



LED Video Processor

User Manual

Model: LVP-1000/1000S

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Representation

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The product specifications and information mentioned in this Manual are for reference only and are subject to change without notice. Unless specifically agreed, this Manual is for guidance only. No statement or information in this Manual constitutes guarantee in any form.

About This Manual

- Read this Manual carefully before using this device.
- For persons who need to purchase the accessories to this device
- This Manual also provides the instructions on how to use such accessories.
- If this Manual provides the instructions on how to use an accessory to this device, the name of the accessory will be provided accordingly.
- Read this Manual together with the supplied instructions on the accessories to this device.

Trademark Credit

VGA and XGA are the registered trademarks of IBM.

VESA is the trademark of Video Electronics Standards Association.

The HDMI logo and High-Definition Multimedia Interface are the trademarks of HDMI Licensing LLC.

Safety Precautions

- ✧ The device is designed for indoor . For outdoor use, please take precautions.
- ✧ The device needs to use voltage with rated power. The error of input voltage must be $\pm 10\%$.
- ✧ Never use the device in a place with the altitude over 3048m.
- ✧ Never use the device after putting any foreign matter, such as water or metal object, into it, otherwise the device may be damaged and a fire may be caused.
- ✧ Never use the device in certain special environments, such as near a heat source. This may overheat and damage the device. Use the device in a well-ventilated place and prevent the ventilation opening of the device from being blocked.
- ✧ Never use the device in an environment where the temperature changes suddenly to prevent condensation.
- ✧ Never use the device in an environment with excessive dust or high humidity.
- ✧ Use the device in an environment with the ambient temperature from -10°C to 40°C and relatively humidity of 90% or below.
- ✧ Never expose the device to a place where accidental collision or vibration may occur. Consolidate the device when it is to be used in a place with vibration.
- ✧ Never connect the AC power cable to an AC power cable that may cause excessive noise.
- ✧ The device must be connected with a ground wire.
- ✧ In case any irregular or abnormal phenomenon is found, immediately switch off the power supply, disconnect the AC power cable, and handle the phenomenon by referring to the Troubleshooting Guide.
- ✧ If the device is damaged, never dismantle it without permission. Please contact the service department.

Accessories

Open the package carefully, and check whether the following objects are contained in it.

If any accessory is lacked, contact the seller.

- ✓ **AC power cable 1 pcs** (for 100-240 V) Connected to the AC power connector to supply power to this device.



- ✓ **Network cable 1 pcs**
Universal network cable, used for communication between devices and for debugging.



- ✓ **DVI cable 1 pcs** Used to connect the signal source to the DVI input port of the device or connect the DVI output port of the device to the LED transmission card.



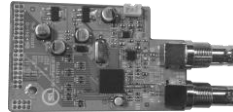
- ✓ **Φ5*18 Copper Pillar (4PCS), M3*6 Round Head Screw (4PCS)** Used to fix the LED sending card.



- ✓ **LED Sending Card** (optional)



- ✓ **SDI Module** (optional)



- ✓ **Flightcase** (optional)



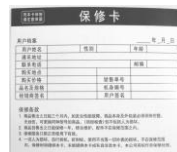
- ✓ **User Manual** Reference for the user purchasing or using the device.



- ✓ **Qualified Certificate** The certificate that proves the product passes the strict quality inspection.



- ✓ **Warranty Card** Product after-service recording card, with which, the after-service provided by the Company can be enjoyed within the warranty period.



Function Information

LVP Series Video Processor is a high performance LED video processor that uses the 30-bit bital signal processing technology, advanced deinterlacing signal processing and real Seamless Switch technology for professional demonstration. It supports 1080p and 1920x1200@60Hz full HD resolution output (up to 2304X1152@60Hz). Point-to-point pixel adjustment can be realized. It can receive several types of video input formats, such as 3G-SDI, HDMI, DVI, VGA, ,YPbpr/YCbCr,CVBS.

Splicing LED Video Processor

The LVP Series Video Processor supports signal cascade. Through a simple fusion device, ultra high resolution display can be realized without the purchase of expensive fusion controller.

Multi-device Interconnection

All connected machines can be controlled with one key, and it is more convenient in the splicing mode.

Seamless Switch

The seamless Switch quick switching and fade-in fade-out effects are provided to enhance and present demonstration pictures of professional quality.

Signal Pre-selection and Quick Switch

The pre-selection and quick switch function is provided to reduce errors in onsite switching and realize quick switch.

Internal Test Patterns for Calibration and Setup

A number of test patterns are provided, including square, color bar, gray-scale, alternating pixel, white field, red, green, and blue test patterns.

Picture-in-picture Any Size Any Position

The position, size, transparency, border width, color, ,border,etc. of picture-in-picture can be adjusted and controlled at will.

Broadcast Quality Image Scaling Engine

The LVP1000 Video Processor adopts the high performance 30-bit Faroudja® DCDI image scaling engine for up or down the resolution conversion of signals with various resolutions, and is equipped with the professional ACC and ACM video processing engine to give you completely new visual enjoyment.

More Input/Output Interfaces

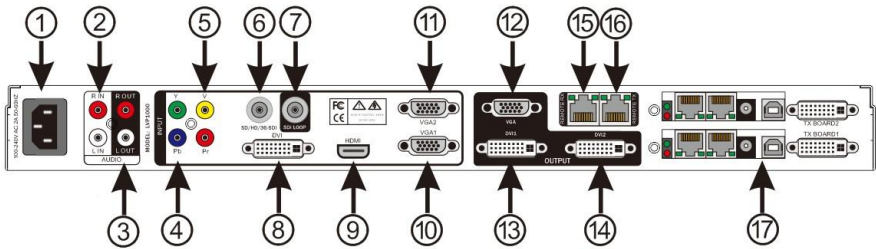
LVP1000 has 7 video input interfaces and 3 video output interfaces, covering the currently most common video interfaces and SDI high definition camera interface.

Convenient Panel Keys

A visual LCD interface and clear keypad backlight simplify the installation and control of the system.

Ports and Specifications

Ports are the important parameters the user should understand before the installation. By understanding the ports, the user can install and set up the device rapidly and avoid problems. The following are the definitions and specifications of the ports on the back of the video processor.

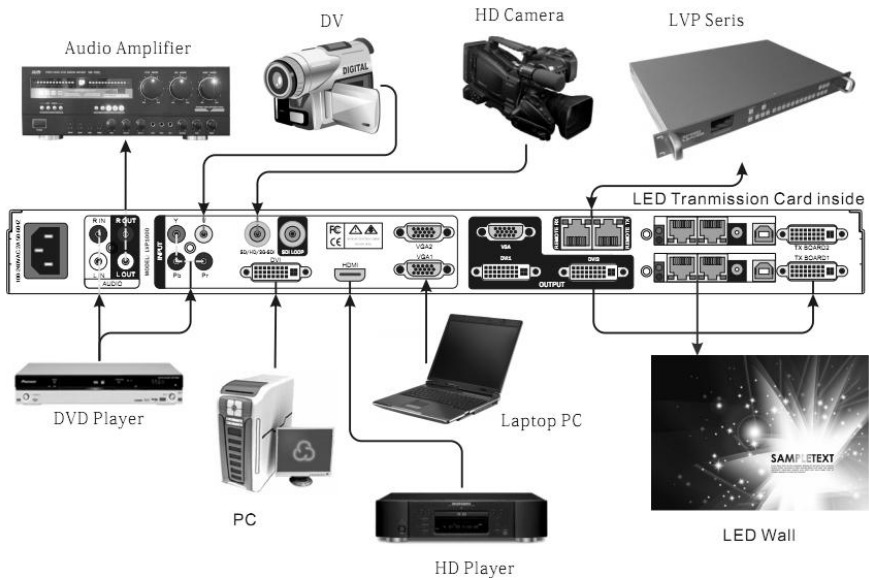


No.	Name	Definition	Description/Support
①	AC Socket	Power supply input	AC power supply interface, for 100V~240V power supply input
②	AUDIO INPUT	Audio input	Analog audio input
③	AUDIO OUTPUT	Audio output	Analog audio output
④	YPbPr	Video input	Y:1Vpp±3dB (0.7V Video+0.3v Sync) 75 ohm, Pb/Pr:0.7Vpp±3dB 75 ohm 480i, 576i, 480p, 576p, 720p50, 1080i50, 1080p50, 1080p60
⑤	V	Composite video input	1Vpp±3db (0.7V Video+0.3v Sync) 75 ohm PAL, NTSC, PAL-M/N, SECAM
⑥	SD/HD/3G-SDI	Video input	1080p 60/50/30/25/24/25(PsF)/24(PsF) 720p 60/50/25/24 1080i 1035i 625/525 line Support 1-channel loop out
⑦	SDI LOOP	SDI loop out	Consistent with SD/HD/3G-SDI input
⑧	DVI	Input	VESA standard, PC to 1920x1200, HD to 1080p
⑨	HDMI	Input	480i/p, 576i/p, 720p, 1080i/p, support 8-, 10-, and 12-bit color depth

⑩	VGA1	Input	VESA standard, PC to 1920x1200@60Hz
⑪	VGA2		
⑫	VGA	Output	1024×768@60Hz 1280×720@60Hz 1280×1024@60Hz 1440×900@60Hz 1600×1200@60Hz 1680×1050@60Hz 1920×1080@60Hz 1920×1200@60Hz 1024×1280@60Hz 1536×1536@60Hz 2048×640@60Hz 2048×1152@60Hz 2304×1152@60Hz 2560×816@60Hz 1280×720@50Hz 1920×1080@50Hz 1024×1920@60Hz
⑬	DVI1		
⑭	DVI2		
⑮	REMOTE RX		
⑯	REMOTE TX	RS232 transmission	Communication port for multi-machine cascade
⑰	LED Sending Card position		
Parameters of the Machine			
Weight		3.6kg	
Dimensions		4.4cm(H)x44cm(W)x28.5cm(D) (1U high, width of the full rack) (The depth does not include the connector and handle. The width does not include the rack lug. The width is 48.3cm for a rack with lug.)	
Input Power		100VAC – 240VAC 50/60Hz	
Max. Power		20W	
Note: Specifications are subject to change without notice.			

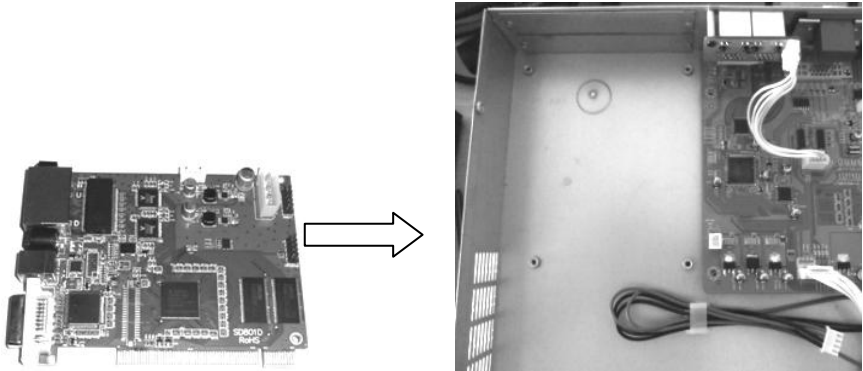
Installation

Before the installation, please check whether the installation components are complete and carefully read the Safety Precautions and the Ports and Specifications. Humanized treatment is used for the ports of the video processor, with a box indicating the input ports and a box indicating the output ports. The ports in the box filled with black color are output ports; the port name containing “LOOP” indicates port loop out. In an engineering program, try to use HD interfaces, such as HDMI, DVI, or SDI. The figure below shows the common installation programs.

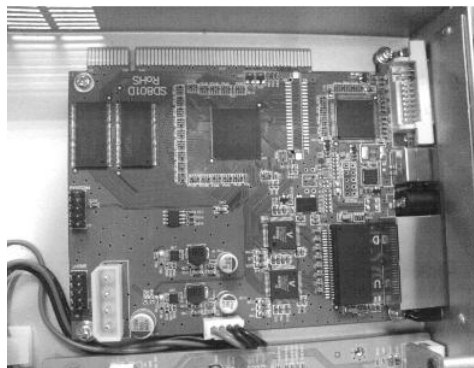


Installation of LED Transmission Card

1. Remove the upper cover and then the baffle of the case and install the fixing bolts at the corresponding positions so as to install the transmission card of the corresponding brand.



2. Install the LED transmission card, fix it with the 4 screws supplied, tighten the hexagonal bolt of the DVI interface, and insert the 4PIN, 5V power cable into the power socket of the transmission card, as shown in the figure. When the transmission card is installed, install the baffle of the case.

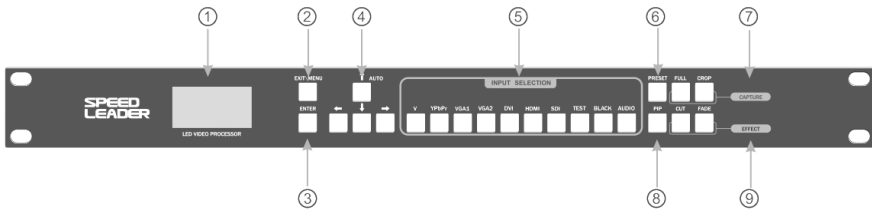





Front panel

The Front Panel of the video processor uses a friendly human machine interface and clear and simple LCD menu displaying. The default menu displays the operation modes of the video processor for you, and you can use the main menu to set detailed parameters. The panel provides the most frequently used shortcut keys with LED indicator inside (except menu operation keys) to indicate the operation mode of the current function.

Among the input shortcut keys of ‘INPUT SELECTION’, press a key, and two indication modes may occur. When the indicator is flashing, it indicates there is no signal or no signal connection is detected; when the indicator is lit up, it indicates the signal connection is normal.

The following figure shows the Front Panel:



No.	Name	Description	
①	LCD	Used to display the menu and current information.	
②	EXIT\ MENU	Main menu or exit. In the main menu mode, when it is pressed, the system will return to the previous menu.	
③	ENTER	Confirmation key	
④	Direction keys	 AUTO	In the Default menu, the input VGA video displaying can be positioned automatically.
			Down operation key
			In the Default menu, the brightness of videosoutput can be adjusted. Left: -, right: +

			In the function menu, the various parameters can be adjusted. Left: -; right: +
⑤	INPUT SELECTION	Main channel signal selection shortcut key (7 video interfaces and 3 audio interfaces) HDMI and SDI decode sound output.	
		TEST	Outputs test patten
		BLACK	Outputs black screen
		AUDIO	Select external audio or sound for various video channels
⑥	PRESET	Saves or calls out the scenario modes, including signal channel mode, video quality setup, etc.	
⑦	CAPTURE	Full video displaying, partial video displaying, Multi-device video splicing	
		FULL	Full video displaying
		CROP	Multi-device splicing, partial video displaying
⑧	PIP	Picture-in-picture, Keying. The set PIP or Keying parameters are invoked for displaying. Press the PIP key repeatedly to disable or enable the PIP function. When the TEST and BLACK functions are activated, the PIP function can't be used. When the PIP function is activated, the CUT and FADE functions can't be used.	
⑨	EFFECT	CUT	Seamless switching. When the main channel is switched, the video will not interlace or flash. When the PIP function is enabled, the CUT function can't be used.
		FADE	Video fade-in fade-out. When the main channel is switched, the video fades in or fades out. When the PIP function is enabled, the FADE function can't be used.

Menu

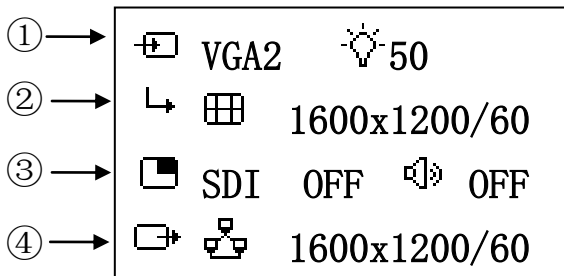
Use the LCD menu system to set the device quickly and intuitively, thus meets your use requirements.

When you do not operate or your operation is time-out, the LCD will display the default menu. If you use the keys on the Front Panel to set the device, the LCD will display the corresponding menu according to your operation in order to prompt you and in order for better, quicker and more intuitive operation.

The menu system of the video processor will be described in details below by combining the displaying on the LCD and the keys on the panel.

Default Menu

After the device powered on, the LCD will display the current state of the device, as shown in the figure:
















The meanings of the contents of the figure are as follows:

No.	Description
①	The main channel is VGA2; the luma is 50.
②	Crop mode; input resolution 1600x1200@60Hz
③	The PIP channel is SDI; the PIP mode is "OFF".Audio output is"OFF".

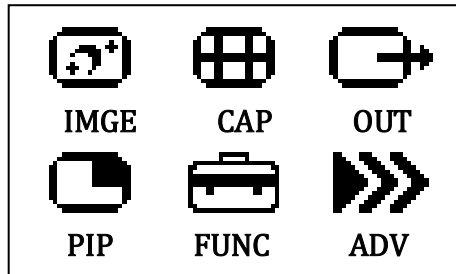
④	Multi-device interconnection mode; output resolution 1600x1200@60Hz
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In the default menu, the LCD displays the icons of the various functions. The meanings of the icons are described in the table below:

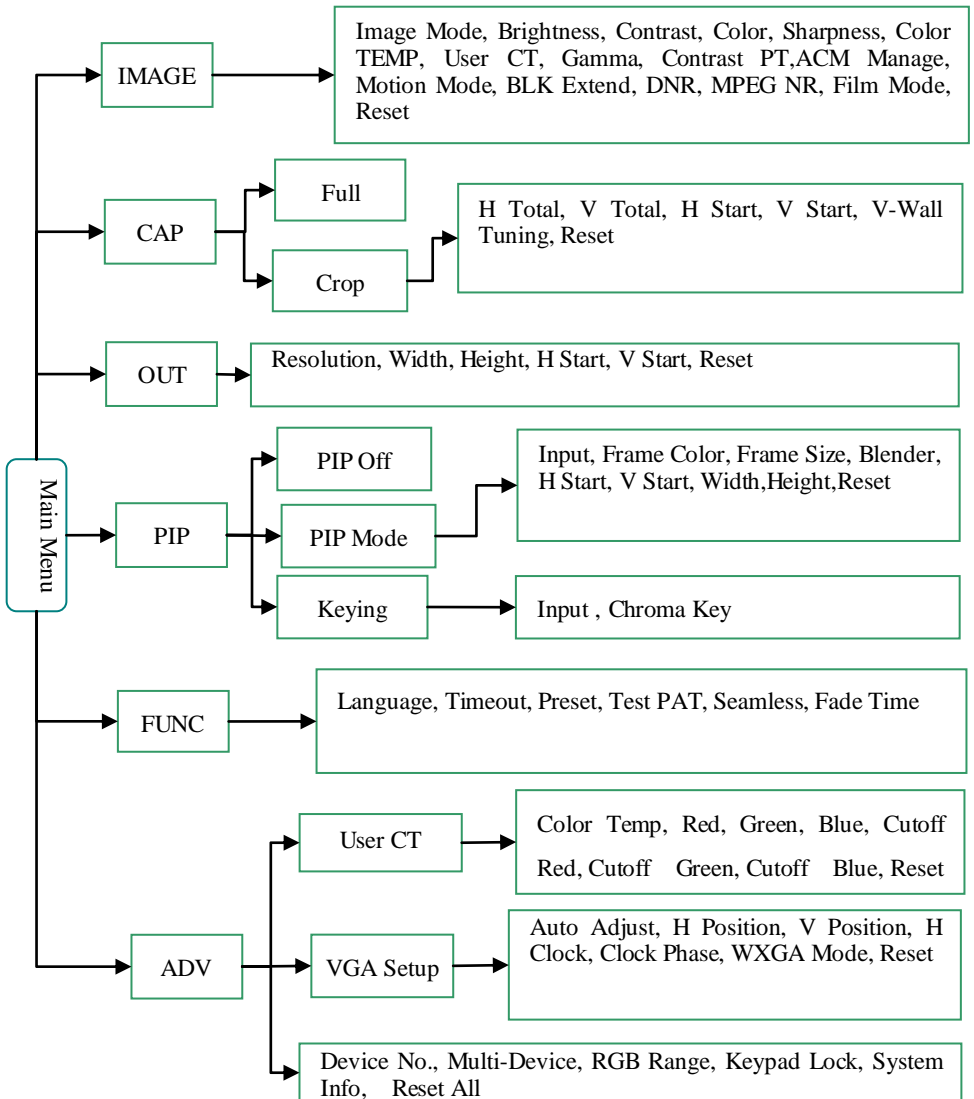
Icon	Name	Description
	Main channel input	Indicates the information and mode of the current main channel input.
	Signal output	Indicates the information and mode of the current output channel.
	PIP channel	PIP channel input mark
	Brightness	Indicates the current brightness
	Full video output	The signal full output is enabled. (Same as the “FULL” key)
	Crop mode	The video Crop mode is enabled.
	PIP mode	Indicates the current mode is PIP mode.
	Keying Mode	The Keying Mode is enabled.
	Line feed connection	Line feed mark
	Menu connection	Next level menu connection symbol
	Interconnection mode	The Multi-device interconnection mode is enabled.
	Single machine mode	Indicates the current mode is single machine mode.
	Audio Channel	Used to indicate the current audio channel mode.

Main Menu







When you press the “EXIT/MENU” key, the video processor will enter the main menu mode and the LCD will display the following screen. Use the “EXIT/MENU”, “↑AUTO”, “↓”, “←”, “→” and “ENTER” keys to select and adjust the various options.



Structure of Main Menu



The menu is operated in a fixed mode, as shown in the table below :

Operation	Key
Open main menu	In the default menu, press the “EXIT/MENU” key.
Exit main menu	Press the “EXIT/MENU” key.
Select	Press the “  AUTO” or “  ” key.
Adjust	Press the “  ”、 “  ” key.
Enter next level menu	When “→” appears on the right of the option, press the “  ” or “ENTER” key.
Execute specific function	Press the “  ” or “ENTER” key.
Confirm an operation	Press the “ENTER” key.

Function Description

Through the critical function description, you can configure the video processor quickly to complete the installation and debugging. Before setting the various functions, check that the device has been correctly connected and the signal input is normal.

Output Resolution Setup

When the device is installed, you need to set the output resolution of the processor according to the resolution of the LED wall, which can be completed through the “Output” setup of the main menu.

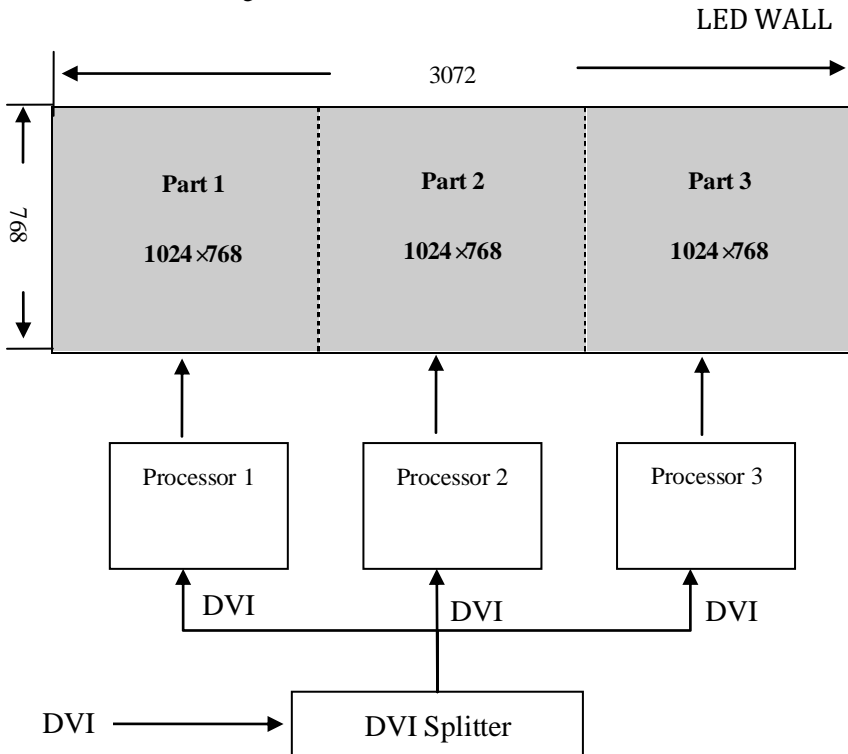
In the default menu, press the “EXIT/MENU” key to enter the main menu, select “OUT” → “Resolution” → Resolution, select the appropriate resolution, and press the “ENTER” key.

Crop

The fusion function is a solution used to solve the restriction of a single video processor's being unable to drive an ultra big LED. The ways of fusion are flexible. The fusion function can be applied in various LED fusion systems.

Signal Connection

The Crop function uses one input signal splicing unit, that is, a channel can use a signal source only (signal loop out or signal distribution input may be used), and outputs video on the LED wall after processing. Take the DVI input splicing as an example, the connection method is shown in the figure:



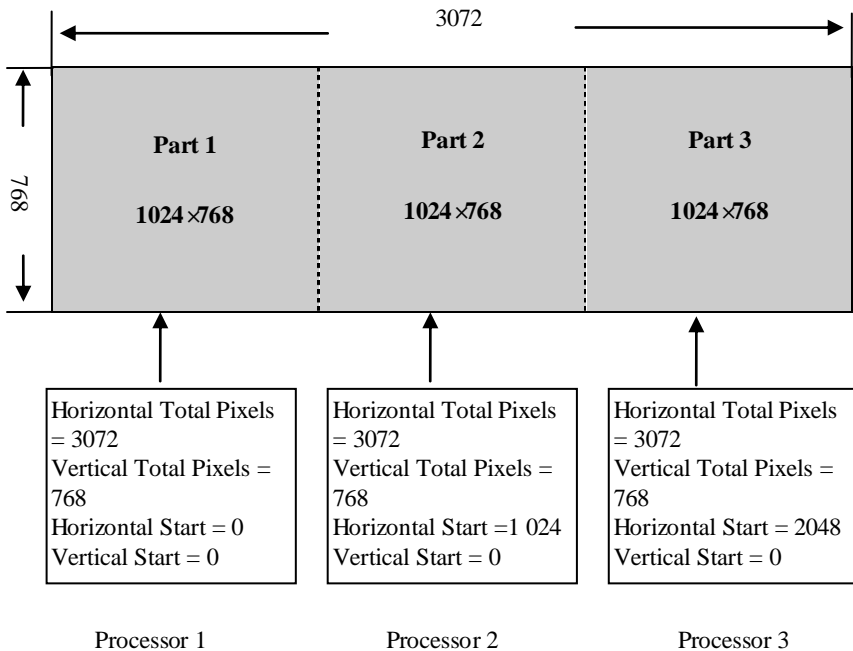
Crop Setup

After the device is connected, set the corresponding output resolution and Crop method according to the LED wall.

Set output resolution: On the main menu, select “Output” → “Output Resolution” → Resolution, select the appropriate resolution, and press the “ENTER” key.

Set Crop method: On the main menu, select “CAP” → “Crop”, set the horizontal/vertical size and start position, and press the “ENTER” key. Refer to the figure when making the setup.

Example of Crop parameters:



The above example shows that the “H Total” is the sum of the horizontal pixels of the various LED walls; the “V Total” is the sum of the vertical pixels of the various LED walls; these two parameters are the same in the various processors. The Horizontal Total Pixels and

Vertical Total Pixels form a coordinate plane with pixel as scale. The processor sets the desired parameters “H Start” and “V Start” according to the coordinate plane.

PIP

The PIP function includes the Picture-in-Picture mode and KEY mode. When the function is turned on, the “Seamless Switching” function will be turned off automatically.

PIP Mode

The PIP mode is Picture-in-Picture that uses the bital technology to display two programs on the same screen, that is, on the main screen being watched normally, one or more compressed sub-screens are inserted, so that the user can monitor other channels while watching the main screen. In the PIP mode, the user needs to provide at least two channels of signal input and set the PIP menu accordingly. Before using the PIP function, the user should understand the Source Input Conflict List.

Source Input Conflict List

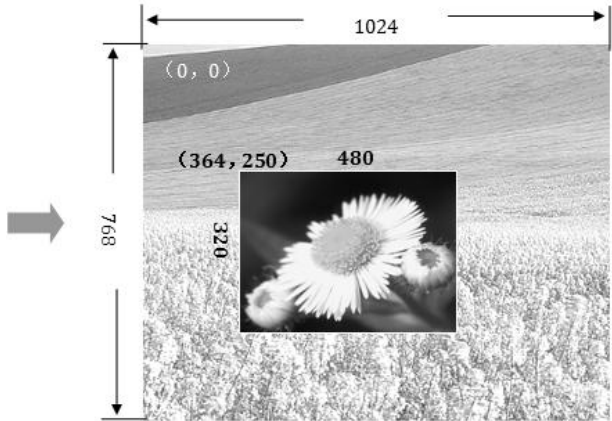
		Main Channel						
		V	YPbPr	VGA1	VGA2	DVI	HDMI	SDI
PIP Channel	V	√	√	√	√	√	√	√
	YPbPr	√	×	√	√	√	√	√
	VGA1	√	√	√	×	√	√	√
	VGA2	√	√	×	√	√	√	√
	DVI	√	√	√	√	√	×	√
	HDMI	√	√	√	√	×	√	√
	SDI	√	√	√	√	√	√	√

The example of detailed PIP parameter setup is as follows:

Enter PIP menu: In the main menu, select “PIP” → “PIP Mode” → Parameter Setup and set the parameters of the PIP mode.

Note: To select the input signal channel of PIP, you must select in the “PIP Mode” menu. There is no shortcut key.

Input	V
Border Color	White
Border Width	3
Transparency	0
Horizontal Start	364
Vertical Start	250
Horizontal Width	480
Vertical Height	320



Keying Mode

Keying is the extension of the PIP function. It is realized by reducing the specified colors from the picture colors of the PIP channel input. The Keying function can be used in some simple special effect processing and caption adding. The setup operation is simple. Refer to the setup example:

Enter the Keying menu: In the main menu, select “PIP” → “Keying” → Parameter Setup, set the “Input” to “VGA” and the “Chroma Key” to “Black”. Tip: Here, the “Chroma Key” refers to the colors extracted, including blue, green, red, and black.



PIP Channel + Main Picture Channel = Caption Effect

The above figure shows that the PIP channel input is a picture of white text in the blue background, and when the two pictures are overlaid and the blue color is removed, the caption effect is realized.

Seamless Switch

The Seamless Switch is an effect realized when the main channel is switched. This effect allows the audience to watch pictures smoothly and comfortably when watching video being switched. When the PIP function is activated, the picture switching effect function can't be used. To use this function, disable the PIP function first. (The PIP function can be disabled in the main menu or with the "PIP" shortcut key.)

Seamless Switch has two effects, i.e. "CUT" and "FADE". "CUT" is instant Seamless, and "FADE" is fade-in fade-out. The time of fade-in fade-out can be set in the main menu, select "FUNC" → "Fade Time" → Parameter Setup.

Test Patten

After the LED wall is installed, you may need to use the test patten to inspect whether the LED wall is normal. The video processor provides a number of test patten for you to test whether the LED wall has any defective pixel or blind spot and whether the LED wall lattice is aligned. You may make adjustment through the following operations.

test patten output: On the Front Panel, press “TEST” to output the current patten; press “TEST” again and use the direction keys to select different test patten.

Preset Mode

In the preset mode, you can quickly invoke various frequently used application scenarios during use to reduce repeated, complex setup, thus improves the efficiency of operations. Each preset mode includes such parameters as signal channel mode, displaying mode, picture quality setup, etc. The saving and invocation of the preset mode are described below.

Saving of preset mode: In the main menu, select “FUNC” → “Preset” → “Save Mode”, select any set of preset settings, and press “ENTER” to save it. Up to 4 sets of preset settings can be saved.

Invocation of preset mode: On the Front Panel, press “PRESET”, use the direction keys to select a set of preset settings, and press the “ENTER” key to confirm the selection.

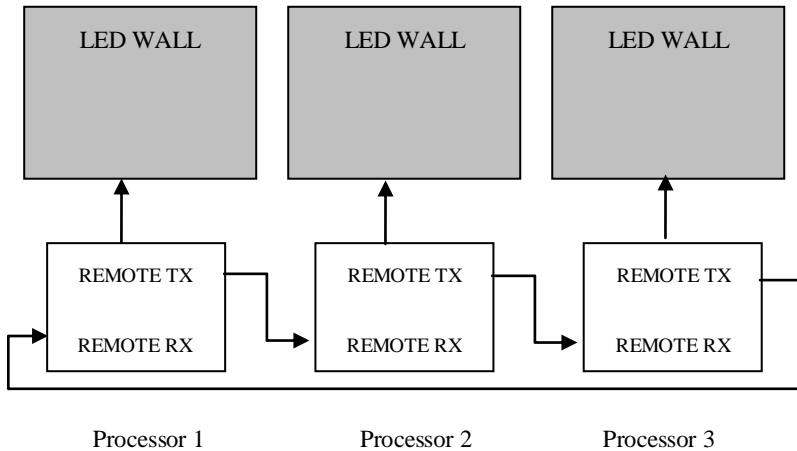
Multi-device

The purpose of Multi-device interconnection is to control multiple machines simultaneously through a LED video processor to realize displaying on the same large display or displaying of multiple independent LED walls, with each processor realizing input and output of multiple video signals. The advantage of Multi-device interconnection is that when any device is operated, the concatenated devices will act simultaneously. The functions that can be realized include:

- ✓ Switch of input signals (INPUT SELECTION (main channel selection))
- ✓ Multi-device template loading (PRESET key)
- ✓ Seamless Switch (CUT and FADE keys)
- ✓ VGA automatic positioning (AUTO key)
- ✓ Brightness adjustment (left and right keys)
- ✓ Partial or full picture output (FULL and CROP keys)

Multi-device Connection

The figure below is the sketch map of Multi-device interconnection realized by 3 LED walls. The premise of Multi-device interconnection is the simultaneous communication between devices. Therefore, the devices should be concatenated to realize a closed loop. The rear panel of the video processor has two RS232 communication ports: REMOTE TX (transmission) and REMOTE RX (receiving). Just connect them as shown in the figure.



About Setup and Operation

After the devices are connected, all interconnected devices should be set as follows:

Set Machine No.: Press the “EXIT/MENU” key to enter the main menu, select “Advanced” → “Machine No.,” set the desired machine number, and press the “ENTER” key. (The machine numbers must be different from each other, otherwise interconnection can’t be realized.)

Set Multi-device Mode: Press the “EXIT/MENU” key to enter the main menu, select “ADV” → “Multi-device”, and set the Multi-device Interconnection mode to “On”.

Just operate any device, and you can realize all above functions of Multi-device interconnection. Through the shortcut keys on the Front Panel, you can control the interconnected devices quickly. The following is the list of active keys and functions in the interconnection mode:

List of Keys Available in the Interconnection Mode

Key	Functions	
INPUT SELECTION	Shortcut key of main channel signal selection	
	TEST	Output test patten
	BLACK	Output black screen (LVP-2000 does not have this function.)
PRESET	Invoke scenario mode, including signal channel mode, video quality setup, etc.	
CAPTURE	Full video displaying, partial video displaying, Multi-device video Crop	
	FULL	Full picture displaying
	CROP	Multi-device video splicing, partial video displaying
EFFECT	CUT	Seamless switch. When the main channel is switched, the video will not interlace or flash. When the PIP function is enabled, the CUT function can't be used.
	FADE	Video fade-in fade-out. When the main channel is switched, the video fades in or fades out. When the PIP function is enabled, the FADE function can't be used.

Audio Switching

LVP-1000 has 3-channel audio switching, including external audio, HDMI audio, and SDI audio. The processor can realize 3 audio switching modes, i.e. Fixed External Input, Sound Channel Following, and Audio Off. Press the “AUDIO” key repeatedly to switch between these 3 modes.

Fixed External Input: The audio connection is in the External Sound Channel Input mode, and the video is switched without changing the sound channel.

Sound Channel Following: When the video is switched to HDMI, the sound channel outputs HDMI audio; when the video is switched to SDI, the sound channel outputs SDI audio; when the video is switched to V, YPbPr, VGA1, VGA2, or DVI, the sound channel outputs external audio.

Audio Off: Press the “AUDIO” key repeatedly to turn off audio output, and the LCD will prompt the user of the mode of the audio.

Troubleshooting

Problems may occur during installation or use. The user can try to troubleshoot the device through the following steps. If the problem still cannot be solved, the user can contact the local dealer.

Phenomenon	Solution
The device has no signal, and the indicator is not lit up.	Check whether the power plug is in bad contact. Check whether the power switch is turned on.
The LCD on the Front Panel displays contents, but no signal.	Check whether the signal cable is connected correctly. Check whether the device supports the resolution and refresh frequency. Make factory reset.
The VGA input signal can't be displayed on the display normally, and the video can't be displayed on the full screen or is blurred.	This can be solved through automatic positioning of VGA input signal. When the current input source of the video processor sends effective VGA input signals, press the "AUTO" key, and the video processor will position the sampling parameter of VGA input signals automatically to make the VGA video clear and complete. The operation is usually conducted only when a new VGA signal source is connected. Sometimes, the automatic positioning should be conducted several times till the output video is clear, complete, and stable.
When the DVI\HDMI signal of a desktop or notebook is connected, the picture output is not	Change the zoom option of the output of the video card DVI/HDMI, and set it to zoom to realize full screen output.

displayed on the full screen.	
Video are not displayed normally.	Check whether the resolution and refresh rate input are compliant.
The displaying of PIP is abnormal.	Check whether the PIP parameters are set correctly and reasonably.
The Seamless Switch function does not work.	Check whether the current mode is PIP mode. Disable the PIP function.
No sound	Check whether the input sound is normal, whether the system is switched to the current sound channel, and whether the audio amplifier is normal.



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