4K-WALL

HDMI/DVI VIDEO WALL CONTROLLER AND 4X4

Integrated 2x2 Video Wall Controller and 4x4 Port HDMI, Real Time Switch Matrix with On Screen Display Control & No Software Required.

Designed and Manufactured in the USA

Smart-AVI

1-800-284-2131
www.smartavi.com

TABLE OF CONTENT

WHAT'S IN THE BOX?

PART NO.	QTY	DESCRIPTION
SM-4KWL-S	1	4x4 Port HDMI, Real-Time switching matrix with intergrated 2x2 video wall
CCPWR06	1	6' Power Plug Cable
SAVI-RMT	1	IR Remote Control
SM-EYE-NY	1	IR Receiver
EN-QKVM-EAR-P	2	Rack mount brackets
	1	Quick Start Guide

Brackets for mounting this device in a standard 19" rack can be ordered from SmartAVI.

Figure 2-1

INTRODUCTION

To create a four-screen 2x2 video wall with four HD video inputs, the 4K-Wall video wall controller provides a truly simple plug-and-play hardware solution. With four inputs and four outputs, users can arrange their content in numerous ways, providing unique functionality by combining the abilities of a video wall hardware controller and a 4x4 HDMI port Matrix. The 4K-Wall is HDCP compliant.
Users can stretch one large image over four screens, send an input to each screen, send four images to each screen or create a customizable Picture-in-Picture display. Better still, there's no software required, as all content management options are effortlessly controlled via the 4K-Wall video wall controller unit itself. There's no need for additional drivers. Just connect the HD inputs and HD screens to the controller and it's ready to go.

FEATURES

- Stand-Alone Unit, Requiring no Additional Hardware or Software
- Plug-and-play ready
- Four HDMI inputs and four HDMI outputs
- DVI-D up to 1920x1200 input
- Learns any EDID
- Internal EDID database
- Multiple configurations
- HDCP and HDMI 1.4 compliant
- Supports IR and RS-232

APPLICATIONS

- Corporate or Educational Presentations
- Corporate Lobbies
- Airport Installations
- Restaurants
- Wall Displays
- Entertainment Venues
- Digital Signage
- Point-of-Sale
- Dealer Rooms
- Security
- Control Rooms
- Shopping Centers

TECHNICAL SPECIFICATIONS

VIDEO & AUDIO	
Output Resolutions	Up to 1080P (1920x1080@60Hz)
Input Resolutions	Up to 1080P (1920x1080)
Outputs	(4) HDMI
Inputs	(2) HDMI, (1) VGA, (2) USB 2.0 Type A
HDCP Compliance	1.0/2.0
Audio	(1) 3.5 mm input, (1) 3.5 mm output
CONTROL	
Front Panel	Buttons
IR Remote Control	SAVI-RMT
Ethernet (TCP/IP)	RJ-45
OTHER	
Power Adapter	PS12VDC5A
Dimensions	7.5" W x 2" H x 8.25" D
Weight, Unit only	2.8 lbs.
Working Temperature	32 to 122°F (0 to 50 °C)
Working Humidity	Up to 85% RH (no condensation)
Storage Temperature	-4 to 149 °F (-20 to 65 °C)
Storage Humidity	Up to 90% RH (no condensation)
USB MEDIA PLAYER	USB player requires the IR Remote Control for navigation and media selection.
Signal Type	USB 2.0, 1.1, and 1.0 (Type A)
Video Formats *	MJPEG, MPEG-1, MPEG-2, MPEG-4, Vvid, DivX H.264
Max Resolution	1920x1080 @30fps
Max Data Rate	20 Mbps
Audio Formats *	MP3, WMA, AAC, MP2, PCM, AC3
Photos Max Resolutions *	JPEG - 15360x8640, BMP - 9600x6400, PNG - 9600x6400

*__PLEASE NOTE__: 4K-WALL 3x3V2 only supports the primary formats listed above. Any unlisted formats are not compatible with 4K-Wall.

INSTALLATION

1. Make sure the 4k-WALL is turned off.
2. Connect up to 4 HDMI Inputs (i.e PC, Blu-Ray Player, Digital Signage, etc.) to the HDMI INPUT ports of the 4k-WALL using HDMI cables.
3. Connect up to 4 HDTVs to the HDMI OUTPUT ports of the 4K-WALL using HDMI cables or HDMI-to-DVI adapters for DVI displays.
4. Connect the IR receiver to the IR input jack at the back of the 4K-WALL.
5. Connect a cat5/cat6 cable to the RJ45 connector.
6. Optionally connect an RS-232 cable from PC to the RS232 port of the unit for additional control.
7. Turn on the 4K-WALL.
8. Wait for the unit to initialize. This should take less than 1 minute.

APPLICATION DIAGRAM
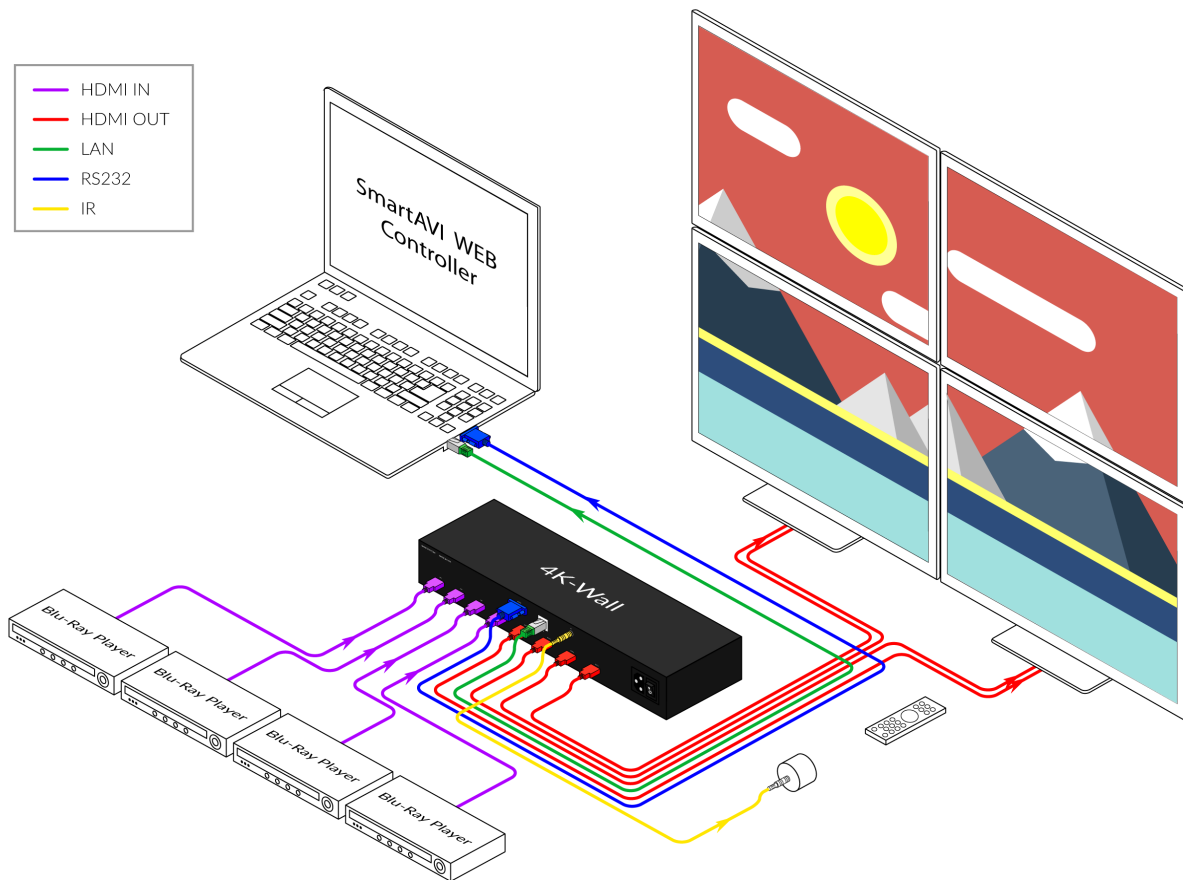
LEARN EDID

Once 4K-WALL 2x2 boots up, it will automatically default to HDMI + Audio for the EDID. Depending on the monitors used, using either the built in custom EDID may work better than the local EDID or vice versa.

 To learn the **Local EDID**, press and hold button **2 + 3** simultaneously on the front panel.
Please note that Local EDID will only take the EDID from **OUTPUT 1**.
To learn **HDMI + Audio EDID**, press and hold button **1 + 4** simultaneously on the front panel.
To learn **HDMI EDID**, press and hold button **1 + 3** simultaneously on the front panel
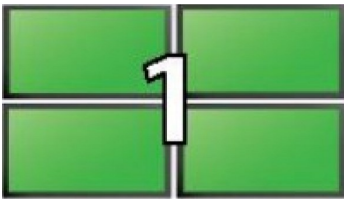To learn **DVI EDID**, press and hold button **1 + 2** simultaneously on the front panel.

AVAILABLE CONFIGURATIONS

To switch to Video Wall Mode: Press the QUAD and MENU buttons simultaneously

then press the desired input channel 1, 2, 3, or 4.

Video Wall Mode: User can select any of the four HD inputs and project the image across four HD screens (2x2 configuration).

Full Mode: User can select any of the four HD inputs and project the image individually on all four HD screens, with supported resolution up to 1920x1080 on each screen.

Press FULL (output, input) Example: Input 4 to out 2 = "Full, 2, 4"

Quad Mode: User can divide each screen into four sections with all four inputs playing on each screen. Users can place each screen in different locations, further enhancing the 4K-WALL's matrix functionality.

Press QUAD with desired channel 1,2,3,4

PiP Mode: Users can create Picture in Picture (PiP) displays on each screen using all four inputs, with one large HD source and three accompanying PiP sources alongside.

Press PiP with desired channel 1,2,3,4

ON-SCREEN DISPLAY (OSD)

On-Screen Display (OSD) gives users great flexibility and ease of use when looking to manage their video wall. It can be operated with the IR Remote Control through the Front Panel Buttons as shown in the following pages. Please note that the OSD will only appear on **OUTPUT 4**.

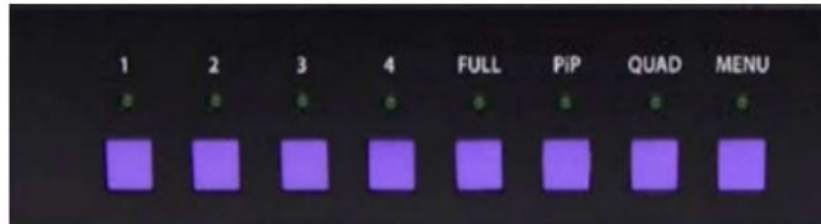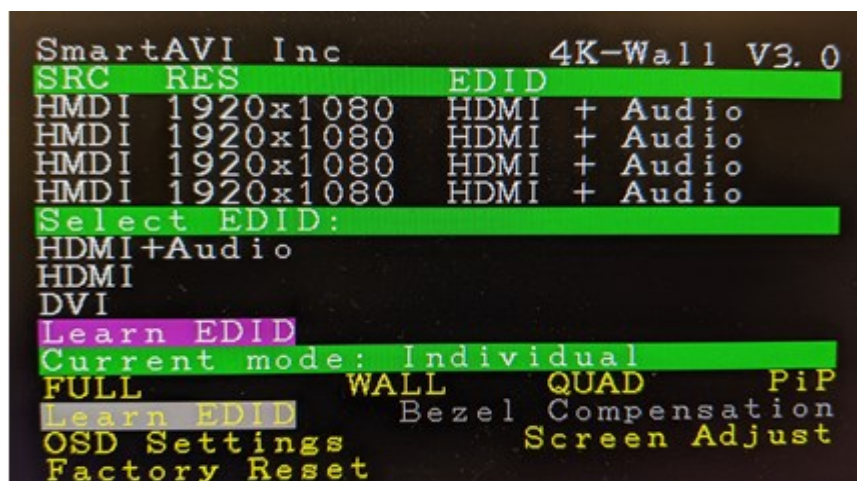### CONTROL USING ON-SCREEN DISPLAY (OSD) WITH THE FRONT PANEL

Figure 7-1

To change modes with the OSD, navigate using the following buttons on the front panel shown in 7-1

FRONT PANEL NAVIGATION

1 = Down
2 = UP
3 = Left
4 = Right
FULL = Enter / OK
PiP = Return / Back
QUAD = (no function)
MENU = Open / Close On Screen Display

DISPLAY MODES

The on-screen display will disappear after a few seconds of inactivity or you can press MENU to make the on-screen display disappear. The 4K-Wall will remain in video wall mode and the input can be changed by pressing the corresponding number button.

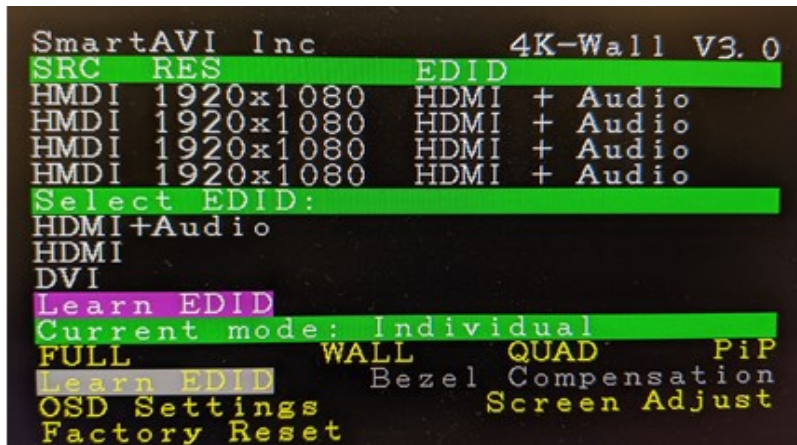# ON-SCREEN DISPLAY (OSD) (CONTINUED)

Figure 7-3

The on-screen display will disappear after a few seconds of inactivity or you can press MENU to make the on-screen display disappear. The 4K-Wall will remain in Full mode and the input can be changed by pressing the corresponding number button.

Video Wall Mode:

VIDEO WALL MODE: Users can select any of the four HD Inputs and project the image across four HD screens (2x2 configuration).

- Press the MENU button and navigate to highlight WALL.
- Press FULL to select into WALL and use 1 (Down) or 2 (UP) button to highlight and select the desired input number to be displayed on the video wall.
- Press FULL. The video wall should now display the selected input.

Full Mode: (Routing individual inputs to individual output displays.)

FULL MODE: Users can take advantage of full matrix functionality by routing any of the four HD inputs to any of the four HD screens, with supported resolutions up to 1920x1080 on each screen

- Press the MENU button and navigate to highlight FULL.
- Press FULL to select into FULL and use 1 (Down) or 2 (UP) button to highlight and select the desired output number, followed by pressing FULL, then highlight and select the input number.
- Press FULL. The specified output should now display the selected input.

To rout another: Repeat steps 2-3 above. After changing to FULL mode once, the on-screen display will always return back to the main menu with FULL mode highlighted again to make it easier for users to quickly assign additional outputs.
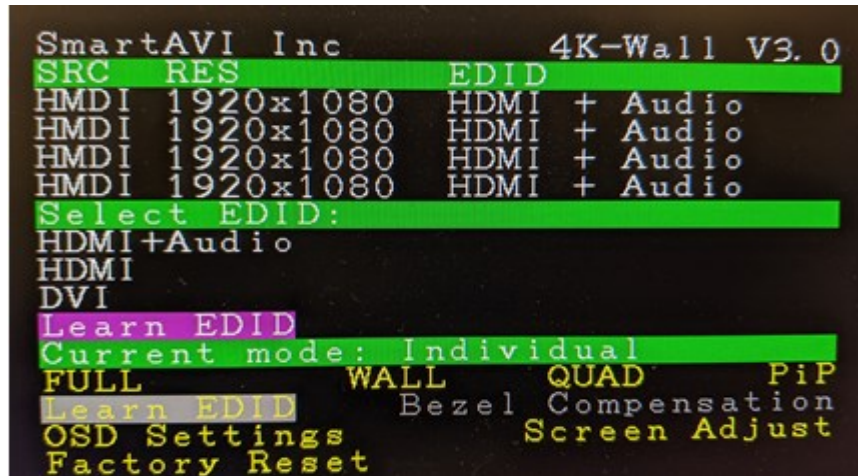
Quad Mode:

QUAD MODE: Users can divide each screen into four sections with all four inputs playing on each screen. Users can place each screen in different locations, further enhancing the 4K-Wall's matrix functionality.

- Press the MENU button and navigate to highlight QUAD.
- Press FULL to select into QUAD and use 1 (Down) or 2 (UP) button to highlight and select the desired input number.
- Press FULL. The selected input number will appear in the upper left corner of each display. The other 3 displays will be in the positions shown below in Figure 7-4 depending on the input selected.
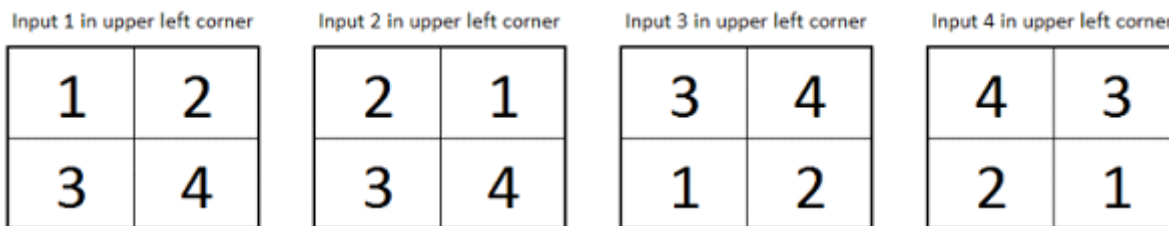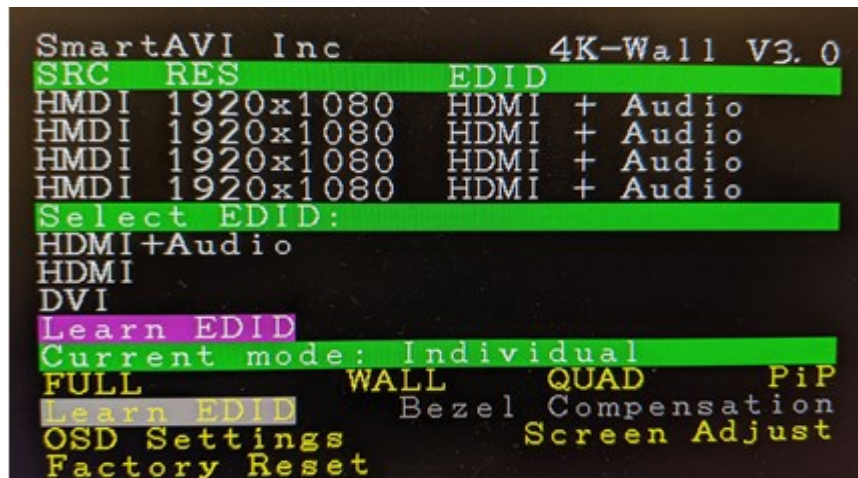

Figure 7-4

To try a different configuration: Repeat step 2 above using a different input.

ON-SCREEN DISPLAY (OSD) (CONTINUED)

PiP Mode:

PiP MODE: Users can create Picture in Picture (PiP) displays on each screen using all four inputs, with one large HD source and three accompanying PiP sources alongside.

- Press the MENU button and navigate to highlight PiP.
- Press FULL to select into PiP and use 1 (Down) or 2 (UP) button to highlight and select the desired input number to be set as the largest display.
- Press FULL. The other inputs will be displayed on the right side starting with the lowest number input at the top to the highest number input towards the bottom. See Figure 7-5
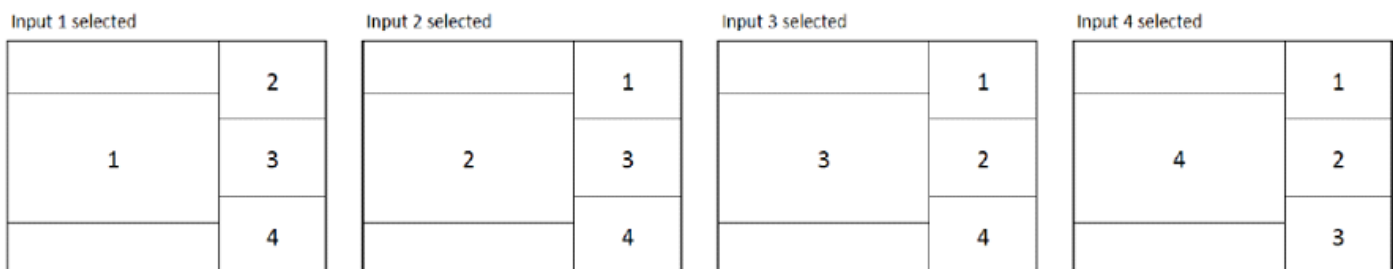

Figure 7-5

The input displayed the largest can be switched by repeating step 2 above using a different input.

ON-SCREEN DISPLAY (OSD) (CONTINUED)

Learn EDID

Users may also learn EDID via the OSD. Simply navigate to the "Learn EDID" menu and select among the three custom EDID or learn the local EDID of the monitor. See Figure 7-2

Please note that local EDID will only learn the EDID of Output 1.

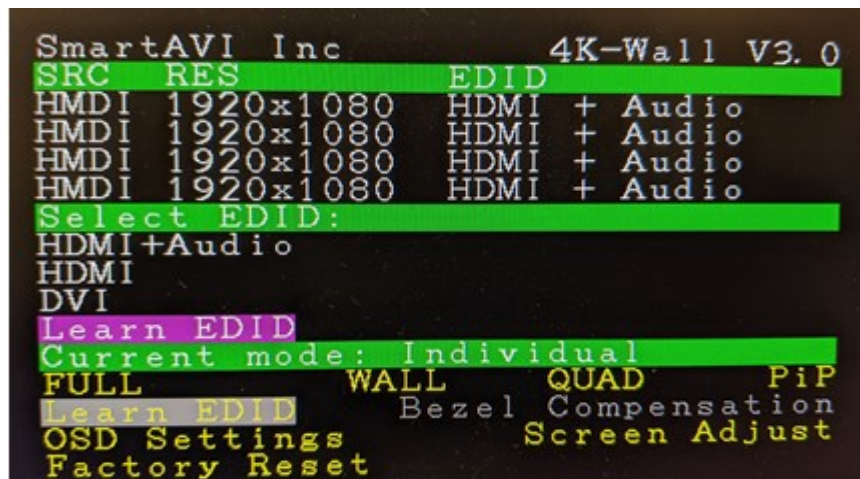Please note that Factory Reset will restore any adjusted values back to default.

Figure 7-6

Bezel Compensation

Bezel Compensation only applies when the 4K-WALL is in Wall Mode. Each individual output can be adjusted horizontally and vertically. See Figure 8-1.

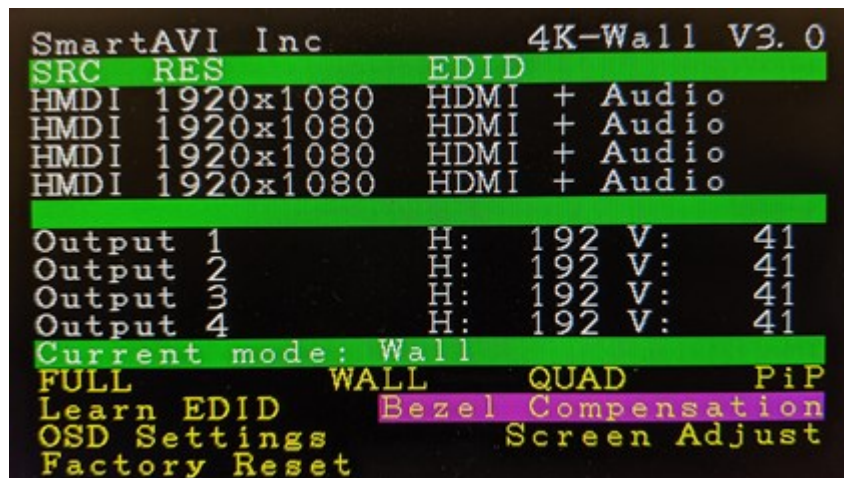Please note that Factory Reset will restore any adjusted values back to default.

Figure 7-7

ON-SCREEN DISPLAY (OSD) (CONTINUED)

OSD Settings
OSD Settings allows the user to adjust the position and transparency of the OSD (On Screen Display).
See Figure 8-2

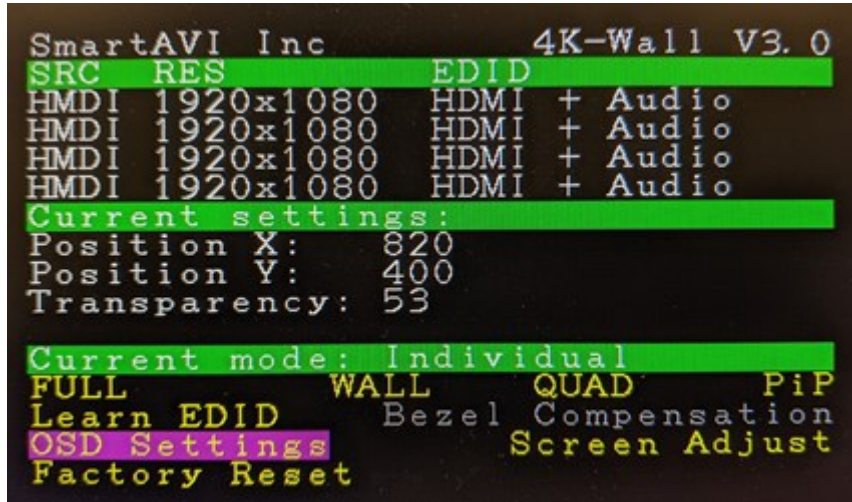Please note that Factory Reset will restore any adjusted values back to default.

Figure 7-8

Screen Adjust
Screen Adjust allows the user to adjust the brightness of each individual output if necessary.

Flip / Unflip allows the user to flip the top row of monitors (1 & 2) to be oriented upside down to adjust for bezel size (dependent on monitor). Flip / Unflip will only apply when the 4K-WALL is in Wall Mode.

See Figure 9-1

Please note that Factory Reset will restore any adjusted values back to default.
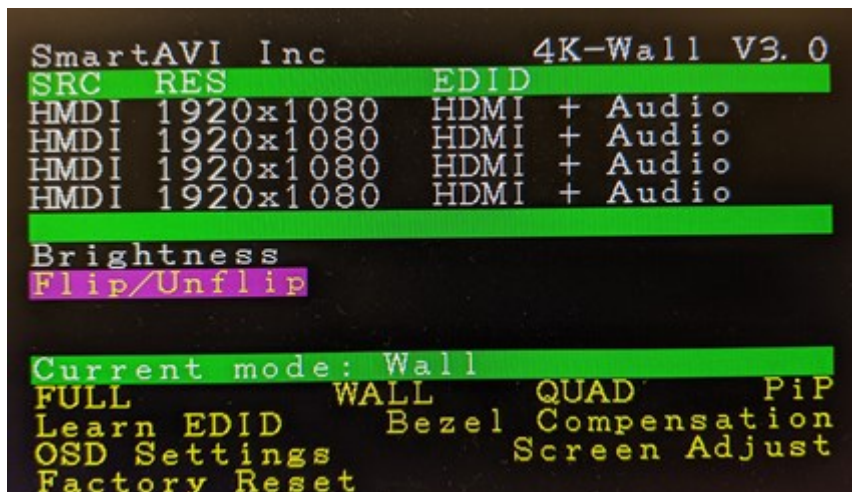

Figure 7-9

ON-SCREEN DISPLAY (OSD) (CONTINUED)

OSD Factory Reset
Factory Reset will restore any adjust values back to default.

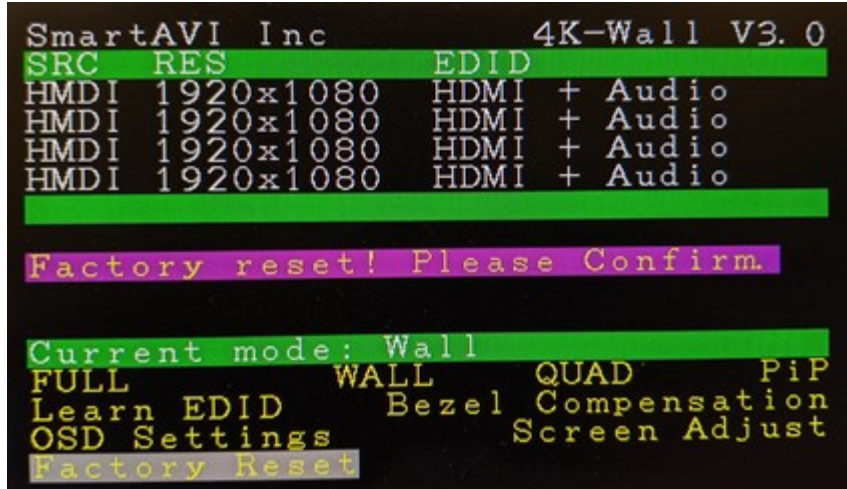Please note 4K-WALL will always default back to HDMI + Audio for the EDID.

Figure 7-10

CONTROL USING IR REMOTE CONTROL

On Screen Display (OSD) gives users great flexibility and ease of use when looking to manage their video wall. It can be operated with the IR Remote Control.

IR REMOTE CONTROL
The 4K-WALL will only respond to the remote control unit provided in the box.
See Figure 10-1.

FUNCTION	BUTTON
Activate On Screen Display Menu	☰
Turn off On Screen Display Menu	ESC
Navigate Right (OSD)	◼+
Navigate Left (OSD)	◼-
Navigate Up (OSD)	CH+
Navigate Down (OSD)	CH-
Select or Execute	OK
Learn EDID of Monitor on Input 1	USB
Load Internal EDID 1	SOURCE
Load Internal EDID 2	0
Video Wall Mode	WALL + Source #
Clone Mode	CLONE +Source #
Quad Mode	QUAD + Source #
PIP Mode	M1 + Source #
To switch any input source to any output display:	
1. First enter CLONE mode.	
2. Then press IN + (1-4)	
3. Then press OUT + (1-4)	

CONTROL VIA ETHERNET (TCP/IP)

4K-Wall TCP/IP control is a feature that allows mode switching and other configurations to be controlled remotely via HTTP or TELNET. Manage the switching functions of your 4x4 matrix with ease from anywhere in the world. You can save input/output configuration presets for easy access. TELNET access provides transparent command control of your 4K-Wall, perfect for use with automated third-party control software.
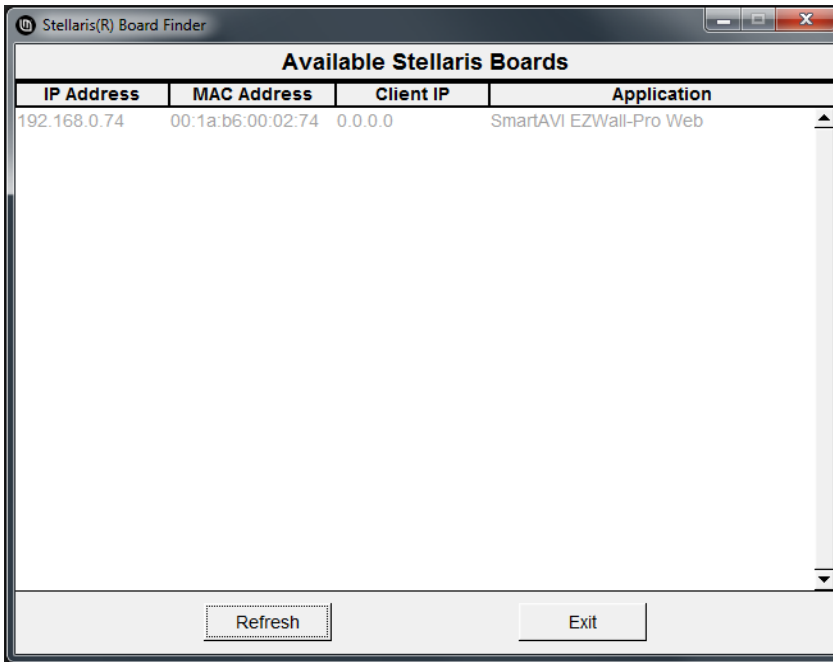
For more information, visit www.smartavi.com.

Start by downloading our software that can detect the IP address for the 4K-Wall. This software is conveniently available on our website; please visit:

https://smartavi.com/helpful-links/

Download and install:

Finder: Detects 4K-Wall

Launch the network finder software and 4K-Wall and its IP address should appear in the display.

Enter the IP address into a web browser of your choice. You should see the 4KWALL Home/ Welcome page as shown in Figure 16-2.

Click on the LOG IN button in the top tool bar.
Enter the User ID and Password in the Login page.
The User ID and Password are case sensitive.
User ID = Admin, Password = Pass

You can change the User ID and Password by clicking the USER ADMINISTRATION button.

USING RS-232 CONTROL

The 4K-WALL 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. Below are instructions on how to properly create an RS-232 connection between a PC and the 4K-WALL.

Establish a connection to 4K-WALL:
1. Connect a straight-through male-to-female RS-232 cable to the RS-232 connector on the PC.
2. Connect the other end of the cable to the RS-232 port of the 4K-WALL.
3. Power on the device.

If you are using a USB to COM port adapter and need to identify the COM port used do the following:

Click on the start button.
Click on the Control Panel.
Click on Device Manager.
Click on the arrow next to Ports (COM & LPT).

The name of the adapter should appear and its COM port number.

Setting up the Terminal Application:
Run the terminal client of your choice such as HyperTerminal or PuTTY.
Select the correct COM port on the PC. Use the following connection settings: **115200, N, 8, 1, no flow control.**
Once the connection is established type "?" and hit enter. The 4K-WALL should respond with a version number and a list of commands. See Figure 11-1 for sample PuTTY screens.
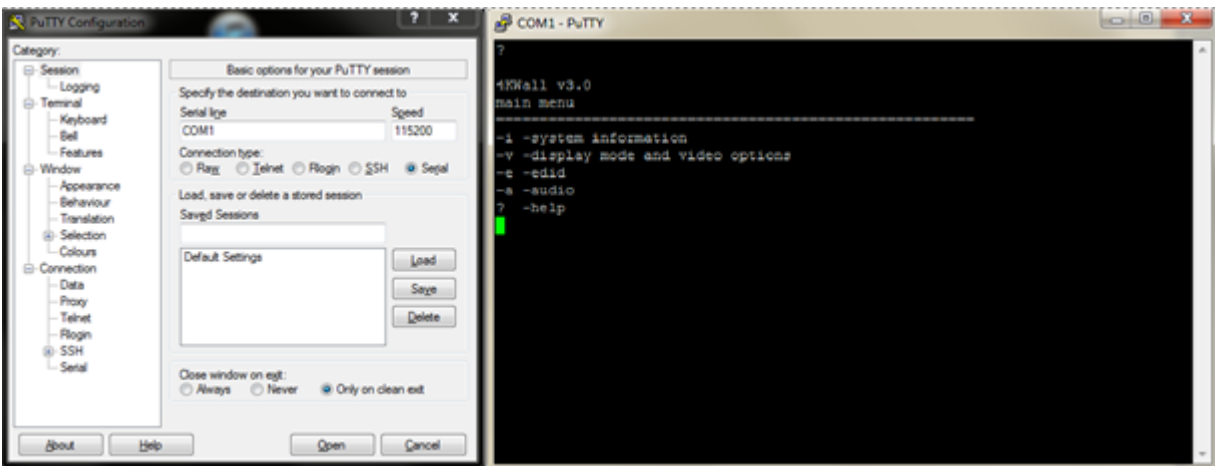
USING RS-232 CONTROL (CONTINUED)

When connected to the 4K-WALL using a computer via RS-232 connection, a startup screen should appear. Below are some examples of RS-232 commands:

Type ? to see the Main Menu list of commands

```
?
4KWall v3.0
main menu
=======================================================
-i  -system information
-v  -display mode and video options
-e  -edid
-a  -audio
?    -help
```

Type -i to view System Information

```
-i

Port  src       res          EDID       HPD     audio
=================================================
 1    HDMI   1920x1080   HDMI + Audio    ON   3
 2    HDMI   1920x1080   HDMI + Audio    ON   3
 3    HDMI   1920x1080   HDMI + Audio    ON   3
 4    HDMI   1920x1080   HDMI + Audio    ON   3
Current Output: 1080P
```

Type -v to switch to the Video Menu, followed by ? to view the Video Menu

```
-v
main -> video menu
?

4KWall v3.0
video menu
=======================================================
f      -set [Input] to [Output] in full screen
q     -set [Input] to quadrant 1
p     -set [Input] to main screen of pip mode
v     -set [Input] as a videowall
fl    -flip [ 1:flip | 2:unflip ]
o    -[1-1080P60|2-1080P30]
ex  -exit to main menu
?     -help
```

USING RS-232 CONTROL (CONTINUED)

Type -e to switch to the EDID Menu, followed by ? to view the EDID Menu

```
-e
main -> edid/hpd menu
?

4KWall v3.0
edid/hpd menu
=======================================================
n    -set [Input] name [Name_Without_Spaces]
r    -read edid of [input]
w    -write edid [input/a-all] [1-HDMI w/Audio|2-HDMI|3-DVI|4-local]
ex   -exit to main menu
?    -help
```

RS-232 INTEGRATION WITH THIRD PARTY SOFTWARE

Smart-AVI RS-232 Protocol 4K-WALL

Carriage return is represented in the examples by **<CR>**
The HEX code for carriage return is **0D**
See Page 6 for an illustration of available modes.

All typed characters must be upper case.

1) Video Wall Mode: Stretch one Source over 4 screens in a 2x2 array.
//V x <CR>
ex. //V 1 <CR>; this command will stretch input 1 over 4 screens

2) Full Mode: Each source will display on individual screens. You can assign a specific input to a specific screen.
//F x y <CR>
x = input
y = output
ex. //F 2 1; this command will do Full mode with input 2 to output 1

3) Quad Mode: 4 Inputs on each screen, equally displayed
//Q x <CR>
ex. //Q 2 <CR>; this command will do Quad mode with channel 2 displayed in top left corner
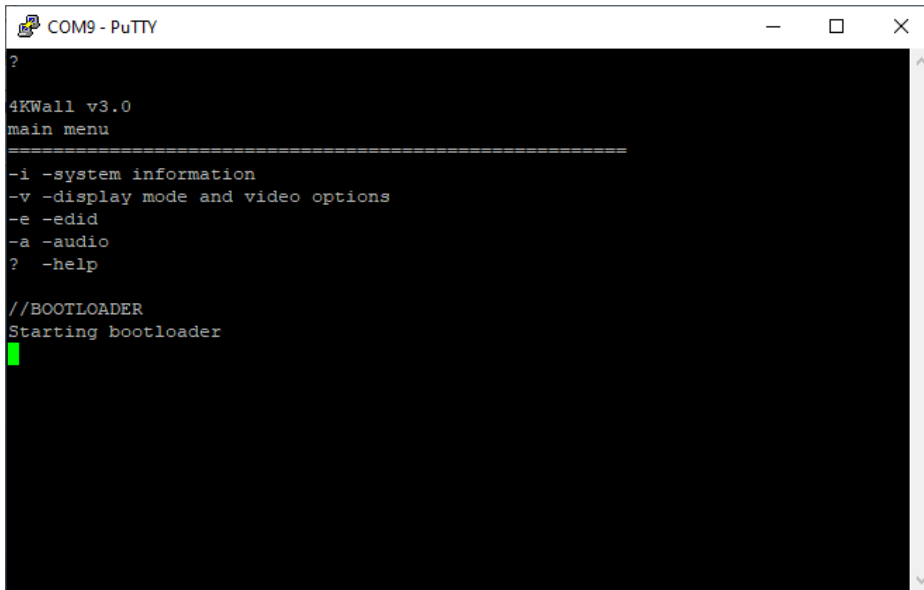
4) PiP Mode: 4 Inputs on each screen
//P x <CR>
ex. //P 3 <CR>; this command will do PiP mode using input 3 as the main display

5) Reset: Resets 4K Wall
//RESET <CR>

UPDATING FIRMWARE VIA RS-232

When new firmware is released, 4K-Wall can be updated through RS-232. To do so, please follow the instruction provided accordingly.
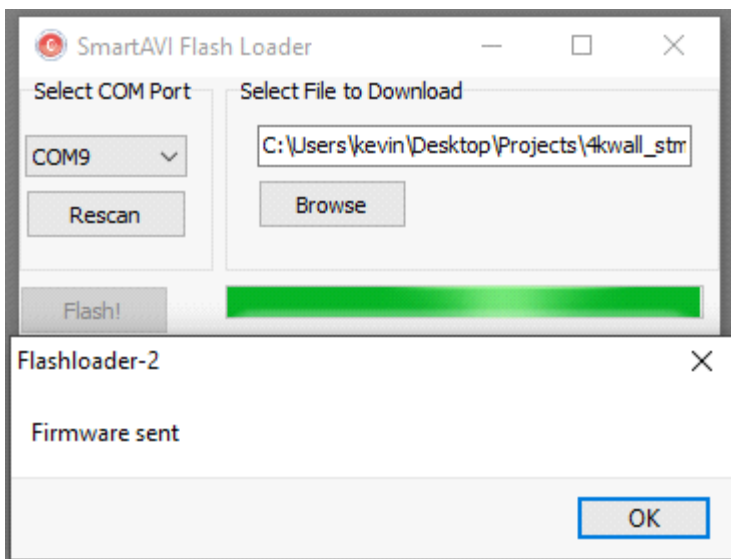

Run the terminal client of your choice such as HyperTerminal or PuTTY.

Select the correct COM port on the PC.

Use the following connection settings: 115200, N, 8, 1, no flow control.

To start the bootloader, send the following command:
`//BOOTLOADER`

Once 4K-Wall receives the bootloader command and returns the "Starting bootloader" acknowledge, launch our SmartAVI Flash Loader application.

This software is conveniently available on our website; please visit:
https://smartavi.com/helpful-links/

Select the correct COM port and browse for the appropriate firmware update file. Click "Flash!" You will see a pop up window when it successfully flashes.

LIMITED WARRANTY STATEMENT

A.   Extent of limited warranty

Smart-AVI Technologies, Inc. warrants to the end-user customers that the Smart-AVI product specified above will be free from defects in materials and workmanship for the duration of 1 year, which duration begins on the date of purchase by the customer. Customer is responsible for maintaining proof of date of purchase.

Smart-AVI limited warranty covers only those defects which arise as a result of normal use of the product, and do not apply to any:
   a. Improper or inadequate maintenance or modifications
   b. Operations outside product specifications
   c. Mechanical abuse and exposure to severe conditions

If Smart-AVI receives, during applicable warranty period, a notice of defect, Smart-AVI will at its discretion replace or repair defective product. If Smart-AVI is unable to replace or repair defective product covered by the Smart-AVI warranty within reasonable period of time, Smart-AVI shall refund the cost of the product.

Smart-AVI shall have no obligation to repair, replace or refund unit until customer returns defective product to Smart-AVI.

Any replacement product could be new or like new, provided that it has functionality at least equal to that of the product being replaced.

Smart-AVI limited warranty is valid in any country where the covered product is distributed by Smart-AVI.

B.   Limitations of warranty
To the extant allowed by local law, neither Smart-AVI nor its third party suppliers make any other warranty or condition of any kind whether expressed or implied with respect to the Smart-AVI product, and specifically disclaim implied warranties or conditions of merchantability, satisfactory quality, and fitness for a particular purpose.

C.   Limitations of liability
To the extent allowed by local law the remedies provided in this warranty statement are the customers sole and exclusive remedies.

To the extant allowed by local law, except for the obligations specifically set forth in this warranty statement, in no event will Smart-AVI or its third party suppliers be liable for direct, indirect, special, incidental, or con-sequential damages whether based on contract, tort or any other legal theory and whether advised of the possibility of such damages.

D.   Local law
To the extent that this warranty statement is inconsistent with local law, this warranty statement shall be considered modified to be consistent with such law.

Smart-AVI
SMART AUDIO VIDEO INNOVATION

NOTICE

20170304

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