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# 1. Introduction

## 1.1. Important Notes

Thank you for choosing our product.

To help you quickly become proficient in operating this device, please carefully read the user manual provided. It contains important information about product safety precautions, product introduction, and usage instructions. After reading, please keep the manual for future reference.

If you encounter any issues during use, please contact our service personnel. We appreciate your cooperation.

## 1.2 Precautions

1. Before connecting the device, ensure the power voltage is correct. Only use the original uncut (unspliced) power cable provided with the device.
2. If the product does not function properly, contact your dealer. Do not attempt to disassemble the device yourself. (We are not responsible for problems caused by unauthorized repairs or maintenance.)
3. This product is designed for indoor use. Do not place it in wet or damp locations.
4. During transportation, the device should be packed in its original packaging.
5. Avoid dropping or subjecting the device to physical impact.
6. Do not use strong cleaning agents to clean the device. For heavy dust, gently wipe with a neutral cleaner, limiting cleaning to the exterior only.
7. Keep the device interface free of dust and moisture.
8. Avoid moving the device between excessively cold and hot environments to prevent internal condensation, which may affect its lifespan.

## 1.3 Disclaimer

1. We have made every effort to ensure the completeness and accuracy of this manual, but errors or omissions may still occur. We are not responsible for any technical or printing errors in the manual.
2. The product appearance shown in this manual is for reference only and may differ from the actual product you purchased.
3. This instruction manual guides multiple product models, so it is not used for any specific product alone.
4. The display interface, parameters, drawings and model value ranges in this manual, illustration may be different. Please refer to the actual product for details.
5. The contents of this manual are subject to change without notice.
6. If the software version is not consistent with this manual, please refer to the software.

# 2. Features

- **HDMI interface supports up to 4K60 input, adapting to the needs of high-definition video sources (\*Only HDMI IN1 and HDMI IN2 interfaces support 4K60 input);**
- **Support 4-channel (HDMI/SDI) video source + 1-channel LAN port (RTSP/ NDI®|HX) or**

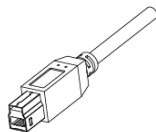
USB/SD card local video source input + 1 Channel picture input to meet the connection needs of different signal sources and devices;

- Support 2-channel HDMI+ 1-channel SDI, 1-channel LAN and 1-channel UVC video signal output interface, which is convenient to connect to different display devices and network streaming and live streaming;
- Up to 8 layers can be superimposed on the channel, providing powerful guiding ability;
- 2-way LOGO, which can be freely adjusted and zoomed in and out, the effect is more realistic and natural;
- Support T-Bar switching, support up to 30 kinds of switching effects, make video switching more vivid;
- Support a variety of PIP and POP layouts and a variety of transition effects, freely adjust and crop the size of the picture-in-picture, enhance video editing and creation flexibility;
- Built-in media library, picture generator, support user-defined preset patterns and external imported images;
- Support DSK, can realize subtitles and other functions;
- Flexible switching between horizontal and vertical screens, and streaming on horizontal and vertical screens;
- Video recording and playback, the played video can be used as an auxiliary source to participate in program production;
- Integrated PTZ camera control, one person and one machine are all under control;
- Professional-grade chroma cutout to create a realistic virtual studio;
- Brightness key to help users achieve video effects;
- Support WEB background operation, support personal computer, mobile phone smart device flexible control;
- Support RTMP/RTMPS protocol, live broadcast at any time
- Support LAN connection Companion software control;

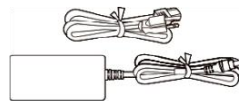
### 3. Product Accessories



KD52 controller\*1



USB3.0 cable\*1

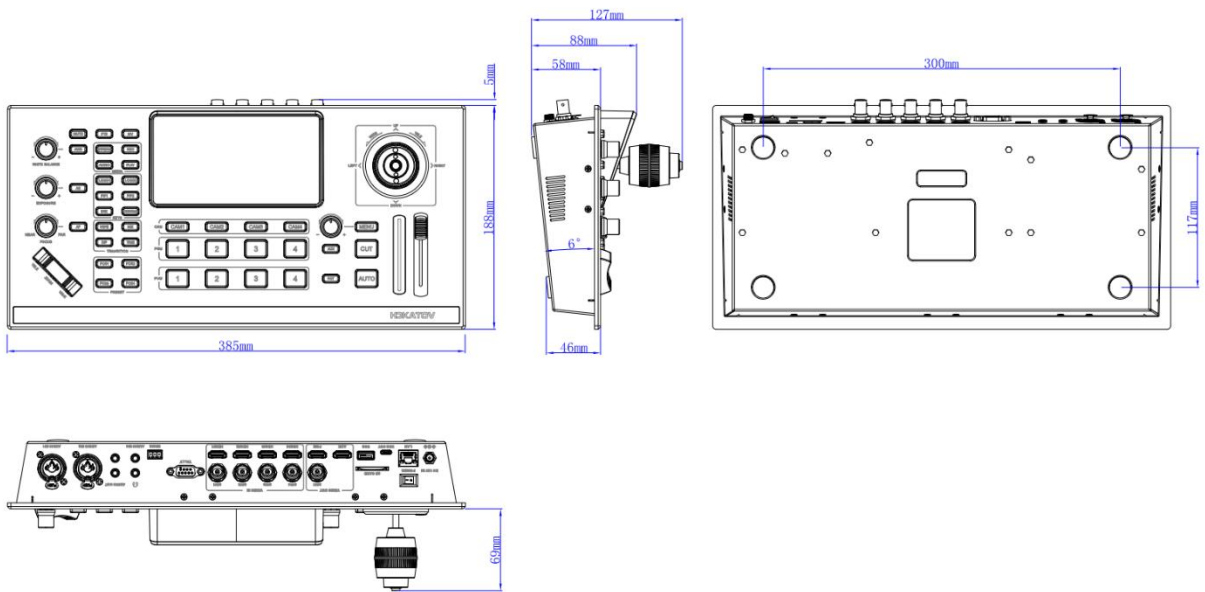


Powercable\*1



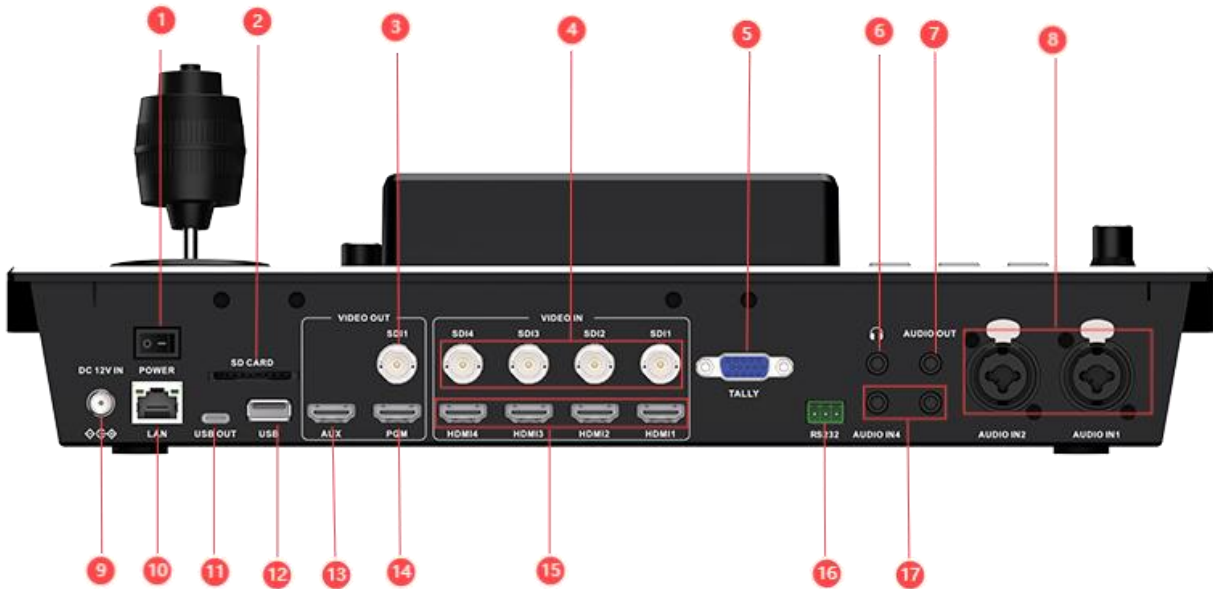
Usermanual\*1

### 4. Dimension Wireframe




## 5. Interface

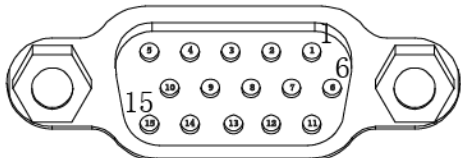
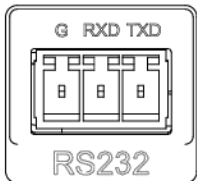
### 5.1 Interface Introduction



1	POWER	Power Switch
2	SD CARD	SD card interface for importing materials, playing local files, video recording, keyboard program updates, etc.
3	SDI	SDI output interface, you can customize the output channel or MultiView, default output PGM

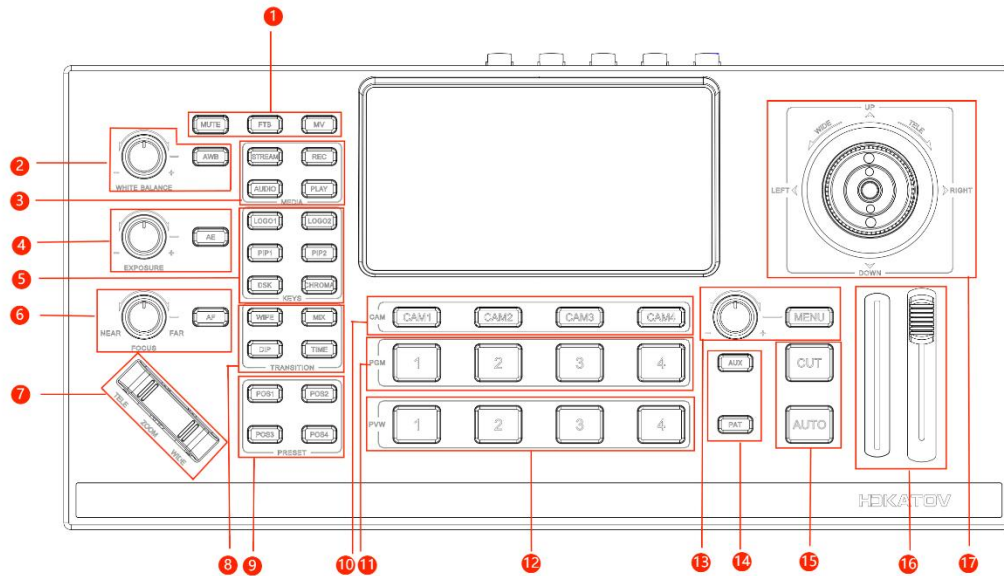
4	SDI 1.2.3.4	4 SDI inputs, up to 1080P60
5	TALLY	TALLY interface, output TALLY signal
6		audio output monitoring interface
7	AUDIO OUT	audio output interface
8	AUDIO IN 3.4	2-way XLR audio input interface
9	DC 12V IN	12 volt power input interface
10	LAN	RJ45 network interface
11	USB OUT	USB TYPE-C INTERFACE, MAINLY USED FOR UVC OUTPUT;
12	USB	USB interface, used to import materials, play local files, video recording, USB camera input, keyboard program update, etc.
13	THE	HDMI output interface, the output channel can be customized and modified, and the default output is MultiView
14	PGM	HDMI output interface, you can customize and modify the output channel or MultiView, and the default output PGM
15	HDMI 1.2.3.4	4 HDMI input interfaces, HDMI 1 and 2 support up to 4KP60 input, HDMI 3 and 4 support up to 1080P60
16	RS232	RS232 serial port, can send VISCA serial port command, the default baud rate is 9600
17	AUDIO IN 3.4	2 X 3.5MM AUDIO INPUT INTERFACES

## 5.2 Interface Pin Definition

 <p style="font-size: 24px; margin-top: 10px;">TALLY</p>	 <p style="font-size: 24px; margin-top: 10px;">RS232</p>																																												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Pin No.</th> <th>Function</th> <th>Pin No.</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">PGM1</td> <td style="text-align: center;">9</td> <td style="text-align: center;">NC</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">PGM2</td> <td style="text-align: center;">10</td> <td style="text-align: center;">GND</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">PGM3</td> <td style="text-align: center;">11</td> <td style="text-align: center;">PVW3</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">PGM4</td> <td style="text-align: center;">12</td> <td style="text-align: center;">PVW4</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">PGM5</td> <td style="text-align: center;">13</td> <td style="text-align: center;">PVW5</td> </tr> <tr> <td style="text-align: center;">6</td> <td style="text-align: center;">PGM6</td> <td style="text-align: center;">14</td> <td style="text-align: center;">PVW6</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="text-align: center;">PVW1</td> <td style="text-align: center;">15</td> <td style="text-align: center;">NC</td> </tr> <tr> <td style="text-align: center;">8</td> <td style="text-align: center;">PVW2</td> <td></td> <td></td> </tr> </tbody> </table>	Pin No.	Function	Pin No.	Function	1	PGM1	9	NC	2	PGM2	10	GND	3	PGM3	11	PVW3	4	PGM4	12	PVW4	5	PGM5	13	PVW5	6	PGM6	14	PVW6	7	PVW1	15	NC	8	PVW2			<table style="width: 100%;"> <thead> <tr> <th>Pin No.</th> <th>Function</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">GND</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">RXD</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">TXD</td> </tr> </tbody> </table>	Pin No.	Function	1	GND	2	RXD	3	TXD
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2	RXD																																												
3	TXD																																												

# 6. Panel Keys and Display Functions

## 6.1 Panel Key Diagram.

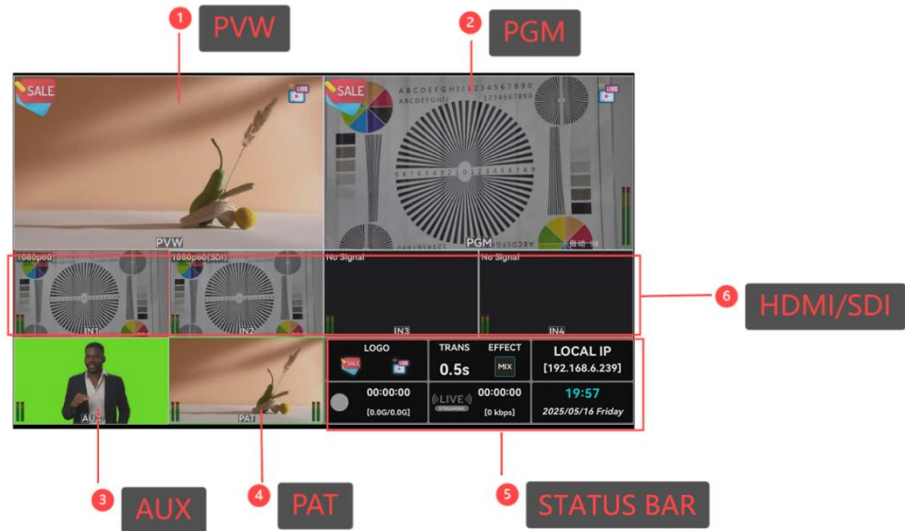


## 6.2 Panel Key Functions

1	MUTE (One-Touch Mute)	Tap to trigger the "Mute" function;
	FTB (Blackout)	Tap to trigger the "Black Field" function, PGM emergency black point and mute;
	MV (MultiView)	When it is turned on, the output mode of "HDMI-AUX" is "MultiView", which is turned on by default, and when it is turned off, it is a single-channel full-screen output, and when it is off, it is a full-screen output of "PGM" by default.
2	WHITE BALANCE (White Balance Adjustment Knob)	Rotate to adjust the "White Balance" related parameters, tap to toggle the "Red/Blue Gain" mode; In the "One-Click Trigger" mode, tap for the "Trigger" function;
	AWB (Auto White Balance)	Tap toggle White Balance mode;
3	STREAM (Streaming)	Tap to turn on/off the "Stream" function;
	REC (Recording)	Tap to turn on/off the "Recording" function;
	AUDIO (Audio)	Tap to adjust the "audio" related parameters, (switch the audio channel with the joystick, rotate the audio parameters with the "menu knob", and tap to switch mode);
	PLAY (Play/Pause)	Tap Play/Pause the video for the AUX channel;
4	EXPOSURE (Exposure Adjustment Knob)	Rotate to adjust the "Exposure" related parameters, tap to switch the "Shutter, Aperture, Gain" mode;
	AE (Auto Exposure)	Tap to toggle Exposure mode;
5	LOGO1/LOGO2 (Logo)	Tap Turn on/off "Desk Mark";
	PIP1/PIP2 (Picture-in-Picture)	Tap to turn on/off the "Picture-in-Picture" layer, press and hold to turn the button light to flash to enter the editing mode, you can adjust the position and size of the picture-in-picture (adjust the size through the "Menu Knob", adjust the position

		through the joystick);
	DSK (Downstream Key)	Tap Turn on/off Caption Cutout;
	CHROMA (Chroma Key)	Press on/off Chroma Keying;
6	FOCUS (Focus Adjustment Knob)	Rotate to adjust the camera's focal length (you need to focus on manual mode for the adjustment to take effect);
	AF (Auto Focus)	Press to toggle manual/autofocus;
7	ZOOM TELE/WIDE (Zoom Rocker Switch)	Controls camera zoom (TELE: zoom in; WIDE: zoom out). Speed depends on pressure
8	WIPE (Wipe Transition)	Press and hold to enter the effect selection, tap to activate the selected transition effect, the default is the "Scratch" effect;
	MIX (Mix Transition) DIP (Dip Transition)	Press to activate mix/dip transitions.
	TIME (Transition Time)	Press to adjust the Transition time;
9	POS (Preset)	Long press to set the preset, short press to call the preset;
1 0	CAM (Camera Selection)	Press to enter the current camera control mode, and press and hold to enter the current camera menu operation;
1 1	PGM (Program Source Switch)	Tap to switch the source of the "PGM" channel;
1 2	PVW (Preview Source Switch)	Tap to switch the source of the "PVW" channel;
1 3	Menu knob	In menus: rotate to adjust parameters; press to confirm. In camera mode: adjusts pan/tilt speed. In PIP mode: adjusts size. In audio mode: adjusts parameters.
	MENU	Press to open/close keyboard menu; long-press to open/close camera menu.
1	AUX (AUX Source)	Tap the "AUX" source to switch to the "PVW" channel;
4	PAT (PAT Source)	Tap the "PAT" source to switch to the "PVW" channel;
1	CUT (Hard Cut)	PVW and PGM for instant switching;
5	AUTO (Transition)	PVW and PGM for special effects switching;
1 6	FADER LIGHT/FADER	Fader light indicates fader progress; fader controls transition effects.
1 7	JOYSTICK	In camera mode: controls pan/tilt (up/down/left/right) and zoom (rotation). Press HOME to return to initial position. In PIP mode: adjusts PIP position. In audio mode: switches audio channels.

## 6.3 Introduction to the display interface



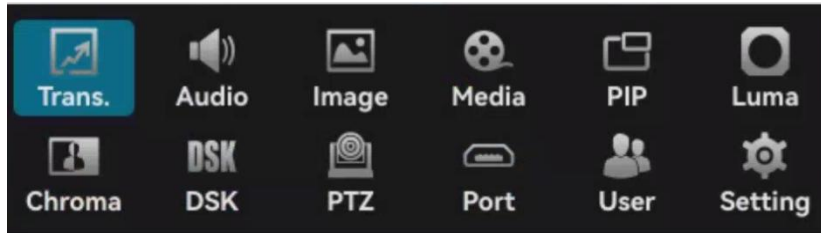
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q

1	PVW	Displays the "PVW" channel source effect;
2	PGM	Displays the "PGM" channel source effect;
3	THE	Display the "AUX" channel source effect, the channel can input USB signal source, RTSP, NDI, local video source;
4	PAT	Displays the "PAT" channel source effect;
5	Status bar	Display the status and effect of the current setting of the guide keyboard;
6	HDMI/SDI	Display the source effect of the "HDMI/SDI" channel, the resolution and interface source of the current source are displayed in the upper left corner, and the "HDMI" or "SDI" source can be set in the menu to be displayed first, and the default "SDI" source is displayed first;

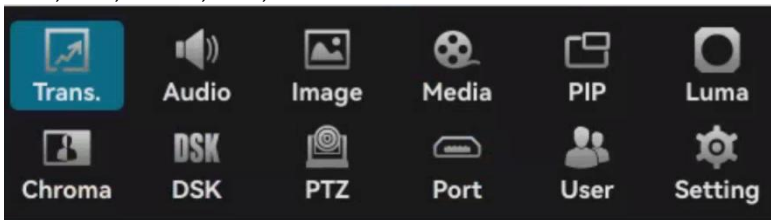
# 7. Menu Operation

## 7.1 Main Menu



### 7.1.1 Transition Effect Settings

Go to the transition settings and select the transition effect, including 30 transition effects such as MIX, DIP, WIPE, etc., the default is the MIX transition effect.



#### 7.1.1.1 MIX

Select MIX, press AUTO to execute MIX transition.



#### 7.1.1.2 DIP

Select DIP, press AUTO to execute DIP transition. Configure dip source (default: color/black).

DIP to Black (fade out):



#### 7.1.1.3 WIPE

Wipe transitions switch between scenes. Select styles and adjust softness in menus.

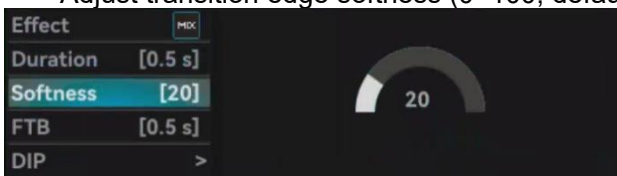
### 7.1.2 Transition Time Settings

Set transition duration (0.1s–5.0s; default: 0.5s). Longer times slow transitions.



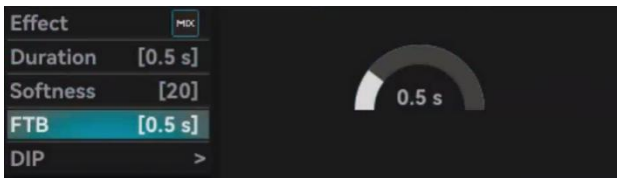
### 7.1.3 Softness settings

Adjust transition edge softness (0–100; default: 20). Lower values yield sharper edges.



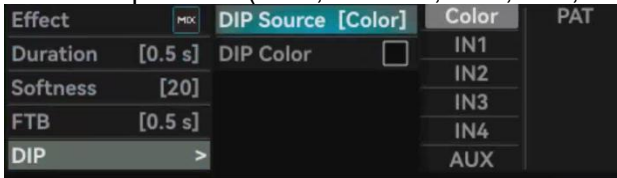
### 7.1.4 Blackout Settings

Set blackout duration (0.1s–2.0s; default: 0.5s). Longer times slow blackout.



### 7.1.5 Dip Settings

Set dip source (color, IN1–IN4, AUX, PAT; default: color/black).

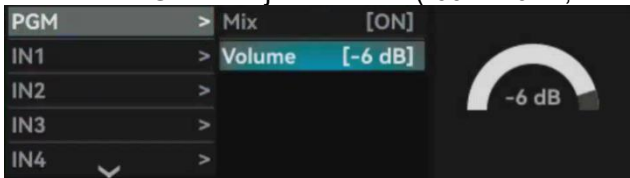


## 7.2 Audio

Supports 4 HDMI + 4 SDI digital audio, 2 3.5mm + 2 XLR mic inputs. Each channel has independent volume, switch, mixing, and delay settings. HDMI audio supports AFV (Audio Follow Video).

### 7.2.1 PGM Audio Settings

Mute PGM or adjust volume (-60dB–0dB; default: -6dB).



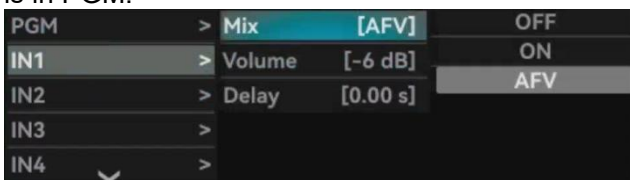
### 7.2.2 Quad HDMI/SDI Input Audio Settings

Go to the audio settings, select inputs 1-4, and set the embedded audio of the four inputs.

#### 7.2.2.1 Mix Mode Settings

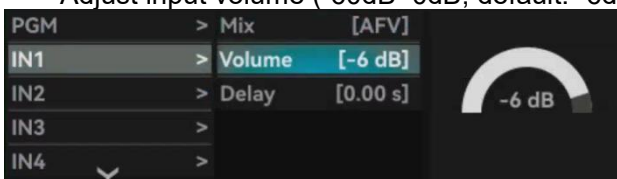
Users can turn on/off the mixing mode independently, or set it to AFV audio follow mode, which defaults to AFV audio follow mode.

When the audio mode of a channel is set to AFV, the audio channel takes effect only when the video is in PGM.



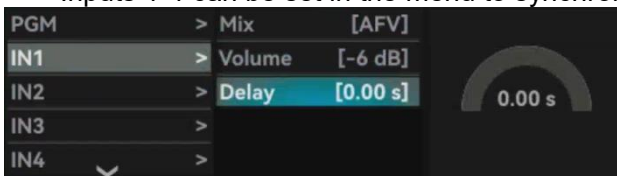
#### 7.2.2.2 Volume Control

Adjust input volume (-60dB–0dB; default: -6dB).



#### 7.2.2.3 Audio Delay

Inputs 1-4 can be set in the menu to synchronize audio and video. (max delay: 1s; default: 0.00s).



### 7.2.3 Multimedia AUX Output Audio Settings

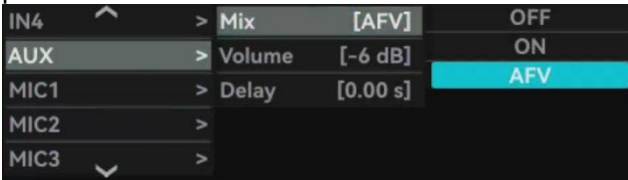
Configure AUX output audio.

#### 7.2.3.1 Mix Mode Settings

Users can turn on/off the mixing mode independently, or set it to AFV audio follow mode, which defaults to AFV audio follow mode.

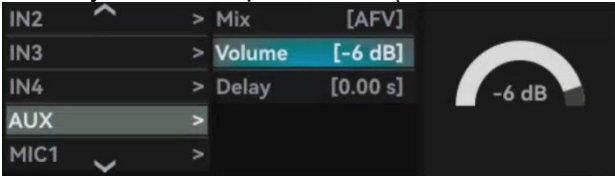
When the audio mode of a channel is set to AFV, only the AUX video takes effect when PGM is in

place.



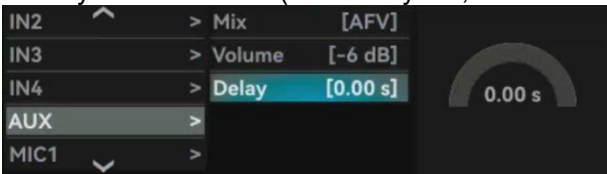
### 7.2.3.2 Volume Control

Adjust AUX output volume (-60dB–0dB; default: -6dB).



### 7.2.3.3 Audio Delay

Sync audio/video (max delay: 1s; default: 0s).



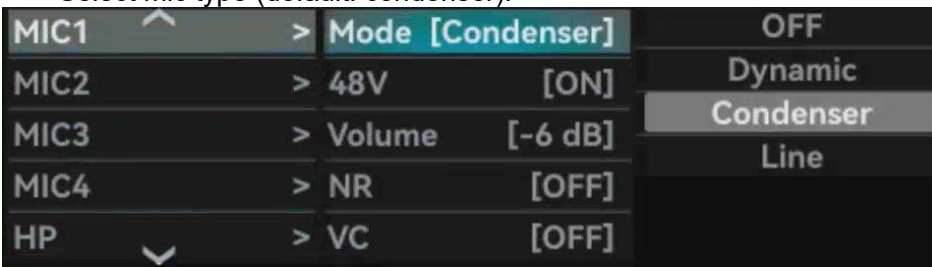
## 7.2.4 Microphone Input Audio Settings

### 7.2.4.1 Two-Channel XLR Interface Microphone Input Audio Settings

Configure XLR mics (condenser/dynamic). Toggle 48V power, adjust volume, noise reduction, and voice effects.

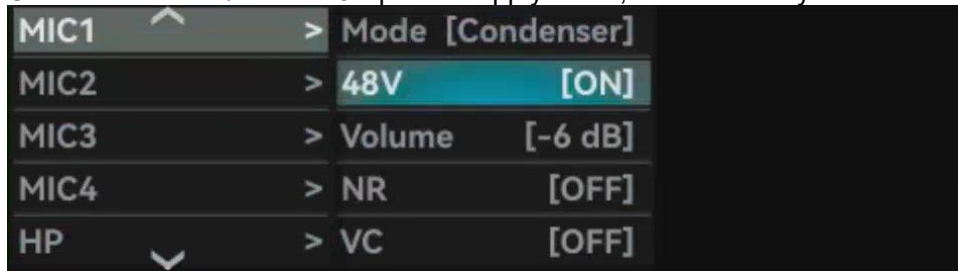
### 7.2.4.2 Audio Mode Settings

Select mic type (default: condenser).



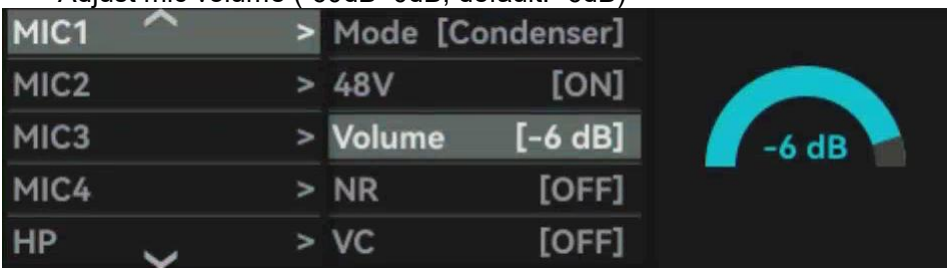
### 7.2.4.3 48V Power Supply Setting

Users can turn on/off the 48V power supply effect, which is on by default.



### 7.2.4.4 Volume Control

Adjust mic volume (-60dB–0dB; default: -6dB)



### 7.2.4.5 Noise Reduction Settings

The user can set the noise cancellation mode, which is off by default.

MIC1	^	>	Mode [Condenser]	OFF
MIC2		>	48V [ON]	Low
MIC3		>	Volume [-5 dB]	Mid
MIC4		>	NR [OFF]	High
HP	v	>	VC [OFF]	

### 7.2.4.6 Voice-Changing Effects Settings

The user can set the voice changing effect, which is off by default.

MIC1	^	>	Mode [Condenser]	OFF
MIC2		>	48V [ON]	Male
MIC3		>	Volume [-5 dB]	Female
MIC4		>	NR [OFF]	Monster
HP	v	>	VC [OFF]	Child

### 7.2.4.7 Two-Channel 3.5mm Interface Microphone Input Settings

Configure Microphone 3/4 for line-level devices, desktop, or lapel microphones. Adjust volume, noise reduction, and pitch shift.

MIC1	^	>	Mode [Mic]	
MIC2		>	Volume [-6 dB]	
MIC3		<	NR [OFF]	
MIC4		>	Key Change [0]	
HP	v	>		

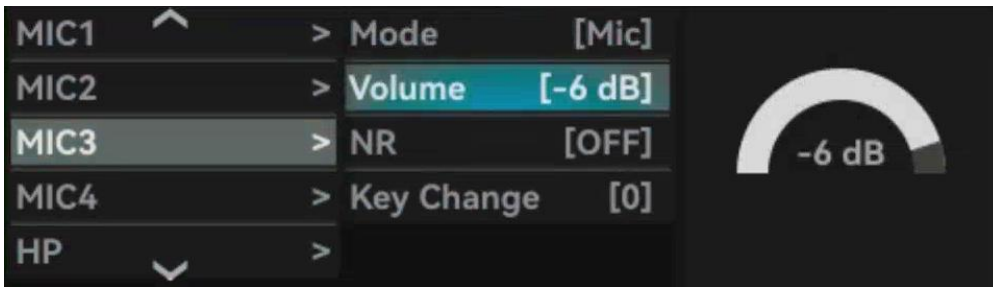
### 7.2.4.8 Audio Mode Settings

The user needs to select the corresponding mode according to the microphone input device, which is the microphone mode by default.

MIC1	^	>	Mode [Mic]	OFF
MIC2		>	Volume [-6 dB]	Line
MIC3		>	NR [OFF]	Mic
MIC4		>	Key Change [0]	
HP	v	>		

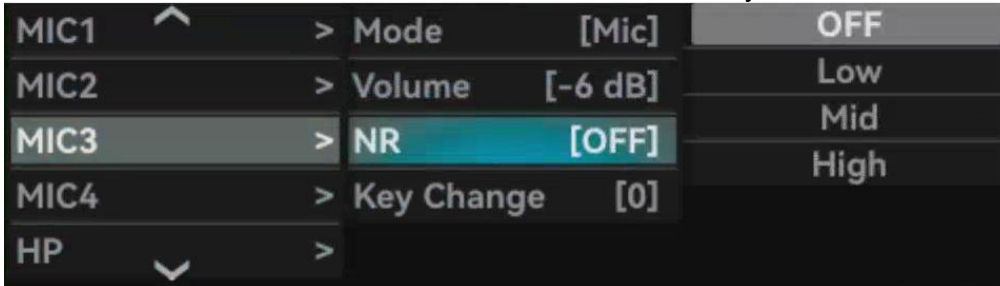
### 7.2.4.9 Volume Control

Users can adjust the volume of each microphone audio, the volume range is -60dB-0dB, the default is -6dB.



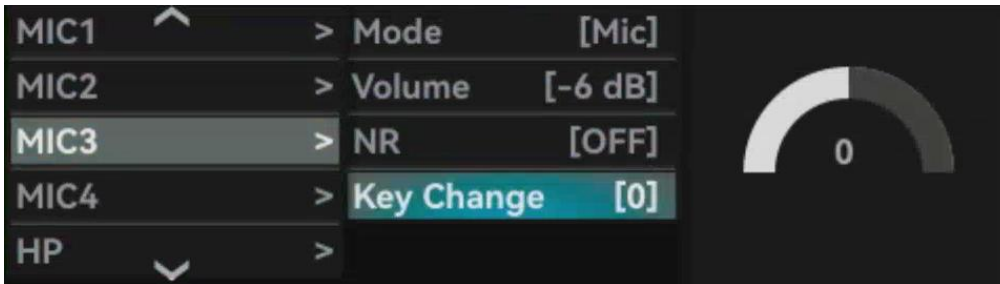
#### 7.2.4.10 Noise Reduction Settings

The user can set the noise cancellation mode, which is off by default.



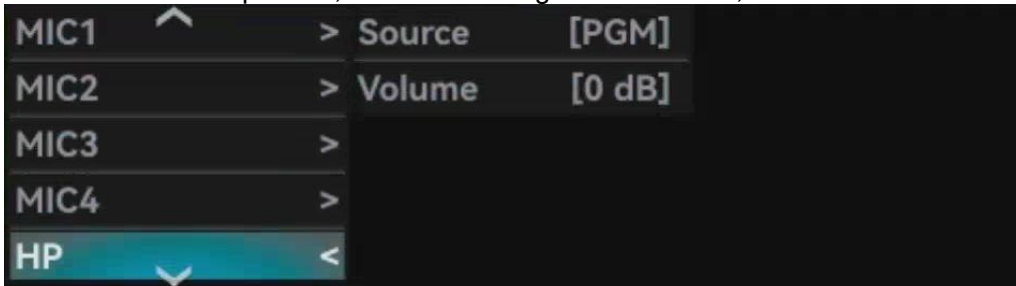
#### 7.2.4.11 Pitch Shift Settings

The user can adjust the pitch by using the pitch change value, which ranges from -4 to 4, with the default value of 0.



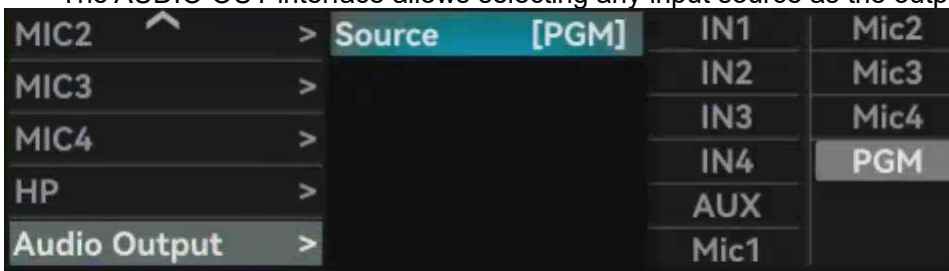
### 7.2.5 Headphone Settings

The switcher has a headphone output for monitoring audio. The user can select any input source as the monitoring target, the earphone source is PGM by default, and the user can adjust the monitoring volume of the headphones, the volume range is -60dB-0dB, and the volume is 0dB by default.



### 7.2.6 Audio Output Settings

The AUDIO OUT interface allows selecting any input source as the output (default: PGM).

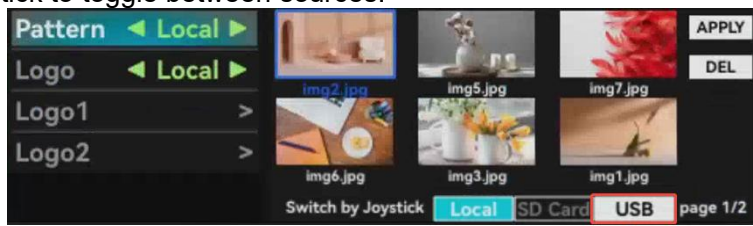


## 7.3 Images

Customize background images and logos. Supports importing images via USB/SD card.

### 7.3.1 Image

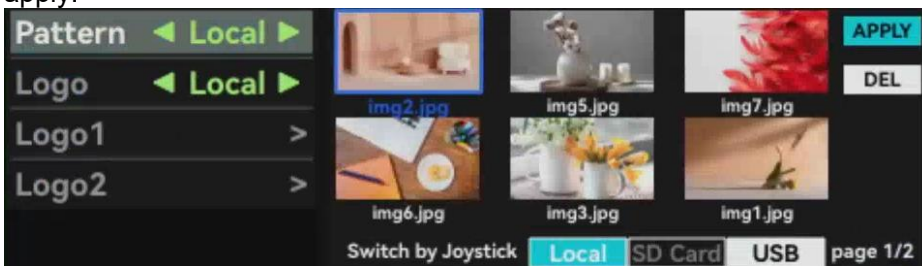
View default/internal images or external images from USB/SD (indicated by white icon). Use the joystick to toggle between sources.



Turns white when a storage device is detected

#### 7.3.1.1 Image Applications

Select the image in the system or USB flash drive/SD card by using the knob, press the knob to apply.



#### 7.3.1.2 Image Deletion

Select and delete images. Note: Cannot delete currently playing images.



#### 7.3.1.3 Image Addition

Image adding: Images can be imported from a USB flash drive or SD card. When inserting a USB flash drive/SD card, a memory used/total memory icon will appear at the bottom of the status/menu page. (Make sure the image is stored in the "images" directory of the USB flash drive/SD card) Use the joystick to switch to the USB stick/SD card image menu, and click Import to load it into the switcher. Note: The recommended format of the picture is PNG, with a resolution of 1920\*1080.

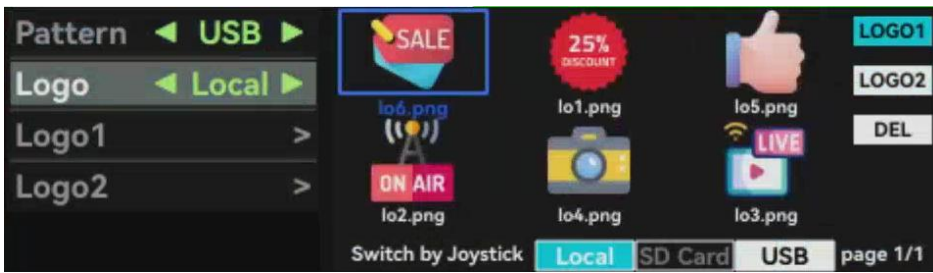


### 7.3.2 Logo

Configure logos (supports PNG/JPEG/BMP, max 960×540).

#### 7.3.2.1 Logo application

Select the image in the system or USB flash drive/SD card by pressing the knob to set the image of LOGO 1 or LOGO 2.



### 7.3.2.2 LOGO 1/2 Deletion

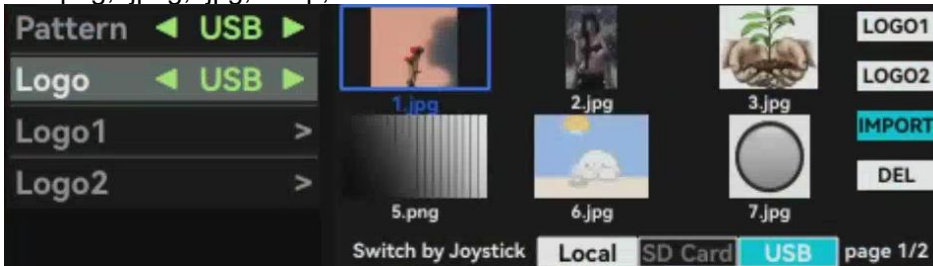
Select the image on the system or USB flash drive/SD card by pressing the knob, and then click Delete.



### 7.3.2.3 LOGO 1/2 Addition

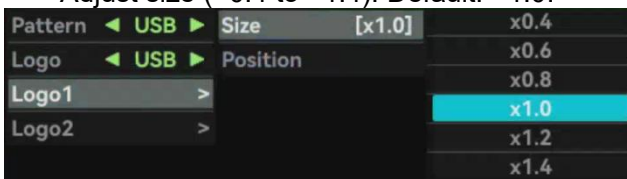
The station logo is added to load the LOGO image from the USB flash drive/SD card. When inserting a USB flash drive/SD card, a memory used/total memory icon will appear at the bottom of the status/menu page. (Please make sure that the LOGO image is stored in the USB flash drive.)logos" directory) via the joystick to switch to the USB stick/SD card LOGOS menu, click Import to load it into the switcher.

The maximum resolution of the LOGO image is 960x540, and the supported formats are .png, .jpeg, .jpg, .bmp, etc.



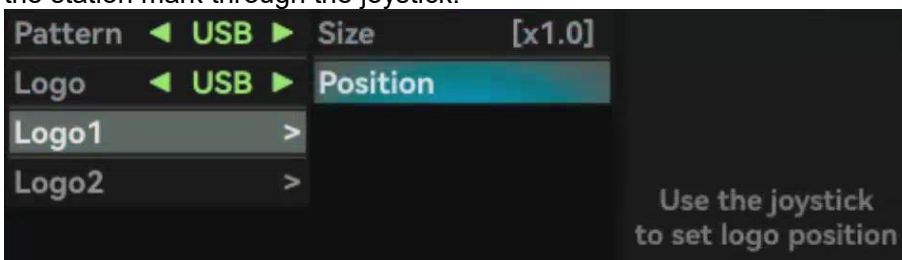
### 7.3.2.4 LOGO 1/2 Size

Adjust size (×0.4 to ×1.4). Default: ×1.0.



### 7.3.2.5 LOGO 1/2 Position

Go to the image settings, select the position of the station mark 1 and 2, and adjust the position of the station mark through the joystick.



## 7.4 Media

Record/play videos (H.264 encoding), stream, and manage media files

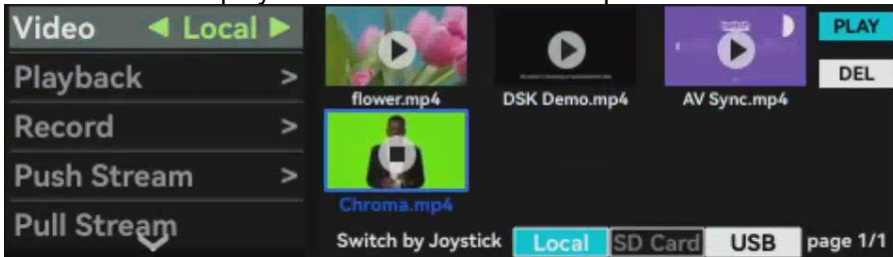
### 7.4.1 Video

Go to Media Settings and select Video to display the default video stored inside the switcher. After inserting a USB flash drive or SD card, switch between the video information inserted inside and outside

the system by moving the joystick.

### 7.4.1.1 Video Playback

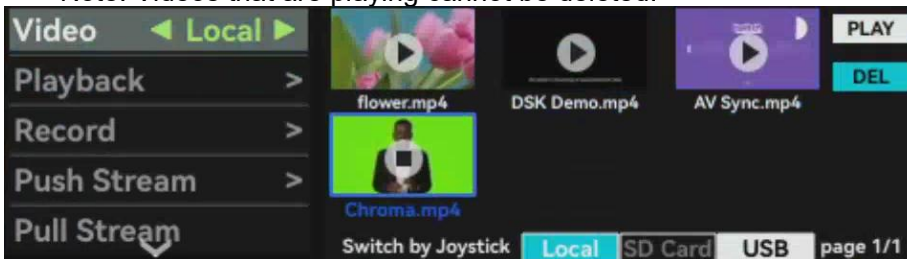
Select the video from the system or USB flash drive/SD card by knob, press the knob, and click play. The video will be played on the multimedia AUX port.



### 7.4.1.2 Video Deletion

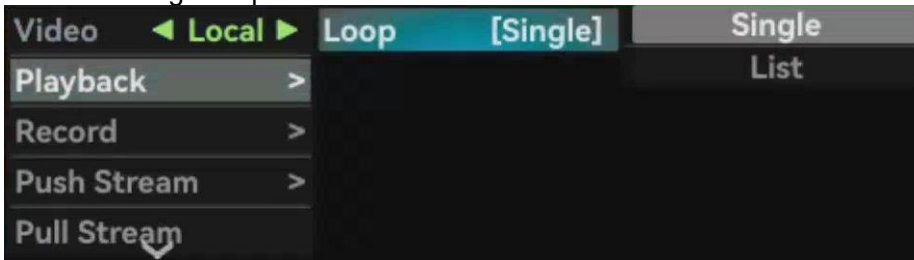
Select the video from the system or USB flash drive/SD card by the knob, press the knob, and click Delete.

Note: Videos that are playing cannot be deleted.



### 7.4.1.3 Video Playback Mode

Entering the media settings, the user can choose the playback mode, and the default playback mode is a single loop.



## 7.4.2 Recording

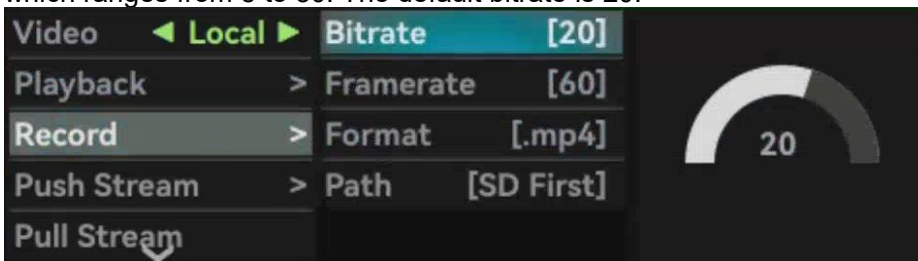
Record PGM images and sounds to the "video\_rec" folder of a USB flash drive/SD card. Support U disk/SD card format is FAT32, NTFS, exFAT (FAT32 can record up to 4G video).

Note: The system will automatically stop recording when the U disk/SD card capacity is insufficient; FAT32 format U disk/SD card recording 4G size will automatically stop recording;

If the recording is not stopped normally (such as the recording power is interrupted and the USB flash drive/SD card is unplugged), the recording file will not be able to be used normally.

### 7.4.2.1 Bitrate

You can modify the recording bitrate. Go to the media settings, select Record, and click the bitrate, which ranges from 5 to 30. The default bitrate is 20.



### 7.4.2.2 Frame Rate

The recording frame rate can be modified by the user. Go to the media settings, select Record, and click on the frame rate, which can range from 24, 25, 30, 50, and 60. The default frame rate is 60.

Video	◀ Local ▶	Bitrate	[20]	24
Playback	>	Framerate	[60]	25
Record	>	Format	[.mp4]	30
Push Stream	>	Path	[SD First]	50
Pull Stream	⌵			60

### 7.4.2.3 Format

The recording format can be modified by the user. Go to the media settings, select Recording, click Format, and modify it to ".mp4", ".ts", or ".flv". The default format is ".mp4".

Video	◀ Local ▶	Bitrate	[20]	.mp4
Playback	>	Framerate	[60]	.ts
Record	>	Format	[.mp4]	.flv
Push Stream	>	Path	[SD First]	
Pull Stream	⌵			

### 7.4.2.4 Storage Path

You can customize the storage path of the recorded video. Go to the media settings, select recording, and click the storage path, which can be modified to SD card first, U disk first. By default, SD card takes precedence.

Video	◀ Local ▶	Bitrate	[20]	SD First
Playback	>	Framerate	[60]	USB First
Record	>	Format	[.mp4]	
Push Stream	>	Path	[SD First]	
Pull Stream	⌵			

## 7.4.3 Streaming

Go to Multimedia Settings and select Network Streaming. You can save two ingest URLs in a network ingest. Click the STREAM button to start streaming. If the ingest address is available, the STREAM button will light up green and start ingesting.

### 7.4.3.1 Bitrate

You can modify the bitrate of ingest streams. Go to the media settings, select Push Stream, and click Bitrate, which ranges from 1 to 20. The default bitrate is 10.

Video	◀ Local ▶	Bitrate	[10]	
Playback	>	Framerate	[60]	
Record	>	Stream1	[ON]	
Push Stream	>	Stream2	[ON]	
Pull Stream	⌵			

### 7.4.3.2 Frame Rate

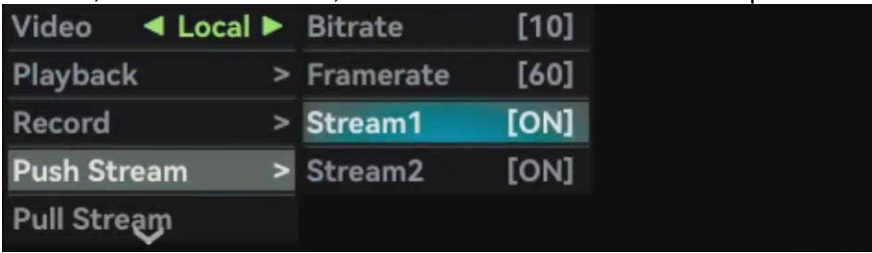
You can modify the frame rate of ingest. Go to the media settings, select Stream, click Frame Rate, and the frame rate range is 24, 25, 30, 50, and 60. The default frame rate is 60.

Video	◀ Local ▶	Bitrate	[10]	24
Playback	>	Framerate	[60]	25
Record	>	Stream1	[ON]	30
Push Stream	>	Stream2	[ON]	50
Pull Stream	⌵			60

### 7.4.3.3 Streaming Switch Control

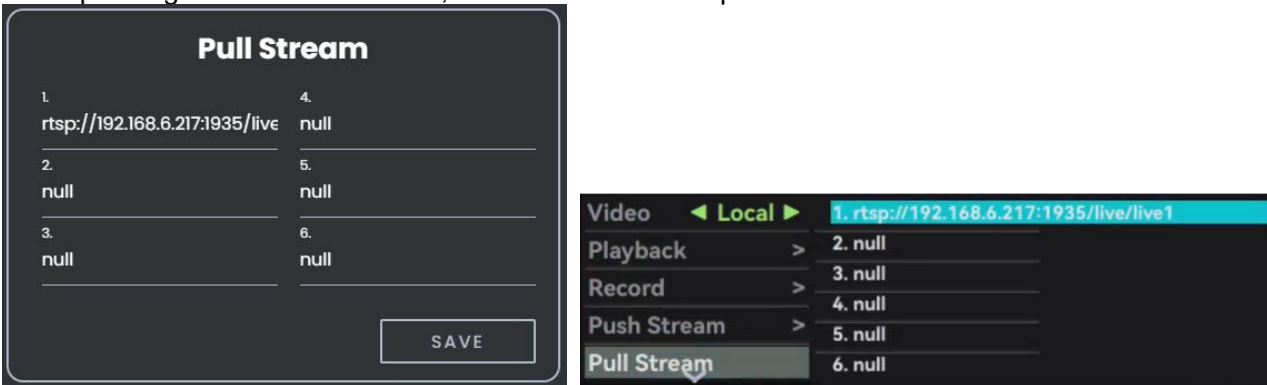
The user can control the two-way stream ingest switch. Go to the media settings, select Push

Stream, click Push Stream, and click the knob to control the push switch.



### 7.4.4 Pull Streaming

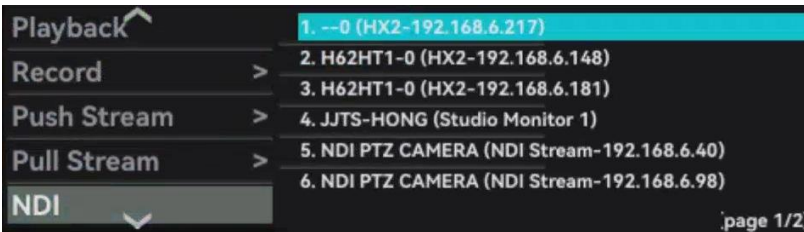
Fill in the streaming address (up to 6 addresses) through the host computer, click Save, select the corresponding address in the menu, and click the knob to pull the stream.



### 7.4.5 NDI

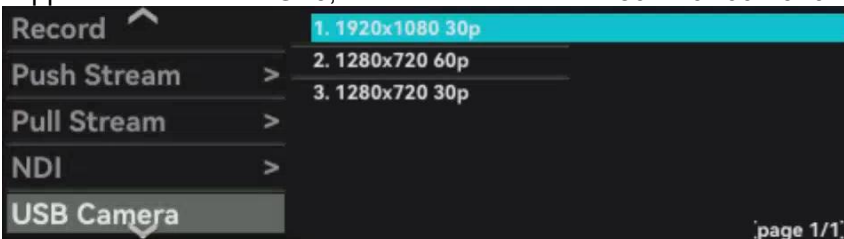
NDI is an efficient network transmission protocol that enables video transmission between multiple devices without the need for dedicated network equipment. It can transmit video signals to multiple devices through the network, so as to realize video editing, playback, control and other functions.

Keep the PTZ camera and switcher on the same LAN, turn on the switcher's network, turn on the NDI function, and connect the PTZ camera. The image of the PTZ camera will be displayed in the AUX window.



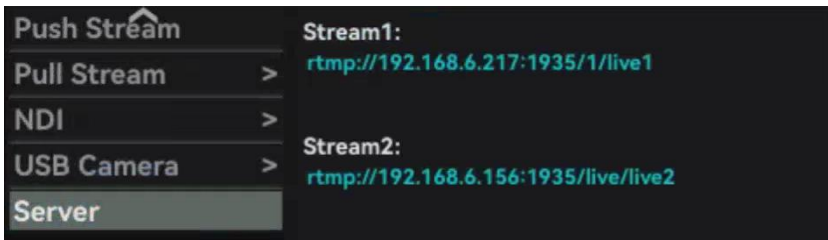
### 7.4.6 USB Camera

The user can input the camera signal source through the USB interface, and the USB signal source supports the format MGPJ, with a resolution of 1280\*720P60-1920\*1080P30.



### 7.4.7 Streaming Server

You can customize the ingest URL. Store the streaming address in the "stream\_url.txt" file of the USB flash drive, insert it into the USB flash drive/SD card, and the streaming address will be automatically modified.



## 7.5 Picture-in-Picture(PIP)

Configure two PIP layers with cropping/resizing..

### 7.5.1 PIP 1/2 Settings

Users need to use the PIP1 button to open the Picture-in-Picture 1 function, and then enter Picture-in-Picture 1 to adjust the screen size and crop.

#### 7.5.1.1 Source Selection

The user can modify the source selection of Picture-in-Picture 1. Go to the picture-in-picture settings, select picture-in-picture1, click the source selection, Select from IN1-IN4, AUX, or PAT. Default: IN1.

PIP1	> Source	[IN1]	IN1
PIP2	> Size&Pos	[Custom]	IN2
PIP Border	> Custom W	[46 %]	IN3
Meeting	> Custom H	[46 %]	IN4
Scene	Crop		AUX
			PAT

#### 7.5.1.2 Size & Position Selection

The user can adjust the size and position of Picture-in-Picture 1. The position can be adjusted by the joystick, Sizes: 1/8 to 1/2 or custom. Default: 1/4.

PIP1	> Source	[IN1]	1/8
PIP2	> Size&Pos	[1/4]	1/6
PIP Border	> Custom W	[46 %]	1/4
Meeting	> Custom H	[46 %]	1/3
Scene	Crop		1/2
			Custom

#### 7.5.1.3 Custom Width & Height

The size and position of Picture-in-Picture 1 can be customized. The position can be adjusted with the joystick, the size & position selection is customized, and the width and height of the picture-in-picture 1 can be adjusted by the knob. Set width/height (10%-100%). Default: W40%, H20%.

PIP1	> Source	[IN1]	
PIP2	> Size&Pos	[1/4]	
PIP Border	> Custom W	[46 %]	
Meeting	> Custom H	[20 %]	
Scene	Crop		

#### 7.5.1.4 Cropping

The crop function allows the user to select the part of the picture to be displayed. Go to the picture-in-picture settings, select Picture-in-Picture 1, and click Crop. Use the PTZ joystick to select a part of the screen to display, and rotate the knob to set the zoom size of the screen. The default zone size is 25%.

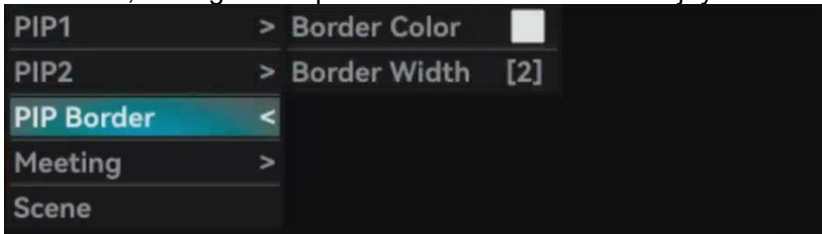
PIP1	> Source	[IN1]	Use joystick and knob to set cropping area zoom : 50%
PIP2	> Size&Pos	[1/4]	
PIP Border	> Custom W	[46 %]	
Meeting	> Custom H	[20 %]	
Scene	Crop		

### 7.5.2 Border Settings

The border setting will apply to both Picture-in-Picture 1 and Picture-in-Picture 2.

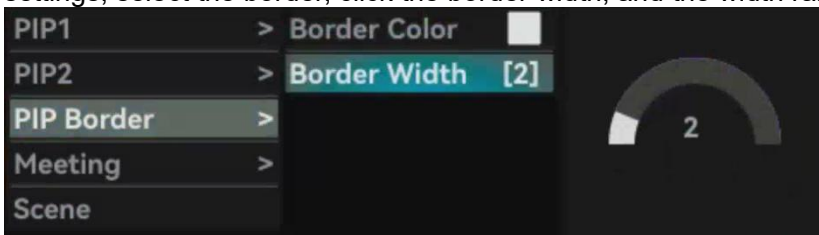
### 7.5.2.1 Border Color

Users can customize the color of the border in the color palette. Go to the picture-in-picture settings, select the border, click on the border color, and modify the red, green, and blue color space and hue, saturation, and lightness parameters via the knob and joystick.



### 7.5.2.2 Border Width

The user can customize the width of the frame of the picture-in-picture. Go to the picture-in-picture settings, select the border, click the border width, and the width range is 0-16. The default width is 2.

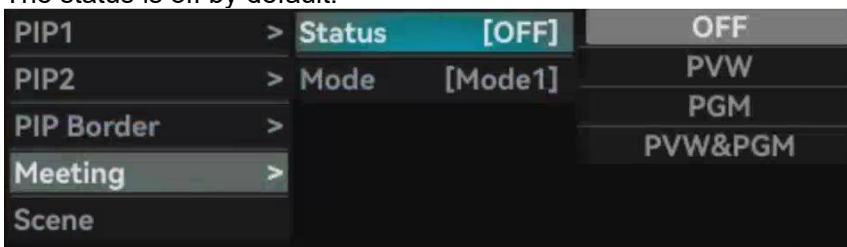


## 7.5.3 Conference Settings

The conference function can display the signals of the four input channels on the preview screen or the playback screen, or on both screens at the same time.

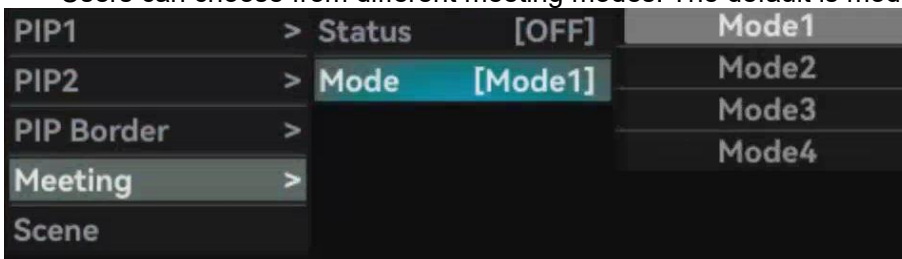
### 7.5.3.1 Status

The user can customize the display in PVW, PGM, or both. Go to the picture-in-picture settings, select the meeting, click Status, and the status can be selected as "Closed", "PVW", "PGM", and "Both". The status is off by default.



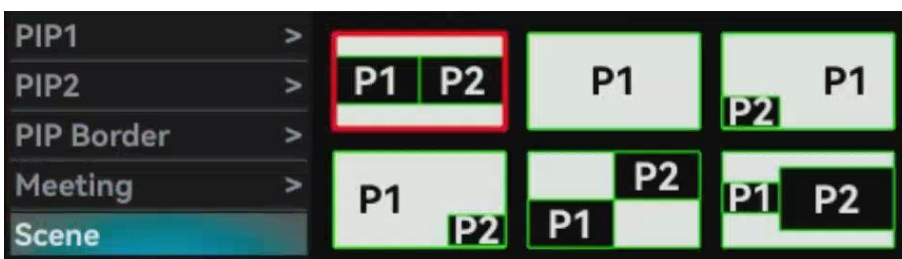
### 7.5.3.2 Mode

Users can choose from different meeting modes. The default is mode 1.



## 7.5.4 Scene

Users can set up picture-in-picture scenes to suit different broadcast requirements.



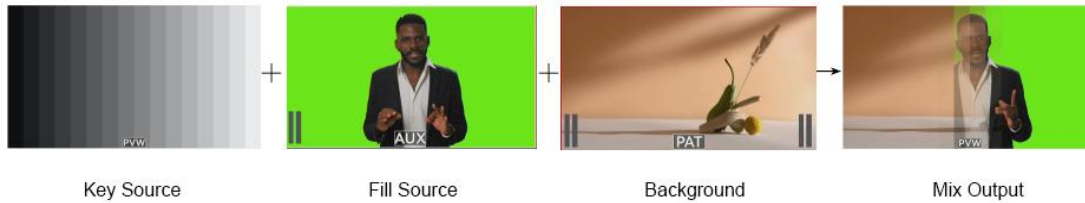
## 7.6 Luma Key

The Brightness key provides a way to synthesize text clips on top of background clips based on the

brightness level in the video.

Go to the Brightness key, select the key source, and set the effect of the Brightness key. The brightness key can take effect in PVW and PGM, turn on the brightness key function in PVW, and the LUMA button will turn on the white light; Turn on the brightness button function in PGM, and the LUMA ON AIR button will light up red.

Threshold adjustment key source cutout area, fill source fill in the cutout area; The background of the source selection covers the image of the key source, which changes as the threshold is adjusted.



### 7.6.1 Key Source

The key source can be adjusted by the user customis. Go to the brightness key settings, click the key source, and the key source can be IN1, IN2, IN3, IN4, AUX, PAT. The default key source is IN4.

Key Source	[IN4]	IN1
Fill Source	[IN2]	IN2
Show	[OFF]	IN3
Parameter	>	IN4
Mask	>	AUX
		PAT

### 7.6.2 Fill Sources

The filling source can be adjusted by the user customis. Go to the brightness key settings, click Fill Source, and the fill source can be IN1, IN2, IN3, IN4, AUX, PAT. The default key source is IN1.

Key Source	[IN4]	IN1
Fill Source	[IN1]	IN2
Show	[OFF]	IN3
Parameter	>	IN4
Mask	>	AUX
		PAT

### 7.6.3 Display

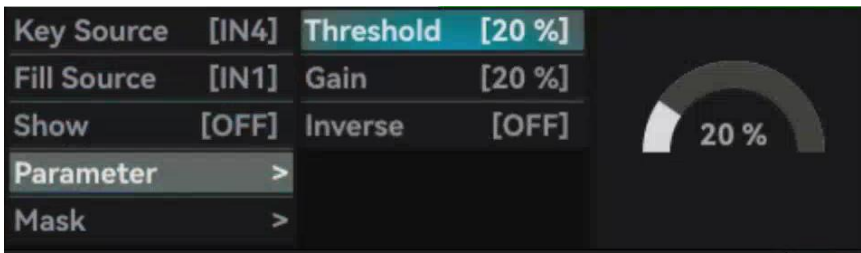
Users can set the brightness cutout effect to take effect in PVW, PGM, PVW&PGM, or off, which is off by default.

Key Source	[IN4]	OFF
Fill Source	[IN1]	PVW
Show	[OFF]	PGM
Parameter	>	PVW&PGM
Mask	>	

### 7.6.4 Adjustments

#### 7.6.4.1 Threshold

In the Brightness key, the threshold is set to a similar range to the Brightness Range, with the higher the value, the larger the range of the cutout. The threshold ranges from 1% to 100%, with the default threshold being 20%.



### 7.6.4.2 Gain

In the luma key, the gain sets a smoothness of the boundary when the cutout, with the higher the value, the smoother the boundary. The gain ranges from 1% to 100%, with a default gain value of 20%.



### 7.6.4.3 Invert

In the Brightness key, turn on Invert to cut out the range that is greater than the threshold. It is off by default.



### 7.6.5 Mask

The mask function adjusts the part of the screen that is displayed by masking layers.

#### 7.6.5.1 Mask Switch

Go to the brightness key settings, click Mask, select the Mask switch, and turn off the mask function. It is off by default.



#### 7.6.5.2 Mask Position

Go to the brightness key settings, click the mask, select the mask position, use the knob to zoom in and out of the mask screen in equal proportions, and use the joystick to move the position of the mask screen.



#### 7.6.5.3 Mask Width

Go to the brightness key settings, tap the mask, select the mask width, and use the knob and joystick to adjust the width and position of the matte screen.



#### 7.6.5.4 Mask Height

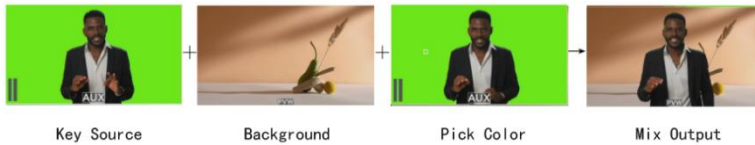
Go to the brightness key settings, tap the mask, select the mask height, and adjust the height and position of the mask screen with the knob and joystick.



### 7.7 Chroma Key

Chroma key is a visual effects and post-production technique used to composite (layer) two images or video streams together based on hue (chroma range). This technology has been used in many fields to remove backgrounds from photo or video subjects, especially in industries such as news broadcasting, movies, games, live streaming, etc.

Go to Chroma Key, select the key source, and set the effect of Chroma Key. Chroma key can take effect in PVW and PGM, turn on the chroma key function in PVW, and the CHROMA key will light up white; Turn on the chroma key function in PGM, and the CHROMA ON AIR key will light up red.



#### 7.7.1 Key Sources

The key source can be adjusted by the user customis. Go to the chroma key settings, click the key source, and the key source can be IN1, IN2, IN3, IN4, AUX, PAT, PIP1, PIP2. The default key source is IN4.

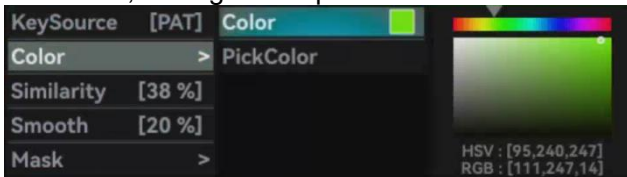


#### 7.7.2 Key Color

The knob and joystick allow the user to customize the color of the chroma key.

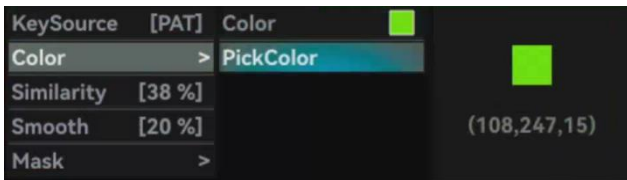
##### 7.7.2.1 Color

Users can customize the color to be cut out in the color palette. Go to the chroma key settings, select the cutout color, click on the color, and modify the red, green, and blue color space and hue, saturation, and lightness parameters via the knob and joystick.



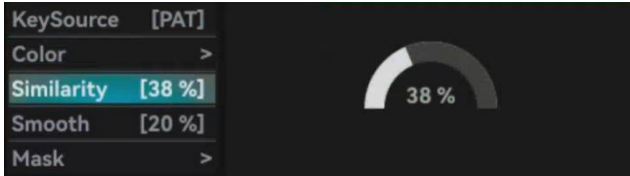
##### 7.7.2.2 Color Picker

Users can customize the color to be cut out in the key source. Go to the chroma key settings, select the cutout color, click to pick the color, and use the joystick to pick the color in the key source to cut out.



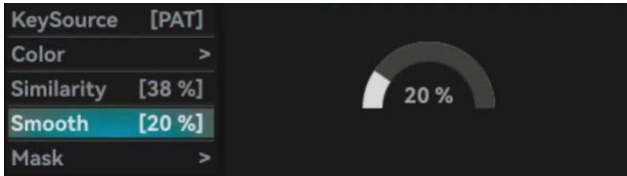
### 7.7.3 Similarity

In chroma key, the similarity sets the range of similarity to the cutout color, with the higher the number, the larger the cutout range. The similarity ranges from 1% to 100%, with a default similarity of 38%.



### 7.7.4 Smoothness

In Chroma Key, Smoothness sets a smoothness of the boundary when the image is cut, with the higher the number, the smoother the boundary. Smoothness ranges from 1% to 100%, with a default smoothness of 20%.



### 7.7.5 Masks

The mask function adjusts the part of the screen that is displayed by masking layers.

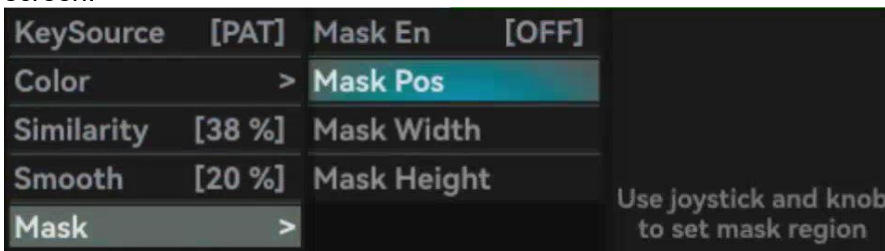
#### 7.7.5.1 Mask Switch

Go to the chroma key settings, click Mask, select the mask switch, and turn off the mask function. It is off by default.



#### 7.7.5.2 Mask Position

Go to the chroma key settings, click the mask, select the mask position, use the knob to zoom in and out of the mask screen in equal proportions, and use the joystick to move the position of the mask screen.



#### 7.7.5.3 Mask Width

Go to the chroma key settings, click the mask, select the mask width, and adjust the width and position of the mask screen with the knob and joystick.



## 7.7.5.4 Mask Height

Go to the chroma key settings, tap the mask, select the mask height, and use the knob and joystick to adjust the height and position of the mask screen.



## 7.8 Downstream Key (DSK)

Support DSK cutout, allowing users to easily add professional subtitles or graphic packaging systems when the program is broadcast, so as to meet the standards of TV broadcast, thereby improving the quality of the program and the viewing experience of the audience.



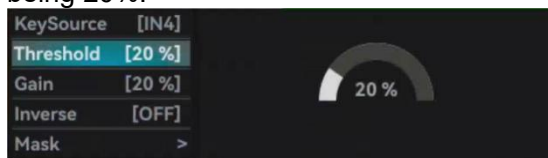
### 7.8.1 Key Sources

The key source can be adjusted by the user customis. Go to the DSK key settings, click the key source, and the key source can be IN1, IN2, IN3, IN4, AUX, PAT. The default key source is IN4.



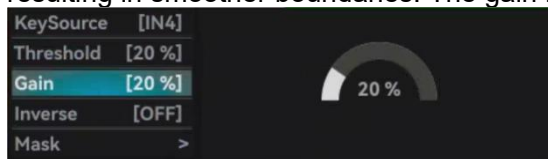
### 7.8.2 Threshold

In the DSK key, the threshold is set to a similar range to the brightness range, with the higher the value, the larger the cutout range. The threshold ranges from 1% to 100%, with the default threshold being 20%.



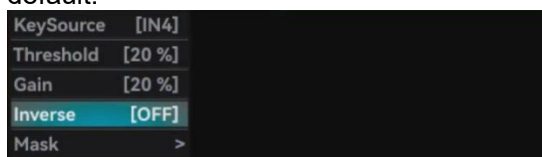
### 7.8.3 Gain

In the DSK key, the gain is set to a smoothness of the boundary when the cutout, with higher values resulting in smoother boundaries. The gain ranges from 1% to 100%, with a default gain value of 20%.



### 7.8.4 Invert

In the DSK key, turn on Invert and cut out the range that is greater than the threshold. It is off by default.



### 7.8.5 Mask

The mask function adjusts the part of the screen that is displayed by masking layers.

#### 7.8.5.1 Mask Switch

Go to the DSK key settings, click Mask, select Mask, and turn off the Mask function. It is off by default.

KeySource	[IN4]	Mask En	[OFF]
Threshold	[20 %]	Mask Pos	
Gain	[20 %]	Mask Width	
Inverse	[OFF]	Mask Height	
Mask			>

### 7.8.5.2 Mask Position

Go to the DSK key settings, click the mask, select the mask position, use the knob to zoom in and out of the mask screen in equal proportions, and use the joystick to move the position of the mask screen.

KeySource	[IN4]	Mask En	[OFF]
Threshold	[20 %]	Mask Pos	
Gain	[20 %]	Mask Width	
Inverse	[OFF]	Mask Height	
Mask			>

Use joystick and knob to set mask region

### 7.8.5.3 Mask Width

Go to the DSK key settings, click the mask, select the mask width, and use the knob and joystick to adjust the width and position of the mask screen.

KeySource	[IN4]	Mask En	[OFF]
Threshold	[20 %]	Mask Pos	
Gain	[20 %]	Mask Width	
Inverse	[OFF]	Mask Height	
Mask			>

Use joystick and knob to set mask region

### 7.8.5.4 Mask Height

Go to the DSK key settings, click the mask, select the mask height, and adjust the height and position of the mask screen with the knob and joystick.

KeySource	[IN4]	Mask En	[OFF]
Threshold	[20 %]	Mask Pos	
Gain	[20 %]	Mask Width	
Inverse	[OFF]	Mask Height	
Mask			>

Use joystick and knob to set mask region

## 7.9 PTZ

It supports the VISCA camera control protocol, which allows you to quickly and easily control the camera movement with joysticks and knobs, and at the same time, you can set the camera's focus, exposure, white balance and other parameters in the camera menu.

In addition, it also supports the storage and recall functions of the camera preset, which can be quickly called

### 7.9.1 Camera Selection

Go to the PTZ settings, tap Camera Select, and select the camera position you want to set through the knob.

Cam ID	[CAM1]	CAM1	192.168.6.159
Search		CAM2	192.168.6.151
Cam IP		CAM3	192.168.6.222
Speed	[20]	CAM4	192.168.6.226
Focus			>

### 7.9.2 Camera Connection

The PTZ camera is connected to the switcher via an HDMI cable and a network cable, and the camera needs to be kept on the same LAN as the switcher.

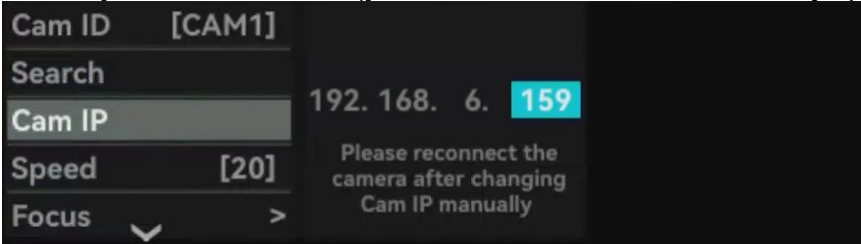
### 7.9.2.1 Search

Go to the PTZ settings, select Search, display all the found camera IPs in the same LAN, and select the camera IP through the knob.



### 7.9.2.2 Manual IP

Go to PTZ settings, select the camera IP, display the IP address of the camera, and you can manually set the IP address (you need to reconnect after manually updating the camera).



## 7.9.3 Camera Settings

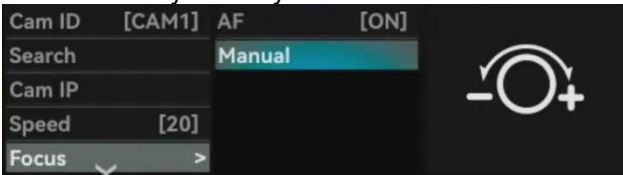
### 7.9.3.1 Speed

Go to the camera settings, select the speed, and adjust the speed of the camera lens movement, the speed range is 1-24. The default speed is 20.



### 7.9.3.2 Focus

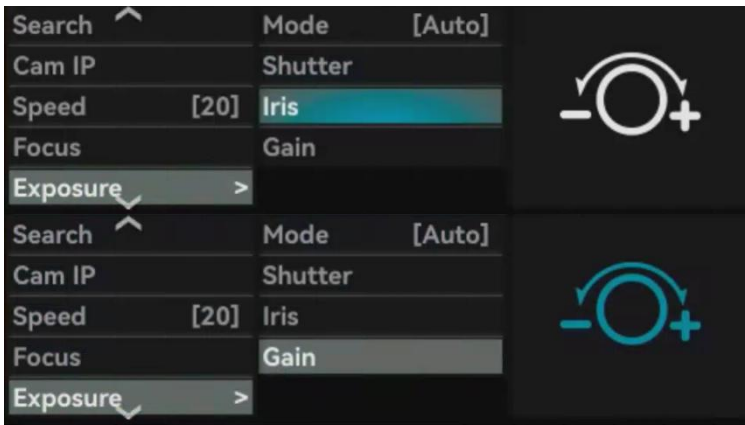
Go to the camera settings and select Focus, which allows you to set autofocus or manual focus, which is set by a rotary knob.



### 7.9.3.3 Exposure

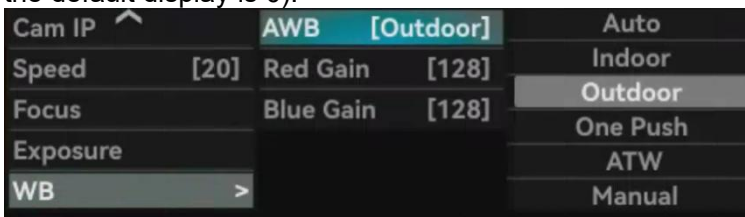
Go to the camera settings, select Exposure, and the exposure mode can be set to Auto, Manual, Shutter Priority, and Aperture Priority. After selecting Manual Exposure, use the knob to set the shutter, aperture, and gain.





### 7.9.3.4 White Balance

Enter the camera settings, select white balance, you can set automatic or manual mode, manual can be set by knob, red gain, blue gain can be set, the gain range is 0-255 (the displayed parameter value is to read the current actual value of the camera, if the actual value of the camera cannot be read, the default display is 0).

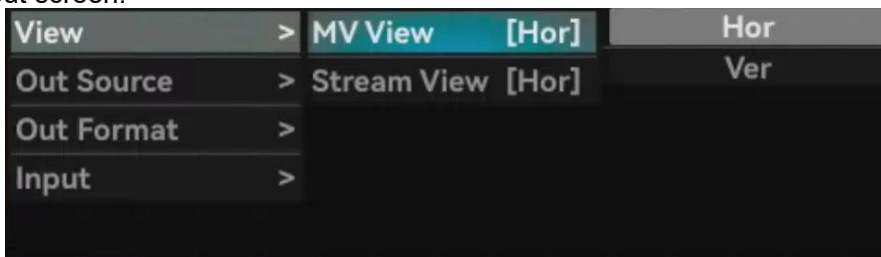


## 7.10 Interface

The interface function controls the layout of the monitor and output screen

### 7.10.1 View Direction

Go to the View Orientation settings and select the horizontal or vertical layout of the monitor and output screen.



#### 7.10.1.1 Multi-View Monitoring

Schematic diagram of landscape mode: Schematic diagram of the native machine of portrait mode:

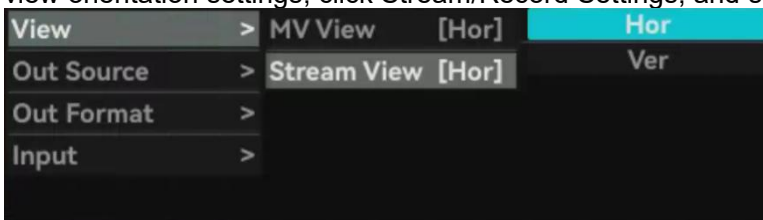


Schematic diagram of the output screen in portrait mode:



#### 7.10.1.2 Recording/Streaming View

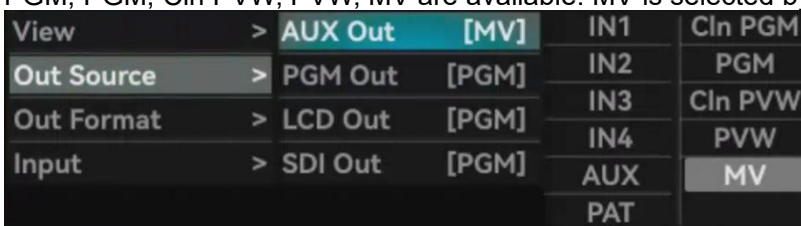
Users can change the horizontal position of the streaming/recording screen as needed. Go to the view orientation settings, click Stream/Record Settings, and select Horizontal or Vertical.



### 7.10.2 Output Source

#### 7.10.2.1 AUX Output

Go to the interface settings, select Output, and click AUX Output. IN1, IN2, IN3, IN4, AUX, PAT, CIn PGM, PGM, CIn PVW, PVW, MV are available. MV is selected by default.



### 7.10.2.2 PGM Output

Go to the interface settings, select Output, and click PGM Output. IN1, IN2, IN3, IN4, AUX, PAT, CIn PGM, PGM, CIn PVW, PVW, MV are available. PGW is selected by default.

View	> AUX Out	[MV]	IN1	CIn PGM
Out Source	> PGM Out	[PGM]	IN2	PGM
Out Format	> LCD Out	[PGM]	IN3	CIn PVW
Input	> SDI Out	[PGM]	IN4	PVW
			AUX	MV
			PAT	

### 7.10.2.3 Screen Output

Go to the interface settings, select Output, and click Screen Output. IN1, IN2, IN3, IN4, AUX, PAT, CIn PGM, PGM, CIn PVW, PVW, MV are available. PGW is selected by default.

View	> AUX Out	[MV]	IN1	CIn PGM
Out Source	> PGM Out	[PGM]	IN2	PGM
Out Format	> LCD Out	[PGM]	IN3	CIn PVW
Input	> SDI Out	[PGM]	IN4	PVW
			AUX	MV
			PAT	

### 7.10.2.4 SDI Output

Go to the interface settings, select Output, and click on SDI Output. IN1, IN2, IN3, IN4, AUX, PAT, CIn PGM, PGM, CIn PVW, PVW are available. IN1 is selected by default.

View	> AUX Out	[MV]	IN1	CIn PGM
Out Source	> PGM Out	[PGM]	IN2	PGM
Out Format	> LCD Out	[PGM]	IN3	CIn PVW
Input	> SDI Out	[PGM]	IN4	PVW
			AUX	MV
			PAT	

## 7.10.3 Output Format

### 7.10.3.1 Frame Rate

Go to the interface settings, select the output format, and click Frame Rate. Choose from 24p, 25p, 30p, 48p, 50p, 60p. The default option is 60p.

View	> FrameRate	[60p]	24p
Out Source	>		25p
Out Format	>		30p
Input	>		48p
			50p
			60p

## 7.10.4 Input

The user can customize the priority display of the four input signals. The default SDI signal takes precedence.

View	> IN1	[SDI First]	HDMI First
Out Source	> IN2	[SDI First]	SDI First
Out Format	> IN3	[SDI First]	
Input	> IN4	[SDI First]	

## 7.11 User

The user function allows you to save up to 6 custom configurations.

Call	[User1]	User1
Save		User2
		User3
		User4
		User5
		User6

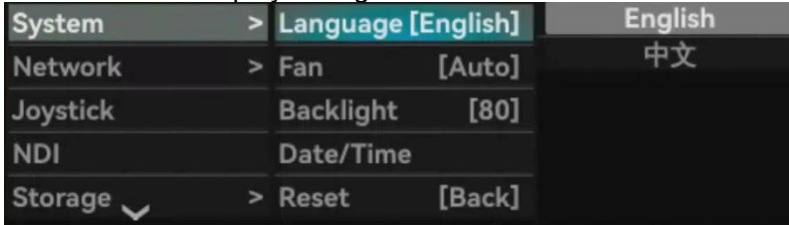
## 7.12 Settings

### 7.12.1 System Settings

Select System Settings to set the switcher's operating system, including language, fan, screen backlight, date/time, and reset settings.

#### 7.12.1.1 Language

Go to the system settings, select the language, select the multi-language switch through the knob, and the default display is English.



#### 7.12.1.2 Fan

Go to the system settings, select the fan, and through the knob, select the mode of the fan, the default is the automatic mode.

Auto mode: Fan speed control according to the switcher temperature, the higher the temperature, the faster the speed.

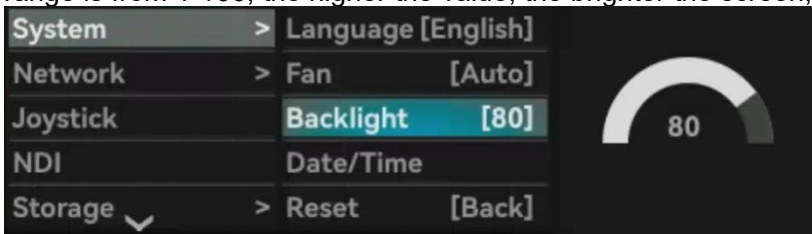
Off Mode: Turn off the fan and switch to auto mode only when a certain temperature is reached.

ON mode: The fan is always on during the working process.



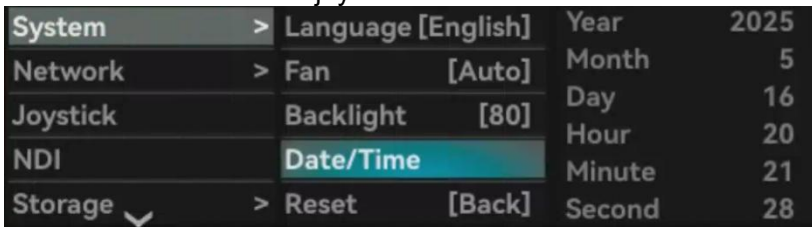
#### 7.12.1.3 Backlight

Go to the system settings, select the backlight, through the knob, adjust the screen backlight, the range is from 1-100, the higher the value, the brighter the screen, the default is 80.



#### 7.12.1.4 Time/Date

Go to the system settings, select the time/date, and modify the year, month, day, hour, minute, and second via the knob and joystick.



#### 7.12.1.5 Reset

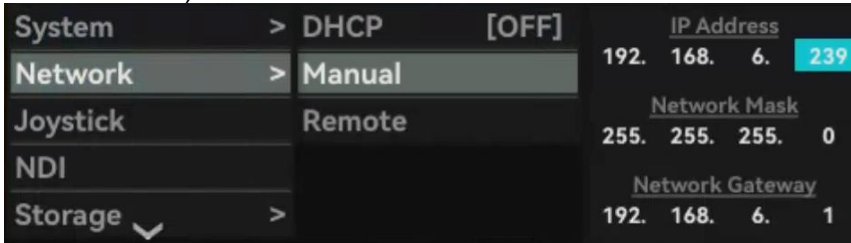
Go to the system settings, select Reset, go through the knob, select Confirm, click the knob, the switcher will perform a reset operation, after the reset will clear all configurations and return to the default state.



## 7.12.2 Network

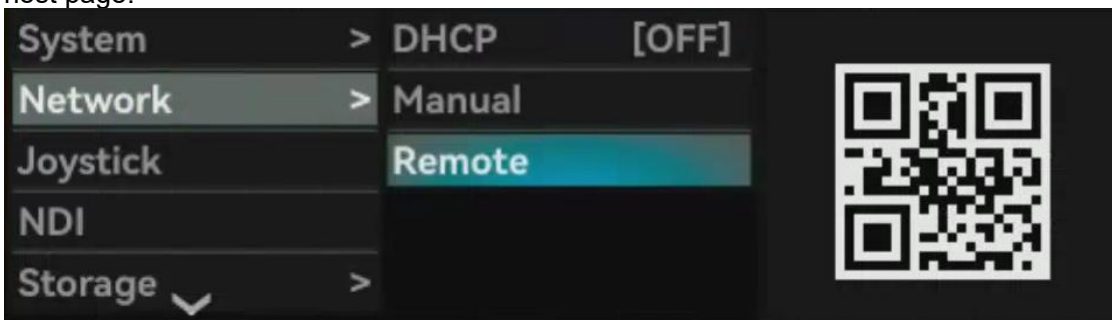
### 7.12.2.1 Network Connection

In the network settings, you can choose to automatically obtain the network IP address or manually configure it (you need to automatically obtain and disable the network IP address to manually configure the IP address).



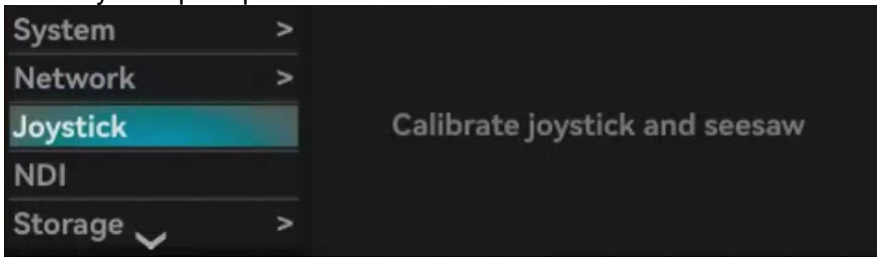
### 7.12.2.2 Remote control

Keep the switcher and the phone on the same LAN, go to the network settings, turn on the switcher network, click Remote Control, and use WeChat to scan the remote QR code to enter the mobile phone host page.



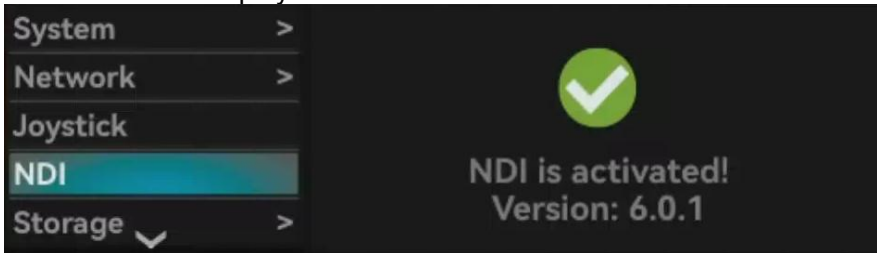
### 7.12.3 Joystick Calibration

Go to the settings, click Joystick Calibration, and follow the steps to calibrate the joystick according to the system prompts.



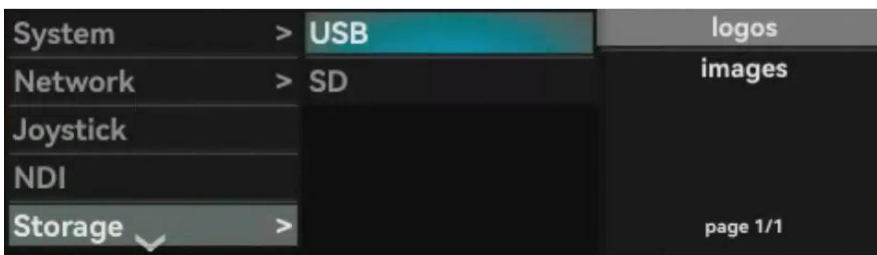
### 7.12.4 NDI

The NDI field displays whether the NDI is active and the version information



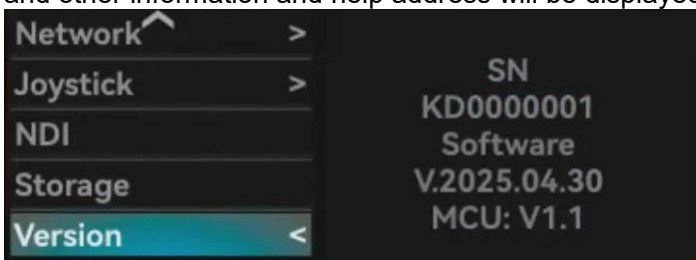
### 7.12.5 Storage

Storage items can be imported in batches, such as logos, images, local video sources, and software upgrades.



### Version 7.12.6

Go to the settings, click on the version, and the QR code of the device serial number, version date and other information and help address will be displayed.

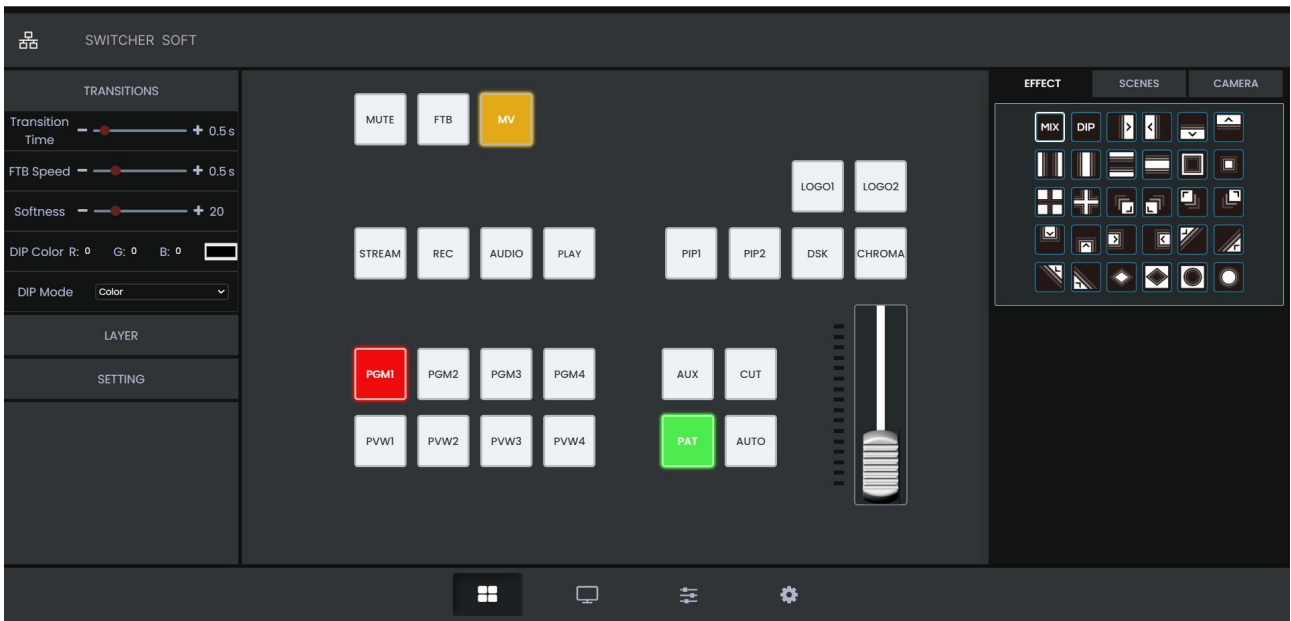


## 8. Web UI

### 8.1 Connect the web UI

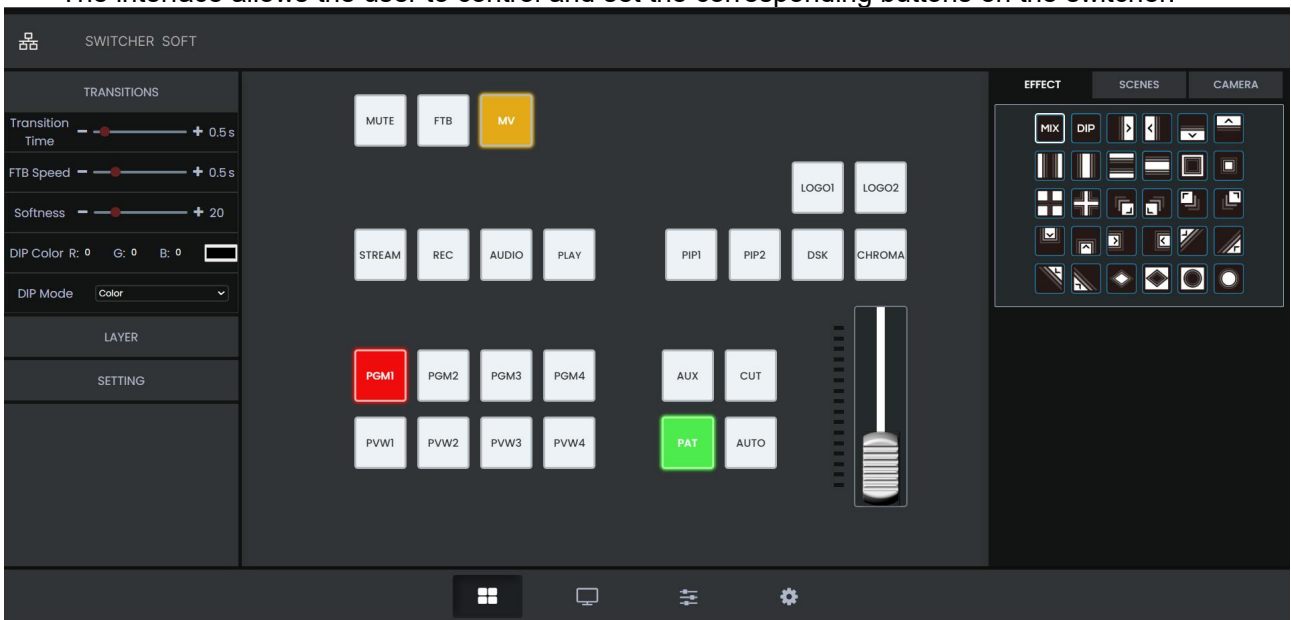
#### 8.1.1 Computer Connection

Confirm that your computer is connected to the same LAN by automatically obtaining or manually setting the network IP address. Open the browser on the computer, press Enter the IP address to connect, and enter the home page of the host computer, that is, the switcher page.

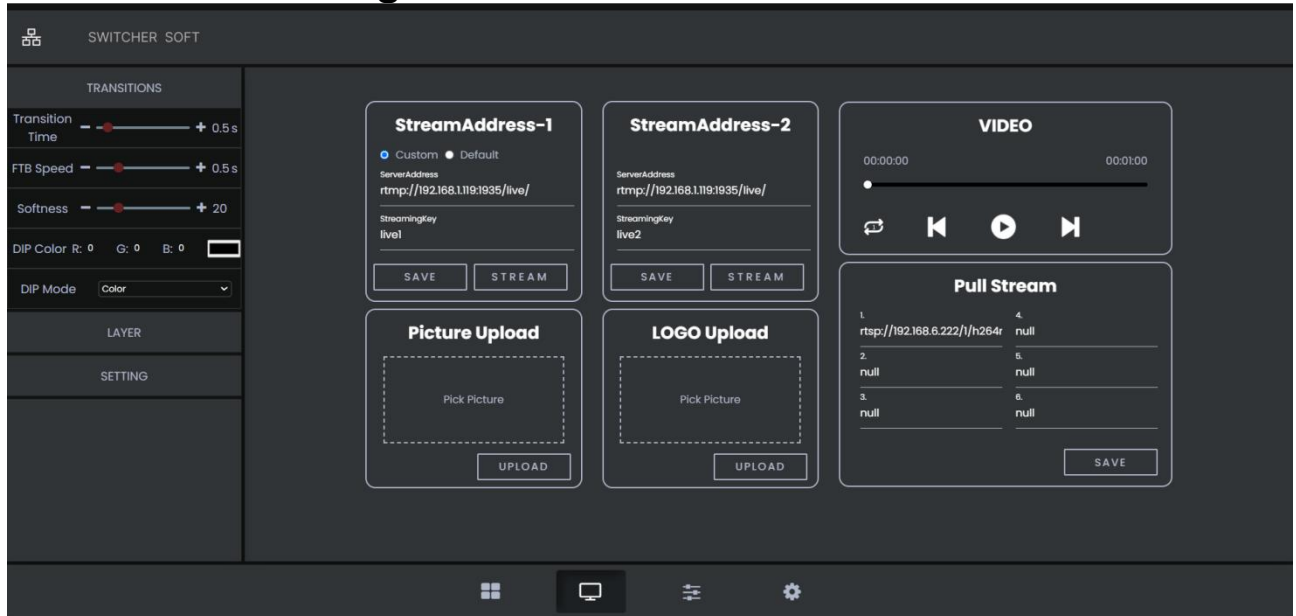


## 8.2 Switcher Panel Control

The interface allows the user to control and set the corresponding buttons on the switcher.



## 8.3 Multimedia Settings



### 8.3.1 Streaming Settings

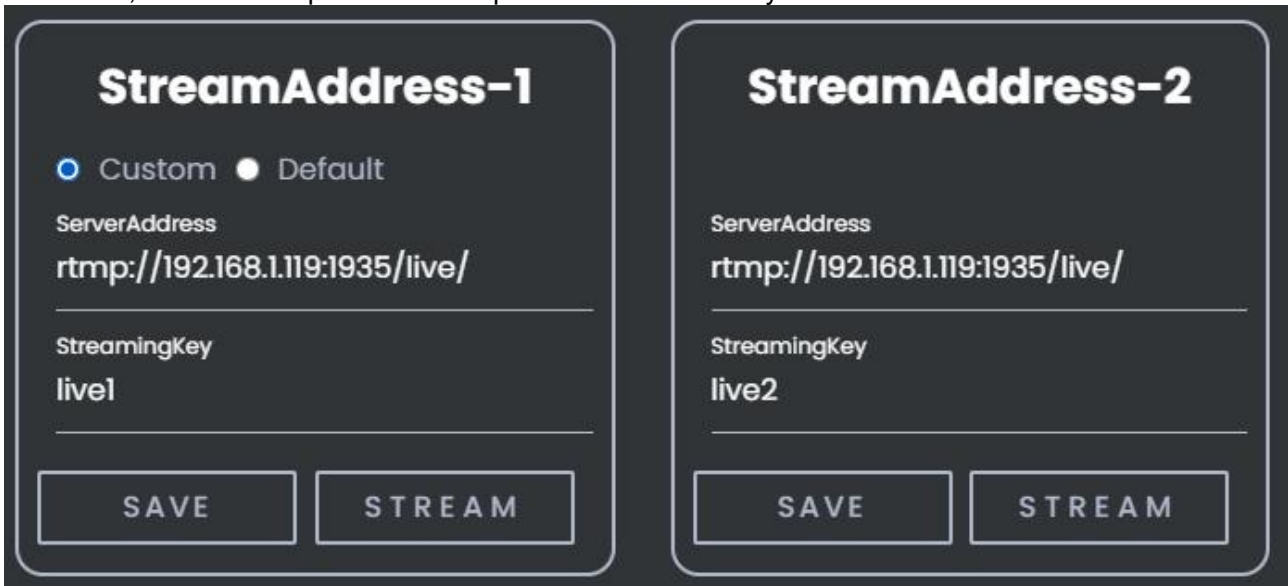
#### 8.3.1.1 Setting Streaming Address

Custom ingest URL:

Enter the host computer page, enter the server address and streaming key of the push stream in the push address -1 and push address -2 (used for the push of live streaming platforms such as Bilibili and Huya), and click the push button to push the stream.

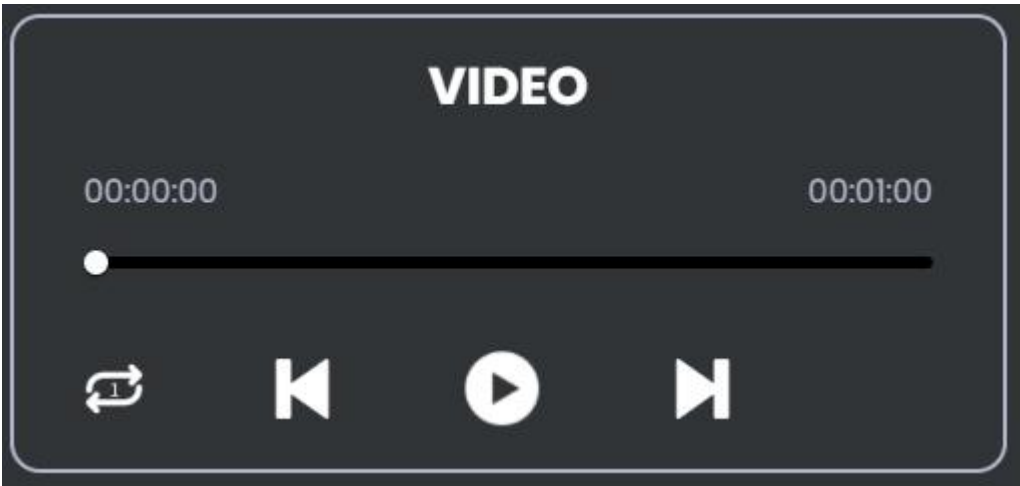
Default ingestion:

Enter the default server address and streaming key of the streaming address-1 and ingest address-2, and click the push button to push the stream locally.



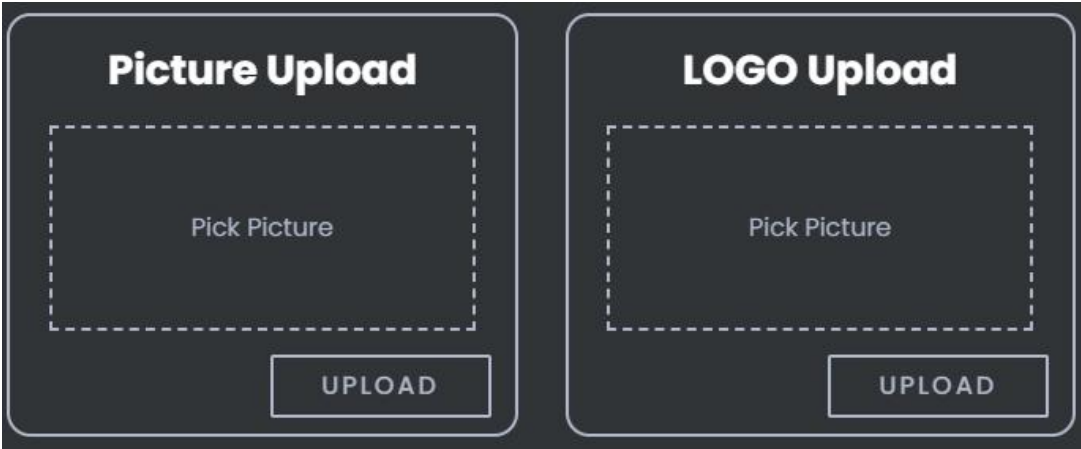
### 8.3.2 Video

You can use this interface to operate the local video source played by AUX.



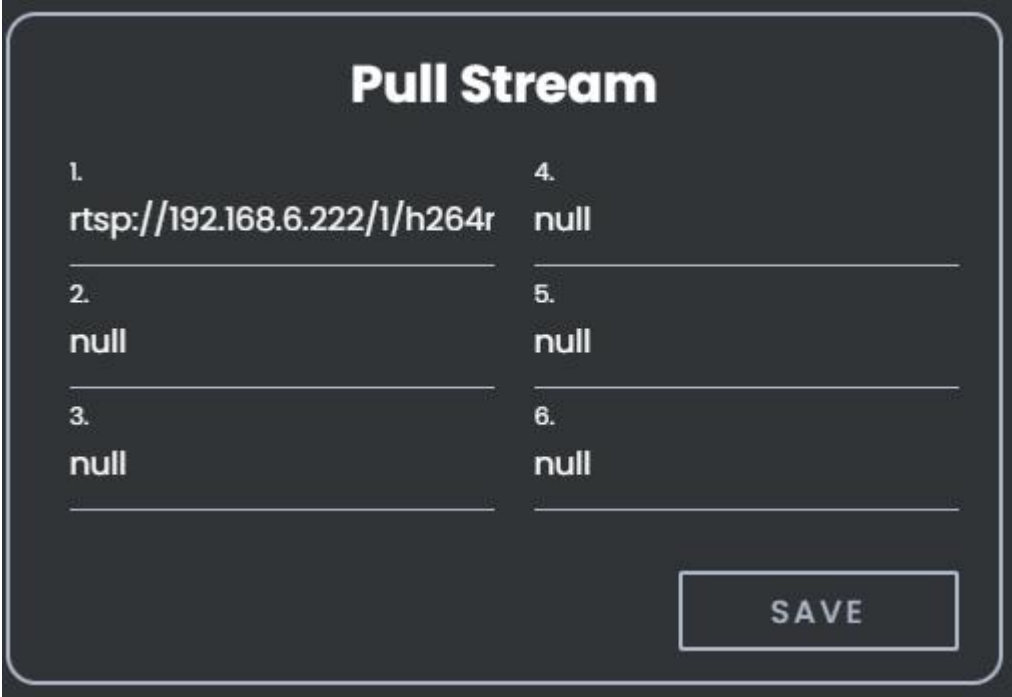
### 8.3.3 Upload images and logos

Users can upload images and logo materials through this interface.



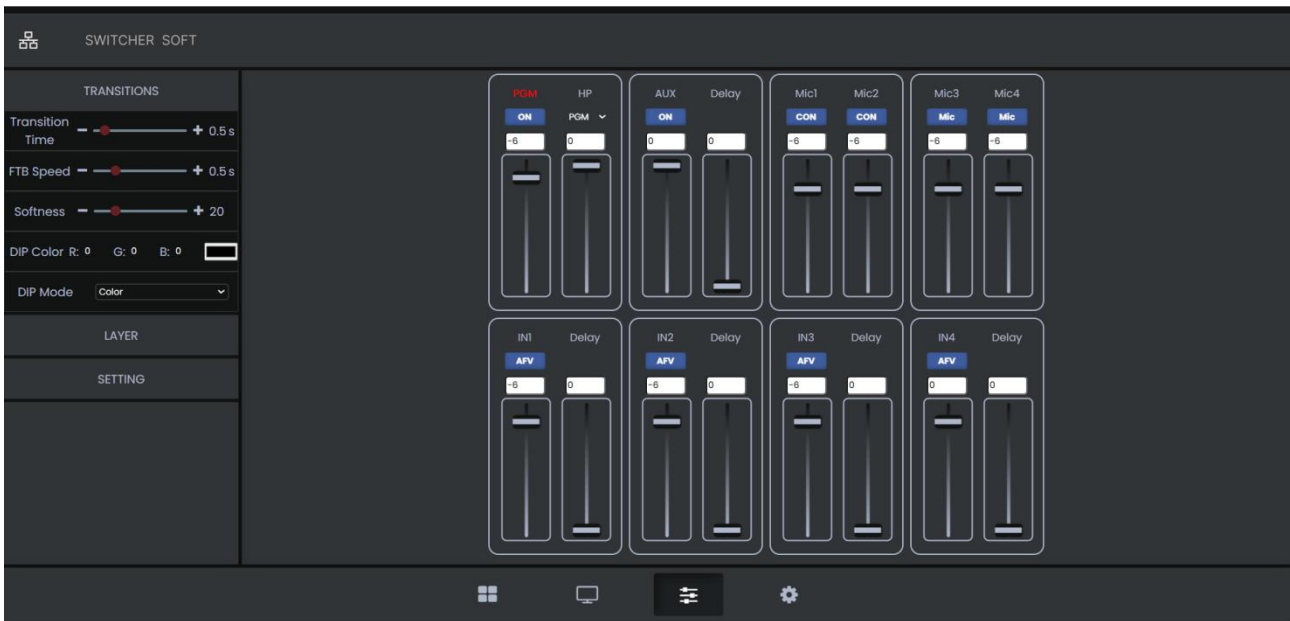
### 8.3.4 Pull stream settings

Fill in the streaming address (up to 6 addresses) on the host computer, click Save and sync to the switcher.



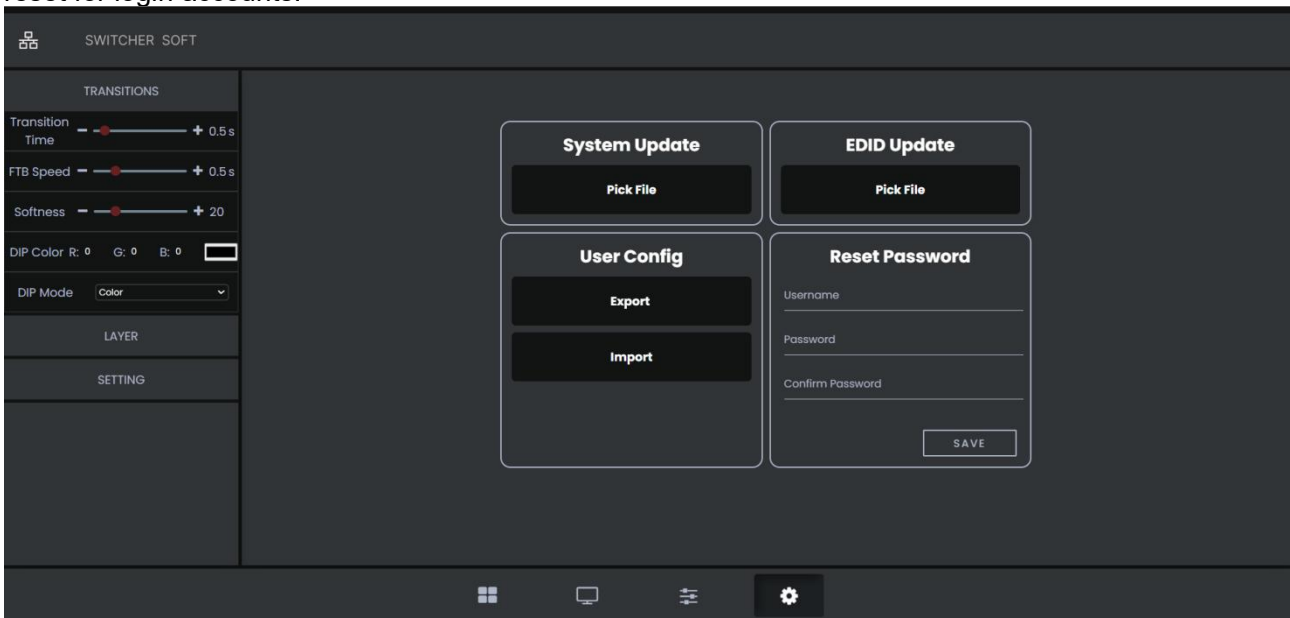
### 8.4 Audio

Users can modify audio-related parameters on this interface.



## 8.5 Upgrades

Users can perform system updates, EDID updates, user configuration import/export, and password reset for login accounts.



## 9. Technical Specifications

Technical Specifications	
Video input	4× HDMI (2× 4K60), 4× SDI (1080p60), 1× USB/RTSP/NDI
Video output	HDMI PGMx1+HDMI AUXx1+SDI PGMx1+USB 3.1x1 (Type-C) and RJ45x1 (Network Streaming).
Audio input	Line (3.5mm stereo) x2, XRLx2
Audio output	Line (3.5mm stereo) x2
USB	USB/SD for recording/media (FAT32/NTFS/exFAT)
Control interface	LAN x 1 is used for network streaming, PTZ camera control, and web interface
SD card	It is used for video recording and storage, LOGO, pictures, local videos, firmware upgrades, etc
<b>function</b>	
Transition	T-Bar/AUTO/ CUT

Transitions	WIPE (MULTI-PATTERN)/MIX/DIP/TRANSITION PREVIEW
Key	Upstream key: chroma key x1/PIPx2 Downstream key: DSKx1/LOGOx2
Layer	Up to 8 layers are supported
audio	HDMI x 4, SDI x 4, multimedia and 4 mic/analog audio inputs; Audio delay: 0-1s
PTZ	VISCA OVER IP
Media Library	Support preset a variety of background images, logos and video streams
Streaming	H.264 encoding, supports recording and multi-network stream ingestion, and supports bitrate separation for recording and ingesting streams
LOGO	Any size (up to 960x540) and position, support alpha transparent channel (PNG image).
<b>Format support</b>	
HDMI input support	2160p 60/59.94/50/30/29.97/25/24/23.98 (HDMI2.0 接口) 1080p 60/59.94/50/30/29.97/25/24/23.98 1080i50/1080i60
SDI input support	1080p 60/59.94/50/30/29.97/25/24/23.98 1080i50/1080i60
HDMI output	1080p 60/50/48/30/25/24
SDI output	1080p 60/50/48/30/25/24
HDMI color space	RGB/YUV
UVC output	USB 3.1 lossless output, up to YUV2 1080p60
Dataflow support	1080p 60/59.94/50/30/29.97/25/24/23.98
<b>other</b>	
power supply	12V
power consumption	≤15W
size	385x188x88mm/385x188x127mm (including joystick height)
weight	2.2kg
temperature	Operating temperature: 0°C~40°C, Storage temperature: -10°C~60°C