



4K Multi Scaler Viewer MSV 2

User's Guide

Before connecting, operating or adjusting this product, please read this instruction booklet carefully and completely.

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Introduction

The MSV2 (Multi Scaler Viewer2) is 4K Multi Scaler Viewer which is an advanced video processor for multimedia presentations. It is an ideal solution for applications where up to four different or same video signals must be displayed on a single display. MSV2 allows you to manipulate output images, wherever positions and whatever size you want for display and also allows you to control brightness, overlay, etc. The embedded scaler converts the input images to match the output settings that you can select (up to 4K (4096x2160)). MSV2 can be easily controlled through various methods such as web controller, front panel controller (OSD) and RS-232 .

Main function:

- A four-channel input image signal is output from one display equipment.
- Downscaling and upscaling each input image signal to the output image resolution

Input features:

- Various input resolutions

Output features:

- Selectable output resolution
- Crop settings for each input
- Each window size and location can be readjusted.
- Window labeling, Border (Timeout/On/Off)
- Function of Overlay and Copy
- 1 audio output signal of 4 input signals can be selected
- Brightness and Contrast can be set.
- Available to save user-defined Preset layout

Application for OPHIT MSV2

- Professional broadcasting and production studios
- Medical Center and laboratory
- Presentation application
- Display application

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use only Power Adapter supplied by OPHIT

1.1 Specification

1.1.1 Power specification

Items	Values / Description
AC/DC adaptor	12V DC, 3.33A
Total power consumption (on 4 inputs operation)	25.2W (12V DC, 2.1A)

1.1.2 Video input specification

Items	Values / Description
Port type	HDMI x 2 HDMI / DisplayPort x 2 (selectable)
Resolutions	4096 x 2160p @60Hz (maximum)
Signal formats	HDMI, DP

For more details on the video input resolutions refer to the document, MSV2 specification.

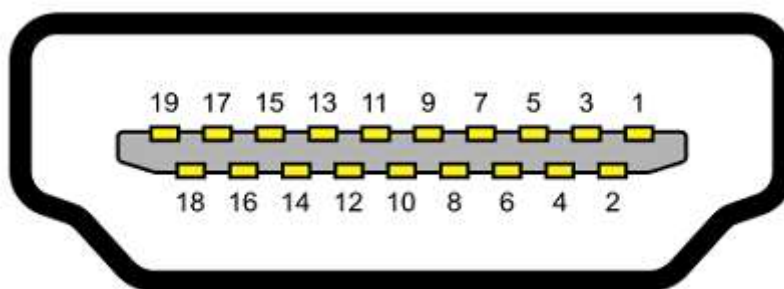
1.1.3 Video output specification

Items	Values / Description
Port type	HDMI x 1
Resolutions	4096 x 2160p @60Hz (maximum)
Signal format	HDMI

For more details on the video output resolutions refer to the document, MSV2 specification or chapter 5.4.

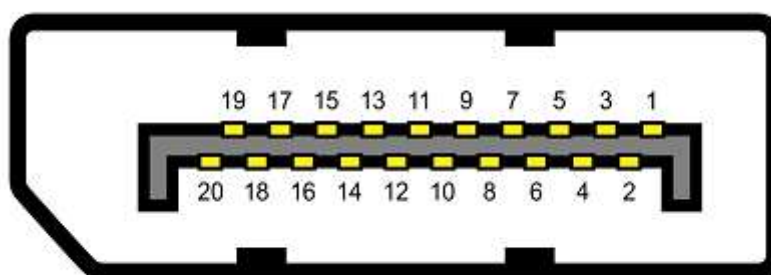
1.1.4 Input/output port pin assignment

HDMI Connector



Pin	Signal Assignment	Pin	Signal Assignment	Pin	Signal Assignment
1	TMDS DATA2+	9	TMDS DATA0-	17	DDC
2	TMDS DATA2 SHIELD	10	TMDS CLOKE+	18	+5V
3	TMDS DATA2-	11	TMDS CLOKE SHIELD	19	HPD
4	TMDS DATA1+	12	TMDS CLOKE-		
5	TMDS DATA1 SHIELD	13	CEC		
6	TMDS DATA1-	14	HEAC		
7	TMDS DATA0+	15	SCL		
8	TMDS DATA0 SHIELD	16	SDA		

Display Connector



Pin	Signal Assignment	Pin	Signal Assignment
1	Main Link Lane 0 (Positive)	11	Ground
2	Ground	12	Main Link Lane 3 (Negative)
3	Main Link Lane 0 (Negative)	13	Config1 (Ground)
4	Main Link Lane 1 (Positive)	14	Config2 (Ground)
5	Ground	15	AUX Channel (Positive)
6	Main Link Lane 1 (Negative)	16	Ground
7	Main Link Lane 2 (Positive)	17	AUX Channel (Negative)
8	Ground	18	Hot Plug
9	Main Link Lane 2 (Negative)	19	Return
10	Main Link Lane 3 (Positive)	20	DP_PWR (+3.3V input)

1.1.5 Mechanical Specification

- MSV2 case construction features

- Button: Power, Menu, Move, Resize, Resolution, Left/Right/Up/Down, OK, 8 display type buttons.
- Input video: 2 HDMI Connectors + 2 HDMI/DisplayPort Connectors (Selectable).
- Output video: 1 HDMI Connector.
- Size : 436(W) x 44(D) X 213(H) mm
- Color : Black, Ivory

▷ MSV2 (Color : Black) ◁

REAR VIEW



TOP VIEW

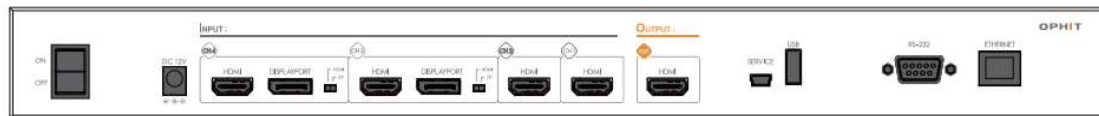


FRONT VIEW



▷ MSV2 (Color : Ivory) ◁

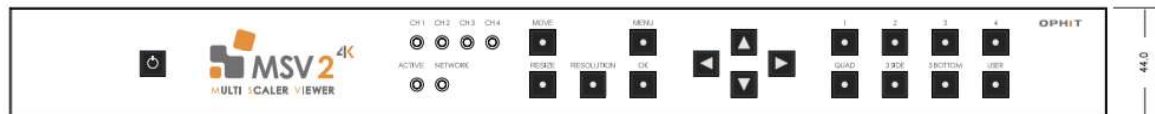
REAR VIEW



TOP VIEW



FRONT VIEW



2. Description



Hardware	Software
HDMI input port 2ea	MSV2 controller(Web)
HDMI/DisplayPort input port 2ea(selectable)	OSD
Front panel	User console

[Table 1] MSV2 Hardware & Software

Hardware

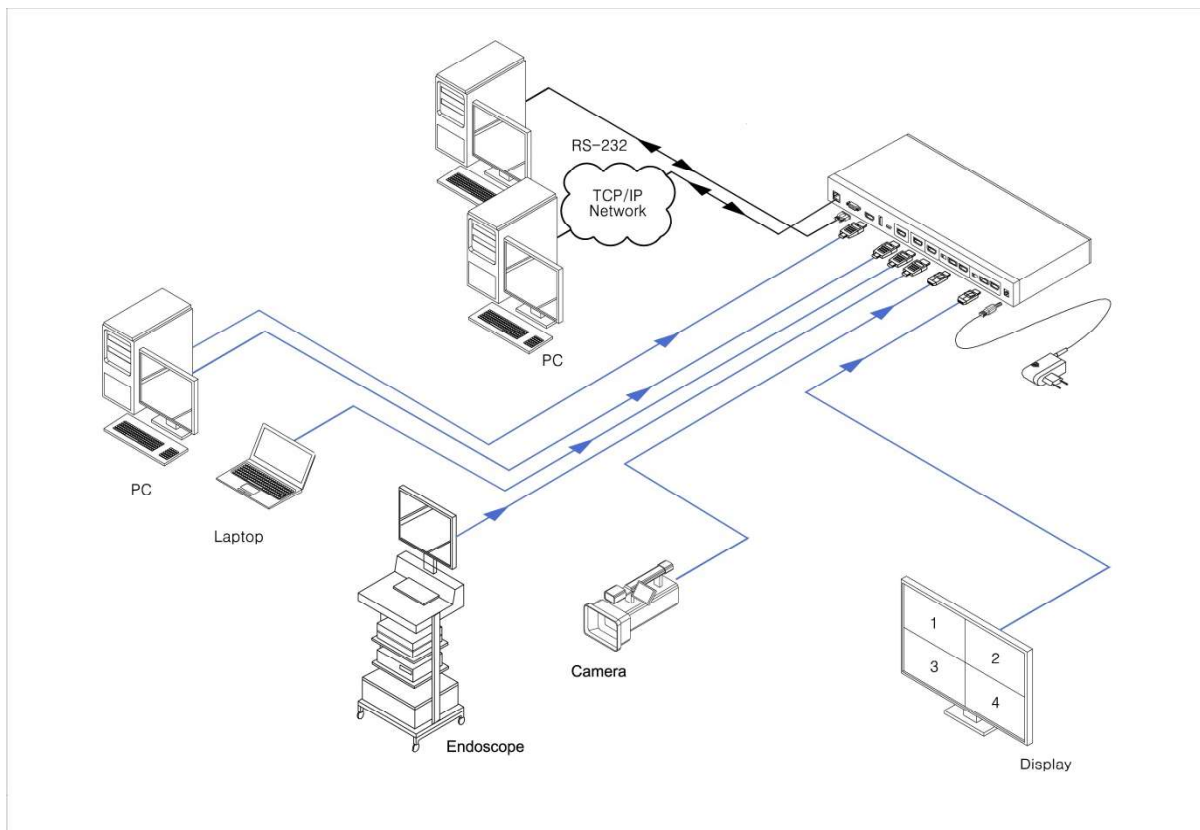
- MSV2 can receive two HDMI inputs and two HDMI/DisplayPort inputs (optional).
- Front panel allows you to change layout presets, move, resize functions, and OSD operation.

Software

- MSV2 operation is possible by utilizing MSV2 Web controller, On Screen Display (OSD), and User console.
 - 1) OSD is operated by front panel.
 - 2) Web Controller supports all operation functions of MSV2.
 - 3) The User Console can be operated via the RS232 cable (Basic operation functions only)

3. Quick Start

The MSV2 (Multi Scaler Viewer2) is 4K Multi Scaler Viewer which is an advanced video processor for multimedia presentations. It is an ideal solution for applications where up to four different or same video signals must be displayed on a single display. MSV2 allows you to manipulate output images, wherever positions and whatever size you want for display and also allows you to control brightness, overlay, etc. The embedded scaler converts the input images to match the output settings that you can select (up to 4K (4096x2160)). MSV2 can be easily controlled through various methods such as web controller, front panel controller and RS-232.



[Figure 1] MSV2 System Application

Operate in quad mode unless there is a separate operation using MSV2 Web Controller, OSD, User Console, etc. You can operate MSV2 by Quick Start Flow as below.

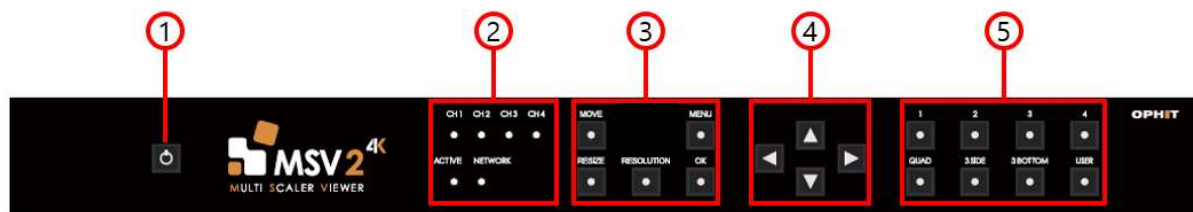
MSV2 Quick Start Flow
<ol style="list-style-type: none"> 1. Connect source device/devices to MSV input port (HDMI /DisplayPort) 2. Connect display device to MSV output port(HDMI) 3. Connect power adapter on MSV 4. Turn the MSV power switch On (on the rear panel) 5. Press MSV power button (on the front panel)

[Table 2] MSV2 Quick Start Flow

4. Starting Guide and Basic Functions

MSV2 can be controlled by OSD, Web controller and user console (RS-232) but basic functions can be operated by front panel without OSD and Web controller. In this chapter we will see the basic functions of MSV. Please refer to other chapters for using of OSD and Web controller.

4.1 MSV2 Front Panel Description



① Power: Power On/Off button.

② LEDs

CH 1~4 LED: Input signal is detected, for each channel led is illuminated

ACTIVE LED: If MSV2 is operating normally, this LED will flash.

NETWORK LED: If the network connection is normal, the LED will illuminate. If this LED is not lit, you will not be able to access the Web Controller.

③ Function buttons

MOVE: Enables window position setting mode.

RESIZE: Enables window size setting mode.

RESOLUTION: Opens a banner that allows you to view the current resolution. Before the banner disappears (Timeout: 5 sec) Pressing the button again sets the next output resolution.

MENU: Place the OSD on or off the screen

OK: Enter/Select.

④ Navigation buttons: Select or move the OSD menu. This controls window movement and sizing when activating Move and Resize functions.

⑤ Layout preset buttons: This button allows you to select Layout mode. The selected button LED is illuminated. When controlling the Move and Resize function, it is possible to use the User button while it is active. Use the buttons 1 to 4 to select the channel you want to control.

➤ When Move, Resize is selected, the button LED turns on to indicate that it is active. To deactivate, press the button again or press the Move or Resize button. Pressing another function button activates the newly pressed function.

4.2 Basic Function

4.2.1 Power On/Off

1. The front MSV2 power button LED will illuminate red when the rear power switch is switched on.
2. When the power button is pressed, the blue LED flashes and starts booting
3. The power button LED will turn blue after boot.
4. If the power button is pressed for more than 3 seconds, the red LED on the power button flashes and a Power off banner is displayed on the screen. The red LED illuminates when MSV2 is fully shut down.

4.2.2 Menu - OSD

Press the Menu button to display the OSD Menu. Press the Menu button again to exit the OSD Menu and disappear from the screen.

You can operate MSV2 settings and basic functions on the OSD.

Check the OSD Chapter for more information.

4.2.3 Move

1. Press Move Button, LED will light up and Move function will be activated
2. Select the number of window you want to configure by pressing one of 1,2,3 and 4 button, when a screen is selected LED above number button will light up
3. Reposition window using up (▲), down (▼), left (◀) and right (▶) buttons
4. You can select any window while repositioning just by pressing 1, 2, 3 and 4 buttons.
5. After setting, press the OK button to save your changes and press the Move button again to disable the function without saving.

4.2.4 Resize

1. Press Resize Button, LED will light up and Resize function will be activated
2. Select the number of window you want to configure by pressing one of 1,2,3 and 4 button, when a screen is selected LED above number button will light up
3. Resizing window using up (▲), down (▼), left (◀) and right (▶) buttons
4. You can select any window while resizing just by pressing 1, 2, 3 and 4 buttons
5. After setting, press the OK button to save your changes and press the Resize button again to disable the function without saving.

4.2.5 Resolution

MSV2 supports output resolution of 4K(4096x2160p@60), 1080P.720P and more.

(See Chapter 5 for detailed output resolution of MSV2 Function)

When the Resolution button is pressed, the currently set output resolution is displayed on the screen banner, and you can change the output resolution by pressing the resolution button again before the banner disappears (Timeout: 5sec).

The output resolution supported by MSV2 is only capable of setting the resolution supported by the connected display equipment.

4.2.6 Layout Button

You can select Quad, 3 side, 3 bottom, Channel 1-4 only mode, and User 0 to 4 mode from the front panel. The button LED is illuminated for layout shown on the current screen. User mode is set to User 0 layout when the User button is pressed. Press the 1,2,3,4 button to set the user 1,2,3,4 layout. Press the User button again to set User 0 layout. If the same CH button is subsequently pressed again, it will change to CH only mode.

4.2.7 Factory Reset

Pressing the User button while holding down the power button enters Factory reset mode and the power button red LED flashes. The message "Factory Reset" will be shown on screen. When Factory reset is shut down, a red LED illuminates on the power button. Press the power button to boot MSV2 again.

4.2.8 Swap

By pressing Up and Down on all presets (except channel only mode when Move, Resize, and Menu are not enabled), the swap function is activated.

Swap function is automatically turned off when the preset is changed.

5. MSV2 Function

MSV 2 is a multiprocessor that accepts 4 inputs and arranges all inputs into 1 layout.

Windows of different inputs can overlap due to resizing and moving function. In this case you will see the window with higher priority on the top of lower priority window. You can set Transparency level of overlapped areas of windows and also set border and label details.

In this chapter you will see descriptions of MSV functions. Please refer to OSD, Web Controller chapter for detail setting instruction..

5.1 Adjusting the position of windows

The horizontal and vertical position of each window can be adjusted. You can adjust one window's position each time and when windows are overlapped it will be displayed based on screen priority.

(Control tool → Front panel, Web controller)

5.2 Adjusting the size of windows

The horizontal and vertical size of each window can be adjusted. You can adjust one window's size each time and when windows are overlapped it will be displayed based on screen priority.





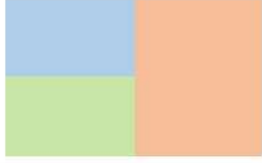
(Control tool → Front panel, Web controller)

5.3 Screen layout

There are pre-configured layouts available from the Web controller and Front Panel buttons.

User can also save additional 5 layouts and save it as user mode.

(Control tool → Front panel, Web controller)

Quad mode	
3 Side mode	
3 Bottom mode	
Ch[1~4] only mode	
User[0~5] mode	

[Table 3] Screen layout

5.4 Output resolution

Output resolutions can be selected. Supporting output resolution is shown on [Table 4] Output resolution.

(Control tool → Front panel, Web controller)

(Only SINK-supported resolutions in the below table are displayed.)

Output resolution
4096 x 2160p (24/30/60Hz)
3840 x 2160p (25/30/50/60Hz)
1920 x 1080p (50/60Hz)
1280 x 720p (50/60Hz)
1920 x 1200p (60Hz)
1680 x 1050 (60Hz)
1650 x 1050 (60Hz)
1600 x 1200 (60Hz)
1400 x 1050 (60Hz)
1360 x 768 (60Hz)
1280 x 1024 (60Hz)
1280 x 960 (60Hz)
1280 x 768 (60Hz)
1024 x 768 (60Hz)

[Table 4] Output resolution

5.5 Input resolution

MSV2 supports various input resolutions from the source. Information on supported resolutions can be found in the specification

5.6 Audio setting

User can set the audio output channel when it is not in CH 1-4 only mode.

MSV2 allows you to have 4 audio inputs and 1 output. You can select 1 output audio among 4 inputs and also can turn On/Off audio function.

(Control tool → Front panel, Web controller)

5.7 Input/Output signal monitoring

User can check detail information of input and output on OSD and Web controller.

(Control tool → Front panel, Web controller)

OSD

	Monitoring function	Description
System	Border	Window border display timeout/on/off
	Label	Label display timeout/on/off
	Audio	Output audio information
Output	Layout	Output layout mode
	Resolution	Output resolution information
Input	Scale mode	Input screen scale information
	Input size	Input size (W x H)
	Brightness	Brightness value
	Contrast	Contrast value

[Table 5] OSD Information Table

Web controller

	Monitoring function	Description
System	Front control lock	Front panel lock on/off
	Banner	Window banner display on/off
	Audio	Output audio information
	Firmware version	Version of MSV2 firmware
	Network	Network information of MSV2
Output	Preset mode	Output layout mode
	Resolution	Output resolution information
	HDCP	Output HDCP
Input	Resolution	Input resolution
	Label name	Label name
	Priority	Window priority setting information
	Type	Input type
	Crop	Channel crop information
	Brightness	Brightness value
	Contrast	Contrast value
	Position	Output window size and position information

[Table 6] Web Controller Information Table

5.8 Window priority

The Input priority setting affects the output screen and the Web controller window display.

If a window overlaps, display a window with a high priority at the top of the output screen and the Web controller preview screen.

A high number has a high priority. When a window is being repositioned or resized, that selected window will have higher priority for a while to show you modifying process,

This is only when User Priority function is turned on, when it's turned off then window that is being modified will always has highest priority.

(Control tool → Web controller)

5.9 Label name

Users can label each window with the desired characters.

5.10 Scale

The user can set the scale mode of each window.

When set to Same aspect, it is displayed on the screen to match the percentage of the screen that is actually entered. When set to Fit, change the screen percentage to match the window, size, and then display it.

5.11 Crop

User can Crop and output only the desired areas in the window.

5.12 Brightness / Contrast

User can set the Contrast and Brightness of each window.

5.13 Label / Border

Label and Border can set to Timeout/Always on/Always off in the display mode of the Label and Border respectively in the OSD menu.

5.14 Front button lock

MSV2 can use the Web controller to prevent Front panel operation.

This prevents unauthorized users from changing settings.

6. MSV2 Web Controller

Front panel, user console, and OSD control do not support all functions, but MSV2 Web controller supports all the functions of MSV2...

☞ The MSV2 Web controller is available only when Ethernet is connected to MSV2 and the IP initial value is 169.254.0.193

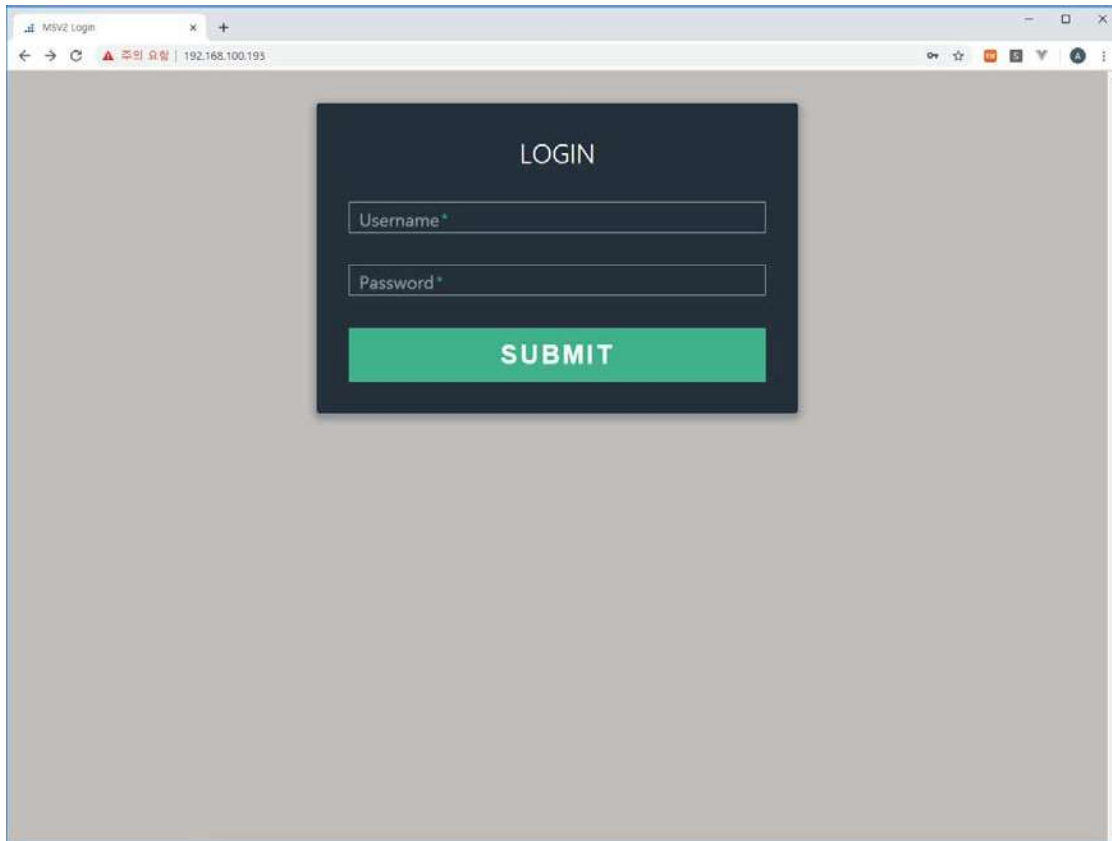
Function	Control	Details
Preview	Web controller	Preview enabled/disabled
Front lock on/off	Web controller	Front panel lock setting when controlling on MSV2 web controller
Split	Web controller	Change number of windows
Move	Web controller	Window repositioning
Resize	Web controller	Window resizing
Output resolution	Web controller	4096x2160, 3840x2160, 1920x1080
Audio	Web controller	Audio setting
Priority	Web controller	Channel layer priority setting
Label	Web controller	Label name setting
Crop	Web controller	Crop windows
Scaling	Web controller	Scaling windows
Brightness	Web controller	Change the value of brightness from 0 to100
Contrast	Web controller	Change the value of contrast from 0 to100
Layout	Web controller	Quad, 3-Side, 3-Bottom, Channel 1~4 only, User 1~4 mode

[Table 7] Web Controller Function

6.1 MSV2 Web controller Setup

The MSV2 Web controller can be started at any time if Ethernet is connected without installation.

6.2 MSV2 Web Controller Connection



To connect to the MSV2 Web controller, launch an Internet browser then connect to
“ <http://169.254.0.193>”

(Caution)

We recommend using the Google Chrome, Google Chromium, Google ChromiumPortable, Internet Explorer, Microsoft Edge, and Opera Software Opera browsers to ensure seamless use of the MSV2 Web Controller.

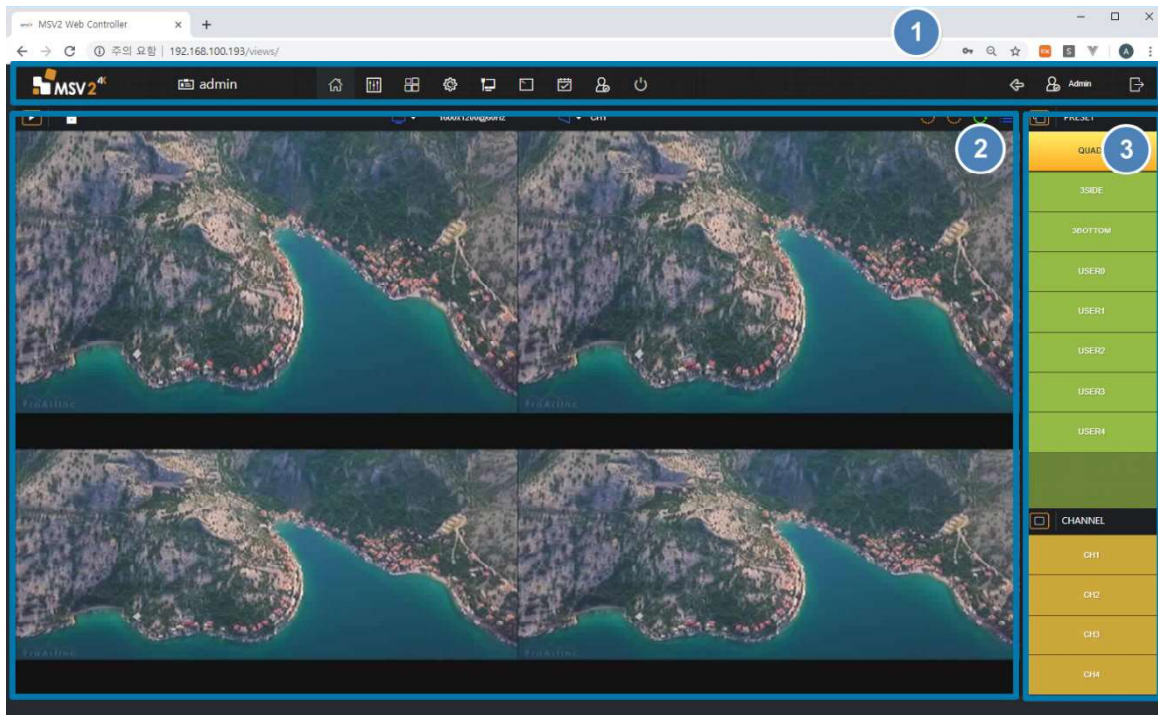
For Chromium and ChromiumPortable, Version 50.0.2633.3 and for IE is recommended starting with IE10 version. IE does not support large previews.

Enter the MSV2 Web controller ID and Password and start it by pressing the login button. One admin account and two guest accounts are provided. (It could be change later.)

Default admin ID	admin
Default password	123123123!
Default Guest1 ID	guest1
Default admin ID	123123123!
Default Guest2 ID	guest2
Default password	123123123!

[Table 8] Default ID & Password

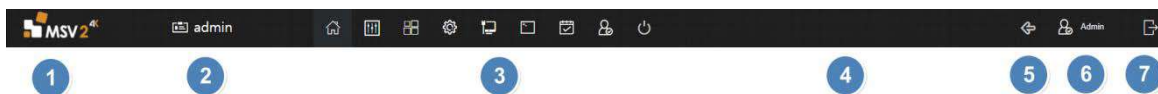
6.3 Home



- ① Menu – Device name, menu button, user rights information, message information, logout
- ② Preview & Screen control window – Preview, Banner, Front Lock, Resolution, Audio, Swap
- ③ Layout control – Use saved Preset and Channel Enabled buttons

6.4 Menu

Name of device, Preview On/Off, Banner On/Off, Screen Settings, Front Button Lock On/Off, current layout, and audio settings are available in the Menu



6.4.1 MSV2 Logo[①]

6.4.2 Device name[②]

User can create the device name that they want, and users can change it in Account management, and for more settings, see Account Management.

(Caution)

Device name Indicates that the default value is "MSV2" and is not displayed in that case.

6.4.3 Menu button[③]

Menu button of MSV2

6.4.4 Message information[④]

Provide message information

6.4.5 Go home button [⑤]

Return to home

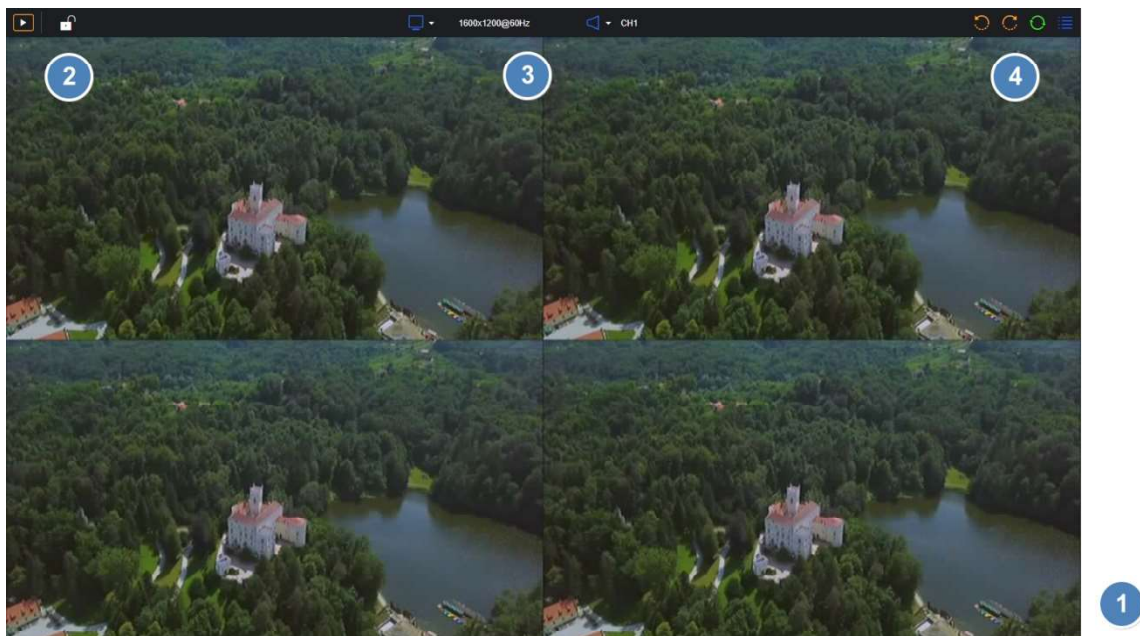
6.4.6 User permission information[⑥]

Indicates the permissions of the user you are currently connected to.

6.4.7 Logout[⑦]

Log out

6.5 Preview & Screen Control Window



.Show Preview settings, layout status, screen control, etc

6.5.1 Preview[①]

The current video is shown in the Web Controller via real-time streaming.

6.5.2 Front Lock[②]

If Front Lock selected, it will prevent to use control button on the front of MSV2

6.5.3 Resolution, Audio[③]

Displays the resolution currently output from MSV2 and the channel of the audio used. User can change it by clicking the mouse.

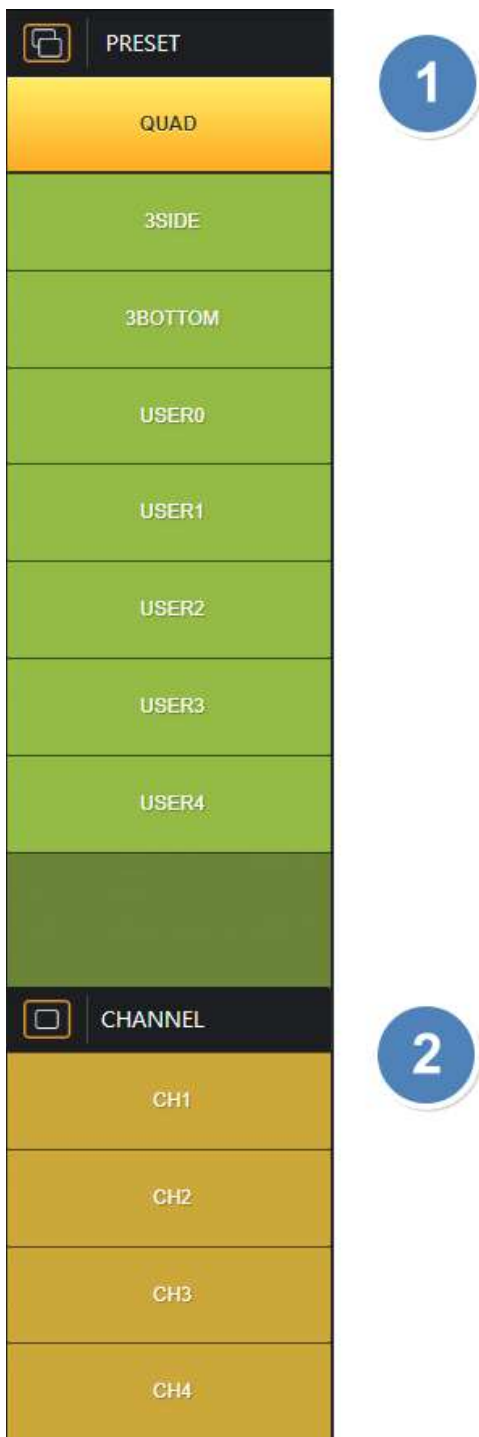
6.5.4 Swap function[④]

Move the images in half-clockwise or clockwise order

(Caution)

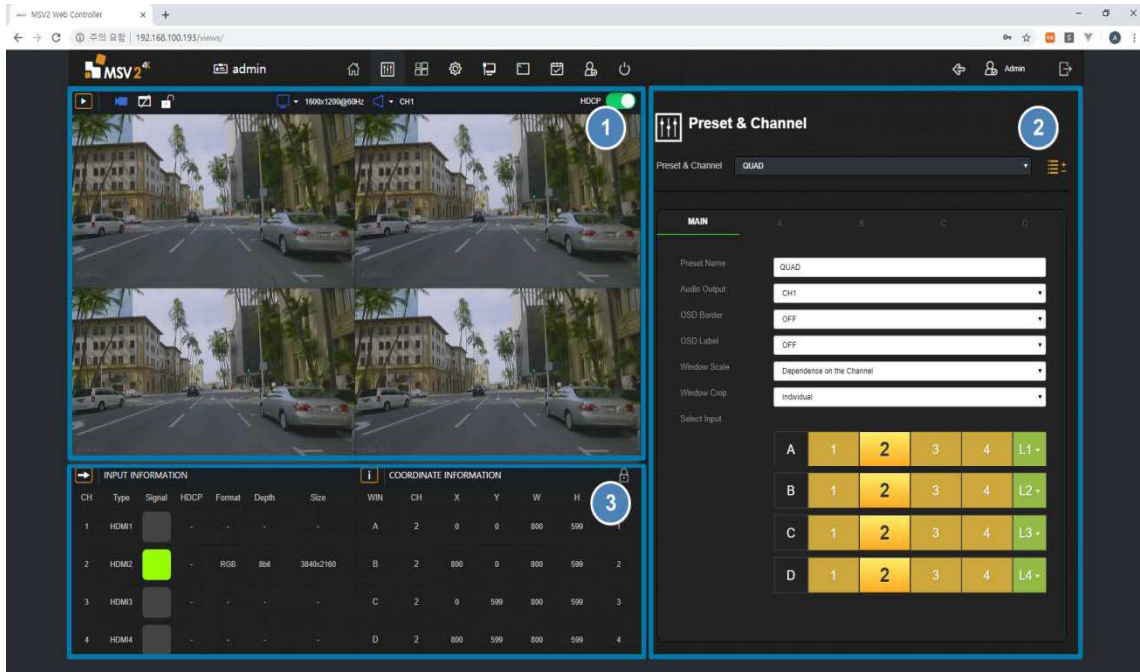
The swapped state is not saved, and it will be restored when the layout is changed.

6.6 Layout Control



User can change Layout or select options for Layout, and select and set channels.

6.7 Preset & Channel



You can enter when Preset & channel is selected in the Menu.

- 1) Preview & Screen control window – Preview, Banner, Front Lock, HDCP settings, resolution changes and audio changes
- 2) Preset & channel options – preset settings and channel settings
- 3) Screen Information – Input Information, Coordinate Information, Output Information, Coordinate Setting

6.8 Preview & Screen Control Window



Available setting for preview, banners, HDCP, etc.

6.8.1 Preview[①]

The current video is shown in the Web Controller via real-time streaming.

6.8.2 Preview Mode, Banner, Front Lock [②]

Streaming can be turned on or off through Preview Mode. Banners can be enabled or turned off via the Banner function. The front lock prevents operation of the MSV2 front.

6.8.3 Resolution, Audio [③]

Displays the resolution currently output from MSV2 and the channel of the audio used. User can change it by clicking the mouse.

6.8.4 HDCP [④]

Lets you select whether or not to use HDCP.

6.9 Preset & Channel Option

Preset & Channel

Preset & Channel **USER0**

MAIN A B C D

Preset Name: USER0

Audio Output: OFF

OSD Border: OFF

OSD Label: OFF

Window Scale: Dependence on the Channel

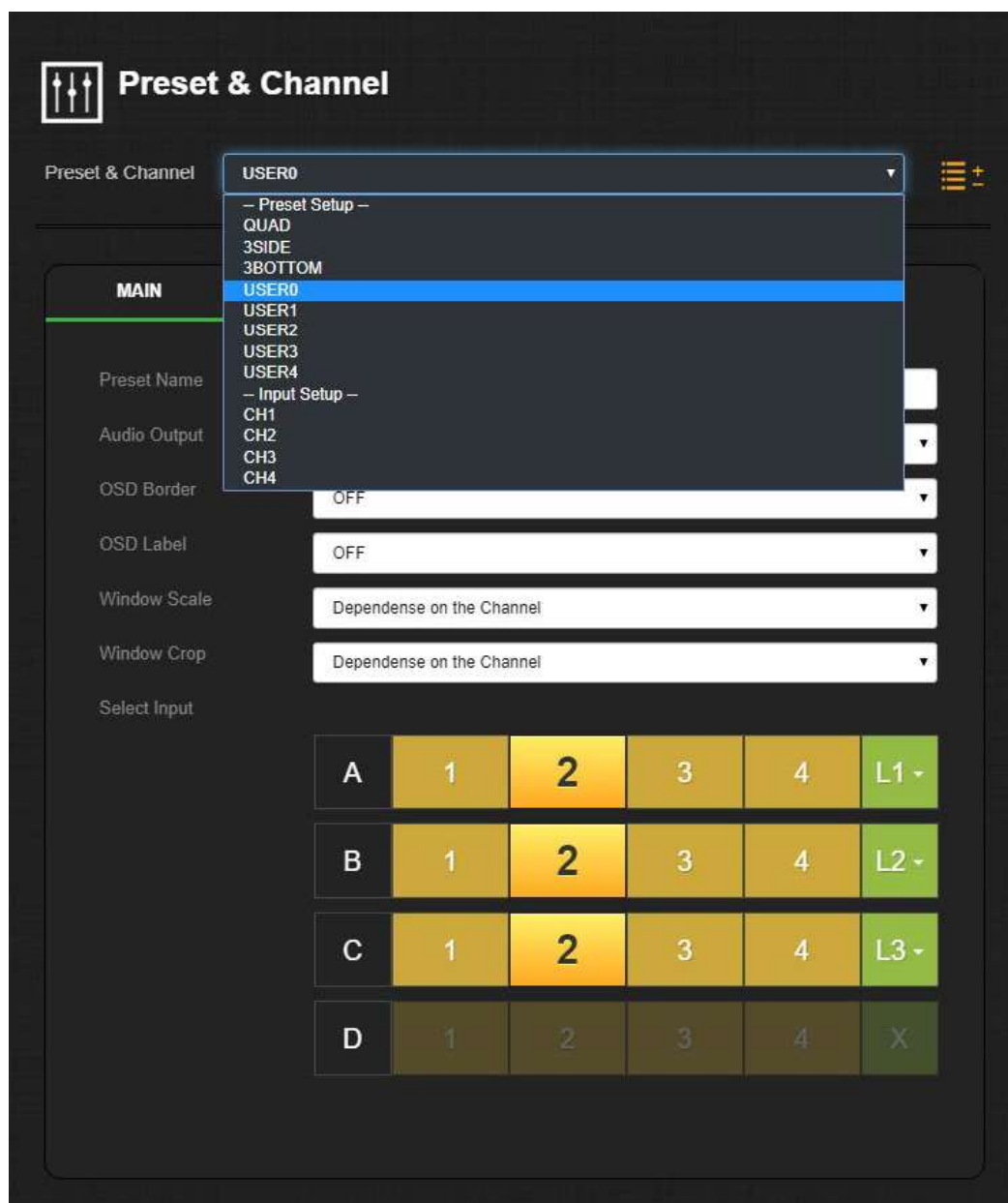
Window Crop: Dependence on the Channel

Select Input:

	A	B	C	D
1	1	2	3	4
2	1	2	3	4
3	1	2	3	4
4	1	2	3	4
L1				
L2				
L3				
X				

By Preset, you can save the settings you want, and you can also set up the channels. You can adjust the number of layout buttons.

6.9.1 Select Preset & Channel



Press the select button on Preset & Channel to select the presets and channels as follows:
Select to view and change the settings for the corresponding preset or channel.

6.9.2 Preset & Channel Setup

Preset & Channel

Preset & Channel **USER0**

MAIN A B C D

Preset Name: USER0

Audio Output: OFF

OSD Border: OFF

OSD Label: OFF

Window Scale: Dependence on the Channel

Window Crop: Dependence on the Channel

Select Input

A	1	2	3	4	L1
B	1	2	3	4	L2
C	1	2	3	4	L3
D	1	2	3	4	X

Select preset to :

1. Preset Name – You can rename the current preset.
2. Audio Output – You can select AUDIO in current preset.
3. OSD Border – You can select Enable OSD Border when you select the current preset.

4. OSD Label - You can select Enable OSD Label when you select the current preset.
5. Window Scale – You can select whether the scale is based on channel settings or individually set..
6. Window Crop – You can choose whether to set the Crop according to channel settings or individually.
7. Select Input – You can select output channels by window, and you can select layer priority..

1) Preset Name



You can also see that the Select button changes when you change Preset Name.

2) Audio Output



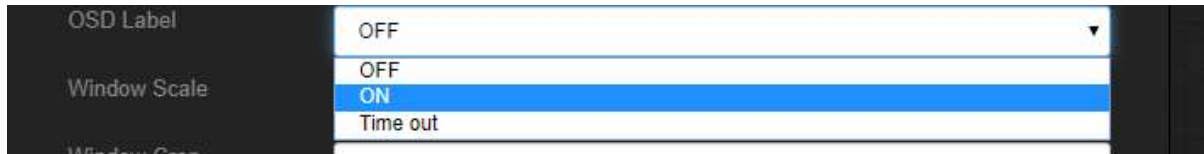
You can select the desired audio by pressing the Audio Select button.

3) OSD Border



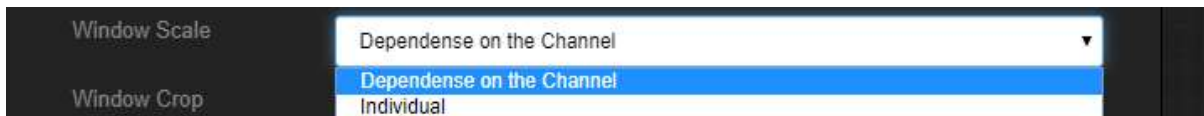
You can select the OSD Border option you want by pressing the OSD Border Select button.

4) OSD Label



You can select the OSD Label option you want by pressing the OSD Label Select button.

5) Window Scale



You can select the desired Window Scale Mode by pressing the Window Scale Select button.

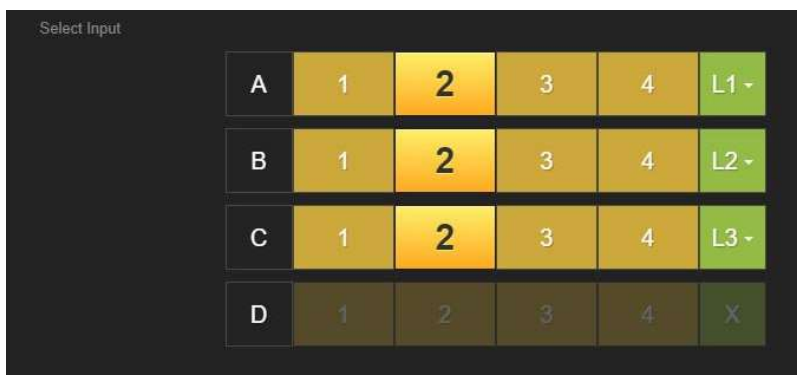
6) Window Crop



You can select the desired Window Crop Mode by pressing the Window Crop Select button.

7) Select Input

You can change the Input value by window. If the window is off, it will turn gray and you will not be able to select Input. You can change the layer priority. The higher the number, it will be top layer .

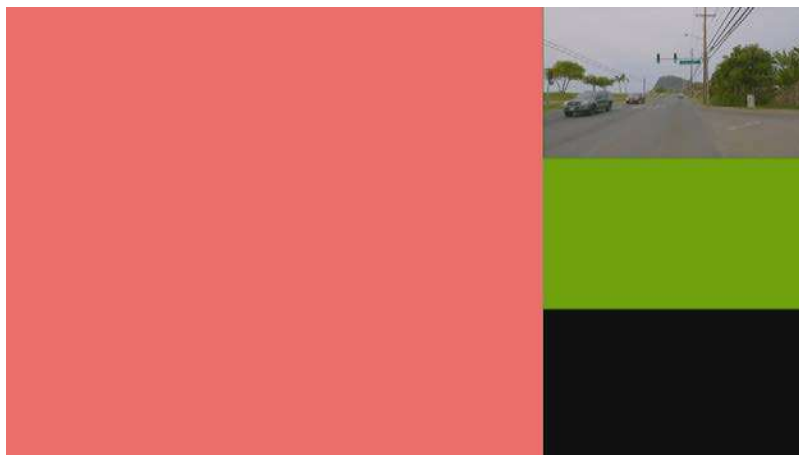




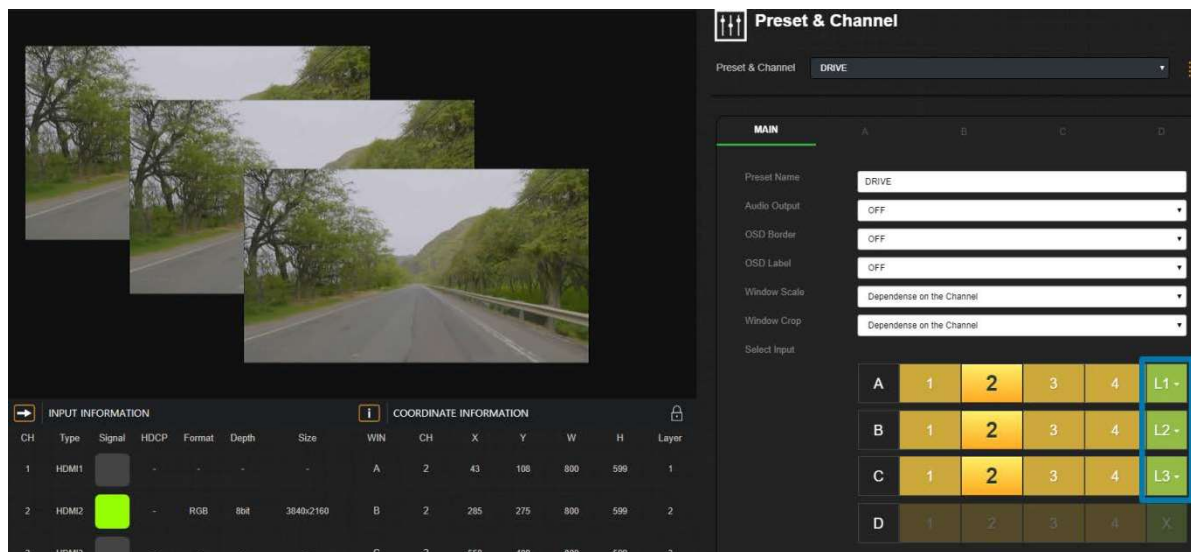
Before Input change

Select Input

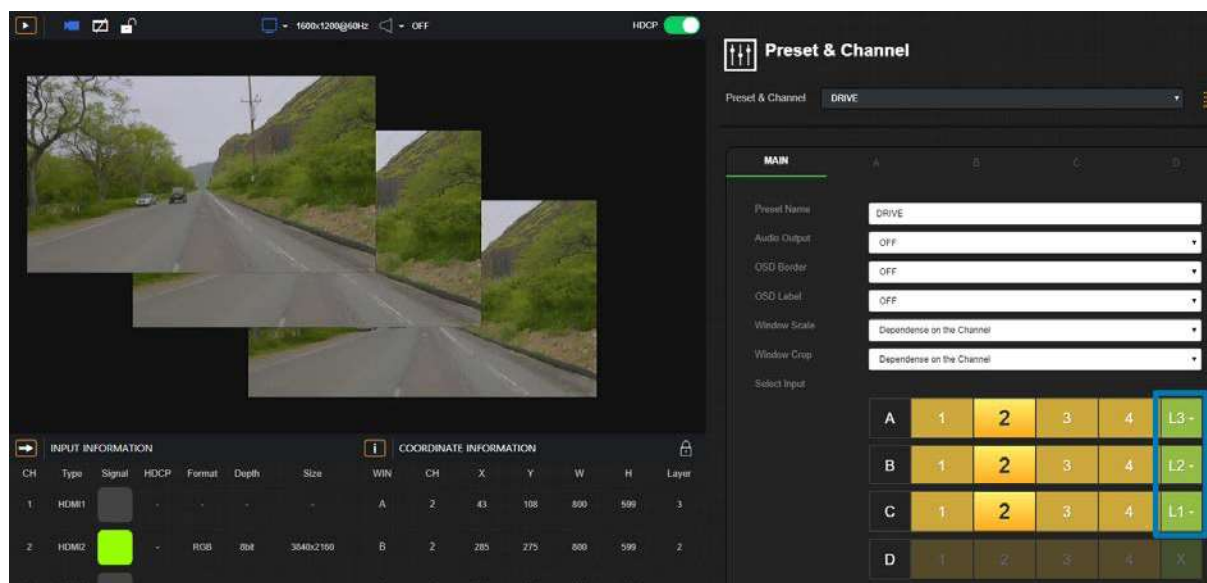
A	1	2	3	4	L1 ~
B	1	2	3	4	L2 ~
C	1	2	3	4	L3 ~
D	1	2	3	4	X



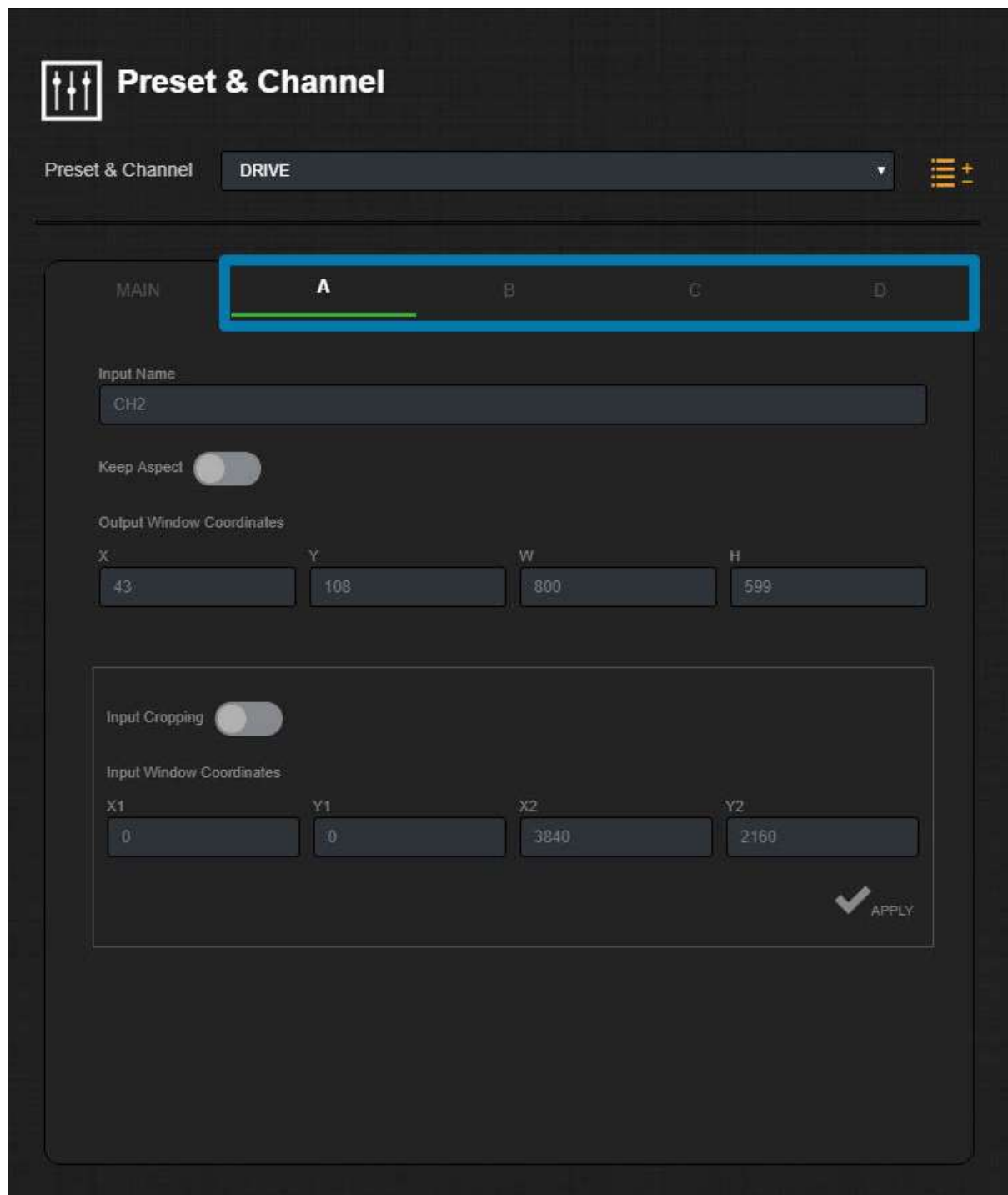
After Input change



Before Layer change



After Layer change



With Preset selected, press the Tab A, B, C, and D buttons to view information about that window. If the window is OFF, the window tab remains disabled.

Input Name

CH2

Keep Aspect ☐

Output Window Coordinates

X	Y	W	H
43	108	800	599

- 1) Input Name – Displays the channel name that is output from the current window..
- 2) Keep Aspect – When it enabled, the image remains at the original ratio.
- 3) Output Window Coordinates – Show the output coordinates.

Input Name

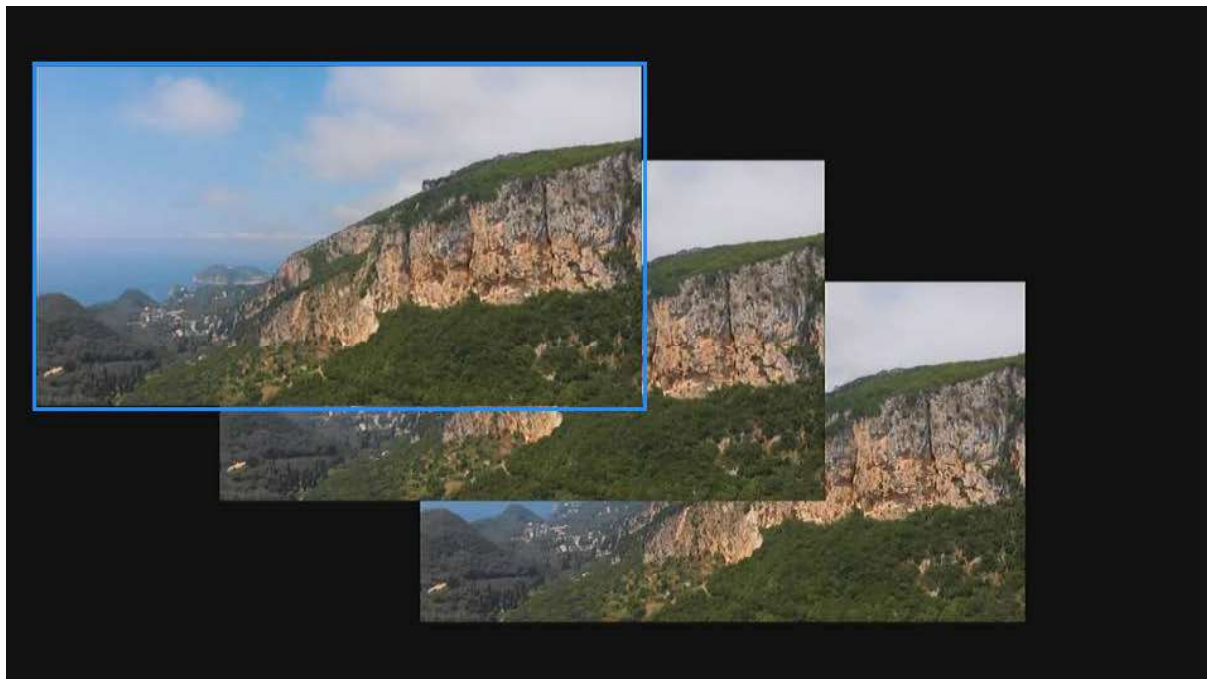
CH2

Keep Aspect ☒

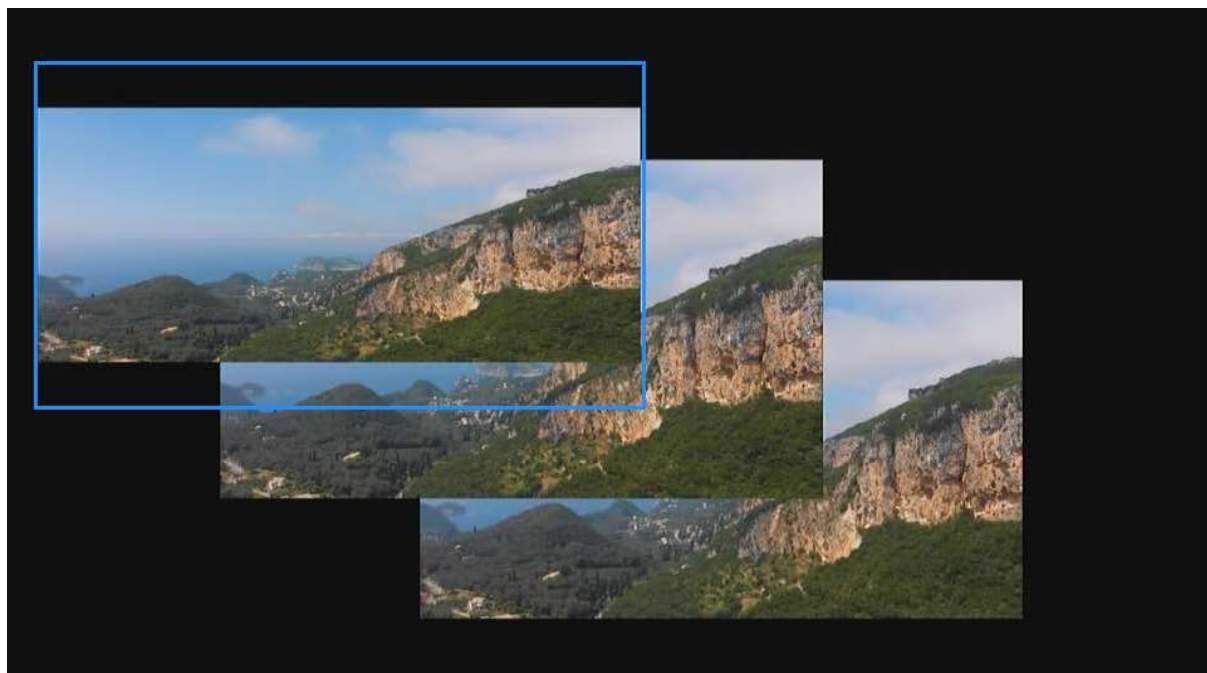
Output Window Coordinates

X	Y	W	H
43	108	800	599

MAIN Tab – The Keep Aspect setting is possible when Window Scale is set to Individual.



Keep Aspect (Disable)

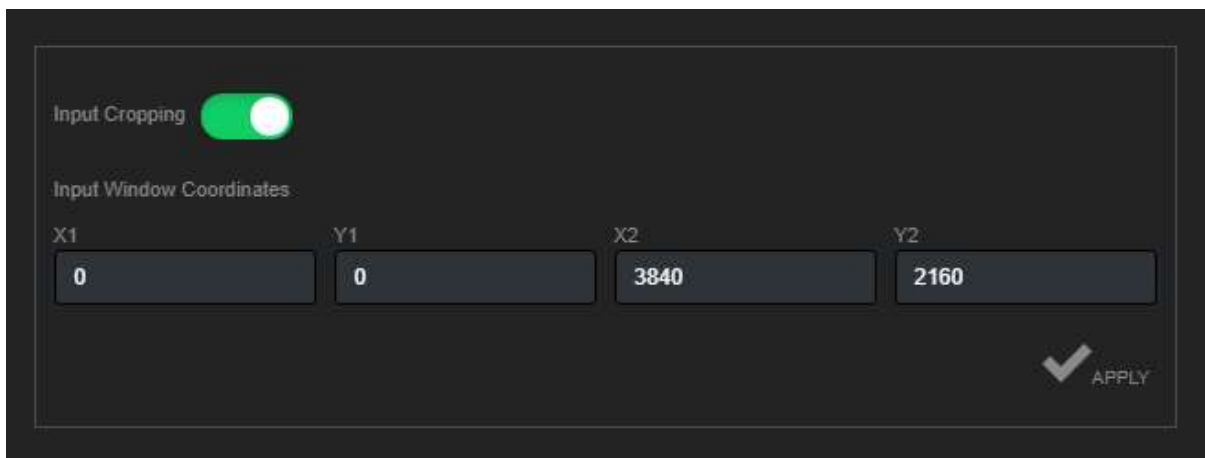


Keep Aspect (Enable)



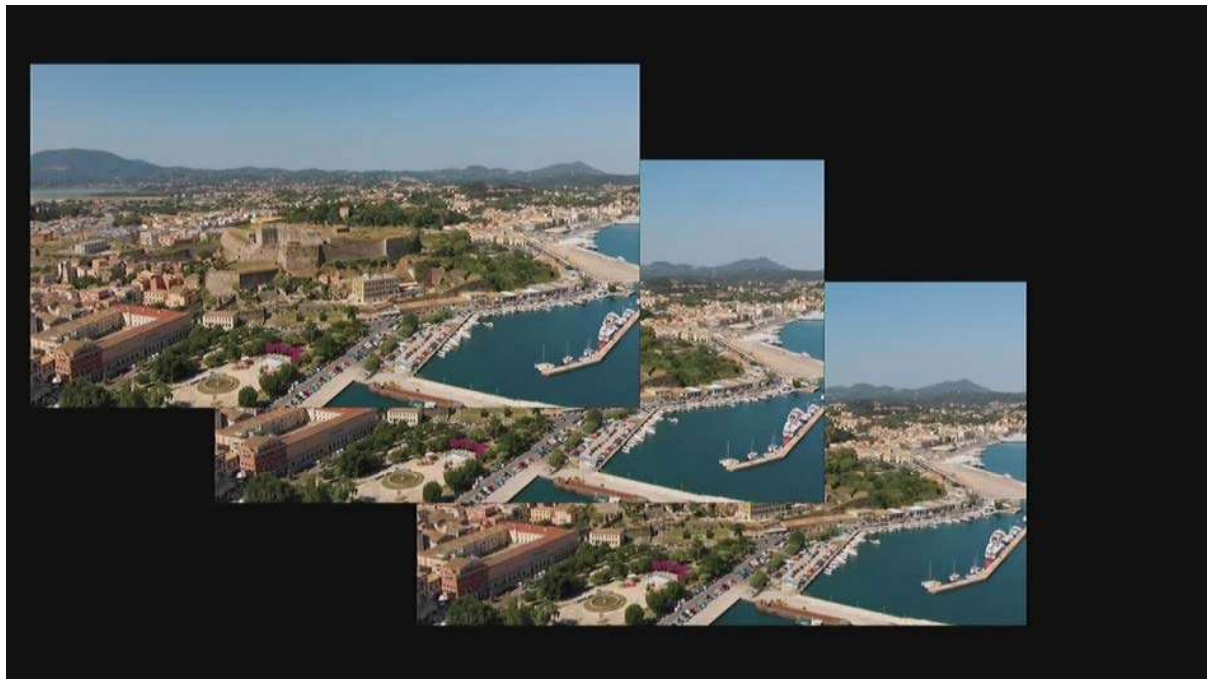
There are buttons at the bottom related to the Crop setting.

- 1) Input Cropping – Select whether or not to activate crop
- 2) Input Window Coordinates – When Crop is enabled, you can insert the value and enter the coordinates you want to Crop.
- 3) Apply – Press apply button to be applied for crop function...

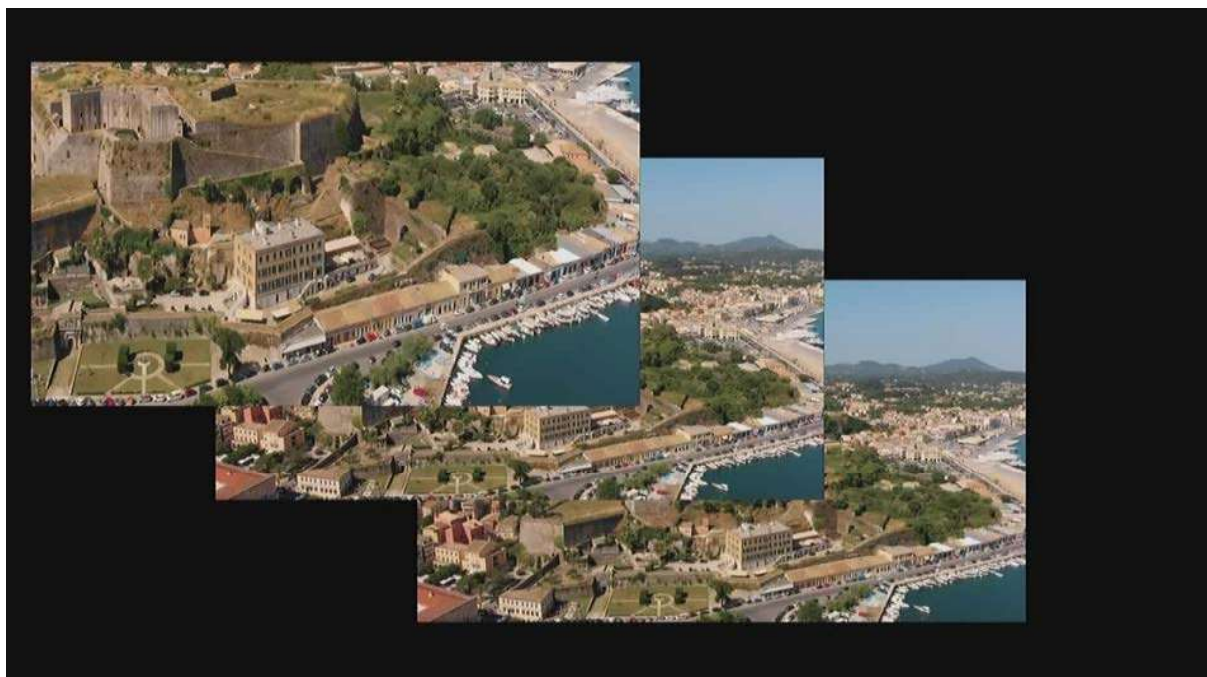


MAIN Tab – Input Cropping is enabled when Window Crop is set to Individual.

The Crop coordinate value must be greater than zero and less than the corresponding channel size.
Press the Apply button after entering a value to save the settings.



Before Top Window Crop (Size 3840x2160)



After Top Window Crop (X1 : 1000, Y1 : 1000, X2 : 3840, Y2 : 2160 applied)

When you select a channel in Preset & Channel Select, you will see the below channel information 1.

Input Name – You can change the name of the current channel when it appears..

2. Input Port – Indicates the physical port of the current channel.

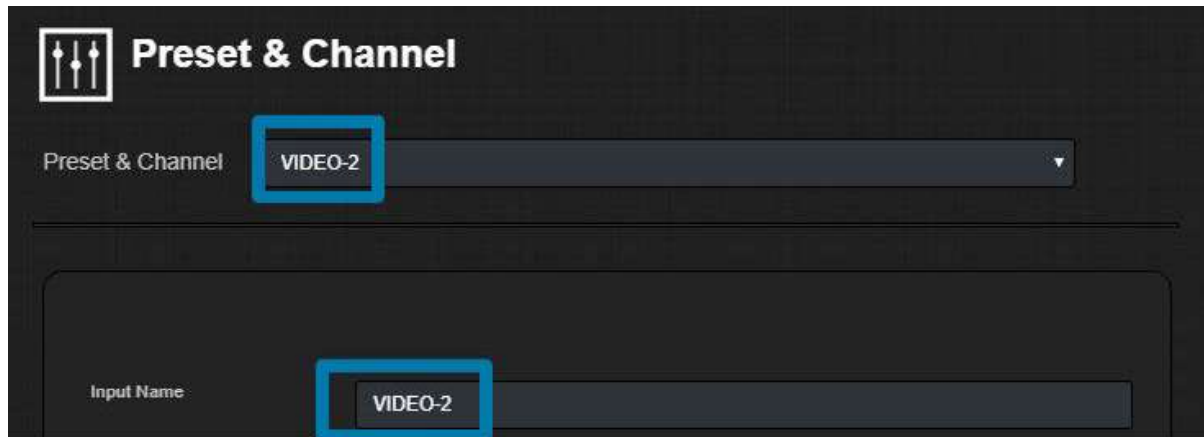
3. EDID Mode – You can select the EDID for the current channel

4. Audio Output – You can turn audio off or on for the current channel

5. Keep Aspect – You can set the scale mode for the current channel.

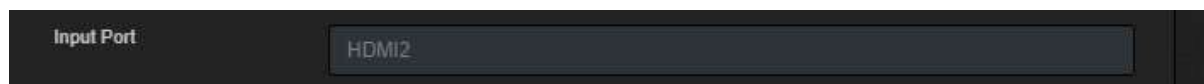
- 6. Brightness – You can adjust the Brightness value of the current channel
- 7. Contrast – You can adjust the Contrast value of the current channel
- 8. Input Cropping – You can adjust the Crop value of the current channel

1) Input Name



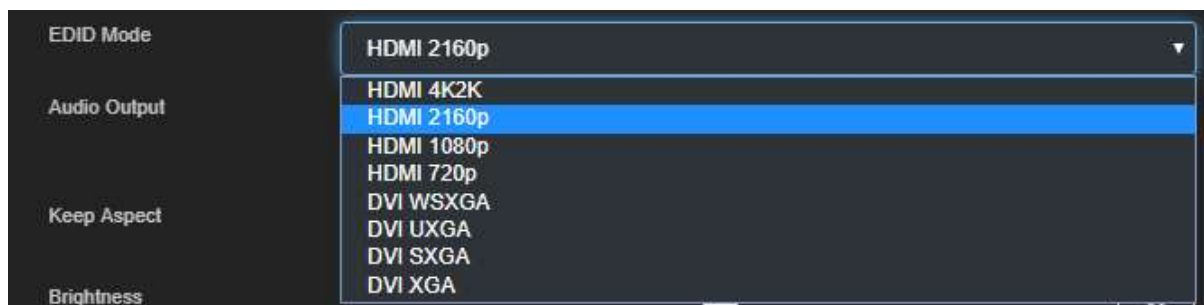
You can also see that the Select button changes when you change Input Name. In Input value, "?" is not recognized.

2) Input Port



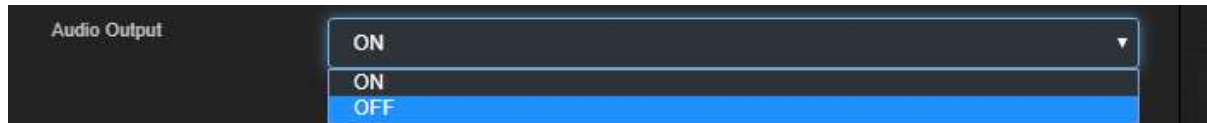
You can view the physical port number of the current channel through the Input Port.

3) EDID Mode



You can select EDID in the EDID mode.

4) Audio Output



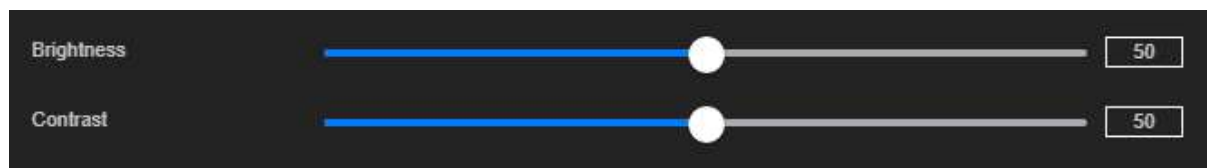
You can turn audio off or on for the current channel.

5) Keep Aspect

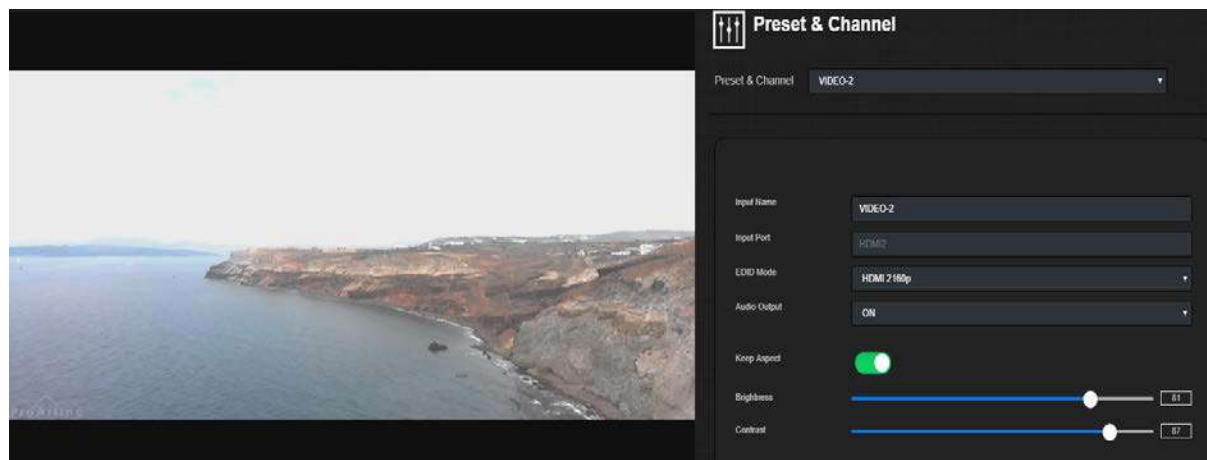


You can set the scale mode for the current channel.

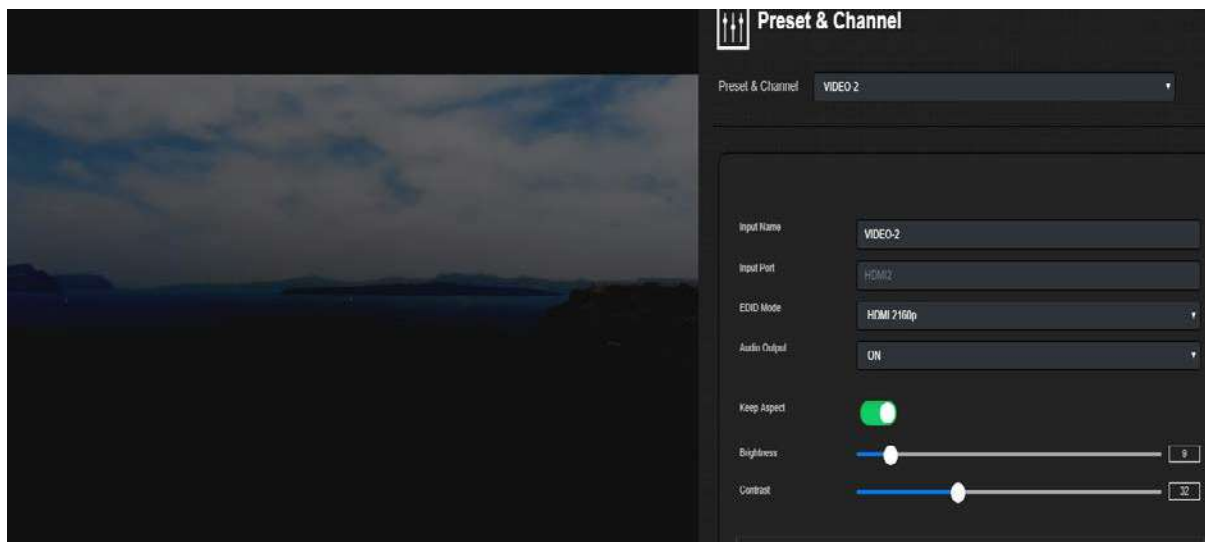
6) Brightness & Contrast



You can adjust the Brightness and Contrast of the current channel .



In case of increased Brightness and Contrast



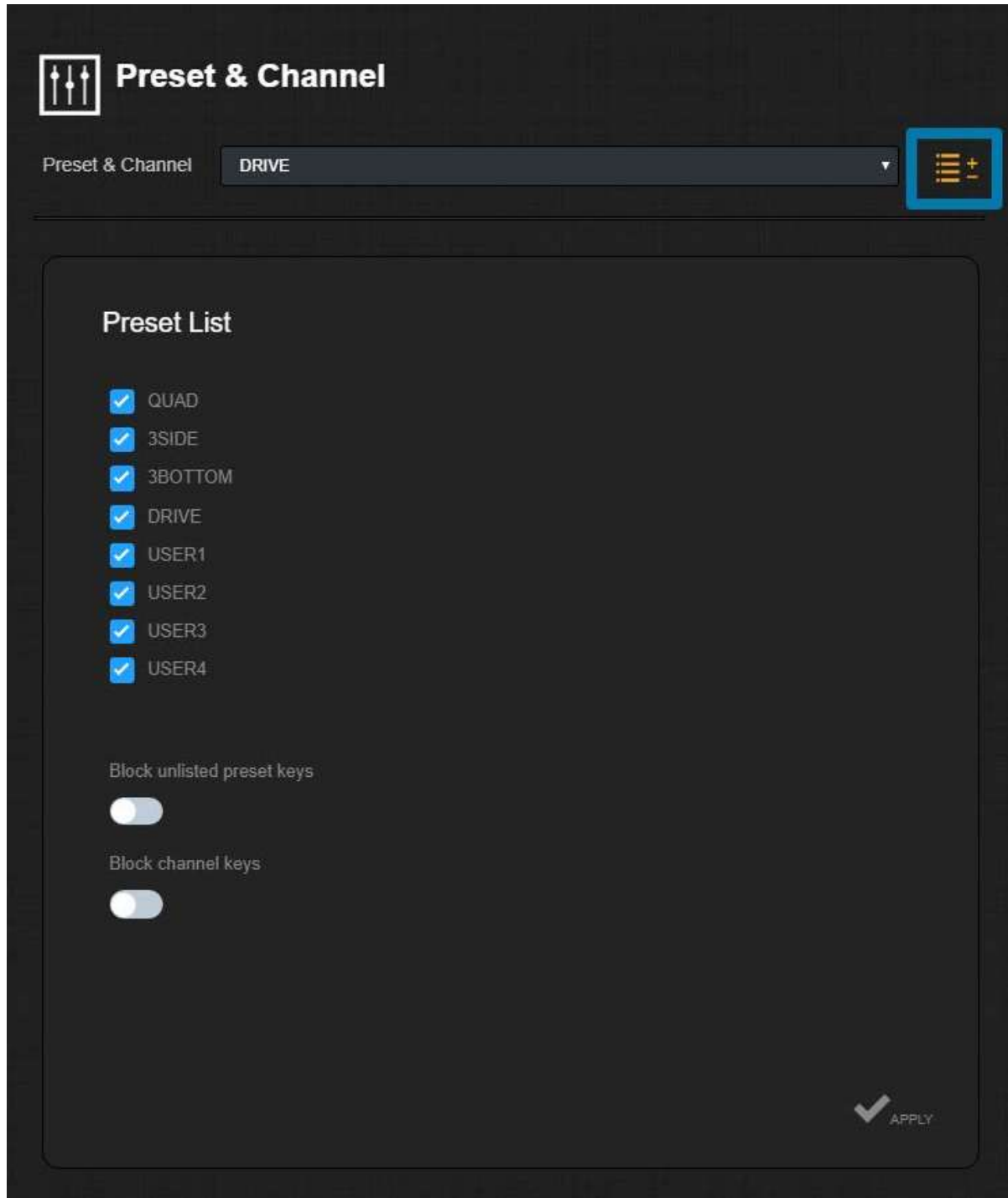
In case of reduced Brightness and Contrast



There are buttons at the bottom related to the Crop setting.

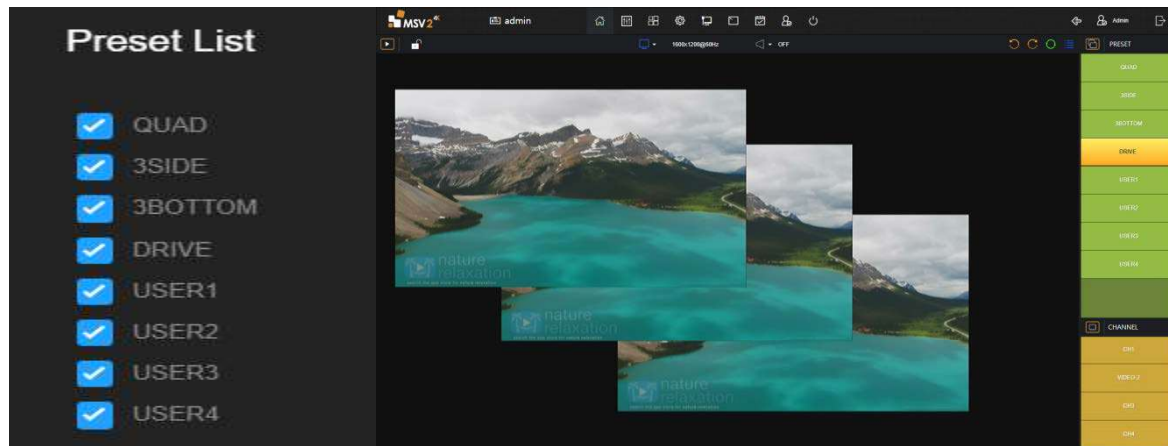
1. Input Cropping – Select whether to enable Crop.
2. Input Window Coordinates – When Crop is enabled, you can insert the value and enter the coordinates you want to Crop.
3. Apply – Press apply button to be applied for crop function..

6.9.3 Preset List

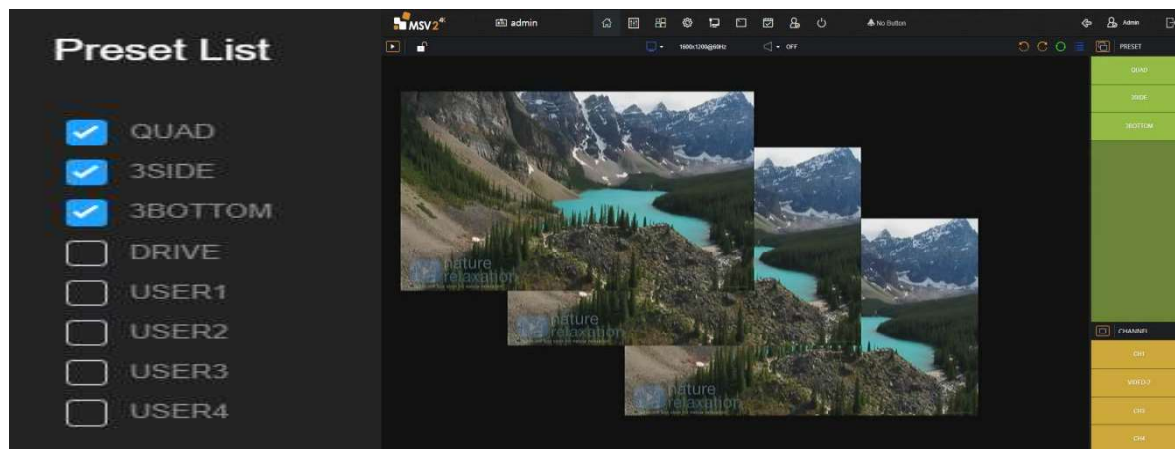


The Preset List is activated when you click a button with a blue line drawn. You can remove unnecessary Preset buttons in the Preset list. When the Block Unlisted Preset keys are enabled, the button that does not exist in the preset list is prevented from being pressed on the MSV2 Front. When Block channel keys are enabled, the function prevents the channel button from being pressed on the front. You must press the Apply button to apply it

1. Preset List

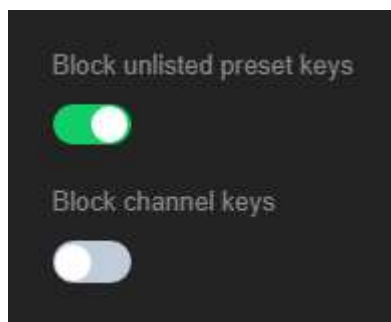


In case of all Preset Lists are checked



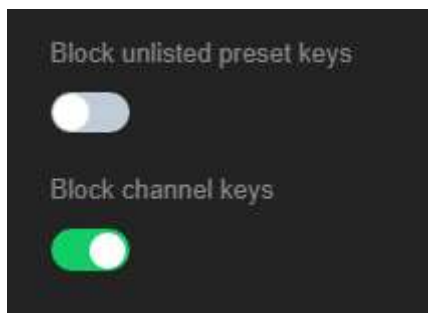
In case of some of the Preset lists checked

2. Block unlisted preset keys



When activating Block unregistered presets, it prevents the front button from selecting the presets that are in the Preset list..

3. Block channel keys



When activating Block channel keys, the channel selection is disabled through the front button.

6.9.4 Input Information, Coordinate Information

INPUT INFORMATION								COORDINATE INFORMATION					
CH	Type	Signal	HDCP	Format	Depth	Size	WIN	CH	X	Y	W	H	Layer
1	HDMI1		-	-	-	-	A	2	43	108	800	599	3
2	HDMI2		-	RGB	8bit	3840x2160	B	2	285	275	800	599	2
3	HDMI3		-	-	-	-	C	2	550	488	800	599	1
4	HDMI4		-	-	-	-	D	-	-	-	-	-	OFF



Shows the information and output coordinates of the source that MSV2 recognizes.

1. Input Information

INPUT INFORMATION						
CH	Type	Signal	HDCP	Format	Depth	Size
1	HDMI1		-	-	-	-
2	HDMI2		-	RGB	8bit	3840x2160
3	HDMI3		-	-	-	-
4	HDMI4		-	-	-	-

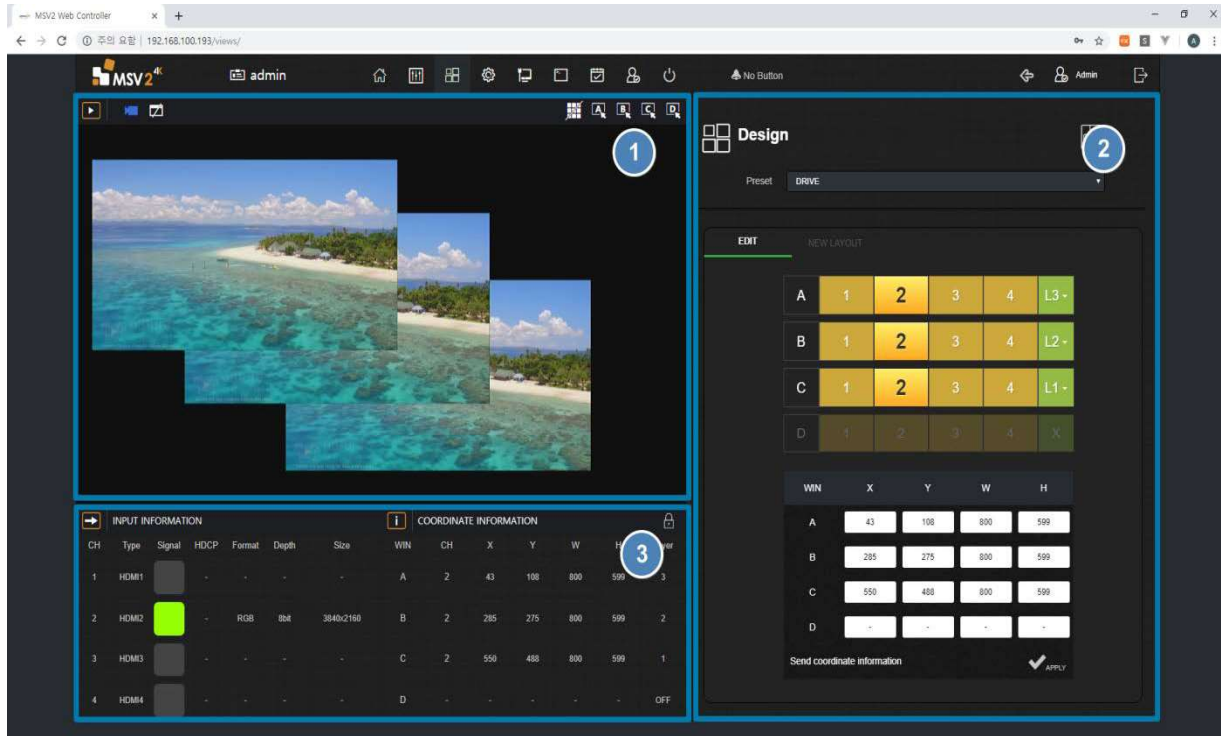
- 1) CH – Displays the current channel number.
- 2) Type – Indicates the physical port number that the current channel is connecting.
- 3) Signal – Displays if there is an input on that channel at this time. If you have an input, it will be green, and if it is not, it will be greyed out.
- 4) HDCP – Displays the presence and version of HDCP for the source.
- 5) Format – Provides information about the Color Format for the source.
- 6) Depth – Provides information about the color depth of the source.
- 7) Size – Provides information about the resolution of the source

2. Coordinate Information

<div>  COORDINATE INFORMATION  </div>						
WIN	CH	X	Y	W	H	Layer
A	2	43	108	800	599	3
B	2	285	275	800	599	2
C	2	550	488	800	599	1
D	-	-	-	-	-	OFF

- 1) WIN – Displays the current window name
- 2) CH – Displays the channel number that is output to the window.
- 3) X,Y,W,H – Provides the starting coordinates and size of the corresponding window.
- 4) Layer – Provide information of the priority and existence of windows

6.10 Design



Design mode allows layout editing and allows you to save the layout of your choice.

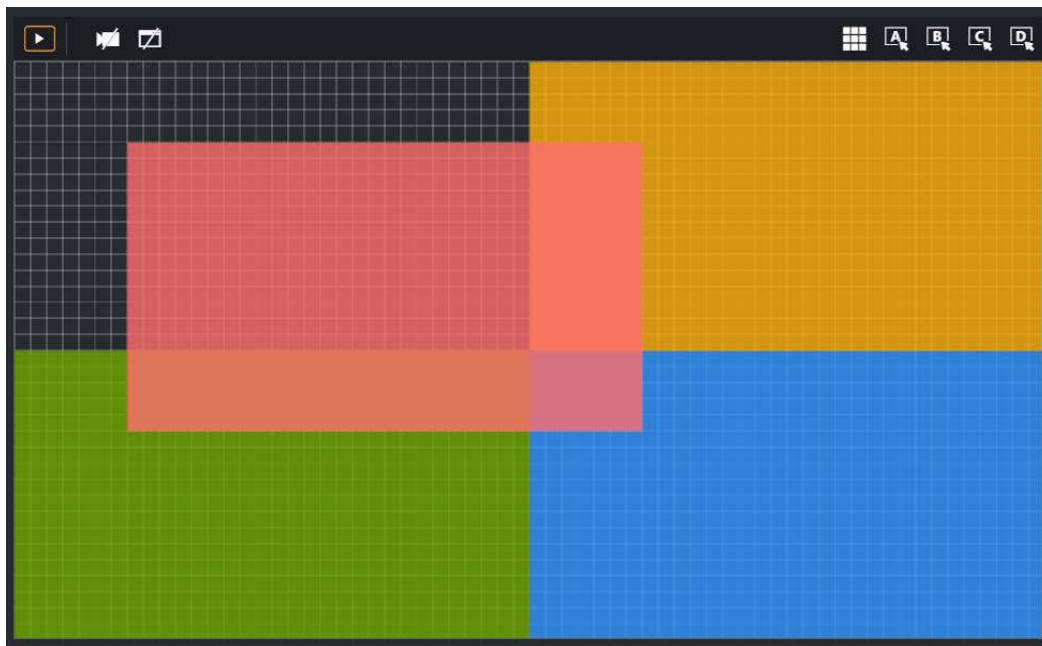
- ① Preview & Screen control window – Screen Layout, Preview, Banner, Grid setting, win1~win4 select function
- ② Design Option – Provide functionality for editing layouts
- ③ Display information – Input Information, Coordinate Information, Output Information, Coordinate Setting

6.11 Preview & Screen Control Window

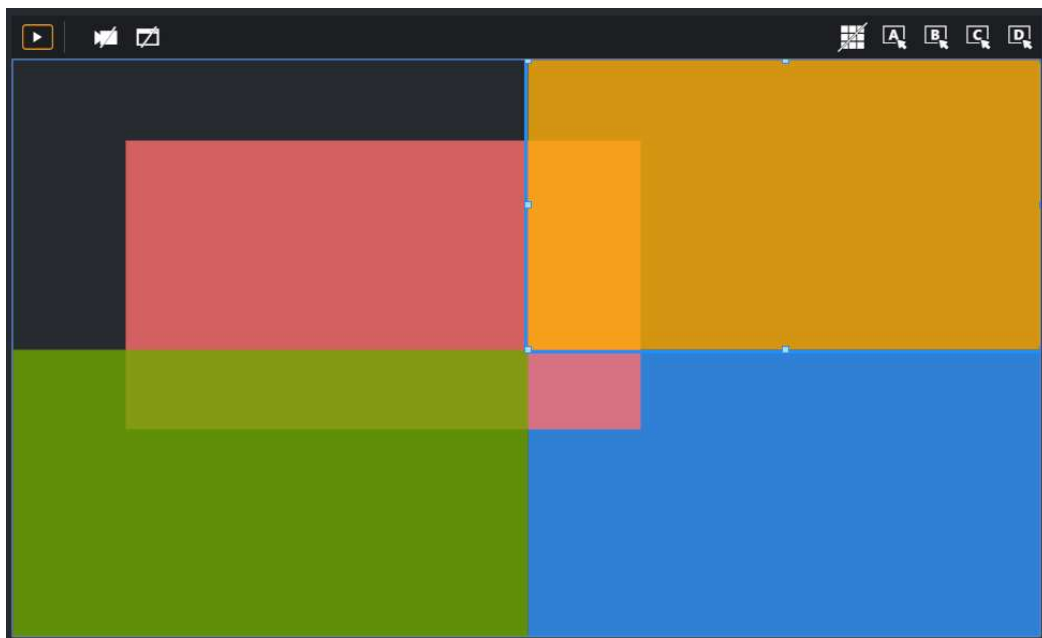


The horizontal and vertical positions of each window can be modified. To adjust the position, position the mouse cursor in the middle of the window and hold the left mouse button while dragging the window to the desired position. When selected for control, the Border color changes to blue. The output display shows the modification process shown on the MSV2 Web Manager screen in real time. Provides grid function and window selection.

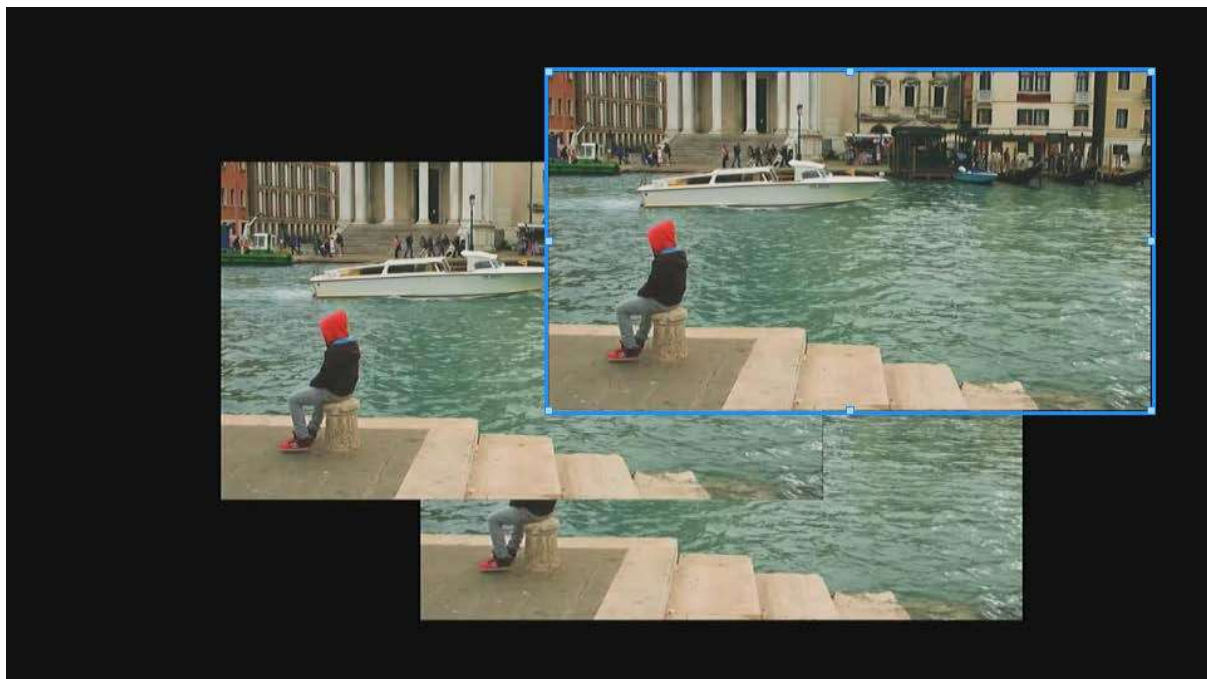
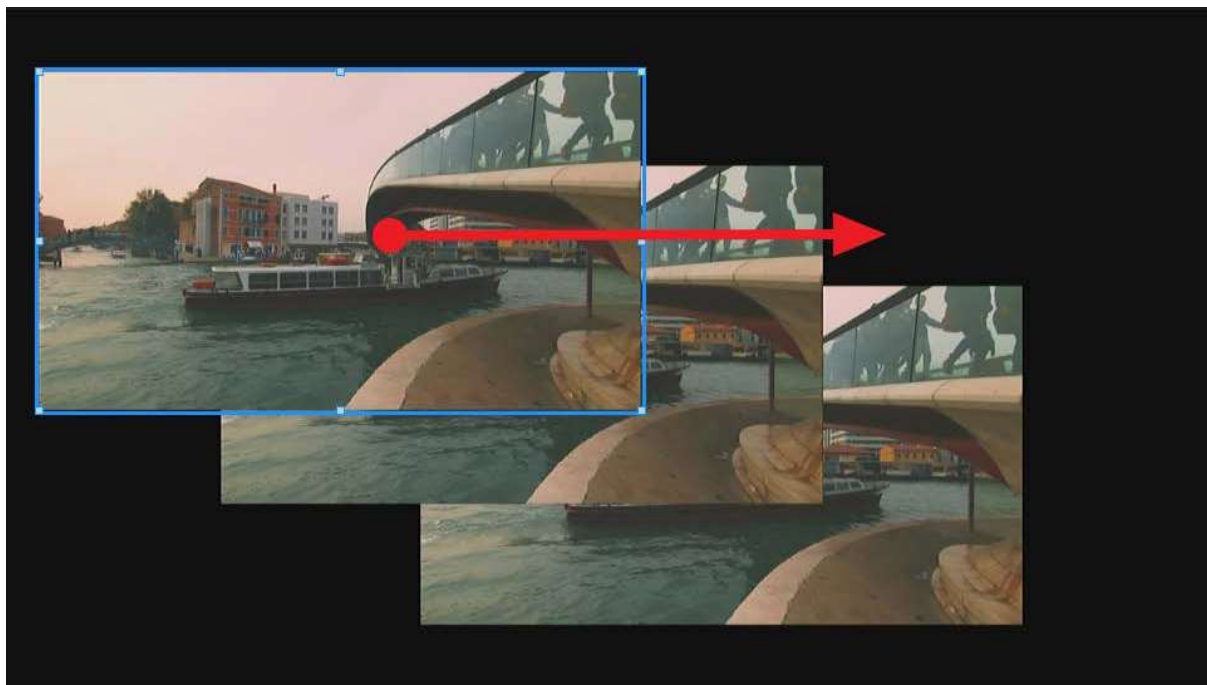
- 1) Preview - The video currently shown on MSV2 is shown in the Web Controller through real-time streaming
- 2) Preview On/Off, Banner On/Off – You can turn the preview and banner on and off..
- 3) Grid, Window Selector – By activating the Grid function, you can move the window in a unit of a certain size or increase the screen The Window Selector selects that window.



Grid Function View



The shape of Window B using by window selector

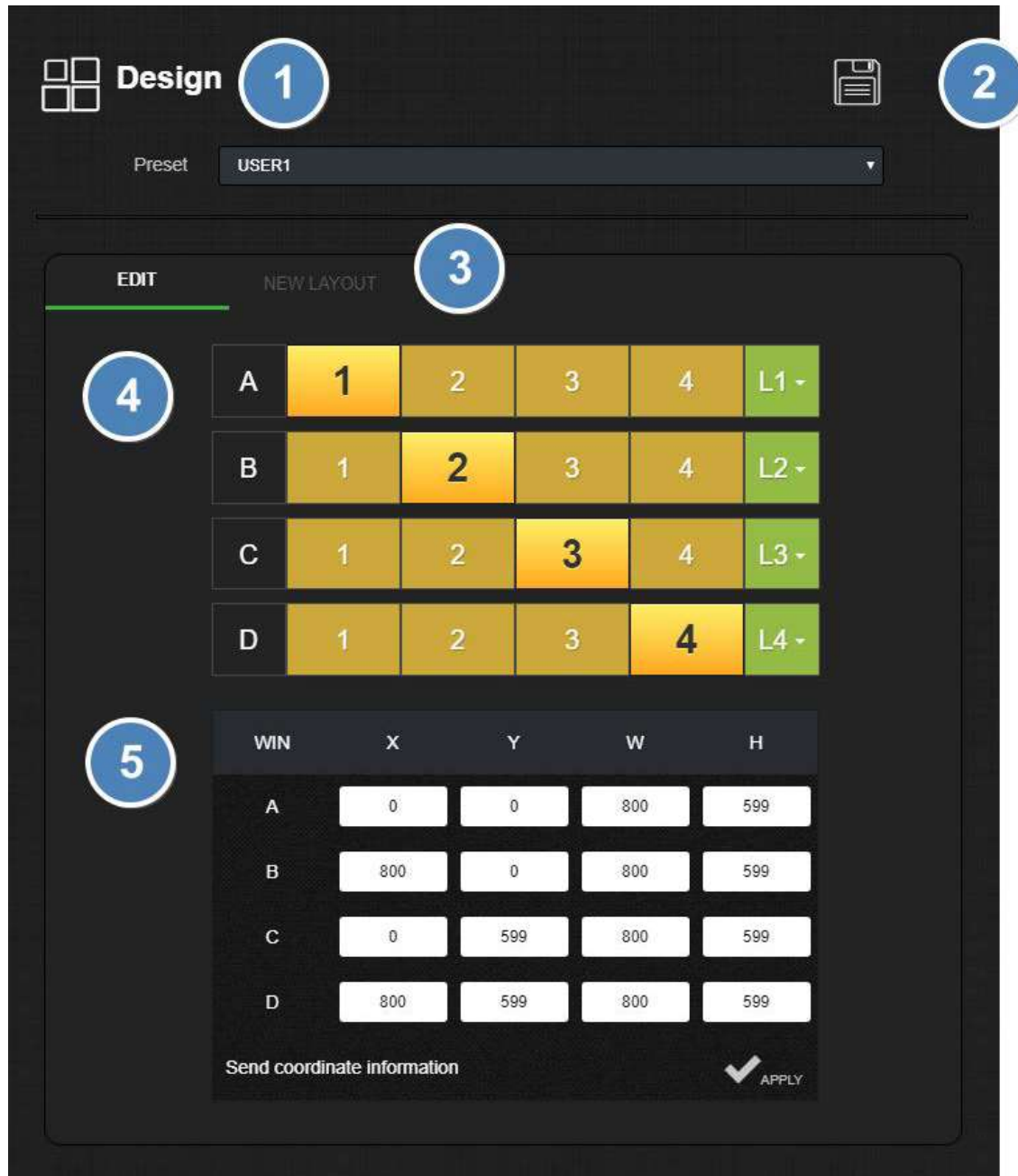


Changing window position via drag



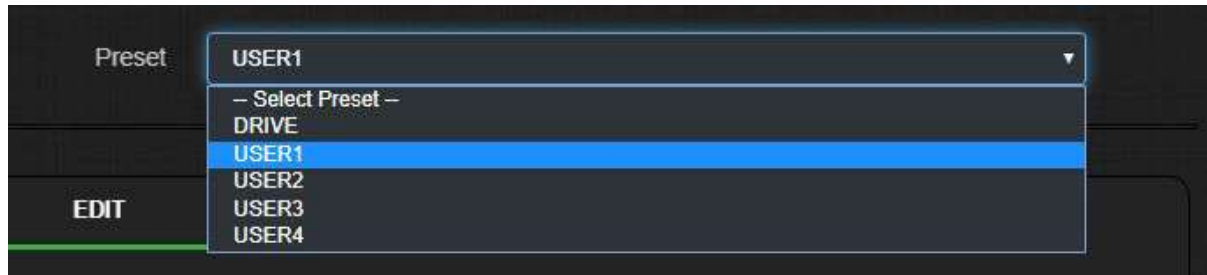
Changing window size via drag

6.12 Design Option - EDIT



Design options help users edit layouts more quickly and in more detail. User0~User4, 5 Presets are selected and provide Window On/Off functions, Input Select, Layer, Coordinate settings, and New Layout functions.

1. Preset Select



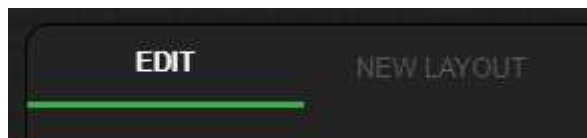
Allows users to select a Preset so that they can save it to the desired Preset.

2. Preset Save



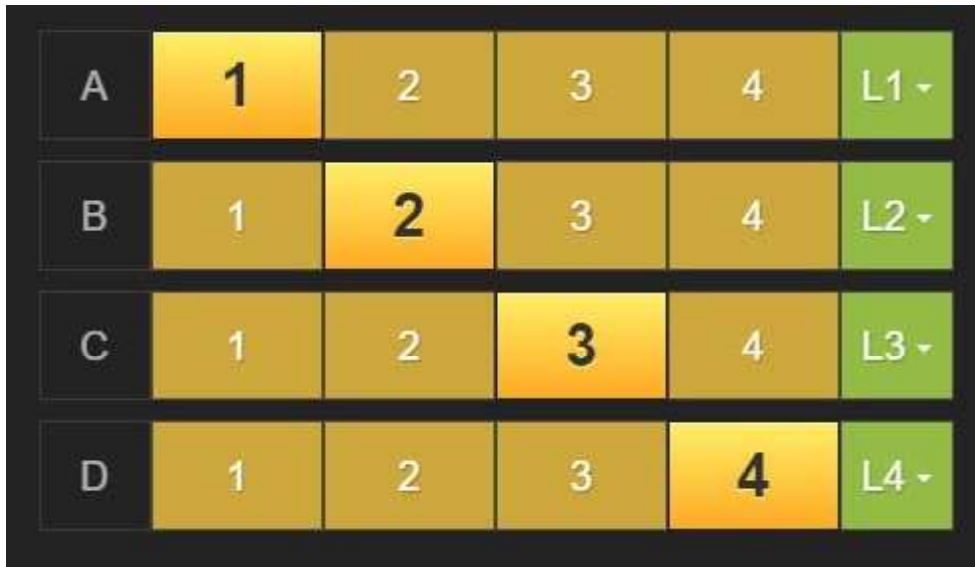
The button to save the edited layout. If you move to a different menu without pressing Save, you will be returned to the previously saved layout.

3. EDIT/NEW LAYOUT tab

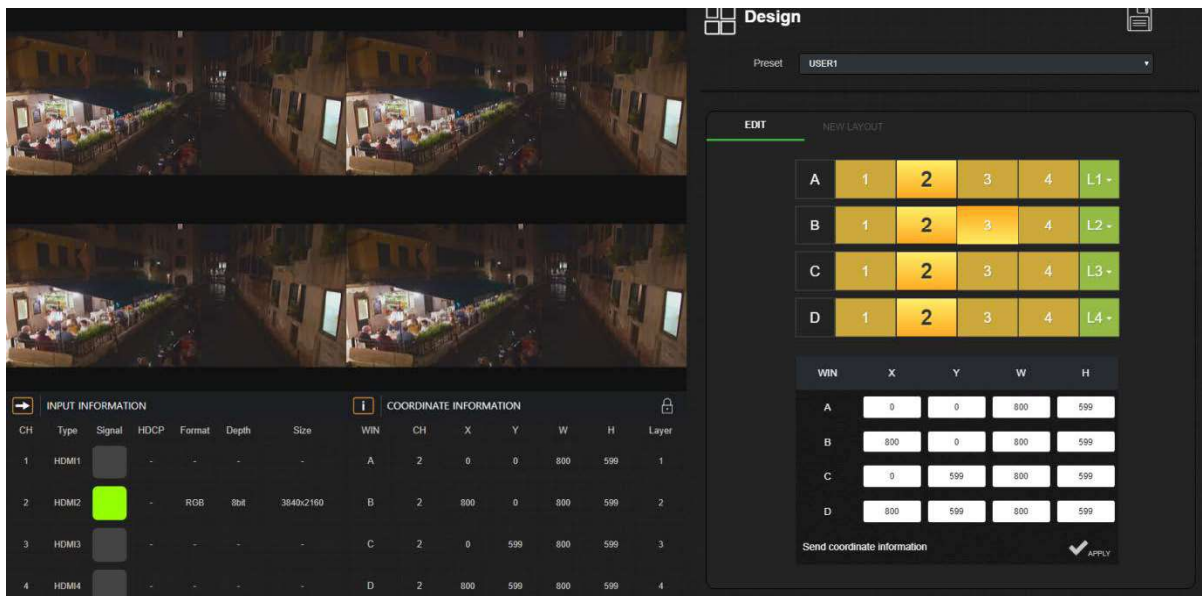


You can select EDIT mode and NEW LAYOUT mode. NEW LAYOUT allows you to edit quickly via Layout preregistered with MSV2. For more information, see 6.13 Design Option – NEW LAYOUT.

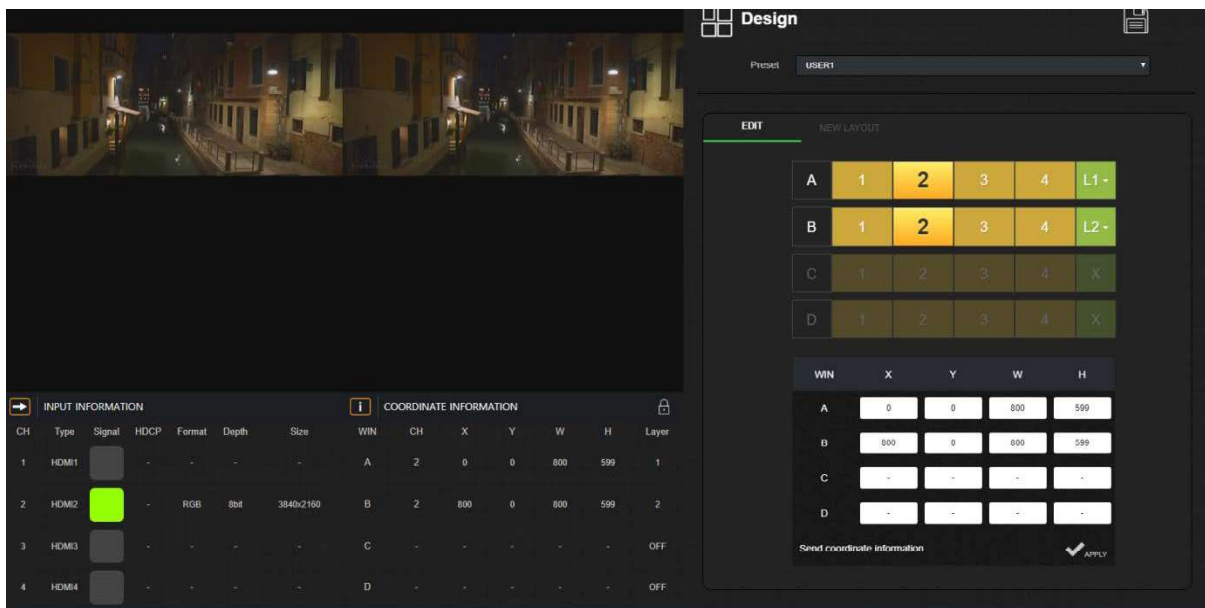
4. Design Select Input



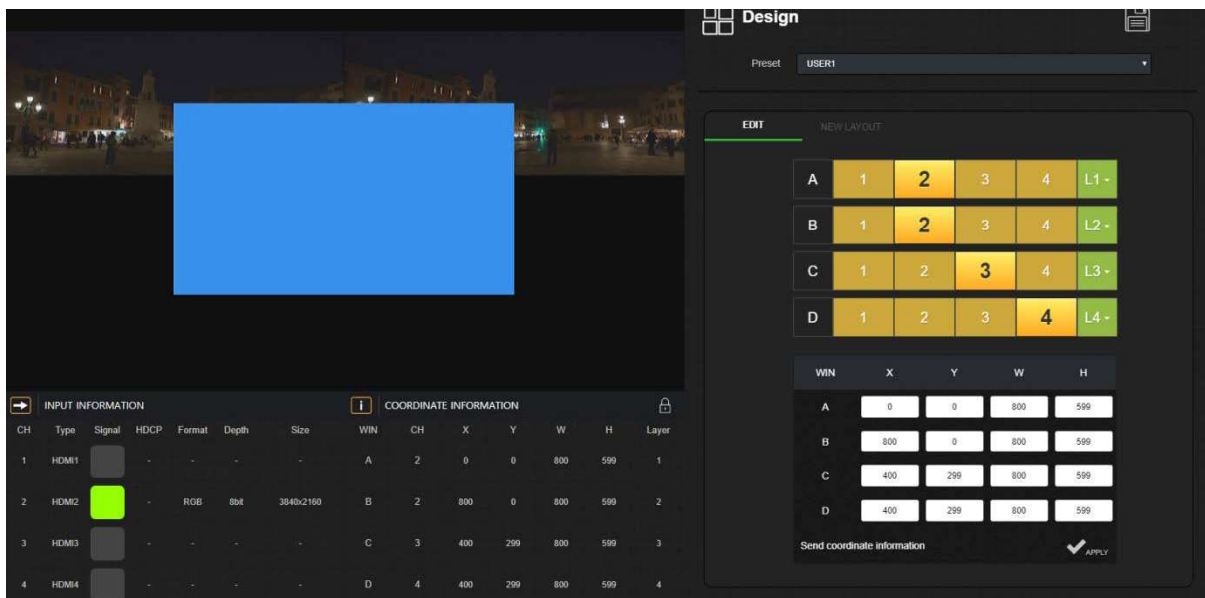
Please refer to the Select Input function 6.9.2 Preset & Channel Setup – Select Input. Window On/Off is provided in the Design Select Input. Click the name of the leftmost window to turn it on or off. When off, the corresponding window button line changes to grey. The window will be in the center of the screen if you turn it on again from the Off state.



Before Window Off



Shape of Window C, D OFF




Shape of Window C, D ON

5. Send Coordinate Information

WIN	X	Y	W	H
A	0	0	800	599
B	800	0	800	599
C	400	299	800	599
D	400	299	800	599

Send coordinate information

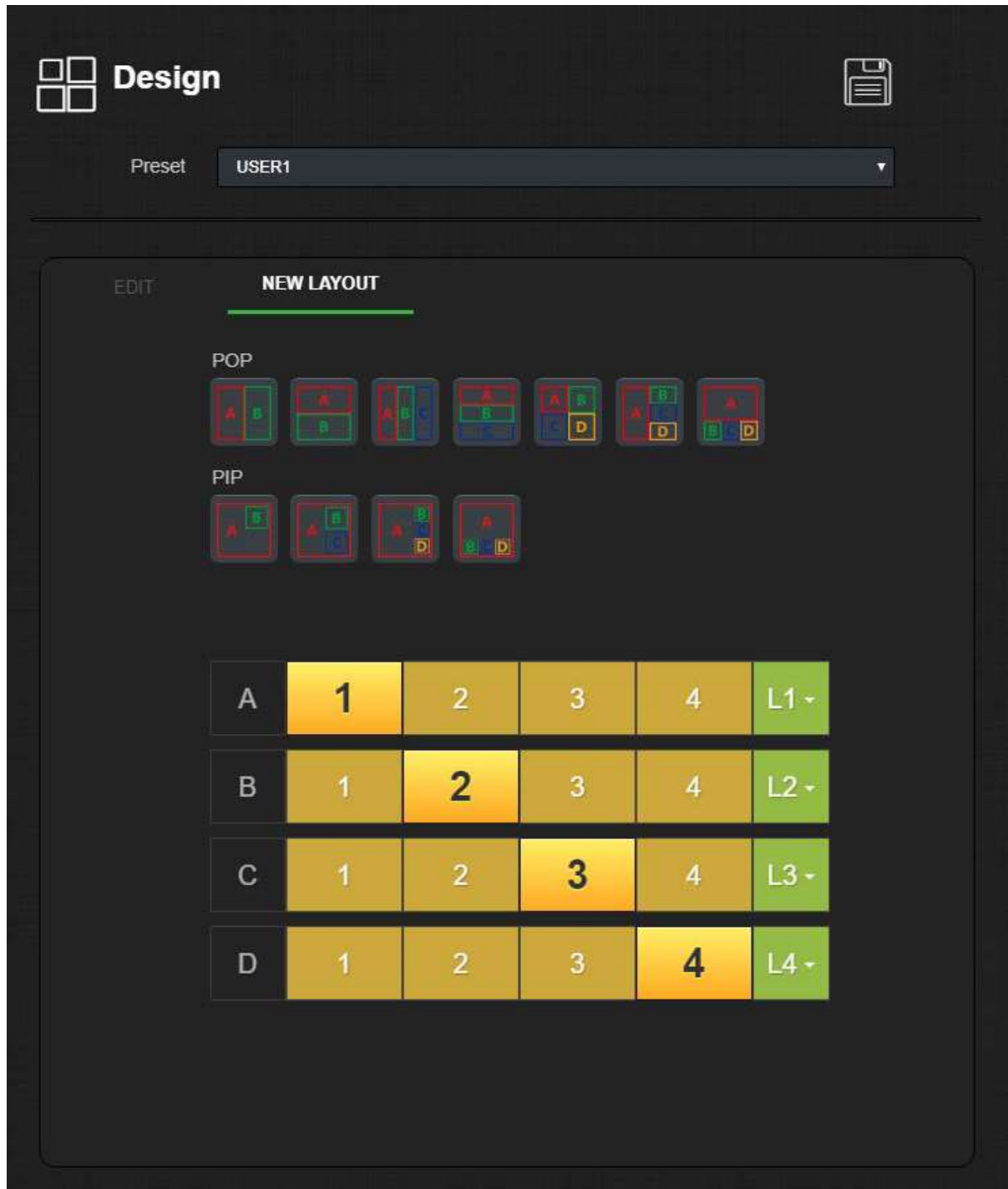
 APPLY

Send Coordinate Information is a feature that is provided for precise movement of coordinates. Insert the desired start coordinates, height, and width, then press the Apply button to apply. The total coordinate size is the output resolution size.

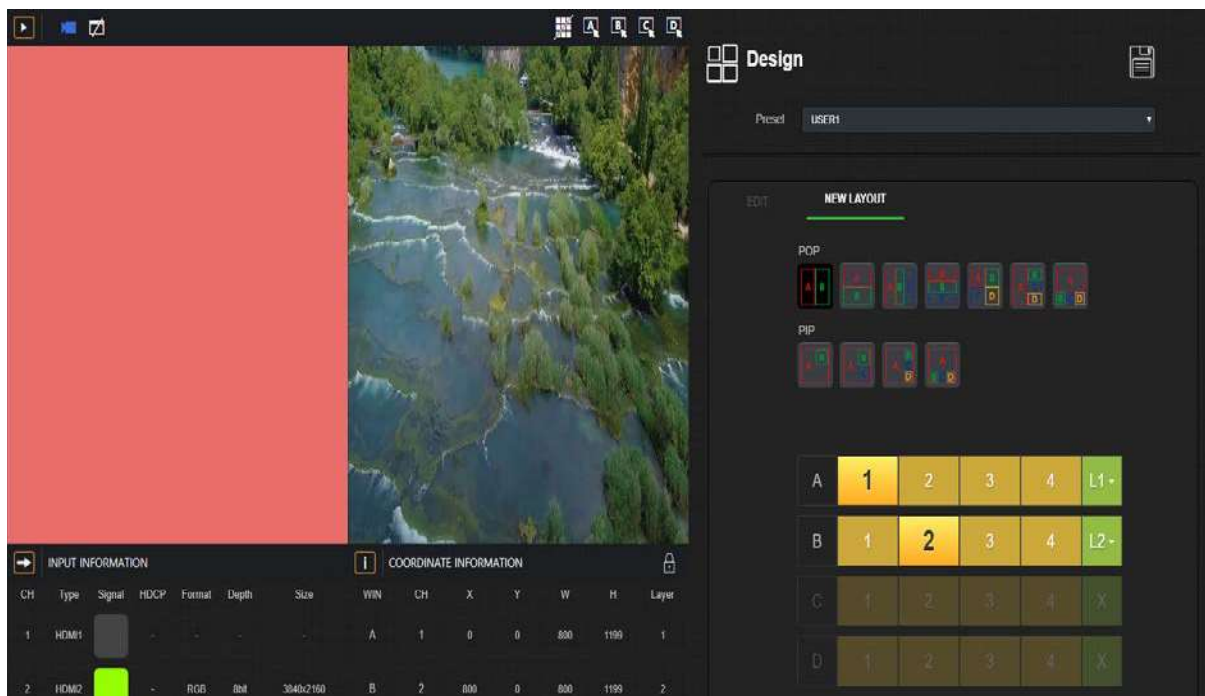
(Caution)

Because the 3840x2160 is multiples of 4 and the 1920x1080 is multiples of 2, the coordinate values, such as multiples of 2 are shifted by resolution, even if you add them, a slight error value can be obtained. For example, you have inserted 1 but it can be displayed as 0 or 2. However, please note that it is not an error.

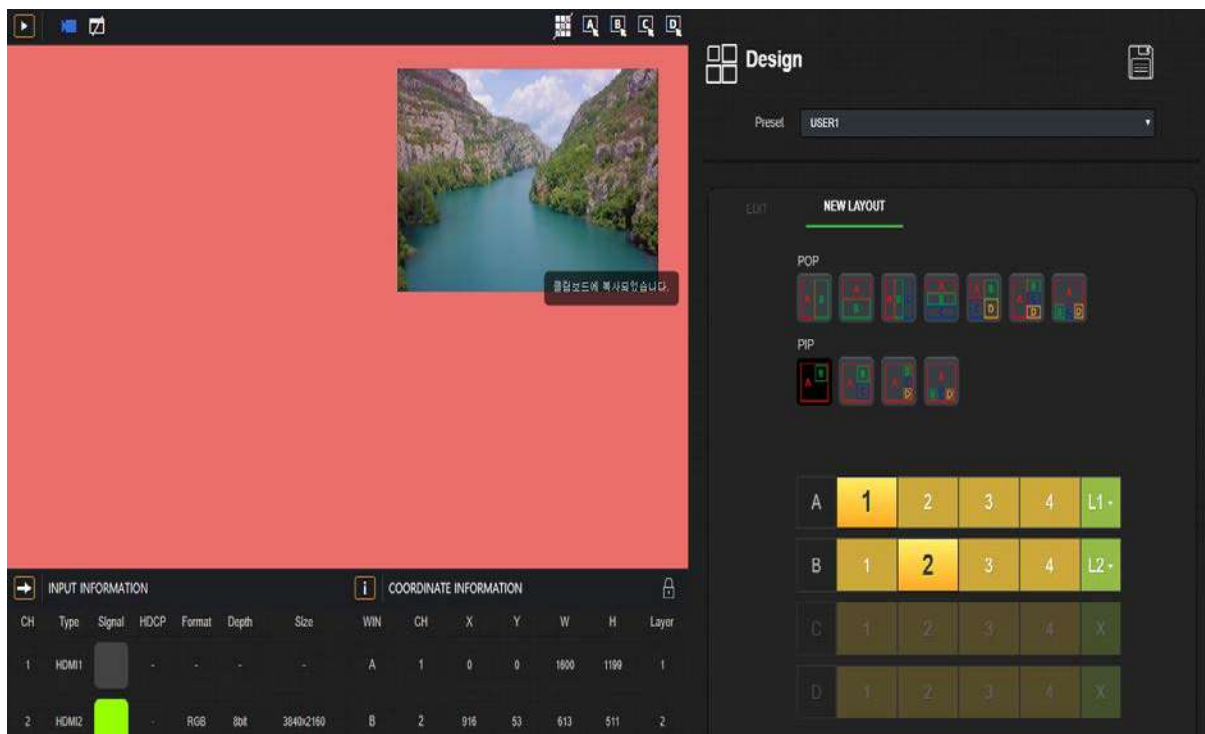
6.13 Design Option – NEW LAYOUT



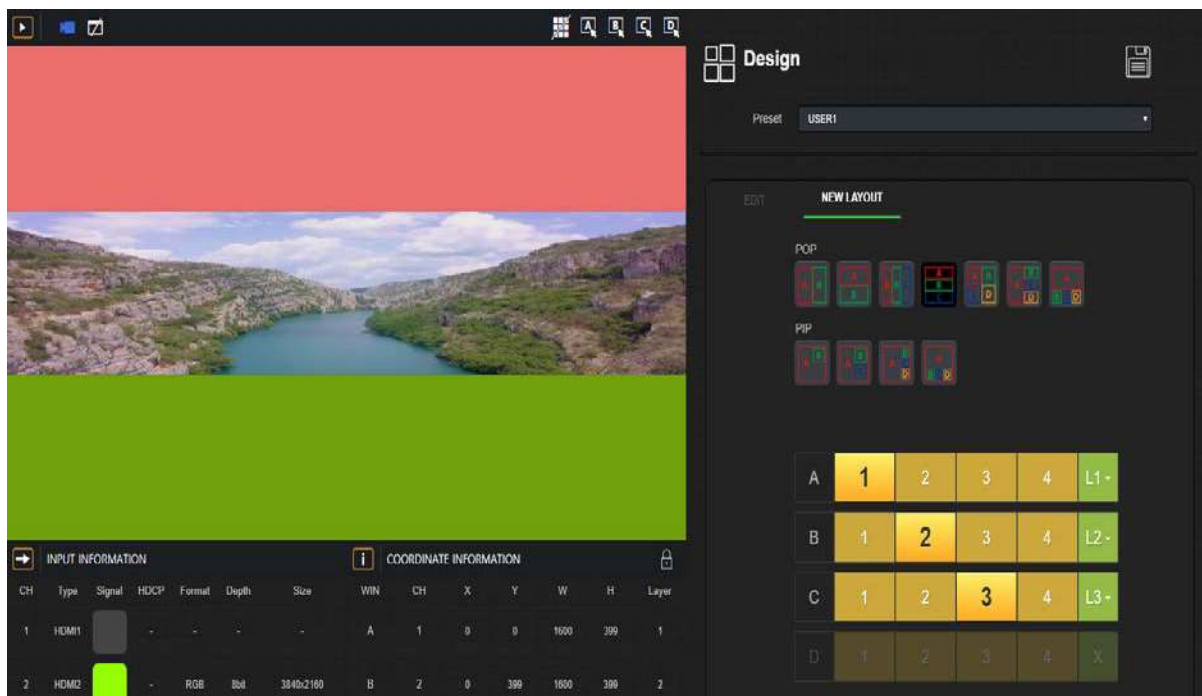
NEW LAYOUT is a feature that allows you to edit layouts quickly through layout provided in MSV2. Click the desired Layout shape, set Input, and press the Save button to save the Layout.



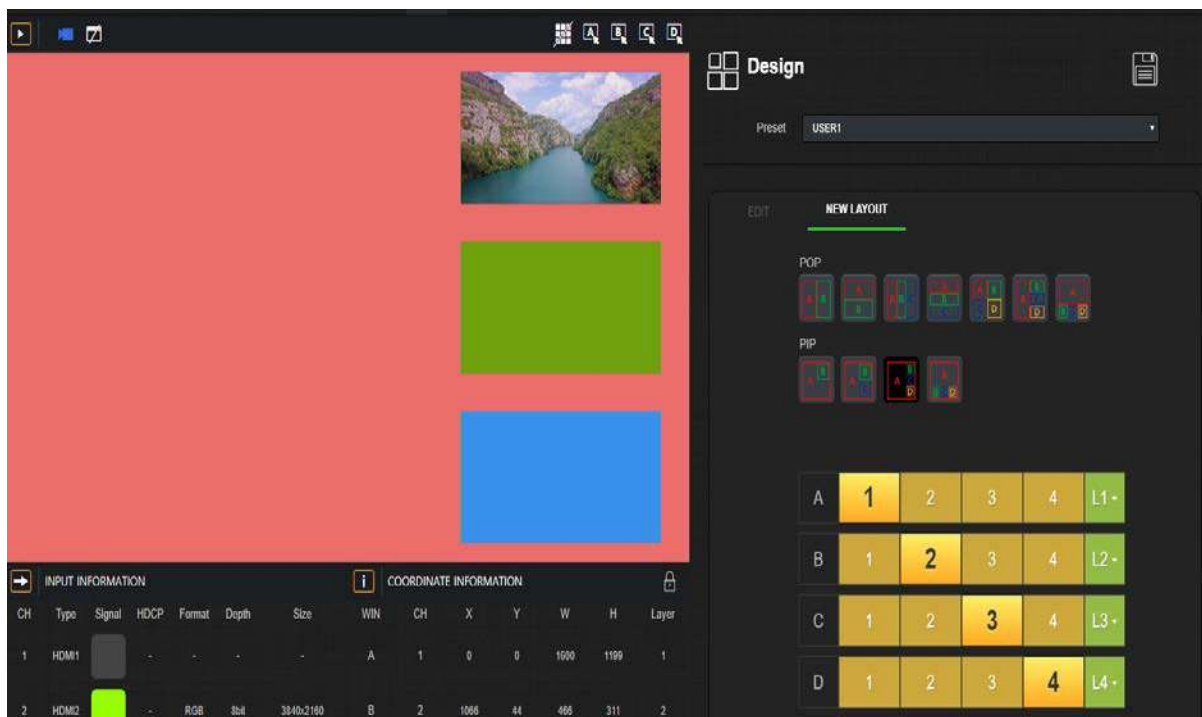
Vertical 2



PIP 1



Horizontal 3

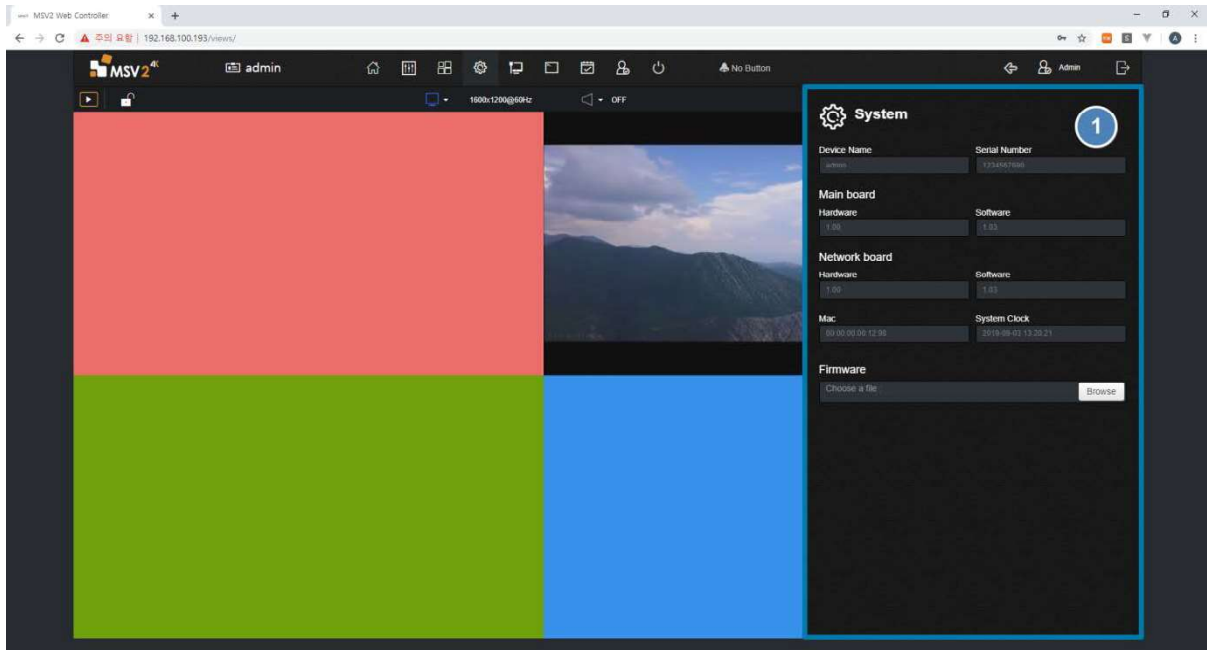


PIP Side 3

6.14 Input Information, Coordinate Information

Please refer 6.9.4 Input Information, Coordinate Information.

6.15 System



User can check the version of MSV2 and various settings in the system.

The name of the device, MSV2 serial number, hardware / software version, Mac address, system clock, and an upload button for firmware upgrade exists

6.15.1 Device Name

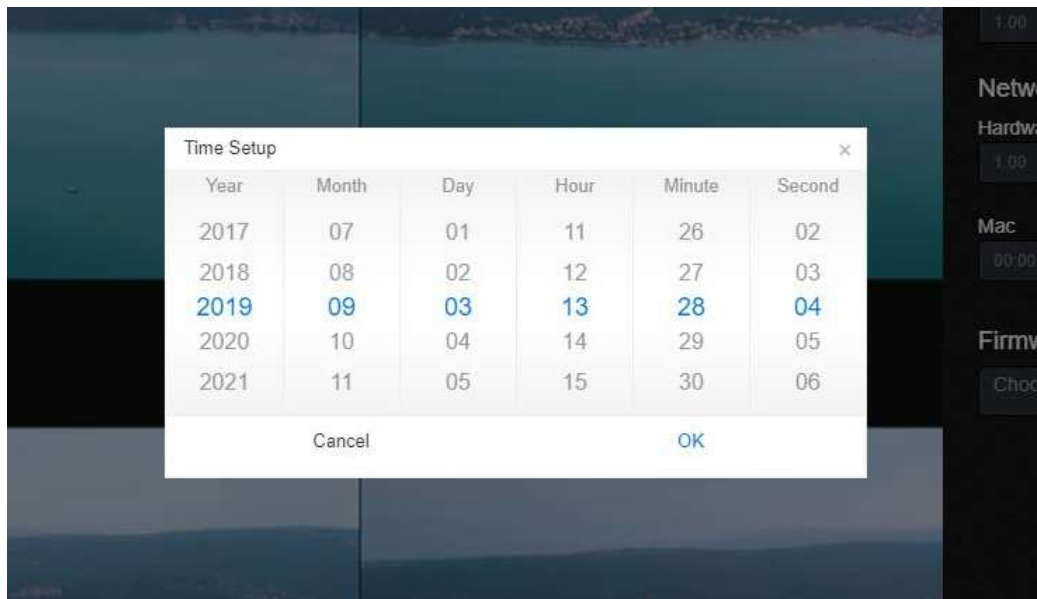
Shows input information for MSV2.

Displays information about Type, Signal, HDCP, Format, Depth, and resolution

6.15.2 System Clock

Displays the system time of the current MSV2.

Click to set the time. When user connect to the Web, the host automatically performs synchronization with the host if the time differs from the PC



If user wants to adjust the time manually, press System Clock to display the following Time Setup window.

Time Setup allows user to set the time user wants.

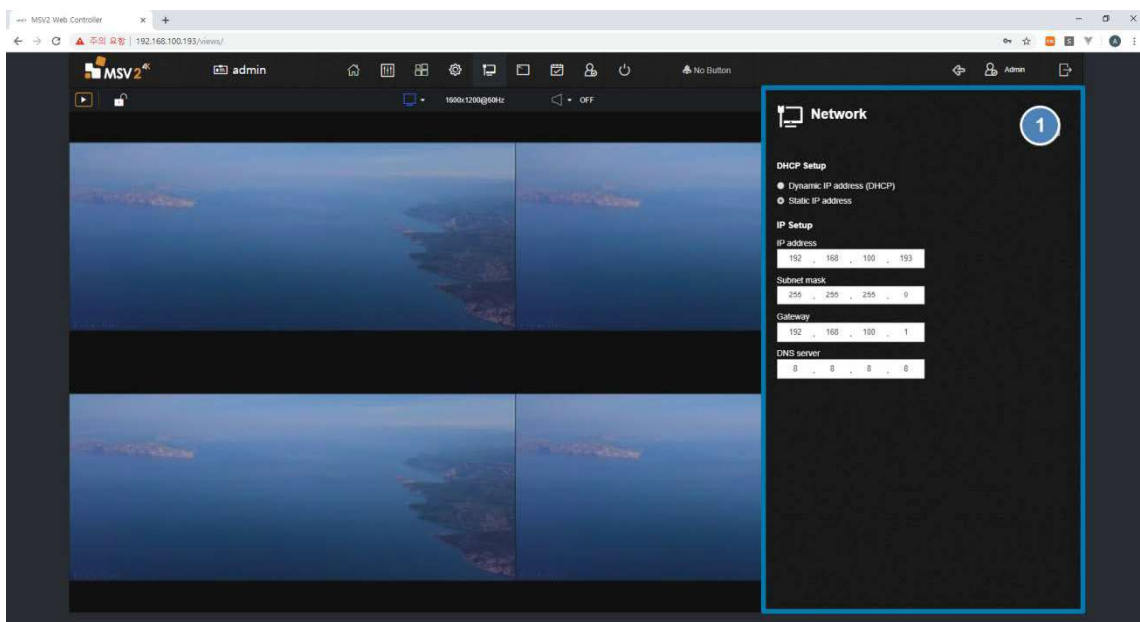
When the time setting is complete, press OK to apply.

6.15.3 Firmware

Firmware upgrade is possible through MSV2 Web Manager.

If a pkg file exists, the upgrade will proceed automatically after user click the button

6.16 Network



User can view network information such as IP, Gateway, Subnet, DNS, and so on on, and change the network settings.

DHCP features are available.

Check MSV2 OSD for the changed IP and connect to the web. Creates the desired network setting value and is saved by pressing the Save button.

Only digits 0-255 can be entered, no other characters or numbers can be created

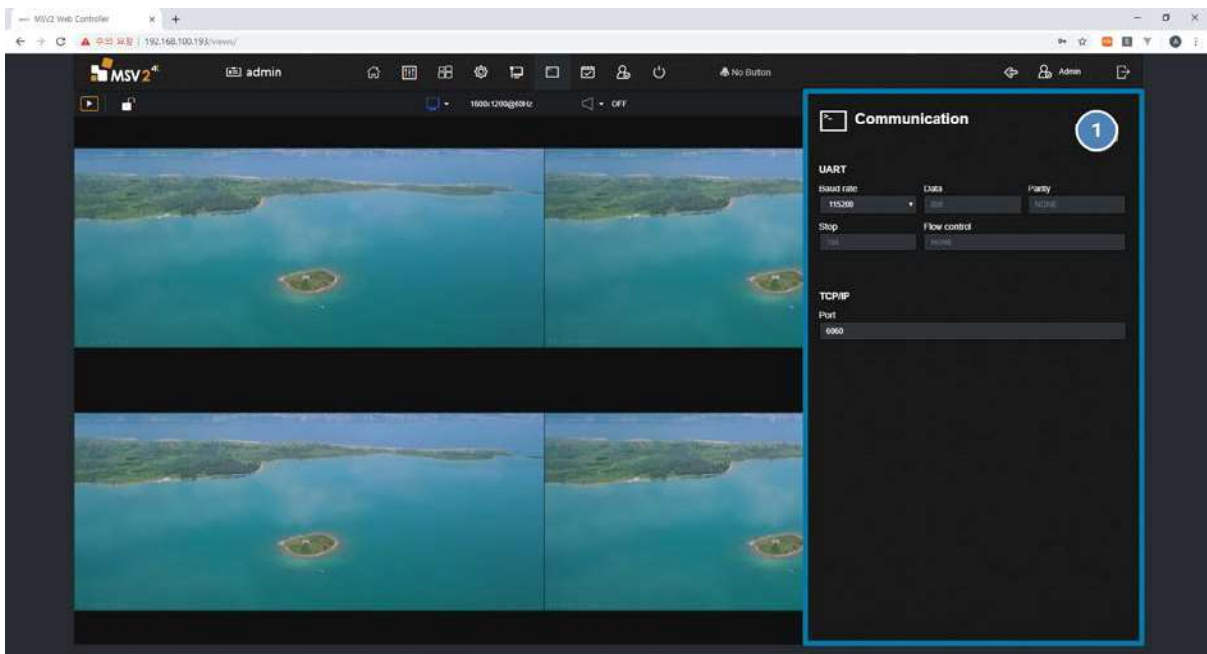
6.16.1 DHCP Setup

When DHCP mode is set, IP is automatically set

6.16.2 IP Setup

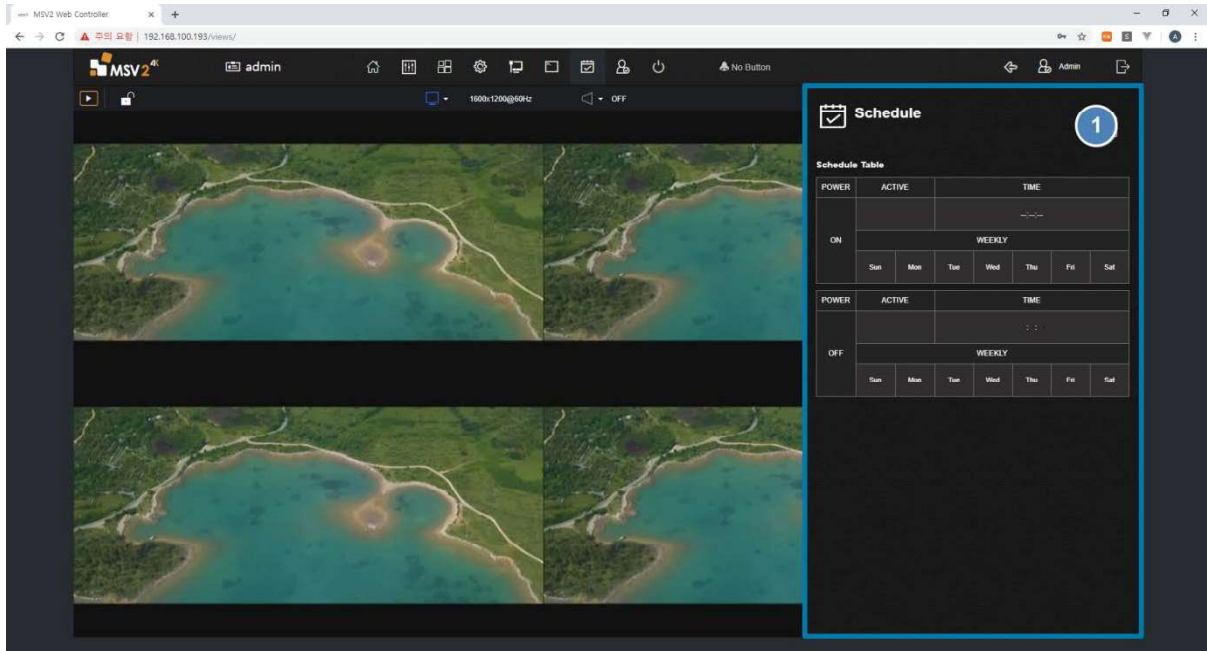
If you are using static IP, set the IP address in IP setup

6.17 Communication



User can set UART settings and TCP/IP settings. Baud rate setting and Port setting are possible

6.18 Schedule



MSV2 schedule functionality is available. user can set the power on, off time to automatically turn MSV2 on or off when necessary



Schedule



Schedule Table

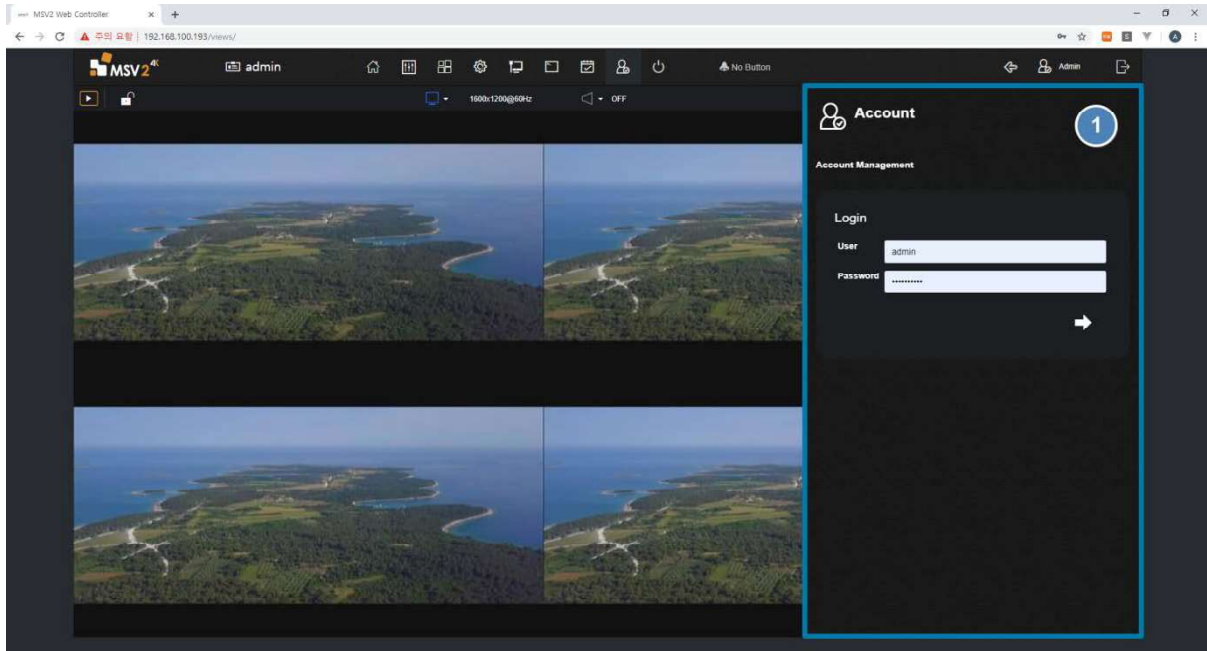
POWER	ACTIVE	TIME					
ON	v	09:00:00					
	WEEKLY						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat

POWER	ACTIVE	TIME					
OFF	v	18:00:00					
	WEEKLY						
	Sun	Mon	Tue	Wed	Thu	Fri	Sat

Active is enabled, Time is on or off, and WEEKLY is the day of the week when the schedule function will operate.

The green part is the active part. Set the schedule user wants and click the Save button to take effect.

6.19 Account



User can change the account information for MSV2 account. After logging in again, you can set the ID, password, and device name of your account

The image shows a dark-themed window titled "Account Management". At the top left is a user icon and the word "Account". Below this is the section "Account Management". The main content area is titled "Change account" and contains a form with the following fields:

Selects user	Admin ▼
Device name	Device name
Username	Username
Password	Password
Confirm password	Confirm password

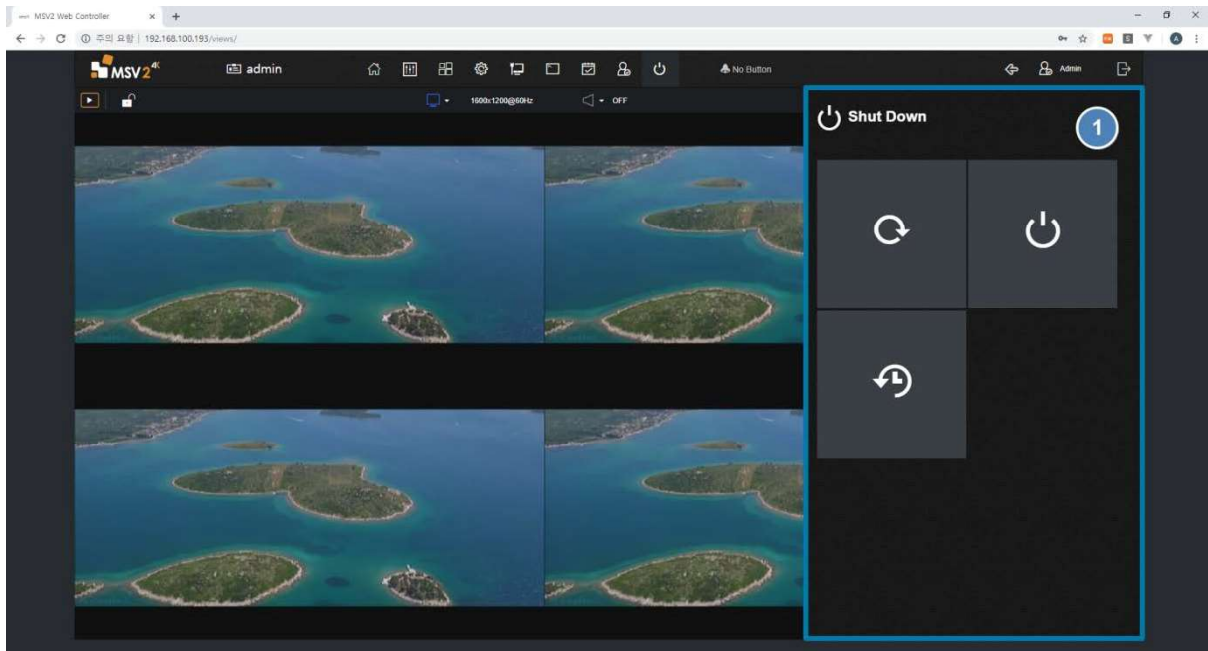
At the bottom right of the form area is a white arrow pointing to the right.

After connecting, the following window will appear:

Selects user is the list of users to change (MSV2 provides Admin, guest1, guest2 total 3 accounts), and Device name is the name to enter the Device name column (see Manual 6.4.2). Username, password means ID and password when logging in.

Once you have completed all of the values, user can save it by click the shape of arrow.

6.20 Shut down



The MSV2 web controller provides Shutdown and Restart functions.

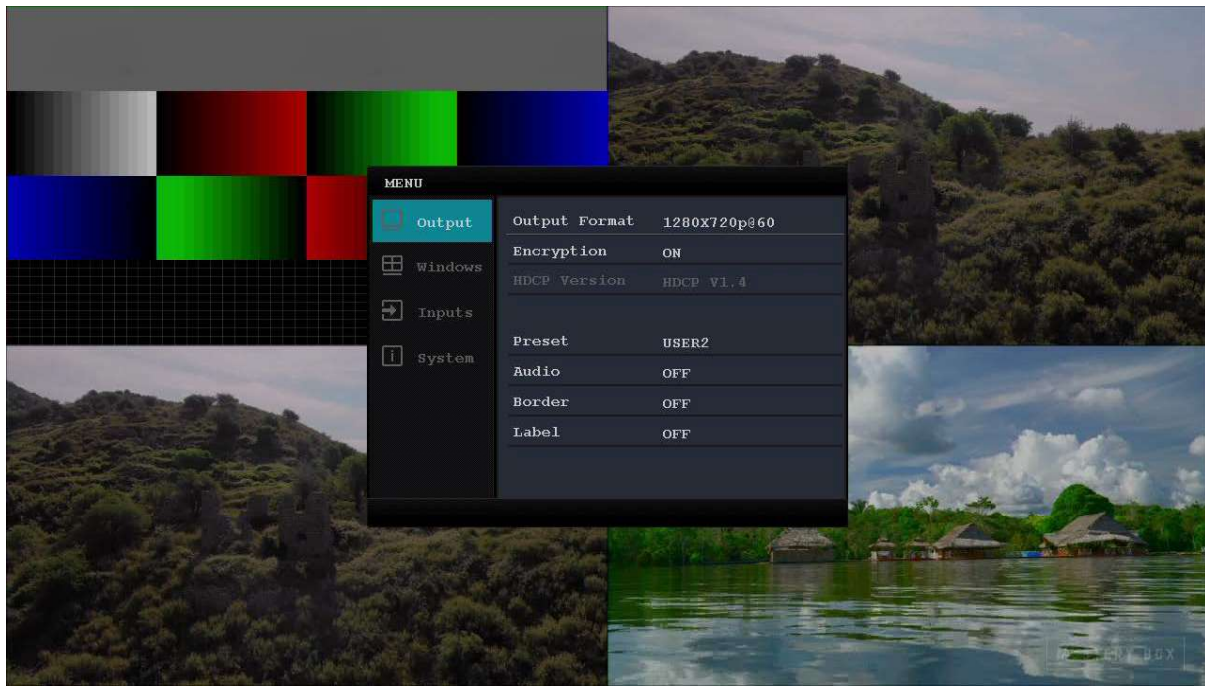
It is available when powering off or restarting MSV2.

7 MSV2 OSD

MSV2 supports the On Screen Display (OSD) feature. The OSD can be controlled by the front panel..

7.1 OSD Introduction

When press the Menu button, display the OSD in the center of the screen.



OSD Menu operating button

Menu button : Display or exit OSD menu

Right button : User can go down a step in the menu hierarchy or increase and select of the Item value..

Left button : User can go up a step in the menu hierarchy or decrease the Item value.

Up /Down button : Move up/down the menu list or increase or decrease the Item value by 10..

OK button : Select a menu or set an Item value.

[Table 9] OSD Control buttons

Layer 1	Layer 2	Layer 3	Layer 4	Note
Output	Output format	1920x1080@60		Only the resolution supported by the display device is displayed in the list.
		3840x2160@60		
		4096x2160@60		
	Encryption	ON		
		OFF		
	Preset	QUAD		
		3SIDE		
		3BOTTOM		
		USER0		
		USER1		
		USER2		
		USER3		
		USER4		
		CH 1		
		CH 2		
		CH 3		
		CH 4		
	WinScale	Depends on the CH		
		Individual		
	WinCrop	Depends on the CH		
		Individual		

	Audio	Channel1		
		Channel2		
		Channel3		
		Channel4		
		Off		
	Border	Timeout		
		On		
		Off		
	Label	Timeout		
		On		
		Off		
Windows	Window A	Input Port	Channel1	
			Channel2	
			Channel3	
			Channel4	
		Priority	Layer1	
			Layer2	
			Layer3	
			Layer4	
		Scale mode	Fit window	
			Same aspect	
		X pos		
		Y pos		
		Width		
		Height		
	Window B	Same as window A		
	Window C	Same as window A		
	Window D	Same as window A		
Input	Channel1	Input name		
		Input format		
		Color space		
		HDCP Version	HDCP Ver.	
		EDID Mode	HDMI 4K2K	
			HDMI 2160p	
			HDMI 1080p	
			HDMI 720p	
			DVI WSXGA	
			DVI UXGA	
			DVI SXGA	
			DVI XGA	
		Brightness	0~100	Default : 50
		Contrast	0~100	
	Channel2	Same as Channel1		
	Channel3	Same as Channel1		
	Channel4	Same as Channel1		
System	S/W Version			
	IP			
	Subnet			
	Gateway			
	DNS			
	MAC			
	RS-232			
	TCP port			
	Factory reset	ON		
		OFF		

[Table 10] OSD Layer Table

7.2 Output menu

7.2.1 Output Format

User can select the output resolution.

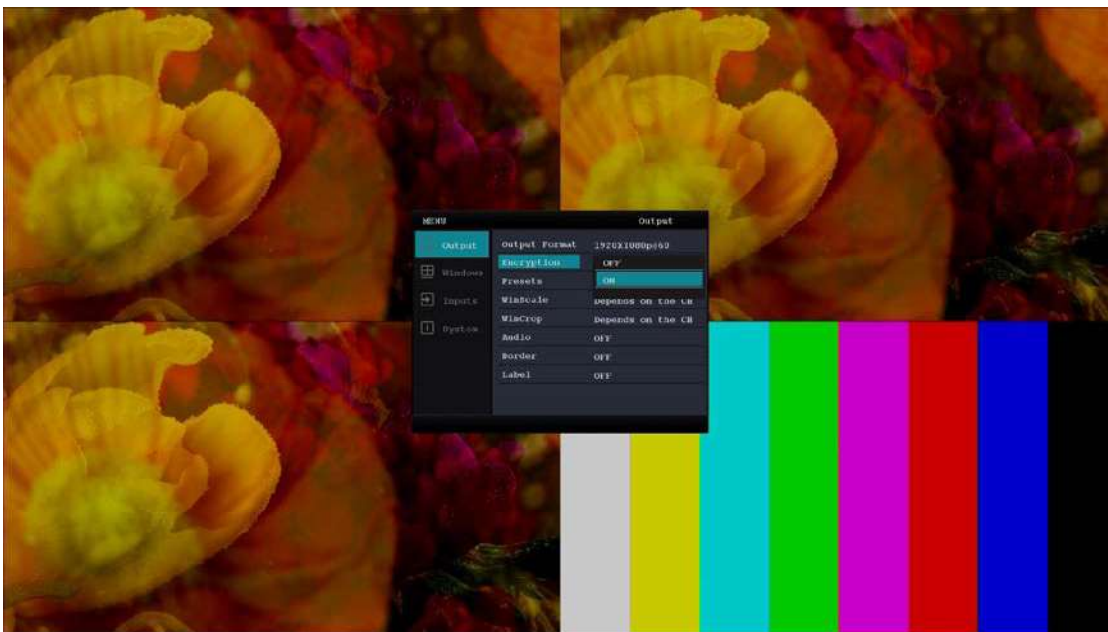
The Resolution list shows only the resolutions supported by the Display device in the MSV2's supported resolution.

(Interlace resolution is not currently supported.)



7.2.2 Encryption

User can set HDCP on/off



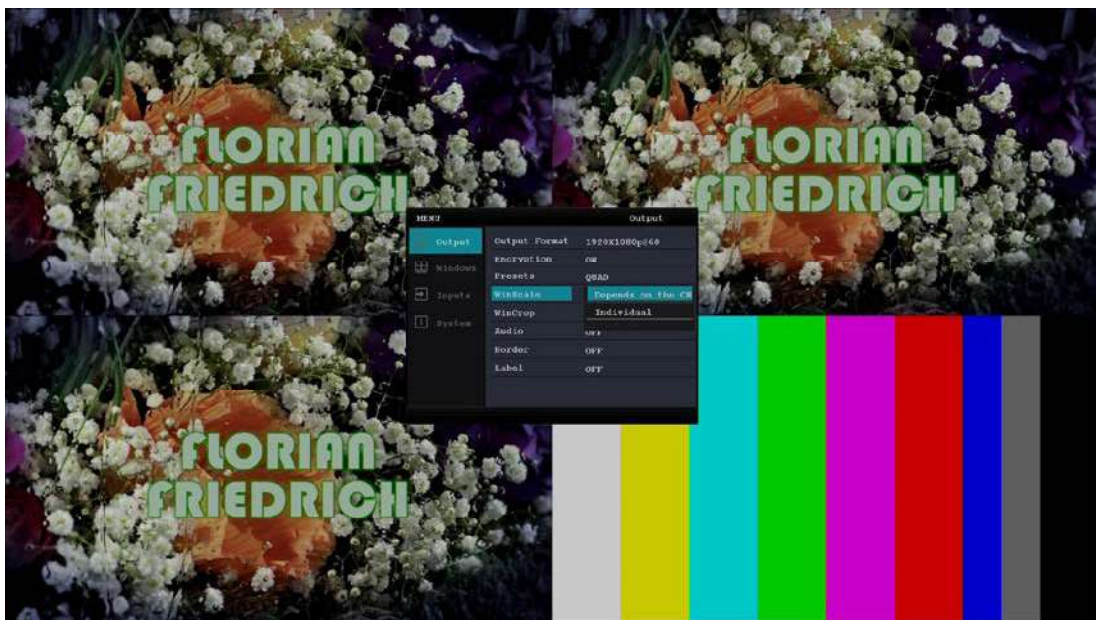
7.2.3 Preset

User can show the currently selected Layout and select a different Layout



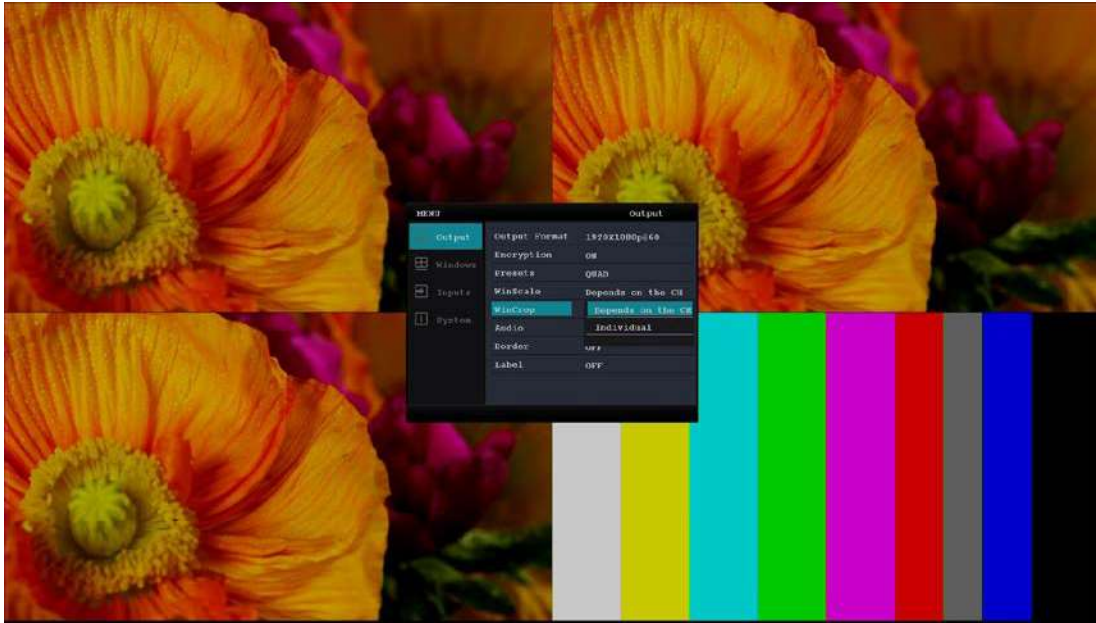
7.2.4 WinScale

Options for whether you want the scale mode of the current image to follow the channel or individual settings.



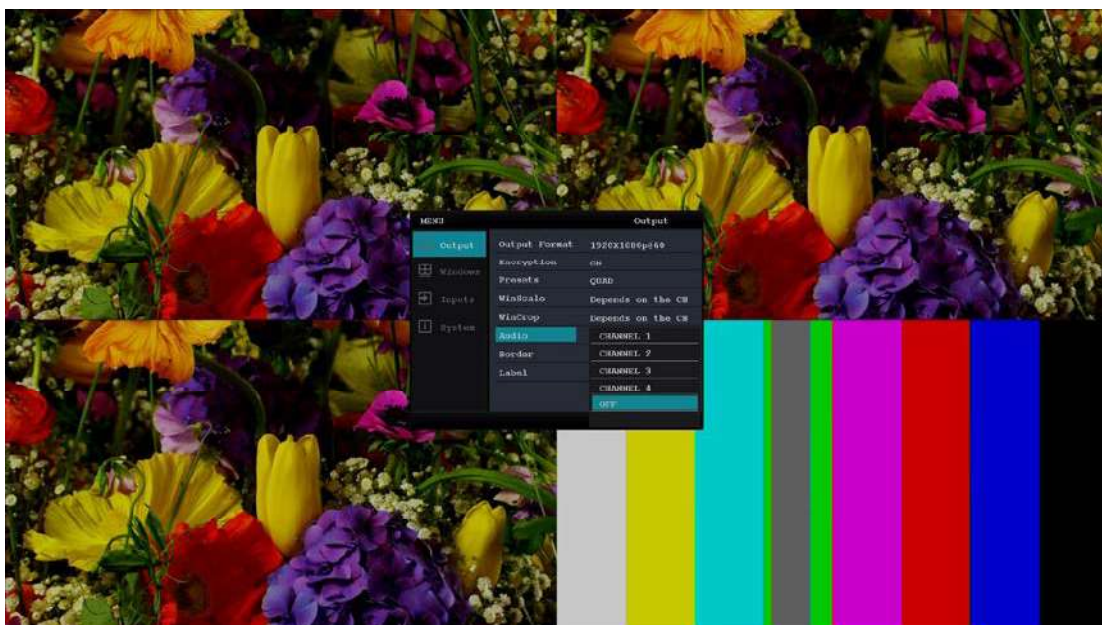
7.2.5 WinCrop

Options for whether you want the crop mode of the current image to follow the channel or individual settings.



7.2.6 Audio

Shows the channel where the current audio is output, and allows you to select audio for the other channel. When Layout is selected, the audio is fixed to the selected channel and cannot be changed.



7.2.7 Border

User can draw a Border on the MSV2 window. User can select 3 type of Time out, On, and Off.

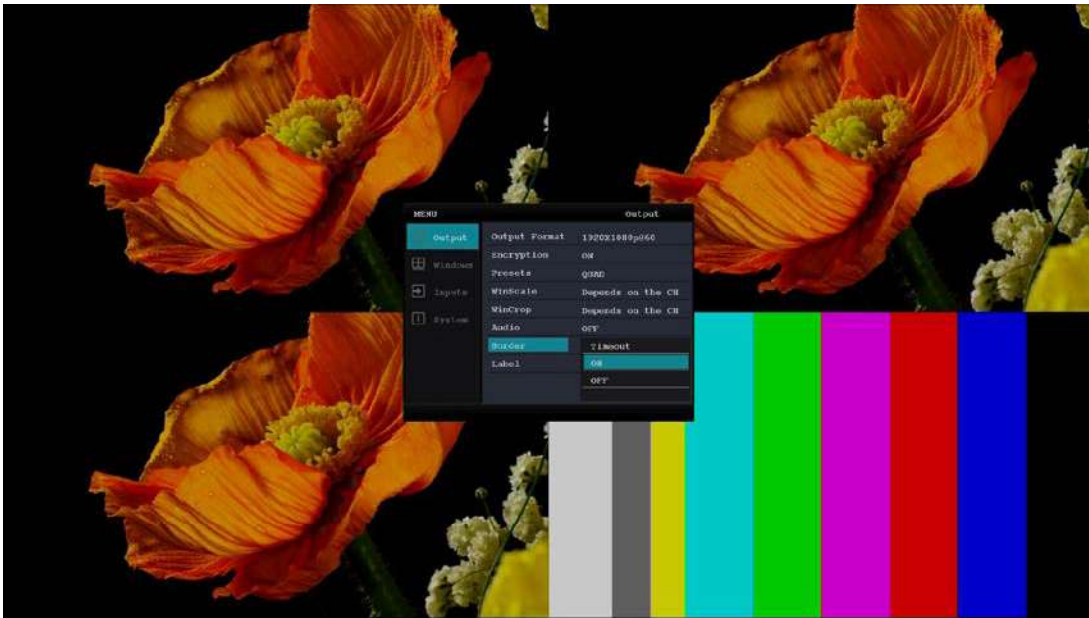
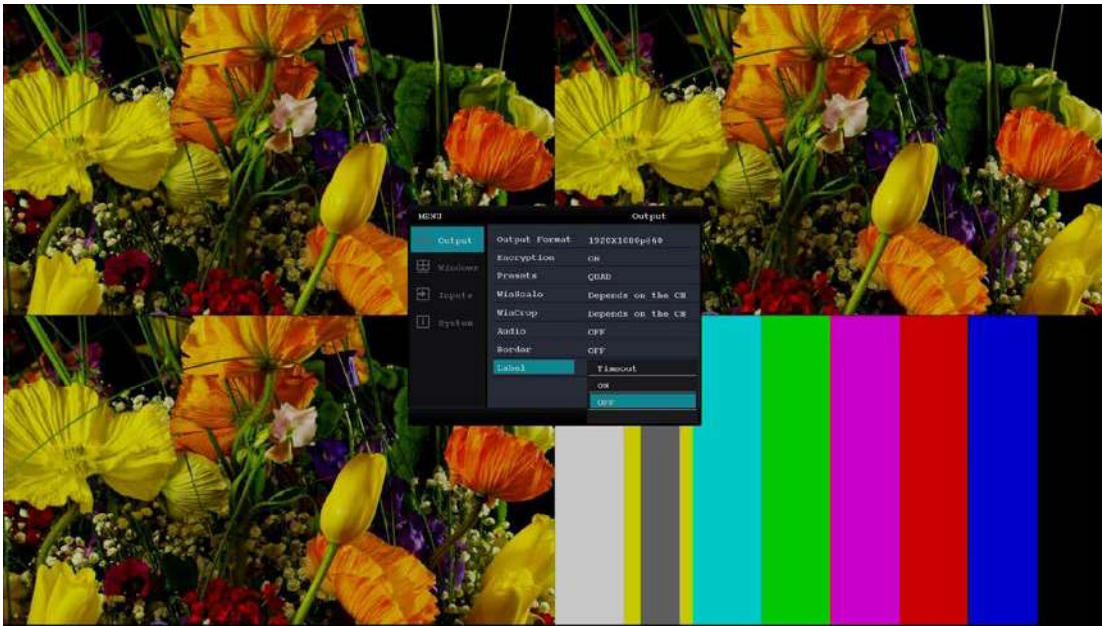


Image of Border applied

7.2.8 Label

It can be shown the input name of outputed in each window through the OSD. user can select 3 type of Time out, On, and Off

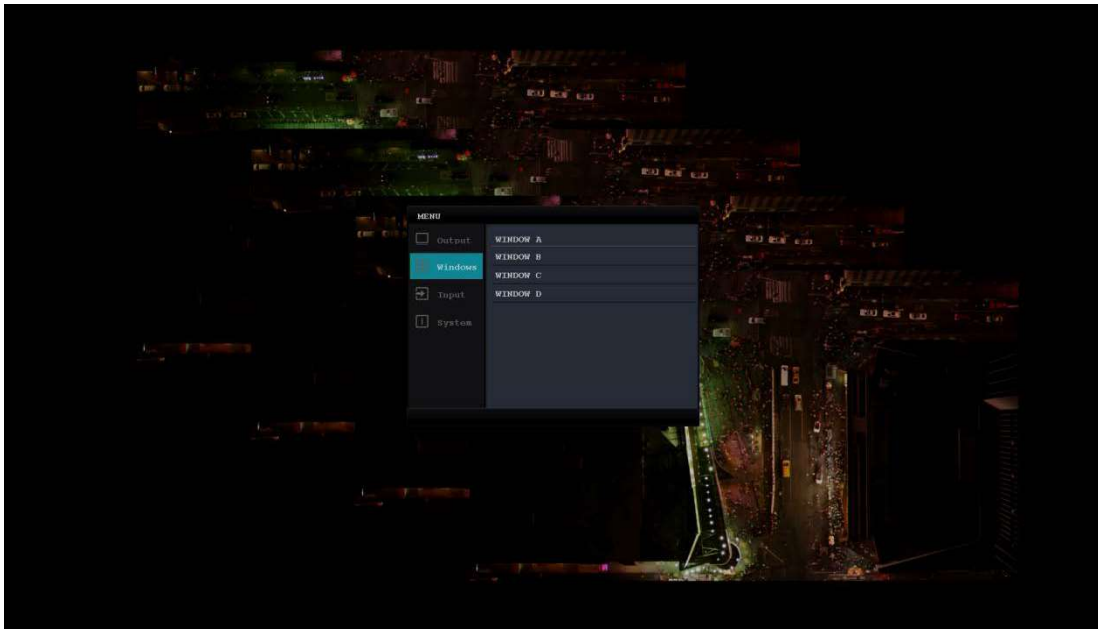


* When using the output menu in Channel only mode, the value of Border, label on/off/timeout is shared by all four channels



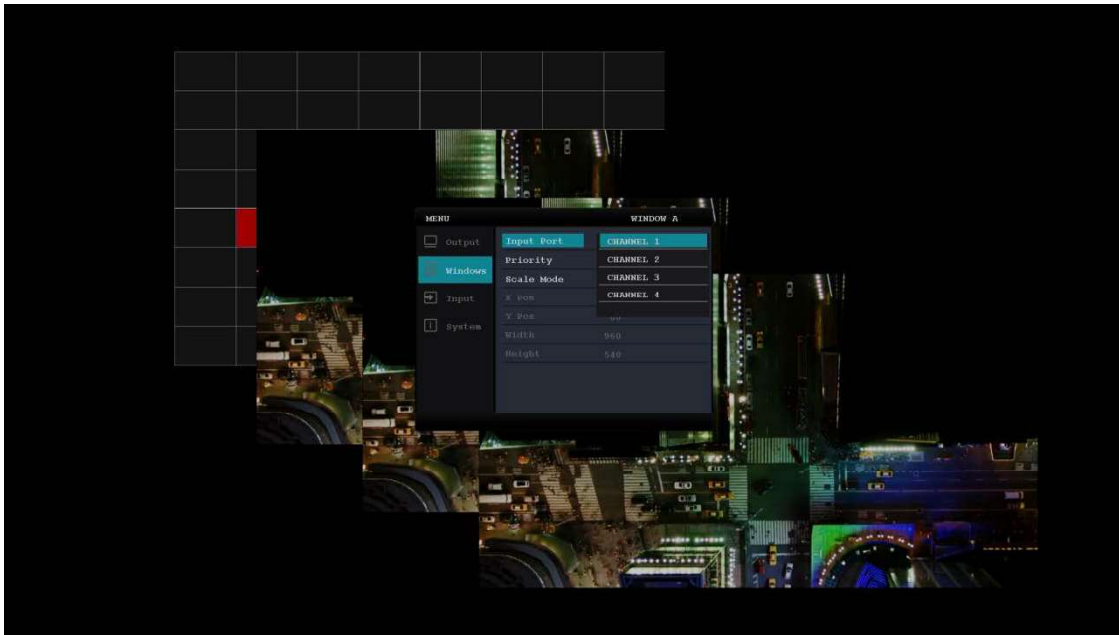
7.3 Windows menu

In the Window menu, user can change the Input port, Priority, and Scale mode for each window and view the coordinate information for that window.



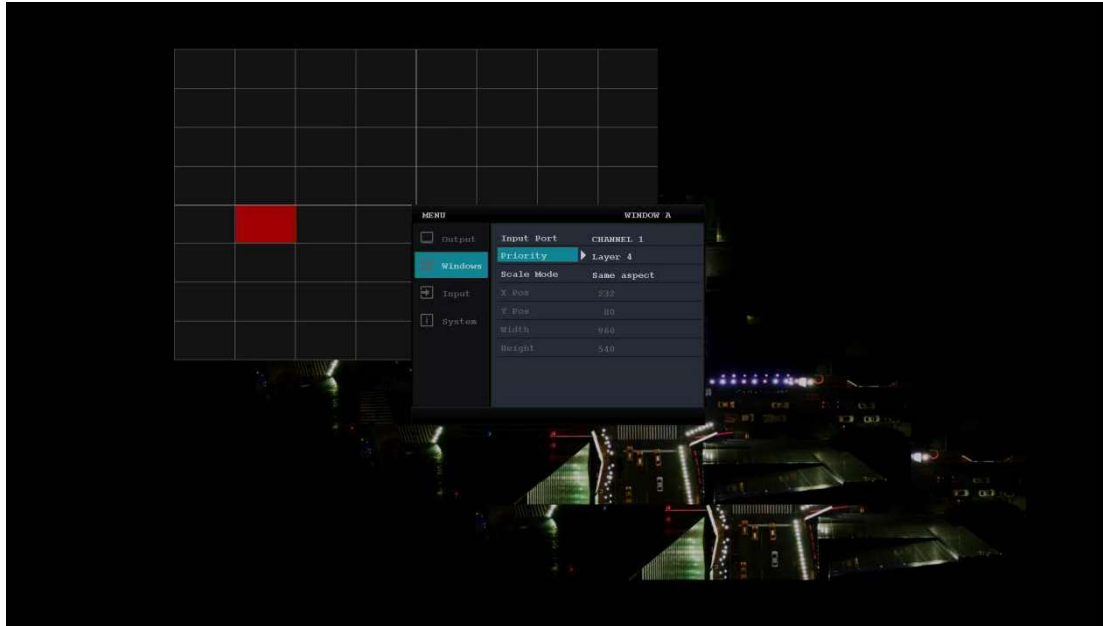
7.3.1 Input Port

User can change the input in the window



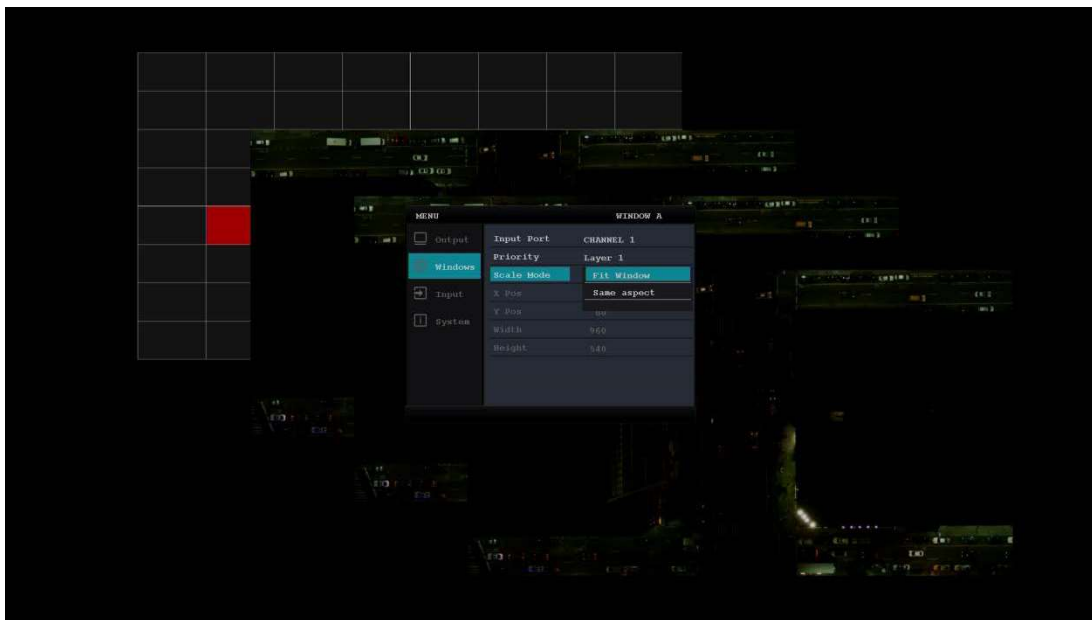
7.3.2 Priority

Available to change the order of layers on window. Layer4 is the front and Layer1 is the rearmost.



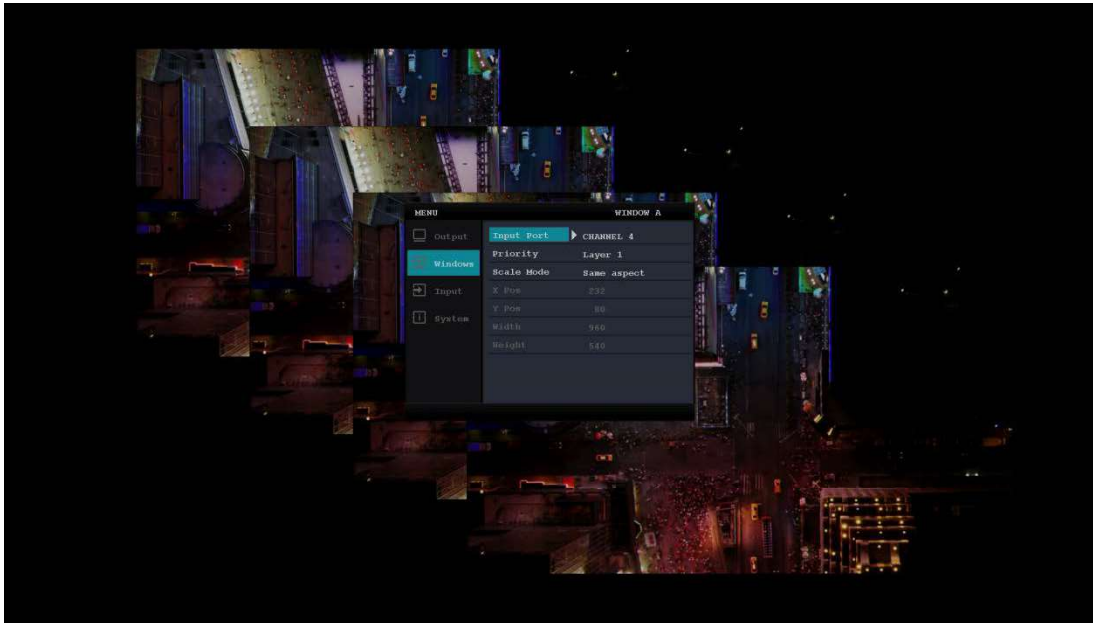
7.3.3 Scale Mode

When Scale mode is Same Aspect, maintain the same ratio as Input size and when scale mode is Fit window, output is displayed the adjusted of image size and ratio according to the area occupied by Window. You can select when WinScale is Individual..

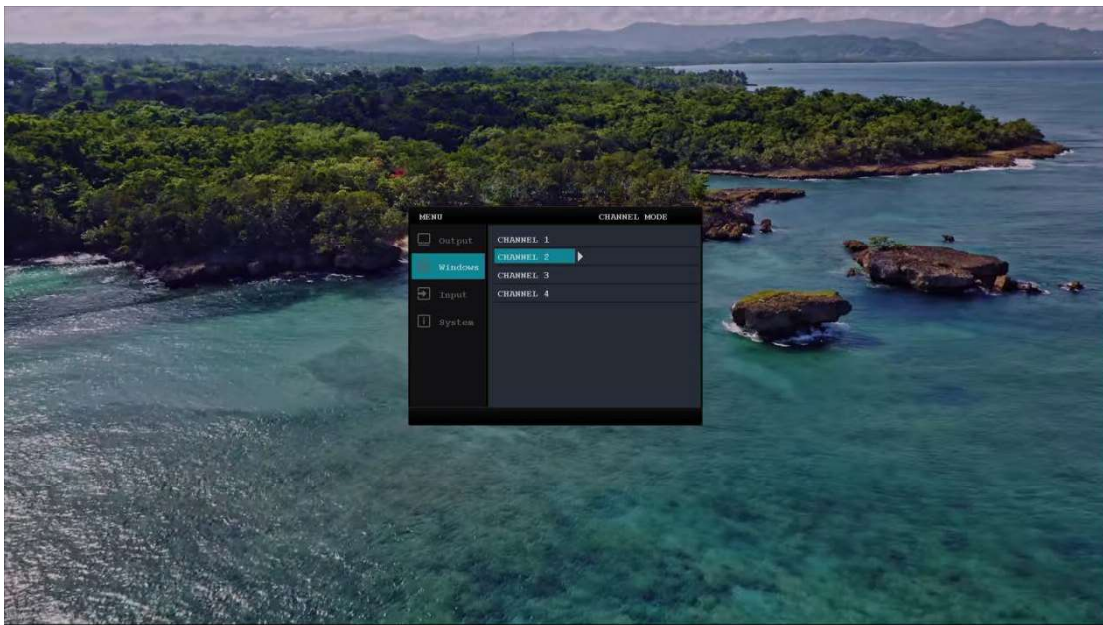


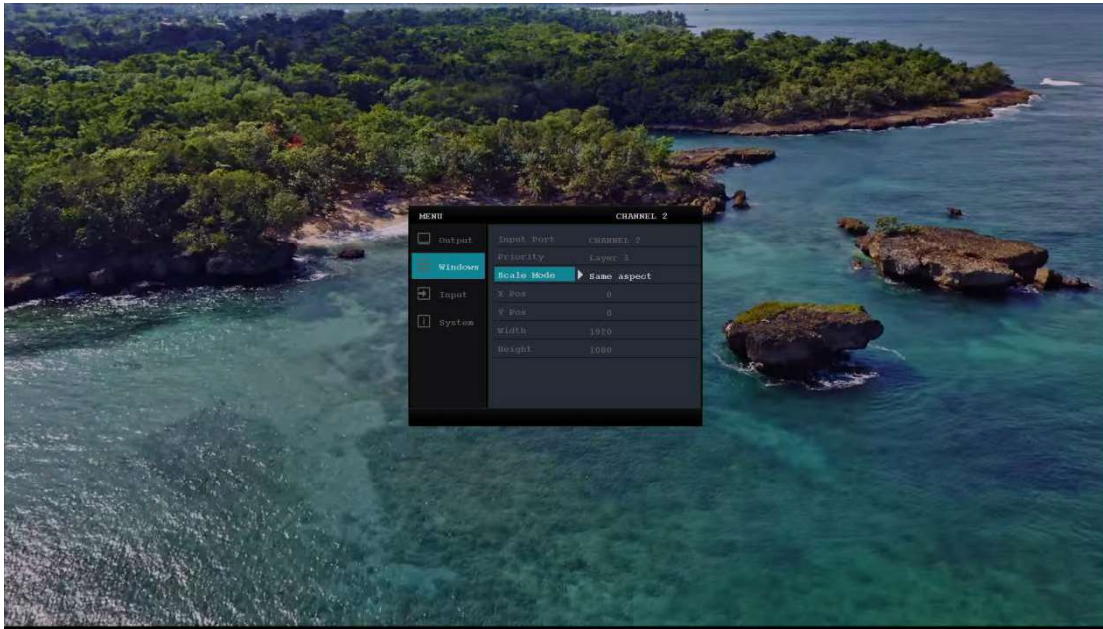
7.3.4 Coordinate Information

User can view the x, y coordinates, width, and height of the selected window.



* If Layout is a channel, if you enter Windows menu, the following picture and window will be changed to a channel and only scale mode can be changed

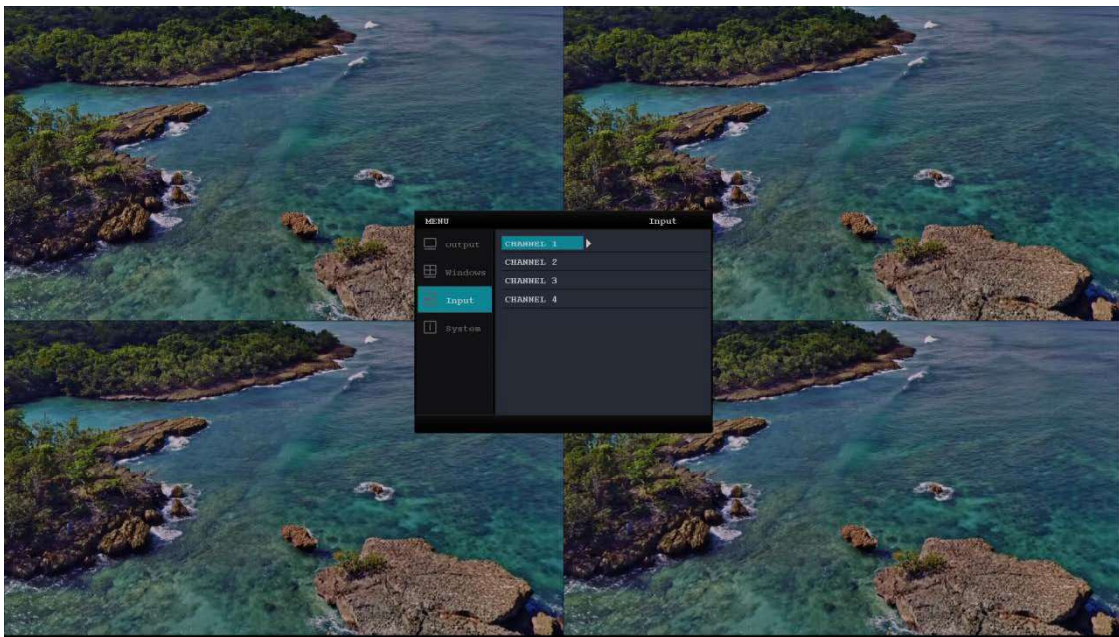


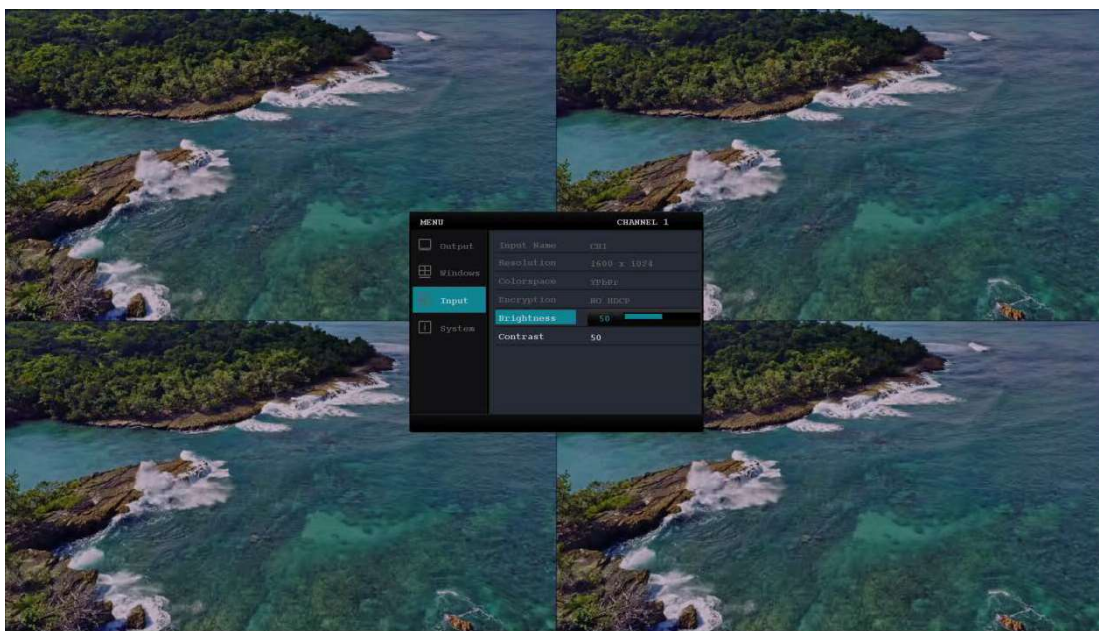


7.4 Input menu

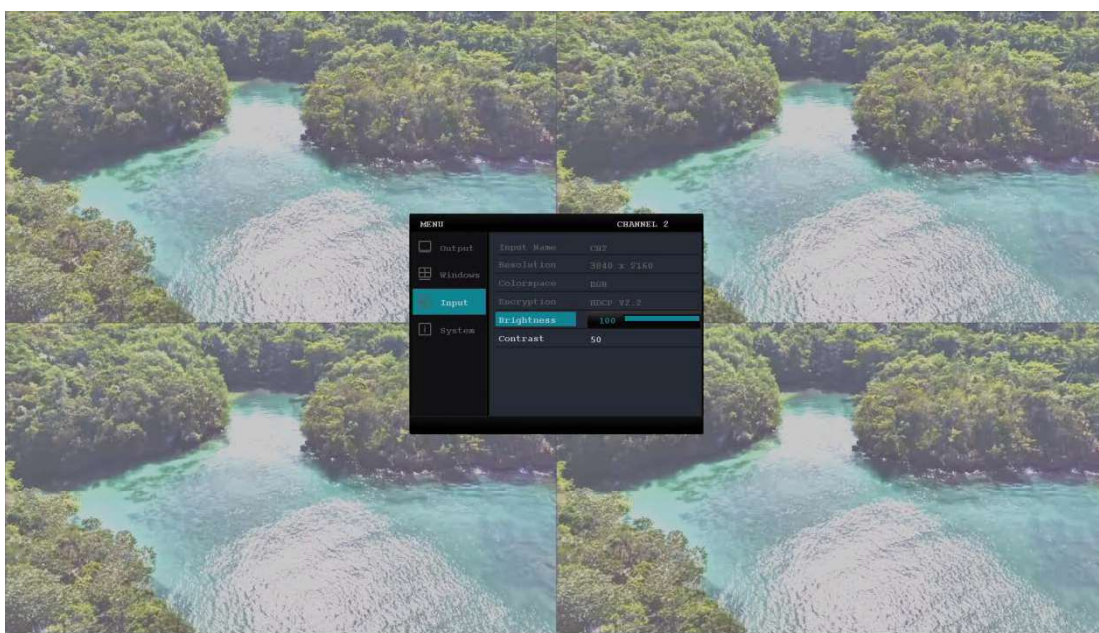
In the Input menu, you can set information about each channel, Brightness, and Contrast, and range from 0 to 100.

The Left/Right button decreases/increases the value by 1 and the Up/Down button decreases /increases the value by 10. User can select EDID Mode.

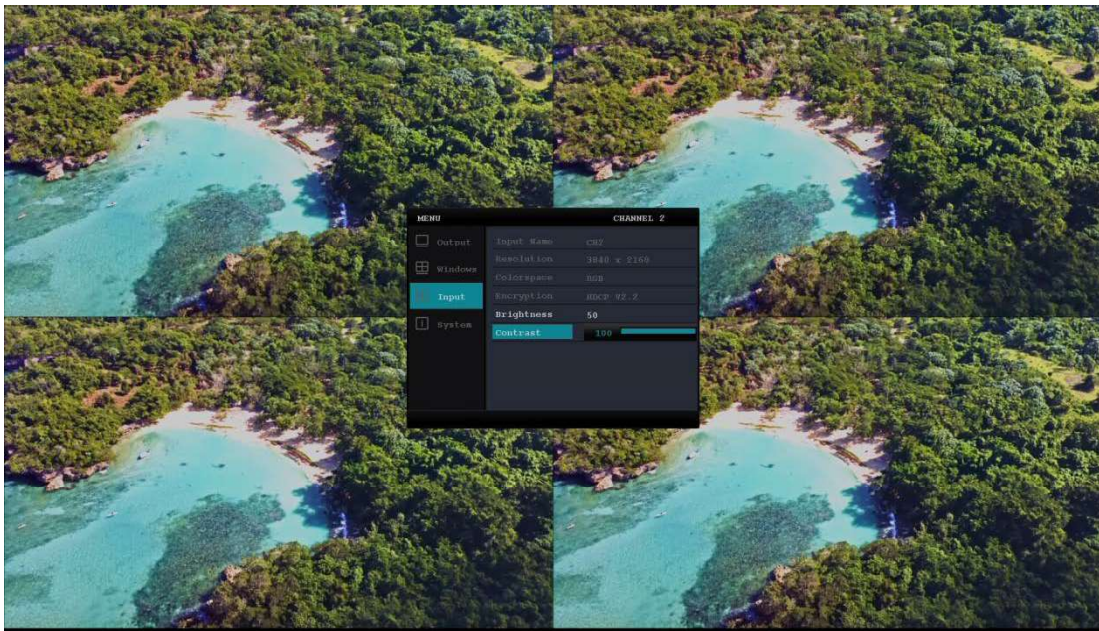




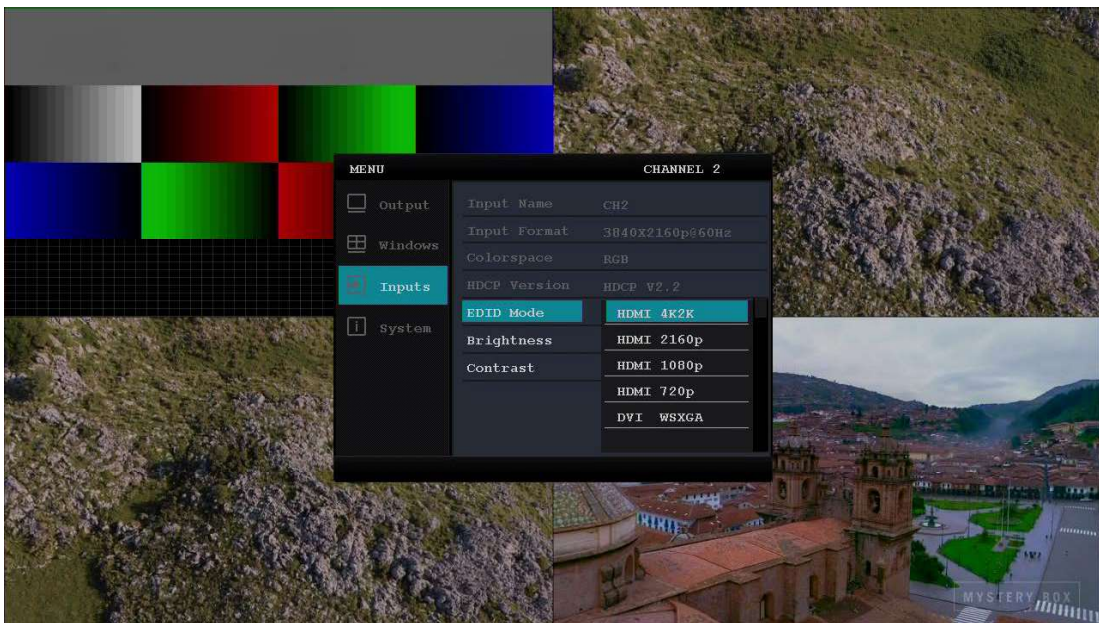
Brightness (Default)



Brightness (Raise up)



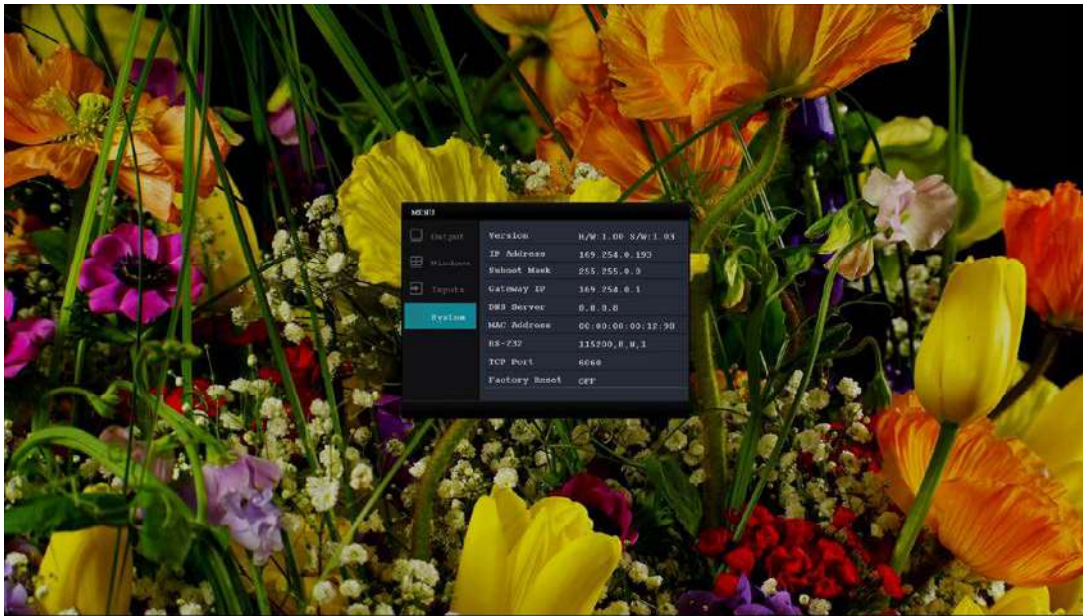
Contrast (Raise up)



EDID Mode

7.5 System menu

User can view information about the S/W version, IP information, Mac, RS-232 and TCP Port on MSV2.



8 API(Command Set)

On UART Controlling or TCP you can control MSV using text commands via RS-232 port on MSV. UART Control, TCP supports some of the functions of MSV, please control via MSV manager if you need full control.

Currently, only “set” is supported and “get” commands may be added as required in the future.

For more information, please refer to the [API document](#).

Warranty

We hereby warrant the final purchase of our product as follows.

In the case of troubles on our products, please contact the seller purchased.

One (1) year limited warranty

Our customers have right to be served with free charge when there is trouble in this product during one(1) year from the day purchased.

Out of warranty services

When you request services (in the case of non-manufacturing defect but the troubles by misuse), charges may apply, for example:

- Defects of products caused by accident, disaster.
- Damages of products caused by the customer's carelessness or mistaken application.
- Damages of products caused by the application of parts or products not supplied or sold by our company.
- Damages of products and related defects caused by not our staff or the man or group not nominated by us for services.

Warning

- Do not dismantle the housing or modify the product.

Dismantling the housing or modifying the product may result in electrical shock or burn.

- Refer all servicing to qualified service personnel.

Do not attempt to service this product yourself as opening or removing housing may expose you to dangerous voltage or other hazards.

- Keep the product away from liquids.

Spilling into the housing may result in fire, electrical shock, or equipment damage. If an object or liquid falls/spills into the housing, unplug the product immediately.

Have the product checked by a qualified service engineer before using it again.

- Do not touch the product with wet hands.

Touching the housing and plug with wet hands is dangerous and can cause electrical shock.

Thank you for choosing our product.

Service

Please contact our customer service if you need any information or help with our products.

Warranty

One year, parts and labor.

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