NEXIS

VW01R

HDMI Video Wall Rotation Processor



HDMI®
HIGH-DEFINITION MULTIMEDIA INTERFACE

Operation Manual

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SAFETY PRECAUTIONS

Please read all instructions before attempting to unpack, install or operate this equipment and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through any openings or empty slots in the unit, as you may damage parts inside the unit.
- Do not attach the power supply cabling to building surfaces.
- Use only the supplied power supply unit (PSU). Do not use the PSU if it is damaged.
- Do not allow anything to rest on the power cabling or allow any weight to be placed upon it or any person walk on it.
- To protect the unit from overheating, do not block any vents or openings in the unit housing that provide ventilation and allow for sufficient space for air to circulate around the unit.
- Please completely disconnect the power when the unit is not in use to avoid wasting electricity.

VERSION HISTORY

REVISION	DATE	SUMMARY OF CHANGE
VS1	26/09/18	Final technical review
VS2	04/10/18	Added Sections 6.3.1 to 6.3.7 and 7.3

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1. INTRODUCTION

This HDMI Video Wall Rotation Processor is capable of scaling and rotating the input source to nearly any angle and size desired. Its the ideal solution for presenting sources across the unique video display arrangements often found in commercial displays, control rooms, or classrooms. HDMI Input and output resolutions up to 1080p@60Hz with LPCM audio up to 7.1 channels at 192kHz are supported. In Rotation Mode the output is locked to 1080p, but video latency is only 1 to 2 frames and the unit is capable of scaling and rotating the source, with an accuracy of 1°, as required. In Scaler Mode, the unit can scale to a selection of output resolutions, up to 1080p@60Hz as well as apply video mirror, flip and freeze effects to the output.

By combining multiple units with an HDMI splitter or matrix it is possible to create fantastically varied arrangements of rotated displays for large video wall applications. This is perfect for creating distinct and eye-catching advertising or promotional displays limited only by your imagination. Configuring these large video walls is made simple by use of our Video Wall PC application, allowing the user to visually lay out and configure the entire video wall at one time in a graphical WYSIWYG user interface. A number of common video wall arrangement presets are included with the software by default to make it possible to get started quickly. Basic control of the unit is provided by front panel controls with an informational OSD. Complete control of the unit is accomplished by use of Telnet, RS-232 or the Video Wall PC software.

2. APPLICATIONS

- Public Commercial Displays
- Demo Room Displays
- Hotel Lobby Information Displays
- Live Public Events

3. PACKAGE CONTENTS

- 1×HDMI Video Wall Rotation Processor
- 1×5V/2.6A DC Power Adapter
- 1×Shockproof Feet (Set of 4)
- 1×Operation Manual

4. SYSTEM REQUIREMENTS

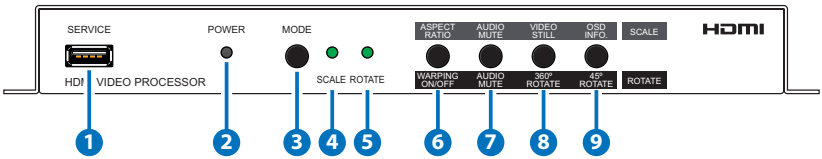
- HDMI source equipment such as media players, video game consoles or set-top boxes.
- HDMI receiving equipment such as HDTVs, monitors or audio amplifiers.

5. FEATURES

- HDMI 1.3 & HDCP 1.4 compliant
- 1 HDMI input and 1 HDMI output
- Input and output supports HD resolutions up to 1080p@60Hz
- Supports pass-through of audio formats including LPCM 2.0/5.1/7.1, Bitstream, and HD Bitstream
- Only 1 to 2 frames of video latency
- Supports horizontal/vertical video warping with zooming in/out and 360 degree display rotation in 1° increments (Rotation Mode)
- Video mirror, flip, and freeze (Scaler Mode)
- Wide variety of video adjustments, including: contrast, brightness, hue, sharpness, aspect ratio
- Custom EDID management
- Basic control of the unit is provided by front panel controls with an informational OSD
- Complete control of the unit is accomplished by use of Telnet, RS-232 or the Video Wall PC software

6. OPERATION CONTROLS AND FUNCTIONS

6.1 Front Panel



1. **SERVICE PORT:** This port is used for logo upload, EDID upload and firmware updates.
2. **POWER LED:** This LED will illuminate to indicate the unit is on and receiving power.
3. **MODE BUTTON:** Press the button to toggle between Scaler Mode and Rotation Mode.
4. **SCALE LED:** This LED will be illuminated when the unit is in Scaler Mode.
5. **ROTATE LED:** This LED will be illuminated when the unit is in Rotation Mode.
6. **ASPECT RATIO & WARPING ON/OFF BUTTON**
   - A. **Scaler Mode:** Press to switch between the available output aspect ratios (Full, 4:3, 16:9, 16:10).
   - B. **Rotation Mode:** Press to turn Warping Mode on or off.
7. **AUDIO MUTE BUTTON:** Press to mute or unmute the audio output.
8. **VIDEO STILL & 360° ROTATE BUTTON**
   - A. **Scaler Mode:** Press to freeze the video output.

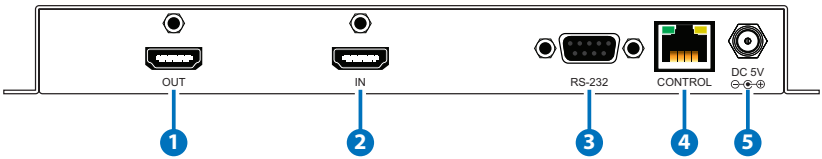
     Note: Audio will continue to play while the video is frozen.
   - B. **Rotation Mode:** Press to enter automatic 360° rotation mode and toggle through the available rotation directions and speeds (slow counterclockwise, slow clockwise, fast counterclockwise, fast clockwise, stop).

     Note: Activating 360° rotation will disable Warping Mode.
9. **OSD INFO. & 45° ROTATE BUTTON**
   - A. **Scaler Mode:** Press to display information about the unit on the OSD including details about video, audio and Ethernet.

B **Rotation Mode:** Press to rotate the output video in 45 degree increments. Press and hold this button to display the OSD Info screen.

Note: Activating 45° rotation will disable Warping Mode.

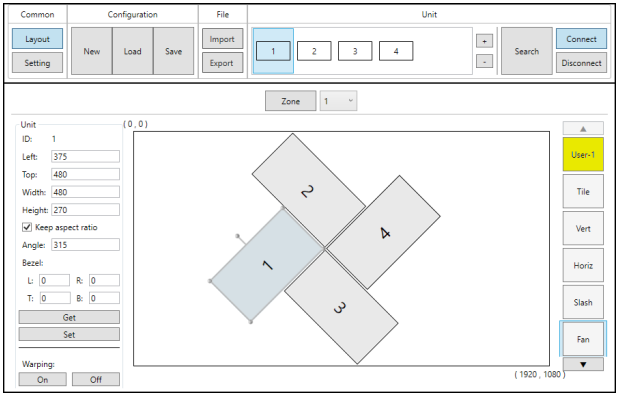
6.2 Rear Panel



1. **OUT PORT:** Connect to an HDMI TV, monitor or amplifier for digital video and audio output.
2. **IN PORT:** Connect to HDMI source equipment such as a media player, game console or set-top box.
3. **RS-232 PORT:** Connect directly to a PC, laptop or other serial control device to send RS-232 commands to control the unit.
4. **CONTROL PORT:** Connect directly, or through a network switch, to your PC/laptop to control the unit via Telnet or the control software.
5. **DC 5V PORT:** Plug the 5V DC power adapter into this port and connect it to an AC wall outlet for power.

6.3 Video Wall Control Software

The Video Wall Control software provides complete control over the Video Wall Rotation Processor via Ethernet or RS-232. This software can scan the local network, as well as any RS-232 connections on the PC, for controllable units to add to the current video wall grouping. Multiple video wall configurations can be stored in the software for quick local recall, or the configurations can be exported as a file for use in other video wall deployments.



In addition to video wall design, creation, and positioning, this software can also be used to configure the scaler mode of the unit, if needed.

6.3.1 Software Operation

Please obtain the "Video Wall Control" software from your authorized dealer and save it in a directory where you can easily find it.

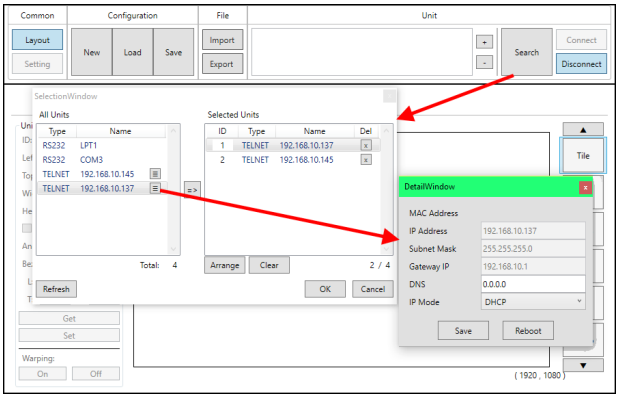
Ensure that all the units you wish to control have been powered on and that they are all connected to the same network as your laptop/ PC. Start the software by double clicking on the *.exe file to start the Video Wall Control software.

By default, when the software starts, the layout will be empty. Dummy displays may be added to/removed from the layout using the "+"/"−" buttons in the "Unit" section if there are no live units available for control and the user wishes to visualize different display arrangements. To add physical units to the layout, perform a "Search".

Note: This software is only compatible with Windows 7 or later PCs.

6.3.2 Video Wall Unit Search

By clicking on the "Search" button at the top-right corner of the window, all Video Wall Rotation Processors that are located on the local network or are directly connected via RS-232 can automatically discovered. Each detected unit can then be added to the current video wall layout and assigned a unique ID number.



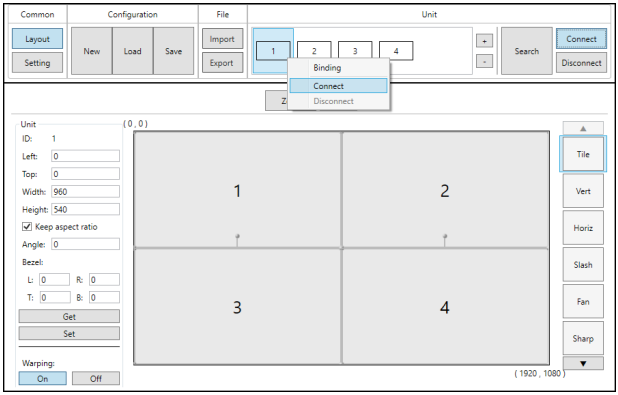
1) **Search Button:** Click on the "Search" button to open the Unit Selection Window. All detected units on the local network as well as all available local serial ports will be listed in the "All Units" section. After all units have been selected and arranged, click on the "OK" button to add them to the layout.

   Note: Units connected via RS-232 can't be directly detected, so all available serial ports will be listed, even if they do not currently have a connected unit.

   - **All Units List:** All detected units on the local network as well as all available local serial ports are listed here. All detected units are identified by their IP address. If additional units are added to the network after the window is opened, click "Refresh" to detect them. Selecting a Unit (or serial port) and then clicking the right arrow button ([=>]) will place them in the Selected Units window in the order they are added. The Ethernet details of each detected unit may also be changed by clicking on the associated details icon ([≡]).
   - **Selected Units:** All selected units will appear here with an ID number indicating their order to be added to the layout. If you wish to re-order the units, type new ID numbers next to each

unit and click “Arrange”. To remove an individual unit from the list, click the “X” next to it’s name. To remove all units, click the “Clear” button.

After all desired displays have been added to the layout, each display must be connected to so that they may be controlled. If some displays that need to be a part of the layout are not currently available for connection, dummy monitors may be added in their place. Displays that are no longer a part of the layout may also be disconnected, or removed completely. Each display can be connected or disconnected individually, or as a group.



2) **Connect Button:** Clicking the “Connect” button will activate the software's connection to all discovered units, allowing control and configuration of those units. To connect to only a single unit, right click on the unit's number and select "Connect".

3) **Disconnect Button:** If you want to ensure that no additional settings are sent to the units, click the “Disconnect” button and all units will be disconnected from the software. To disconnect a single unit, right click on the unit's number and select "Disconnect".

   Note: Disconnected units will still be shown in the layout, but the "Get", "Set", and "Setting" functions will not be available.

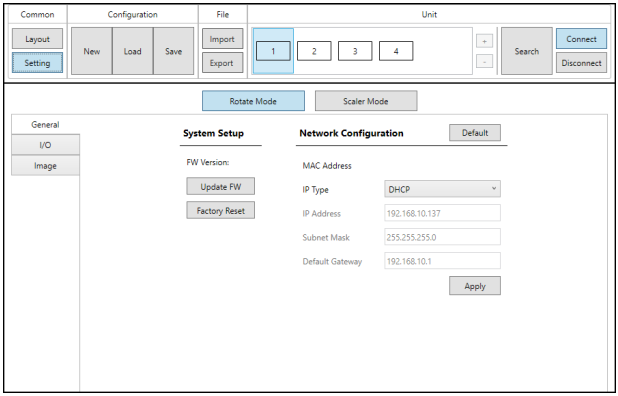
4) **+/− Buttons:** To add dummy units (displays with no physical unit currently connected) to a layout, click the “+” button. To completely remove both real and dummy units from a layout, select the unit to remove and then click the “−” button.

6.3.3 Basic Unit Settings & Configuration

The basic configuration and settings for each connected unit can be set by selecting the unit to configure from the "Unit" section and then clicking on the "Setting" button in the upper-left "Common" section of the window. The operational mode of the unit (Rotate Mode or Scaler Mode) may be set here, as well as the Ethernet, I/O, and mode-specific image features. To exit the setting configuration tabs and return to the layout mode, click on the "Layout" button in the upper-left "Common" section of the window.

Note: Some configuration options are not available in both modes.

The "General" tab provides control over the network configuration, and provides a way to initiate a firmware update or perform a factory reset. This tab provides the same options in both operational modes.



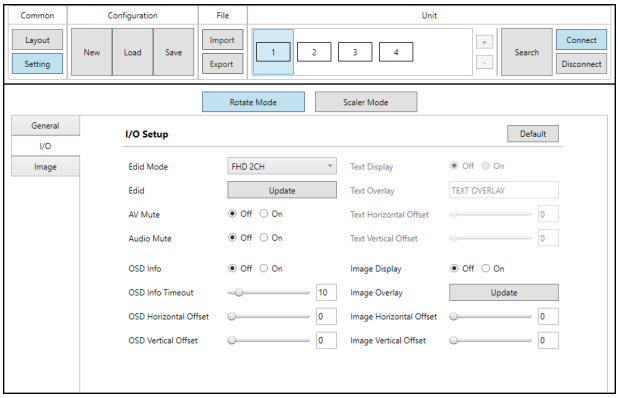
1) **System Setup:** Displays the current firmware version and provides options to update the firmware or perform a factory reset on the unit.
   - **Update FW Button:** Provides a way to update the unit's firmware. Insert a USB thumb drive, with a valid firmware file (*.bin format) in the root directory, into the unit's USB service port then click the "Update FW" button. After the update is complete the unit will automatically reboot.
   - **Factory Reset Button:** Selecting this will reset the unit's settings back to their factory defaults.
2) **Network Configuration:** The IP Address, Netmask and Gateway can be set manually, or DHCP can be enabled for automatic IP

Configuration if your local network supports it. Click on "Apply" to confirm and activate any changes made to these settings. To return these settings to their factory defaults, click on the "Default" button.

Note: If the IP address is changed then the IP address required for Software or Telnet access will also change accordingly.

6.3.3.1 Rotation Mode Configuration

The "I/O" tab in Rotation Mode provides control over input and output functions such as EDID selection, audio/video mute, OSD Information, and custom graphics overlay. To return these settings to their factory defaults, click on the "Default" button.



1) **EDID Mode:** Select the preferred EDID for the unit to use from the dropdown menu (FHD 2CH, FHD MCH, User, and Sink).
2) **EDID Update:** To upload a custom User EDID, insert a USB thumb drive, with a valid EDID file named "USEREDID.BIN" in the root directory, into the unit's USB service port then click the "Update" button.
3) **AV Mute:** Enables or disables the audio/video mute function. When enabled, video output will be black, and audio will be muted.
4) **Audio Mute:** Enabled or disables the audio mute function. When enabled, the audio output will be muted.
5) **OSD Info:** The OSD Info On/Off selector both shows the current OSD Info state and provides a control to manually activate it. When "On" is manually selected the OSD Info will show on the output until the set timeout value has expired then it will revert to "Off".

6) **OSD Info Timeout and Offset:** The OSD Info timeout value (in seconds) and horizontal and vertical position may be set here.

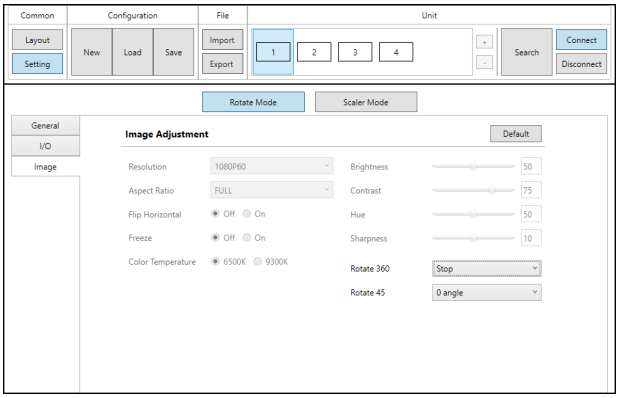
7) **Image Overlay Display:** Enables or disables the custom image overlay feature.

   Note: Enabling OSD Info will automatically disable the Image Overlay.

8) **Image Overlay Update:** To upload a custom overlay image, insert a USB thumb drive, with a valid graphics file named "LOGO.BMP" (1920×1080 max resolution, 8-bit color) in the root directory, into the unit's USB service port then click the "Update" button.

9) **Image Overlay Positioning:** Set the horizontal and vertical position of the upper-left corner of the custom overlay image.

The "Image" tab in Rotation Mode provides control over the automatic 360° rotation mode as well as the 45° fixed screen rotation mode. To return these settings to their factory defaults, click on the "Default" button.

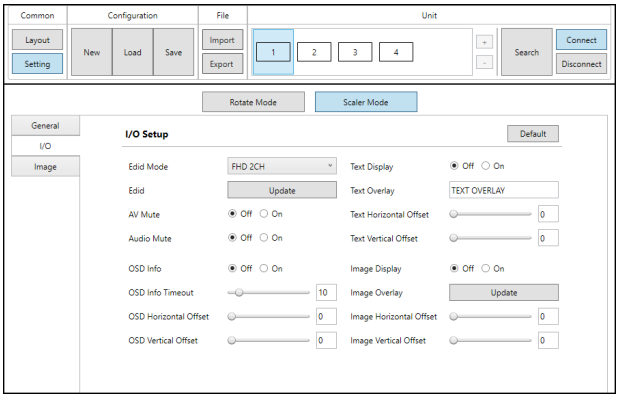


1) **Automatic 360° Rotation Mode:** Allows activation of the automatic 360° rotation mode. Select the speed and direction from the dropdown menu (slow counter-clockwise, slow clockwise, fast counter-clockwise, fast clockwise, stop).

2) **Fixed 45° Rotation Angle Mode:** Allows rotating the source image to fixed, 45°, angles. Select the preferred rotation angle from the dropdown menu.

6.3.3.2 Scaler Mode Configuration

The "I/O" tab in Scaler Mode provides control over input and output functions such as EDID selection, audio/video mute, OSD Information, customized text overlay, and customized graphics overlay. To return these settings to their factory defaults, click on the "Default" button.



1) **EDID Mode:** Select the preferred EDID for the unit to use from the dropdown menu (FHD 2CH, FHD MCH, User, and Sink).
2) **EDID Update:** To upload a custom User EDID, insert a USB thumb drive, with a valid EDID file named "USEREDID.BIN" in the root directory, into the unit's USB service port then click the "Update" button.
3) **AV Mute:** Enables or disables the audio/video mute function. When enabled, video output will be black, and audio will be muted.
4) **Audio Mute:** Enabled or disables the audio mute function. When enabled, the audio output will be muted.
5) **OSD Info:** The OSD Info On/Off selector both shows the current OSD Info state and provides a control to manually activate it. When "On" is manually selected the OSD Info will show on the output until the set timeout value has expired then it will revert to "Off".
6) **OSD Info Timeout and Offset:** The OSD Info timeout value (in seconds) and horizontal and vertical position may be set here.
7) **Text Overlay Display:** Enables or disables the custom text overlay feature.

   Note: Enabling OSD Info or Image Overlay will automatically disable the Custom Text Overlay.

7) **Text Overlay Content:** Type the text to display when the Custom Text Overlay is active. The text string can be up to 32 characters long.

8) **Custom Text Overlay Positioning:** Set the horizontal and vertical position of the custom text overlay.

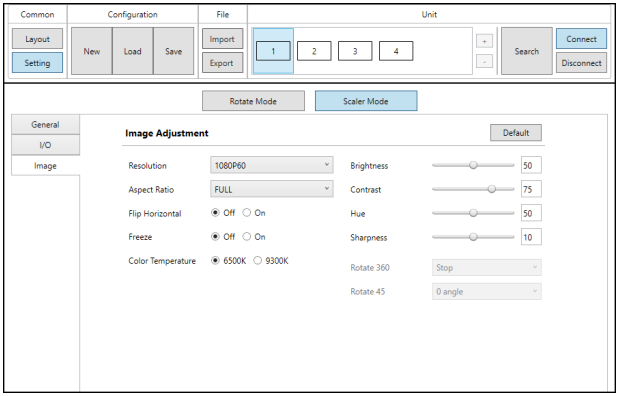
9) **Image Overlay Display:** Enables or disables the custom image overlay feature.

   Note: Enabling OSD Info or Custom Text Overlay will automatically disable the Image Overlay.

10) **Image Overlay Update:** To upload a custom overlay image, insert a USB thumb drive, with a valid graphics file named "LOGO.BMP" (1920×1080 max resolution, 8-bit color) in the root directory, into the unit's USB service port then click the "Update" button.

11) **Image Overlay Positioning:** Set the horizontal and vertical position of the upper-left corner of the custom overlay image.

The "Image" tab in Scaler Mode provides control over the output resolution and aspect ratio, horizontal flip and video freeze features, as well as multiple video color and quality settings. To return these settings to their factory defaults, click on the "Default" button.



1) **Output Resolution:** Selects the output resolution to use in Scaler mode. Selecting "Native" will make the unit automatically select an output resolution based on the detected EDID of the connected display.

2) **Aspect Ratio:** Selects the aspect ratio to use for the scaled output. "Full" stretches the source to fill the output resolution, regardless

of the original aspect ratio. The “4:3”, “16:9”, and “16:10” options force the source to output at the specified aspect ratio relative to the currently selected output resolution.

3) **Horizontal Flip:** When enabled, flips the scaled output horizontally.
4) **Video Freeze:** When enabled, freezes the scaled video output.

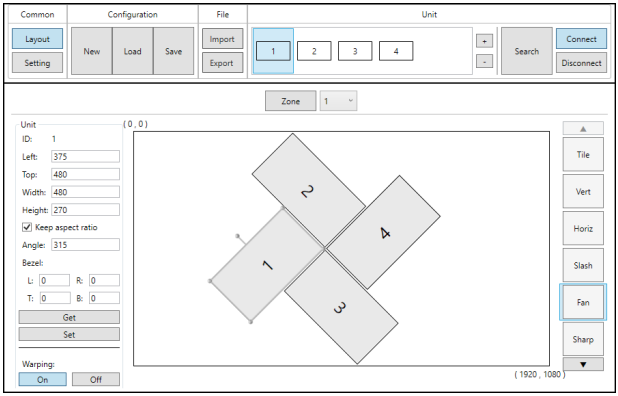
   Note: While the output is frozen, audio will continue to play normally.
5) **Color Temperature:** Provides control over the color temperature of the scaled output image.
6) **Brightness:** Provides control over the overall brightness of the scaled output image.
7) **Contrast:** Provides control over the overall contrast of the scaled output image.
8) **Hue:** Provides control over the hue shift of the scaled output image.
9) **Sharpness:** Provides control over the amount of sharpness processing to apply to the scaled output image.

6.3.4 Pre-Defined Video Wall Layouts

The position, size and angle of the display connected to each unit is set in the Layout window when in Rotation Mode. If you are currently in the Setting window, clicking on the "Layout" button in the upper-left "Common" section of the window will switch back to the Layout window and activate Rotation mode.

The outline of the layout window represents the source video (1920×1080 pixels) and each display must be placed within this space, without exceeding the edges (not including bezel size, if active). Each display contains a number which matches the ID number of the unit that is connected to it and the size/position of each display (listed to the left) is measured in pixels relative to its size/position within the layout space. Pre-defined layouts do not include bezel compensation.

Note: Video wall configuration and warping is not available in Scaler Mode.



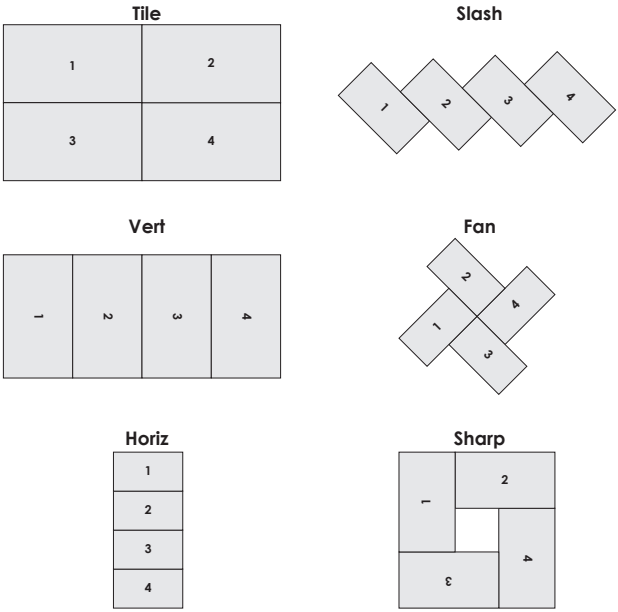
This control software provides a number of common, pre-defined, video wall configurations which can be selected and easily applied to any connected units. All pre-defined configurations are designed around video walls containing 4 displays.

1) **Selecting Pre-Defined Layouts:** Select any of the provided pre-defined layouts from the right-hand scroll bar. After selecting a new layout, you must confirm that you wish to leave the current layout.

   Note: It is not possible to save changes to the pre-defined layouts. Switching to a new layout will remove any changes made to the

current layout.

- **Available Pre-Defined Layouts**



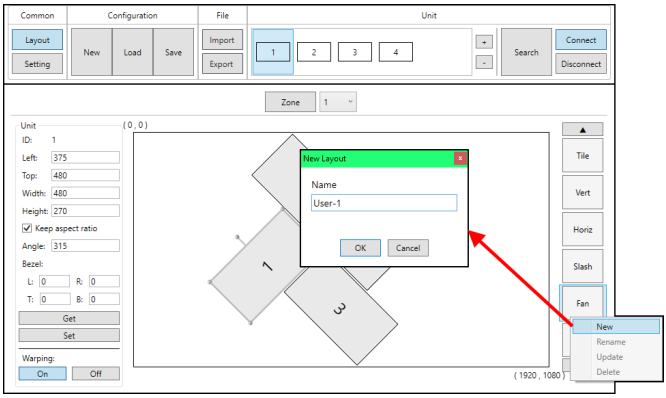
After confirming the preferred layout, select all of the units involved in the video wall from the "Unit" section at the top of the window and then click on the "Set" button in the bottom-right corner of the window to upload the new layout configuration to all selected units. After clicking "Set", the units will take a few seconds to fully update with the new configuration.

6.3.5 Customized Video Wall Layouts

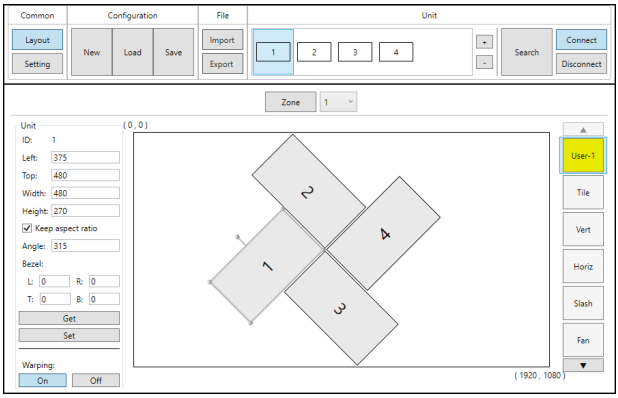
The position, size and angle of the display connected to each unit is set in the Layout window when in Rotation Mode. If you are currently in the Setting window, clicking on the "Layout" button in the upper-left "Common" section of the window will switch back to the Layout window and activate Rotation mode.

The outline of the layout window represents the source video (1920×1080 pixels) and each display must be placed within this space, without exceeding the edges (not including bezel size, if active). Each display contains a number which matches the ID number of the unit that is connected to it and the size/position of each display (listed to the left) is measured in pixels relative to its size/position within the layout space. When a bezel measurement is used, the display width/height measurement should be the total measurement of the screen plus the bezel.

Note: Video wall configuration and warping is not available in Scaler Mode.



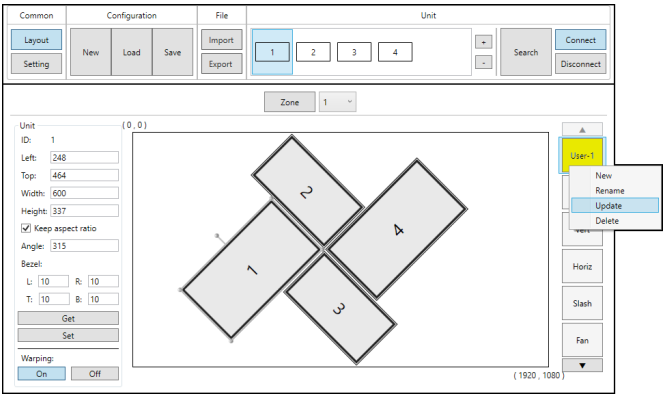
This control software provides a number of common, pre-defined, video wall configurations, however in most cases a customized layout will be needed. Custom layouts are created by selecting a layout to use as a basis, and then right-clicking on the layout's selection button and selecting "New" from the dropdown. You then provide a name for the new layout and click "OK" to generate it. Custom layouts are colored differently to make them easy to identify.



The Unit information area on the left shows all of the relevant details of the currently selected display. You may freely reposition or resize any of the displays by simply clicking on them and dragging them around the layout space, or by typing numbers directly into the Unit information area. If bezel measurements are to be used, the display width/height measurement should be the total measurement of the screen plus the bezel. After arranging the layout to approximately match the arrangement of the real displays, select all of the units involved in the video wall from the "Unit" section at the top of the window and then click on the "Set" button in the Unit information section to upload the new layout configuration to all selected units. After clicking "Set", the units will take a few seconds to fully update with the new configuration. In most cases it will take multiple adjustment and tweaking passes to perfectly match the physical layout.

It is recommended to periodically save the modifications that have been made to the current layout by right clicking on the layout and selecting "Update". This will save the changes to the layout, so that they are not lost if you close the software, or change to another layout.

Note: Making changes to a layout and then switching to a new layout without updating the layout will cause those changes to be lost.



1) **Unit Information and Details:** This section displays all of the relevant position, dimension, and orientation details of the selected unit/ display.

   Note: Only one unit's details will be displayed if multiple units are currently selected.

   - **ID:** The ID number of the currently selected unit/display.
   - **Dimensions:** Displays the current values for the pixel position of the top/left corner of the un-rotated display as well as the current width and height in pixels. After changing any of these values, press the enter key to commit the change to the layout.

     Note: If the bezel values are set to 0, the height and width values should only be the measurement of the video panel within the display. However, if bezel values are being used, these dimensions represent the size of the entire physical display (including the bezel).
   - **Keep Aspect Ratio:** Enabled or disables forcing the current aspect ratio to be maintained when the display is resized either by typing a new value, or by mouse-dragging a corner of the display in the layout.
   - **Angle:** Displays the current rotation angle of the selected display in degrees. After changing this value, press the enter key to commit the change to the layout.
   - **Bezel:** Displays the current bezel measurements, in pixels, for the selected display and allows for their modification. The bezel is represented in the layout by a darkened rectangle around

the viewable portion of the display. After changing this value, press the enter key to commit the change to the layout.

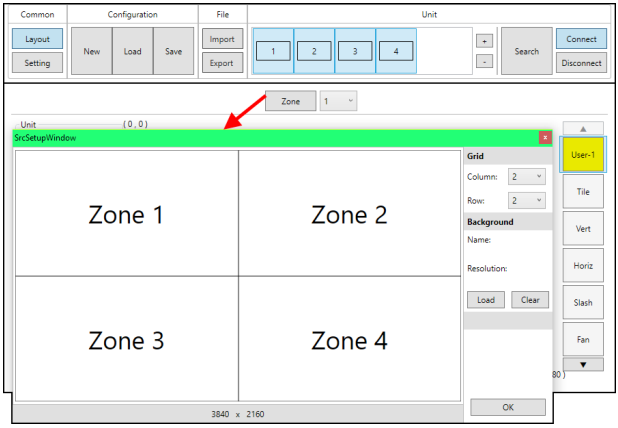
Note: Bezel measurements are optional. Bezel values subtract from the entered horizontal and vertical measurements of the display and reduce the size of the viewable portion of the display in the layout window.

2) **Get Button:** Downloads the current layout settings from all selected unit(s) into the software.
3) **Set Button:** Uploads the current layout to all selected unit(s).
4) **Warping On/Off Buttons:** Enables or disables warping on the currently selected unit(s). When warping is disabled, the complete source video will display normally, filling the display.
5) **Custom Layout Selection Right-Click Menu:** Right clicking on any custom layout button brings up a menu of functions that can be performed on that layout.
   - **New:** Opens the "New Layout" window and allows for the creation of a new custom layout based on the current layout.
   - **Rename:** Brings up a window allowing for the selected layout to be renamed.
   - **Update:** Updates the selected layout with the data in the currently live layout.
   - **Delete:** Deletes the selected layout.

6.3.6 Multi-Zone Video Wall Layouts

Though this unit's input is limited to a maximum resolution of 1080p, it is possible to generate large, flexible, video walls from 4K, or larger, sources by using a traditional 4K+ capable video wall splitter product with each output of the video wall splitter generating a 1080p block of video which is then further distributed to each group of Video Wall Rotation Processors.

Note: It is not possible for a display to be used in more than one zone at a time, or cross zone borders.



The Zone feature makes managing, and visualizing, this special arrangement of displays easier. Simply click on the "Zone" button to launch the Zone Source Setup window. Select the number of horizontal and vertical zones needed. The total effective resolution of all zones together is displayed at the bottom of the window. For example, a 2×2 zone arrangement would be used if the original source (before being split) is 4K (3840×2180). Click "OK" to accept the new zone configuration and return to the main layout window. To arrange the displays used in a specific zone, select the zone from the dropdown and then add the displays that belong to that zone (via the "Search" function or the "+" button).

1) **Zone Button:** Click this to launch the Zone Source Setup window.
2) **Zone Selection:** This dropdown selects the zone to view or modify.
3) **Zone Grid Column:** Sets the number of zones, horizontally, within the full layout.

4) **Zone Grid Row:** Sets the number of zones, vertically, within the full layout.

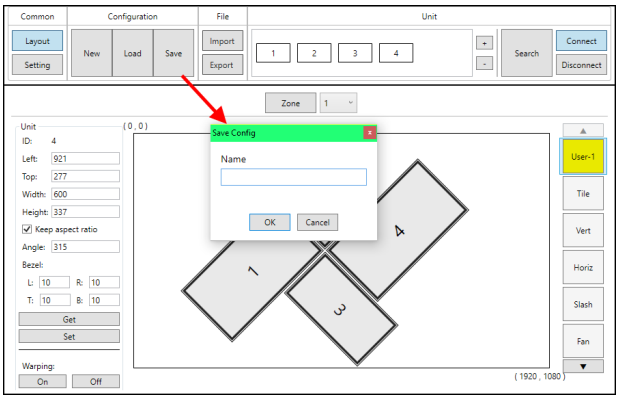
5) **Background Load:** Click this button to load a graphic image to use as a background for the video wall(s) to help visualize the effect of the whole layout on the source video.

6) **Background Clear:** Click this button to remove the background image.

6.3.7 Configuration Export/Import

The Configuration and File sections of the main window provide ways to save/load populated layout configurations as well as to export/ import configurations/layouts to a file on your local PC. A saved layout configuration includes unit connection information as well as display orientation.

1) **Configuration:** This section provides a way to load, save, or clear populated layout configurations.



- **New Button:** Completely clears all displays from the currently viewed layout edit window.

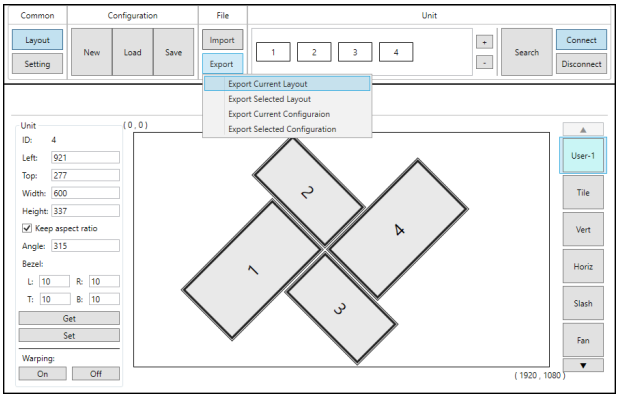
  Note: Only displays and their unit connection details are cleared. Layouts saved to the right-side selection bar are unaffected.

- **Load Button:** Load a previously saved layout configuration.
- **Save Button:** Save the currently viewed layout, including unit connection information as well as display orientation.

  Note: Using the same name as a previously saved configuration will overwrite it.

2) **File:** This section provides a way to export saved layouts and configurations to a file on the local PC, or to import previously saved layouts and configurations.

*Note: Exported configurations and layouts are stored as protected *.zip files and cannot be opened for direct editing.*



- **Import Button:** Click this button to import a saved layout or configuration from a file (*.zip format) located on the local PC.
- **Export Button:** Click this button to open the export dropdown.
  - **Export Current Layout:** Exports the currently viewed layout to a file on the local PC.
  - **Export Selected Layout:** Select a layout, from all available custom user layouts, to save it to a file on the local PC.
  - **Export Current Configuration:** Exports the current layout's configuration to a file on the local PC.
  - **Export Selected Configuration:** Select a configuration, from all available stored configurations, to save it to a file on the local PC.

6.4 RS-232 Control

Unit	
Pin	**Definition**
1	NC
2	TxD
3	RxD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Controlling PC	
Pin	**Definition**
1	NC
2	RxD
3	TxD
4	NC
5	GND
6	NC
7	NC
8	NC
9	NC

Serial Port Settings	
Baud Rate	19200
Data Bits	8
Parity Bit	None
Stop Bits	1
Flow Control	None

6.5 Telnet Control

Before attempting to use Telnet control, please ensure that both the unit and the PC are connected to the same active networks.

To Access the Command Line Interface (CLI)	
Windows 7	Click **Start**, type "cmd" in the search field, and press **Enter**.
Windows XP	Click **Start** > **Run**, type "cmd", and press **Enter**.
Mac OS X	Click **Go** > **Applications** > **Utilities** > **Terminal**.

Once in the Command Line Interface (CLI) type "**telnet**" followed by the IP address of the unit (and the port number if it is non-standard) and then hit "Enter". This will connect us to the unit we wish to control.

```
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\Adminstrator\telnet 192.168.1.50 23
```

Note: The default IP address is 192.168.1.50. If the IP address is changed then the IP address required for Telnet access will also change accordingly.

6.6 RS-232 and Telnet Commands

COMMAND Description and Parameters
get fw ver↵
Show the unit's current firmware version.
set factory default↵
Reset the unit to the factory defaults.
set in a edid N1↵
Set the EDID to be used by the HDMI input. Available values for **N1**: 1 [FHD/2CH] 2 [FHD/MCH] 3 [User EDID] 15 [Sink EDID]
get in a edid↵
Show the EDID currently being used by the HDMI input.
set out a mute N1↵
Enable or disable audio/video mute on the HDMI output. Available values for **N1**: on [A/V Mute enabled] off [A/V Mute disabled]
get out a mute↵
Show the current audio/video mute state of the HDMI output.
set out a audio mute N1↵
Enable or disable the audio-only mute on the HDMI output. Available values for **N1**: on [Mute enabled] off [Mute disabled]
get out a audio mute↵
Show the current audio mute state of the HDMI output.

COMMAND Description and Parameters
get out a sync status↵
Show the current sync state of the HDMI output.
set out a osd info N1↵
Enable or disable the info OSD for the HDMI output. Available values for **N1**: on [Enable OSD] off [Disable OSD]
get out a osd info↵
Show the current info OSD state for the HDMI output.
set out a osd info timeout N1↵
Set the info OSD's timeout value for the HDMI output (in seconds). **N1** = 0 ~ 100 [Timeout length]
get out a osd info timeout↵
Show the current info OSD's timeout value for the HDMI output.
set out a osd info vposition N1↵
Set the vertical position of the OSD on the HDMI output. **N1** = 0 ~ 100 [Vertical position]
get out a osd info vposition↵
Show the current vertical position of the OSD on the HDMI output.
set out a osd info hposition N1↵
Set the horizontal position of the OSD on the HDMI output. **N1** = 0 ~ 100 [Horizontal position]
get out a osd info hposition↵
Show the current horizontal position of the OSD on the HDMI output.
get mac addr↵
Show the unit's MAC address.

COMMAND	
Description and Parameters	
set ip mode N1↵	
Set the IP address assignment mode. Available values for **N1**: 0 [Static IP mode] 1 [DHCP mode]	
get ip mode↵	
Show the current IP address assignment mode.	
get ipconfig↵	
Show the unit's current IP configuration information.	
set ip addr N1↵	
Set the unit's static IP address. **N1** = x.x.x.x [x = 0 ~ 255, IP address]	
get ip addr↵	
Show the unit's current IP address.	
set netmask N1↵	
Set the unit's netmask address. **N1** = x.x.x.x [x = 0 ~ 255, Netmask]	
get netmask↵	
Show the unit's current netmask.	
set gateway N1↵	
Set the unit's gateway address. **N1** = x.x.x.x [x = 0 ~ 255, Gateway]	
get gateway↵	
Show the unit's current gateway address.	
set telnet port N1↵	
Set the unit's Telnet access port. **N1** = 0 ~ 65535 [Port number]	

COMMAND Description and Parameters
get telnet port↵
Show the unit's current access Telnet port.
usb update mcu↵
Begins the firmware update process and searches for a firmware file on a thumb drive in the USB port. *Note: The firmware's filename must be "FIRMWARE.BIN".*
usb update edid↵
Upload a new User EDID from a thumb drive in the USB port. *Note: The EDID's filename must be "USEREDID.BIN".*
usb update bmp↵
Upload a new User Bitmap from a thumb drive in the USB port. *Note: The logo filename must be "LOGO.BMP" and the resolution must be 1920×1080 (or less) with 256 colors.*
set warping enable N1↵
Enable or disable Warping Mode. Available values for **N1**: on [Warping enabled] off [Warping disabled] *Note: Rotation Mode only.*
get warping enable↵
Show the current Warping Mode state.
set scaling a mode N1↵
Set the unit's output scaler mode. Available values for **N1**: 1 [Rotation Mode] 2 [Scaler Mode]
get scaling a mode↵
Show the unit's current output scaler mode.

COMMAND Description and Parameters
set rot360 a mode N1↵
Control the unit's 360° automated rotation demonstration mode. Available values for **N1**: 0 [Stop rotation] 1 [Rotate counterclockwise slowly] 2 [Rotate clockwise slowly] 3 [Rotate counterclockwise quickly] 4 [Rotate clockwise quickly] *Note: Rotation Mode only. Automatically disables Warping.*
get rot360 a mode↵
Show the 360° automated rotation demonstration mode's current state.
set rot45n a mode N1↵
Set a fixed rotation angle for the output image. Available values for **N1**: 0 [Rotate 0°] 1 [Rotate 45°] 2 [Rotate 90°] 3 [Rotate 135°] 4 [Rotate 180°] 5 [Rotate 225°] 6 [Rotate 270°] 7 [Rotate 315°] *Note: Rotation Mode only. Automatically disables Warping.*
get rot45n a mode↵
Show the current fixed rotation angle setting.
set out a timing N1↵
Set the output resolution to use for the HDMI output using the universal timing number.

COMMAND	
Description and Parameters	
Available values for **N1**:	
0	[Native]
4	[480p@60Hz]
6	[720p@60Hz]
10	[1080p@60Hz]
11	[576p@50Hz]
12	[720p@50Hz]
14	[1080p@50Hz]
16	[1080p@24Hz]
17	[1080p@25Hz]
19	[1080p@30Hz]
416	[1024×768@60Hz]
417	[1280×800@60Hz]
419	[1280×1024@60Hz]
420	[1366×768@60Hz]
423	[1440×900@60Hz]
424	[1600×900@60Hz (RB)]
425	[1600×1200@60Hz]
426	[1680×1050@60Hz]
430	[1920×1200@60Hz]
Note: Scaler Mode only.	
get out a timing↵	
Show the universal timing number of the current resolution used by the HDMI output.	
get out a timing string↵	
Show the universal timing number and description string of the current resolution used by the HDMI output.	
set in a contrast N1↵	
Set the contrast level of the video source.	
N1 = 0 ~ 100	[Contrast level]

COMMAND
Description and Parameters
Note: Scaler Mode only.
get in a contrast↵
Show the current contrast level of the video source.
set in a brightness N1↵
Set the brightness level of the video source. **N1** = 0 ~ 100 [Brightness level] *Note: Scaler Mode only.*
get in a brightness↵
Show the current brightness level of the video source.
set in a hue N1↵
Set the hue value of the video source. **N1** = 0 ~ 100 [Hue value] *Note: Scaler Mode only.*
get in a hue↵
Show the current hue value of the video source.
set in a sharpness N1↵
Set the sharpness level of the video source. **N1** = 0 ~ 20 [Sharpness level] *Note: Scaler Mode only.*
get in a sharpness↵
Show the current sharpness level of the video source.
set out a aspect ratio N1↵
Set the aspect ratio of the video shown on the HDMI output.
Available values for **N1**: 1 [Full screen] 2 [4:3] 3 [16:9] 4 [16:10]

COMMAND Description and Parameters
Note: Scaler Mode only.
get out a aspect ratio↵
Show the current aspect ratio setting for the video shown on the HDMI output.
set in a temperature N1↵
Set the color temperature of the video source. Available values for **N1**: 1 [6500K] 2 [9300K] *Note: Scaler Mode only.*
get in a temperature↵
Show the current color temperature setting for the video source.
set in a flip N1↵
Enable or disable horizontally flipping the video source. Available values for **N1**: on [Enable horizontal flip] off [Disable horizontal flip] *Note: Scaler Mode only.*
get in a flip↵
Show the current horizontal flip state of the video source.
set in a image still N1↵
Enable or disable freezing the video source. Available values for **N1**: on [Enable video freeze] off [Disable video freeze] *Note: Scaler Mode only.*
get in a image still↵
Show the current video freeze state of the video source.

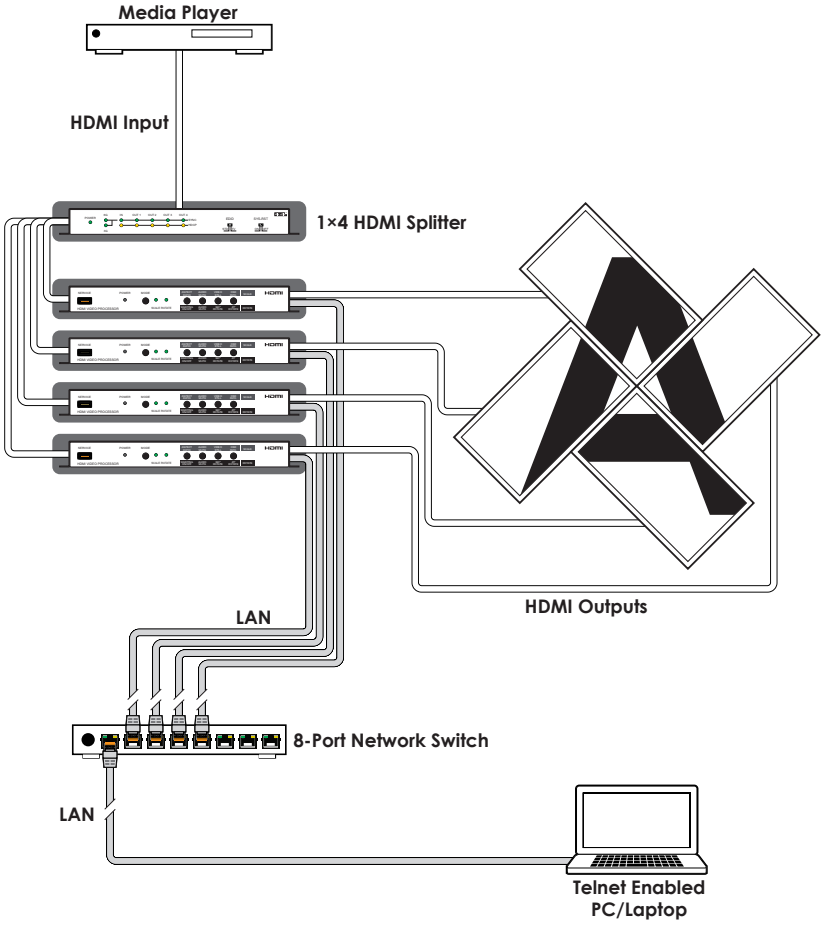
COMMAND Description and Parameters
set out a osd text N1↵
Set a text overlay string for display over the video output. **N1** = {String} [32 characters max]
get out a osd text↵
Show the current text overlay string content.
set out a text overlay N1↵
Enable or disable display of the custom text overlay string. Available values for **N1**: on [Enable text overlay] off [Disable text overlay] *Note: Scaler Mode only.*
get out a text overlay↵
Show the current state of the custom text overlay display.
set out a overlay hpos N1↵
Set the horizontal position of the custom text overlay on the HDMI output. **N1** = 0 ~ 100 [Horizontal position]
get out a overlay hpos↵
Show the current horizontal position of the custom text overlay on the HDMI output.
set out a overlay vpos N1↵
Set the vertical position of the custom text overlay on the HDMI output. **N1** = 0 ~ 100 [Vertical position]
get out a overlay vpos↵
Show the current vertical position of the custom text overlay on the HDMI output.

COMMAND Description and Parameters
set out a osd bitmap N1↵
Enable or disable display of the User Bitmap image. Available values for **N1**: on [Enable bitmap display] off [Disable bitmap display] *Note: Scaler Mode only.*
get out a osd bitmap↵
Show the current state of the User Bitmap image display.
set out a bitmap hpos N1↵
Set the horizontal position of the User Bitmap on the HDMI output. **N1** = 0 ~ 100 [Horizontal position]
get out a bitmap hpos↵
Show the current horizontal position of the User Bitmap on the HDMI output.
set out a bitmap vpos N1↵
Set the vertical position of the User Bitmap on the HDMI output. **N1** = 0 ~ 100 [Vertical position]
get out a bitmap vpos↵
Show the current vertical position of the User Bitmap on the HDMI output.

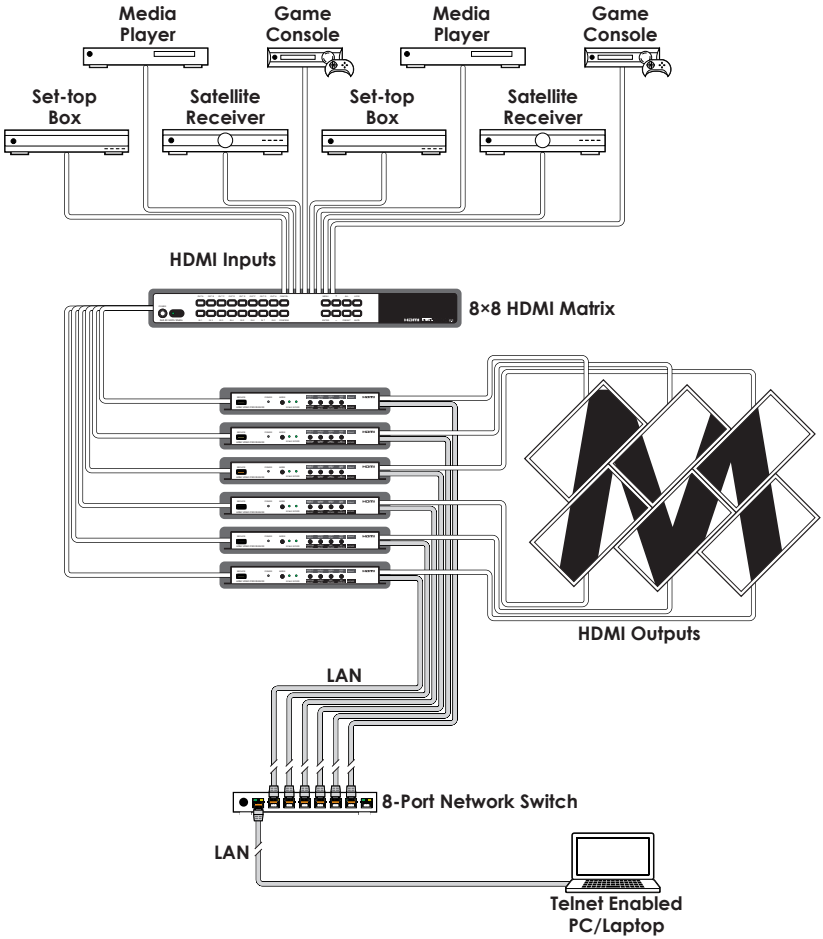
Note: Commands will not be executed unless followed by a carriage return. Commands are not case-sensitive.

7. CONNECTION DIAGRAM

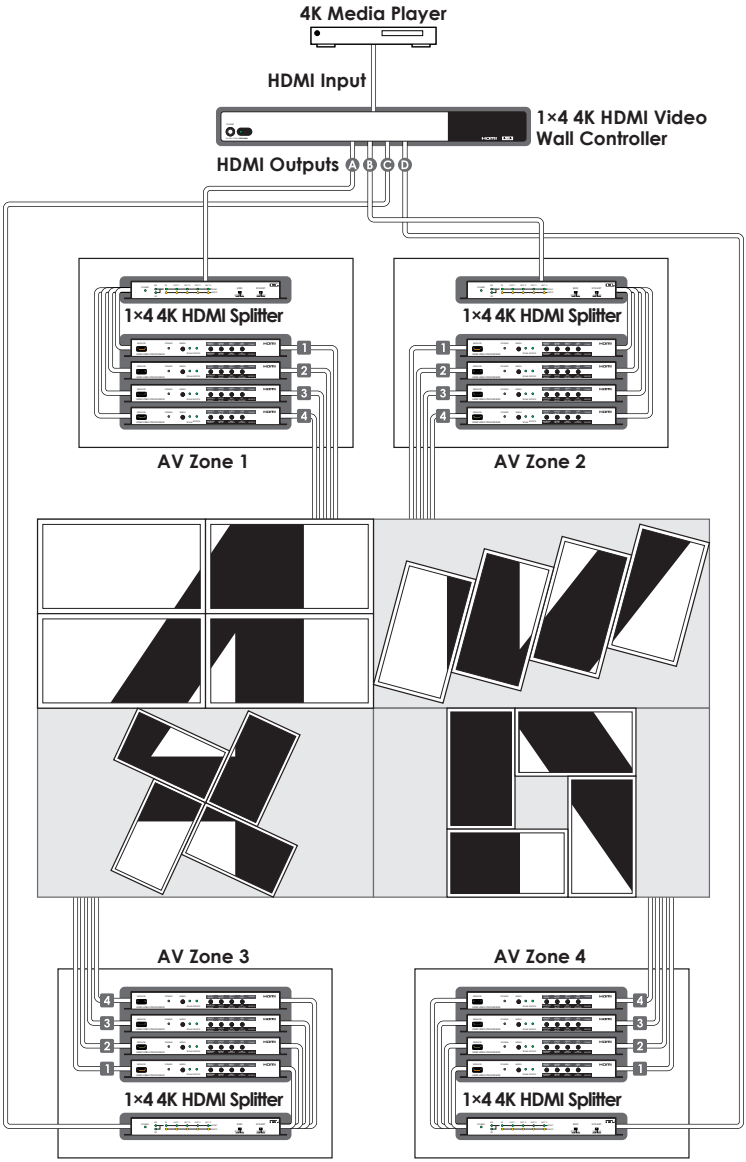
7.1 Basic Screen Array System



7.2 Advanced Screen Array System



7.3 4K Quad-Zone Screen Array System



8. SPECIFICATIONS

8.1 Technical Specifications

HDMI Bandwidth	340MHz/10.2Gbps
Input Port	1×HDMI
Output Port	1×HDMI
Control Ports	1×RS-232 (DE-9) 1×IP Control (RJ45)
Baud Rate	19200bps
Power Supply	5V/2.6 DC (US/EU standards, CE/FCC/UL certified)
ESD Protection	Human Body Model: ±8kV (Air Discharge) ±4kV (Contact Discharge)
Dimensions	231.5mm×25mm×108mm (W×H×D) [Case Only] 231.5mm×25mm×117mm (W×H×D) [All Inclusive]
Weight	652g
Chassis Material	Metal (Steel)
Silkscreen Color	Black
Operating Temperature	0 ˚C–40 ˚C/32 ˚F–104 ˚F
Storage Temperature	-20 ˚C–60 ˚C/-4 ˚F–140 ˚F
Relative Humidity	20–90% RH (Non-condensing)
Power Consumption	5.9W

8.2 Video Specifications

Scaler Mode		
Supported Resolutions (Hz)	**Input**	**Output**
640×480@60/72/75/85	✓	×
800×600@56/60/72/75/85	✓	×
1024×768@60/70/75/85	✓	60
1280×768@60/75	✓	×
1280×800@60	✓	60
1280×960@60	✓	×
1280×1024@60/75	✓	60
1360×768@60	✓	60
1366×768@60	✓	×
1400×1050@60	✓	×
1440×900@60	✓	60
1600×900@60 (RB)	✓	×
1600×1200@60	✓	×
1680×1050@60	✓	×
1920×1200@60 (RB)	✓	60
720×480i@59.94/60	✓	×
720×480p@59.94/60	✓	60
720×576i@50	✓	
720×576p@50	✓	50
1280×720p@50/59.94/60	✓	50/60
1920×1080i@50/59.94/60	✓	×
1920×1080p@23.97/24/25/29.97/30	✓	24/25/30
1920×1080p@50/59.94/60	✓	50/60

Note: Rotation mode only supports 1080p@24/25/30/50/60 input and output. The output refresh rate will always match the input refresh rate.

8.3 Audio Specifications

HDMI Input/Output	
LPCM	
Max Channels	8 Channels
Sampling Rate (kHz)	32, 44.1, 48, 88.2, 96, 176.4, 192
Bitstream	
Supported Formats	Standard & High-Definition

8.4 Cable Specifications

HDMI Cable Length	1080p	
	8-bit	12-bit
Input	5m	5m
Output	5m	5m

9. ACRONYMS

ACRONYM	COMPLETE TERM
CEC	Consumer Electronics Control
CLI	Command-Line Interface
DHCP	Dynamic Host Configuration Protocol
DVI	Digital Visual Interface
EDID	Extended Display Identification Data
GUI	Graphical User Interface
HD	High-Definition
HDCP	High-bandwidth Digital Content Protection
HDMI	High-Definition Multimedia Interface
HDTV	High-Definition Television
IP	Internet Protocol
LAN	Local Area Network
LPCM	Linear Pulse-Code Modulation
OSD	On-Screen Display
PC	Personal Computer
USB	Universal Serial Bus
VGA	Video Graphics Array
WUXGA (RB)	Widescreen Ultra Extended Graphics Array (Reduced Blanking)
WYSIWYG	What You See Is What You Get