



**4-Port True 4K HDMI Switch
VS481C User Manual**



www.aten.com

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 1-949-428-1111

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 VS481C 4-Port True 4K HDMI Switch
- 1 HDMI Cable
- 1 IR Remote Control Unit
- 1 Power Adapter
- 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 VS481C. 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 4-Port HDMI Switch. Its purpose, features, and installation considerations are presented and described.

Chapter 2, *Hardware Setup* describes the panel components and the steps that are necessary to quickly and safely set up the VS481C.

Chapter 3, *Operation* provides details on how to operate the VS481C using the panel pushbuttons, IR remote control unit, and RS-232 commands.

Chapter 4, *The Firmware Upgrade Utility* explains how to download the VS481C's firmware and upgrade the device using the utility.


An 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 VS481C 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

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Chapter 1

Introduction

Overview

The ATEN VS481C is designed for applications that require routing of 4 sources to one compatible display device. It enables the reliable transmission at video resolutions up to true 4K (4096 x 2160 @ 60Hz 4:4:4), data rates up to 18 Gbps, 3D, Deep Color up to 12-bit, and HD lossless audio formats.

Integrator-friendly features include Auto Switch, bidirectional RS-232, and IR pass-through for remote device control. Engineered to meet today's demand of true 4K signal transmission and user-oriented design, the ATEN VS481C is a powerful solution for a wide range of settings, such as home theater, meeting rooms, trade shows, and shopping centers.

Features

- ◆ Allows up to 4 HDMI sources to be connected to one HDMI display
- ◆ HDMI 2.0 (3D, Deep Color, 4K); HDCP 2.2 compliant
- ◆ Superior video quality – True 4k resolutions of 4k x 2k @ 60 Hz (4:4:4)
- ◆ Supports IR extension
- ◆ Built-in bi-directional RS-232 serial port for high-end system control
- ◆ Switch modes for automatic port selection
- ◆ LED indication of power status and source device status
- ◆ Plug-and-play

Planning the Installation

Required Equipment

- ◆ 1 - 4 source devices equipped with an HDMI Type-A connector
- ◆ 1 display device equipped with an HDMI Type-A connector
- ◆ 1 - 5 HDMI cables

Note: ATEN recommends using the High Speed HDMI Cable (2L-7D02H-1) or the equivalent for best results.

Optional Equipment

Purpose	Equipment
To control the VS481C using serial commands	<ul style="list-style-type: none"> ◆ 1 Hardware Controller ◆ 1 Serial Cable with a 9-pin male connector
To extend the reception range for the IR remote control unit	<ul style="list-style-type: none"> ◆ 1 ATEN IR Receiver Cable (ATEN 2XRT-0003G IR Receiver) or IR Remote Control (ATEN 2XRT-0101G)

Compatible ATEN Products

The VS481C is compatible with the following ATEN products:

Product Type	Models
ATEN Video Extender	VE811T, VE811R, VE8900T, VE8900R, VE8950T, VE8950R
ATEN Video Switch	VS0801HB
Others	VanCryst HDMI cables

Note: For an up-to-date list of compatible ATEN products, go to the VS481C product web page at <http://www.aten.com/global/en/>

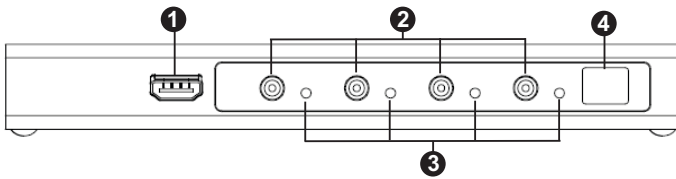
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Chapter 2

Hardware Setup

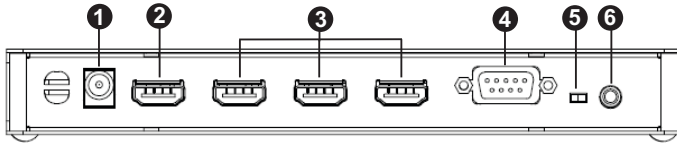
Components

Front View



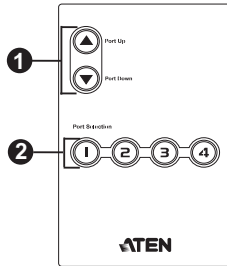
No.	Component	Description
1	HDMI In Port	Connects to the HDMI Out Port on the source device.
2	Port Selection Pushbuttons	Selects the corresponding HDMI input.
3	Port LEDs	A Port LED lights green to indicate that the corresponding HDMI input is selected.
4	IR Receiver	Receives IR signals from an IR remote control unit.

Rear View



No.	Component	Description
1	Power Jack	Connects to the power adapter.
2	HDMI Out Port	Connects to the HDMI In Port on the display device.
3	HDMI In Port	Connects to the HDMI Out Port on the source device.
4	RS-232 Serial Port	Connects to an RS-232 serial controller, such as a PC or a control system.
5	Auto Switch ON/OFF	Enables or disables the next mode. For details, see <i>Setting the Switch Mode</i> , page 13 Note: When the Auto Switch is put to ON , the VS481C will remain in next mode regardless of any RS-232 commands to set the unit into other switch modes.
6	IR Extension Port	Connects to an IR Receiver to extend the reception range for IR signals.

IR Remote Control Unit



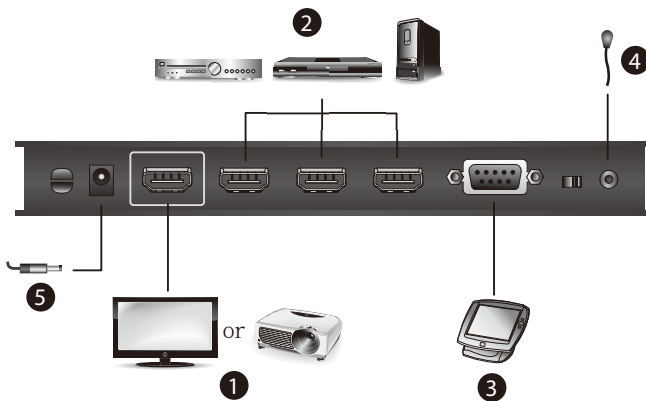
No.	Component	Description
1	Port Up / Port Down Buttons	Press the Port Up Button to cycle forward (e.g. source 1 to 2) through the source devices and the Port Down Button to cycle backward (e.g. source 2 to 1).
2	Port Selection Buttons	Press a button to bring the focus directly to the source device attached to its associated port.

Connecting the VS481C



1. Please review the safety information regarding the placement of this device in *Safety Instructions*, page 23.
2. Do not power on the VS481C until all the necessary hardware is connected.

Follow the steps below to connect the VS481C to a source, a compatible ATEN Video Extender, and other devices as required.



1. Use an HDMI cable to connect the HDMI In Port on the display device to the HDMI Out Port on the VS481C.
2. Use an HDMI cable to connect the HDMI Out Port on the source device to the HDMI In Port on the VS481C. You can connect up to four HDMI sources to the VS481C. Three HDMI In Ports are located on the rear panel, and one on the front.
3. (Optional) To configure the VS481C system settings using RS-232 serial commands, connect a hardware/software controller to the RS-232 Serial Port on the VS481C.

4. (Optional) To extend the reception range for IR signals, plug in an IR Receiver to the to the IR Port on the VS481C.

Note: This requires a separate purchase of an IR Receiver. ATEN recommends using the 2XRT-0003G IR Receiver. For more information about this accessory, visit our website at <http://www.aten.com/global/en/>

5. Plug the Power Adapter Cable into the Power Jack.

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Chapter 3

Operation

Overview

You can operate the VS481C using the panel pushbuttons, the IR remote control unit, or an RS-232 serial controller. The availability of actions with the three methods is summarized in the table below.

Action	Operation Methods		
	Panel Pushbuttons	IR Remote Control Unit	Serial Controller
Switch the port			
Switch the display to a specific source	✓	✓	✓
Switch to the next available port		✓	
Switch to the previous available port		✓	
Set the switch mode			
Enable the off mode	✓		✓
Enable the next mode (default)	✓		✓
Enable the priority mode			✓
Enable/disable the POD mode			✓
Other settings			
Read (display) the device settings			✓

Switching the Display Source

You can switch the display source using either the panel pushbuttons, IR remote control unit, or RS-232 serial controller:

- ◆ Panel pushbuttons

Press the **Port Selection Pushbutton** that corresponds to the source you wish to switch to. The corresponding Port LED lights green to indicate that the source is selected.

- ◆ IR remote control unit

Aim the IR remote control unit at the VS481C and press the corresponding **Port Selection Button**. Alternatively, cycle through the available sources by pressing the **Port Up** button to cycle forward (e.g. from source 1 to 2), and the **Port Down** button to cycle backward (e.g. from source 2 to 1).

- ◆ RS-232 serial controller

You can switch the display to a specific source by executing RS-232 commands. For detailed steps, refer to the *RS-232 Commands*, page 15.

Note:

- ◆ Make sure to use the IR mote control unit within the effective range (6 m).
 - ◆ For optimum performance, make sure there is a clear line-of-sight between the remote control unit and the connected IR receiver on the VS481C.
-

Setting the Switch Mode

You can have VS481C automatically switch ports for display. The VS481C supports the following switch modes:

Switch Mode	Description
off mode	The VS481C does not switch ports automatically.
next mode (default)	The VS481C switches to the next port that has a new source device connected to it.
priority mode	The VS481C switches to and only displays the source from a user-defined port as soon as a source is detected from the port.
POD mode	The Power-on Detection (POD) mode allows the VS481C to automatically switch to the next port with a powered-on source device when the currently connected source device is powered off. The POD mode works independently of the other switch modes.

Enabling/Disabling the Next Mode

Use any of the following methods to enable/disable the next mode

- ◆ Device Panel
Put the Auto Switch to **ON** or **Off** to enable or disable the next mode respectively.
- ◆ RS-232 serial controller
Send an RS-232 command from the serial controller. For detailed steps, refer to the *Setting the Switch Mode*, page 13.

Note:

When the Auto Switch is put to **ON**, the VS481C will remain in next mode regardless of any RS-232 commands to set the unit into other switch modes.

Enabling/Disabling the Priority and the POD Mode

Send an RS-232 command from the serial controller. For detailed steps, refer to the *Setting the Switch Mode*, page 13.

Executing an RS-232 Command

1. Make sure you have connected a hardware device (e.g. PC) to the VS481C. For information on device requirements and installation, see *Optional Equipment*, page 3 and *Connecting the VS481C*, page 8 respectively.
2. Send the command from your serial controller. For details on RS-232 commands, see *RS-232 Commands*, page 15.

Restarting the VS481C

Make sure to follow the steps below to safely restart the VS481C.

1. Power off the attached devices.
2. Unplug the power adapter cable from the VS481C.
3. Wait 10 seconds, and then replug the power adapter cable
4. After the VS481C is powered on, power on the attached devices.

Note:

When the VS481C is restarted, it selects the first port detected with a powered-on source.

RS-232 Commands

Task	RS-232 Command	Description
Switch the source		
Switch the display to a specific source	sw i<source_number>	For example, to switch to source 1, type sw i01 or sw
Turn on the output port	sw on	-
Turn off the output port	sw off	-
Change the switch mode		
Enable the next mode (Default)	swmode next	The VS481C switches to the next port that has a new source device connected to it.
Enable the priority mode	swmode i<source_number> priority	The VS481C switches to and only displays the source from a user-defined port as soon as a source is detected from the port. For example, to prioritize port 1, type swmode i01 priority or swmode priority
Disable the switch mode	swmode off	Disable the switch mode and the VS481C does not switch ports automatically.
Enable the POD mode	swmode pod on	The Power-on Detection (POD) mode allows the VS481C to automatically switch to the next port with a powered-on source device when the currently connected source device is powered off.
Disable the POD mode	swmode pod off	The POD mode works independently of the other switch modes.
Other		
Read (display) the VS481C's settings	read	-

Note: Separate each command string with a space.

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Chapter 4

The Firmware Upgrade Utility

Introduction

The purpose of the Windows-based Firmware Upgrade Utility is to provide an easy process for upgrading the VS481C. The program comes as part of a Firmware Upgrade Package that is specific for each device.

As new firmware versions become available, new firmware upgrade packages are posted on our website. Check the website regularly to find the latest information and packages.

Downloading the Firmware Upgrade Package

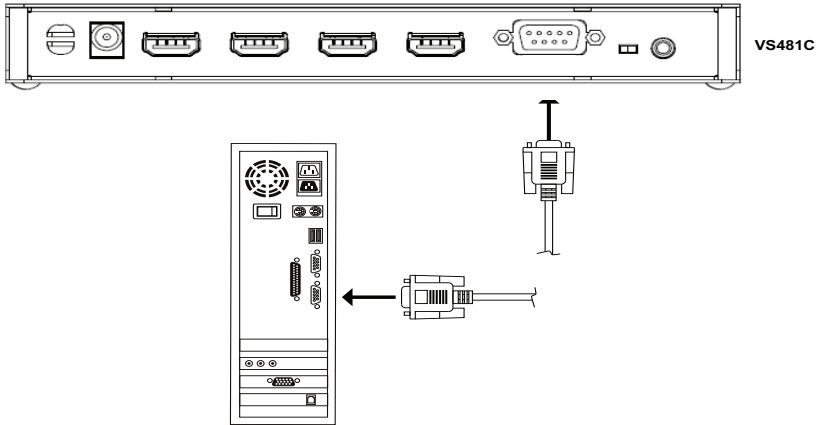
To download the firmware upgrade package:

1. On our Website go to: *Download - Firmware* and choose the device model, or from the VS481C product page under the *Resources* tab, select *Firmware*. A list of available firmware upgrade packages appears.
2. Choose the firmware upgrade package that you wish to install (usually the most recent) and download it to your computer.

Preparation

To prepare for the firmware upgrade, do the following:

1. Use an RS-232 cable to connect a COM port on your computer to the *RS-232 Serial Port* of your VS481C.



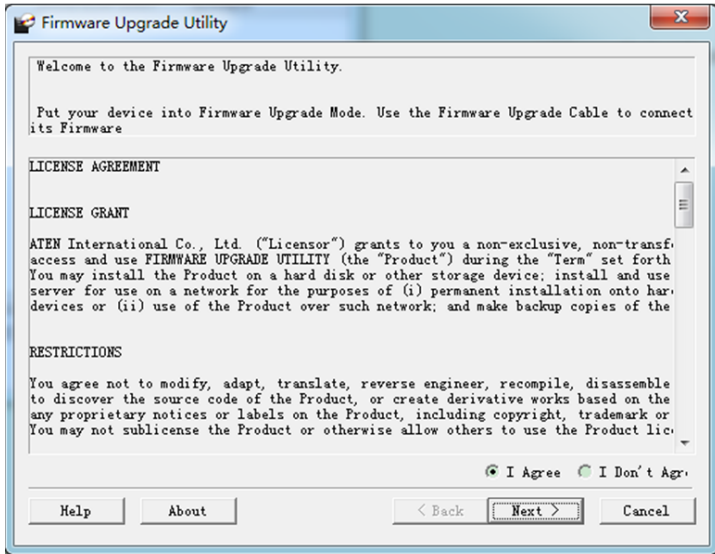
2. Unplug the VS481C's power adapter.
3. Hold-down front panel pushbutton 1 and plug the power adapter into the VS481C to power the unit.
4. If successful, all the port LEDs will start flashing and you can start the upgrade process as explained on the next page.

Starting the Upgrade

To upgrade the firmware:

1. Run the downloaded firmware upgrade package file either by double-clicking the file icon, or by opening a command line and entering the full path to it.

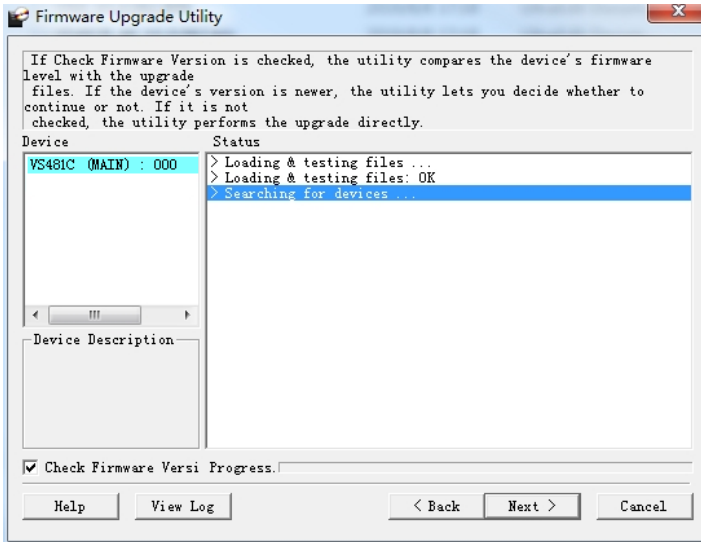
The *Firmware Upgrade Utility* welcome screen appears:



Note: The screens shown in this section are for reference only. The wording and layout of the actual screens put up by the *Firmware Upgrade Utility* may vary slightly from these examples.

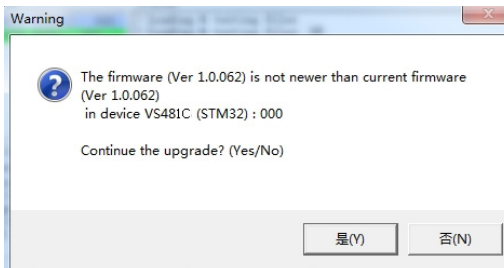
2. Read and **Agree** to the License Agreement (click the **I Agree** radio button).

- Click **Next** to continue. The *Firmware Upgrade Utility* main screen appears. The devices capable of being upgraded are listed in the *Device List* panel:



- Click **Next** to perform the upgrade. The Port LEDs 1, 3, and 4 will flash while the upgrade is in process.

If you enabled *Check Firmware Version*, the Utility compares the device's firmware level with that of the upgrade files. If it finds that the device's version is higher than the upgrade version, it brings up a dialog box informing you of the situation and gives you the option to continue or cancel.

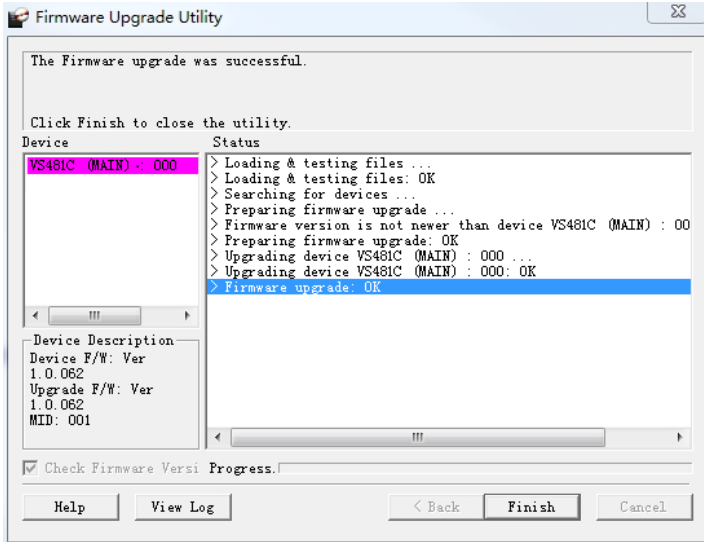


If you didn't enable *Check Firmware Version*, the Utility installs the upgrade files without checking whether they are a higher level, or not.

Status messages appear in the *Status Messages* panel, and the progress toward completion is shown on the *Progress* bar.

Upgrade Succeeded

After the upgrade has completed, all port LEDs will stop flashing and a screen appears to inform you that the procedure was successful:



Click **Finish** to close the *Firmware Upgrade Utility*.

Upgrade Failed

If the *Upgrade Succeeded* screen doesn't appear, it means that the upgrade failed to complete successfully. See the next section, *Firmware Upgrade Recovery*, for how to proceed.

Firmware Upgrade Recovery

There are three conditions that call for firmware upgrade recovery:

- ◆ When a firmware upgrade is manually aborted.
- ◆ When the mainboard firmware upgrade fails.
- ◆ When the I/O firmware upgrade fails.

To perform a firmware upgrade recovery, do the following:

1. Power off the device.
2. Connect the RS-232 cable to the *RS-232 Serial Port*.
3. Repeat the upgrade procedure.

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.

Technical Support

International

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

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	4 x HDMI Type A Female (Black)	
Impedance	100 Ω	
Max. Distance	3 m	
Video Output		
Interfaces	1 x HDMI Type A Female (Black)	
Impedance	100 Ω	
Max. Distance	3 m	
Video		
Max. Data Rate	18 Gbps (6 Gbps per lane)	
Max. Pixel Clock	600 MHz	
Compliance	HDMI (3D, Deep Color, 4K)	
	HDCP 2.2	
	Consumer Electronics Control (CEC)	
Max. Resolutions	4096 x 2160 / 3840 x 2160 @ 60Hz (4:4:4)	
Audio		
Input	4 x HDMI Type A Female (Black)	
Output	1 x HDMI Type A Female (Black)	
Control		
RS-232	Connectors	1 x Terminal Block, 3 Pole
	Baud Rate	19200
	Data Bits	8
	Stop Bits	1
	Parity	No
	Flow Control	No
IR	1 x Mini Stereo Jack Female (Black)	
Power		
Connectors	1 x DC Jack (Black)	
Consumption	DC 5V, 5W	
Environmental		

Function	Specifications
Operating Temperature	0 - 40°C
Storage Temperature	-20 - 60°C
Humidity	0 x 80% RH, Non-Condensing
Physical Properties	
Housing	Metal
Weight	0.47 kg
Dimensions (L x W x H)	20.00 x 8.21 x 2.50 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/>