



10-Port 4K HDMI Splitter VS0110HA User Manual



www.aten.com

Preface

EMC Information

FEDERAL COMMUNICATIONS COMMISSION INTERFERENCE

STATEMENT: 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 the user will be required to correct the interference at his own expense.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

CE Warning: Operation of this equipment in a residential environment could cause radio interference.

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.

RoHS

This product is RoHS compliant.



User Information

Online Registration

Be sure to register your product at our online support center:

International	http://eservice.aten.com
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Telephone Support

For telephone support, call this number:

International	886-2-8692-6959
China	86-400-810-0-810
Japan	81-3-5615-5811
Korea	82-2-467-6789
North America	1-888-999-ATEN ext 4988

User Notice

All information, documentation, and specifications contained in this manual are subject to change without prior notification by the manufacturer. The manufacturer makes no representations or warranties, either expressed or implied, with respect to the contents hereof and specifically disclaims any warranties as to merchantability or fitness for any particular purpose. Any of the manufacturer's software described in this manual is sold or licensed as *is*. Should the programs prove defective following their purchase, the buyer (and not the manufacturer, its distributor, or its dealer), assumes the entire cost of all necessary servicing, repair and any incidental or consequential damages resulting from any defect in the software.

The manufacturer of this system is not responsible for any radio and/or TV interference caused by unauthorized modifications to this device. It is the responsibility of the user to correct such interference.

The manufacturer is not responsible for any damage incurred in the operation of this system if the correct operational voltage setting was not selected prior to operation. PLEASE VERIFY THAT THE VOLTAGE SETTING IS CORRECT BEFORE USE.

Package Contents

- ◆ 1 VS0110HA 10-Port 4K HDMI Splitter
- ◆ 1 Power Adapter
- ◆ 1 Rack Mount Kit
- ◆ 1 User Instructions

Note: Make sure that all of the components are present and in good order. If anything is missing or was damaged in shipping, contact your dealer.

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About this Manual

This user manual is provided to help you get the most from the VS0110HA. It covers all aspects of installation, configuration, and operation. An overview of the information found in the manual is provided below.

Chapter 1, *Introduction* introduces you to the 10-Port 4K HDMI Splitter. Its purpose, features, and installation considerations are described and discussed.

Chapter 2, *Hardware Setup* describes the panel components and the steps to quickly and safely set up the VS0110HA.

Chapter 3, *Operation* provides details on how to operate and configure the VS0110HA using the panel pushbuttons and RS-232 commands.


Appendix provides a list of safety instructions and precautions, contact information for ATEN technical support, product specifications, and other technical information.

Note:

- ◆ Read this manual thoroughly and follow the installation and operation procedures carefully to prevent any damage to the unit or any connected devices.
 - ◆ ATEN regularly updates its product documentation for new features and fixes. For an up-to-date VS0110HA documentation, visit <http://www.aten.com/global/en/>
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Conventions

This manual uses the following conventions:

- | | |
|---|--|
| Monospaced | Indicates text that you should key in. |
| [] | Indicates keys you should press. For example, [Enter] means to press the Enter key. If keys need to be chorded, they appear together in the same bracket with a plus sign between them: [Ctrl+Alt]. |
| 1. | Numbered lists represent procedures with sequential steps. |
| ◆ | Bullet lists provide information, but do not involve sequential steps. |
| → | Indicates selecting the option (on a menu or dialog box, for example), that comes next. For example, Start → Run means to open the <i>Start</i> menu, and then select <i>Run</i> . |
|  | Indicates critical information. |

Product Information

For information about all ATEN products and how they can help you connect without limits, visit ATEN on the Web or contact an ATEN Authorized Reseller. Visit ATEN on the Web for a list of locations and telephone numbers:

International	http://www.aten.com
North America	http://www.aten-usa.com

Chapter 1

Introduction

Overview

The VS0110HA 4K HDMI Splitter is a perfect solution for applications that require sending one source of high-definition 4K video to ten displays at the same time. The HDMI interface caters to most mainstream sources and sinks, such as DVD players, satellite set-top boxes, and any HDMI displays. Featuring ATEN EDID technology, the VS0110HA guarantees continuous EDID communication with connected devices and maintains correct video outputs.

The VS0110HA 4K HDMI Splitter is HDCP (High-bandwidth Digital Content Protection) compliant, making it effective for use with all HDMI displays in home theater applications, as well as in corporate, educational and commercial settings.

Features

- ◆ Connects one HDMI source to up to ten HDMI displays at the same time
- ◆ HDMI (3D, Deep color, 4K); HDCP 1.4 compliant
- ◆ Superior video quality – up to 4K resolutions (4096 x 2160 @ 60Hz; 4:2:0)
- ◆ Long distance transmission from source to output – up to 15 m
- ◆ Built-in bi-directional RS-232 serial port for high-end system control
- ◆ Clear LED indication of device status
- ◆ EDID Expert™ – Selects optimum EDID settings for smooth power-up, high quality display, and use of the best resolution across different screens
- ◆ Plug-and-play
- ◆ Rack-mountable (1U design)

Planning the Installation

Required Equipment

- ◆ 1 source device equipped with an HDMI Type-A connector
- ◆ 1 ~ 10 display devices equipped with an HDMI Type-A connector
- ◆ 1 HDMI cable to connect the VS0110HA to source device
- ◆ 1 ~ 10 HDMI cables to connect the VS0110HA to the display devices

Note:

- ◆ You can connect a DVI source to the VS0110HA via a DVI to HDMI adapter.
 - ◆ ATEN strongly recommends that you use high-quality HDMI cables of appropriate length since this will affect the quality of the audio and video output. Contact your dealer to purchase the correct table sets.
-

Optional Equipment

To control the VS0110HA using RS-232 serial commands, prepare the following equipment:

- ◆ 1 RS-232 controller, e.g. a PC
- ◆ 1 serial cable with a 9-pin male connector

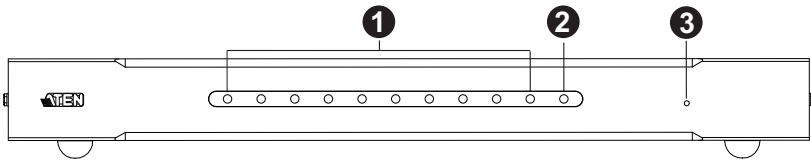
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Chapter 2

Hardware Setup

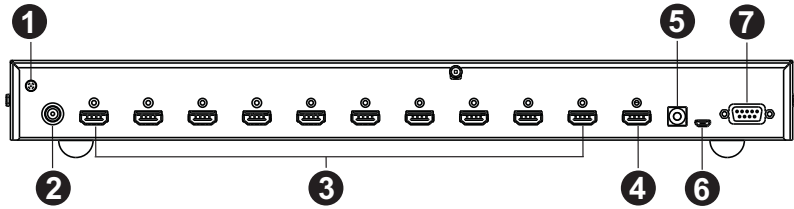
Components

Front View



No.	Component	Description
1	Output Port LEDs (1~10)	Lights to indicate there is a working connection to the display device(s) connected to the output port(s).
2	Input Port LED	Lights to indicate that there is a working connection to the source device (i.e., computer).
3	Power LED	Lights to indicate that the VS0110HA is receiving power and is up and running.

Rear View

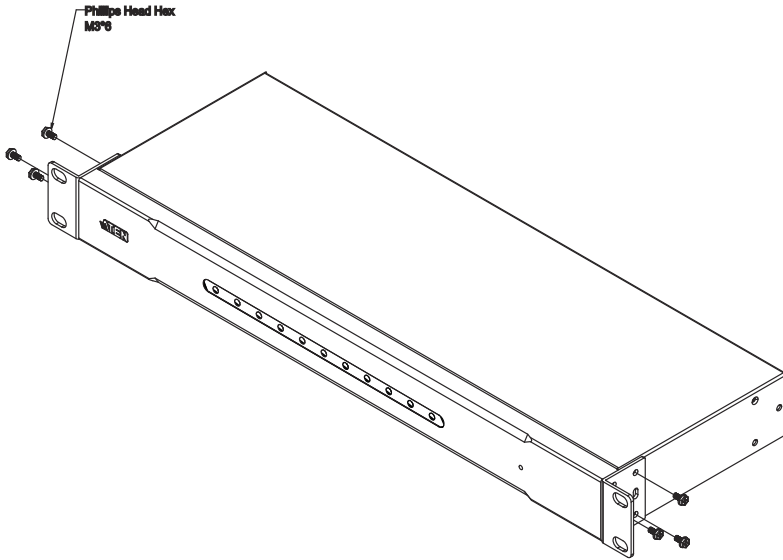


No.	Component	Description
1	Grounding Terminal	The grounding wire connects here.
2	Power Jack	The power adapter cable plugs in here.
3	HDMI Output Port section	The cables from your HDMI display devices plug into these ports.
4	HDMI Input Port	The cable from your HDMI source device plugs in here.
5	EDID Mode Switch	Turn this switch to select the EDID mode (0~7). See "EDID Mode Selection" on page 10.
6	Firmware Upgrade Port	This port is reserved for ATEN Technical Support. If you would like to do a firmware upgrade yourself, please contact your dealer.
7	RS-232 Serial Port	This is the serial remote port for output source selection and high-end system control, as well as for upgrading the device firmware.

Rack Mounting

The VS0110HA can be mounted in a 19" (1U) system rack. For the most convenient front panel pushbutton configuration and operation at the local site, mount the unit at the front of the rack, as follows:

1. Use the M3 x 6 Phillips head hex screws supplied with the Mounting Kit to screw the rack mounting brackets onto the front of the unit.



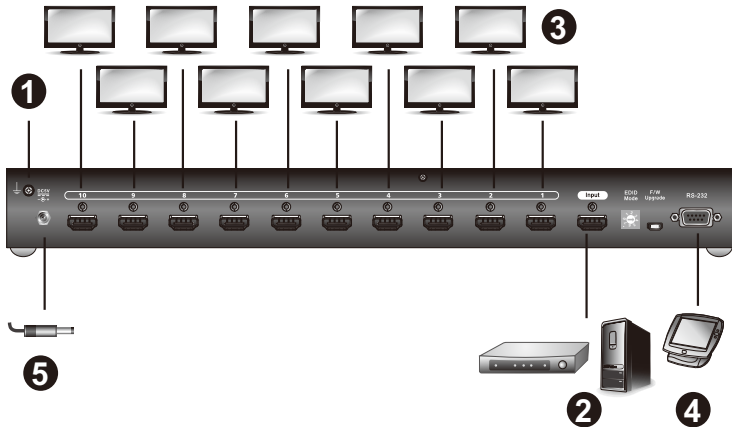
2. Screw the mounting brackets to the rack.

Installation



1. Please review the safety information regarding the placement of this device in *Safety Instructions*, page 15.
2. Do not power on the VS0110HA and the connected devices until all the necessary hardware is connected.

Follow the steps below to safely connect the required devices to the VS0110HA.



1. Use a grounding wire to ground the unit by connecting one end of the wire to the grounding terminal, and the other to a suitable grounded object.

Note: Do not omit this step. Proper grounding helps prevent damage to the unit from surges or static electricity.

2. Use an HDMI cable to connect your source device to the HDMI Input Port on the VS0110HA.
3. Use HDMI cables to connect up to 10 display devices to the HDMI Output Ports on the VS0110HA.
4. (Optional) To configure the VS0110HA settings through the RS-232 port, connect a hardware/software controller to the VS0110HA.
5. Plug the provided power adapter into an appropriate AC power source, and then plug the power adapter cable into the Power Jack on the VS0110HA.

Chapter 3

Operation

Overview

You can operate the VS0110HA using the panel pushbuttons or an RS-232 serial controller. The availability of actions with the two methods is summarized in the table below.

Action	Operation Methods	
	Rotary Switch	Serial Controller
Switch Port		
Switch on/off one or all output port		✓
EDID		
Select an EDID Mode	✓	✓
Select the ATEN default EDID configuration		✓
Baud Rate		
Set the baud rate		✓
Read Information		
Read and display information from the VS0110HA		✓
Reset		
Reset the VS0110HA to default factory settings		✓

Switching On/Off the Port

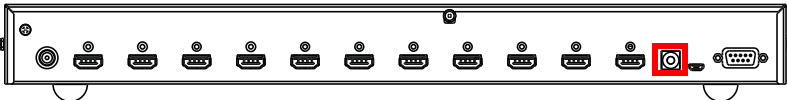
You can switch on/off one or all output ports using the RS-232 command (see *RS-232 Commands*, page 12).

EDID

EDID is a data format that contains a display's basic information and is used to communicate with the video source/system. The VS0110HA lets users select a preset video configuration or EDID Mode, which utilizes the best resolution across different screens.

EDID Mode Selection

The EDID Mode can be selected using the EDID Mode Switch located at the VS0110HA unit's rear panel or via an RS-232 serial controller.



To select an EDID Mode, turn the EDID Mode Switch to toggle between the Modes (0~7) as follows:

- ◆ **0 (Port 1)** - Implements the EDID of the connected display to Port 1, and passes it to the video source. The VS0110HA is able to copy the EDID of any connected display to the input source.
- ◆ **1 (ATEN Default)** - EDID is set to the ATEN default configuration. Users can further choose between 10 ATEN default EDID settings available via the RS-232 command (see *RS-232 Commands*, page 12).
- ◆ **2 (Auto)** - Implements the EDID of all connected displays. The VS0110HA uses the best resolution for all displays.
- ◆ **3 (Switch)** - Uses the EDID configuration defined through the RS-232 command (see *RS-232 Commands*, page 12).
- ◆ **4 ~ 7** - EDID is set to the ATEN default configuration. Users can further choose between 10 ATEN default EDID settings available via the RS-232 command (see *RS-232 Commands*, page 12).

ATEN Default EDID

You can use one of the 10 available ATEN default EDID configurations using the RS-232 command (see *RS-232 Commands*, page 12). The 10 ATEN default EDID lists as follows:

Default EDID No.	Description
00	1080p video, 2 ch audio (default)
01	1080p video, 5.1 ch audio

Default EDID No.	Description
02	1080p video, 7.1 ch audio
03	1080i video, 2 ch audio
04	1024 x 768 DVI format
05	1280 x 1024 DVI format
06	1920 x 1080 DVI format
07	1920 x 1200 DVI format
08	3840 x 2160 @ 30 Hz, 2 ch audio
09	3840 x 2160 @ 60 Hz, 2 ch audio

Serial Control Protocol Commands

The VS0110HA's built-in bi-directional RS-232 serial interface allows system control through a high-end controller or PC.

Configuring the Serial Port

The controller's serial port should be configured as follows:

Baud Rate	19200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

RS-232 Commands

Task	RS-232 Command	Description
Switch Port		
Switch output port(s) on	sw o<output_number> on	Switch on one or all output ports. For example, to turn output port 02, type sw o02 on output_number: 01-10, * (all output ports)
Switch output port(s) off	sw o<output_number> off	Switch off one or all output ports. For example, to turn off all output ports, type: sw o* off output_number: 01-10, * (all output ports)
EDID		
Implement the display's EDID	edid portyy	Implement the EDID of the display connected to Port yy, and pass it to the video source. yy: 01-10
Implement auto EDID	edid auto	Implement the EDID of all connected displays. The VS0110HA uses the best resolution for all displays.
Implement ATEN default EDID	edid defaultyy	Implements the specified ATEN default EDID configuration. yy: 00-09, default is 00 (see <i>ATEN Default EDID</i> , page 10)
Baud Rate Setting		
Set up the baud rate	baud <baud_rate_value>	For example, to set the baud rate to 9600, type: baud 9600 baud_rate_value: 9600, 19200 (default), 38400, 115200
Read Information		
Read (display) the VS0110HA's settings	read	Reads and displays information from the VS0110HA.
Reset		
Reset the VS0110HA to default factory settings	reset	-

Note:Each command string should be separated with a space.

Verification

After entering a command, a verification message appears at the end of the command line as follows:

- ◆ Command OK - indicates that the command is correct and successfully performed by the splitter.
- ◆ Command incorrect - indicates that the command has the wrong format and/or values or the EDID switch is not set to Mode 3 (see *EDID Mode Selection*, page 10).

Firmware Upgrade

Go to ATEN's website and choose the model name of your device (VS0110HA) to download the latest firmware upgrade package to a computer, and then do the following steps:

1. Power on your VS0110HA.
2. Use a USB cable to connect a USB port on your computer to the VS0110HA's Micro USB port.
3. From the downloaded package, execute the EXE file. The upgrading screen appears and the upgrade is automatically processed.
4. When the upgrade is complete, a confirmation message "Success" appears and then the screen automatically closes.

Note: The firmware upgrade package should be saved in an independent folder to make sure only the latest firmware version is executed.

Restarting the VS0110HA

Make sure to follow the steps below to safely restart the VS0110HA.

1. Power off the attached devices.
2. Unplug the power adapter cable from the VS0110HA.
3. Wait 10 seconds, and then replug the power adapter cable
4. After the VS0110HA is powered on, power on the attached devices.

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Safety Instructions

General

- ◆ This product is for indoor use only.
- ◆ Read all of these instructions. Save them for future reference.
- ◆ Follow all warnings and instructions marked on the device.
- ◆ Do not place the device on any unstable surface (cart, stand, table, etc.). If the device falls, serious damage will result.
- ◆ Do not use the device near water.
- ◆ Do not place the device near, or over, radiators or heat registers.
- ◆ The device cabinet is provided with slots and openings to allow for adequate ventilation. To ensure reliable operation, and to protect against overheating, these openings must never be blocked or covered.
- ◆ The device should never be placed on a soft surface (bed, sofa, rug, etc.) as this will block its ventilation openings. Likewise, the device should not be placed in a built in enclosure unless adequate ventilation has been provided.
- ◆ Never spill liquid of any kind on the device.
- ◆ Unplug the device from the wall outlet before cleaning. Do not use liquid or aerosol cleaners. Use a damp cloth for cleaning.
- ◆ The device should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
- ◆ The device is designed for IT power distribution systems with 230V phase-to-phase voltage.
- ◆ To prevent damage to your installation it is important that all devices are properly grounded.
- ◆ The device is equipped with a 3-wire grounding type plug. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not attempt to defeat the purpose of the grounding-type plug. Always follow your local/national wiring codes.

- ◆ Do not allow anything to rest on the power cord or cables. Route the power cord and cables so that they cannot be stepped on or tripped over.
- ◆ If an extension cord is used with this device make sure that the total of the ampere ratings of all products used on this cord does not exceed the extension cord ampere rating. Make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
- ◆ To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or uninterruptible power supply (UPS).
- ◆ Position system cables and power cables carefully; Be sure that nothing rests on any cables.
- ◆ Never push objects of any kind into or through cabinet slots. They may touch dangerous voltage points or short out parts resulting in a risk of fire or electrical shock.
- ◆ Do not attempt to service the device yourself. Refer all servicing to qualified service personnel.
- ◆ If the following conditions occur, unplug the device from the wall outlet and bring it to qualified service personnel for repair.
 - ◆ The power cord or plug has become damaged or frayed.
 - ◆ Liquid has been spilled into the device.
 - ◆ The device has been exposed to rain or water.
 - ◆ The device has been dropped, or the cabinet has been damaged.
 - ◆ The device exhibits a distinct change in performance, indicating a need for service.
 - ◆ The device does not operate normally when the operating instructions are followed.
- ◆ Only adjust those controls that are covered in the operating instructions. Improper adjustment of other controls may result in damage that will require extensive work by a qualified technician to repair.

Rack Mounting

- ◆ Before working on the rack, make sure that the stabilizers are secured to the rack, extended to the floor, and that the full weight of the rack rests on the floor. Install front and side stabilizers on a single rack or front stabilizers for joined multiple racks before working on the rack.
- ◆ Always load the rack from the bottom up, and load the heaviest item in the rack first.
- ◆ Make sure that the rack is level and stable before extending a device from the rack.
- ◆ Use caution when pressing the device rail release latches and sliding a device into or out of a rack; the slide rails can pinch your fingers.
- ◆ After a device is inserted into the rack, carefully extend the rail into a locking position, and then slide the device into the rack.
- ◆ Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating.
- ◆ Make sure that all equipment used on the rack – including power strips and other electrical connectors – is properly grounded.
- ◆ Ensure that proper airflow is provided to devices in the rack.
- ◆ Ensure that the operating ambient temperature of the rack environment does not exceed the maximum ambient temperature specified for the equipment by the manufacturer.
- ◆ Do not step on or stand on any device when servicing other devices in a rack.

Technical Support

International

- ◆ For online technical support – including troubleshooting, documentation, and software updates: <http://support.aten.com>
- ◆ For telephone support, See *Telephone Support*, page vi:

North America

Email Support		support@aten-usa.com
Online Technical Support	Troubleshooting Documentation Software Updates	http://www.aten-usa.com/support
Telephone Support		1-888-999-ATEN ext 4988

When you contact us, please have the following information ready beforehand:

- ◆ Product model number, serial number, and date of purchase
- ◆ Your computer configuration, including operating system, revision level, expansion cards, and software
- ◆ Any error messages displayed at the time the error occurred
- ◆ The sequence of operations that led up to the error.
- ◆ Any other information you feel may be of help

Specifications

Function	Specifications	
Video Input		
Interfaces	1 x HDMI Type A Female (Black)	
Impedance	100 Ω	
Max. Distance	5m (at 4K resolution)	
Video Output		
Interfaces	10 x HDMI Type A Female (Black)	
Impedance	100 Ω	
Max. Distance	10m (at 4K resolution)	
Video		
Max. Data Rate	10.2 Gbps (3.4 Gbps per lane)	
Max. Pixel Clock	340 MHz	
Compliance	HDMI 1.4 (3D, Deep Color, 4K); HDCP 1.4 Compatible	
Max. Resolutions	Up to 4096 x 2160 / 3840 x 2160 @ 60Hz (4:2:0); 4096 x 2160 / 3840 x 2160 @ 30Hz (4:4:4)	
Audio		
Input	1 x HDMI Type A Female (Black)	
Output	10 x HDMI Type A Female (Black)	
Control		
RS-232	Connectors	1 x DB-9 Female (Black)
	Baud Rate	19200
	Data Bits	8
	Stop Bits	1
	Parity	No
	Flow Control	No
EDID Settings	EDID Switch x 1 EDID Mode: Port 1 / Default / Auto / Switch	
Connectors		
Power	1 x DC Jack	
USB Port	1 x Micro USB (F/W upgrade)	
LEDs		
Video Input	1 x LED (Green)	

Function	Specifications
Video Output	10 x LED (Green)
Power	1 x LED (Green)
Power Consumption	5 VDC, 4.34W
Environmental	
Operating Temperature	0 - 40°C
Storage Temperature	-20 - 60°C
Humidity	0 x 80% RH, Non-Condensing
Physical Properties	
Housing	Metal
Weight	2.10 Kg
Dimensions (L x W x H)	43.72 x 15.78 x 4.40 cm

Limited Warranty

ATEN warrants its hardware in the country of purchase against flaws in materials and workmanship for a Warranty Period of two [2] years (warranty period may vary in certain regions/countries) commencing on the date of original purchase. This warranty period includes the LCD panel of ATEN LCD KVM switches. Select products are warranted for an additional year (see *A+ Warranty* for further details). Cables and accessories are not covered by the Standard Warranty.

What is covered by the Limited Hardware Warranty

ATEN will provide a repair service, without charge, during the Warranty Period. If a product is defective, ATEN will, at its discretion, have the option to (1) repair said product with new or repaired components, or (2) replace the entire product with an identical product or with a similar product which fulfills the same function as the defective product. Replaced products assume the warranty of the original product for the remaining period or a period of 90 days, whichever is longer. When the products or components are replaced, the replacing articles shall become customer property and the replaced articles shall become the property of ATEN.

To learn more about our warranty policies, please visit our website:

<http://www.aten.com/global/en/legal/policies/warranty-policy/>