

# MANUAL

10 Channels 1080p60  
Full HD Video Switcher

**LUMANTEK**

[English]

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### **LUMANTEK CUSTOMER SERVICES**

gs@lumantek.com

TEL : +82-2-6947-7429

FAX : +82-2-6947-7440

### **Installation Precautions**

This page states the safety measures the users must take to avoid circumstances where the system may occur physical damages or injuries. Please THOROUGHLY go over this page before the system installation/operation.

### **General Precautions**

- Maintain dust FREE condition during and after System Installation/Operation.
- Please place the system cover in a safe location when opened.
- Securely stow tools and cables away from the passages.
- Avoid wearing loosened clothes or accessories during installation/Operation.
- Avoid any unnecessary actions that may damage/harm system or personnel.
- Do NOT open the system unless advised by Lumantek representative. Lumantek takes no responsibility on units with broken RMA seals.

### **Power Precautions**

- Please check cable overload before connecting the system to the power supply.
- Avoid wearing metal accessories (Rings, Earrings) connecting system to the power source.
- Avoid operating on wet floors. Make sure power extension cables, floors, and instruments are grounded and in a safe operating condition.
- Please discharge static electricity by touching grounding metals before starting hardware installation.
- The grounding parts must be disassembled last.
- Manufacturer takes no responsibilities on Direct/Indirect losses or damages due to use of inappropriate parts or services by unauthorized service provider
- Supplying power during the system installation may cause damages to the system and personnel.

# 1. Introduction

## INTRODUCTION

ez-Liveshow is a brand born through combination of LUMANTEK's encoding and video switching technology especially designed for small studio size event. VS10 is one of the main product of ez-Liveshow brand. It is a stand-alone video switcher with scaler installed giving the ability to set the outgoing resolution up to 1080p60. VS10 allows live monitoring of 10 input video streams, media, test patterns (color bar, color background), PGM, PVW through multiview screen. Internal scalers allows VS10 to synchronize frames, and these can be controlled with console buttons, jog or joystick. Through touch-screen LCD, you can check the PGM and multiview. VS10 can receive 10 audio sources from the video inputs and 1 extra source from external audio (XLR) input. You can change the volume, mute and change to AFV (audio follow video) modes.

## FEATURES

### VIDEO SWITCHER VS10

1. Input : SDI x 8 , HDMI x 2

Output : SDI : AUX x 4 , PGM x 2

HDMI : PGM x 1, Multiview x 1

2. Supports PIP, Key (Chroma/Luma), DSK (Fill/Key)

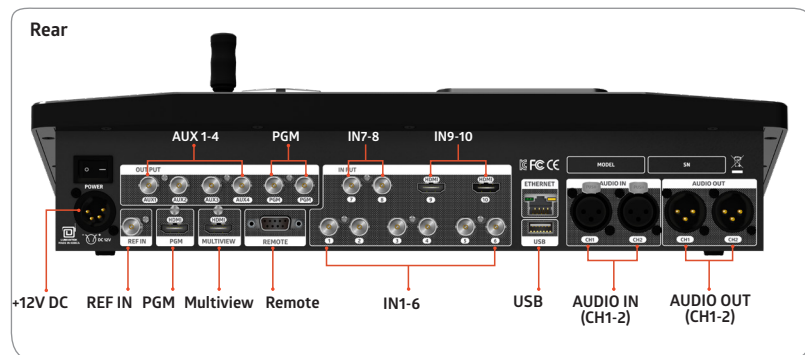
3. SDI inputs supports both 3G-SDI levels A and B.

4. VS10 has internal scalers in all 10 inputs.

You can use different video resolutions as a source.

# 1. Introduction

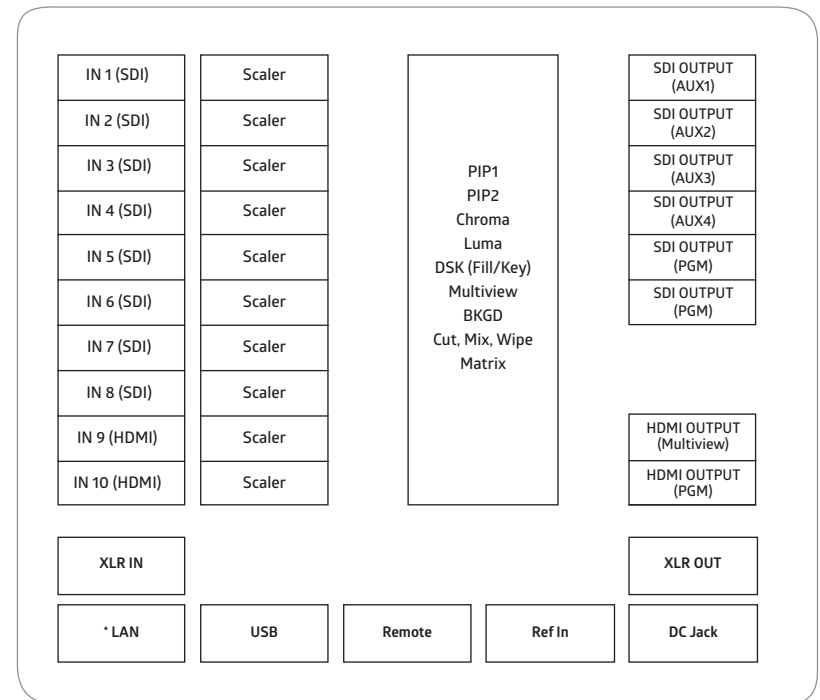
## (1) VS10 Interface



\* ETHERNET : No function

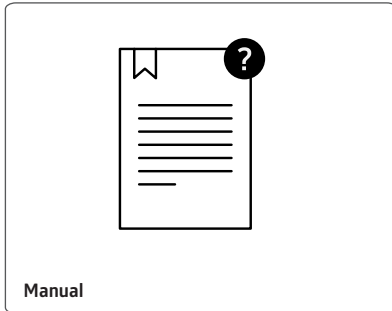
# 1. Introduction

## (2) VS10 BLOCK DIAGRAM



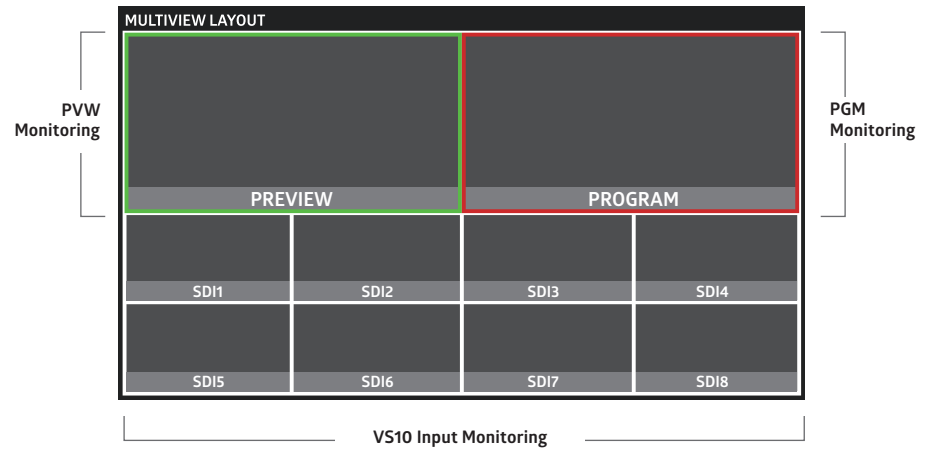
\* LAN port is for internal use only. No function available for users.

## 2. Product Configuration

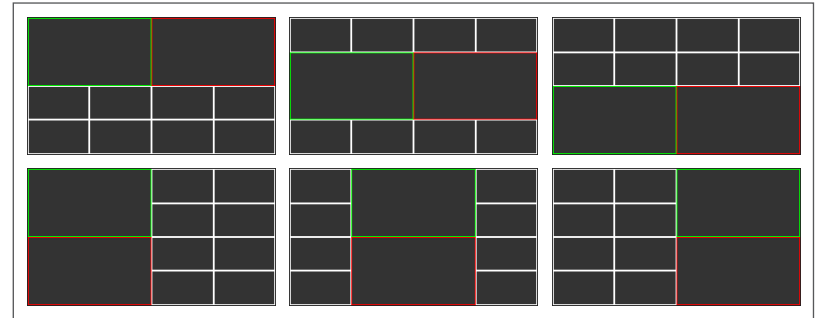


## 3. Interface

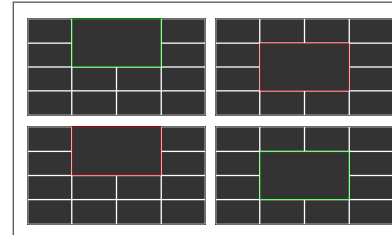
### (1) Multiview Interface



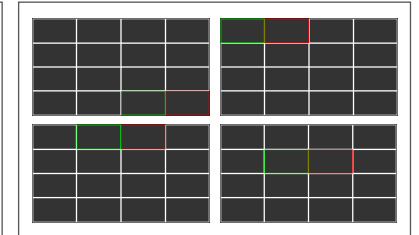
### 10 View



### 13 View

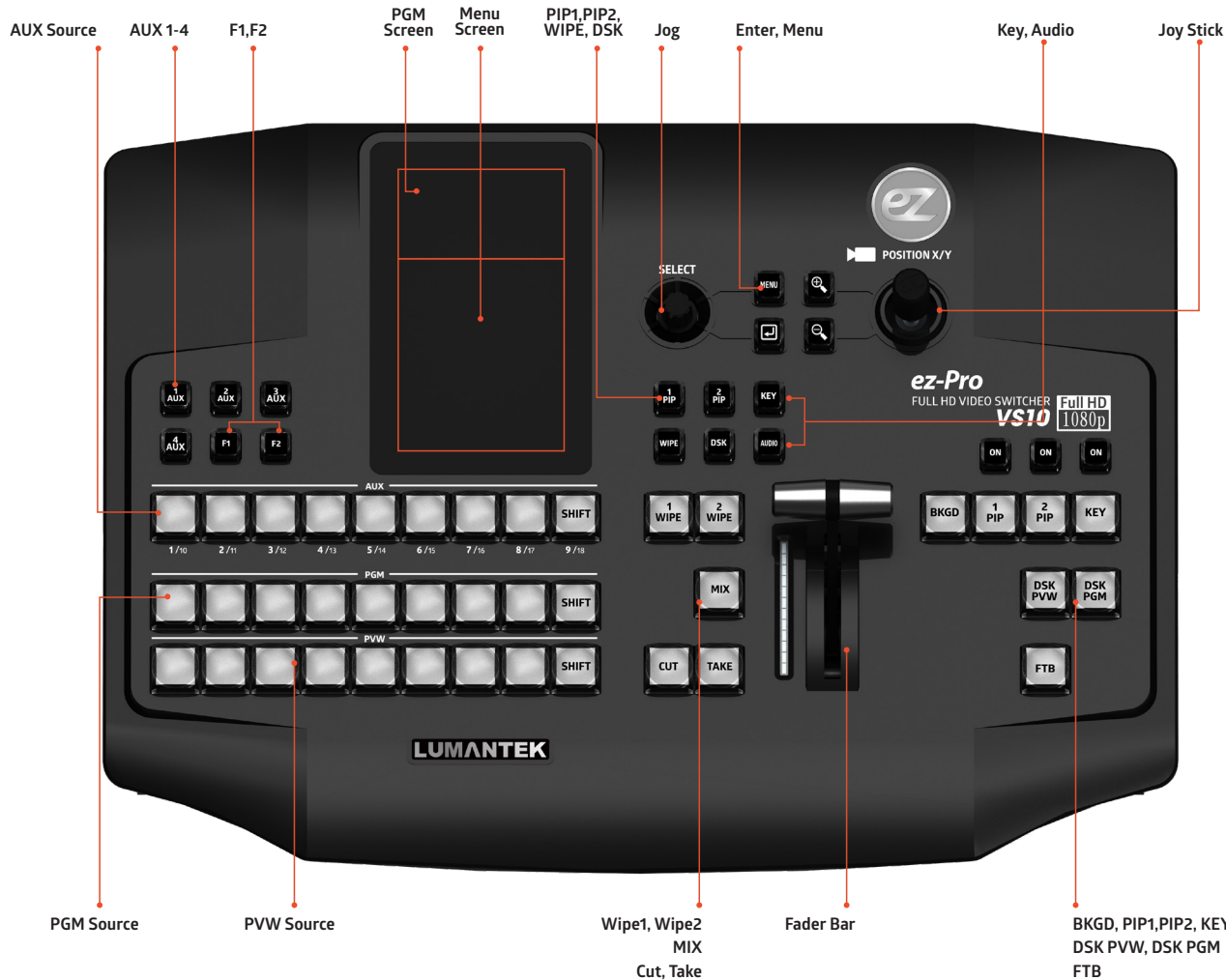


### 16 View



### 3. Interface

#### (2) Console Interface



**[AUX1-4]** [AUX1-4] AUX outputs setting.

Selected AUX source is displayed on the PGM screen of the LCD.

**[F1]** Go to PTZ camera

**[F2]** Undefined

**[PGM Screen]** LCD screen displays PGM & MULTIVIEW when you touch the screen.

**[PIP1]** Go to PIP1 menu

**[PIP2]** Go to PIP2 menu

**[KEY]** Go to KEY menu

**[WIPE]** Go to WIPE menu

**[DSK]** Go to DSK menu

**[AUDIO]** Go to AUDIO menu

**[JOG]** Move through selections

**[Menu]** Go to MENU

**[+Zoom In]** Changing values of settings

**[- Zoom Out]** Changing values of settings

**[ENTER]** Enter button

**[Joy Stick]** Changing values of settings (PIP position, scale)

**[AUX Source]** Select source for each function

**[PVW Source]** Select PVW

**[PGM Source]** Select PGM

**[WIPE1, WIPE2]** Select WIPE transition effect

**[MIX]** Select MIX transition effect

**[CUT]** Select CUT transition effect

**[TAKE]** Automatic transition between PVW and PGM

**[BKGD]** Background screen triggered on set

**[PIP1]/[PIP1 ON]** PIP1 screen display on PVW and PGM

**[PIP2]/[PIP2 ON]** PIP2 screen display on PVW and PGM

**[KEY]/[KEY ON]** KEY (Chroma/Luma) screen display on PVW and PGM

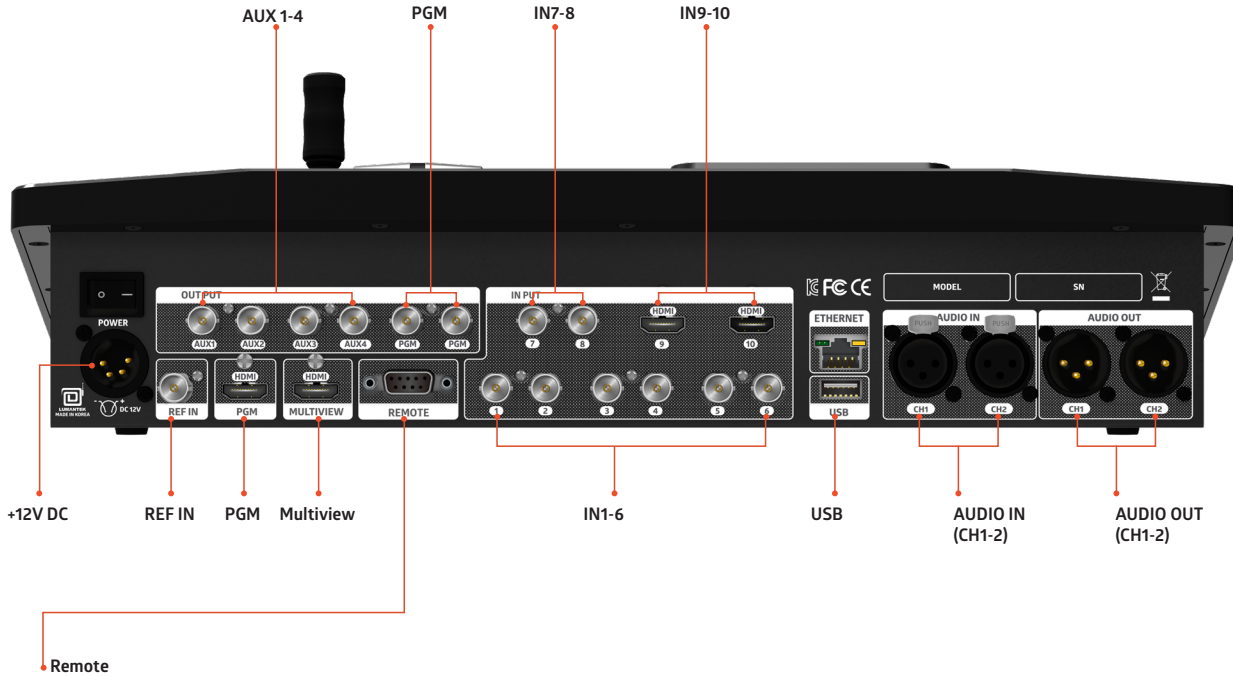
**[DSK PVW]** DSK display on PVW

**[DSK PGM]** DSK display on PGM

**[FTB]** Video fades to Black

### 3. Interface

#### (2) Console Interface

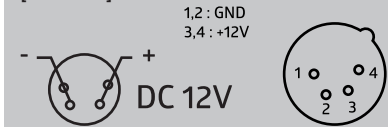


Remote (DB9 Female)

Remote (DB9 Female)	Pin	RS-422 Full-Duplex
5 4 3 2 1	Pin1	-
	Pin2	-
	Pin3	-
	Pin4	TXD-
	Pin5	Ground
	Pin6	RXD+
	Pin7	RXD-
	Pin8	TXD+
9 8 7 6	Pin9	-

[Power Switch] Power On / Off

[DC 12V IN]



[IN1-8(BNC)] Connects SDI signal

[IN 9-10(HDMI)] Connects HDMI signal

[USB] Used for updates

(Firmware update/Multiview/Button Map/Media Player)

[AUDIO IN(XLR)] Audio input socket

[AUDIO OUT(XLR)] Audio output socket

[AUX 1-4, PGM(BNC)] SDI signal output

[REF IN(BNC)] Connects reference signal

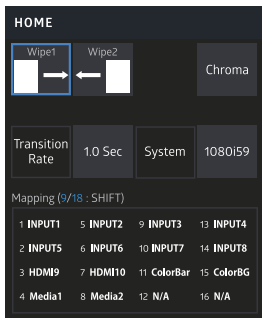
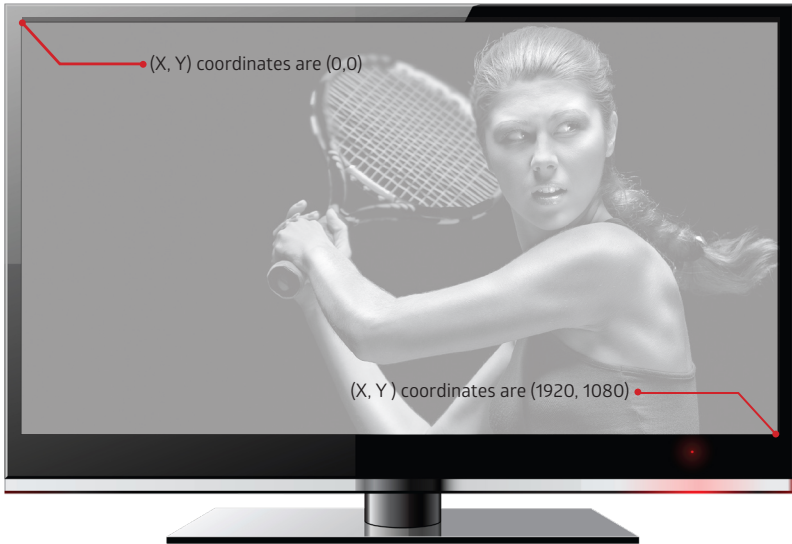
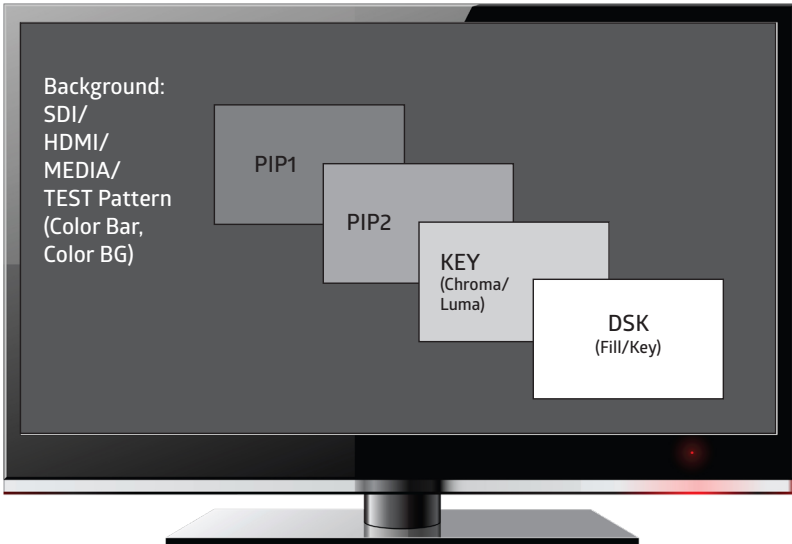
[PGM(HDMI)] Outputs HDMI signal

[Multiview (HDMI)] Outputs HDMI signal

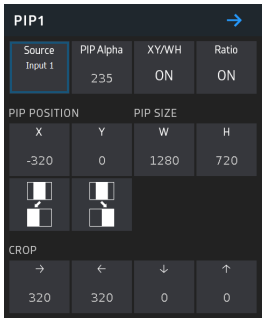
[Remote] Used for debug and other control

\* ETHERNET port is for internal use only. No function available for users.

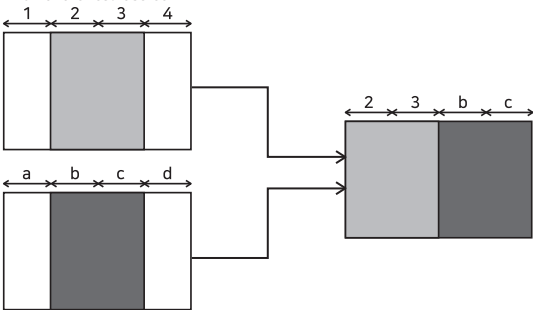
# 4. LCD Screen



- HOME MENU
- [Wipe1] [Wipe2] Shows WIPE1, WIPE2 type
- [Chroma/Luma] Shows selected KEY
- [Transition Rate] Shows AUTO TIME
- [System] Shows VS10 SYSTEM RESOLUTION
- [Inputs] Shows the source given to the button



- PIP Menu
- [Source] Go to PIP source selection menu, can be used as AUX button also
- [PIP Alpha] Select degree of transparency of PIP
- [XY/WH] Select if to simultaneously set values of XY (or WH) or not
  - \* On : XY (or WH) values change simultaneously
  - \* Off : XY (or WH) values change independently
- [Ratio] Select if to maintain 16:9 ratio setting values of W and H
  - \* On : W, H values change maintaining 16:9 ratio
  - \* Off : W, H values change without maintaining 16:9 ratio
- [PIP Position] Preset PIP position
  - \* Crop 1/4 of both ends of video screen width and snap PIP to left or right half of the result screen.



- [PIP Size] Change PIP size
- [Crop(Left, Right, Top, Bottom)] Change PIP crop
- [→] Go to PIP border menu

**PIP1 BORDER**

Source	PIP Alpha	XY/WH	Ratio
Input1	235	ON	ON

**BORDER THICK**

W	H	TYPE
4	4	Ellipse

**BORDER COLOR**

R	G	B
255	0	0

● **PIP Border**

**[Source]** Go to PIP source selection menu, can be used as AUX button also

**[Border Alpha]** Select degree of transparency of PIP border

**[XY/WH]** Select if to simultaneously set values of XY (or WH) or not

\* On : XY (or WH) values change simultaneously

\* Off : XY (or WH) values change independently

**[Ratio]** Select if to maintain 16:9 ratio setting values of W and H

\* On : W, H values change maintaining 16:9 ratio

\* Off : W, H values change without maintaining 16:9 ratio

**[Border Thick(W,H)]** Change border thickness

**[TYPE]** Select border type (i.e. NONE, INNER, OUTER, MIDDLE, ELLIPSE)

**[R,G,B]** Select border color

\* Use jog, +, -, or touch-screen to change values

**KEYER [CHROMA]**

Source	X/Y
Input1	ON

**HUE**

Center	Width	X	Y
126	20	64	64

Gain  
30%

**SATURATION**

Min	Gain	PRESET
12%	90%	Green High Gain

● **KEYER MENU [Chroma]**

**[Source]** Go to CHROMA source selection menu

(PIP1, PIP2 also selectable as CHROMA source)

**[XY]** Select if to simultaneously set values of XY or not

**[Hue Center, Hue Width, Hue Gain]**

Center : Select the transparency color of the foreground

Width : Select the range of transparency color of the foreground

(hue center 4-90 degrees)

Gain : Select the range of half-transparency of the foreground

(0%-100%)

Preview		Program	
Input1	Input2	Input3	Input4
Input5	Input6	Input7	Input8

Hue Pick

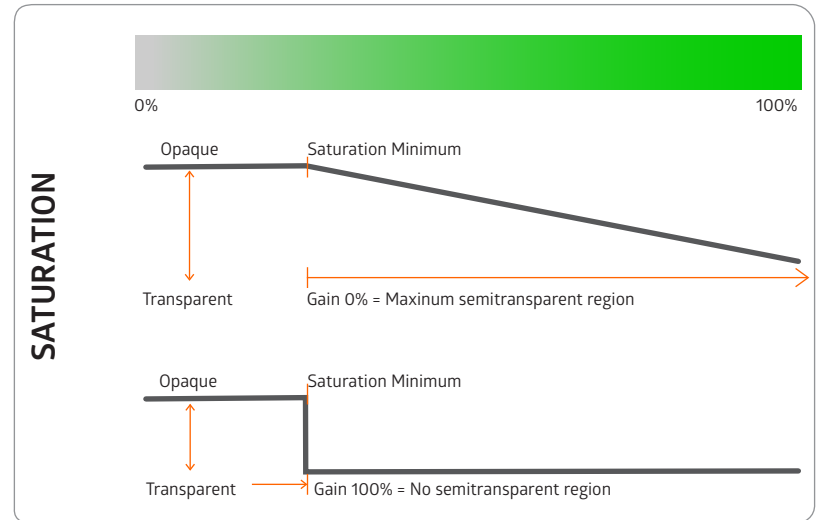
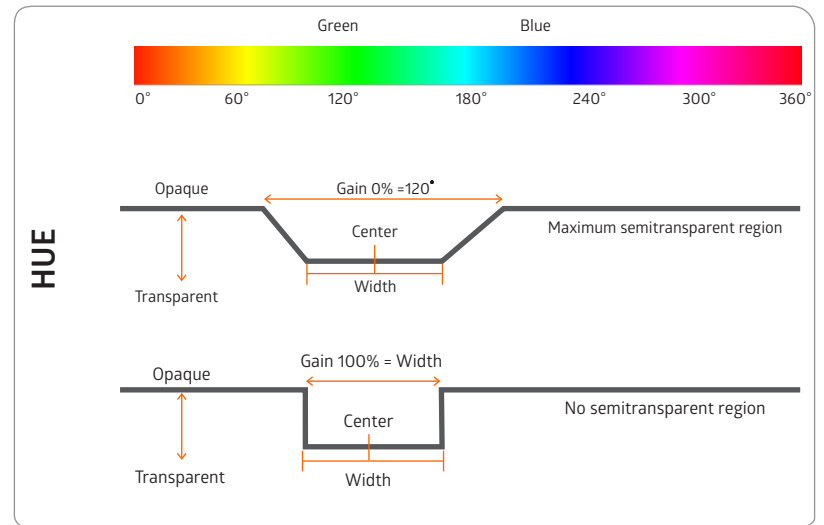
**[HUE PICK X, Y]** New "HUE" value can be applied by placing the spoid icon over a color in Multiview screen. The spoid icon can be moved with joystick

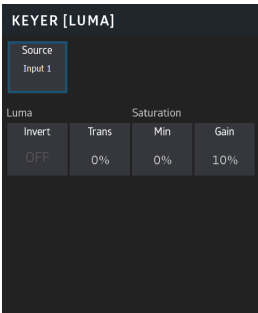
**[PRESET]** Select GREEN HIGH/LOW GAIN, BLUE HIGH/LOW GAIN

Change made to set values when PRESET is changed

\*Use jog, +, -, or touch-screen to change values

● **CHROMA Key Mode**





### ● KEYSER MENU [Luma]

#### [Source]

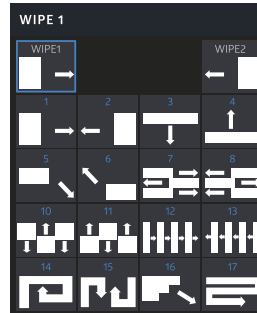
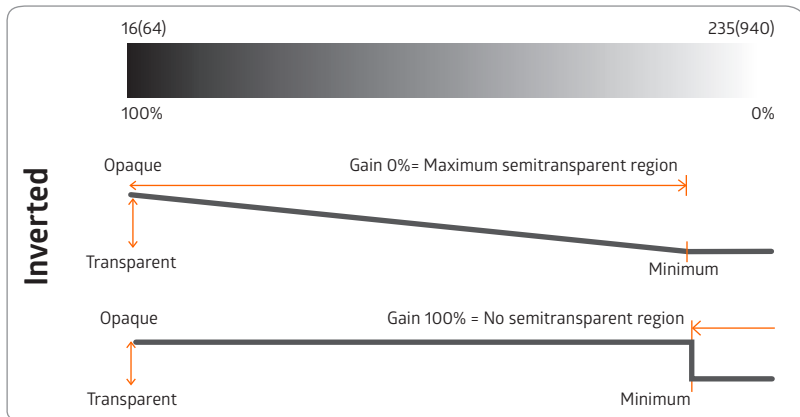
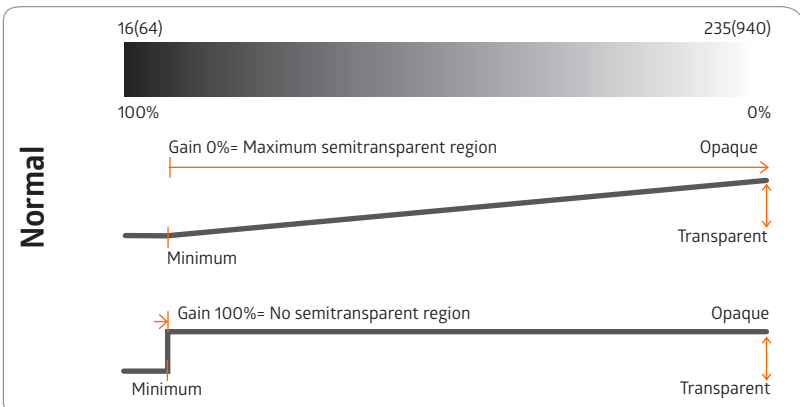
Go to LUMA source selection menu  
(PIP1, PIP2 also selectable as LUMA source)

#### [LUMA Invert, Trans, Saturation Min/Gain]

Inv : Set invert off/on  
Transparency: Set transparency of the foreground at its minimum  
Saturation Min: Set range of opacity of the foreground  
Saturation Gain: Set area of translucency of the foreground  
(100%: only black turns transparent, 0%: translucent maximum area)

\* Use jog, +, -, or touch-screen to change values

### ● LUMA Key Mode

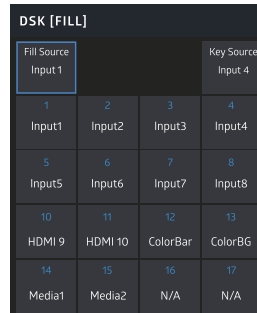


### ● Wipe Menu

\* Select WIPE type used in WIPE1, WIPE2

\* To select, use:

1. AUX button
2. Touch-screen
3. Rotate jog button to select and select by pressing



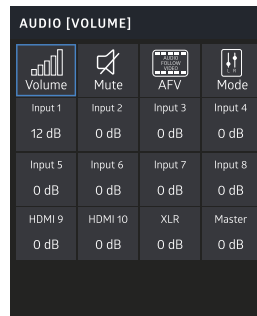
### ● DSK Menu

[Fill Source] Select DSK Fill source

[Key Source] Select DSK Key source

\* To select, use:

1. Touch-screen
2. Rotate jog button to select and select by pressing



### ● Audio Menu

#### [Volume]

Control volume of 10 x input video sources, external audio and outgoing PGM audio (control range is from -90dB to +12dB)

#### [Mute]

Select to mute the audio volume

1. On: Audio muted
2. Off: Audio unmuted. Volume levels set to user's setting

#### [Audio Follow Video]

\* On : Audio on only when input source is selected as PGM

\* Off : Volume level set to user's setting.

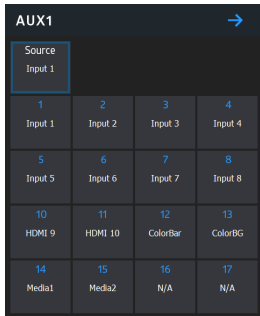
If MUTE is ON then no audio will be outgoing.

#### [Audio Mode]

\* L|L : Use only left audio channel of selected sources.

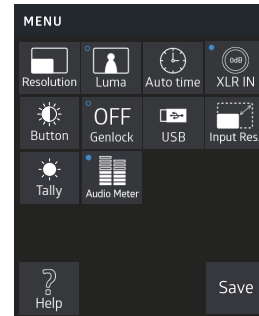
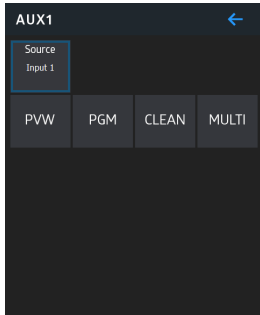
\* L|R : Use left and right audio channel of selected sources separately.

\* R|R : Use only right audio channel of selected sources.



### ● AUX Menu

- \* Select AUX output source
- \* PVW, PGM, CLEAN, MVW can be selected as AUX by pressing blue arrow on the top right-hand corner
- \* CLEAN is the video without DSK(Fill, Key)
- [→] Go to next page
- [←] Go to previous page
- \* AUX output video source appears on PGM screen

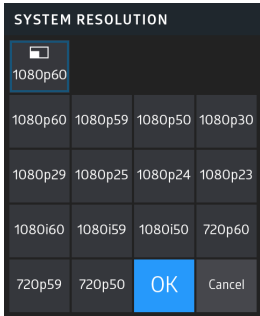


### ● Menu

- [Resolution]** Select system resolution
- [Chroma, Luma]** Select KEY type
- [Auto time]** Set the auto transition time
- [0dB]** Select to decrease the external audio levels
  - \* 0dB : No audio decrement
  - \* -10dB : Decreases -10dB relative to the actual audio input
- [Button]** Controls brightness of the console buttons
- [Genlock]** Select to use GEN LOCK function
  - \* On : Use Ref In
  - \* Off : Not use Ref In

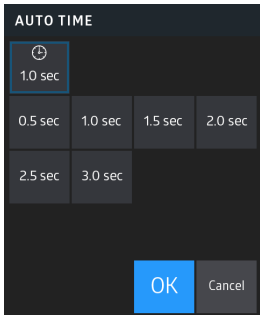
Output Resolution (System Resolution)	REF IN Resolution
1280x720p50	576i50(PAL), 720p50, 1080p50, 1080i50
1280x720p59	480i59(NTSC), 720p59, 1080p59, 1080i59
1280x720p60	720p60, 1080p60, 1080i60
1920x1080i50	576i50(PAL), 1080i50
1920x1080i59	480i59(NTSC), 1080i59, 1080p29
1920x1080i60	1080p30, 1080i60
1920x1080p23	1080p23
1920x1080p24	1080p24
1920x1080p25	576i50(PAL), 1080i50, 1080p25
1920x1080p29	480i59(NTSC), 1080i59, 1080p29
1920x1080p30	1080i60, 1080p30
1920x1080p50	576i50(PAL), 720p50, 1080i50, 1080p50
1920x1080p59	480i59(NTSC), 720p59, 1080i59, 1080p59
1920x1080p60	720p60, 1080i60, 1080p60

- [USB]** Load and apply contents to VS10 generated through VS10 Utility software
- [Input Res]** Check each resolution of the inputs
- [Tally]** Select pin for Tally
- [Audio Meter]** Display on / off at Multiview.
- [Help]** Check minimum and maximum values of the joy stick and T-bar.  
Check the temperature of VS10.
- [Save]** Save current settings



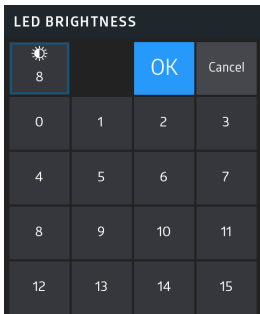
### Menu > System Resolution

- \* Select system resolution
- \* Press OK button to apply and save



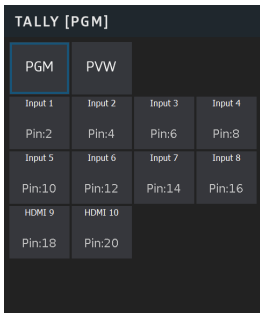
### Menu > Auto Time

- \* Select transition time
- \* Press OK button to apply and save
- \* Selected time will be applied to transition time after pressing TAKE button



### Menu > LED Brightness

- \* Select the degree of brightness of the buttons
- \* Brightness applied right



### Menu > Tally

- \*VS10 supports serial Tally by using Firmata Protocol.
- \*Consider remote port when connecting to RS 422.

- o) TXD+ (Pin8) ↔ RXD+ (PC)
- TXD- (Pin4) ↔ RXD- (PC)
- RXD+(Pin6) ↔ TXD+(PC)
- RXD- (Pin7) ↔ TXD- (PC)

### Firmata Protocol

- \* Pin : 0 - 7 → Port : 0
- \* Pin : 8 - 15 → Port : 1
- \* Pin : 16 - 23 → Port : 2

	1	2	3	4	5	6	7	8	9	10
<b>PGM</b>	Pin:2	Pin:4	Pin:6	Pin:8	Pin:10	Pin:12	Pin:14	Pin:16	Pin:18	Pin:20
<b>PVW</b>	Pin:3	Pin:5	Pin:7	Pin:9	Pin:11	Pin:13	Pin:15	Pin:17	Pin:19	Pin:21

Port	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
<b>Port : 0</b>	1	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
	Data : 0x90, 0x24, 0x00																							
<b>Port : 1</b>	1	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Data : 0x91, 0x00, 0x00																							
<b>Port : 2</b>	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Data : 0x92, 0x00, 0x00																							

- \* RS422
- \* Baud rate : 9600/ 38400/115200 bps
- \* Data bits : 8
- \* Parity : None
- \* Stop bits : 1

Port	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
<b>Port : 0</b>	1	0	0	1	0	0	0	0	0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0	0	0	0	0	0	0	0/1
<b>Pin : 0 - 7</b>	□ 6 5 4 3 2 1 0 □ □ □ □ □ □ □ 7																							
<b>Port : 1</b>	1	0	0	1	0	0	0	1	0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0	0	0	0	0	0	0	0/1
<b>Pin : 8 - 15</b>	□ 14 13 12 11 10 9 8 □ □ □ □ □ □ □ 15																							
<b>Port : 2</b>	1	0	0	1	0	0	1	0	0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0	0	0	0	0	0	0	0/1
<b>Pin : 16 - 23</b>	□ 22 21 20 19 18 17 16 □ □ □ □ □ □ □ 23																							

INPUT RESOLUTION			
Input 1	Input 2	Input 3	Input 4
720p50	720p50	720p50	720p50
Input 5	Input 6	Input 7	Input 8
720p50	720p50	unknown	unknown
HDMI 9	HDMI 10		
720p50	unknown		

OK Cancel

## Menu > Input Resolution

\* Shows resolution information of 10 input video sources

HELP			
All Red	All Green	All Yellow	All Off
Joystick X	Joystick Y	Tbar	Temperature
Adjust	Adjust	Adjust	55 C
APP VER.	F1 VER.	F2 VER.	F3 VER.
3.3.2	4.1.1	3.0.6	6.0.2

Default OK Cancel

HELP			
Vibrate	Backup	Restore	Ref Info
RS422 Remote Enable	RS422 Tally Disable	RS422 PTZ Disable	In(0) Lock(0) 115200 bps RS422

OK Cancel

## Menu > Help

**[All Red]** All buttons lighted with Red LED momentarily

**[All Green]** All buttons lighted with Green LED momentarily

**[All Yellow]** All buttons lighted with Yellow LED momentarily

**[All Off]** All buttons LED's off momentarily

**[Joystick X]** Saves the maximum and minimum values of joystick's X axis

\* Minimum value (x): Move joystick to the left and select

\* Maximum value (x): Move joystick to the right and select

**[Joystick Y]** Saves the maximum and minimum values of joystick's Y axis

\* Minimum value (y): Move joystick downward and select

\* Maximum value (y): Move joystick upward and select

**[Tbar]** Saves the maximum and minimum values of T-bar

\* Minimum value: Pull down all the way and up a little, then select

\* Maximum value: Pull up all the way and down a little, then select

**[Temperature]** Shows the temperature of VS10


\* Always use ENTER button after selection 

**[Ver]** Shows the version of VS10 firmware

**[Default]** Turns all values to default

\* Media Player 1 and Media Player 2 keeps unchanged

\* Always use ENTER button after selection

**[Vibrate]** Changes the vibration level when  is touched

**[Backup]** Backup the switcher's settings into a USB disk

**[Restore]** Restores the settings saved in a USB disk to the switcher

**[Ref Info]** Shows "Ref In" status

\* In(0) : No "Ref In" signal detected

\* In(1) : "Ref In" signal detected

\* Lock(0) : No sync with "Ref In" signal

\* Lock(1) : Sync completed with "Ref In" signal

**[RS422 Remote]** Press ENTER button  to enable/disable remote option.

\* Enable : Enable remote control commands through RS422.

\* Disable : Disable remote control commands through RS422.

\* Refer to the command reference list for remote control commands.

**[RS422 Tally]** Press ENTER button  to enable/disable Tally option.

\* Enable : Output Tally data through RS422 .

\* Disable : Disable output Tally data through RS422.

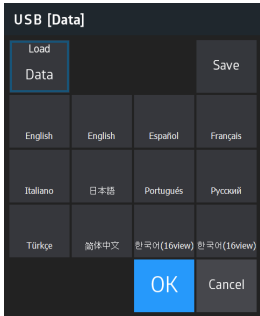
**[RS422 PTZ]** Press ENTER button  to enable/disable PTZ option.

\* Enable : Enable to control PTZ through RS422.

\* Disable : Disable to control PTZ through RS422.

**[RS422 bps]** Press ENTER button  to choose Baud Rate.

\* 9600 bps | 38400 bps | 115200 bps



## Menu> USB

Data saved in USB disk can be retrieved in USB menu

(Supported USB format is FAT)

3 types of data can be used

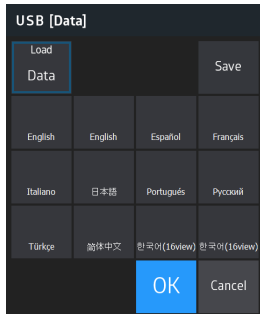
1. Data: Multiview layout, button mapping, source names, test patterns (color background) colors
2. Images to store in Media Player 1 and Media Player 2 storage
3. System upgrade

(Warning!)

Do not retrieve the USB disk from VS10 while data is being transferred

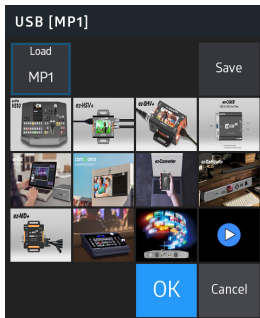
Insert the USB disk before moving to USB menu

If any problem is seen, change the USB disk or re-boot VS10



### [Load Data]

- \* Change VS10 Multiview to 10/13/16 view (Make selection from 14 options)
- \* Change input source name
- \* Change button mapping

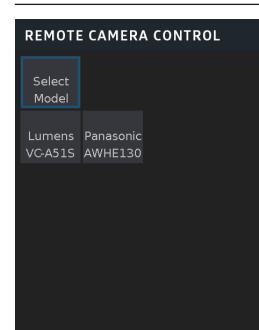
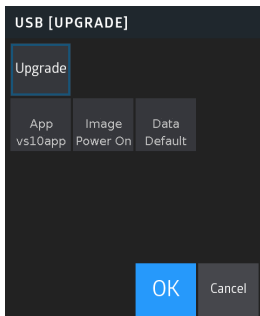


### [Load MP]

- \* Change the image of Media of Media Player 1 / Media Player 2 (Maximum number of selection: 12)
- \* Selected media is saved to VS10 by pressing SAVE button (Due to internal memory capacity, no copy will be made if there are several images)
- \* Press OK to preserve current selection but does not COPY media to VS10.
- \* Press CANCEL to return to the original media file

### [Upgrade]

- \* Upgrade VS10 software
- \* Opening image can be changed
- \* Can change to the default data

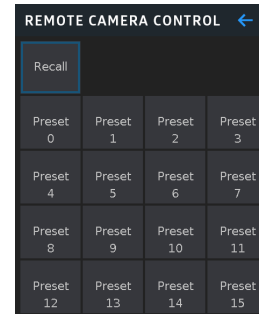
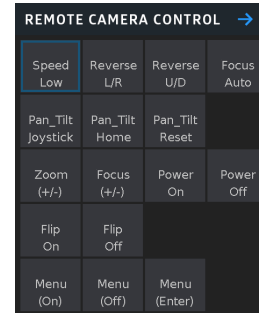


Press **F1** button for PTZ camera selection menu.

### **F1** > Remote Camera Control

[For example : Select Lumens VC-A515]

- You can choose up to 7 cameras through AUX buttons.
- Protocol: VISCA
- Proper RS422 bps setting needed. \*Refer to HELP menu.
- \* Speed Low/Middle/High : Adjust Pan-Tilt speed.
- \* Reverse Left/Right
- \* Reverse Up/Down
- \* Focus auto/manual
- \* Pan\_Tilt Joystick : Control pan-tilt through Joystick.
- \* Pan\_Tilt Home : Home position.
- \* Pan\_Tilt Reset : Clear the Pan\_Tilt setting.
- \* Zoom : Zoom in/out through [+]/[-] button.
- \* Focus : Focus on/off through [+]/[-] button.
- \* Power On/Off
- \* Flip On/Off
- \* Menu On : OSD Camera on
- \* Menu Off : OSD Camera off
- \* Menu Enter : OSD Camera Enter
- \*\* Use joystick to move around menu.



\* Recall preset position data.

## 5. VS10 Utility

\* Windows and Mac OS versions available

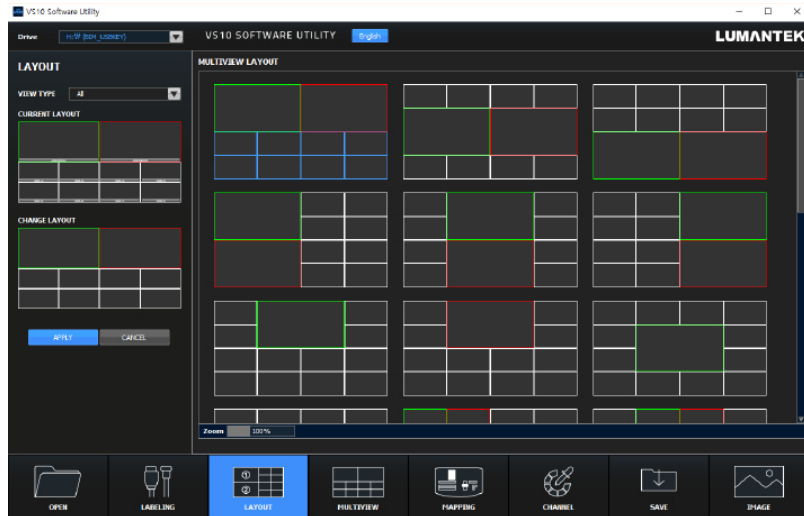
### ● Labeling

Select desired port in LABELING tap and change the input name as desired.



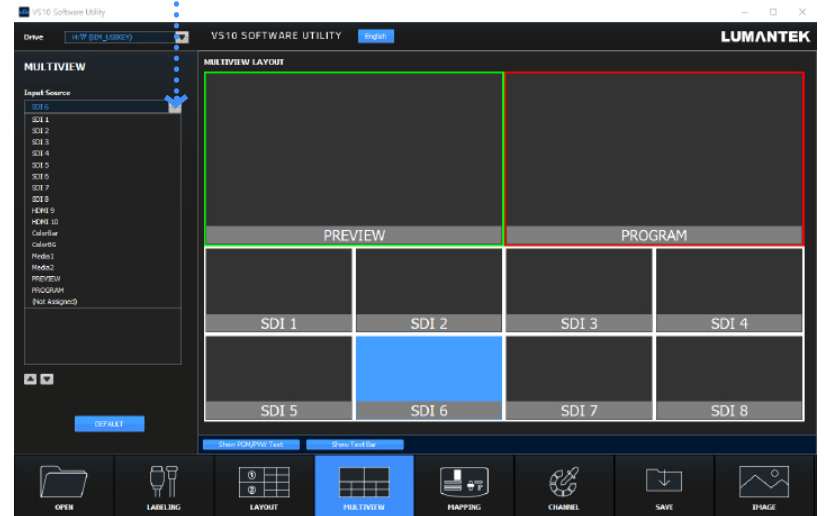
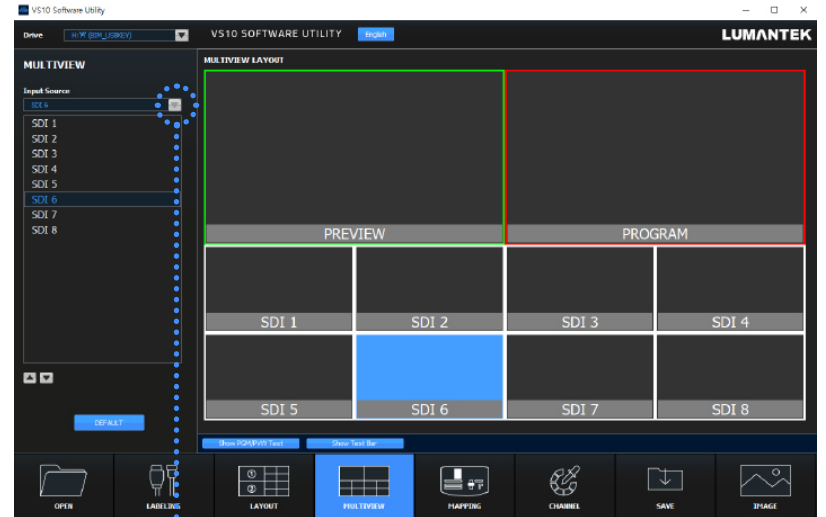
### ● Layout

Select preferred Multiview layout.



### ● Multiview

Multiview layouts are even more customizable at INPUT SOURCE tap (Select the source and drag-n-drop to change positions)



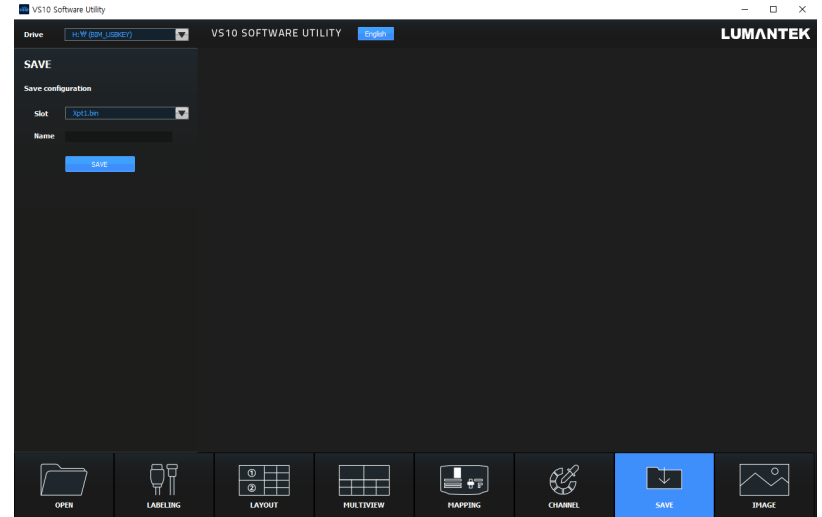
### ● Mapping

Map the input port to desired button on the console.



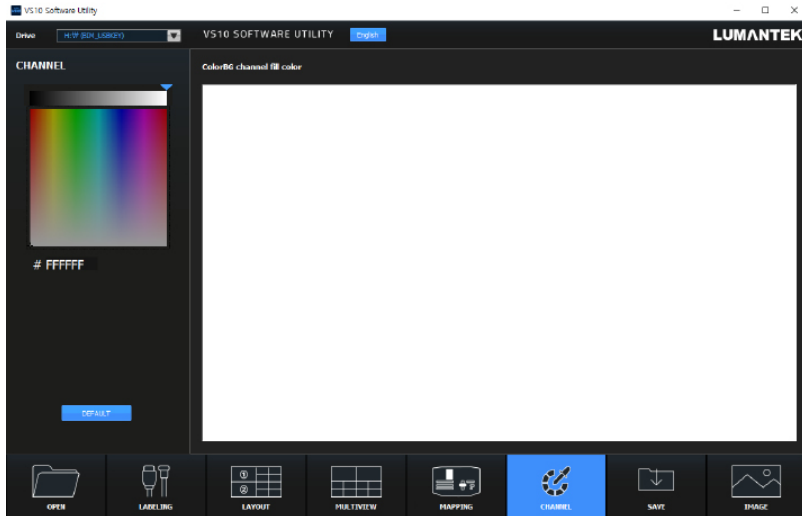
### ● Save

Save the setting to the USB.



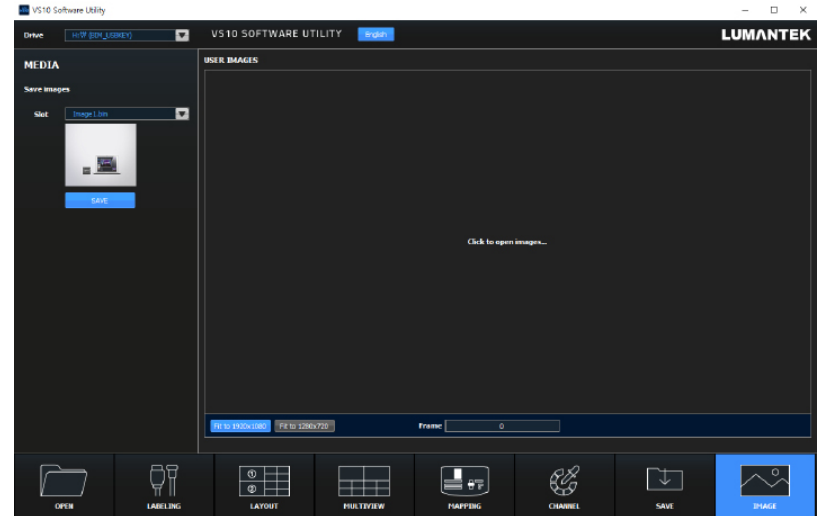
### ● Channel

Select the desired ColorBG.



### ● Media

Select the image to save in Media 1 and 2. Select size.



## 6. System Specifications

<b>Connections</b>	<ul style="list-style-type: none"> <li>· 3G/HD/SD-SDI Input : BNC 75Ω 8ea (with Scaler)</li> <li>· HDMI Input : 2ea (with Scaler)</li> <li>· 3G/HD/SD-SDI Output : BNC 75Ω 6ea (AUX1/AUX2/AUX3/AUX4/PGMx2)</li> <li>· HDMI Output : 2ea (PGM/MULTIVIEW)</li> <li>· Remote: 1ea</li> <li>· Reference Input: 1ea</li> <li>· USB2.0: 1ea</li> <li>· External Analog Audio Input : XLR 2ea</li> <li>· External Analog Audio Output : XLR 2ea</li> <li>· DC 12V: 1ea</li> </ul>
<b>Video Format Support</b>	<ul style="list-style-type: none"> <li>· 480i59/576i50 (Input only for SD resolution)</li> <li>1080p30/1080p29/1080p25/1080p24/1080p23</li> <li>1080i60/1080i59/1080i50/720p60/720p59/720p50</li> <li>1080p60/1080p59/1080p50</li> </ul>
<b>Video Switcher</b>	<ul style="list-style-type: none"> <li>· Mix &amp; Effect: 1ea</li> <li>· PIP: 2ea</li> <li>· KEY: 1ea(LUMA/CHROMA)</li> <li>· Downstream Keyer: 1ea(FILL/KEY)</li> <li>· Pattern Generator: 2ea(Color Bar/Color BG)</li> <li>· Media: 2ea</li> <li>· Multiview: 10view/13view/16view 1ea</li> <li>· Audio Mixer: 10 stereo input mixer 1ea</li> </ul>
<b>Management</b>	<ul style="list-style-type: none"> <li>· TFT-LCD (4.98inch, Capacitive Touch Screen)</li> </ul>
<b>Physical</b>	<ul style="list-style-type: none"> <li>· Dimension: 89(H)X400(W)X294(D) (mm, Excluding Connector)</li> <li>· Weight: 3.7kg (8.15lbs)</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>· Operating Temperature: 0 ~ 45°C</li> </ul>
<b>Power Requirement</b>	<ul style="list-style-type: none"> <li>· Power Input: DC 12V</li> <li>· Power Consumption: 40W(max)</li> </ul>

1. Download recent version of the manual from the following link.  
(<http://lumantek.com/index/download/product/37/q/type/-M->)
2. Features of this product can be added, removed, changed.

