

4K-WALL

User Manual

HDMI/DVI Video Wall Controller and 4x4 Switch Matrix.



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

Smart-AVI
SMART AUDIO VIDEO INNOVATION

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WHAT'S IN THE BOX?		
PART NO.	QTY	DESCRIPTION
SM-4KWL-S	1	4X4 Port HDMI, Real-Time switching matrix with integrated 2x2 video wall
CCPWRO6	1	6' Power Plug Cable
SAVI-RMT	1	IR Remote Control
SM-EYE-NY	1	IR receiver
EN-QKVM-EAR-P	2	Mounting Brackets
	1	Quick Start Guide

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

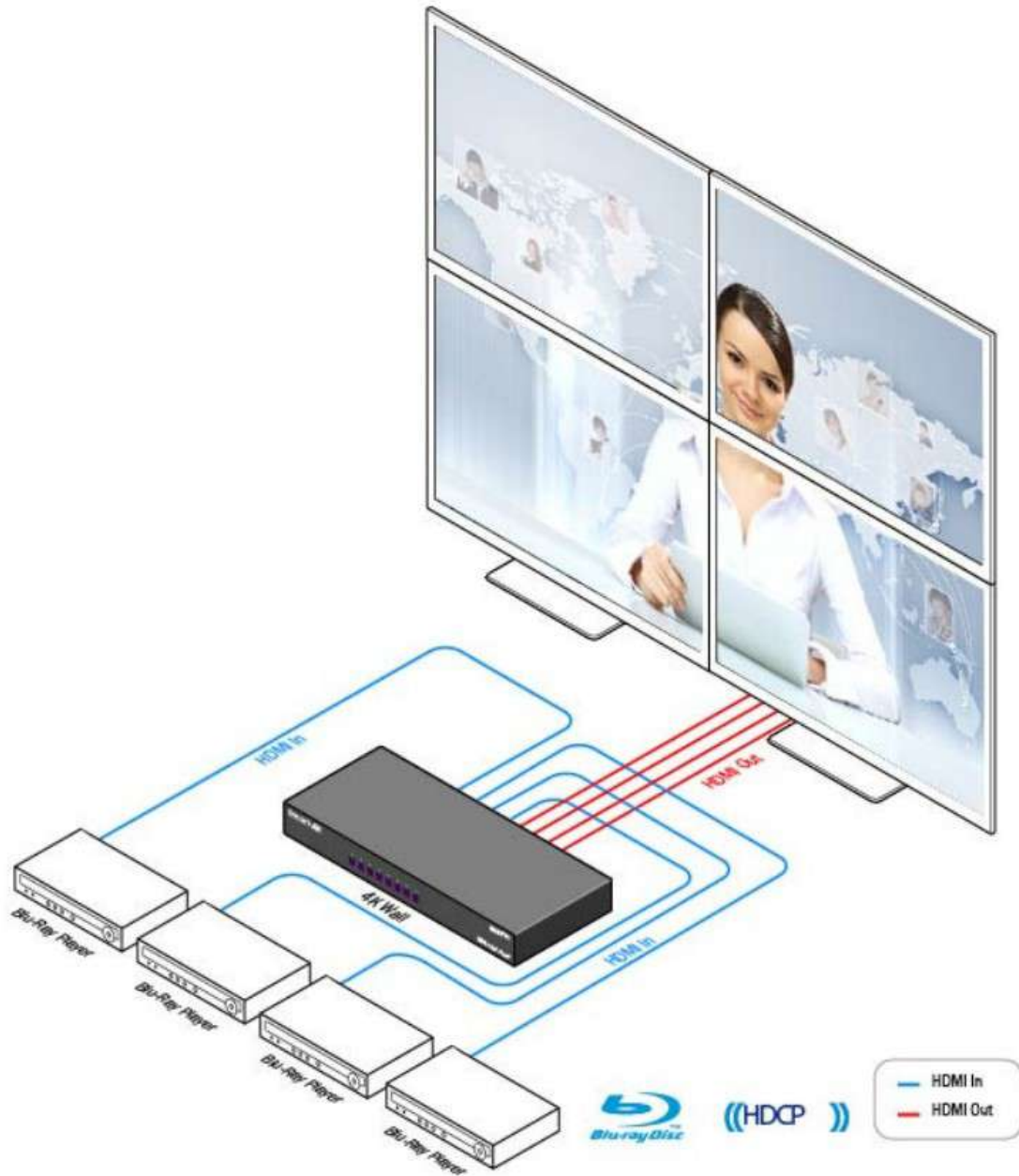
- Stand-Alone Unit, Requiring no Additional Hardware or Software
- Plug-and-play ready
- Four HDMI inputs and four HDMI outputs
- DVI-D up to 1920x1200 input
- Learns any EDID
- Internal EDID database
- Multiple configurations
- HDCP and HDMI 1.4 compliant
- Supports IR and RS-232

TECHNICAL SPECIFICATIONS

VIDEO	
Video Bandwidth	Single-link 340MHz [10.2Gbps]
Resolution HDTV	Up to 1080p
PC Resolution	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	(4) HDMI
Output Interface	(4) HDMI
HDMI Connector	Type A [19-pin female]
CONTROL	
Front Panel	Buttons
RS-232	DB9 (female)
IR Remote Control	IR RC5
TCP/IP	Ethernet Control
POWER	
Requirements	Internal 100-240 VAC
MECHANICAL	
Dimensions	17" W x 10.875" D x 1.875" H
Weight	7.5 lbs. (Unit only)



APPLICATION DIAGRAM



APPLICATIONS

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

HARDWARE INSTALLATION

Make sure the 4K-Wall is turned off.

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.

Connect up to 4 HDTVs to the HDMI OUTPUT ports of the 4k-Wall using HDMI cables for or HDMI-to-DVI adapters for DVI displays.

Connect the IR receiver to the IR input jack at the back of the 4k-Wall.

Connect a cat5/cat6 cable to the RJ45 connector.

Optionally connect an RS-232 cable from PC to the RS-232 port of the unit for additional control.

Turn on the 4k-Wall.

Wait for the unit to initialize. This should take less than 1 minute.

AVAILABLE CONFIGURATIONS

There are four different configurations or modes that are easy to navigate through with the 4k-Wall. See figure 5-1. Switching between the display modes is simple. The front panel buttons, IR remote control, OSD, RS-232 console command, and TCP/IP can be used to switch between modes.



VIDEO WALL MODE: Users can select any of the four HD inputs and project the image across four HD screens (2x2 configuration). With screen resolution of 1920x1080.



INDIVIDUAL 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 resolution up to 1920x1080 on each screen



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.



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.

FIGURE: 5-1

CONTROL USING THE FRONT PANEL



FIGURE: 6-1

To switch to Video Wall Mode: Press the QUAD and MENU buttons simultaneously and then press the desired input channel 1, 2, 3, or 4.



VIDEO WALL MODE: Users can select any of the four HD inputs and project the image across four HD screens (2x2 configuration). With screen resolution of 1920x1080

To switch to Individual Mode:



INDIVIDUAL 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 resolution up to 1920x1080 on each screen

Press the FULL button on the front control panel

Press the Output Channel (1, 2, 3, or 4).

Press the Input Channel (1, 2, 3, or 4).

For Example: Input 4 to output 2 = "FULL, 2, 4"

To switch to Picture in Picture mode: Press the PiP button and then select the desired channel 1, 2, 3, or 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.

To switch to Quad Mode: Press the QUAD button and then select the desired channel 1, 2, 3, or 4.



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.

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 and through the Front Panel Buttons as shown in the following pages.

The initial display, shown in Figure 7-1 is for selecting the various modes available with the 4K-Wall.

The second display, shown in Figure 7-2 is for selecting 1 of 4 inputs or sources.

The third display, shown in Figure 7-3 is for selecting 1 of 4 outputs or displays.



Figure 7-1

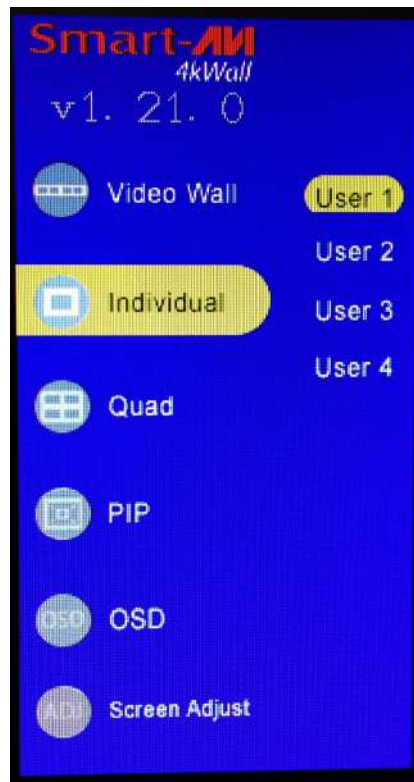


Figure 7-2

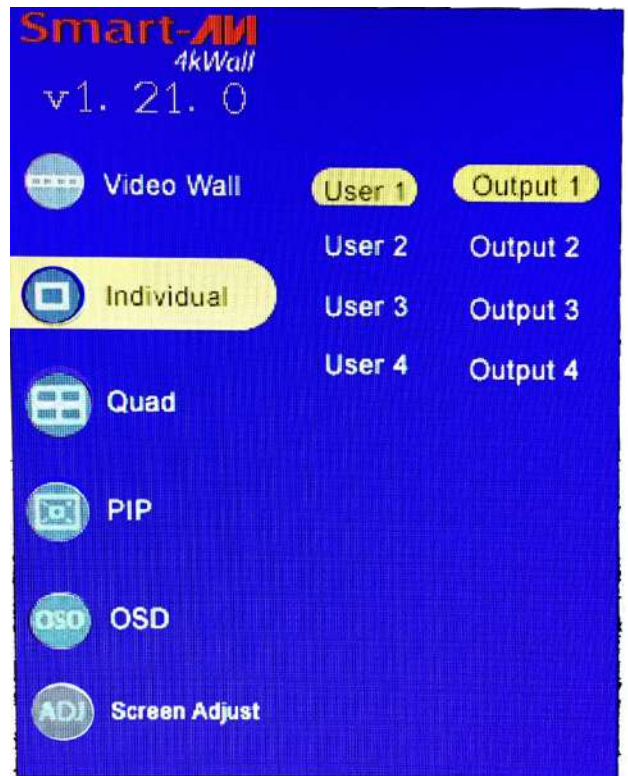


Figure 7-3

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



Figure 8-1

To change modes with the OSD navigate using the following buttons on the front panel shown in Figure 8-1: 1 = Down, 2 = Up, 3 = Back, 4 = Select, FULL = Enter

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). With screen resolution of 1920x1080

Figure 8-2

1. Press the MENU button and use the 1 (Down) or 2 (Up) buttons to highlight Video Wall.
2. Press 4 to display the 4 inputs (Displayed as Users.) Press the 1 (Down) or 2 (Up) buttons to highlight the input number you want displayed as a video wall.
3. Press FULL. The video wall should display the selected input and the OSD display will vanish after a few seconds.

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 you can change inputs by pressing the corresponding number button.

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



Figure 9-1

To change modes with the OSD navigate using the following buttons on the front panel shown in Figure 9-1: 1 = Down, 2 = Up, 3 = Back, 4 = Select, FULL = Enter

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



INDIVIDUAL 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 resolution up to 1920x1080 on each screen

Figure 9-2

1. Press the MENU button and use the 1 (Down) or 2 (Up) buttons to highlight Individual.
2. Press 4 to display the 4 inputs (Displayed as Users.) Press the 1 (Down) or 2 (Up) buttons to highlight the desired input number.
3. Press 4 to display the 4 outputs. Press the 1 (Down) or 2 (Up) buttons to highlight the desired output display number.
4. Press FULL to rout the input to the desired display.

To rout another: Press 3 to move back to the list of inputs. Repeat steps 2-4 above.

Once you're in Individual mode you can rout inputs to a display by pressing the display number followed by pressing the input number.

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 Individual mode and you can change the displays by pressing the display number button followed by the input number button.

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



Figure 10-1

To change modes with the OSD navigate using the following buttons on the front panel shown in Figure 10-1:
1 = Down, 2 = Up, 3 = Back, 4 = Select, FULL = Enter

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.

Figure 10-2

1. Press the MENU button and use the 1 (Down) or 2 (Up) buttons to highlight Quad.
2. Press 4 to display the 4 inputs (Displayed as Users.)
3. Press the 1 (Down) or 2 (Up) buttons to highlight the desired input number. 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 10-3 depending on which input is selected.
4. Press FULL to execute.

Input 1 in upper left corner

1	2
3	4

Input 2 in upper left corner

2	1
3	4

Input 3 in upper left corner

3	4
1	2

Input 4 in upper left corner

4	3
2	1

Figure 10-3

To try a different configuration: Press 3 to move back to the list of inputs and repeat step 3 above selecting a different input.

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 Quad mode and you can switch to any of the configurations in Figure 10-3 by pressing the number button for the input you want in the upper left corner.

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



Figure 11-1

To change modes with the OSD navigate using the following buttons on the front panel shown in Figure 11-1:
1 = Down, 2 = Up, 3 = Back, 4 = Select, FULL = Enter

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.

Figure 11-2

1. Press the MENU button and use the 1 (Down) or 2 (Up) buttons to highlight PIP.
2. Press 4 to display the 4 inputs (Displayed as Users.)
3. Press the 1 (Down) or 2 (Up) buttons to highlight the input number you want displayed the largest. Press FULL to execute the selection. The 3 other inputs will be displayed on the right side starting with the lowest number input at the top to the highest number input at the bottom. See Figure 11-3.

Input 1 selected	Input 2 selected	Input 3 selected	Input 4 selected																								
<table border="1"><tr><td></td><td>2</td></tr><tr><td>1</td><td>3</td></tr><tr><td></td><td>4</td></tr></table>		2	1	3		4	<table border="1"><tr><td></td><td>1</td></tr><tr><td>2</td><td>3</td></tr><tr><td></td><td>4</td></tr></table>		1	2	3		4	<table border="1"><tr><td></td><td>1</td></tr><tr><td>3</td><td>2</td></tr><tr><td></td><td>4</td></tr></table>		1	3	2		4	<table border="1"><tr><td></td><td>1</td></tr><tr><td>4</td><td>2</td></tr><tr><td></td><td>3</td></tr></table>		1	4	2		3
	2																										
1	3																										
	4																										
	1																										
2	3																										
	4																										
	1																										
3	2																										
	4																										
	1																										
4	2																										
	3																										

Figure 11-3

You can change which input is displayed the largest by repeating step 3 above.

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 PIP mode and you can switch to any of the configurations in Figure 11-3 by pressing the number button for the input you want displayed large.

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 12-1.





FUNCTION	BUTTON
Activate On Screen Display Menu	
Turn off On Screen Display Menu	
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)	



Figure 12-1

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 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.

CONNECTOR	PIN	NAME	DESCRIPTION
DB9 MALE - RECEIVE	2	RxD	Receive Data on DB9 Male
	3	TxD	Transmit Data on DB9 Male
	5	SGND	Ground
DB9 FEMALE - TRANSMIT	2	TxD	Transmit Data on DB9 Female
	3	RxD	Receive Data on DB9 Female
	5	SGND	Ground

FIGURE: 13-1

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

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

You should see the name of your adapter and the COM port number in use.

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 13-2 for sample PuTTY screens.

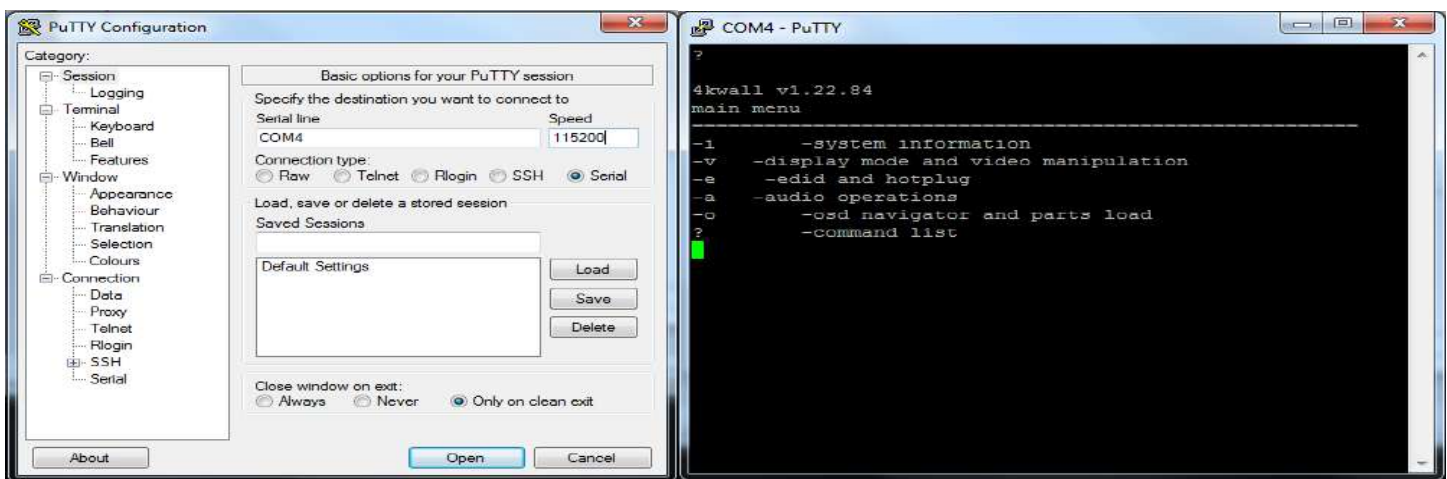


FIGURE 13-2

USING RS-232 CONTROL (Continued)

When you connect to the 4K-WALL to a computer via an RS-232 connection, you will see an opening screen on startup. Below are some examples of RS-232 commands.

Type ? To see the Main Menu list of commands.

?

4KWall v1.23.10

main menu

```
=====
-i -system information
-v -display mode and video options
-e -edid/hotplug
-a -audio
-o -osd navigator and parts load
? -help
```

Type -i to view System Information.

-i

```
Port src  res    EDID  HPD  audio
=====
```

```
1 HDMI  1920x 540  CAT-6066  ON  0
2 HDMI  1920x 540  CAT-6066  ON  1
3 HDMI  1920x1080 CAT-6066  ON  2
4 DVI   1920x 540  CAT-6066  ON  3
Current Output: 1080P
```

Type -v to switch to the Video Menu.

-v

main -> video menu

Then Type ? to view the Video Menu.

?

4KWall v1.23.10

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 [channel] [ 1:flip | 2:unflip ]
o  -[1-1080P60|2-1080P30]
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 5 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 1<CR>

In the above example input #1 is stretched over 4 screens.

2)Individual 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 full mode; input 2 to output 1

3)Quad Mode: 4 inputs on each screen, equally displayed

//Q x <CR>

ex. Q 2 <CR> Quad mode; channel 2 as user control

4)Pip Mode: 4 inputs on each screen

//P x <CR>

X=inputs in the largest screen area

ex. //P 3 Picture in picture mode; input 3 selected

5)Reset: Resets 4K Wall

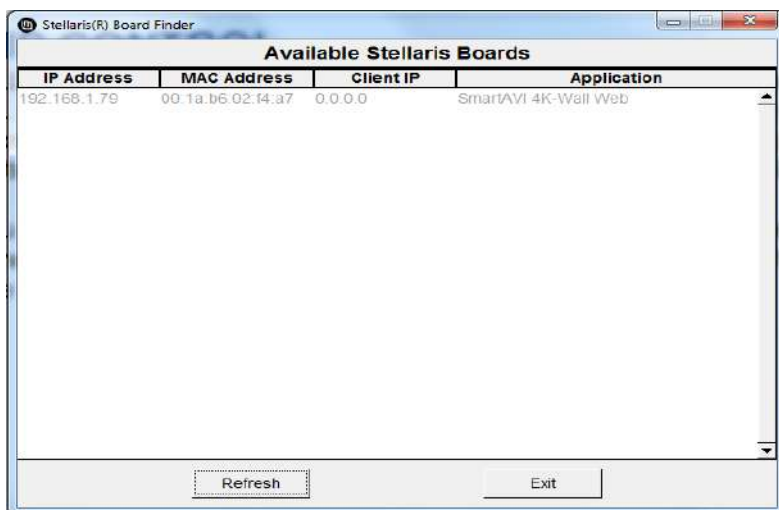
//RESET <CR>

Com Port Settings:

Baud Rate	115200
Start Bits	N
Data Bits	8
Parity	1
Stop Bits	No Flow

TCP/IP CONTROL

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 4KWall, perfect for use with automated third-party control software. For more information, visit www.smartavi.com.



First you must find the IP address for the 4K-WALL. Software is conveniently available on our website; please visit: <http://smartavi.com/helpful-links.html>

Download and install:

[Smart IP-Finder](#): IP address locator software.

Download and execute the Network Finder software for your product. The 4K-WALL and its IP address should appear in the display as shown in Figure 16-1.

Figure 16-1



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.

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.

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 extent 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 extent 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 consequential 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.

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NOTICE

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