

LED Multi-Image Processor --- LVP615N Series

User Manual V1.0



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I Safety Precautions



Danger !

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



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 if the device is powered on.



Caution !

- 1) Please thoroughly read this manual before using this device, and keep it safe.
- 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 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 Accessory Package

Please unpack the product with care, and then check whether all the following items are included in the package.

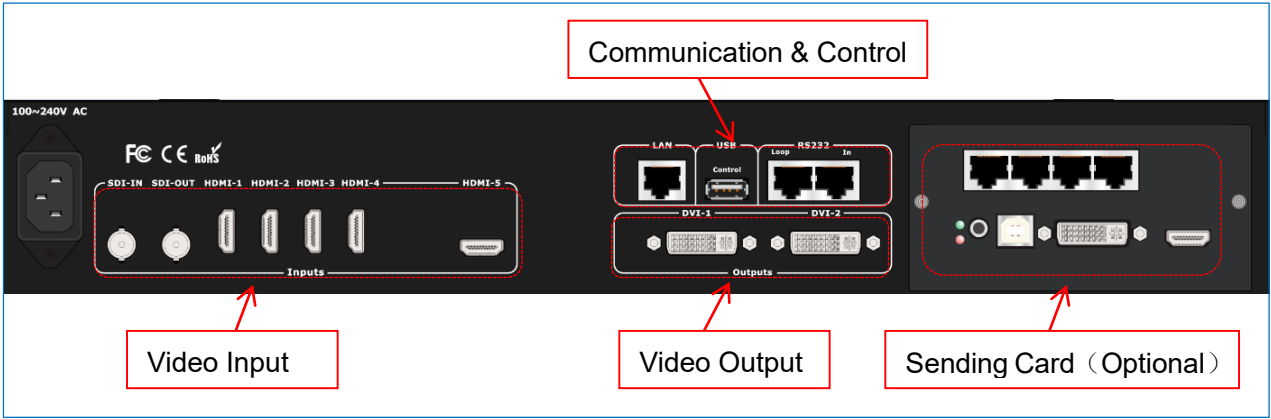
The accessories supplied with this product may differ from the following pictures, but they are applicable for the regions where you live.

		
1.5m Power Cable x 1	0.5m DVI Cable x 2	1.5m HDMI Cable
		
Documentary Disk	1.5m USB Cable x 1	User Manual x 1

III Hardware And Connection

C-1) Signal Port Illustration

Rear panel signal port



Picture 1

Front panel signal port



Picture 2

C-2) Port Description

C-2-1) Video Input Port

LVP615N supports HDMI input, described as following table:

Port	Description
HDMI-1, HDMI-2, HDMI-3, HDMI-4, HDMI-5	HDMI1.4b digital video input (compatible with 2K 60Hz and lower signal)
SDI	Optional input module, supports HD-SDI/3G-SDI signal

C-2-2) Image Output Port

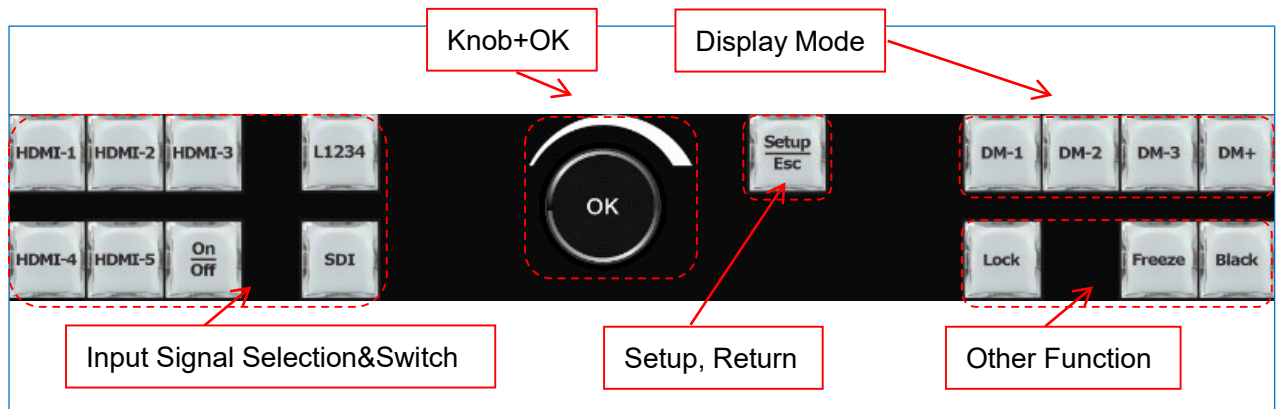
LVP615N supports 2 DVI outputs.

Port	Description
DVI-1, DVI-2	DVI digital video output

C-2-3) Communication And Firmware Update Port

Location	Port	Description
Front Panel	USB-OTG	Plug the USB flash disk with LVP615N firmware, power on processor, LVP615N will automatically start firmware update
Rear Panel	LAN	Ethernet TCP/IP network port control
	RS232 In	Serial communication port, RS232 electrical level, connect to PC RS232 port
	RS232 Out	Serial command cascading output, RS232 electrical level, enable multiple processors centralized control with one PC
	USB-Control	USB control port. Establish communication between LVP615N and control software

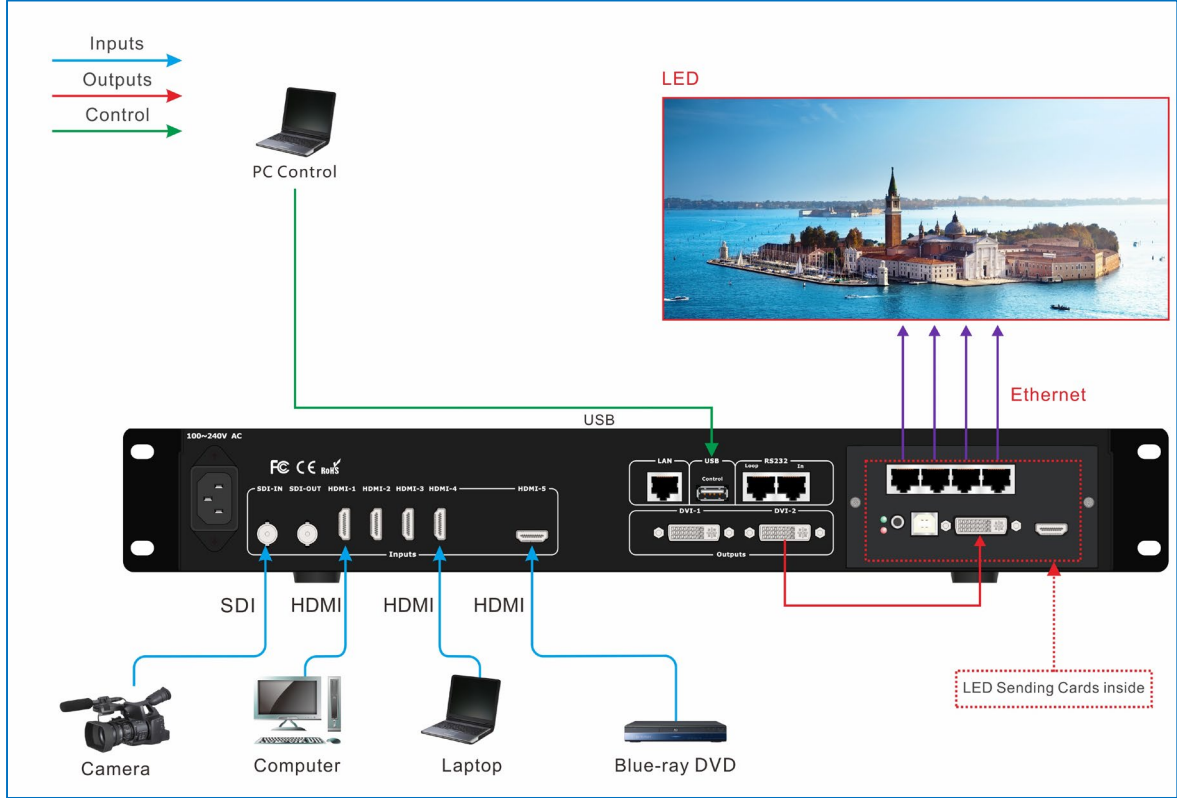
C-3) Front Panel Button Description



Picture 3

Button	Description
	Signal switch button, L1234 is layer switch button, press this button continuously to switch image layer, when selected layer is L1 or L2, press HDMI-1 , HDMI-2 , HDMI-3 , HDMI-4 button to switch layer signal, On/Off is used to open/close selected layer, press HDMI-5 and SDI to directly close L4, L5 layer
	Menu setup (Setup) button, in operation state, press this button to enter menu setup. In menu setup interface, press this button to return to upper menu until exit setup
	Knob (OK) button. In menu setup, rotate to select menu or adjust parameter, press OK to confirm and apply
	3 display mode direct selection button, each display mode contains preset size&position parameters, must configure the mode in advance. Press DM-1 , DM-2 or DM-3 to select or apply
	More display mode selection button, press this button to more mode selection menu. Under this menu, user could switch display mode, copy display mode, backup display mode or recover display mode
	Front control button lock, when front button control is activated, press this button to deactivate the button control. In button lock mode, press Lock button continually to exit button lock
	Image freeze on/off button, press Freeze , button indicator lights up, image freezes; in image freeze mode, press Freeze , to exit freeze mode
	One key black screen button, press Black , button indicator lights up, output one full black image; under image black mode, press Black again to exit, button indicator will light off

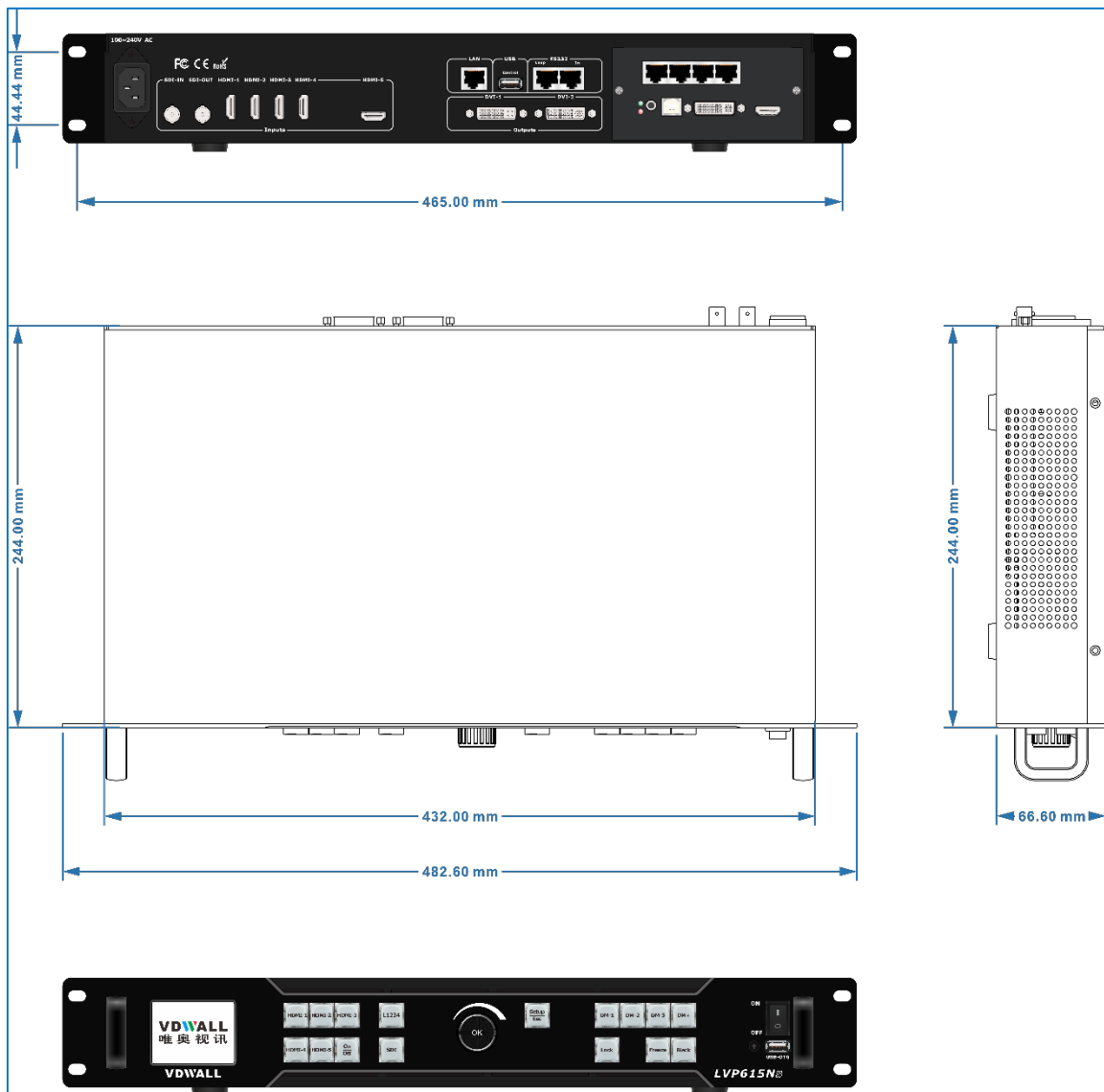
C-4) Signal Connection



Picture 4

C-5) Technical Specification

Input						
Port	Amount	Standard	Specification			
			Resolution		Color	Depth
HDMI-1/2 /3/4	4	HDMI1.4b	CEA_861D , ≤ 1920×1080p_60Hz		RGB /YCbCr420 /YCbCr422 /YCbCr444	8 Bits / 10 Bits
HDMI-5	1	HDMI1.4b	CEA_861D , ≤ 1920×1080p_60Hz (user-defined)			
SDI (LVP615NS)	1	SMPTE 424 SMPTE 425 (A/B)	SMPTE 296	720p_50Hz 720p_60Hz	YCbCr	8 Bits / 10 Bits
		SMPTE 292 (HD-SDI /3G-SDI)	SMPTE 274	1080p_25Hz 1080p_30Hz 1080p_50Hz 1080p_60Hz		
Output						
Port	Amount	Standard	Specification			
			Resolution		Color	Depth
DVI	2	DVI1.0	Preset	1920×1080_60Hz 3296×644_60Hz 2656×798_60Hz 2192×952_60Hz 1824×1116_60Hz 1600×1270_60Hz 1392×1436_60Hz 1200×1600_60Hz 1080×1780_60Hz	RGB	8 Bits
			user-defined	width≤3936 height≤3936		
Other						
Input Voltage		100-240VAC 50/60Hz				
Power Consumption		10W				
Ambient Temperature		0-50℃				
Ambient Humidity		15-90%				
Dimension		482.6(L) x 244(W) x 44(H) mm				
Packing Dimension		535 (L) x 315 (W) x125 (H) mm				
Weight		G.W: 5.2Kg, N.W: 3.7Kg				

C-6) Installation Dimension

Picture 5

IV Device Operation

After powering on the **LVP615N**, the system will automatically detect the current hardware and software configuration of the device. After booting up and in the operation state, the LCD screen displays the interface as following, left picture is **LVP615N** menu, right picture is **LVP615NS** menu.

@DM-1		LVP615N			
In Port	Signal Status	Layer		Source	
HDMI-1	1920x1080_60	L1	On	HDMI-1	
HDMI-2	1920x1080_60	L2	On	HDMI-2	
HDMI-3	1920x1080_60	L3	Off		
HDMI-4	No Signal				
SDI	No SDI Module	L4	Off	None	
HDMI-5	1920x1080_60	L5	On	HDMI-5	
Image Brightness		100	Default =100		

@DM-1		LVP615NS			
In Port	Signal Status	Layer		Source	
HDMI-1	1920x1080_60	L1	On	HDMI-1	
HDMI-2	1920x1080_60	L2	On	HDMI-2	
HDMI-3	1920x1080_60	L3	Off		
HDMI-4	No Signal				
SDI	1920x1080_60	L4	On	SDI	
HDMI-5	1920x1080_60	L5	On	HDMI-5	
Image Brightness		100	Default =100		

Description:

- 1) The left side of the first row of the LCD screen displays current window display mode, as shown in the above picture on the left indicates DM-1, the right side indicates the current device model **LVP615N**;
- 2) The left side of the 2~8 row of the LCD screen indicates input port signal status, if detect valid input signal, display associated resolution and format, if not, display “No Signal”, on above picture, the left side of the third row indicates HDMI-1 port input signal, current resolution is 1920x1080 60Hz;
- 3) The right side of the 2~8 row of the LCD screen indicates Layer On/Off state and signal source, among which, L5 is fixed HDMI-5 signal source, L4 is fixed SDI signal source which is only valid on **LVP615NS**. As above picture **LVP615N** right side indicates L1, L2, L5 layer On/Off state and signal source state, L1 layer is On, signal source is HDMI-1, cause **LVP615N** is not equipped with SDI input module, so L4 is permanently Off state;
- 4) The last row indicates image brightness level, as above picture, brightness is 100;

In operation mode, following operation allowed:

- 1) Input signal selection and layer On/Off operation;
- 2) Layer mode configuration, brightness level adjustment;
- 3) One key freeze image, black screen, button lock and device info check etc.;

D-1) Input Signal Selection And Layer On/Off Operation

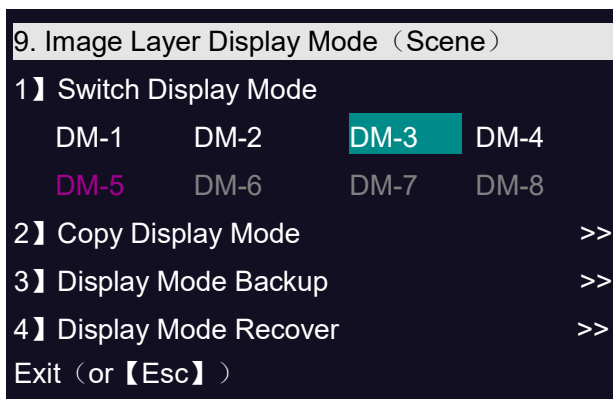
LVP615N supports maximum 4 layers display, L1, L2 layer could randomly select signal source from 4 HDMI input channels, in standby state, press **L1234** continually to select target layer, then press input signal button (**HDMI-1**, **HDMI-2**, **HDMI-3**, **HDMI-4**) for layer source selection, user could press **On/Off** button to close selected layer.

The input signals of the L4 and L5 layers are respectively fixed as SDI and HDMI-5, press **On/Off** button to close this layer, or user could close these layers by pressing SDI/HDMI-5 button, DVI-1 output port supports image Fade In/Out switching effect.

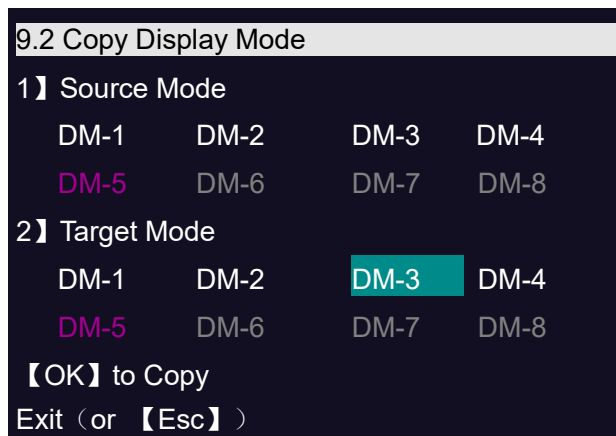
D-2) Layer Mode Operation

LVP615N layer mode preset layer signal source, On/Off state and layer size&position. **LVP615N** could preset 8 layer modes, indicated as: DM-1, DM-2, DM-3,, DM-8. Among which, DM1~DM5 could be recalled directly, DM-6, DM-7, DM-8 is only for backup, can't be recalled.

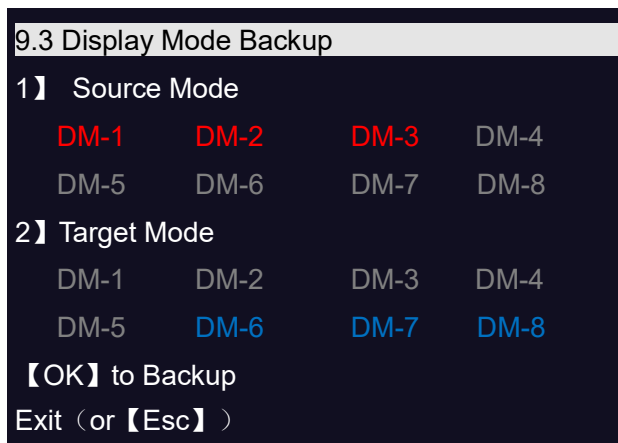
Mode recall: DM-1~DM-3 could be recalled by pressing **DM-1**, **DM-2** and **DM-3** directly, other mode need to enter mode operation menu by pressing **DM+** button, select menu **9.1】 Switch Display Mode**, rotate **Knob** to target display mode, press **OK** to apply.



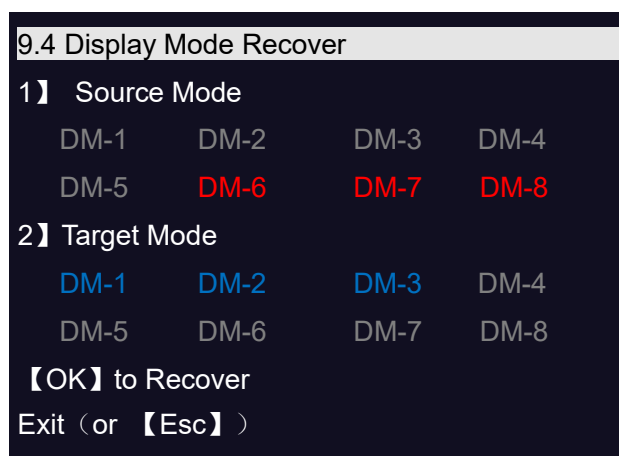
Copy Display Mode: This menu is used to copy DM1~DM5 to target mode position. Press **DM+** button to mode operation menu, select following **9.2】 Copy Display Mode** menu, select source mode and target mode separately, press **OK** to confirm and apply.



Display Mode Backup: This menu is used to backup DM-1, DM-2, DM-3 to DM-6, DM-7, DM-8. Press **DM+** button to enter mode operation menu, select menu **9.3】 Display Mode Backup**, press **OK** to confirm and apply.



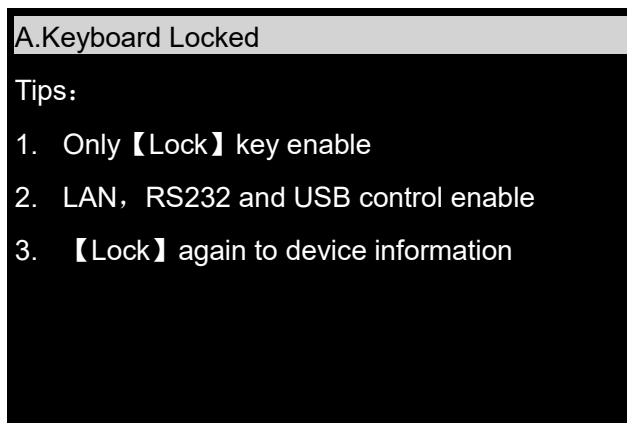
Display Mode Recover: This menu is used to copy DM-6, DM-7, DM-8 parameters back to DM-1, DM-2, DM-3. Press **DM+** button to enter mode operation menu, enter menu **9.4】 Display Mode Recover**, select source mode and target mode, press **OK** to confirm and apply.



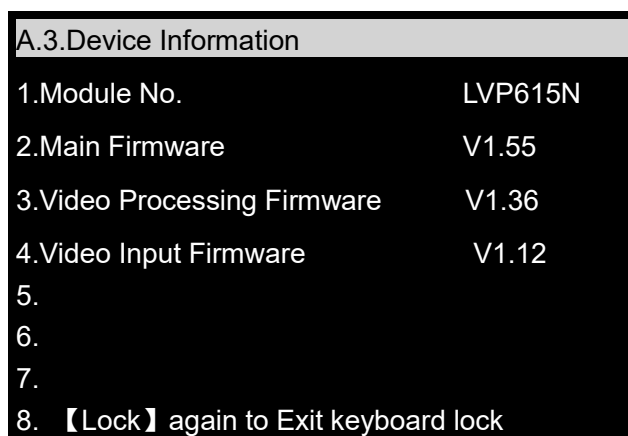
D-3) Other Operation

D-3-1) Button Lock And Device Info Check

Press **Lock**, other buttons will be locked, only LAN, RS232, USB control is accessible, thus avoid control conflict between local control and remote control. When **LVP615N** receive remote control command, device will automatically enter button lock mode.



In button lock mode, press **Lock** again to check device model, modular card software info and other information. Under device information menu, press **Lock** to exit button lock state.



D-3-2) One Key Black Screen

Press **Black** button, **Black** button light indicator on, output one full black image, press **Black** button again or reboot processor, return to normal output image.

D-3-3) One Key Freeze Image

Press **Freeze** button, **Freeze** button light indicator on, activate image freeze, press **Freeze** or

reboot processor, return to normal output image.

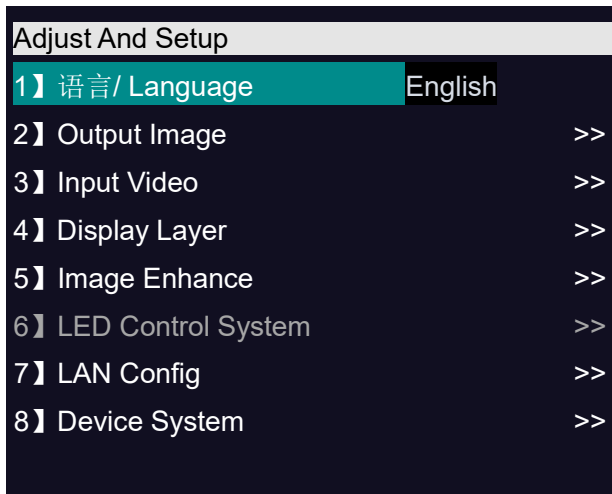
D-3-4) Brightness Adjustment

In operation state, rotate **Knob** to directly adjust output Image brightness level, press **Knob** to confirm and apply.

@DM-1		LVP615N	
In Port	Signal Status	Layer	Source
HDMI-1	1920x1080_60	L1 On	HDMI-1
HDMI-2	1920x1080_60	L2 On	HDMI-2
HDMI-3	1920x1080_60	L3 Off	
HDMI-4	No Signal		
SDI	No SDI Module	L4 Off	None
HDMI-5	1920x1080_60	L5 On	HDMI-5
Image Brightness		100	Default=100

V Adjustment And Setup

When processor boot up, in operation state, press **Setup** to enter menu Adjust And Setup, LCD interface is displayed as following.

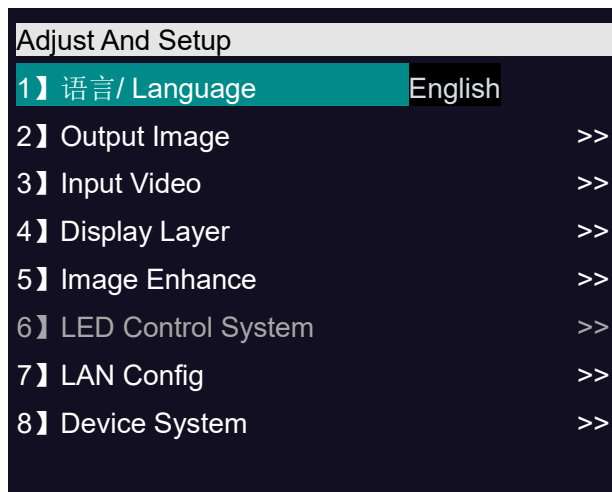


Description:

- 1) **LVP615N** provides 8 menu items, includes: 1) 语言/ Language, 2) Output Image, 3) Input Video, 4) Display Layer, 5) Image Enhance, 6) LED Control System, 7) LAN Config, 8) Device System
- 2) In setup mode, rotate **Knob** to select menu, selected menu will be under blue background. Then press **Knob** button (**OK**) to enter sub-menu. Following is detailed description:

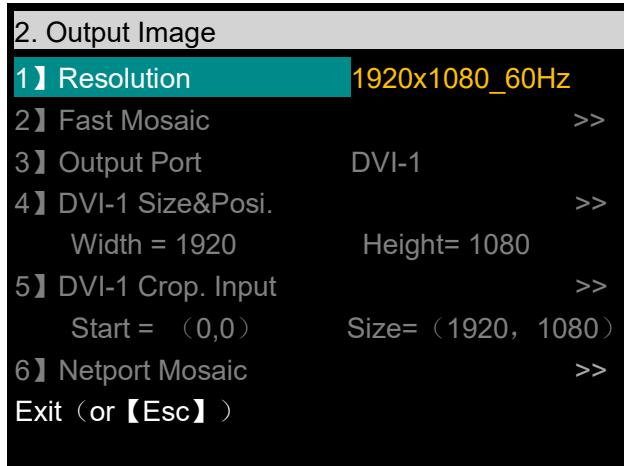
E-1) Language Setup

After boot up, press **Setup** to enter menu setup, select 1) 语言/ Language, under this menu, rotate **Knob** to select language, press **OK** to confirm and apply.



E-2) Output Image Setup

After boot up, press **Setup** to enter menu setup, rotate **Knob** to select 2. Output Image, press **Knob** (**OK** button) to enter following menu:



LVP615N output image setup, only menu 2.1] Resolution is adjustable, other item is invalid.

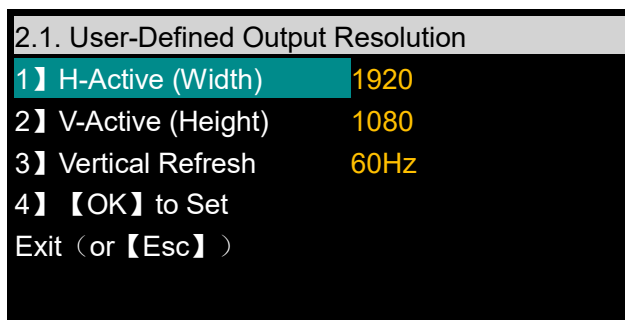
E-2-1) Output Resolution Setup

2.1) Resolution is used to set DVI output resolution. Under this menu, rotate **Knob** to select appropriate resolution, press **OK** button to confirm, system will prompt data reset, press **OK** button again to apply and system will automatically reboot, after reboot, new resolution will be activated.

Description:

- 1) **LVP615N** output ports share same resolution, DVI-1 and DVI-2 output image size&position can't exceed this range;

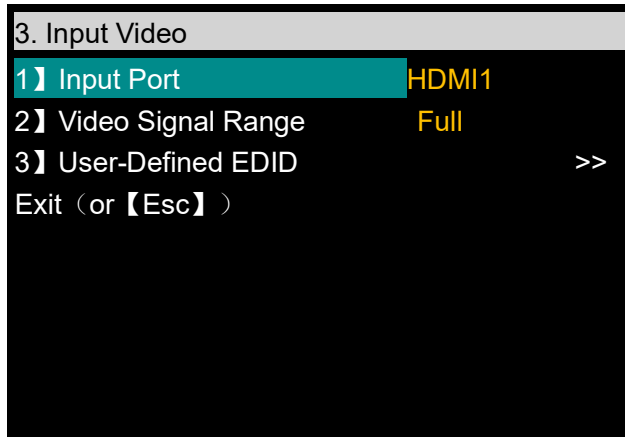
Besides preset output resolution, **LVP615N** supports custom output resolution. After select custom output resolution, need to configure 2.1.1) H-Active(Width), 2.1.2) V-Active(Height) and 2.1.3) Vertical Refresh, then press **Knob** to select 2.1.4) **【OK】to Set**, system will prompt data reset, press **OK** button again to confirm and system will automatically reboot, after reboot, new resolution will be activated.



- 2) Custom resolution width range 640~3936, height range 480~3936, frequency 60Hz or 50Hz.
As above picture showed, current output resolution is 1920x1080.

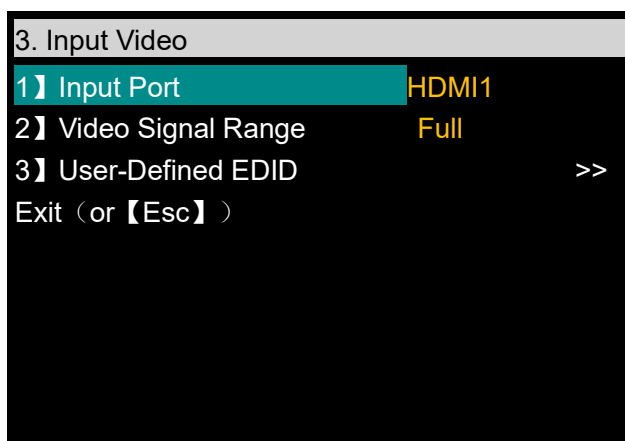
E-3) Input Video Setup

After boot up, press **Setup** to enter menu setup, rotate **Knob** to select 3. Input Video, press **Knob** (**OK**) into menu, user could configure each input HDMI Video Signal Range and User-Defined EDID.



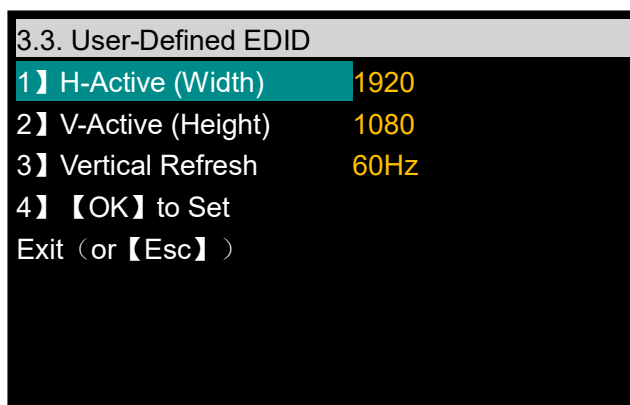
E-3-1) Video Signal Range

Video Signal Range is used to set HDMI input signal gray scale range, optional full(0-255,) and limited(16-235), solve the problem of dark and bright in full black display or insufficient brightness level in peak bright area. If user encounter such issue, enter menu 3. Input Video, 3.1) Input Port, select associated HDMI signal, set 3.2) Video Signal Range to *Full* or *limited*.



E-3-2) Custom EDID

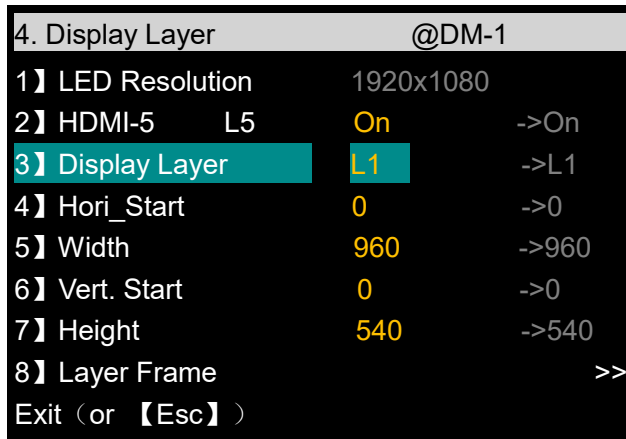
LVP615N all HDMI inputs support custom EDID, press **Knob** to enter menu 3.3. User-Defined EDID as following picture, rotate **Knob** to adjust 1) H-Active(Width) ,2) V-Active(Height) and 3) Vertical Refresh (Hz) , then press **OK** to activate new EDID.

**Description:**

- 1) 1) H-Active(Width) range 960 --- 2176;
- 2) 2) V-Active(Height) range 680 --- 2024;
- 3) 3) Vertical Refresh (Hz) option 25,30,50,60;
- 4) Some graphics card need to reboot **LVP615N** to validate new EDID

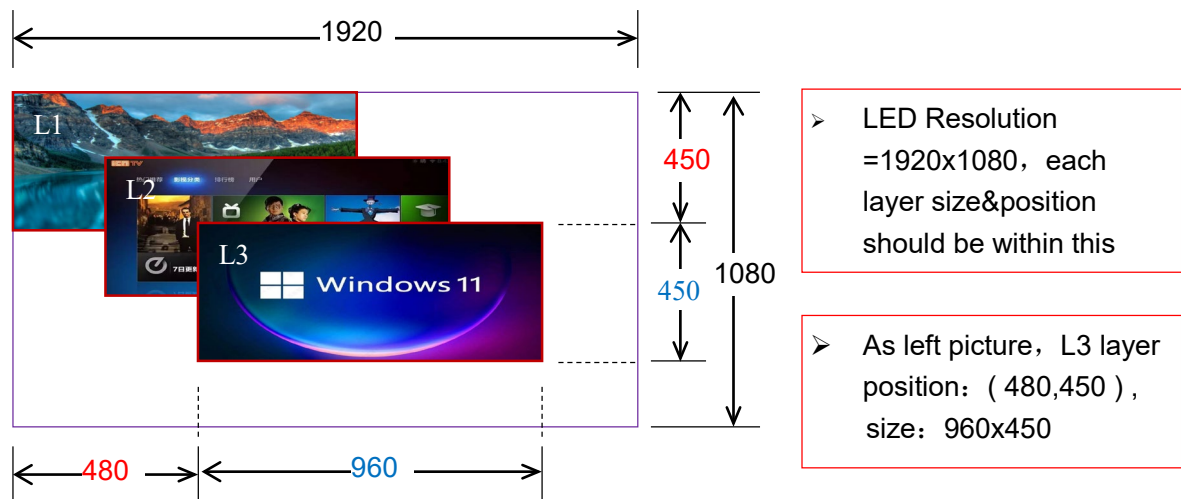
E-4) Layer Setup

After boot up, press **Setup** to enter menu setup, rotate **Knob** to select 4. Display Layer, press **Knob** button(**OK**) to following menu. **LVP615N** supports 4 layers display, this menu is used to set each window position, size and frame.



E-4-1) Window Layer Size And Position Setup

4.1] LED Resolution corresponds to 2.1 Resolution.



Picture 9

Setup Procedure:

- 1) Press (**DM-1**, **DM-2**, **DM-3**, **DM+**) button to select window display mode;
- 2) Under 4.3) Display Layer, select target window layer (L1, L2, L4, L5) ;
- 3) Configure Hori_Start, Width, Vert_Start, Height of each layer;

E-4-2) Image Frame Setup

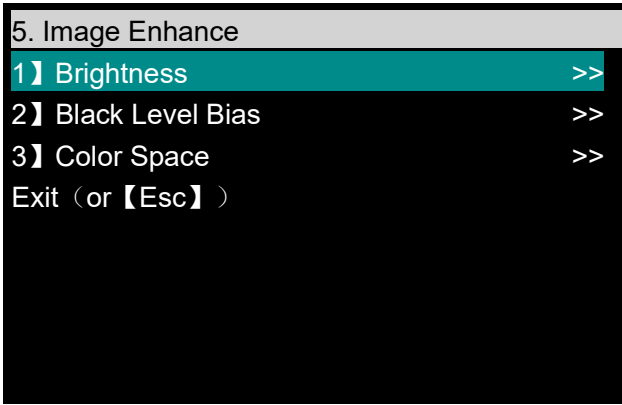
LVP615N window layer supports image frame color and thickness customization, following table is description of 4.8 Layer Frame. Under menu 4.8.1) Display Layer, rotate **Knob** to select window layer (L1, L2, L4, L5), use 4.8.2) Enable to open/close window frame, then adjust frame color and thickness in menu 4.8.3) ~ 4.8.6).

Menu Item	Description
4.8.1) Display Layer	Layer selection, includes L1, L2, L4, L5
4.8.2) Enable	Open/Close layer frame, if enable layer frame, set to On
4.8.3) Frame Color Red 4.8.4) Frame Color Green 4.8.5) Frame Color Blue	Frame color option, adjust red,green,blue channel to realize different display color
4.8.6) Frame Size	Frame thickness, range 0~255

4.8. Layer Frame	
1] Display Layer	L1
2] Enable	On
3] Frame Color Red	0
4] Frame Color Green	0
5] Frame Color Blue	0
6] Frame Size	2
Exit (or [Esc])	

E-5) Image Quality

After boot up, press **Setup** to enter menu setup, rotate **Knob** to select 5. Image Enhance, press **OK** to following menu. 5. Image Enhance menu provides brightness, black bias and color gamut mapping adjustment.



E-5-1) Brightness, Black Bias Setup

LVP615N could adjust image brightness and black bias in independent RGB channel. Following table is description.

Menu Item	Description
5.1 Brightness	Brightness adjustment, brightness R/G/B channel range: 0~512, default value 255.
5.2 Black Level Bias	Black field black background adjustment, Black Bias R/G/B channel range: -255~255, default value 0.

5.1. Brightness				5.2. Black Level Bias			
1] Out Layer	L2			1] Out Layer	L2		
2] Red	256			2] Red	0		
Green	256			Green	0		
Blue	256			Blue	0		
Red=Green=Blue	256	Default=255		Red=Green=Blue	0	Default=0	
3] Exit (or [Esc])				3] Exit (or [Esc])			

E-5-2) Color Mapping Setup

5.3.Color Space				
1】 Out Layer	L1	2】 On/Off	Off	
3】 S-white	D65	4】 S-Space	HD-709	
5】 T-white	D65	6】 T-Space	DCT-P3	
7】 Measure.	-----			
	R	G	B	White
Cx:	0.680	0.265	0.150	0.313
Cy:	0.320	0.690	0.60	0.329
【OK】 to Set				
Exit (or 【Esc】)				

LVP615N supports color gamut mapping function, enable LED screen to convert different color gamut to LED screen built-in gamut, achieve realistic display. Following table is menu item description.

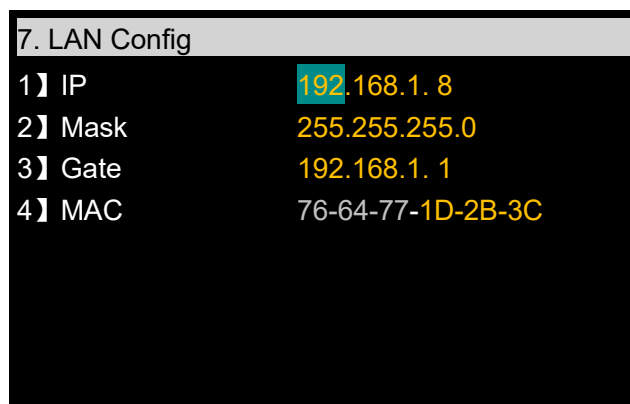
Menu Item	Description
5.3.1 Out Port	Output Layer selection
5.3.2 On/Off	Color space open/close, to activate this function, choose On
5.3.3 S-White	Source white point, D50,D65
5.3.4 S-Space	Source space, includes: HD709, NTSC, sRGB, L1L, Adobe, UHD-2020, Apple, DCT-P3 and actual measure
5.3.5 T-White	Target white point, D50,D65
5.3.6 T-Space	Target space, includes DCT-P3, Adobe, sRGB, UHD-2020, Apple, HD709 and actual measure
5.3.7 Measure	When the color space option is actual measure, manually configure associated value.

E-6) LED Control System

LVP615N doesn't provide internal sending card, menu is invalid.

E-7) LAN Configuration

After device boot up, press **Setup** to enter menu setup, rotate **Knob** to select 7. Lan Config, press **Knob** button(**OK**) to following menu.

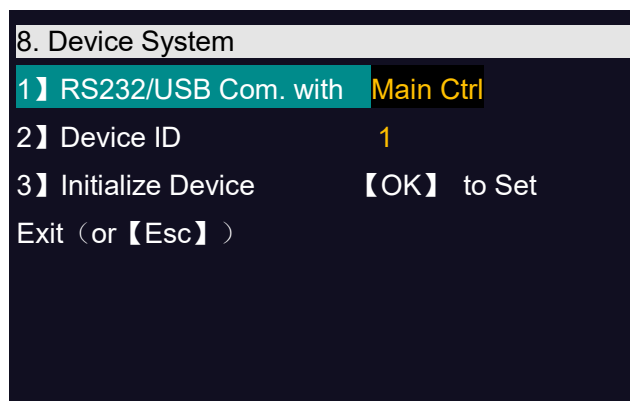


Description:

7. LAN Config is used to configure processor LAN communication parameters. Under this menu, press **Knob** to enter menu setup, rotate **Knob** to adjust parameter, press **OK** to confirm and apply. When press **Setup** to exit communication setup, processor LCD screen will prompt LAN parameters are changed and need reboot, reboot accordingly to activate new setup.

E-8) Device System

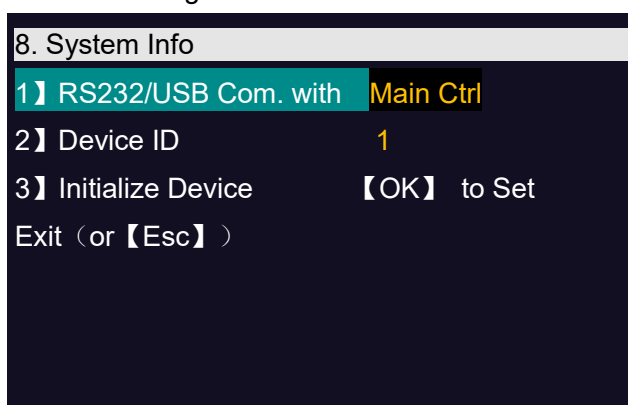
Device system menu consists RS232/USB Com.with, Device ID, Initialize Device.



E-8-1) RS232/USB Connection Setup and Device ID

1] RS232/USB Com.with is used to configure processor USB communication state, optional main control or sending card

2] Device ID is used to configure each processor ID when LVP615N is in multiple device cascading control state. Rotate **Knob** to select corresponding menu and configure device ID, press **OK** to save setting.



E-8-2) Initialize Device

3] Initialize Device could reset processor configuration and initialize processor to factory default mode. Under this menu, press **OK** button, system will prompt device reset, press **OK** again to confirm and apply.

Appendix: Manual Modification Record

Ver.	Date	Description	Draft
V1.0	2024.7	First release	