16 x 16 HDMI Matrix Switch with Scaler

VM51616H

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.

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.

KC Information: 이 기기는 업무용 (A 급) 전자파 적합기기로서 판매자 또는 사용자는 이점을 주의하시기 바라며 , 가정외의 지역에서 사용하는 것을 목적으로합니다 .

RoHS

This product is RoHS compliant.

SJ/T 11364-2006

The following contains information that relates to China.

部件名称	有毒有害物质或元素					
	铅	汞	镉	六价铬	多溴联苯	多溴二苯醚
电器部件	●	○	○	○	○	○
机构部件	○	○	○	○	○	○

○: 表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T 11363-2006规定的限量要求之下。

●: 表示符合欧盟的豁免条款，但该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006的限量要求。

×: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出SJ/T 11363-2006的限量要求。

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	1-949-428-1111
United Kingdom	44-175-3539-121

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 VM51616H package consists of:

- 1 VM51616H 16 x 16 HDMI Matrix Switch with Scaler
- 1 Power Cord
- 1 Mounting Kit
- 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 VM51616H 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 VM51616H 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 VM51616H 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 VM51616H installation.

Chapter 3, Front Panel Configuration, explains the fundamental concepts involved in operating the VM51616H at the local site via the front panel LCD display using pushbuttons.

Chapter 4, Browser Operation, provides a complete description of the VM51616H's Browser Graphical User Interface (GUI), and how to use it to remotely configure and operate the VM51616H.

Chapter 5, 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 be utilized in the installation.

An Appendix, which provides specifications and other technical information regarding the VM51616H.

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 VM51616H 16 x 16 HDMI Matrix Switch with Scaler is a versatile solution that provides an easy way to route high definition video and audio from any of 16 HDMI sources to any of 16 HDMI displays at the same time. As a Matrix Switch, each input can be independently connected to any or all outputs, giving you the ultimate in flexibility and control in any multi-display audio/video installation.

The VM51616H features Seamless Switch™, which employs FPGA matrix system architecture to seamlessly switch between multiple sources and multiple displays. With EDID Expert technology, the VM51616H selects the optimum EDID settings for smooth power-up and the highest quality display. It also features a high-performing scaling engine that converts the video resolution into the display's native resolution for the best image quality.

You can easily configure the VM51616H via the front panel LCD display and pushbuttons. The LCD provides a quick view of all port connections, and lets operators access the unit’s built-in configuration utility. Furthermore, the VM51616H allows convenient configuration and operation via an intuitive Graphical User Interface (GUI). The web GUI provides you with advanced features which include easy setup of custom Video Wall and Digital Signage configurations that can be saved and recalled. Because your VM51616H can be controlled over a standard TCP/IP connection, it conveniently integrates into any existing network for easy remote access. For complete system integration, serial control is standard through the built-in RS-232 port that allows the switch to be controlled through a high-end controller or PC.

The VM51616H is designed with a local HDMI output port that allows users to monitor the input sources in real time. Through the HDMI connection, users can directly preview up to 16 sources over one single display to quickly check on source status anytime from the local side. The viewing mode of the local display can be easily set as array of 1x1, 2x2, or 4x4 via the web GUI according to different application demand.

The VM51616H is an ideal solution for applications that require HDMI outputs from multiple sources to be conveniently delivered to multiple destinations, such as for stage presentations, competitions, control centers, and system installations that require real-time reports.

Features

- Connects any of 16 HDMI sources to any of to 16 HDMI displays
- Multiple Control Methods – system management via front-panel pushbuttons, RS-232 control, and Ethernet connections (Telnet / Web GUI)
- Seamless Switch™ – ATEN FPGA design unifies video formats to provide continuous video streaming, real-time switching and stable signal transmissions*
- Scaler – features a video scaling function to convert input resolutions to the optimum display resolutions
- Video Wall – allows you to create custom video wall layouts via intuitive web GUI*
- EDID Expert™ – selects optimum EDID settings for smooth power-up, high-quality display, and use of the best resolution across different screens
- FrameSync – prevents image tearing by synchronizing the scaler output frame rate to the input signal frame rate
- Superior video quality – HDTV resolution of 480p, 720p, 1080i and 1080p (1920 x 1080)
- HDMI (3D, Deep color); HDCP 1.4 compatible
- Consumer Electronics Control (CEC) support
- Local HDMI output – allows multiple preview of 16 video sources
- Audio-enabled; HDMI audio can be extracted to stereo audio
- Supports Dolby True HD and DTS HD Master audio
- Built-in bi-directional RS-232 serial port for high-end system control
- ESD protection for HDMI
- Firmware upgradeable
- Rack-mountable (2U design)

Note: When Seamless Switch™ is enabled, mind the following:

- Video outputs will not display 3D, Deep Color, or interlace (i.e., 1080i) resolutions correctly. To use these features, make sure to first disable Seamless Switch™.
- Videos may not display within range, in which case make sure to adjust the display settings on your device.

Requirements

The following devices are required for a complete VM51616H installation:

Source Devices

- Computer or A/V source device with HDMI Type A output connector(s)

Note: A DVI/HDMI adapter is required when connecting a DVI source device.

Display Devices

- Display devices or receivers with an HDMI Type A input connector

Cables

- 1 HDMI cable for each source device you will be connecting
- 1 HDMI cable for each display device you will be connecting
- 1 Cat 5e cable
- 1 RS-232 serial cable
- 1 audio cable

Note: No cables are included in this package. We strongly recommend that you purchase high-quality cables of appropriate length since this will affect the quality of the audio and video display. Contact your dealer to purchase the correct cable sets.

Source Device Operating Systems

Supported operating systems are shown in the table below:

OS		Version
Windows		2000 and higher
Linux	RedHat	6.0 and higher
	SuSE	8.2 and higher
	Mandriva (Mandrake)	9.0 and higher
UNIX	AIX	4.3 and higher
	FreeBSD	3.51 and higher
	Sun	Solaris 8 and higher
Novell	Netware	5.0 and higher
Mac		OS 9 and higher
DOS		6.2 and higher

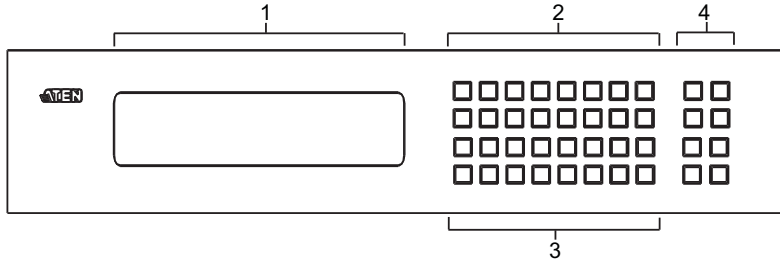
Browsers

Supported web browsers are shown in the table below:

OS	Java Version	Browser	Version
Windows 8.1	V1.8.0_60	Chrome	45.0.2454.85 m
		Firefox	40.0.3
		Safari	5.1.7
		Opera	31.0.1889.174
		IE11	11
Windows 2012 R2 (64bit)	V1.8.0_60 (64bit)	IE11	11 (64bit)
Windows 2008 R2 (64bit)	V1.8.0_60 (64bit)	IE8	8
Windows 7 SP1(64bit)	V1.8.0_60 (64bit)	IE10	10 (64bit)
Windows XP	V1.8.0_60	IE8	8
CentOS 7.0 (64Bit)	V1.8.0_60 (64bit)	Firefox	40.0.3
Ubuntu 12.04	V1.8.0_60	Chrome	45.0.2454.85
Solaris 11(64bit)	V1.8.0_25	Firefox	33
Mac 10.10	V1.8.0_25	Safari	8

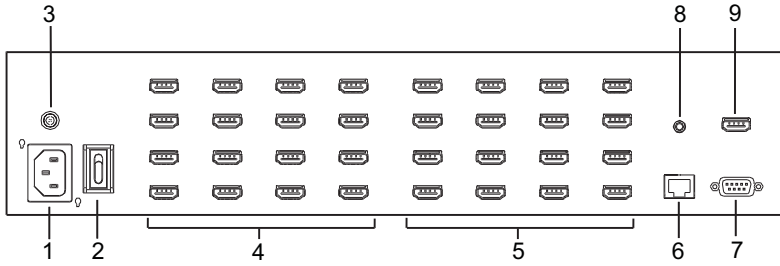
Components

VM51616H Front View



No.	Component	Description
1	LCD Display	The LCD Display gives a quick view of all port connections, and shows the various options for configuring and operating the VM51616H. For full details, see *Main Screen*, page 14.
2	Input Pushbuttons	These pushbuttons refer to the HDMI Input ports found on the VM51616H rear panel. Press to select the Input port. These pushbuttons may also correspond to menu options, connection profiles (P1–P16) and so on. **Note:** The **INPUT** (1–16) front panel pushbuttons have built-in LEDs that light to indicate they have been selected.
3	Output Pushbuttons	These pushbuttons refer to the HDMI Output ports found on the VM51616H rear panel. Press to select the Output port. These pushbuttons may also correspond to connection profiles (P17–P32). **Note:** The **OUTPUT** (1–16) front panel pushbuttons have built-in LEDs that light to indicate they have been selected.
4	Function Pushbuttons	The function pushbuttons (**ARRAY, AUDIO, MENU**, **PROFILE**, **^, V, ENTER** and **CANCEL**) are for navigating the LCD built-in configuration utility. For full details, see *Front Panel Pushbuttons*, **page 11**. **Note:** The function pushbuttons (except for **ENTER** and **CANCEL** pushbuttons) have built-in LEDs that light to indicate they have been selected.

VM51616H Rear View



No.	Component	Description
1	Power Socket	This is a standard 3-pin AC power socket. The power cord from an AC source plugs in here.
2	Power Switch	This is a standard rocker switch that powers the unit on and off.
3	Grounding Terminal	The grounding wire attaches here. See *Grounding*, page 8, for further details.
4	HDMI Output Ports	The cables from your HDMI display devices plug into these ports.
5	HDMI Input Ports	The cables from your HDMI source devices plug into these ports.
6	Ethernet Port	In order to access the VM51616H's Browser Graphical User Interface (GUI), the VM51616H must be connected to your network. The cable that connects the VM51616H to your LAN plugs in here. See *Cable Connection*, page 9, for further details.
7	RS-232 Serial Port	Connect a computer or serial controller via this serial port.
8	Audio Output Port	The audio output port allows you to extract HDMI audio to stereo audio. The cable from a speaker plugs in here.
9	Local HDMI Output Port	The local HDMI output port allows you to preview the multiple view from the connected source device(s). The cable from a HDMI display plugs in here.

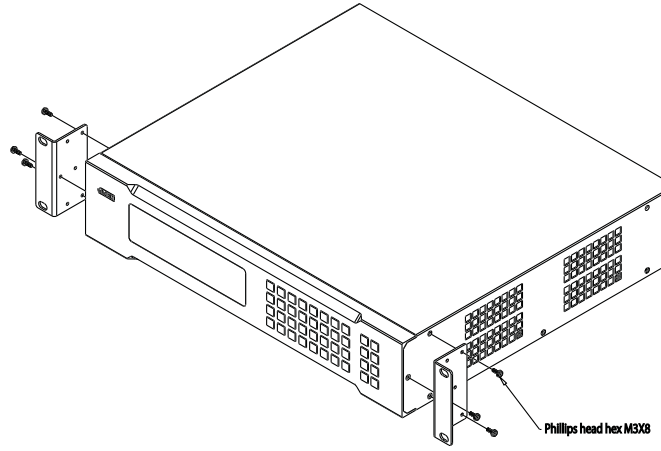
Chapter 2
Hardware Setup

1. Important safety information regarding the placement of this device is provided on page 109. 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.

Rack Mounting

The VM51616H can be mounted in a 19” (2U) system rack. For the most convenient front panel pushbutton configuration and operation at the local site, mount the unit at the front of the rack, as follows:

1. Use the M3 x 8 Phillips head hex screws supplied with the Mounting Kit to screw the rack mounting brackets onto the front of the unit.

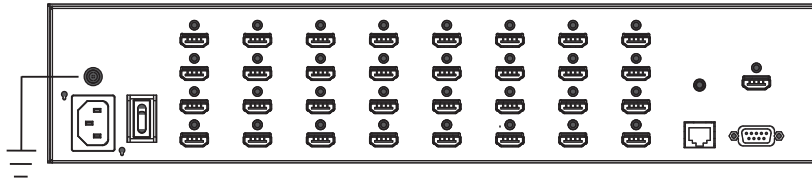


2. Position the unit in the front of the rack and align the holes in the mounting brackets with the holes in the rack.
3. Screw the mounting brackets to the rack.

Grounding

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

1. Use a grounding wire to ground the VM51616H 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 all devices in your VM51616H installation are properly grounded.

Cable Connection

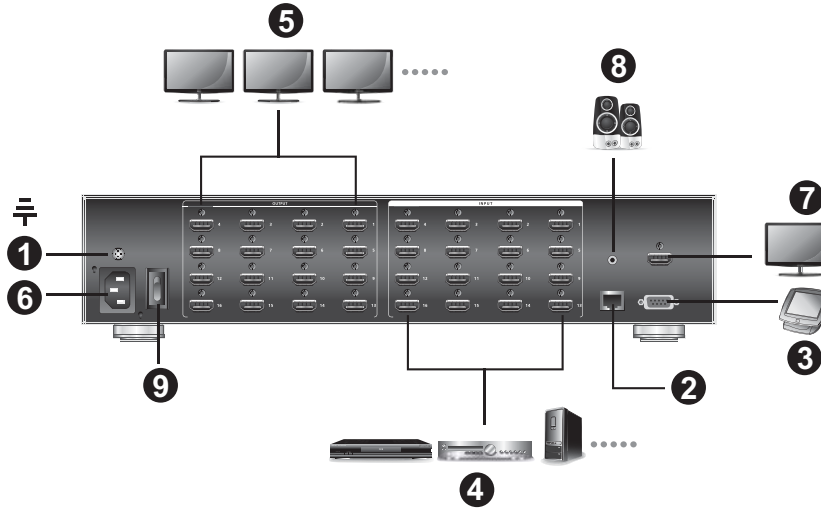
Installation of the VM51616H is simply a matter of connecting the appropriate cables. Refer to the installation diagram on the following page (the numbers in the diagram correspond to the steps below), and do the following:

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

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

2. If using the Browser Operation features (see *Browser Operation*, page 37), plug a Cat 5e cable from the LAN into the VM51616H's **Ethernet** port.
3. If you are using the serial control function, use an appropriate RS-232 serial cable to connect the computer or serial controller to the VM51616H's female **RS-232 Serial** port.
4. Connect up to 16 HDMI video sources to the **HDMI Input** ports.
5. Connect up to 16 HDMI display devices to the **HDMI Output** ports.
6. Plug the power cord supplied with the package into the VM51616H's 3-prong AC socket, and then into an AC power source.
7. (Optional) Connect a display to the local HDMI output port to enable multi-view preview from the connected source device(s).
8. (Optional) Connect a speaker to extract HDMI audio.
9. Power on the VM51616H and all devices in the installation.

Installation Diagram



Chapter 3
Front Panel Configuration

Overview

The VM51616H can be configured and operated locally via the front panel LCD/pushbuttons; remotely over a standard TCP/IP connection via graphical user interface (GUI) using a web browser; via a remote terminal session using Telnet; or by a RS-232 serial controller.

The local front panel operation is discussed in this chapter. Web GUI Operation is discussed in Chapter 4, and RS-232 serial control is discussed in Chapter 5.

Front Panel Pushbuttons

The front panel features an LCD display and pushbuttons for convenient operation locally. This allows users to perform operations such as selecting which source shows on which display, viewing the IP settings, configuring the serial port, setting the EDID Mode / CEC / OSD /Output Status, setting the Array Mode for the local display, selecting security settings, and loading/ saving profiles.

Note the following front panel pushbutton functions:

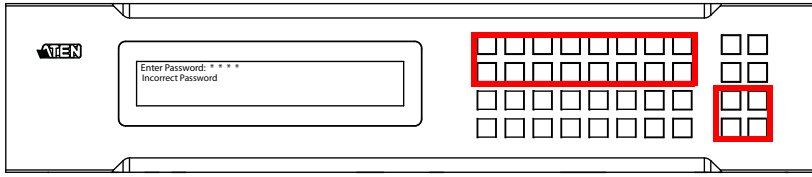
- Use the **MENU** pushbutton to access the Menu page options: IP Setting, Serial Port Setting, Operation Mode, Security Mode, and Save to a Profile (see *LCD Menu Organization*, page 18).
- Use the **PROFILE** pushbutton to switch between the connection profiles which have been added to the Profile List (see *Profile List*, page 39). Pressing this pushbutton for longer than 3 seconds displays the Save to a Profile page (see *Save to a Profile*, page 31).
- Use the **CANCEL** pushbutton to go back to a previous page, return to the Main Screen, stop or exit an operation.
- Use the **ENTER** pushbutton to select options and confirm operations.
- Use the **ARRAY** pushbutton to select a viewing mode and the input sources for the local display (See *Array Pushbutton*, page 34).
- Use the **AUDIO** pushbutton to select an Input source for the stereo audio output or mute it (see *Audio Pushbutton*, page 35).

- Use the **INPUT / OUTPUT** (**1–16)** pushbuttons to select the Input/Output port. These pushbuttons may also correspond to menu options, connection profiles, and so on.
- The VM51616H provides **Prev** / **Next** pushbuttons to navigate the menus.

Enter Password

Upon VM51616H startup, check the front panel LCD to view the loading progress. If the Password screen / LCD Menu fails to load, an error message displays. Reset the unit and try again.

If you are accessing the VM51616H for the first time, the Password screen appears as soon as the LCD loading process is done. Enter the default password 1234 to continue to the Main Screen (see *Main Screen*, page 14).



Additionally, the Password Screen appears if the VM51616H has been configured to require a password for Front Panel operation (see *Security Mode*, page 28).

To enter a password, do the following:

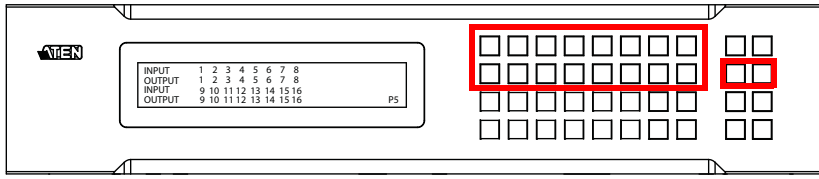
1. In the **Enter Password** field, check that the cursor is at the first asterisk (*) and flashing.
2. Use the front panel Input Port pushbuttons (1–9) to enter the 4-digit password. After the fourth digit has been entered correctly, the Main Screen displays.
3. Press **Cancel** to clear the password. The digits revert to 4 asterisks and the cursor goes back to the first asterisk.

Note: 1. The VM51616H password can be any four digit combination between 1111 to 9999. The default password is 1234.

2. If you enter an incorrect password, the cursor goes back to the first digit and reverts to flashing. The Incorrect Password message displays at the bottom of the screen, but clears as soon as a new password is entered.
3. If Password option is Enabled (see *Security Mode*, page 28), the LCD display time-out is 5 minutes by default.

Main Screen

The Main Screen shows the Input ports in the top row, which are tied to the Output ports shown in sequential order (1–16) at the bottom row.



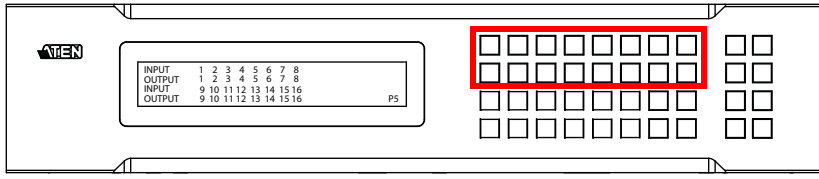
- The front panel pushbutton label (1–16) corresponds to the **Input** ports and **Output** ports on the unit's rear panel.
- Use the **Menu** pushbutton to view the LCD Menu (see *LCD Menu Organization*, page 18).
- Use the **Profile** pushbutton to switch between profile connections (see *Profile List*, page 39).

Port Switching

From the Main Screen, users can configure the Input-to-Output port connections to associate an Input source device to an Output display.

Input Port Selection

Use the Input Port pushbuttons to select the Input port you want to configure.



To select which input source displays on each output port, do the following:

1. Press any Input port pushbutton (1–16). The Output port LED(s) tied to the said Input port will begin to flash. Available output port LED(s) will light up (steady).

(Continues on next page.)

(Continued from previous page.)

In the example below, pressing Input port **1** shows it is tied to Output ports **1** and **2**.

2. To disconnect an Output port from an Input port, press the corresponding Output port pushbutton.

   In the example below, Output port **2** has been disconnected from Input port **1**.

3. To switch to another Input port, press any Input port pushbutton. The Output port LED(s) tied to the said Input port will flash.

   In the example below, pressing Input port **2** shows it is tied to Output ports **3** and **4**.

4. To connect Output port **2** to Input port **2** in the example above, then press the Output port **2** pushbutton. The Output port 2 LED will also begin to flash (0.5 sec on, 0.2 sec off). This indicates that Input port **2** is now connected to Output ports **2**, **3** and **4**.

Once the signal from the selected Input port is successfully tied to the Output port, the LEDs turn off and the LCD information is updated.

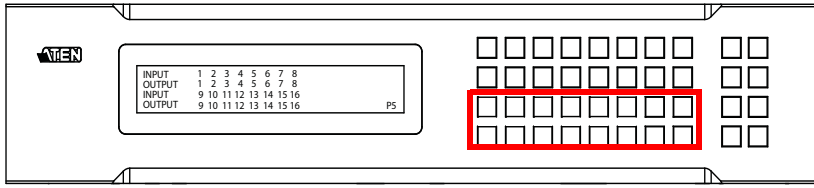
Note: 1. Pressing an Input port a second time deselects it.

2. Input ports that are not configured or tied to any output port do not in the LCD screen.

3. Pressing the **Cancel** pushbutton once stops the Input Port Selection operation and the LCD displays the active setting. Pressing the **Cancel** pushbutton again turns all LEDs off.
4. After 10 seconds of inactivity, all the LEDs turn off.

Output Port Selection

Use the Output Port pushbuttons to select the Output port you want to configure.



To select which output display corresponds to each input source device, do the following:

1. Press any Output port pushbutton (1–16).

   In the example below, Output port **1** pushbutton has been pressed. Available Input ports light up. Because no Input LEDs are flashing, no ports have already been assigned to Output port **1**.

2. If an Output port pushbutton is pressed a second time, it is deselected and the LED turns off.
3. To connect the selected Output port(s) to an Input port, press the Input port pushbutton. to which you want the Output port(s) tied. The newly selected Input port LED flashes (0.5 sec on, 0.2 sec off), and the LCD information is updated.

   In the example below, pressing Input port **2** ties it to Output ports **2**, **3** and **4**.

4. To switch Output ports **2, 3** and **4** to another Input port (and disconnect it from Input port **2**), press another Input port pushbutton to which you want them tied.

   In the example below, Input port **3** has been pressed and is now connected to Output ports **2**, **3** and **4**.

Note: 1. Pressing an Output port a second time deselects it.

2. Pressing the **Cancel** pushbutton once stops the Output Port Selection operation, and the LCD displays the active setting. Pressing the **Cancel** pushbutton again turns all LEDs off.

3. After 10 seconds of inactivity, all the LEDs turn off.

LCD Menu Organization

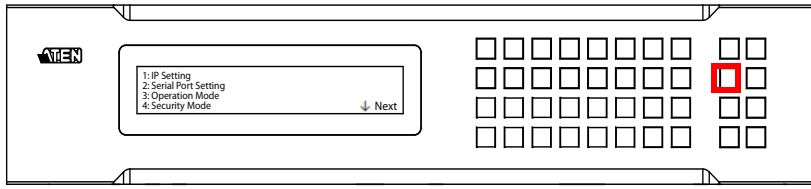
The VM51616H has a built-in configuration utility via the front panel LCD, which can be controlled by pressing the **MENU** and front panel Input pushbuttons (1–16). User can cycle through the menu options, starting from IP Setting page, in the order shown in the table below:

Menu Page	Sub-Menu Page(s)		
IP Setting	IP Address		
	Subnet Mask		
	Gateway		
Serial Port Setting	Baud Rate	9600 / **19200** / 38400 / 115200	
Operation Mode	EDID	**Default** / Port1 / Remix / Customized	
	CEC	On / **NA**	
	OSD	**On** / NA	
	Output Status	Video	**On** / NA
		Audio Extract Mute	01-16 On / **NA**
		Output Resolutions	01-16
Security Mode	Mode	**None**	
		Password Enable	
		Lock Screen	
	Change Password	Old Password	New Password
Save to a Profile	Save to a Profile No.	01–32	
Play/Stop the Profile Schedule			
Turn Video Wall Off			

Note: The highlighted values are the default settings of the VM51616H.

Menu Pushbutton

Press the **MENU** pushbutton to switch between the Main Screen and LCD Menu page. When the Menu is active, the MENU pushbutton's built-in LED lights up:



From the Menu page:

- Press **1** to go to the IP Setting page (see *IP Setting*, page 19)
- Press **2** to go to the Serial Port Setting page (see page 21)
- Press **3** to go to the Operation Mode Setting page (see page 22)
- Press **4** to go to the Security Mode Setting page (see page 28)
- Press **Next** to go to the next page(s) for the sub-menu pages
- Press **Menu** or **Cancel** to return to the Main Screen

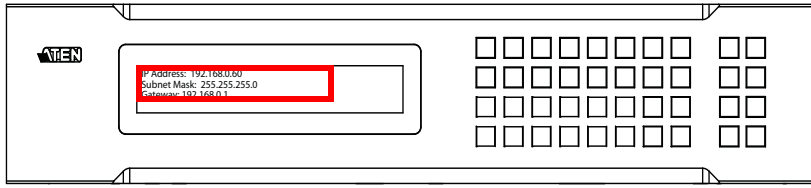
IP Setting

The IP Setting page displays the VM51616H's IP configuration. The values in the LCD Menu are read-only and can be edited via the Browser GUI (*Network*, page 63).

IP Address / Subnet Mask / Gateway

To view the VM51616H's IP address, Subnet Mask, and Gateway, do the following:

From the Menu page, press **1** to see the IP Setting submenu. The IP address, Subnet Mask, and Gateway are then shown.

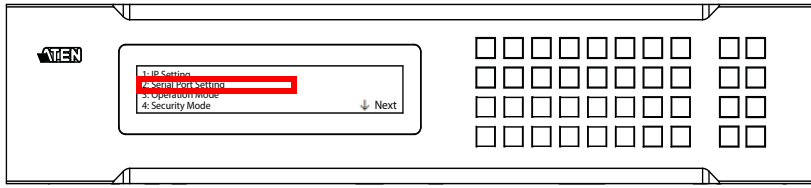


Note: The VM51616H default IP address is 192.168.0.60. The default Subnet Mask is 255.255.255.0. The default Gateway is 192.168.0.1.

4. Press **Next** to go to the next page.
5. Press **Menu** to return to the Menu page.
6. Press **Cancel** to return to the previous page without saving.

Serial Port Setting

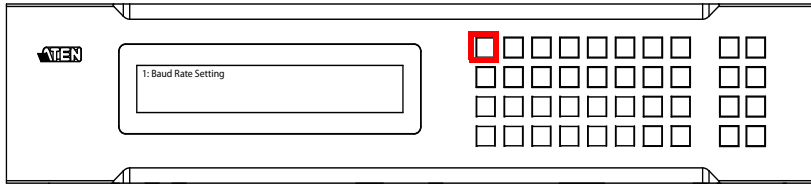
To configure the VM51616H's baud rate for its serial port connection, press 2 to select Serial Port Setting from the Menu page.



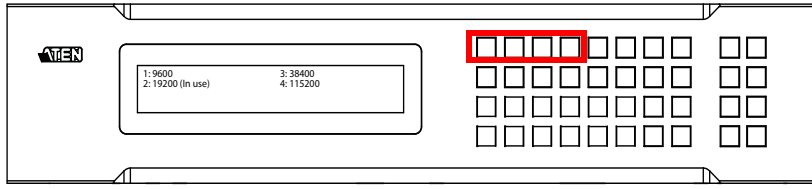
Baud Rate

To set the VM51616H's baud rate, do the following:

1. Select **Baud Rate Setting** from the Serial Port Setting submenu by pressing **1**:



2. Press pushbuttons 1–4 to make your selection.



Baud Rate options are:

- **1:** 9600
- **2**: 19200
- **3**: 38400
- **4**: 115200

Note: The default baud rate is 19200.

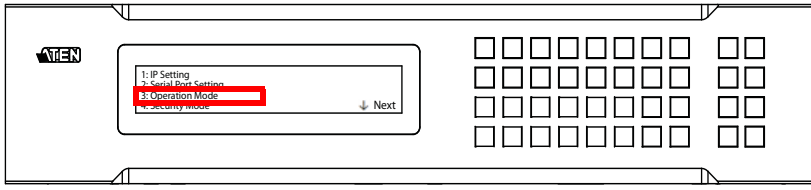
3. Press **Menu** to return to the Menu page.
4. Press **Cancel** to return to the previous step without saving.

Operation Mode

The EDID Mode, CEC, OSD and Output Status features can be configured from the Operation Mode page.

- EDID (Extended Display Identification Data) is used to have the VM51616H automatically apply a preset video configuration or EDID Mode, which utilizes the best resolution across different monitors
- Consumer Electronics Control (CEC) allows interconnected HDMI devices to communicate and respond to one remote control
- The OSD, when enabled for a port, lets an attached display/monitor show real-time port switching information
- The Output Status shows whether the video/audio of an Output port is turned on or off and allows viewing and setting of the Output Resolution

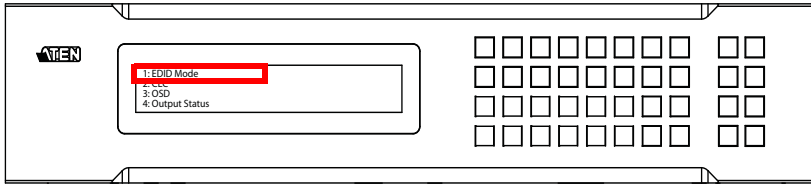
To configure the VM51616H's operation mode settings from the Main Screen, use the **Menu** pushbutton to access the Menu page, then press pushbutton **3** to access the Operation Mode page.



EDID Mode

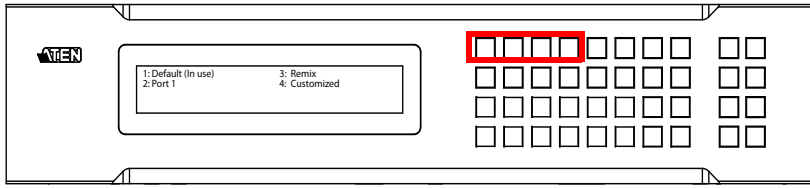
To configure the EDID Mode, do the following:

1. From the Operation Mode page, press pushbutton **1**:



(Continues on next page.)

2. Press pushbuttons 1–4 to make your selection.



EDID Mode options are:

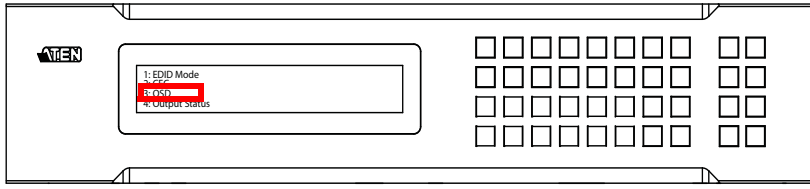
EDID Option	Description
1: Default	The default EDID is passed to all video sources.
2: Port1	The EDID from port1 is passed to all video sources.
3: Remix	Uses the EDID of each connected display according to its connection when the VM51616H is first powered on, or immediately after pressing 3 to select the Remix option.
4: Customized	Automatically retrieves and saves the EDID settings of a connected monitor/display device to an input source port. This can be configured using the Browser GUI. See *Customized EDID Settings*, page 68.

3. Press **Menu** to return to the Menu page.
4. Press **Cancel** to return to the previous step without saving.

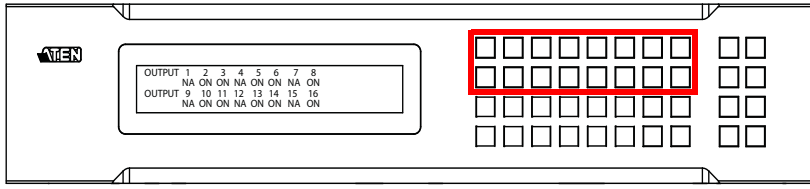
CEC

To configure the CEC setting, do the following:

1. From the Operation Mode page, press pushbutton **2**:



2. Press pushbuttons (1–16) to enable (**ON**) or disable (**NA**) the CEC feature for the output port. If the port does not support CEC, an **NA** is shown.



Note: The default CEC setting is NA.

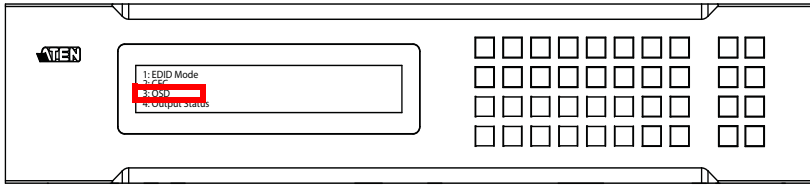
3. Press **Menu** to return to the Menu page.
4. Press **Cancel** to return to the previous step without saving.

OSD

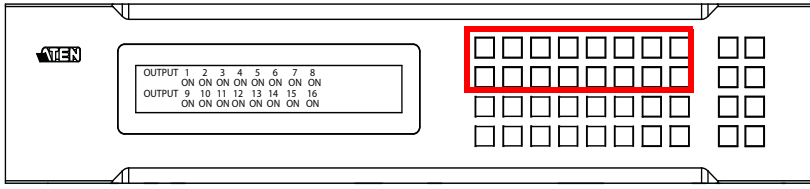
The On-Screen Display (OSD) feature enables real-time text updates to appear on the display device's screen for any configuration changes made to the Output port via the VM51616H's front panel or Browser GUI.

To configure the OSD setting for each output port, do the following:

1. From the Operation Mode page, press pushbutton **3**:



2. Press pushbuttons (1–16) to enable (**ON**) or disable (**NA**) the OSD feature for the output port.



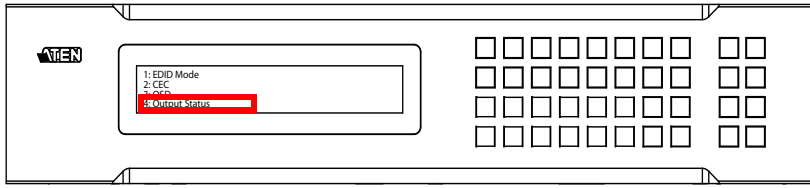
Note: The default OSD setting is On.

3. Press **Menu** to return to the Menu page.
4. Press **Cancel** to return to the previous step without saving.

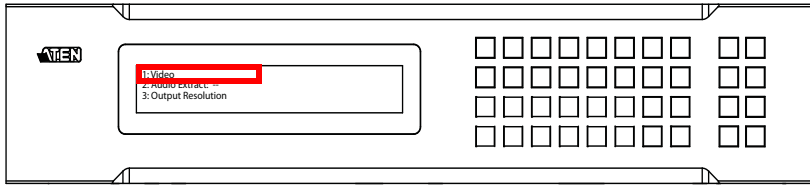
Output Status

To configure the Output Status settings for each output port, do the following:

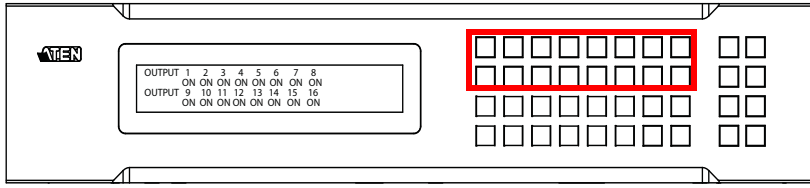
1. From the Operation Mode page, press pushbutton **4**:



2. Press **1** to select Video.



3. Press pushbuttons (1–16) to enable (**ON**) or disable (**NA**) the video/audio of the output port.



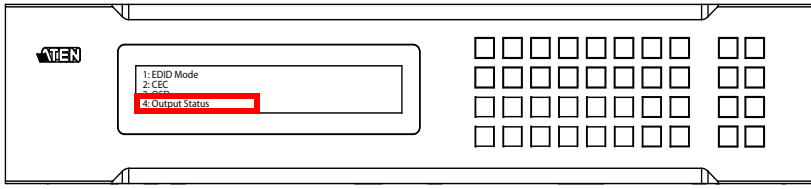
Note: The default Output Status setting is On.

4. Press **Menu** to return to the Menu page.
5. Press **Cancel** to return to the previous step without saving.

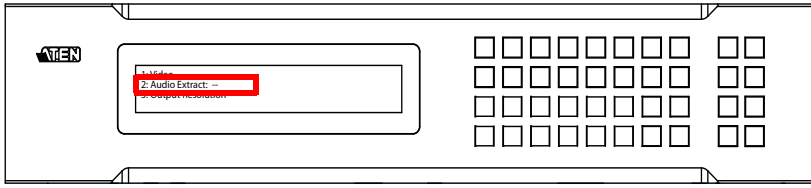
(Continues on next page.)

To configure the Audio Extract settings, do the following:

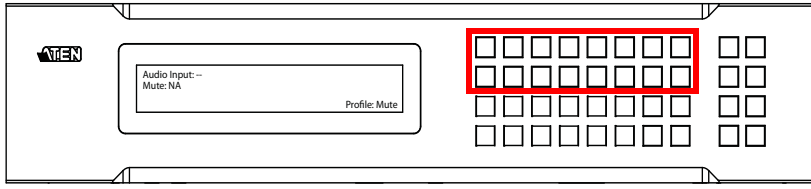
1. From the Operation Mode page, press pushbutton **4**:



2. Press **2** to select Audio Extract.

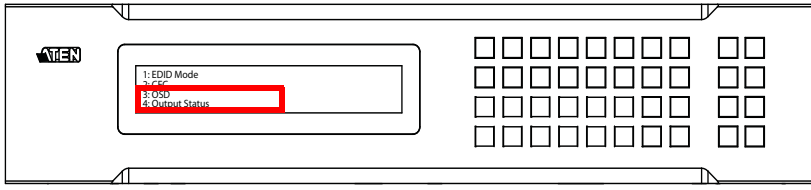


3. Press pushbuttons (1-16) to select an input port to the stereo audio output. To mute the audio, press the PROFILE pushbutton until it indicates ON.



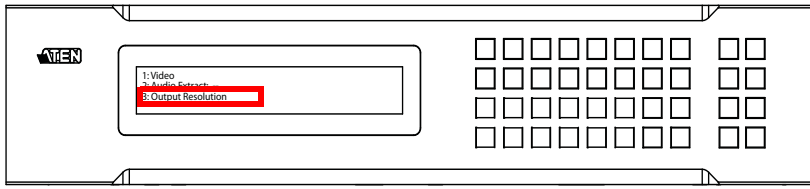
To configure the Output Resolution settings for each output port, do the following:

1. From the Operation Mode page, press pushbutton **4**:

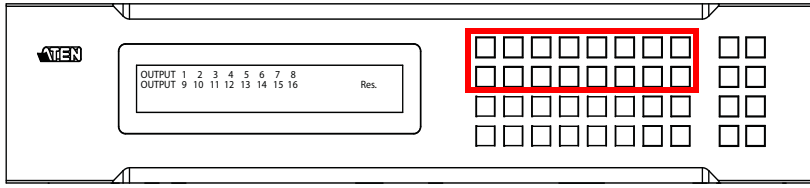


(Continues on next page.)

2. Press **3** to select Output Resolution.



3. Press pushbuttons (1–16) to select an output port whose resolution will be changed.

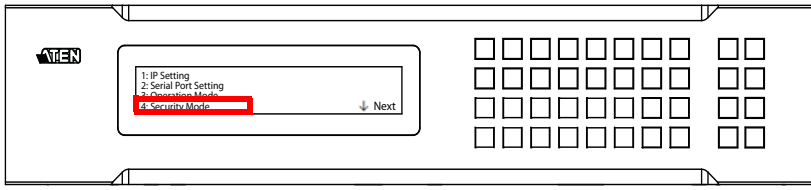


4. Available options include: Native Resolution, 1024x768@60Hz, 1280x720@60Hz, 1280x1024@60Hz, 1400x1050@60Hz, 1600x1200@60Hz, 1920x1080@60Hz, 1920x1200@60Hz, 1280x720@50Hz, 1920x1080@50Hz, 1280x800@60Hz, 720x576@50Hz, and 1600x900@60Hz.
5. Press **Menu** to return to the Menu page.
6. Press **Cancel** to return to the previous step without saving.

Security Mode

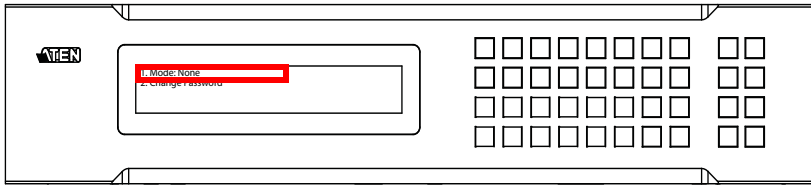
The Security Mode page allows users to manage the VM51616H's security-related settings. Three security modes are available: None, Password Enable, and Lock Screen. The VM51616H's password can also be changed here.

To configure the VM51616H's security settings from the Main Screen, use the **Menu** pushbutton to access the Menu page, then press pushbutton **4** to access the Security Mode page.

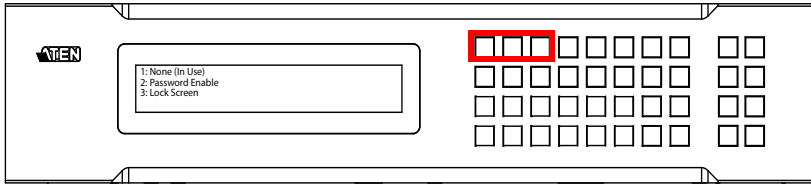


Mode

1. To change the VM51616H's security mode, press pushbutton **1** in Security Mode.



2. In the Mode menu, to disable security settings, press pushbutton **1**. The menu will then return to Security Mode. To require a password after the LCD display times out or is powered off/on, press pushbutton **2**. The menu will then return to the home screen. To enable a lock screen, press pushbutton **3**. The menu will then return to the home screen. When Lock Screen is enabled, pressing any pushbutton from the home screen will trigger the following message: *Please press "Menu" to start.*

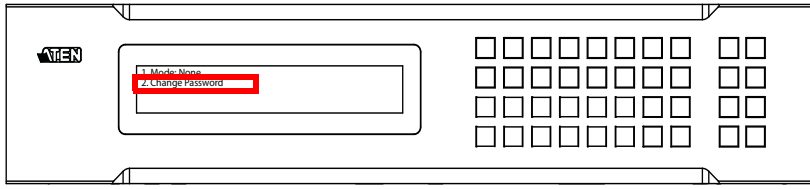


Note: If Password is Enabled, the LCD display's default time-out is 5 minutes. The VM51616H's default password is 1234.

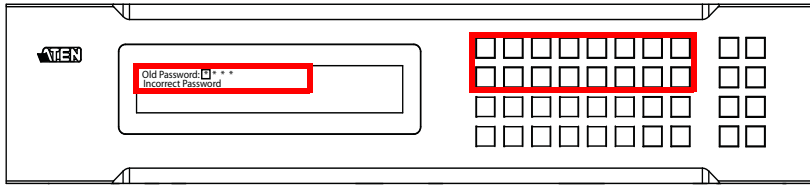
3. Press **Menu** to return to the Menu page.
4. Press **Cancel** to return to the previous step without saving.

Change Password

1. To change the password for accessing the unit, press pushbutton **2**.

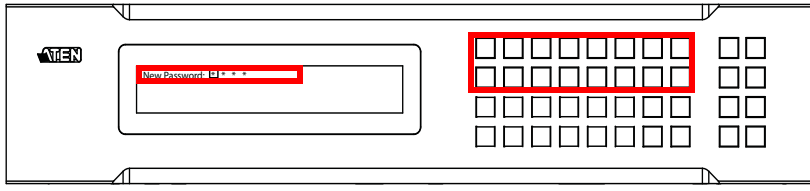


2. In the Old Password field, the cursor flashes at the first digit. Enter the old password (see *Enter Password*, page 13). If the old password is entered correctly, you can proceed to the next step.



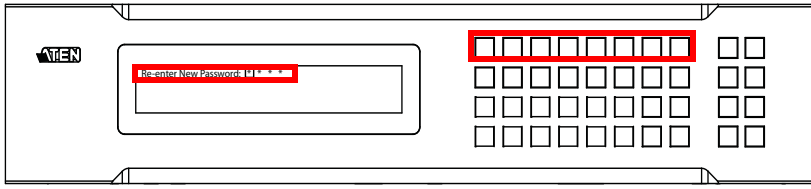
Note: If you entered an incorrect password, an error message appears and the cursor goes back to the first digit (flashing). The Incorrect Password message clears as soon as a new digit is entered.

3. In the New Password field, the cursor flashes at the first digit. Enter the new password (1111–9999) using the front panel number pushbuttons.



(Continues on next page.)

4. Re-enter the new password in the following screen. The new password is applied by the VM51616H immediately.



   If the password you entered does not match the one entered in the previous screen, an error message appears. Enter the new password correctly.

5. Press **Menu** to return to the Menu page.

6. Press **Cancel** to return to the previous step without saving.

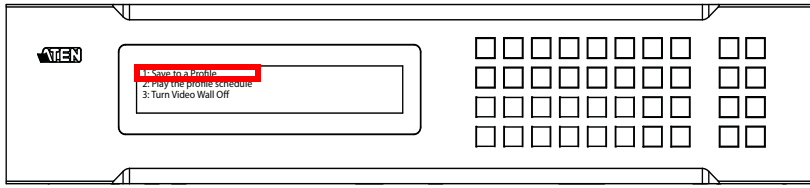
Save to a Profile

The VM51616H allows users to store up to 32 of different connection profiles (numbered P1–P32) that can be saved and recalled later.

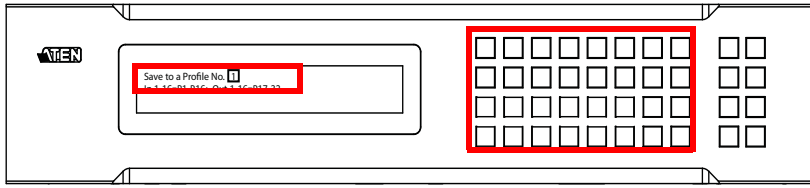
The active Input-to-Output port connections on the LCD Main Screen is the configuration saved to a profile. When a user loads a profile, the change is immediate and the profile number is shown on the lower right corner of the LCD screen.

To save a profile once the desired port connections are set, do the following:

1. Press the **Menu** pushbutton to access the Menu page, then **Next** to navigate to the next pages. Press pushbutton **1** to open the select Save to a Profile page.



2. On the page that opens, you are asked to give the profile a number. Use the front panel number pushbuttons to select a profile number into which you want to save the configuration.



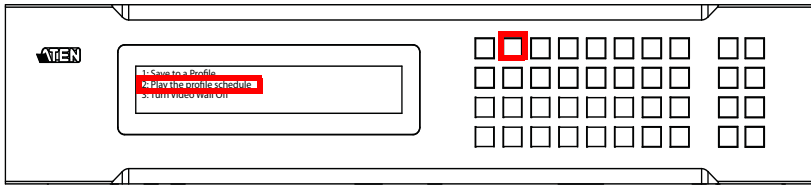
   - Input port pushbuttons **1–16** correspond to Profile **P1** to **P16**
   - Output port pushbuttons **1–16** correspond to Profile **P17** to **P32**

3. Press **Enter** to store the configuration – the LCD shows Profile Saved.
4. Press **Menu** to return to the Menu page,
5. Press **Cancel** to return to the previous step without saving.

Note: Access the Save to a Profile page quickly by pressing the **Profile** pushbutton for longer than 3 seconds.

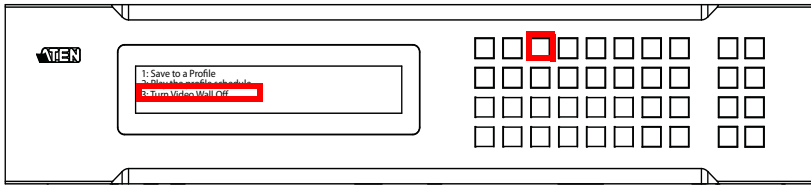
Play/Stop the Profile Schedule

Press port pushbutton **2** to Play or Stop the active Profile Schedule.



Turn Video Wall Off

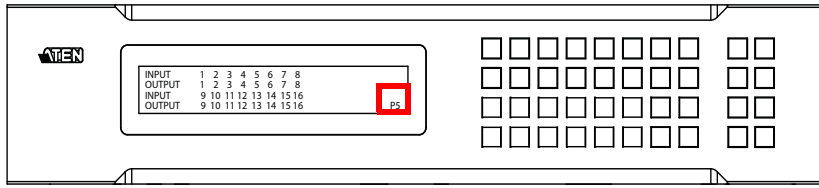
If a video wall is currently playing, the submenu will show as below. Press pushbutton **3** to Turn Video Wall Off. The port assignments will return to their default (i.e. disassemble the video wall).



Profile Pushbutton

The **PROFILE** pushbutton lets users conveniently switch between connection profiles that have been saved or added to the Profile List (see *Profile List*, page 39).

When a Profile is in use, its profile number (P1–P32) is shown on the lower right corner of the LCD display.



The Profile pushbutton functions as follows:

- After pressing the Profile pushbutton, available profile numbers will light up. The active profile number will flash. use the Input/Output pushbuttons to switch to a specific profile (P1 to P32). Note that:
  - **Input** ports **1–16** correspond to Profile **P1** to **P16.**
  - **Output** ports **1–16** correspond to Profile **P17** to **P32** (where Output Port 1=Profile 17, Output Port 2=Profile 18... Output Port 16=Profile 32).

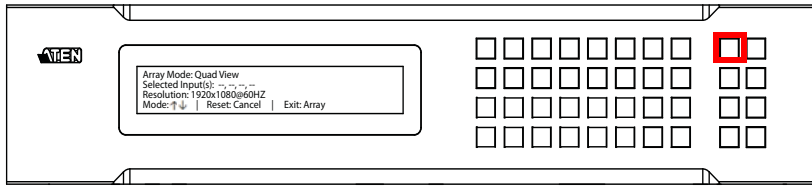
  The selected pushbutton's light flashes, and the VM51616H immediately applies the port connections configured in the selected profile. If the light changes to a steady state, it means the profile is valid.
- After pressing the Profile pushbutton, pressing it again will change to next profile in Profile Scheduling (see page 44), not the profile list. This feature is only available while a schedule is playing.
- Press the **Cancel** pushbutton to exit.

Note: If there are no profiles configured on the VM51616H device, an error message "*No Available Profile*" is displayed when the Profile pushbutton is pressed.

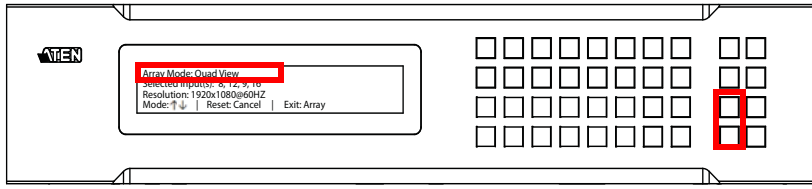
A Profile's port connections can be edited using the front panel pushbuttons (see *Port Switching*, page 14) or from the *Connections* page of the Browser GUI (see *Connection Profiles*, page 46). Additionally, the Profile List can be configured via the Profile page of the Browser GUI (see *Profile List*, page 39).

Array Pushbutton

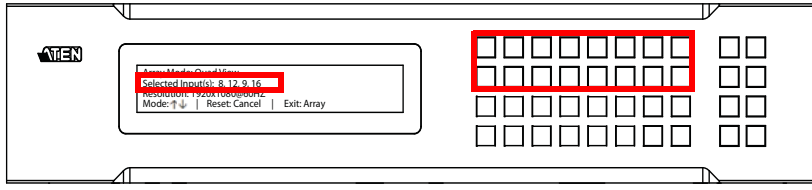
The **ARRAY** pushbutton allows users conveniently select the viewing mode and the input sources for the local display. Press the **Array** pushbutton to enter the setting page.



- Press the **Prev** or **Next** pushbutton to select a viewing mode for the display connected to the local HDMI Output Port. The available viewing modes are: Single (1x1), Side by Side (1x2), Quad View (2x2), and Show All (4x4).



- Use pushbuttons **1-16** to select the input sources to be shown on the local display. The selected sources will show on the display sequentially (from upper left to lower right).

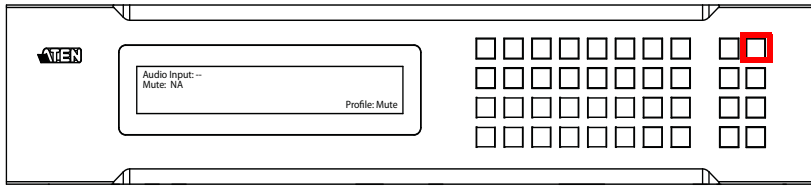


- Press the **Cancel** pushbutton to reset the settings.
- Press the **Array** pushbutton to exit.

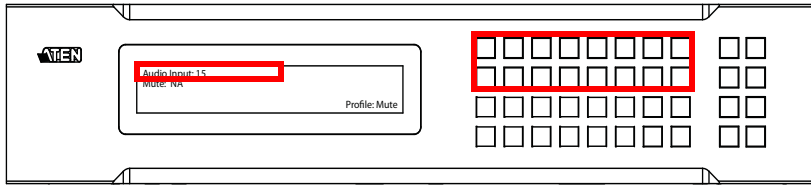
Note: The resolution cannot be set with the Front Panel Operation (default resolution: 1920x1080@60HZ). Users can select the resolution using the Browser GUI. See *Local Output*, page 79.

Audio Pushbutton

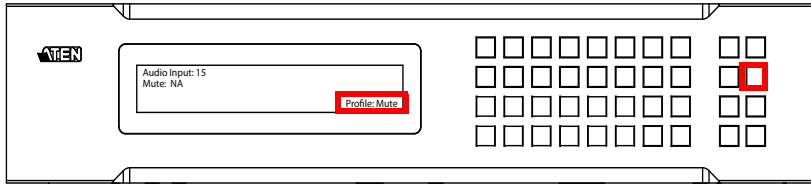
The HDMI audio of the VM51616H can be extracted to the stereo audio. The **AUDIO** pushbutton lets users easily select an Input source for the stereo audio output or mute it. Press the **Audio** pushbutton to enter the setting page.



- Use pushbuttons **1-16** to select an input source to the stereo audio output. Press the selected pushbutton again to deselect the output port.



- Press the **Profile** pushbutton to Mute or Unmute the audio.



- Press the **Cancel** pushbutton to reset the settings.
- Press the **Array** pushbutton to exit.

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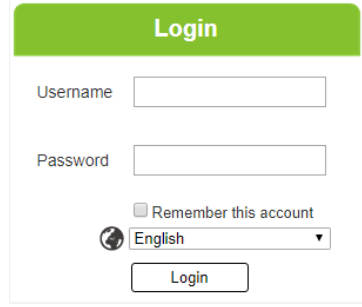
Chapter 4
Browser Operation

Overview

The VM51616H can be configured over a standard TCP/IP connection via its built-in Graphical User Interface (GUI). Because it can be accessed from anywhere over a network or the Internet, operators can easily log in via web browser. Security is ensured by password protection and user-configurable time-out. The VM51616H supports three levels of remote users with various privileges, and up to 16 users can log into the GUI at one time. For full details, see the sections that follow.

Logging In

To access the GUI, type the VM51616H's IP address into the address bar of any browser. If a Security Alert dialog box appears, accept the certificate – it can be trusted. The login screen appears:

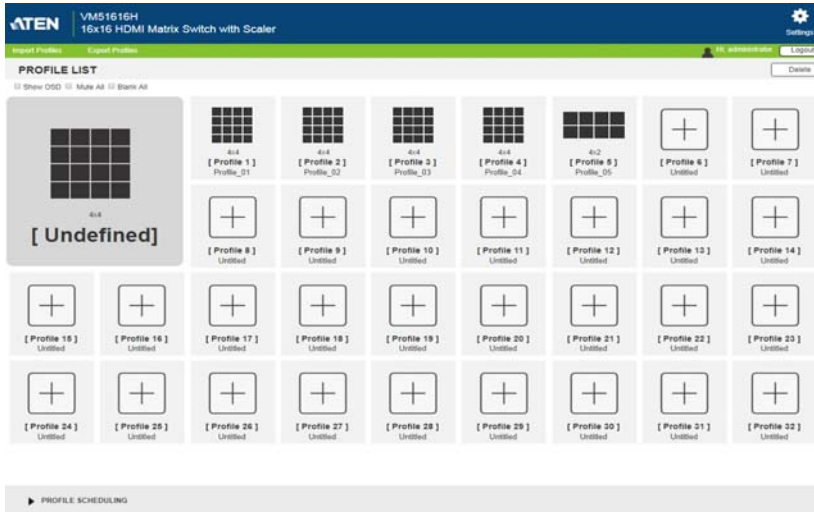


- The default IP address is **http://192.168.0.60**
- The default Username and Password are: **administrator / password**
- Enter the username and password, then click **Login**.
- The same user can not be logged in simultaneously.
- Use the drop-down menu to select the GUI language
  - English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Simplified Chinese and Traditional Chinese

Note: The username supports lower case letters only.

Main Page

The Main Page opens to the **Profile List**. This is where you configure the input to output connections by creating profiles. The page is divided into three parts: the *Menu Bar*, *Profile List*, and *Profile Scheduling*.



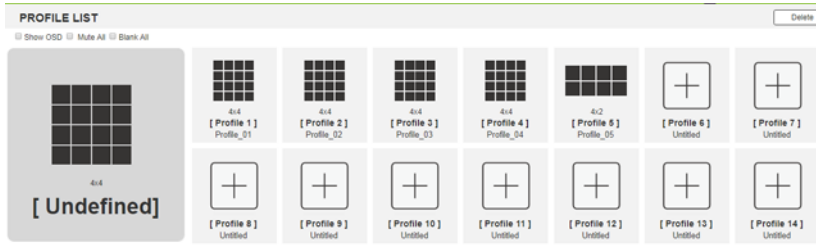
Menu Bar

The Menu Bar consists of *Model information*, *Import Profiles*, *Export Profiles*, the *Settings* icon, and the *Logout* button.

- Click the model number to add a description for the Video Matrix switch that you wish to show after the model number.
- Click **Import Profiles** or **Export Profiles** to import or export a configuration file (see page 41).
- Click **Settings** to enter the System Settings (see page 55).
- Click the **Logout** button to log out of the GUI.

Profile List

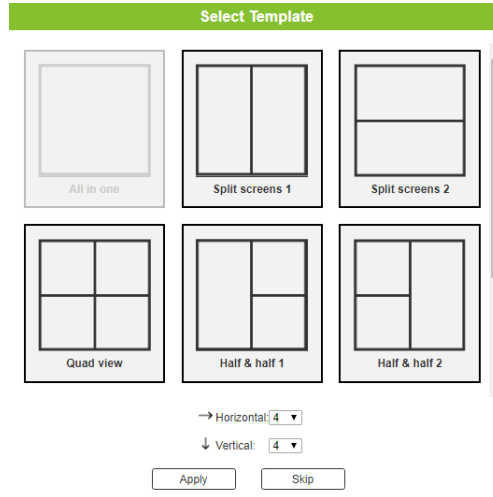
The *Profile List* lets you configure the input to output port connections by creating profiles to use. You can store up to 32 differently configured profiles that can be saved and played by two methods: locally via the unit's front panel pushbuttons and via the web GUI.



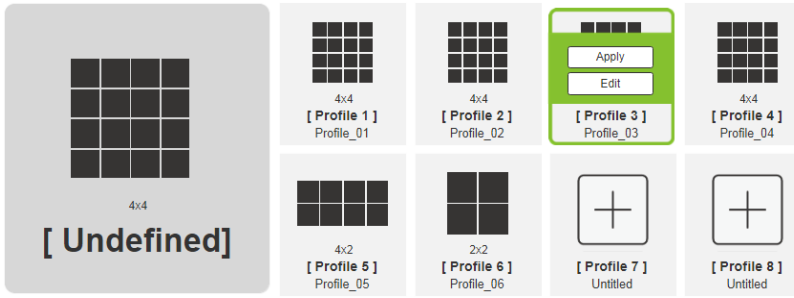
Adding/Playing a Profile

To configure a connection profile:

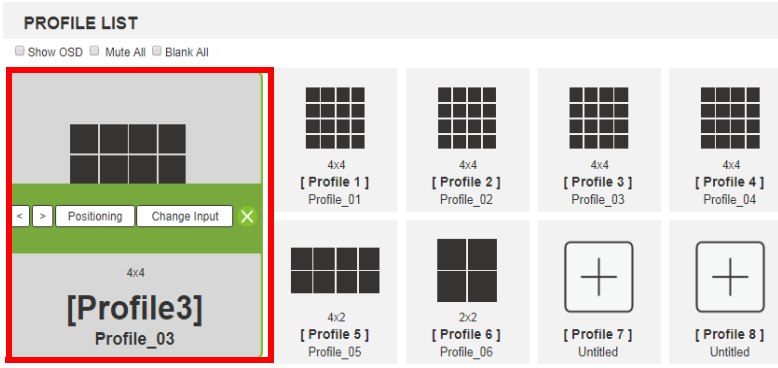
1. From the Profile List, click a **[Profile]**.
2. Select a template for the profile and click **Apply** to save your configuration or click **Skip** to enter the next page.



3. Configure the input to output connections for the profile (see page 46).
4. New profiles appear in the *Profile List*, as shown here:



5. Select the profile and click **Apply.**
6. The profile appears in the large **Play** window and the connections start:



Note: More information about Profile List page options are provided on the next page.

Importing/Exporting a Profile

To export the VM51616H's connection profiles, do the following:

1. Click **Export Profiles**. A configuration file will then begin downloading.

To import connection profiles to the VM51616H, do the following:

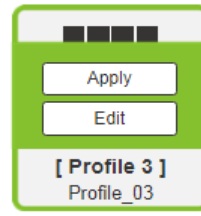
1. Click **Import Profiles**.
2. Browse to the configuration file, select it and click **Open**.

Note: Importing a connection profile database will overwrite the current profiles.

Profile List Options

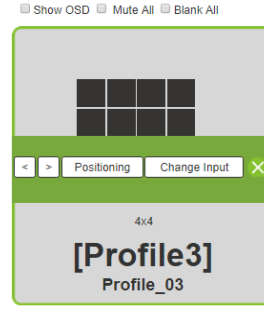
Clicking a *Profile* and a pop-up menu opens with options.

Profile



Option	Description
Apply	Click **Apply** to put the profile in the Play window. This allows you to start the profile connections.
Edit	Click **Edit** to configure the profile's input to output connections.

Play Window



Option	Description
On Sequence	**On Sequence** will appear when a profile schedule is playing (see page 44).
<	Click < to go back to the previous profile in the sequence, when Profile Scheduling is in use. Only available with *On Sequence*.
>	Click > to advance to the next profile in the sequence, when Profile Scheduling is in use. Only available with *On Sequence*.
Positioning	Click **Positioning** to open a window that allows you to adjust the image position on each display. For Video Wall profiles, you can also set the Bezel Dimension, which is the frame thickness between each display.
Change Input	Click **Change Input** to configure the profile's input to output connections.

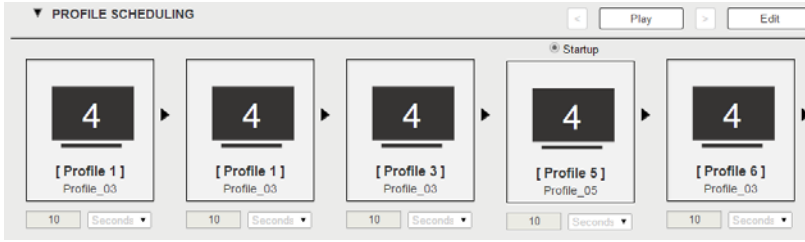
Option	Description
	Removes the profile from the Play window.

Other

Option	Description
Show OSD	Check **Show OSD** to show text updates that appear on the display when configuration or port changes are made.
Mute All	Check **Mute All** to mute the audio for all ports.
Blank All	Check **Blank All** to turn off the video to all displays.

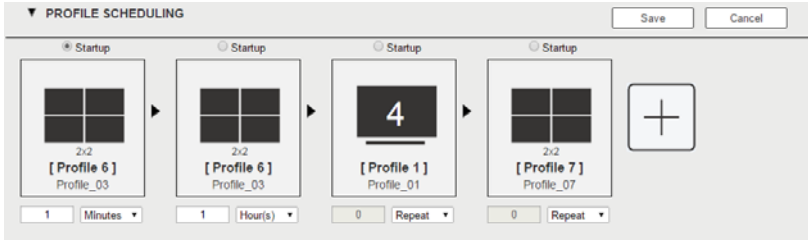
Profile Scheduling

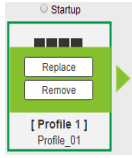
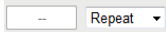
Profile Scheduling is located below the Profile List. Scheduling allows you to queue and play connection profiles in sequence for a specific amount of time.



Option	Description
Edit	Click to edit profile schedule.
Play	Click to play profile schedule.
Stop	Click to stop profile schedule.
< >	Click to change to next or previous profile when a profile schedule is playing.

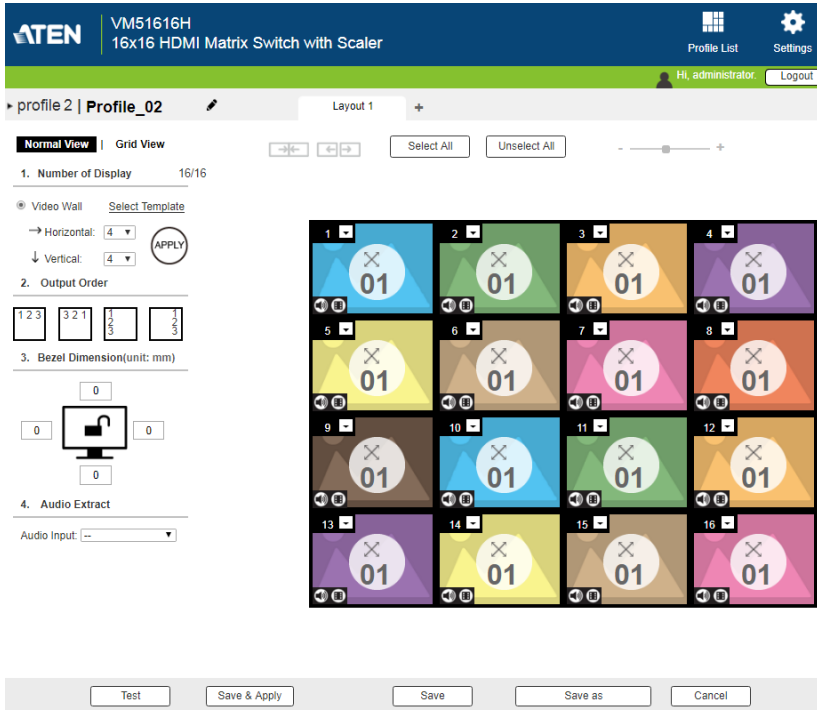
After selecting **Edit**, you will be presented with the following options.



Option	Description
	Click to add profiles to the schedule in the order to be played, left to right, then set the amount of time each profile plays.
	Click a profile for a pop-up menu to appear: ◆ Select **Startup** to use the profile as the starting point for the schedule. ◆ Click **Replace** to replace the selected profile with another profile. ◆ Click **Remove** to delete the profile from the schedule. ◆ Use **< >** to change the profile's position in the schedule.
	Use the drop-down menu to select the duration (Hours, Minutes, or Seconds) and enter the amount of time for the profile to play. After the time expires, the schedule switches to the next profile. Use **Repeat** to stop switching between schedules and stay on the currently selected profile. If **Repeat** isn't used, the schedule will loop back to the first profile. If **Repeat** is used, a specific number of hours, minutes, and seconds cannot be set and later profiles will not be played.
Save	Click **Save** to save the schedule as it appears. After saving, the Profile Scheduling window will close. When a Profile Schedule is playing the *On Sequence* box will appear in the Play window.
Cancel	Click **Cancel** to discard changes and return to the Profile Schedule page.

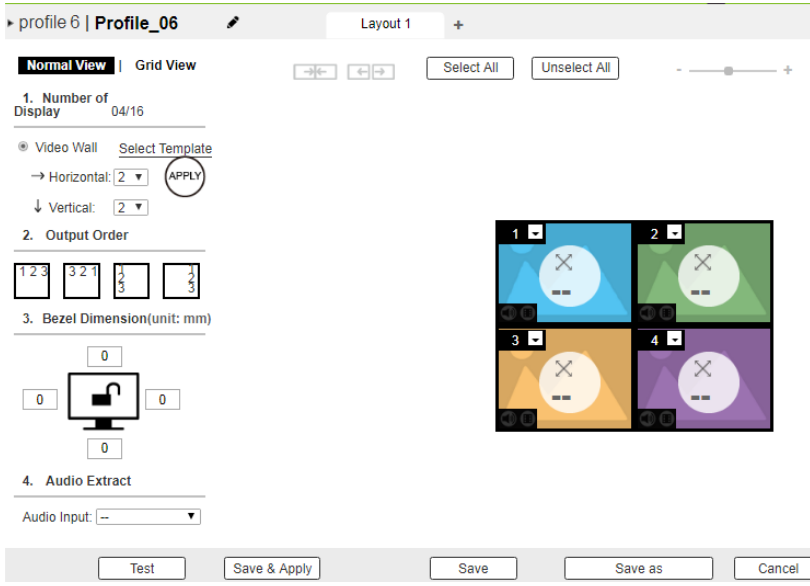
Connection Profiles

After finishing the settings of Adding/Playing a Profile (see page 39), you are able to configure the connection profiles with inputs and outputs here. The Connection Profiles allow you to configure one or multiple inputs to one or multiple outputs that form various video layouts to fulfill diverse applications, such as digital signage, video wall, surveillance, etc.

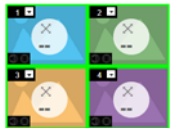


Profile Layout

Each blank icon represents an Output port and the connected display. The blank circle at the center shows the number of **Input** port selected for the display. The small number (upper-left corner) is the **Output** port for the display. Click the icons to select options. Use the icons to create Independent and Grouped Outputs. **Independent** Outputs will display video on a single monitor. **Grouped** Outputs will display video across multiple monitors as one large screen.



Profile Options

Option	Description
	Click an icon to choose its **Output** and **Video Input** from the *Display Preference* menu (see page 51).
	Click multiple icons to Group Outputs (see *Grouping*, page 50) and choose the **Video Input** from the *Display Preference* menu.
+	Use + next to **Display Layout _1** to create additional layouts under the same profile.
	Click the PEN icon or name to edit the profile name.
Select All	Click **Select All** to select all outputs.
Unselect All	Click **Unselect All** to unselect all outputs.
	Click “-” or “+” to zoom out or zoom in the layout of the Video Wall.
Test	Click **Test** to play current profile without saving.
Save & Apply	Click **Save & Apply** to save the profile and put it in the *Play window* (see page 42).
Save	Click **Save** to save the profile.
Save as	Click **Save as** to save the profile as a different profile number.
Cancel	Click **Cancel** to discard changes and return to the Profile List.
Grid View	Click **Grid View** to use a *Grid View* for configuring connection profiles (see page 53).

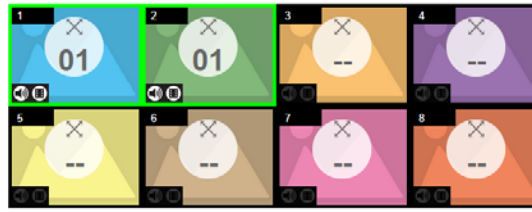
Blank Output

Option	Description
Blank Icon	Click Blank Output icons to highlight icons in green and use the Display Preferences menu to set the video options (see *Display Preferences*, page 51). Select a **single** icon to set the **Output** and **Video Input** for an independent display (see *Independent Output*, page 49). Select **multiple** icons and set the **Video Input** to group displays as one screen (see *Grouping*, page 50). *You must first set the Output port for each icon*.
Drop-down Menu	Use the drop-down menu to select the Output port.

Independent Output

Option	Description
Independent Output	Independent Outputs are displays that have their own **Video Input** and **Output** selected. Independent Outputs: ◆ Display their own video ◆ Icons have their own color and Video Input Select an Independent Output and use the *Display Preferences* (page 51) menu select the **Video Input**.
Drop-down Menu	Use the drop-down menu to select the Output port.
Mute / Video 	Click the **speaker** icon to mute the audio on/off. Click the **video** icon to turn the video off/on.

Grouping

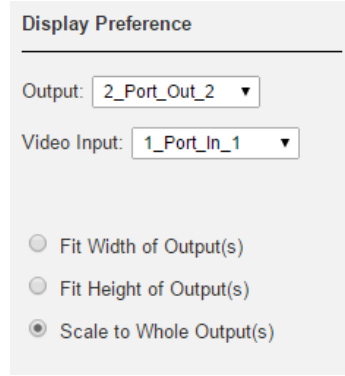


Option	Description
Grouping	Click multiple icons to Group Outputs (highlighted in green) and click →|← to group the displays into one screen*. Use the **Display Preferences** menu to select the **Video Input** for the group - each Output icon in the Group will appear with the same Video Input number and icon color (see *Group*, page 50). **Note:** Before grouping you must set the Output port for each icon.
Ungroup	Select a group and click ←|→ to ungroup the displays.

Group

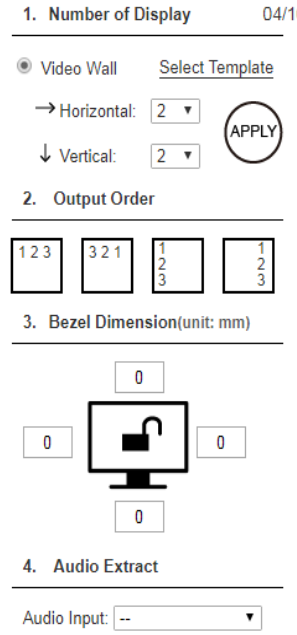
Option	Description
Group	A **Group** (of Outputs) shares the same **Video Input** and displays the video together as one large screen. A Group of Outputs: ◆ Displays video across multiple monitors to form one screen ◆ Icons have the same color and Video Input number. ◆ Select a Group and use the *Display Preferences* menu to select the **Video Input**. ◆ To group outputs see *Grouping*, page 50.
Mute / Video 	Click the **speaker** icon to mute the audio on/off. Click the **video** icon to turn the video off/on.

Display Preferences



Option	Description
Display Preferences	Click Output icons for the Display Preferences menu to appear– to select the **Output** and/or **Video Input** port.
Output	Use the drop-down menu to select the **Output** port (Independent and single Blank icons only). If you select multiple displays the output ports selected will appear here. You can use the output icon's drop-down menu to change the output port for the display.
Video Input	Use the drop-down menu to select the **Video Input** port.
Radio Button	◆ **Fit Width of Output(s)**: fits the video to the width of the display. ◆ **Fit Height of Output(s)**: fits the video to the height of the display. ◆ **Scale to Whole Output(s)**: fits the video on the entire display.

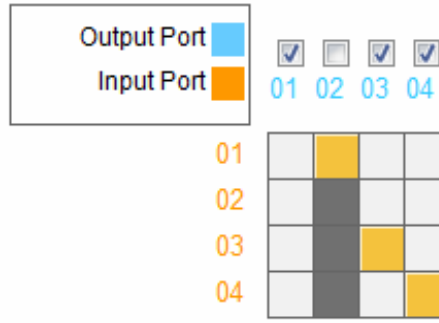
Number of Displays / Bezel Dimensions / Audio Extract



Option	Description
Number of Displays	Use the *Horizontal* and *Vertical* drop-down menu to select the number of displays that make up the video wall (a maximum of 64 are supported). Match this to the physical layout of the displays. Click **Apply** to set the layout.
Output Order	Automatically assign output ports by selecting one of the following options: Left to right (top to bottom), right to left (top to bottom), top to bottom (left to right) or top to bottom (right to left).
Bezel Dimension	Use the four boxes to increase/decrease the frame size for each active display.
Monitor Lock / Unlock 	Click the monitor icon to **Lock** the (4) bezel settings, so that when one size is changed they all change. Click the monitor icon to **Unlock** the (4) bezel settings, so that each size can be set independently.
Audio Extract	Use the drop-down menu to select the input source to be extracted to stereo audio output.

Grid View

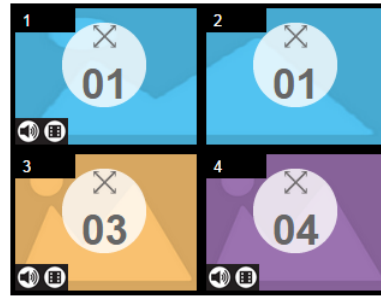
The Grid View allows you to select the **Input** to **Output** connections using a simple grid.



- Select a box to coordinate *Input Ports* to *Output Ports*. By default, ports will be aligned so that *i01* will correspond to *o01*, etc.
- **Uncheck** a box to disable the video for that Output Port. The column will no longer contain a yellow box.
- **Check** an *Input Port* radio button to align all *Output Ports* to that *Input Port*.
- Click **Test** to play current profile without saving.
- Click **Save & Apply** to save a profile and begin playing it.
- Click **Save** to save the profile.
- Click **Save as** to save the profile as a different profile number.
- Click **Cancel** to undo all unsaved changes.

Video Wall Example

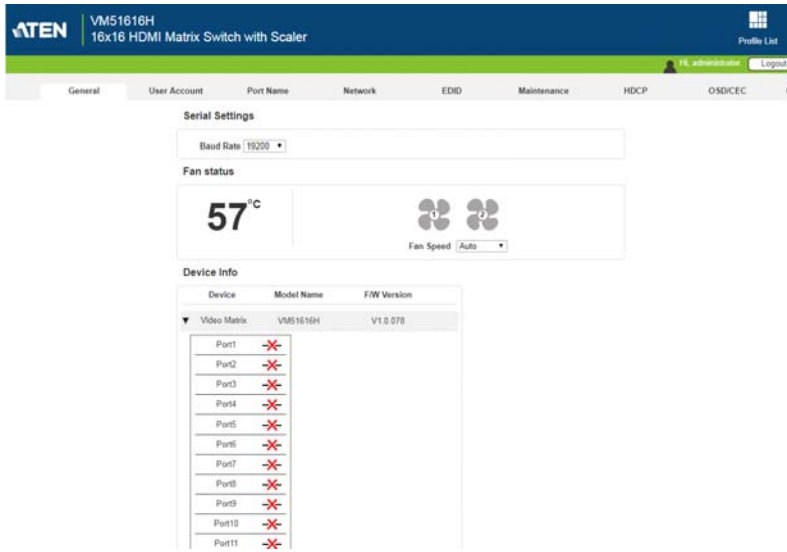
The example below shows a video wall with 8 displays.



- Each Group and Independent Output has a unique color.
- This video wall has 1 **Group** and 2 **Independent** displays.
- The Group will show **Video Input 01** across both displays as one large screen.
- The Independent displays will show the video from their own **Video Input –** 03 and 04.
- Add Display Layouts to create separate video walls (see *Profile Options*, page 48).

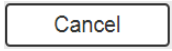
System Settings

Click the **Settings** link from the Main page for the System Settings to open on the General page:



- The *General* page allows you to edit Baud Rate, Language, and Fan settings as well as view device information.
- The *User Account* page allows you to add and edit user accounts.
- The *Port Name* page allows you to name each input and output port.
- The *Network* page allows configuration of the network settings.
- The *EDID* page is used to set the EDID modes.
- The *Maintenance* page is for upgrading, backup, and restoring the device's firmware.
- The *HDCP* page lets users view and set HDCP key settings.
- The *OSD/CEC* page allows users to control port OSD and CEC settings.
- The *Video* page allows users to set Seamless Switch™ options which determine how a display performs when the input port is changed.
- The *Read Status* page lists the status overview of the Video Matrix Switch, including System Network, Device Info, Video Connection, Audio Connection, CEC, OSD, and Output Resolution.

- The *Local Output* page allows users to configure the resolution, HDCP, and the Array Mode of the display device that is connected to the local HDMI port.
- Click **Profile List** to return to the Main page.

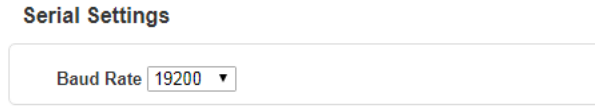
Option	Description
	Click **Save** to apply the settings.
	Click **Cancel** to discard changes and reset settings.

General

The *General* page has three sections: Fan Status, Device Info, and Other.

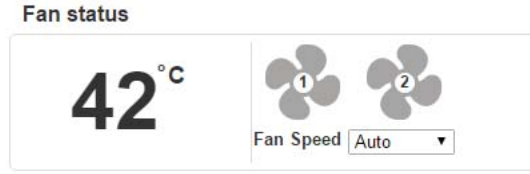
Serial Setting

- Use the **Baud Rate** drop-down menu to select a serial port setting.
  - Options include: 9600, 19200, 38400 and 115200.



Fan Status

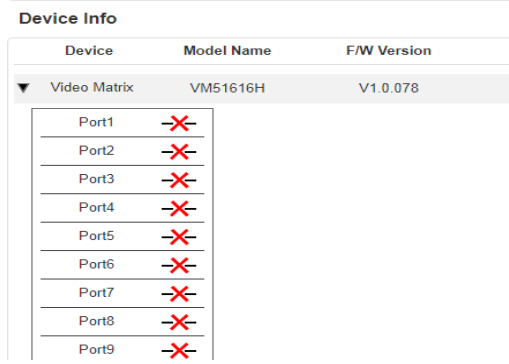
- This section displays the VM51616H's fans' statuses.
- The VM51616H also includes a drop-down menu which allows for manual selection of fan speed.



Note: If the fans have stopped working, they will appear as follows. 

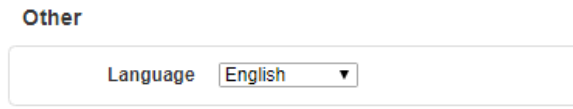
Device Info

- This section lists the device's type, Model Name, Firmware Version and port statuses.



Other

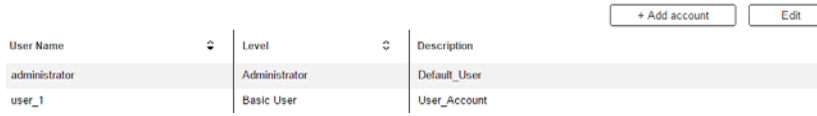
- Use the **Language** drop-down menu to select a preferred user interface language.
  - Options include: English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Simplified Chinese and Traditional Chinese.



User Account

The *User Account* page lets you add, edit, or delete users and change the password for accessing the VM51616H's GUI.

Note: This is an Administrator only function.



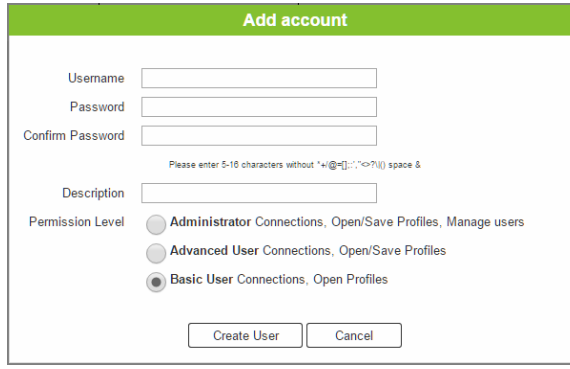
- **Add account** – Click the *Add account* button to add another user to the list. The VM51616H supports up to 32 users and allows up to 16 concurrent logins (see page 60 for more details).
- **Edit** – Click the *Edit* button to change user information. This option allows an Administrator to edit individual accounts.

  - Edit – Rename the user account, set the password, add a description, and set the user's permission level (see page 61 for more details).
  - Delete – Removes the user account.

- The default username and password are: administrator/password.

Add Account

Use the Add Account / Edit buttons to create a user account, set the user's password, add a description, and set the user's permission level (see page 61) when accessing the VM51616H's GUI.



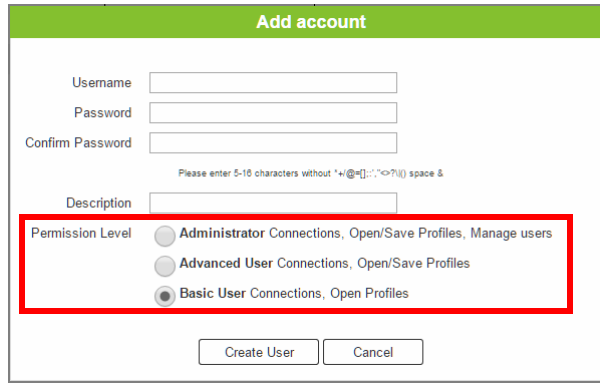
- Fill in a username or edit an existing one.
- Enter a password and re-type the password to confirm.

Note: Usernames and passwords accept multi-lingual characters, and must be 5–16 alphanumeric characters (excluding :;=[]+=/?\|). Passwords are case sensitive. Usernames only support lower case letters.

- Add or edit the description for the user.
- Select the permission level that you want to grant the user (see *Permission Level*, page 61).
- Click **Create User** to save the data.
- Click **Cancel** to discard the changes and exit.
- If a user is logged into the VM51616H's GUI, their user settings cannot be edited, and the fields in this screen are grayed out.

Permission Level

At the bottom of the New/Edit User page is the permission section, which is used to set a user's permission level.

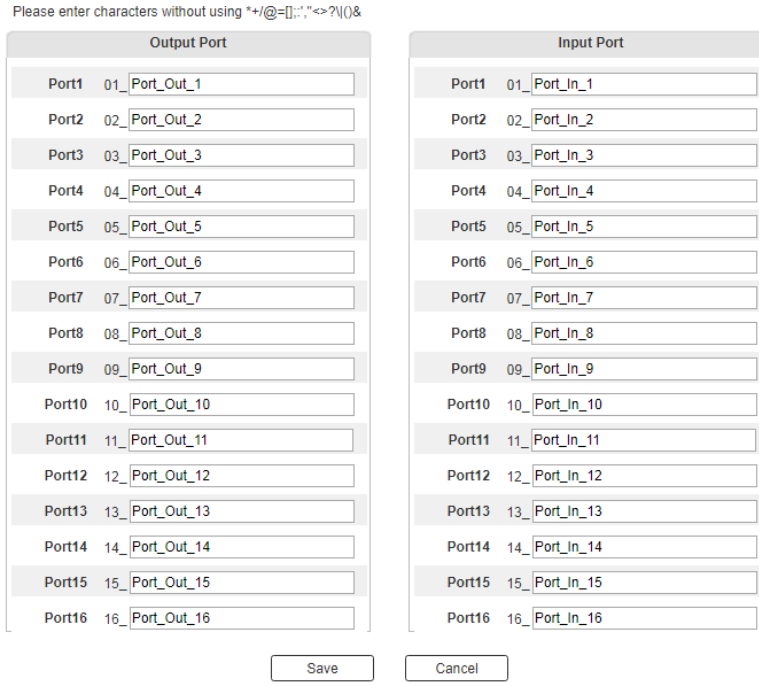


The three available permission levels are as follows:

- **Administrator** – this level provides full access and control of the VM51616H, in addition to full User Management privileges.
- **Advanced User** – this level provides full access and control with no User Management privileges.
- **Basic User** – this level only provides basic functions (connections and open profiles).

Port Name

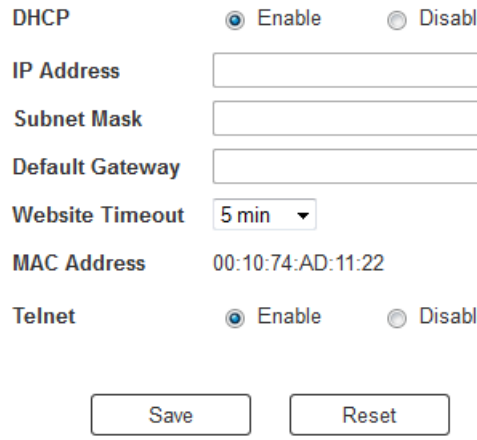
The *Port Name* page lets you name the input and output ports for easy identification.



- To name an Input/Output port, enter a descriptive name of up to 16 multi-language characters (excluding :;=[]+=/?\|) in the corresponding field and click **Save.**
- Language characters available include: English, French, German, Italian, Japanese, Korean, Portuguese, Russian, Spanish, Simplified Chinese and Traditional Chinese.
- To change an Input/Output port's name, enter another value and click **Save.**
- Input and Output port names can be the same.
- Press **Cancel** to discard changes and reset settings.

Network

The *Network* page lets you configure the IP settings, website timeout, and Telnet settings for connecting to the VM51616H.



Enable DHCP to allow the DHCP server to assign an IP address to the VM51616H. Select **Disable** to enter your own static IP address settings for the device.

Click **Reset** to use the following default values:

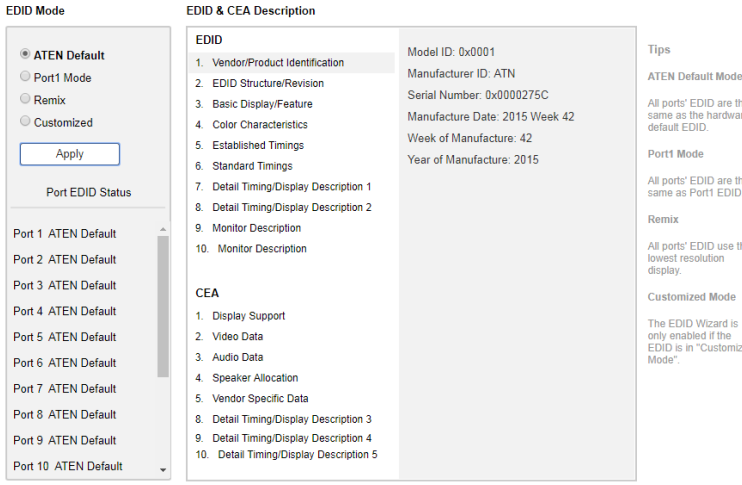
- IP Address – 192.168.0.60
- Subnet Mask – 255.255.255.0
- Default Gateway – 192.168.0.1
- Website Timeout* – 5 minutes
- Telnet Enabled

Enter the values, then click **Save**. Changes may take a few seconds and after refreshing the page automatically redirects you to the IP address specified.

***** This option controls how long an inactive web connection stays logged into the VM51616H. Use N/A to disable this option. Other options include 5, 10, 30 and 60 minutes. Any changes will take effect immediately.

EDID

The *EDID Settings* page lets users view and select an EDID Mode so that the VM51616H can use the best resolution for its display(s).

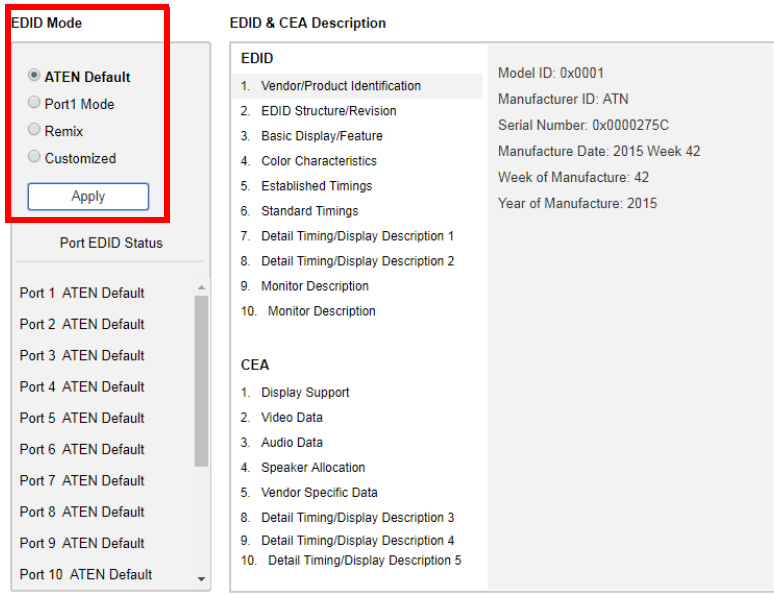


Note: The EDID Mode can also be selected via the Front Panel pushbuttons – see *EDID Mode*, page 22.

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.

EDID Mode

In the left panel of the page, users can select a pre-configured EDID Mode using the **EDID Mode** radio buttons.



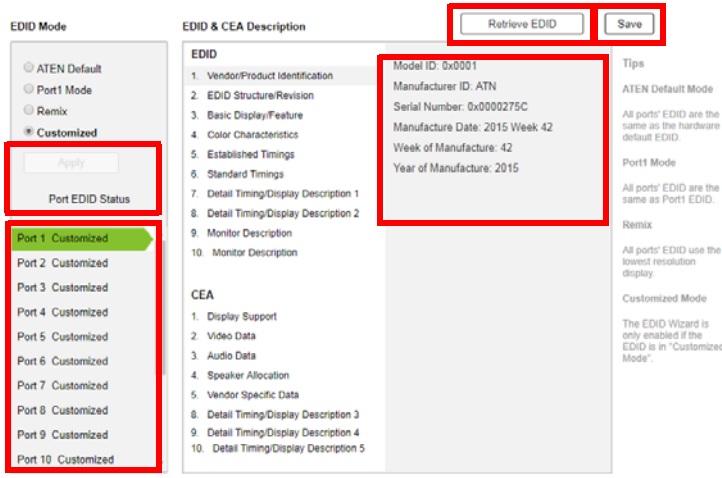
Select the EDID Mode to use and click **Apply**. The VM51616H uses the settings configured for that EDID mode.

Options are:

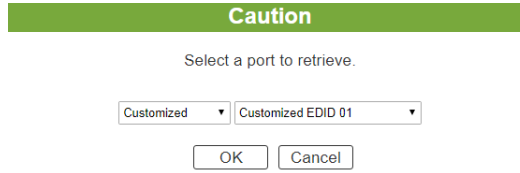
- **ATEN Default**: All ports' EDID are the same as the hardware default EDID.
- **Port 1 Mode**: All ports' EDID are the same as Port1's EDID.
- **Remix**: All ports' EDID use the best display resolution.
- **Customized**: See Customized Mode, see page 66.

Customized Mode

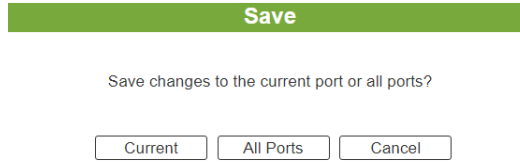
Use the *Customized* Mode to automatically retrieve and save the EDID settings of a connected monitor/display device to an input source port.



- In the left-most panel of the page, select **Customized** from the *EDID Mode* section and click **Apply.**
- **Port EDID Status**: Select which input source port you want to store the EDID configuration (01–16).
- **Retrieve EDID**: Click and a pop-up window appears to retrieve the EDID settings of a stored EDID configuration: *Customized EDID 01-16*, or *ATEN Default*. Select the port to retrieve:

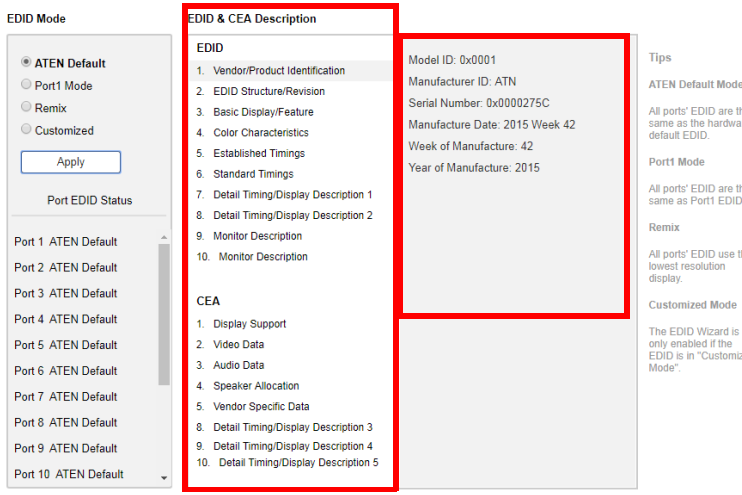


- The right panel displays a summary of the acquired EDID settings that you can edit. Click **Save** and select the configuration for the **Current** or **All Ports** for the duration of the session.



EDID & CEA Description

The right panel of the screen lets users view the configuration of the *EDID* and *CEA* Modes selected:



- From the left column, click the option that you want to view and/or edit. There are two categories: **EDID** (Extended Display Identification Data) and **CEA** (Consumer Electronics Association).
- When you highlight the menu items on the left column, the right column displays the current settings for the corresponding EDID configuration. Some of the screens are read-only.
- See *Customized EDID Settings*, page 68 for more information on these two columns.

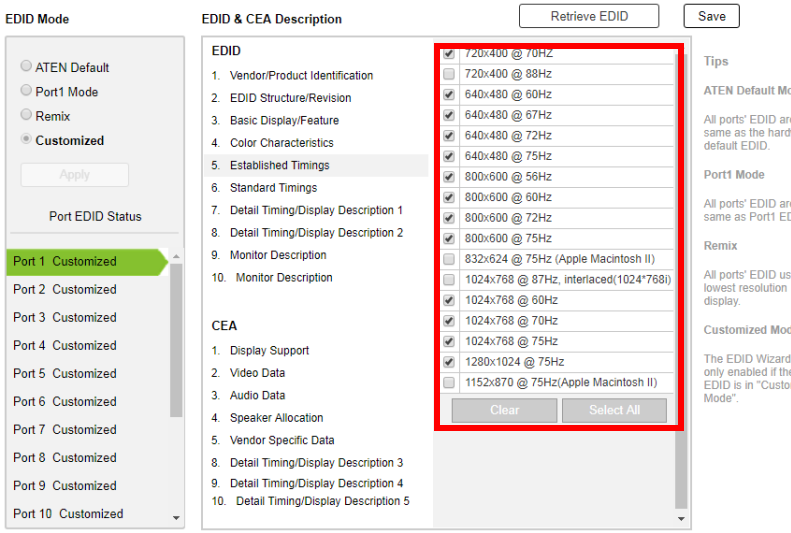
Customized EDID Settings

The EDID structure is comprised of 128 bytes in total – each heading shown in the left column corresponds to a specific number of bytes.

The pages for the pre-configured EDID Modes (Port 1, Default and Remix) cannot be edited. The pages for the Customized EDID, which can be edited, are discussed in the proceeding sections:

Established Timings

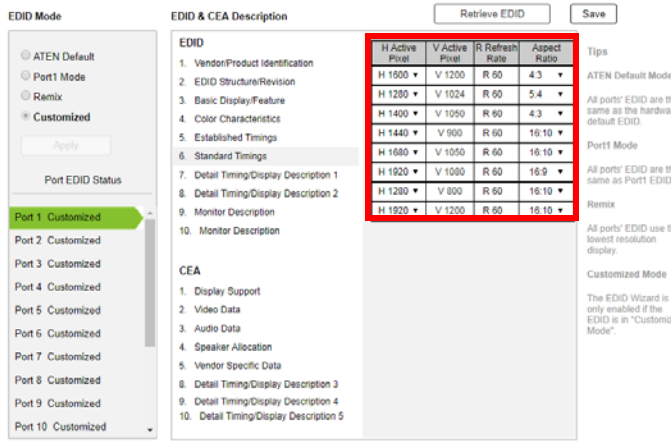
This page lists video resolutions/timings that display devices can support.



- Select the resolution(s) you want to use for the attached monitor/ display device.
- Click **Clear** to deselect all the items.
- Click **Select All** to check all the items.
- Click **Save** to apply the changes.

Standard Timings

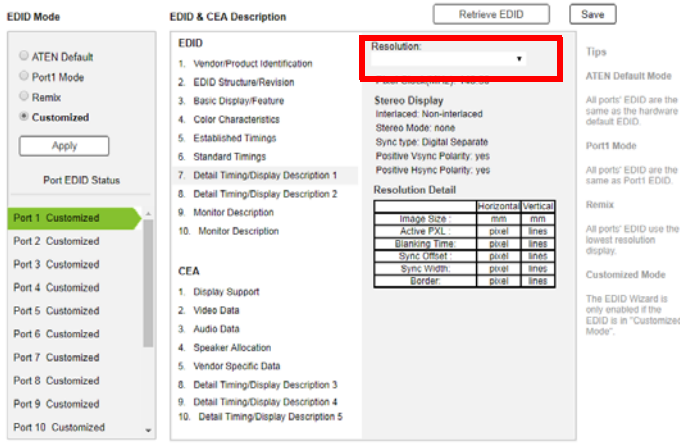
This page shows eight resolutions/timings that display devices can support in addition to those listed in the Established Timings page.



- Select the *H Active Pixel* from the drop-down menu.
- Select the *Aspect Ratio* from the drop-down menu.
- Click **Save** to apply the changes.

Detail Timing / Display Description

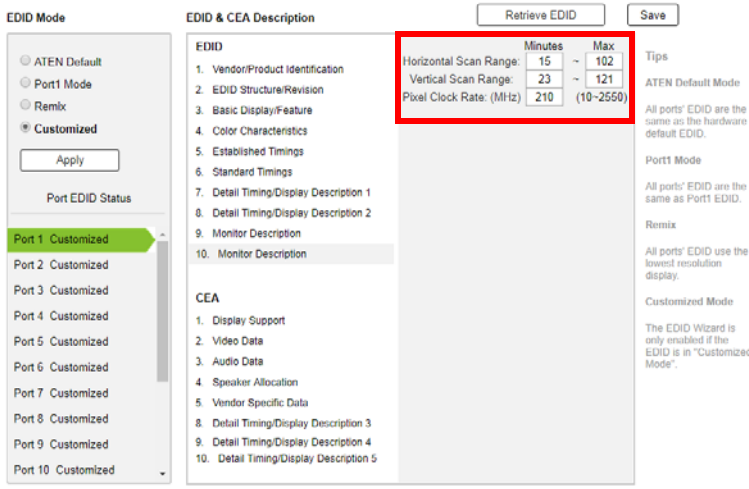
This screen gives more video resolution options, and provides resolution/ timing details.



In the drop down menu, choose a resolution with values that fit the attached monitor/display device and click **Save**.

Monitor Description

This screen lets you specify the viewing specifications, namely horizontal and vertical scan ranges and pixel clock rate, of your monitor/display device.



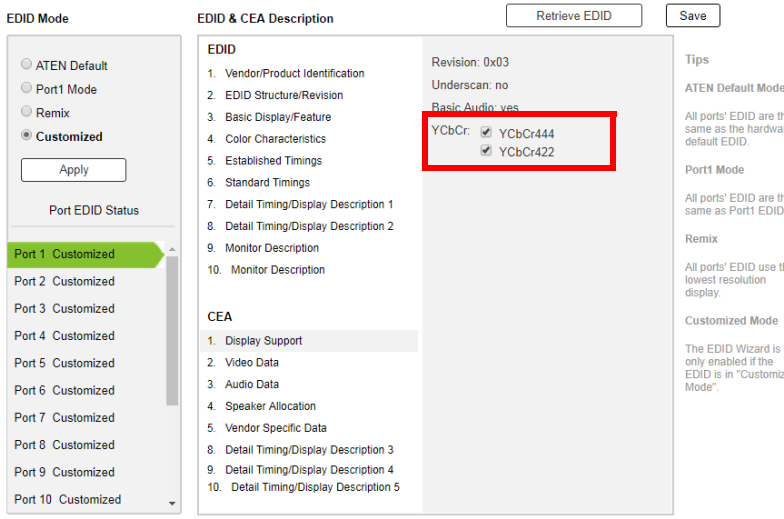
Enter the values that correspond to your device and click **Save** to apply the changes.

CEA Settings

CEA is an extension data of the EDID structure, which further extends the standard definitions of EDID to support advanced features of monitors/display devices.

Display Support

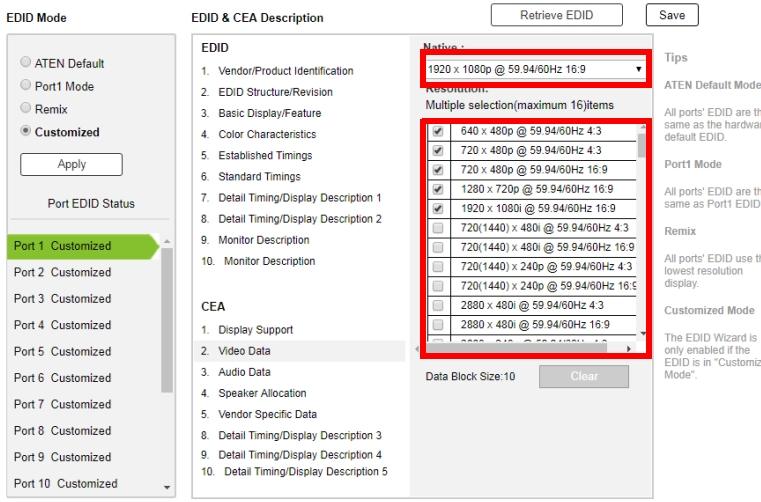
This screen describes the display's basic digital components.



Select the YCbCr mode applicable to your display and click **Save**.

Video Data

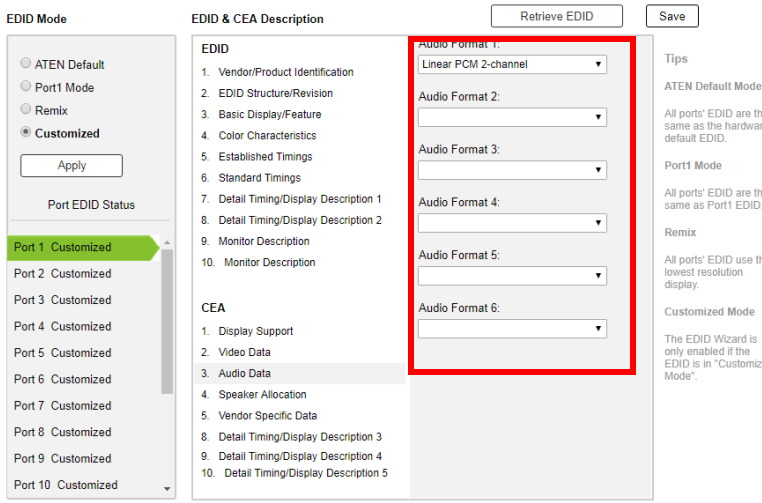
This screen lists additional video resolution/timing displays that may be supported by devices other than PC monitors (for example, 1080i).



- Select the native resolution of the attached display device.
- Select the resolutions that work with the attached monitor/display device.
- Click **Clear All** to deselect all the items.
- Click **Save** to apply the changes.

Audio Data

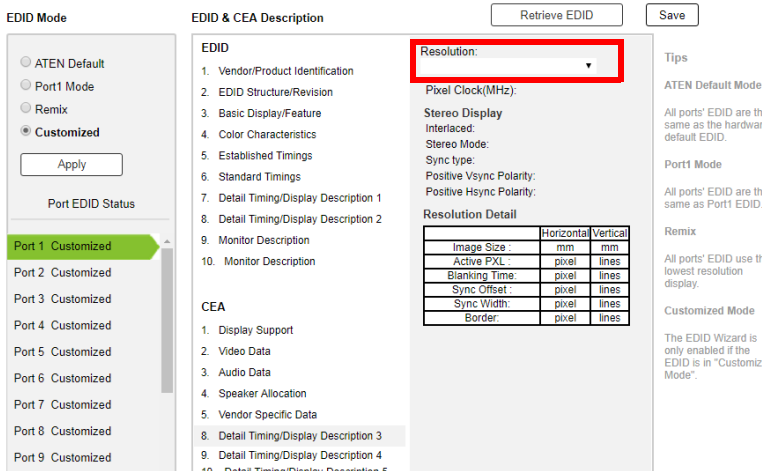
This screen lets you select advanced audio configurations for your device.



Use the drop down menu to select the **Audio Format** (1~6) applicable to your audio output device, and click **Save** to apply the changes.

Detail Timing / Display Description

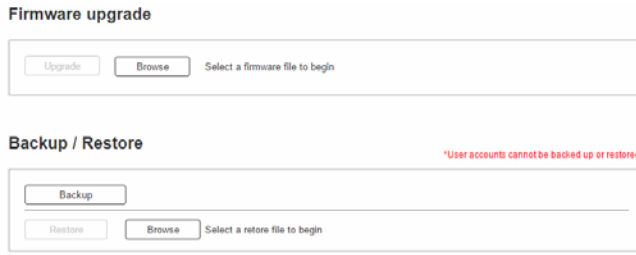
This screen gives more video resolution options, and provides resolution/ timing details (in addition to those specified in the EDID structure).



In the **Resolution** drop down menu, choose a resolution with values that fit the attached monitor/display device and click **Save**.

Maintenance

The *Maintenance* page lets users upgrade the VM51616H's firmware and back up or restore system settings. This is an Administrator only function.



To upgrade the VM51616H's firmware, do the following:

1. Use the **Browse** button to locate the firmware upgrade file. Make sure you have the correct file saved on your PC.
2. Click **Upgrade** to begin the upgrade procedure.

Note: After updating the firmware, it's recommended that you clear your web browser's cache and then close and reopen the web browser. This will ensure the GUI refreshes and functions properly.

To back up the VM51616H's system settings, do the following:

1. Click **Backup**. A configuration file will then begin downloading.

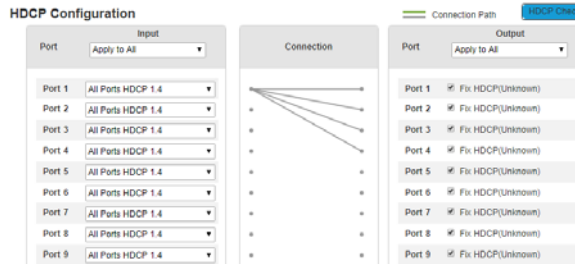
To restore the VM51616H's system settings, do the following:

1. Use the **Browse** button to locate the configuration file. Make sure you have the correct file saved on your PC.
2. Click **Restore** to begin the restoration procedure.

Note: User accounts cannot be backed up or restored.

HDCP

The *HDCP* page lets users view and set HDCP key settings between input and output ports for digital copy protection and to ensure seamless switching functionality between different devices. This is an Administrator and Advanced User only function.



Input

Here users can select whether input port content is HDCP 1.4 or non-HDCP enabled, either individually or by applying one setting to all ports.

Connection

Here users can find a visual display of connection paths between inputs and outputs. When selecting an input, its path is displayed in green.

Output

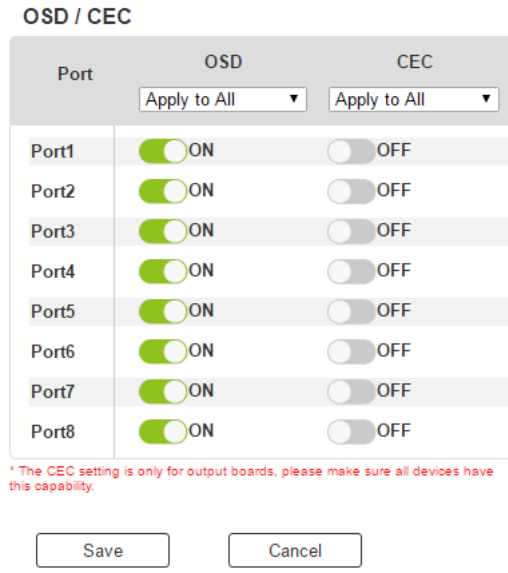
Here users can define whether or not HDCP settings are fixed, either by individual port or by applying one setting to all ports. By prearranging and fixing keys, this setting ensures that the Seamless Switch™ feature is possible even when switching between HDCP and non-HDCP enabled devices.

HDCP Check

The HDCP Check button allows you to check the HDCP capability of the connected displays at one time. The analyses are indicated in the brackets after the Fix HDCP check box for each port.

OSD/CEC

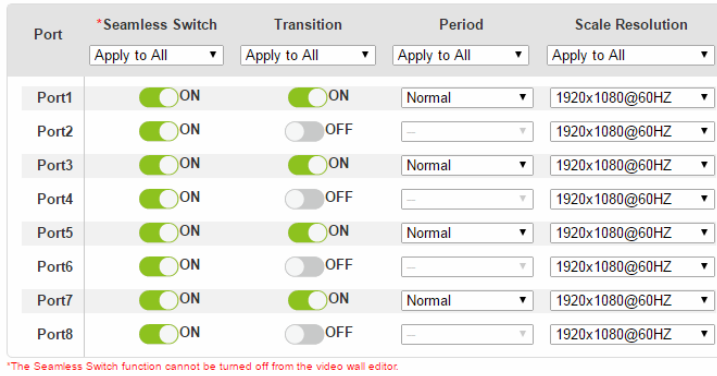
The OSD/CEC page lets users view and set OSD and CEC settings for all ports.



- **OSD**: Sets the default OSD option for the port. When OSD is on, real-time text updates appear on the display for 10 seconds when configuration and port changes are made to its output.
  - Use the drop-down menu to apply options to all ports, or ON/OFF button to enable/disable the OSD for each port.
- **CEC**: Consumer Electronics Control (CEC) allows interconnected HDMI devices to communicate and respond to one remote control.
  - Use the drop-down menu to apply options to all ports, or On/Off button to enable/disable CEC for a port.
- Click **Save** to save the settings or **Cancel** to exit without saving the settings.

Video

The Video page allow you to set Seamless Switch™ options which determine how a display performs when the input port is changed.



Note: When Seamless Switch™ is enabled:

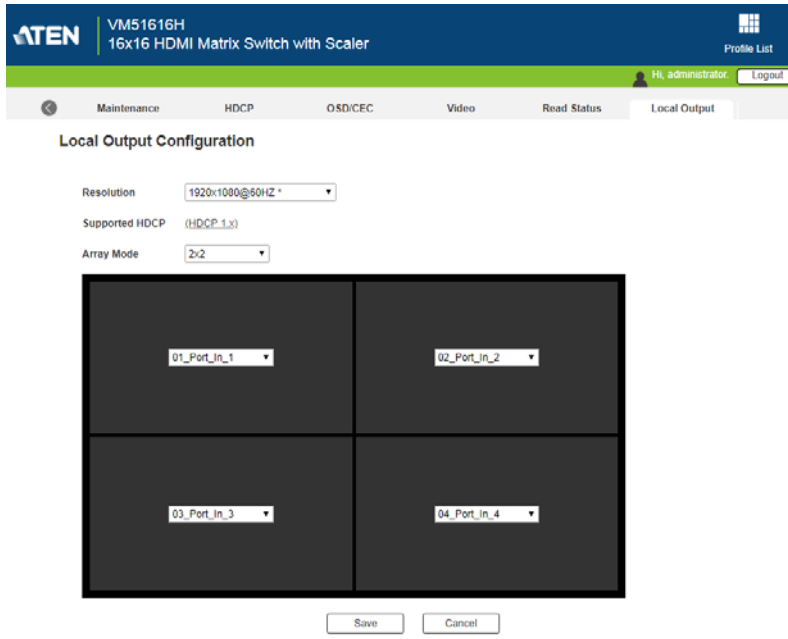
1. The *Transition*, *Period* and *Scale Resolution* options can be enabled.
2. Video outputs will not display 3D, Deep Color, or interlace (i.e., 1080i) resolutions correctly. To use these features, first disable Seamless Switch™.
3. Videos may not display within range (fit on the screen), in which case, make sure to adjust the display settings on your device.

- **Seamless Switch™:** Turning Seamless Switch on removes the video distortion and delay seen when an input port is switched.
  - Use the drop-down menu to apply to all ports, or the ON/OFF button to enable/disable Seamless Switching per port.
- **Transition**: Allows you to fade the video display when the input port is changed.
  - Use the drop-down menu to apply to all ports, or ON/OFF button to enable/disable Transitions per port.
  - Use the period option to set the fade speed.
- **Period**: Sets the fade speed for the Transition option.
  - Use the drop-down menu to apply an option (*Slow*, *Normal*, or *Fast*) to all ports, or lower drop-down menus to apply options per port.

- **Scale Resolution**: Forces the port to scale the video displayed to the selected resolution. Use the top drop-down menu to apply an option to all ports, or use the lower drop-down menus to apply options per port. Options are: 560x360@60HZ, 720x576@50HZ, 768x480@60HZ, 1024x768@60HZ, 1280x720@50HZ(720p), 1280x720@60HZ(720p), 1920x1080@30HZ(1080p), 1280x800@60HZ, 1280x1024@60HZ, 1366x768@60HZ, 1400x1050@60Hz, 1600x900@60HZ, 1600x1200@60HZ, 1920x1200@60HZ, 1920x1080@50HZ(1080p), and 1920x1080@60HZ(1080p).
- Click **Save** to save the settings.
- Click **Cancel** to discard changes and return to the Video page.

Local Output

The VM51616H is designed with a local HDMI output port that allows users to monitor multiple input sources in real time. The Local Output page allows users to configure the resolution, HDCP, and the Array Mode of the display device that is connected to the local HDMI port.



- **Resolution**: Use the drop-down menu to apply a resolution for the display that is connected to the Local Output. Options are: 560x360@60HZ, 720x576@50HZ, 768x480@60HZ, 1024x768@60HZ, 1280x720@50HZ, 1280x720@60HZ, 1920x1080@30HZ, 1280x800@60HZ, 1280x1024@60HZ, 1366x768@60HZ, 1400x1050@60Hz, 1600x900@60HZ, 1600x1200@60HZ, 1920x1200@60HZ, 1920x1080@50HZ, and 1920x1080@60HZ.
- **Supported HDCP**: Click to check and show the HDCP capability of the connected display.
- **Array Mode**: Use the drop-down menu to select a viewing mode for the local display. Options are: 1x1, 1x2, 2x2, and 4x4.
- Use the drop-down menu to select the input source for the split screen.

Telnet Operation

The VM51616H can be operated and configured via a remote terminal session using Telnet.

To log into the VM51616H by means of a Telnet session, do the following:

1. On your computer, open a terminal (command line) session.
2. At the prompt, key in the VM51616H's IP address in the following way:

   ```
   telnet [IP address]:23
   ```

3. Press **Enter**. The login screen appears. At the login prompt, provide your Username and Password.

Note: If a user logs on using a Username that is already in session, the newest login takes effect and the previous session is replaced.

Configuration Menu

Once a Telnet connection to the VM51616H is established, the device's text-based Configuration Menu comes up, with the following items:

1. H – Call up the command list for help

Command list:

IP – Set IP address

LO – Load connections from profile *nn*

PW – Change password

RI– Read what input is connected to *nn* output

RO – Read what output is connected to *nn* input

SB – Set the serial port baud rate

SS – Switch input to specified port

SV – Save the current connections into profile *nn*

TI – Set timeout

VR – Software version information

Ctrl-Q – Quit

2. IP – Set network settings

- **Set IP Address**

  `IP`

  Old IP Address: 192.168.0.60

  Old IP Subnet Mask: 255.255.255.0

  Old Gateway Address: 192.168.0.1

  New IP Address:

- **Set Subnet Mask**

  `IP`

  Old IP Address: 192.168.0.60

  Old IP Subnet Mask: 255.255.255.0

  Old Gateway Address: 192.168.0.1

  New IP Address: 10.3.52.220

  New IP Subnet Mask:

- **Set Gateway Address**

  `IP`

  Old IP Address: 192.168.0.60

  Old IP Subnet Mask: 255.255.255.0

  Old Gateway Address: 192.168.0.1

  New IP Address: 10.3.52.220

  New IP Subnet Mask: 255.255.254.0

  New Gateway Address:

Note: After the New IP Address, Subnet Mask, and Gateway Address are entered, the Video Matrix Switch will automatically reboot to apply the new network settings.

3. LO – Load connections from profile

```
LO 01
```

Load profile 01 OK.

4. PW – Change password

```
PW
```

Old password: ********

New password:

5. RI – Read what input is connected to *nn* output

```
RI 01
```

Input port 02 04 is connected to output port 01

6. RO – Read what output is connected to *nn* input

```
RO 01
```

Output port 02 is connected to input port 01

7. SB – Set serial port baud rate

```
SB 96
```

Serial port baud rate is set to 9600

8. SS – Switch input to specified output

```
SS 01,03
```

Switch input 01 to output 03

9. SV – Save the current connections into a profile

```
SV 01
```

Save the current connections into profile 01

10. TI – Set timeout

```
TI 30
```

Set 30 minute timeout

11. VR – Software version information

VR

Software version 1.0.

Note: All RS-232 commands in this manual are also applicable in Telnet mode, see *RS-232 Commands*, page 91.

Note: For further information about these functions, please reference the equivalent Browser GUI functions earlier in this chapter.

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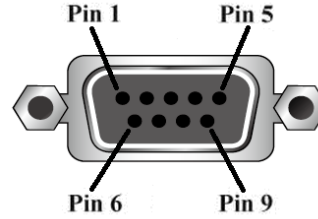
Chapter 5
RS-232 Commands

Serial Control Protocol Commands

The VM51616H's built-in bi-directional RS-232 serial interface allows system control through a high-end controller or PC.

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:

Baud Rate	19200
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

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

Switch Port Command

The Switch Port command allows you to switch ports on the VM51616H.

The formula for the Switch command is as follows:

Command + Input + Number + Output + Number + Group + Control + [Enter]

1. For example, to switch input port 02 to output port 05, type:

   sw i02 o05 [Enter]

2. To switch output port 04 to the next port, type:

   sw o04 [Enter]

3. To turn off video output on port 03, type:

   sw o03 off [Enter]

4. To switch audio from input port 06 to stereo audio output, type:

   sw i06 console audio [Enter]

The following tables show the possible values for the **Switch Port** command:

Command	Description
sw	Switch command

Input Command	Description
i	Input command

Port number	Description
xx	01-16 port

Output Command	Description
o	Output command

Port number	Description
yy	01-16 port
*	All output ports

Group	Description
normal	default HDMI audio outputs
console audio	Switch the audio to the stereo audio output

Control	Description
on	Turn on the display
off	Turn off the display
+	Next Port
-	Previous Port

Note: 1. By default, input port 01 is tied to output port 01; input port 02 is tied to output port 02; and so on until port 04 (i.e., o01 i01, o02 i02).

2. Each command string should be separated with a space.

3. The **Port Number** can be skipped, and the default value will be used.

4. The **Group** can be skipped, and the default value (normal; HDMI audio output) will be used.

The following table lists the available Switch Port commands:

Command	Input Command	Input Port	Output Command	Output Port	Group	Control	Enter	Description
sw	i	xx	o	yy *	normal console audio		[Enter]	Switch Input Port xx to Output Port yy (xx:01~16; yy:01~16, *)
sw			o	yy *		on off	[Enter]	Turn on Output Port yy Turn off Output Port yy (yy:01~16, *)
sw			o	yy *	normal console audio	+ -	[Enter]	Switch Output port yy to next Output port. Switch Output port yy to previous Output port. (yy:01~16, *)

EDID Mode Command

Extended Display Identification Data (EDID) is a data that contains a display's basic information and is used to communicate with the video source.

The formula for the EDID command is as follows:

Command + Control + [Enter]

1. For example, to use the Port1 EDID mode, type:

   edid port1 [enter]

The following tables show the possible values for the **EDID** command:

Command	Description
edid	EDID Mode command

Control	Description
port1	Implement the EDID of the connected display to Port 1, and pass it to the video source.
remix	Implement the EDID of each connected display according to its connection when the VM51616H is first powered on, or immediately after selecting the Remix option.
default	Implements ATEN's default EDID. (default)
custom	Implements the customized mode as set in the EDID system settings. (See *Customized EDID Settings*, page 68)

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

The following table lists the available EDID commands:

Command	Control	Enter	Description
edid	port1	[Enter]	The EDID from Port 1 is passed to the video source.
edid	remix	[Enter]	The VM51616H implements the EDID of each connected display according to its connection when the VM51616H is first powered on, or immediately after selecting the Remix option.
edid	default	[Enter]	ATEN's default EDID is passed to the video source.
edit	custom	[Enter]	Implements the customized mode.

Mute Command

Mute allows you to enable or disable an output port(s) audio.

The formula for the Mute command is as follows:

Command + Output + Number + Group + Control + [Enter]

1. For example, to mute the audio coming from output port 1, type:
   mute o01 on [enter]

The following tables show the possible values for the **Mute** command:

Command	Description
mute	Mute command

Output Command	Description
o	Output command

Port number	Description
yy	01-16 port (default is 01)
*	All output ports

Group	Description
normal	Mute the default HDMI audio outputs.
console	Mute the stereo audio output

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

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

2. Skip the output port command to mute or enable the audio of all output ports.
3. The **Group** can be skipped, and the default value (normal; HDMI audio output) will be used.

The following table lists the available Mute commands:

Command	Output Command	Port Number	Group	Control	Enter	Description
mute	o	yy *	normal console	on	[Enter]	Audio on for output port yy (yy:01~16, *)
mute	o	yy *	normal console	off	[Enter]	Audio off for output port yy (default) (yy:01~16, *)

CEC Command

Consumer Electronics Control (CEC) allows interconnected HDMI devices to communicate and respond to the same remote control.

The formula for the CEC command is as follows:

Command + Output + Number + Control + [Enter]

1. For example, to enable the CEC function on output port 1, type:

   cec o01 on [enter]

The following tables show the possible values for the **CEC** command:

Command	Description
cec	CEC command

Output Command	Description
o	Output command

Port number	Description
yy	01-16 port (default is 01)
*	All output ports

Control	Description
off	Disable CEC (default)
on	Enable CEC

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

The following table lists the available CEC commands:

Command	Output Port	Control	Enter	Description
cec	yy *	off	[Enter]	CEC off for output port yy (default) (yy:01~16, *)
cec	yy *	on	[Enter]	CEC on for output port yy (yy:01~16, *)

Scaling Command

The Scaling command allows you to set a resolution for scaling the display connected to an output port.

The formula for the Scaling command is as follows:

Command + Output + Number 1 + Horizontal Resolution + Number 2 + Vertical Resolution + Number 3 + Frequency + Number 4 + Control + [Enter]

1. For example, to turn scaling off for output port 02, type:

   scaling o02 off [Enter]

2. To set the scaling for output port 04 to 1920x1080@60Hz, type:

   scaling o04 1080p [Enter]

3. To set the scaling for all output ports to the connected display's native resolution, type:

   scaling o* native [Enter]

The following tables show the possible values for the **Scaling** command:

Command	Description
scaling	Scaling command

Output	Description
o	Output command

Port Number	Description
yy	01-16 port
*	All output ports

Horizontal Resolution	Description
hor	Horizontal resolution command for scaling

Resolution Number	Description
hhhh	Horizontal resolution

Vertical Resolution	Description
ver	Vertical resolution command for scaling

Resolution Number	Description
vvvv	Vertical resolution

Frequency	Description
freq	Frequency command for scaling

Frequency Number	Description
fff	Frequency resolution

Control	Description
off	Turn off the scaling function (by pass mode)
native	Map display's native resolution for scaling (default)

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

2. The **Port Number** command string can be skipped, and the default value will be used.

The following table lists the available Scaling commands:

Command	Output	Port Number	Horizontal Resolution	Number	Vertical Resolution	Number	Frequency	Number	Control	Enter	Description
scaling	o	yy *							off	[Enter]	Turn off scaling for port yy (by pass mode) yy: 01~16 or *
scaling	o	yy *							native	[Enter]	Enable display's native resolution for scaling on output port yy (default) yy: 01~16 or *

Command	Output	Port Number	Horizontal Resolution	Number	Vertical Resolution	Number	Frequency	Number	Control	Enter	Description
scaling	o	yy *	hor	1920	ver	1080	freq	60		[Enter]	Scale output port yy to 1920x1080@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1280	ver	720	freq	60		[Enter]	Scale output port yy to 1280x720@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1920	ver	1200	freq	60		[Enter]	Scale output port yy to 1920x1200@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1600	ver	1200	freq	60		[Enter]	Scale output port yy to 1600x1200@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1400	ver	1050	freq	60		[Enter]	Scale output port yy to1400x1050@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1280	ver	1024	freq	60		[Enter]	Scale output port yy to 1280x1024@60Hz yy: 01~16 or *
scaling	o	yy *	hor	1024	ver	768	freq	60		[Enter]	Scale output port yy to 1024x768@60Hz yy: 01~16 or *

Command	Output	Port Number	Horizontal Resolution	Number	Vertical Resolution	Number	Frequency	Number	Control	Enter	Description
scaling	o	yy *	hor	1280	ver	800	freq	60		[Enter]	Scale output port yy to 1280x800@60Hz yy: 01~16 or *
scaling	o	yy *	hor	720	ver	576	freq	50		[Enter]	Scale output port yy to 720x576@50Hz yy: 01~16 or *
scaling	o	yy *	hor	1600	ver	900	freq	60		[Enter]	Scale output port yy to 1600x900@60Hz yy: 01~16 or *

FrameSync Command

The FrameSync command allows you enable or disable the Frame Synchronization function for VM51616H.

The formula for the Scaling command is as follows:

Command + Control + [Enter]

For example, to enable the Frame Synchronization function, type:

frsync on [Enter]

The following tables show the possible values for the **FrameSync** command:

Command	Description
frsync	Frame Synchronization command

Control	Description
off	Turn off the FrameSync
on	Turn on the FrameSync

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

The following table lists the available FrameSync commands:

Command	Control	Enter	Description
frsync	off	[Enter]	Turn off the Frame Synchronization function
frsync	on	[Enter]	Turn on the Frame Synchronization function

Fan Speed Command

The Fan Speed command allows you to set the internal fan speed that cools the VM51616H.

To set the fan speed, use the following command:

Command + Control + [Enter]

1. For example, to set the fan to low speed, type:

   fan low [Enter]

The following tables show the possible values for the **Fan Speed** command:

Command	Description
fan	Fan Speed Command

Control	Description
low	Set internal fan to low speed (default)
mid	Set internal fan to normal speed
high	Set internal fan to high speed
Auto	Set internal fan to auto speed

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

The following table lists the available Fan Speed commands:

Command	Control	Enter	Description
fan	low	[Enter]	Sets fan speed to low
fan	mid	[Enter]	Sets fan speed to normal
fan	high	[Enter]	Sets fan speed to high
fan	auto	[Enter]	Sets fan speed to auto

Echo Command

The Echo function updates the RS232 controller when operations are made via the front panel pushbuttons, web browser, or telnet. The changes echo back to the RS232 controller to keep the settings in sync with the device.

The formula for the Echo command is as follows:

Command + Control + [Enter]

1. For example, to enable the echo feature, type:

   echo on [Enter]

The following tables show the possible values for the **Echo** command:

Command	Description
echo	Echo command

Control	Description
on	Turns Echo function on
off	Turns Echo function off (default)

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

The following table lists the available Echo commands:

Command	Control	Enter	Description
echo	on	[Enter]	Turn on Echo function
echo	off	[Enter]	Turn off Echo function

Black Screen Command

The Black Screen command turns a display screen black when no source signal is detected. This prevents the display from showing the default blue or other color used when no source signal is detected.

The formula for the Black Screen command is as follows:

Command + Control + [Enter]

1. For example, to enable the Black Screen function, type:

   blackscreen on [Enter]

The following tables show the possible values for the **Black Screen** command:

Command	Description
blackscreen	Black Screen command

Control	Description
on	Turns Black Screen function on (default)
off	Turns Black Screen function off

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

The following table lists the available Black Screen commands:

Command	Control	Enter	Description
blackscreen	on	[Enter]	Turn on Black Screen function
blackscreen	off	[Enter]	Turn off Black Screen function

Read Command

The Read command allows you to view the current configuration, firmware and other information about the device.

The formula for the Read command is as follows:

Command + [Enter]

1. To view information about the device, type:

   read [Enter]

The following table shows the possible values for the **Read** command:

Command	Description
read	Read command

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

The following table lists the available Read commands:

Command	Enter	Description
read	[Enter]	View information about the device

Reset Command

The Reset command allows you to reset the VM51616H to the default factory settings.

The formula for the Reset command is as follows:

Command + [Enter]

The following tables show the possible values for the **Reset** command:

Command	Description
reset	Reset command

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

2. User account settings will not be reset to the factory defaults.

The following table lists the available Reset commands:

Command	Enter	Description
reset	[Enter]	Resets the device settings

Baud Rate Command

The Baud Rate command allows you to set the RS-232 data rate for the VM51616H to use. Options are 9600, 19200 (default) 38400 and 115200.

The formula for the Baud Rate command is as follows:

Command + Control + [Enter]

1. For example, to set 38400 as the baud rate, type:

   baud 38400 [Enter]

The following tables show the possible values for the **Baud Rate** command:

Command	Description
baud	Sets the RS-232 baud rate

Control	Description
9600	Use 9600 baud rate
19200	Use 19200 baud rate (default)
38400	Use 38400 baud rate
115200	Use 115200 baud rate

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

The following table lists the available Baud Rate commands:

Command	Control	Enter	Description
baud	9600 / 19200 / 38400 / 115200	[Enter]	Sets the RS-232 baud rate

Save/Load Profile Command

The Save/Load Profile command allows you to save and load connection profiles. Saving profiles will save the connections currently in use.

The formula for the Save/Load Profile command is as follows:

Command + Profile + Number + Control + [Enter]

1. For example, to save the current connection configuration to profile 02, type:

   profile f 02 save [Enter]

The following tables show the possible values for the **Save/Load Profile** commands:

Command	Description
profile	Save / Load profile

Profile	Description
f	Profile command

Profile Number	Description
yy	01-32 (default is 01)

Control	Description
save	Save the connection configuration
load	Load a saved profile

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

The following table lists the available Save/Load Profile commands:

Command	Profile	Profile Number	Control	Enter	Description
profile	f	yy *	save	[Enter]	Save the connections as profile yy. yy:01~32, *
profile	f	yy *	load	[Enter]	Load profile yy. yy:01~32, *

OSD Command

To enable or disable the On-Screen Display (OSD) for displays, use the following command:

Command + Output + Number + Control + [Enter]

1. For example, to enable the OSD for output 07, type:

   osd o07 on [Enter]

2. For example, to disable the OSD for all outputs, type:

   osd o* off [Enter]

The following tables show the possible values for the **OSD** command:

Command	Description
osd	OSD command

Output	Description
o	Output port command

Number	Description
yy	Output port 01~16 port (default is 01)
*	All output ports

Control	Description
on	Enable OSD function
off	Disable OSD function (default)

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

The following table lists the available OSD commands:

Command	Output Command	Output Port	Control	Enter	Description
osd	o	yy *	on	[Enter]	OSD on for output yy yy:01~16, *
osd	o	yy *	off	[Enter]	OSD off for output yy (default) yy:01~16, *

Array Command

To set up an viewing mode (1x1, 1x2, 2x2, or 4x4) for the local display, use the following command:

Command + Vertical + Number + Horizontal + Number + Input + Sequence + [Enter]

1. For example, to set up the viewing mode to a 2x2 array with video inputs from Input Port 7, 8, 2, and 3 sequentially, type:

   array ver 2 hor 2 i7,8,2,3 [Enter]

2. For example, to set up a single view with video from Input Port 9, type:

   array ver 1 hor 1 i9 [Enter]

3. For example, to set up the viewing mode to a 4x4 array with all 16 video inputs, type:

   array ver 4 hor 4 [Enter]

The following tables show the possible values for the Array command:

Command	Description
array	array viewing mode command

Vertical	Description
ver	vertical command

Vertical Number	Description
m	numbers of vertical inputs 1, 2, or 4

Horizontal	Description
hor	horizontal command

Horizontal Number	Description
n	numbers of horizontal inputs 1, 2, or 4

Input	Description
i	input command

Input Sequence	Description
yy	sequence of input ports to show 01-16 port

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

2. The viewing array supports modes of 1x1 (single), 1x2 (side by side), 2x2 (quad mode), or 4x4 (show all) only.

3. Use commas to separate the Input Ports when setting the Input Sequence. The Input Sequence can be omitted in the 4x4 mode, which all 16 Input Ports will show on the local screen.

The following table lists the available Array commands:

Command	Vertical Command	Vertical Number	Horizontal Command	Horizontal Number	Input	Input Sequence	Enter	Description
array	ver	m	hor	n	i	yy	[Enter]	Show an m x n array on the local display with sequence yy yy:01~16
array	ver	m	hor	n			[Enter]	Show all Input sources in a 4x4 array mode m:4; n:4

Alert Command

To trigger a warning when issues arise for a specific input port, use the following command:

Command + Input + Number + Control + [Enter]

1. For example, to enable the basic Alert function for input port 1, type:

   alert i01 m1 [enter]

The following tables show the possible values for the **Alert** command:

Command	Description
alert	Alert command

Input	Description
i	Input command

Port number	Description
yy	01-16 port

Control	Description
off	Disable Alert (default)
m1	Show basic Alert (flashing border)
m2	Show detailed Alert (flashing border and port information)

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

The following table lists the available Alert commands:

Command	Input Command	Input Port	Control	Enter	Description
alert	i	yy	off	[Enter]	Alert off for input port yy (yy:01~16)
alert	i	yy	m1	[Enter]	Basic Alert on for input port yy (yy:01~16)
alert	i	yy	m2	[Enter]	Detailed Alert on for input port yy (yy:01~16)

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Appendix

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.
- Avoid circuit overloads. Before connecting equipment to a circuit, know the power supply's limit and never exceed it. Always review the electrical specifications of a circuit to ensure that you are not creating a dangerous condition or that one does not already exist. Circuit overloads can cause a fire and destroy equipment.

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.
- 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://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		VM51616H
Video Input	Interface	16 x HDMI Type A Female (Black)
	Impedance	100 Ω
	Max. Distance	up to 5 m
Video Output	Interface	16 x HDMI Type A Female (Black) (Array Mode): 1 x HDMI Type A Female (Black)
	Impedance	100 Ω
	Max. Distance	up to 15 m
Video	Max. Data Rate	6.75 Gbps (2.25 Gbps per Lane)
	Max. Pixel Clock	225 MHz
	Compliance	HDMI (3D, Deep Color) HDCP 1.4 Compatible Consumer Electronics Control (CEC)
	Max. Resolution	Up to 1080p
Audio	Output	1 x Mini Stereo Jack Female (Green)
Control	RS-232	Connector: 1 x DB-9 Female (Black) Baud rate and protocol: Baud Rate: 19200, Data Bits: 8, Stop Bits:1, Parity: No, Flow Control: No
	Ethernet	1 x RJ-45 Female
EDID Settings		EDID Mode: Default / Port1 / Remix / Customized (EDID Wizard support)
Switches	Power	1 x Rocker Switch
Power	Connector	1 x 3-Prong AC Socket
	I/P Rating	100-240VAC; 50-60Hz; 4.8A
	Consumption	120 VAC, 125W ; 230 VAC, 122W
Environment	Operating Temp.	0–40ºC
	Storage Temp.	-20–60ºC
	Humidity	0–80% RH, Non-condensing
Physical Properties	Housing	Metal
	Weight	7.86 kg
	Dimensions (L x W x H)	43.24 x 38.18 x 8.80 cm
Carton Lot		1 pc

Limited Warranty

IN NO EVENT SHALL THE DIRECT VENDOR'S LIABILITY EXCEED THE PRICE PAID FOR THE PRODUCT FROM DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THE PRODUCT, DISK, OR ITS DOCUMENTATION.

The direct vendor makes no warranty or representation, expressed, implied, or statutory with respect to the contents or use of this documentation, and especially disclaims its quality, performance, merchantability, or fitness for any particular purpose.

The direct vendor also reserves the right to revise or update the device or documentation without obligation to notify any individual or entity of such revisions, or update. For further inquiries, please contact your direct vendor.