

# MX-12

## HD/SD Digital AV Mixer

### Operation Manual



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## • **Safety Precautions**

Please read all instructions before attempting to unpack or install or operate this equipment, and before connecting the power supply. Please keep the following in mind as you unpack and install this equipment:

- Always follow basic safety precautions to reduce the risk of fire, electrical shock and injury to persons.
- To prevent fire or shock hazard, do not expose the unit to rain, moisture or install this product near water.
- Never spill liquid of any kind on or into this product.
- Never push an object of any kind into this product through module openings or empty slots, as you may damage parts.
- Do not attach the power supply cabling to building surfaces.
- Do not allow anything to rest on the power cabling or allow it to be abused by persons walking on it.
- To protect the equipment from overheating, do not block the slots and openings in the module housing that provide ventilation.

## • **Revision History**

<b><i>Version No</i></b>	<b><i>Date</i></b>	<b><i>Summary of Change</i></b>
<b><i>VS1</i></b>	<b><i>20101201</i></b>	<b><i>Add HDCP Description</i></b>

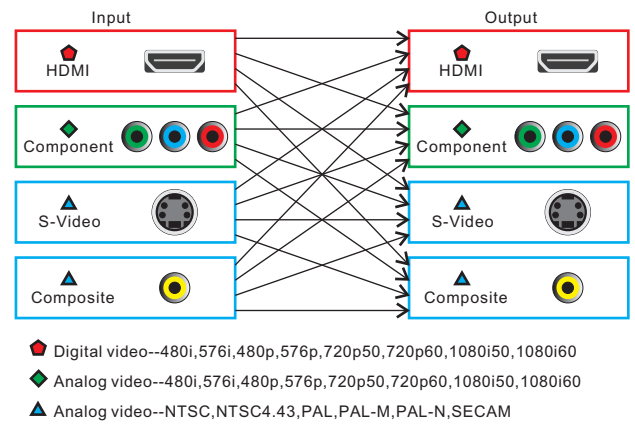
# Table of Contents

<b>1. Introduction</b> .....	1
<b>2. Features</b> .....	2
<b>3. Major Operating Controls and Their Functions</b> .....	3
■ POSITION/TIME .....	3
■ FUNCTIONS .....	3
■ MODE CONTROL .....	4
■ DIGITAL EFFECTS .....	5
■ ADJUST .....	6
■ VIDEO SOURCE SELECT .....	7
■ VIDEO/AUDIO MIXER .....	8
■ AUDIO LEVEL .....	9
■ REAR PANEL .....	10
<b>4. Basic Operations</b> .....	11
A Input signal selection and Back color Selection .....	11
B VIDEO MIX .....	12
C VIDEO WIPE .....	13
D Picture-In-Picture .....	16
E KEY .....	17
F AUTO FADE/WIPE Selection .....	18
G DIGITAL EFFECT .....	18
H AUDIO MIXER .....	18
I OSD ADJUST .....	19
<b>5. Connector and Installation</b> .....	20
<b>6. Specifications</b> .....	21
<b>7. Acronyms</b> .....	22

# 1. Introduction

This high definition HD/SD digital AV Mixer. Each input BUS supports 6 inputs (2 x HDMI, 2 x Component, 2 x S-Video and Composite video) and also Background Color for special efficiency. The output supports 1 x HDMI, 2 x Component, 2 x S-Video and Composite video, it also supports position adjustment and recording.

The output supports HD/SD resolution for example, NTSC, NTSC-4.43, PAL, PAL-M, PAN-N, SECAM, 480p, 576p, 720p 50/60, 1080i 50/60. The output resolution can auto adjust to consistency resolution, please refer to the diagram on the right side.



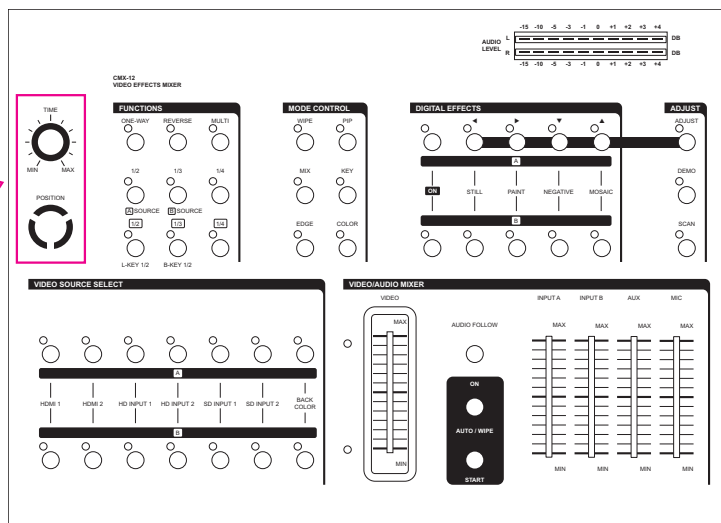
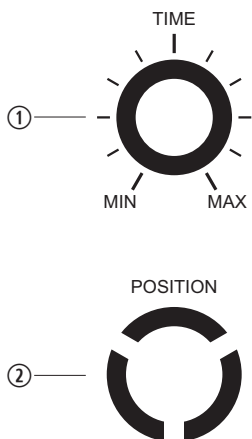
## 2. Features

- Selective size and position for digital effects area and PIP windows.
- Automatic fade and wipe with speed preset control.
- Digital effects- Still, Mosaic, Paint, Negative.
- 96 wipe patterns.
- Chroma key & Luminance key.
- High Picture Quality.
- 3x8 back color.
- Joystick control for digital effect position.
- Fade control for Video and Audio.
- Video and Audio mixing.
- Two HDMI source inputs.
- Two Component source inputs.
- Two Composite and S-Video source inputs.
- One HDMI recording outputs.
- Two Component recording outputs.
- One Composite and S-Video recording outputs.
- One Composite and S-Video preview outputs(OSD).
- Auxiliary audio input.
- Microphone input and headphone output.
- Picture in Picture control.(3 window sizes)
- Each A/B BUS can adjust the Contrast / Brightness / Color / HUE / Detail & Aspect Ration.
- Supports Lip-Sync delay up to 170ms.
- Composite supports 3D comb filter and YC separation.
- Motion and Edge Adaptive De-interlacing.

**Note:** When receiving content that has HDCP encryption there will be no video output except for HDMI output port.

# 3. Major Operating Controls and Their Functions

## POSITION/TIME



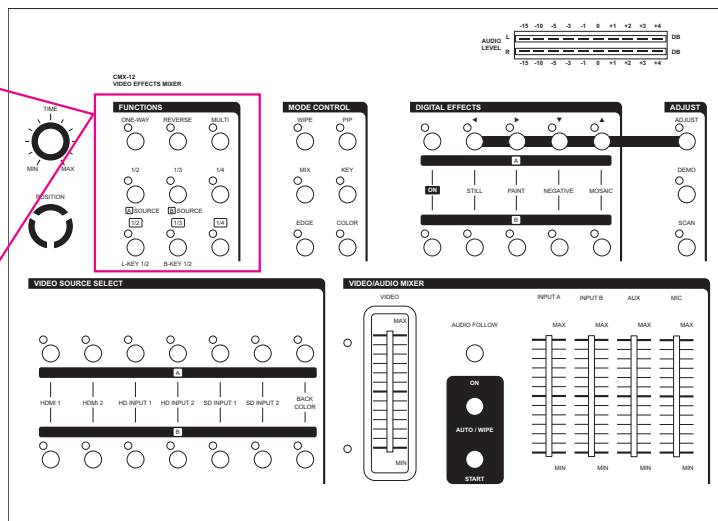
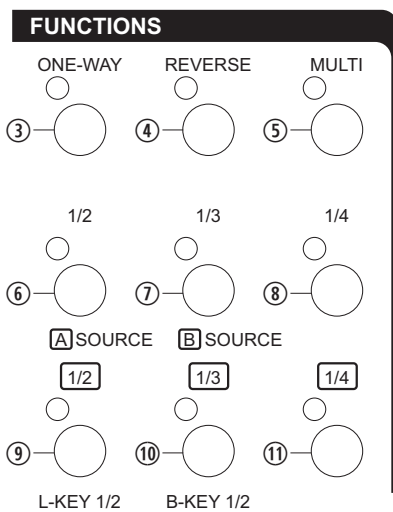
### ① Time Control

For adjusting the transition time of Auto Fade function and Auto take function.

### ② Joystick control

This joystick control has two functions controls the position of the Square wipe pattern and P-IN-P picture.

## FUNCTIONS



### ③ One-way wipe button.

### ④ Reverse wipe button.

### ⑤ Multiple wipe button.

### ⑥ Straight wipe button.

### ⑦ Split wipe button.

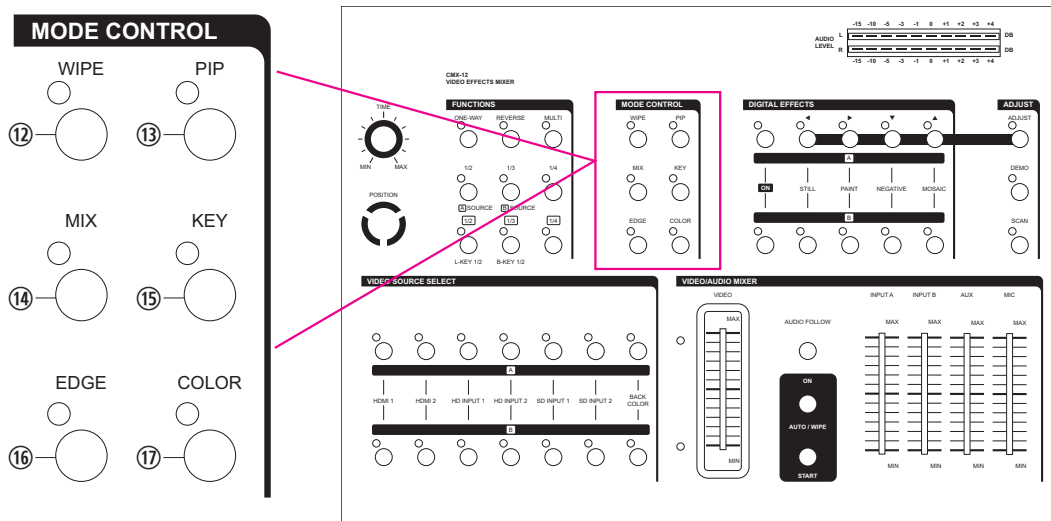
### ⑧ Corner wipe button.

### ⑨ Diagonal wipe button.

### ⑩ Triangle wipe button.

### ⑪ Square wipe button.

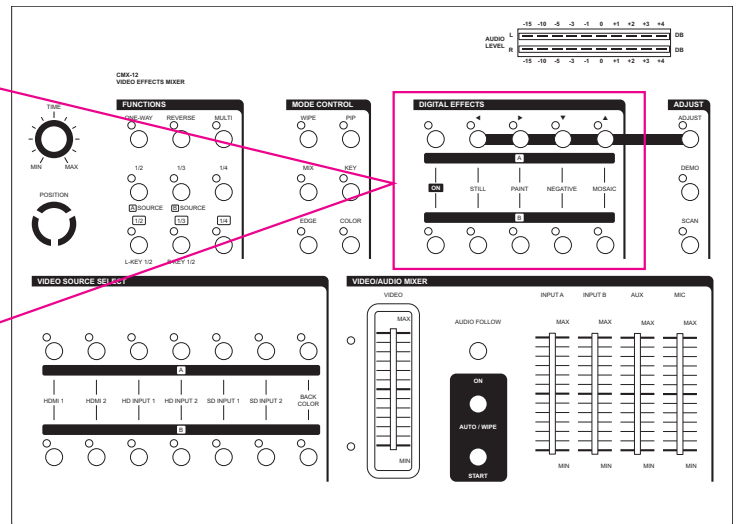
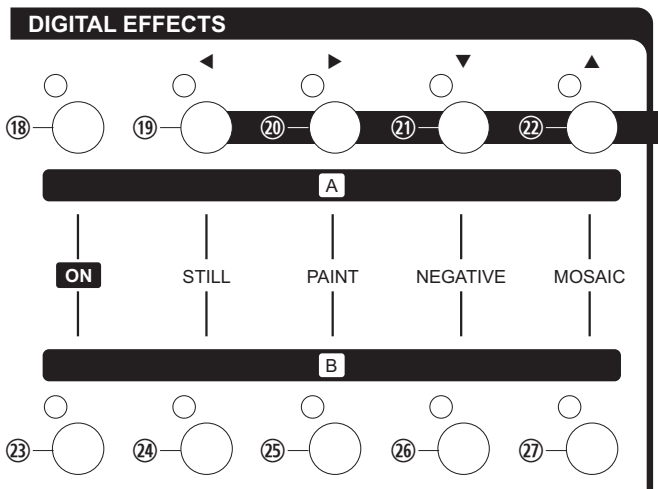
## ■ MODE CONTROL



- ⑫ Wipe button  
For selecting the wipe effect.
- ⑬ PIP button  
Picture in picture mode can be selected by pressing this button.
- ⑭ Mix(Fade) button  
Press this button to select the fade In/Out mode.
- ⑮ KEY button  
This button allows you to tune in a best performance point for the blue key and luma key effects.
- ⑯ EDGE button  
Press WIPE button, can select sharp edge / soft edge or color edge.
- ⑰ COLOR button  
Press color edge, can select eight different color of frame.

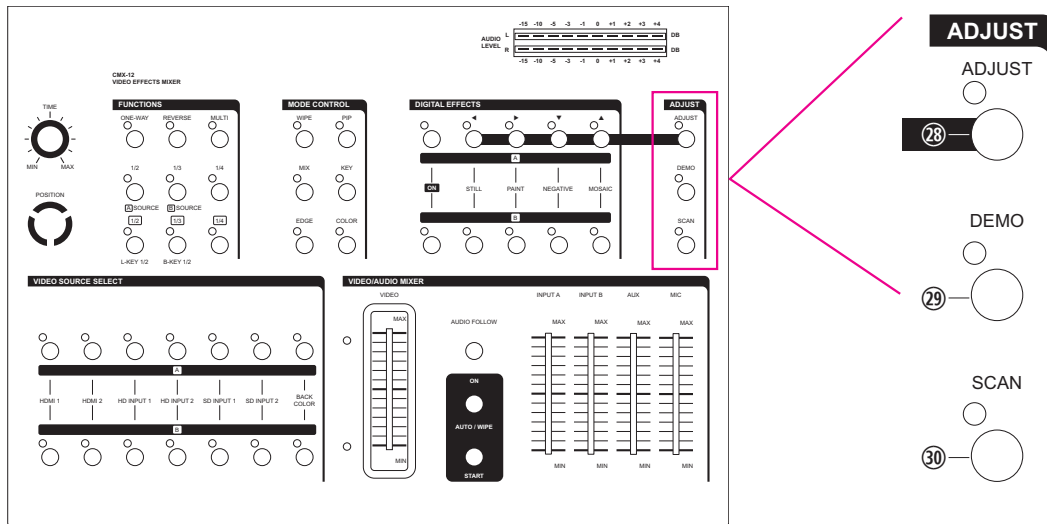


## DIGITAL EFFECTS



- ⑱ A-bus digital effect ON button.
- ⑲ A-bus Still button and osd left adjust.
- ⑳ A-bus Paint button and osd right adjust.
- ㉑ A-bus Negative button and osd up adjust.
- ㉒ A-bus Mosaic button and osd down adjust.
- ㉓ B-bus digital effect ON button.
- ㉔ B-bus Still button.
- ㉕ B-bus Paint button.
- ㉖ B-bus Negative button.
- ㉗ B-bus Mosaic button.

## ■ ADJUST



### ②⑧ Adjust button

When LED switched off, the SDP review output side will show AB-bus / output source and output format. When LED illuminate, the user can press 19 20 21 and 22 buttons to adjust the values.

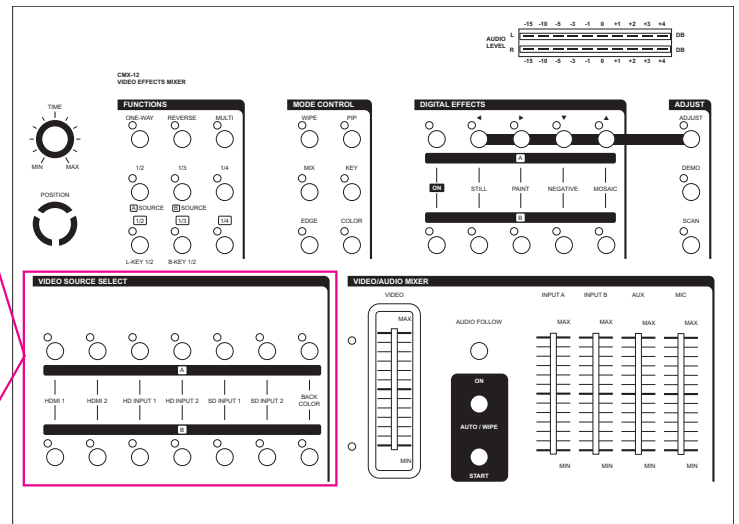
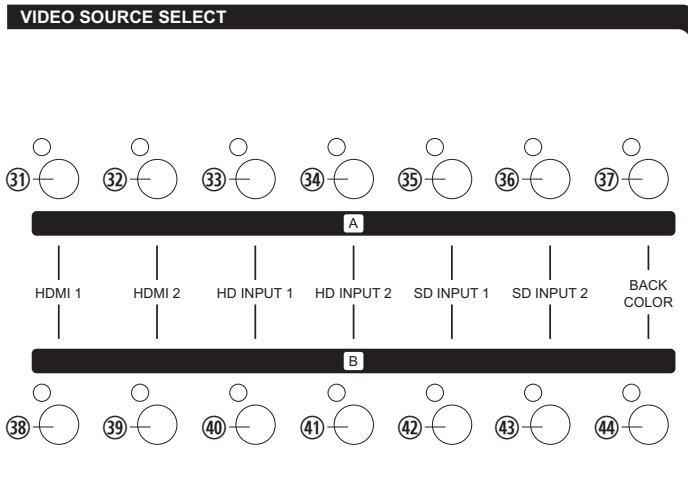
### ②⑨ DEMO button

When LED illuminate, the auto DEMO will switch to ON and the system will auto sequence Demo 96 wipe patterns, press 1 TIME button to adjust the auto sequence.

### ③⑩ SCAN button

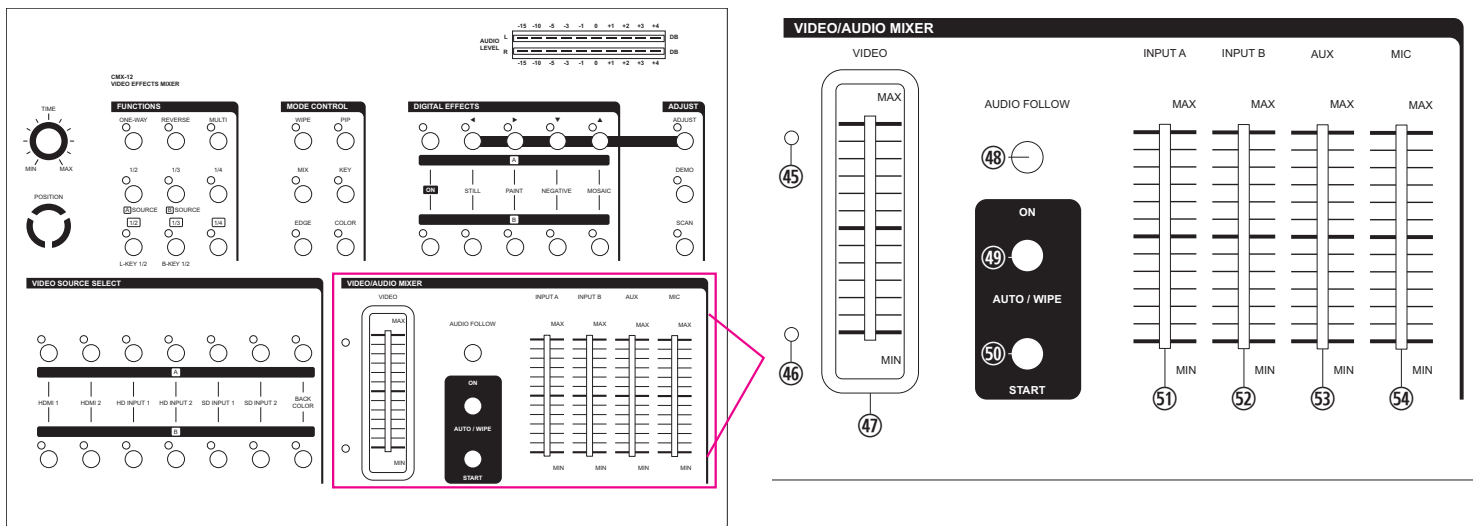
Press SCAN button for 3 seconds, the system will enter into SCAN function and will SCAN the input ports from 1 to 6 and record each port's format to the system.

## VIDEO SOURCE SELECT



- ③①③⑧ Used to select Source1,HDMI1.
- ③②③⑨ Used to select Source2,HDMI2.
- ③③④① Used to select Source3,HD input 1.
- ③④④① Used to select Source4,HD input 2.
- ③⑤④② Used to select Source5,SD input 1. When connecting both S-Video and CV at the same the time S-Video will be the first priority source to be display.
- ③⑥④③ Used to select Source5,SD input 2. When connecting both S-Video and Video at the same the time S-Video will be the first priority source to be display.
- ③⑦ A-bus back color select, can select one out of eight colors.
- ④④ B-bus back color select, can select one out of eight colors.

## VIDEO/AUDIO MIXER



④⑤ A-bus LED indicator.

④⑥ B-bus LED indicator.

When VIDEO slider move to A-bus the A-bus's LED will illuminate and move the slider to B-bus the B-bus's LED will illuminate. When slider move in between A-bus and B-bus the two LED will alternate illuminatd. When in Auto/Wipe the status will be the same condition.

④⑦ VIDEO slide.

Wipe, PIP and Key effects could be controlled by this Video slide which moves A/B bus outputs horizontally or vertically.

④⑧ AUDIO FOLLOW.

When turn on the Audio Follow A/B bus's sound indicator will follow the VIDEO slider movement. When turn off the Audio Follow, the audio indicator will become independent to adjust from ⑤① and ⑤②.

④⑨ AUTO/WIPE.

AUTO FADE/WIPE can be performed with START ⑤⑩ button when the button ④⑨ is set to ON.

⑤⑩ START button.

Automatic MIX and WIPE operation can be performed by pressing the START button. Transition time can be adjusted via TIME ① . When transition time lapsed, the LED goes off.

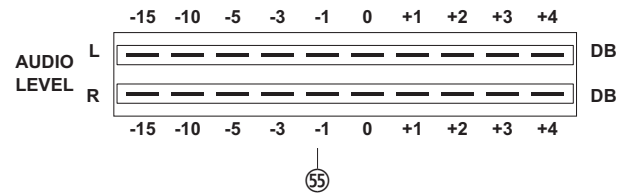
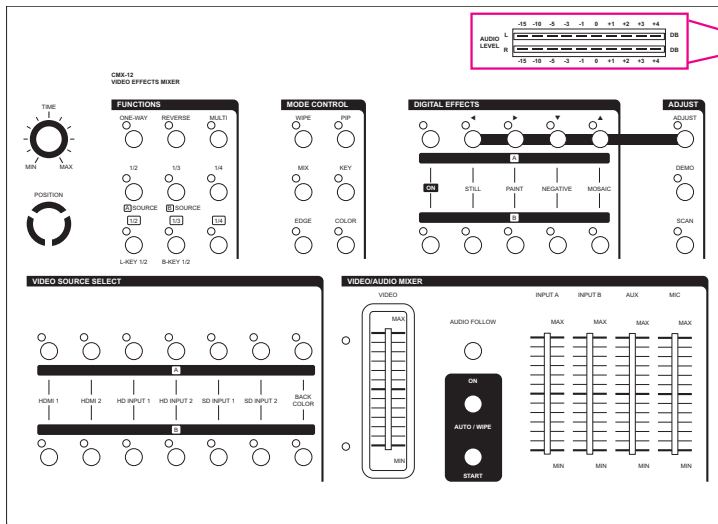
⑤① INPUT A:Controls the audio level of the input A.

⑤② INPUT B:Controls the audio level of the input B.

⑤③ AUX:Controls the audio level of the Auxiliary input.

⑤④ MIC:Controls the audio level of the Microphone input.

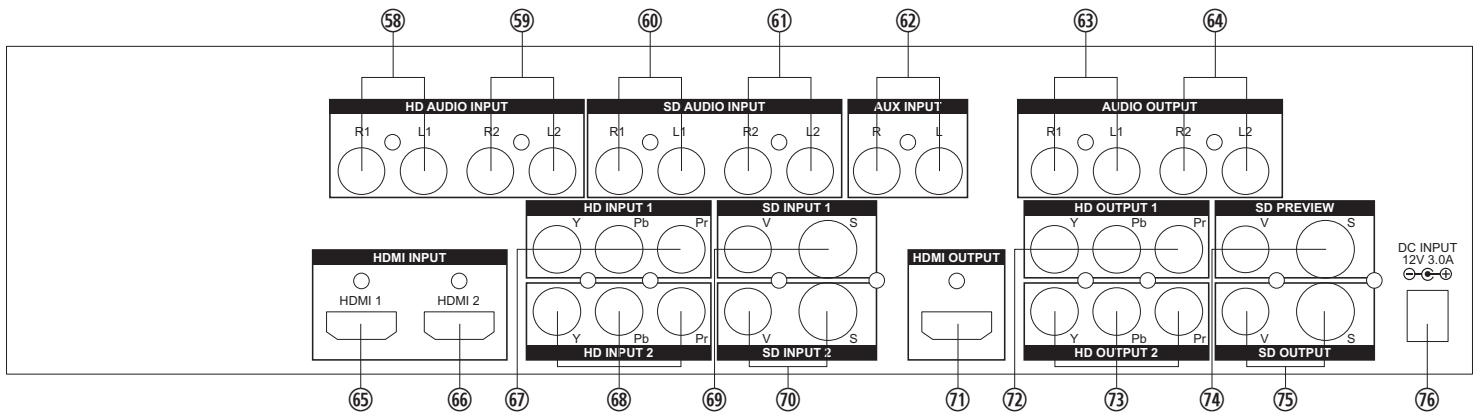
## ■ AUDIO LEVEL



55 Audio level indicator.(Audio level)

This indicator shows the audio output level of REC out 1 and REC out 2.

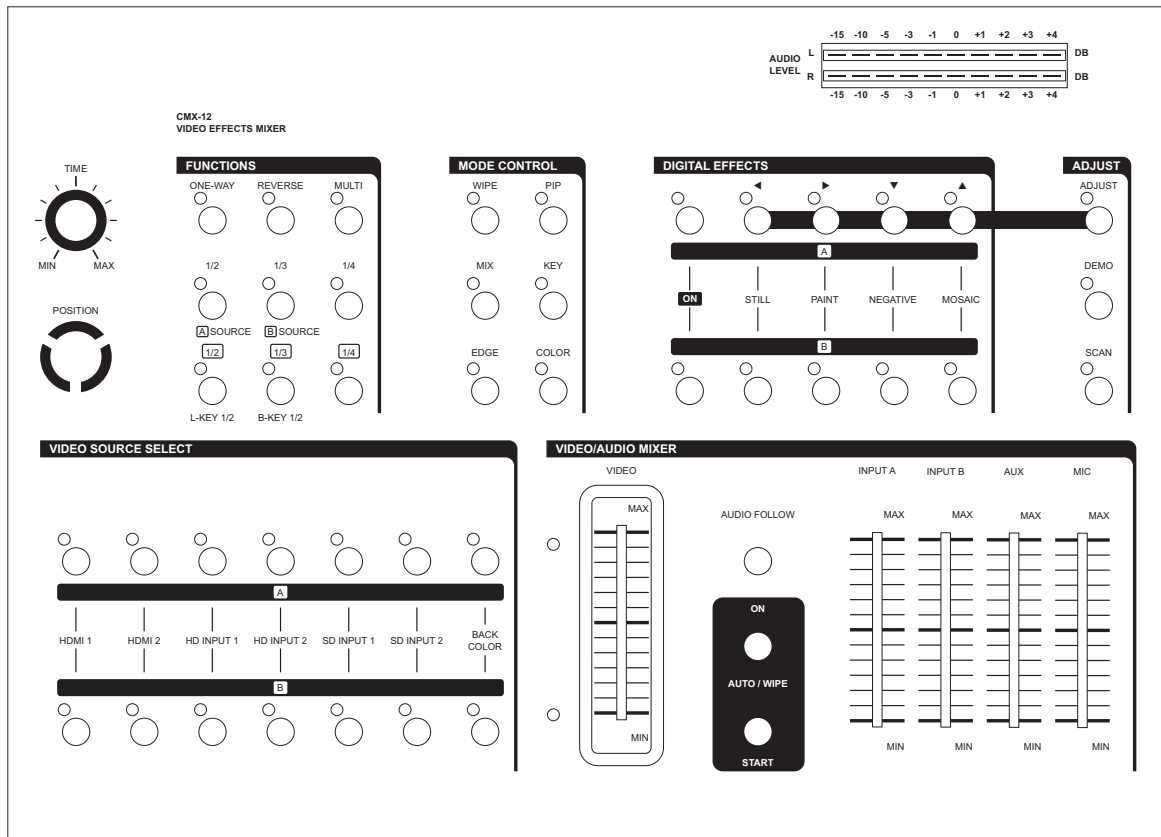
## ■ REAR PANEL



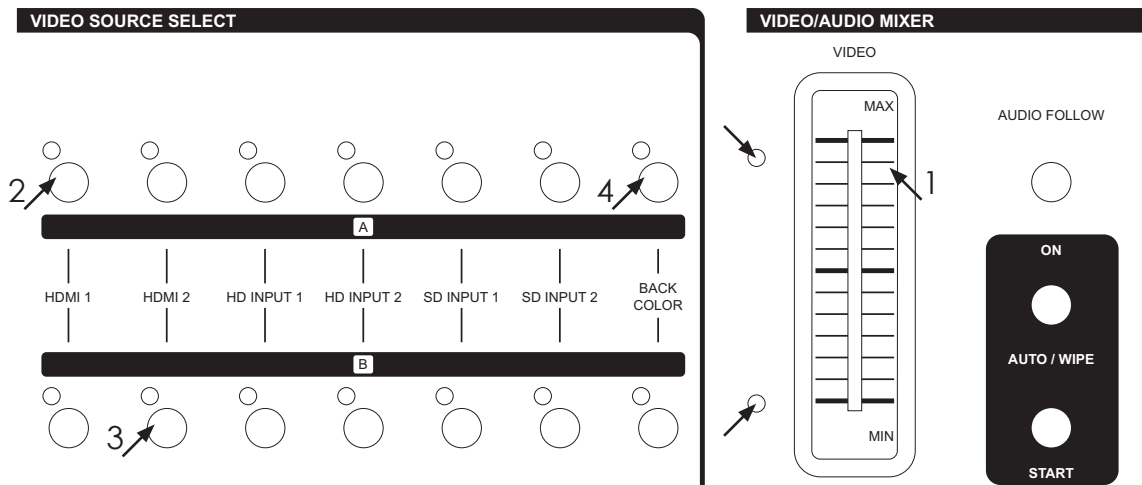
- ⑤⑧ Source 3 HD audio input 1.
- ⑤⑨ Source 4 HD audio input 2.
- ⑥⑩ Source 5 SD audio input 1.
- ⑥⑪ Source 6 SD audio input 2.
- ⑥⑫ Auxiliary Audio input Jack.
- ⑥⑬ Recording out 1 Audio output Jack.
- ⑥⑭ Recording out 2 Audio output Jack.
- ⑥⑮ Source 1 HDMI input 1.
- ⑥⑯ Source 2 HDMI input 2.
- ⑥⑰ Source 3 HD Y-PB-PR Video input 1.
- ⑥⑱ Source 4 HD Y-PB-PR Video input 2.
- ⑥⑲ Source 5 SD Video and YC input 1.
- ⑥⑳ Source 6 SD Video and YC input 2.
- ⑦① HDMI output for monitor.
- ⑦② Recording out 1 HD Y-PB-PR Video output jack.
- ⑦③ Recording out 2 HD Y-PB-PR Video output jack.
- ⑦④ SD PREVIEW out(OSD) Video and YC output jack.
- ⑦⑤ SD Recording out Video and YC output jack.
- ⑦⑥ DC INPUT 12V 2.0A.

## 4. Basic Operations

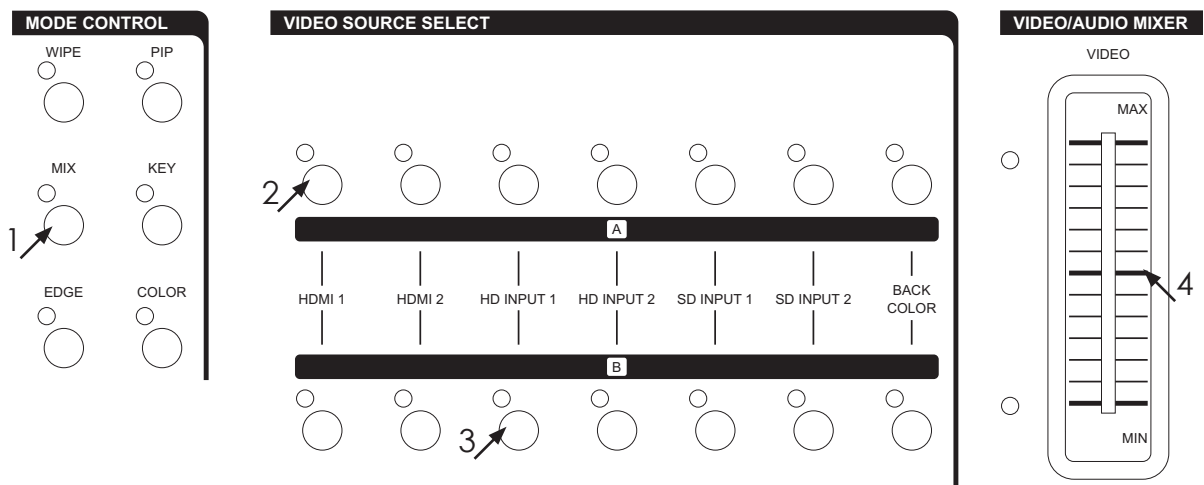
Press the power switch on the rear panel to the ON Position. The LED's on the operation panel light up and the unit is now in initial mode for operation.



- A. Input signal selection and Back color Selection
    1. Slide the Video slide ④⑦ to the A-bus position.  
A-bus LED ④⑤ will illuminate, B-bus LED will turn off.
    2. Press any of the Source 1 to Source 6 and Back color button.  
You will see the corresponding picture on the screen.
    3. Press a Back Color button to select the back color you need.  
Any of the 8 Back Colors-BlueRedMagentaGreenCyanYellowWhiteBlack can be selected by repeatedly pressing the Back color selection button ③⑦.
    4. The same procedures apply to the B-bus.
- \* When the selected input source is not connected with source input or HDCP protection, the image will show with Blue screen.



## B. VIDEO MIX

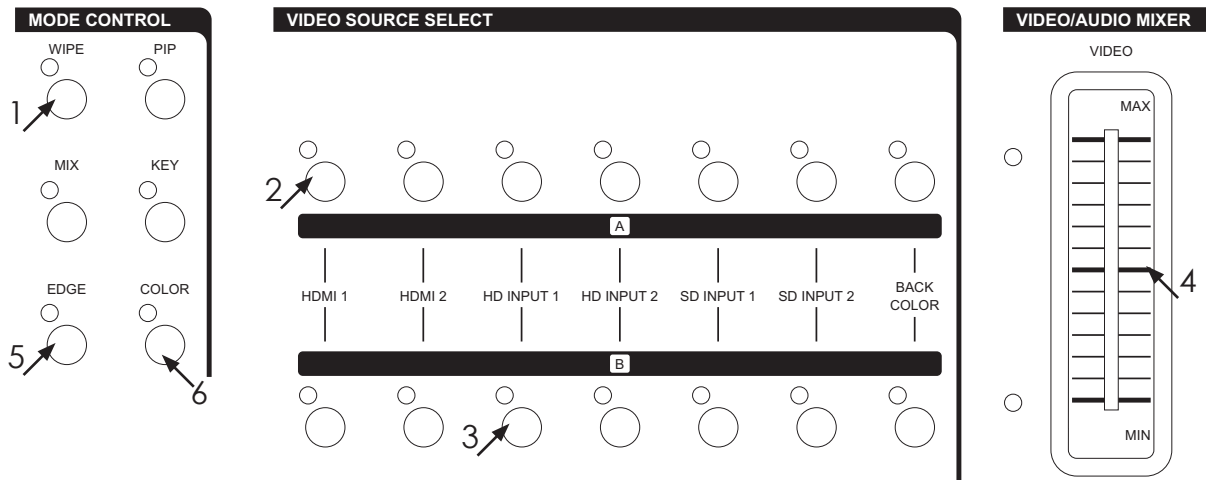


Reset the operation panel to initial mode:

1. Press the MIX button ⑭.
2. Press one of the A-bus selection button.
3. Press one of the B-bus selection button.
4. Mix effect could be controlled by Video slide ⑰ which sliding A to B or B to A.



## C. VIDEO WIPE



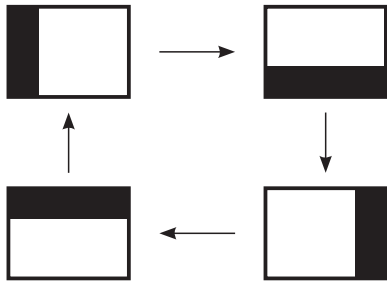
Reset the operation panel to initial mode:

1. Press the WIPE button ①.
2. Press one of the A-bus selection button.
3. Press one of the B-bus selection button.
4. WIPE effect could be controlled by Video slide ④ which moves A/B bus outputs Horizontally or vertically.
5. Press ⑤ EDGE button to select frame sharp edge / soft edge / color edge.
6. When frame color is "color edge, press ⑥ COLOR button to select one out of eight colors to display.

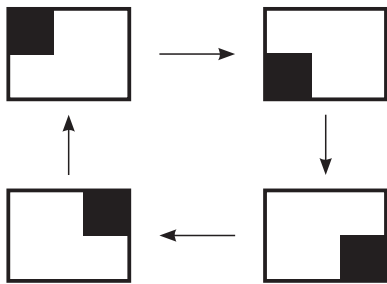
## ■ WIPE PATTERN Selection:

Six wipe modes can be selected as follows:

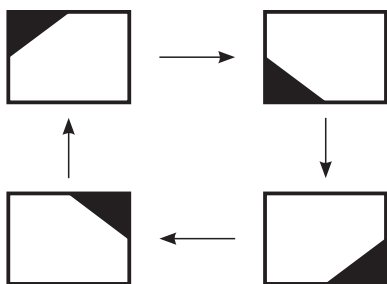
1. Press the straight wipe button ⑥ repeatedly, Four patterns are available.



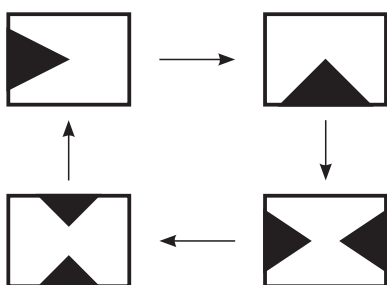
2. Press the corner wipe button ⑦ repeatedly, Four patterns are available.



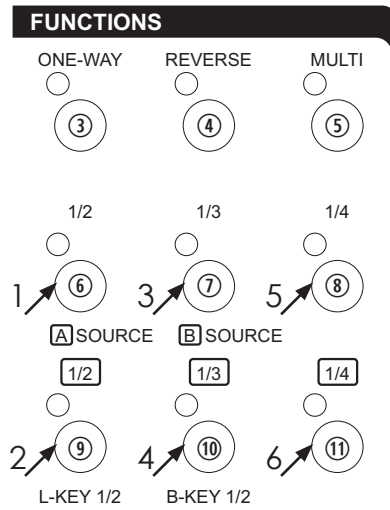
3. Press the diagonal wipe button ⑧ repeatedly, Four patterns are available.



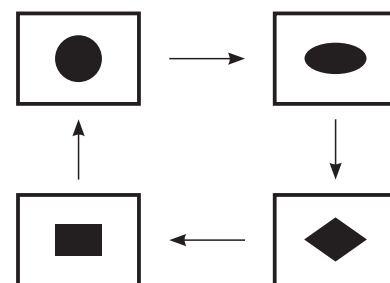
4. Press the triangle wipe button ⑨ repeatedly, Four patterns are available.



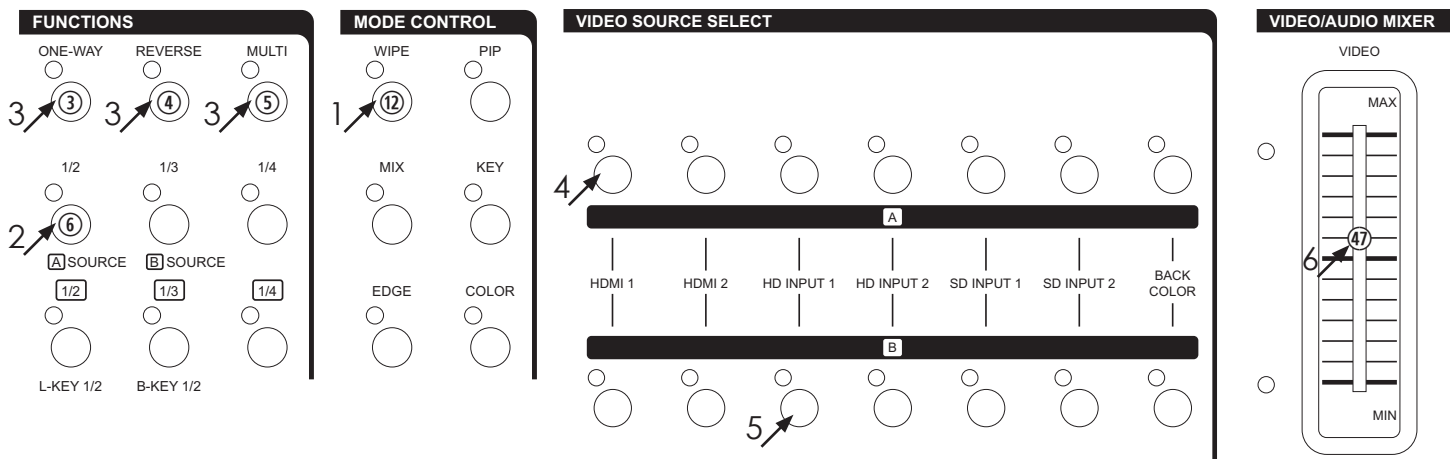
5. Press the split wipe button ⑩ repeatedly, Four patterns are available.



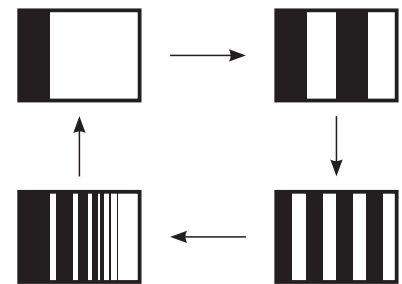
6. Press the square wipe button ⑪ repeatedly. Four patterns below are available. Each pattern position in this section could be set by joystick ②.



## ■ MULTIPLE PATTERN Selection:

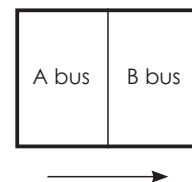


1. Press the wipe button ⑫.
2. Press the straight wipe button ⑥ for example.
3. Press the multi ⑤ button repeatedly to have the desired multiplication.  
Four patterns are available.
4. Press one of the A-bus selection button.
5. Press one of the B-bus selection button.
6. Operate the video slide ④⑦.
- \* The same procedures apply to other patterns.



## ■ ONE-WAY WIPE:

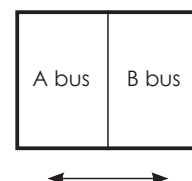
1. Press the wipe button ⑫.
2. Press the straight wipe button ⑥ for example.
3. Press the one-way ③ button.
4. Press one of the A-bus selection button.
5. Press one of the B-bus selection button.
6. Operate the video slide ④⑦.



- \* The wipe scene moves the same way every time the control is operated.

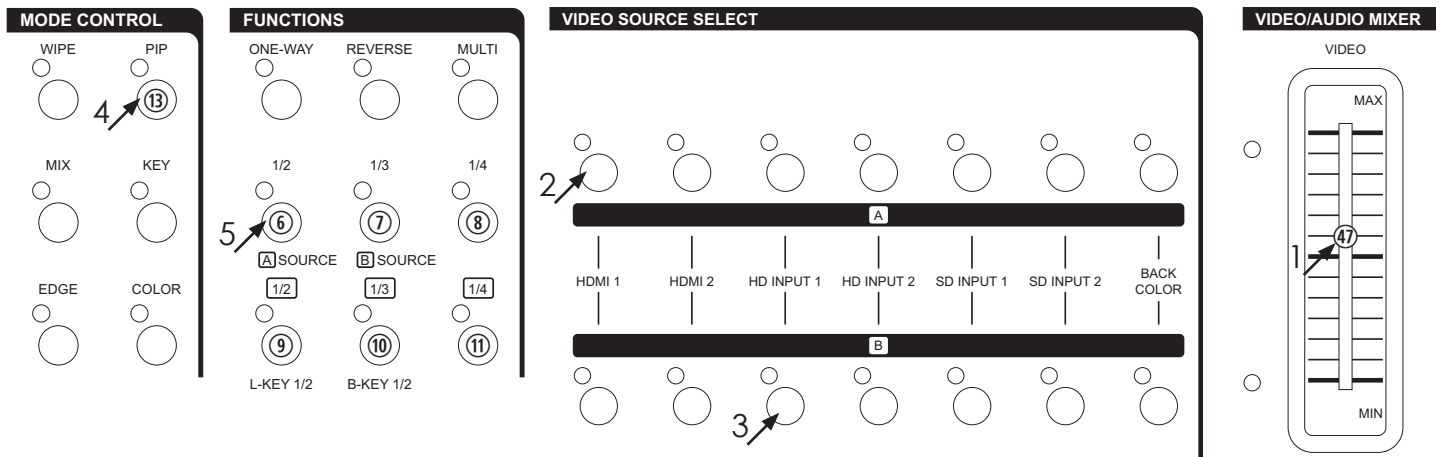
## ■ REVERSE WIPE:

1. Press the wipe button ⑫.
2. Press the straight wipe button ⑥ for example.
3. Press the Reverse ④ button.
4. Press one of the A-bus selection button.
5. Press one of the B-bus selection button.
6. Operate the video slide ④⑦.



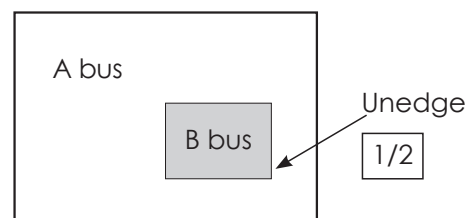
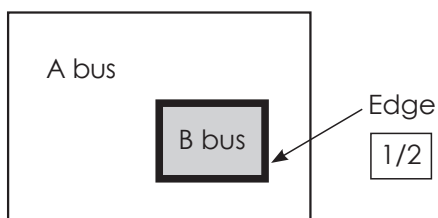
- \* The wipe scene moves the reverse direction every time the control is operated.

## D. Picture-In-Picture

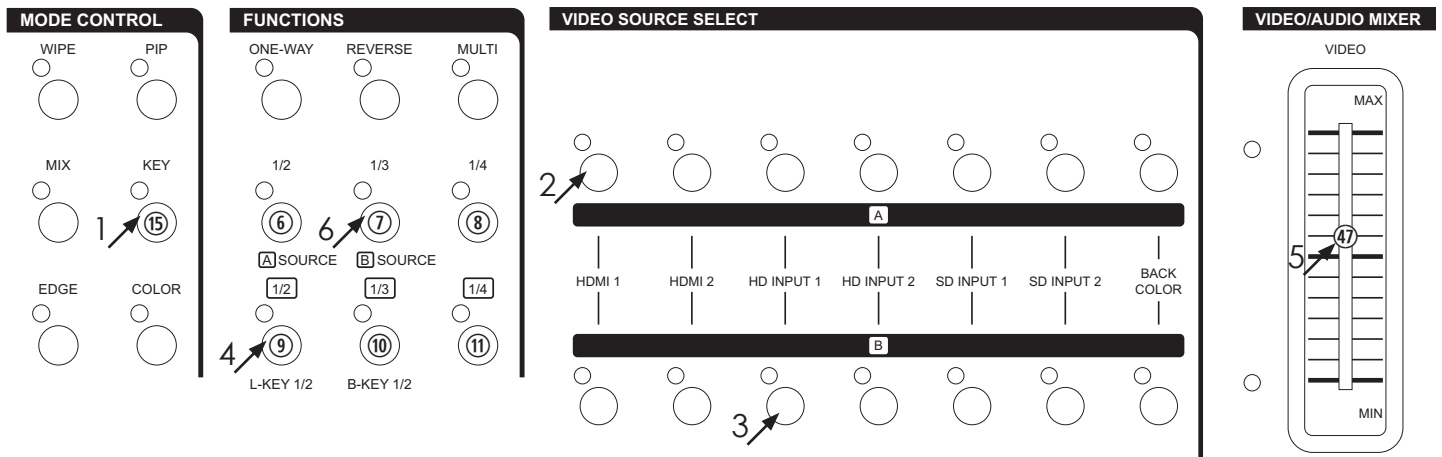


Press the operation panel to initial mode:

1. Slide the video slide fully to the B-bus position.
2. Press one of the A-bus selection button.
3. Press one of the B-bus selection button.
4. Press the PIP button ⑬.
5. PIP mode changes by selecting ⑥ ~ ⑪ buttons.
  - ⑥. Shows sub-picture in 1/2 size without edge.
  - ⑦. Shows sub-picture in 1/3 size without edge.
  - ⑧. Shows sub-picture in 1/4 size without edge.
  - ⑨. Shows sub-picture in 1/2 size with edge.
  - ⑩. Shows sub-picture in 1/3 size with edge.
  - ⑪. Shows sub-picture in 1/4 size with edge.
6. Other PIP features:
  1. 3 PIP sizes selectable for sub-picture PIP channel.
  2. The color of the edge can be changed by pressing back color select button ⑰.
  3. When you slide the video slide ⑰ to the A-bus position PIP picture dissolves into back ground scene.
  4. Sub-picture PIP channel may be placed into different positions by oystick ②.



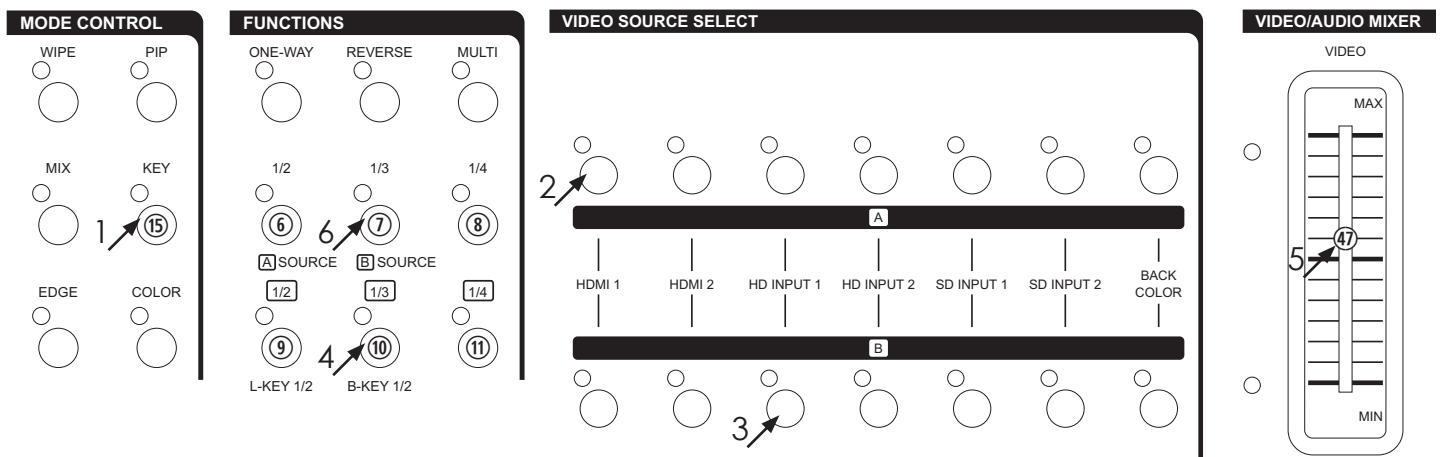
## E. KEY



Reset the operation panel to initial mode:

### ■ How to use the Luma key effect:

1. Press the KEY button ⑮.
2. Press one of the A-bus selection button.
3. Press one of the B-bus selection button.
4. Press the LUMA KEY button ⑨.
5. Use slide bar to control the Luma key level.
6. Press button ⑥ or ⑦ to change the source that is being keyed.
7. Press the LUMA KEY ⑨ once again to achieve Negative Luma Key.



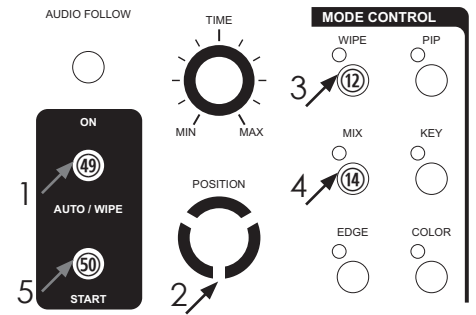
### ■ How to use the Blue key effect:

1. Press the KEY button ⑮.
2. Press one of the A-bus selection button.
3. Press one of the B-bus selection button.
4. Press the Blue KEY button ⑩ .
5. Use slide bar to control the Blue key level.
6. Press button ⑥ or ⑦ to change the source that is being keyed.
7. Press the Blue KEY ⑩ once again to achieve Negative Blue Key.

## F. AUTO FADE/WIPE Selection

Reset the operation panel to initial mode:

1. Press the ON button ④⑨ to enter into AUTO FADE/WIPE mode.
2. FADE/WIPE transition time can be adjusted by operating TIME control ①.
3. Press the WIPE button ⑫ for wipe effect.
4. Press the MIX button ⑭ for mix (fade) effect.
5. Press the START button ⑤⑩ to start Auto wipe or fade effect.

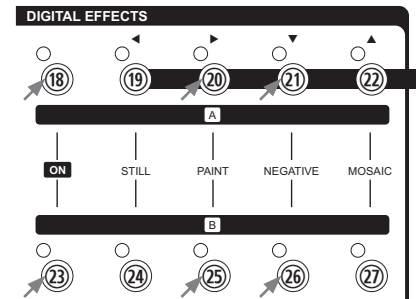


## G. DIGITAL EFFECT

■ Digital effect section which generates digital special effects for the A bus and B-bus source video signals. The selected effect(s) can be added to either the A-bus or B-bus at one time.

■ The mosaic effects is not available in sub-picture under PIP mode.

- ⑮⑲. A-bus, B-bus digital effect ON button.
- ⑯⑳. STILL button.
- ⑳㉑. PAINT button - 3 steps.
- ㉑㉒. NEGATIVE button.
- ㉒㉓. MOSAIC button - 3 steps.

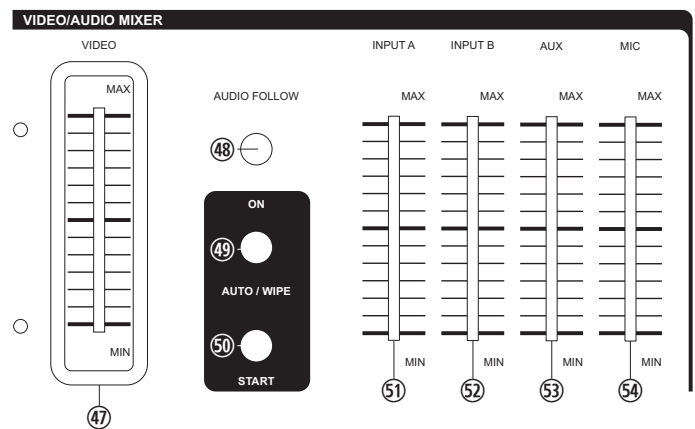


## H. AUDIO MIXER

■ Audio can be processed either separately or in combination with a video source.

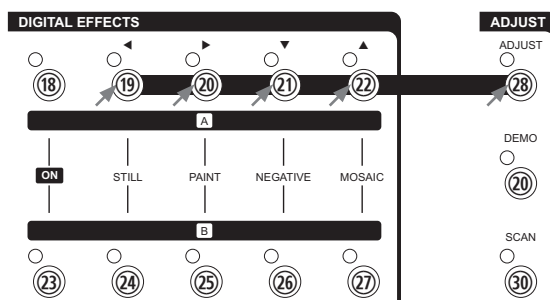
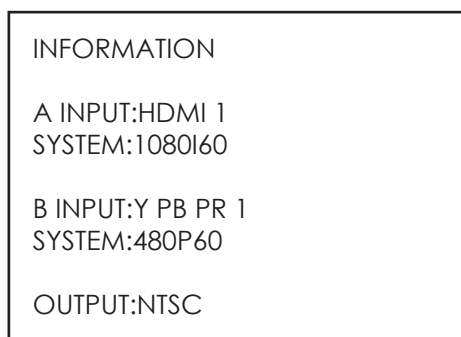
④⑧. When the AUDIO FOLLOW's LED illuminate the Audio may be adjust by Video slider ④⑦ along with the video. When the LED is off the Audio will be adjusted by ⑤① & ⑤②.

- ⑤①. Adjust A-bus's audio level.
- ⑤②. Adjust B-bus's audio level.
- ⑤③. AUX: Controls the audio level of the auxiliary input.
- ⑤④. MIC: Controls the audio level of the microphone input.

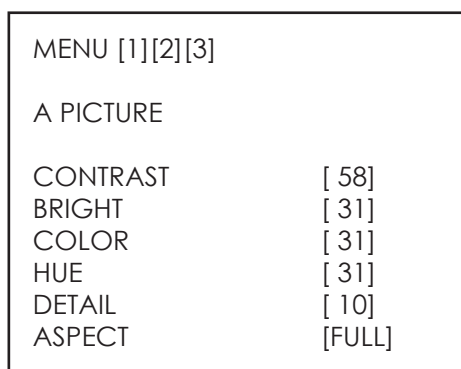


# I. OSD ADJUST

⑳. When turn off the OSD adjust in SD PREVIEW, output will show A/B-bus and output system information. As shown below.

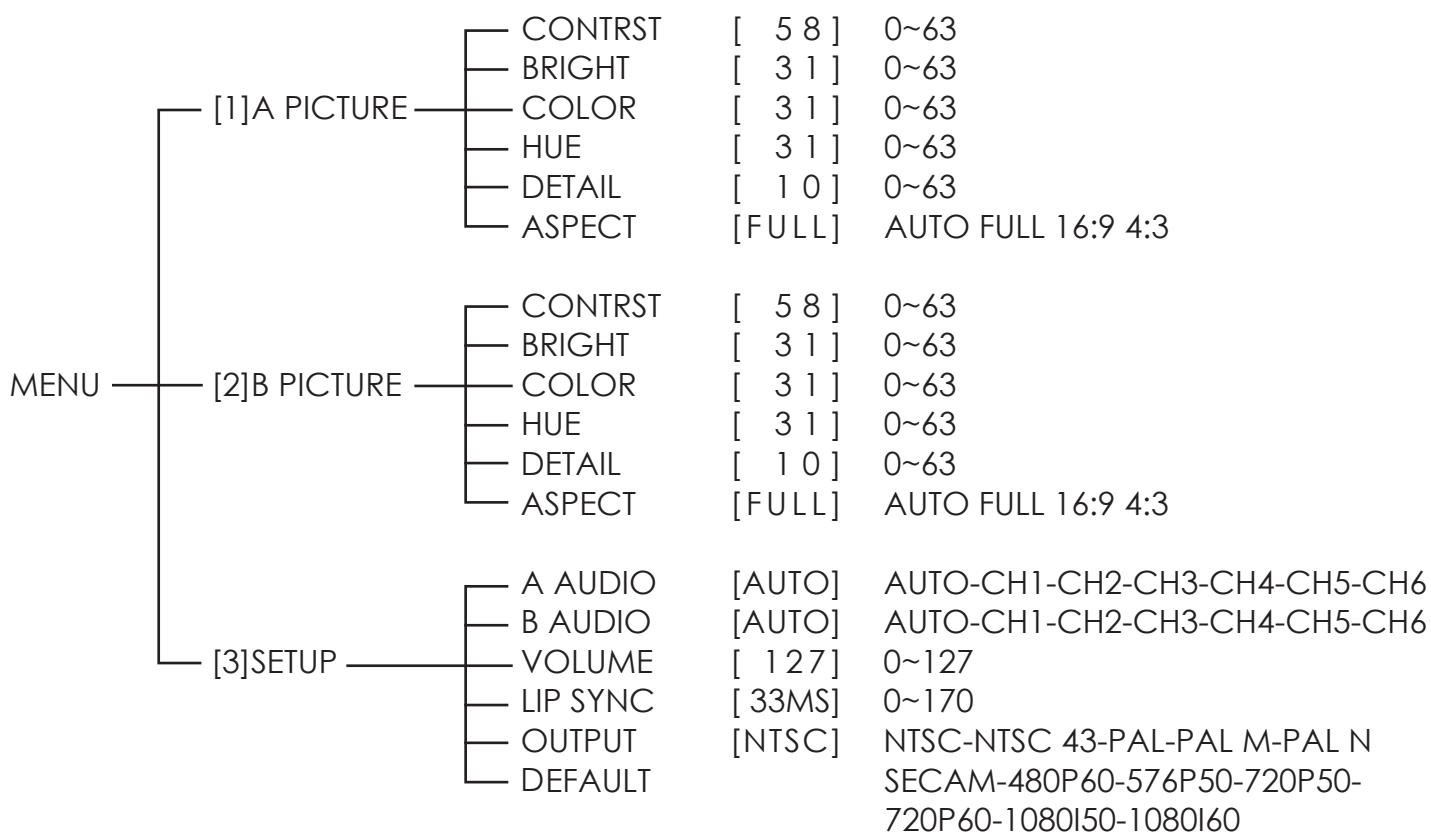


㉑. When turn ON the function in SD PREVIEW, output will show the adjust screen. As shown below.

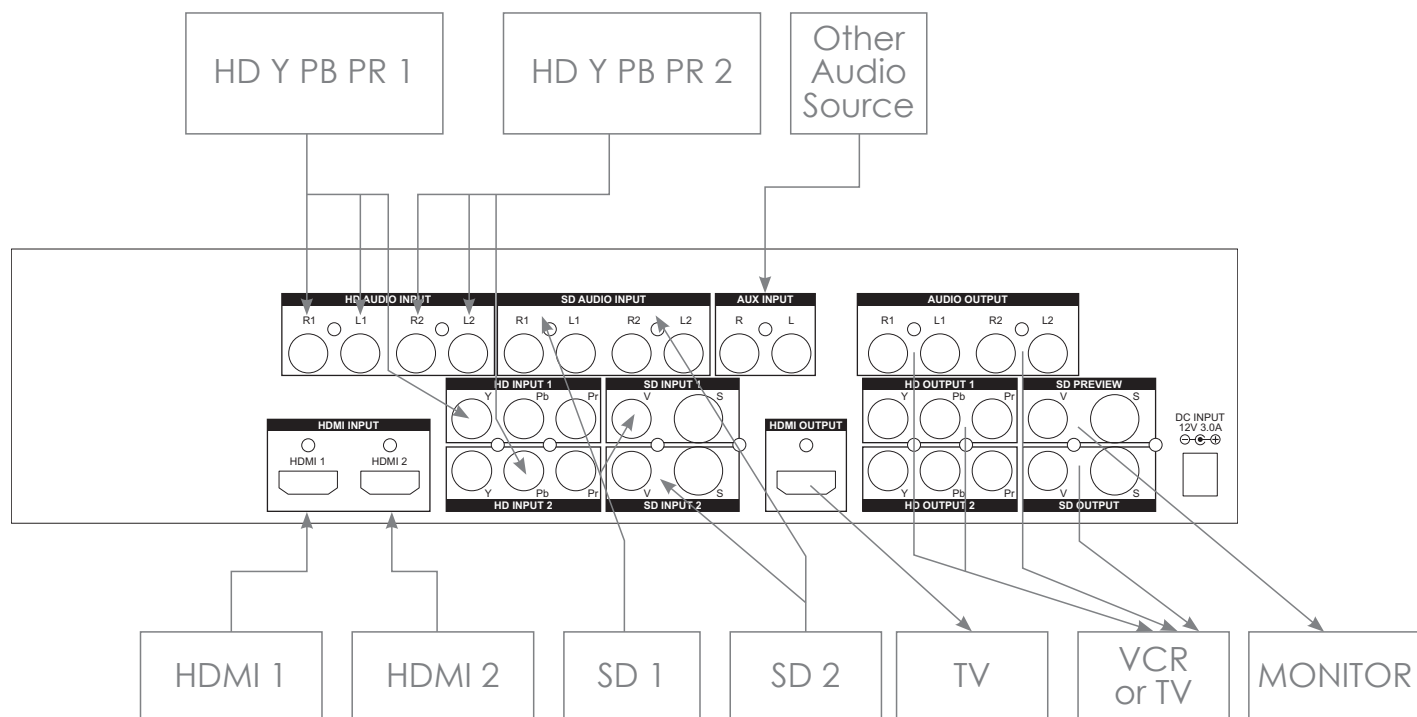


- When in MENU mode, press 19 ◀ 20 ▶ to adjust the page. Press 21 ▼ and 22 ▲ to select the functions; once the functions are selected press 19 ◀ and 20 ▶ to adjust the value.
- Above values are not save to EEPROM. When the device is turn off the system will change the value back to previous value. Press 28 ADJUST to exit the OSD adjust screen and the system will automatically save to the system.

■ OSD adjustment function and range setting as below diagram:



## 5. Connector and Installation



- The output can select HD or SD system. Users can use SD PREVIEW to adjust the output system, or a fast way to switch is to press two keys for 1 second in the same time.

The combination as below:

- ②9 button+ ④5 button → 480P60
- ③0 button+ ④5 button → 576P60
- ③1 button+ ④5 button → 720P50
- ③2 button+ ④5 button → 720P60
- ③3 button+ ④5 button → 1080I50
- ③4 button+ ④5 button → 1080I60
- ③5 button+ ④5 button → NTSC
- ③6 button+ ④5 button → NTSC 43
- ③7 button+ ④5 button → PAL
- ③8 button+ ④5 button → PAL M
- ③9 button+ ④5 button → PAL N
- ④0 button+ ④5 button → SECAM



## 6. Specifications

Source Input	<p>X 6(SOURCE 1/6)  HDMI Input: x2  Digital Video YUV(480i/p,576i/p,720p50/60,1080i50/60, 1080p50/60).  Component Input: x2  Analog Video YUV(480i/p,576i/p,720p50/60,1080i50/60).  Y/C input: x2  Y signal: 1.0 Vp-p 75Ω, Mini Din 4-pin connector  C signal: 0.3 Vp-p 75Ω, Mini Din 4-pin connector  Video input: x2  1.0 Vp-p 75Ω composite signal, Pin-Jack  (NTSC,NTSC4.43,PAL,PAL-M,PAL-N,SECAM)  Audio input: x4  -6 dBs/20 kΩ Pin Jack (L/R).</p>
External Sound Input	<p>MIC input: x 1 (MIC); -60 dBv/600Ω  AUX input: x 1 (AUX); -6 dBs/20 kΩ, Pin Jacks(L/R)</p>
Recording Output	<p>HDMI Output: x1  Digital Video YUV(480i/p,576i/p,720p50/60,1080i50/60).  Component Output: x2  Analog Video YUV(480i/p,576i/p,720p50/60,1080i50/60).  Y/C Output: x1  Y signal: 1.0 Vp-p 75Ω, Mini Din 4-pin connector  C signal: 0.3 Vp-p 75Ω, Mini Din 4-pin connector  Video Output: x1  1.0 Vp-p 75Ω composite signal, Pin-Jack  (NTSC,NTSC4.43,PAL,PAL-M,PAL-N,SECAM)  Audio Output: x2  -6 dBs/20 kΩ Pin Jack (L/R).</p>
Preview Output(OSD)	<p>Y/C Output: x1  Y signal: 1.0 Vp-p 75Ω, Mini Din 4-pin connector  C signal: 0.3 Vp-p 75Ω, Mini Din 4-pin connector  Video Output: x1  1.0 Vp-p 75Ω composite signal, Pin-Jack  (NTSC,NTSC4.43,PAL,PAL-M,PAL-N,SECAM)</p>
Headphone Output	<p>x 1 (Headphone); -20 dBv~ -80 dBv, 8Ωunbalance, phone-5 jack</p>
Effects	<p>Video:  Still, Mosaic, Paint, Negative, Wipe, Mix, Fade,  Picture-In-Picture, Chroma key, Luminance key</p>
Back Color x3	<p>White, Yellow, Cyan, Green, Magenta, Red, Blue, Black</p>
Wipe Patterns	<p>96 patterns</p>
S/N (Typical)	<p>video: 48 dB (composite), 50 dB (HDMI,Component,Y/C) Audio: 60 dB</p>
Power Source	<p>12V DC 3A</p>
Power Consumption	<p>Approx. 15W</p>
Dimensions	<p>267(W) x 370(D) x 103.5(H) mm</p>
Weight	<p>2Kgs</p>



# ***Acronyms***

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***Acronym***

***Complete Term***



