LCD Display Wall Unit

User's Manual

Foreword

General

This manual introduces the maintenance and configuration of the LCD Display Wall Unit (hereinafter referred to as "the Device"). Read carefully before using the Device, and keep the manual safe for future reference.

Safety Instructions

The following signal words might appear in the manual.

Signal Words	Meaning
⚠ DANGER	Indicates a high potential hazard which, if not avoided, will result in death or serious injury.
⚠ WARNING	Indicates a medium or low potential hazard which, if not avoided, could result in slight or moderate injury.
⚠ CAUTION	Indicates a potential risk which, if not avoided, could result in property damage, data loss, reductions in performance, or unpredictable results.
☞ TIPS	Provides methods to help you solve a problem or save time.
📖 NOTE	Provides additional information as a supplement to the text.

Revision History

Version	Revision Content	Release Time
V1.0.3	Updated the OPS information.	April 2023
V1.0.2	Updated daily maintenance requirements.	December 2022
V1.0.1	Updated port description.	May 2022
V1.0.0	First release.	December 2019

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and license plate number. You need to be in compliance with your local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures which include but are not limited: Providing clear and visible identification to inform people of the existence of the surveillance area and provide required contact information.

Interface Declaration

This manual mainly introduces the relevant functions when you use the device. The interfaces used for manufacture, returning to the factory for inspection, and locating fault are not described in this manual. Please contact technical support if you need information about these interfaces.

About the Manual

- The manual is for reference only. Slight differences might be found between the manual and the product.
- We are not liable for losses incurred due to operating the product in ways that are not in compliance with the manual.
- The manual will be updated according to the latest laws and regulations of related jurisdictions. For detailed information, see the paper user's manual, use our CD-ROM, scan the QR code or visit our official website. The manual is for reference only. Slight differences might be found between the electronic version and the paper version.
- All designs and software are subject to change without prior written notice. Product updates might result in some differences appearing between the actual product and the manual. Please contact customer service for the latest program and supplementary documentation.
- There might be errors in the print or deviations in the description of the functions, operations and technical data. If there is any doubt or dispute, we reserve the right of final explanation.
- Upgrade the reader software or try other mainstream reader software if the manual (in PDF format) cannot be opened.
- All trademarks, registered trademarks and company names in the manual are properties of their respective owners.
- Please visit our website, contact the supplier or customer service if any problems occur while using the device.
- If there is any uncertainty or controversy, we reserve the right of final explanation.

Important Safeguards and Warnings

This section introduces content covering the proper handling of the Device, hazard prevention, and prevention of property damage. Read carefully before using the Device, comply with the guidelines when using it, and keep the manual safe for future reference.

Installation Requirements

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- This is a class A product. In a domestic environment this may cause radio interference in which case you may be required to take adequate measures.
- Do not place the Device in a place exposed to sunlight or near heat sources.
- Keep the Device away from dampness, dust, and soot.
- Install the Device on a stable surface to prevent it from falling.
- Install the Device in a well-ventilated place, and do not block its ventilation.
- The power supply must conform to the requirements of ES1 in IEC 62368-1 standard and be no higher than PS2. Note that the power supply requirements are subject to the device label.
- The Device is a class I electrical appliance. Make sure that the power supply of the Device is connected to a power socket with protective earthing.
- The appliance coupler is a disconnection device. Keep it at a convenient angle when using it.

Operation Requirements

⚠ WARNING

- Improper use of the battery might result in a fire or explosion.
- Replace unwanted batteries with new batteries of the same type and model.
- Use the standard power adapter. We will assume no responsibility for any problems caused by the use of a nonstandard power adapter.
- Use the power cords that are recommended for the region and conform to the rated power specifications.

⚠

- Do not drop or splash liquid onto the Device, and make sure that there is no object filled with liquid on the Device to prevent liquid from flowing into it.
- Operate the Device within the rated range of power input and output.
- Do not disassemble the Device without professional instruction.

- Use the Device under allowed humidity and temperature conditions.
- Operating temperature: 0 ℃to +50 ℃ (32 ℉ to +122 ℉).

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1 Maintenance

1.1 Environment Requirements

- The Device can only be installed indoors. It is recommended to install air conditioner in the room where the Device is installed. Do not use the Device in environments with high humidity and heavy dust.
- Do not block the vent of the Device and the air circulation around the Device. Otherwise, the temperature inside the Device might rise and therefore cause a fire.

1.2 Daily Maintenance Requirements

Strictly comply with the daily maintenance requirements of the Device to prolong its service life and reduce emission for energy saving.

Operating Time

Because of high temperature, electronic products will accelerate aging after running for a long time and working overloaded, resulting in a significant reduction in its theoretical service life. The relationship between operating time and performance is shown in Figure 1-1.

Figure 1-1 Performance
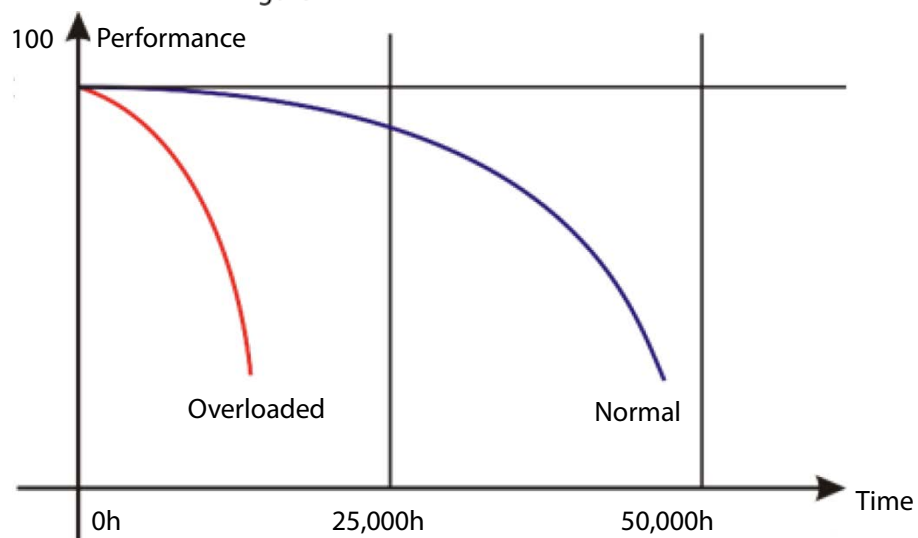
Follow the recommendations below to extend device service life and save maintenance costs.
- After 10 hours of continuous operation, turn off the Device for 15–30 minutes.
- After 7/24 continuous operation, turn off the Device for 2 hours.

Temperature, Humidity, and Ventilation

The ideal working temperature of the Device is 22 ℃ ± 4 ℃ (71.6 ℉ ± 39.2 ℉), and the ideal relative humidity is 30%–70% (no condensation). Make sure that there is no significant temperature difference

and sudden change of humidity, and if necessary, gradual temperature and humidity change is recommended.

If the Device is used for a long time in environments with high humidity, water vapor and droplets will be generated on the surface and the frame of the LCD, and then gradually penetrate into the LCD, slowly corrode and destroy its internal structure, causing liquid leakage. See Figure 1-2.

Figure 1-2 Liquid leakage

During daily operation, pay attention that:
● Before turning off the Device, make sure that the temperatures of the air conditioners in the server room and the room where the Device is installed are the same, and turn on or off these air conditioners at the same time.
● If the Device has been turned off for a long time, check whether there are water drops on the surface. If yes, do not power on the Device, and do not dry the surface with wet cloth. Use absorbent paper to dry the surface, and contact our after-sales service.

⚠️

Free warranty service is not applicable to damages (include but not limited to damages to the Device, user or any third party) arising from incorrect use and maintenance of the Device.

Cleaning

Use degreasing cotton or soft cloth to clean the screen.
● The ideal detergent is isopropanol or n-hexane. Do not use ketone (like acetone) to clean the screen. Before cleaning the screen, pull the plug out of the socket.
● Do not use wet cloth to clean the Device because water vapor and droplets will be generated on the surface and the frame of the LCD, and then gradually penetrate into the LCD, slowly corrode and destroy its internal structure, causing liquid leakage.
● The panel is fragile. As a result, do not press or scratch the surface of the screen with great force.

Power Supply

Stable 100–240 V single phase power supply is needed; otherwise the Device cannot work normally. To get stable voltage and prevent damage caused by electrical surge, use stabilized voltage supply.

Storage

● If the Device will not be used for a long time, cover it with dustproof cover.

- If the Device has not been used for over six months before you start to use it again, do dust removal first, or contact professionals to do the maintenance.

📖

If the Device is not in use for a long time, it will gather dust and heat dissipation will be influenced.

Dust-proof Requirements

During debugging and operation, the dust concentration of the working area should not exceed 10 mg/m^3.

If the Device must be used in environments with high temperature and high humidity, or the Device must be in single display mode for a long time, we strongly recommend you contact our engineers to get suggestions. Otherwise the reliability and performance might be greatly influenced.

Screen Usage Requirements

Playing static images for a long time can damage the screen and cause images to glitch. If this cannot be avoided, take the following measures：

- Avoid playing static images 24/7.
- We recommend playing static and motion images alternately.
  For example, you can alternate between playing static images for 5 minutes and motion images for 10 seconds.
- When the screen is connected to a computer, use motion images as the screen saver.

2 Unpacking the Box

Check against Table 2-1 to see whether the components are complete.

The appearance, items, or quantity might be different.

Table 2-1 Packing list

Item	Quantity
LCD display wall unit	1
AC power cable	1
DP cable	1
Network cable	1
Remote control	1
Battery	1 pair

3 Introduction

3.1 Appearance

Figure 3-1 Appearance

3.2 Ports

Figure 3-2 Ports
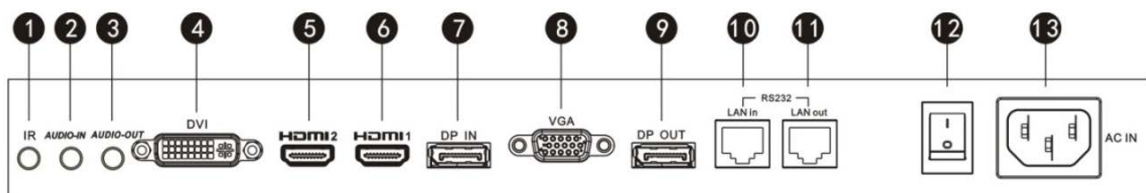
Table 3-1 Ports description

No.	Port	Description
1	IR	Connects to the IR extension cable.
2	AUDIO-IN	Inputs audio signals.
3	AUDIO-OUT	Outputs audio signals.
4	DVI	Inputs DVI signal. Supports maximum 4K@30 Hz.
5	HDMI 2	Inputs HDMI signal. Supports maximum 1080p@60 Hz.
6	HDMI 1	Inputs HDMI signal. Supports maximum 4K@60 Hz.
7	DP IN	Inputs DP signal. Supports maximum 4K@60 Hz.
8	VGA	Inputs VGA signal. Supports maximum 1080p@60 Hz.
9	DP OUT	Outputs DP signal. Supports maximum 4K@30 Hz.
10	LAN in	RJ-45 port. Inputs RS-232 signals for controlling the screen.

No.	Port	Description
11	LAN out	RJ-45 port. Outputs RS-232 signals for controlling signal loop output.
12	Power switch	AC power switch.
13	AC IN	AC power input port.

3.3 Remote Control

Remote control is required. For its appearance and operations, see Figure 3-3 and Table 3-2.

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Make sure to keep the remote control safe if the Device is installed in public areas.

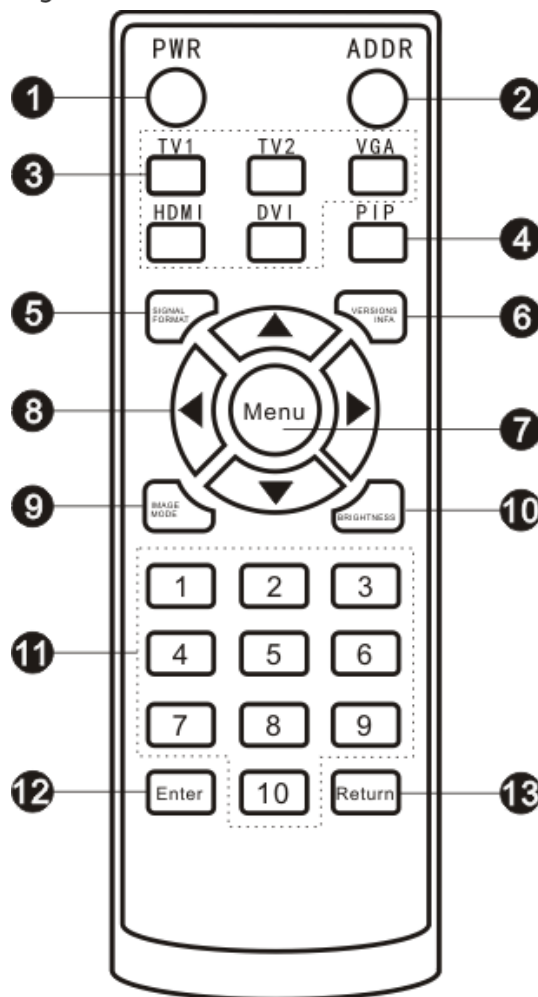Figure 3-3 Remote control buttons

Table 3-2 Remote control buttons description

No.	Name	Function
1	Power	Power on/standby.
2	Address	Shortcut keyboard for address setting (dedicated to monitors).

No.	Name	Function
3	Signal source	Shortcut keyboard for selecting signal source. ● TV1: Pause button, used to stop playing videos. ● TV2: Switch signals to CVBS signals. ● VGA: Switch signals to VGA signals. ● HDMI: Switch signals to HDMI signals. ● DVI: Switch signals to DVI signals.
4	Picture-in-picture (PIP)	Press PIP to start playing multimedia.
5	Signal format	Shortcut keyboard for displaying the current input signals.
6	Version info	Shortcut keyboard for displaying version of the system.
7	Menu	● Press Menu to display or exit the menu. ● Press Menu to confirm the operation that you have done.
8	Direction buttons	● Left and right direction buttons: Press ◀ or ▶ (left or right) to select the item at the left or right of the current item that you have selected on the screen (if you have selected voice, you can use these buttons to adjust the volume). ● Up and down direction buttons: Press ▲ or ▼ (up or down) to select items above or below the current item that you have selected on the screen.
9	Image mode	Shortcut keyboard for selecting image mode.
10	Brightness (backlight)	Shortcut keyboard for selecting backlight mode.
11	Number buttons	Press number buttons to enter numbers.
12	Enter	Press Enter to confirm and enter the multimedia page.
13	Return	Press Return to exit the multimedia page.

4 Local Configuration

Use the remote control to configure parameters for the Device. Press the Menu button of the remote control, and then the menu of the Device is displayed.
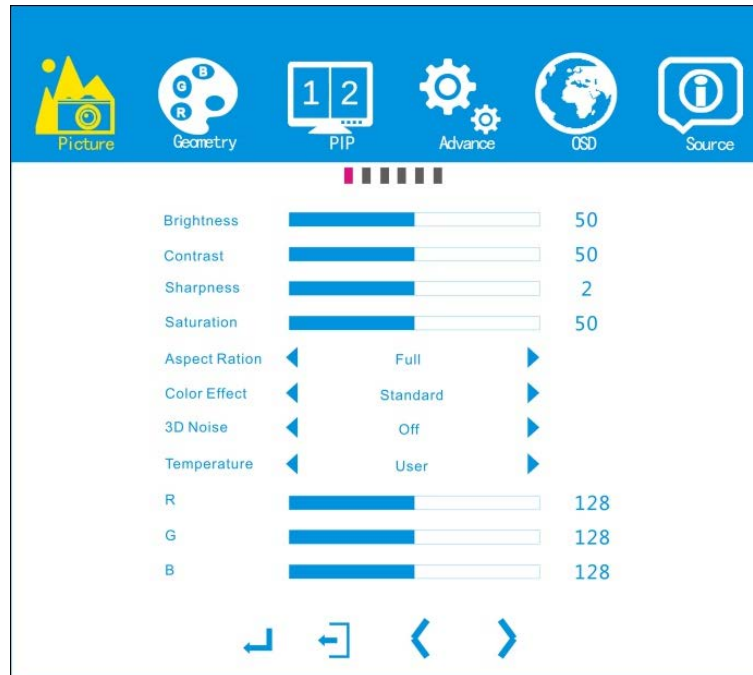
Figure 4-1 Main menu

Table 4-1 Icon description

Icon	Main menu description
Picture	Set imaging effect for the Device.
Geometry	Set picture positions and ADC auto adjustment when VGA signal source is connected.
PIP	Set PIP (picture-in-picture) mode, position, and the signal source for each PIP mode.
Advance	Set advanced parameters of images. 📖 Advanced options must be set by professional personnel.
OSD	Set system parameters.
Source	Set input source.

Step 1   Press Menu on the remote control, and then the menu bar is displayed on the Device.
You can start adjusting the corresponding parameters.

Step 2   Press Enter or ◀ / ▶ to adjust the corresponding submenu.

Step 3   Press Exit to exit the current menu.

4.1 Picture

You can set the brightness, contrast, sharpness, saturation, and more to get the ideal image.

Press Menu on the remote control, and then the **Picture** menu bar is displayed by default.
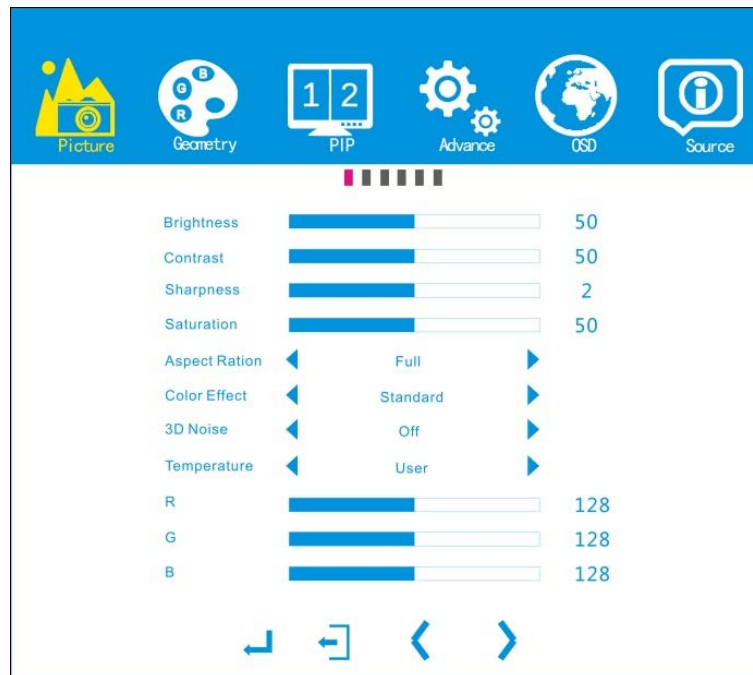
Figure 4-2 Picture

Table 4-2 Picture parameter description

Parameter	Description
Brightness	Brightness of images. Brightness range is 0 to 100. The higher the value, the brighter the image.
Contrast	Difference of the darkest and brightest parts of the image. Contrast range is 0 to 100. The higher the value, the darker the shadows and the brighter the highlights.
Sharpness	Edge contrast. Sharpness range is 0 to 4. The higher the value, the larger the contrast along or near the edges in the image.
Saturation	Color saturation of images. Saturation range is 0 to 100. The higher the value, the deeper the color.
Aspect Ratio	Display ratio of images. You can select **Full** (full screen), **16:9**, **5:4**, and **4:3**.
Color Effect	Overall effect of the image. You can select **Standard**, **Game**, **Movie**, **Photo**, and **Vivid**.
3D Noise	Enable 3D noise reduction to reduce image noise and improve image quality. You can select from **Off**, **Low**, **Middle**, and **High**.
Temperature	Color temperature of the image. You can select **User** (user defined), **9300**, **7500**, **6500**, **5800**, and **SRGB**. 📖 You can adjust **R**, **G**, and **B** values in **User** mode.

The steps of setting the picture parameters are similar, and here uses adjusting **Brightness** as the example.

Step 1 Press Menu on the remote control.

Step 2 Press ▲ or ▼ on the remote control to select the **Brightness** bar, and then press Enter to confirm your selection.

Step 3 Press ◀ or ▶ to adjust the brightness.

4.2 Geometry

Adjust image and screen positions. You can only set geometry parameters when VGA source is connected.

Press Menu on the remote control and then press ◀ or ▶ to go to the **Geometry** page.
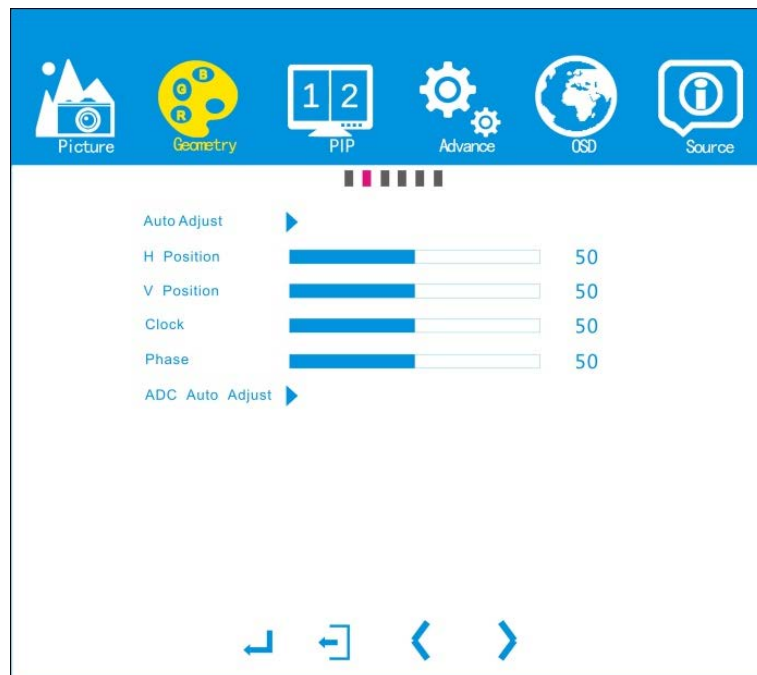
Figure 4-3 Geometry (VGA)

Table 4-3 Geometry (VGA) parameter description

Parameter	Description
Auto Adjust	Automatically adjust the position of image.
H Position	Adjust the horizontal position of screen. Horizontal position range is 0 to 100.
V Position	Adjust the vertical position of screen. Vertical position range is 0 to 100.
Clock	Improper clock and phase values might make the images get blurry. We recommend you to keep the default values.
Phase	
ADC Auto Adjust	When the color of the VGA image is abnormal, the system automatically restores to normal image color through ADC auto adjust.

The steps of setting the geometry parameters are similar, and here takes **Auto Adjust** as the example.

Step 1   Press Menu on the remote control.

Step 2   Press ◀ or ▶ on the remote control to go to the **Geometry** page.

Step 3   Press ▲ or ▼ to select **Auto Adjust**, and then press Enter to start auto adjustment.

Step 4   (Optional) Press ◀ or ▶ to adjust the value of **H Position**, **V Position**, **Clock**, or **Phase**.

4.3 PIP

PIP (picture-in-picture) allows you to set how many split windows can be displayed on the screen.

Press Menu on the remote control and then press ◀ or ▶ to go to the **PIP** page.
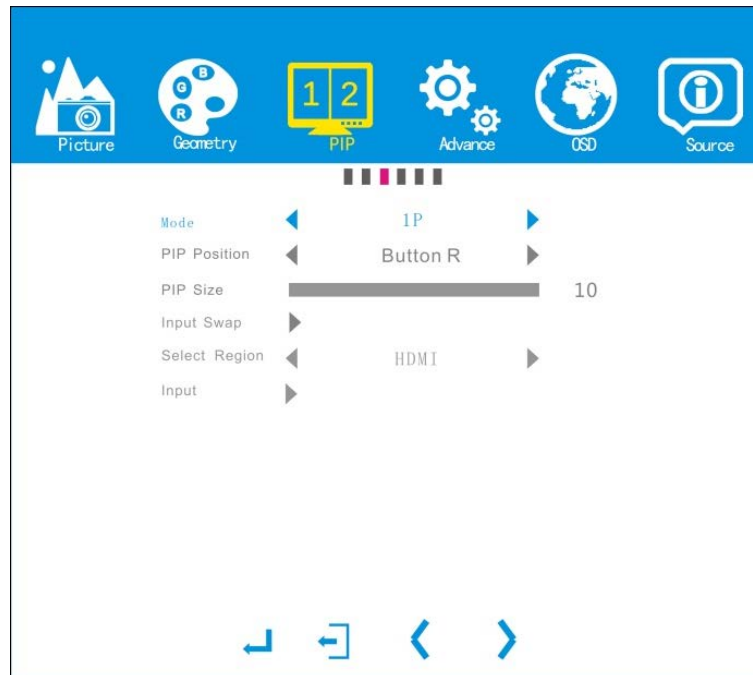
Figure 4-4 PIP

Table 4-4 PIP parameter description

Parameter	Description
Mode	You can select PIP modes from **1P** (1 window), **2P TB** (2 horizontal split windows), **2P PIP** (1 smaller window inside 1 bigger window), **4P** (4 split windows), and **PIP** (2 vertical split windows).
PIP Position	You can adjust PIP position only in **PIP** mode. PIP positions available: **Centre**, **Top L** (upper left), **Top R** (upper right), **Button L** (lower left), and **Button R** (lower right).
PIP Size	You can set PIP size only in **PIP** mode. The size value ranges from 1 to 10. The larger the value, the larger the size.
Input Swap	You can switch the input source of each window in **2P TB**, **2P PIP**, **4P**, and **PIP** modes.
Select Region	Select the region that you want to adjust picture settings.
Input	Select the input source signal for each window. You can select **VGA**, **DVI**, **HDMI1**, **HDMI2**, **OPS**, **DP**, and **Auto**.

The steps of setting PIP parameters are similar, and here uses setting **Mode** as the example.

Step 1   Press Menu on the remote control.

Step 2   Press ◀ or ▶ on the remote control to go to the **PIP** page.

Step 3   Press ▲ or ▼ to select the **Mode** bar, and then press Enter to confirm your selection.

Step 4 Press ◀ or ▶ to select the mode that you want, and then press Enter to confirm your selection.

4.4 Advance

⚠ **WARNING**

Non-professionals are prohibited from modifying the advanced parameters. We are not responsible for any product problems arising from modifications by non-professionals.

4.5 OSD

Press Menu on the remote control and then press ◀ or ▶ on the remote control to go to the **OSD** page.

Figure 4-5 OSD
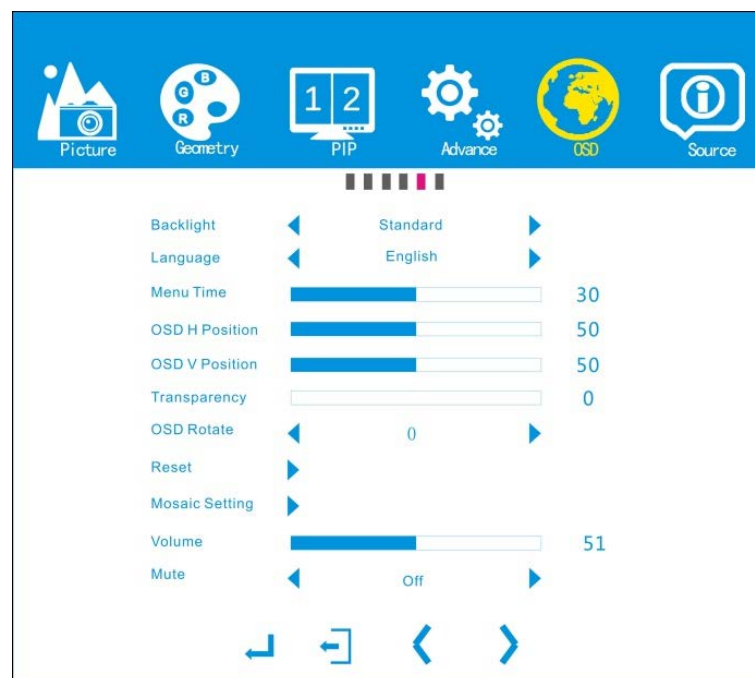
Table 4-5 OSD parameter description

Parameter	Description
Backlight	Set the backlight mode of the screen. You can select from **Standard**, **Energy**, and **Highlight**.
Language	You can select the menu language from Chinese and English.
Menu Time	Set the time that the menu displays on the screen. The time ranges from 10 s to 60 s.
OSD H Position	Adjust the horizontal or vertical position of the menu. You can set the value of

Parameter	Description
OSD V Position	horizontal or vertical position from 0 to 100. 0 refers to the leftmost or uppermost side, and 100 refers to the rightmost or lowermost side.
Transparency	Adjust the transparency of the menu. The value ranges from 0 to 100. The larger the value, the more transparent the menu.
OSD Rotate	Adjust the angle of the menu. You can rotate the menu by **0**, **90**, or **270** degrees.
Reset	You can reset the settings to default value except advanced parameters and **R**, **B**, **G** values from **Picture**.
Mosaic Setting	Set mosaic options of screens. See Figure 4-6 and Table 4-6.
Volume	Set the volume of external speaker. The value ranges from 0 to 100. The larger the value, the higher the volume. ◫ You can adjust the volume by directly pressing ◀ or ▶ on the remote control when no menu is displayed.
Mute	Turn on or off volume.

Figure 4-6 Mosaic setting

Table 4-6 Description of mosaic setting

Parameter	Description
Mosaic Mode	You can select **On** and **Off**. If mosaic mode is off, only one window will be displayed.
Row	Set the row that the screen locates.
Line	Set the line (column) that the screen locates.
Row Start	Set the start row of mosaic.
Row End	Set the end row of mosaic.

Parameter	Description
Line Start	Set the start line (column) of mosaic.
Enter	Confirm your selection.

The steps of setting OSD parameters are similar, and here uses setting **Backlight** as the example.

Step 1   Press Menu on the remote control.

Step 2   Press ◀ or ▶ on the remote control to go to the **OSD** page.

Step 3   Press ▲ or ▼ to select the **Backlight** bar, and then press Enter to confirm your selection.

Step 4   Press ◀ or ▶ to select the backlight mode that you want, and then press Enter to confirm your selection.

Ⅲ

Step 4 is not required for **Reset** and **Mosaic Setting**.

4.6 Source

Select the input source, which includes **VGA**, **DP**, **HDMI1**, **HDMI2**, **DVI**, **OPS**, and **Auto**.

Ⅲ

OPS is available on some models of 65-inch devices only.

Step 1   Press **Menu** on the remote control.

Step 2   Press ◀ or ▶ on the remote control to go to the **Source** page.

Step 3   Press ▲ or ▼ to select the source that is connected, and then press Enter to confirm your selection.

○⊸

You can select signal source by pressing the corresponding buttons on the remote control when no menu is displayed.

Figure 4-7 Source

5 System Upgrade

System upgrade involves complicated operations. Please contact us for any upgrade and other related operations. Do not disassemble the Device or upgrade it by yourself. We are not responsible for any malfunctions and damages caused by arbitrary disassembly or upgrade.

6 FAQ

Most problems can be solved by the following solutions. For any other problem, contact after-sales service.

Table 6-1 FAQ

Problem	Possible Reasons
No images on the screen after turning on the Device.	- Power source (220 VAC) is not connected to mains electricity. - The power cable is broken. - The power switch is off or broken. - The indicator light is off.
No signal.	- Poor contact of signal wires. - Signal source has no output. - The signal wires are broken. - The input signal type does not belong to the types supported by the Device.
LCD lost color.	- Poor contact of signal wires. - The signal wires are broken.
Remote control does not work.	No batteries are installed, or batteries are not installed properly.
Device temperature is too high.	Device ventilation is not good.

Appendix 1 Cybersecurity Recommendations

Cybersecurity is more than just a buzzword: it's something that pertains to every device that is connected to the internet. IP video surveillance is not immune to cyber risks, but taking basic steps toward protecting and strengthening networks and networked appliances will make them less susceptible to attacks. Below are some tips and recommendations from Dahua on how to create a more secured security system.

Mandatory actions to be taken for basic device network security:

1. **Use Strong Passwords**

    Please refer to the following suggestions to set passwords.

    - The length should not be less than 8 characters.
    - Include at least two types of characters; character types include upper and lower case letters, numbers and symbols.
    - Do not contain the account name or the account name in reverse order.
    - Do not use continuous characters, such as 123, abc, etc.
    - Do not use overlapped characters, such as 111, aaa, etc.

2. **Update Firmware and Client Software in Time**

    - According to the standard procedure in Tech-industry, we recommend to keep your device (such as NVR, DVR, IP camera, etc.) firmware up-to-date to ensure the system is equipped with the latest security patches and fixes. When the device is connected to the public network, it is recommended to enable the "auto-check for updates" function to obtain timely information of firmware updates released by the manufacturer.
    - We suggest that you download and use the latest version of client software.

"Nice to have" recommendations to improve your device network security:

1. **Physical Protection**

    We suggest that you perform physical protection to device, especially storage devices. For example, place the device in a special computer room and cabinet, and implement well-done access control permission and key management to prevent unauthorized personnel from carrying out physical contacts such as damaging hardware, unauthorized connection of removable device (such as USB flash disk, serial port), etc.

2. **Change Passwords Regularly**

    We suggest that you change passwords regularly to reduce the risk of being guessed or cracked.

3. **Set and Update Passwords Reset Information Timely**

    The device supports password reset function. Please set up related information for password reset in time, including the end user's mailbox and password protection questions. If the information changes, please modify it in time. When setting password protection questions, it is suggested not to use those that can be easily guessed.

4. **Enable Account Lock**

    The account lock feature is enabled by default, and we recommend you to keep it on to guarantee the account security. If an attacker attempts to log in with the wrong password several times, the corresponding account and the source IP address will be locked.

5. **Change Default HTTP and Other Service Ports**

    We suggest you to change default HTTP and other service ports into any set of numbers between

1024–65535, reducing the risk of outsiders being able to guess which ports you are using.

6. **Enable HTTPS**

We suggest you to enable HTTPS, so that you visit Web service through a secure communication channel.

7. **MAC Address Binding**

We recommend you to bind the IP and MAC address of the gateway to the device, thus reducing the risk of ARP spoofing.

8. **Assign Accounts and Privileges Reasonably**

According to business and management requirements, reasonably add users and assign a minimum set of permissions to them.

9. **Disable Unnecessary Services and Choose Secure Modes**

If not needed, it is recommended to turn off some services such as SNMP, SMTP, UPnP, etc., to reduce risks.

If necessary, it is highly recommended that you use safe modes, including but not limited to the following services:

● SNMP: Choose SNMP v3, and set up strong encryption passwords and authentication passwords.

● SMTP: Choose TLS to access mailbox server.

● FTP: Choose SFTP, and set up strong passwords.

● AP hotspot: Choose WPA2-PSK encryption mode, and set up strong passwords.

10. **Audio and Video Encrypted Transmission**

If your audio and video data contents are very important or sensitive, we recommend that you use encrypted transmission function, to reduce the risk of audio and video data being stolen during transmission.

Reminder: encrypted transmission will cause some loss in transmission efficiency.

11. **Secure Auditing**

● Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.

● Check device log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

12. **Network Log**

Due to the limited storage capacity of the device, the stored log is limited. If you need to save the log for a long time, it is recommended that you enable the network log function to ensure that the critical logs are synchronized to the network log server for tracing.

13. **Construct a Safe Network Environment**

In order to better ensure the safety of device and reduce potential cyber risks, we recommend:

● Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.

● The network should be partitioned and isolated according to the actual network needs. If there are no communication requirements between two sub networks, it is suggested to use VLAN, network GAP and other technologies to partition the network, so as to achieve the network isolation effect.

● Establish the 802.1x access authentication system to reduce the risk of unauthorized access to private networks.

- Enable IP/MAC address filtering function to limit the range of hosts allowed to access the device.

More information

Please visit Dahua official website security emergency response center for security announcements and the latest security recommendations.

ENABLING A SAFER SOCIETY AND SMARTER LIVING