GeoBox

G406s User Guide

2 Channel 4K/60 video wall controller

1 in / 2 out, up to 8k/1k 30Hz and 4K/2k 60 Hz input, 10-bit, 4:4:4 Chroma sampling,
independent rotation / scaling / cropping

Sales & Technical support

DCi/UHD 4k/60/4:4:4	HDMI 2.0	HDCP 2.2/1.4	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

Table of Contents

Introduction

GeoBox G406s is dual channel 4k/60 fps Video Wall controller. It is simplified version of G406s 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, a 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.
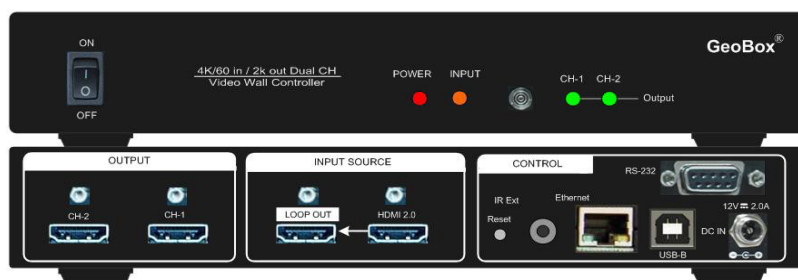
Features

✧   1x HDMI 2.0 input, 2x HDMI 1.4 output up to 2048x1200 @60Hz with flexible multi-unit cascade.

✧   Support up to 4096x2160@60Hz, 7680x1200 @30Hz input.

✧   Input supports HDCP 1.4/2.2 and output supports HDCP 1.4.

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

✧   Pixel base position alignment up to +_ 1800 pixels in H&V for flexible image capture, cropping, position alignment, bezel compensation & irregular video wall.

✧   Set overlap output up to 1800 pixels for projector edge blending application.

✧   Independent Image color adjustment in each channel.

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

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

✧   Flexible aspect ratio adjustment in each edge up t0 +_ 1800 pixels.

✧   Frame rate conversion and 50Hz in / 50Hz out to keep video quality without artifact.

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

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

✧   Ready for 24/7 working environment.

Quick Setup Guide

1. Content in the packing box

➢ The G406s Quad Channel 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)

➢ Please download UHD Wall Manager PC Tool at www.geoboxav.com.

2. Quick Setup via IR Remote Controller

2.1. How to extend distance of IR control

➢ IR remote controller is designed 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 distance up to 20 meters.

Audio connector for IR extender

2.2. How to avoid IR interference in multiple unit application

➢ If multiple units are used, user can set different [Box ID] (#1 - #99) or IP address in each Box for individual control. For IR control, the [Box ID] number range is #1 - #9.

➢ 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 G406s OSD menu except G406s with Box ID #1. User can see flashing LED on the Front Panel for the units with OSD locked.

✓ Press 853 will only unlock ID # 3 G406s for further OSD operation and lock all the others.

✓ Press 850 will unlock all G406s OSD Menu. Remote controller can control all boxes at the same time.

Profile recall hotkey

Power on/off

System Information

Channel selection

OSD Menu operation keys

HDMI2.0-2 input port

HDMI2.0-1 input port

Input source selection

Output resolution selection

Profile recall hotkey

Combination key to work with other function keys to execute function to all channels at the same time

Video Wall Menu hotkey

Video Wall [Overlap] hotkey

System reset hotkey

Profile [Save] hotkey

RC-400

2.3. Quick Video Wall setting through remote controller

1) Click [RESET] hotkey to clear unnecessary settings.

2) Click [INFO] key and check input/output timings are correct or not.

3) Select Channel 1 to do settings.

4) Click [V. Wall] hotkey to open Video Wall OSD menu.

5) Use OSD Operation keys to do [Zoom], [Pan] and [Overlap] settings.

6) If necessary, use [Overlap] hotkey to adjust image position or aspect ratio.

Please repeat (3) to (6) processes for all channels.

7) After finish the settings for all channels, click [Save] hotkey, then click Number key (7-1) to save the final result into [Profile]➜ [Index]. Only 1-5 is valid for selection. User can save twice to different Indexes as backup.

Click [Reset] (1) hotkey again to reset the system to test if the setting is properly saved or not.

8) Click [Profile] hotkey and click Number key (7-1) again to recall the setting and make sure the settings are saved correctly.

System Setup Procedures

1. Connecting the inputs

Please apply signal source to HDMI input port before video wall settings. Otherwise, the settings will assume the input resolution is the same as output resolution. It may affect Video wall Overlap setting result. User can also apply DVI-D signal through DVI to HDMI adapter.

Raw signal Loop out for daisy chain connection

HDMI Input source connector (Max. 8k/1k)
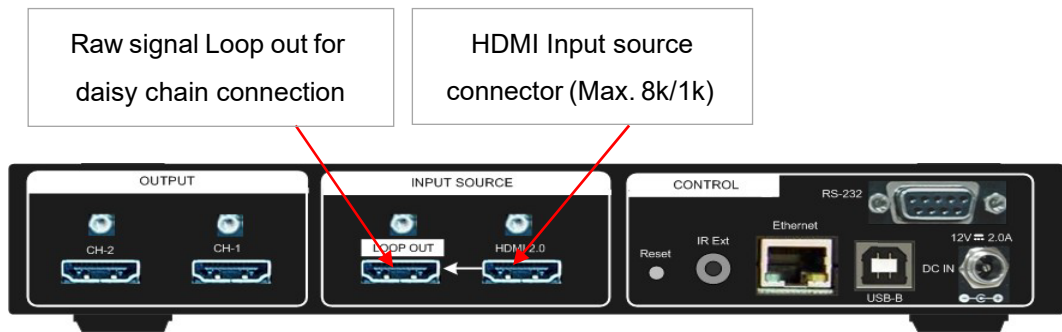
2. Connecting the outputs

CH-1 & CH-2 HDMI Output Connectors (Max. 2048*1200)
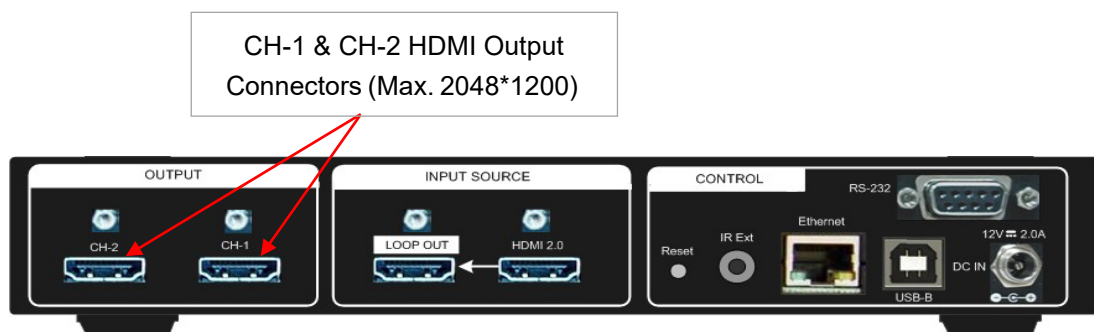
Actual system connection
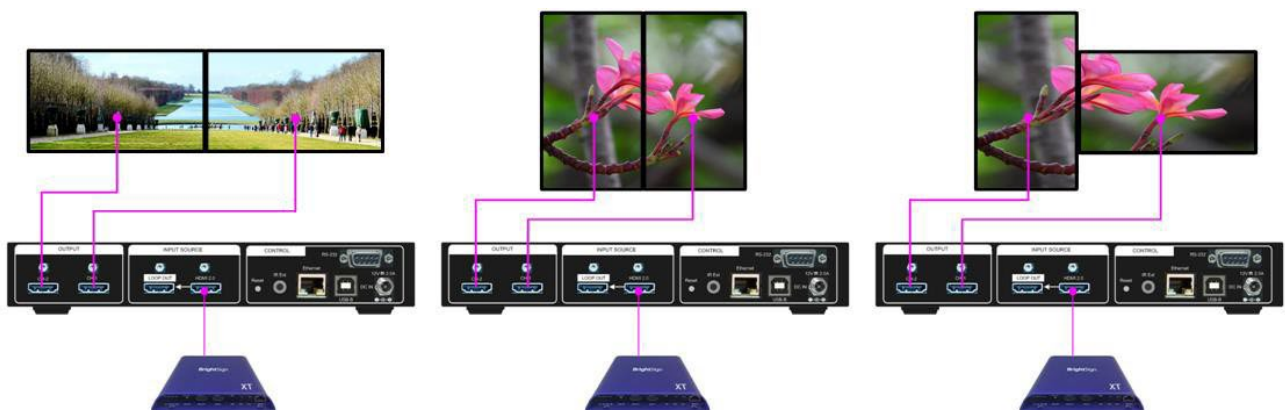
3. HDMI Loop Out for Multiple Unit Connection and monitoring

Loop Out raw signal from HDMI input to next GeoBox
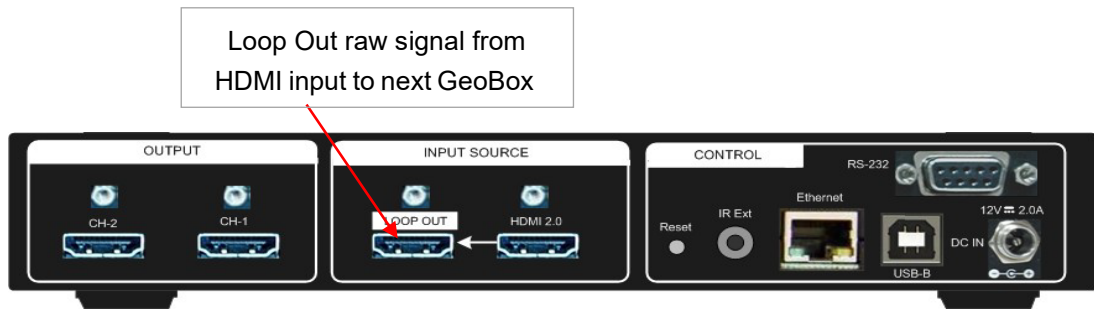
Loop out port provides the same raw signal from HDMI input. It supports up to 8k/1k @30Hz.

➢ User can connect any Loop Out signal to any HDMI input port in the next GeoBox or other devices.

➢ User can connect up to more than 10 units of G406s through daisy chain connection. The daisy chain connection number is related to the quality of HDMI cables and signal source resolution—good cable or lower source resolution can connect more units. User can also add HDMI splitter at the front end to increase daisy chain connection number for large scale video wall. For instance, user can use 1x4 HDMI splitter at the front end and provide the same signal to 4 group of daisy chain units. if each daisy chain group consists of 8 units of G406s, the total LCD can be connected will be 8x2x4=64.
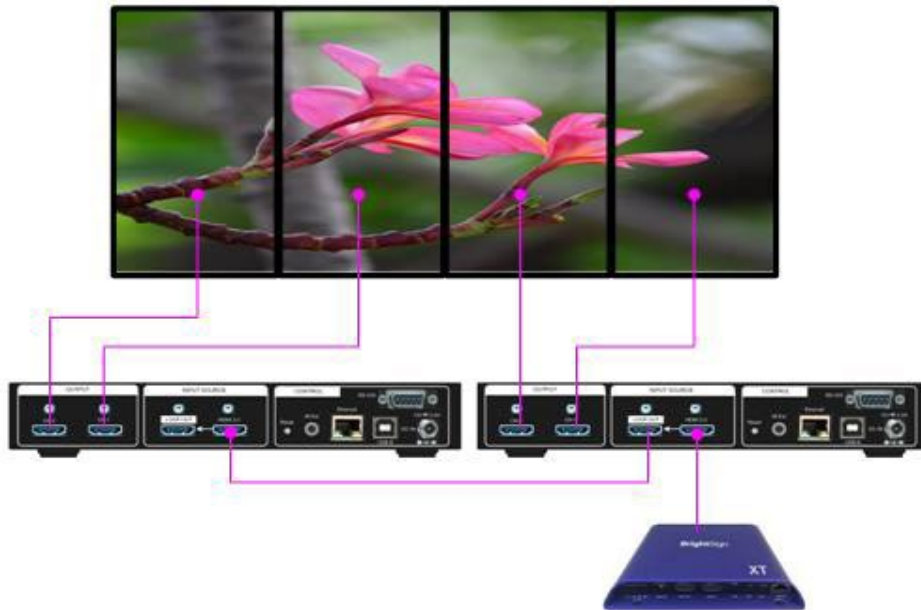
Daisy chain connection with other GeoBox models

G406s   G408

No specific output connection sequence is required.
Location can be set by Video Wall [PAN] menu.

➢ 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 video wall content.

4. <u>System Connection and Power On</u>

➢ Poor quality HDMI cable and signal source will affect the connection distance and may cause signal noise or intermittent display.

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

➢ Complete video wall system should be connected to one power Distribution Box with proper grounding. Power on the system after finishing all connections to avoid system damage by floating voltage among devices.

➢ When power is switched on, the booting time is about 19 seconds and the Input & Output LEDs on front panel will stay "Light up" for the channel with correct input source and output monitor connections.

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5.   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
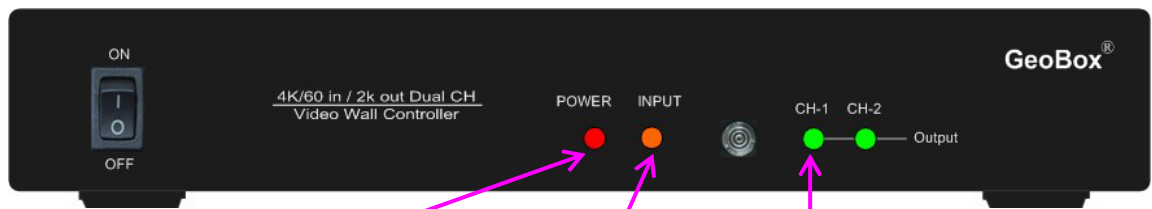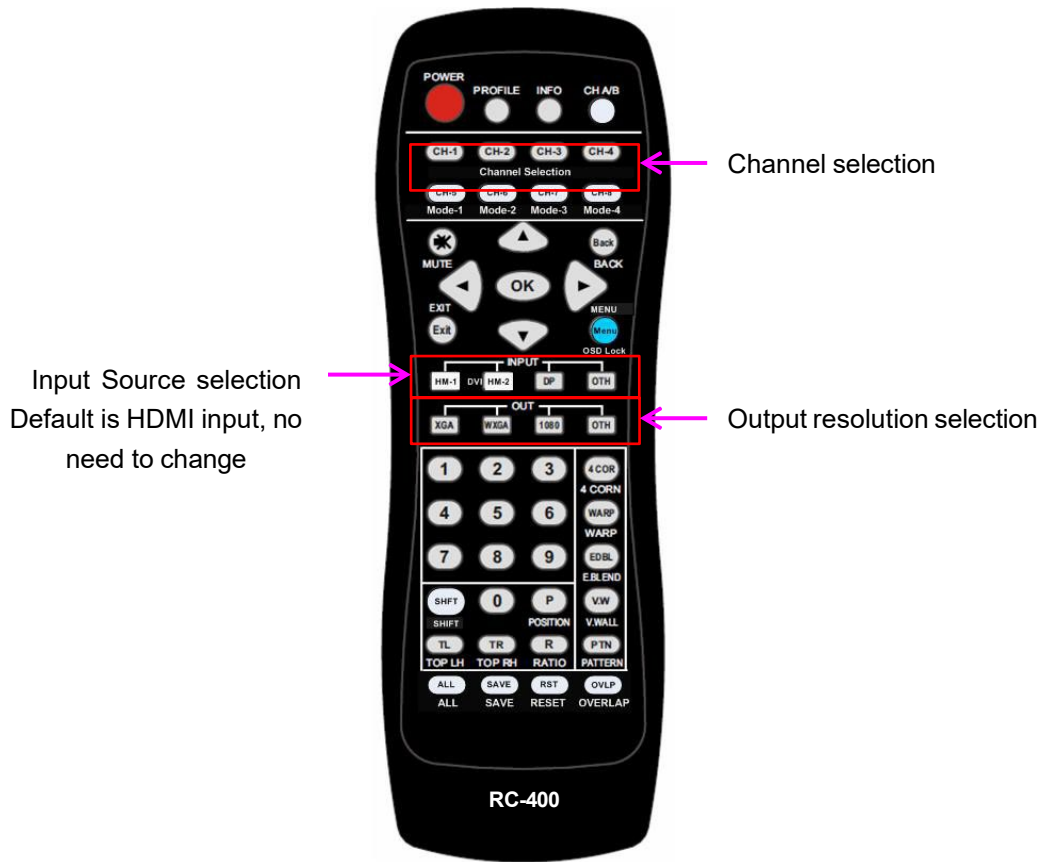
Power LED indicator. Green: Power on, Flashing: OSD Lock

Green LED: input signal is detected

Green LED: monitor is detected

> ➢ G406s has only one HDMI input port. System default input is HDMI. No need to change.

> ➢ The output resolution selection will apply to both output channels.

> ➢ If continuous flashing in Power key LED at 0.5" interval, it means the OSD function has been Locked. Please press [Menu] key for 5 seconds to disable [OSD Locked] function. If user sets menu lock through remote controller, the Power key LED will be flushing at 1.0" interval. User needs to press number keys [850] to disable menu lock.

> ➢ Output resolution list: 1024x768 60/120Hz, 1280x720 60/120Hz, 1280x800 60/120Hz, 1280x1024 60Hz, 1360x768 60Hz, 1400x1050 60hz, 1600x1200 60Hz, 1920x1080 24/30/50/60Hz, 1920x1200 30/60Hz, 2048x1080 60Hz, 2048x1200 60Hz & Deep Color.

9

> ➢ All output resolution is RGB 4:4:4 and progressive. If the input source and display device can support 10-bit color, user can turn on [Deep Color] to display 10-bits color. User can click [INFO] key to check input / output result.

➢ User can set EDID to tell input source to output desired resolution. User may need select from PC Display Control Panel to set output resolution again or to re-boot PC to output EDID resolution.

➢ G406s can support non-VESA standard input timing once signal source can provide, such as 7680x1200 @30Hz or 2400x2400 @60Hz.

➢ When press [OTH] key to select output resolution, the monitor will resynchronize the timing and it will take few seconds to finish the selection.

➢ 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 synchronization issue among the displays.

➢ User can select output resolution from remote controller. When press [OTH] key, it will show resolution of 1920x1200, 1280x720 and 1360x768 continuously. After release from keypad, the system will apply the selected resolution to the selected output port.

➢ 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 each processing module has detected input signal.

➢ Green LED will light up when G406s has detected the monitor in each output.

➢ Power LED:
  ✓ Red: Power connected
  ✓ Green: Power on
  ✓ Red flashing at 0.5" interval: OSD lock through Menu key
  ✓ Red flashing at 1.0" interval: Box ID lock through remote controller 85x ID # control key

6. **Set 10-bits color output**

➢ If the input is 10-bit signal and the output display device can support 10-bit output, user can set 10-bit output mode through [Image Properties]➔ [Output Mode]➔ [ON]

➢ User can click [INFO] key on remote controller or front panel keypad to check input / output timing result.

➢ The setting will apply to two channels at the same time.
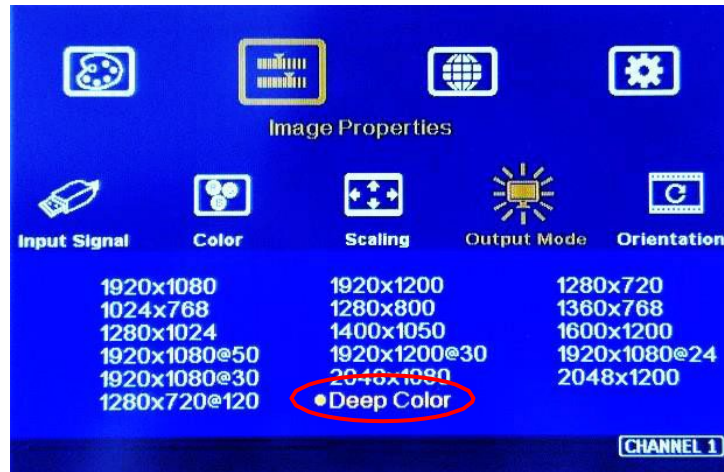
7. System setting: Box ID, RS232, Ethernet

- ➢ Box ID, RS232 and Ethernet settings can be executed through CH-1 or CH-2.

- ➢ User can set different IP address in each G406s through Ethernet, USB or remote controller so that each G406s can be controlled independently. Default IP address is 192.168.0.100.

7.1. Box ID

- ➢ The range of Box ID is 0 ~ 99 for RS232 command.

- ➢ If user uses remote controller to do system operation, the Box ID range is 0 ~ 9.

7.2. RS232 settings

- ➢ RS232 is designed with DB-9 connector. User can select baud rate between 11520 and 9600.

- ➢ We can provide UART protocol for the control from RS-232, USB, or Ethernet.
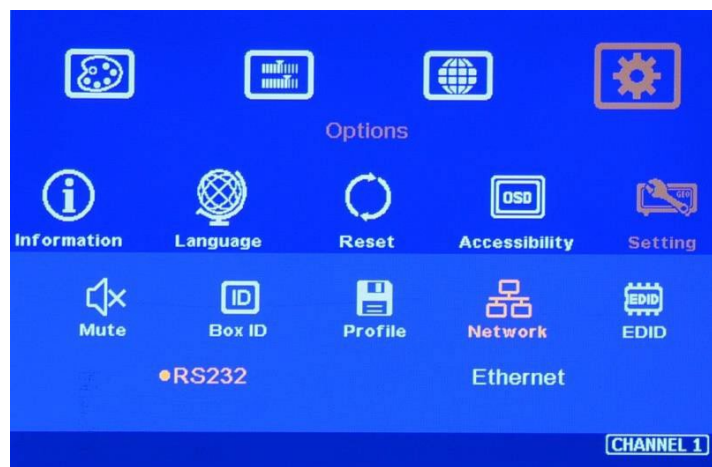
7.3. Ethernet

- ➢ User needs to connect G406s to WiFi Router or switch/hub through RJ45 to LAN port. Then user can control the system through Ethernet.

- ➢ Crossover UTP cable can be used for direct connection between PC and GeoBox. User needs to set PC TCP/IPv4 with the same domain segment as GeoBox (for instance, to set IP address at 192.168.0.105) and subnet mask at 255.255.255.0).

- ➢ Open web browser (Google Chrome or Internet Explorer) and input G406s IP address (default is 192.168.0.100), user can see GeoBox WebGui and menu with virtual keys similar to OSD for further system operation. There is no additional software is required.

- ➢ User can set DHCP for the connection. If necessary, please [Renew] DHCP to get IP address before network connection.

- ➢ UWM is another web tool that has full function for system setting and operation. It can also update Firmware or MCU code. UWM can be downloaded from www.GeoBoxAV.com website.

- ➢ Each G406s can set different IP address for independent operation and control.

- ➢ Please use < > OSD keys to select OSD menu items and use ∧ ∨ OSD keys to change IP address.

- ➢ If GeoBox is connected with WiFi Router (through LAN port), user can control GeoBox through WiFi via PC, iPad or mobile phone.

- ➢ Default TCP server port is 1266.

Please note: RS232 and Ethernet are available for system control. They can be used simultaneously to provide the most flexibility in system control.
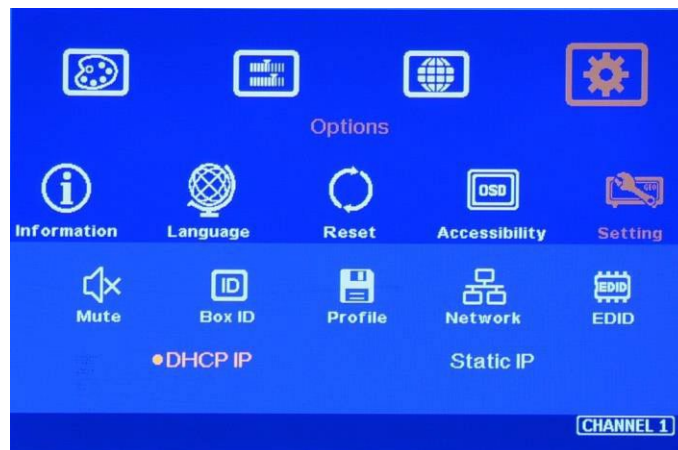
8. Video Wall Settings

- ➢ Signal source shall be connected before video wall settings. The setting parameters inside GeoBox will automatically change to match with different input resolution once the setting is finished. If no signal source is connected during video wall setting, the [Overlap] setting value may be wrong.

- ➢ Press [Video Wall] hotkey on Front Panel or Remote Controller to activate [Video Wall] menu. WebGui and UHDWall Manager (UWM) PC tool are available for Ethernet configuration.

> ➢ Note: Image 90/270 flip and rotation are only available when input resolution is under 4k/2k @*30Hz*.

8.1.   [Zoom]

Use [Zoom] to split the display in horizontal and vertical directions. GeoBox can cut the image into different sections. Maximum split image is 15 in both horizontal and vertical directions.

u	v	w

For 3x1 video wall display

Horizontal Zoom= 3, Vertical Zoom = 1

u	v	w
x	y	z
{	l	}
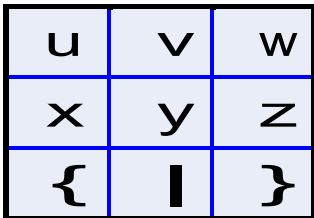
For 3x3 video wall display

Horizontal Zoom = 3, Vertical Zoom =3

8.2.   [Pan]-Assign image position

[Pan] will assign the location of each split image in the video wall in both horizontal and vertical directions. Horizontal direction is counted from Left to Right and Vertical direction is counted from Top to Bottom.
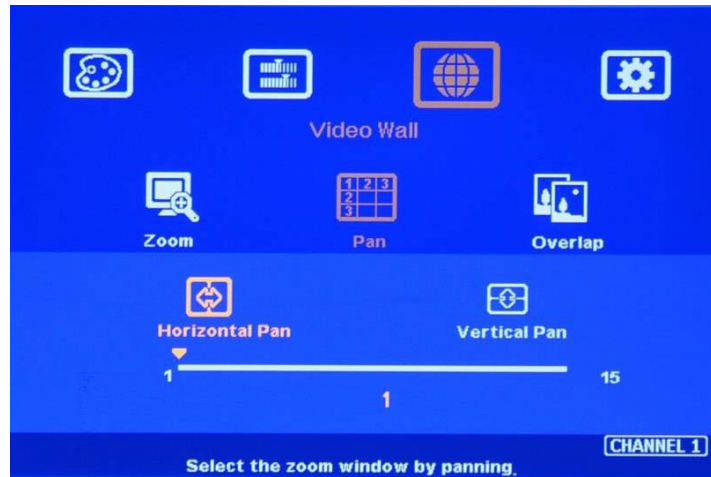
In the case of 3x3 video wall display, Pan settings are as below:

u	∨	w
x	y	z
{	I	}

For No. W *monitor:*   *For No.* Z *monitor:*

Horizontal Pan = 3   *Horizontal Pan = 3*

Vertical Pan = 1   *Vertical Pan = 2*

8.3. [Overlap] – Position Alignment

[Overlap] adjustment changes the cropping area of the source 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 capture less image area and cause [zoom in] (enlarged) effect. If overlap value is increased, each monitor will capture more image area and cause [zoom out] (shrunk) effect. User can also use this function to correct position mis-alignment in installation, shift image location for irregular video wall and set overlap area for projector edge blending application.
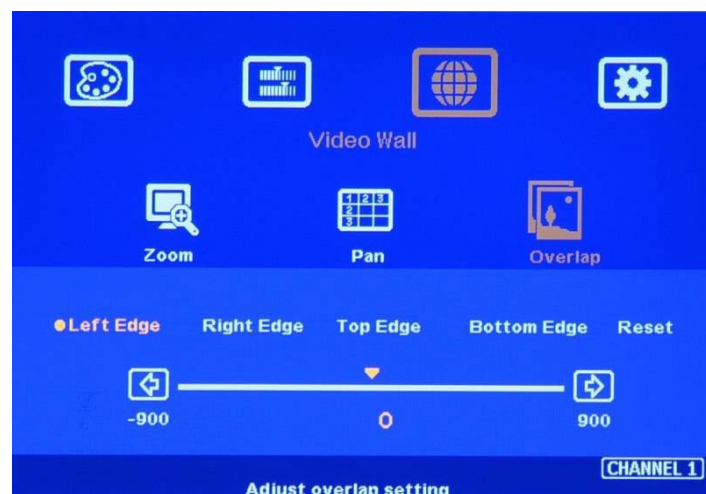
➢   Maximum [Overlap] adjustment value is 1800 pixels in all directions.

➢ User can see the image and select Edge to adjust [Overlap] value for Bezel compensation and to adjust image mis-alignment due to monitor installation issue.

➢ User can use [Overlap] function 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. This function can adjust the aspect ratio of the content to meet required aspect ratio of the video wall. Please see more details in [Flexible Aspect Ratio Adjustment] section.

➢ Asymmetric video wall can be achieved through overlap adjustment even with different size of monitor and bezel dimension.

8.4. **Bezel Compensation**

➢ Through [Overlap] menu, user can adjust image cropping area and adjust image position.

➢ User can apply test pattern and reduce [Overlap] value to enlarge the image to the bezel center line between two monitors to achieve bezel compensation.

➢ 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 360cm in width and the input source is 3840, then the pixel number for each centimeter is 3840/360=10.67 pixel/cm. If the bezel size is 12mm in one edge, then user can decrease Overlap value 10.67*1.2=12.8 (13) pixels to do bezel compensation for that edge (to enlarge the image 13 pixels at that edge).

9.   <u>OSD Lock and Unlock</u>

➢ User can hold [MENU] key on front panel or remote controller for 5 seconds to lock OSD to prevent someone to change the settings. After OSD menu is locked, user will see flashing LED on Power key on the front panel at 0.5" interval.

➢ User can hole [MENU] again for another 5 seconds to unlock OSD and do further operation.

➢ User can set Box ID for each G406s and control via remote controller:
  ✓ Press［851］，all the box OSD will be locked except ID #1 G406s. The [INFO] LED will be lighted in the locked unit and only ID #1 G406s can be operated.
  ✓ Press［853］，all the box OSD will be locked except ID #3 G406s. The [INFO] LED will be lighted in the locked unit and only ID #3 G406s can be operated.
  ✓ Press［850］，all the box OSD will be unlocked and can be operated through remote controller.
  ✓ The units have been locked will show flashing Power LED at 1.0" interval.

10. <u>Save and Load system settings</u>

10.1.   **Save System Settings through IR remote controller and OSD Menu**

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

- ➤ [Save] Profile from OSD menu will take effect for two channels at the same time..
- ➤ User can use [Save] hotkey + Number key on remote controller to save settings directly for all channels at the same time. Don't use Direction key or Enter to select Index #, Otherwise, it will save only for two channels.
- ➤ 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.
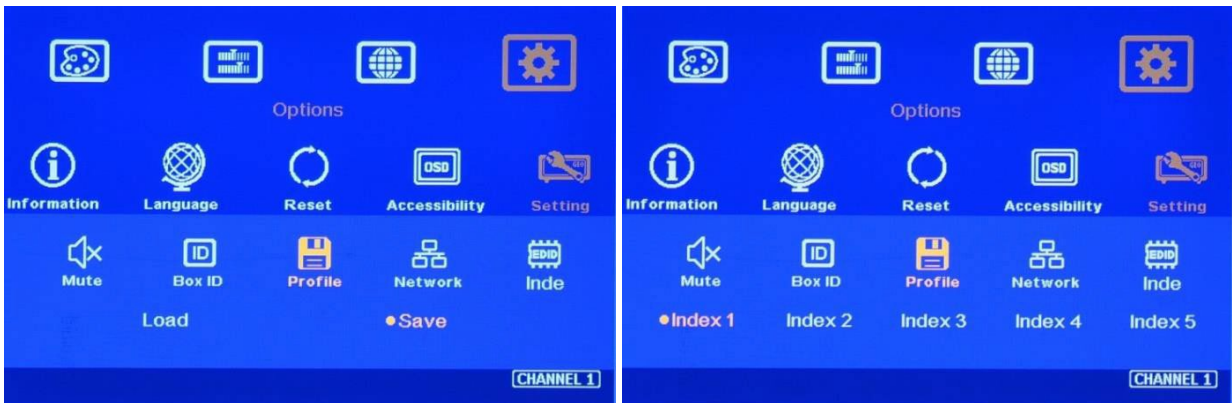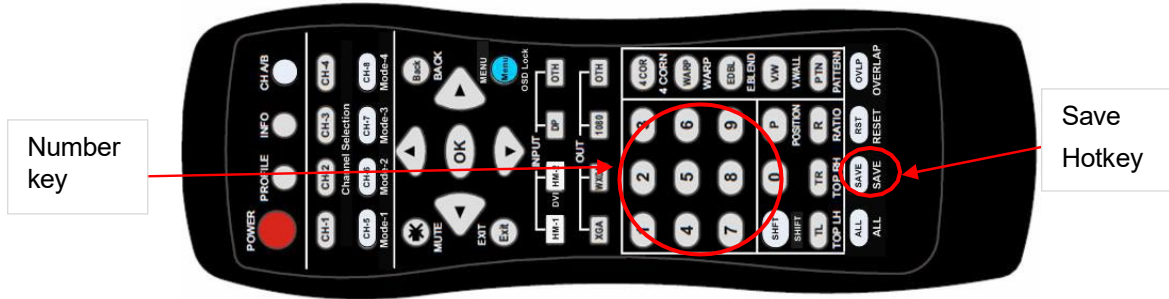
- ➤ When user power off the system, GeoBox will keep user setting without loss even the setting is not saved into Profile Index, unless someone to change the setting.
- ➤ When system has been reset from OSD menu or update new Firmware, Profile data will still be kept inside G406s.

10.2. Load Profile settings through remote controller

- ➤ Press [Profile] shortcut key in remote controller➔ Select number keys 1-5 to recall Index 1 – Index 5. Profile Load will apply to all channels at the same time.
- ➤ Please don't use Direction key or press Enter to select Index #, otherwise, it will be only functional in CH1/CH2 or CH3/CH4.
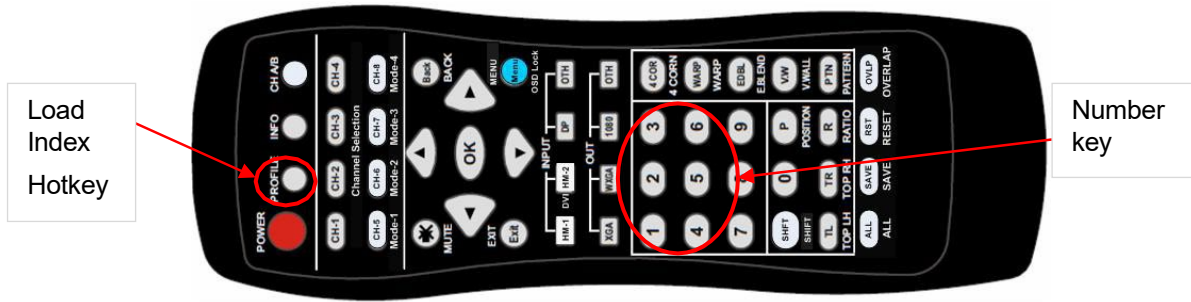
10.3. Load/Save Profile Index through WebGui and UWM PC Tool

➢ Profile [Load] and [Save] button under [System] menu are available to Load and Save profile settings.

➢ Load and Save will apply to all channels at the same time.

11. System Reset

User can rest system through below method:

➢ User small pin to insert RESET hole at back panel for 5 seconds, user will see [Reset to Default] message. It will apply to all channels at the same time. It will also delete the data saved in Profile Indexes.

➢ OSD menu to reset the system will only be functional for two channels at the same time.

➢ [Reset] hotkey on remote controller will access directly to RESET OSD menu directly.

➢ When operating through OSD or remote controller, user can select to reset [Reset All] or only reset [Video Wall setting] setting.

➢ Reset through [Reset] hole on the back panel will clean [Profile Index] settings.

➢ Reset through [Reset] hotkey on the remote controller or OSD menu, [Profile Index] settings will not be deleted.

12. 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 content. The Maximum adjustment range is 1800 pixels in each edge.
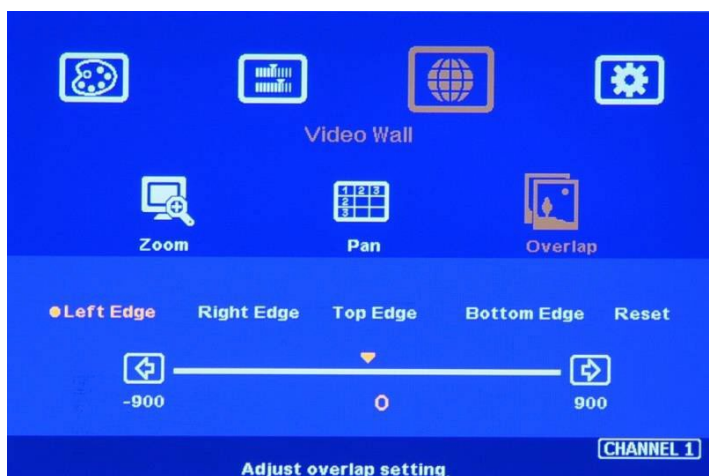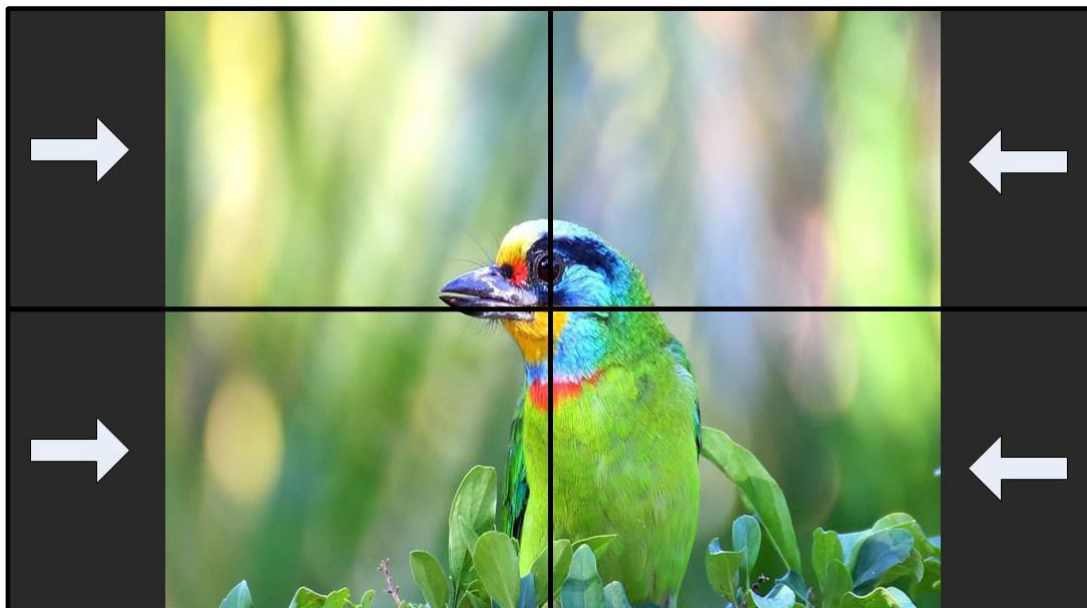
Activate [Overlap] under [Video Wall] menu

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

✓ The image position shift range is +_1800 pixels in each edge.
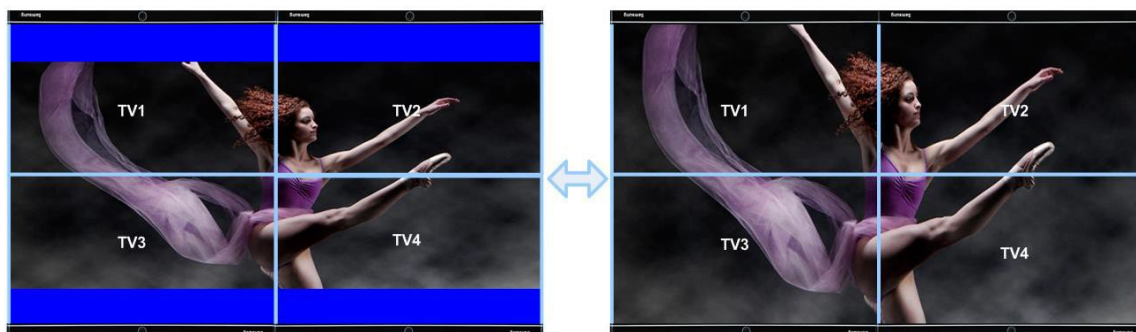
➢ If the image is at portrait position, this function is only available under input signal up to 4k/2k @30Hz.

➢ If Video Wall [Zoom] is set to H=2 & V=2 or above, user can apply 4k/2k @60Hz input signal. The adjustment range (1800 pixels) is calculated based on signal source resolution.

➢ 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 to let all monitors has the same scaling factor.

> ➤ The adjustment range of 1800 pixels is calculated according to the signal source resolution. If the signal source is 1080p and the adjustment value is 450 pixels, when switching to 4k/2k input signal, the adjustment value will be converted to 900 pixels automatically to maintain the same image position.

13. <u>Passive 3D application</u>

13.1. System Configuration

GeoBox will decode 3D format from all kinds of 3D video sources, including Blue Ray DVD, STB, Media player, Game console and PC… 3D signal will be decoded by GeoBox into signals for Right/Left eyes. The signal needs to be displayed through two projectors. Each projector will display signal only for one eye. User needs to set a polarized filter in front of the projector and also wears polarized glasses. The glasses need to match the polarized filter in front of the projectors so that the right eye can only see the scene for right eye and the left eye can only see the scene for left eye. Silver 3D screen is required to preserve the polarization of the light for 3D display. It is possible to use optic spectrum method from Infitec or Enciircle Inc. to allow 3D displayed on conventional 2D screen.
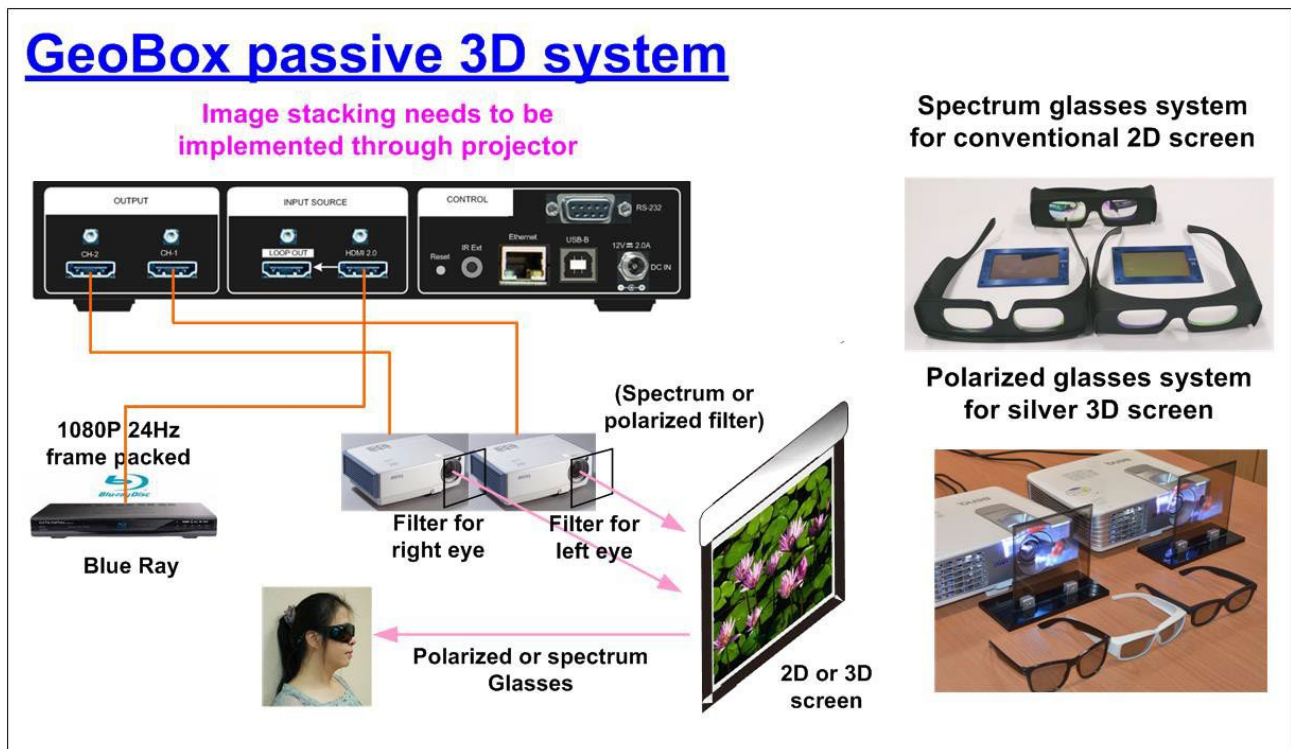


13.2.   System installation and setup

a.   GeoBox should not be installed at side of the projector where the ventilation hot air comes out.

b.   Two projectors can be put side by side or top/bottom. Closer lens position will reduce geometry adjustment range and reduce the loss of the image resolution and brightness. Please make sure hot ventilation air will not affect the other projectors.

c.   Set higher output resolutions (such as FHD) from 3D signal source and connect to HDMI input of GeoBox, then daisy chain connection to another channel.

d.   GeoBox will decode and distribute RH/LH eye signals for two projectors.

e.   Install polarized filter at some distance from projector lens to avoid thermal damage (at least 5-10 cm depending on projector lumens). The filter only allows up to 70°C temperature.

f.   Setup the polarized filter and glasses so that right/left eye can only see the scene for one eye.

g.   Use geometry alignment function inside projector to align the images from two projectors completely stacking together. Please place the polarized filter in front of the projector before geometry alignment because polarized filter will affect the light path from projectors. Some deviation is allowed for 3D display but will affect the performance in 2D display.

13.3.   GeoBox 3D settings

2 sub-menu under [3D properties] menu.
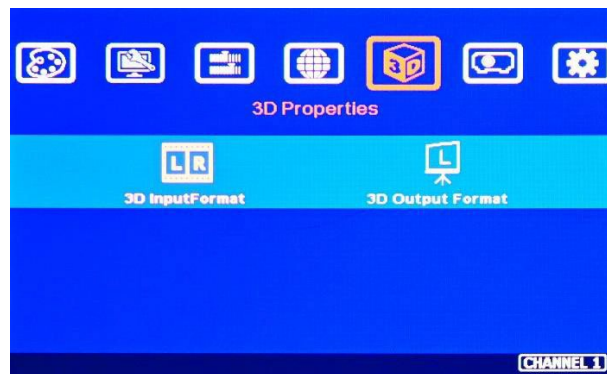
13.4.   Input Format]
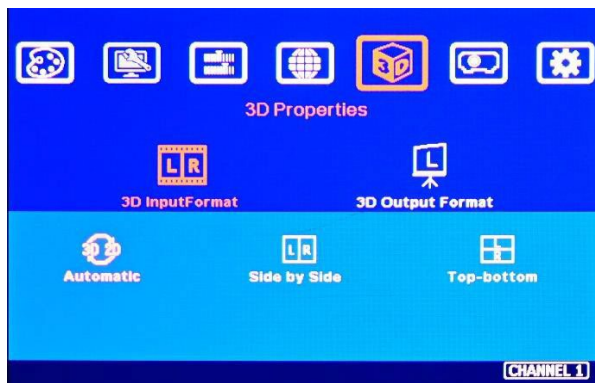
[Input Format] selection:

✓ Select [Automatic] if the 3D signal is standard 3D formats from Blue Ray player or sources with 3D INFO inside the signal.

✓ Select [Side By Side] or [Top-Bottom] based on 3D input format.

PS. User can apply dual camera RH/LH images as 3D signal source. In this case, please feed the output from each camera to each channel of UD102 input ports to implement passive 3D. User can also execute POP function to output side by side 3D format for 3D display devices.

13.5.   [Output Format]
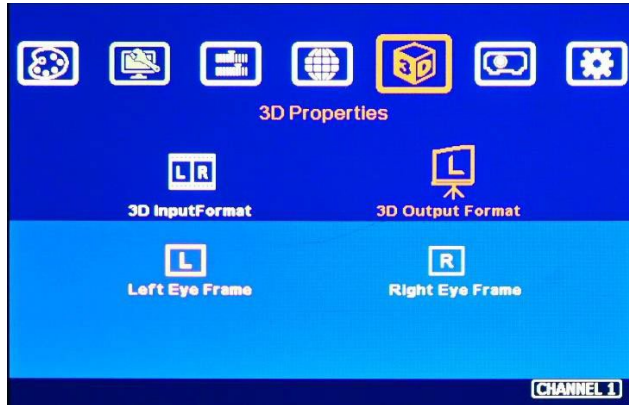
- ✓ To set [Right Eye Frame] for RH projector and [Left Eye Frame] for LH projector.
- ✓ [Output Fromat] setting is based on the filter location. If RH optical filter is installed at LH projector, then user needs to set LH projector at [Right Eye Frame]. User can swap [Output Format] setting to fix wrong position installation in optical filters.

14. PC tool

- ➢ Each G406s has independent IP address. The default IP address is 192.168.0.100. User can set different IP address in each G406s and control multiple units of G406s at the same time.
- ➢ Two PC tool is available for the control of GeoBox:
    - ✓ WebGui: embedded inside G406s. No additional software is required.
    - ✓ UHDWall Manager (UWM): HID PC tool, can be used through USB or Ethernet connection without installation process.

14.1. 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 or appropriate software tool is required.
- ➢ User can turn on/off the system through WebGui and see the status through power indicator.
- ➢ WebGui can be controller through mobile phone. Please note that iPhone may have different behavior and cause some mistake.
- ➢ In WebGui operation, the icon in the slide bar may need to move to middle point to take effect.

Example: WebGui for Video Wall setting
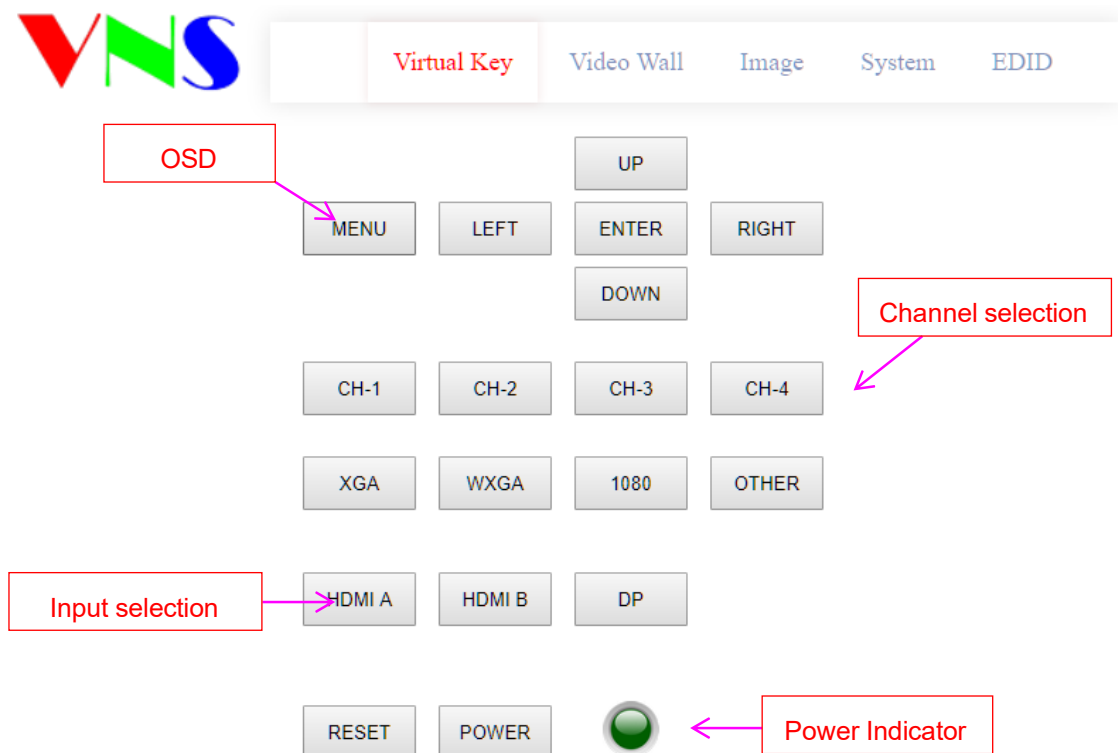
14.2. UHDWall Manager (UWM) PC Tool

➢ UWM Manager is a PC tool executed through PC. User needs to download this tool from GeoBoxAV.com 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 keyboard and mouse. User can backup system setting in PC and restore/copy to other units.

➢ UWM is for system setup and can't read back the settings parameters from GeoBox.

➢ UWM PC tool is designed for G400 series product. If user connects with G408, user will see 8 channels for selection instead of 2 channels.

➢ User can execute full operation functions and also update Firmware and MCU code through UWM. User can control multiple units at the same time through change IP address.
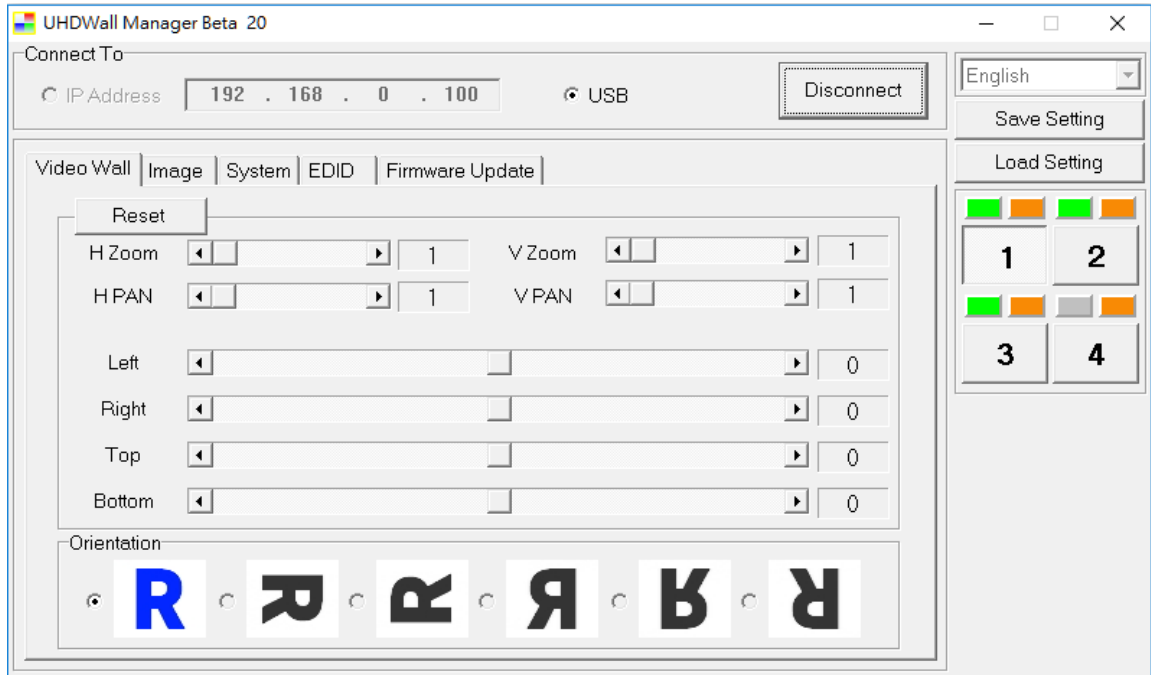
The color icons on the top of CH indicator is to show the system connection status. Green indicates that the channel has connected with display device and input LED indicates that input signal is connected.

15. Miscellaneous features

15.1. EDID Setting

➢ [Options]➔ [Setting]➔[EDID]. [Customize] EDID is in the selection list. The range is H= 1024~3860, V= 720~2400.

➢ HDMI: select CH1 or CH2 with HDMI input, then to set EDID

➢ User can set EDID directly through WebGui and UWM by selecting input port.

15.2. HDMI vs. DVI Output Signal

HDMI digital signal is compatible with DVI signal. Most of display devices can support both digital signals. Some old equipment may have less flexibility in digital signal compatibility. In this case, user may need to select DVI output format for normal display.

15.3. 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 (hot plug 5V signal), it will automatically turn on the system again.

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

15.4. Change Background Color

When no signal input, the system will show blue color background with [Power Saving Mode] message on the screen. User can change background color to black from the OSD menu as below.
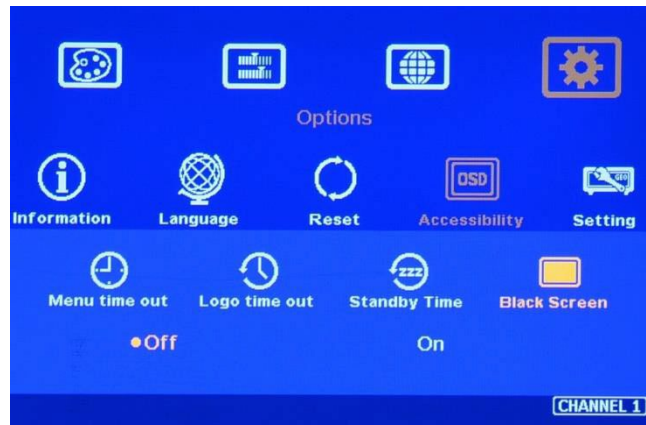
15.5. Change OSD Menu display time

User can set [Options]➔ [Accessibility]➔ [Menu time out]➔[0] to display OSD menu all the time. It will apply to two channels at the same time.

15.6. Change Splash screen logo display time

User can set [Options]➔ [Accessibility]➔ [Logo time out]➔[0] to eliminate splash screen Logo. It will apply to two channels at the same time.

16. <u>Helpful tips for video wall settings</u>

➢ 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, you will have two choices:

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

  ➢ Draw the image into video wall and keep some blanking border at some edge.

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

➢ 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.

➢ Pay attention to image rotation limitations in input signal resolution. G406s doesn't have 90/270 image rotation function when the input is 4k/60 Hz.

➢ Please apply signal source before video wall setting. Otherwise the settings may be wrong.

➢ G406s can support interlaced signal source (i.e. 1080i). However, if user rotates or flips the image, there will be no 3D motion adaptive de-interlaced function. User may see some small flick image while the input is still image. We recommend applying progressive signal for the best video quality.

➢ Some media players will output maximum resolution when it is powered on each time but not follow the EDID settings in sink device. It will cause abnormal display in the video wall if this video wall has image rotation setting and the signal source resolution is more than 4k/60Hz because G406s can only support image rotation under 4k/30Hz source signal.

➢ Please make sure no Over-scan setting in monitor. Otherwise, the image position will be wrong.

17. <u>Limitations in Image Flip and Rotation</u>

Image 90/270 degrees image rotation is only available in input resolution under 4k/2k @30Hz (included). While image is rotated or flipped, there will be no 3D motion adaptive de-interlaced function. We recommend apply progressive source signal to get the best video quality.

Technical Support

18. Trouble Shooting

18.1. Front Panel LED lights

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

➢   If user sees continuous flashing at 0.5" interval in Power LED, it means OSD may be locked. Please press [Menu] key for 5 seconds, it will disable [OSD locked] function.

➢   If Power key LED is flushing at 1" interval, the OSD Menu is locked and can't be used. Please use remote controller and press [850] number keys to disable OSD Menu Lock.

18.2. 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.

➢   Resolution issues: check if signal source and connecting cables can provide right signal requested 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].

➢   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.

18.3. Image rotation can't be implemented

➢   If the input signal is above 4k/2k @30Hz, image 90/270 degrees rotation function will be disabled.

18.4. Video quality issues

➢   Use the highest resolution and number of color bits (RGB 4:4:4) images allowed by G406s to be used as a signal source whenever possible.

➢   There are a number of lower-quality AV players, the specification and actual output are difference, or because of the use of lower color sampling bits or poor image compression technology, resulting in lower quality or image is not smooth (LAG).

➢   If the use of H.264/H.265 compressed files, please select a player with hardware decoding to get

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smooth video quality.

➢ If the input signal is interlaced signal (interlaced-1080i), and the image is rotated or flipped, then the channel will have no [3D Motion adaptive de-interlaced] processing function. If user applies static image source, the output video will have a slight jitter phenomenon. The processing channel quality will be reduced. Use a progressive signal source setting (1080p/2160p) whenever possible.

➢ Please press [INFO] shortcut key to check the input/output signal settings.

18.5. System setting can't be executed:

➢ System control applied to complete system can only be executed through CH-1.

➢ 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.

➢ After Reset, user will see "Reset to Default" message and the FW update process is finished.

18.6. 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, then it is possible to see some lag among the displays.

➢ The display devices may have different delay time under different settings. For examples, if the system with high end video processing, such as noise reduction or ME/MC, it may increase few frame delays. Please make sure all the display with the same settings.

➢ Please set Options➔ Setting➔ Frame Lock as [Normal] to implement Frame Locked function while using multiple units of G406s to avoid not synchronization or frame tear issues.

➢ It will apply to two channels at the same time..

19. <u>Technical support</u>

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

➢ The following information is required for a swift response.

  ✓ Sink device (monitor): type and model number

  ✓ Monitor layout or specific application details (shape of video wall).

  ✓ 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 input/output timing and F/W version.

  ✓ The exact nature of the problem. Please be as detailed as possible.

  ✓ If possible, please attach the Pictures of the issue.

  ✓ Usually we will response with 24 hours (excluding weekends)

  ✓ Please note that if the machine is sent back for repair, user needs to pay for some delivery cost.

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20.   <u>Safety Precaution and Maintenance</u>

> **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.

> **Working Environment**

Please locate G406s in an environment free from dust, moisture and high temperature with good ventilation.

20.1. Warranty:

This device is designed and tested to the highest standards and backed by Thirty-month's parts and labor warranty. Warranties are effective upon the first delivery date to the end customer and are non-transferable.

20.2. Maintenance and Repair

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

Specifications

✧   Input: 1x HDMI 2.0b

✧   Output: 2x HDMI 1.4

✧   1x HDMI 2.0b loop out port for multiple unit cascade & daisy chain connection.

✧   HDCP compliance: Input: HDCP V2.2/V1.4. output: HDCP V1.4

✧   Max. input resolution: 4096x2160 @60Hz, 7680x1200 @30Hz. 4:4:4 Chroma sampling, 30 Color bits.

✧   Support non-VESA STD input timings.

✧   18 selectable output modes up to 2048x1200 60Hz in each independent output port.

✧   Selectable 8/10-bit output color depth.

✧   One frame latency: 16.7ms (V=60Hz)

✧   Support xvYCC color processing & 8/10/12-bit deep color.

✧   Video Wall overlap setting in each edge up to

    +_ 1800 Pixels.

✧   3:2/2:2 cadence, low angle smooth algorithm, high-quality scaling engine.

✧   3D motion adaptive de-interlace.

✧   10-bit processor, frame rate conversion

✧   50Hz in/out in FHD to avoid video artifact.

✧   Frame lock for synchronized outputs.

✧   Support HDR input signal but no HDR effect in the output.

✧   Individual 90/180/270 rotation, flip, cropping, scaling & color adjustment in each channel.

✧   When image rotation at 90/270 degrees, the maximum input is 4k/2k 30 fps.

✧   Embedded HDMI audio in each output.

✧   Selectable and programmable EDID.

✧   ESD Protection: ±8kV (Air-gap discharge), ±4kV (Contact discharge).

✧   DC 12V/0.55A, max. 6.6w, (100-240 VAC PSU)

✧   Working environment: 45°C, 10-90% RH

✧   Control: IR, RS232, USB, Ethernet

✧   Dimensions (Body only): 220mm*161mm*41mm (without protruding parts). 220mm*168mm*46mm (including protruding part)

✧   Weight: 0.86kg (body only)

✧   CE/FCC/RoHS Certified

✧   30-Month Warranty