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Chapter 1 Safety precautions

Danger !

There is high voltage in the processor, to prevent any unexpected hazard, unless you are maintenance, please do not open the cover of the device.

Warning !

1. This device shall not encounter water sprinkle or splash, please do not place anything containing water on this device.
2. To prevent fire, keep this device far from any fire source.
3. If this device gives out any strange noise, smoke or smell, please immediately unplug the power cord from receptacle, and contact local dealer.
4. **Signal cables are not hot swappable.**

Caution !

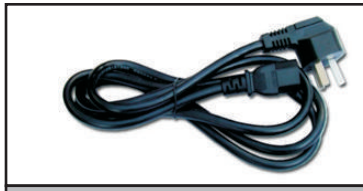
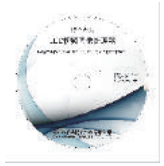
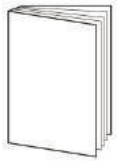
1. Please thoroughly read this manual before using this device, and keep it well for future reference.
2. In the event of lighting or when you are not going to use the device for a long time, please pull the power plug out of receptacle.
3. Nobody other than professional technicians can operate the device, unless they have been appropriately trained or under guidance of technicians.
4. To prevent equipment damage or electric shock, please don't fill in anything in the vent of the device.
5. Do not place the device near any water source or anywhere damp.
6. Do not place the device near any radiator or anywhere under high temperature.
7. To prevent rupture or damage of power cords, please handle and keep them properly.
8. Please immediately unplug power cord and have the device repaired, when
   1) Liquid splashes to the device.
   2) The device is dropped down or cabinet is damaged.
   3) Obvious malpractice is found or performance degrades.

Chapter 2 Item list

Please unpack the product carefully, then check whether all the following things are included in the package. If anything is found missing, please contact the dealer.

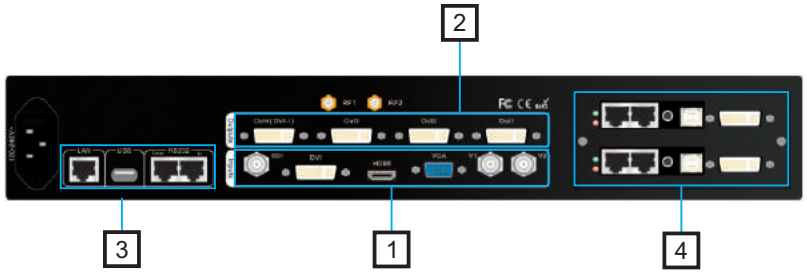
Standard accessories

The accessories supplied with this LED Video Processor may differ from the figures contained in the User Manual, but they are applicable for the regions where you live (LED sending card is optional).

	
1.5m power cord x 1	1.5m DVI cable x 1
0.5m DVI cable x 4	1.5m RS232 / RJ45 adapter cable x 1
DVI-I to VGA adapter x 1	BNC-RCA adapter x 3
	
Disk x 1	User manual x 1

Chapter3 Hardware Connections

3-1 Rear View



3-1 Rear Panel Signal Ports Diagram

3-2 Ports Description

1. Video Signal Inputs (Inputs)

LVP909 supports 6 video signals input as follows :

Ports	Description
V1、V2	2 channels Composite video (PAL/ NTSC)
VGA	1 channels PC analog signal input
DVI	Channel DVI (PC digital signal)
HDMI	1 channel HDMI (HD digital signal)
SDI	1 channel SDI digital serial signal input

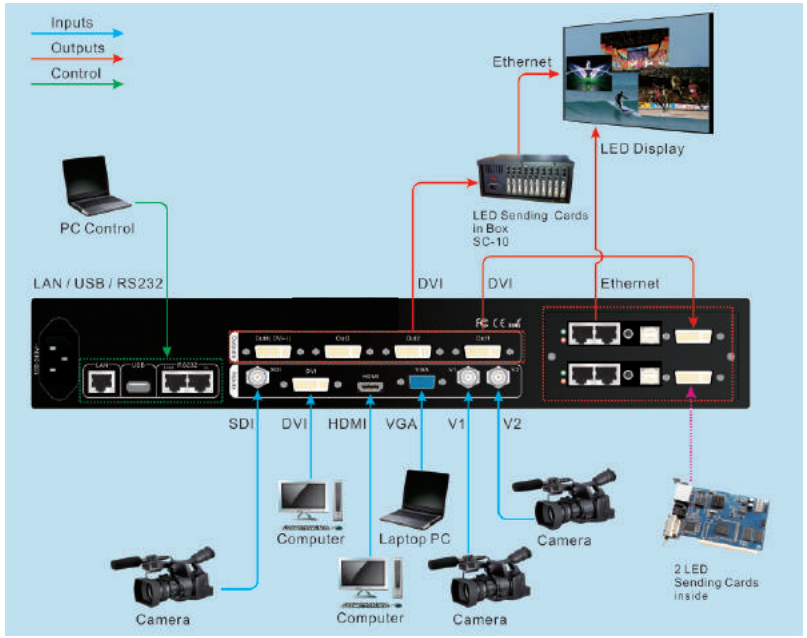
2. Video Signal Outputs (Outputs)

Ports	Description
Out1 ~ Out4	4 channels DVI output ports to connect LED sending cards or monitor. And Out 4 is DVI-I port including VGA output port.

3. Communication Ports

Ports	Description
LAN	TCP/IP local area network control interface
USB	USB communication port
RS232 IN	Serial communication interface, used to connect the RS232 port of PC to realize PC software control.
RS232 LOOP	Serial communication cascading output for connecting the RS232 IN of next unit, through single PC can control all units.

3-3 Hardware Connection Diagram



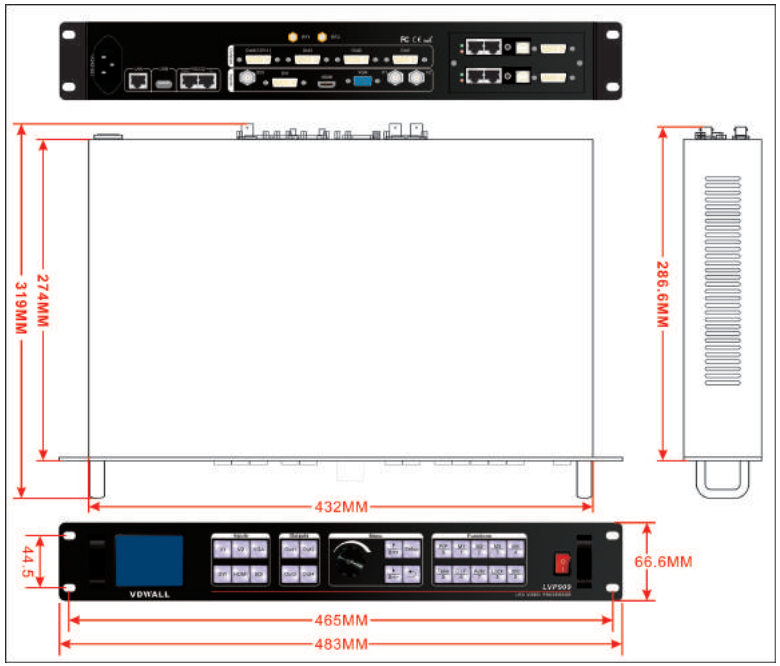
Pic 3-2 hardware connection diagram

3-4 Specifications

Inputs		
Number / type	2×Video 1×VGA (RGBHV) 1×DVI (VESA / CEA-861) 1×HDMI (VESA / CEA-861) 1×SDI	
Video system	PAL / NTSC	
Composite Video Amplitude Impedance	1V (p_p) / 75Ω	
VGA format	PC (VESA standard)	≤2048 x 1152_60Hz
VGA Amplitude Impedance	R、G、B = 0.7 V (p_p) / 75Ω	
DVI format	PC (VESA standard) HDMI 1.3 (CEA-861)	≤1920×1200_60Hz
HDMI format	PC (VESA standard) HDMI 1.3 (CEA-861)	≤1920 x 1200_60Hz
SDI format	SMPTE 259M-C SMPTE 292M SMPTE 274M / 296M SMPTE 424M / 425M	480i_60Hz 576i_50Hz 720p、1080i、1080p
Input connectors	Video：BNC VGA：15pin D_Sub(Female) DVI：24+1 DVI_D SDI：BNC / 75Ω HDMI：HDMI port A type	
Outputs		
Number / type	4×DVI,1×VGA (RGBHV) (Out4)	
VGA / DVI format	1024×768_60Hz 1280×1024_60Hz 1440x1440_60Hz 1920×1080p_50Hz / 60Hz 1920×1200_60Hz	
Output connectors	DVI OUT：24+5 DVI_I	

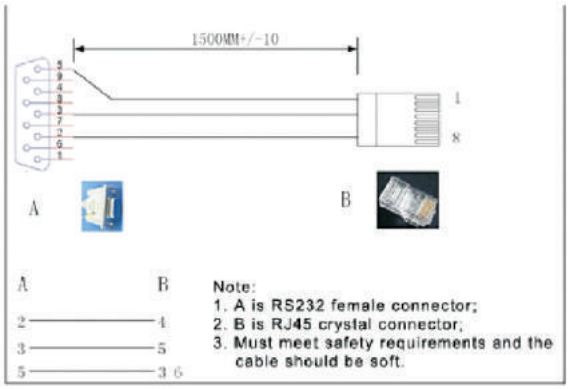
Others	
Control port	RS232 / USB / LAN
Input voltage	100~240VAC 50 / 60Hz
Power consumption	≤45W
Environment Temperature	0-45 ℃
Environment Humidity	15-85%
Product size	483(L) x 274(W) x 66.6(H) mm
Packing size	520(L) x 350(W) x 130(H) mm
weight	G.W.: 5.9Kg, N.W.: 4.2Kg

3-5 Product Dimensions



Pic 3-5a product dimension

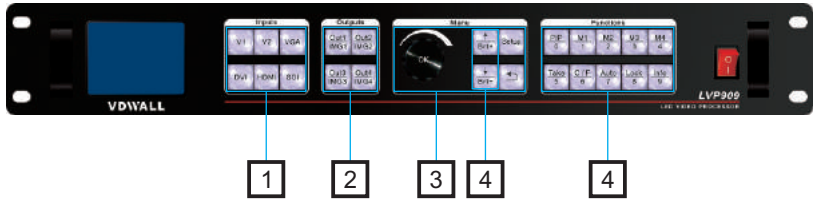
Rs232 cable order:



Pic 3-5b Rs232 cable order

Chapter4 Front Panel Buttons Instructions

4-1 Front Panel Buttons Schematic



4-1 Front Panel Buttons Schematic

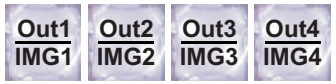
① Input signal selection buttons
② Output ports / image switching buttons
③ Setup buttons
④ Other function buttons

1. Input signal selection buttons

Input signal selection buttons are used for selecting input signals.

2. Output ports selection buttons

Output ports selection buttons are used for selecting output port under mosaic modes (APPM2, 3, 4).



3. Image switching buttons

Under dual picture and multi-windows display modes, image switching buttons are used for selecting corresponding image or displaying the corresponding image on the top.

4. Setup buttons

Setup buttons: set the output image parameters.

Enter the setup menu

Select setup item

(**knob**) Rotate **Knob** to adjust parameters or select parameters.

(**OK**) Press **Knob** even **OK** button to save parameters.

Return to previous item.

5. VGA Auto Adjustment

VGA auto adjustment button (**Auto**): automatically adjust the VGA input signal.

6. Switching effect Selection Button (C/F)

Switching effect selection button (**C / F**): used to select the signals switching effect and time.

7. Take Switching Button

Take switching button (**Take**): under Pre. +Take switching mode, realize to switch from current signal to the pre-select signal.

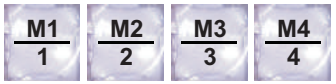
8. Information Display Button

Information display (**Info**): display the processor current settings and information.

9. PIP Function Button

PIP: Turn on / off dual picture display under AppM1 mode. When the indicator is on, that means dual picture function is ready.

PIP mode buttons to set PIP modes or switch modes under PIP on state.

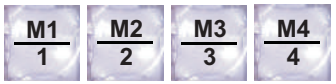


10. Brightness Adjustment Buttons (Brt+ , Brt-)

Brightness adjustment buttons (Brt+,Brt-): adjust processor output image brightness.

11. Display Mode Buttons

Display mode buttons (M1， M2， M3， M4): set display modes and call modes under mosaic and multi-windows application modes.

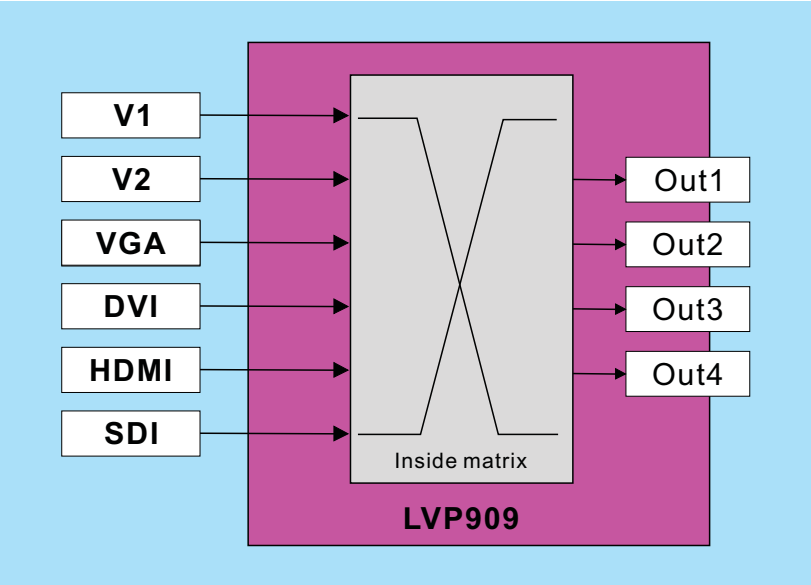


12. Lock Button (Lock)

Lock button(Lock): lock all buttons. When lock is on. The red light will be on all the time. In addition to the Lock button, the other buttons are not available. Press Lock button 3 times without stop to unlock, the red light is off.

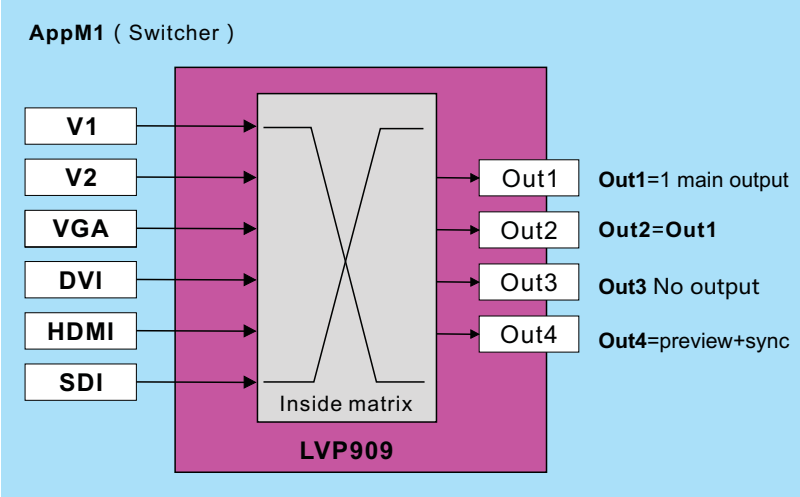
Chapter 5 Configuration Modes and Function Instructions

LVP909 supports 6 channels video input signals including composite video, VGA, DVI, HDMI, SDI and other different signals. It has 4 channels DVI output and 1 channel VGA output (Out4). The maximum output format is 1920x1200_60Hz. According to different application, LVP909 has 6 different application modes(AppM) including AppM1(switcher)、AppM2(2 mosaic)、AppM3(3 mosaic)、AppM4(4 mosaic)、AppM5 (4 image)、AppM6 (3 image).



Pic 5 input and output sketch map

5-1 AppM1 (Switcher)



Pic 5-1a application mode 1 sketch map

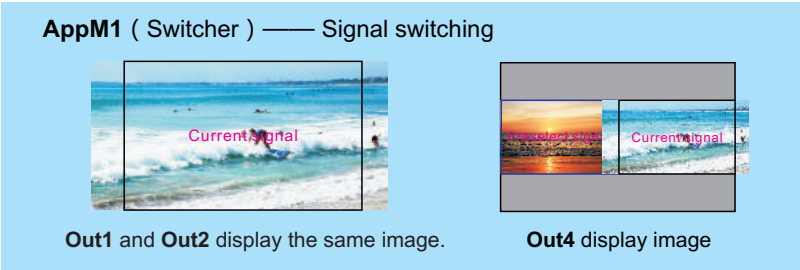
Under this application mode, Out1=Out2=1main output, Out3 no output Out4=preview +sync monitoring, means:

Out1 and Out2 output the same image and display current signal.

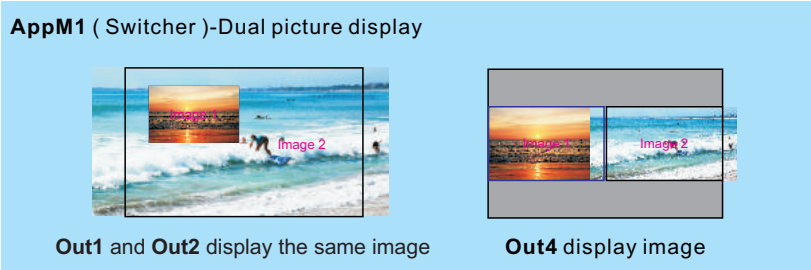
Out4 in the form of left and right dual picture to display preview monitoring and sync monitoring respectively.

This application mode is also called switcher application. The main functions and features include:

1. Output the selected any input signal to Out 1 in seamless switching or fade in fade out or wipe switching way.
2. Realize **one key switch** and **Pre.+Take switch**
3. Display any dual picture in 4 different modes.
4. Out4output realize one single screen to display preview + sync monitoring.

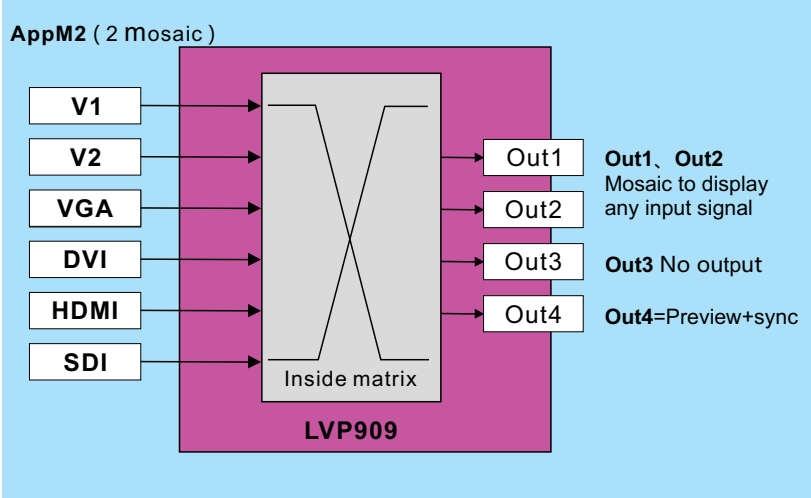


Pic 5-1b application mode1 signal switching display image sketch map



Pic 5-1c application mode 1 dual picture display output image sketch map

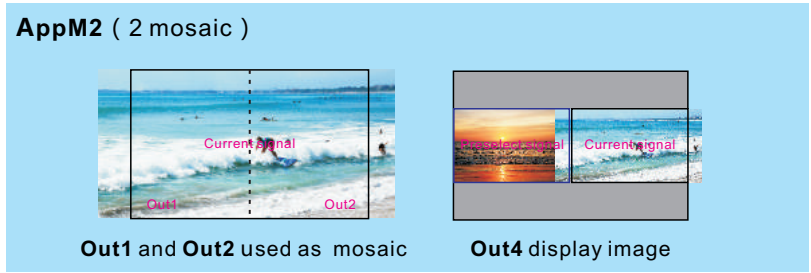
5-2 AppM2 (2 mosaic)



Pic 5-2a application mode 2 sketch map

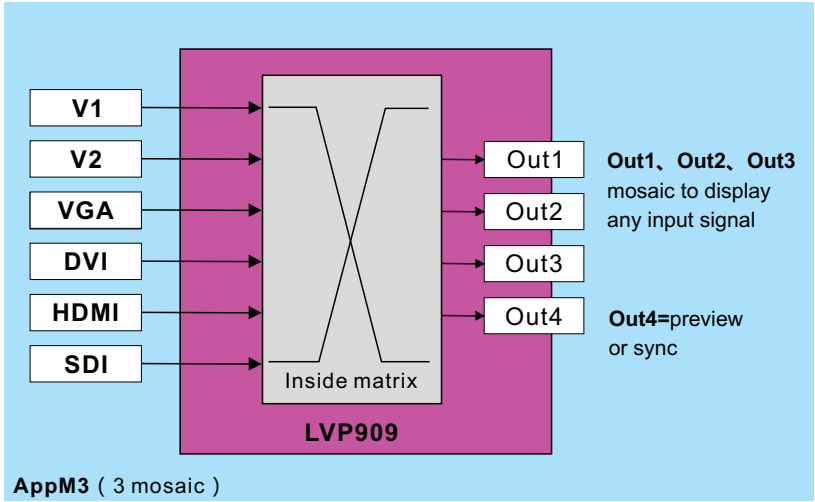
Under this application mode, Out1=Out2=current input signal, Out4=preview +sync monitoring, means:
Out1 and Out2 display current signal and can be used for mosaic.
Out4 in the form of left and right dual picture to display.

This application mode is mainly used as mosaic of 2 output ports to realize seamless switching between input signals. Out4 display preview image and sync monitoring image.



Pic 5-2b application mode 2 display image sketch map

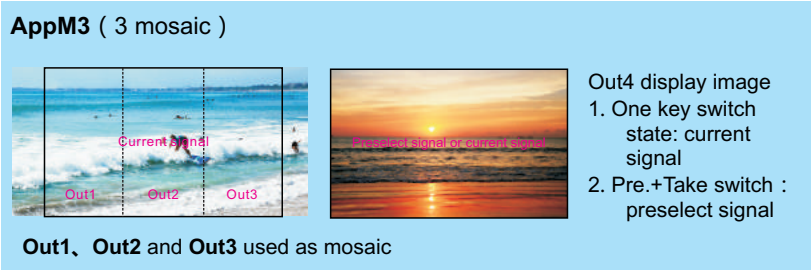
5-3 AppM3 (3 mosaic)



Pic 5-3a application mode 3 sketch map

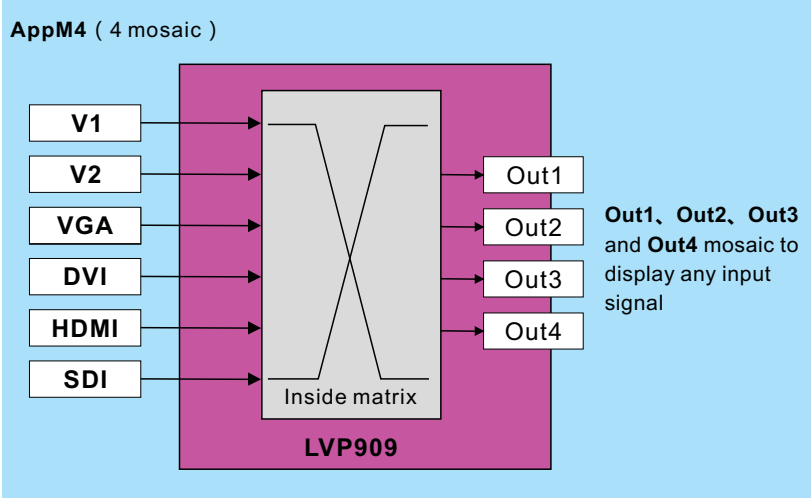
Under this application mode，**Out1**=**Out2**=**Out3**= current signal, Out4=current signal or monitoring signal，means：
Out1，Out2 and Out3 display current signal and can be used for mosaic.
Out4 display current signal or preselect signal.

This application mode is mainly used as mosaic for 3 output ports to realize seamless switching. Out4 display current signal under one key switch state and display preselect signal under Pre.+take switch state.



Pic 5-3b application mode3 display image sketch map

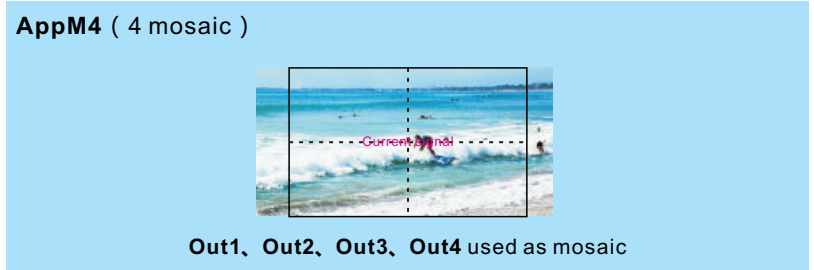
5-4 AppM4 (4 mosaic)



Pic 5-4a application mode 4 sketch map

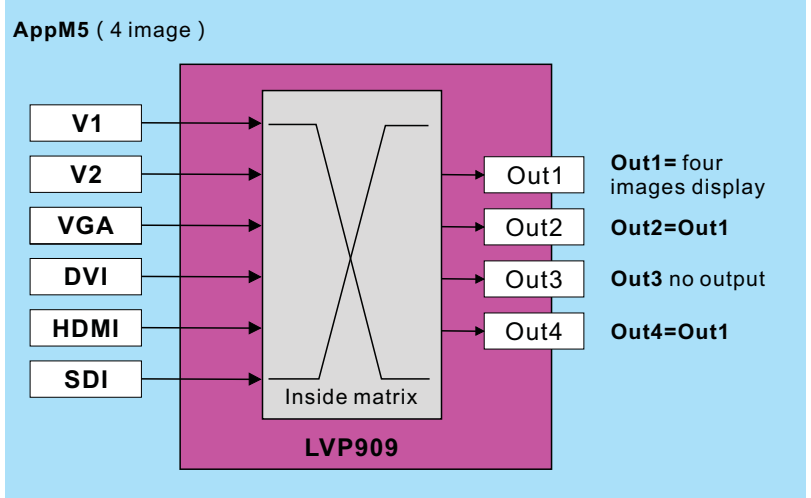
Under this application mode , Out1=Out2=Out3=Out4=current signal , means : Out1、 Out2、 Out3 and Out4 display any input signal and can be used for mosaic.

This application mode is mainly used as mosaic for 4 output ports to realize seamless switching between any input signals.



Pic 5-4b application mode4 display image sketch map

5-5 AppM5 (4 image)



Pic 5-5a application mode 5 sketch map

Under this application mode、Out1=Out2= four images display, Out4=sync monitoring means :

Out1、 Out2 display the same four images assembled by any four input signals. Wherein Out1 and Out 2 output the same image.

Out4 display sync monitoring image of four images.

This application mode is mainly used for mulit-windows display. The maximum output is four images. Size, location and overlay order can be set four display modes and switch by mode buttons.

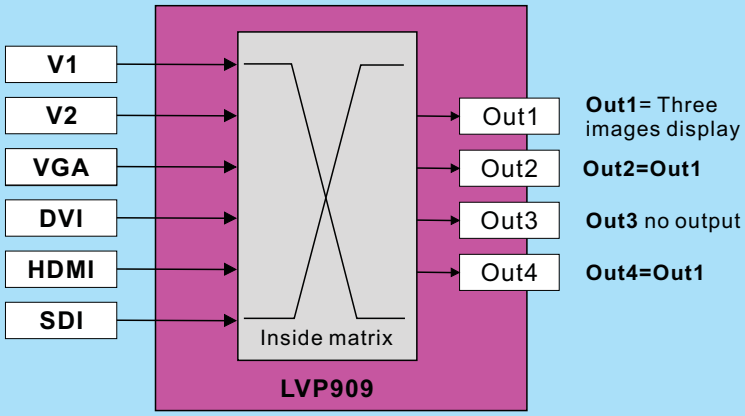
AppM5 (4 image)

Out1、**Out2** display the same image：any four images display
Out4 display output sync monitoring

Pic 5-5b application mode 5 display image sketch map

5-6 AppM6 (3 image)

AppM6 (3 image)



Pic 5-6a application mode 6 sketch map

Under this application mode、Out1=Out2=three images display, Out4=input sync monitoring， means：
Out1 and Out2 display the same any three images.
Out4 display three images monitoring in split-screen mode and switch through Out4 button.

This application mode is mainly used as three image display. Size, location and overlay order of three images can be set four display modes and switch through mode buttons. Comparing with AppM5, image 3 has higher resolution and display clear as background picture.

AppM6 (3 image)

Out1、**Out2** display the same image： any three images display

Out4 display the same image：display three sync monitoring image in split-screen mode.

Pic 5-6b application mode 6 display image sketch map

Chapter 6 Basic User Instructions

After the system is powered on, LVP909 will automatically detect the device information and enter the user operating status before the last shutdown. LVP909 has 6 application modes. And each mode can realize different functions. The operation is also different. Here we explain the basic user operation.

6-1Signal Switching

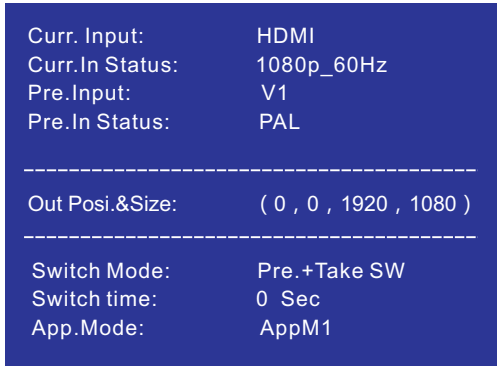
In the application mode 1~4, that application under switcher and mosaic, LVP909 supports seamless switching between any two input signals. LVP909 supports two signal switching way including **one key switch** and **Pre.+Take switch** which can be set in user setup menu 3.1 switch mode. **One key switch** is **default switching mode.** Switch new signal through pressing input signals selection buttons. Pre.+Take switch adopts to press input signal buttons to preselect and then press TAKE button to switch from current input signal to preselect signal.

Input signal selection buttons as follow list:

Buttons	Description
V1、V2	2 * Composite video signal inputs (PAL/ NTSC)
VGA	1 * PC analog signal input
DVI	1 * DVI digital signal input
HDMI	1 * HDMI digital signal input
SDI	1 * SDI digital serial video signal input

1. Pre.+Take switch

In this switching mode LCD screen display as shown below, respectively, show the current and the pre-selected input signal source and their status. If there is no valid input signal input, it will display" no input". Meanwhile the corresponding input button is flicker slowly and LED screen is black. If there is effective signal, it will display the input format.



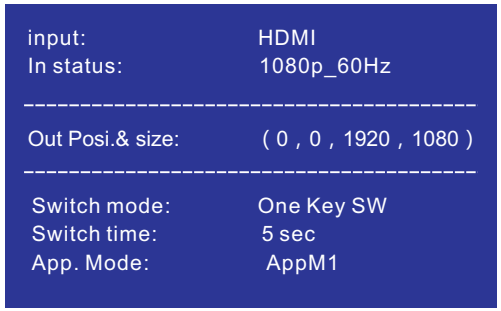
Pic 6-1a LCD window: Preselect +Take switch

Switching signal way:

Press input buttons to preselect signal. LCD will display the preselect signal status after signal steady. Then press **Take** button to switch current output signal to preselect signal. After the completion of the switching, the preselect signal will be the current playing signal. In this switching mode, preselect signal lights: indicator flashes quickly with signal input. Indicator flash very slowly without signal input.

2. One key switch

In the one key switch status, LCD screen displays the following figure, LCD screen will display input signal and its status respectively.



Pic 6-1b LCD window: one key switch

Switching signal way: press to select signal, the processor will auto finish the new signal preselection and switching process.

3. Switch effect selection (C / F)

```
Switch effect:        Cut
----------------------------------------
Cut                   Fade
Slip: R->L            Slip : L->R
Slip: LU->RD
Switch time:          0sec
----------------------------------------
      1sec            2sec
```

Pic 6-1c LCD window: switch effect selection

This function is only available for non mosaic mode. Specific effects are as follow:

1. In AppM1 signal switching state, press **C / F** button, the LCD will display the above menu and rotate **knob** to select **Cut**, **Fade** or **Slip** switching effect and switching time.

2. In AppM1 PIP display mode and App5 and App6 multi-windows display modes, press **C / F** to switch **Image overlay fade time** including 0 sec (**CUT**) , 1 sec and 2 sec.

6-2 Dual Picture Display Operation

In AppM1 state, LVP909 can realize two pictures display. The two input signals can be any selection. And the position, size and overlay order can be preset four modes.

```
Image_1 source:       HDMI
Image_1 status:       1080p_60Hz
Image_2 source:       V1
Image_2 status:       PAL
----------------------------------------
Image_1 Posi.&Size:  ( 0、 0、 1920、 1080 )
Image_2 Posi.&Size:  ( 64、 32、 640、 360 )
Display Mode:         M2
App. Mode:            AppM1
Image2->1:            2 S
```

Pic 6-2a LCD window: dual picture operation

The specific operation methods are as follow:

Enter dual picture display mode: press **PIP** button and the indicator is on, lvp909 will enter dual picture display mode. Then press **Setup** button to enter setup menu to operate PIP(like the following figure).


```
D. PIP                AppM1  M3
----------------------------------------
D.1 Image_1 source    V1     V2     VGA
                      DVI    HDMI   SDI
----------------------------------------
D. 2 Image_2 source   V1     V2     VGA
                      DVI    HDMI   SDI
----------------------------------------
D. 3 output image                   >>
```

Pic 6-2b LCD window: dual picture setting

Switch dual picture display mode: when dual picture mode is on, press mode buttons directly (**M1**、 **M2**、 **M3**、**M4**) to fast switch to corresponding display modes.

Change image source: when dual picture mode is on, enter setup menu D.1 Image_1 source or D.2 Image_2 source and rotate **knob** to select corresponding input signal and press **OK** to save.

Change image overlay order: when dual picture mode is on, press **IMG1** or **IMG2** button. And then the selected signal will display on the top.

Change image overlay order switching time: Press **C / F** to select Image overlay switching time including 0 sec (Cut), 1 sec and 2 sec.

Set output image: when dual picture mode is on, enter setup menu D.3 output image, press ↑ or ↓ to select corresponding setting and rotate **knob** to change parameters. Press **OK** to save.

6-3 Mosaic function operation

The AppM2, 3, 4 of LVP909 are mosaic mode. The corresponding output ports can splice together to drive huge LED screen. In the mosaic application modes, in addition to signal switching operation, users can call mosaic modes, check mosaic parameters and do other operation.

```
Input:                HDMI
In Status:            1080p_60Hz
----------------------------------------
OUT1 out posi.& size:  (0, 0, 1920,1080 )
OUT1 in posi.&size:    (0, 0, 1920,1080 )
----------------------------------------
Switch mode:          One Key SW.
App. Mode:            AppM4
```

Pic 6-3a LCD window: mosaic application mode

1. Call modes

In mosaic application mode, LVP909 can preset 4 groups mosaic parameters. Press mode buttons **M1**、**M2**、**M3**、**M4** to call corresponding modes directly.

2. Check parameters

In mosaic application mode, press output port buttons **Out1**, **Out2**, **Out3**, **Out4** . Then the LCD will display the current port output position and size.

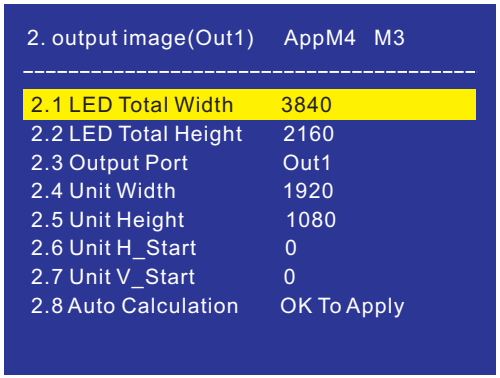
3. Switch Out4 output monitor modes

In application mode3, Out4 output current signal or preselect signal monitor which is decided by the current signal switching way. Enter setup menu 3.1 switch mode to select signal switching way.

Switch mode	Out4 monitor output
One key switch	Current signal
Pre. +Take switch	Preselect signal

4. Set parameters

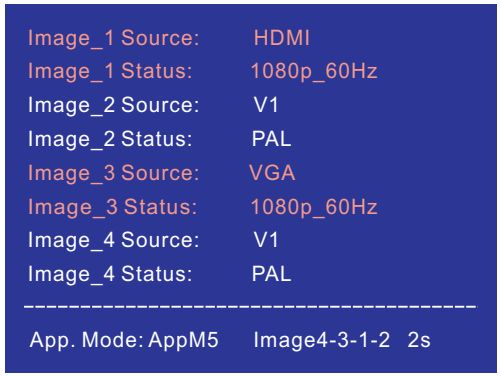
In mosaic application mode, press **Setup** to enter item 2.output image setup menu (the detail setting way please refer to page 67 -mosaic application mode output parameters setting)



Pic 6-3b LCD window: mosaic parameters setting

6-4 Multi-windows display operation

The AppM5 and AppM6 are multi-windows modes. They will realize four images and three images display respectively. Users can preset 4 modes to display multi-windows position, size and overlay order. The following is the related operation.



Pic 6-4a LCD window: multi-windows application mode

1. Switch image overlay order

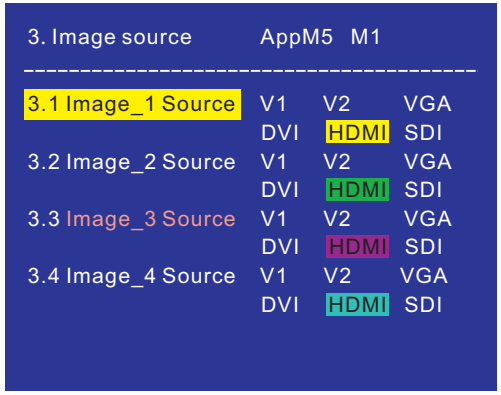
Multi-windows display of LVP909 is realized through multi-windows overlay. The default overlay order is image 4/3/2/1 from top to bottom. The overlay relations can be switched through image buttons **IMG1**, **IMG2**, **IMG3**, **IMG4** . If you press corresponding image button **IMG1** , then image 1 is sticky.

2. Switch multi-windows display modes

Press mode buttons **M1**, **M2**, **M3**, **M4** to switch corresponding display mode.

3. Switch image input source

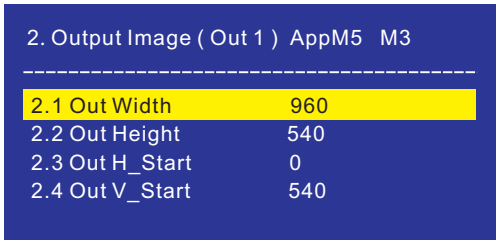
Press **Setup** to enter setup menu 3. Image Source , Press ↑ or ↓ to select corresponding image source and rotate **Knob** to select input signals. Press **OK** to save.



Pic 6-4b LCD window: multi-windows setting

4. Set output image position and size

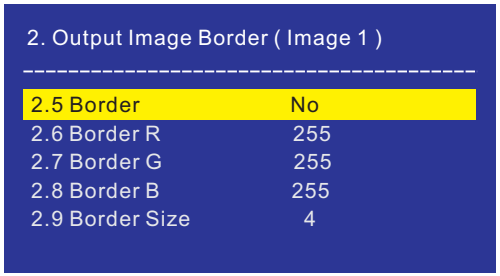
Press **Setup** to enter setup menu, then press ↓ to select 2. Output Image and press **OK** to enter. Press mode buttons **M1** , **M2** , **M3** , **M4** to select the desired adjustment display modes. Press ↑ or ↓ to select corresponding setting and rotate **knob** to change parameters. Press **OK** to save.



Pic 6-4c LCD window: multi-windows output image setting

5. Set output image border

LVP909 can set different color and size boarders for each output image. Press Setup to enter **setup** menu. Then press ↓ to select 2.Output image and press **OK** to enter. Press ↑ or ↓ to select corresponding setting and rotate **knob** to change parameters. Press **OK** to save.



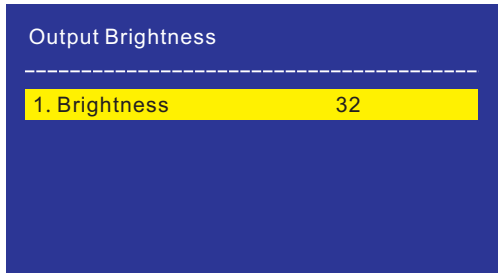
Pic 6-4d LCD window: multi-windows output image setting

6-5 Other basic operation

1. Output brightness selection

LVP909 can support 32 level brightness selection. To make sure of full gray scale of output image, it always set as 32.

Button	Description
BRT -	Reduce **LVP909** output brightness, the lowest is 0.
BRT +	Increase **LVP909** output brightness, the highest is 32.



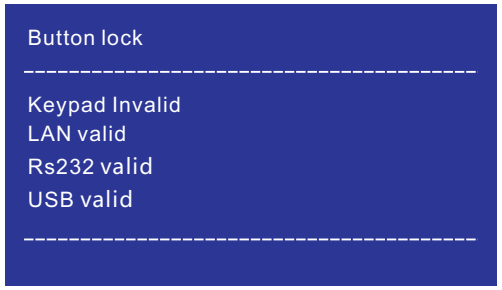
Pic 6-5a LCD window: output brightness setting

1. VGA input auto adjustment (Auto)

When LVP909 is in AppM1 and current input signal is VGA or Image 1 is VGA input in multi-windows mode, VGA input is effective. Press **Auto** to adjust VGA input signal sampling parameters. Then the VGA output image can be clear and full.

2. Button Lock (Lock)

Press Lock, then all buttons of LVP909 will be lock. In addition to Lock button, all other buttons are invalid to prevent misuse. Press 3 times Lock without stop to unlock. In the key locked, only LAN, Rs232, USB communication are available to prevent conflict between remote control and panel buttons. When remote control give commands, the device will enter buttons lock state auto. The menu will be as follow.



Pic 6-5b LCD window: button lock

3. Check system information (Info)

Press button **Info** to enter System Info menu. Press ↑, ↓ to check. Press ↩ to exit. System info menu as follow:

System Info

Model:	LVP909
Version:	V0.0.7
IP:	192.168.1.8
Mask:	255.255.255.0
Gate:	192.168.1.1
MAC:	76-64-77-1A-2B-3A
Resolution:	1920x1080_60Hz

Pic 6-5c LCD window: system information

System Info

Made Data:	2016-08
App. Mode:	AppM1 (switcher)

Pic 6-5d LCD window: system information

Chapter 7 Setup Menu Instructions

User setup menu is setting for the entire processor including 9 sections. They are output port configuration, output image setting, input signal setting, user parameters setting, communication setting, language setting, Audio setting, advance setting, dual pictures setting.

Setup

1. Output CFG >>
2. Output Image >>
3. Image Source >>
4. Color&Brightness, etc. >>
5. Communication >>
6. Language >>
7. Advance >>

Pic 7 LCD window: Setup

After the system start, press **Setup** to enter user setup menu. Press ↑,↓ buttons to select corresponding setting items. Then press knob button (**OK** button) to enter and press ↩ to return back the previous menu. Here we will explain the detail functions of each menu.

7-1 Output port configuration

After the system start, press **Setup** to enter user setup menu. Press ↑ , ↓ button to select 1.Output CFG . Then press knob button (**OK** button) to enter following figure 1.output CFG menu. This menu is used to set output resolution and application mode of output ports.

1. Output CFG

1. 1 Resolution	1920x1080_60Hz	?
1. 2 App. Mode	AppM5 (4 image)	
1. 3 Setup	OK To Apply	

Out1 = Out2 = 1 program (4 image)
Out3 = No output
Out4 = Sync. Monitor

Pic 7-1a LCD window: output port config

Operation steps:

↑ or ↓ button to select desired adjustment menu and rotate **knob** to select suitable parameters. Then press ↓ button to select 1.3 setup and press **OK**. The screen will display following confirmation menu. Press **OK** to restart the device. And the changed parameters are effective.

```
Tips
-----------------------------------------
Data will reset
Press <OK> to reset
Press <return> to cancel
```

Pic 7-1b LCD window: initialization tips

1. Resolution

LVP909 outputs image from output ports. There are 6 fixed output resolution (refer to page 43 specification). Users can choose one not to be less than the LED screen resolution.

2. App. Mode

LVP909 has 6 application modes including AppM1 (switcher)、AppM2 (2 mosaic)、AppM3 (3 mosaic)、AppM4 (4 mosaic)、AppM5 (4 image)、and AppM6 (3 image)。

7-2 Output Image setting

Setup menu 2.output image is used to set output image parameters of corresponding output ports.Different application modes, different setup menu. Here we will explain the entry way and setting method of different modes.

1. Output image parameters setting of AppM1

AppM1 is switcher mode. In this mode, output parameters menu is as follow. Press **Setup** to enter user setup menu and press ↓ button to select item 2.output image. Then press **OK** to enter 2.output image menu. The setting method is as follow: ↑ or ↓ button to select desired adjustment setting and rotate **knob** to select suitable parameters and press **OK** to save.


```
2. Output image ( Out1 )      AppM1
-----------------------------------------
2.1 Out Width                 1920
2.2 Out Height                1080
2.3 Out H_Start               0
2.4 Out V_Start               0
2.5 In Width                  1920
2.6 In  Height                1080
2.7 In  H_Start               0
2.8 In  V_Start               0
```

Pic 7-2a output image setting menu of App M1

2. Output image parameters setting of mosaic modes

Application mode 2 ,3 and 4 are mosaic mode. Setimage mosaic parameters in output image setting menu. In this modes, press **Setup** to enter 2.output image menu directly.

```
2. Output Image ( Out1 )      AppM4   M3
-----------------------------------------
2.1 LED Total Width           3840
2.2 LED Total Height          2160
2.3 Output Port               Out1
2.4 Unit Width                1920
2.5 Unit Height               1080
2.6 Unit H_Start              0
2.7 Unit V_Start              0
2.8 Auto Calculation          OK To Apply
```

Pic 7-2b output image parameters setting of mosaic modes

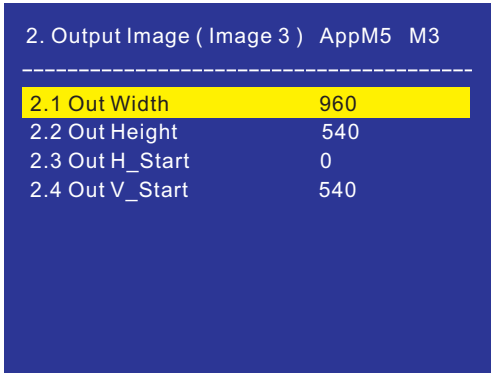
	Adjustment items	Description
Auto Mosaic Menu	2.1 LED Total Width	Total screen width and height
	2.2 LED Total Height	
	2.4 Unit Width	Each port control LED screen size and position with respect to the entire screen.
	2.5 Unit Height	
	2.6 Unit H_Start	
	2.7 Unit V_Start	
	2.8 Auto Calculation	Calculate the mosaic parameters automatic.
Manual Setting Menu	2.9 In Width	Intercept DVI input image position and size.
	2.10 In Height	
	2.11 In H_Start	
	2.12 In V_Start	
	2.13 Out Width	Output parameters
	2.14 Out Height	
	2.15 Out H_Start	
	2.16 Out V_Start	

The setting method is as follow:

1. Press display mode buttons (**M1** , **M2** , **M3** , **M4**) to select desired setting mode.
2. Press output port buttons (**Out1** , **Out 2** , **Out 3** , **Out 4**) to select desired adjustment output ports.
3. Set the total width and height of need mosaic LED screen in turn. And the port controls LED screen size and the position with respect to the entire LED screen. Then enter setup menu 2.8 Auto Calculation and press **OK** . LVP909 will calculate the output and input parameters of this port.
4. From item 2.9~2.16, slight adjust the auto parameters according to the output image display effect.
5. Repeat steps (2~4) to set other ports parameters.

3. Output image parameters setting of multi-windows mode

Application mode 5 and 6 are multi-windows modes. Set each image output parameters in output image window. Press **Setup** to enter user setup menu and press ↓ to select 2.output image and press rotate button (**OK**) to enter the following picture 2. output image menu.



Pic 7-2C output image parameters setting of multi-windows mode

Setting method:

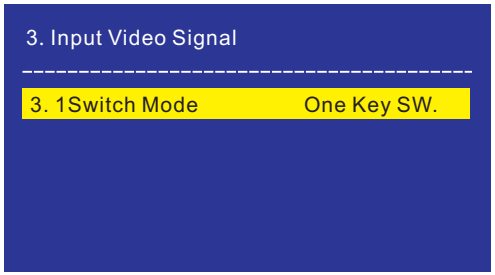
Press mode buttons (**M1** , **M2** , **M3** , **M4**) to select desired setting mode. Then press image selection button (**IMG1** , **IMG2** , **IMG3** , **IMG4**) to select desired setting image. Press ↑ or ↓ to select desired adjustment setting and rotate **knob** to select suitable parameters. And press **OK** button to save parameters.

7-3 Input video signal setting

Setup menu 3. Input Video Signal is used to set processor input signal corresponding configuration. In switcher, mosaic and multi-windows mode, there are different setting.

1. Input signal switch mode

In switcher and mosaic mode(AppM1~4), this menu is used to set signal switching mode.

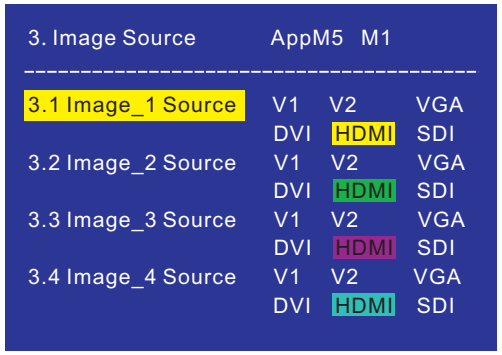


Pic 7-3a LCD window: Input signal switching mode

Setting method:

Enter setup menu 3.1 Switch mode and rotate **knob** to select **One Key SW**. or **Pre.+Take SW**. Then press **OK** button to save parameters.

2. Image Source setting



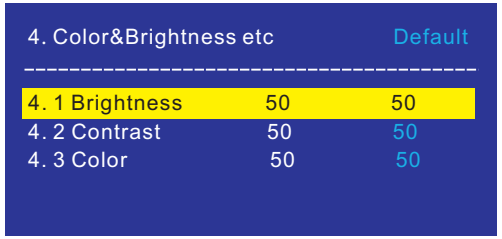
Pic 7-3b LCD window: image signal source setting

In multi-windows application mode (AppM5~6) , this menu is used to switch image sources. Setting method:

Press **Setup** to enter menu 3. Image Source and press display modes(**M1** , **M2** , **M3** , **M4**) to switch modes. Press ↑ or ↓ to select corresponding image source and rotate **knob** to select input signal. And press **OK** to save.

7-4 Color &Brightness etc. setting

LVP909 supports custom input image brightness, contrast and color setting.



Pic 7-4 LCD window: image quality setting

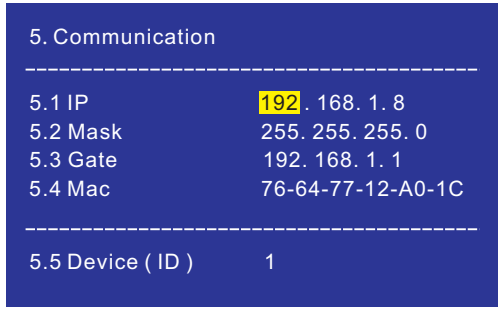
Adjustment items	Description
4.1 Brightness	Range:0~100. Default value is 50
4.2 Contrast	Range:0~100. Default value is 50
4.3 Color	Range:0~100. Default value is 50

Notes:

1. To make sure of full gray scale of output image, they are always set as default value.
2. Color parameters are only available for V1、V2、SDI and Non -RGB format HDMI.

7-5 Communication setting

LVP909 can be remotely controlled via Ethernet. Communication setting menu is used to set network parameters including IP address, mask, gate, MAC and number the multiple LVP909 under the same IP.



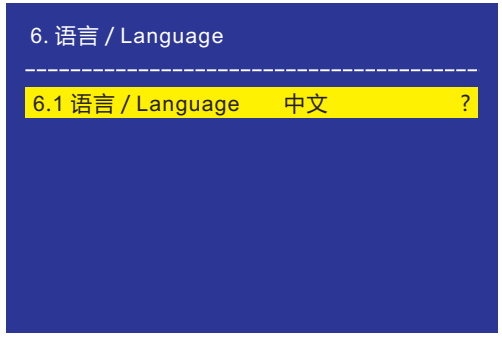
Pic 7-5 LCD window：communication setting

Setting method:

In 5. Communication , press ↓ to find desired adjustment setting and rotate **knob** to select parameters. Finally press **OK** to save them. Then press ↩ button, the LCD will give tips to restart the system and follow it.

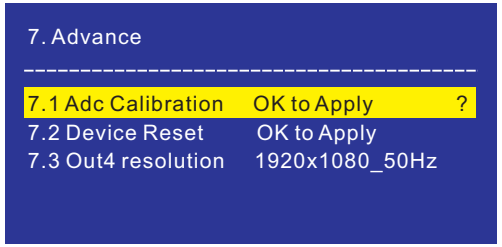
7-6 Language setting

LVP909 supports **Chinese** and **English** language. Rotate **Knob** to select one and press **OK** to save and effect.



Pic 7-6 LCD window：Language setting

7-7 Advance setting



Pic 7-7a LCD window：Advance setting

1. ADC Calibration

"7.1 ADC Calibration" is used to calibrate the white balance of analog signals to avoid color cast or extreme darkness problem. This function is only available for V1,V2 and VGA ports. Setting method:

In the current available Analog signals, enter "7.1 ADC calibration" and press **OK** to start to calibrate.

Note: Processors finished white balance calibration before leaving factory. Please use this item carefully.

2. Device Reset

The menu is used to reset LVP909 back to current application mode and current output resolution default state. Setting method：

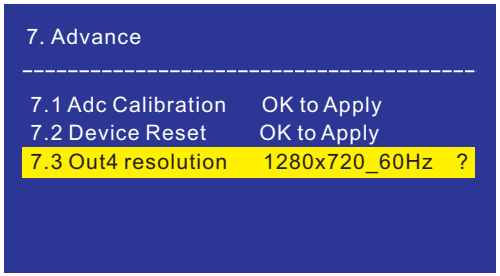
Enter 7.2 Device reset , press **OK**. LCD will give reset tips and press **OK** to reset and restart the processor before it disappear.

Pic 7-7b LCD window: initialization tips

3. Out4 resolution

Out4 output resolution defaults to be consistent with 1.1 Resolution. It also can be set as 1280x720_60Hz. The setup menu is 7.3 Out4 resolution . Setting method：

Enter 7.3 Out4 resolution and rotate **knob** to select output resolution and then press **OK** to save parameters.

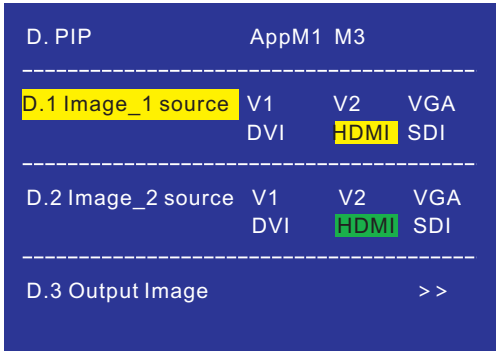


Pic 7-7c LCD window: Out4 resolution

Note: AppM4 need Out4 port to mosaic. It cannot set Out 4 resolution in this mode.

7-8 Dual picture setting (PIP)

In switcher mode (AppM1) and dual picture function is turned on(PIP indicator on) , press **Setup** to enter setup menu D. PIP . Users can set PIP signal and output image parameters.



Pic 7-8a LCD window: PIP setting

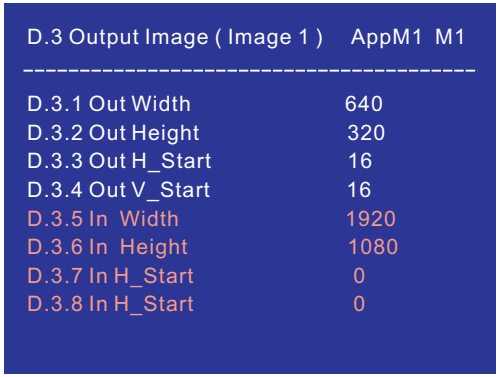
1. Switch image source

D.1 Image_1 source and D.2 Image_2 source is used to switch image source.
Setting method：

Enter setup menu D. PIP, press display mode buttons (M1 , M2 , M3 , M4) to switch display modes. Then press ↑ or ↓ to select corresponding image source and rotate knob to select input signal and press OK to save.

2. PIP output image setting

D.3 Output image is used to set PIP output image parameters. Setting method: Enter setup menu D.3 Output image PIP, press display mode buttons (M1 , M2 , M3 , M4) to switch display modes and press ↑ or ↓ to select corresponding output parameters. Rotate knob to adjust parameters and press OK to save.



Pic 7-8b LCD window: PIP output image setting

Chapter 8 Remote control instructions

LVP909 opens RS232 control protocol, supporting remote control by PC, Android or iOS and other intelligent terminals. As below we illustrate the hardware connection and relative software operation.

8-1 Hardware communication

The remote control ports of LVP909 include RS232, USB and wired network control. We will illustrate the hardware communication connection and setting.

Pic 8-1a LVP909 remote control ports

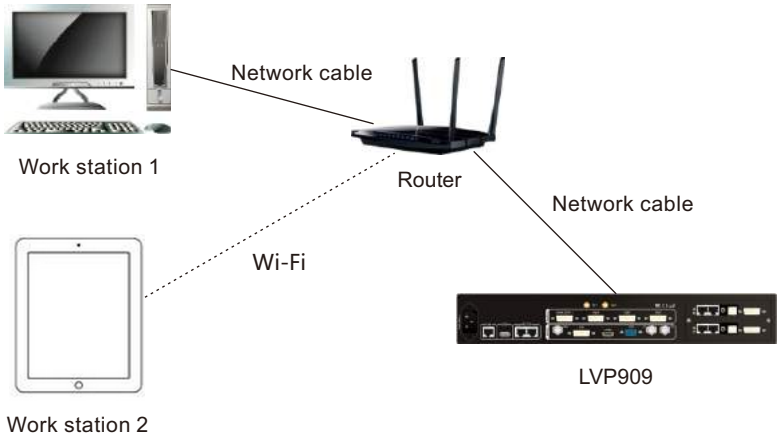
1. RS232 and USB

RS232 is the most common remote control port. When use RS232, we only need to use an RS232 cable to connect PC to processor's RS232 port, then we can use software to remote control processor. When PC does not have RS232 port, USB control method can be used.

Pic 8-1b PC connection by USB / RS232

2. Wired network

LVP909 has built-in network-RS232 convert module. After wired network connecting LAN and setting relative network configuration parameters (refer to user manual page 102 “7-5.Communication setting”), LVP909 becomes a work station in the local area network. So another terminal device in the local area network can remotely control the LVP909 by software. As the picture below, any terminal (work station) in the local area network can remotely control the LVP909.

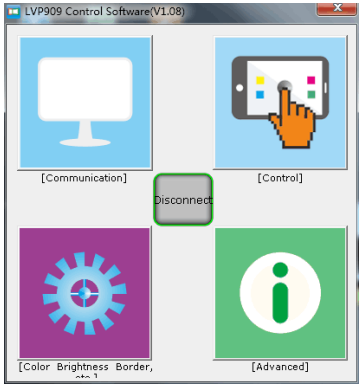


Pic 8-1b Wired network

8-2 LVP909 PC software instruction

LVP909 control software run in PC to realize the control of LVP909.

Double click to start the software “LVP909 Control Software.exe”, it shows as below:



Pic 8-2a PC software Guide interface

As shown above, there are 4 parts of the software:

1) Communication

2) Control Setting

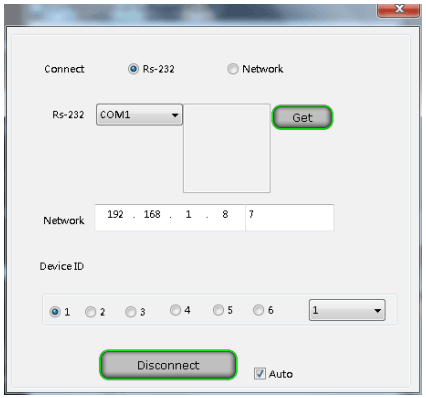
3) Image Quality and Border Setting

4) Advance Setting

Click **Connect**, when device connect successfully, the button will become **Disconnect**, if not successfully, please click **Communication**, to check whether the communication setting is correct.

As below we will introduce the operation way of each function of the software:

1. Communication setting



Pic 8-2b PC software connection interface

LVP909’s communication connection interface as above, first select the connection way as **RS-232** or **Network**。

If select **RS-232**, need to choose correct COM port, click **Get** to check RS232 ports of the PC.

If select Network, input correct parameters in IP address and port. For wired network, need to set the processor according to the network to be connected.
(refer to 7-5.Communication, Page 102 of this manual).

Connection way	Default IP address	Default port
LAN	192.168.1.8	7

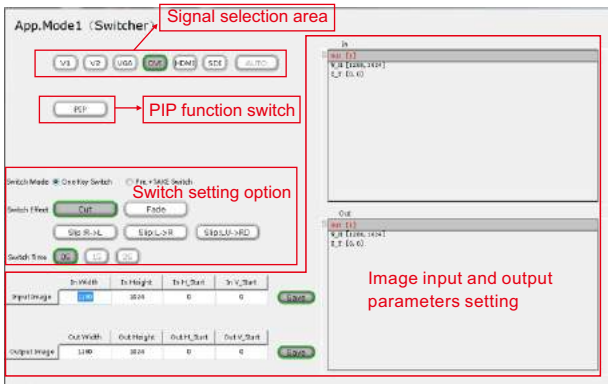
After setting parameters above, click **Connect**, after success connection, **Connect** button will become **Disconnect**, then we can close the connection menu and enter other function settings through main interface.

If auto connection is needed after PC software starts, please check the **Auto**.

2. Control setting

LVP909's control setting menu has 3 different interfaces according to different application modes: Switcher (AppM1), Splicer (AppM2~4) and Multiple image (AppM5~6).

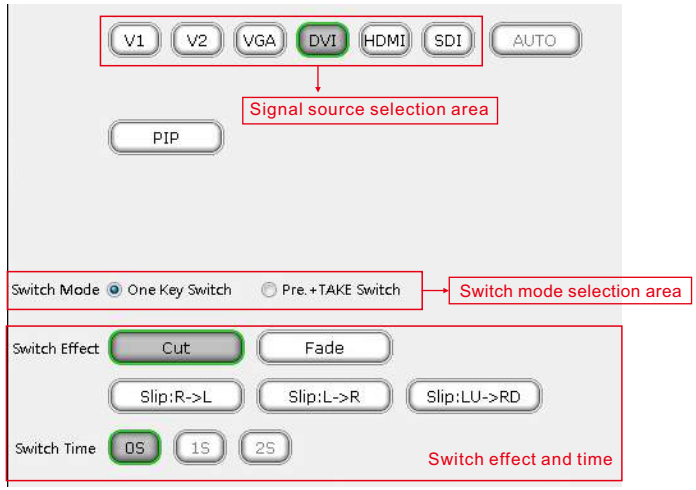
1). Switcher application mode control setting



Pic 8-2c PC software Switcher application mode instruction

Main functions of Switcher application mode include: Signal switch, PIP, input and output setting.

(1) Signal switch



Pic 8-2d PC software Switcher application mode instruction

Signal switch effect and time selection: In switch effect **Seamless Switch**, **Fade in / Fade out** or **Slide** switching effects. When selected **Fade in / Fade out** and **Slide** switch effect, user can set switch time as 1 second or 2 second.

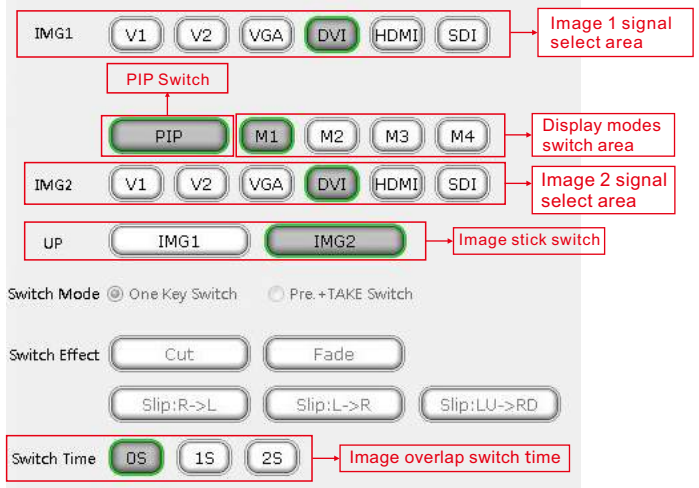
Signal switch mode selection: In signal switch mode selection menu, user can choose **One Key Switch** or **Pre+Take Switch** according to needs.

Pre + Take Switch: As show below, use signal button to pre select, then use **TAKE** button to switch. Present signal is marked as blue button, pre selected signal is marked with green button.

Pic 8-2e PC software Switcher Pre+Take Switch

(2) Dual pictures (PIP) setting

PIP is the switch to turn on or off the PIP function (dual picture display). Click PIP to turn on PIP function, operation menu as below:



Pic 8-2f PC software Switcher PIP setting

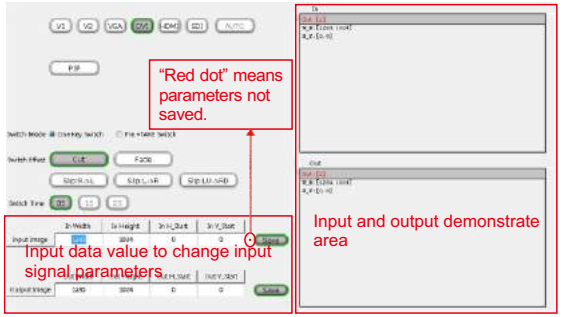
Switch PIP display mode: use display mode button (M1、M2、M3、M4) to select corresponding display mode quickly.

Change image signal: press corresponding signals at image 1 and image 2 signal switch areas.

Change overlap sequence: Press IMG1 or IMG2 button, the selected signal will display on top.

Change image overlap switch time: Press switch time selection button 0S , 1S , 2S .

(3) Image input and output setting



Pic 8-2g PC Software Switcher Application image parameters setting

The figure above is LVP909's input and output setting interface, user can input parameters value to set. If the parameters are not saved, red dot will appear in the right.

(4) Other control setting

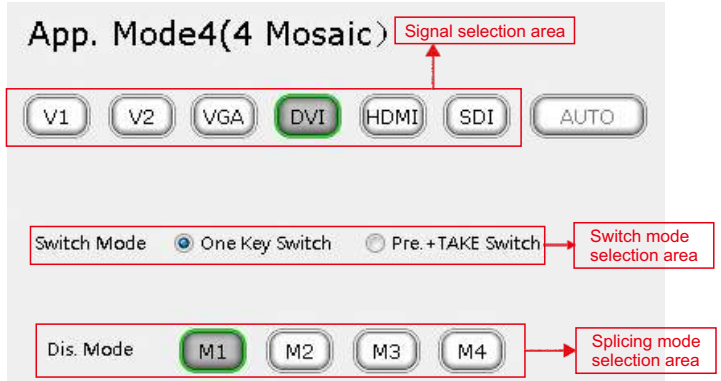
AUTO : VGA automatic adjustment. When present signal is valid VGA, press this button, processor will adjust the VGA signal automatically to make VGA image clear.

2). Splicer application mode control setting

Pic 8-2h PC Software Splicer application interface

Switcher application mode control setting interface include: signal switch, image input and output setting.

(1) Signal Switch



Pic 8-2i PC Software Splicer application signal switch function instruction

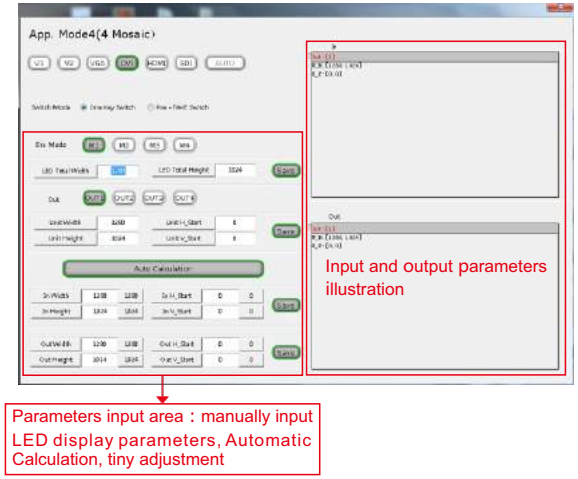
Signal switch mode selection: In the switch mode option, user can choose One Key Switch or Pre+Take Switch according to needs.

Pre + Take Switch: As show below, use signal button to pre select, then use TAKE button to switch. Present signal is marked as blue button, pre selected signal is marked with green button.

Pic 8-2j PC Software Splicing application Pre+TAKE Switch interface

Splicing mode selection: Press display mode button (M1 , M2 , M3 , M4) to switch.

(2) Splicing parameters setting



Pic 8-2k PC Software Splicer application image parameter setting

Spicing parameters area: upper part is the illustration of input and output image, user can use mouse to adjust size and location; lower part is splicing parameters input area, for input LED screen parameters to set splicing. Below shows the splicing steps:

a. Click splicing display mode button (**M1** , **M2** , **M3** , **M4**) to choose display mode;

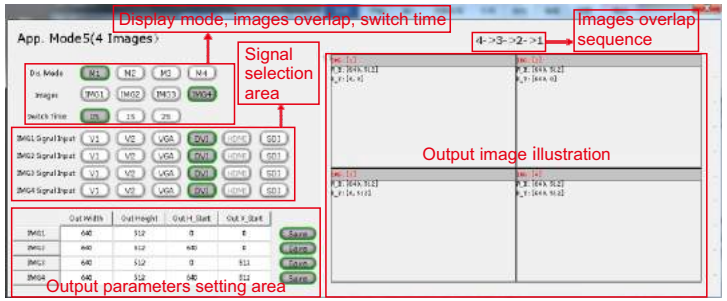
b. Click output port button (**Out1** , **Out 2** , **Out 3** , **Out 4**) to choose output that needs to be adjusted;

c. Set width and height of the whole LED screen, and size and starting point of each unit screen the output drive based on the whole LED screen, click **Auto Calculation** , LVP909 will automatically calculate the input and output parameters of the output port and display in the right area;

d. According to the output image display effect, do tiny adjustment;

e. Repeat step b~d to set parameters for other output ports.

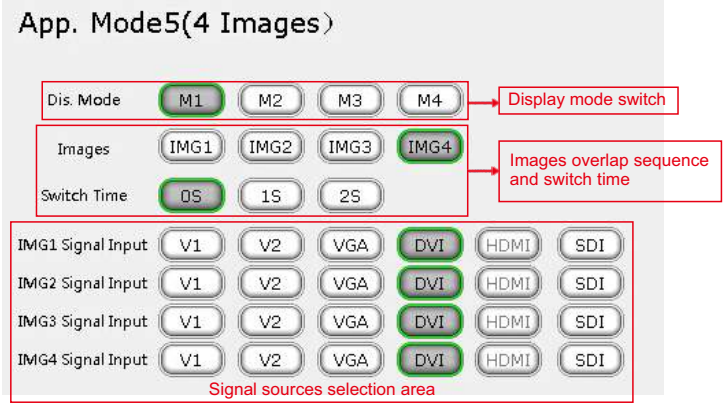
3). Multiple images application mode control setting



pic 8-2l PC Software multiple images application interface

Main functions of multiple images application control interface include: image signal switch and image output setting.

(1) Image signal switch



Pic 8-2m PC Software multiple images application signal switch illustration

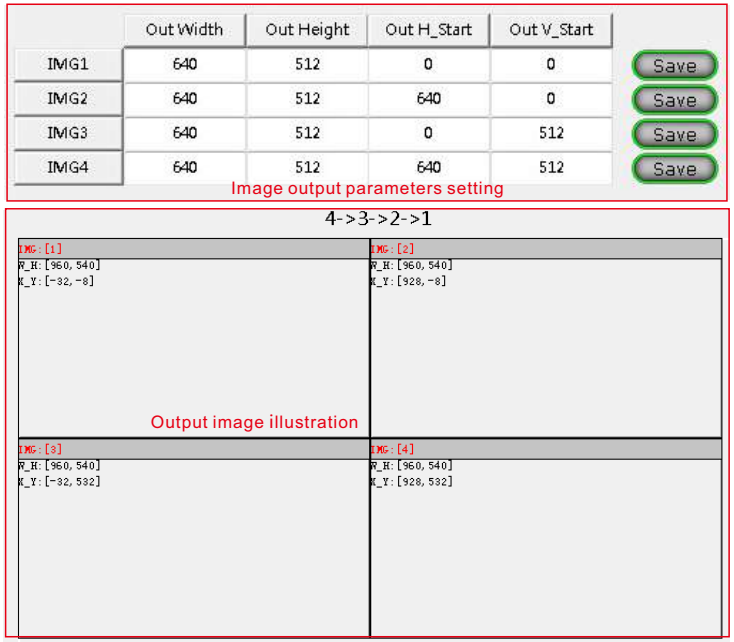
Images overlap sequence switch: Click images button (**IMG1** , **IMG2** , **IMG3** , **IMG4**) to switch: for example by clicking **IMG1** , IMG1 will be stick on top.

Images overlap switch time: Images overlap switch time can be set as 0s, 1s or 2s.

Switch multiple images display mode: Click corresponding display mode button (**IMG1** , **IMG2** , **IMG3** , **IMG4**) to switch;

Image signal sources switch: In the image signal sources selection area, click corresponding signal to switch.

(2) Image output parameters setting



Pic 8-2n PC Software multiple images application output image setting illustration

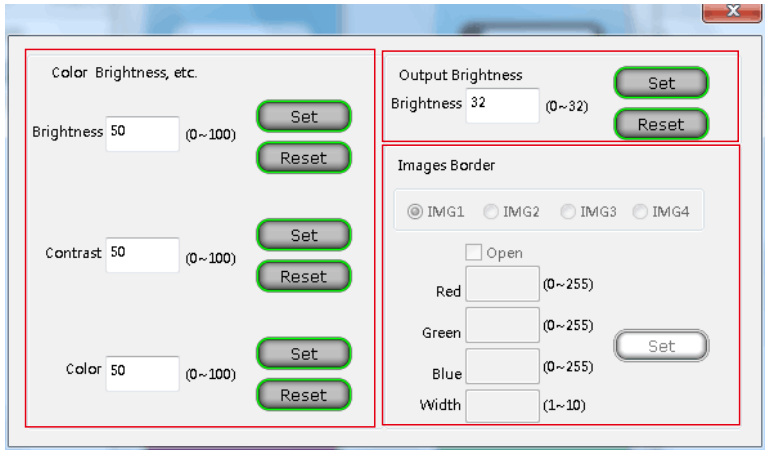
Output image parameters setting area: upper part is parameter input area for set parameters for each image; lower part is the output image illustration.
Setting way:

a. First click display mode (**M1**, **M2** , **M3** , **M4**);

b. Then click image button (**IMG1** , **IMG2** , **IMG3** , **IMG4**), to set images overlap;

c. Set location ans size for each image and click **Save** , to finish multiple images output parameters setting.

3. Image quality and border setting



Pic 8-2o PC Software image quality and border setting interface

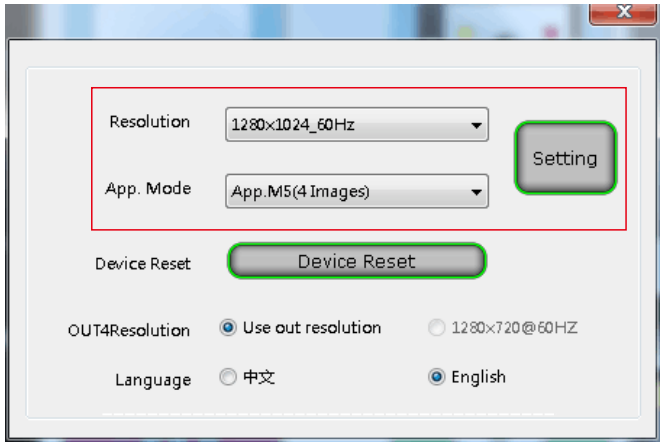
Image quality and border setting interface include 3 parts: image quality setting, output brightness and image border setting.

Image quality setting, used to set brightness, contrast and color parameters. Setting way: input the needed value in the set items and click **Set** to save, press **Reset** to restore default values.

Output brightness setting, used to adjust output brightness value. Setting way：input needed brightness value, press **Set** , to save, press **Reset** to restore default values.

Image border setting： used to set border or dual images or multiple images display application modes. Setting way: select corresponding image, for example **IMG1** , tick **Open** to turn on image border, input Red, Green and Blue and border width values. Click **Set** to save setting.

4. Advanced setting



Pic 8-2p PC Software advanced setting interface

Advanced setting interface includes: output port configuration setting, default setting, Out4 output resolution setting and language setting.

Output port configuration setting, used to set output port's **Output Resolution** and **Application Mode**. Setting way: click output resolution and application mode, choose needed resolution, click **Setting**, a tip"changing resolution and application mode" will appear, when the tip disappears, the new settings are applied.

Device Reset, used to restore default data of present output resolution and application mode. Setting way: Click **Device Reset**, software prompt"Initializing", when dialog box disappears, new setting is applied.

Out4 resolution, used to set output 4 output resolution same as the processor or 1280*720_60Hz. Setting way：click corresponding option, setting is valid.

Language setting, used to set processor and PC software to be Chinese or English. Setting way: click corresponding option, language update immediately.

8-3 Remote control by APP

LVP909 supports iPad, mobile phone and other mobile devices to realize remote control. User can download the APP download through VDWALL website and install. For IOS, can download through

https://itunes.apple.com/cn/app/ledprocessor/id1179345783?mt=8

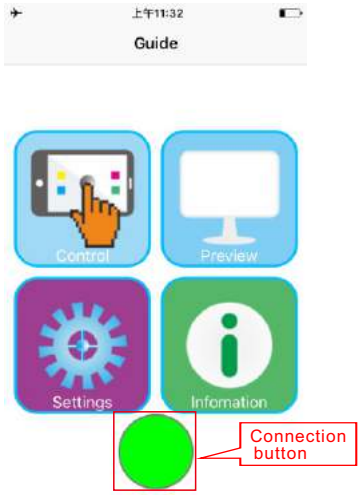
or scan the QR code below to install.
We will introduce how to remote control LVP909 by iOS APP.

Pic 8-3a IOS LVP909 remote control APP download QR code

1. Connection

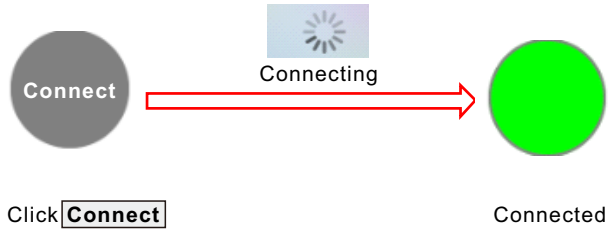
First connect LVP909 and APP-installed mobile device to same local area network by wired network (LAN) and Wi-Fi. Make sure LVP909's network parameters setting (refer to Page 102 7-5 Communication setting) match the router parameters.

Second, turn on LVP909 control APP, enter guide interface, as below.



Pic 8-3b2 APP Guide interface

Click **Connect**, if communication is normal, the button will turn from Grey to Green.



Pic 8-3b3 APP connection

If failed to connect, click the **Modify IP address** option on the popped-up dialogue box to check whether IP address and port setting are correct.

Click **Modify IP address**

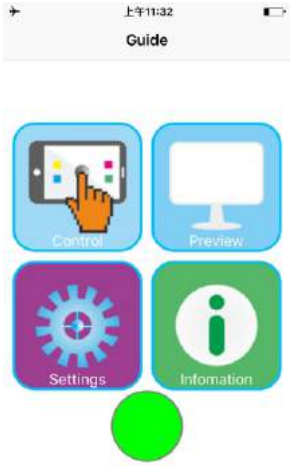
Check whether IP address and port are correct

Pic 8-3b4 APP IP address modification

For wired network, need to set the processor according to the network to be connected. (refer to 7-5.Communication , Page 102 of this manual). Below is the default parameter value.

Connection way	Default IP address	Default port
LAN	192.168.1.8	7

2. APP instruction



Pic 8-3c APP Guide interface

After communication connected successfully, user can operate the LVP909 by APP. As shows above, the APP has 4 function areas: **Control**, **Preview**, **Setting** and Information. Press the button to enter interface of each function. Below is instruction of the 4 functions.

1). Operation control

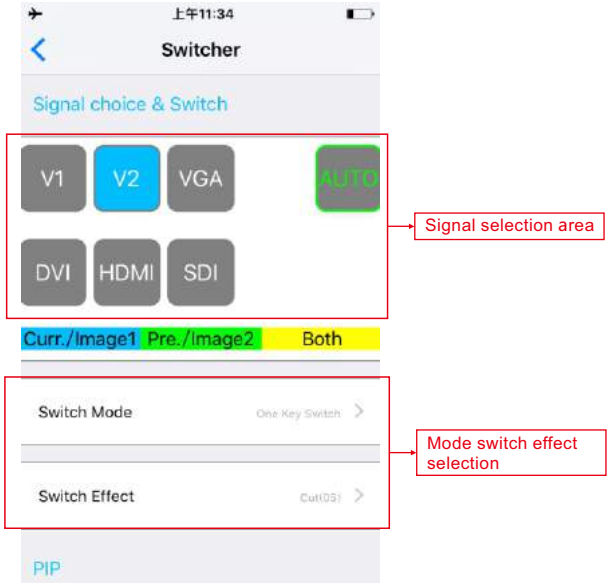
LVP909 has 3 different application mode: Switcher (AppM1), Splicer (App M2~4) and Multiple images (AppM4,5). The interfaces of each application modes are different.

(1) Switcher application operation interface

Pic 8-3d Switcher operation interface

The main functions in this application mode are: signal switch, PIP setting and output image setting.

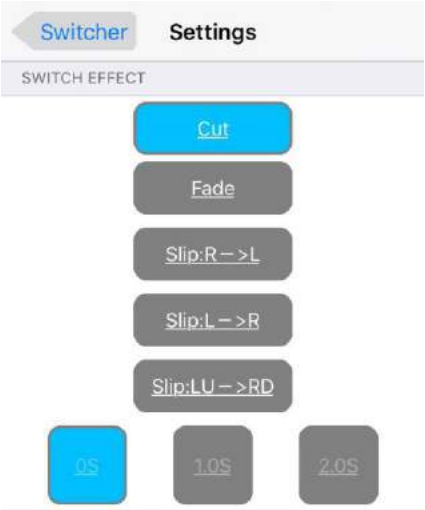
Signal switch: LVP909 support two switch ways in switcher application mode: **One Key Direct Switch** and **Pre+ Take Switch**.



Pic 8-3e1 APP signal switch

Pic 8-3e2 APP signal switch way

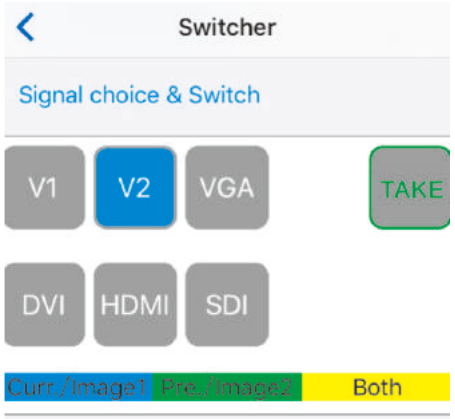
Signal switch effect selection: Click **Switch effect**, interface as below will pop up, press to choose switch effect and switch time. The switch time of seamless switch is 0s, while switch time of other switch effects cab be 1s or 2s.



Pic 8-3f Switch effect setting

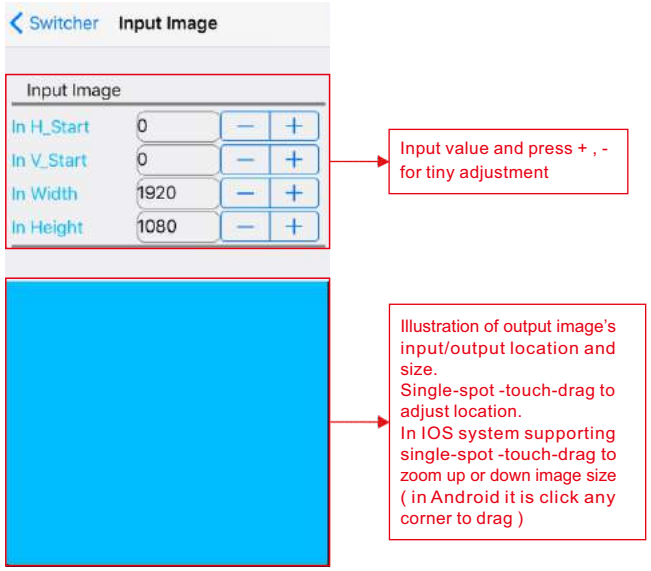
One key direct switch operation: LVP909's default switch way, directly press the signal button to realize signal switch.

Pre+Take switch operation: The below illustration shows the operation interface of this switch way. First pre select by pressing signal button, then press "TAKE" button to select. Present signal is marked with blue button and pre selected signal is marked with green button.



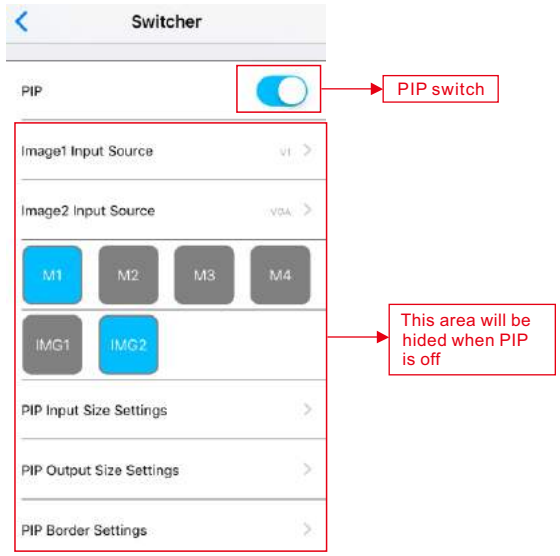
Pic 8-3g Pre+Take Switch interface

Output image parameters setting : This option is used to set output image's input and output parameters. Interface shows below:



Pic 8-3h Output image input / output parameters setting interface

Dual pictures (PIP) setting

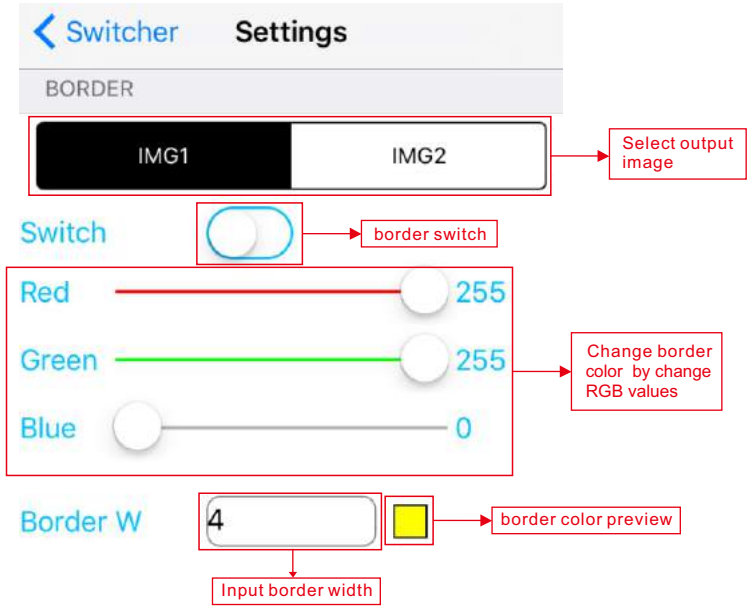


Pic 8-3i PIP interface

PIP interface shows as above, the setting steps are:

First press **PIP** button to turn on PIP function, then select signals for **IMG1** and **IMG2**, choose display mode by pressing (**M1** , **M2** , **M3** , **M4**). To set PIP location, size and border, press **PIP Input Size Setting**, **PIP Output Size Setting** and **PIP Border Setting** .

Pic 8-3j PIP input / output parameters setting interface



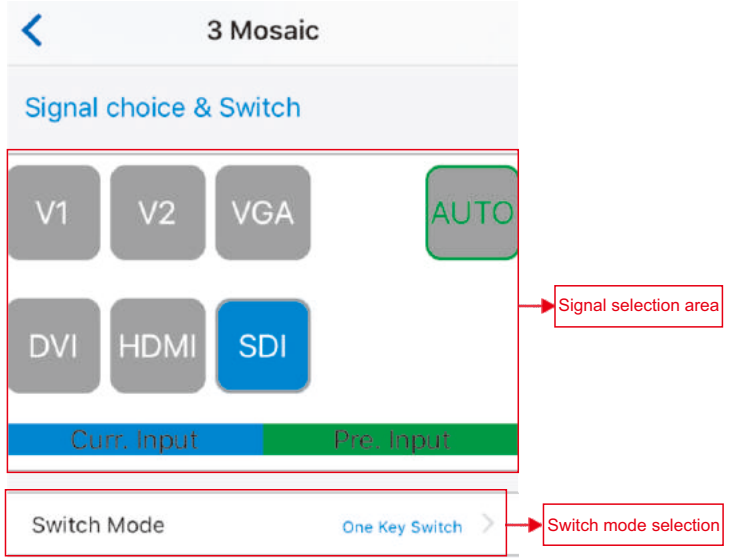
Pic 8-3k PIP border setting interface

(2) Splicer application operation control interface

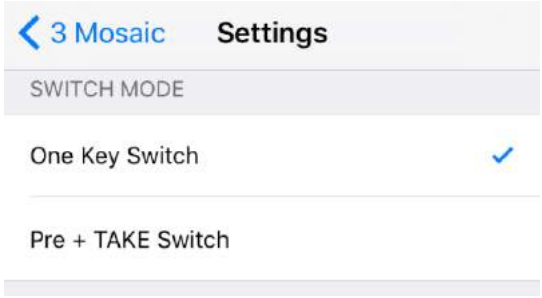
Pic 8-3l Splicer operation interface

The main functions of interface in this mode include：**Signal switch**, **Display mode switch** and **Splice parameters setting**.

Signal switch: In Splicer / Mosaic application mode, LVP909 supports two switch ways: One Key Direct Switch and Pre+Take Switch. In this application mode, the difference in switch way compared with Switcher is--Splicer mode only support Seamless Switch, can't support Fade in / Fade out switch.

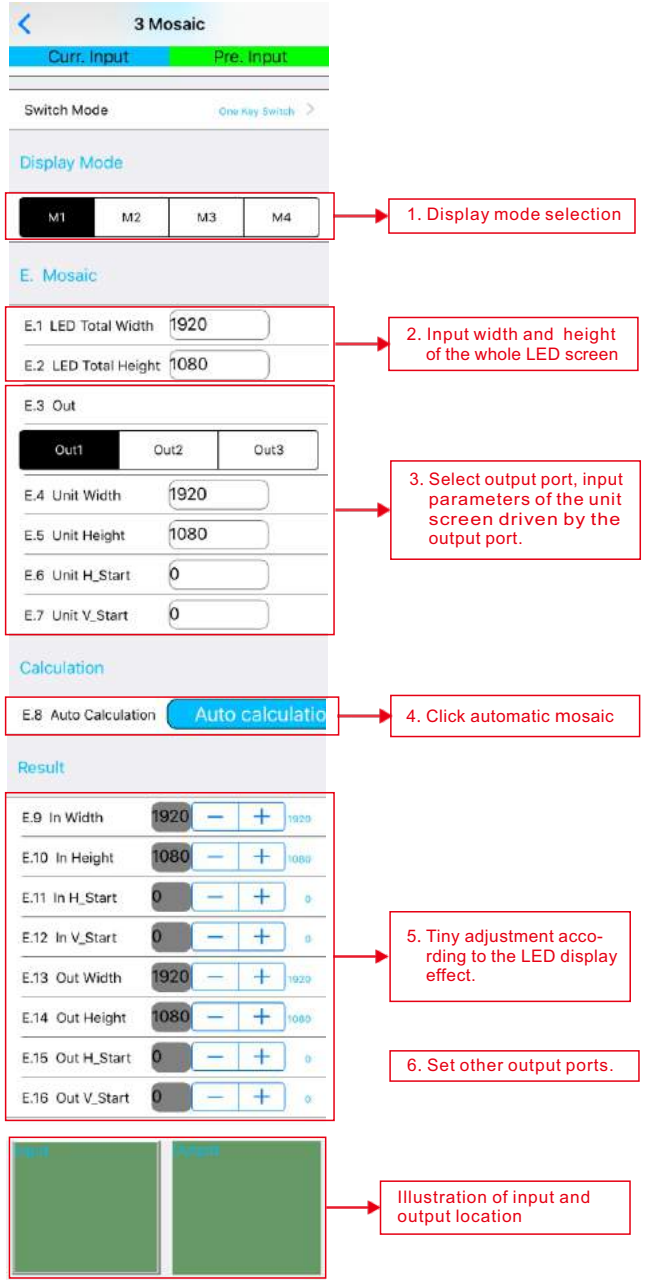


Pic 8-3m1 APP Switch selection



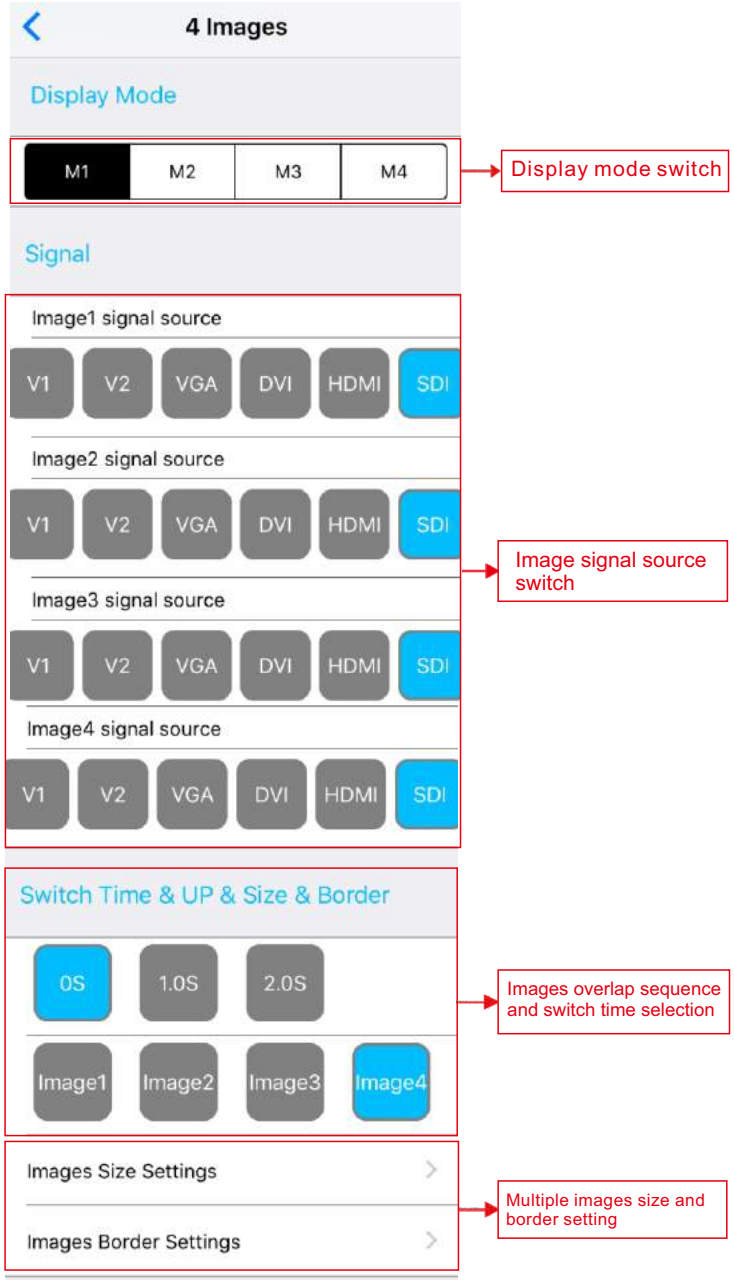
Pic 8-3m2 APP signal switch way selection

Splice / Mosaic parameters setting



Pic 8-3n Splice parameters setting steps

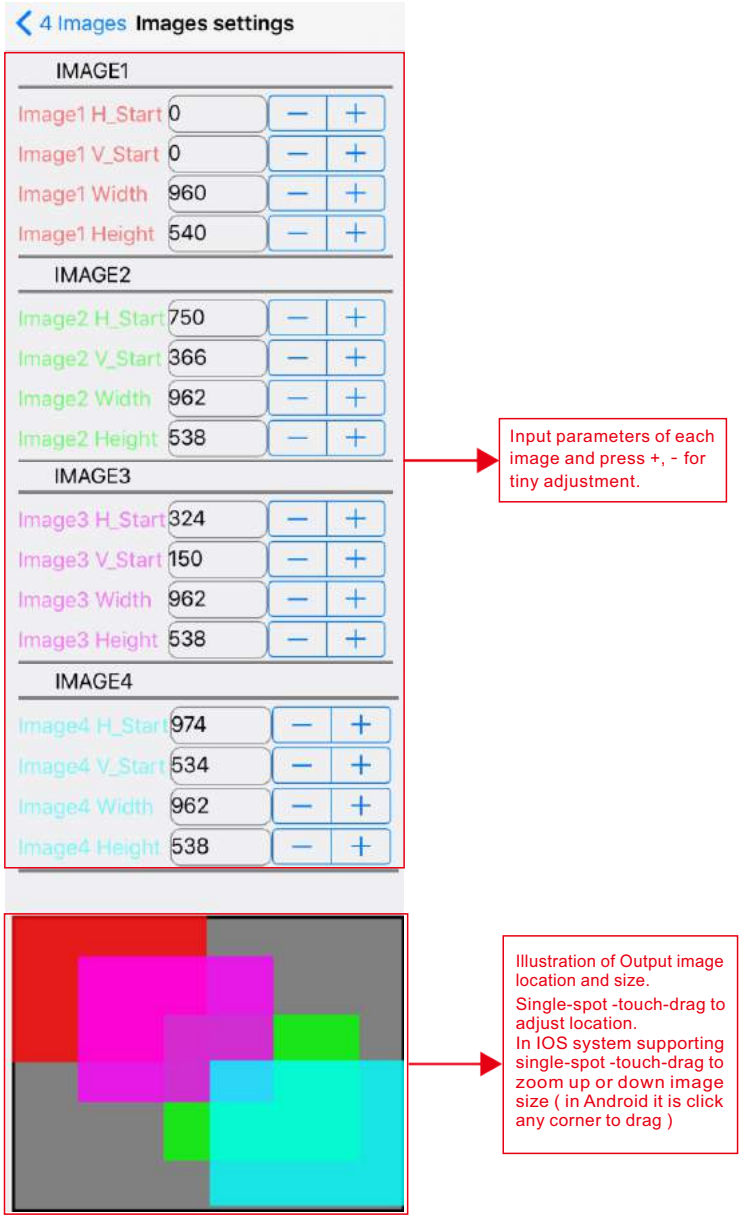
(3) Multiple images display operation control interface



Pic 8-3o Multiple images mode operation interface

The interface includes: Display mode switch, Image signal source switch, Image overlap switch, image location and size setting, and etc.

Multiple images output parameters setting



Pic 8-3p multiple images output parameters setting interface

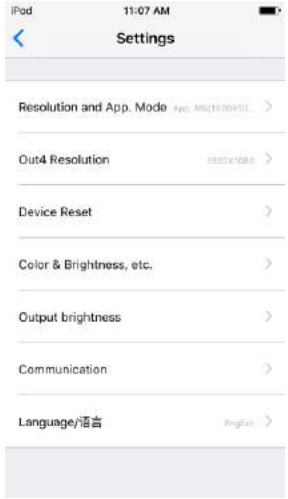
2). Preview

Pic 8-3q Preview function interface

Preview function is realized by the image return function of LVP909F Wi-Fi module, LVP909 can't realize this function.

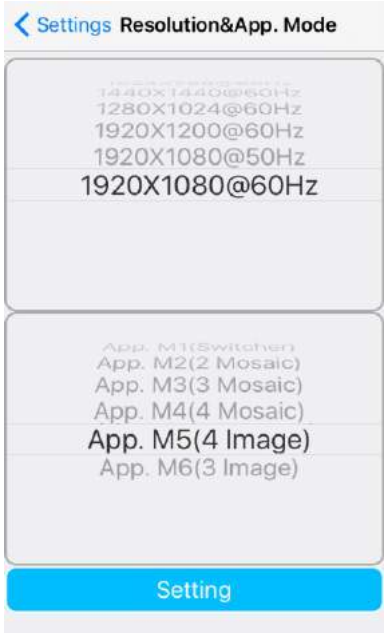
3). Setting

The setting interface includes: Resolution and application mode, Out4 resolution, Reset, Image quality, Output brightness, Communication and Language.



Pic 8-3r Setting interface

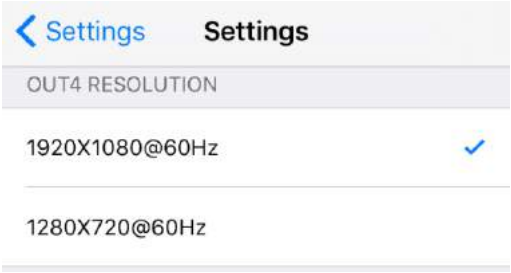
(1) Resolution and application mode



Pic 8-3s Resolution and application mode setting interface

In Resolution&Application Mode, click to choose output resolution and application mode, click **Setting**, then click **Confirm** on the pop-up dialog box to confirm parameters and continue other settings.

(2) Out4 Resolution



Pic 8-3t Out4 Resolution interface

Default Out4 output resolution is the same as the processor output resolution. Except in 4 Mosaic (AppM4), Output4 can be also set as1280x720_60Hz. In this option, click the resolution and it is valid immediately.

(3) Reset

Pic 8-3u Reset interface

Reset function is used for restore LVP909 to default values in present output resolution and application mode. Click **Reset**, LVP909 will perform relative operation.

(4) Image quality

Pic 8-3v Image quality setting interface

This option is use to set LVP909's color, contrast and brightness values. User can drag to set parameter or click **Reset** to restore to default values.

Remark：Color option is only valid for Video、SDI, or None- RGB HDMI.

(5) Output brightness

Pic 8-3w Image brightness interface

This option is used to set LVP909's output brightness value. User can drag to set parameter or click **Reset** to restore the brightness to default value.

(6) Communication

Pic 8-3x Communication setting interface

This option is used to set communication parameters of the APP. If choose network, user need to set processor according to the local area network (Refer to 7-5.Communication, Page 102 of this manual). The table below shows the default values for Wi-Fi and wired network.

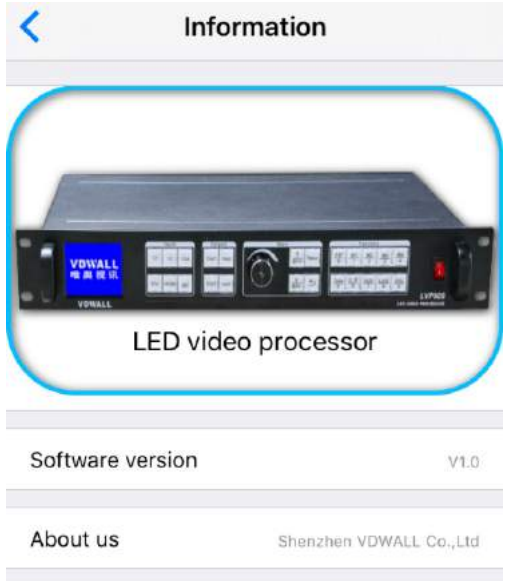
Connection way	Default IP address	Default port
LAN	192.168.1.8	7

(7) Language

Pic 8-3y Language setting interface

This option is used for setting language for APP and LVP909 processor. Currently LVP909 has Chinese and English. Click the needed language, the language of APP interface and processor will change automatically.

4). Information



Pic 8-3z Information interface

Information interface present processor model, version information, copyright and other information of the APP.

Chapter 9 Notes about models

LVP909: without Wi-Fi module

LVP909F: with Wi-Fi module

Chapter 10 Copyright Information

The copyright of this Manual is owned by SHENZHEN VDWALL CO., LTD., unless with prior consent of VDWALL, nobody is permitted to copy or use any part or all of the information contained herein.

This Manual is provided for reference only, VDWALL reserves right to change the product appearance, dimensions and specifications from time to time without notice to users.

FCC STATEMENT :

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.
Warning: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.