ATEN
Simply Better Connections

VE814A

HDMI HDBaseT Extender with Dual Output
User Manual

Compliance Statements

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.

The 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.

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.

Achtung

Der Gebrauch dieses Geräts in Wohnumgebung kann Funkstörungen verursachen.

Suggestion

Shield twisted pair (STP) cables must be used with the unit to ensure compliance with FCC & CE standards.

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 .

HDMI Trademark Statement

The terms HDMI, HDMI High-Definition Multimedia Interface, and the HDMI Logo are trademarks or registered trademarks of HDMI Licensing Administrator, Inc.

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.

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

Package Contents

Check to make sure that all the components are in working order. If you encounter any problem, please contact your dealer.

VE814A Package Contents

1 VE814AT Transmitter
1 VE814AR Receiver
1 IR transmitter
1 IR receiver
2 RS-232 terminal blocks
2 power adapters
1 user instructions

VE814AT Package Contents

1 VE814AT Transmitter
1 RS-232 terminal block
1 power adapter
1 user instructions

VE814AR Package Contents

1 VE814AR Transmitter
1 RS-232 terminal block
1 power adapter
1 user instructions

Note: The included IR cables supports frequencies from 30 kHz to 56 kHz.

Table of Contents

About this Manual

This user manual is provided to help you get the most from the VE814A 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 HDMI HDBaseT Extender with Dual Output. Its purpose, features, and installation considerations are described and discussed.

Chapter 2, *Hardware Setup* introduces the panel components and describes the steps to quickly and safely install the product.

Chapter 3, *Operation* explains the Long Reach Mode, its concept, requirements, and limitations.

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.

◆ The product may be updated, with features and functions added, improved or removed since the release of this manual. For an up-to-date user manual, visit http://www.aten.com/global/en

<u>Conventions</u>

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.

Chapter 1
Introduction

Overview

ATEN VE814A is an HDBaseT Video Extender that is capable of sending HDMI signals up to 100 m over a single Cat 5e/6/6a or ATEN 2L-2910 Cat 6 cable. Featuring dual synchronous outputs, the VE814A can transmit identical outputs to two remote displays and one display at the local side. This HDCP 2.2-compliant extender meets the HDMI Specification, including 3D, Deep Color, the maximum data rate of 10.2 Gbps, and transmission of 4K videos up to 100 m.

Supporting bi-directional RS-232 and full-range IR signaling pass-through, the VE814A allows you to control an HDMI source device from the remote unit (VE814AR) while granting access to the HDMI display device from the local unit (VE814AT). In addition, it supports Long Reach Mode that extends HDMI signals up to 150 m, 1080p, via a single Cat 5e/6 cable.

The VE814A is a powerful solution for where digital signage is required, such as bars, educational spaces, and public transportation stations, allowing display of identical contents at different spots.

Features

- Extends HDMI signals to one local and two remote displays up to 100 m over a single Cat 5e/6/6a or ATEN 2L-2910 Cat 6 cable
- HDMI (3D, Deep Color, 4K); HDCP 2.2 compatible
- Superior video quality
  - 4K up to 100 m
  - 1080p up to 150 m when in HDBaseT Long Reach Mode
- Supports HDBaseT Long Reach Mode – extends signals up to 150 m, 1080p, via a single Cat 5e/6 cable
- Extends Ethernet communication using the Ethernet pass-through port (for device supporting the Ethernet port only)
- Supports two IR channels for simultaneous IR signal transmissions, ranged from 30 kHz to 56 kHz
- EDID Expert^{TM} – selects optimum EDID settings for high-quality display and use of optimum video resolution
- RS-232 channel – allows you to connect to serial terminals or serial devices, such as touch screens and barcode scanners
- Supports wide screen format
- Built-in 8 kV/15 kV ESD protection
- Plug-and-play
- Rack-mountable

Planning the Installation

Requirements

Prepare the following before installing the VE814A unit:

Required Equipment	Details
Display device	◆ 1 HDMI display capable of the highest required resolution.
Source device	◆ 1 source device with an HDMI port.
Cables	◆ 1 Cat 5e/6/6a cable for connecting the VE814AT and VE814AR. **Note:** For best video quality, we strongly recommend using the ATEN 2L-2910 Cat 6 cable to connect the VE814AT and VE814AR.

Considerations

Note that the maximum transmission distance varies at different parts of the transmission depending on the transmission interface:

Connection	Interface	Distance
Computer to the VE814AT	HDMI	1.8 m
VE814AT to VE814AR	Cat 5e/6/6a 2L-2910	100 m*
VE814AR to the display	HDMI	5 m

Note: The maximum transmission distance using a Cat 5e/6/6a or an ATEN 2L-2910 cable can go up to 150 m when long reach mode is enabled.
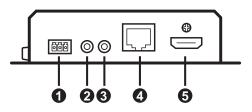
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Hardware Setup

1. Please review the safety information regarding the placement of this device in *Safety Instructions*, page 19.

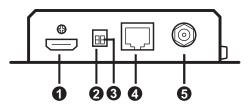2. Do not power on the VE814A until all the necessary hardware is connected.
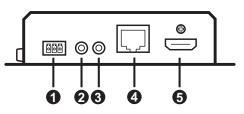
Components

VE814AT Front View

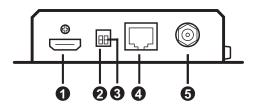| No.	Component	Description
1	RS-232 serial port	Connects to a computer or control system.
2	IR out	Connects to an IR transmitter.
3	IR in	Connects to an IR receiver.
4	Ethernet port	◆ If there is no Ethernet port on the device, the Ethernet capability is not supported. ◆ For device supporting the Ethernet port, plug a Cat 5e/6/6a cable or an ATEN 2L-2910 cable which connects to the local computer.
5	HDMI in	Connects to the HDMI out port on a video source device.

VE814AT Rear View

No.	Component	Description
1	HDMI out	Connects to the HDMI in port on a video display device.
2	HDBaseT long reach mode switch	Put the switch to **ON** to enable the long reach mode to transmit HDMI signals up to 150m, at 1080p. For details, see *Long Reach Mode*, page 15.
3	firmware upgrade switch	This function is reserved for ATEN Technical Support. If you would like to do a firmware upgrade yourself, please contact your dealer.
4	HDBaseT out	Connects to the HDBaseT in port on a VE814AR.
5	power jack	Connects to the power adapter.

VE814AR Front View

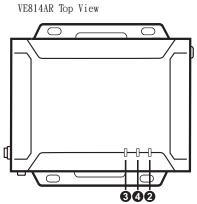| No.	Component	Description
1	RS-232 serial port	Connects to a computer or control system.
2	IR out	Connects to an IR transmitter.
3	IR in	Connects to an IR receiver.
4	Ethernet port	◆ If there is no Ethernet port on the device, the Ethernet capability is not supported. ◆ For device supporting the Ethernet port, plug a Cat 5e/6/6a cable or an ATEN 2L-2910 cable which connects to the local computer.
5	HDMI out 2	Connects to the HDMI in port on a video display device.

VE814AR Rear View

No.	Component	Description
1	HDMI out 1	Connects to the HDMI in port on a video display device.
2	HDBaseT long reach mode switch	Put the switch to **ON** to enable the long reach mode to transmit HDMI signals up to 150m, at 1080p. For details, see *Long Reach Mode*, page 15.
3	firmware upgrade switch	This function is reserved for ATEN Technical Support. If you would like to do a firmware upgrade yourself, please contact your dealer.
4	HDBaseT in	Connects to the HDBaseT out port on a VE814AT.
5	power jack	Connects to the power adapter.

LED Display

You can find the unit's LEDs on the top and front panel as illustrated below. See the table below for details on LED indication.
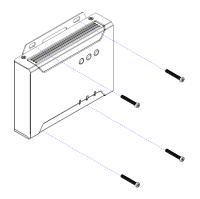
VE814AT Top View   VE814AR Top View

No.	LED	Indication	Description
1	HDMI out LED (VE814AT)	Lights green	The HDMI out signals are stable.
		Blinks green	The VE814AT is being upgraded for firmware.
2	power / link LED	Blinks green	The unit is receiving power with no data flow.
		Lights green	The connection between the VE814AT and VE814AR is stable
3	HDMI 1 out LED (VE814AR)	Lights green	The HDMI out signals are stable.
4	HDMI 2 out LED (VE814AR)	Lights green	The HDMI out signals are stable.
		Blinks green	The VE814AR's firmware is being upgraded.

Mounting the VE814A Unit

Wall Mount

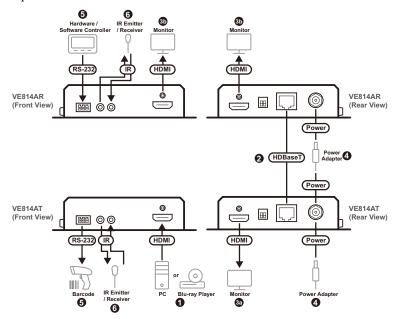Secure or hang the VE814A unit to the wall using the built-in mounting brackets.

Rack Mount

Use the VE-RMK1U Rack Mount Kit to rack-mount the VE814A. For more information about this accessory, go to www.aten.com/download

Connecting the VE814A Unit

Follow the steps below to connect the VE814A to a source and other devices as required.

1. Connect the HDMI in port on the VE814AT to the HDMI out port on your video source device using an HDMI cable.

2. Connect one end of the RJ-45 cable to the HDBaseT out port on the VE814AT, and then connect the other end of the RJ-45 cable to the HDBaseT in port on the VE814AR.

3. Depending on your preferred location of display, connect a display device to the VE814AT or VE814AR using an HDMI cable.

Note: When displays are connected to the VE814A transmitter and VE814A receiver, the VE814A system adopts the EDID values of the display connected to the transmitter's side.

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a) For local display, connect the HDMI out port on the VE814AT to the HDMI in port on your video display device using an HDMI cable.

b) For remote display, connect the HDMI out port 1/ port 2 on the VE814AR to the HDMI in port on your video display device using an HDMI cable.

4. Plug the power adapter cables into the power jacks on the VE814AT and VE814AR.

5. (Optional) Connect your serial controller and a serial device (e.g., barcode scanner) to the RS-232 serial port on the VE814AT and VE814AR.

   Note: The RS-232 serial port supports bi-directional transmission.

6. (Optional) For IR control, depending on your preferred location of control, connect the IR transmitter to the IR out port at the VE814AT or VE814AR, and then connect the IR receiver to the IR in port at the corresponding VE814AR or VE814AT.

   Note: For IR control from both the VE814AT or VE814AR side, purchase another pair of ATEN IR transmitter and IR receiver and install them to the VE814AT and VE814AR.

7. (Optional) For Internet connectivity, connect the Ethernet port on the VE814AT/VE814AR to the network using an RJ-45 cable.

   Note: This step is required for the device supporting the Ethernet port only.

RS-232 Channel Transmission

You can manage the VE814A via RS-232 serial devices, such as computers or bar code scanners. The RS-232 signal transmission flow can be illustrated as follows:
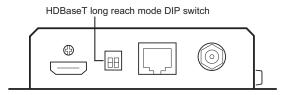
**PIN Configuration
(Captive Screw Connectors)**

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Chapter 3
Operation

Long Reach Mode

Long reach mode is a modulation that extends the transmission distance up to 150 m while compromising the maximum frame rate to 1080p, 60 Hz, 24 bpp. To enable the long reach mode, make sure to do the following:

- Use a Cat 5e/6/6a or ATEN 2L-2910 cable to connect the VE814AT and the VE814AR

- Put the HDBaseT long reach mode switch to **ON** at either the VE814A transmitter or the VE814A receiver.
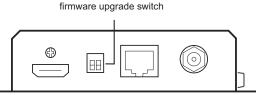
HDBaseT long reach mode DIP switch

Note: When enabled with long reach mode, the VE814AT and VE814AR will not be able to transmit 4K signals, in which case, the output display will be blank.

Changing EDID formats

To change the EDID formats using RS-232 commands, do the following:

1. Before attempting to use RS-232 commands, make sure to upgrade the unit to firmware v1.1.103 or later. Please contact your ATEN dealer for more information.

2. Connect a host computer or control system to the RS-232 serial port on the unit.

3. Download and install controller software that supports RS-232 serial control and the operation system of your controller PC.

4. Power on the unit.

5. Wait for at least 10 seconds, and then switch the firmware upgrade switch to **ON** to enter the RS-232 command mode.

firmware upgrade switch

6. Execute the software and configure the connection settings to the following:
   - Serial line to connect to: **COM1**
   - Speed (baud): **57600**
   - Data bits: **8**
   - Stop bits: **1**
   - Parity: **None**
   - Flow control: **None**

7. When a session is established with the unit, you can change the EDID formats by entering the corresponding commands and press [Enter]. Please refer to the table below for a list of available EDID formats and the corresponding commands. For example, to change the EDID format to 1080p @ 60 Hz, type **edid default04** and then press **[Enter]**.

EDID Format	RS-232 Command
4K x 2K @ 60 Hz / 4:2:0 / 2.0 ch	edid default00
4K x 2K @ 60 Hz / 4:2:0 / 7.1 ch	edid default01

EDID Format	RS-232 Command
4K x 2K @ 30 Hz / 4:4:4 / 2.0 ch	edid default02
4K x 2K @ 30 Hz / 4:4:4 / 7.1 ch	edid default03
1080p @ 60 Hz	edid default04
720p @ 60 Hz	edid default05
1024 x 768 / DVI	edid default06
1280 x 1024 / DVI	edid default07
1920 x 1080 / DVI	edid default08
1920 x 1200 / DVI	edid default09
ATEN default	edid port01

8. To read the EDID format status, type **read** and then press **[Enter]**.

Function	RS-232 Command
EDID format status	read

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Appendix

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.

- 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.

- 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 iv:

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		VE814AR	VE814AT
Video Input			
Interfaces		N/A	1 x HDMI Type-A Female (Black)
Impedance		N/A	100 Ω
Max. Distance		N/A	1.8 m
Video Output			
Interfaces		2 x HDMI Type-A Female (Black)	1 x HDMI Type-A Female (Black)
Impedance		100 Ω	
Video			
Max. Data Rate		10.2 Gbps (3.4 Gbps per lane)	
Max. Pixel Clock		340 MHz	
Compliance		HDMI (3D, Deep Color, 4K)	
		HDCP Compatible	
		Consumer Electronics Control (CEC)	
Max. Resolutions / Distances		Up to 4K@70m (Cat 5e/6) / 100m (Cat 6a/ATEN 2L-2910 Cat 6); Up to 1080p@100m (Cat 5e/6/6a) 4K supported: 4096 x 2160 / 3840 x 2160 @ 60 Hz (4:2:0); 4096 x 2160 / 3840 x 2160 @ 30 Hz (4:4:4);	
Audio			
Input		N/A	1 x HDMI Type-A Female (Black)
Output		2 x HDMI Type-A Female (Black)	1 x HDMI Type-A Female (Black)
Connectors			
Unit to Unit		1 x RJ-45 Female	
Control			
RS-232	Connectors	1 x Terminal Block, 3 x Pole	
	Baud Rate	57600 bps	
	Data Bits	8	
	Stop Bits	1, no parity and flow control	
IR		2 x Mini Stereo Jack Female (Black)	
Ethernet		1 x RJ-45 Female **Note:** The RJ-45 port is functional or device supporting the Ethernet port only.	
Switches			
Long Reach Mode		1 x Slide Switch (ON/OFF)	
Firmware Upgrade		1 x Slide Switch (ON/OFF)	

Function	VE814AR	VE814AT
Power		
Connectors	1 x DC Jack (Black) with locking	
Consumption	DC 5V, 7.9W	DC 5V, 5.1W
Environmental		
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 (1.01 lb)	0.45 Kg (0.99 lb)
Dimensions (L x W x H) with Bracket	14.02 x 12.30 x 3.00 cm (5.52 x 4.84 x 1.18 in)	
Dimensions (L x W x H) without Bracket	13.60 x 10.10 x 2.90 cm (5.35 x 3.98 x 1.14 in)	

Ethernet Capability List

Please refer to the table below to distinguish whether your VE814A supports Ethernet port or not.

SKU / Part No.	With Ethernet Port Function	Without Ethernet Port Function
VE814A	VE814A-AT	VE814A-ATA

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/