



4x4 Video Matrix Switch with Audio VM0404 User Manual



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FCC Information

This is an FCC 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.

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.

RoHS

This product is RoHS compliant.

Safety

This product has been classified as Information Technology Equipment.



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

The VM0404 package consists of:

- ◆ 1 VM0404 4x4 Video Matrix Switch 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 VM0404 since this manual was published. Please visit our website to download the most up-to-date version.

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About this Manual

This User Manual is provided to help you get the most from your VM0404 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 VM0404 system. Its purpose, features and benefits are presented, and its front/back panel, and remote control components are described.

Chapter 2, Hardware Setup, describes how to set up your VM0404 installation and all the necessary steps.


Chapter 3, Operation, explains the fundamental concepts involved in operating the VM0404 via the front panel pushbuttons and LEDs.

Chapter 4, RS-232 Protocol Commands, provides a complete list of the serial control protocol commands used when utilizing the RS-232 Serial Port so that an extra source device can function further as transmitter and receiver.

An Appendix, provides specifications and other technical information regarding the VM0404.

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

The ATEN VanCryst VM0404 4x4 Video Matrix Switch with Audio provides a convenient way to simultaneously route audio/video content from four VGA source devices to four VGA monitors, projectors and displays.

As a Matrix Switch, each input can be independently connected to any or all outputs, and the audio from each source device can also be switched independently, giving you the ultimate in flexibility and control in any multi-display audio/video installation. The VM0404 duplicates and enhances video signals over distances of up to 30m, and supports multiple resolutions up to 1920 x 1440.

Convenient front panel pushbuttons allow you to quickly and easily cycle through the sources and displays, while the front panel LEDs indicate the source device for each display at a glance.

Furthermore, for complete system and install integration, RS-232 control is standard through the VM0404's built-in bi-directional RS-232 serial port that allows the switch to be controlled through a high-end controller, PC, and/or home automation / home theater software package.

Features

- ◆ Display the output from four video source devices to four display devices
- ◆ Easily switch between 4 media sources and enjoy the video content on any of up to 4 displays
- ◆ Long distance transmission – up to 30m
- ◆ Superior video quality – up to 1920 x 1440; VGA, SVGA, SXGA, UXGA and WUXGA (1920x1200)
- ◆ Configure and control the switch via front panel buttons, via RS-232
- ◆ Features RS-232 serial port for command controls
- ◆ Independent audio/video focus – each input can be independently connected to any or all outputs
- ◆ Supports up to 300 MHz bandwidth for high performance video
- ◆ EDID Expert – selects the optimum EDID settings for smooth power-up and highest quality display

Requirements

The following equipment is required for a complete VM0404 installation

Source Devices

- ◆ Computer or A/V source device with VGA and stereo output

Display Devices

- ◆ A VGA, SVGA, XGA, SXGA, UXGA, WUXGA, or multisync display device with an HDB-15 connector
- ◆ Stereo speakers

Cables

- ◆ Use VGA/Audio/RS-232 cables to connect the computer (or other audio/video source device) to the VM0404

Note: Cables are not provided in the VM0404 package.

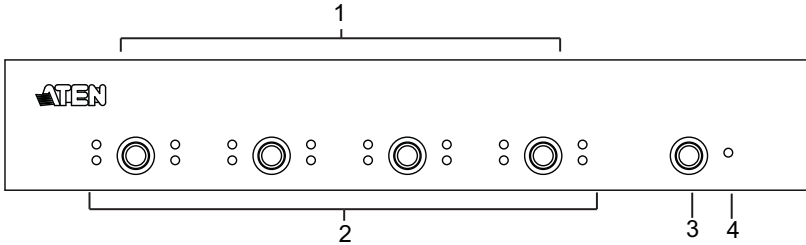
Source Device Operating Systems

Supported operating systems are shown in the table, below:

OS		Version
Windows		2000 and higher
Linux	RedHat	9.0 and higher
	SuSE	10 and higher
	Mandriva (Mandrake)	9.0 and higher
	Debian	3.1 and higher
	Ubuntu	7.04 and higher
UNIX	AIX	4.3 and higher
	FreeBSD	5.5 and higher
	Sun	Solaris 8 and higher
Novell	Netware	5.0 and higher
Mac		OS 10.1 and higher
DOS		6.2 and higher

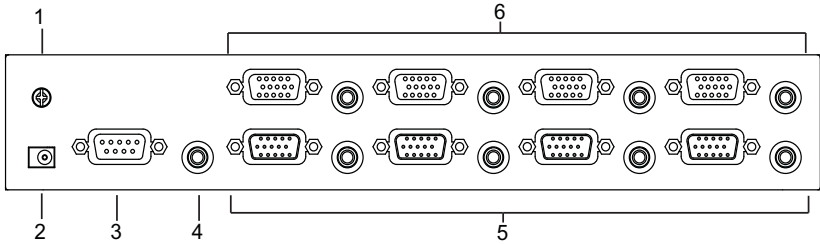
Components

Front View



No.	Component	Description
1	Port Selection Pushbuttons	Pressing a port selection pushbutton cycles through the four VGA input sources (Source 1, 2, 3, or 4) to be displayed on the display device attached to the corresponding output port (Display 1, 2, 3, or 4).
2	Port LEDs	The LEDs (Input Port 1, 2, 3 and 4) light to indicate that the VGA source attached to the corresponding input port is routed to the display device attached to the corresponding output port. The LEDs flash when the front panel pushbutton is locked.
3	Power Pushbutton	Press this button to turn on / off the switch.
4	Power LED	Power LED behavior: <ul style="list-style-type: none"> ◆ The LED lights green to indicate that the unit is receiving power. ◆ The LED lights orange to indicate that the unit is in standby mode.

Rear View



No.	Component	Description
1	Grounding Terminal	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.
2	Power Jack	The power adapter cable plugs in here.
3	RS-232 Serial Port	This serial remote port is for input source selection and high-end system control.
4	External IR Receiver Port	3.5 mm Mini Stereo Jack which connects the IR Receiver unit (optional).
5	Audio/Video Input Ports	The VGA ports are for connecting your input source. The Mini Stereo Jack ports are for the audio source.
6	Audio/Video Output Ports	The VGA ports are for connecting your output displays. The Mini Stereo Jack ports are for the audio speakers.

Maximum Cable Distances

Connection	Distance
Computer to Unit	10 m
Unit to Monitor	30 m

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Chapter 2

Hardware Setup



1. Important safety information regarding the placement of this device is provided on page 23. Please review it before proceeding.
2. Make sure that the power to all devices connected to the installation are turned off. You must unplug the power cords of any computers that have the Keyboard Power On function.

Cable Connections

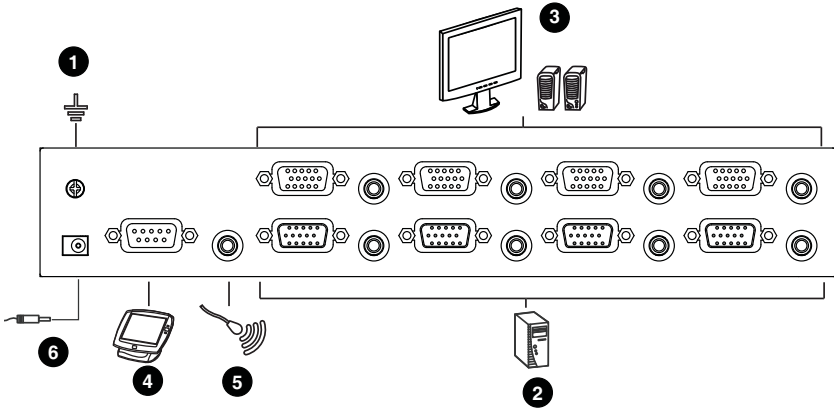
Installation of the VM0404 is simply a matter of connecting the appropriate cables. Refer to the installation diagram in the next page (the numbers in the diagrams correspond to the steps below), and do the following:

1. Use a grounding wire to ground the units you are installing. Connect one end of the wire to the grounding terminal, and the other end of the wire to a suitable grounded object.
2. Connect up to 4 video/audio sources to the VGA/Audio Input ports.
3. Connect up to 4 display/audio devices to the VGA/Audio Output ports.
4. If you are using the serial control function, use an appropriate RS-232 serial cable to connect the computer or serial controller to the VM0404's female RS-232 port.
5. (Optional) Connect an IR Receiver into the External IR Receiver Input Port.

Note: The IR Extension Cable (2XRT-0003G) and IR Remote Control (2XRT-0106G) are not included in the package and are sold separately. Contact your dealer for purchasing details.

6. Plug the power adapter supplied with the package into the VM0404's power jack, and then into a power source.
7. Power on the VM0404 and all devices in the installation.

Installation Diagram



Chapter 3

Operation

Overview

The VM0404 can be configured and operated via the front panel pushbuttons or by connecting an RS-232 Serial controller.

You can also use an IR Remote Control if there is an IR receiver connected to your VM0404 unit.

Note: The IR Extension Cable (2XRT-0003G) and IR Remote Control (2XRT-0106G) are not included in the package and are sold separately. Contact your dealer for purchasing details.

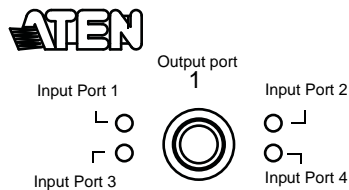
The front panel pushbuttons and remote control operation are discussed in this Chapter. See *RS-232 Commands*, page 13 for details on using the serial controller.

Front Panel Operation

The VM0404 features front panel pushbuttons for convenient configuration and operation. They allow you to perform operations, such as:

- ♦ Selecting which audio/video source shows on which output display – press the button for the output port (1 to 4) and the LED of the corresponding input port (1 to 4) lights up.

VM0404 Front Panel



-
- ♦ Turning the switch on/off – press the Power button to turn the switch on or put it on standby

IR Remote Control Operation

You can use an IR Remote Control if there is an IR receiver connected to your VM0404 unit.

Note: The IR receiver and remote control are not included in the package and requires a separate purchase. Contact your dealer for more details.

The remote control allows you to change the Output port status for each display using an IR remote control.

You can use the remote control to: change the Input source of any Output display port, power on/off any individual Output display, or power on/off all Output displays simultaneously.

Before using the remote control feature you must first plug the IR External Receiver into the rear of the VM0404 (see *External IR Receiver Port*, page 5), and place the receiver where the IR signal can be reached.

Change the Input source of an Output port

To change the Input source for an Output display, use the IR remote control to do the following:

1. Press the OUTPUT port number (1–4) you want to change.
2. Press the INPUT port number (1–4) you want the OUTPUT port to display within 2 seconds.

Note: For the change to occur the INPUT number must be pressed within 2 seconds of pressing the OUTPUT number.

3. Repeat steps 1-2 to change additional ports.

Power on/off individual Output displays

To power on/off individual Output displays, use the remote control to do the following:

1. Press the OUTPUT port number (1–4) you want to power on/off.
2. Press the ON or OFF pushbutton within 2 seconds.

Note: For individual power on/off to occur properly the ON or OFF pushbutton must be pressed within 2 seconds of pressing the OUTPUT number. Failing to do so will result in all displays being powered on or off respectively.

3. Repeat steps 1-2 to change the power status back on/off.

Power on/off all Output displays

To power on or off all output displays simultaneously (either on or off) regardless of its original power status, use the remote control and do the following:

1. Press the ON or OFF pushbutton.
2. Repeat step 1 to simultaneously change the power status of all Output ports back on/off.

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Chapter 4

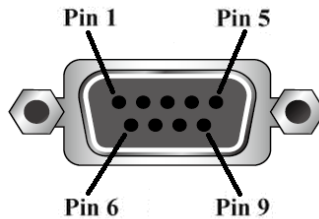
RS-232 Commands

Serial Control Protocol Commands

This chapter provides a complete list of the serial control protocol commands used when utilizing the RS-232 Serial Port.

RS232 Pin Assignment

Pin	Description	Pin	Description
1	Not connected	6	Not connected
2	RXD	7	Not connected
3	TXD	8	Not connected
4	Not connected	9	Not connected
5	GND		



Configuring the Serial Port

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

RS-232 Serial Control Protocol Settings	
Baud Rate	19200 (Default)
Data Bit	8 bits
Parity	None
Stop Bit	1 Bit
Flow Control	None

Switch Port Commands

The formulas for Switch Port commands are as follows:

1. Switch Command + Input Command + Port number + Output Command + Port Number + Control + [Enter]

For example, to switch input port 02 to output port 04, type the following:

```
sw i02 o04 [Enter]
```

Note: The hexadecimal code for [Enter] is 0D0A.

2. Switch Command + Output Command + Port Number + Control + [Enter]

For example, to turn off video output on port 03, type the following:

```
sw o03 video off [Enter]
```

3. Switch Command + Output Command + Port Number + Control + [Enter]

For example, to switch the next input to port 02 (audio and video), type the following:

```
sw o02 + [Enter]
```

Possible Values

The following table shows the possible values for switch commands:

Command	Description
sw	Switch command

Input Command	Description
i	Input command

Input Port Number	Description
xx	01-04 port (default is 01)

Output Command	Description
o	Output Command

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

Control	Description	
on	Turn on	
off	Turn off	
+	Next port	
-	Previous port	
video	Switch video only	skip = video+audio
audio	Switch audio only	

Enter	Description
[Enter]	Enter and send out the command

Switch Port Command Table

Cmd	In	N1	Out	N2	C1	C2	Enter	Description
sw	i	xx	o	yy *	video audio		Enter Key	Switch Input Port xx to Output Port yy (xx:01~04; yy:01~04, *) Note: Skipping the video/audio command automatically switches both Video and Audio
sw			o	yy *	video audio	on off	Enter Key	Turn on Output Port yy Turn off Output Port yy (yy:01~04, *)
sw			o	yy *	video audio	+ -	Enter Key	Switch Next Output to Port yy Switch Previous Output to Port yy (yy:01~04, *)

Note: 1. Each command string can be separated with a space.

- The **Port Number** command string can be skipped, and the default value will be used.
- The **Audio or Video** command string can be skipped, and both values will be used.

EDID Commands

The formulas for EDID commands are as follows:

1. EDID Command + Control + [Enter]

For example, to change EDID to use the port1 setting, type the following:

edid port1 [Enter]

Possible Values

The following table shows the possible values for switch commands:EDID

Command	Description
edid	EDID mode selection

Control	Description
port1	Pass through EDID from the display connected to port 1
remix	Conditional remix mode. The device implements remix mode once when the VM0404 is powered on.
auto	Implement true EDID remix of all connected displays.
default	Implement ATEN default EDID for all.

Enter	Description
[Enter Key]	Send out command

EDID Command Table

Command	Control	Enter	Description
edid	port1	[Enter Key]	The EDID from the display connected to port 1 (or the smallest port number) is passed to the video source.
edid	remix	[Enter Key]	Applies a mix of EDIDs from connected displays according to each connection when the VM0404 is powered on.
edid	auto	[Enter Key]	The EDIDs of all connected displays are detected, and the best resolution is applied.
edid	default	[Enter Key]	The ATEN default EDID is passed to all video sources.

Mute Commands

The formulas for Mute commands are as follows:

1. Mute Command + Output Command + Port Number + Control + [Enter]

For example, to mute output port 04 on device 01, type the following:

mute o04 on [Enter]

2. Mute Command + Output Command + Port Number + Control + [Enter]

For example, turn on audio at output port 04 on device 01, type the following:

mute o04 off [Enter]

Possible Values

The following table shows the possible values for mute commands:

Command	Description
mute	Mute selected output port
Output Command	Description
o	Output Command
Output Port Number	Description
yy	01-04 port Output port
*	All output ports (default)
Control	Description
on	Mute on; audio from selected output port is disabled
off	Mute off; audio output enabled (default)

Mute Command Table

Command	Output	Num2	Control	Enter	Description
mute	o	yy	on	[Enter Key]	Mute Output Port yy (yy:01~04, *) (Default: *)
mute	o	yy	off	[Enter Key]	Turn on Audio at Output Port yy (yy:01~04, *) (Default: *)

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

Save / Load Profile Commands

The formulas for Save/Load Profile commands are as follows:

1. Command + Profile + Number + Control + [Enter]

For example, to save the current connection configuration to profile 01, type the following:

profile f 01 save [Enter]

2. Command + Profile + Number + Control + [Enter]

For example, to load profile 01, type the following:

profile f 01 load [Enter]

Possible Values

The following table shows the possible values for Save/load Profile commands:

Command	Description
profile	Save / Load profile
Profile	Description
f	Profile
Profile Number	Description
yy	00-07 (default is 00)
Control	Description
save	Save the current connection configuration
load	Load a saved profile

Profile Command Table:

Command	Profile	Num1	Control	Enter	Description
profile	f	yy	save	[Enter Key]	Save current connection configuration to profile yy (yy:00~07) (Default: 00)
profile	f	yy	load	[Enter Key]	Load saved profile yy (yy:00~07) (Default: 00)

Read Commands

View information from the device using the following command:

Read Command + Control [Enter]

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

Command	Description
read	Reads and displays information from the VM0404

Control	Description
version	Displays the firmware version of the VM0404

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

The following table shows the available command list:

Command	Control	Enter	Description
read	version	[Enter]	Displays firmware version

RS-232 Baud Rate Setting Commands

Set the RS-232 Baud Rate using the following command:

Baud Command + Control [Enter]

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

Command	Description
baud	Sets the baud rate to the value specified

Control	Description
value	9600 / 19200 / 38400 / 115200 (Default: 19200)

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

The following table shows the available command list:

Command	Control	Enter	Description
baud	value	[Enter]	Sets the baud rate to the value given

Button Control

The formulas for Button Control commands is as follows:

Command + Control + [Enter]

For example, to enable the button function, type the following:

button on [Enter]

Possible Values

The following table shows the possible values for Button Control commands:

Command	Description
button	Panel button enable/disable control

Control	Description
on	Button function is enabled
off	Button function is disabled (the source port's LED flashes every 1 sec)

Button Command Table

Command	Control	Enter	Description
button	on	[Enter Key]	The button function is enabled.
button	off	[Enter Key]	The button function is disabled.

Acknowledge:

Ack	Description
Command OK	Command is correct and function executed
Command Incorrect	Unavailable command or parameters

After commands are sent acknowledge messages are returned.

RS-232 Pin Assignment

Pin	Description	Pin	Description
1	Not connected	6	Not connected
2	RXD	7	Not connected
3	TXD	8	Not connected
4	Not connected	9	Not connected
5	GND		

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Safety Instructions

General

- ◆ Read all of these instructions. Save them for future reference.
- ◆ Follow all warnings and instructions marked on the device.
- ◆ This product is for indoor use only.
- ◆ 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 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.
 - ◆ 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://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		VM0404
Connectors	Video In	4 x HDB-15 Male (Blue)
	Video Out	4 x HDB-15 Female (Blue)
	Audio In	4 x Mini Stereo Jack Female (Green)
	Audio Out	4 x Mini Stereo Jack Female (Green)
	RS-232	1 x DB9 Female (Black)
	IR Port	1 x Mini Stereo Jack Female (Black)
	Power	1 x DC Jack
Switches	Port Selection	4 x Pushbutton
	Power	1 x Pushbutton
LEDs	Input	16 (Green)
	Power	1 (Green / Orange)
Video	Bandwidth	300 MHz
	Resolution	1920 x 1440 @ 60Hz
Power Consumption		DC 5.3V 2.7W
Environment	Operating Temp.	0–50°C
	Storage Temp.	-20–60°C
	Humidity	0–80% RH, Non-condensing
Physical Properties	Housing	Metal
	Weight	0.87 kg
	Dimensions (L x W x H)	26.0 x 7.6x 4.2 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/>