

# ***HDMV-16x***

## **16-Port Full HD Multi-Viewer**

View up to sixteen different HDMI video sources  
simultaneously on one screen.



## *Installation Manual*

**Smart-AVI**  
SMART AUDIO VIDEO INNOVATION

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## Table 2: What's in the Box?

RT NO.	QTY	DESCRIPTION
HDMV-16X(+)	1	16-Port HDMI, Multi-viewer Switch with 16x/9x/Dual/Quad/Full modes
Power Cord	1	6 ft. Power Cable
CBLDB906	1	6 ft. DB9 Serial RS-232 Cable



Figure 1: HDMV 16x+

## Table 3: Technical Specifications

<b>VIDEO</b>	
Video Bandwidth	Single-link 340MHz [10.2Gbps]
Resolution HDTV	480i,480p,720i,720p,1080i,1080p
PC Resolution	800 x 600 up to 1920 x 1200
Input Video Signal	1.2 volts
Input DDC Signal	5 volts
Single Link Range	1080p
Format	HDMI 1.4
DVI Compliance	Single-link DVI-D 2.0
Output Cable Length	Up to 20 ft.
HDCP Compliance	1.0/2.0
Video Bandwidth	Single-link 340MHz [10.2Gbps]
Input Interface	(16) HDMI
Output Interface	HDMI
Connector	Type A [19-pin female]
<b>CONTROL</b>	
Front Panel	Tact Switches
RS-232	DB9 (female)
KVM	USB-connected keyboard
TCP-IP	LAN accessible website
<b>MECHANICAL</b>	
Height	12 in. (6.86 U)
Width	19 in. (431.8 mm.)
Depth	12.125 in. (259 mm.)
Weight	25 lbs. (11.3 kg.)
<b>POWER</b>	
Requirements	Internal 100-240 VAC
Power Supply Approvals	UL, CE, CSA, CEC, RoHS

## Introduction

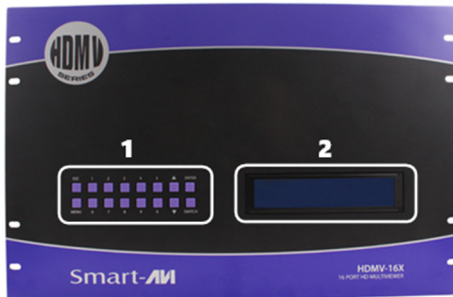
The HDMV Multi-viewer Switch allows you to view up to sixteen different high definition video sources simultaneously on one display device. Connections to video sources are managed via HDMI connectors. Advanced viewing options include 16x mode, 9x mode, quad-mode, full-screen mode, and dual-mode mode. Use this device to simplify management of multiple sources by controlling them all through a single display using the front panel, RS-232, and either through TCP-IP or the optional KVM. The HDMV-16x uses TCP-IP control while the HDMV-16x+ has KVM control.

## Features

- View up to sixteen computers (16x) on a single monitor at the press of a button
- On-screen display (OSD) makes setup and switching easy
- Change views by pressing the Control Panel switches, RS-232, USB keyboard, or through LAN depending on your model
- Display each computer with clean and crisp high-resolution video
- Supports HD resolutions up to 1920x1080p
- Delivers uncompressed digital video with zero signal loss
- HDCP and HDMI 1.4 compliant
- Supports EDID for total control of compliant displays
- Outputs HDMI up to 20 feet
- 16x-mode splits the screen to show 16 sources on one screen
- 9x-mode splits the screen to show 9 sources on one screen
- Quad-mode splits the screen to show 4 sources on one screen
- Dual-mode splits the screen to show 2 sources on one screen
- Full-mode displays 1 source in full screen

## Panel Layout

Front Panel



- 1. Control Panel**
- 2. Status LCD**

Figure 2: Front Panel

## Rear Panel

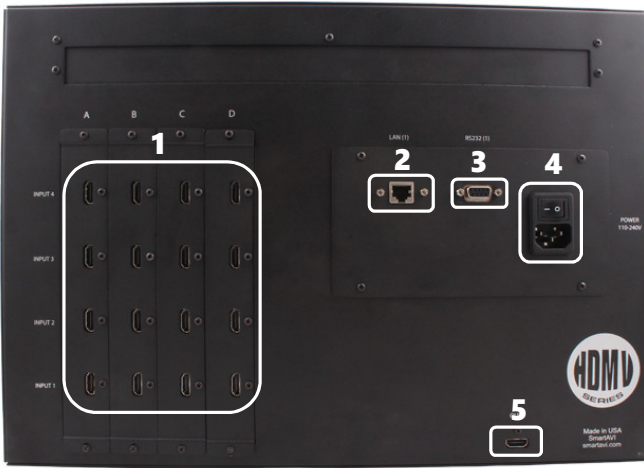


Figure 3: Rear Panel of HDMV-16x

- 1. HDMI inputs**
- 2. TCP/IP Control**
- 3. RS232(1) Control**
- 4. RS232(2) Control**
- 5. Power IN**
- 6. HDMI output**

## Connecting the Box

The power connection and switch are located at the back of the unit as well as the RS-232 connection and all HDMI inputs and output. Connect all peripheral devices first and turn them on before powering on the HDMV.

# Modes



**Full Screen Mode** - In the Full Screen mode, one of sixteen video sources are displayed in full screen size and maximum resolution.



**Dual Screen Mode** - In the Dual Screen mode, the screen is split into two fields of equal size with two video sources displayed in each field. Aspect ratio is maintained in dual screen mode.



**Quad Screen Mode** - In the Quad Screen mode, the screen is split into four fields of equal size with four video sources displayed in each field.



**9x Mode** - In the 9x mode, the screen is split into nine fields of equal size with nine video sources displayed in each field.



**16x Mode** - In the 16x mode, the screen displays all sources in a four by four matrix.

## Using the Front Control Panel

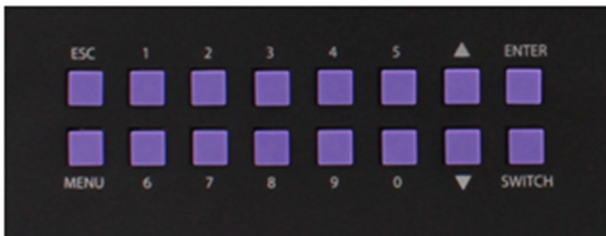


Figure 4: Front Control Panel

To switch display modes, press the "MENU" button, then use the "UP Arrow" button and the "DOWN Arrow" button to cycle between all the modes. Hit enter on the desired mode. Refer to Figure 4 above for help.

To switch the source press the "ENTER" button and enter the desired source number (1-16), then either hit the "SWITCH" button to move to the field or hit the "ENTER" button to finish and execute.

Hit the "ESC" button to escape out of the menu at any time.

The On-Screen-Display can also be accessed by hitting the "ESC" button when not inside the menu. Refer to the OSD section for more information.

To write EDID, press the button "MENU" then use the "UP" or "DOWN" button to cycle through the options until "EDID" appears. Hit "ENTER" then select the desired EDID by hitting 1,2, or 3 on the front control panel. Then select either yes or no by hitting the "SWITCH" button and confirming with "ENTER".

## TCP-IP Control

**Please note that TCP-IP control is only enabled for the HDMV-16x, the HDMV-16x+ offers KVM control instead.**

To enable TCP-IP control, connect an ethernet cable to the HDMV's ethernet port. Refer to page 5 for port information. By default, the HDMV will connect to the network using DHCP. If no DHCP server is available, the HDMV will attempt to use the default IP address of 192.168.0.200. Static IP assignment can be setup later and is detailed in next sections. The IP address is shown on the bottom of the OSD screen. Refer to the OSD section for more information. After finding the IP address, enter it in the browser of your choice and you will see the webpage shown in Figure 5 below:

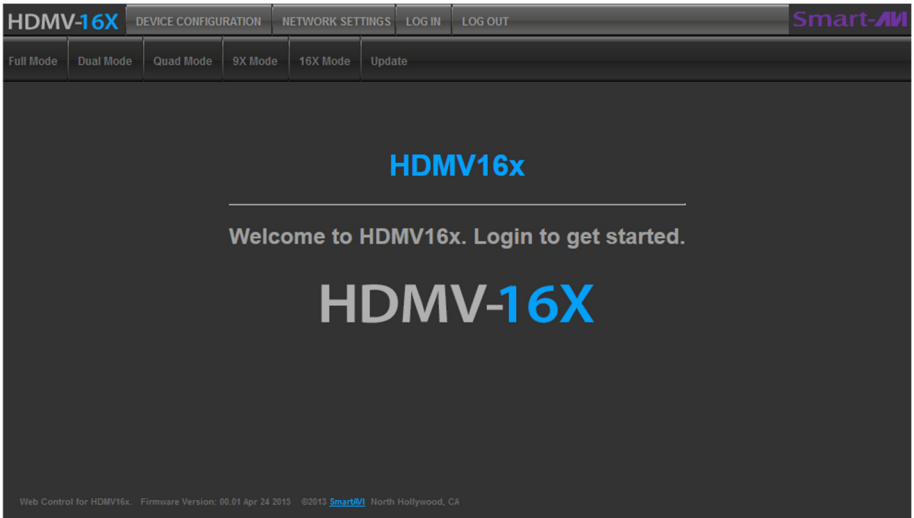


Figure 5: SmartAVI HDMV Webpage

Hit the "LOG IN" button to get started. When prompted for User ID and Password, enter the default "admin" user and the default "1234" password. After logging in successfully, you will be brought to the home screen.

## Device Configuration

In Device Configuration, there are three separate configurable sections: EDID Configuration, Rename Channels, and Device Configuration. This webpage is shown in Figure 6 and Figure 7. EDID configuration allows setting the EDID to either a local monitor, CAT-6605 (EDID 1), or FHX2300 (EDID 2). Select the desired EDID configuration and hit the "Submit" button. The Rename Channels menu allows naming each channel or input. Rename channels as desired then hit the "Submit" button.

The image shows two sections of a web interface. The top section is titled "EDID Configuration" and features a dark background with a light blue header. Below the header, there is a label "EDID:" followed by three radio button options: "All Input:", "Local", "EDID 1", and "EDID 2". The "Local" option is selected. Below these options is a "Submit" button. The bottom section is titled "Rename Channels" and also has a dark background with a light blue header. Below the header, there are 16 rows, each representing a channel. Each row consists of a label (e.g., "Channel 1:") followed by a text input field containing a default name (e.g., "USER1"). The channels are arranged in two columns of eight. At the bottom of this section is a "Submit" button.

Figure 6: EDID Configuration and Rename Channels

Under Device Configuration, shown in Figure 7, the current firmware version is displayed as well as the most recent available version. Clicking on a version allows downloading and installing of new and older versions. Hitting "Reboot" will restart the network card controller. Hitting on the "Factory default setting" will restore default settings for the network card controller. Lastly, hitting the "HDMV16 Reset" will reset the HDMV16x.



# Device Configuration

**Firmware version for Web interface**  
Current: ver.00.03 Jul 6 2015  
Available: no connect server update   
[Firmware history](#)

After reset to factory configuration or update web interface, please run reboot device  
(web interface) for changes to take effect.

Figure 7: Device Configuration

## Network Configuration

In network configuration, shown in Figure 8, the HDMV can be configured to use DHCP or a static IP. By default DHCP is enabled. If static IP is desired, switch the setting to static IP and enter the static IP, the subnet mask, the gateway address, and hit the "Submit" button.

HDMV-16X    DEVICE CONFIGURATION    NETWORK SETTINGS    LOGIN    LOG OUT

Full Mode    Dual Mode    Quad Mode    9X Mode    16X Mode    Update

## Network Configuration

You can choose a method which device will get ip address.  
(Changes will take effect after a reboot)

Use DHCP     Use static IP

IP address:

Subnet mask:

Gateway address:

MAC address:

Figure 8: Network Configuration Webpage

## Administration

In Administration, see Figure 9, new users can be added by first hitting the "Add new user" then typing a new username in the name field and a password in the password fields. Checking the box under Admin elevates user rights to admin level for that user. Hit the Save button to create the specified user.

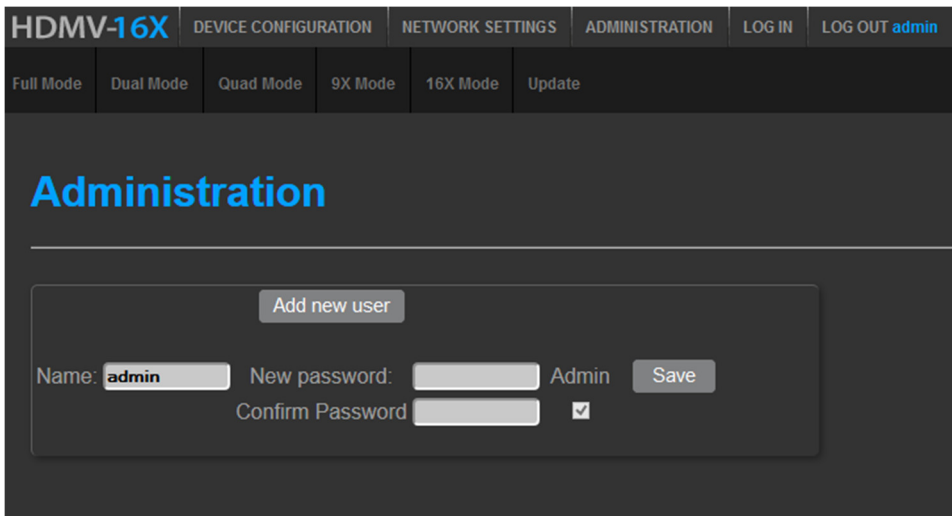


Figure 9: Administration Webpage

## Full Mode

In Full Mode menu, the webpage in Figure 10 will appear:

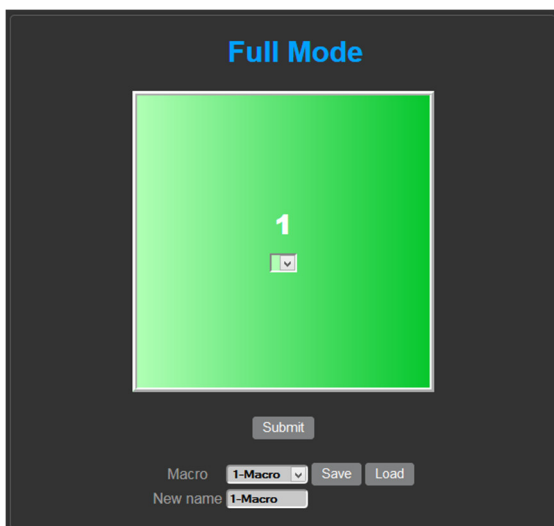


Figure 10: Full Mode Webpage

The drop-down menu will display all the channels available. Select the desired channel, then hit the “Submit” button. A macro with the selected channel can also be saved for common configurations. To do so, selected an unused macro from the macro drop-down menu, enter a new name for the macro, and hit save. To load a macro, select it from the macro drop-down menu and hit load.

## Dual Mode

In Dual Mode menu, two screens will be shown with two drop-down menus with all available channels. Select the desired channels, then hit submit. Refer to Figure 11 for reference to layout.

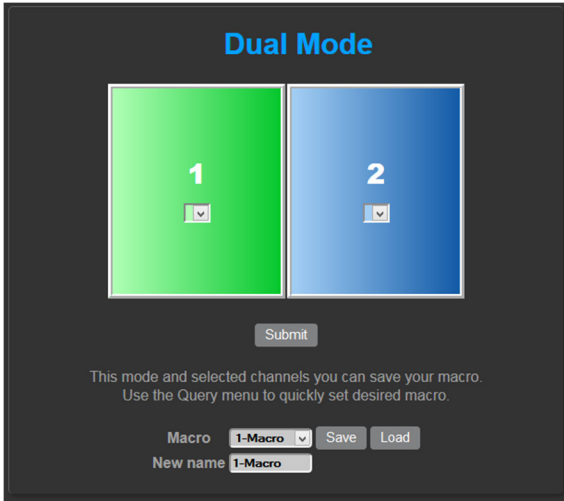


Figure 11: Dual Mode Webpage

## Quad Mode

In Dual Mode menu, four screens will be shown with four drop-down menus for each screen with all available channels. Select the desired channels, then hit submit. Refer to Figure 12 below for reference to layout.

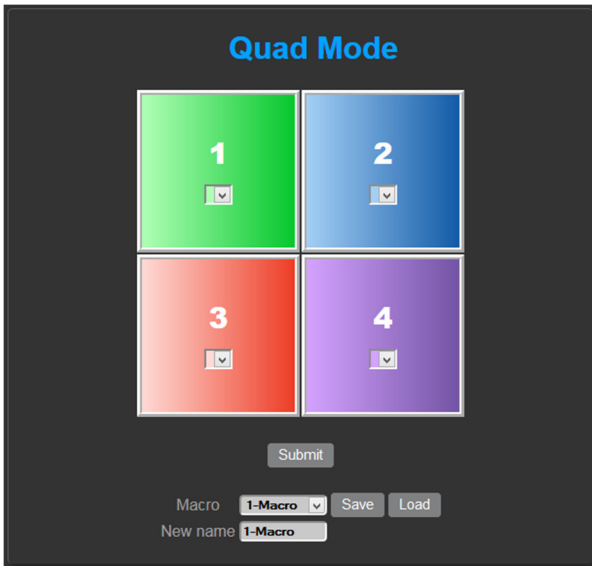


Figure 12: Quad Mode Webpage

## 9x Mode

In 9x Mode menu, nine screens will be shown with nine drop-down menus for each screen with all available channels. Select the desired channels, then hit submit.

## 16x Mode

In 16x Mode menu, sixteen screens appear. All channels are pre-selected. Hit submit to activate.

# KVM Operation

## KVM Setup

**Please note that KVM control is only enabled for the HDMV-16x+, the HDMV-16x offers TCP-IP control instead.**

To enable KVM functionality connect USB type B to type A connectors, shown in Figure 13 below, for each desired user. Connect the Type B end to the HDMV then the Type A end of to the workstation corresponding to that user.

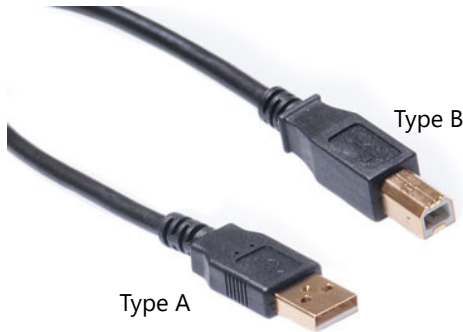


Figure 13: USB Type B to USB Type A

Next, connect a keyboard to the keyboard slot of the KVM panel indicated by the keyboard symbol and connect a mouse to the mouse slot of the KVM panel indicated by the mouse symbol.

## KVM Control

KVM control can be granted through RS-232 operation, detailed in the next section, or through the KVM keyboard directly. Furthermore, in full screen mode, KVM control is always granted to the selected user.

To grant KVM control through the KVM keyboard among other functions, refer to Table 4.

Table 4: Hotkey Sequences

Function	Hotkey Sequence	Description
16x	[Ctrl][Ctrl][1][6][x][ENTER]	Displays all sources in a 4x4 matrix
Full	[Ctrl][Ctrl][F][m(m)][ENTER]	Display 1 defined source full screen
Dual	[Ctrl][Ctrl][D][m(m)][ENTER] [n][(n)][ENTER]	Displays all sources in a 1x2 matrix
Quad	[Ctrl][Ctrl][Q][m(m)][ENTER][n(n)][EN TER][o(o)][ENTER][p(p)][ENTER]	Displays all sources in a 2x2 matrix
User Switch	[Ctrl][Ctrl][U][x(x)][ENTER]	Grants KVM control to selected user
OSD on	[Ctrl][Ctrl][O][ENTER]	Enables the OSD menu
Reset	[Ctrl][Ctrl][R][ENTER]	Resets the HDMV

## RS-232 Operation

The HDMV may also be controlled via RS-232 commands; this feature requires an RS-232 card installed on your computer or a USB to RS-232 adapter. First connect the RS-232 cable between your PC and the HDMV. Different connections can be seen in Figure 14.



Figure 14: RS-232 Connection Diagram

Next connect to the device using HyperTerminal or a similar serial data application and a DB9 for RS-232 connection. Use the following settings for the connection: 115200 baud rate, 8 data bits, no parity bits, one stop bit, and no flow control.

Any serial data application similar to HyperTerminal will be able to connect to the HDMV. HyperTerminal comes standard on Windows XP. On Windows Vista, Windows 7, Windows 8, and Windows 10 a third-party application must be used. There are many third-party applications available for Windows, Linux, and Mac operating systems. Type "ON" and hit enter to enable console commands.

Once connected and enabled, refer to Table 5 for console commands. To see the command list and enable commands in hyperterminal, type "ON" then hit enter.

Table 5: Console Commands

Commands	Input	Description
16x Mode	16x[ENTER]	Displays all sources in a 4x4 matrix
9x Mode	9x m n o p q r s t u[ENTER]	Displays 9 defined sources in a 3x3 matrix
Quad Mode	Q m n o p[ENTER]	Displays 4 defined sources in a 2x2 matrix
Dual Mode	D m n[ENTER]	Displays 2 defined sources in a 1x2 matrix
Full Mode	F m[ENTER]	Display 1 defined source full screen
Source Info	I[ENTER]	Lists information for all sources
Write EDID	WE m[ENTER]	Write EDID. 1 = CAT6066, 2 = FHX2300, 3 = Local Monitor
Enable Hotplug	EH m[ENTER]	Enables hotplug for the specified port.
Disable Hotplug	DH m[ENTER]	Disables hotplug for the specified port.
ON	ON[ENTER]	Enables commands
OFF	OFF[ENTER]	Disables commands
IP address*	IP[ENTER]	Displays the IP address
KVM version**	USB[ENTER]	Displays the KVM version
Help	?[ENTER]	Displays this menu in terminal

\*Only available on HDMV-16x

\*\*Only available on HDMV-16x+

## Navigating the OSD

The OSD can be accessed through the front panel or USB keyboard if your HDMV has the optional KVM. Hit OSD/Esc button on the front panel for the menu shown below in Figure 15:

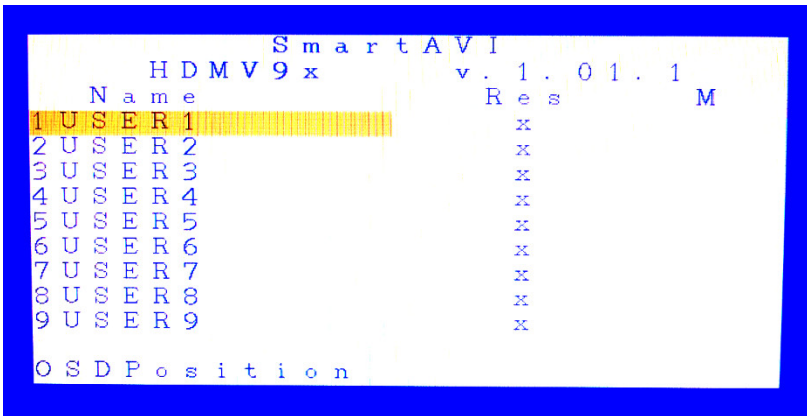


Figure 15: OSD Menu

Note: The menu may appear different for the HDMV-16X

The first column displays the name of each source. The second column displays the resolution for each source. Finally the third column display the Mode a source is displayed in.

All sources default to USER[X] on first launch. The name of each source can be changed through the web control or through the optional KVM. The HDMV-16x will save the names in its memory and it will retain the names after power cycles.

The resolution displayed in the second column is the input resolution for that particular source. It is updated in real-time if any resolution changes are made.

The mode for a source is displayed in the third column. If a source is unused, it will display a blank field in the third column. Conversely, if a source is used, its mode will be displayed here.

Hit the "DOWN" button to see the remaining sources. Hit the "UP" button to see the first nine inputs again.

The OSD menu will also display either the IP address of the HDMV or the KVM firmware version at the bottom of the menu.

## Accessories

SmartAVI makes a full line of accessories that can be used to enhance features of this product, for example, extending the range of inputs and the output to over 200 ft. Visit our website for more information.

## Firmware Upgrade

Please see Appendix A for further instructions on how to upgrade the firmware.

# Notes



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