

LVS5066

LED HD Seamless Switcher

USER'S MANUAL



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I. 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. **Please do not plug or unplug DVI signal cable when the device on power.**

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.

II. Connections of hardware

1. Rear view

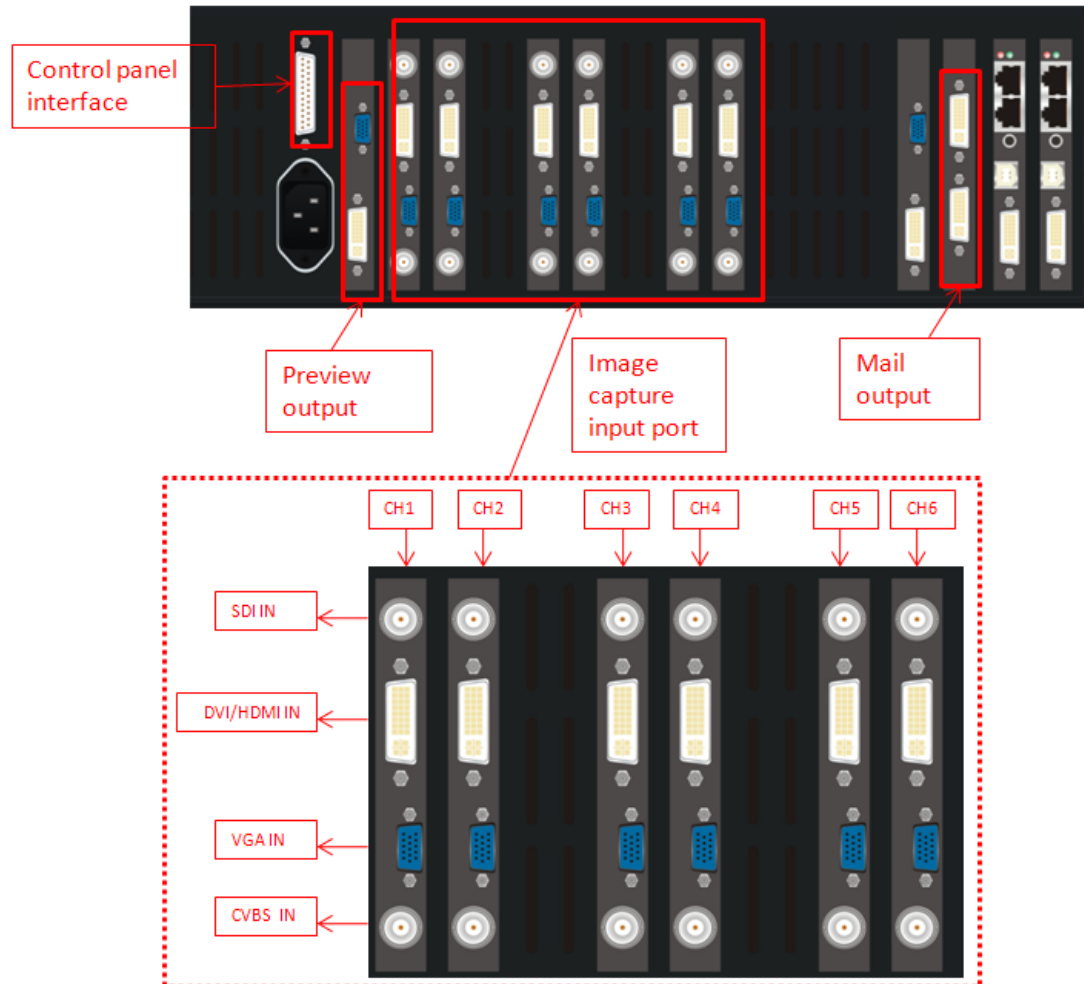


Figure 1

2. Port description

1) Video Input

LVS5066's signal input employs plug & play design, the type and number of input image signals are configurable based on user's demand. Each image capture card is arranged with one channel (as shown in figure below). Now HD Seamless Switcher is configured with 4 or 6 pieces of image capture cards.

Each image capture card of LVS5066 supports the following video signal inputs:

Port name	Description
V1	1-channel PAL/NTSC composite video input
VGA	1-channel computer analog signal input
DVI /HDMI	1-channel HDMI digital HD signal input
SDI/HDSDI (IN)	1-channel digital video signal input (HD /SD)

2) Main output ports(DVI)

2 same DVI digital video outputs. They can be connected with external LED transmission card or LED transmission box.

3) Pre-view monitor output port

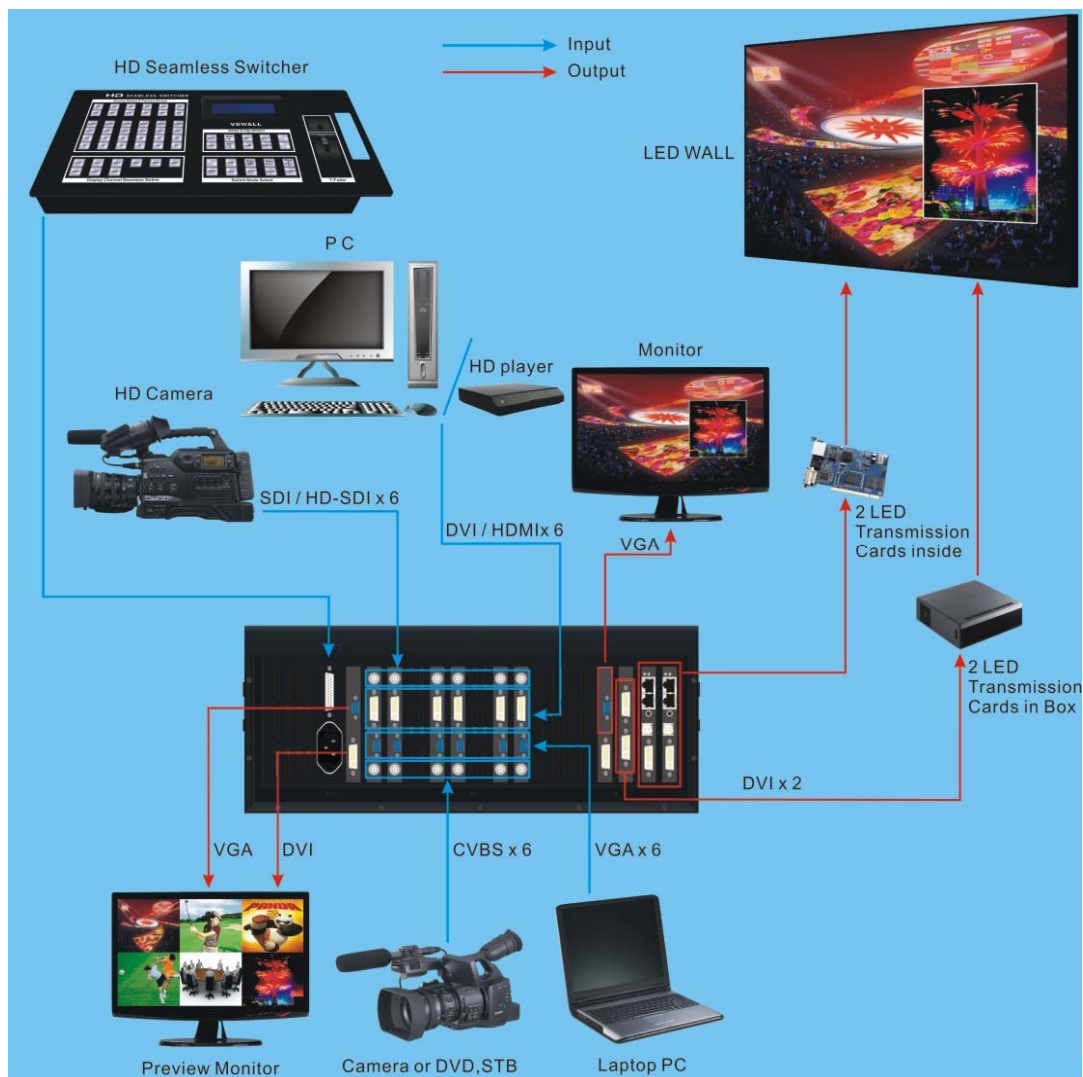
With this port, the images you currently selected in 6 channels can be displayed in one monitor, so that user could perform real-time monitoring over the images of each channel and switch the video timely and accurately.

Terminal	Description
VGA OUT	Analog RGB output. It can be connected to a local display and used as monitor.
DVI OUT	DVI digital video output. It can be connected to a local display and used as monitor.

4) Signals of other ports

25pin D-SUB, connected with control panel.

3. Connection diagram



III. Frontal panel operations

1. Diagram of control panel

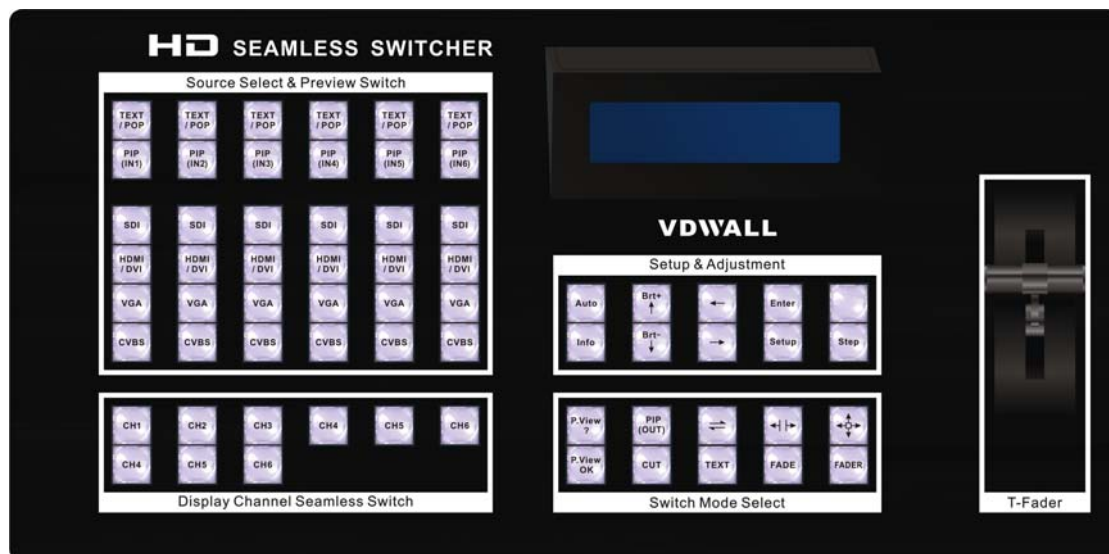


Figure 2

2. Button instructions (operation mode):

There are 65 buttons on the control panel of LVS5066, of which 45 buttons on the left are used to switch input signals. The 20 buttons on the right are function and setting buttons, used for mode switching or settings.

1) Select input video source

LVS5066 has 6 channels, their buttons are Ch1, Ch2,Ch6 respectively. Each channel is furnished with 6 operation buttons. The table below lists the functions of these buttons:

Port name	Description
V1~V2	Input signal via V1, V2 BNC port
VGA	Computer analog signal input
HDMI	HDMI digital HD signal input
DVI	Computer digital signal input
SDI	Digital video signal input (HDSDI)
PIP(INx)	Turn on/off PIP in each channel. When the indicator lights up, the function is on.
TEXT/POP	Turn on/off Text or POP in each channel. When the indicator lights up, the function is on.

Notes: LVS5066 adopts 2-level switching architecture. Level 1 switching is input pre-selection switching, namely the switching among 4 signals in a single channel; Users can proceed to level 2 switching namely switching between channels until all inputs pre-selection of each are completed. which is used to realize a series special switching effects such as seamless switching, fading-in/out, WIPE or used to select PIPs. Seamless switching can be realized among signals in channels.

2) Select output brightness

Button names	Description
BRT -	Decrease output image brightness of LVS5066 , the lowest brightness is 0.
BRT +	Increase output image brightness of LVS5066 , the highest brightness is 64.

LVS5066 supports 32 levels Brightness, “0” represents the lowest brightness, and 64 represents the highest brightness. To ensure full gray level of output image, normally the output brightness is set as 64!

3) VGA input auto adjustment (Auto)

With this button, **LVS5066** can automatically adjust the sampling parameters of VGA input signals to make VGA picture clear and complete. Operating procedures: when the main output is the VGA input signal, first press VGA input selection button of the channel, for example, VGA button of Ch3. Press “Auto” button before the message “**Source Ch2.=VGA**” disappears in the screen.

In general, this operation is made only when new VGA signal source is to be connected in. The time spent in auto adjustment may vary with the conditions of signal source, but it is usually shorter than 1 minute. Sometimes user need repetitively do such adjustment till VGA picture looks clean, complete and stable.

4) Information display (Info)

This button can be operated to display the Current settings of **LVS5066**.

press Info button to display current settings and information of **LVS5066**. There are total 29 entries of information. Press “Info”

button again before the information disappears in LCD, the next entry of information will appear in LCD.

5) CUT mode

LVS5066 will automatically enter seamless switching mode after startup. Now the indicator is ON. If the moment LVS5066 is in other switching modes, you can press CUT button to enter seamless switching mode. The system will realize seamless switching between the six channels, i.e.: Ch1, Ch2...Ch6. The picture will change fluently and stably without flicker, tremble, stasis, delay, tearing or black screen occurring.

PS: the switching between different signals of current channel will lead to black screen. The above switching effects are only realizable in the switching between different channels.

6) Fade-in/Fade-out(Fade)

Press Fade button while in operation mode, LVS5066 will enter Fade-in/Fade-out(Fade) mode, the moment the switching time "Fading Time= N Seconds" will appear in LCD (N represents the number of seconds, e.g.: 1, 2, 3...). The moment, the system can realize seamless switching between the 6 channels, i.e.: Ch1, Ch2...Ch6 without any tremble or interference occurring.

While in Fade-in/Fade-out(Fade) mode, user can press Fade button to change fading time.

7) Fader mode

Press Fader button while in operation mode, LVS5066 will enter Fader mode. Now you can operate T-Fader manually to control the fading process, or stop it halfway to make new picture and old one overlay each other in transparent mode. LCD displays the ratio of the signals in the recent two channels, e.g.: "CH3=100% CH5=0%".

Operating procedures: press a button to select the channel to be switched, then push T-Fader forward or backward, the image will change in fading-in/out mode. If no signal is selected, when T-Fader is pushed, the screen will return to the picture of the channel most recently displayed.

8) WIPE mode

LVS5066 supports 4 WIPE modes. Press **WIPE1**, **WIPE2**, **WIPE3** while in operation mode, LVS5066 will enter corresponding wipe mode, the moment corresponding mode will appear in LCD (e.g.: “**Switch Mode= Wipe: L → R**”). Table below lists the descriptions of each switching mode and their respective operation buttons:

Switching direction	Description of mode	Buttons
L→R	Wipe from the left toward the right	WIPE1 (as described in note)
L←R	Wipe from the right toward the left	
L←M→R	Wipe from the centre toward both sides	WIPE2
RECT	If it is a square, wipe from the centre perimeter	WIPE3

Note: Both **L→R** and **L←R modes (as described in above table)** are operated using WIPE1 button. User can press this button to switch the modes.

9) PIP / POP

LVS5066 has PIP function, that is to say, it can add a zipped picture (PIP) to current picture (background). The PIP can be switched between the 6 channels including the background. User can preset the size of 4 PIPs switch between them. The switching between PIPs is made in Fade-in/Fade-out(MIX) mode.

Operating procedures:

Enter PIP display mode: press PIP button while in any mode, LVS5066 will enter PIP mode, in the meantime, the information on the background channel and the position and channel of PIP to be added will appear in LCD, e.g.: “**Background=CH2, PIP_3=CH5**”.

Select PIP: while in PIP mode, select 1 channel from the 6 channels, the picture in this channel will be set as PIP.

Change position of PIP window: press PIP button while in PIP mode, the position of the PIP in LCD will become vacant, e.g.: “**Background=CH2, PIP_3=CH**”. Press PIP again, PIP will move to another position. When PIP arrives at the position you selected (e.g.: PIP_4), reselect PIP channel (e.g.: CH1), the PIP will appear in the new position after a Fade-in/Fade-out action (the moment

“**Background=CH2, PIP_4=CH1**” will appear in LCD).

Change the background: you must first switch **LVS5066** into CUT mode, then select a channel you desire as background, and press PIP to enter PIP mode, and next, reselect PIP.

10) Text overlay mode (Text)

LVS5066 provides text overlay function: first switch into CUT mode, then select a channel you desire as background, then press Text to enter text overlay mode, and next, select the channel of the text.

Text overlay signals: to ensure good text displaying effect, please select digital signals such as **DVI/HDMI** signals. The background must be full white or black (the switcher is to be switched into corresponding mode). The text is to be made in other colors. See the figure below (the text is made by Powerpoint)



Main picture



Text



Text overlay effect

11) Preview multi pictures display model(Preview ?, OK)

LVS5066 not only can show the current chosen input signal of the six channels, also its preview output can support 7 kinds multi pictures display. These displays are from CH1-CH4 which can be realized by connecting DVI to CH5 or CH6, then to LED screen by pressing cut button. The operation method is as follow:

Press “Preview?” button in succession to cut display modes. Then press “Preview ok” to make the chosen mode become effective.

Multi pictures modes	showing contents	showing instruction
PM60:2X3=6 Pictures	CH1~CH6	6 picture preview
PM40:2X2=LU+RU+LD+RD	CH1~CH4	2x2 mode four pictures display of 4channels
PM34:3X1= U+M+D	CH1~CH3	three pictures display of up, middle and down
PM33:1X3=L+RU+RD CH3=L	CH1~CH3	Three pictures display of one main picture and two pictures on the up and down of the right side.
PM32:1X3= L+RU+RD CH2=L	CH1~CH3	
PM31:1X3= L+RU+RD CH1=L	CH1~CH3	
PM30:1X3= L+M+R	CH1~CH3	Three pictures display of left, middle and right.
PM21:2X1= U+D	CH1、CH2	Two pictures display of up and down.
PM20:2X1= L+R	CH1、CH2	Two pictures display of left and right.

IV. Setup

The following setup must be made by relevant qualified technicians. For ordinary users, unless they have received adequate relevant training, they shall not attempt the following setup operations!

There are 33 items in 5 categories available for you to set in **LVS5066**. Technicians can set these items as necessary, for details see the table below:

Category		Items	
1	Select language	1	Language
2	Output Image Setup	2	Hori_Start
		3	Hori_Width
		4	Vert_Start
		5	Vert_Height
		6	Out_Format
3	Brightness / Color	7	Brightness
		8	Color
4	PIP/POP setup	9	Out_PIP1_H_Start
		10	Out_PIP1_H_Width
		11	Out_PIP1_V_Start
		12	Out_PIP1_V_Heigh
		13	Out_PIP2_H_Start
		14	Out_PIP2_H_Width
		15	Out_PIP2_V_Start
		16	Out_PIP2_V_Heigh
		17	Out_PIP3_H_Start
		18	Out_PIP3_H_Width
		19	Out_PIP3_V_Start
		20	Out_PIP3_V_Heigh
		21	Out_PIP4_H_Start
		22	Out_PIP4_H_Width
		23	Out_PIP4_V_Start
		24	Out_PIP4_V_Heigh
		25	Inx_PIP_H_Start
		26	Inx_PIP_H_Width
		27	Inx_PIP_V_Start
		28	Inx_PIP_V_Heigh
		29	Text_Overlay
		30	PIP_Frame
5	Factory district Setup	31	Init
		32	Auto ADC
		33	Bias

1. Enter Setup of LVS5066

Press "Setup" for consecutive 8 times while in operation mode,

“Password: **8 Enter Setup ...**” will appear in LCD, **LVS5066** will enter the No.1 setup item.

After **LVS5066** enters the setup mode, the 7 buttons on frontal panel will have the functions as defined in table below:

Name	Functions
Step	Select step value 1 or 10
↑	Move to last item
↓	Move to next item
←	Decrease value or select last value
→	Increase value or select next value
Enter	Save the adjustment or selected values
Setup	Enter or exit setting mode

After **LVS5066** enters setup mode, the relevant setup information will be displayed in LCD as per the layout shown in the figure below:

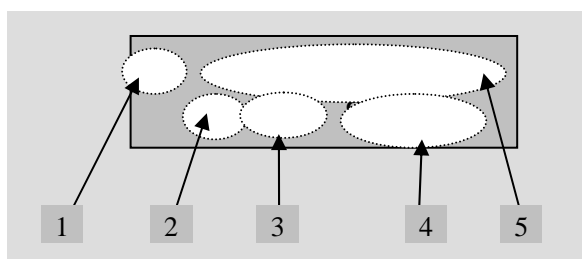


Figure 3

As shown in above figure, LCD consists of five sectors:

Sector	Description
1	The No. of current setting item
2	? : ask you whether to save the adjustment; ! : The adjustment already be saved and takes effect.
3	Newly adjusted value
4	Step value
5	Name of current setting item

2. Select language

Item 1: “**Language** 语言”

After entering setup mode, **LVS5066** will enter the first setup item “**Language** 语言”. **LVS5066** supports Chinese and English display, press “←” or “→” to select either of them, then press “**Enter**” to save it and make it valid.

3. Output image setup

LVS5066 outputs images from DVI OUT1 and DVI OUT2. There are 3 output formats as listed in the table below. User can enter the No.6 setup item "**Out Format**" to select one of them.

	Format
1	1024×768_60
2	1280×1024_60
4	1920×1080_60

Item 6: "**Out Format**"

Press "←" or "→" key to select 1 output format listed under this option, then press "**Enter**" to save it.

If you select "**1024×768_60**", the output resolution of LVS5066 will be 1024×768; the vertical refresh rate is 60Hz.

However, the resolution of LED screen is not exactly 1024×768 pixels. When the resolution of LED screen is less than 1024×768 pixels, we can set LVS5066 to output the images exactly fitting the resolution of LED screen, so that the LED could display a full frame of image. See the schematic diagram below:

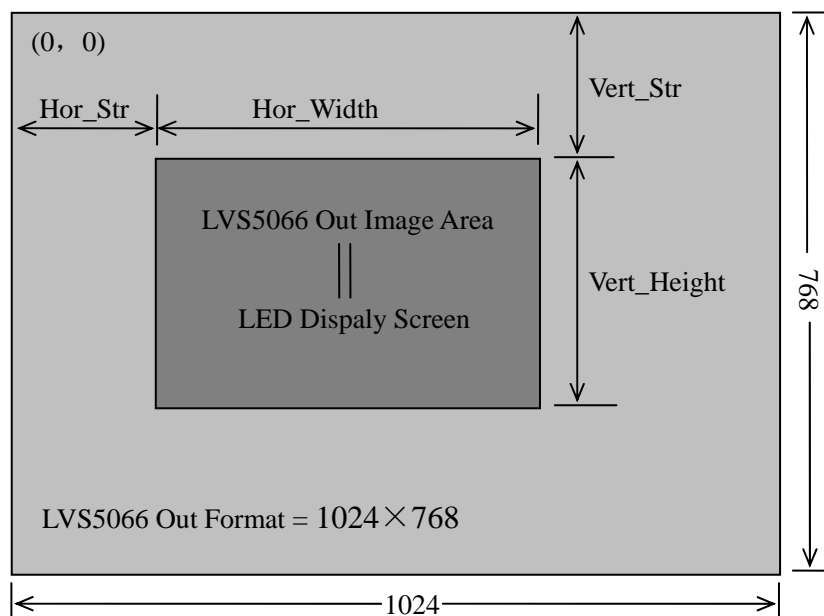


Figure 4

As above figure shows: the size and location of **LVS5066** output images are defined by 4 groups of parameters, which correspond to four setting items respectively, for details of their relationship see Table 5 below:

No. of setup item	Setting Item Name	Names of parameters
2	<i>Hori_Start</i>	Hor_Str
3	<i>Hori_Width</i>	Hor_Width
4	<i>Vert_Start</i>	Vert_Str
5	<i>Vert_Height</i>	Vert_Height

The start coordinates (0, 0) of **LVS5066** output image is defined in the left top of 1024×768 pixels output area.

Set the four setting items as listed in above table as per the size of current LED screen (pixels) and start position of the input image that LED displays. Press “↑” or “↓” to select setting item, press “←” or “→” to increase or decrease the values of current item. Press “**Enter**” to save the settings.

4. Brightness / Color

Item 7: “Brightness”

LVS5066 supports 32 levels Brightness, “0” represents the lowest brightness, and 64 represents the highest brightness.

Press “←” or “→” to increase or decrease the values of brightness. Press “**Enter**” to save the settings.

To ensure full gray level of output image, normally the output brightness is set as **64!**

Item 8: “Color”

For V1 and HDMI video input source, **LVS5066** can set color saturation for them ranging from 22 to 38. The lower this value is, the weaker the color looks; the higher this value is, the stronger the color looks. Press “←” or “→” to increase or decrease the values of color saturation. Press “**Enter**” to save the settings.

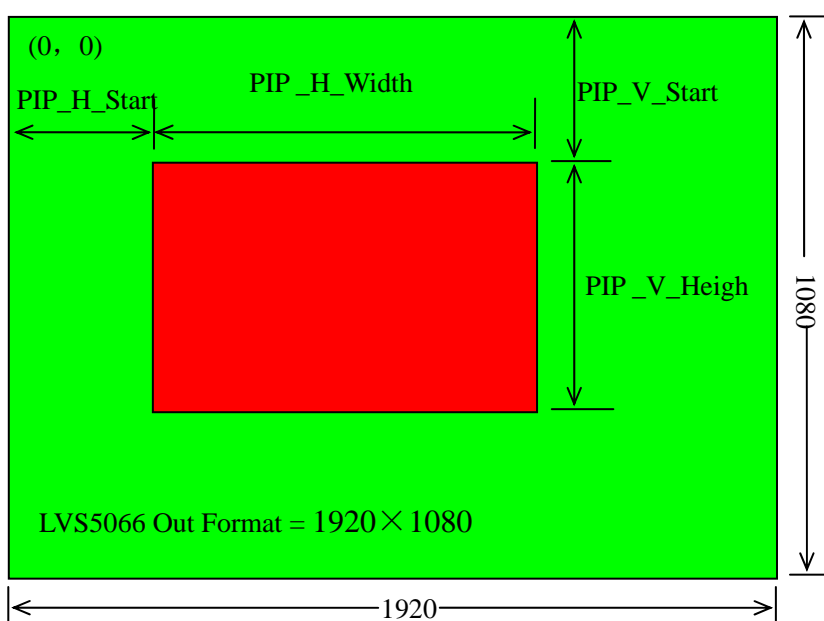
Normally the value of color saturation is set as **30!**

5. PIP/POP setup

Items 9~24: “*PIP image output setup*”

As in PIP mode the PIP image is to be zoomed-in/out after being added to background, so the following 4 values listed in the table below don't represent PIP's number of pixels in LED screen, but represent the width and height values of “*Out_Format*”, option 6 of the menu. See figure below (provided output resolution “*Out_Format*” is 1920×1080 mode).

No. of setup item	Setting Item Name	Names of parameters
9	<i>Out_PIP_H_Start</i>	<i>PIP horizontal start</i>
10	<i>Out_PIP_H_Width</i>	<i>PIP width</i>
11	<i>Out_PIP_V_Start</i>	<i>PIP vertical start</i>
12	<i>Out_PIP_V_eigh</i>	<i>PIP height</i>



Items 25~28: "Set PIP image in current channel"

The signals in each channel of **LVS5066** can realize **PIP** function. And users can set the **PIP** size and position in each channel. The size and position of current **PIP** pictures are decided by 4 group parameters. The related settings are as follows:

No. of setup item	Setting Item Name	Names of parameters
25	<i>Inx_PIP_H_Start</i>	<i>PIP horizontal start</i>
26	<i>Inx_PIP_H_Width</i>	<i>PIP width</i>
27	<i>Inx_PIP_V_Start</i>	<i>PIP vertical start</i>
28	<i>Inx_PIP_V_eigh</i>	<i>PIP height</i>

x=1,2,3,……, 6 (current channel)

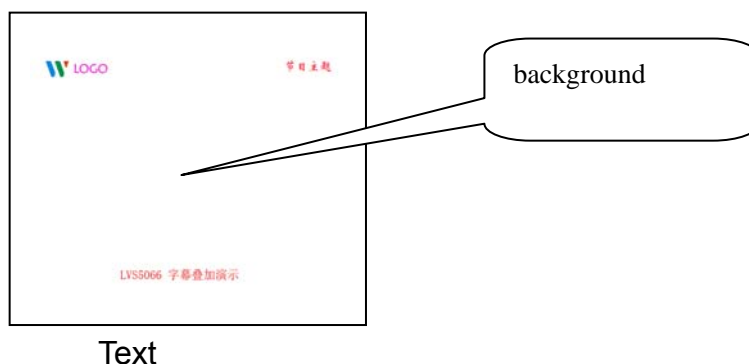
Notes: Users must switch to current channel under operation model and enter into set menu to set the size and position of PIP pictures.

Items 29: "PIP_Frame"

Users can set the width of black frame of images by themselves. If the value is set as "0", it means that PIP has no black frame. If it is set as "1", it means PIP has a black frame of 1 pixel wide. The maximum value of the black frame width is 16.

Items 30: "Text_Overlay"

In the operations of HD text overlay, the background of text signal can be set in black or white.



9. Exit setup

Item 80: "Exit Setup"

Press “ ↑ ” to move to the last item: “ **Exit setup**”, then press “ ← ” or “ → ” to select “ **YES** ”, then press “ **Enter**” to exit setting mode.

If you press “ **Setup**” key while in any setup mode, the system will skip to the item 80.

10. Factory district setup

The following settings must be made by relevant qualified technicians or the guidance of the plant technician, otherwise the incorrect and improper operation will result to abnormal situation.

Item 31: “Init”

While in operation mode, press SETUP for 8 times continuously, “**Password: 8 Enter Setup ...**” will appear in LCD, LVS5066 then enter item 1 setup, then press SDI button of Ch1 once, LVS5066 will then enter item 31 setup “Init”. Press “ ← ” or “ → ” to select “ **OK**”, then press Enter, the processor will be reset to default settings made in factory, and the system will remind you “the device has been reset, please power off it then restart it”, please operate following this instructions.

Item 32: “Auto ADC”

After inputting the analog signal to the video processor who's ADC has not been revised, the picture on the display may appear some bad phenomena, such as color cast, extreme-darkness. **LVS5066** can overcome all of problems by automatically revising white balance in terms of the input analog signals (AV, YPbPr and VGA). Figure below shows the method of “**Auto ADC**”.

When switched to the corresponding analog input signal, the processor will receive and output the signal to the LED display, then, get into the No.18 Item, press “ ← ” or “ → ” to select “ Yes”, at last, press “ **Enter**” to carry on auto ADC.

Caution: All video processors have gone though the auto ADC, please use this item delicately!

Item 33: “Bias”

In order to decrease the noise on gray scale display, the LED display system usually removes the lower gray scale one of all input signals, which will cause the lose of the video information, especially in dark scene ,such as night view.

LVS5066 can improve problems as follow mentioned by adjusting the “**Bias**”, whose limit ranging from 0 to 32. When losing the signal of dark scene, you can restore the drop-out information to the LED display by increasing the value.

Normally in order to keep the completeness of output signals, the standard value is set as **0!**

V. Specifications

Inputs	
Nums/Type	6×composite video 6×VGA (RGBHV) 6×DVI/HDMI 6×SDI (HDSDI)
Video system	PAL/NTSC
Composite Video Scope/Impedance	1V (p_p) / 75 Ω
VGA Format	PC (VESA) ≤1600x1200 @60HZ
VGA Scope/Impedance	R, G, B = 0.7 V (p_p) / 75Ω
	PC(VESA) ≤1600x1200 @60HZ
DVI /HDMI Format (HDCP)	SD/HD(EIA-861B) ≤1920x1080P @60HZ
	PC(VESA) ≤1600x1200 @60HZ
SDI format	SDI-SMPTE 576i @50HZ
	259M-C 480i @60HZ
HDSDI format	HDSDI-SMPTE 1080p@50HZ/60HZ
	292M 1080i @50HZ/60HZ
	SMPTE 720P @60HZ
	274M/296M
Input Connectors	Component video: BNC VGA: 15pin D_Sub(Female) DVI: 24+1 DVI_D SDI/ HDSDI : BNC/ 75Ω
Outputs	
Main output	2×DVI
Pre-view monitor output	1×VGA (RGBHV) 1×DVI
VGA/DVI Format	1024×768@60Hz 1280×1024@60Hz 1920×1080p@60Hz
VGA Scope/Impedance	R, G, B = 0.7 V (p_p) / 75Ω
Main output connectors	VGA: 15pin D_Sub(Female) DVI OUT1: 24+5 DVI_I DVI OUT2: 24+1 DVI_D
Pre-view monitor output connectors	VGA: 15pin D_Sub(Female) DVI: 24+5 DVI_I
Others	
Control	Panel Button
Power	100-240VAC 60W 50/60Hz

Operating Temp	5-40 °C
Humidity	15-85%
dimensions	178 mm (high) × 344mm (wide) × 490mm (length)
Weight	12 Kg (N.W.)

VI. Notes to model

LVS50*6: * represents number of capture card. For example, if there are 6 channels of capture card, the model will be LVS5066.