform in your facility (even on different IP networks), rename the unit via **System Properties** > **Computer Name** > **Computer Description**.

11. Adjust the IP setup according to your requirements. Refer to "Network configuration guidelines" for rules on port usage.

Related information

Powering down a SystemManager platform

Some maintenance or configuration procedures may require that you power down the SystemManager platform.

1. On the SystemManager Platform, exit all Windows.

2. On the desktop, click **Start** > **Shutdown** to display the Shut Down dialog.

3. In the **Shut Down Windows** dialog, ensure that "Shut down" is selected in the drop-down box, then click **OK** to shut down the system. Before proceeding, make sure the computer has turned itself off.

4. Turn off the Power switch on your Monitor.

5. Turn off the Power switch on the SystemManager Platform.

Installing the SystemManager application

The SystemManager application (SystemManager) is factory-installed on Harmonic-supplied SystemManager Platforms, or is customer-installed on customer-supplied client PCs.

To install, reinstall, or upgrade the SystemManager application on a SystemManager Platform, or a client PC, review the installation procedures in order.

- *Obtaining and installing a SystemManager License File*
- *Downloading software updates*
- *Verifying that the SNMP service is running*
- *Installing .NET Framework 3.5 (Windows Server 2012 only)*
- *About installing vDHCP from the SystemManager SystemManager installer*
- *Installing, reinstalling, or upgrading SystemManager software*
- *Installing Java Runtime Environment*
- *Configuring FLEXlm License Server Data using the SystemManager*

Obtaining and installing a SystemManager License File

You must have a valid License File managed by a FLEXlm License Server installed on the SystemManager platform or client PC to run the SystemManager application.

The NSM-2017/NSM-2017K SystemManager platforms ship with the FLEXlm License Server installed; all you need to do is obtain a License File from Harmonic and install to the D:\Licenses directory on the unit. Depending on your order, the License File may already be installed on the unit. To check if your unit already has a License File installed, go to the C:\Licenses or the D:\Licenses directory.

📝 **NOTE:** D:\ Licenses is the default directory. The directory in which your license is installed may differ.

For the software-only SystemManager (NSM-2017SW), the FLEXlm License Server is installed by default during the installation process. You must obtain and install the License File according to the following instructions.

1. Identify the MAC address for the computer on which SystemManager will be installed:
   a. Open a Command Prompt session, by clicking **Start** > **Run**. Type **cmd**, and then click **OK**.
   b. From the Command Prompt, type **ipconfig/all**, and then press **Enter**.
   c. Locate the numbers identified as the Physical Address. This is the MAC address. Note that there may be more than one.

2. Email your MAC address, sales order number (located on the packing list), and contact and mailing information to zLicense@harmonicinc.com.

3. Harmonic will send the license file to you via email. Save the attached file to your hard drive and create a backup copy of the license file in a safe place (for example, in a network file server backed up on a regular basis).

4. Install the License File as follows.

    a. Create a Licenses folder at the root level of the same drive on which you will install the SystemManager software (for example, C:\Licenses or D:\Licenses).
    b. Copy the license file to the Licenses folder. When you install SystemManager, the installer will automatically locate the license file.

Related information

Downloading software updates

Before you install, reinstall, or upgrade SystemManager, make sure you have downloaded the software.

Before you begin

Ensure that your SystemManager Platform or client PC is connected to the Internet.

1. Contact Harmonic technical support for login information to download software updates from the Harmonic website.

2. Locate and download the files for your system.

Option	Description
SystemManager	◦ SystemManager-v<version#>-Documentation.exe ◦ SystemManager-v<version#>-Software.exe ◦ jre-6-windows-i586.exe
Spectrum	◦ Spectrum-v<version#>-Software.zip ◦ Spectrum-v<version#>-Documentation.exe ◦ HarmonicTemplatesAndTools-v<version#>-SWandDoc.exe
Harmonic MediaGrid	◦ Harmonic-MediaGrid-v<version#>-Software.exe ◦ Harmonic-MediaGrid-v<version#>-Documentation.exe 📝 **NOTE:** Harmonic recommends you do not download the Harmonic MediaGrid server files unless you have an Harmonic MediaGrid and you wish to upgrade to the latest version. See the *Harmonic MediaGrid Installation Guide* for installation details.
Media Application Server	◦ MAS-v<version#>-Documentation.exe ◦ MAS-v<version#>-Software.exe

Option	Description
	📝 **NOTE:** Harmonic recommends you do not download the MAS system files unless you have a MAS system and you wish to upgrade to the latest version.

3. Download the required files.

    a. Right-click on the specific file(s) that you want to download. For each release, you should download the both the release file and the documentation files.

    b. Choose **Save Target As**, and then select a directory in which to save the file.

What to do next

Once you have finished installing the SystemManager software, upgrade your system components via the SystemManager application.

*   For Spectrum systems, refer to the "Upgrade Firmware" section in the *Spectrum System Installation Guide* for step by step instructions.
*   For Harmonic MediaGrid systems, refer to "Upgrading Harmonic MediaGrid Firmware" in the *SystemManager User Guide* for step by step instructions.
*   For MAS systems, refer to "Software Upgrade and Reinstallation" in the *Media Application Server Installation and Configuration Guide* for detailed instructions.

Verifying that the SNMP service is running

Verify that the Windows SNMP agent is installed and running. An SNMP Agent must be available on your client PC for system monitoring and configuration purposes.

Note that SystemManager Platforms ship with SNMP Agents already installed.

⚠️ **IMPORTANT:** A Microsoft SNMP Agent must be available on your computer for system monitoring and configuration purposes. If an SNMP Agent is not found by the SystemManager installer, a warning appears and you will be unable to continue with the installation process.

📝 **NOTE:** The following instructions apply to Windows Server 2012. For other Windows versions, steps may vary. Consult Windows documentation for assistance.

1. Open the Windows Services dialog box. Navigate to **Administrative Tools**, and then double-click **Services**.

2. Locate **SNMP Service** and verify that the Status is set to **Running** and the Startup Type is set to **Automatic**. If necessary, double click SNMP Service to modify its properties. If the SNMP Service is not available, then install the SNMP Agent as described in .

3. Locate **SNMP Trap** and verify that the Status is NOT **Running** and that the Startup Type is set to **Manual** or **Disabled**. If necessary, double click **SNMP Trap Service** to stop the service.

6.9 Installation Guide

Installing a Windows SNMP agent

Follow these steps to install a Windows SNMP agent on a SystemManager client PC. Note that SystemManager will work with SNMP versions 1, 2c, and 3.

📝 **NOTE:** The following instructions apply to Windows Server 2012. For other Windows versions, steps may vary. Consult Windows documentation for assistance.

📝 **NOTE:** The SNMP agent comes pre-installed on the SystemManager Platforms provided by Harmonic. If you are using a SystemManager Platform, do not perform the following steps unless you are re-installing the SNMP agent.

1. Log in as Administrator, or as a user account that has been given administrative permissions on the SystemManager client PC

2. In Windows, navigate to the **Control Panel**, and then click **Programs and Features** > **Turn Windows features on or off**.
The **Server Manager** dialog and **Add Roles and Features** wizard appears.

3. Click **Next** four times to open the **Features** tab. From the **Features** tab, scroll down to **SNMP Service**.
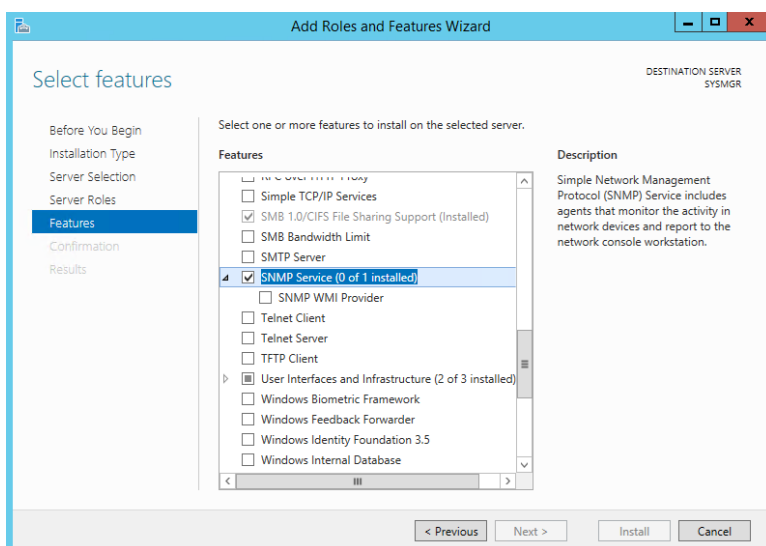

4. Select **SNMP Service**, and then click **Next**. When the confirmation dialog appears, click **Install**.

5. When the installation is complete, Windows requires a restart for the changes to take effect. Click **Restart Now** to restart.

Installing .NET Framework 3.5 (Windows Server 2012 only)

For Windows Server 2012, make sure to install .NET Framework 3.5 before running the SystemManager installer. Otherwise, the installation may not complete.

1. In Windows, navigate to the **Control Panel** and click **Programs and Features** > **Turn Windows features on or off**.

The **Server Manager** dialog and **Add Roles and Features** wizard appears.

2. From the **Add Roles and Features** wizard, click **Next** four times to open the **Features** tab.

3. From the **Features** tab, select **.NET Framework 3.5 (includes .NET 2.0 and 3.0)**, and click **Install**.

4. Follow the on-screen instructions to install .NET Framework 3.5.

   ⚠ **IMPORTANT:** Make sure to select **Restart the destination server automatically**. Otherwise, the installation may fail.
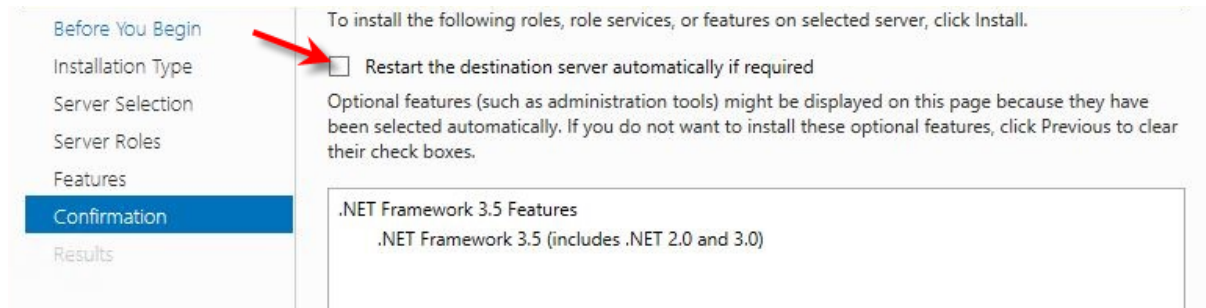
5. Once the installation completes, click **Close** to exit the wizard.
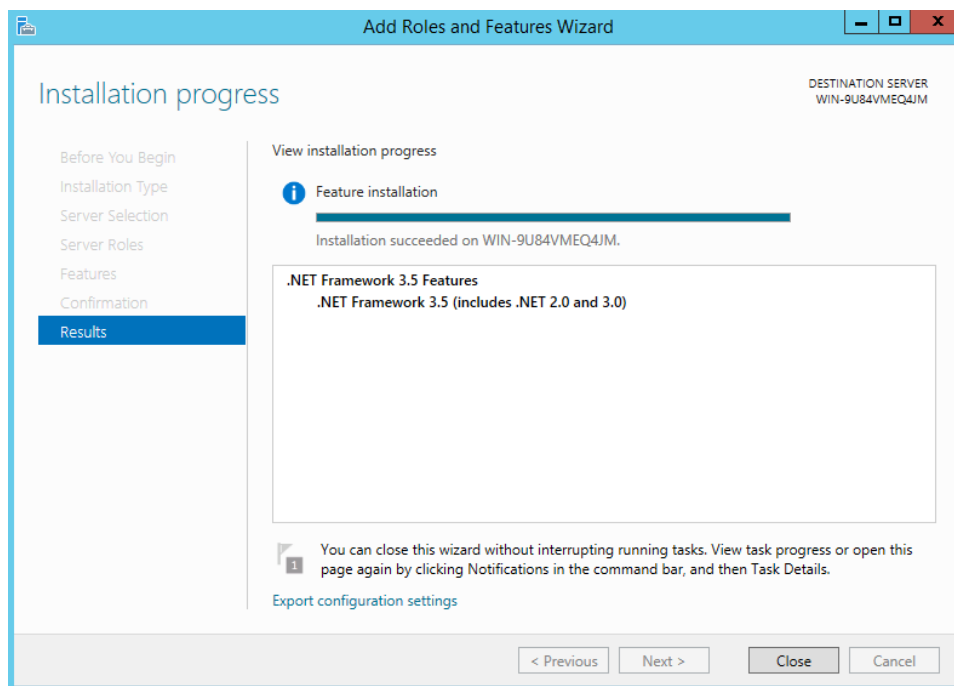
About installing vDHCP from the SystemManager SystemManager installer

vDHCP is a DHCP (Dynamic Host Configuration Protocol) server for Windows, and is included in the SystemManager installer as an optional component.

If you already have a working DHCP service installed on either a SystemManager platform or another device in your subnet, do not install vDHCP from the SystemManager installer. If you are installing a Spectrum system and do not have a DHCP server on your network, Harmonic recommends that you install vDHCP so IP addresses can be automatically configured on your network.

If you do select to install vDCHP during the SystemManager application installation process, and vDHCP is not already installed on the SystemManager Platform or client PC, vDCHP will be installed, the service will commence briefly and then be disabled once the SystemManager application installation process is completed.

Installing, reinstalling, or upgrading SystemManager software

Follow the installation steps to install, reinstall, or upgrade the SystemManager application.

📋 **NOTE:** Before upgrading to the latest version of software, check with your automation, archival, and third party software vendors for compatibility information.

📋 **NOTE:** Some steps may vary depending on your Windows operating system.

Before you begin

Ensure that your SystemManager Platform or client PC is connected to the Internet.

1. On your SystemManager Platform or client PC, exit all Windows programs at this point, particularly any Harmonic utilities.

2. If you are reinstalling or upgrading from a version of SystemManager, remove the existing SystemManager application otherwise continue to the next step. To remove SystemManager:

   a. Open the **Add/Remove Programs** dialog box in Windows, click **Change or Remove Programs**, and select **SystemManager** from the Installed Programs column.

   b. Click **Change/Remove**, and then click **Yes** to confirm the removal of the SystemManager application.

   c. Click **OK** to exit the **Add/Remove Programs** dialog box.

   d. Restart the SystemManager Platform or client PC to ensure the old version is completely uninstalled.

3. Navigate to the directory into which you downloaded the release files and double-click **SystemManager-v<version#>-Software.exe** to commence installation. An InstallShield wizard appears.

```
WinZip Self-Extractor -    SystemManager-v6.6.999.94-Soft...

    Harmonic, Inc - SystemManager Installer              Setup
    --------------------
    Click Setup to continue with installation...          Cancel

                                                          About
```
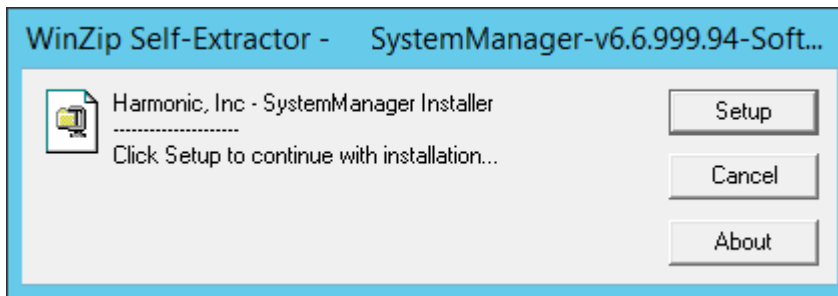
> 📝 **NOTE:** If a Windows SNMP Agent is not found by the SystemManager installer, an error message appears and you will be unable to continue with the installation process. For installation instructions, refer to *Installing a Windows SNMP agent on page 26*.

4. Click **Setup** to proceed to the **Welcome** dialog box, click **Next** to review the system requirements, and then click **Yes** to display and accept the License Agreement.

5. In the **Customer Information** dialog box, enter the **User Name** and**Company Name** in the appropriate fields, and then click **Next** to display the Choose Destination dialog box.

6. The default destination is D:\Omneon if a D drive exists. Otherwise, the default directory is C. Leave the default destination directory at D:\Omneon (recommended) or click **Browse** and select a different destination, and then click **Next**.

7. On the **Select Features** dialog box, note the following important points:

   ◦ If you have an existing installation in which a SystemManager Platform or a client PC manages Spectrum or Harmonic MediaGrid systems, accept the default settings.
   ◦ If you have a new installation with Harmonic MediaGrid systems, do not install vDHCP.
   ◦ If you are installing a Spectrum system and do not have a DHCP server on your network, Harmonic recommends that you install vDHCP so IP addresses can be automatically configured on your network.
   ◦ FLEXlm License Server is needed to hand out licenses for running the SystemManager application. Harmonic recommends using the same MAC address (same unit) for running the License Server and the SystemManager application.

   > 📝 **NOTE:** If you intend to install vDHCP, Harmonic recommends you unplug the network cable attached to the SystemManager Platform or client PC. Failure to unplug the cable could result in network problems as the vDHCP service will be running before the service is configured. Once the SystemManager installation process is completed, you can reattach the network cable and configure vDHCP.
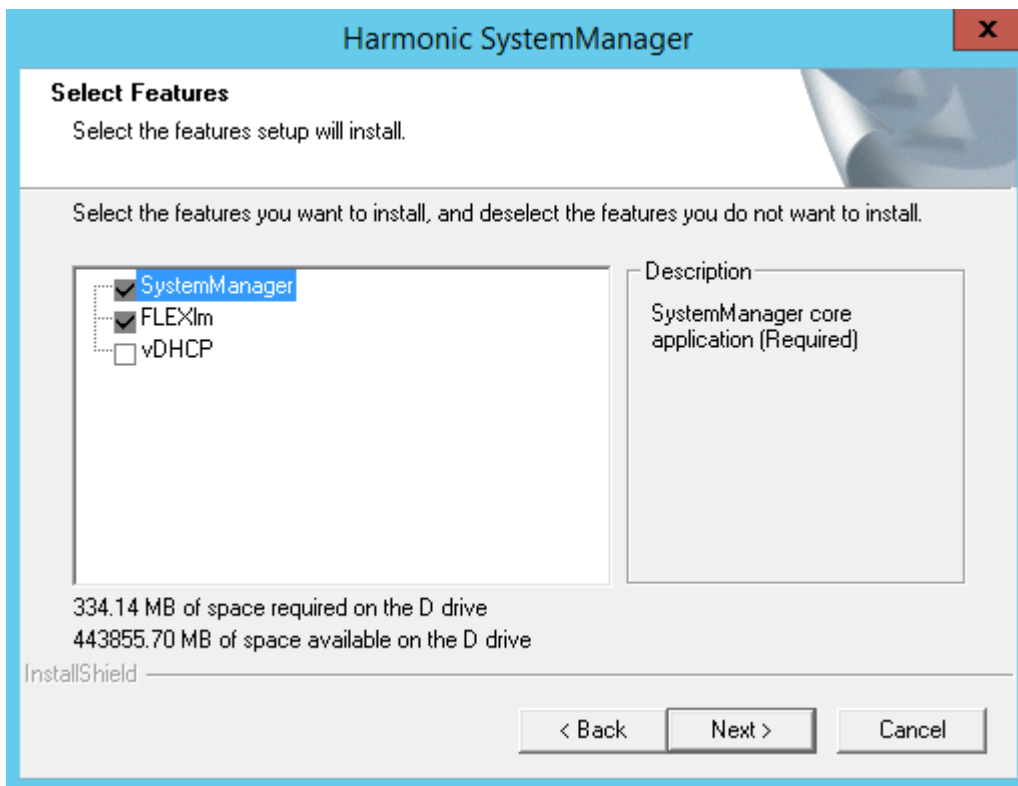
8. Click **Next** to display the **Review Settings** dialog box.

9. Click **Next** to begin copying the files. After a few moments, the **InstallShield Status** dialog box opens and begins to copying your files.

10. Follow the on-screen recommendations for installing FLEXlm.

   a. Leave the default destination directory at **C:\Program Files\FLEXlm** (recommended) or click **Browse** and select a different destination.

   b. On the **Choose License Folder** dialog box, make sure the path shown under **Destination Folder** matches the location of the Licenses folder you created when you obtained the License File.

   c. Click **Next** to continue through the FlexLM installation, select a program folder, copy files, complete the setup, and review the Readme.txt file.

11. Click **Finish** to complete the SystemManager installation.

Installing Java Runtime Environment

Java Runtime Environment (JRE) is required for some SystemManager and Harmonic MediaGrid switch functionality.

1. From the SystemManager software download package, double-click on the file: **jre-6-windows-i586.exe**.

2. Follow the on-screen instructions to complete the typical installation.
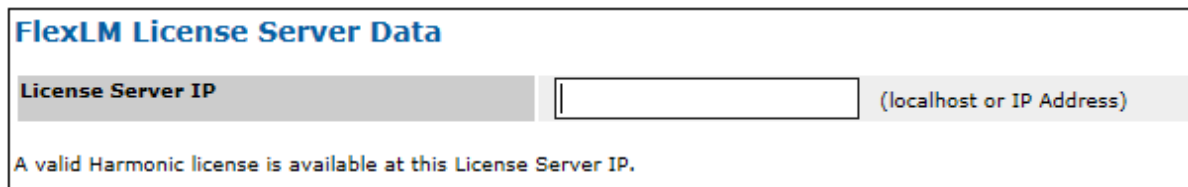
Configuring FLEXlm License Server Data using the SystemManager

Once you have installed a valid License File on the SystemManager Platform or client PC, you must configure the License Server Data.

1. Start the License Server as follows.
    a. In Windows, choose **Start** > **All Programs** > **FLEXlm** > **LM Tools**. The License Manager Tools utility launches.
    b. Click the **Start/Stop/Reread** tab.
    c. Click the **Start Server** button.
    d. Click the **X** button to close the **LM Tools** window.

2. Ensure the FLEXlm Service is running as follows.
    a. In Windows, choose **Start** > **Control Panel** > **Administrative Tools** > **Services**.
    b. Under **Name**, double-click **FLEXlm License Manager**.
    c. In the **Startup Type** menu, ensure **Automatic** is selected.
    d. Ensure that the **Service Status** is **Started**.

6.9 Installation Guide
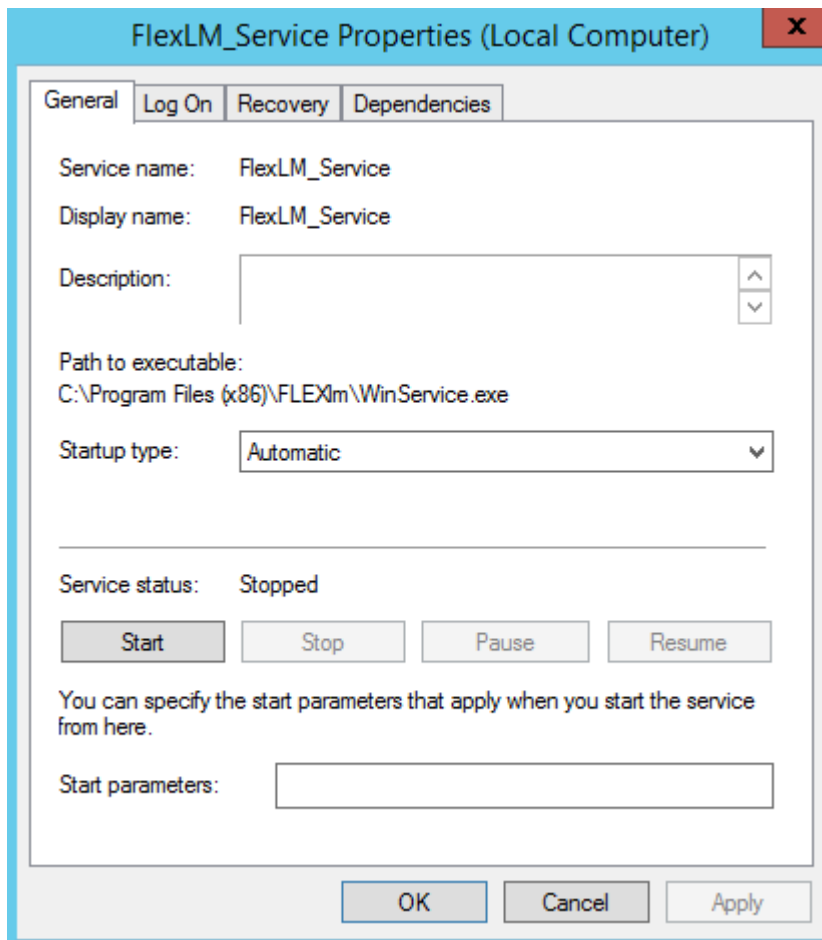
     e.   Click **OK**.

3.   Log on to the SystemManager application and navigate to **Home** > **Options**.

4.   In the **FLEXlm License Server Data** section, enter the IP address for the SystemManager unit where the valid License File is installed.
If the license is on the local SystemManager, you can launch the SystemManager from that PC and enter localhost in the server data field.

FlexLM License Server Data

License Server IP		(localhost or IP Address)

A valid Harmonic license is available at this License Server IP.

5.   Click **Update**. If a valid License File is found at the specified location, the SystemManager GUI becomes fully usable. The IP address is saved as the default License Server for future SystemManager sessions.
Refer to "About the FLEXlm License Server" for general information about using FLEXlm for licensing Harmonic products.

Related information

Logging in to the SystemManager application *on page 33*
About the FLEXlm License Server *on page 17*

SystemManager configuration

Log in and configure your SystemManager.

Logging in to the SystemManager application

Log on to SystemManager using the Internet Explorer browser to control Harmonic devices from both local and remote computers.

The SystemManager application does not have to be installed on the local or remote PC in order to log on.

1. From your SystemManager Platform or client PC, double click the **Internet Explorer** icon to launch Internet Explorer.

2. If the **SystemManager Login** dialog does not appear automatically, there are two different ways to log in, depending upon the computer's location:

   - For the SystemManager Platform or client-PC itself, in the address bar, type: http://localhost/, and then press **Enter**.
   - For any other PC, in the address bar type the name (or IP address) of the SystemManager Platform, and then press **Enter**. This name (or address) can be obtained from your system administrator. For example, http://Managerpc/

3. Press **Enter** to display the SystemManager Log In window.

4. From the Log In window, click **Log In** to display the **Enter Network Password** dialog.
   a. Enter the user name: **Administrator**
   b. Enter the password (case sensitive): **omneon**

5. Click **OK** to display the **Configuration** tab. The **Spectrum - System Diagram** page is displayed by default.).

Synchronizing clocks on Spectrum video servers and the SystemManager

Synchronize the clocks on all Harmonic products to keep time stamps consistent.

Each Spectrum video server host maintains a time-of-day clock that is used to generate timestamps on files and log messages. This clock is different from the video reference signal connected to the Spectrum video server's reference connector. These time-of-day clocks may drift in relation to each other if they are not synchronized to a central source.

The following procedure may be used for clock synchronization purposes. Once synchronized, the time-of-day clocks on all Harmonic products will keep time stamps consistent. This is recommended practice for any Harmonic installation, but particularly important in an EFS SystemManager Platform. This procedure also configures the vDHCP server to grant leases to the Spectrum video server to expect NTP service from the SystemManager Platform.

1. Configure the Windows Time service in Windows to use an internal hardware clock and an external time source. See "Configuring NTP."

2. Add an entry to vDHCP so that Spectrum video servers are instructed to get time from the SystemManager's NTP server.

3. Open the vDHCP application.

4. Highlight existing leases one at a time, and verify that they will not expire in the next few minutes while completing steps 12 through 16. Unless lease duration has been previously changed to a very short time from the factory default, this should not be an issue, as leases are normally renewed halfway through the lease duration as configured in the General tab.

5. Close vDHCP if it is currently running (make sure you shut down the whole program, not just the settings window, best done by stopping the service in Windows Services.

6. Open the VDHCP.INI file in C:\Program Files\vdhcp by using a text editor (for example, Notepad).

7. Add the following lines to the end of the file (unless they already exist in the file; all options should be together under one Options entry). This example assumes the client PC on which the SystemManager is installed has an IP address of 172.16.1.10 (please substitute the actual IP address).

    ```
    [OPTIONS]
    MaxOptions=100
    Option42=I172.16.1.10
    ```

8. Save and close the VDHCP.INI file.

9. Restart vDHCP in Windows Services.

10. Check and set the client PC's date and time clock to the correct time (lower right corner of the desktop).

11. Reboot the Spectrum video server(s) to get new DHCP leases for each host. The leases should now include the client PC's IP address as an NTP server; this may be verified in the video server's monitor log following the reboot.

Result:

The Spectrum video server hosts will update their time-of-day clocks from the client PC's clock periodically (currently, this period is every 11 minutes).

Configuring NTP

To configure the NTP settings, use the Local Group Policy Editor in Windows.

1. To open the Local Group Policy Editor, click **Start**, type **gpedit.msc** in the **Start Search** box, and then press **ENTER**.

2. From the left-hand column, click **Administrative Templates** > **System** > **Windows Time Service** > **Time Providers** as shown in the following figure.
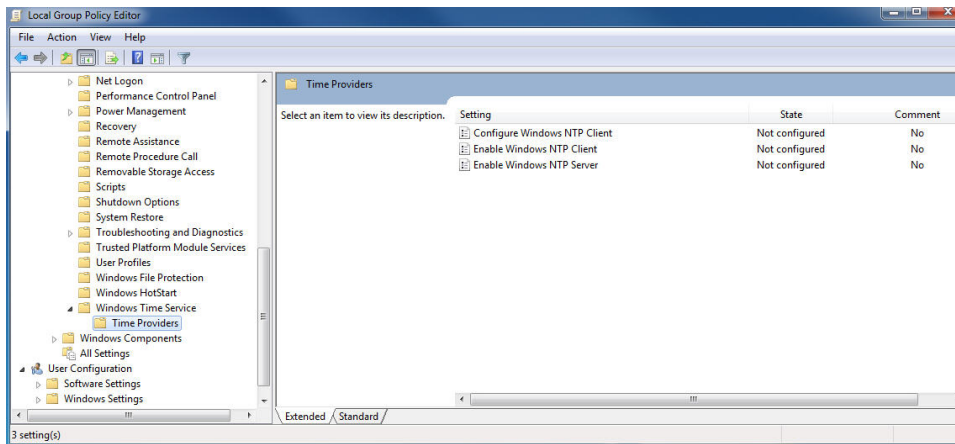
3. Enable the Windows NTP client.
   a. Double-click **Enable Windows NTP Client**.
   b. From the Enable Windows NTP Server dialog, select **Enabled**, and then click **OK**.

4. Enable the Windows NTP server.
   a. Double-click **Enable Windows NTP Server**.
   b. From the Enable Windows NTP Server dialog, select **Enabled**, and then click **OK**.

5. Configure the Windows NTP client.
   a. Double-click **Configure Windows NTP Client**.
   b. From the **Configure Windows NTP Client** dialog, select **Enabled**, and then enter a value for your NTP Server in the **NtpServer** field, as described in the adjacent Help window.
   c. From the **Type** drop-don menu, select **NTP**. Note that NTP is not the default option. Click **OK**.
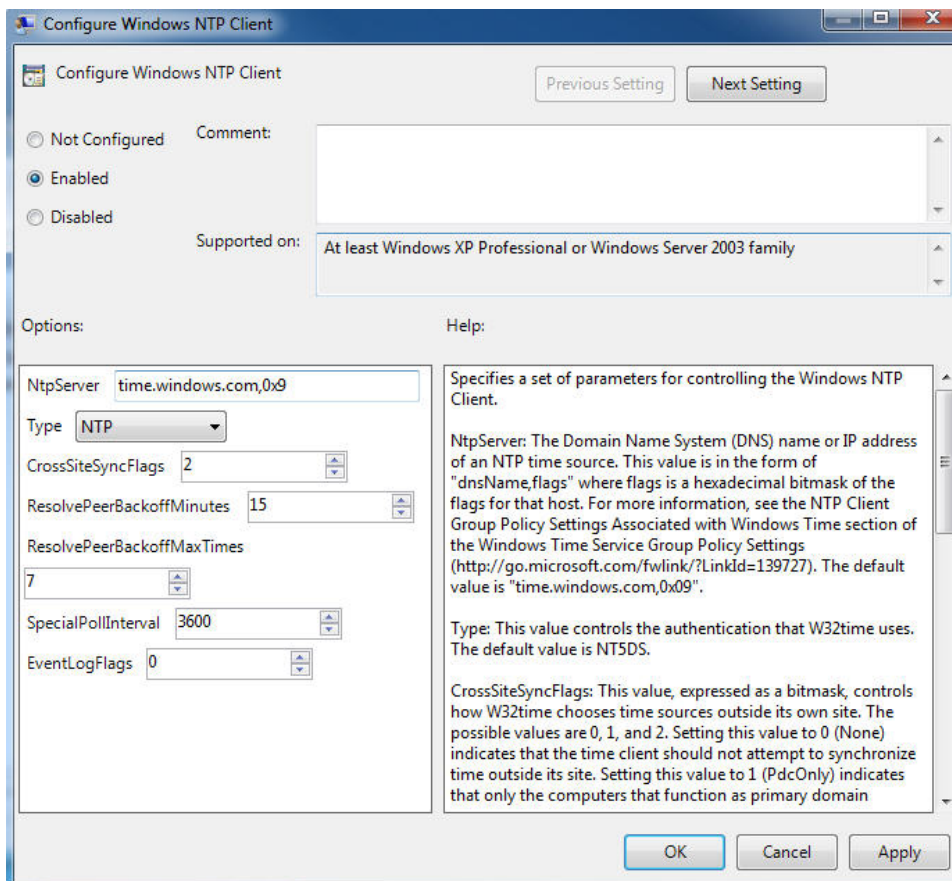
6. Verify that the **Local Group Policy Editor** shows all three NTP settings are **Enabled**, as shown in the following figure.
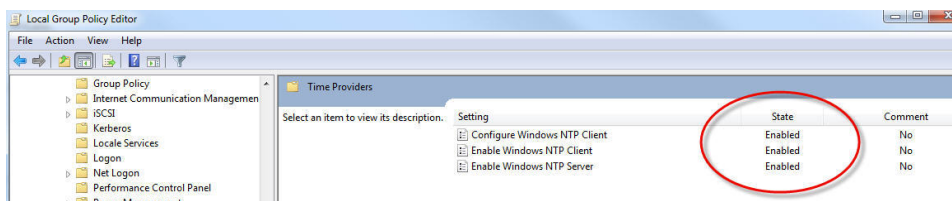
7. Verify that the Windows Time service is started.
    a. Click the **Start** button, type **services.msc** in the **Search** box, and then press **ENTER**.
    b. In the **Services** dialog, scroll down to **Windows Time**.
    c. Verify the status is **Started**. If the status shows Stopped, double-click **Windows Time**, set the Startup type to **Automatic**, click **Start**, and then click **OK**.
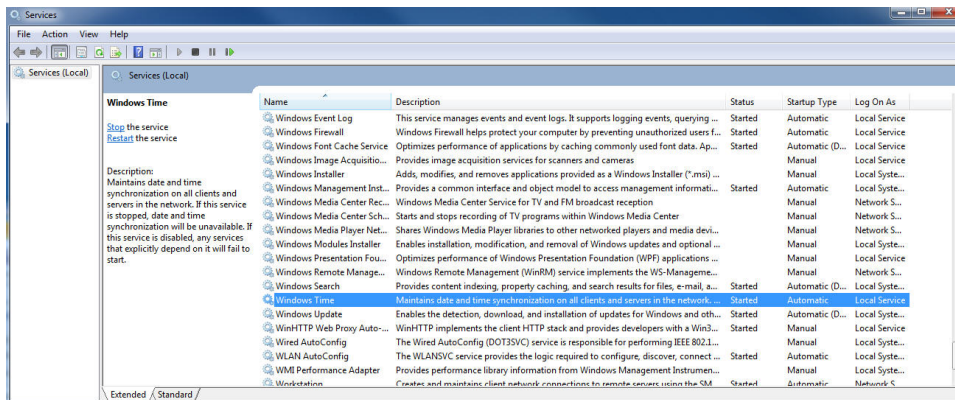
Hot standby configuration

Configure a hot standby SystemManager to ensure that management operations will continue in the event that the primary SystemManager fails.

About configuring a hot standby SystemManager

A hot standby SystemManager takes over operations if the primary SystemManager fails.

When you configure a Hot Standby SystemManager, you specify a SystemManager Platform that can assume operations if the primary SystemManager fails. Once configured, the Hot Standby, or backup SystemManager detects the failure of a primary SystemManager, and takes over monitoring functions — using the last saved database file from the primary SystemManager. Note that this leaves a window of time, approximately 20 minutes long (depending on the backup database save interval), during which changes made on the primary SystemManager may not be reflected in the backup SystemManager. To use the backup SystemManager, point your web browser to the backup SystemManager's IP address. This will allow you to use the backup to continue device configuration and monitoring.

To use this feature, you need to perform several post-installation procedures, before starting the primary and backup SystemManagers.

NOTE: Procedures relating to configuring a Hot Standby SystemManager are designed for qualified technical personnel, skilled at advanced networking procedures. If you have any questions, please consult with your facility's Information Service staff or contact Technical Support.

NOTE: A valid license is required to operate the SystemManager application on either a SystemManager Platform or a customer-supplied PC. You will need two licenses; one for the primary SystemManager and one for the backup SystemManager. Refer to "Obtaining and Installing a SystemManager License File" for detailed instructions on obtaining and installing a license file for use on the SystemManager platform.

Two SystemManagers can be installed in a Hot Standby configuration, with one being the primary and the other being a backup. Hot Standby configurations require two elements.

The first element is the transfer of database information from the primary to the backup. This is accomplished by mounting the database directory of the backup SystemManager on the primary SystemManager as shown in the following figure.
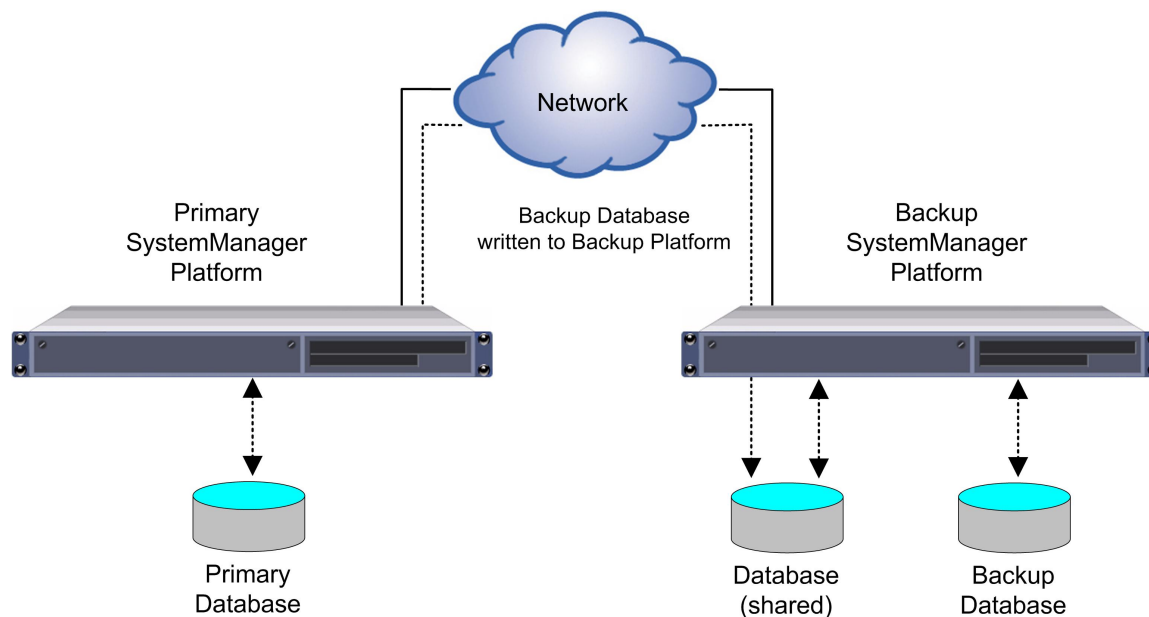
6.9 Installation Guide

Figure 5-1: Hot standby configuration

The primary is then configured to write its backup database to the backup's disk. This ensures that when the backup takes over from the primary, it will use information from the last database backup.

The second element is monitoring the primary to detect failures. The backup is configured to check the status of the primary. Instead of starting immediately, the backup enters standby state, where it waits until it detects a problem in the primary. If a problem is detected, the backup then completes startup and operates as a normal SystemManager.

When creating a Hot Standby configuration, Harmonic recommends that you do not use either SystemManager Platform to supply DHCP (or DNS) service. DHCP service should be supplied by your facility's IT infrastructure, and both SystemManager Platforms should be given DHCP reservations. Additionally, giving DNS names to the SystemManager Platforms will also make operations easier. DNS names for SystemManager Platforms must be unique to avoid Windows name conflicts. Recommended SystemManager Platform names (in the DHCP server) are "PrimaryMgr" and "BackupMgr."

Configuring a hot standby SystemManager

To configure a primary or backup SystemManager, you must have Administrator user privileges for the Windows OS (note that this is not related to SystemManager Administrator privileges or login name).

The factory-configured user account name to access Windows on the SystemManager Platform is "Administrator" with "omneon" set as the default password.

The following procedures refer to this user account name and password. If you change the Administrator level account name or password, replace "Administrator" and "omneon" with the new account name and password.

> **NOTE:** This procedure is designed for qualified technical personnel, skilled at advanced networking procedures. If you have any questions, please consult with your facility's Information Service staff or contact Technical Support.

1. Install the SystemManager software on both Platforms. Do *not* start the "SystemManager" service yet on either Platform.

2. Edit the **httpd.conf** file on the primary SystemManager Platform using a text editor (such as Notepad). The file is typically in **D:\Omenon\Apache\conf\...** as follows.

   a. Save a copy of the original httpd.conf file for future reference.

   b. Find the line with the field **OmneonManagerDatabaseBackupPath**, which may look like: `OmneonManagerDatabaseBackupPath "D:/BackupOmdb/manager"`

   c. Enter the UNC path for the manager.ODA file on the backup SystemManager in the following format:

   ```
   \\<IP address or host name for backup SystemManager>\manager\omdb\manager
   ```

3. On the backup SystemManager, edit the httpd.conf file using a text editor. As before, this file is typically in **D:\Omneon\Apache\conf\...**. Edit as follows.

   a. Find the line with the field **OmneonManagerHotStandby**, which may look like: `# OmneonManagerHotStandby "primarymgr.omneon.com"`

   b. Remove the '**#**' comment symbol, and modify the text in quotes to contain the DNS name or IP address of the primary SystemManager. For example: `OmneonManagerHotStandby "PrimaryMgr"`

   c. Save the configuration file and exit the text editor.

4. Start the "SystemManager" service on the primary SystemManager Platform as follows.

   a. Reboot the primary SystemManager Platform. The SystemManager and SNMP services start automatically.

   b. Verify that the SystemManager is running by logging in.

   c. Verify that all Spectrum video servers and I/O modules are connected and stable.

5. Start the "SystemManager" service on the backup SystemManager Platform as follows.

   a. Reboot the backup SystemManager Platform. SystemManager and SNMP services start automatically.

   b. Verify that the SystemManager is running in the **Hot Standby Mode** by attempting to login. At this point, attempts to log into the backup SystemManager (with Internet Explorer) will fail. This is expected.

Result:

This completes the configuration procedure.

Related information

Returning the primary SystemManager to operation

Once the issues preventing operation of the primary SystemManager have been resolved, switch operation back to the primary SystemManager and place the backup into standby mode again.

1. Verify that the "SystemManager" service on the primary SystemManager Platform is not running. If it is running, stop the service.

2. Stop the "SystemManager" service on the backup SystemManager Platform.

3. Copy the Manager database file "manager.oda" from the backup SystemManager Platform to the primary SystemManager Platform. Place the file at "D:\Omneon\Manager\Omdb\manager.oda" on both SystemManager Platforms.

4. Start the "SystemManager" service on the primary SystemManager Platform.

5. Verify that the SystemManager application is running by logging in.

6. Any files in the backup SystemManager D:\BackupOmdb directory should be deleted.

7. Start the "SystemManager" service on the backup SystemManager Platform.

Result:

The primary SystemManager is now ready for use again, and the backup Platform is primed in "Hot Standby" mode, ready to take over if problems occur.

Upgrading or re-installing software on the primary or backup SystemManager

You may need to upgrade or re-install software on a primary or backup SystemManager.

Before uninstalling the old software, stop the SystemManager and SNMP services on the backup Platform first and then on the primary Platform. This order prevents the backup Platform from taking over when the primary SystemManager services stop.

1. Stop the "SystemManager" service as follows.
   a. Click **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Services**
   b. Right-click **SystemManager**, and then click **Stop**.

2. Stop the SNMP service as follows.
   a. Click **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Services**.
   b. Right-click **SystemManager**, and then click **Stop**.

3. Make a copy of the "httpd.conf" file on both SystemManager Platforms. Put each copy in a separate folder, for example, "D:\Temp\".

4. Uninstall SystemManager from both SystemManager Platforms as follows.
   a. Click **Start** > **Settings** > **Control Panel** > **Add/Remove Programs**.
   b. Select **SystemManager**, and click **Change/Remove**. The removal process starts.
   c. When a dialog appears, click **OK**.
   d. Reboot both SystemManager Platforms.
   e. Stop SNMP services on both Platforms.

5. Install new SystemManager software on both Platforms.

   > 📝 **NOTE:** The primary and backup SystemManagers must have the same software version installed.

6. On the primary SystemManager Platform, edit the httpd.conf file using a text editor such as Notepad. This file is typically in **D:\Omneon|Apache\conf\....** Do not copy the old httpd.conf file onto new installations since the template for httpd.conf changes from time to time. Edit the file as follows.
   a. Locate the line with the field **OmneonManagerDatabaseBackupPath** which usually appears as:
      `OmneonManagerDatabaseBackupPath "D:/BackupOmdb/manager"`
   b. Change the line to point to the network drive as configured in the httpd.conf file as saved from the previous version on the primary SystemManager.
   c. Save the configuration file and exit from the text editor.

7. On the backup SystemManager Platform, edit the httpd.conf file using a text editor such as Notepad. This file is typically in D:\Omneon\Apache\conf\httpd.conf. Do not copy the old httpd.conf file onto new installations since the template for httpd.conf changes from time to time. Edit the file as follows.

   a. Locate the line with the field **OmneonManagerHotStandby** which usually appears as:
      ```
      OmneonManagerHotStandby "primarymgr.omneon.com"
      ```
   b. Remove the # comment symbol and modify the text to match the respective value in the httpd.conf file as saved from the previous version on the backup SystemManager.
   c. Save the configuration file and exit from the text editor.

8. On the primary SystemManager Platform, modify the Manager service to run using the user account name "**Administrator**" and password "**omneon**" as follows.

   a. On the Windows desktop, launch the Service Control Panel by clicking **Start** > **Settings** > **Control Panel** > **Administrative Tools** > **Services**.
   b. On the **Services Control Panel**, click **SystemManager** service.
   c. From the **Action** menu, select properties to display the **SystemManager Properties** dialog.
   d. Click the **Log On** tab to display the **Log on as** dialog.
   e. Click **This account** to enable the **Account and Password** fields.
   f. Enter the default log on user name "**Administrator**" and password "**omneon**" in the account and password fields. Reenter the password in the Confirm Password field.
   g. Click **OK** to close the dialog, and then close the **Services Control Panel**.

9. Reboot the primary SystemManager Platform, and then verify that the SystemManager is running by logging in. Verify that all Spectrum video servers and I/O modules are connected and stable..

10. Reboot the backup SystemManager Platform, and then verify that the SystemManager is running by logging in. Verify that all Spectrum video servers and I/O modules are connected and stable..

Result:

At this point, any attempts to log in to the backup SystemManager (with Internet Explorer) will fail. This is as expected. The installation procedure is now complete.

Configuring two SystemManager platforms on the same subnet

You can set up two SystemManagers on the same subnet such that each SystemManager controls a different set of Spectrum video servers, and provisions redundant DHCP services to yield fixed IP addresses for all Spectrum video servers.

Normally, two SystemManagers and their associated Spectrum video servers are put on unique subnets, and each SystemManager is configured by default to automatically discover all Spectrum video servers and attached I/O modules on its IP subnet. IP data transfer may then be accomplished by an IP (layer 3) switch or router between these subnets. This following procedure addresses the case where there is no such IP switch/router available.

1. Stop the Manager service in Windows Services on both SystemManager Platforms while performing IP configuration.

   ◦ Configure the SystemManager Platforms to have unique IP addresses and computer names.
   ◦ Ensure that the vDHCP server is running on the first SystemManager Platform, but turned off on the other during the setup phase.

2. Set up the vDHCP server as normal, with IP address reservations for all Spectrum video servers.

- ◦ Ensure that the subnet mask is consistent with all devices on the subnet.
- ◦ To verify DHCP setup, delete all existing leases, reboot all Spectrum video servers, and review the list of leases to ensure that all Spectrum video servers are getting their DHCP leases with the reserved IP addresses.

3. Temporarily stop the vDHCP service on the first SystemManager Platform.

   - ◦ Locate the directory where the vDHCP service is installed (normally C:\Program Files\vDHCP).
   - ◦ Copy the vdhcp.ini file from this folder to the corresponding folder on the second SystemManager Platform, replacing the existing .ini file. This will ensure that both SystemManager Platforms may issue DHCP leases with identical IP reservations and other IP configuration information.

4. Start the vDHCP service on both SystemManager Platforms.

5. Start the Manager service on both SystemManager Platforms.

6. Reboot the Spectrum video servers.

7. Verify that both SystemManagers correctly auto-discover all Spectrum video servers.
   Review each Spectrum video server configuration page to verify that the IP address of each Spectrum video server host matches its vDHCP reservation.

   If any of these do not match, it is likely that the SystemManager application discovered them while they were using a prior IP address. In such case, manually remove these Spectrum video servers from the SystemManager and allow the SystemManager to automatically rediscover them at their final IP addresses.

8. Perform the following steps in the SystemManager application on each SystemManager Platform to ensure that each one controls different Spectrum video servers.
   a. From the **Home** tab, click the **Options** icon to display the **Options** page.
   b. Change the **Discovery Interval** field to **0**, and then click the Update button. This will turn off auto device discovery.
   c. Click on the Diagnostics tab, then on the Remove Device icon on the left to display the Remove Device page.
   d. On the Spectrum video server field, select each Spectrum video server that this SystemManager should NOT control, and click the adjacent Remove button.
   e. After the Spectrum video servers have been removed, there will be a number of "Not Responding" I/O modules. Select each of them on the "Not Responding" field and click the adjacent Remove button.
   f. Click the Configuration tab to display the System diagram and verify that the correct Spectrum video servers and I/O modules are displayed.
   g. If any Spectrum video servers are missing, they can be re-attached by using the Add Device function under the Diagnostics tab.

Reinstalling the SystemManager platform operating system

Harmonic provides an ISO image for the SystemManager Platform operating system for the purpose of system recovery.

The SystemManager Platform image contains Windows and additional software for managing Harmonic components.

⚠ **CAUTION:** The SystemManager Platform ISO image is intended for use only if the SystemManager Platform's operating system needs to be reinstalled on certified authentic hardware, for example, after a hard disk failure or a corrupt operating system configuration.

Do not attempt to install the ISO image or any other Harmonic-supplied installation DVD without first contacting Technical Support for assistance. Installing an incorrect ISO image or DVD to your hardware configuration will cause problems with the system.

To reinstall the operating system, first download the ISO image to an empty USB flash drive, and then boot from the flash drive to reformat the SystemManager Platform hard drive and reinstall the operating system. Before you begin, make sure you have:

* Internet access
* An empty USB flash drive with at least 6 GB of space

⚠ **IMPORTANT:** Use only the ISO image provided with your SystemManager platform model. Do not use a recovery DVD provided with any other model.

Creating a USB flash drive with the ISO image

Add the ISO image to a USB flash drive, which can be used to re-install the operating system.

1. Download the latest ISO image provided by the Harmonic support team.
   - FTP Site: **ftp.harmonicinc.com**
   - User: **sysman**
   - Password: **recovery**
   - Folder: **SystemManager**

2. In Windows, create a working directory in windows explorer, and unzip the **USBTools.zip** file to this folder.

3. Locate and move the ISO file to the working directory at the same level as the **USBTools** unzipped directory.

4. Insert an empty USB flash drive. All the existing data will be deleted on the flash drive.

5. Right-click the **CreateUSBImage.bat** file in Windows explorer to run as administrator.

6. When the pop-up window appears, select the USB drive letter to boot from. Note the entries are case-sensitive. Click **Enter**.

7. Type **Y** (in capital letter) to proceed with the copying. After confirmation, the process takes approximately 30 minutes. The image file size is approximately 6 GB.

8. After the process is completed, unplug the USB drive.

What to do next

Continue to the next procedure to use the USB drive to install the ISO image.

Reinstalling the operating system from the USB flash drive

Once you added the ISO image to a USB drive, you can use it to reinstall the operating system.

1. Make sure the SystemManager Platform is powered down and then insert the USB flash drive that contains the ISO image.

2. Power up the system.

3. Click **F11** to view the BIOS Boot Manager menu.

4. In the Boot Manager, select **Hard Drive C:**.

5. In the sub-menu, select the USB flash drive. Note the message: "The hard disk will be reformatted. Are you sure you want to continue?"

> ⚠ **CAUTION:** Upgrading the operating system with the recovery media will erase all data on your local machine.

6. Click **Yes** to continue. A second message displays: "All the data on the hard disk will be deleted. Please backup you data before continuing. Are you sure you want to continue?"

7. Click **Yes** to continue after you have made a backup of the current catalog onto an external storage device. The upgrade process takes approximately 15 minutes.

8. After the system automatically reboots, remove the USB flash drive from the slot.

9. Log on to Windows. User is **Administrator**. Password is **omneon**.

> 📝 **NOTE:** It may take up to two minutes before the keyboard can be used after reboot.

10. You may be prompted with a **Systems Settings Change** dialog, alerting you that system settings have changed and asking if you want to restart your computer for these changes to take effect. Select **Yes** to restart the computer.

11. Configure any network settings and vDHCP server settings as needed. See "Configuring two SystemManager platforms on the same subnet."

12. Reinstall all Harmonic applications including SystemManager.

Related information

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 6-1: Harmonic 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	+81.3.5614.0524	japansupport@harmonicinc.com
Asia Pacific (APAC) – Other Territories	+852.3184.0045 +65.6542.0050	apacsupport@harmonicinc.com

Report an issue online

https://www.harmonicinc.com/service-support/support/

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

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

Important safety instructions

Review important safety guidelines for operators and service personnel.

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

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

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

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

Safety symbols & safety, warning & caution instructions

Understand the meaning of different safety symbols.

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

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

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

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

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

Comprendre la signification des différents symboles de sécurité .

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

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

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

6.9 Installation Guide

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

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

Sicherheit Symbole und Sicherheit, Achtung & Vorsicht Anleitung

Verstehen Sie die Bedeutung der verschiedenen Sicherheitssymbole .

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

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

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

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

Mark	Notes
Warnung	**Elektroschock-Warnung** • Diese Einheit hat möglicherweise mehr als ein Netzkabel. Zur Verringerung der Stromschlaggefahr trennen Sie beide Netzgerätekabel ab, bevor Sie die Einheit warten. • Vor der Arbeit an einem Chassis für Arbeiten in der Nähe Stromversorgung, ziehen Sie das Netzkabel mit Netzeinheiten. • Arbeiten Sie nicht am System und schließen Sie keine Kabel an bzw. trennen Sie keine ab, wenn es gewittert. • Dieses Gerät ist über das Netzkabel Erdungsleiter geerdet. Um einen Stromschlag zu vermeiden, stecken Sie das Netzkabel in eine Steckdose richtig verdrahtet, bevor Sie das Produkt Eingang oder Ausgänge. • Verlegen Sie Netzkabel und andere Kabel, so dass sie wahrscheinlich nicht beschädigt werden. Trennen Eingangsleistung Einheit vor der Reinigung. Verwenden Sie keine flüssigen oder Aerosolreiniger; nur mit einem feuchten Tuch zu reinigen Chassis. • Gefährliche Spannungen vorhanden sind an mehreren Stellen in diesem Produkt. Um Verletzungen zu vermeiden, berühren Sie nicht freiliegenden Anschlüsse und Komponenten während schaltet ist. Sie keine Gegenstände in einem der beiden Stromversorgungs Hohlräume des Systems mit Strom verbunden einführen. • Ein 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
Vorsich	**Elektrostatische Entladung (ESD) Vorsicht** • Folgen Sie statische vorsorglich zu jeder Zeit beim Umgang mit diesem Gerät. • Tragen Sie immer einen ESD-präventive Handgelenk oder Knöchel-Riemen beim Umgang mit elektronischen Komponenten. Schließen Sie ein Ende des Bandes an einem ESD-Buchse oder ein unlackiertes Metallteil auf dem System. • Hand Karten nur durch die Faceplates und Kanten; Berühren Sie die bedruckte Leiterplatte und Steckerstifte. • Legen Sie alle entfernten Komponenten auf eine antistatische Oberfläche oder in einem Statik-Beutel. • Kontakt zwischen den Karten und Kleidung vermeiden. • Den Widerstandswert der gegen statische Gurt in regelmäßigen Abständen überprüfen. Empfohlener Wert ist zwischen 1 und 10 Mega-Ohm (MOhm).
Warnung	**Laserstrahlungen Warnung.** Unsichtbare Laserstrahlung kann von getrennten Fasern oder Stecker emittiert werden. Nicht in die Strahlen blicken oder direkt mit optischen Instrumenten. Niemals ein Gerät mit einem gebrochenen Faser oder mit einem Glasfaseranschluss getrennt.
Warnung	**Lithium-Batterie Handhabung Sicherheitshinweise** • CALIFORNIA PERCHLORATE ADVISORY: Einige Lithium-Batterien kann Perchlorat enthalten. Die folgende Beratungs gesetzt: "Perchlorat - Sonderbehandlung kann erforderlich sein, finden Sie unter: *http://www.dtsc.ca.gov/hazardouswaste/perchlorate/* for information."
Vorsich	• Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr • Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers. • Es gibt keine zu wartenden Akkus im Harmonic Produkte. Siehe Harmonic qualifiziertes Personal, um die austauschbare Batterien Service

Preparing the site

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.

6.9 Installation Guide

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 over-current device is in-line between the equipment and the power source. ◦ Connect DC-input power supplies only to a DC power source that complies with the safety extra-low voltage (SELV) requirements in the UL60950-1, CAN/CSA-C22.2 No. 60950-1-03, AS/NZS 60950-1, EN/IEC 60825-1, 21 CFR 1040, EN 60950-1, and IEC 60950-1 standards.

Option	Description
	◦ 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.

Disassembling an end-of-life product

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

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* .

1. Disassemble equipment at a dedicated area only, gather the needed tools for disassembly.

2. Remove covers, housing, etc.

3. Remove and separate sub-assemblies (i.e. cables, metals, displays, fans, etc.).

4. Separate hazardous materials from the remainder of the material.
   a. Sort hazardous materials into their different types (i.e., batteries, hazardous liquids, hazardous solids, fiberglass, etc.).
   b. Proceed with hazardous waste management processes only.

5. Identify re-usable materials/sub-assemblies and separate these from the rest of the material.

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

Safety rules (English)

Observe the rules for safe product disposal and recycling.

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

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

Règles de sécurité

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

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

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

EU manufacturer's Declaration of Conformity

Learn more about Harmonic product regulatory compliance.

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

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

Electromagnetic compatibility notices – Class A

Learn more about Harmonic product electromagnetic compatibility.

1. FCC verification statement (USA)

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

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

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

2. ICES–003 statement (Canada)

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

French: Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

3. CE Declaration of Conformity (European Union)

This product has been tested in accordance too, and complies with the Low Voltage Directive (2014/35/EU) and EMC Directive (2014/30/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白主規制協議会（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 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며 만약 잘못 판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

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

7. Class A statement (China)

中华人民共和国 "A类" 警告声明

声 明

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

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

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

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

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

Product regulatory compliance

Harmonic products are typically tested to the latest safety and electromagnetic compatibility (EMC) specifications and test methods, and are marked with one or more of the following regulatory/certification markings. Some of the certification markings will vary depending on what certifier was used to obtain a certification.

Please visit Harmonic *Product Regulatory Compliance* page to view information on applied safety & EMC standards and regulatory marks on Harmonic products. You can also email us at *regulatory.compliance@harmonicinc.com* for assistance on regulatory compliance for Harmonic products.

Product regulatory compliance markings

Understand the meaning of different product regulatory compliance markings.

Country/ region	Testing standard/ specification	Certification type	Regulatory mark name	Product marks
USA/ Canada	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013; 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 6, 2016; Class A	EMC	FCC Class A Statement	This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
European Union	RoHS: EN 50581:2012; EN55032:2012/ CISPR 22:2008; EN55024:2010/ CISPR 24:2010; EN61000-3-2:2014 EN61000-3-3:2013 Class A	Safety and EMC	CE / Low Voltage Directive	
Germany	EN 60950-1; EN60825-1 (for laser)	Safety	GS	
Mexico	NOM-019-SCFI-1998	Safety	NOM	

Country/ region	Testing standard/ specification	Certification type	Regulatory mark name	Product marks
Taiwan	BSMI standard CNS15663 CNS 14336-1:2010 CNS 13438:2006; Class A	Safety and EMC	BSMI Certification (RPC) Number & Class A Warning	RXXXXX RoHS
Japan	VCCI V-3/2015.04; CISPR 22:2008, Class A	EMC	VCCI	VCI
Australia and New Zealand	AS/NZS CISPR22:2009 +A1:2010; Class A	Safety	C-Tick	NXXXXX
Korea	KN32 Class A and KN 35	EMC	KC	KC
Russia	TR CU 004/2011 TR CU 020/2011	Safety and EMC	EAC	EAC
China	GB4943.1-2011 GB9254-2008 GB17625.1-2012	Safety and EMC	CCC	CCC
India	IS 13252 (Part 1): 2010	Safety	BIS Compulsory Registration	"Self Declaration - Conforming to IS 13252 (Part 1):2010, R-XXXXXXXX"

Product environmental compliance

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

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

EU RoHS

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

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

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

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

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

Restricted substance statement

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

Table A-1: Restricted substances

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

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

EU REACH

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

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

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

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

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

China RoHS

Review China's Restriction of Hazardous Substances Directive.

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

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

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

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

China RoHS Disclosure report

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

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

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

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

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

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

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

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

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

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

Taiwan BSMI RoHS

Review Taiwan's Restriction of Hazardous Substances Directive.

單元 **Unit**	限用物質及其化學符號 **Restricted substances and its chemical symbol**					
	鉛 **Lead (Pb)**	汞 **Mercury (Hg)**	鎘 **Cadmium (Cd)**	六價鉻 **Hexavalent chromium (Cr^{+6})**	多溴聯苯 **Polybrominated biphenyls (PBB)**	多溴二苯醚 **Polybrominated diphenyl ethers (PBDE)**
風扇	–	O	O	O	O	O
金屬件 （鐵件、 螺絲）	O	O	O	O	O	O
機箱、 機殼	O	O	O	O	O	O
電源線	–	O	O	O	O	O
其他部件 （塑件、 包材 類、線材）	O	O	O	O	O	O
備考1.〝超出0.1 wt％〞及〝超出0.01 wt％〞係指限用物質之百分比含量超出百分比含量基準值。 Note 1: "Exceeding 0.1 wt %" and "exceeding 0.01 wt %" indicate that the percentage content of the restricted substance exceeds the reference percentage value of presence condition.						
備考2.〝0〞係指該項限用物質之百分比含量未超出百分比含量基準值。 Note 2: "O" indicates that the percentage content of the restricted substance does not exceed the percentage of reference value of presence.						
備考3.〝–〞係指該項限用物質為排除項目。 Note 3: The "–" indicates that the restricted substance corresponds to the exemption.						

Other RoHS and REACH type regulations

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

Waste Electrical and Electronic Equipment (WEEE)

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

European Parliament and the Council of the European Union's WEEE Directive (2002/96/EC) came into force on August, 2005 and, were more recently amended in July, 2012. This directive encourages the reuse, recycling, and recovery of WEEE and to improve the environmental performance of all operators involved in the life cycle of electrical and electronic equipment, especially those dealing with WEEE. Harmonic ensures that all requirements for registration, reporting, design and data tracking are complied with to meet the objectives of the WEEE directive.

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

Battery directive

Review the European Union legislation on waste batteries.

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

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

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

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

Download Harmonic Environmental Compliance Statement at the following location:

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

WEEE Take-Back Request Program

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

Harmonic's customers should:

- Not discard equipment in household or office garbage
- Arrange proper recycling of unneeded equipment. For the take-back of Harmonic equipment, customers must:
  ◦ Collect the information required to complete Harmonic's WEEE Take-Back Request form

- ◦ Complete and submit the online WEEE Take-Back Request form. Please note that forms must be fully completed in order to prevent process delays
  - ◦ Receive instant online confirmation indicating the reference number
  - ◦ Receive the End of Life (EOL) asset return authorization number and instruction for EOL asset return
- Not ship EOL product to Harmonic without a Harmonic-provided EOL asset return authorization number

The crossed-out wheeled bin symbol on a Harmonic-branded commercial product indicates that the product should not be disposed of along with municipal waste, but invites our customers to return the product to us under Harmonic's WEEE Take-Back program for product disposal.
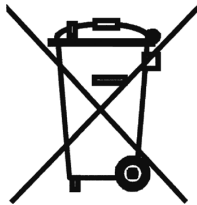
Harmonic will pay for the cost of shipping and will provide a Certificate of Recycling or a Certificate of Destruction upon request. For more information on collection, reuse and recycling or to initiate the WEEE take-back process, please complete the form at *http://www.harmonicinc.com/webform/weee-takeback-request* or contact *Harmonic Technical Assistance Center (TAC)* or email RMA team at *rma.emea@harmonicinc.com*.

Compliance with country specific environmental, safety and EMC standards

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

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