The absolute opposite of ordinary

G901 Datasheet

5x1 Seamless UHD switcher with Quad Split Views

Input: up to 4096*2160 @60Hz, 7680*2160 @30Hz in HDMI2.0b,

7680*4320@30Hz in DP1.4, 4:4:4 chroma sampling

True 10-bit processing and up/down scaling

*Programmable Output resolution: up to 4096*2267/60Hz*

or 7680*1234/60Hz, HDMI2.0, RGB 4:4:4

Selectable output: 24/30/50/60/100/120Hz, 8/10 bits

PIP/POP & 3/4 split view MultiViewer

5 in / 1 out seamless switching

3D format conversion
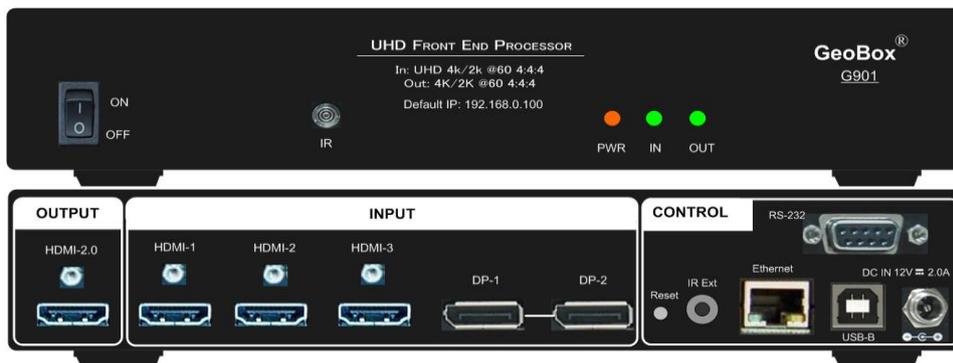
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Introduction

G901 is multiple purpose video processor for seamless switcher, format conversion, scaling up and down, image flip/rotation/cropping, video wall, PIP/POP, 3D format conversion and multi-viewer functions. The input supports various input sources and input timings. It is an ideal front end processor for big display system required 4k/60 input and output.

5 input ports (3x HDMI, 2x DP) and 1x HDMI outputs are designed in G901. Input supports up to 4096*2160 @60Hz, 7680*2160 @30Hz in HDMI input and 7680*4320 @30Hz in DisplayPort input with 4:4:4 chroma sampling. No VESA standard input timings are also supported up to 600 MHz.

Programmable output supports up to 4096*2267 @60Hz or 7680*1234 @60Hz output resolution. The range is from 800-7680 (with 8 pixel/step under 230Mhz, 16 pixel/step above 230MHz) in horizontal and 600-3840 (with 1 pixel/step) in vertical. The maximum resolution is limited to 600MHz. Output refresh rate can be selected from 24/30/50/60/100/120Hz.

It is integrated with 10-bit high end processor, motion adaptive de-interlace, low angle smooth algorithm, 3:2/2:2 pull-down cadence. Programmable EDID enables optimized input timing to get the best video quality.

It is integrated with color adjustment in Brightness, Contrast, Hue, Saturation, Sharpness, color temperature and discrete RGB gain adjustment. **Automatically detect and process HDR BT. 2020 input signal and output with full color 4:4:4 RGB SDR signal.** User can select deep color mode with true 10-bit color output to get smooth gradient color.

Video wall function in G901 can crop specific location & resolution in source image for programmable output. Overlap function allows user to change image position, aspect ratio and cropping area up to +_1800 pixels in each edge. User can also adjust aspect ratio and image position freely. Image 90/180/270 degrees flip and rotation are also available. It is an ideal front end solution for LED and big display system.

PIP (picture in picture) and POP (side by side or top/bottom) are standard functions in G901. 3 split view and 4 split view MultiViewer function are embedded. PIP image size can be from 320*180 up to 1920x1200. It can be located at any location across entire display. Both main and sub-windows can be flipped and rotated at 90/180/270 degrees and quick seamless swap. The cropping range and position in both main and sub-window are adjustable. Maximum input sources can be displayed in one G901 is four. The color adjustment function in sub-window is also integrated to have more application flexibility.

G901 can execute 3D format conversion function. It can convert HDMI 1.4 standard 3D format (side by side, top/bottom, frame sequential, Line interleaved, frame packed, discrete dual camera…) into side by side, top/bottom and frame sequential 3D output format. It can also decode 3D signal into discrete RH or LH for passive display. User can use G901 to convert dual camera and Line interleaved 3D format for medical devices into other 3D format so that it can be displayed in all 3D display devices.

User can use IR controller, USB, Web Gui and Ethernet for system operation and setup. User can save up to 10 customized settings in G901 and recall at any time. It is designed to work in 7/24 working environment and provides easy configuration, low entry barrier, cost effective, reliable and flexible solution.

Outlook
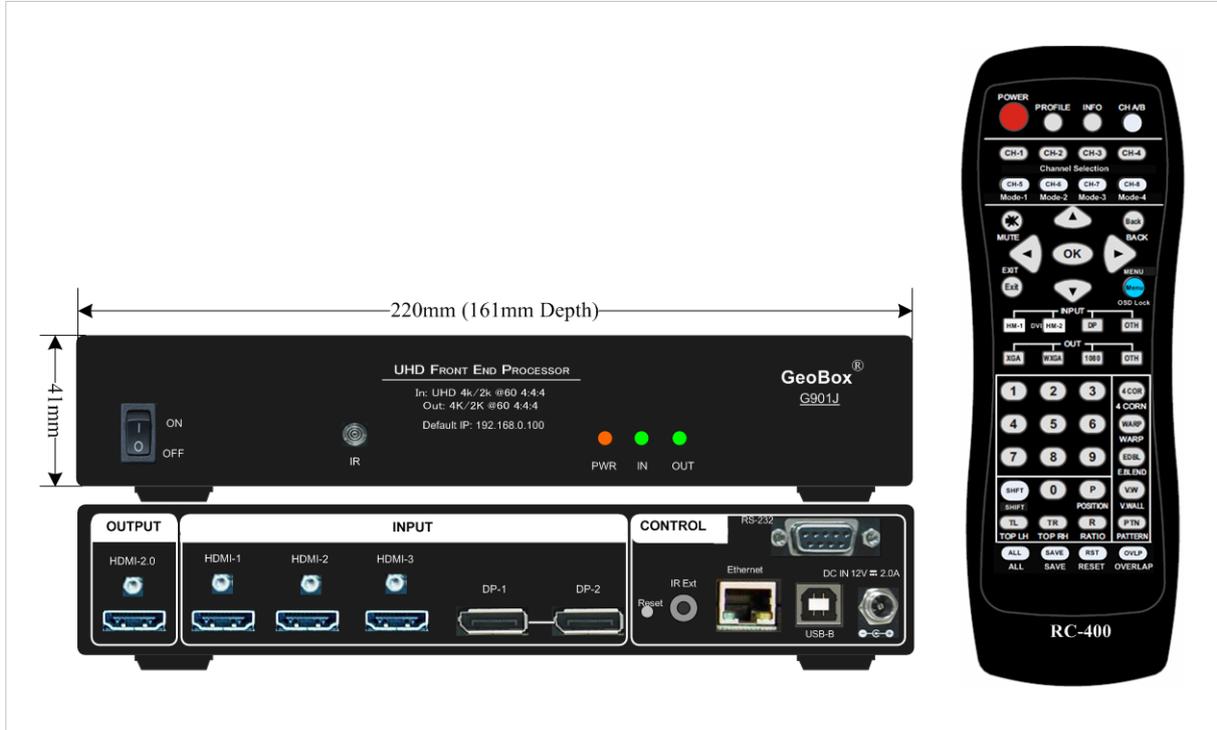
Specifications

✧ Input ports: 3x HDMI 2.0b, 2x DP1.4. Input signal sources cab be seamless switching.

✧ Max. input: 4096*2160 @60Hz or 7680*2160 @30Hz in HDMI up to 600 MHz and 7680*4320 @30Hz (true 8k/4k @30Hz) in DisplayPort.

✧ Supports interleaved and progressive input signals with 4:4:4, 10-bit color up to 4096*2160 50Hz.

✧ Support High Dynamic Range (HDR): SMPTE ST-2084, SMPTE ST-2086 and BT.2020 HDR 10 input signal processing.

✧ Support non-VESA standard input with high end scaling up and scaling down function up to 600 MHz.

✧ Preset 17 output timing modes with selectable 8-bit/10-bit color and HDCP control settings.

✧ Programmable output range is from 800-7680 in horizontal (with 8 Px/step under 230Mhz, 16 Px/step above 230MHz) and 600-3840 in vertical (with 1 pixel/step). Max. programmable Output: up to 4096*2267 @60Hz or 7680*1234 @60Hz (maximum pixel clock < 600MHz).

✧ Selectable refresh rate: 24/30/50/60/100/120

✧ Output signal: SDR, progressive full color RGB 4:4:4, 8-bit/10-bit.

✧ HDCP: V2.2/V1.4 in HDMI & V2.2 in DP ports.

✧ Embedded video wall function for image split, cropping, location assignment and bezel compensation.

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

✧ Support xvYCC 8/10/12-bit wide color gamut input signal processing.

✧ One frame latency: 16.7ms (V=60Hz)

✧ Programmable EDID in the range at H= 1024-4080 (8 pixels/step), V= 720-3840 (1 pixel/step)

✧ PIP/POP function with PIP image size from 320*180 up to 1920*1200 resolution with flexible position, cropping area, aspect ratio, rotation/flip and color adjustment.

✧ PIP-window can be quickly turn on/off or main/PIP swap through remote controller shortcut key.

✧ Individual color adjustment in main and sub-windows.

✧ One G901 can display 4 types of 3 split views on landscape or portrait UHD monitor. 2 types of 4 split views can be displayed in landscape monitor. All inputs can be up to 4k/2k 60Hz.

✧ 3x SBS split view with the center image size from 1/6 to 5/6 adjustable.

✧ 5x1 seamless switching with continuous output signal. Projector needn't re-search input source.

✧ High end video processing: 10-bit processor, 3:2/2:2 cadence, low angle smooth algorithm.

✧ High quality scaling engine for image scaling up and down in the range between XGA and 8K/4K.

✧ 3D motion adaptive de-interlace for interlaced input.

✧ 90/180/270 rotation, flip, cropping, scaling & color adjustment in main and sub-windows.

✧ Embedded HDMI audio output. User can select audio from main or sub-window signal source.

✧ OSD menu position can be shifted for convenient OSD operation.

✧ 3D decoding and format conversion for passive and active 3D display.

✧ Image Freeze by click keypad on remote controller.

✧ Native 1:1 pixel to pixel image display with original quality.

✧ 10 system settings can be stored and backup.

✧ ESD Protection: ±15kV (Air-gap discharge), ±8kV (Contact discharge)

✧ DC power supply: DC adapter: 12V 2A (100V-240V), max. Power consumption: 0.6A (7.2w)

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

✧ Control: IR, RS232, USB, Ethernet

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

✧ Weight: 0.87 kg (body only)

✧ CE/FCC/RoHS/UKCA/KC Certified

✧ 2 Year Warranty, extension package is available up to 5 years.

Function and features:

A. Input and output

- ➤ Input: 3x HDMI 2.0b, 2x DisplayPort V1.4.

  - HDMI 2.0b: Up to 4096*2160 @60Hz, 7680*2160 @30Hz, maximum pixel clock: 600MHz.
  - DisplayPort 1.4: up to 7680*4320 @30Hz (true 8k/4k), maximum pixel clock: 1080MHz.
  - Interleaved or progressive signal, 4:4:4 chroma sampling without compression
  - Connect with various video sources and support none VESA standard input up to 120Hz.
  - Seamless input source switching. Projector needn't re-search input source.

- ➤ 1x HDMI 2.0b Output port with programmable output resolution and refresh rate: The range is from 800-7680 (8 Pixels/step under 230Mhz, 16 Pixels/step above 230Mhz) in horizontal and 600-3840 (1 Pixel/step) in vertical directions (maximum pixel clock 600 MHz). Maximum output: 4096*2267/60 HZ, 7680*1234/60 Hz, 3120*3120/60 HZ. Selectable output refresh rate: 24/30/50/60/100/120 Hz.

- ➤ Preset output resolutions: 1024*768, 1280*720, 1280*800, 1280*1024, 1360*768, 1400*1050, 1600*1200, 1920*1080 (50/60Hz), 1920*1200 (30/60Hz), 2560*1440, 3200*1800, 3840*2160 (50/60Hz), 3840*1080@60.

- ➤ All outputs are RGB 4:4:4 progressive signals.
- ➤ Support xvYCC 8/10/12-bit wide color gamut input signal processing.
- ➤ Support selectable 8-bit/10-bit Deep Color output mode, even the input is 8-bit.
- ➤ Auto-detect HDR BT. 2020 input signal and processing with full color SDR RGB 4:4:4 output.

B. High end 10-bit scaling up and scaling down

- ➤ High end 10-bit scaling engine for image scaling up and down in the range from XGA to 8K/4K.
- ➤ Processor with 3D motion adaptive de-interlace, low angle smooth algorithm and 3:2/2:2 film mode detect and recovery function.
- ➤ Complete color adjustment function, including brightness, contrast, hue, saturation, preset color mode, and independent RGB gain adjustment.

C. PIP/POP and MultiViewer function

- ➤ [PIP]: Picture in Picture display with any two inputs.
- ➤ [SBS]: Horizontal Side by Side display.
- ➤ [Top/Bottom]: Top/Bottom display.
- ➤ [SBS 2/1]: 2/3:1/3 side by side display. Can be swapped to 1/3:2/3 side by side display by image rotation and change the monitor installation direction (top/down direction).

➢ [POP3]: One image at LH side and top/bottom two images at RH side. Can be swapped to one image at RH side and top/bottom two images at LH side by image rotation and change the monitor installation direction (top/down direction).

➢ [POP4]: One image at Top and two images at bottom. Can be swapped to two images at Top and one images at Bottom by image rotation and change the monitor installation direction (top/down direction).

➢ [3X SBS]: Three split views at landscape. The center image size is adjustable from 1/6 to 5/6 screen width through [Size] under [PIP Setting]. Minimum image size in both side windows is 1/12 screen width. Each window can be rotated to be displayed on monitor with portrait position.

➢ [3X T/B]: Three split views at portrait direction.

➢ [4x Split]: Four equal size split views (Monitor at landscape only).

➢ [4x T/B]: Display 4 split views with one image at the top and 3 images at the bottom. Below 3 windows keep 16:9 aspect ratio.

➢ PIP (picture in picture): with flexible PIP size (320*180 to 1920*1200), location and aspect ratio.

➢ Except [4x split] and [4x T/B] functions, all the other multiple window functions can support monitor at portrait and landscape position. Both main image and the sub-window support 90/180/270 degrees rotation and flip and keep [Full Screen] or [Original AR] aspect ratio.

➢ Cropping function (Overlap setting function) is available in Main image and all sub-windows for further location, size and aspect ratio adjustment as well as creating image borders.

➢ Individual color adjustment in main and sub-windows.

➢ All the inputs for main and sub-windows can be up to 4k/2k 60Hz 4:4:4 signals.

D. Image Cropping and Video wall function

➢ Input source can be cropped at H&V directions with any size through video wall function.

➢ Serve as video wall controller for irregular video wall with LCD at landscape or portrait position. One box can only control one monitor. Multiple boxes are required for multi-LCD video wall.

➢ Split the image up to 15x15 sections from single signal source in H&V directions. Assign the location of each split image for the output. The output can be further adjustment with +_ 1800 pixels in H&V for image position shift, aspect ratio adjustment, bezel compensation and creating overlap region for projector edge blending.

➢ Flexible image aspect ratio and position adjustment.

E. Various color adjustment

➢ Independent R.G.B color gain adjustment.

➢ Preset color temperature: Standard, Reddish, Bluish

➢ Brightness, contrast, Hue, saturation and sharpness adjustment.

➢ Brightness, contrast and RGB gain adjustment can be applied to both main and sub-windows.

F. Image rotation and flip

➢ Image 90/180/270 degrees rotation up to 4k/60Hz input resolution.

➢ Image flip in Front/Rear, Left/Right and Top/Bottom directions.

➢ PIP/POP/3 split view main and each sub-window can be rotated independently.

G. 3D function

➢ Support Side by Side, Top/Bottom, Line interleaved, Frame sequential, frame packed and dual camera 3D signals decoding and format conversion.

➢ Convert 3D signal into separate RH/LH eye frame, Side by Side, Top/Bottom or frame sequential output formats.

➢ Decode 3D formats into RH/LH for passive 3D display or frame sequential for active 3D display.

H. Quick PIP ON/OFF and two input seamless swap

➢ User can use remote controller [CH A/B] hotkey to turn ON/OFF PIP image seamlessly.

➢ If the output resolution is set to FHD or 1920x1200, user can assign one input signal to main and another signal to PIP channel and execute quick input seamless swap through [CH A/B] keypad on the remote controller.

I. Image freeze

➢ [Image Freeze] function in integrated in [Shift] shortcut key on the remote controller.

➢ When user click [Shift] key, the video will be frozen. To click [Shift] again, it will be released and turn to normal display.

➢ This function is good for image editing or user wants to see specific clip of the video.

J. Native 1:1 pixel to pixel image display mode

When single content is displayed on the screen, user has below choices for the display:

➢ [Full screen]: to display the content with full screen. The image will be scaled to full screen no matter the input is with what kind of aspect ratio.

➢ [Original AR]: to display content with original aspect ratio. If 4:3 input content is displayed on 16:9 monitor, it will keep 4:3 image aspect ratio with vertical full screen on the monitor.

➢ [1:1]: to display native pixel to pixel image at the center of the screen. When XGA image is displayed on 16:9 monitor, it will show up pixel to pixel XGA image at the center of the monitor without scaling to keep original image quality.

➢ Further image cropping and aspect ratio adjustment is still available

K. System control and other features

- ➢ Professional design and reliable for 7/24 working environment.
- ➢ Full function system setup through remote controller, USB, WebGui or Ethernet (Including through WiFi by PC, Mobile or iPad).
- ➢ Firmware update via USB or Ethernet.
- ➢ User can select main or sub-window-1 audio while implement PIP/POP.
- ➢ PC tool can control multiple processors simultaneously through USB or Ethernet.
- ➢ RS232 & Ethernet system control compatible with most of the control system.
- ➢ Programmable EDID in the range at H=1024~4080, V=720~3840. Beyond this resolution, user needs to set PC output timing through PC Customized settings.
- ➢ BOX ID and programmable IP address for convenient multiple unit control at the same time.
- ➢ User can save up to 10 settings and can be recalled by remote controller, RS232, USB or network.
- ➢ System settings can be backup in PC and copied to another unit.
- ➢ Automatic power ON/OFF through input signal ON/OFF control.

<u>Applications</u>

- ➢ 5x1 seamless switcher with UHD input/output
- ➢ MultiViewer function to display 2/3/4 split views for UHD display.
- ➢ Front end processor for multiple projector edge blending, LED and video wall system.
- ➢ Image rotation processor for display system.
- ➢ Co-work with other G900 models for video wall with odd number of monitors. One G901+ two G904 can build 3x3 video wall with UHD monitors.
- ➢ Mobile game displayed on portrait TV set.
- ➢ The most powerful PIP/POP function for big display system with flexibility sub-windows that is able to change direction, cropping area, position color and aspect ratio.
- ➢ Interface to accept non-VESA standard timings from various input timing up to 4096*2160 @60Hz, 7680*4320 @30Hz or 600MHz.
- ➢ High quality video up/down scaler with selectable output timings and refresh rate.
- ➢ Scaling down 8k/4k signal into low resolution.
- ➢ True 10-bit processor to keep smooth gradient color.
- ➢ Cropping specific image area for selectable output resolution & refresh rate.
- ➢ 3D format conversion for medical and dual camera 3D source.

Feature illustration

A. PIP/POP and MultiViewer functions

➢ [PIP]: Picture in Picture display with any two inputs.

➢ [SBS]: Horizontal Side by Side display.

➢ [Top/Bottom]: Top/Bottom display.

➢ [SBS 2/1]: 2/3:1/3 side by side display. Can be swapped to 1/3:2/3 side by side display by image
rotation and change the monitor installation direction (top/down direction).

➢ [POP3]: One image at LH side and top/bottom two images at RH side. Can be swapped to one
image at RH side and top/bottom two images at LH side by image rotation and change the monitor
installation direction (top/down direction).

➢ [POP4]: One image at Top and two images at bottom. Can be swapped to two images at Top and
one images at Bottom by image rotation and change the monitor installation direction (top/down
direction).

➢ [3X SBS]: Three split views at landscape. The center image size is adjustable from 1/6 to 5/6
screen width through [Size] under [PIP Setting]. Minimum image size in both side windows is 1/12
screen width. Each window can be rotated to be displayed on monitor with portrait position.

➢ [3X T/B]: Three split views at portrait direction.

➢ [4x Split]: Four equal size split views (Monitor at landscape only).

➢ [4x T/B]: Display 4 split views with one image at the top and 3 images at the bottom. Below 3
windows keep 16:9 aspect ratio.

OSD menu   GCT PC Tool
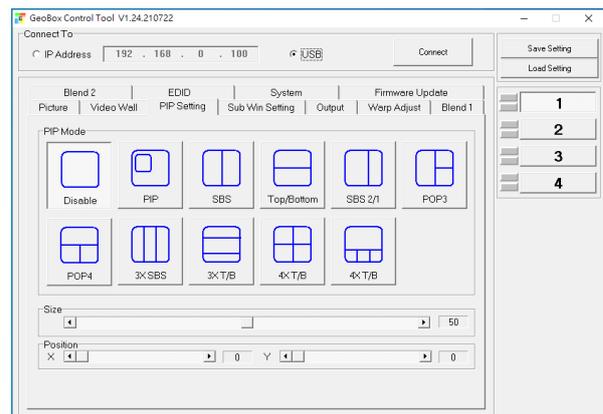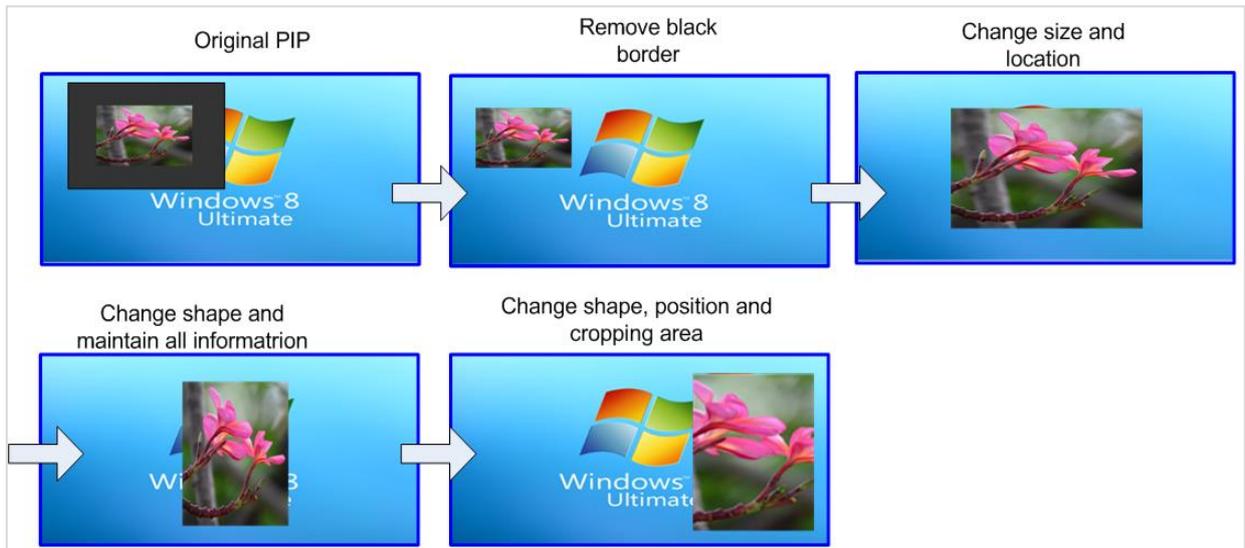
B. **MultiViewer examples**

Landscape 3 split views (3x SBS)

Center image size can be adjusted from 1/6 to 5/6 horizontal size.
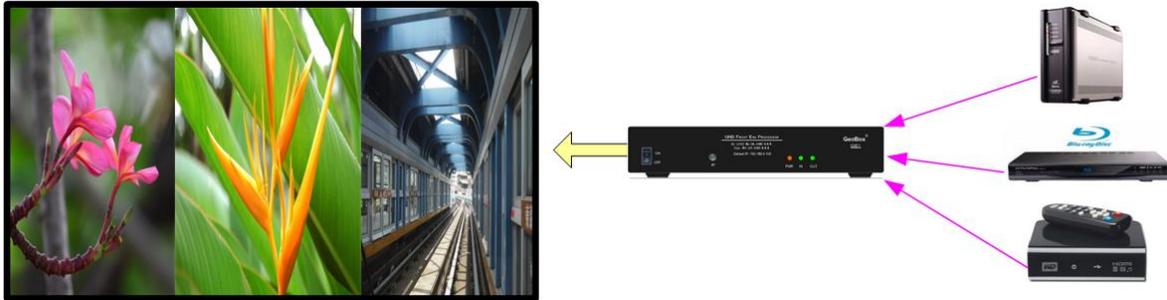
portrait 3 split views (3x SBS with rotation)

3 Split Views (POP3)
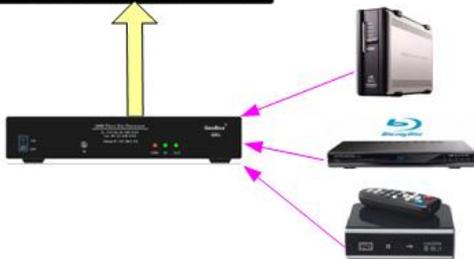
3 split views (POP4)

User can swap the RH/LH images on POP3 and Top/Bottom images on POP4 by image rotation and change the monitor installation direction (top/down direction). Aspect ratio in each window is adjustable.

4 split views (At least one signal shall come from DisplayPort)
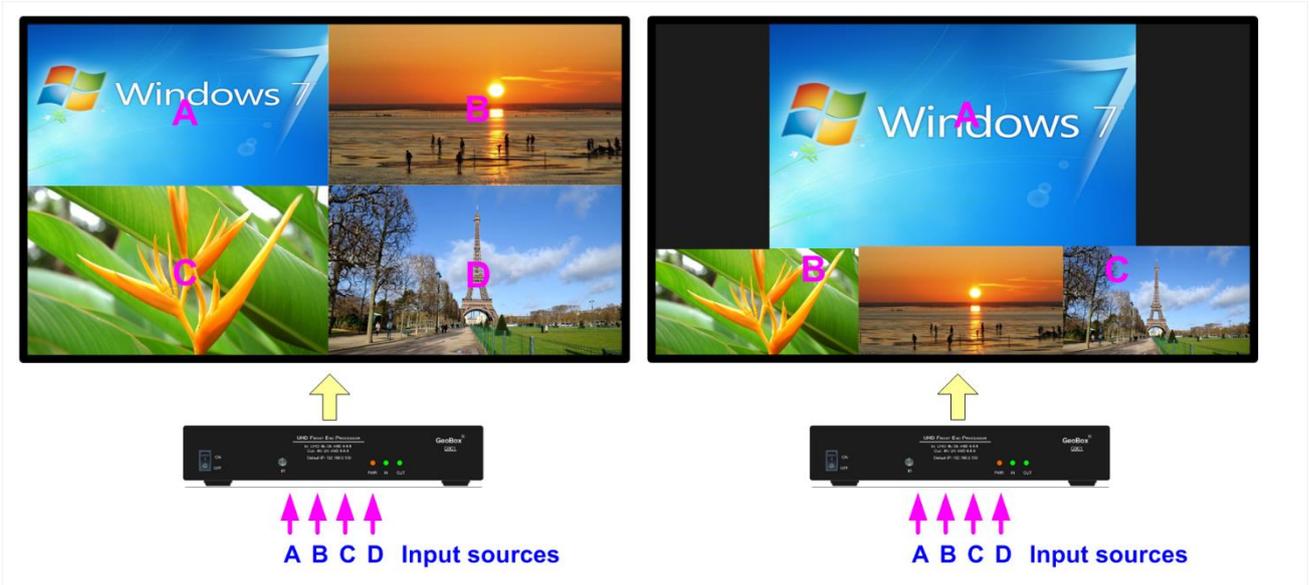
User can crop the image, adjust aspect ratio and add borders for each window.

C. Front end processor

G901 as PIP process   **G901 for PIP & aspect ratio adjustment**

G901 as front-end processor for 3 or 4 split view edge blending system
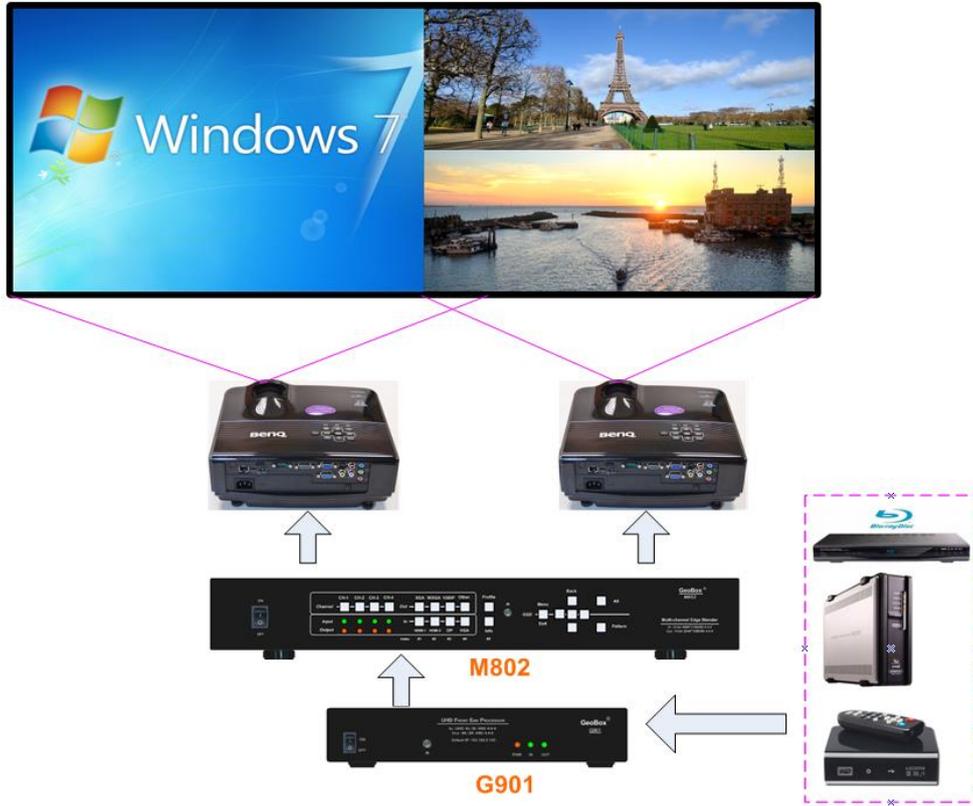
D. Image Flip & Rotation

Image 90/270 degrees rotation and flip up to 4k/60Hz resolution. After image rotation or flip, user can also adjust the aspect ratio and cropping area.
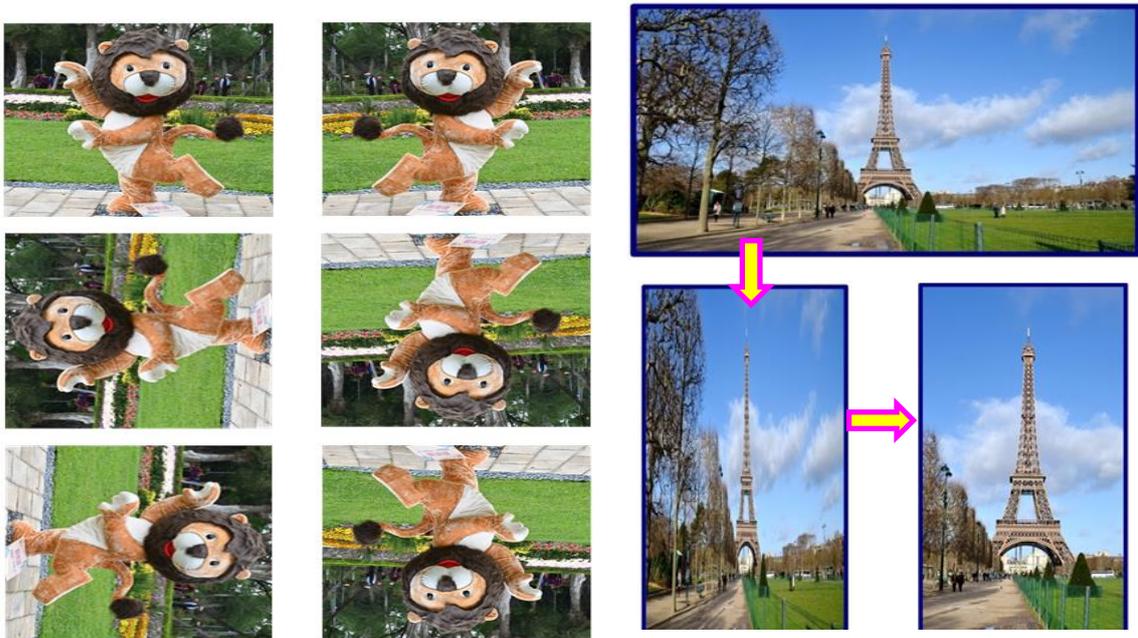
Example for mobile phone application

Mirrored image from mobile phone and display the image on portrait TV.

E. 2/3:1/3 display

User can swap to 1/3:2/3 side by side or top/bottom display by image rotation and change the monitor installation direction (top/down direction).
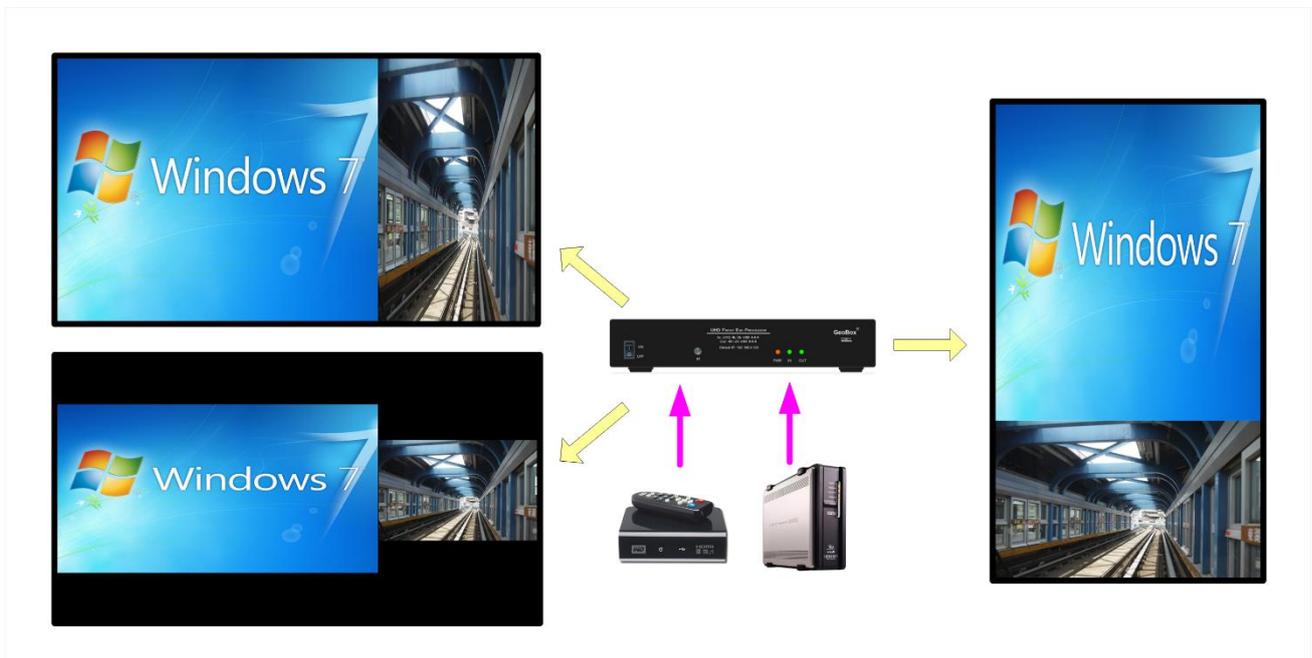
F. 5x1 4K Seamless Scaler Switcher
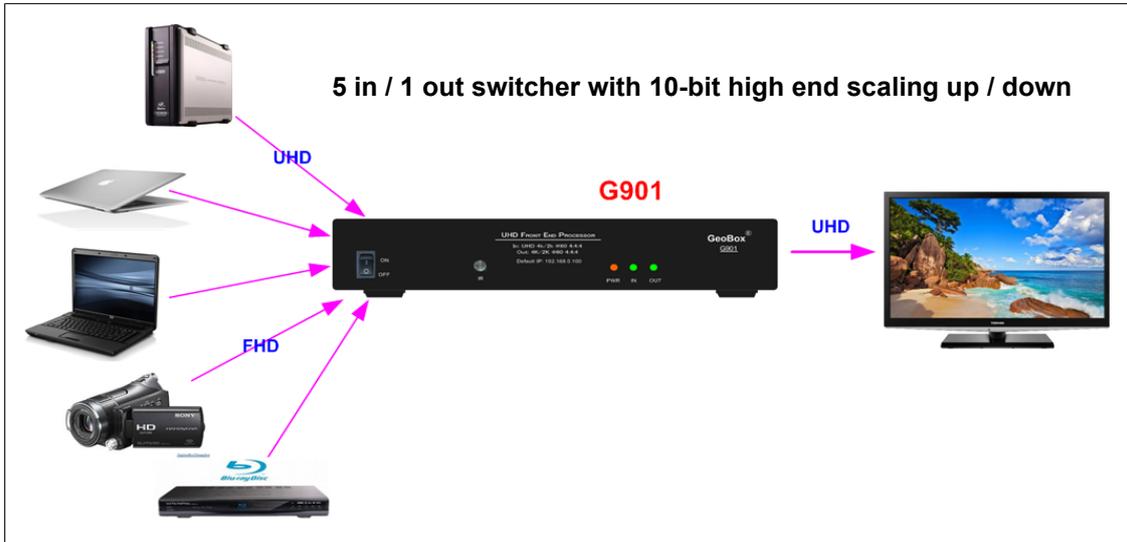
(5x1 seamless switcher. No any frame loss to prevent projector from spending time for re-search input source)

G. Stretch image and change aspect ratio

Video wall Overlap function can change image size, shift image position or change aspect ratio. The adjusting range is up to +_1800 pixels in each edge based on signal source. Standard 16:9 vs 2.35:1 movie aspect ratio can be converted through this function.
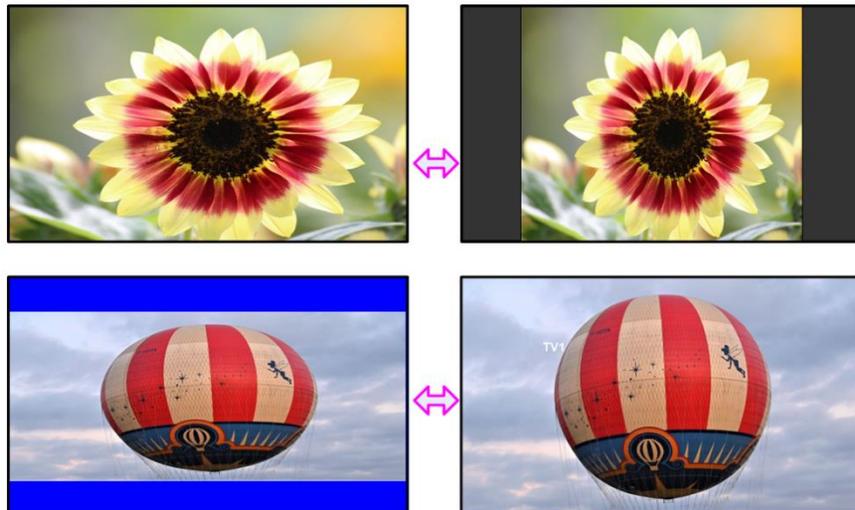
H. 4K Video wall

User can add one HDMI splitter to build 4k video wall with one big content across entire video wall or some monitors display discrete content with true 4k quality. Each monitor can be at different landscape or portrait direction with PIP/POP image inside.

## I.   Image Cropping & Rotation
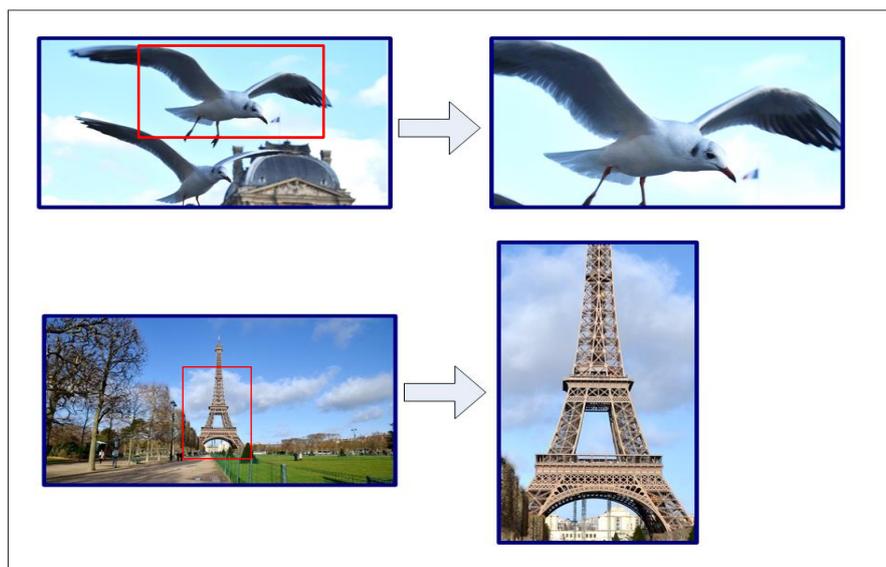
J. Image cropping application in LED display
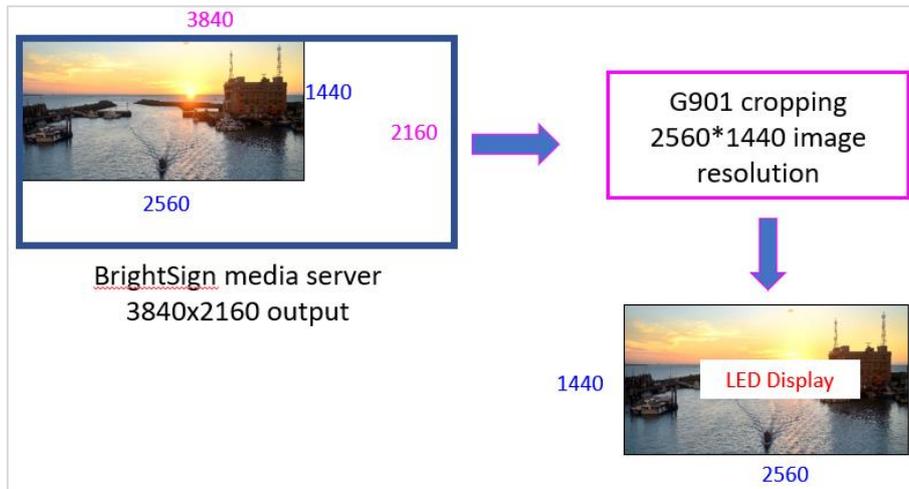
K. Quick PIP ON/OFF and two inputs quick seamless swap

➤ CH A/B key in remote controller can execute quick PIP image on/off.

Quick PIP ON/OFF & main/sub images quick seamless swap
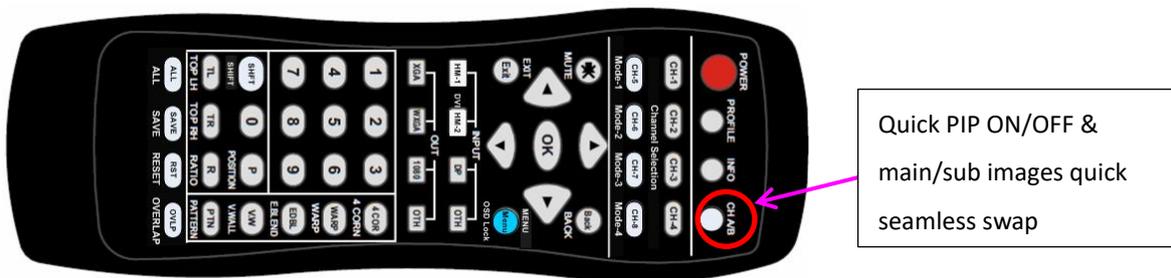
➤ User can assign one input to main image and another input to PIP image with full PIP size and set G901 output resolution at FHD, then click [CH A/B] key to execute seamless quick swap between these two inputs.

L. 3D format conversion and active/passive 3D application

G900 can convert side by side, top/bottom, frame packed, line alternative and dual camera 3D formats with Side by Side, Top/Bottom or frame sequential outputs.
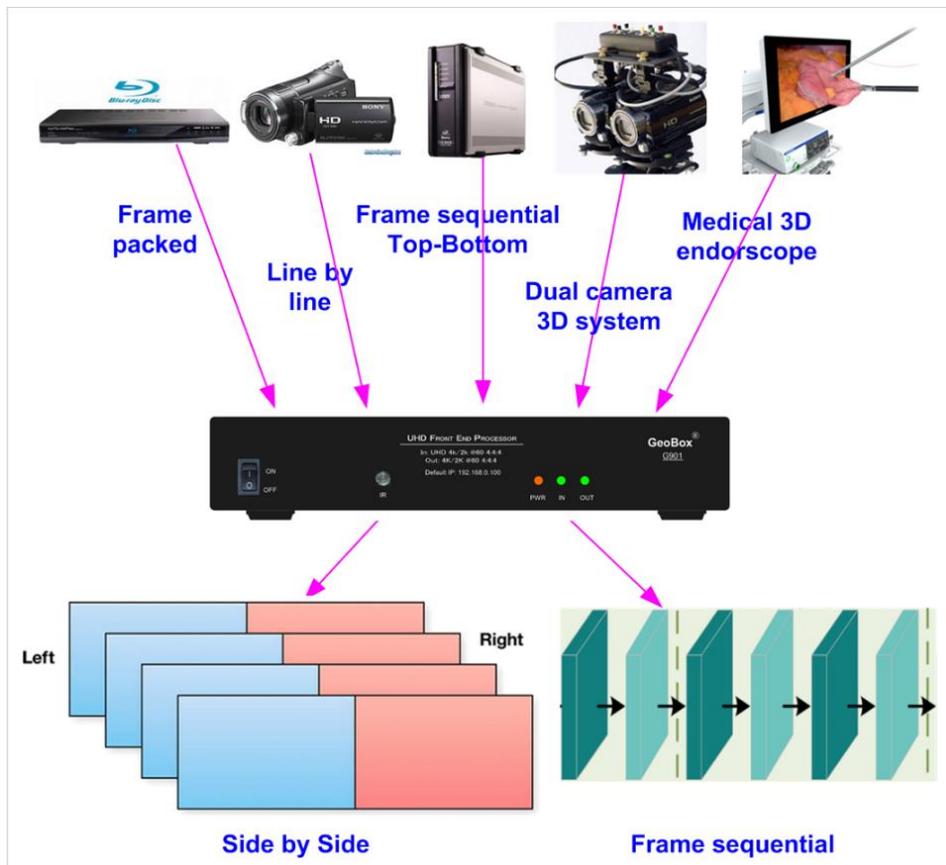
User can apply dual camera FHD 3D signal to G901. G901 can be set at POP SBS mode and output 4k/2k side by side image for 3D display.
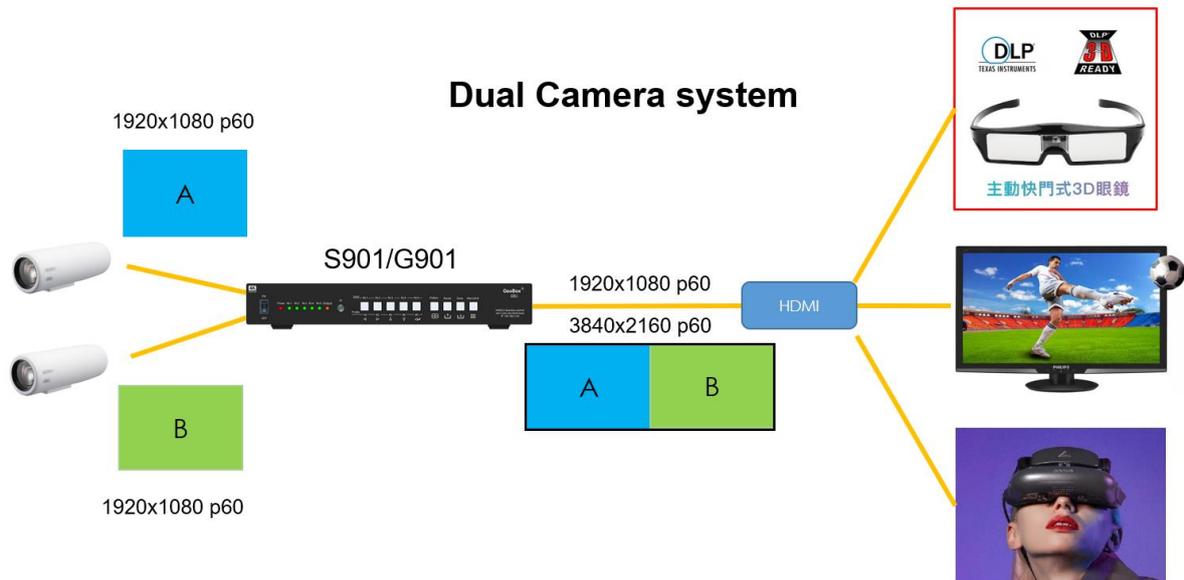
Active 3D display

- ➢ G900 can convert 3D formats into Side by Side, Top/Bottom or 100Hz/120Hz frame [Sequential] format for active 3D.
- ➢ Frame sequential 3D output can be up to full HD 120Hz.

Passive 3D display

G900 can decode 3D signal into RH eye or LH eye frame signal for passive 3D display. User need to use two units of G901J together with one HDMI splitter for this application. It will be more cost effective to use one G902 (no warp) or UD102 (with warp) for passive 3D system

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