

HDCVI Camera

User's Manual








Foreword

General

This manual introduces the functions and operations of the HDCVI camera (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
V1.0.5	<ul style="list-style-type: none">• Updated Important Safeguards and Warnings.• Added PT Preset.• Updated FAQ.	August 2024
V1.0.4	Updated Transmission Distance.	June 2024
V1.0.3	Added PT Camera.	May 2023
V1.0.2	<ul style="list-style-type: none">• Added Smart Dual Illuminators Cameras Configuration.• Added Configuring Smart Dual Illuminators Active Deterrence Camera.	August 2022
V1.0.1	<ul style="list-style-type: none">• Adjusted the format of tables.• Added Cybersecurity Recommendations.	August 2021
V1.0.0	First release.	June 2020

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, audio, 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.

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, and comply with the guidelines when using it.

Transportation Requirements



- Transport the device under allowed humidity and temperature conditions.
- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during transportation.
- Pack the device with packaging provided by its manufacturer or packaging of the same quality before transporting it.

Storage Requirements



- Store the device under allowed humidity and temperature conditions.
- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during storage.

Installation Requirements



- Strictly comply with the local electrical safety code and standards, and check whether the power supply is correct before operating the device.
- 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.
- Make sure that the power adapter meets the device operating voltage requirement before powering up the device (The material and length of the power cable might influence the device voltage).



- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during installation.
- An emergency disconnect device must be installed during installation and wiring at a readily accessible location for emergency power cut-off.
- We assume no liability or responsibility for all the fires or electrical shock caused by improper handling or installation.
- We recommend you use the device with a lightning protection device for stronger protection against lightning. For outdoor scenarios, strictly comply with the lightning protection regulations.
- Ground the device to protective ground before you power it on.
- Use qualified video transmission cable to improve video quality, and use RG59 coaxial cable or higher standard.

Operating Requirements



- Do not connect the device to more than one power supply. Otherwise, the device might be damaged.
- PoC supply voltage is up to 52V. Do not dismantle the device during normal operation; otherwise it might cause danger to both device and users due to high voltage.
- If PoC power supply is used, do not connect any other device between the device and PoC transceiver including UTC, Balun, optical transceiver, distributor and convertor and so on; otherwise, the device might get burned.



- Use the device under allowed humidity and temperature conditions.
- Protect the line cord and wires from being walked on or squeezed particularly at plugs, power sockets, and the point where they exit from the device.
- Do not aim the device at strong light sources (such as lamplight, and sunlight) when focusing it, to avoid reducing the lifespan of the CMOS sensor, and causing overbrightness and flickering.
- When using a laser beam device, avoid exposing the device surface to laser beam radiation.
- Prevent liquid from flowing into the device to avoid damage to its internal components.
- Do not block the ventilation opening near the device to avoid heat accumulation.

Maintenance Requirements



Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.

Table of Contents

Foreword	I
Important Safeguards and Warnings	III
1 Overview	1
1.1 Introduction	1
1.2 Application	1
1.3 Transmission Distance	2
2 Cable Connection	3
2.1 Power Output	3
2.2 12 VDC Power Input Port.....	3
2.3 24 VAC Power Input Port	3
2.4 Video Output Port.....	4
2.5 Audio Input Port.....	4
2.6 Alarm Output Port	4
2.7 DIP Switch	5
2.8 HD/SD Switch Control Cable.....	5
2.9 HDCVI Aviation Connector	5
3 General Configuration and Operation	7
3.1 Entering XVR Main Menu	7
3.2 Setting Audio Input.....	7
3.3 Operating PTZ Control Panel.....	8
3.3.1 Operating OSD Menu	8
3.3.2 Operating Auto Focus (AF)	10
4 Full-Color Camera Configuration	11
4.1 Enabling/Disabling Smart Light	11
4.2 Configuring Smart Light Adjustment.....	11
5 Smart Dual Illuminators Cameras Configuration	12
6 Temperature and Humidity Camera Configuration	14
6.1 Enabling/Disabling Temperature and Humidity	14
6.2 Configuring Temperature Monitoring Mode.....	14
6.3 Adjusting Temperature and Humidity Display.....	14
6.4 Viewing Temperature and Humidity.....	15
7 Active Deterrence Camera Configuration	16
7.1 Detection Range of PIR Detector	16
7.2 Configuring Trigger Mode	16
7.3 Configuring Light Warning and Audio Alarm.....	17
7.4 Configuring Smart Dual Illuminators Active Deterrence Camera.....	17
8 Gateway Camera Configuration	19
8.1 Connecting Node Devices on OSD menu.....	19
8.2 Connecting Node Devices on XVR.....	19
9 Box Camera Installation	21
9.1 Lens Installation.....	21
9.1.1 Installing Lens Type 1	21
9.1.2 Installing Lens Type 2	22
9.2 I/O Port Installation	23

9.2.1 Connecting Cable	23
9.2.2 Removing Cable	23
9.3 Device Installation	23
10 Fisheye Camera Configuration	25
10.1 Fisheye Dewarp on the Live Interface.....	25
10.2 Fisheye Dewarp During Playback.....	26
11 PT Camera Configuration.....	27
11.1 PTZ Control	27
11.2 PT Reset.....	27
11.3 PT Preset.....	28
12 FAQ	29
12.1 Flicker	29
12.2 PoC Power Supply	29
12.3 Long Distance Power Supply	30
12.4 Centralized Power Supply	30
12.5 Connector Waterproof Protection.....	31
13 Maintenance	33
Appendix 1 Security Recommendation	34

1 Overview

1.1 Introduction

The devices comply with the HDCVI standard and support the transmission of video and control signal over coaxial cable. The devices produce video signal with megapixel resolution and require connected XVRs to achieve high-speed, long-distance, and zero-lag transmission of the signal. They are applicable to various scenes, such as roads, warehouses, underground parking lots, bars, pipelines, and gas stations.

1.2 Application

Figure 1-1 Application scenario

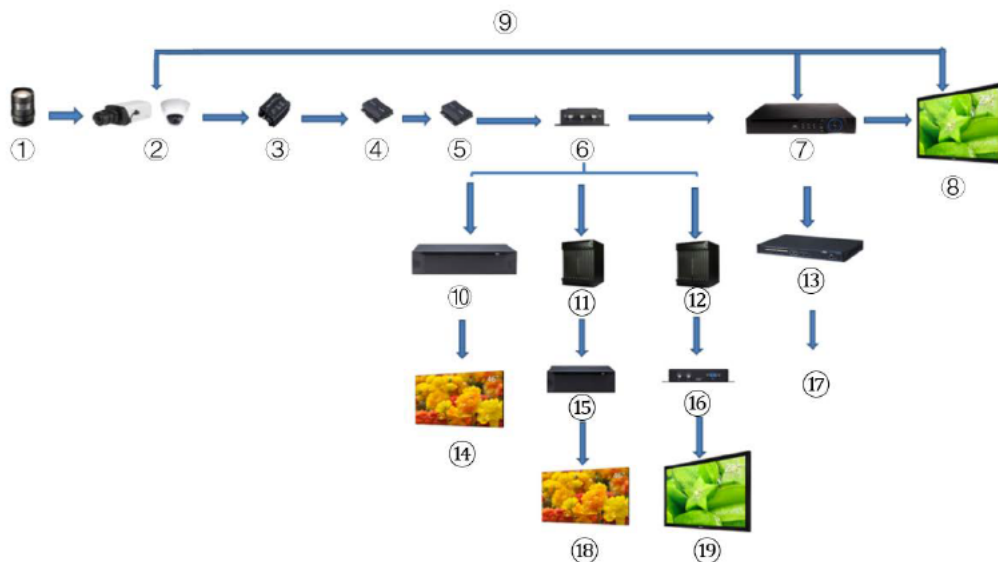


Table 1-1 Description of the application

No.	Name	No.	Name	No.	Name
1	(Optional) Lens	8	Display Screen	15	Splicer
2	HDCVI Products	9	Direct Connection	16	Convertor
3	(Optional) Surge Protection Device	10	Integrated Video Platform	17	Ethernet
4	(Optional) Optical Transceiver (Send)	11	Matrix	18	Splicing Screen
5	(Optional) Optical Transceiver (Receive)	12	Matrix	19	Display Screen
6	(Optional) Distributor	13	Switch	—	—
7	HCVR Products	14	Splicing Screen	—	—

1.3 Transmission Distance

Table 1-2 Transmission distance

Cable		720P	1080P	4MP/4K
Coaxial Cable	RG6 (75-5)	1200 m	800 m	700 m
	RG59 (75-3)	800 m	500 m	500 m
UTP	CAT6	450 m	300 m	300 m

2 Cable Connection



Cable types might vary with different cameras, and the actual product shall prevail.

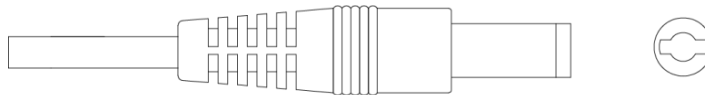
2.1 Power Output

Supplies 12 VDC power.



- Ensure that power consumption of devices connected to this port is below 2 W.
- Ensure that supply frequency of devices connected to this port is higher than 1 MHz, such as sound pick-up, temperature/humidity sensor and other devices without power consumption change. It might cause image flickering if this port is connected to devices with supply frequency less than 1 MHz, such as fan, hall sensor, loudspeaker, motor and other electromechanical devices with power consumption change.

Figure 2-1 Power output



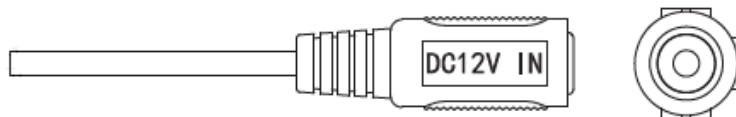
2.2 12 VDC Power Input Port

Inputs 12 VDC power.



Device abnormality or damage could occur if power is not supplied correctly for 12 VDC power input port. Be sure to supply power as instructed in the manual.

Figure 2-2 12 VDC power input port



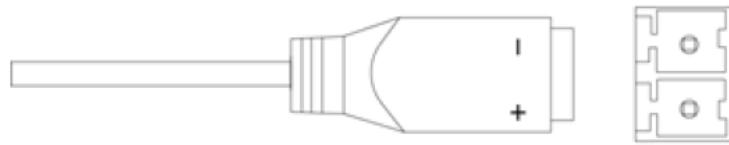
2.3 24 VAC Power Input Port

Inputs 24 VAC power.



Device abnormality or damage could occur if power is not supplied correctly. Please be sure to supply power as instructed in the manual.

Figure 2-3 24 VAC power input port



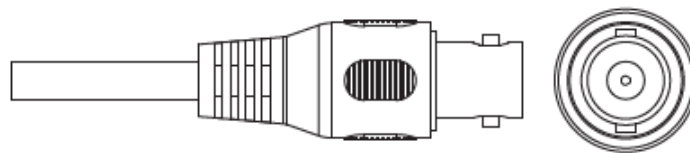
2.4 Video Output Port

Connects to the XVR to output video signal.

WARNING

- When the device is in the condition of PoC power supply, do not connect any other device between the device and PoC XVR or PoC transceiver including UTC, Balun, optical transceiver, distributor and convertor and so on; otherwise, the device might get burned.
- PoC power supply is with high voltage. Do not dismantle the device during normal operation; otherwise it might cause danger to both device and users due to high voltage.

Figure 2-4 Video output port



2.5 Audio Input Port

Connects to sound pickup devices to receive analog audio signal.

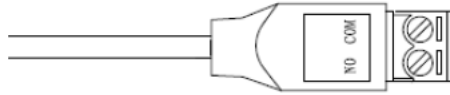
Figure 2-5 Audio input port



2.6 Alarm Output Port

Connects to external alarm devices such as siren to trigger alarms.

Figure 2-6 Alarm output port



2.7 DIP Switch

Dial switches to change output mode. Switch up indicates **ON**, and switch down indicates **OFF**.

Figure 2-7 DIP switch

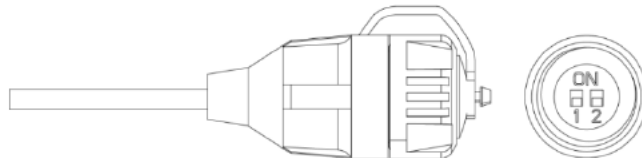


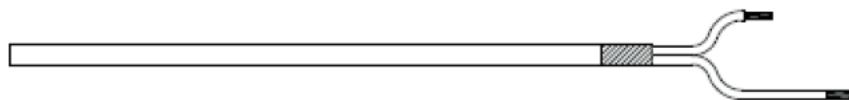
Table 2-1 Operations of DIP switch

Switch1	Switch2	Output Mode
OFF	OFF	CVI
ON	ON	CVBS
ON	OFF	AHD
OFF	ON	TVI

2.8 HD/SD Switch Control Cable

When the HD/SD switch control cable forms a short circuit, video output mode switches from HD to SD. On the contrary, it will switch back to HD video output when the cable forms an open circuit.

Figure 2-8 HD/SD switch control cable



The HD/SD switch control cable is available on select models.

2.9 HDCVI Aviation Connector

Aviation connector could strengthen the connection of mobile devices and provide four ports for your convenience.

Figure 2-9 HDCVI aviation connector

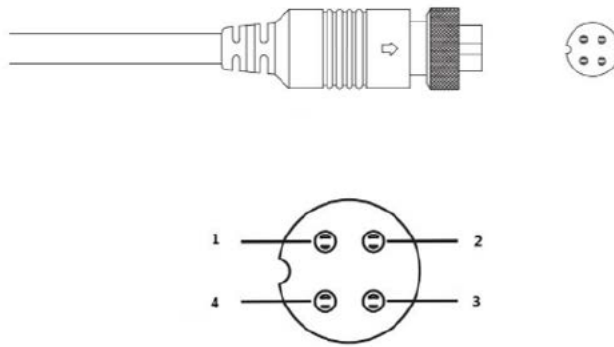


Table 2-2 HDCVI aviation connector components

No.	Name	No.	Name
1	(Yellow): Video	3	(White): Video Ground
2	(Black): Power Ground	4	(Red): Power

3 General Configuration and Operation

Power up the device and connect it to the XVR with coaxial cable, and then the live interface is displayed. Then you can start configuring HDCVI cameras on the XVR.



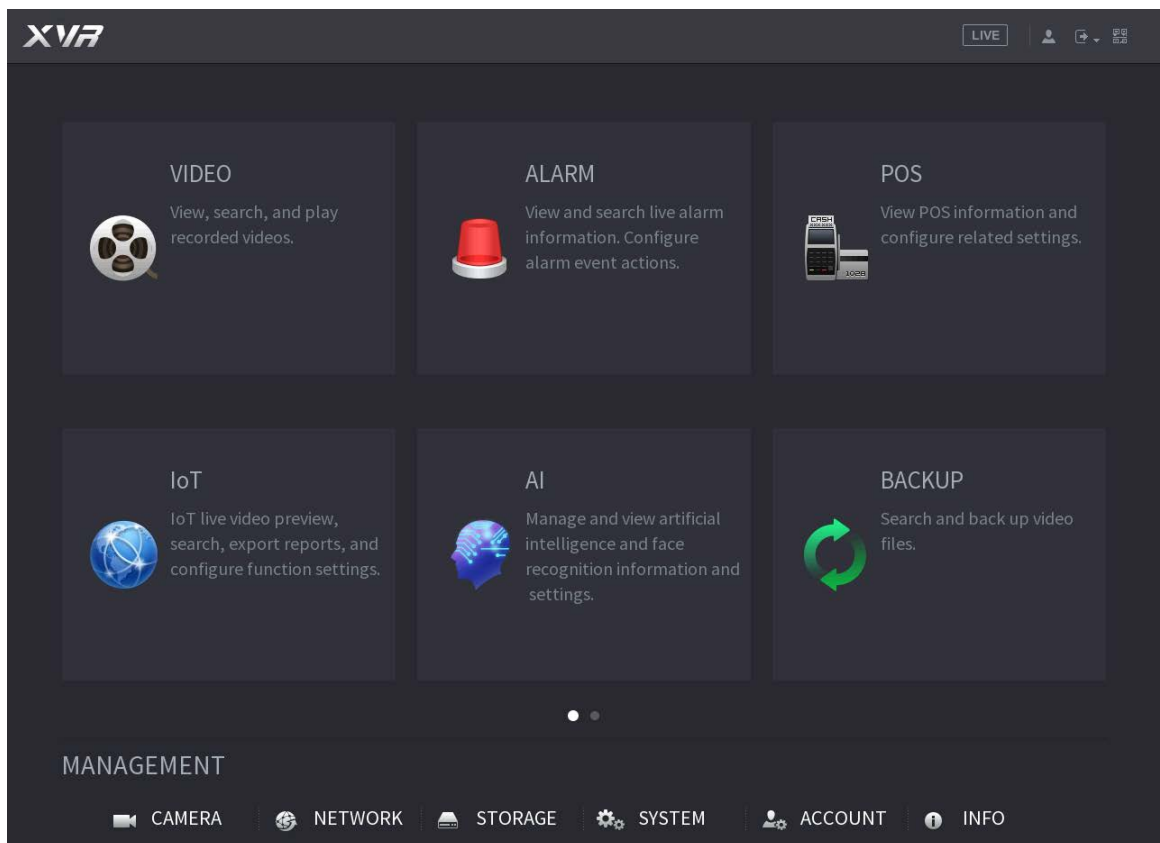
- The No. of the coaxial ports on XVR will display at the lower-left corner of each window to indicate the corresponding camera.
- Ports might vary depending on the XVR models, and the actual product shall prevail.

3.1 Entering XVR Main Menu

Step 1 Right-click on the live interface, and the shortcut menu is displayed.

Step 2 Click **Main Menu** and then log in to the system. The main menu of XVR is displayed.

Figure 3-1 XVR main menu



3.2 Setting Audio Input



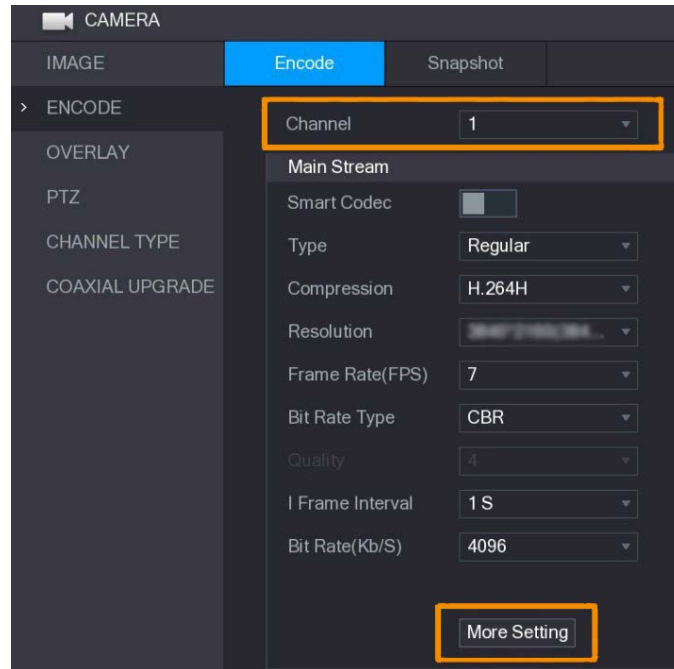
Audio input is available on select models.

Step 1 On the **Main Menu** interface, select **CAMERA > ENCODE > Encode**.

Step 2 On the **Channel I** drop-down list, select the device that you want to configure according to the coaxial port No.

Step 3 Under Main Stream, click More Setting.

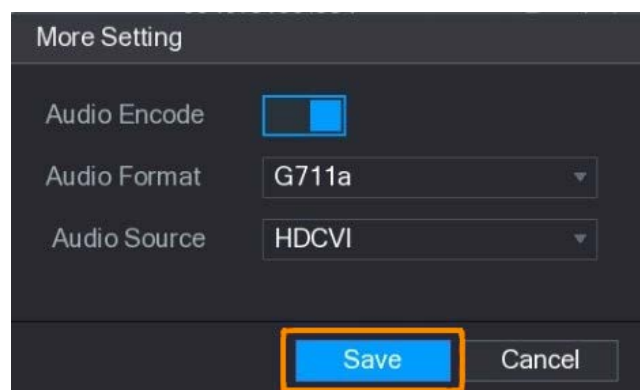
Figure 3-2 Encode setting



Step 4 On the **More Setting** interface, enable **Audio Encode** function and then configure the audio settings. In the **Audio Format** list, leave it as default; in the **Audio Source** list, select **HDCVI**.

Step 5 Click **Save**.

Figure 3-3 More setting



Step 6 On the **Encode** interface, click **Apply**.

3.3 Operating PTZ Control Panel

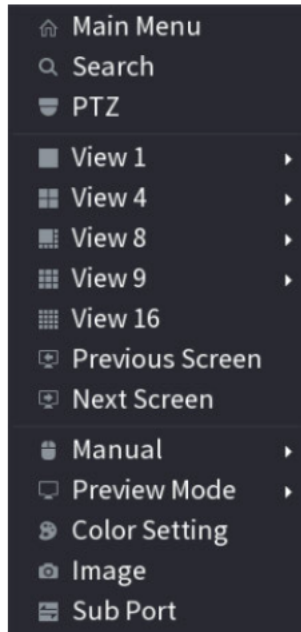
3.3.1 Operating OSD Menu



- The OSD menus of different cameras might vary, and the actual product shall prevail.
- When you use OSD menu to restore the device to default settings, the resolution, mode, frame rate and language of the device will not be restored.

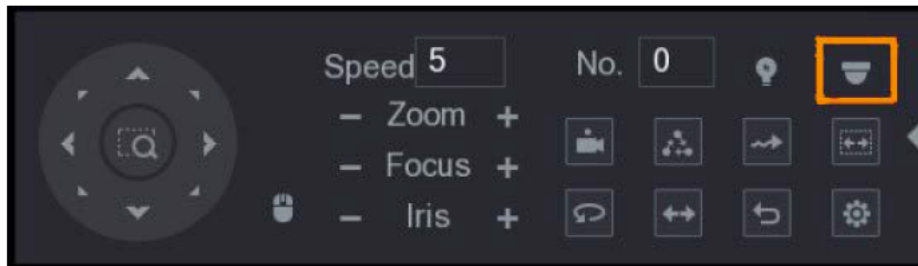
Step 1 On the live interface, right-click the device that you want to configure. The shortcut menu is displayed.

Figure 3-4 Shortcut menu



Step 2 Click **PTZ** and click  to extend the menu.

Figure 3-5 PTZ setting options




Step 3 Click . The **MENU OPERATION** panel is displayed.

Figure 3-6 Menu Operation panel

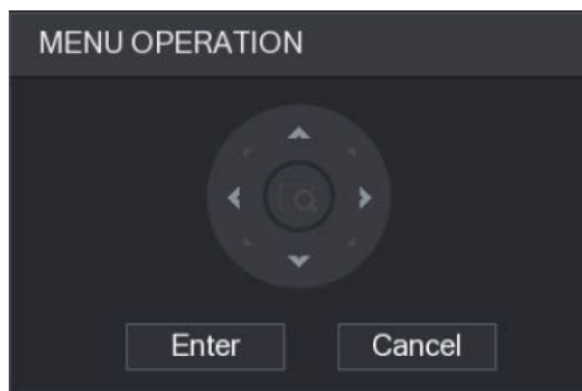






Table 3-1 Menu operation panel function

Button	Function	Button	Function
Enter	Enter or confirm an item	 , 	Select item
Cancel	Exit OSD menu	 , 	Change item value


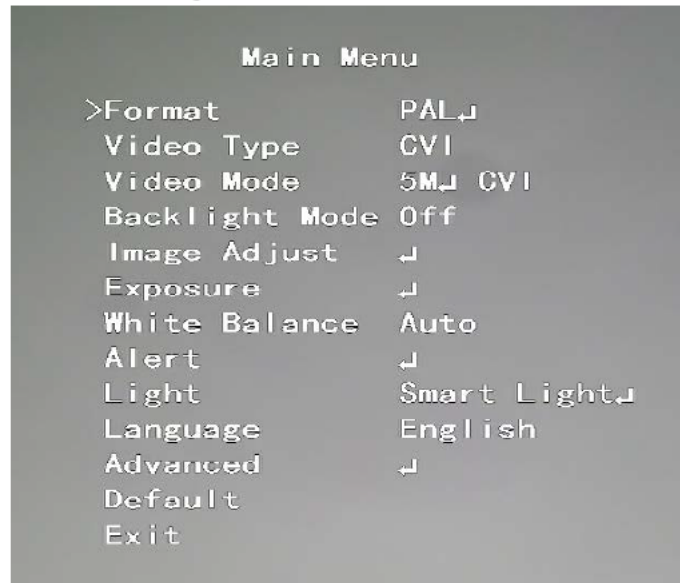










The OSD menu of the corresponding device is displayed on the live interface. If the value of OSD item is , click **Enter** to go to the next level of this item. Click **Return** to go back to the previous level. Click **Cancel** to exit OSD menu without saving the modifications.

Figure 3-7 OSD menu



3.3.2 Operating Auto Focus (AF)

Table 3-2 Parameter of AF

Parameter	Description
Zoom	<ul style="list-style-type: none"> : Zoom out. : Zoom in.
Focus	<ul style="list-style-type: none"> : Focus far. : Focus near.
Iris	<ul style="list-style-type: none"> : Auto focus. : Open OSD menu.
PTZ movement	Supports eight directions.
	Click  , and then you can control the four directions (left, right, up, and down) of PTZ through mouse operation.
	Click  to unfold PTZ control panel.

4 Full-Color Camera Configuration

This chapter introduces how to configure the working modes of smart light, including auto and manual. Smart light will change the brightness of white light automatically according to the ambient lighting condition to avoid over-exposure. Smart light is only available for full-color camera.

4.1 Enabling/Disabling Smart Light

Smart light is enabled by default. To switch the mode of smart light, enter OSD menu (Figure 3-7) and select **Light > Smart Light**.

4.2 Configuring Smart Light Adjustment

In the smart light mode, configure the maximum brightness level of the smart light, and the device will change brightness automatically according to the ambient lighting condition. You can also configure the sensitivity of the smart light.

Configuring Brightness Level

Step 1 On the OSD menu, select **Light > Smart Light > Level**.

Step 2 Select from **1** to **5** to configure the maximum brightness level.



The maximum brightness level is 5 by default.

Step 3 Click **Return** and then **Exit** to exit the configuration.



You can also configure the brightness level manually in **Light > Manual > Level**.

Configuring Sensitivity

Step 1 On the OSD menu, select **Light > Smart Light > Sensitivity**.

Step 2 Select from **1** to **5** to configure the sensitivity value of the smart light.



- The higher the value is, the easier the smart light will be woken up.
- The sensitivity value is 3 by default.

Step 3 Click **Return** and then **Exit** to exit the configuration.

5 Smart Dual Illuminators Cameras Configuration

Smart dual illuminators camera supports three light modes: **Smart IR&WL**, **WL mode**, **IR mode**.

On the OSD menu, select Illuminator, and then view the three different modes.

- **Smart IR&WL:** Turn on the IR light in low ambient brightness. If SMD or IVS has been associated with smart dual illuminators cameras, and when the SMD detects people and vehicles on the screen, or perimeter rules are triggered by the IVS, then the camera will be controlled to turn on the warm light, and the screen automatically switch to the full-color. When SMD or IVS has detected that no rules are triggered by people and vehicles, the camera will turn off the warm light and turn on the IR light to switch to the black & white night vision.
- **WL mode:** If the screen is full-color in low ambient brightness, then the camera is a full-color camera.
- **IR mode:** If the screen is black & white in low ambient brightness, then the camera is an IR camera.

Figure 5-1 Smart IR&WL



Figure 5-2 WL mode

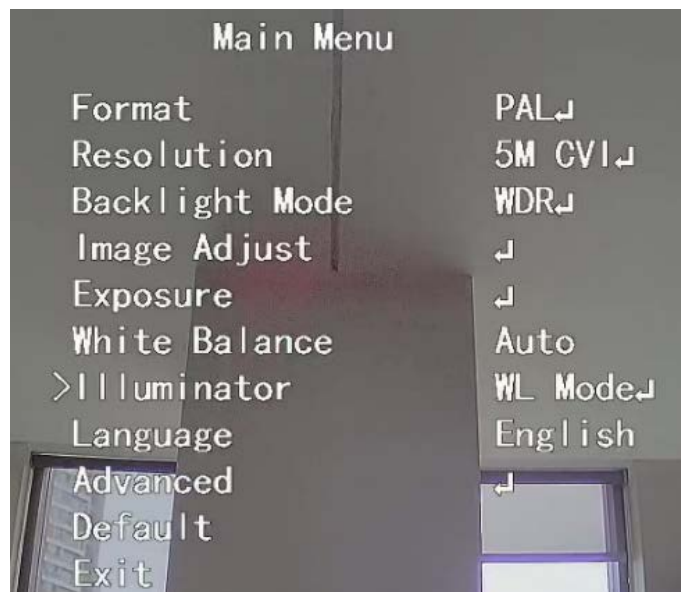


Figure 5-3 IR mode



6 Temperature and Humidity Camera Configuration

Temperature and humidity camera can measure the ambient temperature and humidity and display the value on the live interface.

6.1 Enabling/Disabling Temperature and Humidity

On the OSD menu (Figure 3-7), select **Advanced > Temp. & Humidity** to enable and disable the function. You can view real-time temperature and humidity in the image.

6.2 Configuring Temperature Monitoring Mode

The temperature and humidity camera supports temperature correction under strong light outdoors. You can change the temperature monitoring mode.

Step 1 On the OSD menu, select **Advanced > Temp. & Humidity**.

Step 2 Select **Standard** or **Sunlight** in the **Measure Mode** to change the temperature monitoring mode. **Standard** is set by default.



You are recommended to change the mode into **Standard** or **Sunlight** when the camera is used indoors or outdoors respectively.

6.3 Adjusting Temperature and Humidity Display

Step 1 On the OSD menu, select **Advanced > Temperature & Humidity > Location**.

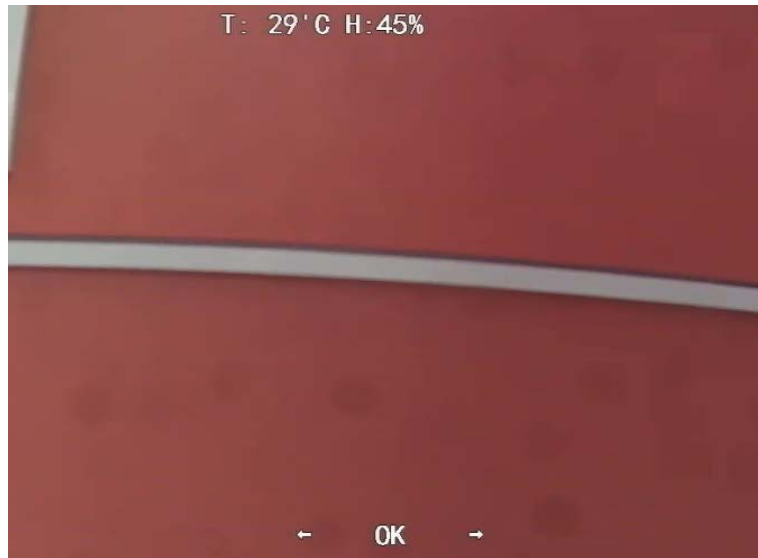


Make sure that the temperature and humidity function is enabled.

Step 2 Click the direction buttons on the PTZ menu to change the display location.

Step 3 Click **Enter** to save the configuration.

Figure 6-1 Adjust temperature and humidity display



Right-click anywhere on the monitoring image to return to the previous interface after all the settings are completed.

6.4 Viewing Temperature and Humidity

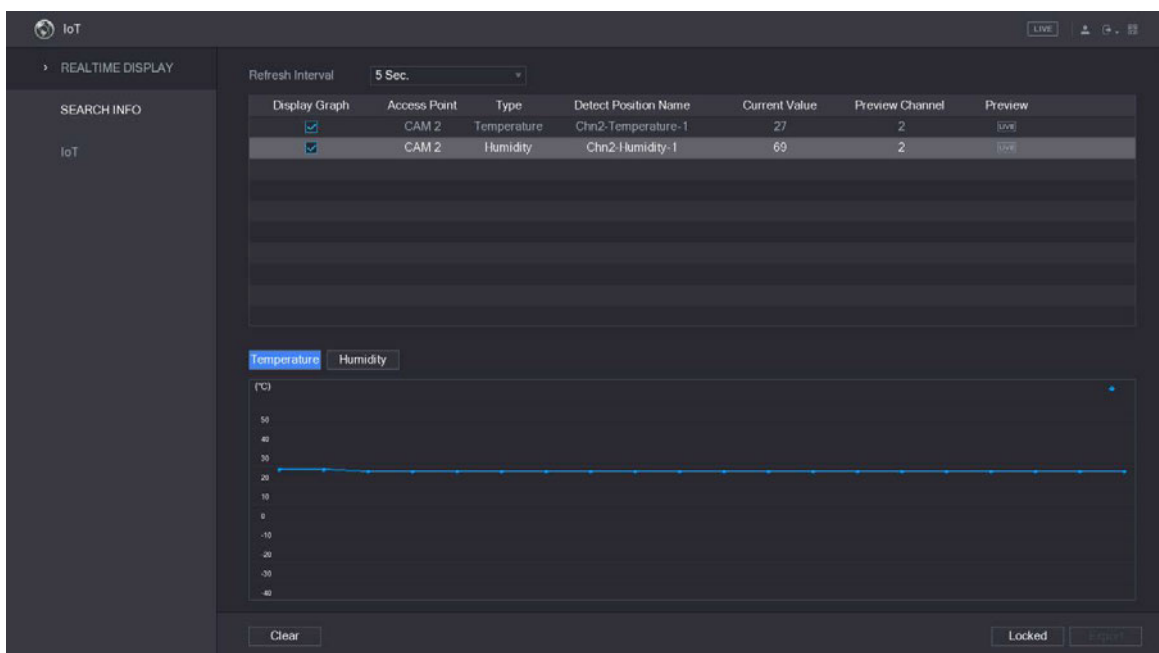
Step 1 Right-click on the live interface to enter XVR main menu (Figure 3-1).

Step 2 Select **IoT > REALTIME DISPLAY**, and then you can view the real-time temperature and humidity.



For details, see XVR user's manual.

Figure 6-2 View temperature and humidity



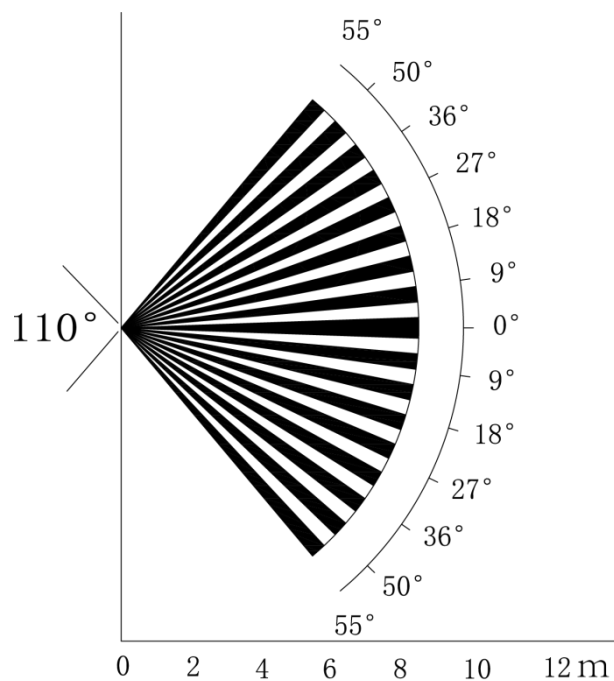
7 Active Deterrence Camera Configuration

Active deterrence camera can warn off intruders actively with LED even before users are aware of the incident. Once an intrusion is detected, the LED will be turned on to alert the intruder.

7.1 Detection Range of PIR Detector

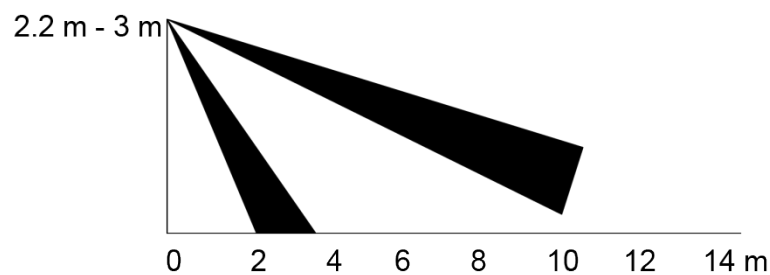
The horizontal detection range of the sensor is 100° or 110°.

Figure 7-1 Horizontal detection range



The vertical detection distance of the sensor is 2 m–10 m, 1 m–14 m or 1 m–12 m.

Figure 7-2 Vertical detection distance



7.2 Configuring Trigger Mode

On the OSD menu (Figure 3-7), select **Alert > Trigger Mode**.

- If you select **Camera Set**, the sound and light alarm will be triggered in the device.
- If you select **XVR Set**, the sound and light alarm will be triggered in the XVR.



For details, see XVR user's manual.

7.3 Configuring Light Warning and Audio Alarm



This function is available only when the trigger mode is set to **Camera Set**.

- On the OSD menu (Figure 3-7), select **Alert**. Set **Light Warning** to **ON**, and then enter the item.
 - ◇ For **Mode**, you can select from **Lighting** to **Flash**. If you select **Flash**, you can set the **Flash Frequency** to **Low**, **Medium** or **High**.
 - ◇ For **Alert Duration**, you can adjust from 5 seconds to 60 seconds.
- On the Audio Alert item, set it to ON, and then enter the item.
 - ◇ In the **Audio** item, you can select from three audios.



You can contact after-sales support to customize alarm audios.

- ◇ In the **Volume** item, you can select from **Low**, **Medium** and **High**.
- ◇ In the **Alert Duration**, you can adjust from 5 seconds to 60 seconds.

7.4 Configuring Smart Dual Illuminators Active Deterrence Camera



For details on configuring smart dual illuminators, see "5 Smart Dual Illuminators Cameras Configuration".

Step 1 Select **Main Menu > Alert**, and then set **Audio Alert** to **ON**.

Step 2 Set the Volume and Alert Duration.



The shortest of alert duration is 5 s, and the longest is 60 s.

Step 3 Select 5 different audio clips (including Alarm, No parking here, Private land no entry, Warning zone keep off, and Welcome).



You can also DIY the first clip to a .bin file and import to the back-end to use.

Figure 7-3 Main menu



Figure 7-4 Alert

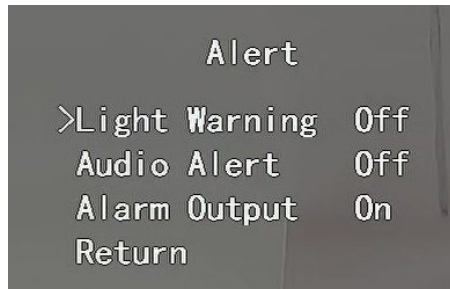
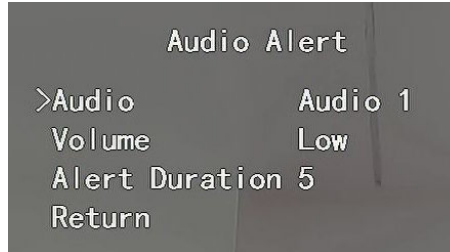


Figure 7-5 Audio alert



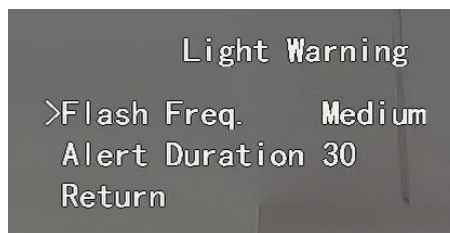
Step 4 Select **Main Menu > Alert**, and then set **Light Warning** to **ON**.

Step 5 Set the Flash Freq and Alert Duration.



The shortest of alert duration is 5 s, and the longest is 60 s.

Figure 7-6 Light warning



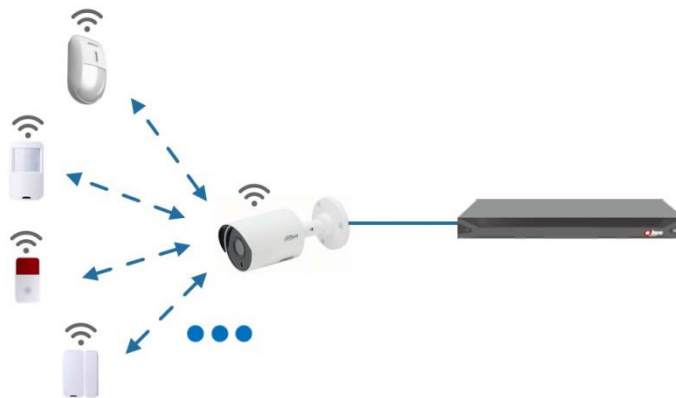
8 Gateway Camera Configuration



This function is available on select models.

This series of devices can serve as a gateway to connect compatible wireless node devices, including door/window contact, siren, and PIR detector to XVR to form a local alarm network. Once any alarm from devices within the network is triggered, the device transmits alarm signal as configured.

Figure 8-1 Network diagram



Connect the wireless node devices to XVR with gateway camera and then configure parameters.



For more detailed configuration, see user's manual of XVR or node device.

8.1 Connecting Node Devices on OSD menu

- Step 1 On the OSD menu (Figure 3-7), select **Advanced**.
- Step 2 Set **Enroll** to **ON**, and the device enters pairing mode.
Operate the node device and enter pairing mode according to corresponding manual.
- Step 3 After pairing is completed, you can check the information of the connected device on the **Sensor Pairing** interface.

8.2 Connecting Node Devices on XVR

- Step 1 On the XVR Main Menu (Figure 3-1), select **IoT > MANAGER > Sensor Pairing**.
- Step 2 Click **Add**.

Figure 8-2 Add sensor pairing (1)

Add

Access Type: Camera Gateway

Add Way: Pair

Access Point: Chn2-Air

Serial No.:

Name:

Type:

Class:

Status: --

Step 3 In the Access Type list, select Camera Gateway.

Step 4 Click **Pair**, and the device enters pairing mode.

Operate the node device and enter pairing mode.

Figure 8-3 Add sensor pairing (2)

Add

Access Type: Camera Gateway

Add Way: Pair

Access Point: Chn6-Air

Serial No.: 3J01837

Name: Chn6-Panic Button-1

Type: Panic Button

Class: Alarm In

Status: Connected

Step 5 Click **Back**.





Click  to modify the device name; click  to delete node device.

Figure 8-4 Connected device

IoT LIVE

REALTIME DISPLAY **Sensor Pairing** Temperature/Hu... Wireless Detector Wireless Siren

SEARCH INFO Access Type: Camera Gateway Channel: All

MANAGER

1	Edit	Delete	Status	Access Type	Access Point	Type
1				Camera Gat...	Chn2-Airfly	Panic Button

9 Box Camera Installation



- The device is not equipped with lens when it is delivered out of factory and you need to install lens.
- Do not remove the electrostatic adsorption film on the surface of transparent cover before installation and debugging are completed, which is to avoid damage during installation.
- Install the lens onto the device in time after unpacking, which is to avoid the device module being exposed in humid environment for a long time.
- The mounting surface shall be thick enough to sustain at least 3 times of the device weight.
- Install the C/CS adapter ring to the camera if you are using C mount lens.
- The following installation figure is for reference only.

9.1 Lens Installation

9.1.1 Installing Lens Type 1

Step 1 Remove the protection cap from the device. Align the lens to the lens position of the device (Install the C/CS adapter ring to the device if you are using C mount lens). Turn clockwise to secure the lens firmly.

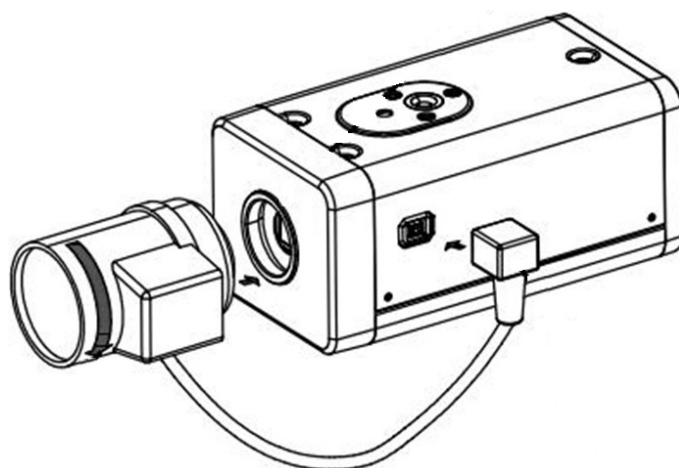
Step 2 Insert the socket of the lens cable into the auto iris lens connector on the side panel of the device. Skip this step if you are using auto iris lens.

Step 3 Fasten the screw near the focusing ring, and then turn anti-clockwise to move the focusing ring out to focus manually until you get clear video.

Step 4 After you completed focusing, fix the screw near the focusing ring firmly.

Step 5 Fasten the focusing ring.

Figure 9-1 Lens installation (1)



9.1.2 Installing Lens Type 2

Figure 9-2 Front panel

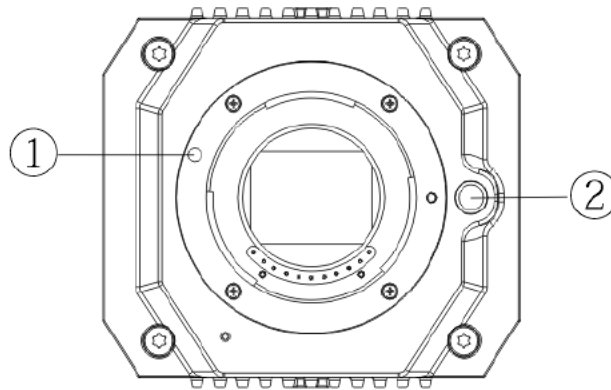


Table 9-1 Front panel components

No.	Name	No.	Name
1	Red sign	2	Lens-dismounting button

Step 1 Remove the protection cover on the device lens, align the red sign of the lens with the red sign ① on the device, rotate the buckle clockwise until the lens-dismounting button ② bounces upward, and then the lens is installed.

Step 2 Loosen the screw on the focusing ring, rotate the focusing ring outward to focus manually until you get clear video. Skip this step if you are using lens that supports auto focusing.

Figure 9-3 Lens installation (2)

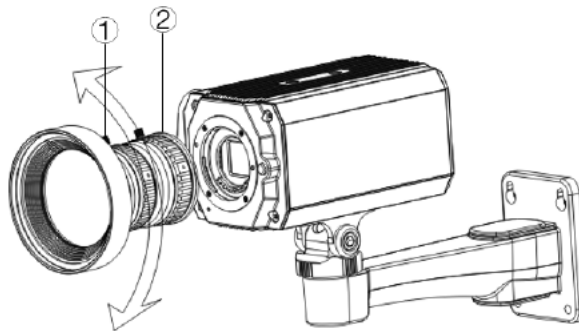


Table 9-2 Lens components

No.	Name	No.	Name
1	Screw	2	Focusing ring

Step 3 After focusing, tighten the screw on the focusing ring and fix the focusing ring.



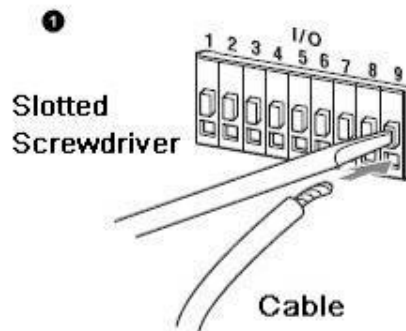
To dismount the lens, press lens-dismounting button ②, rotate the lens anticlockwise, and release the bucket.

9.2 I/O Port Installation

9.2.1 Connecting Cable

- Step 1 Press and hold the mini screwdriver to press the button on the hole groove of the cable to be connected.
- Step 2 Insert the cable into the hole groove.
- Step 3 Release the screwdriver.

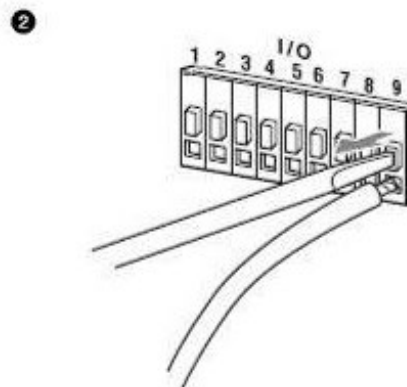
Figure 9-4 Install cable



9.2.2 Removing Cable

- Step 1 Use the mini screwdriver to press the button on the hole groove of the cable to be connected.
- Step 2 Pull out the cable from the hole groove.
- Step 3 Release the screwdriver.

Figure 9-5 Remove cable



9.3 Device Installation



The device is delivered without mounting bracket and screw. You need to purchase them separately.

Figure 9-6 Device components

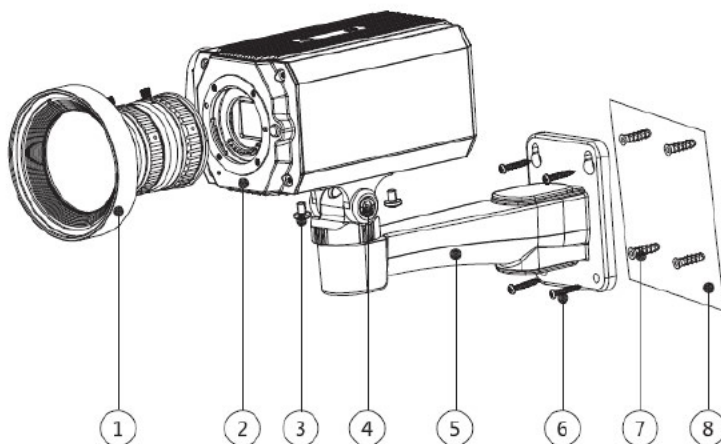


Table 9-3 Device components

No.	Name	No.	Name
1	Lens	5	Mounting bracket
2	Front panel	6	Self-tapping screw
3	Fixing screw	7	Expansion bolt
4	Bracket adjusting screw	8	Mounting surface

Step 1 Fix the mounting bracket ⑤ on the mounting surface ⑧.

- 1) Mark the bracket mounting hole positions on the mounting surface ⑧, drill four holes on the marked positions, insert four expansion bolts ⑦ into the mounting holes and then tighten.
- 2) Align the four screw holes on the bottom of the mounting bracket ⑤ with the expansion bolts, insert four self-tapping screws ⑥ and then tighten.

Step 2 Fix the device on the mounting bracket ⑤.

Align the mounting hole positions on the bottom of device casing with the mounting holes positions on the mounting bracket ⑤, and then install the device on the mounting bracket with fixing screw ③.

Step 3 Adjust camera monitoring angle.

Use a wrench to loosen the adjusting screw ④, adjust camera to the location which needs to be monitored, and then use wrench to tighten bracket adjusting screw ④ to fix the device.

Step 4 Connect the cable to the back panel of the device.

After device installation and cable connection, you can view monitoring image through storage device such as XVR.

10 Fisheye Camera Configuration

The fisheye camera (panoramic camera) has wide monitoring angle but its video is distorted. The dewarp function can provide the proper and vivid video suitable for human eyes. Fisheye function should be configured at XVR.



This function is available on select models.

10.1 Fisheye Dewarp on the Live Interface

Step 1 On the XVR shortcut menu, select **Fisheye**.

Step 2 Set fisheye **Fit Mode** and **Show Mode**.

Figure 10-1 Fisheye menu

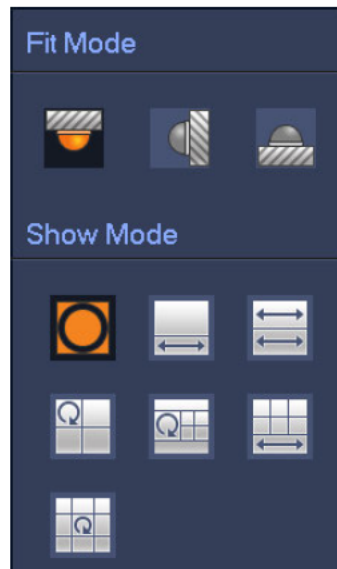

















Table 10-1 Parameters of fisheye

Fit Mode	Icon	Description
Ceilling mount ( Ground mount ()		360° panorama original window
		1 dewarp window and 1 panorama expanded window
		2 panorama expanded windows
		1 360° panorama window and 3 dewarp windows
		1 360° panorama window and 4 dewarp windows
		4 dewarp windows and 1 panorama expanded window
		1 360° panorama window and 8 dewarp windows
Wall mount ()		360° panorama original window
		Panorama expanded window
		1 panorama unfolding window and 3 dewarp windows
		1 panorama unfolding window and 4 dewarp windows
		1 panorama unfolding window and 8 dewarp windows



- The dewarp modes might vary for different installation modes.
- For the non-fisheye channel, a prompt is displayed to remind you that dewarp function is not supported.
- Some series products support 180° dewarp which can only be wall mounted. The actual product shall prevail.

Figure 10-2 Fisheye show mode





You can use the mouse to drag the color areas on the left original screen or the rectangular screens on the right to change the monitoring ranges. (Not supported for wall mount.)

10.2 Fisheye Dewarp During Playback

When playing back the fisheye recorded video, you can use dewarp function to adjust video.

Step 1 On the XVR main menu, click **SEARCH**.

Step 2 Select 1-window playback mode and corresponding fisheye channel, and then click  to play.

Step 3 Right-click  to go to the dewarp playback interface.

11 PT Camera Configuration



This function is available on select models.

11.1 PTZ Control

The newly-added PT rotation function based on the HDCVI camera supports rotating horizontally (0° to 355°) and vertically (0° to 90°).

You can click or click and hold up, down, left and right to control the PT rotation on the **PTZ** page, and then adjust the PT camera viewing angle.



The same operation method is applicable to XVR and DMSS.

You can click **Speed** on the **PTZ** page to control the rotating speed of the PT camera. The higher the value, the faster the camera rotates.

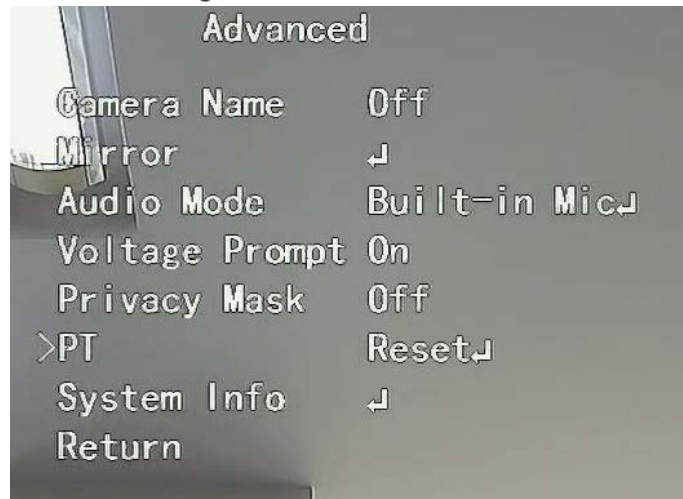
Figure 11-1 PTZ control



11.2 PT Reset

Every time the camera operates self-test once powered on, to check if it can work normally by rotating horizontally, vertically, and then rotates back to the original status. You can also select **Advanced > PT Reset** to reset the PT camera through the OSD menu, and then the camera rotates horizontally, vertically, and then rotates back to the original status.

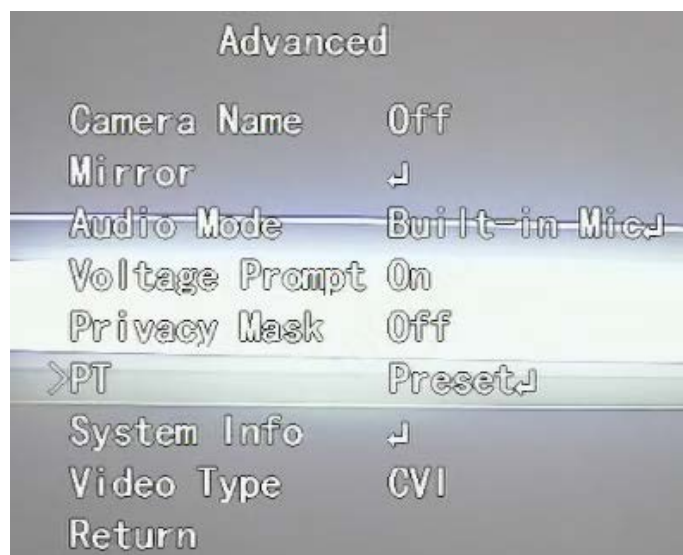
Figure 11-2 PT reset



11.3 PT Preset

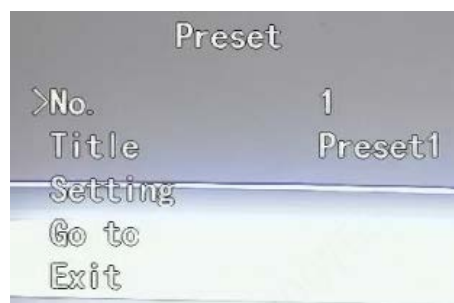
Step 1 On the OSD menu (Figure 3-7), select **Advanced** > **PT** > **Preset**.

Figure 11-3 PT preset (1)



Step 2 Adjust the PT camera to the desired position, and then select the **No.** between **1** and **80**.

Figure 11-4 PT preset (2)



Step 3 Select **Setting**, and then click **Enter** to save this position as a preset point.

Repeat step 2 and step 3 to set multiple preset points.

You can select a **No.** and use **go to** to call the preset point.

12 FAQ

12.1 Flicker

Flicker is a phenomenon where the screen flickers with stripes due to a mismatch between the device's frame rate and the frequency of light sources (such as lighting) in the environment.

To resolve the flickering phenomenon, you can follow these steps:

Step 1 On the OSD menu (Figure 3-7), select **Exposure > Anti-flicker**.

Step 2 Switch parameter options and choose the best parameters based on the image effect.

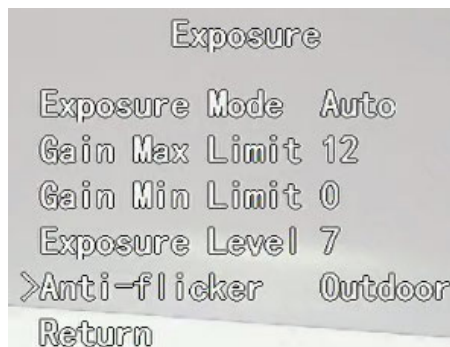


Different devices may support different parameter options, refer to the actual page for the available options.

Figure 12-1 Anti-flicker (1)



Figure 12-2 Anti-flicker (2)



12.2 PoC Power Supply

PoC XVR supports PoC function.

PoC camera can be divided into AT camera and AF camera. Power consumption of AT camera is less than 12W, and power consumption of AF camera is less than 6W.

You need to check the maximum power of PoC before use. Assuming that the maximum power of one XVR is 48W, the XVR can connect AT cameras up to $48/12=4$ and AF cameras up to $48/6=8$.

When the device is in the condition of PoC power supply, do not connect any other device between the device and PoC XVR or PoC transceiver such as UTC, Balun, optical transceiver, distributor and convertor and so on; otherwise, the device might get burned.

PoC power supply is with high voltage. Do not dismantle the device during normal operation; otherwise it might cause danger to both device and users due to high voltage.

12.3 Long Distance Power Supply

In many scenarios, our clients adopt long distance power supply, transmitting 12V DC to cameras located over 100 m. Such long distance power supply might cause problems.

Q1: Recurrent restart of devices or even ICR Failure.

Possible reasons: The long power supply cable leads to a large voltage drop on the equipment power supply cable, and turning on the IR light at night leads to a further increase of the voltage drop, resulting in restart of the device. After the device is restarted, the ICR is switched to the Day mode by default. By judging the ambient light at night, the device will operate in Night mode, and then the infrared light is turned on, which causes the device to restart again because of undervoltage. Thus, ICR is switched to every 2 seconds, impacting its switching lifespan.

Q2: Unable to restart devices at night, and black screen or restart occurs when switching ICR.

Possible reasons: The long power supply cable leads to a large voltage drop on the equipment power supply cable, and turning on the IR light at night leads to a further increase of the voltage drop, resulting in restart of the device and black screen.

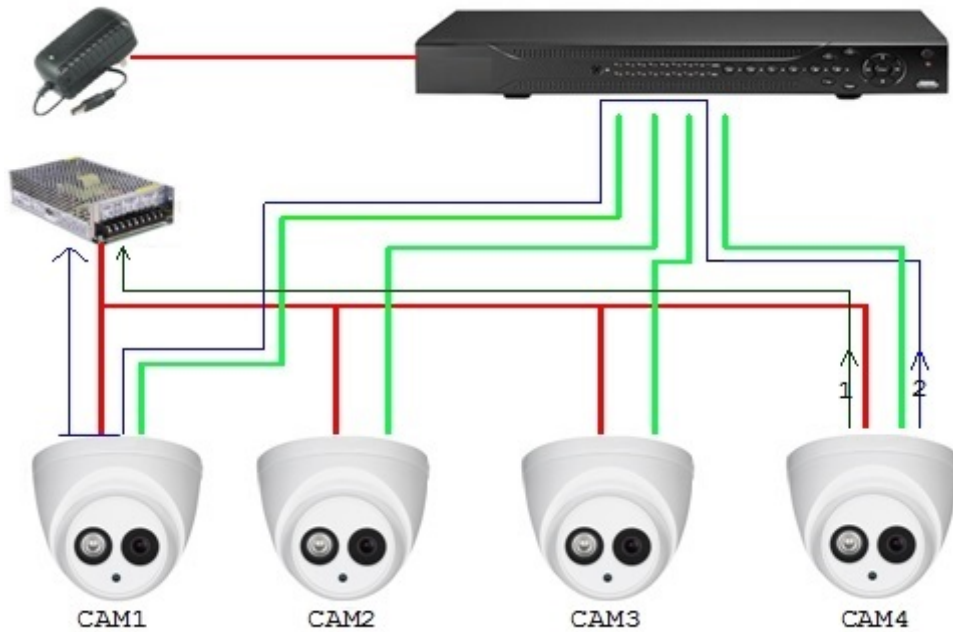
Solution: During construction, when the camera location is far from the power supply, you need to adopt long distance separate power supply or purchase –DP dual power supply to use 24V AC power supply.

12.4 Centralized Power Supply

The typical problem of centralized power supply is that there are obvious black stripes on the device screen, which interferes with the display.

The principle of centralized power supply is as follows:

Figure 12-3 Principle of centralized power supply



There are two paths for the power output of CAM4: Return path 1 and return path 2. Return path 1 first flows to CAM1, and then flows to the power supply from power supply ground of CAM1. In this way, the reflow of power supply ground CAM4 affects the video ground of CAM1, resulting in interference stripes on the screen. And CAM4 also interferes with CAM2 and CAM3.

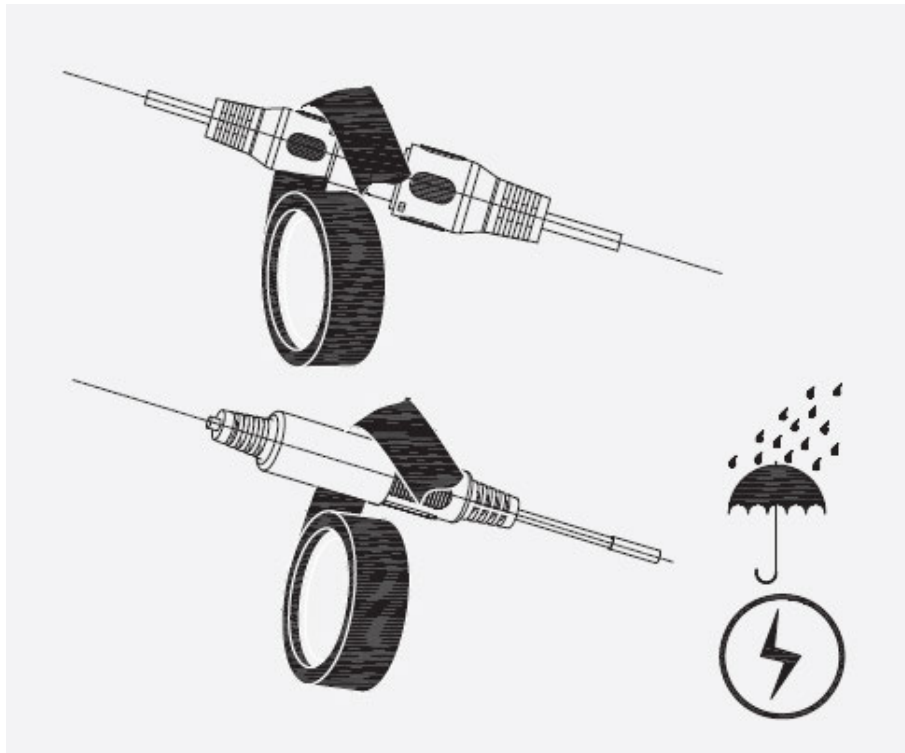
In the same way, CAM1, CAM2 or CAM3 affects other cameras besides itself.

The main reason for the interference of centralized power supply is that the power supply ground of camera is not isolated. To solve this problem: Use dual-power devices with isolation of power supply ground; equip low-power devices with power isolators to block the return path 2; low-power devices can also use power isolators to block the return path 2; use isolated power supplies for each channel, or power the device separately, which are the two recommended methods.

12.5 Connector Waterproof Protection

HDCVI cameras need to be well waterproofed and protected. After installation, wrap the BNC connector and power connector tightly with insulated or waterproofed tape to prevent water and external electromotive forces. When metal casing device is installed on metal surfaces such as elevators and buses, the metal casing should not be in contact with the installation surface to prevent water and external electromotive forces.

Figure 12-4 Waterproof measures



13 Maintenance



In order to maintain the image quality and proper functioning of the device, please read the following maintenance instructions carefully and hold rigid adherence.

Disassembly and Desiccant Replacement

- Carefully follow the instructions in the manual when performing any disassembly operation about the device; otherwise, it might cause water leakage or poor image quality due to unprofessional disassemble.
- Please contact after-sale service for desiccant replacement if there is condensed fog found on the lens after unpacking or when the desiccant turns green. (Not all models are included with the desiccant).

Maintaining Lens and Lens Protector

- The lens and lens protector are covered with antireflection coating, which could be contaminated or damaged and result in lens scratches or haze images when being touched with dust, grease, fingerprints and other similar substances.
- Do not touch the image sensor (CCD or CMOS) directly. Dust and dirt could be removed with air blower, or you can wipe the lens gently with soft cloth that moistened with alcohol.

Maintaining Device Body

- Device body can be cleaned with soft dry cloth, which can also be used to remove stubborn stains when moistened with mild detergent.
- To avoid possible damage on device body coating which could cause performance decrease, do not use volatile solvent such as alcohol, benzene, diluent and so on to clean the device body, nor can strong, abrasive detergent be used.

Appendix 1 Security Recommendation

1. Account Management

1.1 Use complex 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: 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 repeating characters, such as 111, aaa, etc.

1.2 Change passwords periodically

It is recommended to periodically change the device password to reduce the risk of being guessed or cracked.

1.3 Allocate accounts and permissions appropriately

Appropriately add users based on service and management requirements and assign minimum permission sets to users.

1.4 Enable account lockout function

The account lockout function is enabled by default. You are advised to keep it enabled to protect account security. After multiple failed password attempts, the corresponding account and source IP address will be locked.

1.5 Set and update password reset information in a timely manner

Our device supports password reset function. To reduce the risk of this function being used by threat actors, if there is any change in the information, please modify it in time. When setting security questions, it is recommended not to use easily guessed answers.

2. Service Configuration

2.1. Enable HTTPS

It is recommended that you enable HTTPS to access Web services through secure channels.

2.2 Encrypted transmission of audio and video

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

2.3 Turn off non-essential services and use safe mode

If not needed, it is recommended to turn off some services such as SSH, SNMP, SMTP, UPnP, AP hotspot etc., to reduce the attack surfaces.

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

- SNMP: Choose SNMP v3, and set up strong encryption and authentication passwords.
- SMTP: Choose TLS to access mailbox server.
- FTP: Choose SFTP, and set up complex passwords.
- AP hotspot: Choose WPA2-PSK encryption mode, and set up complex passwords.

2.4 Change HTTP and other default service ports

It is recommended that you change the default port of HTTP and other services to any port between 1024 and 65535 to reduce the risk of being guessed by threat actors.

3. Network Configuration

3.1 Enable Allow list

It is recommended that you turn on the allow list function, and only allow IP in the allow list to access the device. Therefore, please be sure to add your computer IP address and supporting device IP address to the allow list.

3.2 MAC address binding

It is recommended that you bind the IP address of the gateway to the MAC address on the device to reduce the risk of ARP spoofing.

3.3. Build a secure network environment

In order to better ensure the security of devices and reduce potential cyber risks, the following are recommended:

- Disable the port mapping function of the router to avoid direct access to the intranet devices from external network.
- According to the actual network needs, partition the network: if there is no communication demand between the two subnets, it is recommended to use VLAN, gateway and other methods to partition the network to achieve network isolation.
- Establish 802.1x access authentication system to reduce the risk of illegal terminal access to the private network.

4. Security Auditing

4.1 Check online users

It is recommended to check online users regularly to identify illegal users.

4.2 Check device log

By viewing logs, you can learn about the IP addresses that attempt to log in to the device and key operations of the logged users.

4.3 Configure network log

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

5. Software Security

5.1 Update firmware in time

According to the industry standard operating specifications, the firmware of devices needs to be updated to the latest version in time in order to ensure that the device has the latest functions and security. If the device is connected to the public network, it is recommended to enable the online upgrade automatic detection function, so as to obtain the firmware update information released by the manufacturer in a timely manner.

5.2 Update client software in time

It is recommended to download and use the latest client software.

6. Physical Protection

It is recommended that you carry out physical protection for devices (especially storage devices), such as placing the device in a dedicated machine room and cabinet, and having access control and key management in place to prevent unauthorized personnel from damaging hardware and other peripheral equipment (e.g. USB flash disk, serial port).