ATEN

2/4-Port DVI Dual Link Splitter with Audio
VS172 / VS174
User Manual

FCC 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.

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.

KCC Information:

유선 제품용 / A 급 기기 (업무용 방송 통신 기기)
이 기기는 업무용 (A 급) 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며 , 가정 외의 지역에서 사용하는 것을 목적으로 합니다 .

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

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

The VS172 / VS174 2/4-Port DVI Dual Link Splitter with Audio package consists of:

◆ 1 VS172 / VS174 2/4-Port DVI Dual Link Splitter with Audio

◆ 1 Power Adapter

◆ 1 User Instructions*

Check to make sure that all the components are present and that nothing got damaged in shipping. If you encounter a problem, contact your dealer.

Read this manual thoroughly and follow the installation and operation procedures carefully to prevent any damage to the unit, and/or any of the devices connected to it.

* Features may have been added to the VS172 / VS174 since this manual was printed. Please visit our website to download the most up-to-date version.

Contents

Appendix

About this Manual

This User Manual is provided to help you get the most from your VS172 / VS174 system. 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 VS172 / VS174 system. Its purpose, features and benefits are presented, and its front and back panel components are described.

Chapter 2, *Hardware Setup,* describes how to set up your VS172 / VS174 installation. The necessary steps are provided.

Chapter 3, *Operation,* explains the fundamental concepts involved in operating the VS172 / VS174 through the RS-232 serial interface.

Chapter 4, *The Firmware Upgrade Utility* explains how to download the VS172 / VS174's firmware and upgrade the device using the utility.

An *Appendix,* provides specifications and other technical information regarding the VS172 / VS174.

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 *Start* menu, and then select *Run*.
⚠	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

Various industry sectors have come to rely on audio-visual displays to broadcast real-time information, advertise products or conduct trainings. To further extend the reach of these video systems, there is a need for splitters that can multiply the number of screens without affecting video quality.

The 2/4-Port DVI Dual Link Splitter with Audio charts a new direction in multimedia functionality by combining DVI quality video and audio. They take the signals from an audio/video source and replicate them to two (VS172) / four (VS174) audio/video outputs.

This 2-port / 4-port video splitter uses dual link technology, which offers high bandwidth capacity for added transmission power and faster refresh rates, thereby providing better video quality of viewing resolutions up to 2560 x 1600.

The built-in bi-directional RS-232 port on the rear panel allows the splitter to be controlled through a Control Unit, PC, and/or home automation/home theater software package for complete system integration. In addition, you can switch ports, enable/disable EDID mode, mute the audio or upgrade the firmware version locally from one console.

The VS172 / VS174 is easy to operate and can be cascaded to three levels and handle up to 8 (VS172) / 64 monitors (VS174), which makes them the ideal solution for situations such as:

a) Broadcasting video information to the public (news headlines, stock prices, airline and train schedules, etc.)

b) Company training facilities

c) Classroom instruction

The VS172 / VS174 provides the best audio-visual solution for a range of scenarios, from informal situations to corporate presentations.

Features

- Displays DVI audio/video to multiple DVI-compatible monitors or projectors
- Superior video quality – up to 2560 x 1600 @ 60Hz, and 1080P
- Cascadable to 3 levels – provides up to 8/64 video signals
- Audio enabled
- Features RS-232 serial port for command controls
- RS-232 Chain Control – use RS-232 commands to control cascaded devices via a DVI cable
- EDID Expert – selects the optimum EDID settings via RS-232

Note: 1. The VS172 / VS174 AP and GUI operation instructions can be downloaded from the ATEN website (www.aten.com).

2. HDCP is not supported.

Requirements

The following equipment is required for a complete VS172 / VS174 installation:

Consoles

- A DVI display that matches the computer's DVI display card that is capable of the highest resolution that you will be using on the DVI output.
- Speakers for audio output (optional)

Computers

The following equipment must be installed on any computer that acts as a source of DVI content:

- A DVI-I or DVI-D display port

Note: The quality of the display is affected by the quality of the DVI display card. For best results, we recommend you purchase a high quality product.

- An audio out port (optional – for audio accompaniment to the display)

Cables

Two (VS172) or four (VS174) sets of DVI cable are required to properly operate this DVI Switch (not included).

Note: 1. Cables are not included in this package. Since the quality of the display is affected by the quality and the length of the cables, we strongly recommend that you purchase high quality cables. Contact your dealer to purchase the correct cable sets for your switch.

2. There are three types of DVI signals. The cable type must match the type of signal being used by the DVI source and the DVI display.

Components

Front View
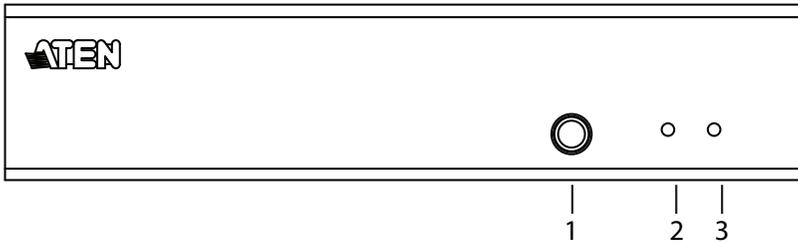
No.	Component	Description
1	Power/Standby button	Use this button to turn on the unit or wake it from standby mode.
2	Power LED	Lights green to indicate that the VS172 / VS174 is receiving power and is up and running. Lights orange to indicate that the VS172 / VS174 is in standby mode.
3	Activity LED	Lights to indicate that there is a working DVI connection to the computer

Note: The VS174's front panel is shown on this page. It is similar to the front panel of VS172.

Rear View

VS172
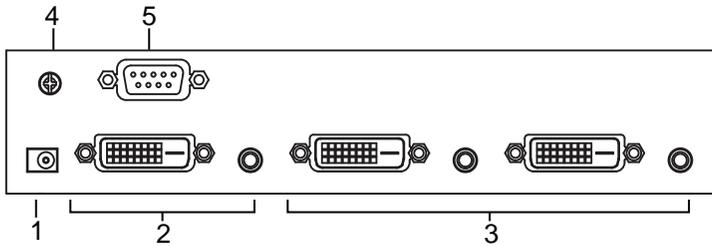
VS174
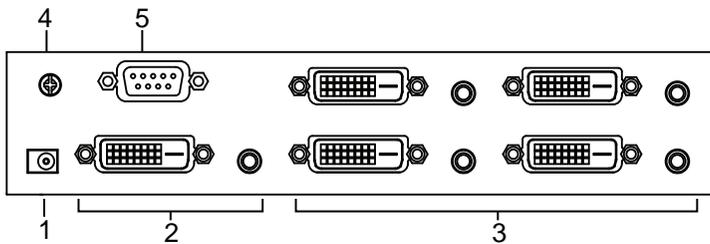
No.	Component	Description
1	Power Jack	The power adapter cable plugs in here.
2	A/V Input Section	The cables from your source device's DVI video and speaker ports plug in here.
3	A/V Output Section	The cables from your DVI monitors and speakers plug in here.
4	Grounding	The grounding wire (used to ground the unit) attaches here. **Note:** The grounding wire is not included in this package. Contact your dealer for more information.
5	RS-232 Serial Port	This is the serial remote port for output source selection and high-end system control, including firmware upgrade.

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Hardware Setup

⚠

1. Important safety information regarding the placement of this device is provided on page 25. Please review it before proceeding.

2. Make sure that the power to all devices connected to the installation are turned off.

3. Make sure that all devices you will be installing are properly grounded.

Grounding

To prevent damage to your installation it is important that all devices are properly grounded.

1. Use a grounding wire to ground the VS172 / VS174 by connecting one end of the wire to the grounding terminal, and the other end of the wire to a suitable grounded object.

2. Make sure that the computer(s)/device(s) that the VS172 / VS174 connects to are properly grounded.

Note: The grounding wire is not included in the package. Please contact your dealer for the appropriate cable.

Single Stage Installation

Refer to the installation diagram (the numbers in the diagram correspond to the numbers of the steps) and do the following:

1. Use a male-to-male DVI cable to connect your source device's DVI port to the VS172 / VS174's Video In port.

2. Use a male-to-male audio cable to connect your source device's speaker port to the VS172 / VS174's Audio In port.

3. Plug your DVI monitors and speakers into the A/V Out ports.

4. (Optional) To edit the VS172 / VS174 system settings through the RS-232 port, connect the hardware / software controller here.

5. Plug the power adapter that came with your switch into an AC power source, then plug the power adapter cable into the switch's Power Jack
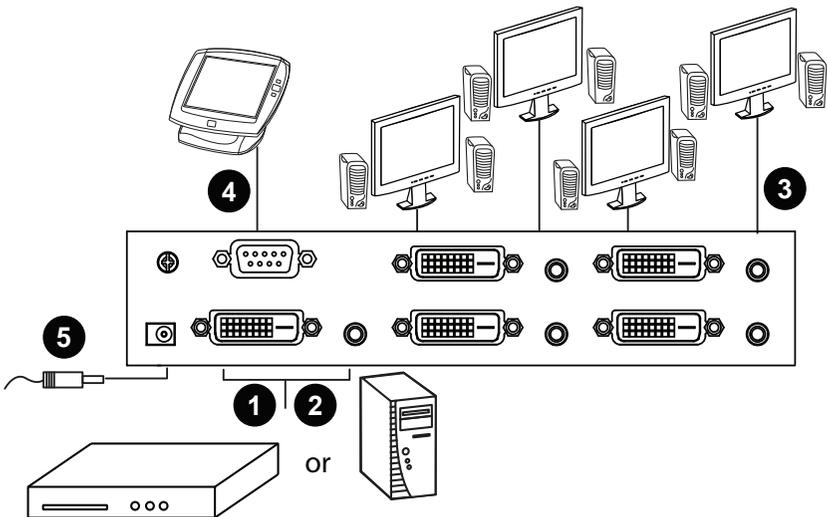
Note: The VS174 is pictured above. The VS172 rear panel is the same as the VS174, except that it has 2 A/V outputs s instead of 4.

Cascading

To provide even more audio/video display, additional units can be cascaded from the VS172 / VS174's A/V Out ports. Simply use additional male to male DVI and audio cables to connect an A/V Out port on the parent splitter to the A/V In port of the child splitter.

Recommended distances between devices in all cascade levels/stages for transmitting a high resolution signal are as follows:

Source to VS172 / VS174: 1.8 m

VS172 / VS174 to VS172 / VS174: 5 m

VS172 / VS174 to display: 5 m
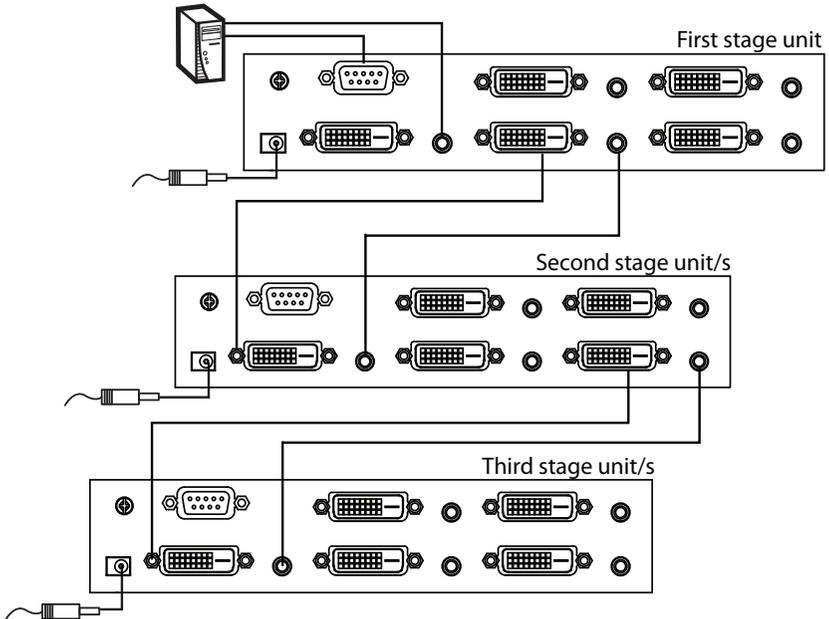
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Operation

Overview

The 2/4-Port DVI Dual Link Splitter with Audio offers easy and flexible source device selection through the RS-232 serial interface.

RS-232 Serial Interface

The VS172 / VS174's built-in bi-directional RS-232 serial interface allows system control through a high-end controller, such as a PC or home automation/home theater software.

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

Switch Port Commands

The formula for Switch Port commands are as follows:

Switch Command + Output + Port + Control [Enter]

For example, to switch output port to port 02, type the following:

sw o02 on [Enter]

The following tables show the possible values and formats for the **Output** command, **Port** number and **Control**:

Command	Description
sw	Switch command

Output	Description
o	Output command

Port	Description
yy	01-04 port (default is 01)
*	All output ports

Control	Description
on	Turn on the VS172 / VS174
off	Turn off the VS172 / VS174

Note: Each command string can be separated with a space. The Port command string can be skipped and the default value will be used.

The following table shows the available command list:

Command	Output	Port	Control	Enter	Description
sw	o	yy	on	[Enter]	Turn on (Display out) for output port
sw	o	yy	off	[Enter]	Turn off (No output) for output port
sw	o	*	on	[Enter]	Turn on (Display out) for all ports
sw	o	*	off	[Enter]	Turn off (No output) for all ports

Command for Cascaded Splitters

Serial port commands for cascaded splitters require identifying the chain of ports to which the target device is connected. The formula for Switch Port commands are as follows:

Switch Command + Output + Port + Port at first stage + Port at second stage + Control [Enter]
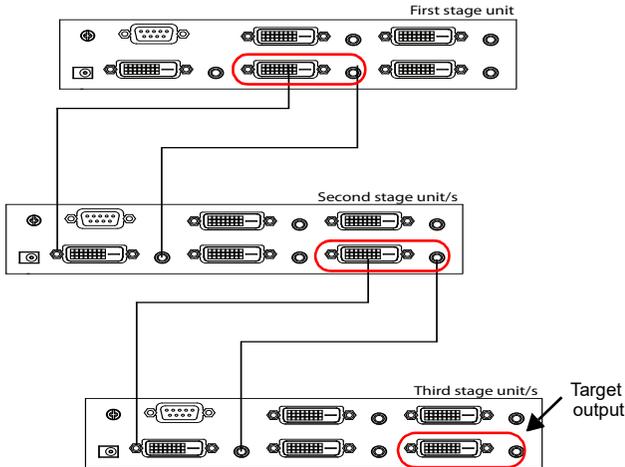
For the example above, the command for switching to the target output Port 1 of the splitter connected to Port 1 at the second stage of the cascade, which, in turn, is connected to output Port 2 at the first stage unit, is as follows:

sw o01-02-01 on [Enter]

This cascade command format is applied to *Mute Commands*, page 15, *Read Commands*, page 17, and *Reset Commands*, page 18. However, this is not applicable to EDID commands, which apply only to the first stage unit splitter, as well as the Firmware commands.

EDID Commands

Extended Display Identification Data (EDID) is a data format that contains a display's basic information and is used to communicate with the video source/ system. You can set up which EDID mode the VS172 / VS174 uses with the following command:

EDID Command + Control [Enter]

The EDID commands work only for the first stage unit when cascading VS172 / VS174 units.

The following tables show the possible values and formats for the **Control** command:

Command	Description
edid	Enable EDID selection

Control	Description
port1	Implement the EDID of the connected display to Port 1, and pass it to the video source (default)
auto	Implement the EDID of all connected displays. The VS172 / VS174 uses the best resolution for all displays
default	Implement ATEN's default EDID

The following table shows the available command list:

Command	Control	Enter	Description
edid	port1	[Enter]	The EDID from Port 1 is passed to the video source
edid	auto	[Enter]	The VS172 / VS174 implements the EDID of all connected displays and uses the best resolution for all displays (default)
edid	default	[Enter]	ATEN's default EDID is passed to the video source

Mute Commands

Enable or disable audio coming from the output port(s) using the following command:

Mute Command + Output + Port + Control [Enter]

The following tables show the possible values and formats for the **Output**, **Port** and **Control** commands:

Command	Description
mute	Enable / Disable audio of output port(s)

Output	Description
o	Output command

Port	Description
yy	Identify the output port to which the mute command applies.
*	All output ports

Control	Description
on	Mute on; audio from output port is disabled
off	Mute off; audio output enabled (default)

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

The following table shows the available command list:

Command	Output	Port	Control	Enter	Description
mute	o	yy	on	[Enter]	No audio from port
mute	o	*	on	[Enter]	No audio from all ports
mute	o	yy	off	[Enter]	Audio enabled for port
mute	o	*	off	[Enter]	Audio enabled for all ports

Firmware Commands

Upgrade the firmware by using this command:

Upgrade Command + Control [Enter]

The firmware upgrade command works only for the unit connected to the local PC or hardware / software controller. In order to upgrade the firmware of other VS172 / VS174 units in the cascade, manually connect them, one by one, to the local PC.

The following tables show the possible values and formats for the **Control** command:

Command	Description
upgrade	Starts the firmware upgrade process

The following table shows the available command list:

Command	Enter	Description
upgrade	[Enter]	Firmware upgrade process starts

Read Commands

View information from the device using the following command:

Read Command + Port + Control [Enter]

The following tables show the possible values and formats for the **Port** and **Control** commands:

Command	Description
read	Reads and displays information from the VS172 / VS174
o	Output port

Port	Description
yy	Displays the status of the port
*	Displays status of all ports

Control	Description
version	Displays the firmware version of the VS172 / VS174
edid	Displays the EDID mode setting of device 01
video	Displays the video status (on/off)
audio	Displays the audio status (on/off)

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

The following table shows the available command list:

Command	Output	Port	Control	Enter	Description
read	o	yy	version	[Enter]	Displays firmware version
read	o	*	version	[Enter]	Displays firmware version of all ports
read	o	yy	edid	[Enter]	Displays EDID mode
read	o	*	edid	[Enter]	Displays EDID mode of all ports
read	o	yy	video	[Enter]	Displays video status
read	o	*	video	[Enter]	Displays video status of all ports
read	o	yy	audio	[Enter]	Displays audio status
read	o	*	audio	[Enter]	Displays audio status of all ports

Reset Commands

Reset the VS172 / VS174 to default factory settings using the following command:

> Reset Command + Output + Port [Enter]

The following tables show the possible values and formats for the **Output** and **Port** commands:

Command	Description
reset	Resets to factory default settings

Output	Description
o	Output port

Port	Description
yy	Identify the output port to which the reset command applies
*	All output ports

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

The following table shows the available command list:

Command	Output	Port	Enter	Description
reset	o	yy	[Enter]	Resets the port
reset	o	*	[Enter]	Resets all ports

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 VS172 / VS174.

- **command incorrect** - indicates that the command has the wrong format and/or values.

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 VS172 / VS174. 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 VS172 / VS174 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 VS172 / VS174.
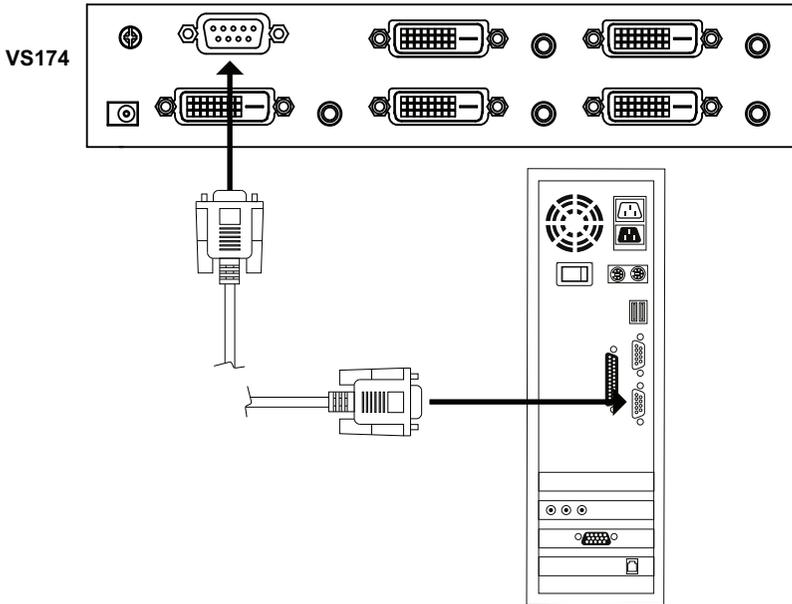
> **Note:** The VS174 is pictured above. The VS172 rear panel is the same as the VS174, except that it has 2 A/V outputs s instead of 4.

2. Unplug the VS172 / VS174's power adapter.

3. Press and hold the Power/Stand by Button located on the VS172 / VS174's front panel, and plug the power adapter into the VS172 / VS174 to power on the unit.

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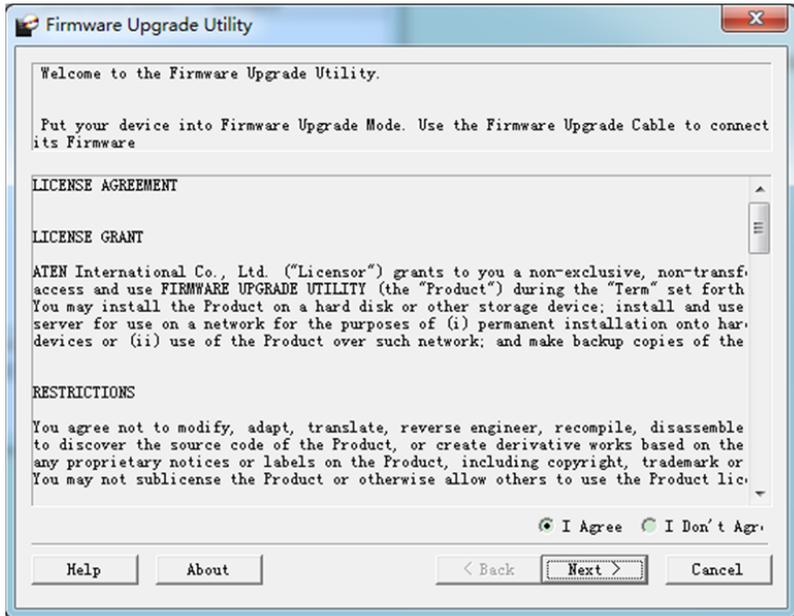
   Note: The screens shown in this section are for reference only. The wording and layout of the actual screens put up by the *Firmware Upgrade Utility* may vary slightly from these examples.

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

3. Click **Next** to continue. The *Firmware Upgrade Utility* main screen appears. The devices capable of being upgraded are listed in the *Device List* panel:
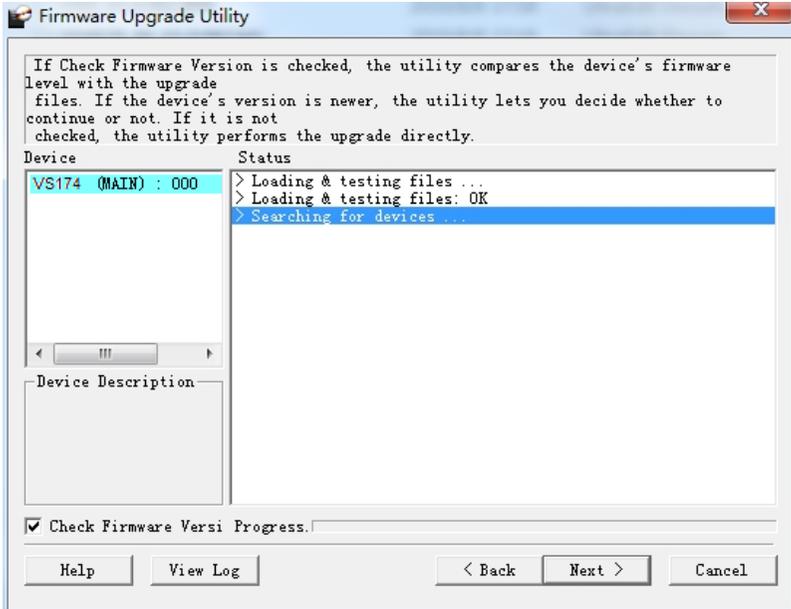
4. Click **Next** to perform the upgrade. The Port LEDs 1, 3, and 4 will flash while the upgrade is in process.

    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.
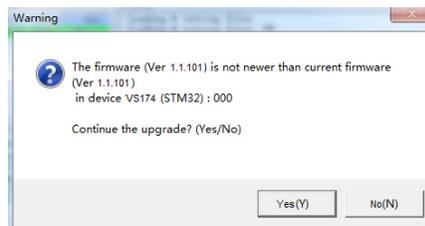

    If you didn't enable *Check Firmware Version*, the Utility installs the upgrade files without checking whether they are a higher level, or not.

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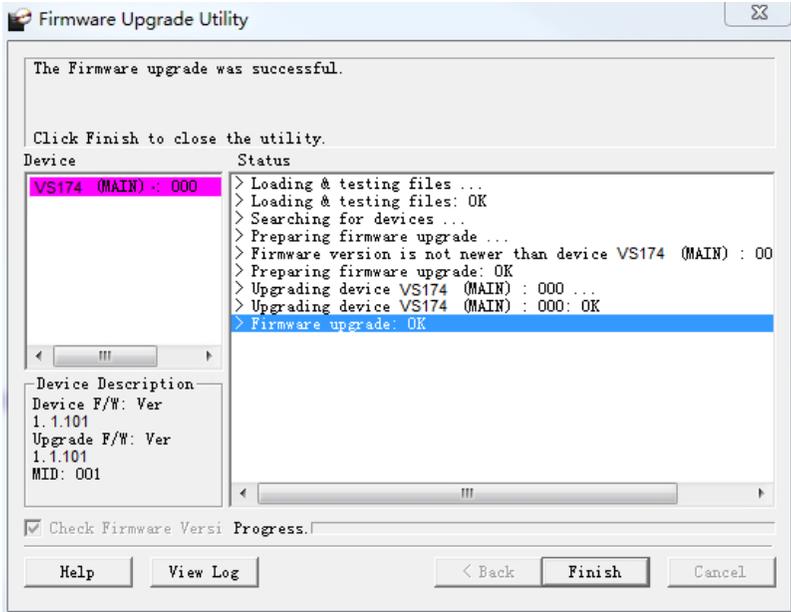
Click **Finish** to close the *Firmware Upgrade Utility*.

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.

Appendix

Safety Instructions

General

- 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 DC adapter. This is a safety feature.

- To help protect your system from sudden, transient increases and decreases in electrical power, use a surge suppressor, line conditioner, or un-interruptible 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.

  - 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://eservice.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		VS172	VS174
Computer Connections		2	4
Connectors	Video In	1 x DVI-D female (White)	
	Audio In	1 x Mini stereo jack (Green)	
	RS-232	1 x DB-9 Female (Black)	
	Video Out	2 x DVI-D F (White)	4 x DVI-D F (White)
	Audio Out	2 x Mini stereo jacks (Green)	4 x Mini stereo jacks (Green)
	Power	1 x DC jack	
LEDs	Link	1 (Green)	
	Power	1 (Green + Orange)	
Resolution		2560 x 1600 @ 60Hz, and 1080P	
Power Consumption		DC5.3V, 3.1W (Max)	DC5.3V, 5.6W (Max)
Signal Range		5 m (15 ft)	
Environment	Operating Temp.	0–50ºC	
	Storage Temp.	-20–60ºC	
	Humidity	0–80% RH, Non-condensing	
Physical Properties	Housing	Metal	
	Weight	0.68 kg	0.73 kg
	Dimensions (L x W x H)	21.00 x 8.80 x 5.55 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 detective, 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