

OPHIT CO., LTD.



USER MANUAL

Model: MSV2

Revised: July. 15. 2019

Revision History

Version Number	Revision Date	Author	Description of Changes
0.1	10. 30. 2018	EB Lee	Initial Version
0.2	12. 05. 2018	JS Jeong	Web Controller – Added Internet Explorer, Update section
0.3	01. 23. 2019	JS Jeong	Web Controller – Added Split option, ID-PW
0.4	02. 12. 2019	JS Jeong	Manual Update
0.5	04. 30. 2019	JS Jeong	Assembly 2D drawing for MSV2 updated.
0.6	07. 12. 2019	JS Jeong	Full revision
1.0	07. 15. 2019	JS Jeong	Chapter 1.1.1, 1.1.2 and 1.1.3 are updated

*Version Number on above refers to MSV2 Software version.

Table of Contents

1. Introduction	5
2. Description	10
3. Quick Start	10
4. Starting Guide and Basic Functions	11
5. MSV2 Function	15
6. MSV2 Web Controller	19
7. MSV2 OSD	62
8. API	76

Table Contents

[Table 1] MSV2 Hardware & Software	10
[Table 2] MSV2 Quick Start Flow.....	11
[Table 3] Screen layout	16
[Table 4] Output resolution	16
[Table 5] OSD Information Table	17
[Table 6] Web Controller Information Table	17
[Table 7] Web Controller Function.....	19
[Table 8] Default ID & Password	20
[Table 9] OSD Control buttons	62
[Table 10] OSD Layer Table.....	64

1. 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.

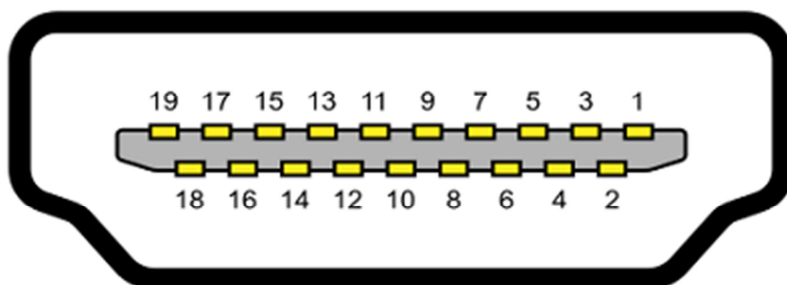
1.1.3 Video output specification

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.

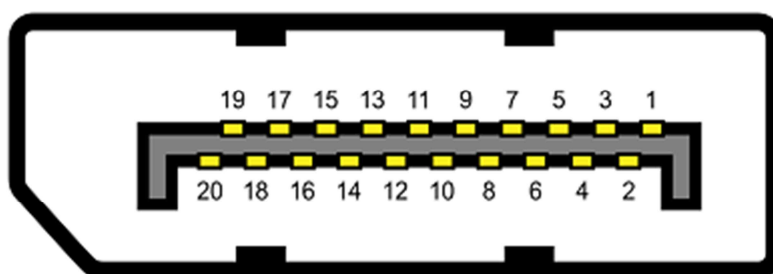
1.1.4 Input/Output port pin assignment

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

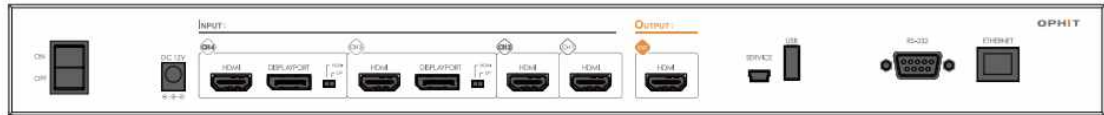


FRONT VIEW



▷ MSV2 (Color : Ivory) ◁

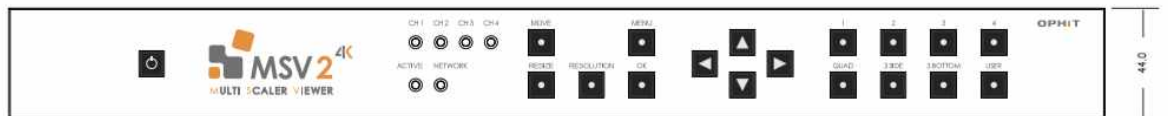
REAR VIEW



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.

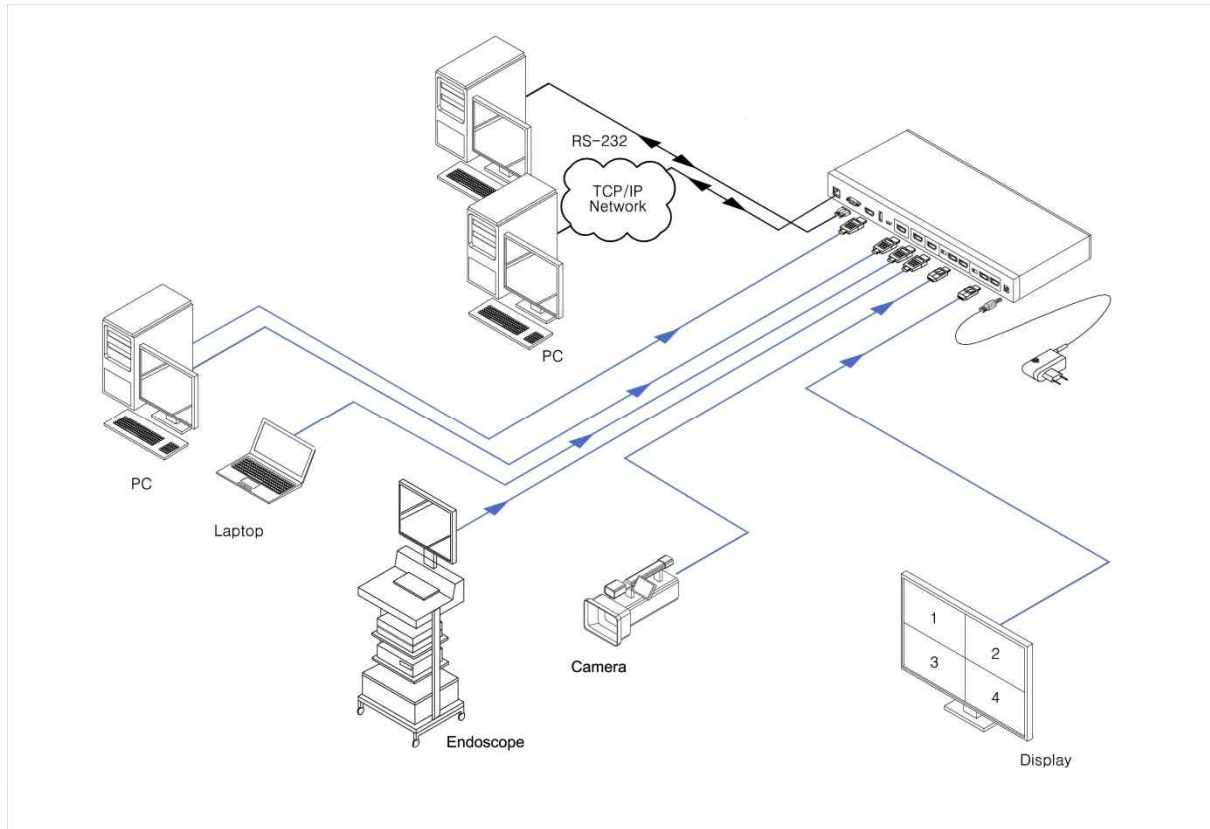
Software

- 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 .

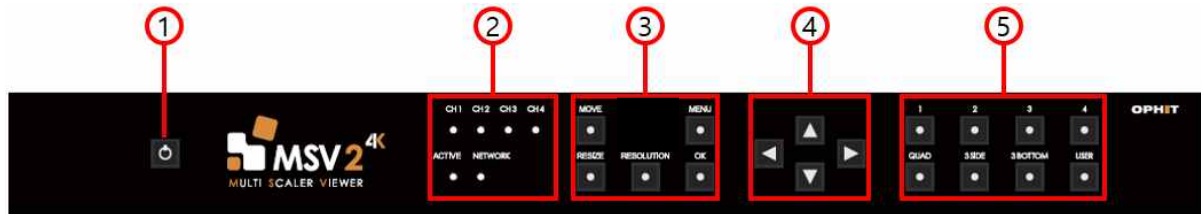
MSV2 Quick Start Flow
<ol style="list-style-type: none"> 1. Connect source device/devices to MSV input port (HDMI /Displayport) 2. Connect display device to MSV output port(HDMI) 3. Connect power adapter on MSV 4. Turn the MSV power switch On (on the rear panel) 5. Press MSV power button (on the front 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 disappeared(Timeout: 5sec) 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. 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.
- 6.

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. you can see the message 'Factory Reset' on screen .

When Factory reset is shut down, a red LED illuminates on the power button and when press the power button,MSV2 boots again .

4.2.8 Swap

If you press 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 is a multiprocessor that enables 4 inputs and puts all inputs in 1 output. 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 window





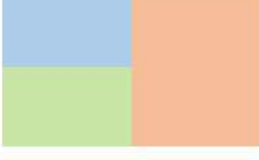
The horizontal and vertical position of each window can be adjusted. You can adjust one window's position each time and when windows are overlapped it will be displayed based on screen priority.
(Control tool → Front panel, Web controller)

5.2 Adjusting the size of window

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

※ User can only use the tablet-specific web for specific tablets.

(Samsung Galaxy Tab 10.1 2019 – SM-T510NZKEKOO)

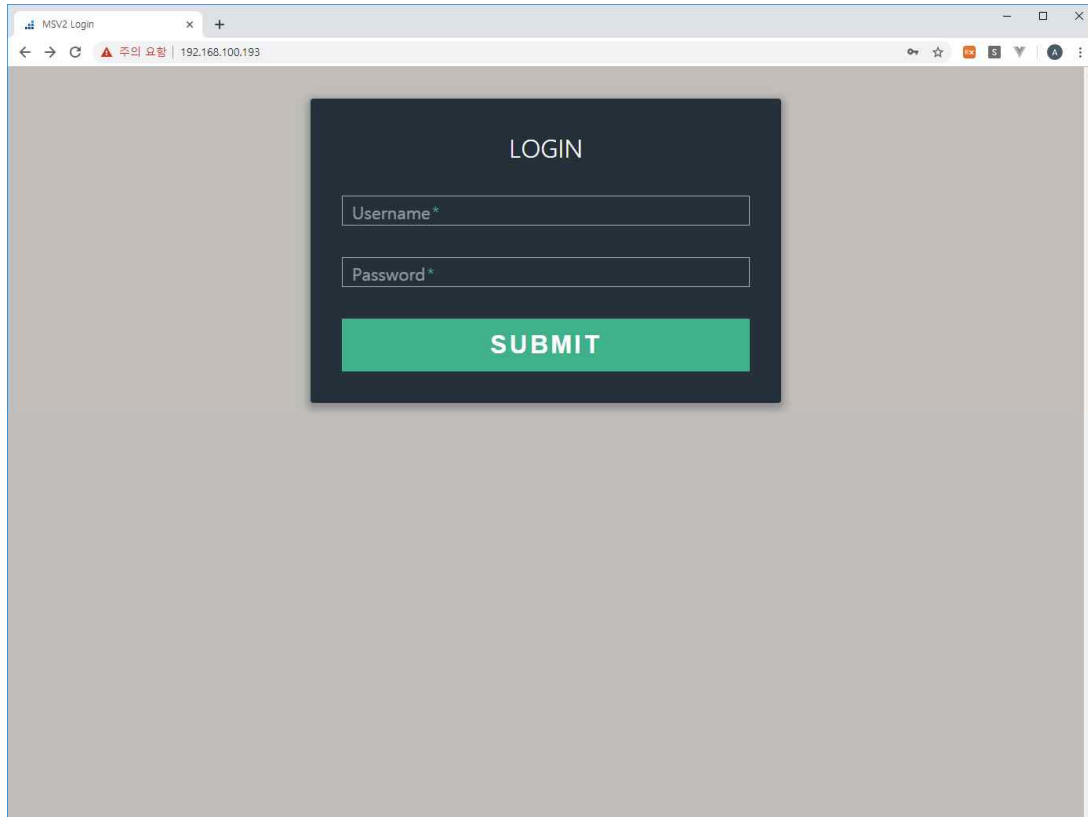
Function	Control	Details
Preview	Web controller	Preview enabled/disabled
Front lock on/off	Web controller	Front panel lock setting when controlling on MSV2 web controller
Split	Web controller	Change number of windows
Move	Web controller	Window repositioning
Resize	Web controller	Window resizing
Output 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.

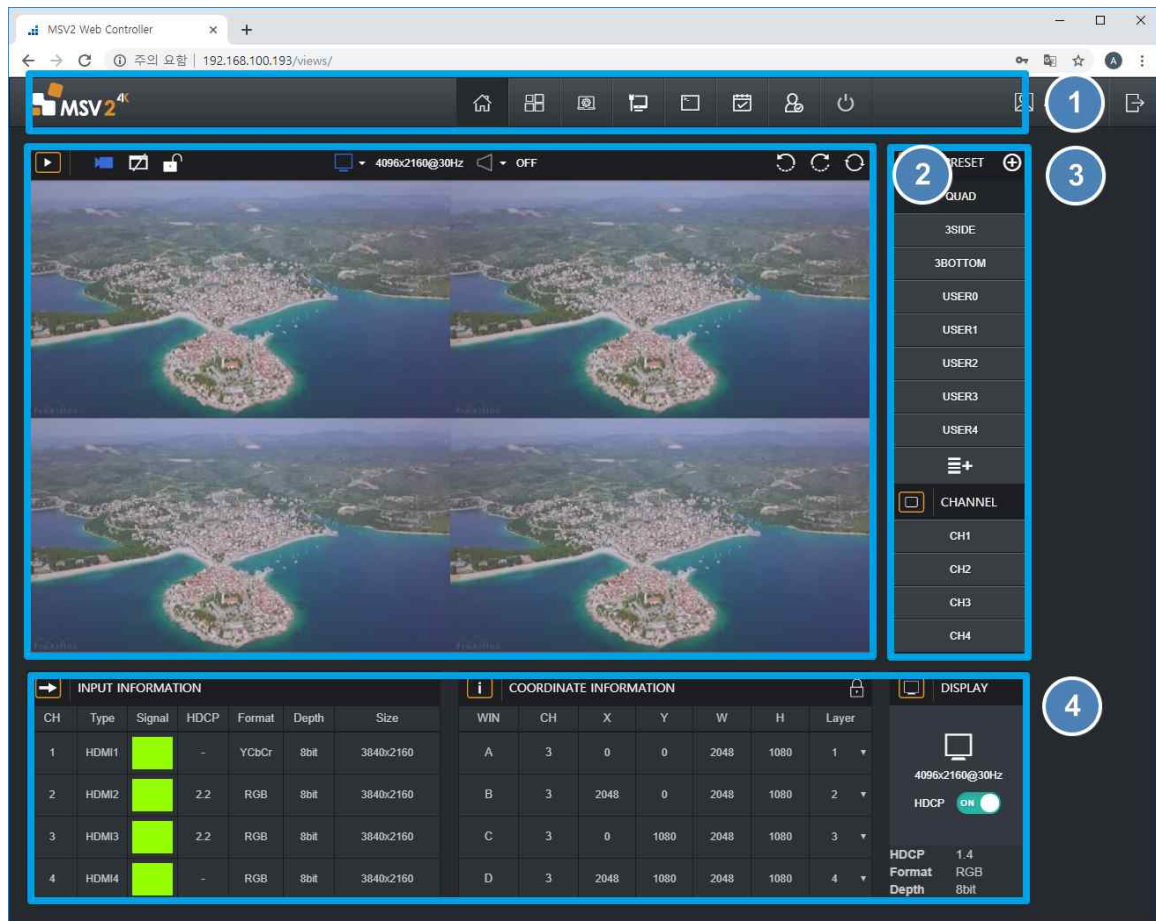
For Chromium and ChromiumPortable, Version 50.0.2633.3 and for IE is recommended starting with IE10 version.

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
- ④ Display information – Input information, Coordinate Information, Output Information

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]

Users 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

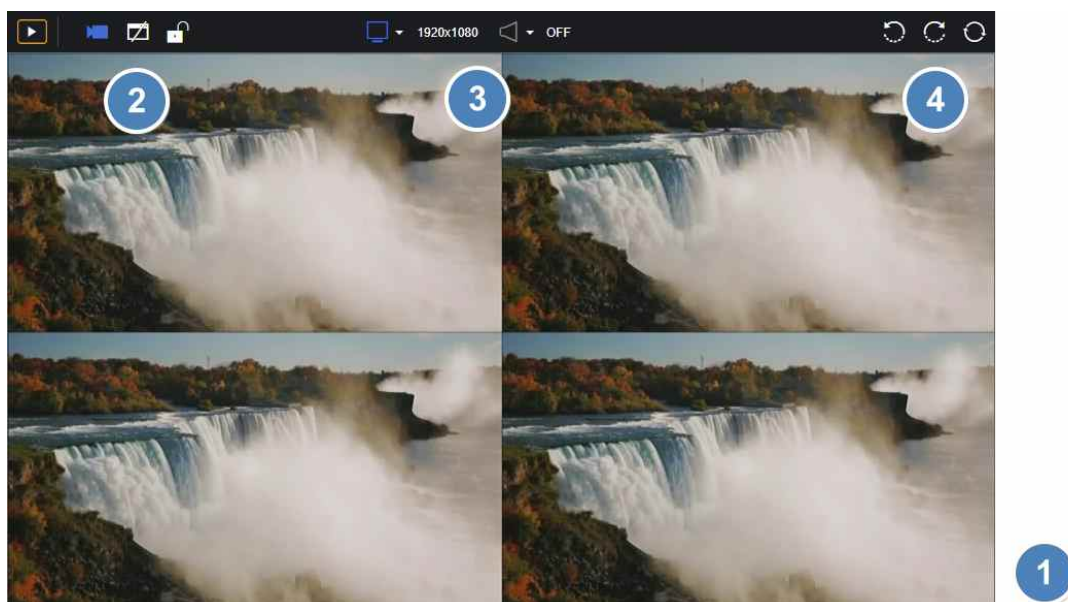
6.4.5 User permission information[⑤]

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

6.4.6 Logout[⑥]

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 Preview Mode, Banner, Front Lock[②]

User can change the Preview mode. window information will display briefly if Banner On,
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)

Swap state is not saved and is returned to its original state when Layout is changed..

6.6 Layout Control



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

6.6.1 Layout Option[①]

The screenshot shows a 'Layout Option' menu with a dark grey background. At the top, there is a header bar with a gear icon on the left, four buttons labeled A, B, C, and D in the center, and a close button (X) on the right. The buttons A, B, C, and D are highlighted with a blue border. Below the header, the menu is organized into sections: 'Preset Name' with a text field containing 'QUAD'; 'Audio Output' with a dropdown menu set to 'OFF'; 'OSD' section containing 'Border' and 'Label' dropdown menus, both set to 'OFF'; and 'Select Input' which contains a table for channel selection. The table has four rows labeled A, B, C, and D. Each row has four columns numbered 1, 2, 3, and 4. In each row, the number '3' is highlighted with a black background. To the right of the numbers is a dropdown menu with a yellow arrow, labeled L1, L2, L3, and L4 respectively. At the bottom right of the menu is a checkmark icon followed by the word 'APPLY'.

	1	2	3	4	
A					L1 ▼
B					L2 ▼
C					L3 ▼
D					L4 ▼

Layout option generates an option button when the Layout button is enabled, and opens when clicked. Features such as Preset name, Audio, OSD, channel selection, and Layer order are available. Press the window button of the blue box to access the window options

(If the Input is interlace, Keep Aspect and Crop functions will be disabled and Apply will not save)



A

B

C

D

X

Preset Name

Camera 1

Audio Output

OFF

OSD

Border

OFF

Label

OFF

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	L4

 APPLY

To change the Preset name, click Preset name, change it to the desired name, and press the Apply button



A

B

C

D

X

Preset Name

Camera 1

Audio Output

OFF

CH1

CH2

CH3

CH4

OFF

Select Input

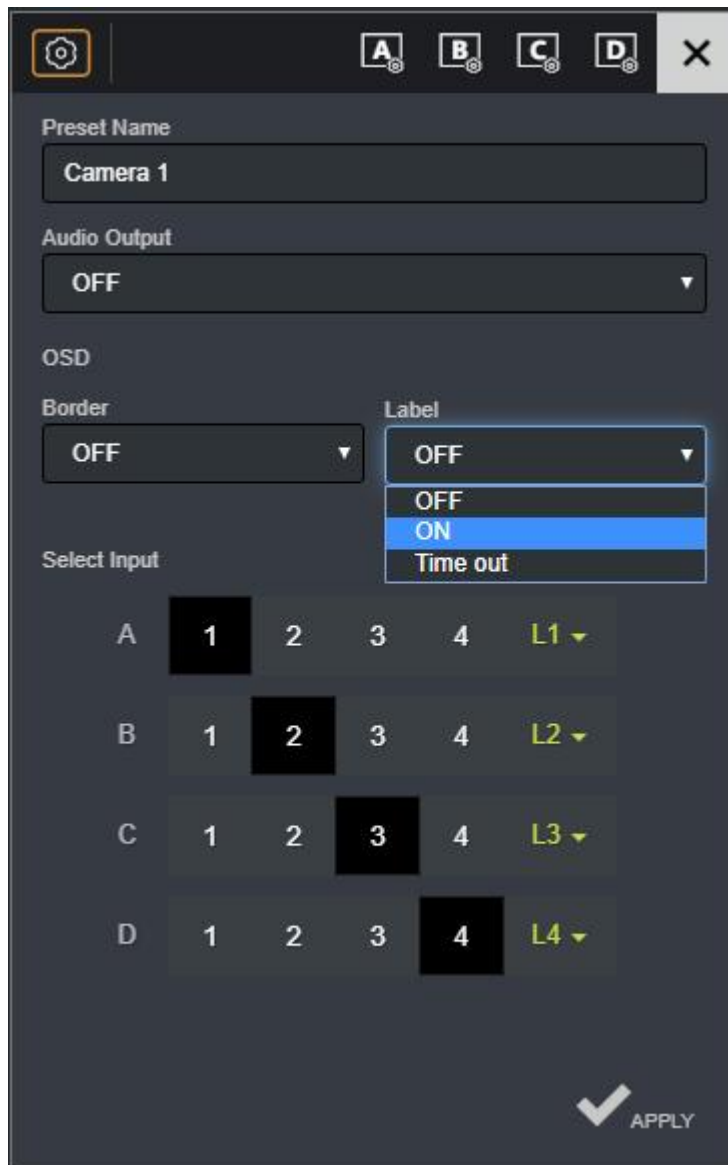
A	1	2	3	4	L1
B	1	2	3	4	L2
C	1	2	3	4	L3
D	1	2	3	4	L4

 APPLY


To change Audio, click Audio, select the audio from the desired source in the select window, and press the Apply button to apply



To change the OSD Border, click Border, select the desired setting, and press Apply button.



To change the OSD Label, click Label, select the desired setting, and press the Apply button



A

B

C

D

X

Preset Name

Camera 1

Audio Output

OFF

OSD

Border


OFF

Label

OFF

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	L4


APPLY

User can use Select Input to change the source of the window or to change the order of the layers.

Press 3 and press the Apply button to apply the source of A Window to channel 3.

The remaining B, C, and D windows can also be pressed on the desired channel and then the Apply button

A

B

C

D

X

Preset Name

Camera 1

Audio Output

OFF

OSD

Border

OFF

Label

OFF

Select Input

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

L1

L2

L3

L4

✓

APPLY

User can change the order of the layers by pressing the button to the far right. Select the layer order and press the Apply button to apply



A

B

C

D

X

Preset Name

QUAD

Audio Output

OFF

OSD

Border

OFF

Label

OFF

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	L4 ▾

 APPLY

Touch the X-mark as shown above, the window will be disappeared.

Options window configuration:

- Input Name: CH1
- Keep Aspect: OFF
- Input Cropping: OFF
- Input Window Coordinates:
 - X1: 0
 - Y1: 0
 - X2: 3840
 - Y2: 2160
- Output Window Coordinates:
 - X: 0
 - Y: 0
 - W: 960
 - H: 540
- APPLY button

Pressing the window button will open the following window: The clicked window changes to green to indicate activation status. Changing of the Input name is not possible in the corresponding Options window and can be changed in the Channel option.

Keep Aspect is an option for maintaining the source's original ratio.

Input Cropping is a function that cuts and shows the source by setting the coordinates.

Input Name

CH1

Keep Aspect **ON** Input Cropping **OFF**

Input Window Coordinates

X1	Y1	X2	Y2
0	0	3840	4320

Output Window Coordinates

X	Y	W	H
0	0	960	540

✓ APPLY

To use Keep Aspect, press the toggle button to "ON",
The source's original rate will maintain.

Press the Input Crop button to activate the Crop function. Input Window Coordinates under the button is active and user can enter the coordinates to output from the source.

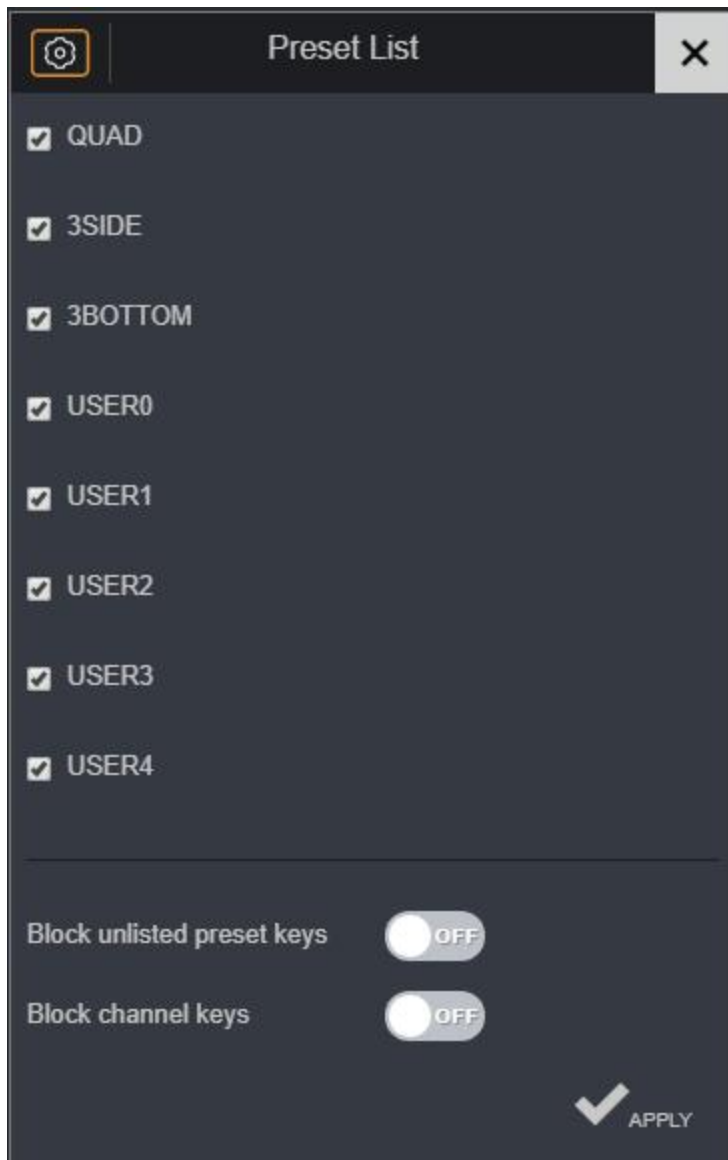
Enter the desired coordinate value and press Apply to apply

6.6.2 Layout Button (Preset Button)[②]

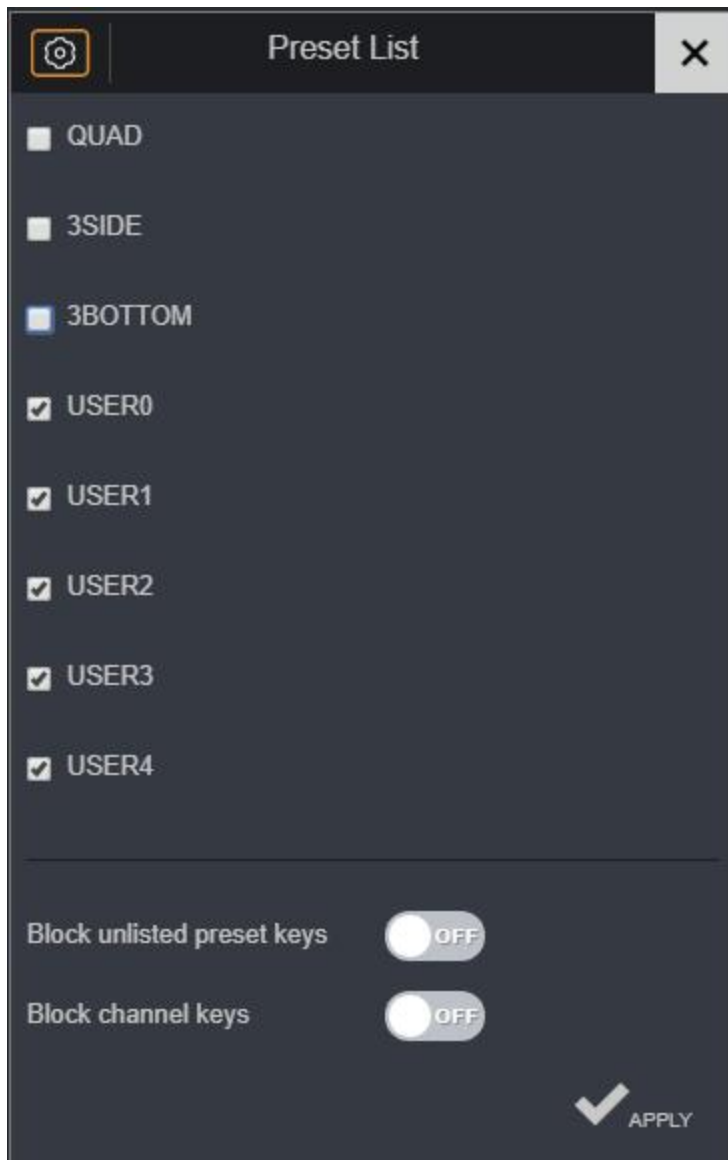
Press button to change layout.

6.6.3 Layout Button Option (Preset List)[③]

When only a few Layout buttons are required, the option allows you to adjust the number of buttons.



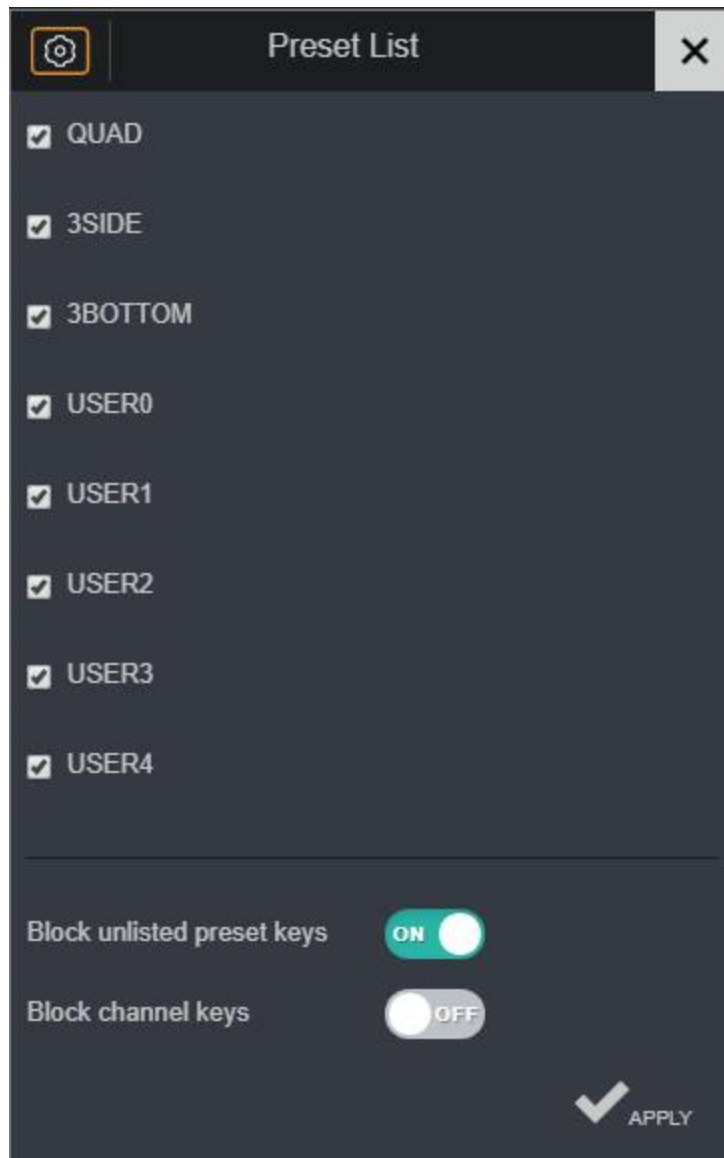
When you click the Preset List button, the following window pops up



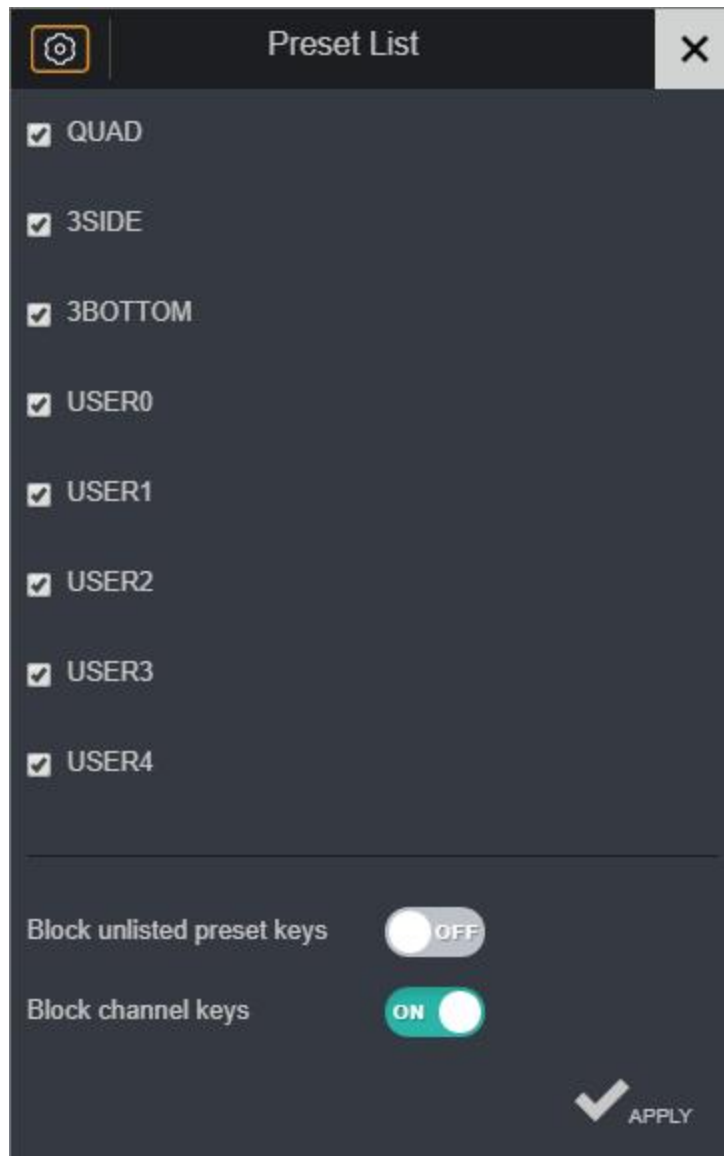
After removing the check of QUAD, 3SIDE, and 3BOTTOM, press Apply, the Preset button window as shown below will be changed



Applied appearance.

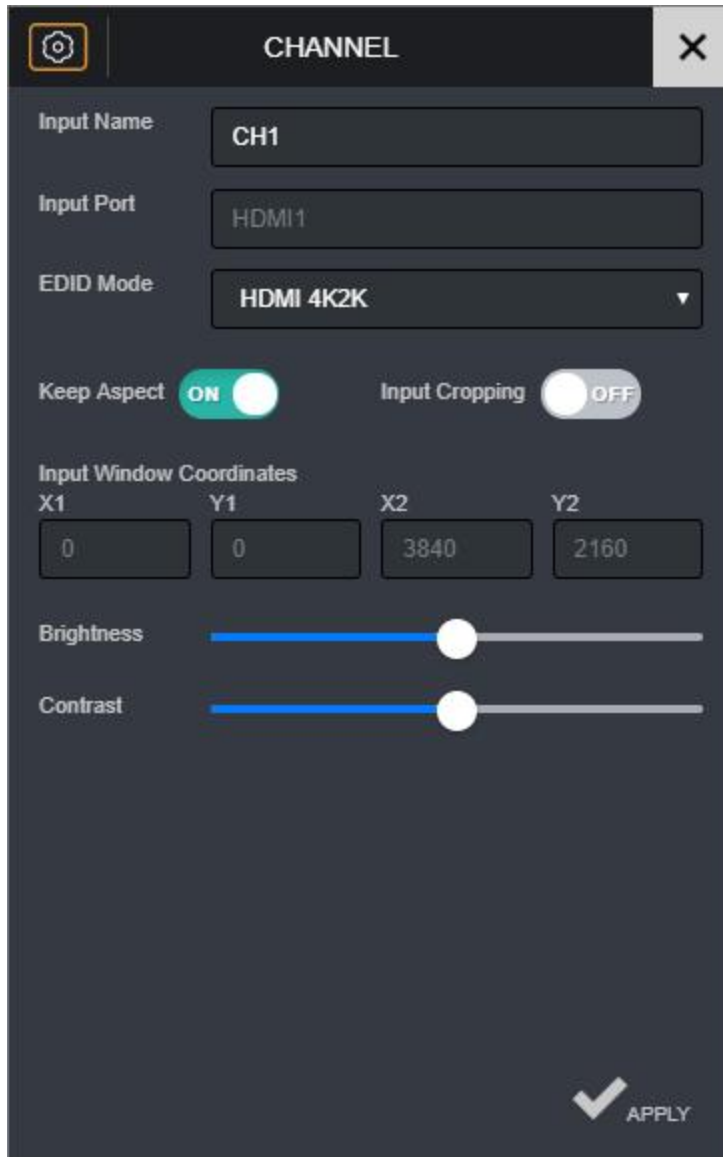


When "on" the Block Unlisted Preset Keys button, the front button is used to block the Preset that is missing from the Preset List.



When "on" the Block channel key button, will be block the channel selection button of the front button

6.6.4 Channel Option[④]





The screenshot shows a 'CHANNEL' settings window with a dark background. At the top, there is a gear icon on the left and a close 'X' button on the right. The settings are organized as follows:

- Input Name:** A text field containing 'CH1'.
- Input Port:** A text field containing 'HDMI1'.
- EDID Mode:** A dropdown menu showing 'HDMI 4K2K' with a downward arrow.
- Keep Aspect:** A toggle switch that is turned 'ON' (green).
- Input Cropping:** A toggle switch that is turned 'OFF' (grey).
- Input Window Coordinates:** Four input fields labeled X1, Y1, X2, and Y2. X1 and Y1 contain '0', while X2 and Y2 contain '3840' and '2160' respectively.
- Brightness and Contrast:** Two horizontal sliders, each with a blue segment on the left and a white knob in the center.
- Bottom Right:** A large checkmark icon and the word 'APPLY'.

Channel option opens when the Channel button is enabled and is clicked. user can use Channel name, Scale, Crop, Brightness, Contrast, EDID Mode, and more.

(If the Input is interlace, Keep Aspect, Crop will be disabled and Apply will not save.)

 CHANNEL 

Input Name

Source 1|

Input Port

HDMI1

EDID Mode

HDMI 4K2K

Keep Aspect

ON

Input Cropping

OFF

Input Window Coordinates

X1

0

Y1

0


X2

3840


Y2


2160

Brightness

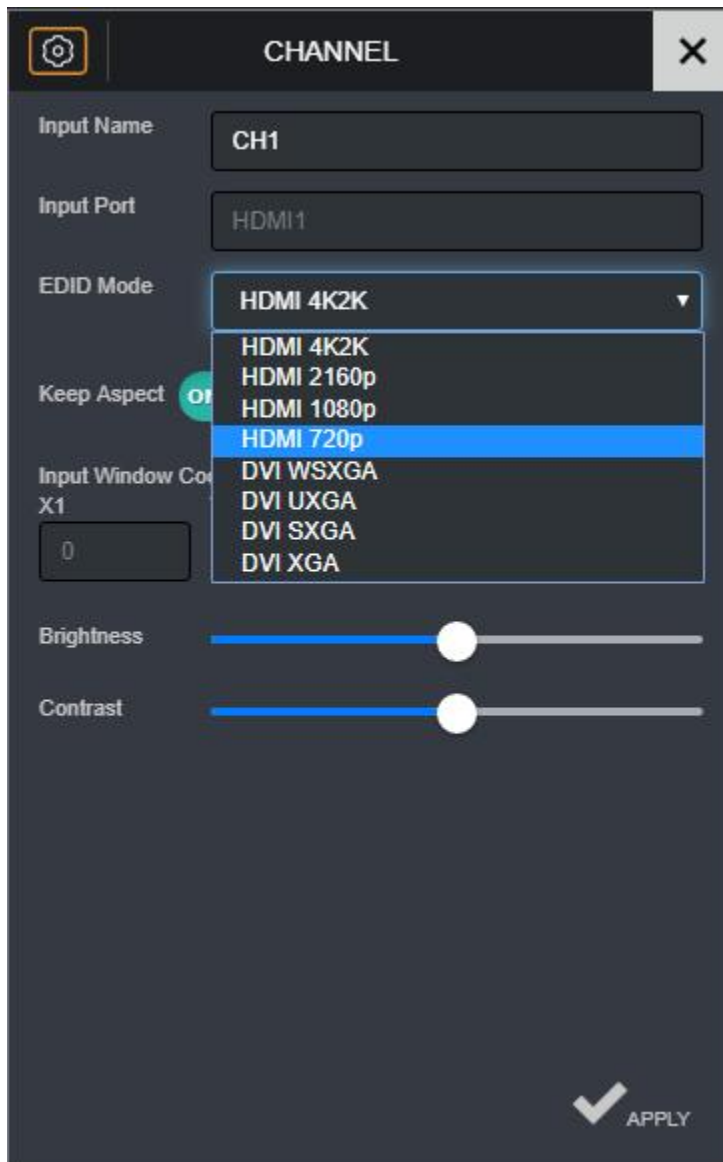


Contrast





 APPLY

To change the Input name, click Input name, change it to the desired name, and press the Apply button. The Input Port tells which port the current source is entering



To change the EDID mode, click EDID mode and select the desired value to change it.

 CHANNEL 

Input Name

CH1

Input Port

HDMI1

EDID Mode

HDMI 4K2K

Keep Aspect

ON

Input Cropping

OFF

Input Window Coordinates

X1

0

Y1

0

X2


3840

Y2

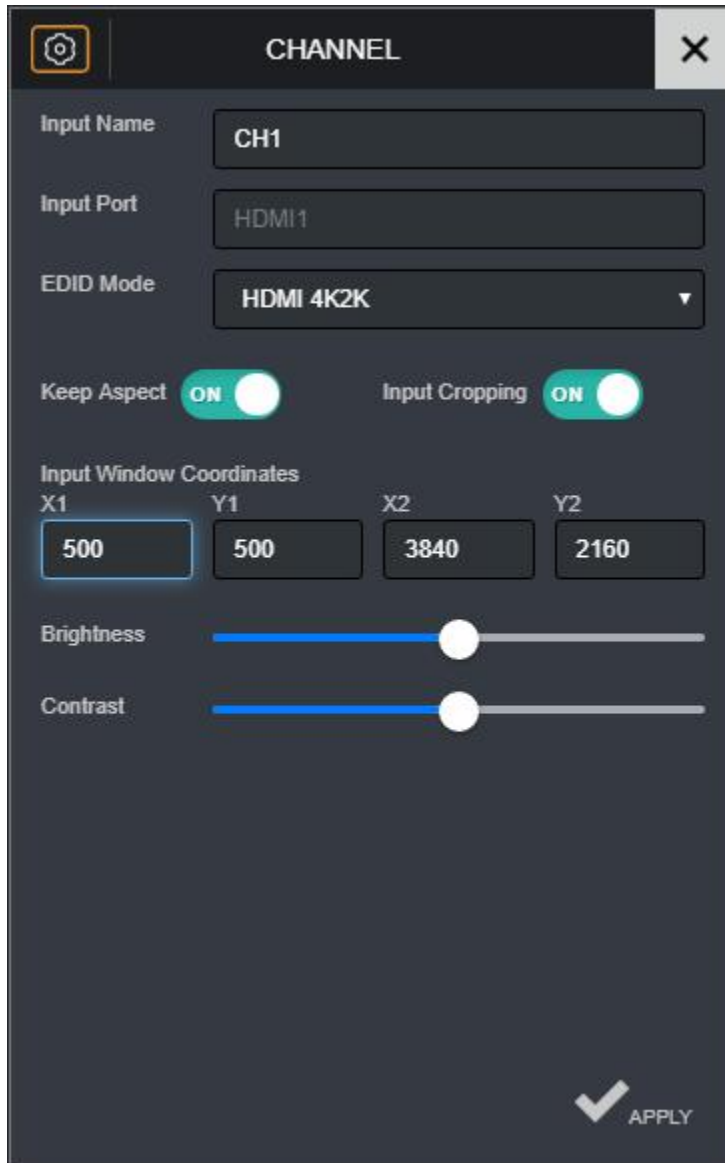
2160

Brightness

Contrast

 APPLY

To use Keep Aspect, press the toggle button to "ON",
The source's original rate will maintain.



The image shows a 'CHANNEL' settings window with a dark grey background. At the top left is a gear icon, and at the top right is a close button 'X'. The settings are organized as follows:

- Input Name:** A text field containing 'CH1'.
- Input Port:** A text field containing 'HDMI1'.
- EDID Mode:** A dropdown menu showing 'HDMI 4K2K' with a downward arrow.
- Keep Aspect:** A toggle switch labeled 'ON'.
- Input Cropping:** A toggle switch labeled 'ON'.
- Input Window Coordinates:** A section with four input fields:
 - X1:** A field containing '500' with a blue border.
 - Y1:** A field containing '500'.
 - X2:** A field containing '3840'.
 - Y2:** A field containing '2160'.
- Brightness:** A horizontal slider with a white knob in the center.
- Contrast:** A horizontal slider with a white knob in the center.
- APPLY:** A button with a checkmark icon and the text 'APPLY' at the bottom right.

Press the Input Crop button to activate the Crop function. Input Window Coordinates under the button is active and user can enter the coordinates to output from the source.

Enter the desired coordinate value and press Apply to apply

CHANNEL

Input Name

CH1

Input Port

HDMI1

EDID Mode

HDMI 4K2K

Keep Aspect

ON

Input Cropping

ON

Input Window Coordinates

X1

Y1

X2

Y2

500

500

3840

2160

Brightness

Contrast

APPLY

Touch the X-mark as shown above, the window will be disappeared.

6.7 Screen Information

1

2

3

INPUT INFORMATION							COORDINATE INFORMATION							DISPLAY	
CH	Type	Signal	HDCP	Format	Depth	Size	WIN	CH	X	Y	W	H	Layer		
1	HDMI1		-	YCbCr	8bit	3840x2160	A	3	0	0	4096	2160	1	<div> <div>4096x2160@30Hz</div> <div>HDCP <div>ON</div></div> <div> <div>HDCP</div> <div>1.4</div> </div> <div> <div>Format</div> <div>RGB</div> </div> <div> <div>Depth</div> <div>8bit</div> </div> </div>	
2	HDMI2		2.2	RGB	8bit	3840x2160	B	-	-	-	-	-	OFF		
3	HDMI3		2.2	RGB	8bit	3840x2160	C	-	-	-	-	-	OFF		
4	HDMI4		-	RGB	8bit	3840x2160	D	-	-	-	-	-	OFF		

Provide Input information and coordinates of windows and output information.

6.7.1 Input Information[①]

Shows input information for MSV2. Displays information about Type, Signal, HDCP, Format, Depth, and resolution

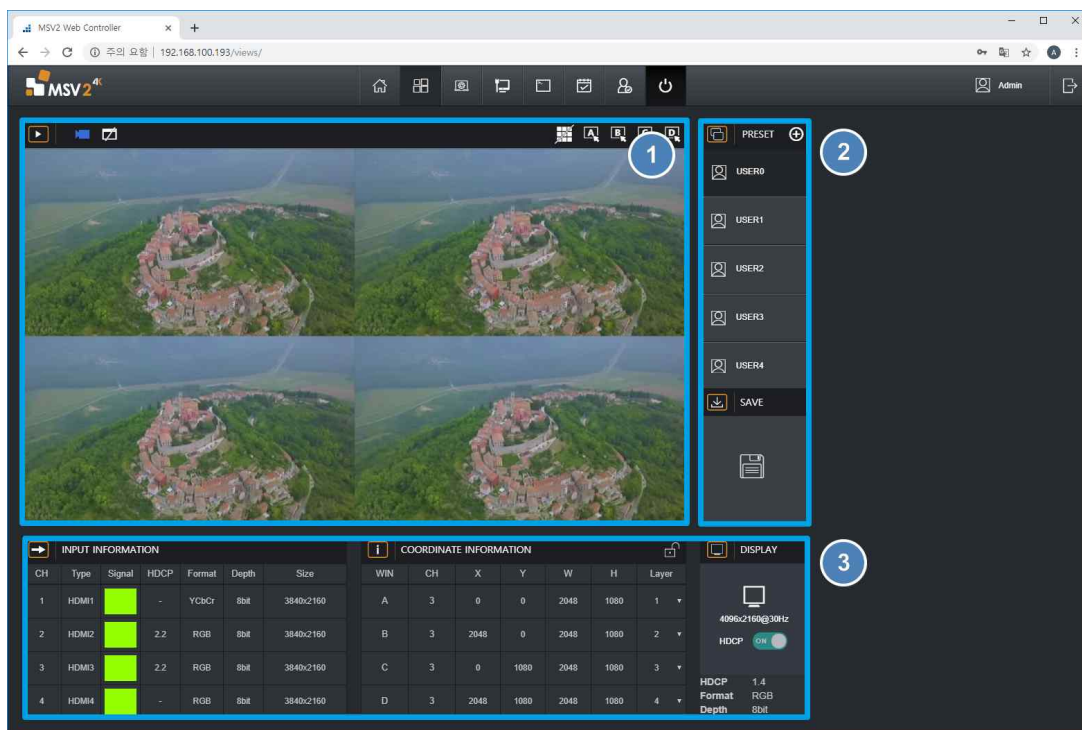
6.7.2 Coordinate Information[②]

Displays the coordinates of the current window in real time. In Home, user can change the coordinates by entering a value in the Design Tab while the lock is on.

6.7.3 Display[③]

Displays information about the current output. Displays resolution, HDCP, Format, and Depth. User can turn off or use HDCP

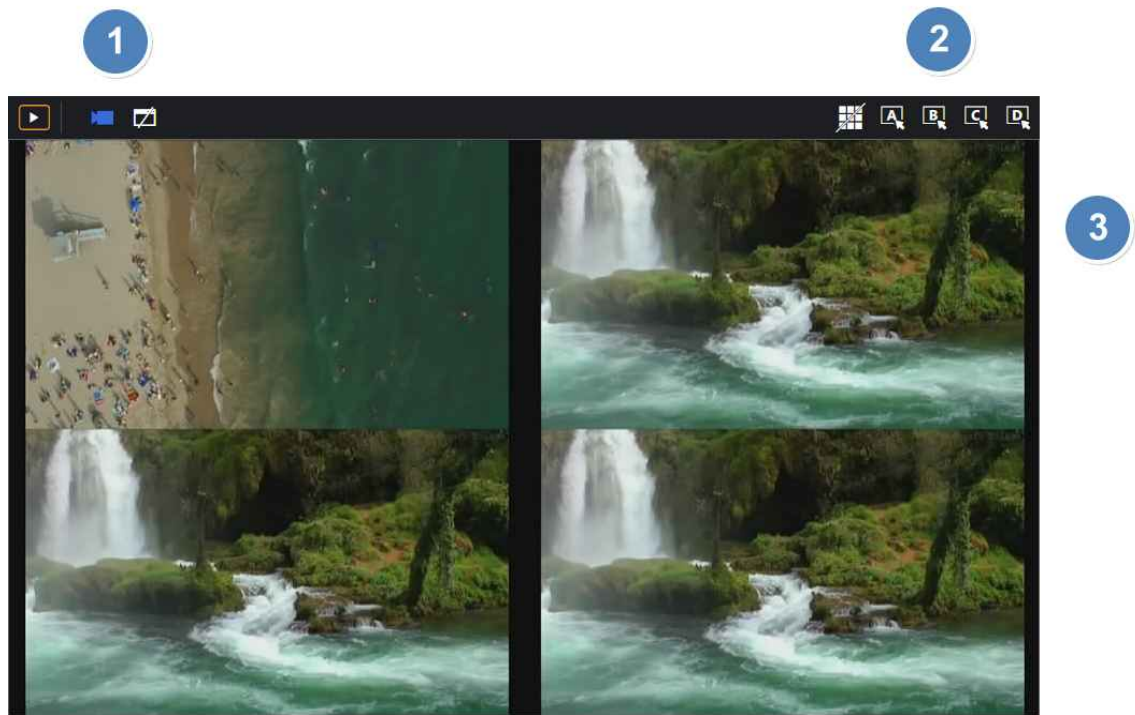
6.8 Design



When user select Design in Menu, user can enter design.

- ① Preview & Screen control window – Setting of Screen Layout, Preview, Banner, and Grid select win1~win4
- ② Layout select button & Layout save – Select Layout and Save
- ③ Screen information – Input information, coordinate information, Output information, Coordinate Setting

6.9 Preview & Screen Control Window



The horizontal and vertical positions of each window can be modified.

To adjust the position, place the mouse cursor in the middle of the window and drag the window to the desired position while keeping the left mouse click.

When selected for control, the Border color changes to blue. The output display shows the modification process shown on the MSV2 Web controller screen in real time

6.9.1 Preview Mode, Banner[①]

User can off or on streaming function through Preview Mode.

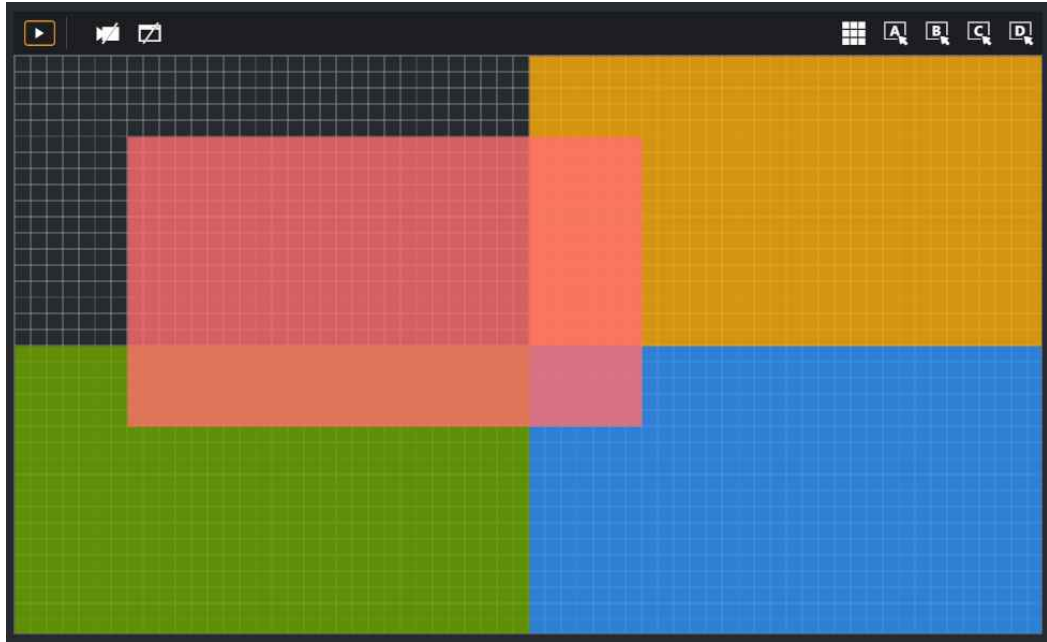
Banners can be enabled or turned off through the Banner function.

6.9.2 Grid, Window Selector[②]

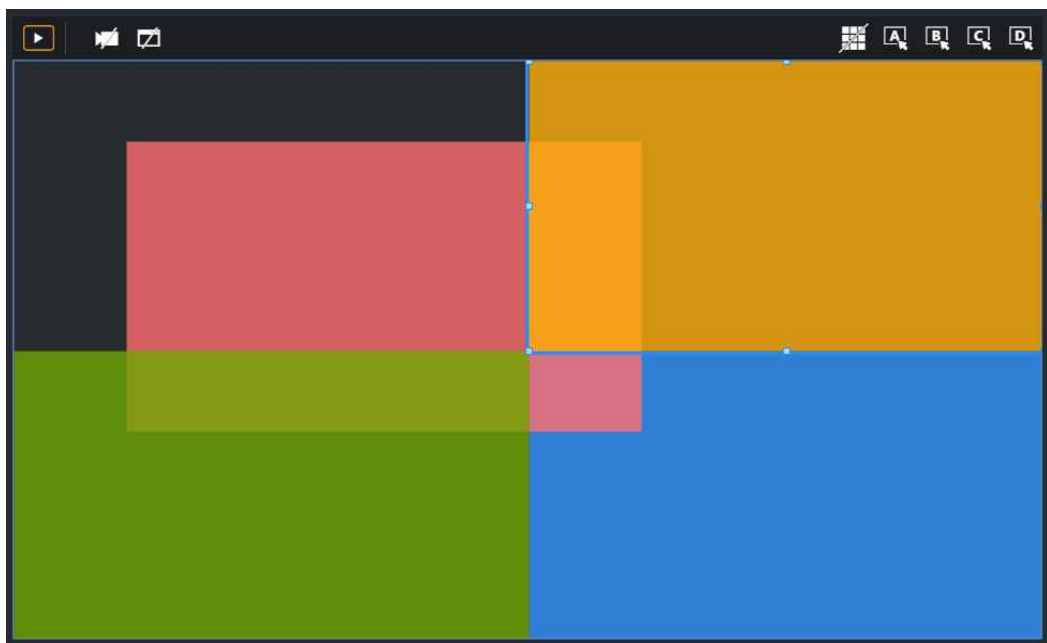
The Grid feature helps users to move or resize in standardized pixels when they move or resize the screen.

If fine tuning is difficult, it can be useful to create layouts without overlap between screens.

When the window selection button is pressed, a blue line is created in the corresponding window and is selected. The selected window will have the highest priority.



The shape of Grid's

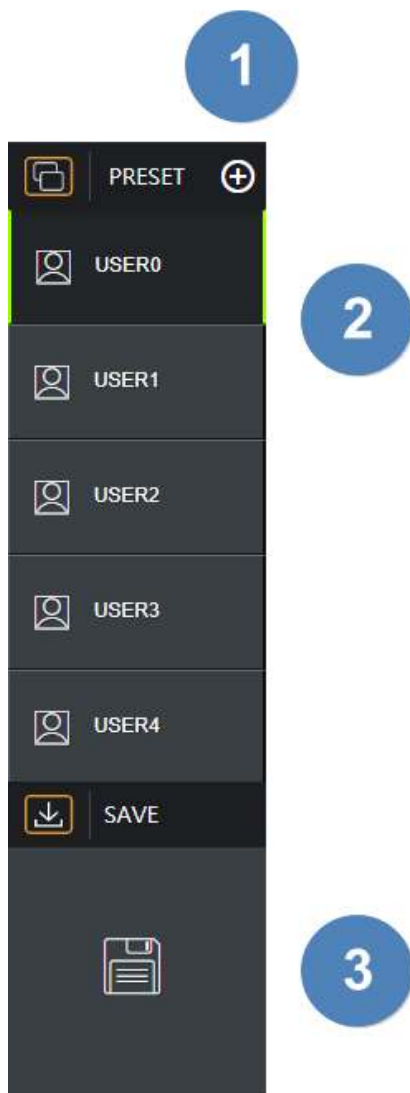


The shape of Window B selected using Window Selector

6.9.3 Screen Layout(User Free) [③]

Show modification process displayed on MSV2 Web Manager screen in real time

6.10 Layout Select Button & Layout Save

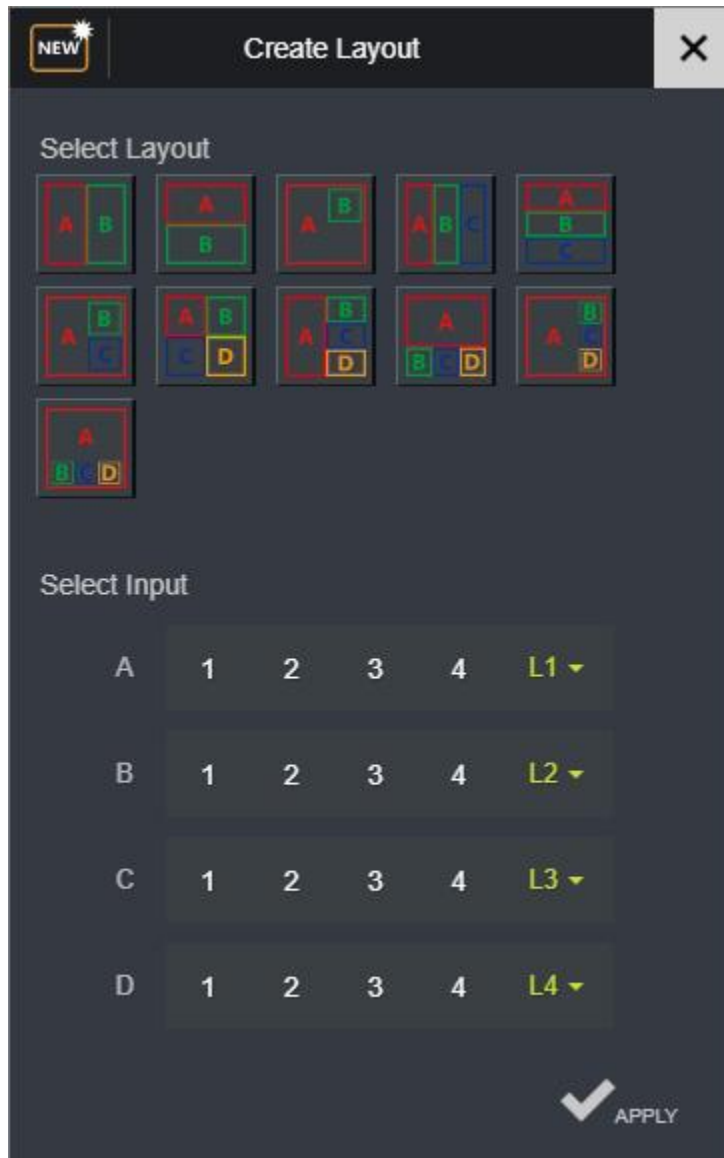


Users can save their desired layout.

Click the layout user wants to save and create the layout by dragging or setting coordinates.

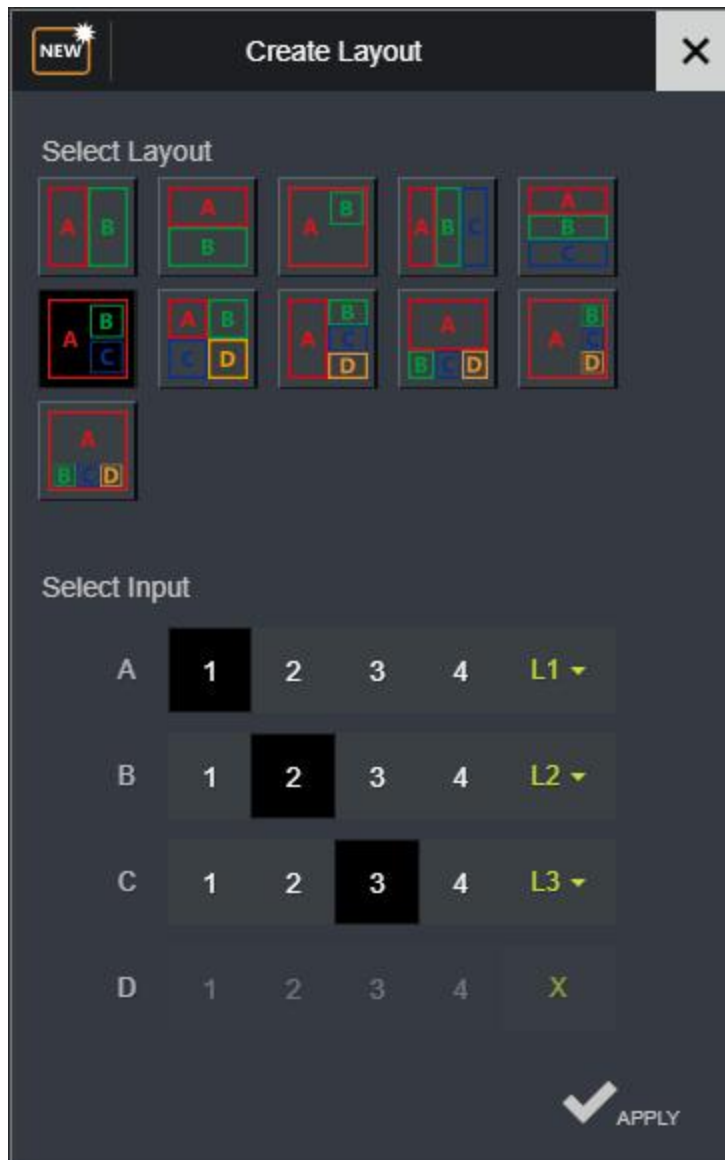
It is also possible to create using the layout of the specified form

6.10.1 Layout Option[①]



When user press the Layout option button, pop up the following window:

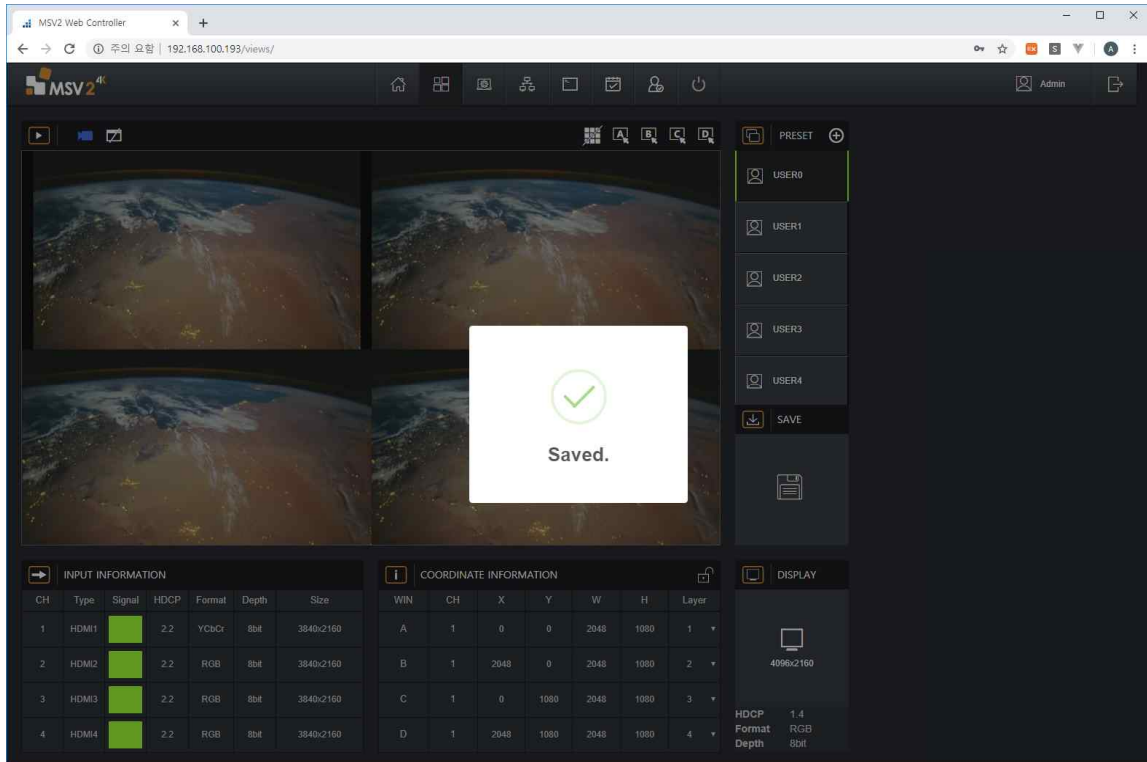
The layout specified in Select Layout is available. Select input allows you to specify channels and order layers for each window.



6.10.2 Layout Button[②]

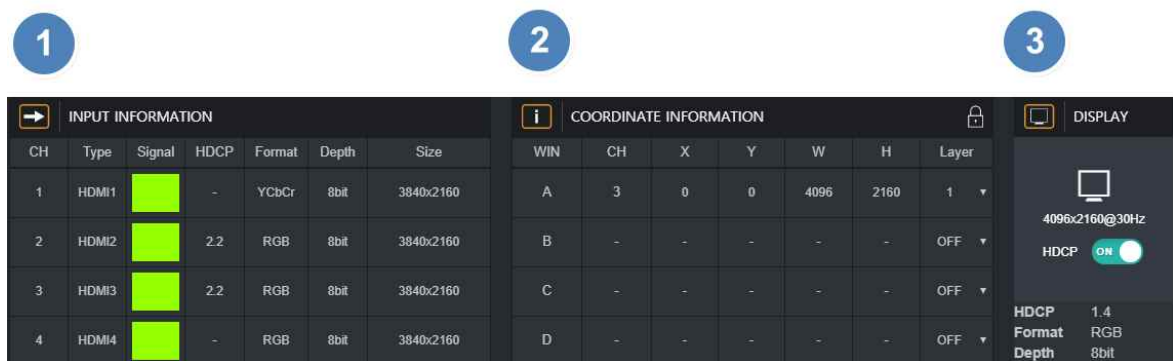
This is Layout space that the user can save. Click the button where you want it to be and then start editing

6.10.3 Save Layout[③]



Once user has created the desired layout design, touch the Save button to save it to the appropriate layout.

6.11 Screen Information



Provide output information, coordinates information of window and output information

6.11.1 Input Information[①]

Shows input information for MSV2. Displays information about Type, Signal, HDCP, Format, Depth, and resolution.

6.11.2 Coordinate Information[②]

Displays the coordinates of the current window in real time.

In Design, USER can change the coordinates by entering a value if the lock doesn't on hanging .

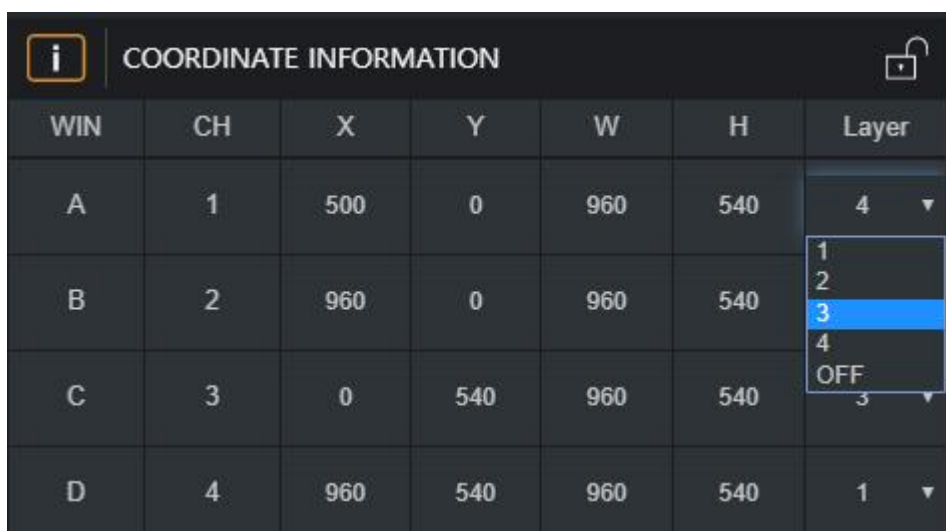


WIN	CH	X	Y	W	H	Layer
A	1	500	0	960	540	4 ▼
B	2	960	0	960	540	2 ▼
C	3	0	540	960	540	3 ▼
D	4	960	540	960	540	1 ▼

When the lock on the header is unlocked, user can be modified the coordinate value.

Touch the coordinates of the desired window and enter a coordinate value.

If the coordinate value exceeds the range, it changes to the maximum value of the possible range.



WIN	CH	X	Y	W	H	Layer
A	1	500	0	960	540	4 ▼ 1 2 3 4 OFF
B	2	960	0	960	540	2 ▼
C	3	0	540	960	540	3 ▼
D	4	960	540	960	540	1 ▼

User can also change the order of the layers

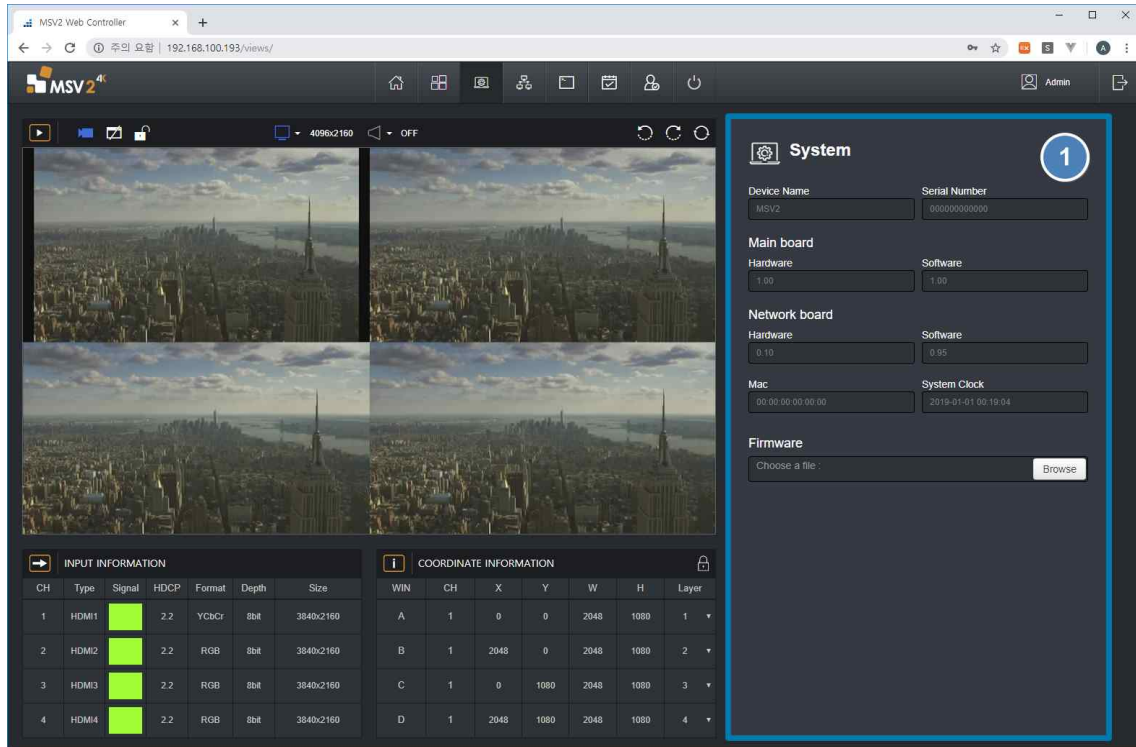
Select the Layer button of the desired window and select Priority to take effect.

The larger the number, the higher the priority and placed at the top of the screen.

6.11.3 Display[③]

Displays information about the current output. Displays resolution, HDCP, Format, and Depth..

6.12 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

6.12.1 Device Name

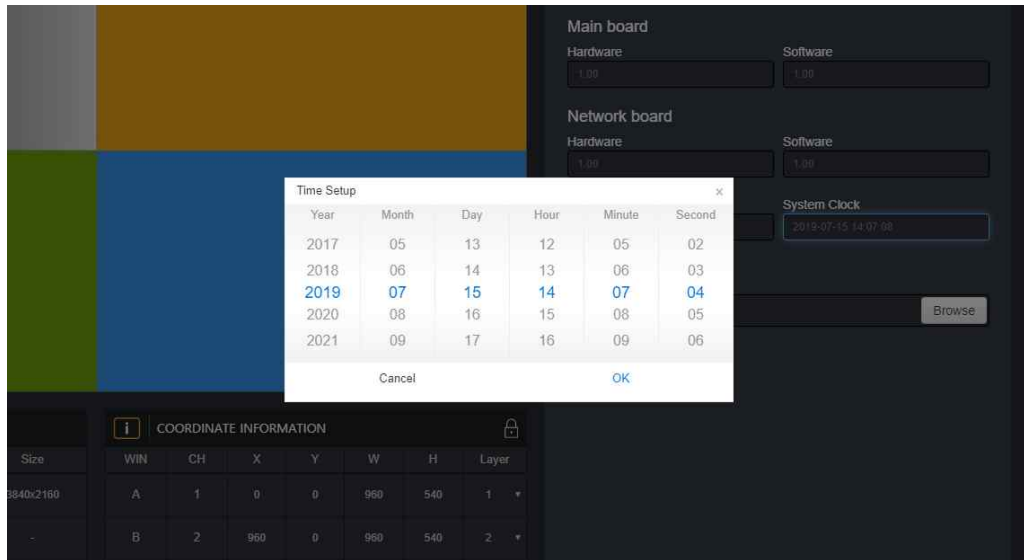
Shows input information for MSV2.

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

6.12.2 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.

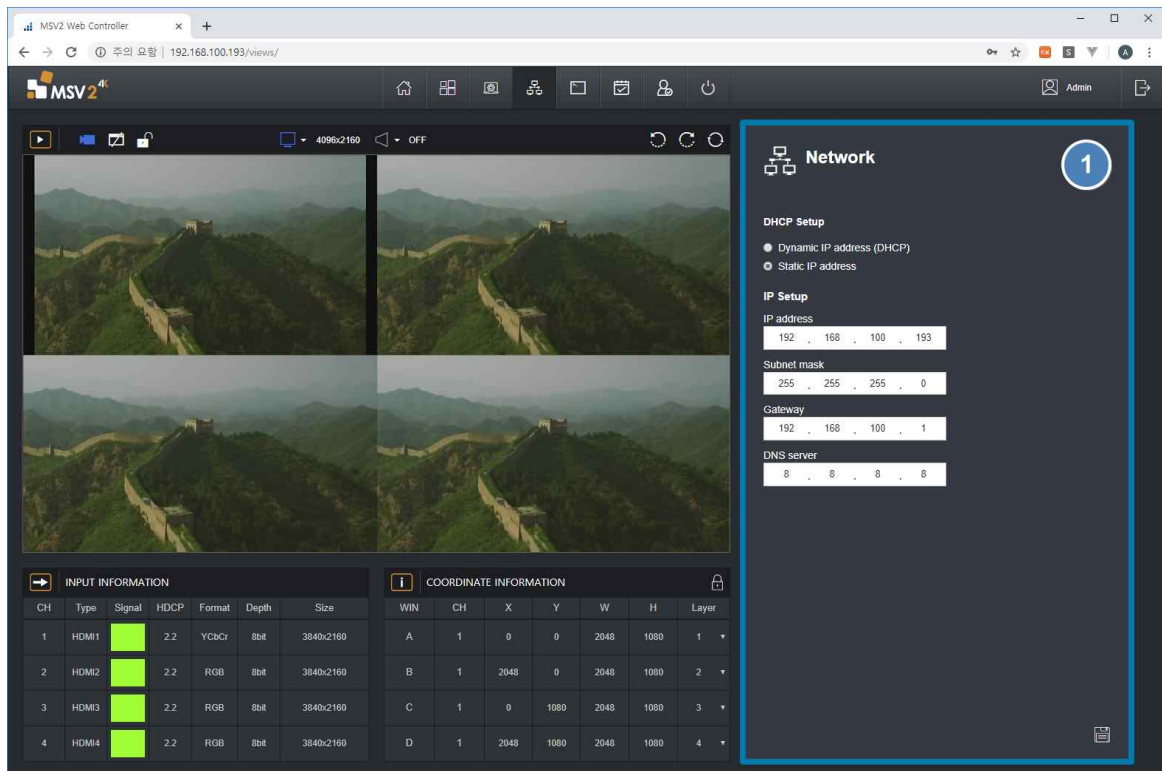
When the time setting is complete, press OK to apply.

6.12.3 Firmware

Firmware upgrade is possible through MSV2 Web Manager.

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

6.13 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

6.13.1 DHCP Setup

When DHCP mode is set, IP is automatically set

6.13.2 IP Setup

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

6.14 Communication

The screenshot shows the MSV2 Web Controller interface. The main area displays a live video feed of a park. Below the video feed are two tables: INPUT INFORMATION and COORDINATE INFORMATION. On the right side, the Communication settings panel is highlighted with a blue border. The panel includes a tab labeled 'Communication' with a '1' in a circle. The UART settings section includes Baud rate (115200), Data (8bit), Parity (NONE), Stop (1bit), and Flow control (NONE). The TCP/IP settings section includes Port (6060).

CH	Type	Signal	HDCP	Format	Depth	Size
1	HDMI1		2.2	YCbCr	8bit	3840x2160
2	HDMI2		2.2	RGB	8bit	3840x2160
3	HDMI3		2.2	RGB	8bit	3840x2160
4	HDMI4		2.2	RGB	8bit	3840x2160

WIN	CH	X	Y	W	H	Layer
A	1	0	0	2048	1080	1
B	1	2048	0	2048	1080	2
C	1	0	1080	2048	1080	3
D	1	2048	1080	2048	1080	4

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


6.15 Schedule

The screenshot shows the MSV2 Web Controller interface. The main area displays a live video feed of a city street. Below the video feed are two tables: INPUT INFORMATION and COORDINATE INFORMATION. On the right side, the Schedule settings panel is highlighted with a blue border. The panel includes a tab labeled 'Schedule' with a '1' in a circle. The Schedule Table section includes a table with columns for POWER, ACTIVE, and TIME. The table is divided into ON and OFF sections, each with a WEEKLY row and a table for days of the week (Sun, Mon, Tue, Wed, Thu, Fri, Sat).

CH	Type	Signal	HDCP	Format	Depth	Size
1	HDMI1		2.2	YCbCr	8bit	3840x2160
2	HDMI2		2.2	RGB	8bit	3840x2160
3	HDMI3		2.2	RGB	8bit	3840x2160
4	HDMI4		2.2	RGB	8bit	3840x2160

WIN	CH	X	Y	W	H	Layer
A	1	0	0	2048	1080	1
B	1	2048	0	2048	1080	2
C	1	0	1080	2048	1080	3
D	1	2048	1080	2048	1080	4

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	

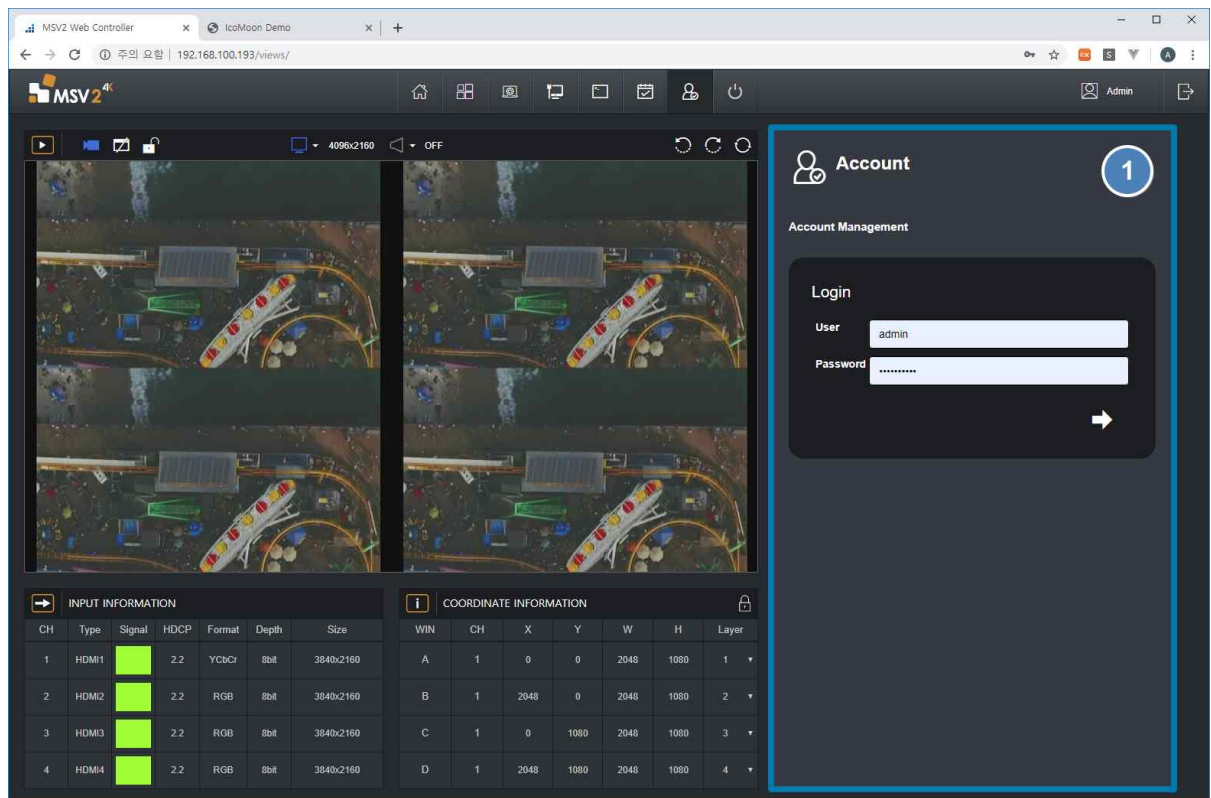
POWER	ACTIVE	TIME						
OFF	v	18:00:00						
	WEEKLY							
	Sun	Mon	Tue	Wed	Thu	Fri	Sat	



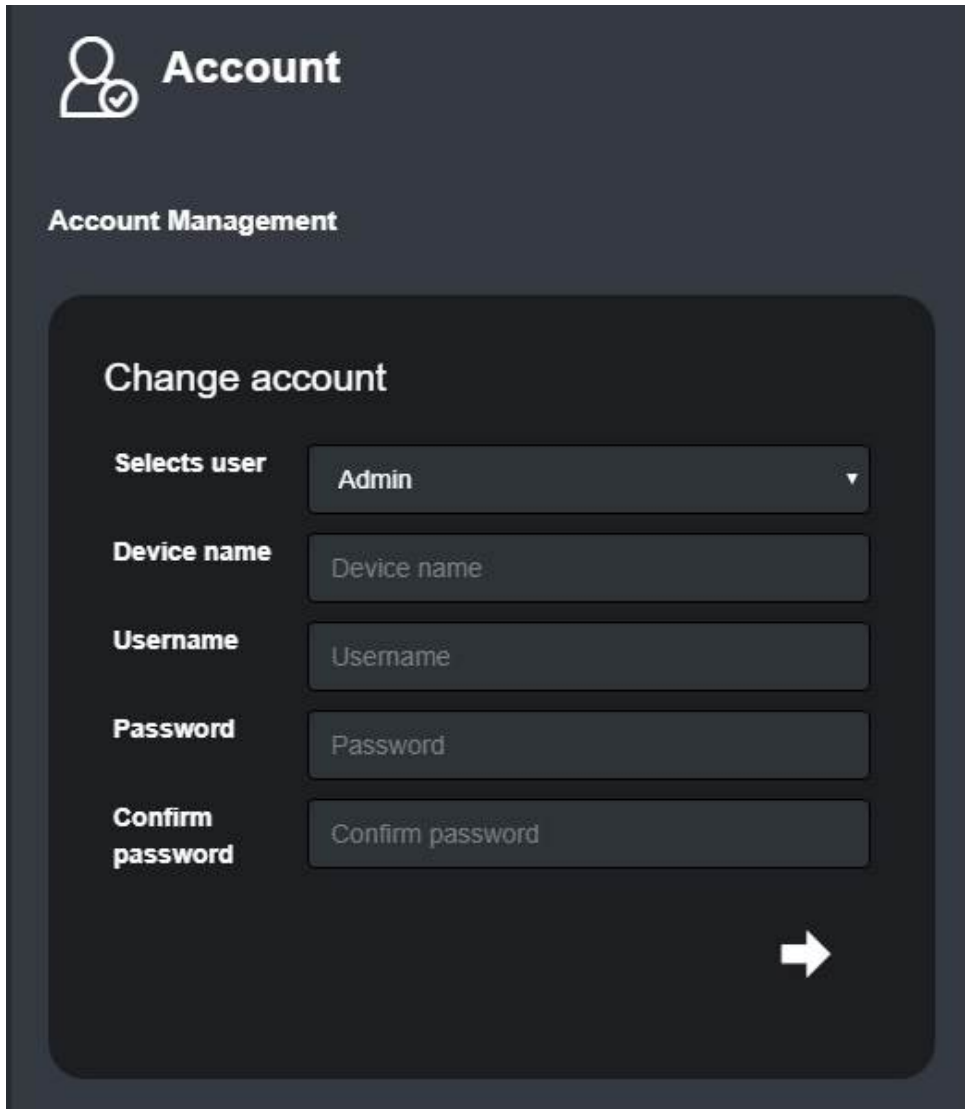
Active is enabled, Time is on or off, and WEEKLY is the day of the week when the schedule function will operate.

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

6.16 Account



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



The screenshot shows a dark-themed user interface for account management. At the top left, there is a user icon and the word 'Account'. Below this, the title 'Account Management' is displayed. The main section is titled 'Change account' and contains five input fields with labels to their left: 'Selects user' (a dropdown menu showing 'Admin'), 'Device name' (a text field with placeholder 'Device name'), 'Username' (a text field with placeholder 'Username'), 'Password' (a text field with placeholder 'Password'), and 'Confirm password' (a text field with placeholder 'Confirm password'). A white arrow icon is positioned at the bottom right of the form area.

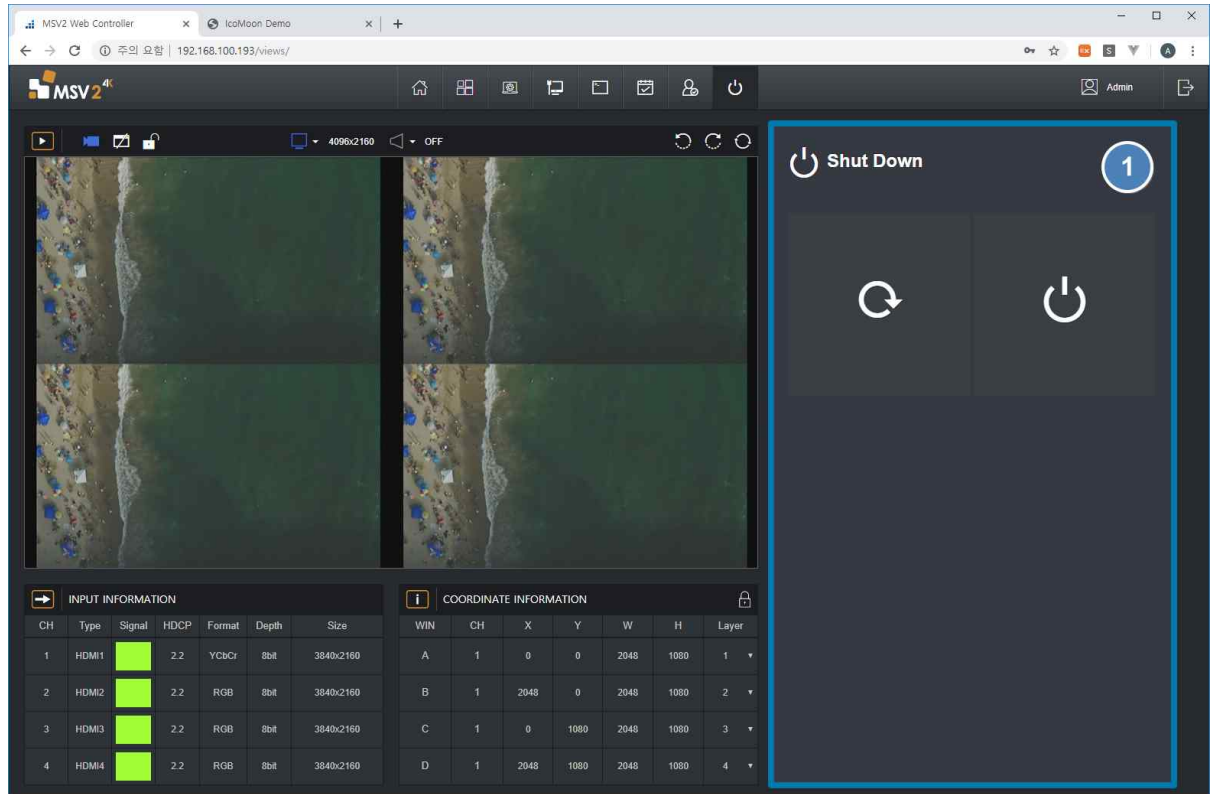
After connecting, the following window will appear:

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.

New account will be applied after power off and restart of MSV2.

6.17 Shut down



The MSV2 web controller provides Shutdown and Restart functions.

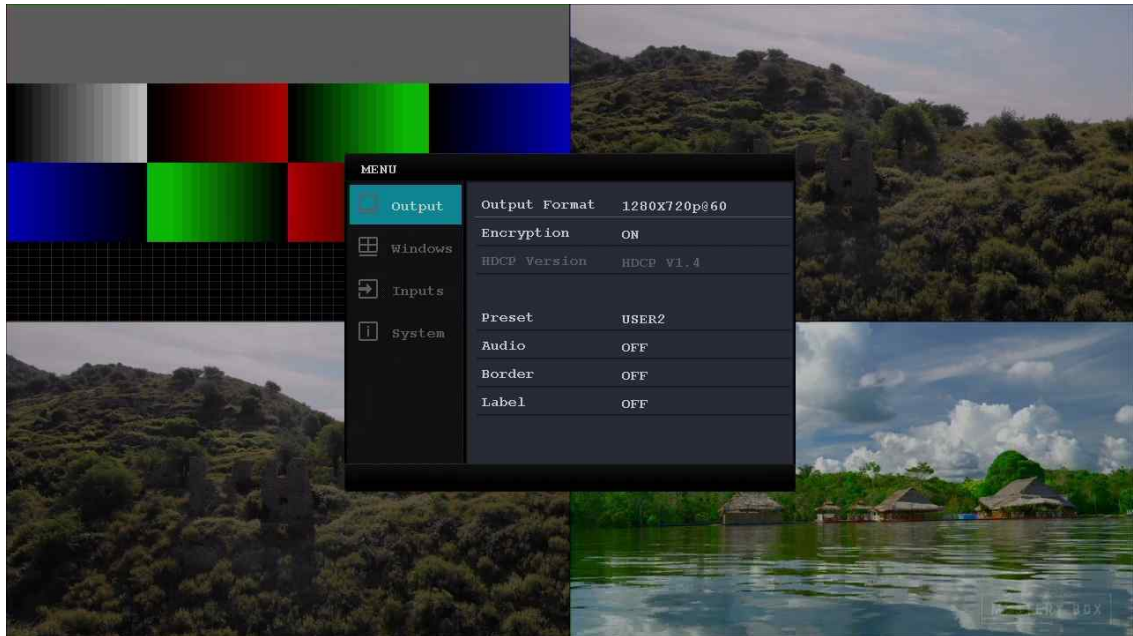
It is available when powering off or restarting MSV2.

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		
	HDCP Version	HDCP Ver		
	Preset	QUAD		
		3SIDE		
		3BOTTOM		
		USER0		
		USER1		
		USER2		

		USER3		
		USER4		
		CH 1		
		CH 2		
		CH 3		
		CH 4		
	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			

[Table 10] OSD Layer Table

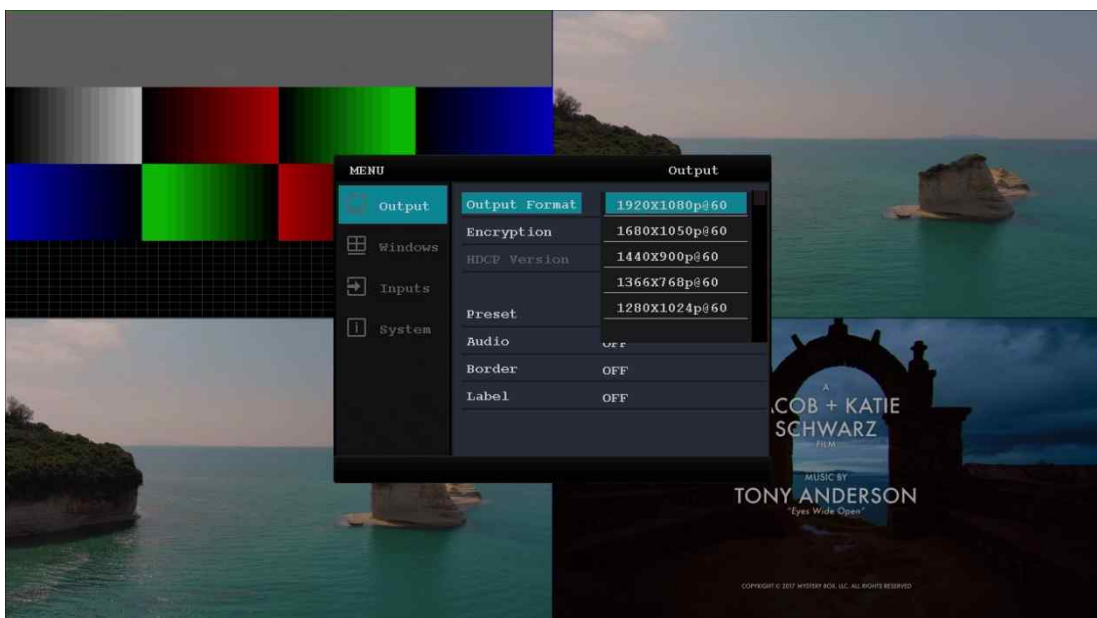
7.2 Output menu

7.2.1 Output Format

User can select the output resolution.

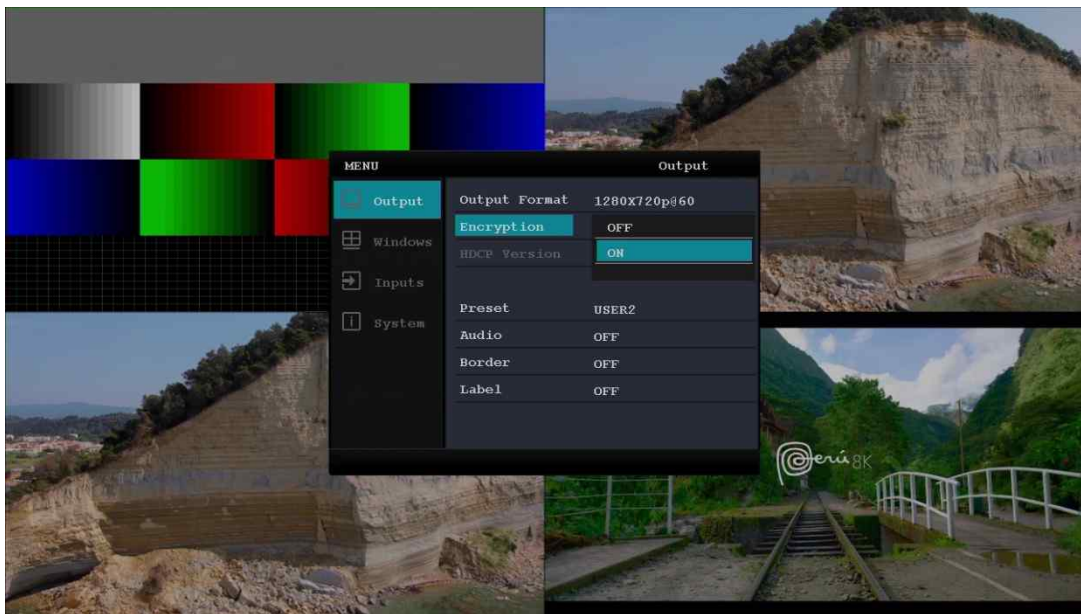
The Resolution list shows only the resolutions supported by the Display device in the MSV2's supported resolution.

(The current Interlace resolution is not supported.)



7.2.2 Encryption

User can set HDCP on/off

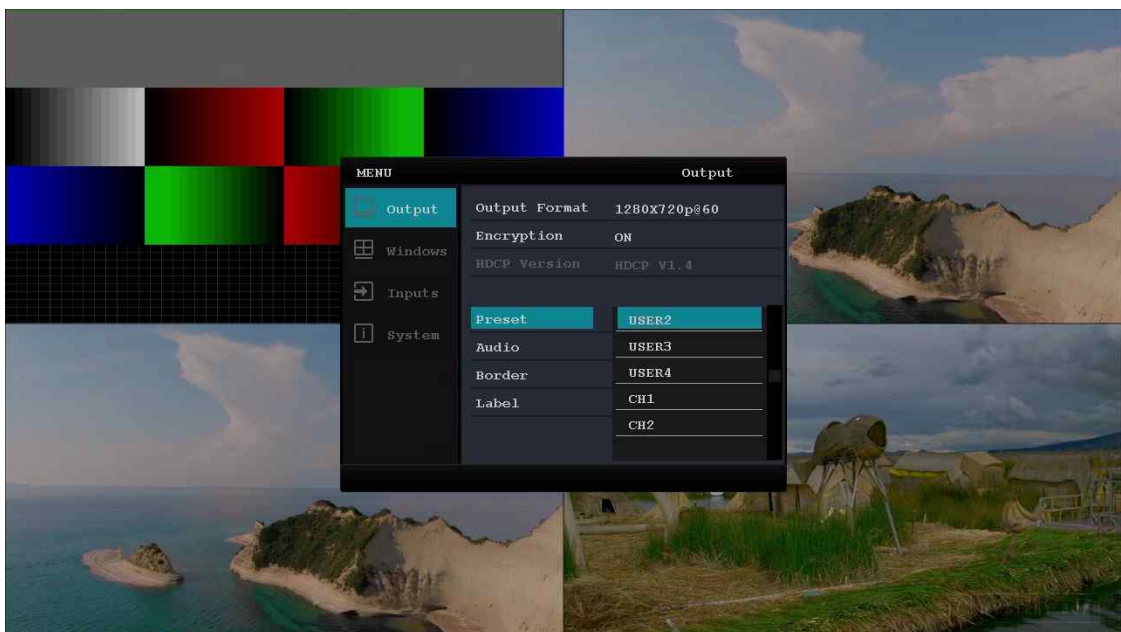


7.2.3 HDCP Version

User can check the current HDCP version.

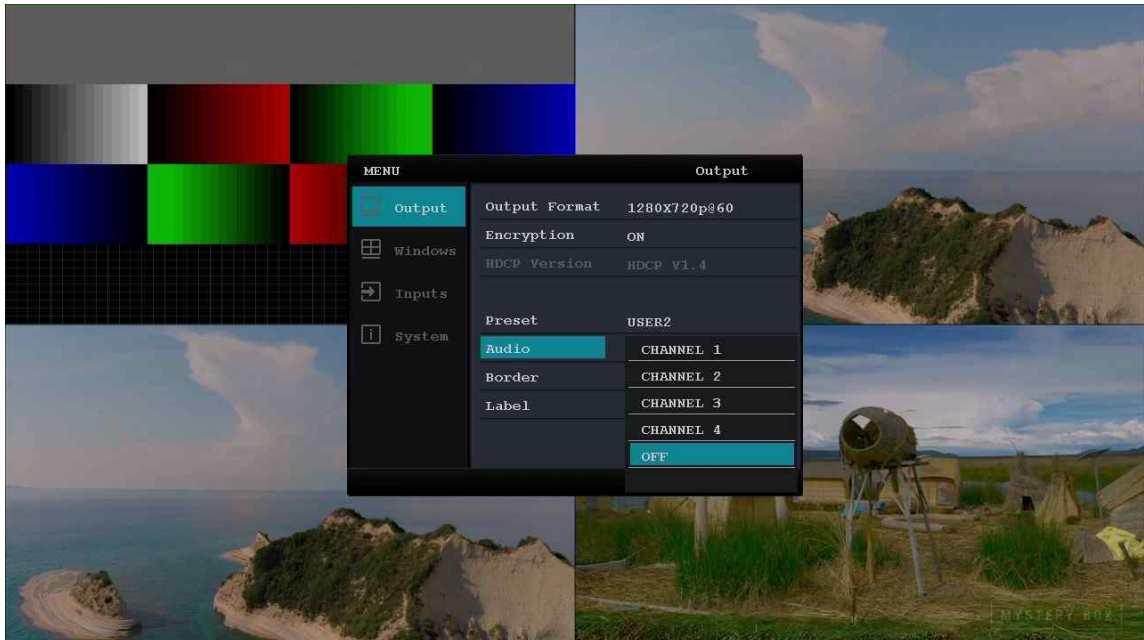
7.2.4 Preset

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



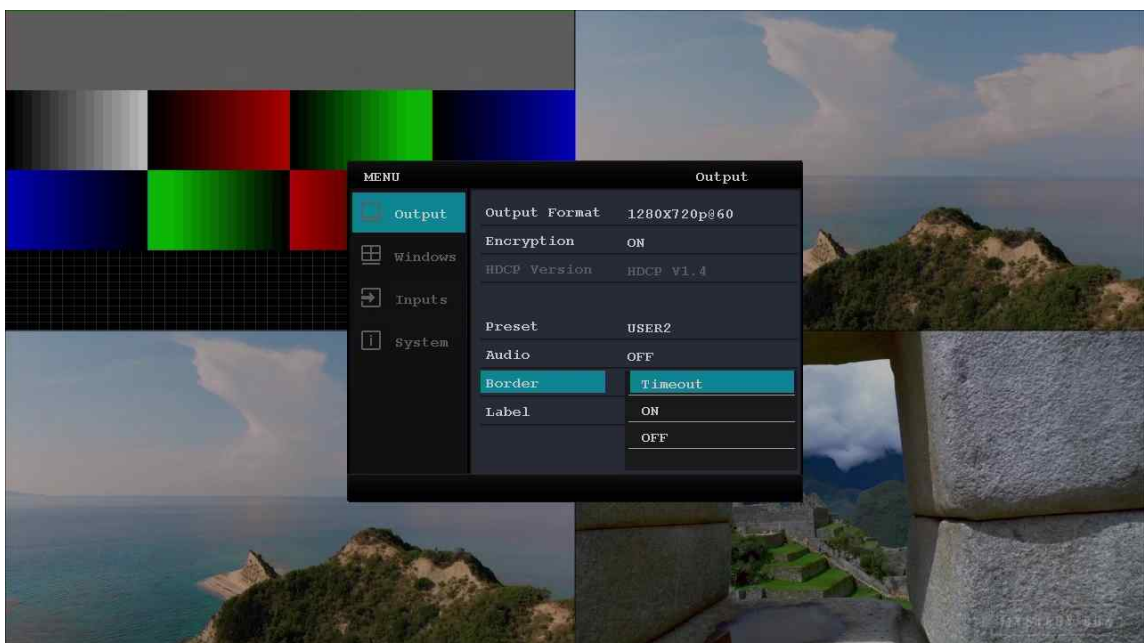
7.2.5 Audio

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.



7.2.6 Border

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

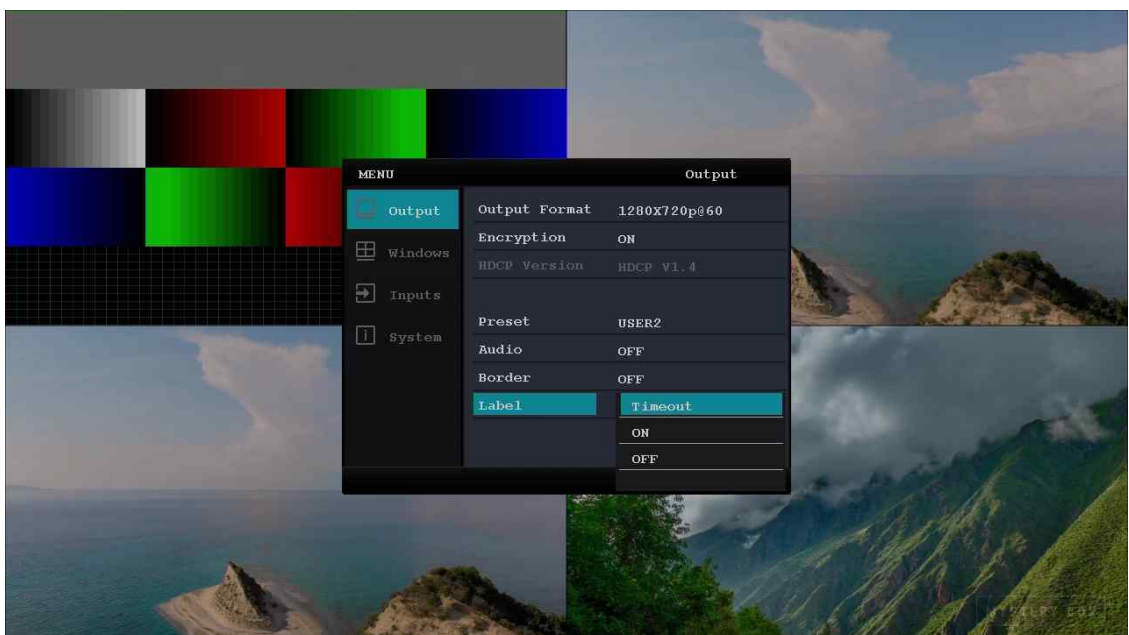




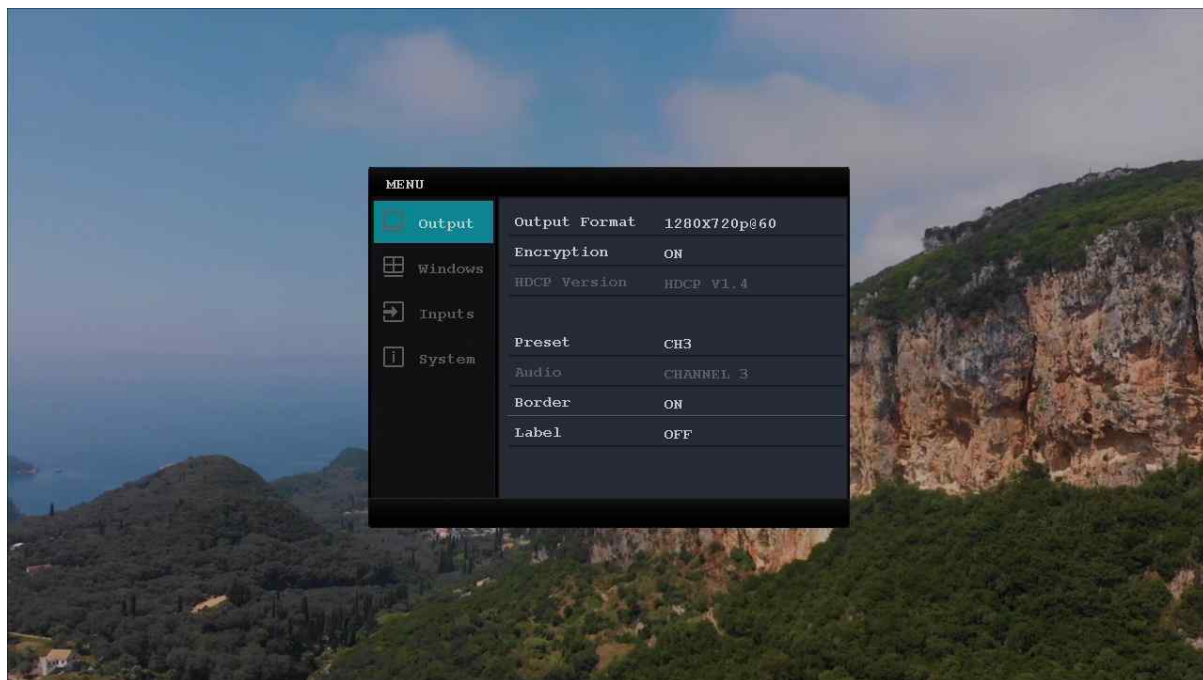
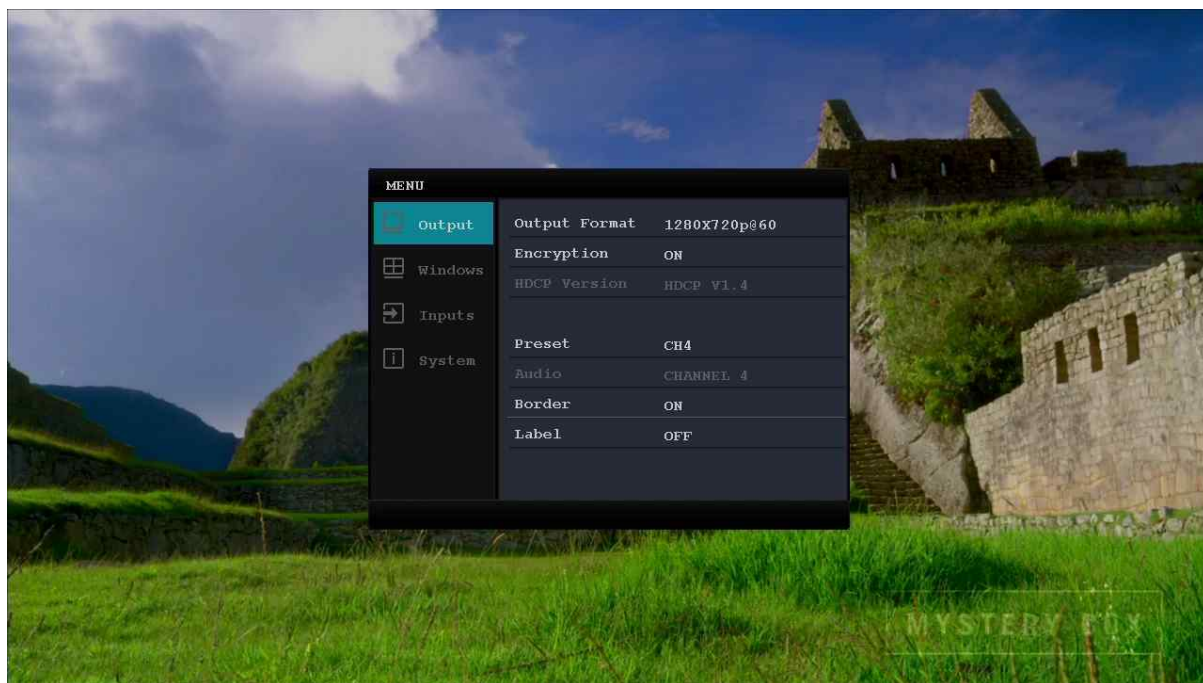
Border applied image

7.2.7 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

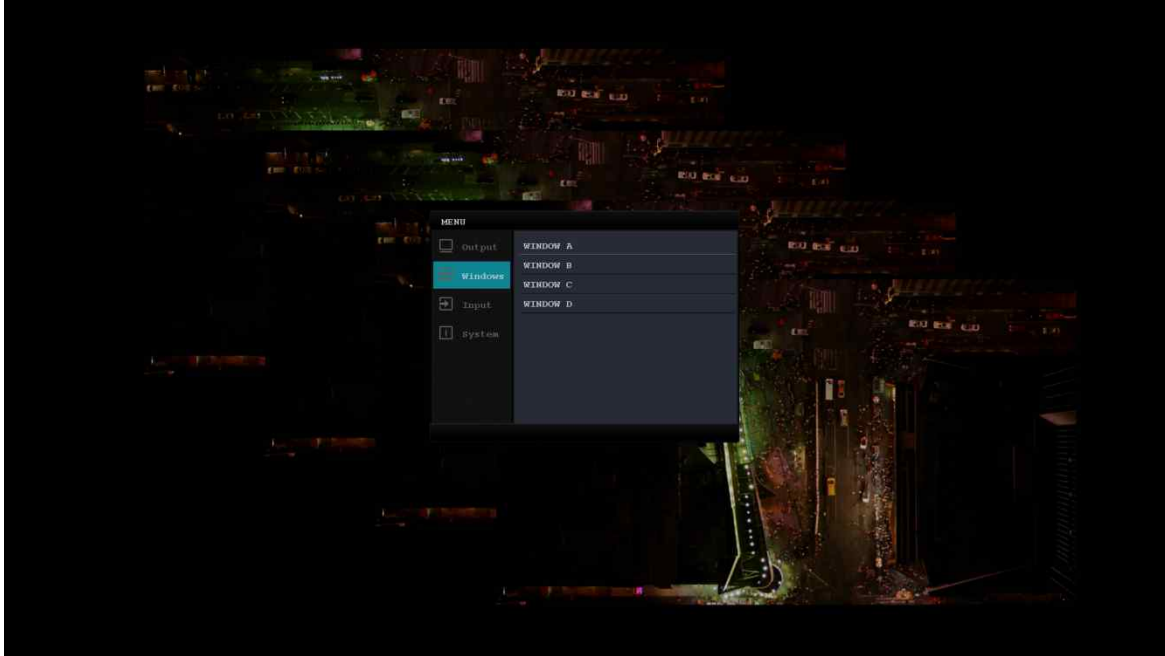


* When using the output menu in Channel only mode, the value of Border, label on/off/timeout is shared by all four channels



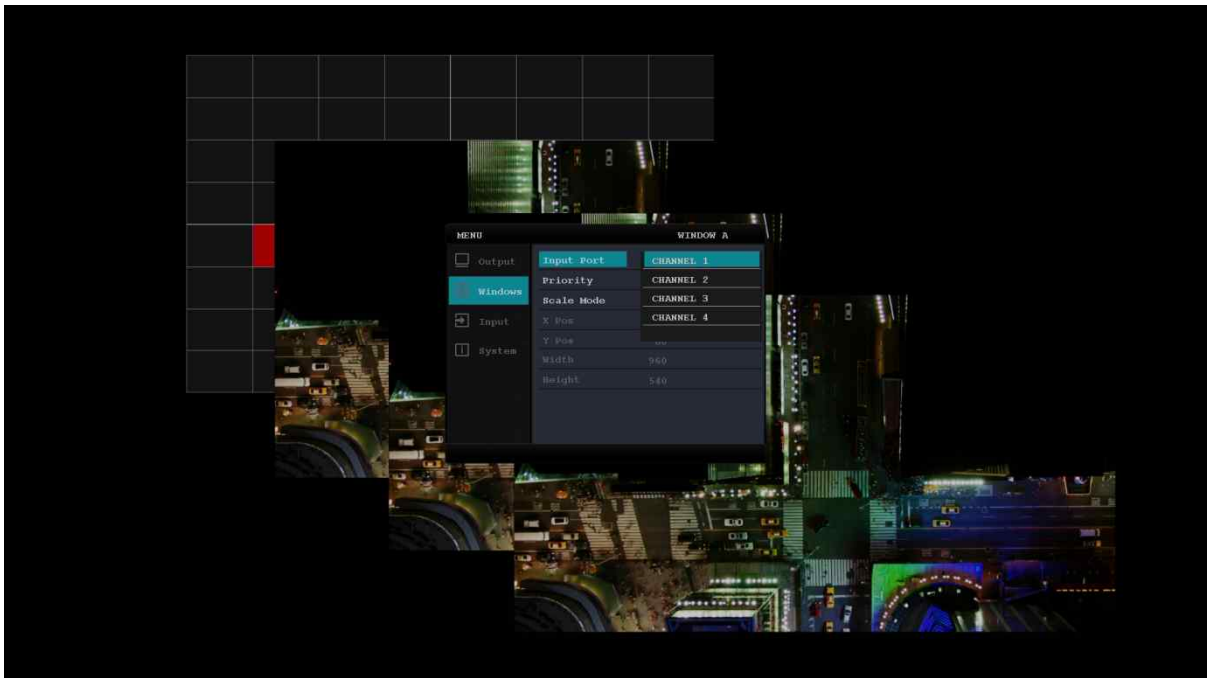
7.3 Windows menu

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.



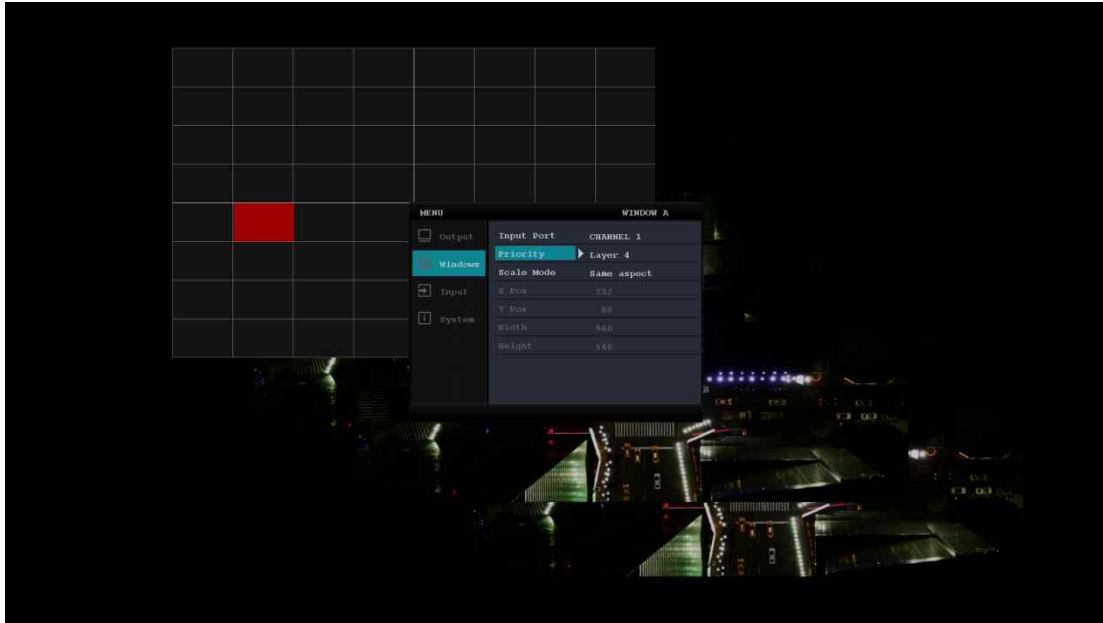
7.3.1 Input Port

User can change the input in the window.



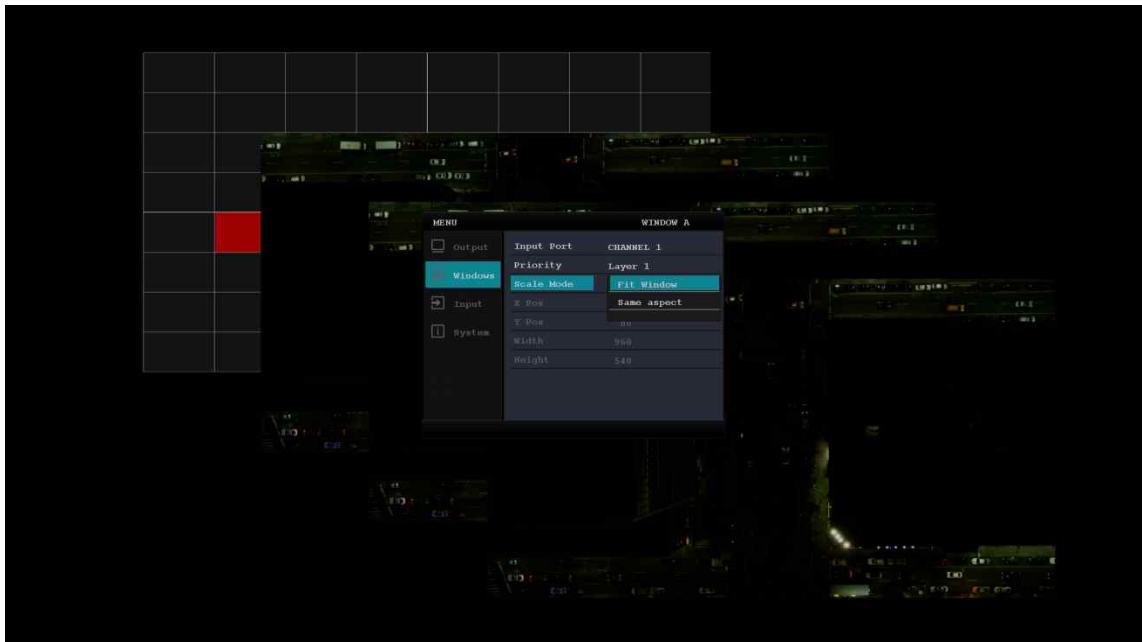
7.3.2 Priority

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



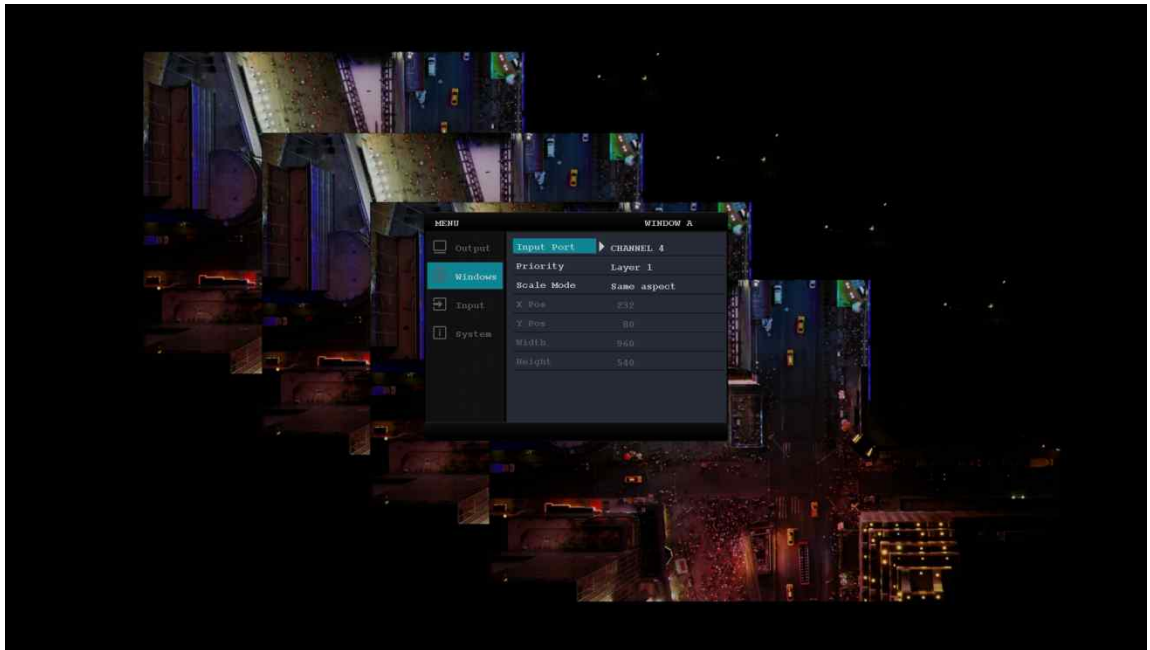
7.3.3 Scale Mode

In case of scale mode is set to "same aspect", output aspect maintain same ratio as input and "fit window", output screen size fit to window area.

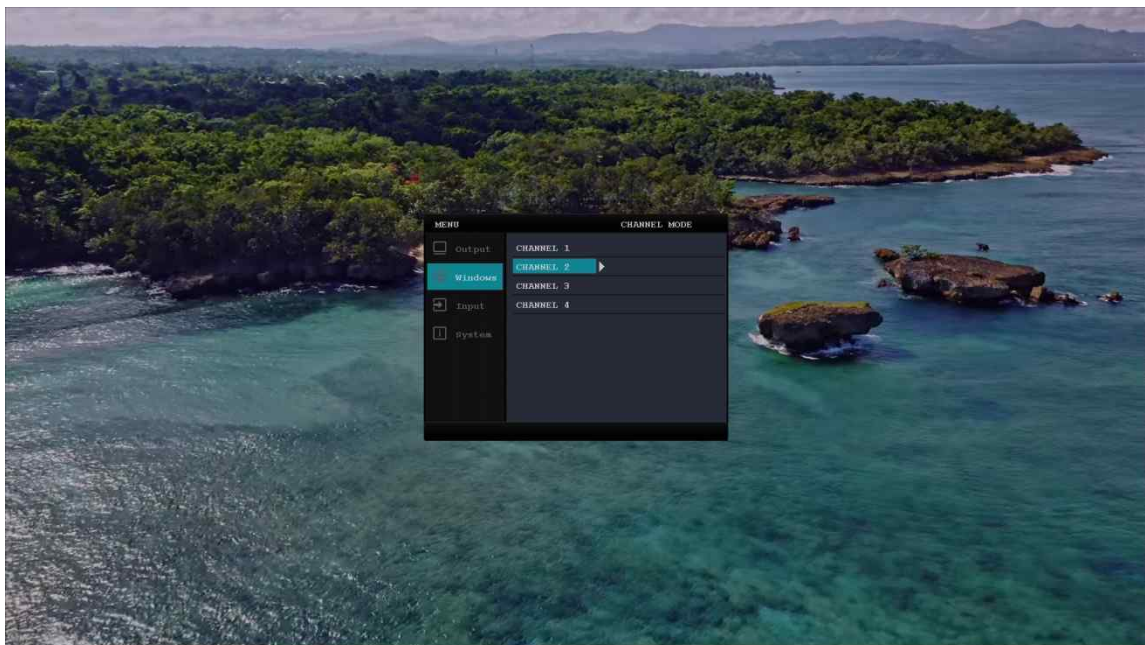


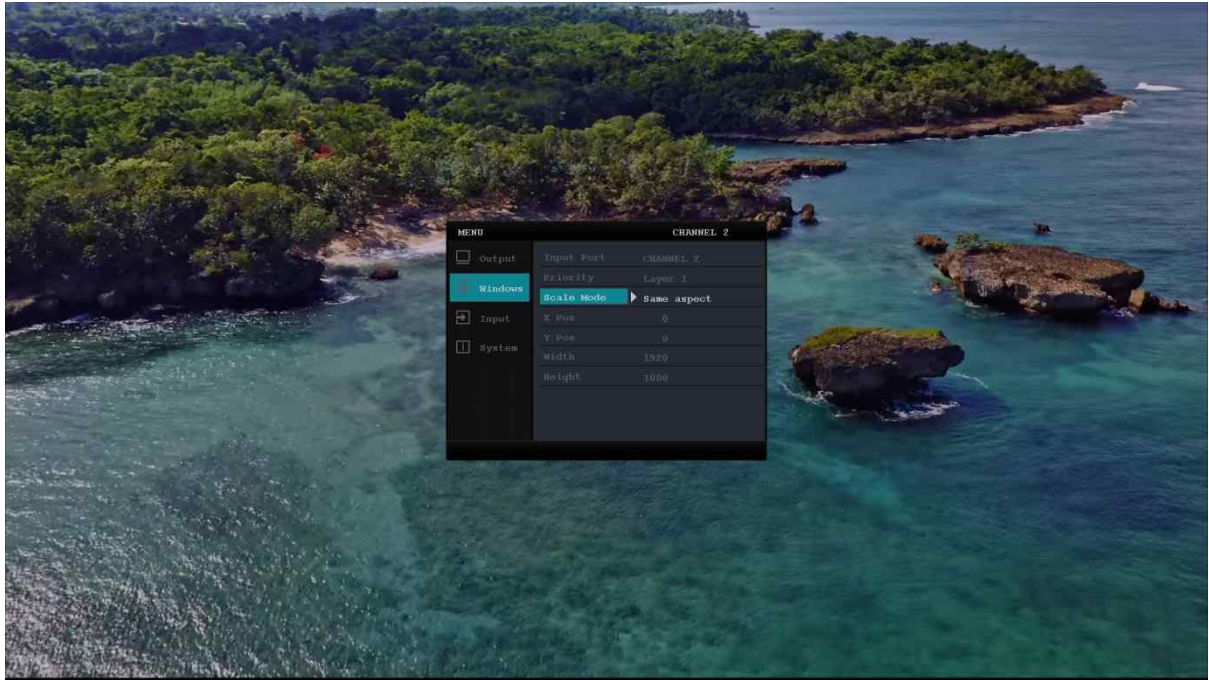
7.3.4 Coordinate Information

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

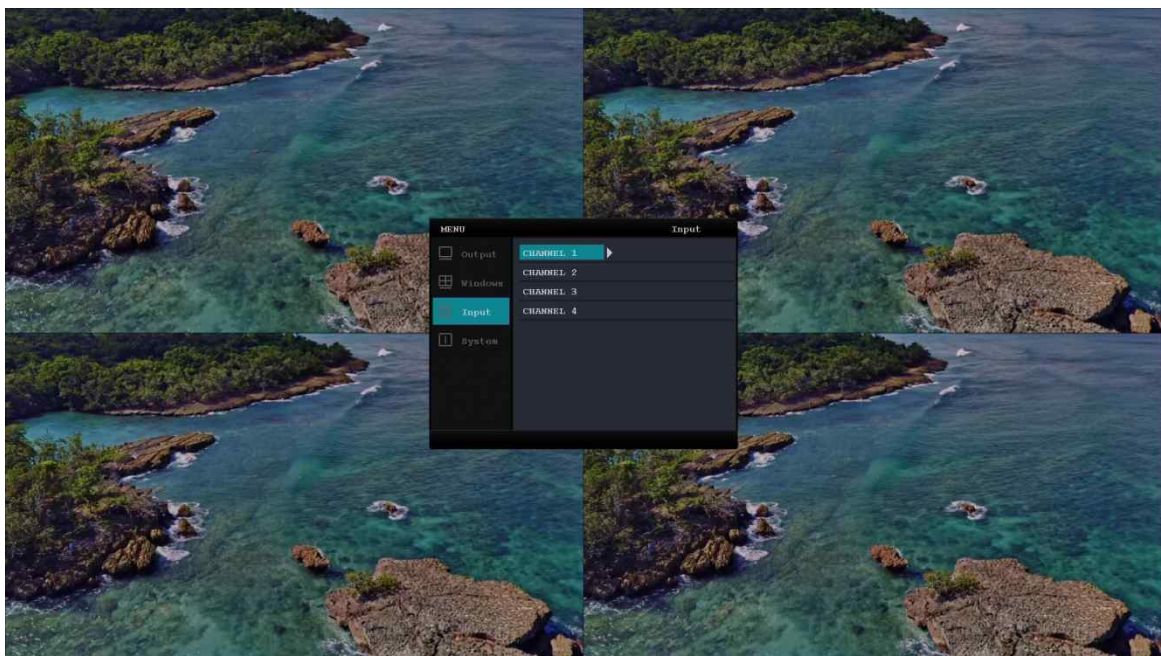


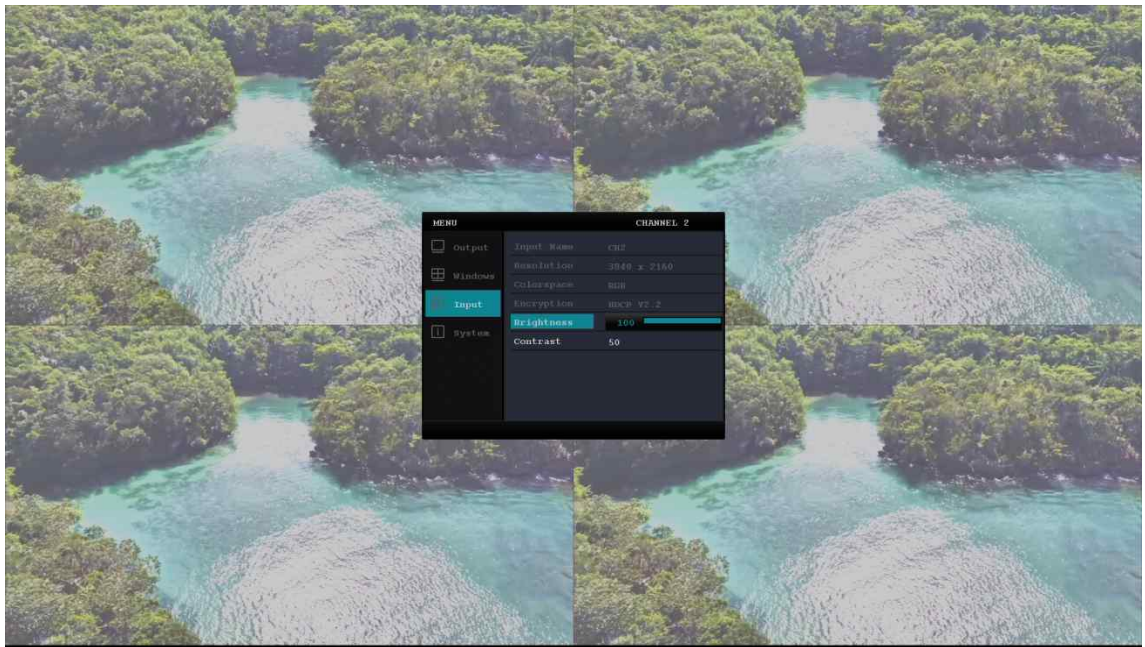
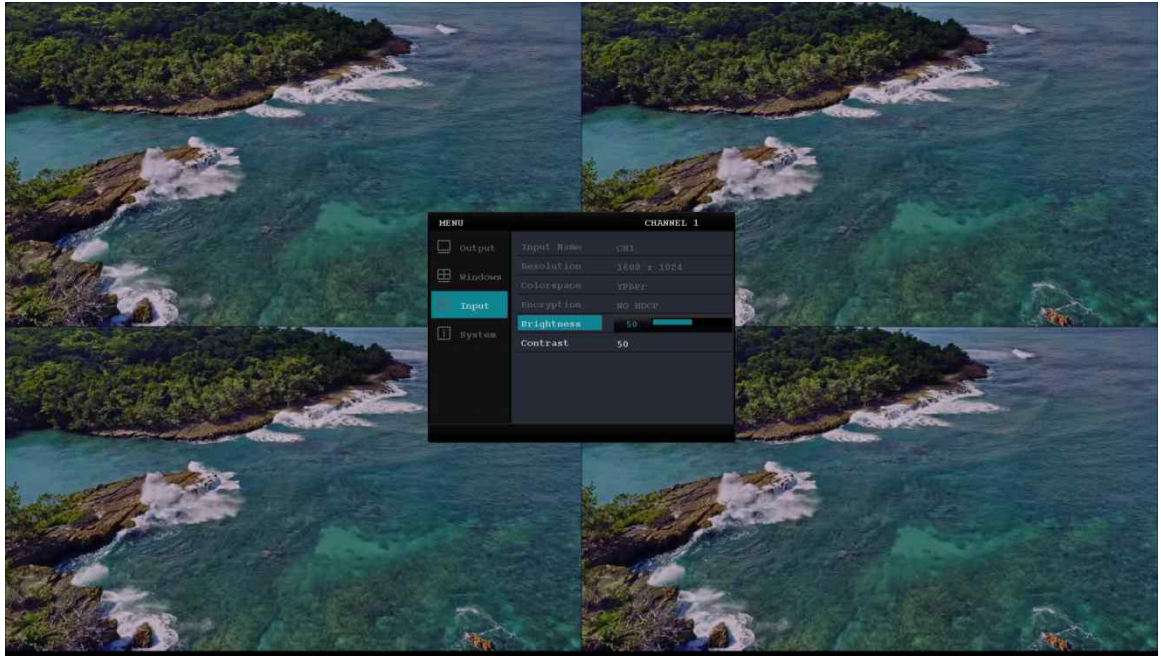


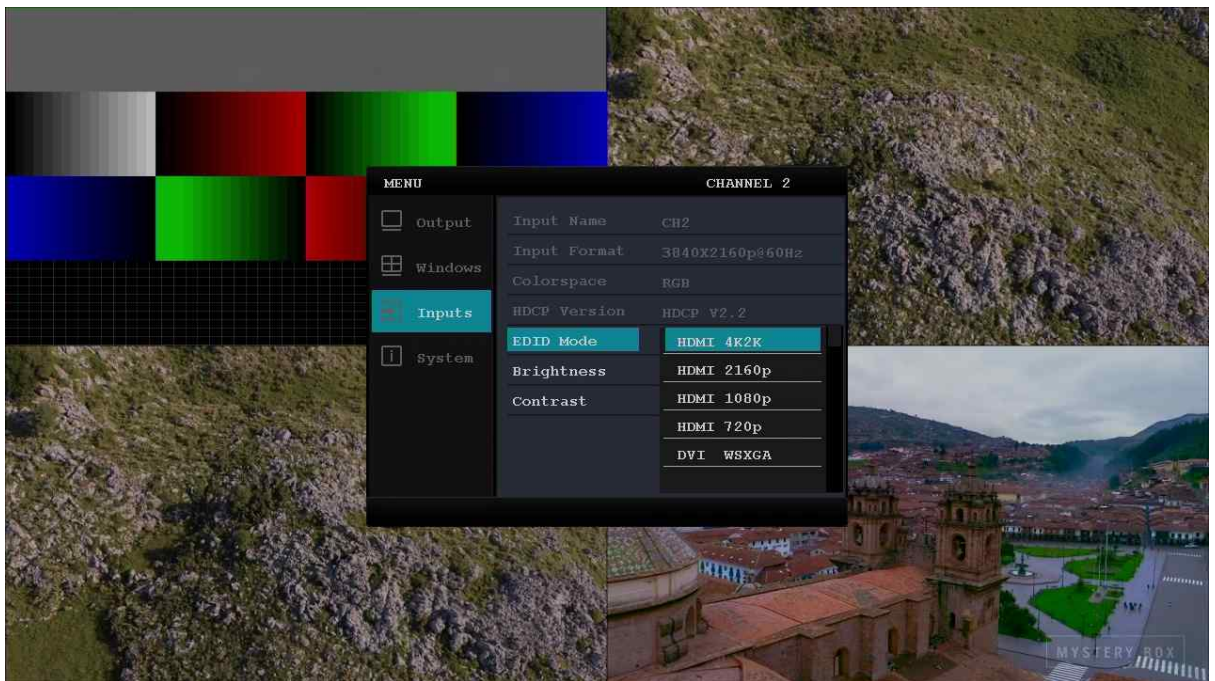
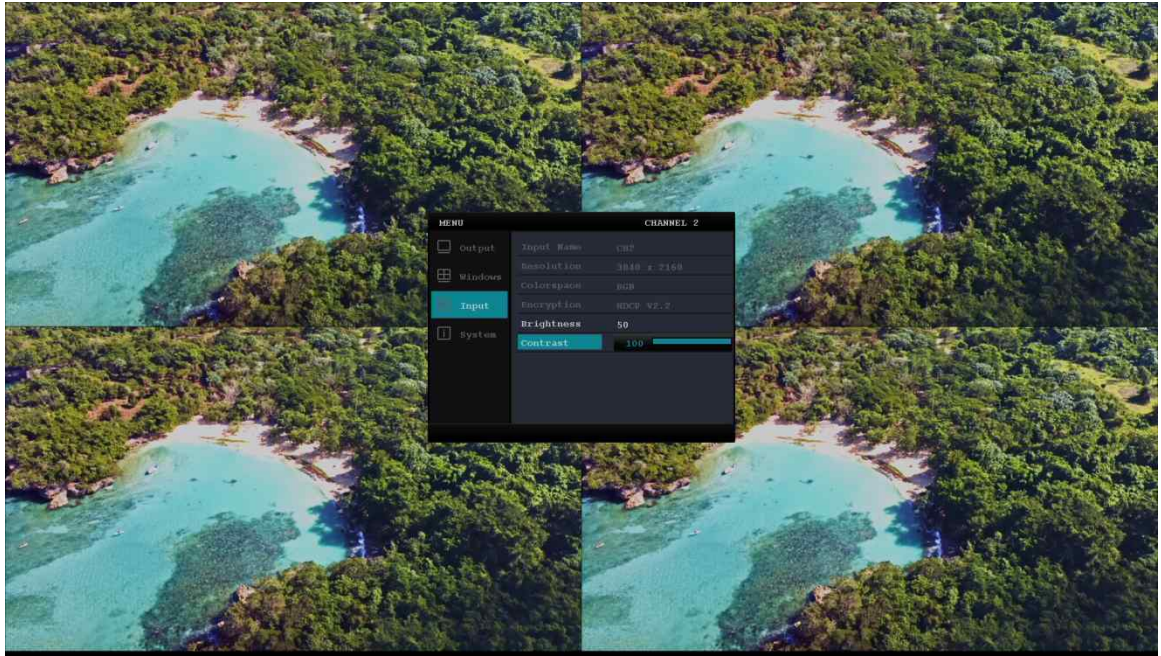
7.4 Input menu

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.

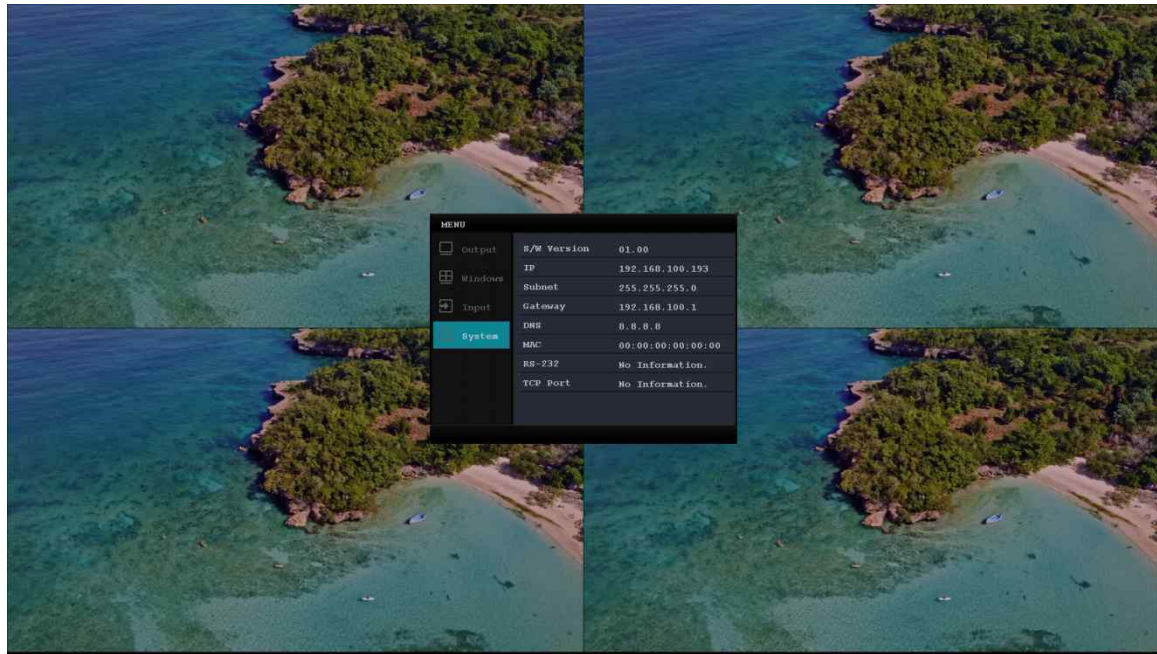






7.5 System menu

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, OPHIT 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), may served with charge of follows.

- 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.