

AV-950W Video-Wall Setup Guide

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Application Note#: AP-950W-110812

What is AV-950W Video Wall?

The AV-950W is a HDMI Video-Wall over Ethernet solution. It includes HDMI Streaming Transmitter (AV-950WT) and HDMI Streaming Receiver (AV-951WR). The Transmitter connects to PC or Blue-ray player for the HDMI input source. The Receivers connect to HDMI video-wall displays.

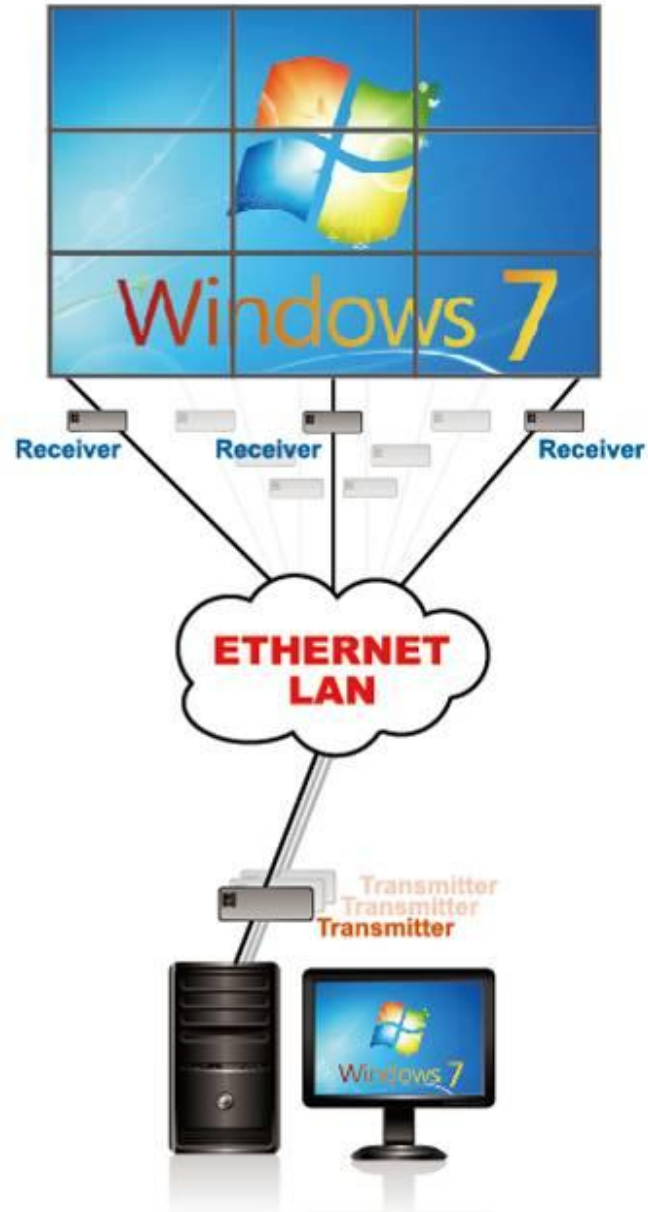
The system provides high flexibility for expansion. A Transmitter unit is required for each row of displays and a Receiver unit is required for each individual display. It is very easy and flexible to expand your video-wall from 2 x 2 to 3 x 3 and ... up to 8 x 8 by adding transmitter and receiver units. In this document we describe the setup for a 3 x 3 Video-Wall.

Bill of Material

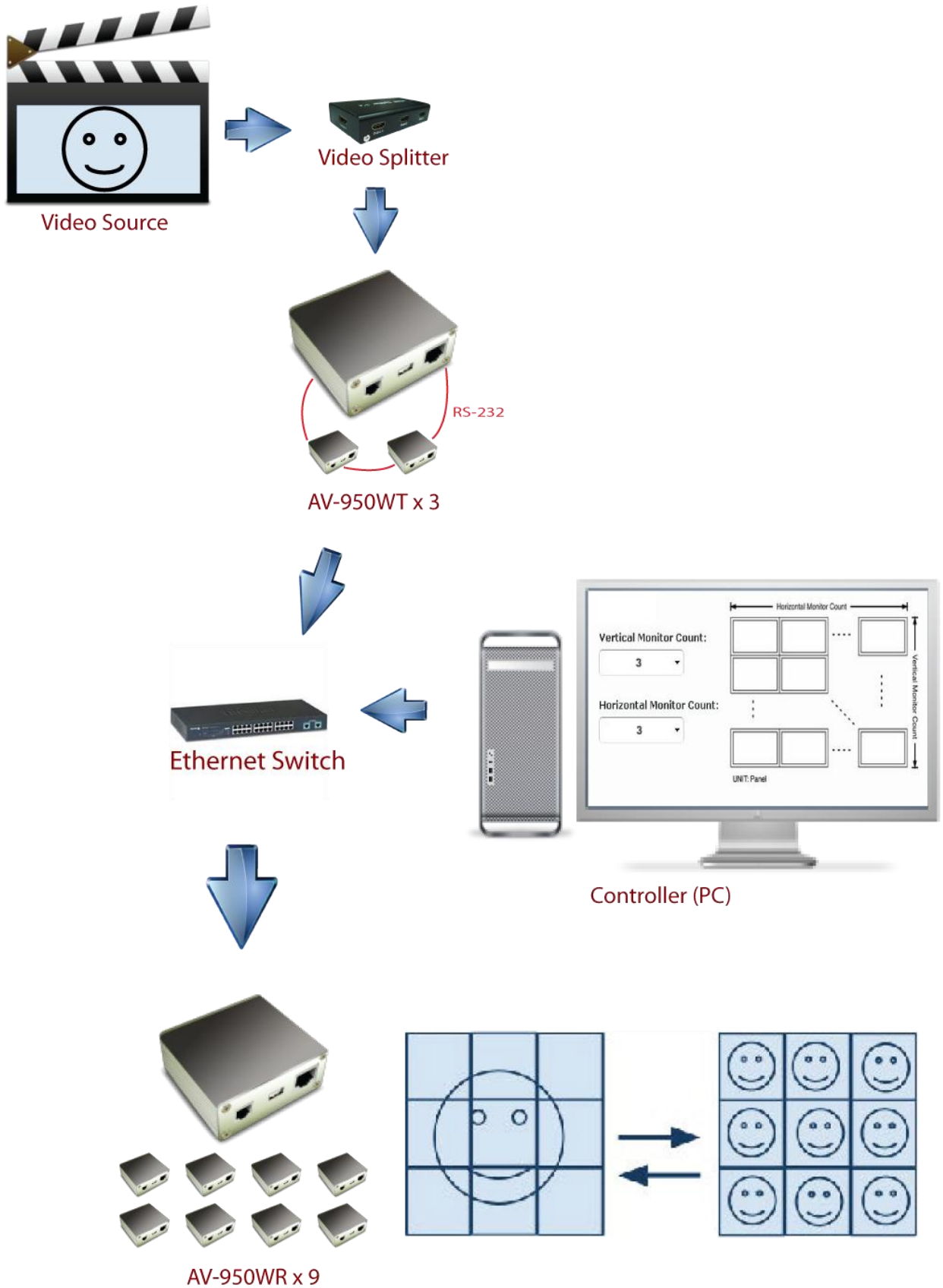
AV-950WT Transmitter (TX) units x 3
AV-951WR Receiver (RX) units x 9
1:4 HDMI splitter x 1
3 x Gigabit switch or 1 x Gigabit switch with IGMP function

Theory of Operation

1. All screens are divided into Rows and Columns. Each Row needs one TX, and each display needs one RX. For a 3 x 3 video-wall, it needs 3 x TX + 9 x RX units.
2. Each TX unit in each Row is responsible to capture the video for that specific Row it belongs to.
3. The first TX of the first Row is called Main TX. There are 2 x RS232 mini-jack ports on each TX. All TX units should be inter-connected through this RS232 close loop chain. The Main TX controls the other TXs through this RS232 loop chain.
4. Each RX unit receives video stream from its Row TX and is responsible to capture the video for the specific Column it belongs to.
5. It is necessary to split your HDMI source first, and connect the HDMI splitter outputs to the 3 x TX HDMI input.
6. You can use 3 x Gigabit switches for 3 individual Rows (1 x TX + 3 x RX), or use one Gigabit switch that come with IGMP snooping function for all 3 x TX + 9 x RX.
7. You need a control PC with Browser (IE or Google Chrome) to access the Main TX for video-wall management control.

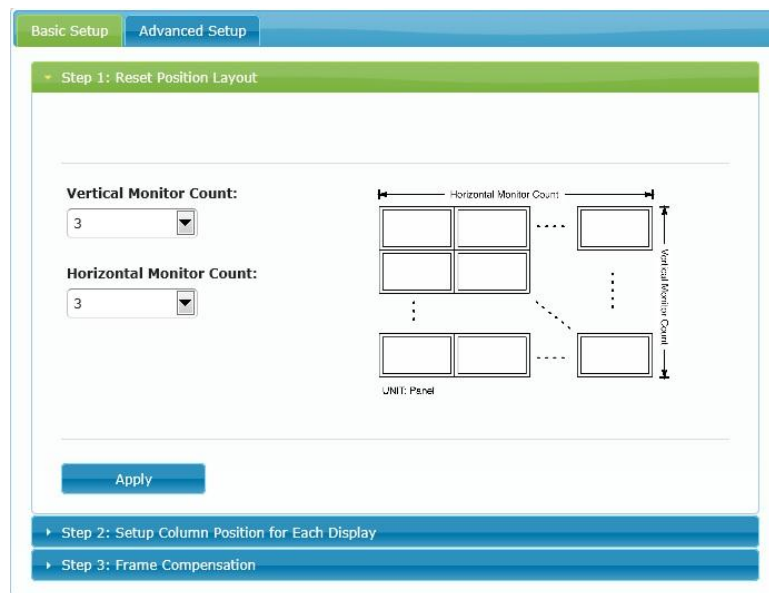


The system Diagram



Setup Procedures

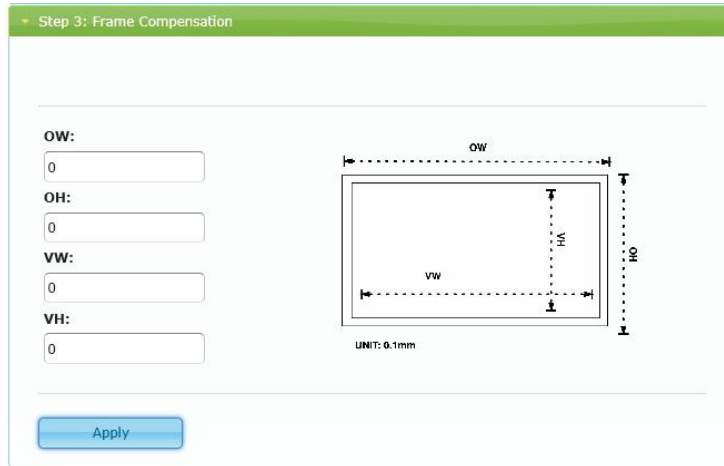
- 1 Connect HDMI source to a 1:4 HDMI splitter then connect the splitter's HDMI outputs to the 3 x TX HDMI input.
- 2 Establish all TX RS232 loop chain: connects the Main TX RS232-1 to the 2nd TX's RS232-2, connect the 2nd TX's RS232-1 to the 3rd TX's RS232-2, loop back the 3rd TX's RS232-1 to the Main TX's RS232-2.
- 3 Set the 4bits DIP switch of 3 x TX units to "0000", "0001", "0010".
- 4 Connect all RX units to displays by HDMI cables.
- 5 Set the 4bits DIP switch for the 3 x 1st ROW RX to "0000", "0001" for the 3 x 2nd ROW RX, "0010" for the 3 x 3rd ROW RX.
- 6 Connect all TX/RX devices and control PC to the Gigabit switch by CAT6 cables.
- 7 Power On all TX/RX devices, displays and HDMI source.
- 8 If the control PC has not been installed with Bonjour SDK, download and install it here:
<http://support.apple.com/kb/DL999>
- 9 Configure the control PC's network setting to 169.254.xxx.xxx with Net Mask 255.255.0.0.
- 10 Open PC's IE or Google Chrome. Link to the Main TX by web address <http://ast-gateway0000.local/vw/> (The 0000 represents the Main TX 4bits DIP switch value). If link succeeded, you will see the following web page for both [Basic Setup] and [Advance Setup]:



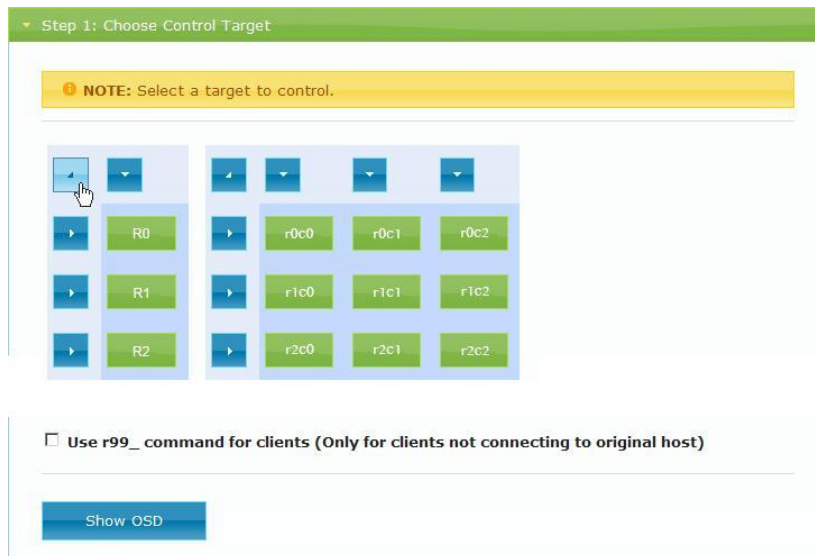
- 11 Setup the Video-Wall array by the [Step 1: Reset Position layout] in [Basic Setup]: Set "Vertical Monitor Count" to 3 and "Horizontal Monitor Count" to 3 then press "Apply" button. Each screen will pop up an OSD of "Wait Video Input" and then refresh with video from its ROW TX source. If all screens in any row don't response, check that ROW TX and the connection of TX RS232 loop-chain. If just 1 or 2 screens in a row don't response, check that specific RX unit and its Ethernet connection.
- 12 Setup the Column Position for each screen by the [Step 2: Setup Column Position for Each Display] in [Basic Setup]: Among the total 9 screens, there is one screen will pop up an OSD of "Column Pos. x" to indicate the current selected RX unit. Click "Next in Column" button to select the next RX unit that is on the same row. Click "Next in Row" button to select the next RX unit that is on the same column. The current selected RX unit will always show up OSD of "Column Pos. x" to indicate its Column Position number. Click the "Change Column" button to change Column Position number (0 --> 1 --> 2 --> 0 --> ...) of the current selected RX. After this step, all RX units are assigned with proper Column Position number in the Row that it belongs to.
- 13 Setup the entire Video-Wall frame size by the [Step 3: Frame Compensation] in [Basic Setup]: In this step, you can define the video-wall OW (Out Width), OH (Out Height), VW (View Width) and VH (View Height) as the

following diagram. Check the screen picture and enter the value to adjust the video-wall frame size. Please note the unit for the value is in 0.1mm and MUST be integer. Keep the default value 0 to skip the frame adjustment.

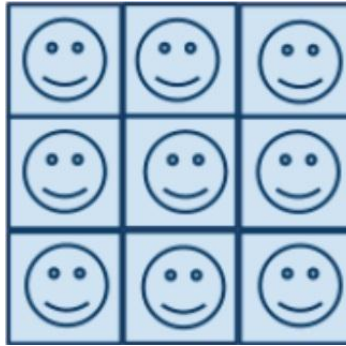
Basic setup is completed.



- 14 Click [Advanced Setup] tab and select [Step 1: Choose Control Target] to select TX and RX units for video-wall operation. The R0, R1, R2 indicates the TX of Row 0, Row 1, Row 2; the r0c0, r0c1, ... indicates the RX unit of Row 0 Column 0, Row 0 Column 1, ... The icons of the selected TX/RX will be shown in Green color.

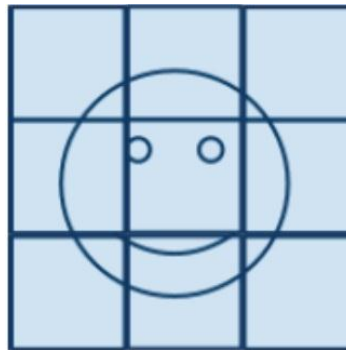


- 15 During the first time installation, it is recommend that you select all TX and RX units and then click the “Show OSD” button to check if all Column Positions have been correctly set.
- 16 After selected TX and RX units from the above step 14, you can click [Step 2: Control Options] to perform video-wall operations:
 - 16.1 [Reset to Basic Setup]: This button will reset the video-wall to the Basic Setup configuration. This function applies to all TX and RX units selected by the step 14.
 - 16.2 [Screen layout (Row x Column)]: You can dynamically change the video-wall layout by this button. For example, to configure the video-wall to 1 x 1:
 Enter [Step 1: Choose Control Target] and select all TX and RX units.
 Enter [Step 2: Control Options] and set [Screen layout (Row x Column)] to 1 x 1.
 The video-wall display as below:



To configure the video-wall back to 3 x 3:

Enter [Step 2: Control Options] and set [Screen layout (Row x Column)] to 3 x 3, the video-wall display as below:

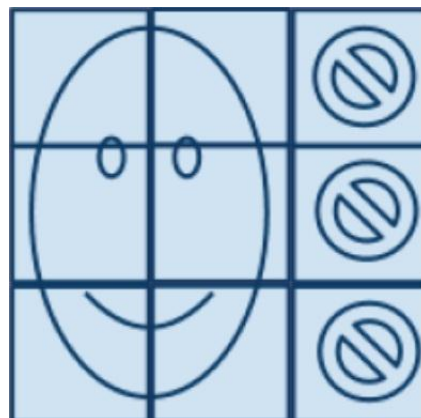


To configure the video-wall to 3 x 2:

Enter [Step 1: Choose Control Target] and select TX_r0, TX_r1, TX_r2, RX_r0c0, RX_r0c1, RX_r1c0, RX_r1c1, RX_r2c0, RX_r2c1 units.

Enter [Step 2: Control Options] and set [Screen layout (Row x Column)] to 3 x 2.

The video-wall display as below:



- 16.3 [Row Position]: You can change the row position for the selected TX and RX.
- 16.4 [Column Position]: You can change the column position for the select RX.
- 16.5 [Horizontal Shift]: You can shift the selected RX screen left/right in $N * 8$ pixels.
- 16.6 [Vertical Shift]: You can shift the selected TX up/down in N pixels, RX up/down in $N * 8$ pixels.
- 16.7 [Horizontal Scale Up]: You can scale the selected RX up in $N * 1/\text{column}$ pixels horizontally.
- 16.8 [Vertical Scale Up]: You can scale the selected RX up in $N * 1/\text{row}$ pixels vertically.
- 16.9 [Tearing Delay Hack]: In a 1 x N (One TX with multiple RX) configuration, you may use this setting to

avoid tearing problem. The selected RXs will delay in $N * \text{micro-second (us)}$. The typical value is 10000~16000. For example, to setup a 3 x 3 video-wall by 1 x TX and 9 RX:

Set the 4bits DIP switch of 1 x TX (TX_r0) and 9 x RX (r0c0, r0c1, r0c2, ..., r0c8) units to the same ID "0000".

In [Step 1: Reset Position layout] in [Basic Setup]: Set "Vertical Monitor Count" to 9 and "Horizontal Monitor Count" to 1 then press "Apply" button.

Enter [Step 1: Choose Control Target] and select TX_r0, then enter [Step 2: Control Options] and set [Screen layout (Row x Column)] to 1 x 1.

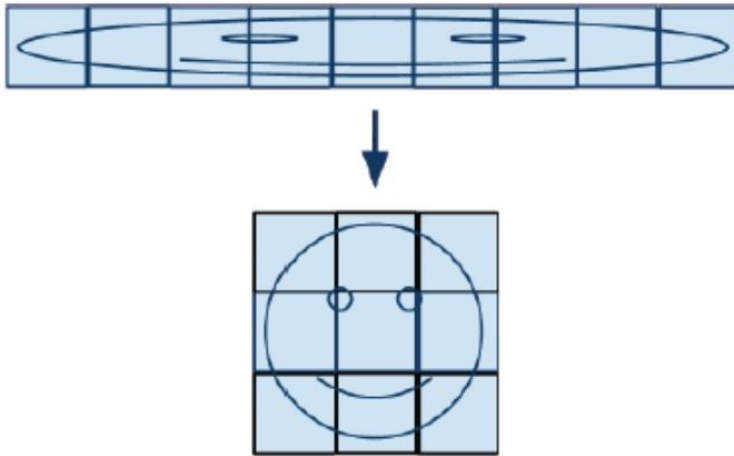
Enter [Step 1: Choose Control Target] and select all RX units, then enter [Step 2: Control Options] and set [Screen layout (Row x Column)] to 3 x 3.

Enter [Step 1: Choose Control Target] and select RX_r0c3, RX_r0c4, RX_r0c5, then enter [Row Position] and set row position to 1.

Enter [Step 1: Choose Control Target] and select RX_r0c6, RX_r0c7, RX_r0c8, then enter [Row Position] and set row position to 2.

Enter [Tearing Delay Hack] and adjust the RX Tearing Delay.

The 1 x 9 and 3 x 3 video-wall with ONLY ONE TX works as below:



16.10 [Console API Command]: (Reserved)