

SPS-U5P

SEAMLESS UHD VIDEO SWITCHER WITH MULTIVIEW



USER MANUAL



Designed and Manufactured in the USA

Smart-AVI

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TECHNICAL SPECIFICATIONS

VIDEO	
Format	DisplayPort1.2, HDMI2.0
Bandwidth	594MHz (18Gbps)
Input Interface	(3) HDMI 19-pin (female), (1) DisplayPort 20-pin (female)
Output Interface	(1) HDMI 19-pin (female)
Resolution	3840 x 2160 @ 60 Hz
Color Mode	24-bit
DDC	5 volts p-p (TTL)
Input Equalization	Automatic
Input Cable Length	Up to 20 ft
Output Cable Length	Up to 20 ft
Data Rate	1.65 Gbps per color
AUDIO	
Input Interface	(3) HDMI 19-pin (female), (1) DisplayPort 20-pin (female)
Output Interface	(1) 3.5 mm Stereo Audio
Impedance	600 Ohm
Frequency Response	20 Hz to 20 kHz
Nominal Level	0-1.0 V
Common Mode	Rejection at 60 dB
USB	
Signal Type	USB 2.0, 1.1, and 1.0 w/ internal hub
Input Interface	(1) USB Type C (female)
CONTROL	
Front Panel	Push Buttons with LED Indicators
LAN	RJ45
Hot Keys	Via Keyboard
OTHER	
Power Adapter	24V/1A, 14W max
Dimensions	8.8" W × 1.0" H × 3.9" D
Weight	1.6 lbs
Approvals	UL, CE, ROHS Compliant
Operating Temperature	+32 to +104°F (0 to +40°C)
Storage Temperature	-4 to 140°F (-20 to +60°C)
Humidity	10 to 70% (No Condensation)
Emulation	Keyboard and Mouse

WHAT'S IN THE BOX?

PART NO.	Q-TY	DESCRIPTION
SPS-U5P Unit	1	Seamless UHD Video Switcher With Multiview
	1	24V/1A power adapter
	1	Remoter
	1	User Manual

FRONT AND BACK



SPS-U5P Front

NAME	DESCRIPTION
HDMI 1	Press HDMI 1 button to select HDMI 1 as the input source. Long press it for 3 seconds to enter SINGLE mode. SINGLE mode means only one display window on the screen Note, when works on non-SINGLE mode, directly short press input buttons will be invalid.
HDMI 2	Press HDMI 2 button to select HDMI 2 as the input source. Long press it for 3 seconds to enter PIP Multiview mode.
HDMI 3	Press HDMI 3 button to select HDMI 3 as the input source. Long press it for 3 seconds to enter PBP Multiview mode.
DP	Press DP button to select DP as the input source. Long press it for 3 seconds to enter 3xWIN mode. 3xWIN mode is Three Windows Multiview mode.
USB-C	Press USB-C button to select USB-C (video only) as the input. Long press it for 3 seconds to enter 4xWIN mode. 4xWIN mode is Four Windows Multiview mode.
WINDOW	Press this button, the screen will show up one yellow border on window 1. Continue press this button the border will be shown on window 2 or 3... then press one input button such as HDMI 1, and then HDMI 1 will display on the current selected window. Long press this button for 3 seconds can select different output resolution with OSD information.

Please note: Press HDMI 3 and DP at the same time can enable/disable AUTO SWITCH function when SINGLE window display mode.

FRONT AND BACK (CONTINUED)



SPS-U5P Back

NAME	DESCRIPTION
HDBT OUTPUT	HDBaseT Scaling output up to 3840x2160 @ 60 Hz
HDMI OUTPUT	HDMI scaling output up to 3840x2160 @ 60 Hz
LR OUTPUT	3.5mm LR stereo audio output, 20Hz ~ 20kHz, 1.5Vrms max
INPUT	HDMI 1, HDMI 2, HDMI 3, DP, USB-C
RS232	External RS232 control Default Baud Rate: 9600, Data Bits:8, Parity: None Stop Bits:1 3 way 3.5mm phoenix connector TX means Switcher → PC; RX means Switcher ← PC; G means Ground Baud Rate can be changed by OSD menu
24V	24V power adapter to plug in



SPS-U5P Side

Please note: USB-A port is here is only for firmware upgrade.

INSTALLATION

Follow these simple steps to set up your SM-EDPN-PRO and get it running smoothly. No special tools or software are required.

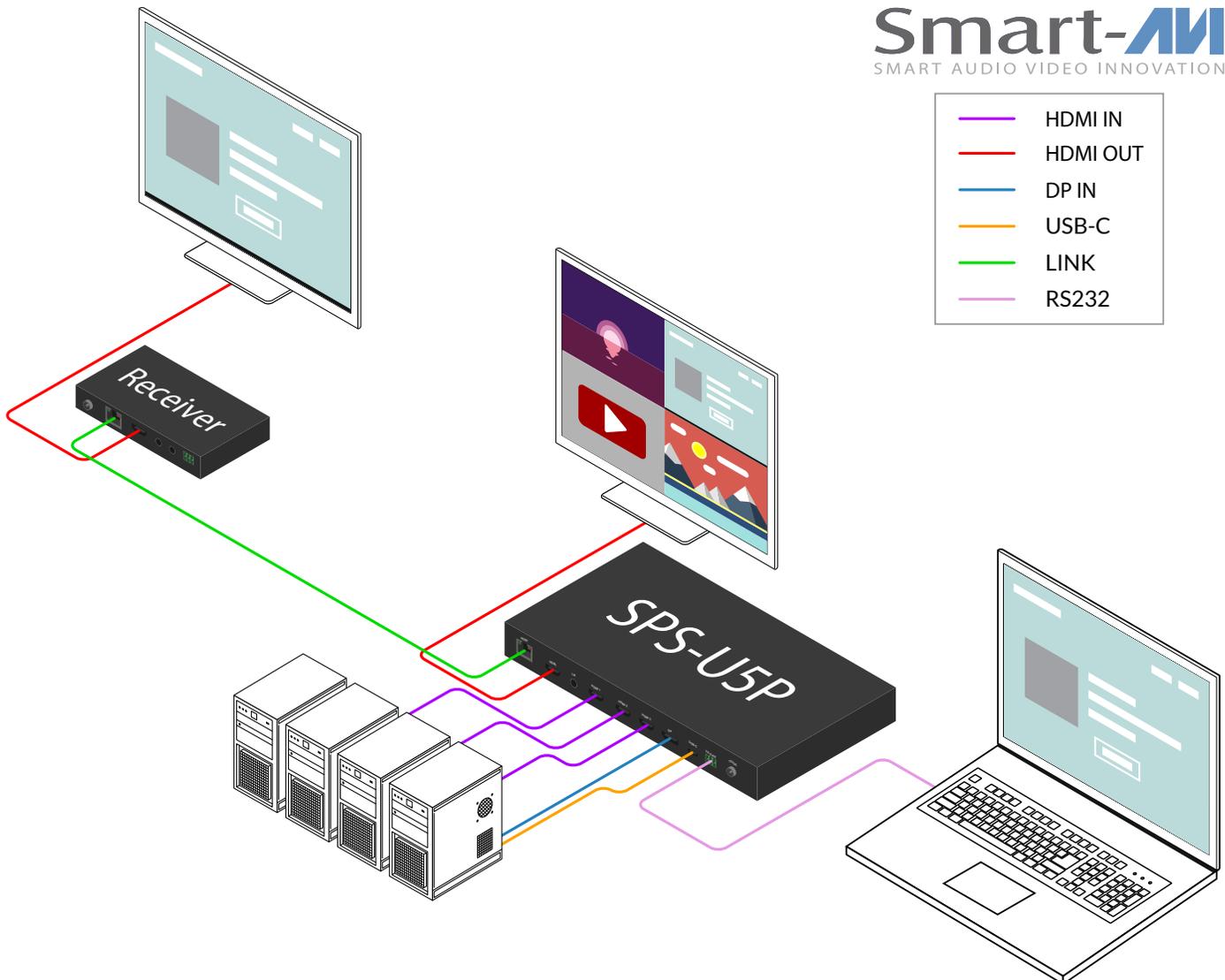
1. Make sure the unit and all connected devices are turned off before you begin.
2. Use the appropriate video cables to connect your source devices to the input ports:
 - HDMI 1 / HDMI 2 / HDMI 3 for HDMI sources;
 - DP (DisplayPort) for DisplayPort sources;
 - USB-C for compatible USB-C video sources.
3. Choose one of the output options to connect your display:
 - HDMI (OUTPUT) for standard HDMI display connection;
 - HDBT (HDBaseT) for long-distance transmission over Ethernet cable.
4. If using HDBT output, connect a network cable from the HDBT port to a compatible HDBaseT receiver connected to your remote display.
5. For external control, connect an RS232 cable to the RS232 (TX / G / RX) terminal block.
6. Plug the power adapter into the 24V DC input and connect it to a power source.
7. Turn on the unit first, then power on all connected input devices and your display.

Note: Multiple input sources can be connected simultaneously, but only one is active at a time depending on switching/control.

Note: Ensure all cables are securely connected to avoid signal issues.

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	HDMI IN
	HDMI OUT
	DP IN
	USB-C
	LINK
	RS232



MULTIVIEW

The Switcher support 5 categories of Multiview display modes:

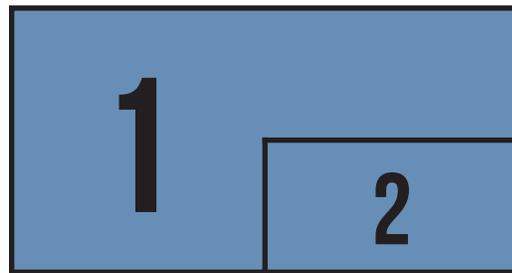
- SINGLE
- PIP
- PBP
- 3xWIN
- 4xWIN

Users can select different operations for different Multiview modes as following:

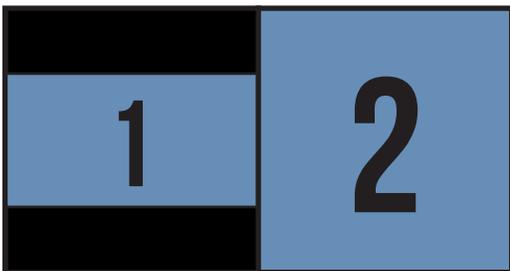
- SINGLE: Inputs selection
- PIP: Inputs selection, Sub window size and position selection
- PBP, 3xWIN, 4xWIN: Inputs selection, Layout Mode, Display Aspect



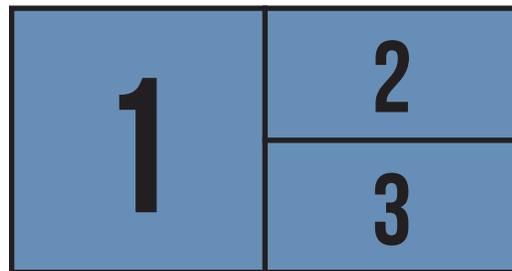
Single Mode



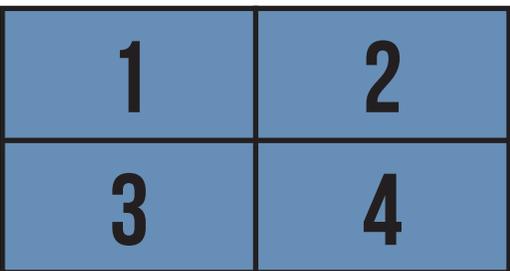
PiP Mode



PBP Mode



3xWin Mode



4xWin Mode

User can do more layouts via RS232 commands or OSD menu navigation and support up to 20 scenes saving and loading function by command

OSD MENU NAVIGATION

Total 6 buttons used for OSD navigation, MENU, EXIT, UP, DOWN, LEFT, RIGHT.

Menu contents as following:

NAME	RESOLUTION	3840x2160p 60	3840x2160p 60	
Output	VKA	BLACKSCREEN	BLACKSCREEN, BLUESCREEN	
	4K-Auto	ON	ON,OFF	
	ITC	OFF	ON,OFF	
Multiview	Single	Input select	HDMI1, ...	
		PIP	Win1 Select	HDMI1, ...
			Win2 Select	HDMI1, ...
			PIP Position	RightBottom, ...
			PIP Size	SMALL, ...
	PBP	Win1 Select	HDMI1, ...	
		Win2 Select	HDMI1, ...	
		MODE	1, 2	
		Aspect	Full, 16:9	
	3xWIN	Win1 Select	HDMI1, ...	
		Win2 Select	HDMI1, ...	
		Win3 Select	HDMI1, ...	
		MODE	1, 2	
		Aspect	Full, 16:9	
	4xWIN	Win1 Select	HDMI1, ...	
		Win2 Select	HDMI1, ...	
		Win3 Select	HDMI1, ...	
		Win4 Select	HDMI1, ...	
		MODE	1, 2	
	Audio	Audio Select	WIN1	WIN1, HDMI1, ...
Volume		100	0...100	
AUDIO-MUTE		OFF	ON, OFF	

RS-232 COMMANDS

Note: All the commands begin with SET or GET, end with Carriage Return (CR).

<CR> Represents Carriage Return (CR).

All return messages are always end with CR.

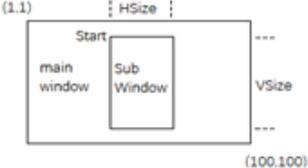
COMMAND	DESCRIPTION
GET HELP <CR>	Get the Commands list
SET RESET <CR>	Recover to default setting
GET VERSION <CR>	Get firmware version Return: VERSION w (w is version number)
SET BAUDRATE w <CR>	w is 9600, 19200, 38400,57600 or 115200 Return: BAUDRATE w
GET BAUDRATE <CR>	Return: BAUDRATE w

Switching Command, only available on SINGLE Mode

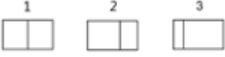
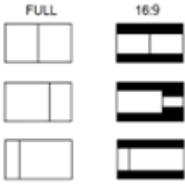
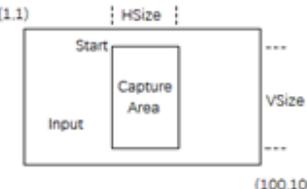
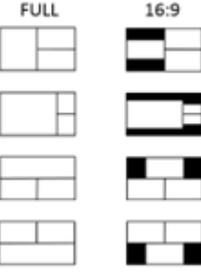
Output Command

COMMAND	DESCRIPTION
SET AUTO SWITCH w <CR>	w is ON or OFF, default OFF Return: AUTO SWITCH w
GET AUTO SWITCH <CR>	Return: AUTO SWITCH w
SET IN SOURCE w <CR>	w is one of the following: HDMI1, HDMI2, HDMI3, DP, USB-C Return: IN SOURCE w
GET IN SOURCE <CR>	Get current input channel selection information Return: IN SOURCE w
GET IN RESOLUTION <CR>	Get current input resolution Return: IN RESOLUTION w (w is input resolution)
GET IN STATUS <CR>	Get status of all input ports x is HDMI1...HDMI4,USB-C Return: IN STATUS x VALID(or INVALID) If input port is valid, Return: IN STATUS x InputRes ColorSpace ColorDepth
SET OUT RESOLUTION w <CR>	w is one of the following, default: 3840x2160p60 4096x2160p60, 4096x2160p50, 3840x2160p60, 3840x2160p50, 3840x2160p30, 3840x2160p25, 1920x1200p60RB, 1920x1080p60, 1920x1080p50, 1360x768p60, 1280x800p60, 1280x720p60, 1280x720p50, 1024x768p60, AUTO, USER Return: OUT RESOLUTION w
GET OUT RESOLUTION <CR>	Get current output resolution setting Return: OUT RESOLUTION w
SET RESO-USER Width Height <CR>	Set user define output resolution: Width is horizontal active pixels; Height is vertical active lines. For user define output resolution,the frame rate is always 60 Hz Return: RESO-USER Width Height <CR>
GET RESO-USER <CR>	Return: RESO-USER Width Height <CR>
SET OUT HDCP w <CR>	w is one of following, default FORCE-OFF FORCE-1.4,FORCE-2.2,FORCE-OFF Return: OUT HDCP w
GET OUT HDCP <CR>	Return: OUT HDCP w
SET OUT VKA w <CR>	w is BLUESCREEN or BLACKSCREEN. Default BLACKSCREEN. It is for no signal display Return: OUT VKA w
GET OUT VKA <CR>	Return: OUT VKA w

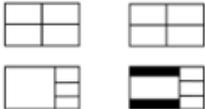
RS-232 COMMANDS (CONTINUED)

COMMAND	DESCRIPTION
SET OUT ITC w <CR>	w is ON or OFF, default OFF Return: OUT ITC w
GET OUT ITC <CR>	Return: OUT ITC w
SET MULTIVIEW w <CR>	Select one Multiview mode for current display w is one of the following, default SINGLE SINGLE, PIP, PBP, 3xWIN, 4xWIN Return: MULTIVIEW w
GET MULTIVIEW <CR>	Get the current Multiview mode Return: MULTIVIEW w
SET WINDOWx IN y <CR>	Select one input for one display window for the current Multiview mode. x is one of 1, 2, 3 or 4 y is one of HDMI1, HDMI2, HDMI3, DP, USB-C Return: WINDOWx IN y
GET WINDOWx IN <CR>	This command to get which is the input source for one display window for the current Multiview mode Return: WINDOWx IN y
SET FREEZE-WINx w	Freeze the display window,x is one of 1, 2, 3,4 or ALL, w is ON or OFF Return: FREEZE-WINx w
GET FREEZE-WINx	x is one of 1, 2, 3,4. Return: FREEZE-WINx w (w is ON or OFF)
SET PIP POS w <CR>	This command to select the PIP sub window position. w is one of the following, default RightBottom LeftTop, LeftBottom, RightTop, RightBottom, USER Return: PIP POS w
GET PIP POS <CR>	This command to get the PIP sub window position Return: PIP POS w
SET PIP SIZE w <CR>	This command to select the PIP sub window size. w is one of the following, default LARGE SMALL,MIDDLE, LARGE, USER Return: PIP SIZE w
GET PIP SIZE <CR>	Return: PIP SIZE w
SET PIP USER HStart VStart HSize VSize <CR>	Return: PIP USER HStart VStart HSize VSize This command allows users to customize a PIP layout include sub window position and size. This customized PIP layout will replace other pre-defined PIP modes (such as Left-Top,LARGE) and display on the screen After the user enters SET PIP POS or SET PIP SIZE command,the PIP USER will become invalid  Please note HStart plus HSize less than or equal to 101 VStart plus VSize less than or equal to 101
GET PIP USER <CR>	Return: PIP USER HStart VStart HSize VSize

RS-232 COMMANDS (CONTINUED)

COMMAND	DESCRIPTION
SET PBP MODE w <CR>	<p>Set the PBP display mode w is one of 1,2 or 3, default 1</p>  <p>Return: PBP MODE w</p> <p>Please note for PBP mode 3, window2 can capture part of the input image area. It is main used for presenter show when work with conference camera situations. The capture area can be defined by SET PBP-PRESENTER command</p>
GET PBP MODE <CR>	Return: PBP MODE w
SET PBP ASPECT w <CR>	<p>Set the PBP window display aspect w is FULL or 16:9, default FULL</p>  <p>Return: PBP ASPECT w</p>
GET PBP ASPECT <CR>	Return: PBP ASPECT w
SET PBP-PRESENTER HStart VStart HSize VSize <CR>	<p>Set window 1 capture area for PBP mode 3 This command only valid when the switcher already work on PBP mode 3 Return: PBP-PRESENTER HStart VStart HSize VSize</p>  <p>Default HStart 38, VStart 13, HSize 25, VSize 75</p> <p>Please note HStart plus HSize less than or equal to 101 VStart plus VSize less than or equal to 101</p>
GET PBP-PRESENTER <CR>	Return: PBP-PRESENTER HStart VStart HSize VSize
SET 3xWIN MODE w <CR>	<p>Set the 3xWIN display mode w is one of 1,2,3 or 4, default 1</p>  <p>Return: 3xWIN MODE w</p>
GET 3xWIN MODE <CR>	Return: 3xWIN MODE w
SET 3xWIN ASPECT w <CR>	<p>Set the 3xWIN window display aspect w is FULL or 16:9, default FULL</p>  <p>Return: 3xWIN ASPECT w</p>
GET 3xWIN ASPECT <CR>	Return: 3xWIN ASPECT w

RS-232 COMMANDS (CONTINUED)

COMMAND	DESCRIPTION
SET 4xWIN MODE w <CR>	Set the 4xWIN display mode w is 1 or 2, default 1 1 2 
GET 4xWIN MODE <CR>	Return: 4xWIN MODE w
SET 4xWIN ASPECT w <CR>	Set the 4xWIN window display aspect w is FULL or 16:9, default FULL FULL 16:9 
GET 4xWIN ASPECT <CR>	Return: 4xWIN ASPECT w
GET MULTIVIEW-SYNC <CR>	Return Multiview layout information
SET SAVE SCENE w <CR>	Save current display scene w is 1, 2,...20 Return: SAVE SCENE w
SET LOAD SCENE w <CR>	Load display scene w is 1, 2,...20 Return: LOAD SCENE w

Audio Command

COMMAND	DESCRIPTION
SET AUDIO SOURCE w <CR>	w is one of the following: WIN1, HDMI1, HDMI2, HDMI3, DP, USB-C Return: AUDIO SOURCE w
GET AUDIO SOURCE <CR>	Return: AUDIO SOURCE w
SET AUDIO VOL+ <CR>	Increase audio out volume Return: AUDIO VOL w (w is the volume value)
SET AUDIO VOL- <CR>	Decrease audio out volume Return: AUDIO VOL w (w is the volume value)
SET AUDIO VOL w <CR>	Set audio volume value w is 0,1,...,or 100, default 100 For example: SET AUDIO VOL 100 Return: AUDIO VOL w
GET AUDIO VOL <CR>	Return: AUDIO VOL w
SET AUDIO-MUTE w <CR>	Mute or unmute audio output Here w is ON or OFF, default OFF Return: AUDIO-MUTE w
GET AUDIO-MUTE <CR>	Return: AUDIO-MUTE w

RS-232 COMMANDS (CONTINUED)

EDID Command

The following commands are used to set EDID mode for the inputs.

COMMAND	DESCRIPTION
SET IN EDIDMODE w <CR>	w is one of the following: 4K60-2.0, 4K60-5.1, 4K60-7.1, 4K30-2.0, 4K30-5.1, 4K30-7.1, 1080p60-2.0, 1080p60-5.1, 1080p60-7.1, 1920x1200, 1680x1050, 1600x1200, 1440x900, 1360x768, 1280x1024, 1024x768, 720p, AUTO, USER Default: 4K60-2.0 Return: IN EDIDMODE w
SET EDID-USER w <CR>	Switcher can only support 256 bytes EDID-USER data. w is 256 bytes EDID data. Return: EDID-USER OK
GET IN EDIDMODE <CR>	Return: IN EDIDMODE w

EDID AND HDCP HANDLE

User can select following EDID modes by RS232 command or OSD menu navigation.

NUMBER	EDID MODE	NUMBER	EDID MODE
1	4K60-2.0CH	11	1440x900
2	4K60-5.1CH	12	1360x768
3	4K30-2.0CH	13	1280x1024
4	4K30-5.1CH	14	1024x768
5	1080P-2.0CH	15	AUTO
6	1080P-5.1CH	16	4K60-7.1CH
7	720P	17	4K30-7.1CH
8	1920x1200	18	1080P-7.1CH
9	1680x1050	19	USER
10	1600x1200		

The HDMI output support 3 HDCP options: FORCE-1.4, FORCE-2.2, FORCE-OFF. User can select it by RS232 command.

VIDEO AND AUDIO

The switcher support multiple resolution video input up to 3840x2160@60, and support multiple audio format such as LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 channel pass through function via HDMI cable.

User can control the audio volume when the audio input is LPCM format.

The switcher support following video output resolution by a powerful scaling engine.

NUMBER	RESOLUTION	NUMBER	RESOLUTION	NUMBER	RESOLUTION
1	4096x2160p 60Hz	6	3840x2160p 25Hz	11	1280x800p 60Hz
2	4096x2160p 50Hz	7	1920x1200p60Hz RB	12	1280x720p 60Hz
3	3840x2160p 60Hz	8	1920x1080p 60Hz	13	1280x720p 50Hz
4	3840x2160p 50Hz	9	1920x1080p 50Hz	14	1024x768 60Hz
5	3840x2160p 30Hz	10	1360x768p 60Hz		

REMOTE CONTROL

NUMBER	DESCRIPTION
1	Return/Exit
2	Video input selection
3	OSD menu navigation Menu (Enter), UP, DOWN, LEFT, RIGHT
4	4K30-5.1CH
5	1080P-2.0CH
6	1080P-5.1CH



TROUBLESHOOTING

No Power

- Make sure that the power adapter is securely connected to the power connector of the unit.
- Check the output voltage of the power supply and make sure that the voltage value is around 12VDC.
- Replace the power supply.

No Video

- Check if all the video cables are connected properly.
- Connect the computer directly to the monitor to verify that your monitor and computer are functioning properly.
- Restart the computers.

Keyboard is not working

- Check if the keyboard is properly connected to the unit.
- Check if the USB cables connecting the unit and the computers are properly connected.
- Try connecting the USB on the computer to a different port.
- Make sure that the keyboard works when directly connected to the computer.
- Replace the keyboard.

Mouse is not working

- Check if the mouse is properly connected to the unit.
- Try connecting the USB on the computer to a different port.
- Make sure that the mouse works when directly connected to the computer.
- Replace the mouse.

No Audio

- Check if all the audio cables are connected properly.
- Connect the speakers directly to the computer to verify that the speakers and the computer audio are functioning properly.
- Check the audio settings of the computer and verify that the audio output is through the speakers.

TECHNICAL SUPPORT

For product inquiries, warranty questions, or technical questions, please contact info@smartavi.com.

LIMITED WARRANTY STATEMENT

A. Extent of limited warranty

SmartAVI, Inc. warrants to the end-user customers that the SmartAVI product specified above will be free from defects in materials and workmanship for the duration of 1 year, which duration begins on the date of purchase by the customer. Customer is responsible for maintaining proof of date of purchase.

SmartAVI limited warranty covers only those defects which arise as a result of normal use of the product, and do not apply to any:

- a. Improper or inadequate maintenance or modifications
- b. Operations outside product specifications
- c. Mechanical abuse and exposure to severe conditions

If SmartAVI receives, during applicable warranty period, a notice of defect, SmartAVI will at its discretion replace or repair defective product. If SmartAVI is unable to replace or repair defective product covered by the SmartAVI warranty within reasonable period of time, SmartAVI shall refund the cost of the product.

SmartAVI shall have no obligation to repair, replace or refund unit until customer returns defective product to SmartAVI.

Any replacement product could be new or like new, provided that it has functionality at least equal to that of the product being replaced.

SmartAVI limited warranty is valid in any country where the covered product is distributed by SmartAVI.

B. Limitations of warranty

To the extent allowed by local law, neither SmartAVI nor its third party suppliers make any other warranty or condition of any kind whether expressed or implied with respect to the SmartAVI product, and specifically disclaim implied warranties or conditions of merchantability, satisfactory quality, and fitness for a particular purpose.

C. Limitations of liability

To the extent allowed by local law the remedies provided in this warranty statement are the customers sole and exclusive remedies.

To the extent allowed by local law, except for the obligations specifically set forth in this warranty statement, in no event will SmartAVI or its third party suppliers be liable for direct, indirect, special, incidental, or consequential damages whether based on contract, tort or any other legal theory and whether advised of the possibility of such damages.

D. Local law

To the extent that this warranty statement is inconsistent with local law, this warranty statement shall be considered modified to be consistent with such law.

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NOTICE

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