ADERTECH

SMV-CH5PIPK

Seamless UHD Video Switcher
With Multiview and KVM Control

Version 1.5



Warning

- Do not expose this device to Rain, Moisture, and Dripping
- Only use accessories specified by the manufacture
- Unplug this device during Lightning Storms
- The manual is for reference only, maybe updated without further notice

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Introduction

The 5x Inputs and 2x Outputs seamless multiview video switcher with USB-KVM control was developed for the purpose of multiple sources displayed on a single screen and supporting high input and output resolutions.

The switcher can combine up to four video signals onto a single UHD or HD displayer.

The switcher support 4x USB-Type A input which connected to PC and 2x USB output which connected to Mouse and Keyboard

User can easily manage it via the front buttons, remoter, RS232 or TCP/IP commands.

The HDMI B mirror output port can be used for audio amplifier, video capture (with HDMI to USB dongle), or remote display (with HDBaseT convert box)

Application Field:

Home Theatre; Video Conference; Security Monitoring; Presentation and Broadcasting; Teaching System; Financial Stock Analysis; Game E-Sports; Medical Display.

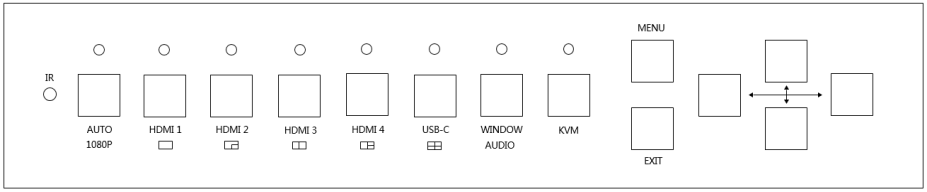
1. Features

- 4x HDMI, 1x USB-C(video only) inputs and 2x HDMI mirror outputs
- Support HDMI 2.0,HDCP 2.2, support video resolution up to 3840x2160@60
- Support 5 categories of multiview modes, SINGLE, PIP, PBP, 3xWIN, 4xWIN
- Seamless switching on single window display mode
  Fast switching on non-single window display modes
- Support 4x USB Host devices and Mouse/Keyboard for USB-KVM control
  Support Mouse/Keyboard control with Windows, Linux and Mac platform
- Support volume control and independently audio selection
  Support LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 audio channel
- Support OSD navigation for advanced setting
- Support USB Roaming for USB-Mouse KVM control

- Extensive EDID and HDCP control

2. Panel Layout

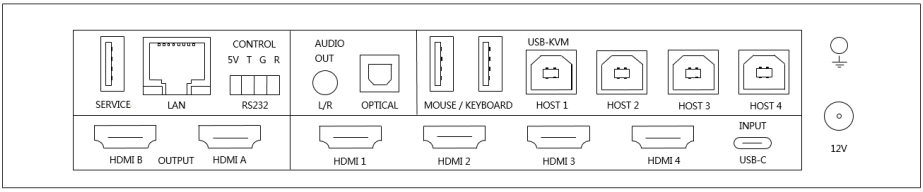
Front



Name	Description
AUTO	Press **AUTO** button to enable or disable auto switching function when single window display mode Long press this button for 3 seconds will change the output resolution to 1080p60
HDMI 1, HDMI 2 **HDMI 3, HDMI 4** **USB-C**	Press these buttons to direct select HDMI 1, 2, 3, 4 or USB-C (video only) as the input source for WIN 1 display Long press these buttons for 3 seconds to select SINGLE,PIP, PBP,3xWIN or 4xWIN Multiview mode
WINDOW, AUDIO	Continue press this button there will be a border shown on window 1 or 2...,then press one input button such as HDMI 1**,** and then HDMI 1 will displayed on the current selected window. Long press this button for 3 seconds, there will be an Audio selection list on the screen, use ▲▼ and Enter (Menu) to select. Note, when work on non-SINGLE mode, the LED is always lit.
KVM	Continue Press this button, the screen will show up one

Name	Description
	border on window 1, 2, 3 or 4, then user can select one display window as KVM source. For example if select WIN 2 as KVM source, then rear USB-Keyboard / Mouse will switched to the USB-Host device which displayed on WIN 2.
MENU,EXIT, ↑ ↓ ← →	OSD Menu Navigation buttons

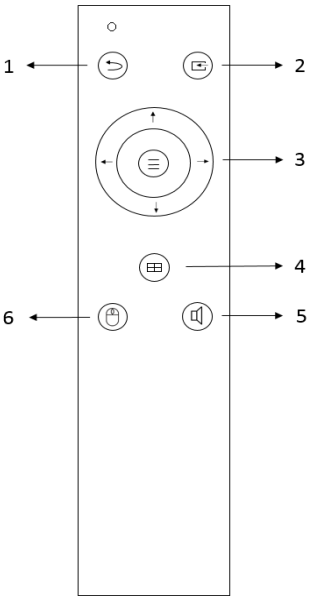
Rear



Name	Description
HDMI A, B out	HDMI scaling output up to 3840x2160@60 **HDMI A** is the main output
INPUTs	HDMI 1, HDMI 2, HDMI 3, HDMI 4, USB-C(Video only)
USB-Service	Used for firmware update
LAN	TCP/IP control. Default parameters as following IP address: 192.168.0.247; Sub Mask: 255.255.255.0 GATEWAY: 192.168.0.1; NETPORT: 2000 All the parameters can be changed by RS232 command
RS232 control	4 way male phoenix connector Default baud rate 9600, 8 data bits, 1 stop bit, no parity Baud rate can be changed via OSD menu **5V** means 5V output; **T** means Switcher → PC **R** means Switcher ← PC **G** means Ground
AUDIO OUTPUT	3.5mm L+R output and Toslink-optical digital output
KVM	USB Connectors which connected to PC or

	Mouse/Keyboard 4x USB Type B ports connected to PC 2x USB Type A ports to be plugged in mouse or keyboard The binding relationship between video inputs and USB Host devices as following HDMI 1<> Host 1, HDMI 2<> Host 2, HDMI 3<> Host 3, HDMI 4<> Host 4, USB-C <> Host 4 HDMI 4 and USB-C can' t be used as KVM source meanwhile
12V	12V power adapter to plug in

3. Remoter



Number	Description
1	Return/Exit
2	Video input selection
3	OSD menu navigation Menu (Enter),UP, DOWN, LEFT,RIGHT
4	Multiview mode selection
5	Audio input selection
6	USB-KVM selection. The same with the front KVM button function

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

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

5. 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
Please note, USB-C input port can only accept LPCM 2.0 audio
The switcher support following video output resolution by a powerful scaling engine

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

6. Multiview

The Switcher support 5 categories of multiview display modes

SINGLE, PIP, PBP, 3xWIN, 4xWIN

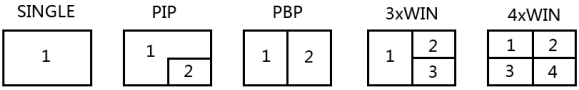
Users can select different operations for different Multiview modes as following:

SINGLE: Inputs selection

PIP: Inputs selection, Display Ratio selection, Sub window size and position selection

PBP, 3xWIN, 4xWIN: Inputs selection, Window Ratio selection, Display aspect

Multiview window distribution as following



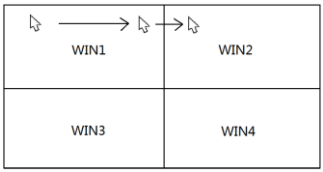
User can do more layouts via RS232 commands or OSD menu navigation

7. USB Roaming and hotkey control

The KVM button on front panel can direct select KVM window

USB Roaming can be enabled when works on PBP, 3xWIN or 4xWIN mode

The following sketch map shows USB Roaming when moving mouse cursor from left (WIN1) to right for 4xWIN display mode



There are some hotkeys of keyboard for KVM control:

1. Ctrl + Ctrl + 1,2,3 or 4, select keyboard/mouse window
2. Ctrl + Ctrl + R + N, disable USB Roaming
3. Ctrl + Ctrl + R + Y, Enable USB Roaming
4. Ctrl + Ctrl + M + 1,2,3,4 or 5 switching multiview mode to SINGLE, PIP, PBP, 3xWIN, or 4xWIN mode
5. Ctrl + Ctrl + W + m + S + n, display source n on window m. m means window number, n is input port number (1 means HDMI 1 input,…, 5 means USB-C input).
6. Ctrl + Ctrl + A + n, n is 1, 2, …5, or A, switch audio source, 1 means HDMI 1, A means WIN 1 (the source of window 1)

7. Ctrl + Ctrl + A + N, audio mute
8. Ctrl + Ctrl + A + Y, audio unmute

Please note:

a. The "+" here represents a sequence, not an actual symbol or letter
b. After press Ctrl + Ctrl, system will enter Hotkey waiting, if the left Keys pressing not finished in 5 seconds, hotkeys will be time out
C. After press Ctrl + Ctrl, system will enter Hotkey waiting, if then press Ctrl or ESC,hotkeys operation will be terminated

8. OSD Menu Navigation

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

Menu contents as following:

Output	Resolution	3840x2160p60	3840x2160p60,...
	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
		Aspect	Full,16:9
AUDIO	Audio Select	WIN1	WIN1,HDMI1,...
	Volume	100	0..100
	AUDIO-MUTE	OFF	ON, OFF
System	Language/语言	English	English, 中文
	EDID	4K60-2.0	4K60-2.0,...
	USB Roaming	OFF	ON, OFF
	Baud rate	9600	9600, 19200, 38400,57600, 115200
	Reset		
	FW Version		Read only
	IP Address		Read only

Please note

For **ITC** setting, suggest **OFF** for video display and **ON** for PC especially desktop display, default setting is **OFF**

9. Specification

Band Width	594MHz (18Gbps), HDMI 2.0, HDCP2,2
Audio Format	LPCM, AC3, DD+, DTS, DTS-HD Up to 7.1 channel
Input ports	4x HDMI, 1x USB-C, 4x USB-B (Host)
Output ports	2x HDMI, 2x USB-A (Device), 1x 3.5mm LR audio, 1x Toslink digital audio
Power Supply	12V/3A ,15W max
Operating	0 to +40°C (+32 to +104 °F)

Temperature	
Operating Humidity	10 to 70 % RH (non-condensing)
ESD	Air: ± 8KV, Contact: ± 4KV,
Dimensions	L219 x W146 x H44 mm
Mass (Main Unit)	1.2kg

10. Package Contents

Item	Quantity
Switcher Unit	1
12V/3A power adapter	1
4-way male captive screw connector	1
User Manual	1
Remoter	1
Bracket	2

11. RS232 command

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

↵ Represents Carriage Return (CR). All return messages are always end with CR.

System and IP command

Command	Details
GET HELP↵	Get the Commands list
SET RESET↵	Recover to default setting

GET VERSION↵	Get firmware version Return: VERSION w (w is version number)
SET BAUDRATE w↵	w is 9600, 19200, 38400,57600 or 115200 Return: BAUDRATE w
GET BAUDRATE w↵	Return: BAUDRATE w
SET IP ADDRESS w↵	For example: SET IP ADDRESS 192.168.0.247 Return: IP ADDRESS w
GET IP ADDRESS↵	Return: IP ADDRESS w
SET SUBMASK w↵	For example: SET SUBMASK 255.255.255.0 Return: SUBMASK w
GET SUBMASK↵	Return: SUBMASK w
SET GATEWAY w↵	For example: SET GATEWAY 192.168.0.1 Return: GATEWAY w
GET GATEWAY↵	Return: GATEWAY w
SET NETPORT w↵	For example: SET NETPORT 2000 Return: NETPORT w
GET NETPORT↵	Return: NETPORT w
SET NETWORK-INFO IP PORT SUBMASK GATEWAY↵	For Example: SET NETWORK-INFO 192.168.0.247 2000 255.255.255.0 192.168.0.1 Return: NETWORK-INFO 192.168.0.247 2000 255.255.255.0 192.168.0.1
GET NETWORK-INFO↵	Return: NETWORK-INFO IP PORT SUBMASK GATEWAY

Switching command, only available on SINGLE mode

Commands	Details
SET AUTO SWITCH w↵	w is ON or OFF, default OFF Return: AUTO SWITCH w
GET AUTO SWITCH↵	Return: AUTO SWITCH w

SET IN SOURCE w↵	w is one of the following: HDMI1, HDMI2, HDMI3, HDMI4, USB-C Return: IN SOURCE w
GET IN SOURCE↵	Get current input channel selection information Return: IN SOURCE w
GET IN RESOLUTION↵	Get current input resolution Return: IN RESOLUTION w (w is input resolution)
GET IN STATUS↵	Get status of all input ports x is HDMI1…HMDI4,USB-C Return: IN STATUS x VALID(or INVALID) If input port is vaild, Return: IN STATUS x InputRes ColorSpace ColorDepth

Output command

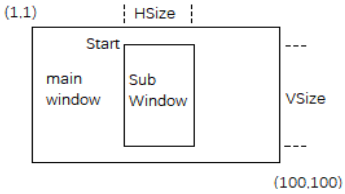
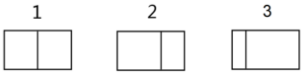
Commands	Details
SET OUT RESOLUTION w↵	w is one of the following, default: 3840x2160p60 4096x2160p60, 4096x2160p50, 3840x2160p60, 3840x2160p50, 3840x2160p30, 3840x2160p25, 1920x1200p60RB, 1920x1080p60, 1920x1080p50, 1360x768p60, 1280x800p60, 1280x720p60, 1280x720p50, 1024x768p60, AUTO, USER Return: OUT RESOLUTION w
GET OUT RESOLUTION↵	Get current output resolution setting Return: OUT RESOLUTION w
SET RESO-USER Width Height↵	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 60Hz

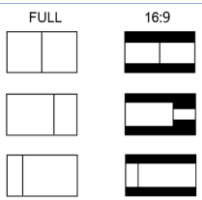
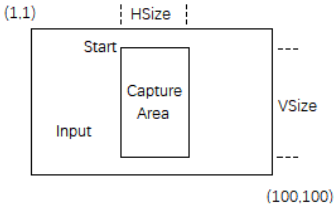
	Return: RESO-USER Width Height↵
GET RESO-USER↵	Return: RESO-USER Width Height↵
SET OUT 4K-AUTO w↵	w is ON or OFF, default ON If we set 4K output to a displayer which can’ t support 4K, then the ON setting can change the resolution to 1080p or 4K-4:2:0 Return: OUT 4K-AUTO w
GET OUT 4K-AUTO↵	Get current OUT 4K-AUTO mode Return: OUT 4K-AUTO w
SET OUT HDCP w↵	w is one of the following, default OFF FORCE-1.4,FORCE-2.2,FORCE-OFF Return: OUT HDCP w
GET OUT HDCP↵	Return: OUT HDCP w
SET OUT VKA w↵	w is BLUESCREEN or BLACKSCREEN. Default BLACKSCREEN. It is for no signal display Return: OUT VKA w
GET OUT VKA↵	Return: OUT VKA w
SET OUT ITC w↵	w is ON or OFF, default OFF Return: OUT ITC w
GET OUT ITC↵	Return: OUT ITC w

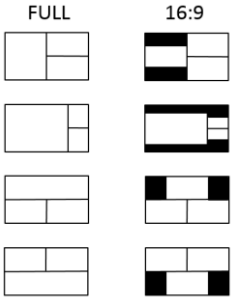
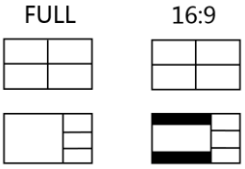
Multiview command

Commands	Details
SET MULTIVIEW w↵	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↵	Get the current Multiview mode Return: MULTIVIEW w

SET WINDOWx IN y↵	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, HDMI4, USB-C Return: WINDOWx IN y
GET WINDOWx IN↵	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↵	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↵	This command to get the PIP sub window position Return: PIP POS w
SET PIP SIZE w↵	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↵	Return: PIP SIZE w
SET PIP USER HStart VStart HSize VSize↵	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 LeftTop,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↵	Return: PIP USER HStart VStart HSize VSize
SET PBP MODE w↵	Set the PBP display mode w is one of 1,2 or 3, default 1  Return: PBP MODE w Please note for PBP mode 3, the window 2 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
GET PBP MODE↵	Return: PBP MODE w
SET PBP ASPECT w↵	Set the PBP window display aspect w is FULL or 16:9, default FULL

	 Return: PBP ASPECT w
GET PBP ASPECT↵	Return: PBP ASPECT w
SET PBP-PRESENTER HStart VStart HSize VSize↵	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  Default HStart 38, VStart 13, HSize 25, VSize 75 Please note HStart plus HSize less than or equal to 101 VStart plus VSize less than or equal to 101
GET PBP-PRESENTER↵	Return: PBP-PRESENTER HStart VStart HSize VSize
SET 3xWIN MODE w↵	Set the 3xWIN display mode w is one of 1,2,3 or 4, default 1  Return: 3xWIN MODE w
GET 3xWIN MODE↵	Return: 3xWIN MODE w

SET 3xWIN ASPECT w↵	Set the 3xWIN window display aspect w is FULL or 16:9, default FULL  Return: 3xWIN ASPECT w
GET 3xWIN ASPECT↵	Return: 3xWIN ASPECT w
SET 4xWIN MODE w↵	Set the 4xWIN display mode w is 1 or 2 ,default 1  Return: 4xWIN MODE w
GET 4xWIN MODE↵	Return: 4xWIN MODE w
SET 4xWIN ASPECT w↵	Set the 4xWIN window display aspect w is FULL or 16:9, default FULL  Return: 4xWIN ASPECT w
GET 4xWIN ASPECT↵	Return: 4xWIN ASPECT w
GET MULTIVIEW-SYNC↵	Return Multiview layout information
SET SAVE SCENE w↵	Save current display scene w is 1, 2,...20 Return: SAVE SCENE w
SET LOAD SCENE w↵	Load display scene w is 1, 2,...20

	Return: LOAD SCENE w

Audio command

Commands	Details
SET AUDIO SOURCE w↵	w is one of the following: WIN1, HDMI1, HDMI2, HDMI3, HDMI4, USB-C Return: AUDIO SOURCE w
GET AUDIO SOURCE↵	Return: AUDIO SOURCE w
SET AUDIO VOL+↵	Increase audio out volume Return: AUDIO VOL w (w is the volume value)
SET AUDIO VOL-↵	Decrease audio out volume Return: AUDIO VOL w (w is the volume value)
SET AUDIO VOL w↵	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↵	Return: AUDIO VOL w
SET AUDIO-MUTE w↵	Mute or unmute audio output Here w is ON or OFF, default OFF Return: AUDIO-MUTE w
GET AUDIO-MUTE↵	Return: AUDIO-MUTE w

KVM command

Commands	Details
SET KVM w↵	w is one of WIN1, WIN2, WIN3, WIN4 Return: KVM w
SET USB ROAMING w↵	w is ON or OFF, default OFF Return: USB ROAMING w
GET USB ROAMING ↵	Return: USB ROAMING w

Please note when work on SINGLE display mode, the KVM function of current

selected source is always activated

EDID command

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

Commands	Details
SET IN EDIDMODE w↵	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↵	Switcher can only support 256 bytes EDID-USER data. w is 256 bytes EDID data. Return: EDID-USER OK
GET IN EDIDMODE↵	Return: IN EDIDMODE w