



12G-SDI to HDMI 2.0 Converter VC486 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.

KCC Statement

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
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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 VC486 12G-SDI to HDMI 2.0 Converter
- ◆ 1 Power Adapter
- ◆ 1 HDMI LockPro
- ◆ 4 Foot Pads
- ◆ 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.

Table of Contents

EMC Information	ii
RoHS	ii
User Information	iii
Online Registration	iii
Telephone Support	iii
User Notice	iii
Package Contents	iv
About this Manual	vii
Conventions	viii
Product Information	viii

1. Introduction

Overview	1
Features	2
Planning the Installation	3
Requirements	3
Considerations	3
Components	4
Front View	4
Rear View	5

2. Hardware Setup

Mounting the VC486 Unit	7
Rack Mounting	7
Connecting the VC486 Unit	8

3. Operation

Selecting the Audio Channel	9
SDI Audio Selection	9

4. The Firmware Upgrade Utility

Introduction	11
Downloading the Firmware Upgrade Package	11
Preparation	12
Starting the Upgrade	13
Upgrade Succeeded	15
Upgrade Failed	15
Firmware Upgrade Recovery	16

Appendix

Safety Instructions	17
General	17
Rack Mounting	19

Technical Support	20
International	20
North America	20
Specifications	21
Supported SDI Resolutions	23
Limited Warranty	26

About this Manual

This user manual is provided to help you get the most from the VC486 unit. 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 12G-SDI to HDMI 2.0 Converter. Its purpose, features, installation considerations, and panel components are presented and described.

Chapter 2, *Hardware Setup* describes the steps that are necessary to quickly and safely set up your installation.

Chapter 3, *Operation* explains the source input operation using the source switch pushbutton and RS-232 commands and its limitations.

Chapter 4, *The Firmware Upgrade Utility* explains the source input operation using the source switch pushbutton and RS-232 commands and its limitations.


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 VC486 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 *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 VC486 is a 12G-SDI to HDMI 2.0 Converter that converts HD/3G/6G/12G-SDI input signals to an HDMI output in real time. It supports various transmission distances depending on different SDI formats, including 45 m (12G-SDI), 60 m (6G-SDI), 90 m (3G-SDI), and 150 m (HD-SDI), offering the flexibility for professional video projects. The VC486 is a perfect choice for applications such as using HDMI televisions as SDI broadcast monitors, and connecting to video projectors.

Features

- ◆ Converts HD/3G/6G/12G-SDI input signals to an HDMI output in real time
- ◆ SDI signal re-clocked for high signal quality
- ◆ Supports SDI standard SMPTE-292/424/425-3/2081/2082
- ◆ Supports an SDI distance of up to 45 m (12G-SDI), 60 m (6G-SDI), 90 m (3G-SDI) and 150 m (HD-SDI)
- ◆ Supported SDI formats:
 - ◆ HD-SDI (SMPTE 292M, 296M, up to 1.485 Gbps)
 - ◆ 3G-SDI (SMPTE 424M, 425M level A and B, up to 2.97 Gbps)
 - ◆ 6G-SDI (SMPTE 2081-1, SMPTE 2081-10, up to 6 Gbps)
 - ◆ 12G-SDI (SMPTE 2081-1, SMPTE 2081-10, SMPTE 2082-1 and SMPTE 2082-10, up to 12 Gbps)
- ◆ Supports analog stereo audio output with RCA (R/L) connector
- ◆ Automatic detection of input video signals
- ◆ Analog Audio channel selection with a 8-step rotary switch
- ◆ Locking power connector

Planning the Installation

Requirements

Prepare the following before installing the VC486 unit:

- ◆ 1 SDI source sevice
- ◆ 1 SDI source output device
- ◆ 2 SDI cables
- ◆ 1 HDMI cable
- ◆ 1 HDMI display
- ◆ 1 speakers

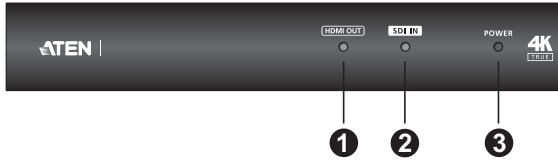
Considerations

- ◆ The maximum transmission distance varies at different parts of the transmission:

Connection	Interface	Distance
SDI source to the VC486	12G – SDI	45 m
	6G – SDI	60 m
	3G – SDI	90 m
	HD – SDI	150 m
VC486 to the display	12G – SDI	45 m
	6G – SDI	60 m
	3G – SDI	90 m
	HD – SDI	150 m
	HDMI	3 m

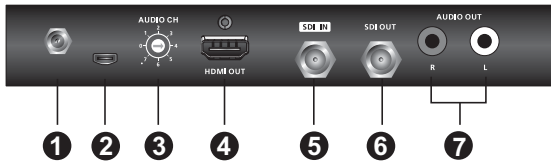
Components

Front View



No.	Component	Description
1	HDMI Output Status LED	When LED lights green, it means the HDMI signal is stable.
2	SDI Input Status LED	When LED lights green, it means the SDI signal is stable.
3	Power LED	When LED lights green, it means the VC486 is receiving power.

Rear View



No.	Component	Description
1	Power Jack	Connects to the Power Adapter.
2	Firmware Upgrade Port	Connects to a Micro USB cable for firmware upgrade. See <i>The Firmware Upgrade Utility</i> , page 11.
3	Audio Channel Switch	Use the switch to set an audio channel from 0 - 7. See <i>Selecting the Audio Channel</i> , page 9.
4	HDMI Out Port	Connects to the HDMI In port on the display device.
5	SDI Input Port	Connects to the SDI Out port on the source device.
6	SDI Output Port	Connects to the SDI In port on the display device.
7	Audio Output Ports	Connects to the Audio In port on a speaker.

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Chapter 2

Hardware Setup



1. Please review the safety information regarding the placement of this device in *Safety Instructions*, page 17.
2. Do not power on the VC486 until all the necessary hardware is connected.

Mounting the VC486 Unit

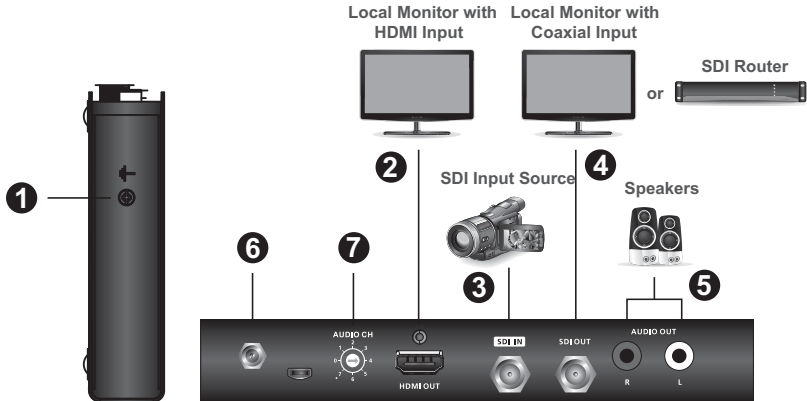
You can mount the VC486 on a rack.

Rack Mounting

Use the VE-RMK 1U Rack Mount Kit to rack-mount the VC486. For more information about this accessory, go to www.aten.com/products

Connecting the VC486 Unit

Follow the steps below to connect the VC486 to a source, and other controls as required.



1. Ground the VC486 by connecting one end of a grounding wire to the Grounding Terminal and the other end to a suitable grounded object. The Grounding Terminal is located on the left side of the unit.

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

2. Use an HDMI cable to connect an HDMI-enabled monitor to the HDMI Output Port on the VC486.
3. Use a coaxial cable to connect an SDI source device to the SDI Input Port on the VC486.
4. Use a coaxial cable to connect an SDI display device or SDI router to the SDI Output Port on the VC486.
5. Connect your audio output device (e.g. speakers) to the Audio Output Ports on the VC486.
6. Plug the provided power adapter into an appropriate power source; plug the power adapter cable into the Power Jack on the VC486.
7. (Optional) Use the Audio Channel Switch to switch your audio output channel.
8. Check that the Power LED, HDMI Output Status LED, and SDI Input Status LED light green to indicate that the VC486 is receiving power and ready to operate.

Chapter 3 Operation





Selecting the Audio Channel







Audio Channel Switch

Switch the Audio Channel Switch on the VC486 to switch the audio channel from 0 - 7. Each audio channel support 2 analogs, see the table below for more information.

SDI Audio Selection

Switches	Supported Analog
	1 - 2
	3 - 4
	5 - 6
	7 - 8

Switches	Supported Analog
	9 - 10
	11 - 12
	13 - 14
	15 - 16

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 VC486. 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

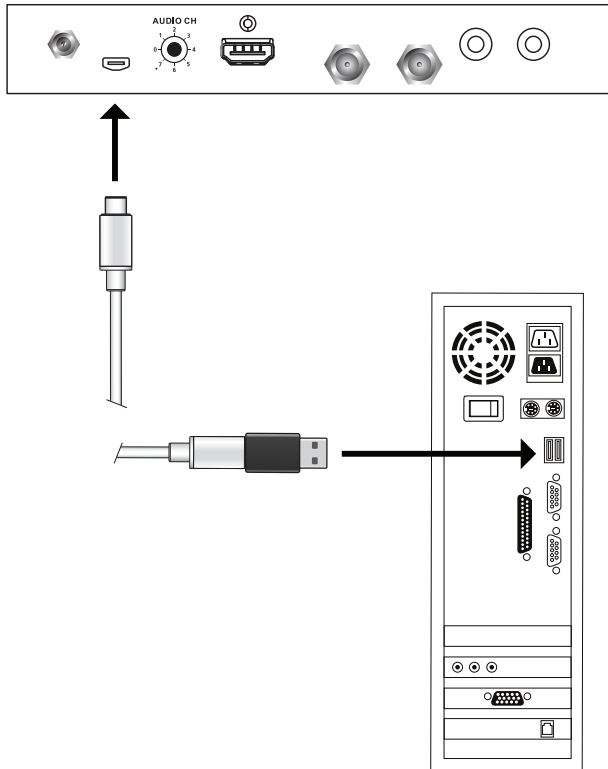
To download the firmware upgrade package:

1. On our Website go to: *Download - Firmware* and choose the device model, or from the VC486 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. Unplug the VC486's power adapter.
2. Use a Micro USB cable to connect a USB Type-A port on your computer, and the other end to the *Firmware Upgrade Port* of your VC486.



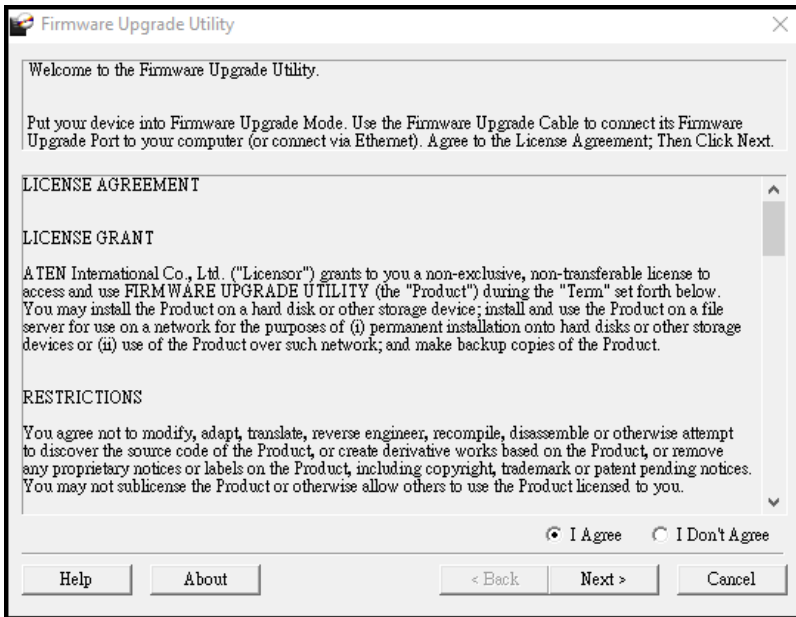
3. Plug the power adapter into Power Jack on the VC486.
4. If successful, the Status LEDs that indicates the SDI, HDMI, and power status will start to flash. Now, you can start the upgrade process as explained on the next page.

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.

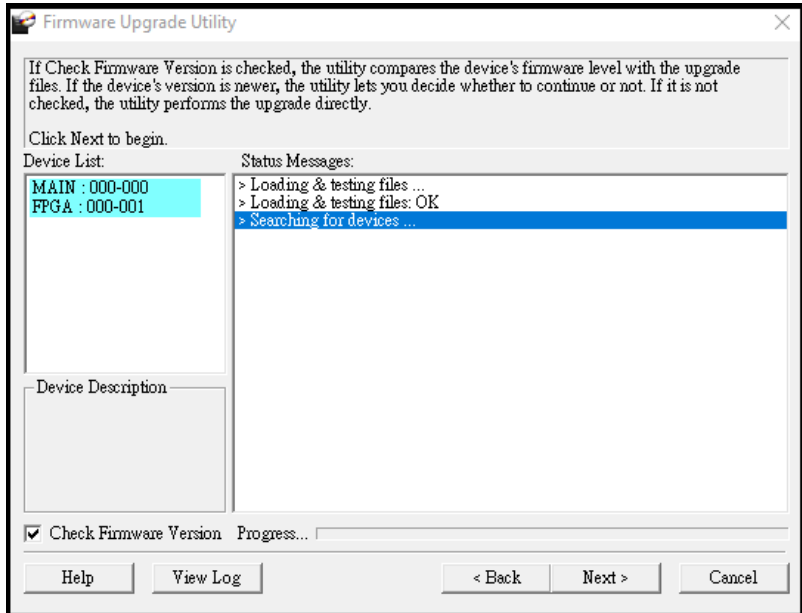
The *Firmware Upgrade Utility* welcome screen appears:



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 slight from these examples.

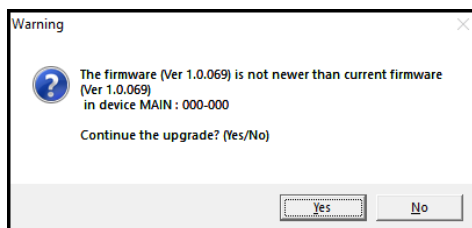
2. Read and *Agree* to the License Agreement (click the **I Agree** radio button).

- 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 Status LEDs SDI, HDMI, and power 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.

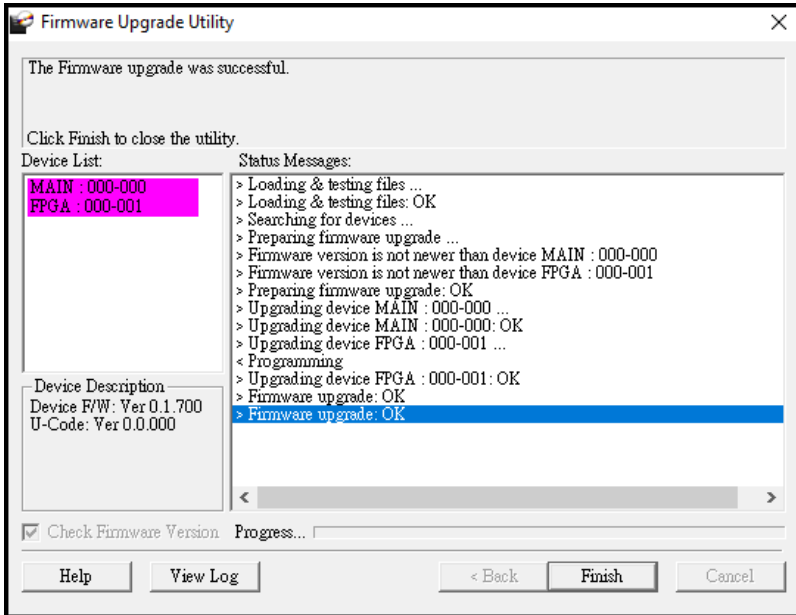


If you didn't enable *Check Firmware Version*, the Utility installs the upgrade files without checking whether they are a higher level, or not.

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 Micro USB cable to the USB Type-A port on your computer, and the other end to the *Firmware Upgrade Port* of your VC486
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.
- ◆ 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 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	VC486
Switches	
Audio Selection	1 x Rotary Switch (8-steps)
Control	
USB	1 X Micro USB (Firmware Upgrade)
Video Input	
Interfaces	1 x SDI (BNC Connector, Inter-locked Socket)
Impedance	75 Ω
Video Output	
Interfaces	1 x HDMI Type A Female (Black) 1 x SDI (BNC Connector, Inter-locked Somet)
Impedance	HDMI: 100 Ω SDI: 75 Ω
Video	
Max. Data Rate	12 Gpbs
Supported Resolutions	720p50, 720p59.94, 720p60 1080p23.98, 1080p24, 1080p25, 1080p29.97, 1080p30, 1080p50, 1080p59.94, 1080p60 , 1080PsF25, 1080PsF29.97, 1080PsF30 1080i50, 1080i59.94, 1080i60 2K DCI 23.98p, 2K DCI 24p, 2K DCI 25p, 2K DCI 25PsF: 2160p23.98, 2160p24, 2160p25, 2160p29.97, 2160p30, 2160p50, 2160p59.94, 2160p60, 4K DCI 23.98p 4K DCI 24p, 4K DCI 25p
Max. Distance	[12G-SDI] up to 45 m [6G-SDI] up to 60 m [3G-SDI] up to 90 m [HD-SDI] up to 150 m HDMI up to 3 m (3840 x 2160 @ 60Hz)
Audio	
Output	1 x HDMI Type A Female (Black) 2 x RCA Connector Female (R/L, Analog Audio)
Format	Compliance with HDMI 2.0 with Audio 2 CH

Function	VC486
SDI Formats	
SDI Formats	HD-SDI (SMPTE 292M, 296M, up to 1.485 Gbps) 3G-SDI (SMPTE 424M, 425M Level A and B, up to 2.97 Gbps) 6G-SDI (SMPTE 2081-1, SMPTE 2081-10, up to 6 Gbps) 12G-SDI (SMPTE 2081-1, SMPTE 2081-10, SMPTE 2082-1, and SMPTE 2082-10, up to 12Gbps)
Connectors	
Power	1 x DC 5V 3A, Locable
Power	
Consumption	DC5V; 5.69W; 27BTU
Environmental	
Operating Temperature	0 - 40°C
Storage Temperature	-20 - 60°C
Humidity	0 - 80% RH, Non-Condensing
Physical Properties	
Housing	Metal
Weight	0.65 kg (1.43 lb)
Dimensions (L x W x H)	18.20 x 12.96 x 2.87 cm (7.17 x 5.10 x 1.13 in.)

Supported SDI Resolutions

The VC486 supports the following SDI resolutions:

Video Format	Resolution	Color Space	Scan Frequency
HD	720p	YCbCr-422-10bit	25
			29.97
			30
			50
			59.94
			60
	1080i		50
			59.94
			60
	1080sF		23.98
			24
			25
			29.97
			30
	1080p		23.98
			24
25			
29.97			
30			

Video Format	Resolution	Color Space	Scan Frequency	
3GA	1080p	YCbCr-422-10bit	47.95	
			48	
			50	
			59.94	
			60	
		YCbCr-444-10bit	23.98	
		RGB-444-10bit	24	
		YCbCr-444-12bit	25	
		RGB-444-12bit	29.97	
		YCbCr-422-12bit	30	
		720p	YCbCr-444-10bit	25
			RGB-444-10bit	29.97
				30
			50	
			59.94	
			60	
	1080i	YCbCr-444-10bit	50	
		RGB-444-10bit	59.94	
		YCbCr-444-12bit	60	
		RGB-444-12bit		
		YCbCr-422-12bit		
	1080sF	YCbCr-444-10bit	23.98	
		RGB-444-10bit	24	
		YCbCr-444-12bit	25	
		RGB-444-12bit	29.97	
		YCbCr-422-12bit	30	

Video Format	Resolution	Color Space	Scan Frequency
3GB-DL	1080p	YCbCr-422-10bit	47.95 48 50 59.94 60
		YCbCr-444-10bit	23.98
		RGB-444-10bit	24
		YCbCr-444-12bit	25
		RGB-444-12bit	29.97
		YCbCr-422-12bit	30
	1080i	YCbCr-444-10bit	50
		RGB-444-10bit	59.94
		YCbCr-444-12bit	60
		RGB-444-12bit	
		YCbCr-422-12bit	
	1080sF	YCbCr-444-10bit	23.98
		RGB-444-10bit	24
		YCbCr-444-12bit	25
		RGB-444-12bit	29.97
YCbCr-422-12bit		30	
6G	1080p	YCbCr-444-10bit	50
		RGB-444-10bit	59.94 60
	2160p	YCbCr-422-10bit	23.98
			24
			25
			29.97 30
12G	2160p	YCbCr-422-10bit	47.95 48 50 59.94 60
		YCbCr-444-10bit	23.98
		RGB-444-10bit	24
		YCbCr-444-12bit	25
		RGB-444-12bit	29.97
		YCbCr-422-12bit	30

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>