4K60 2x1 Multiviewer
Seamless UHD Video Switcher



User Manual

VER 1.1

Thank you for purchasing this product

For optimum performance and safety, please read these instructions carefully before connecting, operating or adjusting this product. Please keep this manual for future reference.

Surge protection device recommended

This product contains sensitive electrical components that may be damaged by electrical spikes, surges, electric shock, lighting strikes, etc. Use of surge protection systems is highly recommended in order to protect and extend the life of your equipment.

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1. Introduction

This 4K60 2x1 Multiviewer Seamless UHD Video Switcher was developed for the purpose of supporting higher output resolution (4K@60) for multiple sources on a single screen. It can combine two video signals onto a single UHD or HD displayer. The user can manage each input, and create combinations of the two inputs on a single display, as well as adjust the position of either input.

This product supports 4 display modes, within the mode range, users can freely switch 2-channel HD input signals. It can realize single screen display and multiview display on a single screen.

This device supports full range of input video resolutions up to 4K@60 (RB) and audio RCA /Optical de-embedding supported for external audio distribution systems.

This device can be controlled via front panel buttons, IR remote, OSD menu navigation, Controller software, RS-232 commands.

2. Features

- ☆ HDMI 2.0b, HDCP 2.2 and HDCP 1.x compliant
- ☆ Support 18Gbps video bandwidth
- ☆ Input and output resolutions support up to 4K2K@60 4:4:4
- ☆ Support LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 audio channel
- ☆ Seamless switching between input channels and combined multiple images on single UHD monitor
- ☆ Up to 4 display modes: SINGLE, PIP, PBP (1), PBP (2)
- ☆ Audio de-embedding via analog and optical fiber audio ports
- ☆ Support volume control and independent audio selection
- ☆ Advanced EDID management
- ☆ Control via front panel buttons, IR remote, OSD menu navigation, Controller software, RS-232 commands
- ☆ Compact design for easy and flexible installation

3. Package Contents

① 1 x 4K60 2x1 Multiviewer Seamless UHD Video Switcher
② 1 x IR Remote
③ 1 x 3pin-3.81mm Phoenix Connector (male)
④ 1 x 38KHz IR Wideband Receiver Cable (1.5 meters)
⑤ 2 x Mounting Ears
⑥ 4 x Machine Screws (KM3*4)
⑦ 1 x 12V/1A Locking Power Adapter
⑧ 1 x User Manual

4. Specifications

Technical	
HDMI Compliance	HDMI 2.0b
HDCP Compliance	HDCP 2.2 / 1.x
Video Bandwidth	18Gbps
Video Resolution	Up to 4K2K@60 4:4:4
IR Level	5Vp-p
IR Frequency	38KHz
Color Space	RGB, YCbCr 4:4:4, YCbCr 4:2:2, YCbCr 4:2:0
Color Depth	8bit
Audio Formats	**HDMI:** PCM2.0/5.1/7.1CH, Dolby Digital/Plus, DTS, DTS High Res **Analog audio [3.5mm L/R]:** PCM2.0 **SPDIF (OPTICAL):** Dolby Digital, DTS 5.1, PCM2.0 **Note:** It does not support HBR audio.
ESD Protection	Human body model — ±8kV (Air-gap discharge) & ±4kV (Contact discharge)

Connection	
Input ports	2 x HDMI IN [Type A, 19-pin female]
Output ports	1 x HDMI OUT [Type A, 19-pin female] 1 x L/R OUTPUT [RCA] 1 x OPTICAL OUTPUT [S/PDIF]
Control ports	1 x RS-232 [3pin-3.81mm phoenix connector] 1 x IR EXT [3.5mm Stereo Mini-jack]
Mechanical	
Housing	Metal Enclosure
Color	Black
Dimensions	175mm [W] x 100mm [D] x 30mm [H]
Weight	497g
Power Supply	Input: AC 100 - 240V 50/60Hz Output: DC 12V/1A (US/EU standard, CE/FCC/UL certified)
Power Consumption	4.56W (Max)
Operating Temperature	32 - 104°F / 0 - 40°C
Storage Temperature	-4 - 140°F / -20 - 60°C
Relative Humidity	20 - 90% RH (no-condensing)

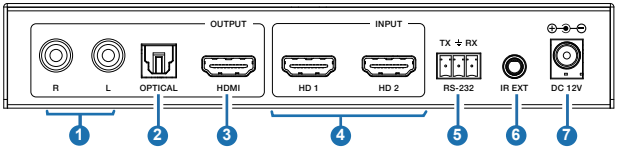
5. Operation Controls and Functions

5.1 Front Panel



No.	Name	Function Description
1	Power button	▪ Short press this button to power on the device. ▪ Long press this button for 1 seconds to enter the standby mode.
2	Power LED	The Power LED will light in green when the product is powered on, and red when the product is on standby.
3	Input 1-2 LEDs	Input signal indicator lights. In single screen display mode, when the HDMI OUTPUT port outputs the signal from the HD 1/2 port, the corresponding green LED will be on. In multiview mode, all input signal LEDs will light in green.
4	IR Window	IR signal receiving window.
5	INPUT button	Input source switching button, only available in single screen display mode.
6	Multiview button	Multiview display mode switching button. ▪ Short press this button to circularly select: SINGLE - PIP - PBP (1) - PBP (2) . ▪ Long press this button for 3 seconds to select the aspect ratio for PBP (1) / PBP (2)
7	RES button	Output resolution switching button. ▪ Short press the RES button, the OSD will display the current output resolution of the HDMI OUTPUT port. Short press the RES button again before the OSD disappears to circularly switch the output resolution (Please refer to the output resolution list of “8. Video & Audio”). ▪ Long press the RES button for 3 seconds to switch the output resolution to 720P60.

5.2 Rear Panel



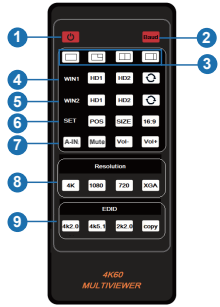
No.	Name	Function Description
1	L/R port	PCM2.0 Analog audio output port.
2	OPTICAL port	Optical fiber digital audio output port.
3	HDMI OUTPUT port	HDMI signal output port, connected to HDMI display device such as TV or Monitor with HDMI cable.
4	HD 1-2 INPUT ports	HDMI signal input ports, connected to HDMI source device such as DVD or Set-top box with HDMI cable.
5	RS-232 port	3-pin phoenix connector, connected to a PC or control system for serial port upgrade or RS-232 command control.
6	IR EXT port	IR signal receiving port, connected with 38KHz IR Receiver cable. If the IR signal receiving window of the unit is blocked or the unit is installed in a closed area out of infrared line of sight, the IR receiver cable can be inserted to the “IR EXT” port to receive the IR remote signal.
7	DC 12V	DC 12V/1A power input port.

5.3 IR Pin Definition

IR Receiver pin’s definition is as below:



6. IR Remote



① **Power on or Standby:** Press this button to power on the switcher or set it to standby mode.

② **Baud:** Press this button to pop up OSD menu, then circularly select the serial port baud rate: 115200, 57600, 38400, 19200, 9600

③ **Multiview display mode buttons:** Press these buttons to select the display mode: SINGLE - PIP - PBP (1) - PBP (2).

④ **WIN1:** These buttons are available in all modes.
In single screen display mode, press **HD1**/**HD2/** ↻ button to directly/circularly select input source for the WIN1 screen, and the corresponding input LED on the front panel will light in green.
In PIP / PBP(1) / PBP(2) display mode, press **HD1**/**HD2/** ↻ button to directly /circularly select input source for the WIN1 screen, and both input LEDs on the front panel will light in green.

⑤ **WIN2:** These buttons are unavailable in single screen display mode.
In PIP / PBP(1) / PBP(2) mode, press **HD1**/**HD2/** ↻ button to directly /circularly select input source for the WIN2 screen, and both input LEDs on the front panel will light in green.

⑥ **SET:**
In PIP mode, press **POS** to change the position of sub window; press **SIZE** to zoom in / out the size of sub window.
In PBP(1) / PBP(2) mode, press **16:9** to switch the aspect ratio between 16:9 and FULL.

⑦ **AUDIO:** Press **A-IN** to switch between the two HDMI input audio sources. Press **Mute** to mute / unmute the audio output. Press **VOL- / VOL+** to increase / decrease the audio output volume.

⑧ **Resolution:** Press **4K**, **1080P**, **720P** or **XGA** to select output resolution.

⑨ **EDID:** Press **4K2.0**, **4K5.1**, **2K2.0** or **COPY** to select EDID mode.

7. EDID Settings

User can select following EDID modes via RS-232 commands or Controller software.

No.	EDID Mode	No.	EDID Mode
1	4K60-2.0CH	11	1680x1050-2.0CH
2	4K60-5.1CH	12	1600x1200-2.0CH
3	4K60-7.1CH	13	1440x900-2.0CH
4	4K30-2.0CH	14	1360x768-2.0CH
5	4K30-5.1CH	15	1280x1024-2.0CH
6	4K30-7.1CH	16	1024x768-2.0CH
7	1080P-2.0CH	17	720P-2.0CH
8	1080P-5.1CH	18	AUTO
9	1080P-7.1CH	19	USER1
10	1920x1200-2.0CH		

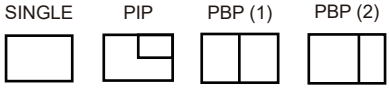
8. Video & Audio

The switcher supports multiple resolution video input up to 3840x2160@60, and supports multiple audio formats such as LPCM, AC3, DD+, DTS, DTS-HD, up to 7.1 channel pass through function via HDMI cable.
User can control the volume of audio in LPCM format.
The switcher supports following video output resolutions via a powerful scaling engine.

No.	Output Resolution	No.	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	1920x1200p 60Hz RB	14	1024x768 60Hz

9. Multiview

The switcher supports 4 categories of multiview display modes:
SINGLE, PIP, PBP (1), PBP (2)
Users can select different operations for different multiview modes as following:
SINGLE: Inputs selection
PIP: Inputs selection, Sub window size and position selection
PBP (1), PBP (2): Inputs selection,
Display mode selection, Display aspect selection
Multiview window distributions are as following:



User can select multiview display modes via IR remote, RS-232 commands or Controller software.

10. OSD Menu Navigation

A total of four buttons on the IR Remote are used for audio setting on OSD menu navigation, including Baud, Mute, VOL-, VOL+.
Menu contents are as follows:

Baud	Baud rate	115200	115200,57600,38400, 19200,9600
Mute	Audio Mute	OFF	ON, OFF
VOL-/VOL+	Audio Volume	100	0..100

11. Controller Software Operation Guide

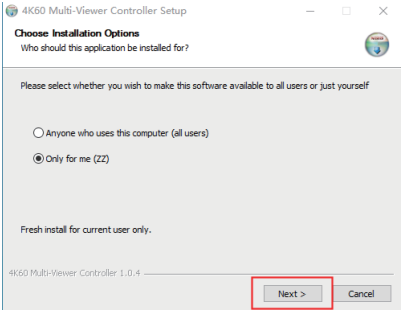
11.1 Installation & Connection

Follow the steps below to install the Controller software.

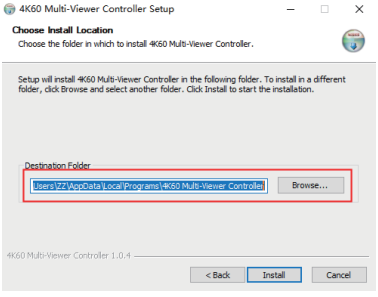
Step 1. Double-click the following driver to install the Controller software.

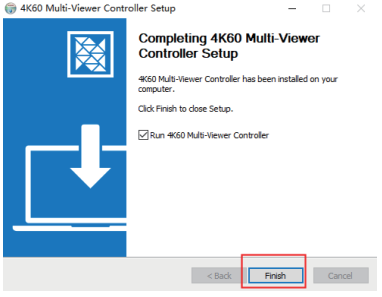


Step 2. Select “Anyone who uses this computer (all users)”, and then click “Next”.

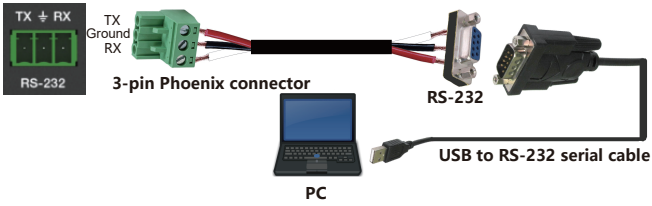


Step 3. Select the installation path and click “Install”. After the installation is completed, click “Finish” to start using the Controller software.

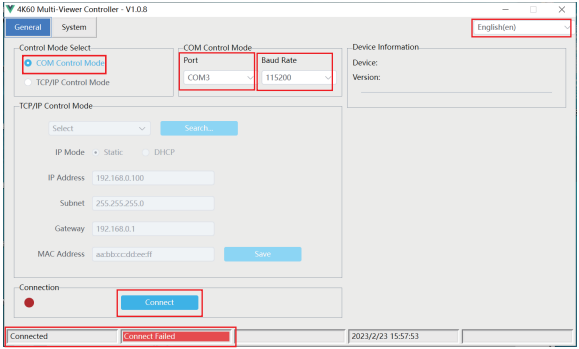




Follow the steps below to connect the Controller software and the device.
Step 1. Connect the RS-232 port of the switcher to a PC with an RS-232 serial cable and an USB to RS-232 serial cable, as shown in the figure below.



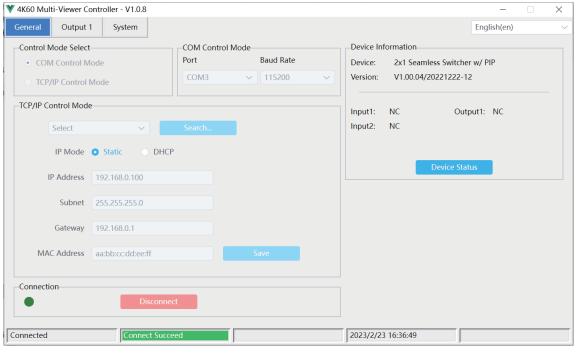
Step 2. Launch the installed Controller software. (The default language is English, and you can set the language on the upper right corner of the main page.) Select “COM Control Mode” on the “General” page, then select the Port number and Baud Rate (default: 115200), and finally click “Connect”.



After successful connection, the “General” page will display the relevant information of the connected device, and the status bar at the bottom will display “Connected”.

11.2 Controller Main Interface

■ General Page



You can do the following operations on the General page:

① **Control Mode Select:** Select the “COM Control Mode”. (TCP/IP control is not supported temporarily, so the TCP/IP Control Mode is disabled.)

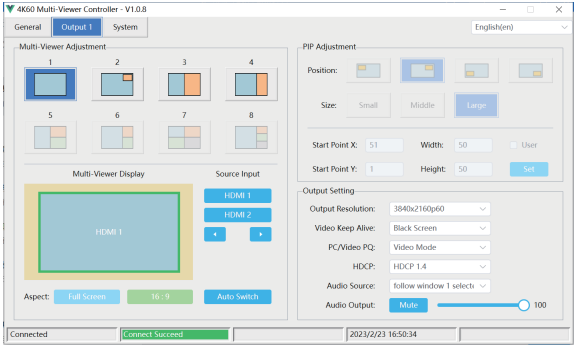
② **COM Control Mode:** Select the Port number and Baud Rate of the device.

③ **Device Information:** Display the device name, version and input/output connection status. Click “Device Status” to refresh the device status.

④ **Connection:** Click to set the connection status.

⑤ **Connected:** Display the connection status.

■ Output Page



You can do the following operations on the Output page:

① **Multi-View Adjustment:** Click to select the desired screen display mode. There are four modes available: SINGLE-PIP-PBP(1)-PBP(2).

② **PIP Adjustment:** In the PIP mode, you can switch the location and size of the PIP and set the user-defined PIP, as shown in the following table.

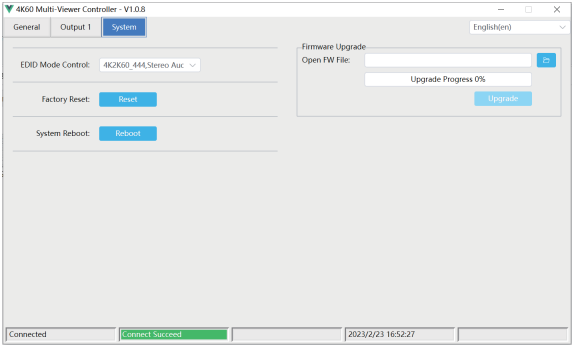
Size	**Relative Position (Starting Position)**	**Height and Width of the Inner Frame**
Small	Start Point X: 71 Start Point Y: 71	Width: 30 Height: 30
Middle	Start Point X: 61 Start Point Y: 61	Width: 40 Height: 40
Large	Start Point X: 51 Start Point Y: 51	Width: 50 Height: 50
User	Start Point X: 1-100 Start Point Y: 1-100	Width: 1-100 Height: 1-100

③ **Multi-Viewer Display:** Display the input and output.

④ **Source Input:** Select the input signal source. You should select the window in “Multi-Viewer Display” firstly, and then click “HDMI 1/2” in “Source Input” to select a signal source, or click ◂ / ▸ to select the last/ next signal source.

⑤ **Aspect:** Click “Full Screen” or “16:9” to switch the display aspect. Only the following modes are available: PBP(1)-PBP(2).
⑥ **Auto Switch:** Enable or disable the function of automatically switching input signal source, available only in SINGLE mode.
⑦ **Output Setting:** Set the output resolution, video keep alive, PC/Video PQ, HDCP, audio source and audio output.

■ System Page



You can do the following operations on the System page:
① **EDID Mode Control:** Click the drop-down list on the right to select EDID mode.
② **Firmware Upgrade:** Click the folder icon on the right to import the firmware upgrade file, then click “Upgrade” to start upgrade. There will be a progress bar prompt during the upgrade process. When the progress bar reaches 100%, it indicates the upgrade is successful, and the device will be restarted automatically.
③ **Factory Reset:** Click “Reset” to reset the device to factory default settings.
④ **System Reboot:** Click “Reboot” to reboot the device.

12. RS-232 Command

The product also supports RS-232 command control. Connect the RS-232 port of the product to a PC with an RS-232 to USB serial cable. Then open a Serial Command tool on PC to send ASCII commands to control the product. The ASCII command list about the product is shown as below.

ASCII Commands				
Serial port protocol. Baud rate: 115200 (default); Data bits: 8bit; Stop bits:1; Check bit: 0				
x - Parameter 1; y - Parameter 2; ! - Delimiter				
Command Code	**Function Description**	**Example**	**Feedback**	**Default**
System Setting				
help!	List all commands	help!		
r type!	Get device model	r type!	2x1 HDMI Multiviewer	
r fw version!	Get Firmware version	r fw version!	MCU FW version x.xx.xx SCALER FW version x.xx.xx	
power z!	Power on/off the device,z=0~1 (z=0 power off, z=1 power on)	power 1!	Power on System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	
r power!	Get current power state	r power!	power on/power off	
reboot!	Reboot the device	reboot!	Reboot… System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	
reset!	Reset to factory defaults	reset!	Reset to factory defaults System Initializing... Initialization Finished! MCU FW version x.xx.xx SCALER FW version x.xx.xx	

Command Code	Function Description	Example	Feedback	Default
Output Setting				
s output res x!	Set Output Resolution (x=1~14) 1. 4096x2160p60, 2. 4096x2160p50, 3. 3840x2160p60, 4. 3840x2160p50, 5. 3840x2160p30, 6. 3840x2160p25, 7. 1920x1200p60RB, 8. 1920x1080p60, 9. 1920x1080p50, 10.1360x768p60, 11.1280x800p60, 12.1280x720p60, 13.1280x720p50, 14. 1024x768p60,	s output res 3!	out resolution: 3840x2160p60	3840x2160p60
r output res!	Get output resolution	r output res!	out resolution: 3840x2160p60	
s output hdcp x!	set output hdcp (x=1~3) 1. HDCP 1.4 2. HDCP 2.2 3. HDCP OFF	s output hdcp 2!	output HDCP: HDCP 1.4	HDCP 1.4
r output hdcp!	Get output hdcp status.	r output hdcp!	output HDCP: HDCP 1.4	
s output vka x!	Set output video keep active pattern. (x=1~2) 1. black screen 2. blue screen	s output vka 1!	output VKA pattern: black screen	black screen
r output vka!	Get output video keep active pattern.	r output vka!	output VKA pattern: black screen	
s output itc x!	Set output video mode (x=1~2) 1: video mode 2: pc mode	s output itc 1!	output ITC: video mode	video mode
r output itc!	Get output video mode	r output itc!	output ITC: video mode	

Command Code	Function Description	Example	Feedback	Default
EDID Setting				
s input EDID x!	Set HDMI input EDID mode (x=1~19) 1. 4K2K60_444,Stereo Audio 2.0 2. 4K2K60_444,Dolby/DTS 5.1 3. 4K2K60_444,HD Audio 7.1 4. 4K2K30_444,Stereo Audio 2.0 5. 4K2K30_444,Dolby/DTS 5.1 6. 4K2K30_444,HD Audio 7.1 7. 1080P,Stereo Audio 2.0 8. 1080P,Dolby/DTS 5.1 9. 1080P,HD Audio 7.1 10.1920x1200,Stereo Audio 2.0 11.1680x1050,Stereo Audio 2.0 12.1600x1200,Stereo Audio 2.0 13.1440x900,Stereo Audio 2.0 14.1360x768, Stereo Audio 2.0 15.1280x1024,Stereo Audio 2.0 16.1024x768, Stereo Audio 2.0 17.720p,Stereo Audio 2.0 18.copy from HDMI out 19.USER1	s input EDID 1!	input EDID:4K2K 60_444, Stereo Audio 2.0	4K2K60_ 444,Stereo Audio 2.0
r input EDID!	Get input EDID mode	r input EDID!	input EDID:4K2K60 _444, Stereo Audio 2.0	
s edid user1 00 FF FF …!	Set user1 EDID data	s edid user1 00 FF FF FF FF …!	user1 EDID data: 0 0 FF FF FF FF FF 00 ……	
r edid user1!	Get user1 EDID data	r edid user1!	user1 EDID data: 00 FF FF FF FF FF FF 00 ……	
Audio Setting				
s output audio x!	Set output audio source (x=0~4) 0. follow window 1 selected source 1. HDMI 1 input audio 2. HDMI 2 input audio 3. HDMI 3 input audio 4. HDMI 4 input audio	s output audio 0!	output audio: follow window 1 selected source	output audio: follow window 1 selected source
r output audio!	Get output audio source	r output audio!	output audio: follow window 1 video	
s output audio vol+!	Increase output audio volume	s output audio vol+!	output audio volume: 50	
s output audio vol-!	Decrease output audio volume	s output audio vol-!	output audio volume: 50	
s output audio vol x!	Set output audio volume value (x=0~100)	s output audio vol 30!	output audio volume: 30	100

Command Code	Function Description	Example	Feedback	Default
r output audio vol!	Get output audio volume	r output audio vol!	output audio volume: 30	
s output audio mute x!	Set output audio mute on/off (x=0~1) 0. mute off 1. mute on	s output audio mute 0!	output audio mute: off	off
r output audio mute!	Get output audio mute on/off	r output audio mute!	output audio mute: off	
Single Screen Mode Setting				
s auto switch x!	Enable/disable auto switch feature(x=0~1) 0. Disable auto switch 1. Enable auto switch	s auto switch 0!	auto switch off	auto switch off
r auto switch!	Get auto switch feature	r auto switch!	auto switch off	
s in source x!	Route input source to output (1~2) 1. HDMI 1 2. HDMI 2	s in source 1!	HDMI 1	HDMI 1
r in source!	Get output selected input source	r in source!	HDMI 1	
Multi-viewer Mode Setting				
s multiview x!	Set multi-viewer display mode (x=1~3) 1. single screen 2. PIP 3. PBP	s multiview 1!	single screen	single screen
r multiview!	Get multi-viewer display mode	r multiview!	single screen	
s window x in y!	Select one input for one display window for the current Multiview mode. (x=1~2) 1. window 1 2. window 2 (y=1~2) 1. HDMI 1 2. HDMI 2	s window 1 in 1!	window 1 select HDMI 1	
r window x in!	Get windows selected input source (x=0~2) 0. ALL 1. window 1 2. window 2	r window 1 in!	window 1 select HDMI 1	

Command Code	Function Description	Example	Feedback	Default
s window x border y!	Set the border mode of the specified window. (x=1~2) 1. window 1 2. window 2 (y=0~1) 0. off 1. on	s window 1 border 1!	window 1 border on	off
r window x border!	Get the border mode of windows (x=0~2) 0. ALL 1. window 1 2. window 2	r window 1 border!	window 1 border on	
s window x border color y!	Set the border color of the specified window. (x=1~2) 1. window 1 2. window 2 (y=1~9) 1. BLACK 2. RED 3. GREEN 4. BLUE 5. YELLOW 6. MEGENTA 7. CYNA 8. WHITE 9. GRAY	s window 1 border color 1!	window 1 border color:BLACK	YELLOW
r window x border color!	Get the border color of windows (x=0~2) 0. ALL 1. window 1 2. window 2	r window 1 border color!	window 1 border color:BLACK	
s PIP Hstart Vstart Hsize Vsize!	Set PIP window to user define mode Hstart=(1~100) Vstart=(1~100) Hsize=(1~100) Vsize=(1~100) NOTE:Hstart+Hsize<=101, Vstart+Vsize<=101	s PIP 10 10 20 20!	PIP 10 10 20 20	

Command Code	Function Description	Example	Feedback	Default
s PIP position x!	Set PIP window position (x=1~5) 1. Left Top 2. Left Bottom 3. Right Top 4. Right Bottom 5. user	s PIP position 3!	PIP on right top	PIP on right top
r PIP position!	Get PIP window position	r PIP position!	PIP on right top	
s PIP size x!	Get PIP window size (x=1~4) 1. small 2. middle 3. large 4. user	s PIP size 3!	PIP size: large	PIP size: large
r PIP size!	Get PIP window size	r PIP size!	PIP size: large	
s PBP mode x!	Set PBP windows display mode (x=1~2) 1. PBP mode 1 2. PBP mode 2	s PBP mode 1!	PBP mode 1	PBP mode 1
r PBP mode!	Get PBP windows display mode	r PBP mode!	PBP mode 1	
s PBP aspect x!	Set PBP windows display aspect ratio (x=1~2) 1. Full screen 2. 16:9	s PBP aspect 1!	PBP aspect: full screen	PBP aspect: full screen
r PBP aspect!	Get PBP windows display aspect ratio	r PBP aspect!	PBP aspect: full screen	

13. Application Example

