The absolute opposite of ordinary

G406s Quick User Guide

2 Channel 4K/60 video wall controller

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DCi/UHD 4k/60/4:4:4	**HDMI 2.0**	**HDCP** 2.2/1.4	**HDR** Ready	**10-bit** High-end scaler	**Cadence** Film 3:2 / 2:2	**3D Motion** De-interlace	**Deep Color** xvYCC/12-bit

Mosaic Irregular wall	**Multi-Unit** Cacade	**Flexible** Aspect Ratio Bezel Correction	**Rotation** Landscape Protrait	**Loop Out** Daisy chain	**Control** IR/USB/RS232 /Ethernet	**Projector** Output overlap	**RoHS** CE FCC

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<u>Table of Contents</u>

Introduction

GeoBox G406s is dual channel 4k/60 fps Video Wall controller. It is simplified version of G406L with 1x HDMI 2.0 input, 1x HDMI 2.0 loop-out port for daisy chain connection and 2 synchronized HDMI outputs. Each output has independent image rotation/flip, scaling, cropping and color adjustment to allow great freedom in creating video wall with variable display scales and styles. It was designed for dual LCD video wall and companion with G408 for 3x3 video wall application. It is also good for high resolution dual projector edge blending application together with projector with warp and edge blending function.

It is pure hardware, standalone system and easy-of-use. All operations can be executed through IR remote controller, USB, RS232 or Ethernet. No additional PC or appropriate software is required in the setup.
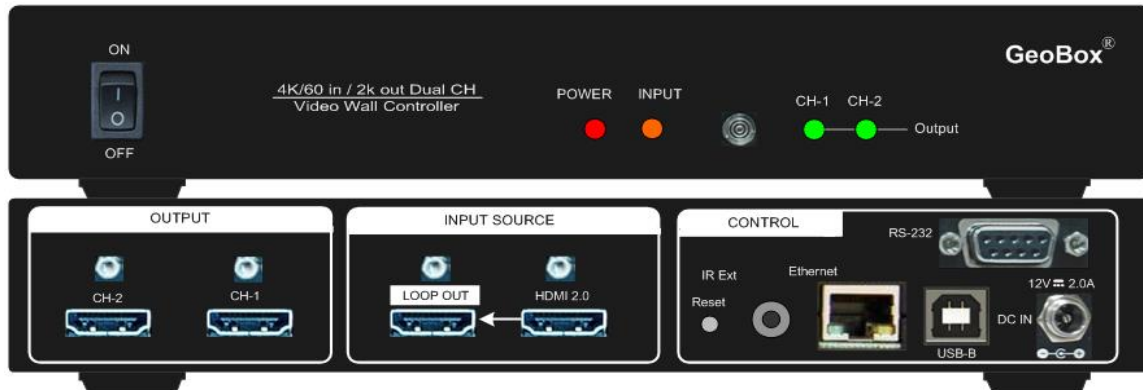
Features

✧ Each unit consists of below I/O ports.

- Input: 1x HDMI 2.0b, HDCP: 2.2/1.4

- Output: 2x HDMI up to 1080P & WUXGA

- 1x HDMI 2.0 loop out port from adjacent HDMI input port for daisy chain connection.

✧ Support up to 4096x2400@60Hz input source.

✧ Inputs support HDCP 1.4/2.2. Outputs support HDCP 1.4.

✧ Loop-through port for multiple units cascade in any scale display.

✧ Cropping ZOOM range up to 15x and pixel base position alignment up to +_ 900 pixels (based on signal source resolution) in H&V directions for flexible image capture, cropping, position alignment, bezel compensation & asymmetric video wall.

✧ Set overlapped output up to 900 pixels for projector edge blending application.

✧ Flexible aspect ratio adjustment in each edge up to +_ 900 pixels.

✧ Independent Image color adjustment in each channel.

✧ Independent image rotation and flip in each channel for variable landscape, portrait and irregular video wall.

✧ Selectable output resolution and programmable EDID to optimize video quality.

✧ Frame-Lock function to get perfect synchronization among output channels.

✧ Support HDR 10 high dynamic range color input signal.

✧ Support HDMI 2.0b 8/10/12-bits deep color mode.

✧ Easy setup via IR, USB, RS232 & Ethernet. No PC is required.

✧ Ready for 24/7 working environment.

Quick User Guide

Content in the packing box

- ➢ The G406s Video Wall Controller
- ➢ 1x RC-400 IR Remote Controller with battery
- ➢ 1x IR Extending Receiver with 1.8m cable
- ➢ 1x AC Main Power Cord.
- ➢ 1x DC 12V Power Supply Unit
- ➢ Mounting Rack with screw (Option)
- ➢ UHD Wall Manager PC Tool is available at www.vnstw.com.

How to Use IR Remote Controller

- ➢ IR remote controller has all the functions for the operation of G406s.
- ➢ IR receiver is on Front Panel. One 3.5ø mm audio connector for IR extender is located at Back Panel of G406s. 1.8m IR extension cable is equipped in the packing. User can add audio cable to extend the control distance up to 20 meters.

Audio connector for IR extender

Profile recall shortcut key

Power on/off

System Information

Operation Channel selection

OSD Menu operation keypads

Activate OSD Menu, press 5 seconds will execute OSD Lock function, press another 5 seconds will unlock OSD

Input source selection Default at HDMI input, no need to change

Output resolution selection

Video Wall Menu shortcut key

Video Wall Overlap setting shortcut key

Profile Save shortcut key

System Reset shortcut key

System Setup Procedures

1   Step 1 – Connecting The Inputs

Please connect signal source to HDMI input port. User can also apply DVI-D signal but DVI to HDMI adapter is required.

Raw signal Loop Out from HDMI input source

HDMI Input source connector
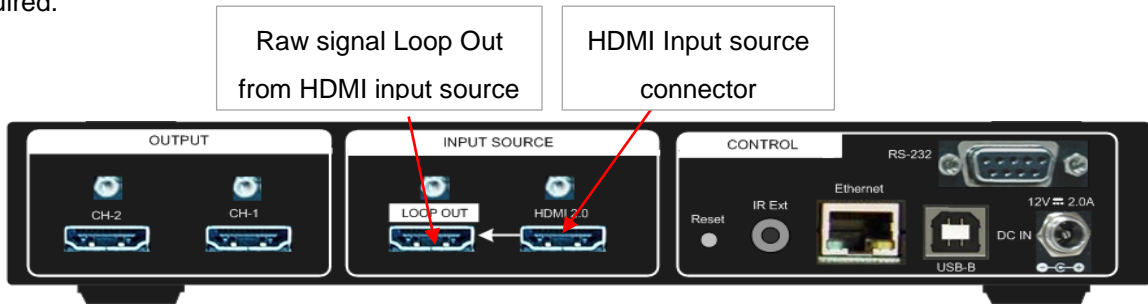
2   Step 2 – Connecting The Outputs

CH-1 / CH-2 HDMI Output Connectors (Max.
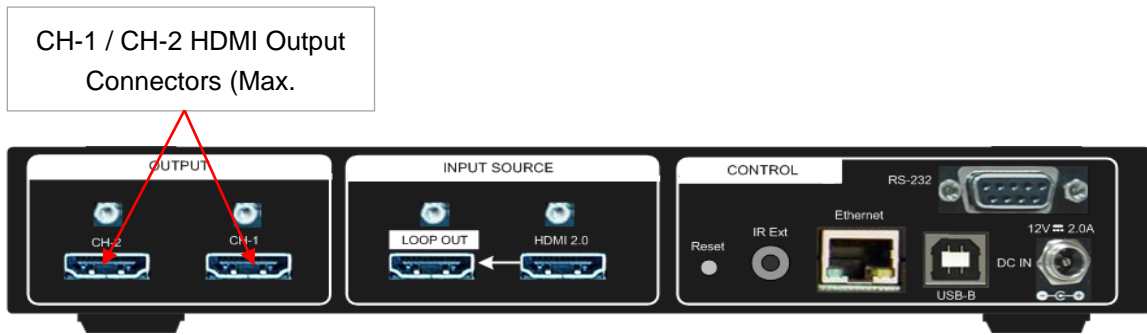
Actual system connection
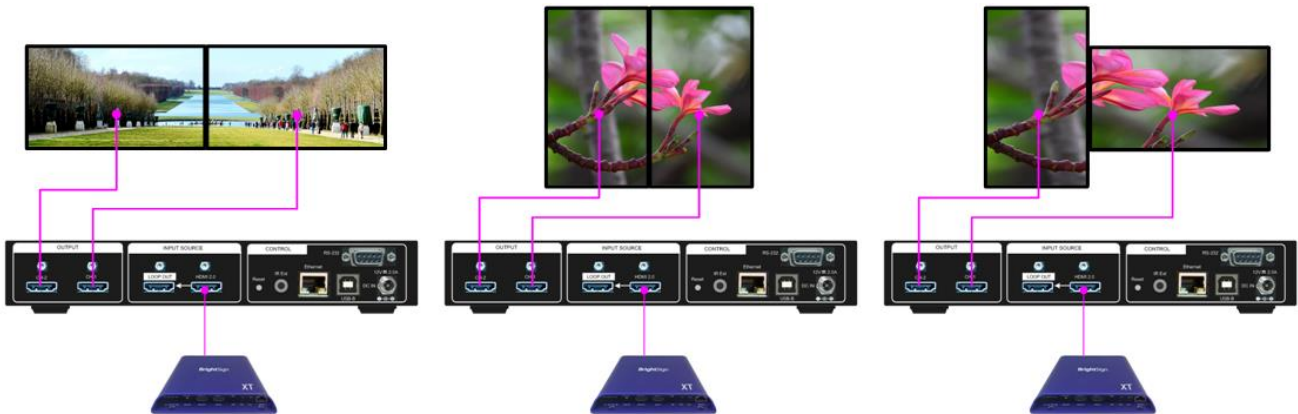
3   Step 3 – HDMI Loop Out for Multiple Unit Connection and monitoring

Unprocessed signal looped out from HDMI input source
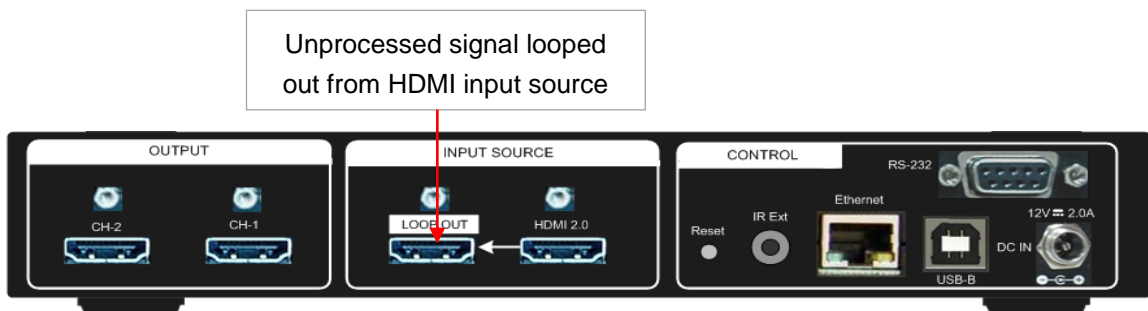
Loop out port provides the same raw signal from HDMI input. It supports up to 4k/2k @60Hz.

3.1   User can connect any Loop Out signal to any HDMI input port in the next processing module or other devices.

3.2   User can connect up to10 units of GeoBox through daisy chain connection. The daisy chain connection number is related to source resolution and the quality of HDMI connection cables—poor cable will have less connection number and good cable can connect more units in daisy chain connection.

Daisy chain connection with other GeoBox models

No specific output connection sequence is required.
Location can be set by Video Wall [PAN] menu.
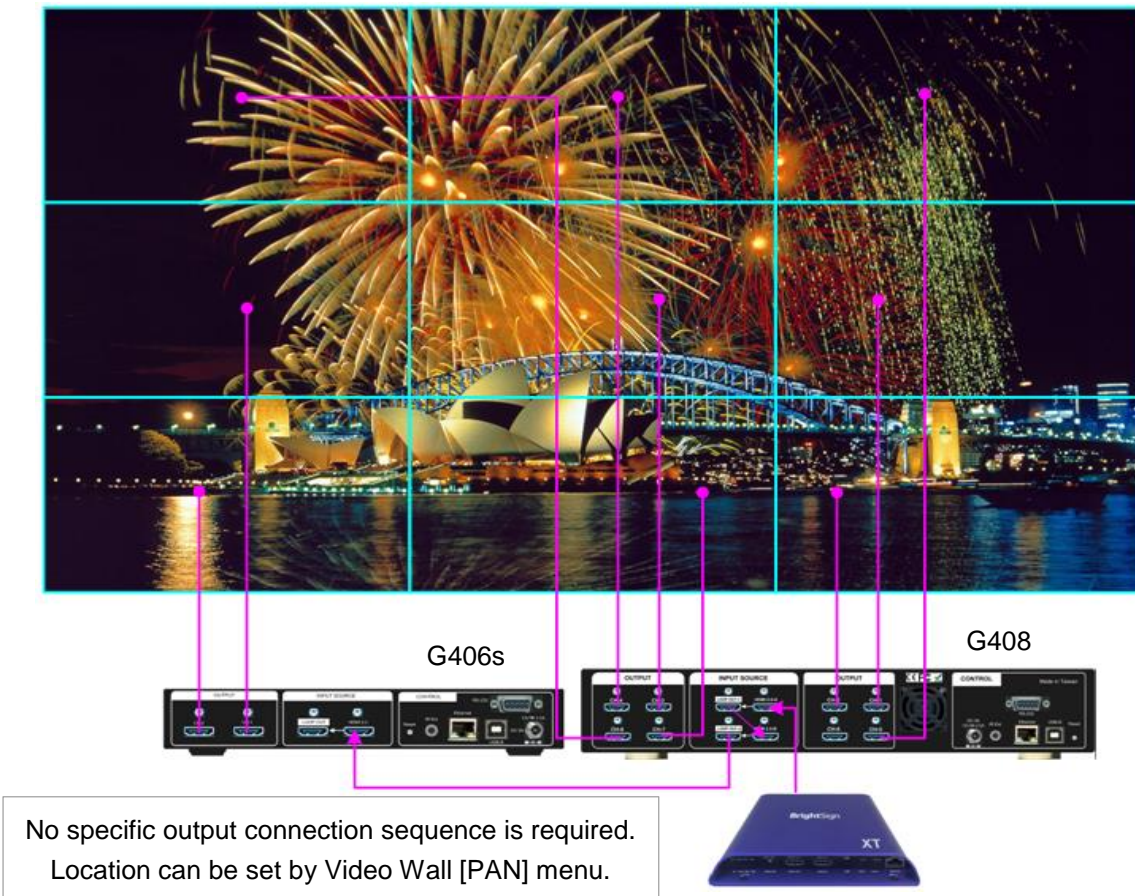
3.3 If Loop out port has not been used, user can use loop out port to connect with monitoring system in control room to see the status of the source signal.

4 Step 4 – System Connection and Power On

4.1 Poor quality HDMI cable and signal source will affect the connection distance and may cause signal noise.

4.2 To ensure all cables are connected correctly, it is recommended to use locking cables.

4.3 Complete video wall system should be connected to one power Distribution Box with proper grounding. To check whether floating voltage exists between HDMI cable and G406s housing. Power on the system after finishing all connections to avoid system damage by floating voltage among devices.

4.4 When G406s power is switched on, the booting time is about 19 seconds and the Input & Output LEDs on front panel will stay "Lighted" while G406s has correct input source and output monitor connections.

5 Step 5 - System setting: Box ID, RS232, Ethernet

5.1 The system setting for Box ID, RS232 and Ethernet can be set through CH-1 or CH-2. Please make sure to connect monitor to the channel to see the OSD and execute system setting.

5.2 User can control G406s directly from Ethernet. The default static IP address is 192.168.0.100. User can change the IP address for further operation.

5.3 When multiple units are used in the same environment, user can set different IP address or Box ID for each unit so that user can execute independent control to each GeoBox without interference.

5.4 Box ID range is from #0 - #99. When user uses remote controller to control the system through OSD, the maximum ID setting for remote controller is #0 - #9.

5.5 Remote Controller

➢ User can control individual GeoBox through below method when all boxes or IR extender receivers are installed together so that all units can receive the same IR signal.

✓ To Press 851 number keys on remote controller will lock all other GeoBox OSD menu except ID #1 GeoBox. User can see flashing LED on the Front Panel for the units with OSD locked.

✓ To Press 853 will only unlock ID # 3 GeoBox for further OSD operation.

✓ Press 850 will unlock all GeoBox OSD menu. Remote controller can access to all GeoBox simultaneously.

5.6 RS232 setting

➢ Able to select RS232 baud rate between 9600 & 115200 for different controller system.

5.7 Ethernet

➢ User can connect all GeoBox and PC in one Ethernet (or WiFi) Router (or switch hub) LAN ports and set at DHCP or different Static IP address for each Box.

➢ User can check IP address under [Ethernet] OSD menu. Then connect GeoBox through Chrome or Explorer by IP address to open WebGui for further operation.

> ➢   UHDWall Manager PC tool is also provided to control each GeoBox independently through USB or Ethernet connection.
> ➢   If user connects PC to the same Router and set Router with DHCP mode, PC can access to GeoBox directly. If PC is not connected with the same Router, user needs to set PC with the same Domain Segment as GeoBox for Ethernet connection.

6   Step 6 - Input Source / Output Resolution selection & LED Indicators

Channel selection

Input Source selection
Default is HDMI input, no
need to change

Output resolution selection

RC-400
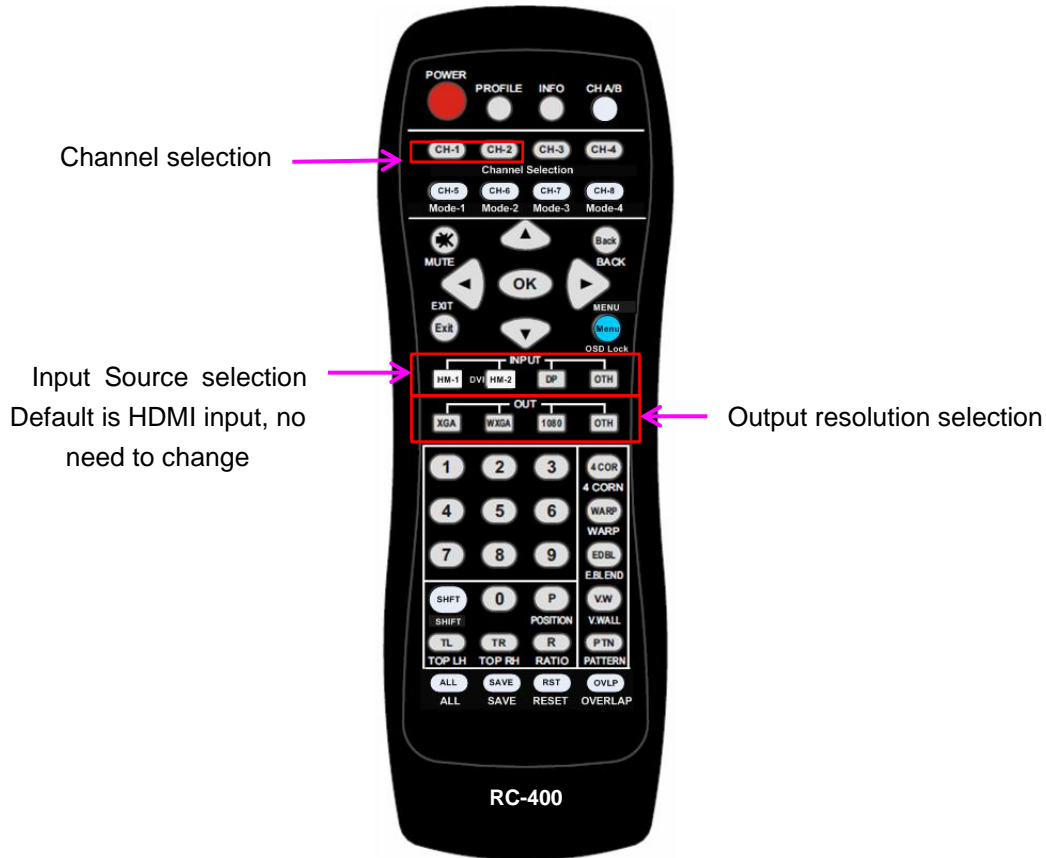
Power LED indicator.
Red: power connected and need to
open by remote controller, Green:
Power on. Flashing: OSD Lock

If Input Source is
connected, Green
LED will light up

If Monitor is connected,
Green LED will light up

> ➢   G406s has only one HDMI input port. System default input is HDMI. No need to change.
> ➢   The output resolution selection will apply to two output channels at the same time.
> ➢   Output resolution list: 1920x1200, 1920x1080, 1280x720, 1360x768, 1280x800, 1024x768, 1080p@50, 1080p@30, 1080p@24, Deep Color on/off.
> ➢   User can select output resolution by remote controller. When press [OTH] key, the image will blink and switch resolution among 1920x1200, 1280x720 and 1360x768 continuously. Please confirm the final result by INFO key on top of remote controller.

- User can also get into OSD menu to do output resolution settings: [Image Properties]→ [Output Mode]→ Select output resolution
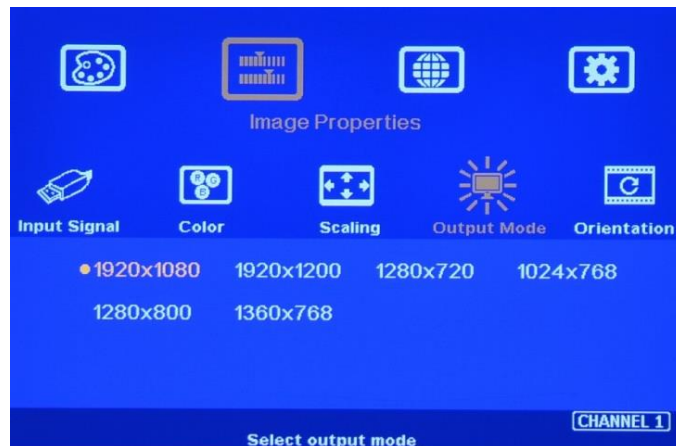
- Input green LED will light up when G406s has detected input signal.
- Output Green LED will light up when G406s has detected the monitor in each output.
- Power LED:
  - ✓ Red: Power connected and has been turned off by remote controller. Need to turn on by remote controller again.
  - ✓ Green: Power on
  - ✓ Green flashing at 0.5" interval: OSD lock through Menu key or Lock through remote controller 85x Box ID # control key. Hold Menu key for 5" to unlock if the system is locked by OSD Menu key. Press 850 on remote controller number keys if the system is locked by Box ID 85x key.
- All default output resolution is 60Hz, RGB 4:4:4 format and progressive. When input source is 50Hz, please select the output resolution at 50Hz to reduce the artifact in frame rate conversion.
- Input resolution is determined by signal source. G406s can support non-VESA standard input timing.
- User can click [Info] key to get system information and see input & output signal resolution.
- The input refresh rate should be the same as output refresh rate so that the system can implement Frame Lock to synchronize all the outputs. If the input source is 50Hz with 60Hz output, then it is possible to see some lag among the displays.

7   Step 7 – Conventional Video Wall Settings

Press Remote Controller to activate [Video Wall] menu. WebGui and UHDWall Manager PC tool are available for Ethernet configuration and video wall settings.

7.1   [Zoom]

Use [Zoom] to split the display in horizontal and vertical directions. GeoBox will cut the image into different sections. Maximum split image is 15 in both horizontal and vertical directions.
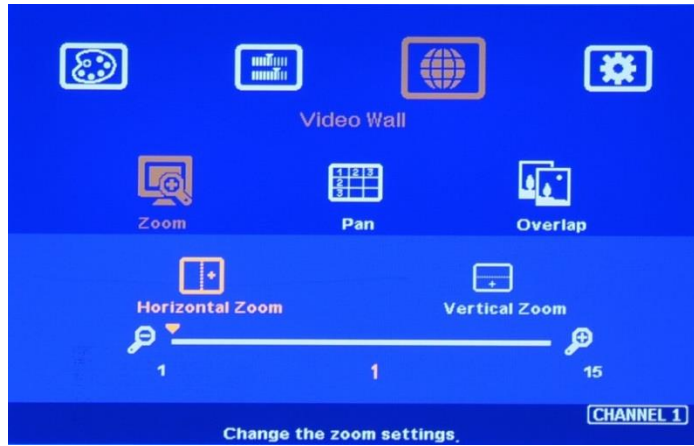
For 3x1 video wall displays

Horizontal Zoom= 3, Vertical Zoom = 1
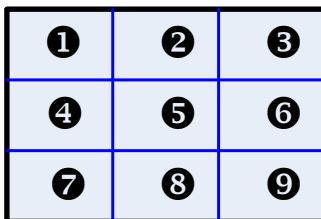
For 3x3 video wall displays

Horizontal Zoom = 3, Vertical Zoom =3

7.2   [Pan]

[Pan] will assign the location of each split image in the display in both horizontal and vertical directions.

Horizontal direction is counted from Left to Right and Vertical direction is counted from Top to Bottom.
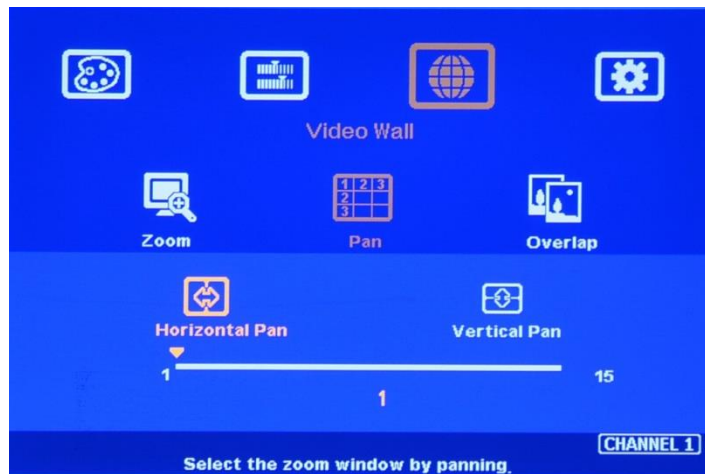
In the case of 3x3 video wall display, Pan settings are as below:
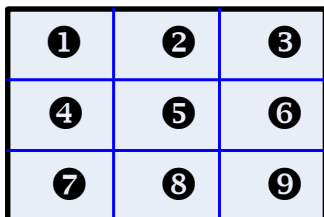
For No. ❸ monitor: *For No. ❻ monitor:*

Horizontal Pan = 3   *Horizontal Pan = 3*

Vertical Pan = 1   *Vertical Pan = 2*

7.3   [Overlap] – Bezel Compensation and Position Alignment

[Overlap] adjustment changes the cropping area of the image so that image position in each monitor will

be shifted. It can compensate Bezel Size of the monitor and correct misalignment in monitor installation.

If overlap value is decreased, each monitor will crop less image area and cause [zoom in] (enlarged) effect. If overlap value is increased, each monitor will crop more image area and cause [zoom out] (shrunk) effect. User can also use this function to shift the whole image location for irregular video wall and set overlap area for projector edge blending application.
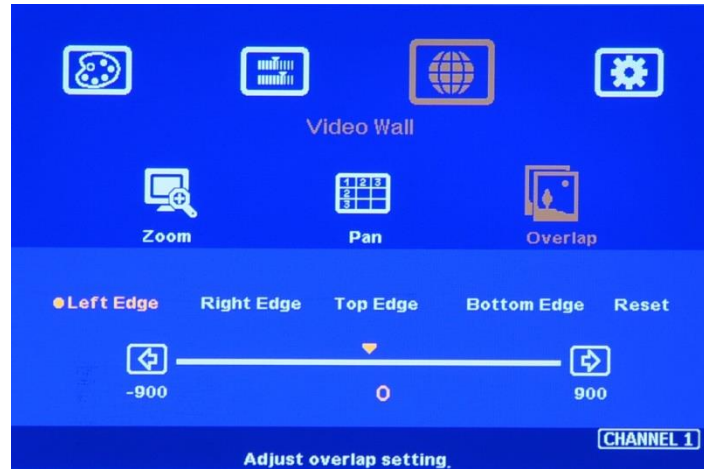
> ➢   Maximum [Overlap] adjustment value is +_900 pixels in all directions.
> ➢   User can see the image and select Edge to adjust [Overlap] value for Bezel compensation.
> ➢   [Overlap] adjustment can also compensate the position mis-alignment while monitor installation.
> ➢   User can reduce [Overlap] value to stretch the image outside video wall (some image will be missing) or draw image inside video wall with Black blanking area at the edge through increase [Overlap] value. This function can adjust the aspect ratio of the content to match required aspect ratio of the video wall. Please see more details in [Flexible Aspect Ratio Adjustment] section.

7.4   3x3 Video wall Setup

User can use one G408+ one G406s to create 3x3 video wall as below. Signal source needs to be fed into all processors through loop out daisy chain connection. All the rest setup is the same as described above.

No specific connection sequence is required.
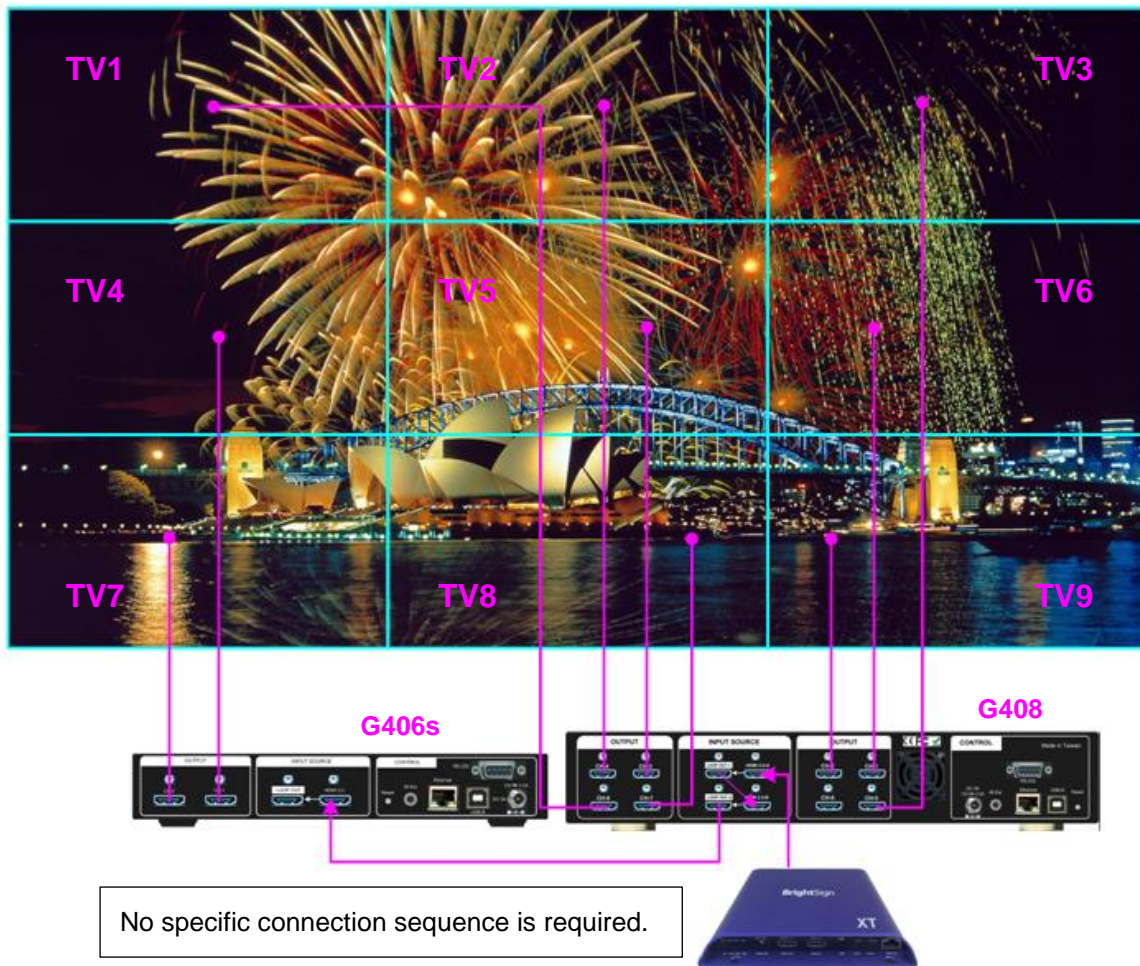
8   Bezel Compensation

8.1   Video Wall [Overlap] function can adjust the cropping area resulting image position shift.

8.2   User can see the image and reduce [Overlap] value to enlarge the image to the center line between two bezels and achieve monitor bezel compensation.

8.3   User can also calculate the pixels number for bezel compensation based on the video wall dimension and bezel size. If the video wall active display area is 3600mm in width and the input source is 3840, then the pixel number for each centimeter is 3840/3600=1.067 pixel/mm. If the bezel size (or gap) between two monitors active display areas is 24mm, then user can decrease Overlap value 1.067*24/2=12.8 (-13) pixels to do bezel compensation for that edge (to enlarge the image 13 pixels at that edge). The edge in adjacent monitor shall apply the same Overlap number (-13), then the bezel can be well compensated.

8.4   User can apply the same method to correct the position mis-alignment in monitor installation or set image position for irregular video wall.

9   Irregular / Asymmetric Video Wall Settings

9.1   Introduction

➢   Asymmetric video wall can be created by rotating monitor installation direction or position. User can crop different area image for each monitor, rotate image direction and adjust image position through G406s to achieve it.

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Note: Image 90/270 rotation is only available when input resolution is under 4k/2k @30Hz.

➢ User can use monitors with different dimensions, bezel size and resolution as display devices. No data base for monitor is required and it allows user to have installation position deviation. All of these factors can be corrected by GeoBox video wall settings.

➢ G406s can only rotate the image at 90/180/270 degrees. The monitors need to be installed at landscape or portrait position. If users want to install monitor at other rotation angle, G-403 model should be used.

9.2   Wind-Mill Asymmetric Video Wall Setup Procedures

➢ System connection

User can use two G406s for below asymmetric video wall with 4 monitors.
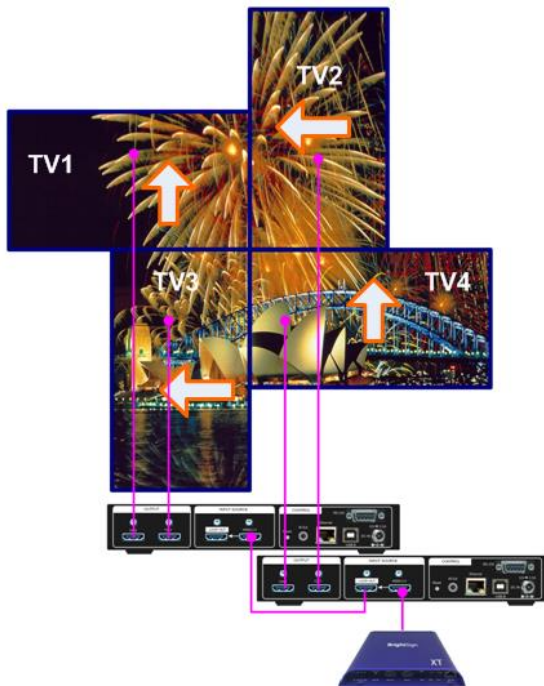
➢ Monitor can be with different bezel size, screen dimensions, and resolution.

➢ All monitors can be installed at 90 / 180 / 270 degree display direction.

➢ Each monitor can be connected with any output port.

➢ User can select any signal source to display on video wall.

➢ **Apply test pattern from signal source**

Below test pattern should be applied as signal source for easy setup. Please download from below website: http://www.vnstw.com/otherfile/14/file249-1-20180319194450-84.png

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Test pattern downloaded from VNS website

Test pattern applied to video wall
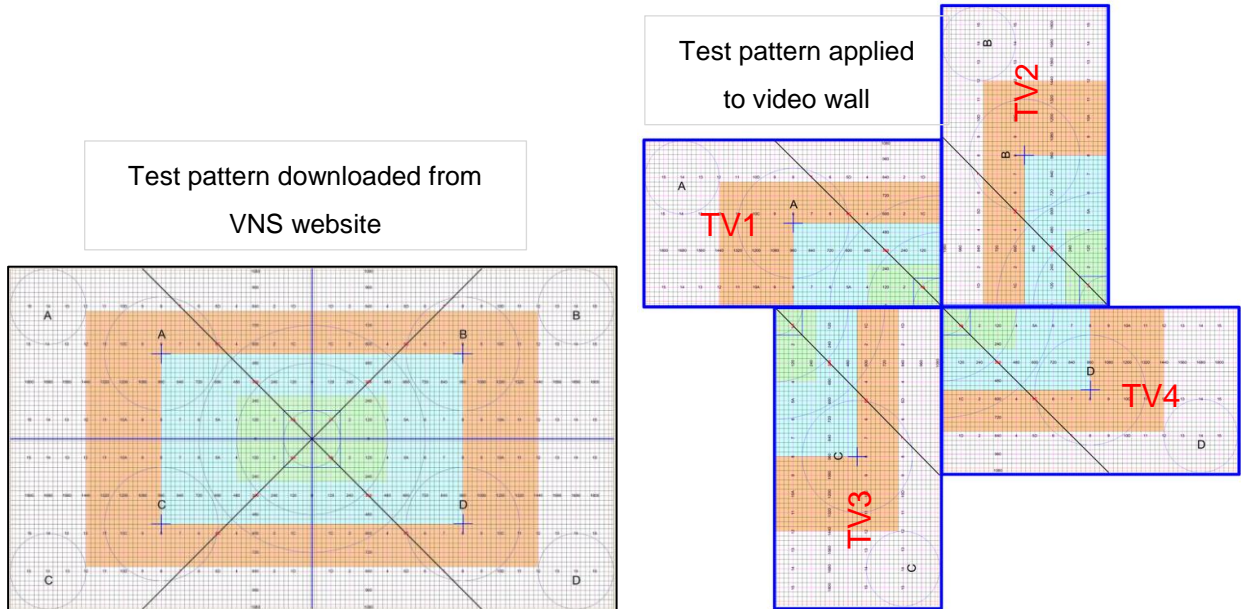
> **Split the content by [Zoom]**

  ✓ Set [Horizontal Zoom] = 2, [Vertical Zoom] = 2 in all channels.

  ✓ If TV2 & TV3 dimension is smaller, user can set TV2 & TV3 [Horizontal Zoom]=4 and [Horizontal Pan]: TV2=3, TV3=2, so that user can reduce the image position adjustment range.

> **Assign image location by [Pan]**

  ✓ Set [Horizontal Pan]: TV1=1, TV2=2, TV3=1, TV4=2

  ✓ Set [Vertical Pan]: TV1=1, TV2=1, TV3=2, TV4=2

> **Image rotation**
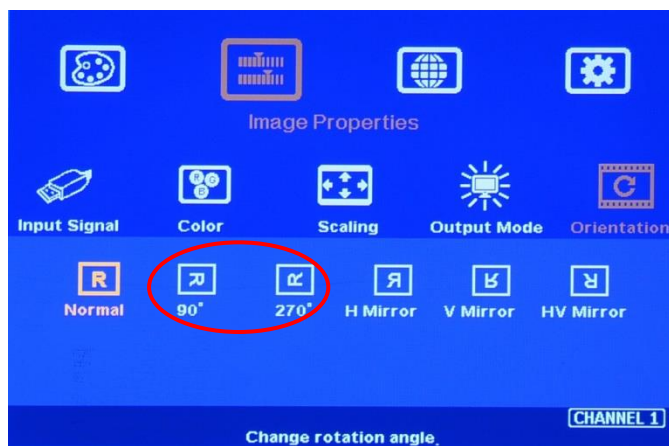
Use [Orientation] menu to rotate images in TV2 and TV3 to display the same image direction.

Before TV2 & TV3 image 90 degrees rotation.

After TV2 & TV3 image 90 degrees rotation.

Video wall center line

Max. video wall display borders
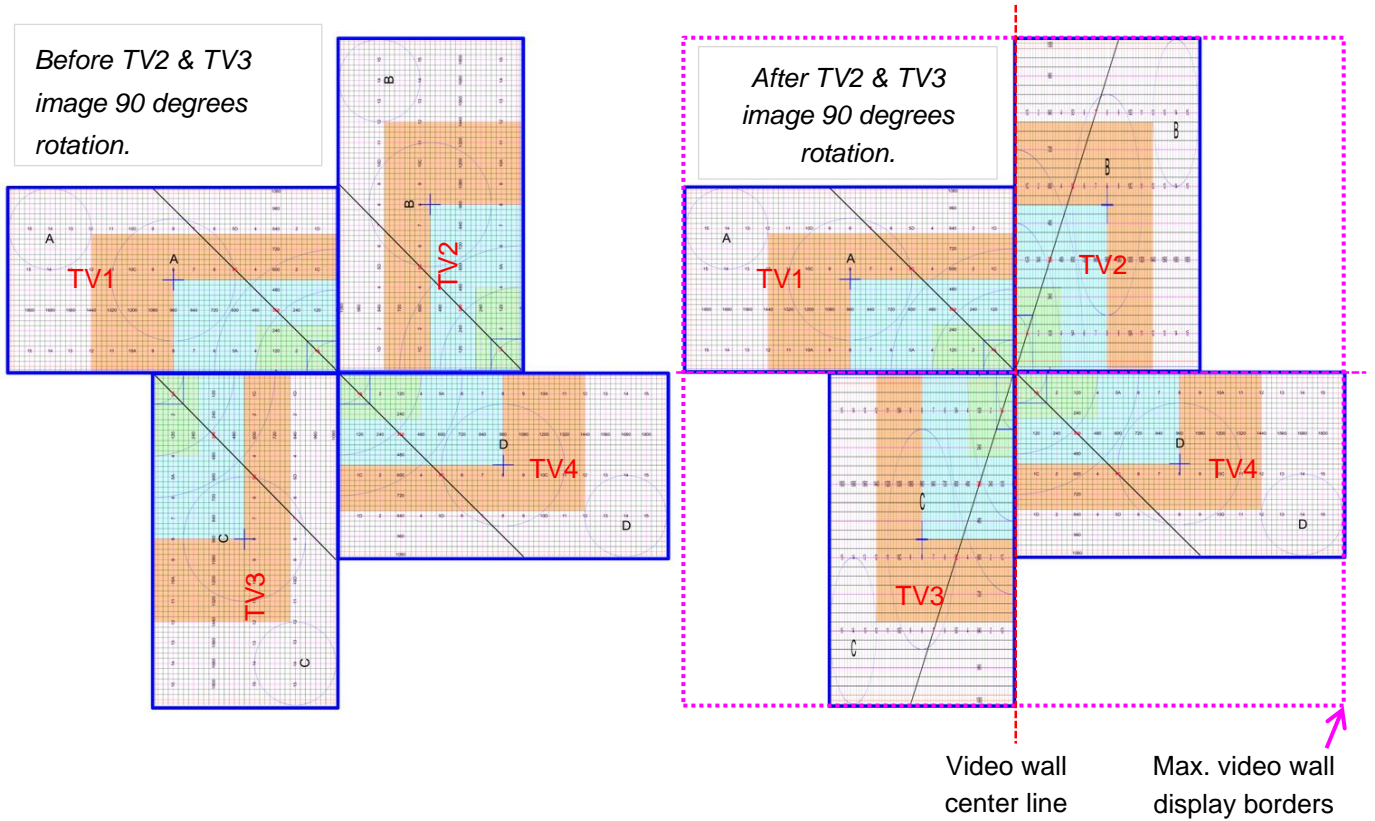
➢ **Set standard position as reference in horizontal and vertical directions**

✓ User should determine Horizontal & Vertical image sizes and reference position so that all monitors have criteria for image position adjustment.

✓ Usually, image display borders are the maximum active display borders in the video wall.

✓ In the above example, the horizontal borders are decided by TV1 & TV4. Vertical borders are decided by TV2 & TV3.

✓ User can decide video wall display center through test pattern. It can be asymmetric.

➢ **Adjust image position by [Overlap] menu to finish video wall settings**
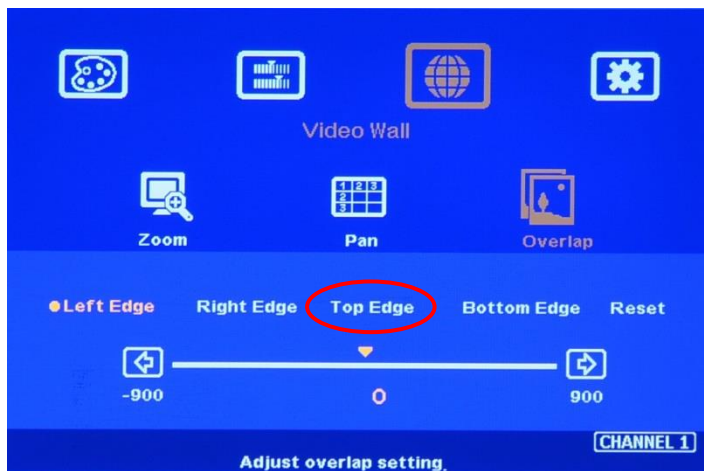
1	[Overlap] is to change image capture range.
2	Decrease value in Top Edge of TV1 will stretch top edge of TV1 to match image position of TV2.
3	For TV2 adjustment, user needs to adjust Overlap value based on the actual image direction but not based on OSD direction. In this example, user needs to stretch Right Edge to match TV4.

After decrease TV1 [Overlap] value at Top Edge

After decrease TV2 [Overlap] value at Right Edge

After decrease TV3 [Overlap] value at Left Edge

After decrease TV4 [Overlap] value at Bottom Edge, then it is finished.

Complete setup is finished.
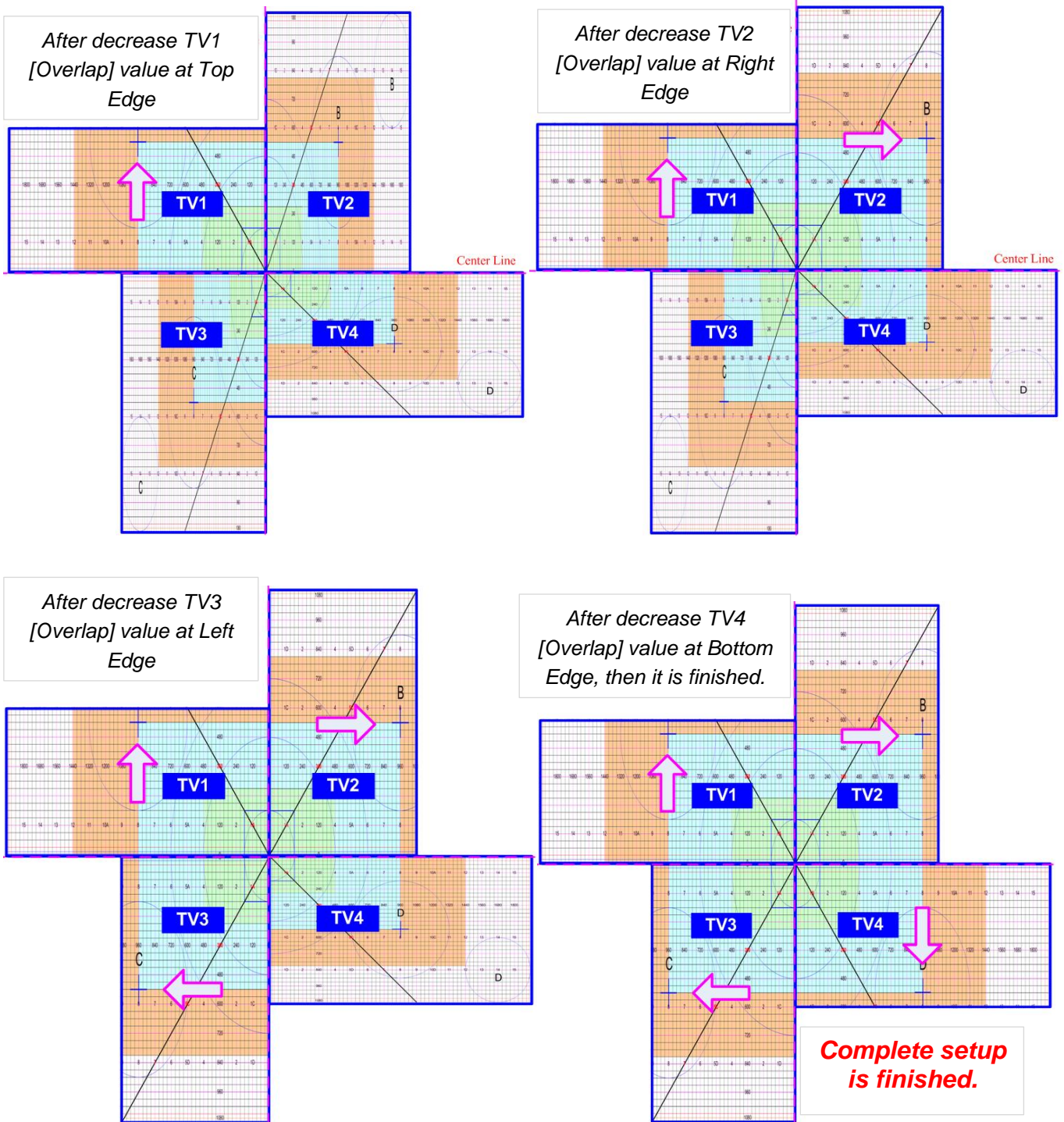
9.3   Square Asymmetric Video Wall Setup Procedures

User can use two G406s for square asymmetric video wall. Source signal should be applied to two G406s through loop out port by daisy chain connection. No special connection sequence is required. The LCD can be installed at landscape or portrait direction.

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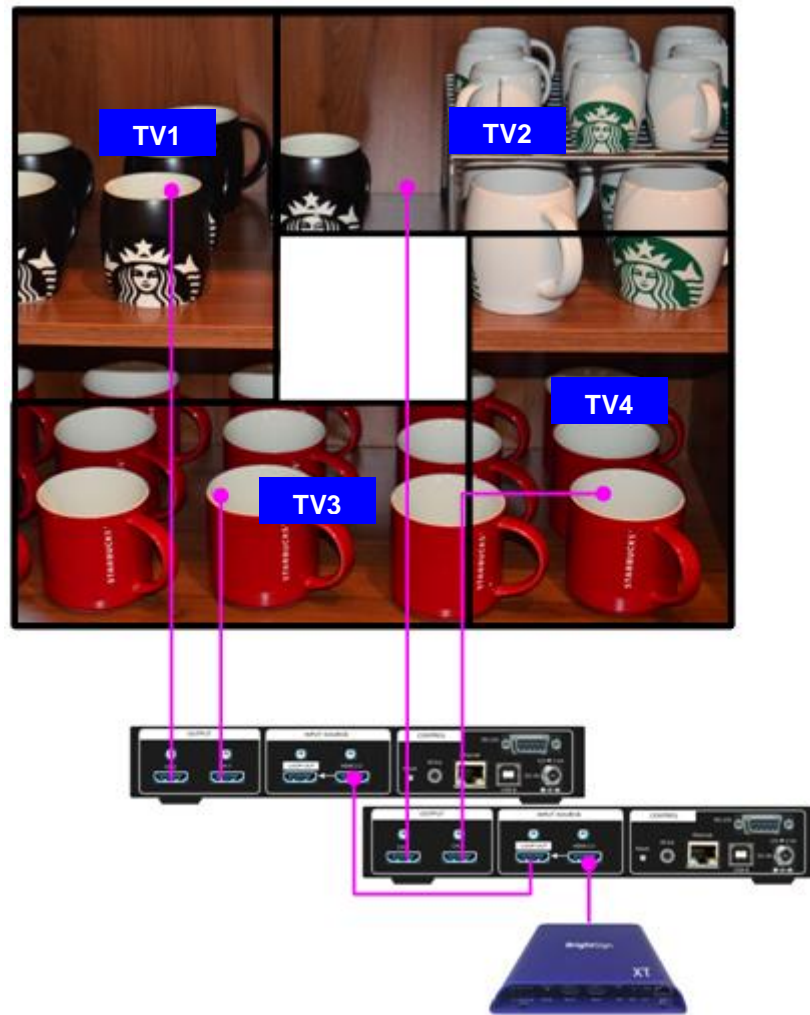
➢   Step 1: Video Wall settings for all channels

[Zoom]: H=2, V=2

[Pan]: TV1: H=1, V=1, TV2: H=2, V=1, TV3: H=1, V=2, TV4: H=2, V=2

➢   Step 2: Apply Test Pattern and Rotate TV1 & TV4 images at 90 degrees

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Original Image after applied test pattern   *Image after image rotation in TV1 & TV4*
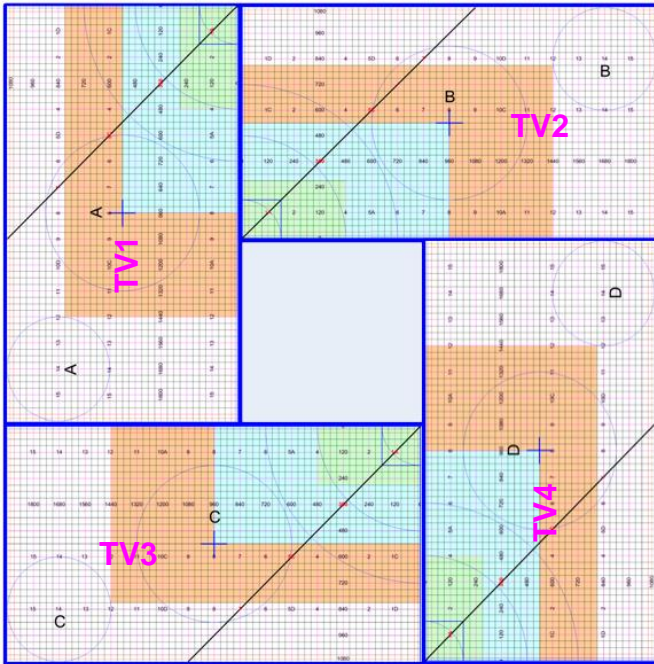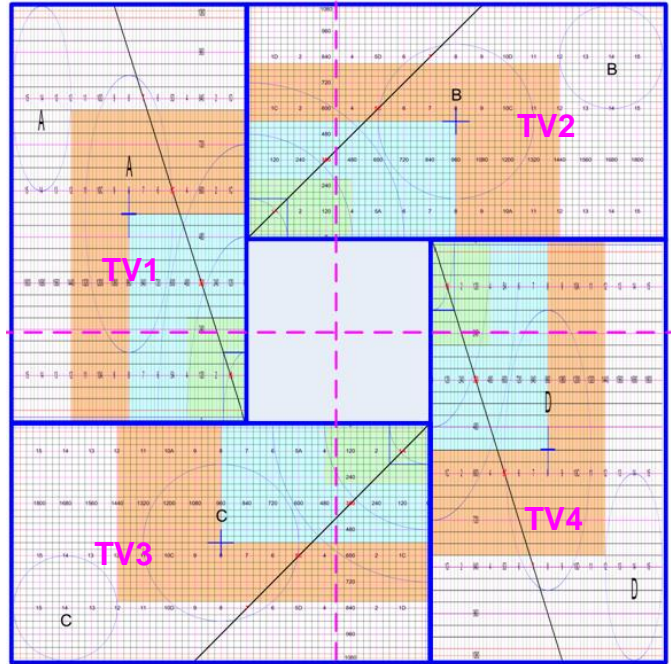
> ➢ Step 3: Determined image center, marked with paper tape.
> ➢ Step 4: Set standard Position Reference in horizontal and vertical directions
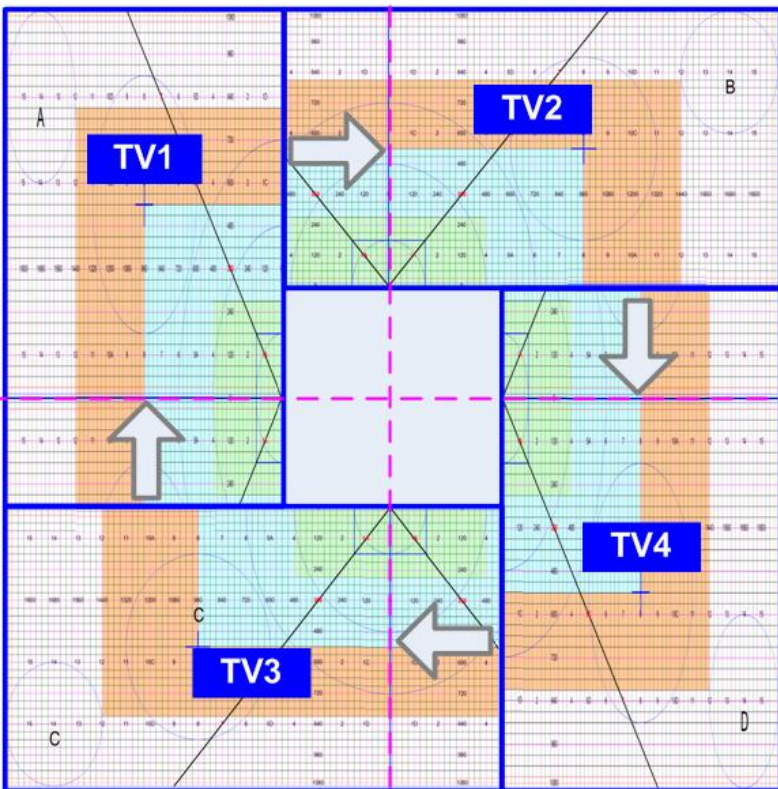
✓ Horizontal Position Reference is determined by TV2 & TV3 and Vertical Position Reference is determined by TV1 & TV4.

✓ Once user can line up the image center to Video wall center H&V lines, it can serve as Position Reference lines.

✓ Left figure shows the result after setting Horizontal and Vertical Position Reference (Move TV1 center line Up, TV2 center line to Right, TV3 center line to Left and TV4 center line Down — please see the arrow direction)

TV1: increase [Overlap] value in Bottom Edge to move Horizontal center line up to video wall center

TV2: increase [Overlap] value in Left Edge to move Vertical center line right to video wall center.

TV3: increase [Overlap] value in Right Edge to move Vertical center line left to video wall center.

TV4: increase [Overlap] value in Top Edge to move Horizontal center line down to video wall center.

> ➢ Step 5: Individual monitor position adjustment based on Horizontal and Vertical Position Reference resulting from Step 4.
>
> > TV1: increase [Overlap] value in Left Edge and decrease [Overlap] value in Right Edge to align Vertical lines to match TV3
> >
> > TV2: increase [Overlap] value in Top Edge and decrease [Overlap] value in Bottom Edge to align Horizontal lines to match TV1
> >
> > TV3: increase [Overlap] value in Bottom Edge and decrease [Overlap] value in Top Edge to align Horizontal lines to match TV4
> >
> > TV4: increase [Overlap] value in Right Edge and decrease [Overlap] value in Left Edge to align Vertical lines to match TV2
>
> ➢ Step 6: After final image positioning, all horizontal and vertical pattern can be matched together. The setup procedure is finished.

1st alignment to set Position Reference (Set center lines)

2nd alignment to finish all position alignments
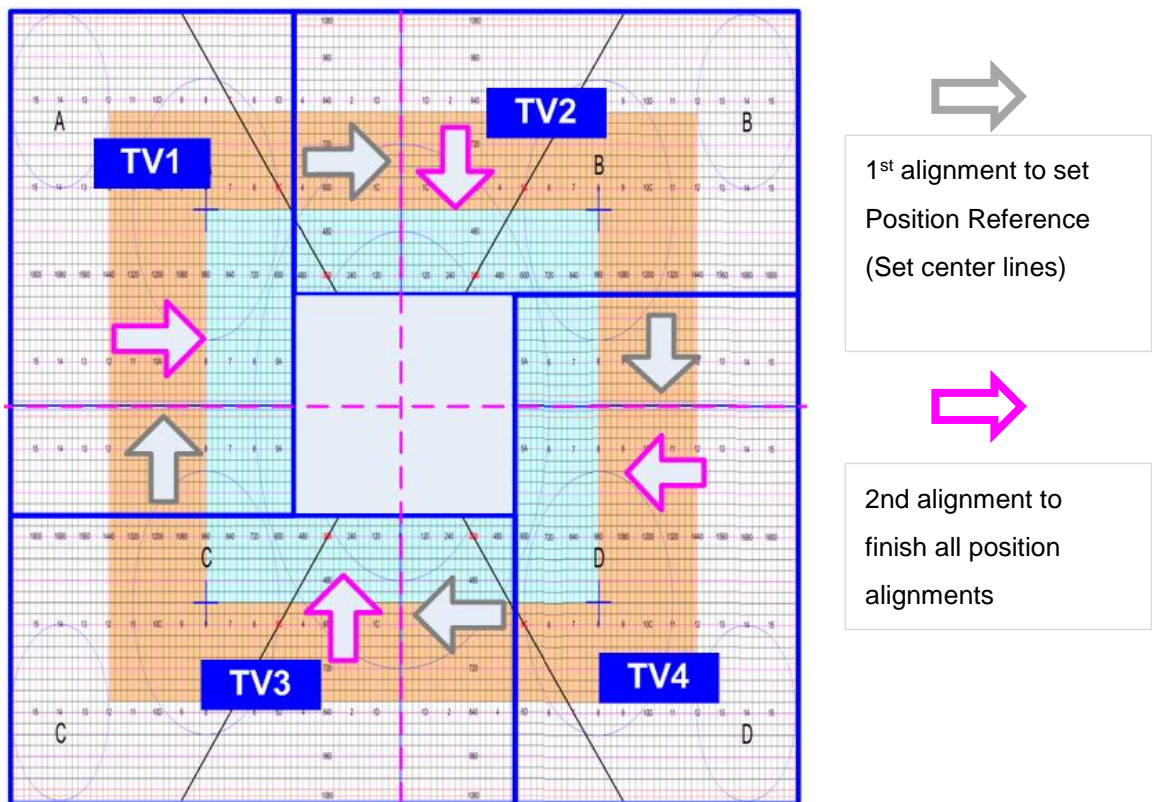
> ➢ Aspect Ratio and image distortion
> > ✓ If the source content aspect ratio is not 1:1 in this Video Wall setting, the final image will have some distortion.
> > ✓ User can adjust source resolution and content aspect ratio to fix this issue
> > > ■ Set display EDID with 2160*2160 with same as the aspect ratio of Video Wall.
> > > ■ Use PC as signal source with 2160*2160 output resolution and apply content with 1:1 aspect ratio. Customized output resolution setting in PC may be required.
> > ✓ If source resolution and content doesn't match the above conditions, user can adjust the display aspect ratio in video wall settings to reduce image distortion but it may have below issues:
> > > ■ With some blanking area at some borders.

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- Display with full screen but some image will be stretched outside display borders and can't be seen.

✓ If user wants to change video wall display image aspect ratio, user needs to adjust Position Reference Line first. In this example, if user wants to stretch horizontal image, user needs to adjust TV3 and TV2 horizontal scaling factor first, then to align TV1 and TV4 to match TV3 and TV2 test pattern.

✓ User can set different display profiles and save into [Index] under [Profile] OSD menu and recall through remote controller, RS232 or Ethernet. 5 Profiles settings can be stored in the system.

10 Split Image for projector edge blending application

✓ G406s can split 4k/2k 60Hz signal source and set overlap pixels for high resolution projector edge blending application.

✓ The projector shall have geometry alignment and edge blending functions.

✓ Different signal sources with different input resolution can be used and no need to use PC.

✓ Through multiple G406s daisy chain connection, user can set up large scale edge blending system.

✓ User can implement image rotation for edge blending system with projectors at portrait position.

✓ Flexible aspect ratio can be achieved.

✓ Multiple G406s cascade is possible.

11 Flexible Aspect Ratio Adjustment

User can use Video Wall [Overlap] function to change the aspect ratio of the image with black borders or to stretch the image in specific direction to compensate the aspect ratio difference between video wall and the

Activate [Overlap] under [Video Wall] menu

1. User can select the channel and the edge required, then adjust Overlap value to see aspect ratio change.

2. The image position shift range is +_900
pixels in each edge.

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content. The Maximum adjustment range is 900 pixels in each edge.
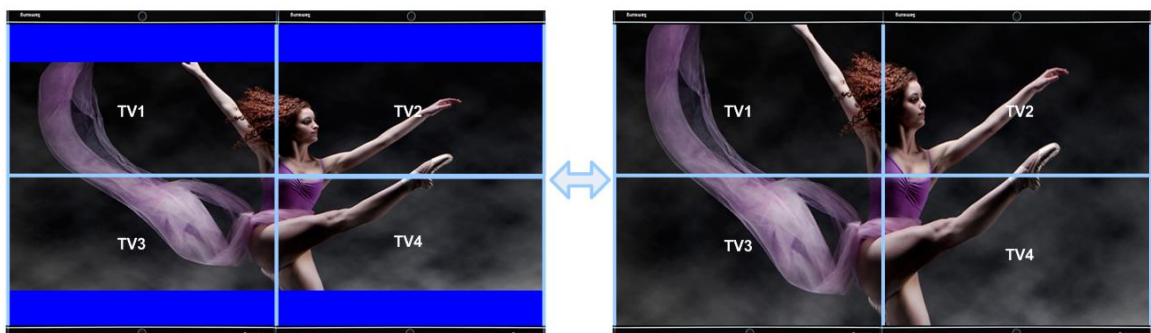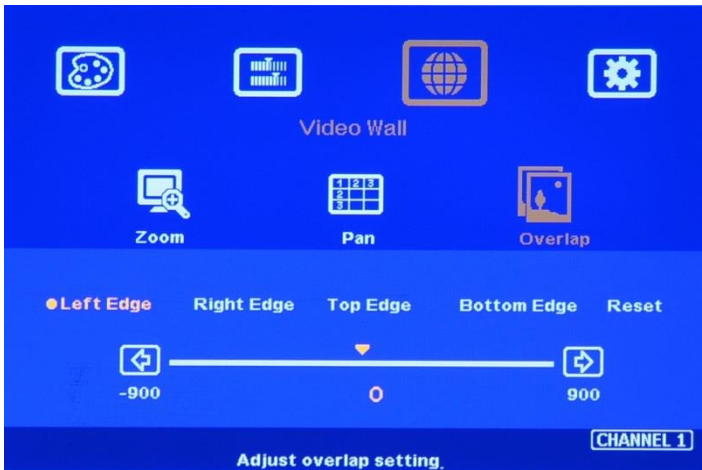
1. The adjustment range 900 pixels is calculated based on signal source resolution.

2. When user adjusts Overlap value in one monitor, it will also change the scaling factor. User needs to adjust the Overlap value in other monitors in the video wall to let all monitors has the same scaling factor.

3. Please apply the right input signal and resolution during aspect ratio adjustment. The overlap value will automatically change while changing input resolution. If user sets the overlap value in 1080p input resolution and set overlap value more than 450 and change the input resolution to 4k/2k, the overlap

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value will change to more than 900 pixels. It is possible the final image position will not be at desired location under this condition.

12 Step 8 – Save System Settings through Remote Controller

➢ After finishing system settings, user can save the setting by OSD menu through [Menu]→ [Options]→ [Setting]→ [Profile]→ [Save]→ [Index 1-5].

➢ [Save] Profile will take effect for two channels at the same time.

➢ User can recall (load) the setting through IR remote controller.

➢ Five different display settings can be saved to [Profile]. The data stored in Profile include EDID setting, input source, output resolution, color settings and all user customized settings.
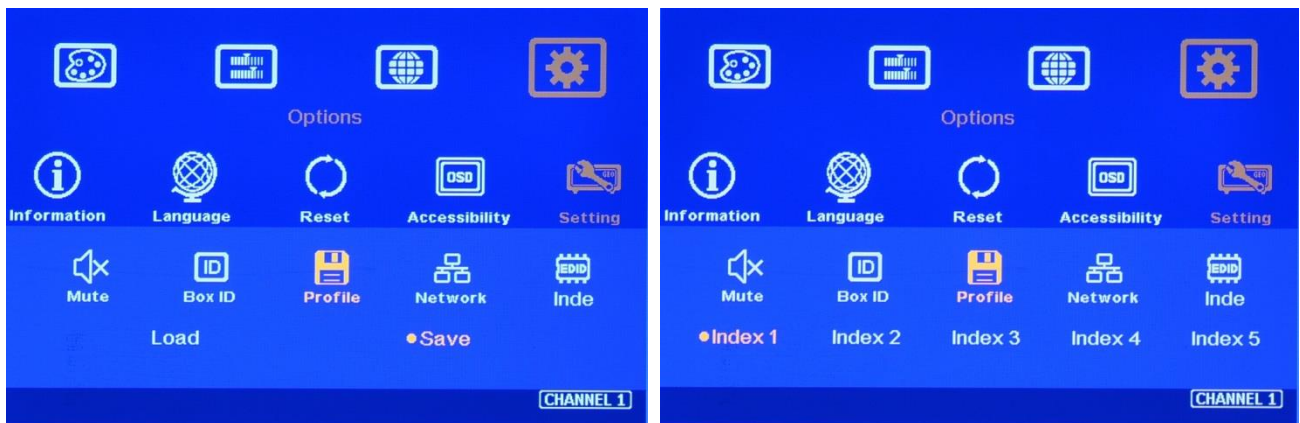
➢ When user power off the system, G406s will save user setting without loss even the setting is not saved into Profile Index, unless someone to change the setting.

➢ When system has been reset from OSD menu or update new Firmware, Profile data will still be kept inside G406s.

13 Load Profile Index through Remote controller

➢ Press [Profile] shortcut key→ Select number keys 1-5 directly to recall Index 1 – Index 5.

➢ Profile Load will apply to two channels at the same time.

14 Important notice for video wall settings

14.1   Image distortion and aspect ratio issues

If the content aspect ratio is different from video wall, it will cause image distortion. User can adjust aspect ratio through [Overlap] settings. However, user will have two choices:

➢ Full screen display but some content will be drawn outside border.

➢ Draw the image into video wall and keep some blanking borders at some edges.

14.2   If the signal is from PC, user can set customized EDID in GeoBox to let PC output the right output resolution. Some PC may not follow GeoBox EDID resolution and require customized output setting from display card.

14.3   User can try to change EDID resolution to another resolution, wait for response from PC, then set to the required EDID resolution again. Some PC will output desired resolution after this process.

14.4   User can set different video wall settings in each channel and crop different area for the display. In combination with ZOOM, PAN and OVERLAP settings, user can crop any location of the image for each LCD, no matter it is in landscape or portrait position.

14.5   Pay attention to image flip and rotation limitations in input resolution. Image 90/270 degree rotation function is only available up to 4k/2k @30Hz.

14.6   Some media players will output 4k/2k 60Hz resolution when it is powered on each time but not follow the EDID settings. It will cause abnormal display in the video wall if the monitor is 90/270 degree rotated because G406s can't support image rotation under 4k/2k 60Hz.

15 Easy Setting In Multiple Unit Application

15.1   Setup by Remote Controller

1.1.1   If multiple units are used, user can set different [Box ID] (#1 - #99) to each GeoBox in control system. For IR control, the number range is #1 - #9.

1.1.2   User can control individual GeoBox through below method when all boxes or IR extender receivers are installed together.

- ✓   Press 851 number key on remote controller will lock all other GeoBox OSD menu except ID #1 G-406. User can see flashing LED on the Front Panel for the units with OSD locked.
- ✓   Press 853 will only unlock ID # 3 GeoBox for further OSD operation.
- ✓   Press 850 will unlock all GeoBox OSD menu. Remote controller can access to all box simultaneously.

15.2   Setup by Ethernet

User can connect all G406s in one Ethernet (or WiFi) Router (or switch hub) LAN ports and set different Static IP address for each Box, then use WebGui virtual keys or UHDWall Manager PC tool to control each G406s independently. If user connects PC to the same Router and set Router with DHCP mode, PC can access to G406s directly. If PC is not connected with the same Router, user needs to set PC with the same Domain Segment as G406s for Ethernet connection. Web Server function is also available, Please contact us for more details.

15.2.1 WebGui

- ✓   WebGui is embedded inside G406s. Once user connects G406s with PC through Ethernet, user can access WebGui and execute all operation similar to OSD menu through Virtual Keys and OSD Menu. No PC tool is required.
- ✓   The connection can go through Ethernet router LAN port, WiFi Router or Cross Over Cab 5/6 cable. User can set each unit of G406s with different static IP address in the same domain, then open Google Chrome or Microsoft Explorer with IP address to access each unit of G406s for independent operation. There is no limitation in the number of G406s that can be controller at the same time.
- ✓   User can turn on/off the system through WebGui and see the status through power indicator.
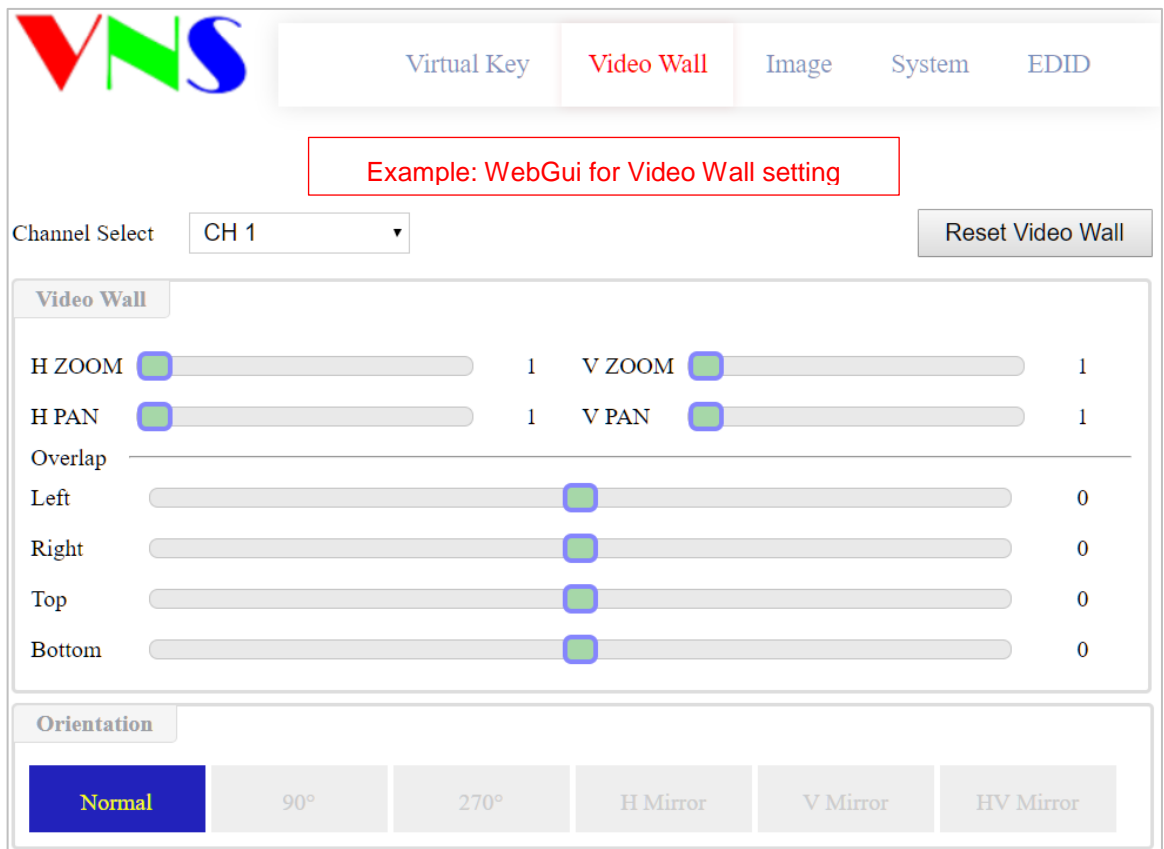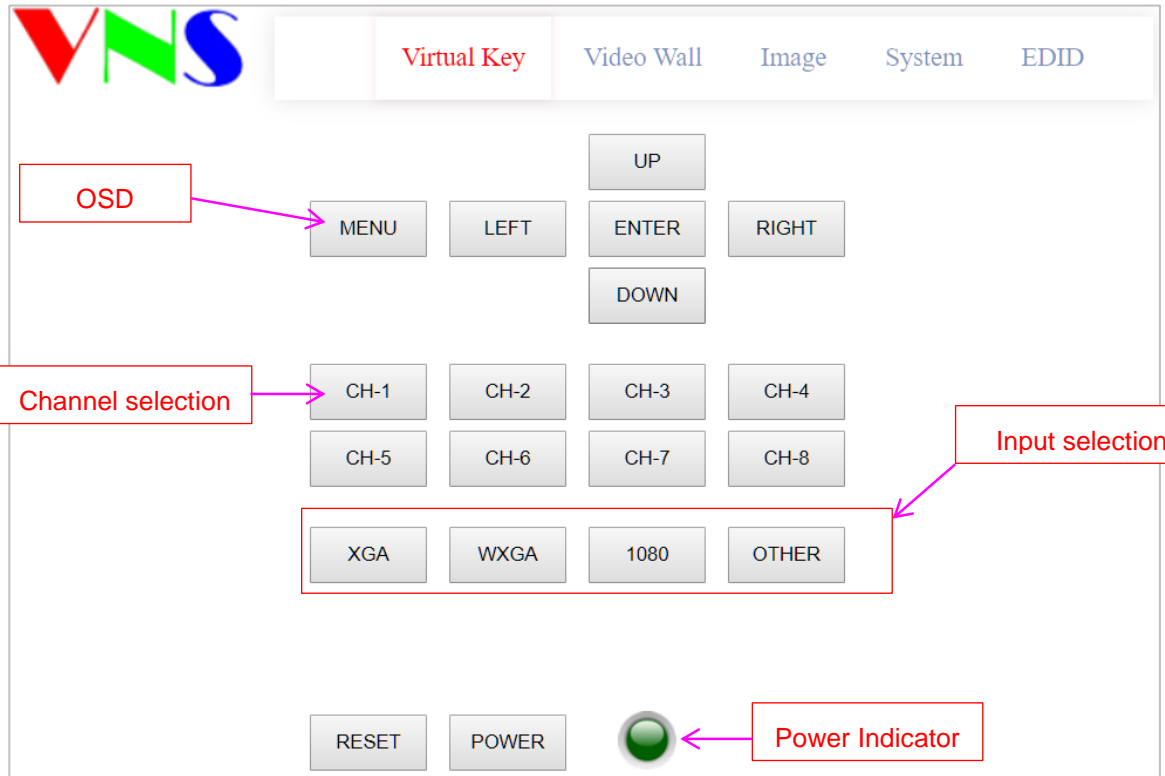


15.2.2 UHDWall Manager (UWM) PC Tool

✓   UWM Manager is a PC tool executed through PC. User needs to download this tool from VNS website. Once user connects G406s with PC through Ethernet or USB and open UWM Manager, user can access UWM and execute all operation similar to OSD menu through PC

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keyboard and mouse. User can also backup system setting in PC and restore/copy to other
units.

✓ UWM PC tool is designed for G400 series product. If user connects with G406s, user will see 2
channels for selection instead of 4 channels.

✓ User can execute full operation functions and also update Firmware and MCU code through
UHDWall. User can control multiple units at the same time through change IP address.
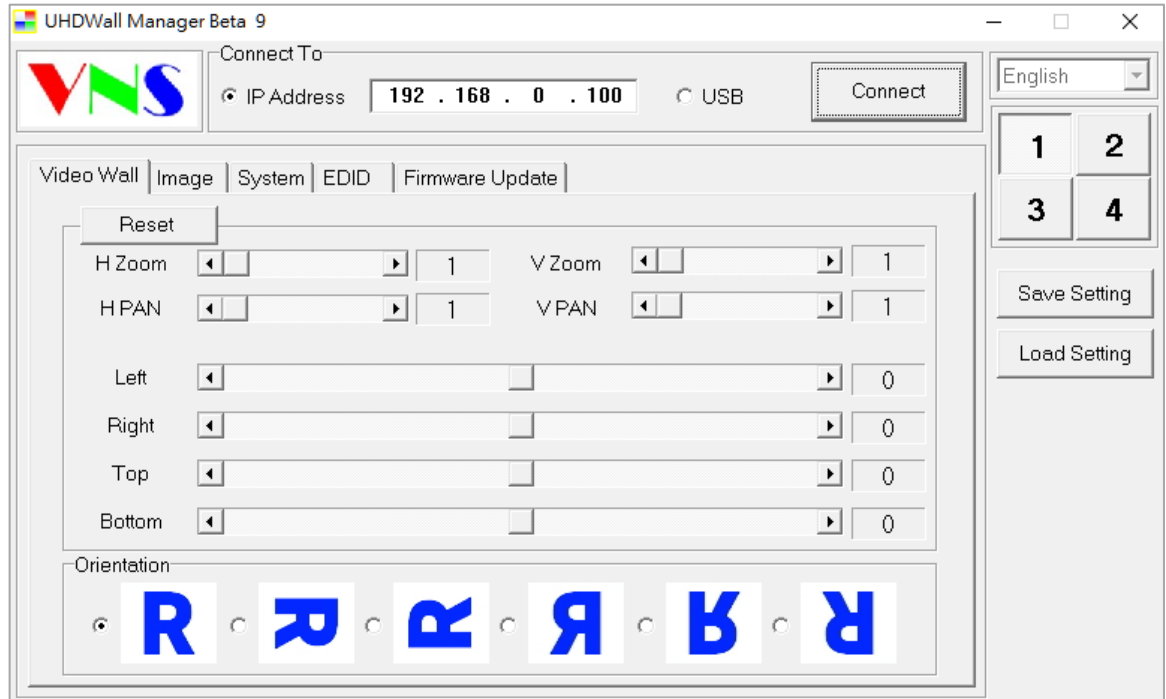
16 System Structure and Control

RS232 and Ethernet are available for system control. They can be used simultaneously to provide the most
flexibility in system control.

16.1 System control

✓   Level 1: The items will apply to both channels at the same time. The settings can be set from
CH-1 or CH-2.

✓   Level 2: The items will apply to channel 1 & channel 2 separately.

16.2 OSD Command Execution in CH-1 / CH-2 Independently

✓ All the menu under [Video Wall]

✓ All menu under [Picture]

✓ [Image Properties]→ [Color]

✓ [Image Properties]→ [Orientation]

✓ [Options]→ [Information]: show system information

✓ Except for the above items, all the rest settings will apply to all channels at the same time.

16.3 EDID Setting

✓   [Options]→ [Setting]→[EDID]

✓ HDMI 2.0 input EDID resolution can be set by CH-1 or CH-2.

16.4 HDMI vs. DVI Output Signal

HDMI digital signal is compatible with DVI signal. Most of display devices can support both digital signals. However, some old equipment may have less flexibility in digital input signal compatibility. In this case, user may need to select DVI output format for normal display. While select DVI output, there will be no audio output. The setting will apply to both channels at the same time.
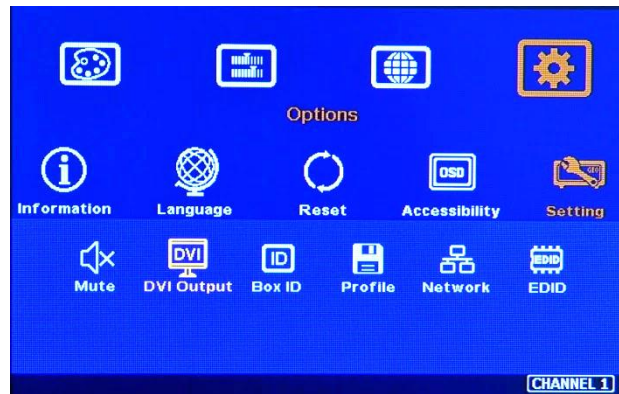

16.5 System Standby and Automatically Turn Off Output Signal

✓ [Options]→ [Accessibility]→[Standby Time]

✓ If set [Standby Time] at 60, the system will get into Standby Mode after 60 seconds when no input signal is detected. The output signals from G406s will also be terminated at the same time. If G406s detects input signal again, it will automatically turn on the system again.

✓ If the monitor can automatically turn off/on function by detecting input signal, user can control signal source to execute entire system on/off control.

✓ The settings should be executed from CH-1 or CH-2.

16.6 RS232 Setting

1.1.3 RS232 interface is designed with DB-9 connector. User can select 11520 or 9600 baud rate.

1.1.4 The UART Protocol between GeoBox and a Host computer can be provided. The protocol can be implemented via RS-232, USB, Ethernet or other forthcoming communication methods.

1.1.5 Please execute RS232 setting through CH-1 or CH-2. User can select baud Rate between 9600 & 115200 as needed.
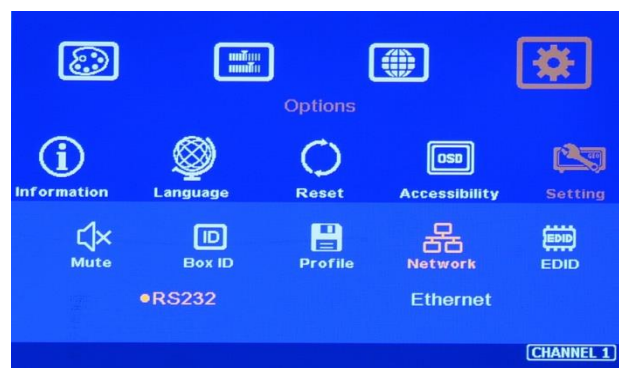
16.7   Ethernet Setting
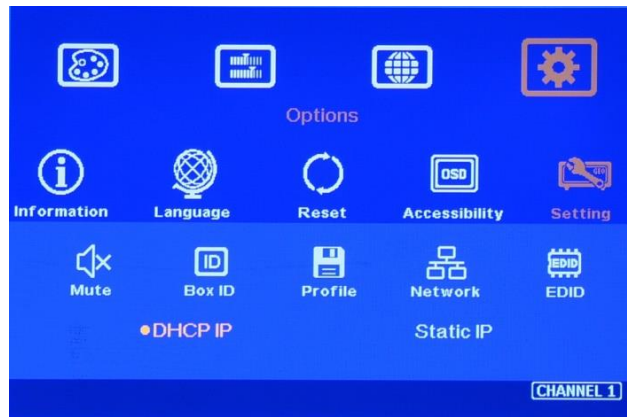
> ➢   Ethernet control: Ethernet is integrated in G406s via RJ45 connector. User can controller G406s through Ethernet or WiFi via PC or mobile devices. A WebGui with keypad icons will be showed in control devices for user to control G406s by keyboard, mouse or touch screen.
> ➢   UHDWall Manager PC tool is available for full function operation and firmware & MCU code update.
> ➢   DHCP & Static IP can be set in each G406s for independent operation.
> ➢   User can use < > OSD direction keys to access the position for the modification and ∧ ∨ OSD direction keys to change the IP address settings.
> ➢   Please connect G406s to LAN port of WiFi Router. Once execute correct WiFi settings in WiFi Router, user can access G406s by PC, Notebook, mobile phone or iPad and control it through WebGui or UHDWall Manager.
> ➢   User can connect PC with G406s using Cat5/6 crossover UTP cable directly.

16.8   Change Background Color

When no signal input, user can select either blue color background with [Power Saving Mode] message on the screen or black background color without message. User can change background color from the OSD menu as below.
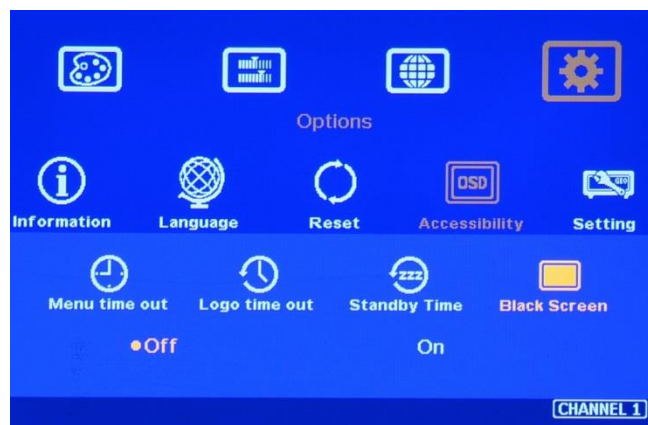
17 Limitations in Image Flip and Rotation

Image 90/270 degrees rotation and image flips are only available in input resolution under 4k/2k @30Hz (included).

18 Limitation in Audio Output

User will open or mute audio output in two channels at the same time.

19 Trouble Shooting

19.1 Front Panel LED indicators

User should see Input/Output LED lighted in each operation channel. If no light illuminated in specific channel, please check Input/Output connecting cables, signal source & monitor in that channel.

19.2 Intermittent or Loss of Input Signal

➢ Check the HDMI cable quality and make sure all cables are fitted correctly. 4k/60 signal requires high speed certified cables.

➢ Cable length: Connecting cable length should be short as possible. Replace a short cable to verify the possible root cause.

➢ HDCP compliant issues: If the input source or the monitors are not HDCP compliant, it is possible to stop G406s from negotiating HDCP link and show intermittent, abnormal or no image.

➢ Bit Rate or resolution issues: check if signal source and connecting cables can provide right resolution and data rate supported by G406s.

➢ DVI/HDMI signal compatibility: some display devices may only support HDMI or DVI video signal and execute wrong signal format detecting. The default output is HDMI. User can change output with DVI format through [Options]→ [Setting]→ [DVI]→ [On].

➢ While select DVI output, the audio will be muted.

➢ Usually, to swap with different cable, output channel, signal source and monitor can verify the root cause for the failure.

➢ When it is possible to have signal compatibility issue, user can add one HDMI splitter or switch in the middle to change signal impedance. It may fix the issue.

19.3 System setting can't be executed:

➢ After FW update, please insert small pin into RESET hole on back panel for 5 seconds to reset the system to default to eliminate unnecessary settings. It will not affect Profile Index storage data.

19.4 Synchronization issue in the outputs

➢ The input refresh rate should be the same as output refresh rate so that the system can implement Frame Lock to synchronize all the outputs. If the input source is 50Hz with 60Hz output, it is possible to see some lag among the displays.

➢ Different monitors may have different signal processing time. Different settings will also have different processing time. These may cause system synchronization issues. Please make sure to use the same monitor with the same settings.

20 Technical support

➢ User can send e-mail to support@vnstw.com with as much information as possible.

➢ The following information is required for a swift response.

● Display device: type and model number

● Monitor array or specific application details.

- GeoBox model No. and series No.
- Detailed timing of signal source and resolution.
- Press [Info] key to get System Information and send the data to us, including F/W version.
- The exact nature of the problem. Please be as detailed as possible.
  - Usually we will response with 24 hours (excluding weekends)

21 Safety Precaution and Maintenance

21.1 Power Supply

Please connect electric power for all devices in the system from the same Power Distribution Box with correct grounding. Open the power after finishing system connection to reduce the risk for system damage from high floating voltage.

21.2 Working Environment

Please locate G406Sin an environment free from dust, moisture and high temperature with good ventilation.

21.3 Warranty:

This device is designed and tested to the highest standards and backed by two years' parts and labor warranty. Warranties are effective upon the first delivery date to the end customer and are non-transferable. Warranty period extension is available up to 5 years through paying extra charges.

21.4 Maintenance and Repair

Apart from what is detailed in User Guide, maintenance should be carried out by competent technician assigned by VNS. If G406s is physically damaged, it should be returned for repair using VNS RMA procedures. If the unit is opened by user, it will lose the right for warranty protection.

Specifications

- ✧ Input: 1x HDMI 2.0b, HDCP: 2.2/1.4.
- ✧ Output: 2x HDMI up to 1080P & WUXGA.
- ✧ 1x HDMI 2.0 loop out ports from HDMI input
- ✧ Max. input resolution: 4096x2400 @60Hz.
- ✧ Support non-VESA STD input timings.
- ✧ Support pixel to pixel 8k/4k display.
- ✧ Selectable output up to 1920x1200 60Hz.
- ✧ 4:4:4 Chroma sampling, 30 Color bits, 12-bit RGB gamma CLUT.
- ✧ Support sRGB & xvYCC color processing & 8/10/12-bit deep color.
- ✧ 3:2/2:2 cadence, low angle smooth algorithm, high quality scaling engine.
- ✧ Flexible aspect ratio adjustment in each edge up to +_ 900 pixels (based on input resolution).
- ✧ When the input is 50Hz signal, user can select 1080p 50Hz output to avoid video artifact in frame rate conversion.
- ✧ 10-bit processor, frame rate conversion.
- ✧ 3D motion adaptive de-interlace.
- ✧ Frame lock for synchronized outputs.
- ✧ High Dynamic Range (HDR) support: SMPTE ST-2084, SMPTE ST-2086.
- ✧ Individual 90/180/270 rotation, flip, cropping, scaling & color adjustment in each channel. 90/270 rotation is available only under 4k/2k @30Hz input resolution.
- ✧ Embedded HDMI audio in each output.
- ✧ Selectable and programmable EDID.
- ✧ ESD Protection: ±8kV (Air-gap discharge), ±4kV (Contact discharge).
- ✧ DC 12V/1.1A, max. 13w, (100-240 VAC PSU).
- ✧ Working environment: 45°C, 10-90% RH.
- ✧ Control: IR, RS232, USB, Ethernet.
- ✧ Dimensions: 220mm*160mm*36, Weight: 0.98kg
- ✧ CE/FCC/RoHS/Green Certified.
- ✧ 2 Year Warranty, extra fee for extension up to 5 years is available.

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<u>Revision History</u>

Revision	Date	Originator	Comments
V1.0	2018-04-04	Steve Wang	First version
V1.1	2018-12-28	Steve Wang	Add information about system synchronization