# HDCVI Camera

## User's Manual

V1.0.0

# Foreword

## General

This manual introduces the functions and operations of the HDCVI camera (hereinafter referred to as "the device").

## Safety Instructions

The following categorized signal words with defined meaning 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 |
|---|---|---|
| V1.0.0 | First release. | 2024.10 |

## About the Manual

- The manual is for reference only. If there is inconsistency between the manual and the actual product, the actual product shall prevail.
- We are not liable for any loss caused by the operations that do not comply with the manual.
- The manual would be updated according to the latest laws and regulations of related jurisdictions. For detailed information, refer to the paper manual, CD-ROM, QR code or our official website. If there is inconsistency between paper manual and the electronic version, the electronic version shall prevail.
- All the designs and software are subject to change without prior written notice. The product updates might cause some differences between the actual product and the manual. Please contact the customer service for the latest program and supplementary documentation.
- There still might be deviation in technical data, functions and operations description, or errors in print. 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 the company names in the manual are the properties of their respective owners.
- Please visit our website, contact the supplier or customer service if there is any problem occurring when 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.
- Pack the device with packaging provided by its manufacturer or packaging of the same quality before transporting it.
- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during transportation.

## Storage Requirements

- Store the device under allowed humidity and temperature conditions.
- Do not place the device in a humid, dusty, extremely hot or cold site that has strong electromagnetic radiation or unstable illumination.
- Do not place heavy stress on the device, violently vibrate or immerse it in liquid during storage.

## Installation Requirements

 **WARNING**

- Strictly comply with the local electrical safety code and standards, and check whether the power supply is correct before operating the device.
- Please follow the electrical requirements to power the device.
  - ◇ When selecting the power adapter, the power supply must conform to the requirements of ES1 in IEC 62368-1 standard and be no higher than PS2. Please note that the power supply requirements are subject to the device label.
  - ◇ We recommend using the power adapter provided with the device.
- Do not connect the device to two or more kinds of power supplies, unless otherwise specified, to avoid damage to the device.
- The device must be installed in a location that only professionals can access, to avoid the risk of non-professionals becoming injured from accessing the area while the device is working. Professionals must have full knowledge of the safeguards and warnings of using the device.

- 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 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 earthing portion ⏚ of the device to improve its reliability.
- Ground the function earthing portion ⏚ of the device to improve its reliability (certain models are not equipped with earthing holes). 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 lens is an optical component. Do not directly touch or wipe the lens surface during installation.

## Operation Requirements

**WARNING**

- The cover must not be opened while the device is powered on.
- Do not touch the heat dissipation component of the device to avoid the risk of getting burnt.

- Use the device under allowed humidity and temperature conditions.
- 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.
- Protect indoor devices from rain and dampness to avoid electric shocks and fires breaking out.
- Do not block the ventilation opening near the device to avoid heat accumulation.
- 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 directly touch the photosensitive CMOS. Use an air blower to clean the dust or dirt on the lens.

● Strengthen the protection of the network, device data and personal information. All necessary safety measures to ensure the network security of the device must be taken, such as using strong passwords, regularly changing your password, updating firmware to the latest version, and isolating computer networks. For the IPC firmware of some previous versions, the ONVIF password will not be automatically synchronized after the main password of the system has been changed. You need to update the firmware or change the password manually.

## Maintenance Requirements

- Strictly follow the instructions to disassemble the device. Non-professionals dismantling the device can result in it leaking water or producing poor quality images. For a device that is required to be disassembled before use, make sure the seal ring is flat and in the seal groove when putting the cover back on. When you find condensed water forming on the lens or the desiccant becomes green after you disassembled the device, contact after-sales service to replace the desiccant. Desiccants might not be provided depending on the actual model.
- Use the accessories suggested by the manufacturer. Installation and maintenance must be performed by qualified professionals.

- Do not directly touch the photosensitive CMOS. Use an air blower to clean the dust or dirt on the lens. When it is necessary to clean the device, slightly wet a soft cloth with alcohol, and gently wipe away the dirt.
- Clean the device body with a soft dry cloth. If there are any stubborn stains, clean them away with a soft cloth dipped in a neutral detergent, and then wipe the surface dry. Do not use volatile solvents such as ethyl alcohol, benzene, diluent, or abrasive detergents on the device to avoid damaging the coating and degrading the performance of the device.
- The lens is an optical component. When it is contaminated with dust, grease, or fingerprints, use degreasing cotton moistened with a little ether or a clean soft cloth dipped in water to gently wipe it clean. An air gun is useful for blowing dust away.
- It is normal for a camera made of stainless steel to develop rust on its surface after being used in a strong corrosive environment (such as the seaside, and chemical plants). Use an abrasive soft cloth moistened with a little acid solution (vinegar is recommended) to gently wipe it away. Afterwards, wipe it dry.

# Table of Contents

# 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 Features

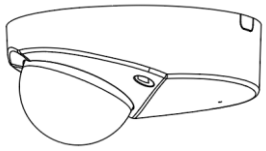
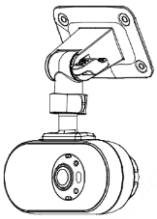
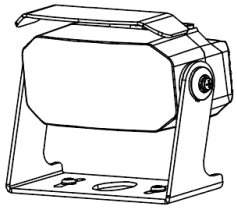
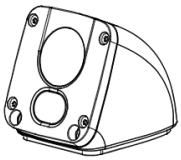
- High-performance CMOS image sensor, high definition of images.
- Supports HDCVI video output.
- Supports parameter configuration of OSD.
- Supports auto exposure, auto white balance and electronic gain.
- High-speed, long-distance, real-time transmission. The 720P series supports lossless transmission of ordinary 75-3 class coaxial line for more than 500 meters, and the 1080P series supports lossless transmission of ordinary 75-3 class coaxial line for more than 300 meters.
- Supports ultra-wide dynamic function, the range is up to 120dB (supported by some models of devices).

# 2 Structure

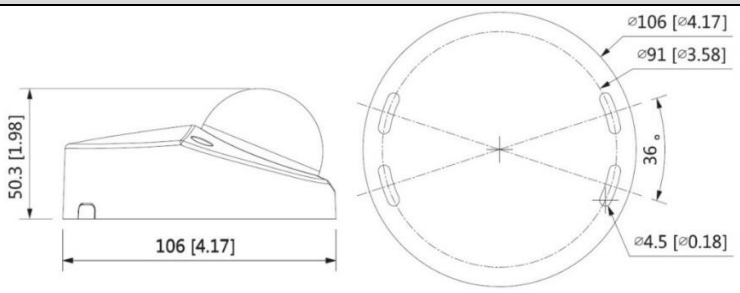
This chapter introduces the device information, such as appearance, dimensions, and cables.

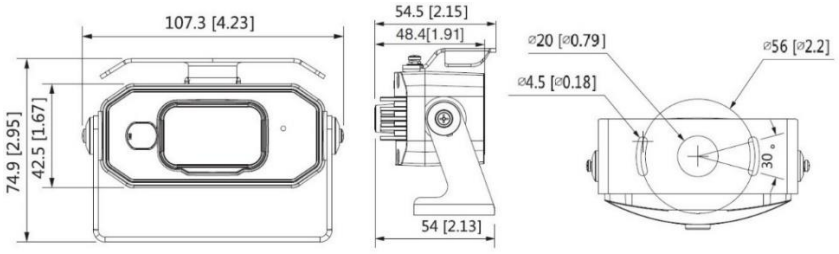
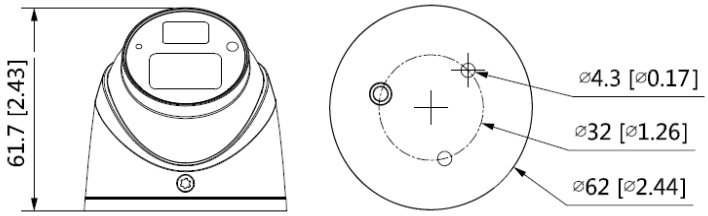
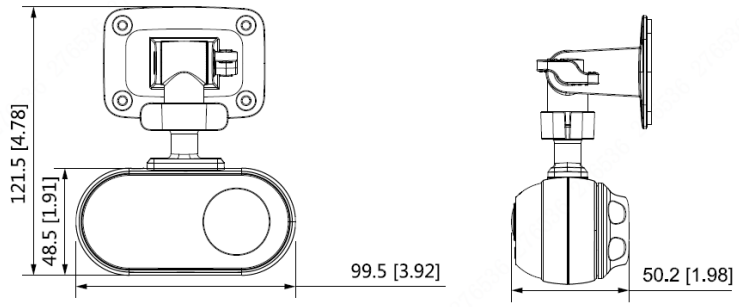
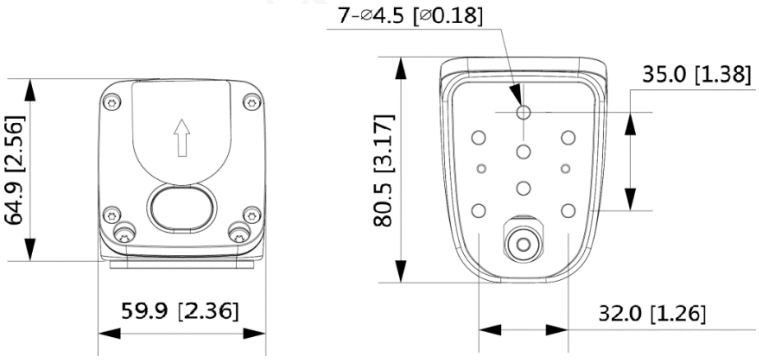
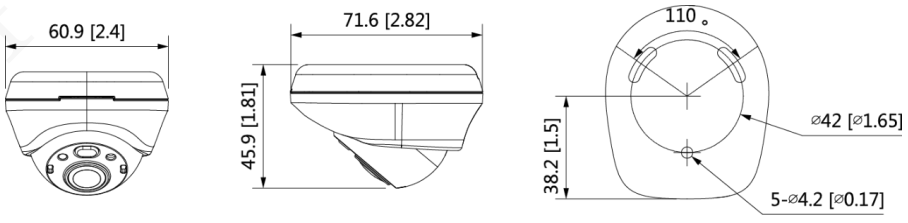
The following figures are for reference only, and the actual product shall prevail.

## 2.1 Appearance

| Model | Appearance | Model | Appearance |
|---|---|---|---|
| A |  | D |  |
| B |  | E |  |
| C |  | F |  |

## 2.2 Dimension

| Model | Appearance |
|---|---|
| A |  |

| Model | Appearance |
|---|---|
| B |  |
| C |  |
| D |  |
| E |  |
| F |  |

# 2.3 Cable

- Cable types might vary with different cameras, and the actual product shall prevail.
- Waterproof the cable connections of the device to prevent water ingress.

Figure 2-1 HDCVI aviation connector

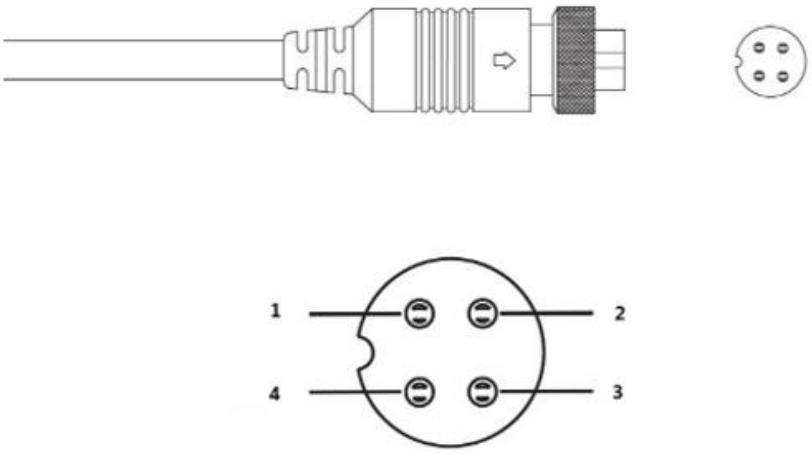



Table 2-1 HDCVI aviation connector components

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

# 3 Installation

- Make sure the mounting surface is strong enough to hold at least three times of the camera weight.
- Keep the protection film on the dome before installation and adjustment finished to avoid possible scratch.
- Properly handle the device after unpacking. Do not expose the device in humid environment.
- The following figure is for reference only, and the actual product shall prevail.

## 3.1 Installing Model A

Screw cover is available on select models.

For the installation diagram and item list of model A, see Figure 3-1 and Table 3-1.

Figure 3-1 Model A installation diagram

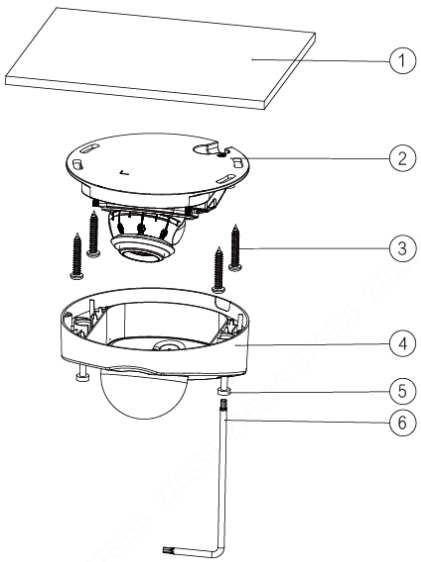



Table 3-1 Model A installation item list

| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Mounting surface | 2 | Pedestal | ③ | Self-tapping screw |
| 4 | Cover | 5 | Locking screw | ⑥ | Wrench |

Step 1 Drill screw holes (and the cable outlet hole if it needs to go through the mounting surface) on the mounting surface① as indicated on the positioning map.

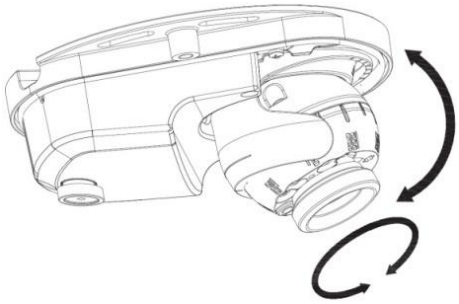
Step 2 Loosen the locking screws5 on the cover4 with the supplied wrench⑥ and take the cover4 off.

Step 3 Adjust the location of the pedestal2 according to cable outlet requirement (top out or side out), then pull the cable out through mounting surface or the side cable tray. Align the screw holes on the pedestal cover4 to those on the mounting surface.

Step 4 Insert the self-tapping screw③ through the screw holes on the pedestal③and fasten them to attach the camera to the mounting surface.

Step 5 Connect the camera to power source and HCVR, and aim the lens to the ideal angle, see Figure 3-2. Put the cover4 back on and fasten the locking screws5 .

Figure 3-2 Adjusting Model A



## 3.2 Installing Model B

For the installation diagram and item list of model B, see Figure 3-3 and Table 3-2.

Figure 3-3 Model B series installation diagram

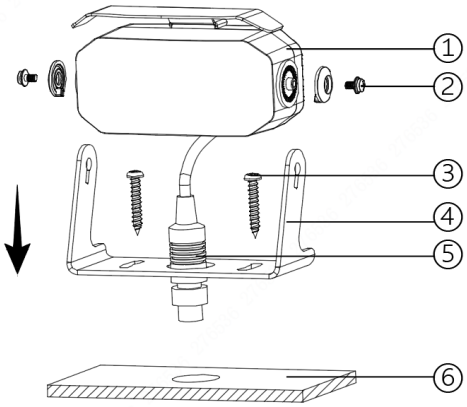



Table 3-2 Model B series installation item list

| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Device | 2 | Locking screw | ③ | Self-tapping screw |
| 4 | Bracket | 5 | Cable | ⑥ | Mounting surface |

Step 1 Unscrew the locking screws on the bracket4 to detach it.

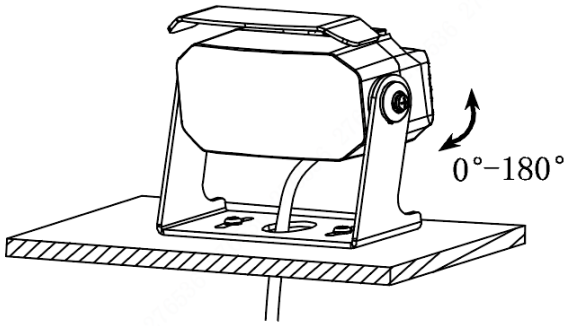
Step 2 Drill screw holes (and the cable outlet hole if it needs to go through the mounting surface) on the mounting surface⑥.

Step 3 Align the screw holes on the bracket4 to those on the mounting surface⑥, then put in and fasten the supplied self-tapping screws③ to attach the bracket4 to the mounting surface.

Step 4 Adjust the location of the device① on the bracket4 and fasten the locking screws to attach the device① on the bracket4 .

Step 5 Connect the device to power source and HCVR, aim the lens to the ideal angle (see Figure 3-4) and fasten the locking screws2 .

Figure 3-4 Adjust lens




## 3.3 Installing Model C

For the installation diagram and item list of model C, see Figure 3-5 and Table 3-3.

Figure 3-5 Model C installation diagram

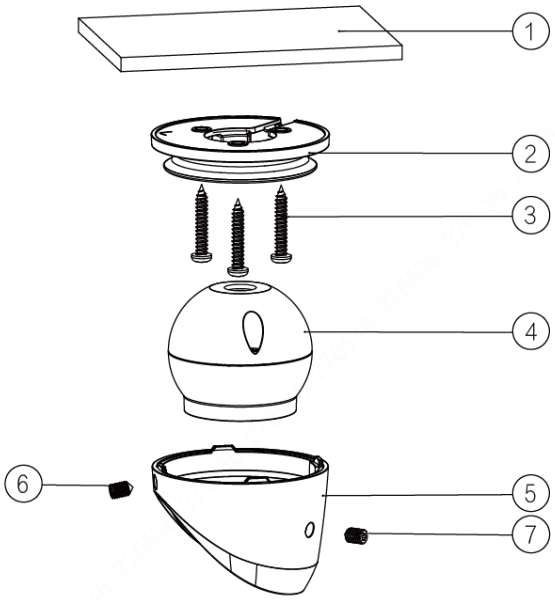



Table 3-3 Model C installation item list

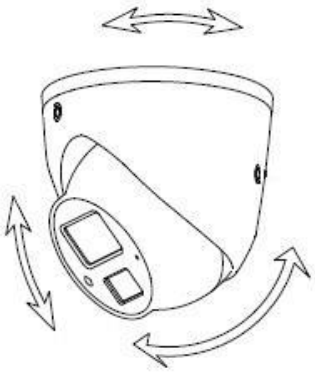
| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Mounting surface | 2 | Pedestal | ③ | Self-tapping screw |
| 4 | Dome | 5 | Cover | ⑥/⑦ | Locking screw |

Step 1 Loosen the locking screws⑥/⑦ and take the pedestal2 off.

Step 2 Adjust the location of the pedestal2 according to cable outlet requirement (top out or side out), then pull the cable out through the mounting surface① or the side cable tray. Align the screw holes on the pedestal2 to those on the mounting surface, then put in and fasten the self-tapping screws③ to attach the dome4 to the mounting surface.

Step 3 Put the cover5 back on and adjust the locking screws⑥/⑦ to hold it. Connect the dome 4 to power source and HCVR, aim the lens to the ideal angle (see Figure 3-6) and fasten the locking screws⑥/⑦.

Figure 3-6 Adjusting Model C



## 3.4 Installing Model D

Installing this model on the front windshield is recommended.

For the installation diagram and item list of model D series, see Figure 3-7 and Table 3-4.

Figure 3-7 Model D installation diagram

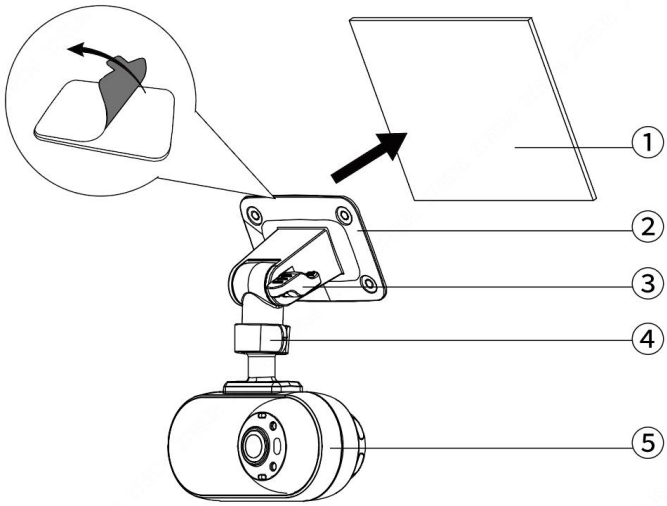


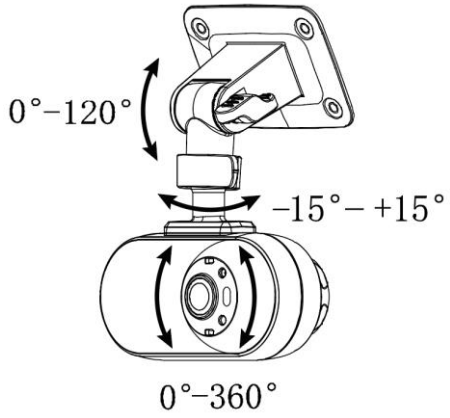

Table 3-4 Model D series installation item list

| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Mounting surface | 2 | Bracket | ③ | Adjusting knob |
| 4 | Locking ring | 5 | Lens | — | — |

Step 1 Tear off the adhesive on the bottom of the bracket2 , and then press the bracket to the mounting surface①.

Step 2 Connect the device to power source and HCVR, and aim the lens to the ideal angle, see Figure 3-8. Adjust the lens through the adjusting knob③ and locking ring4 .

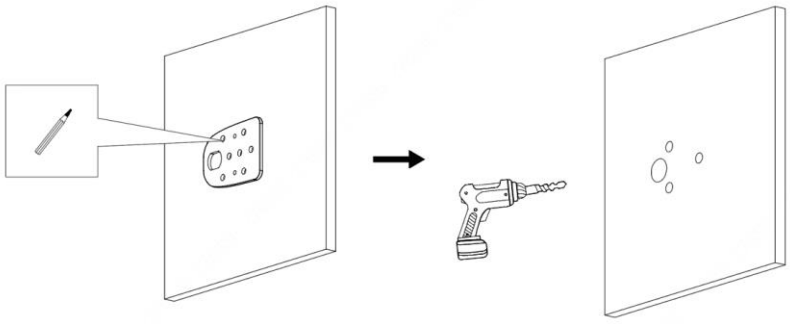
Figure 3-8 Adjusting Model D series




## 3.5 Installing Model E

Step 1 Mark installation holes and cable outlet holes on the silicone pad by pencil, and drill holes on the installation surface according to the marked holes.

Figure 3-9 Drill holes



For the installation diagram and item list of model D series, see Figure 3-10 and Table 3-5.

Figure 3-10 Separate camera and base

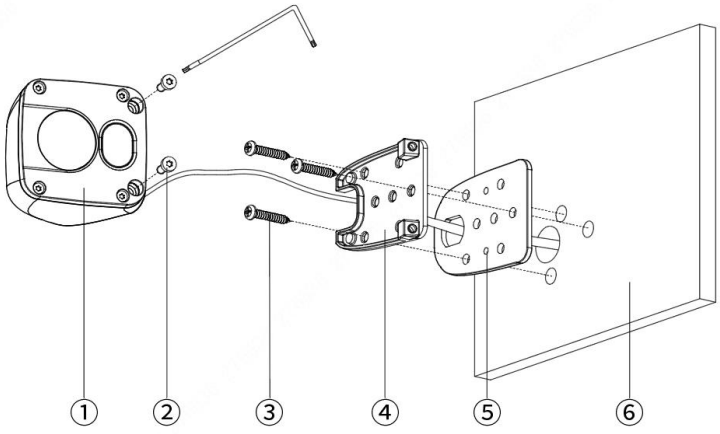



Table 3-5 Model E series installation item list

| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Camera | 2 | Fixing screw | ③ | Self-tapping screw |
| 4 | Bracket | 5 | Silicone pad | ⑥ | Mounting surface |

Step 1 Loosen the fixing screw2 with T15 L wrench to separate camera① and base4 .

Step 2 Align the installation hole of the device bracket4 with the installation hole on the mounting surface⑥, and then pull the wire out of the installation hole. Fix the bracket4 and silicone pad5 to the mounting surface⑥ with self-tapping screw③.

Step 3 Install the camera to the base and tighten the fixing screw2 .

Step 4 Connect the device to power source and HCVR.

# 3.6 Installing Model F

This model can be installed at various locations in the vehicle including dashboard, rear area, and the roof inside.

For the installation diagram and item list of model F, see Figure 3-11 and Table 3-6.

Figure 3-11 Model F installation diagram

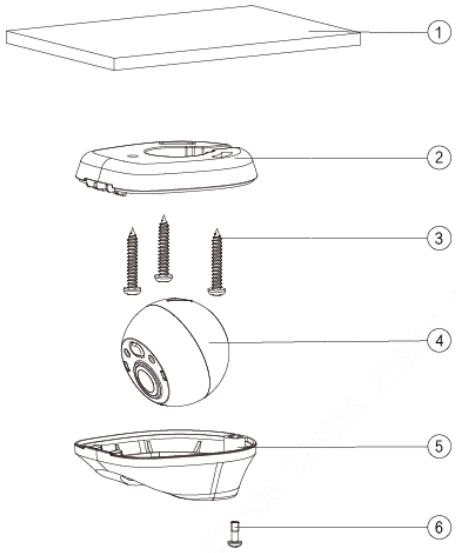



Table 3-6 Model F installation item list

| No. | Item | No. | Item | No. | Item |
|---|---|---|---|---|---|
| ① | Mounting surface | 2 | Pedestal | ③ | Self-tapping screw |
| 4 | Dome | 5 | Enclosure | ⑥ | Locking screw |

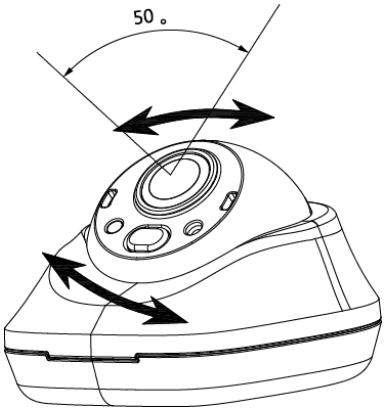
Step 1 Loosen the locking screws⑥ and take the pedestal2 off.

Step 2 Adjust the location of the pedestal2 according to cable outlet requirement (top out or side out), then pull the cable out through the mounting surface① or the side cable tray.

Step 3 Align the screw holes on the pedestal2 to those on the mounting surface, then put in and fasten the self-tapping screws③ to attach the dome4 to the mounting surface.

Step 4 Put the enclosure5 back on and adjust the locking screw⑥ to hold it. Connect the device to power source and HCVR; aim the lens to the ideal angle (see Figure 3-12) and fasten the locking screw⑥.

Figure 3-12 Adjust angle



# 4 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.

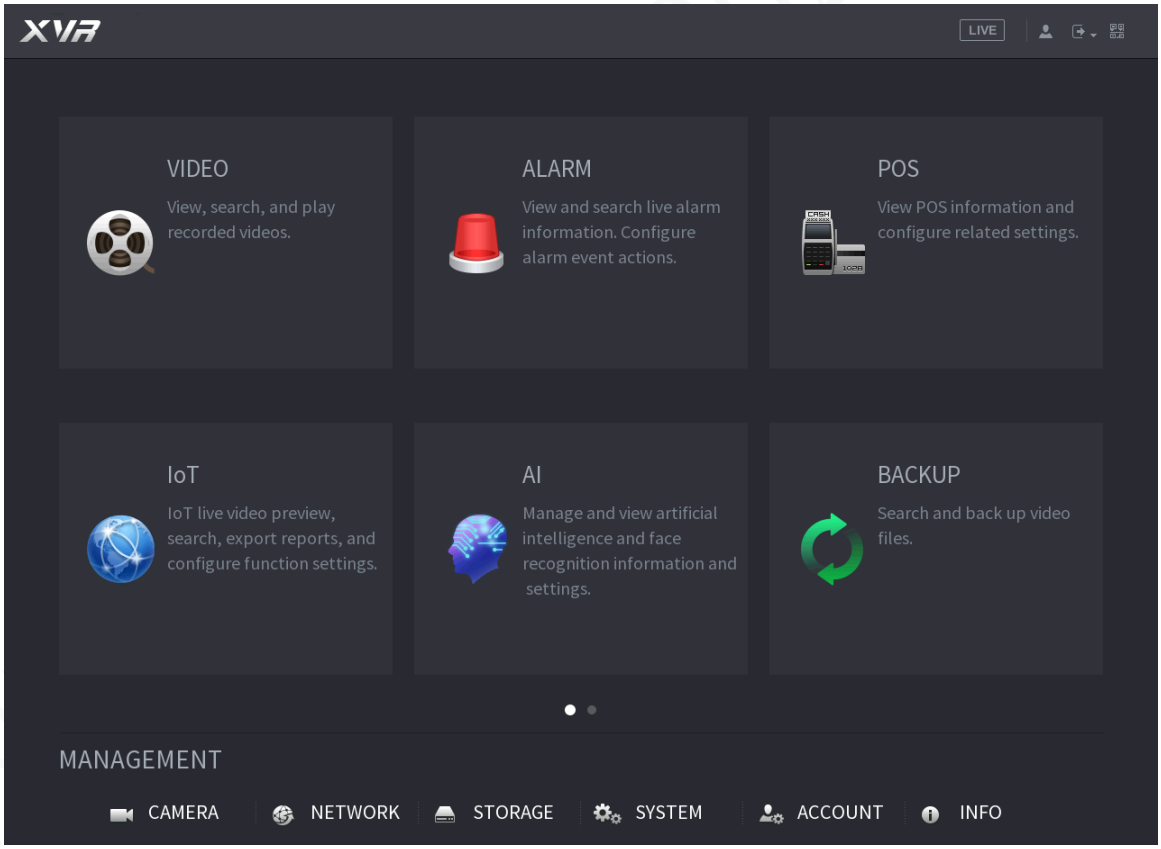
## 4.1 Entering XVR Main Menu

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. See Figure 4-1.

Figure 4-1 XVR main menu



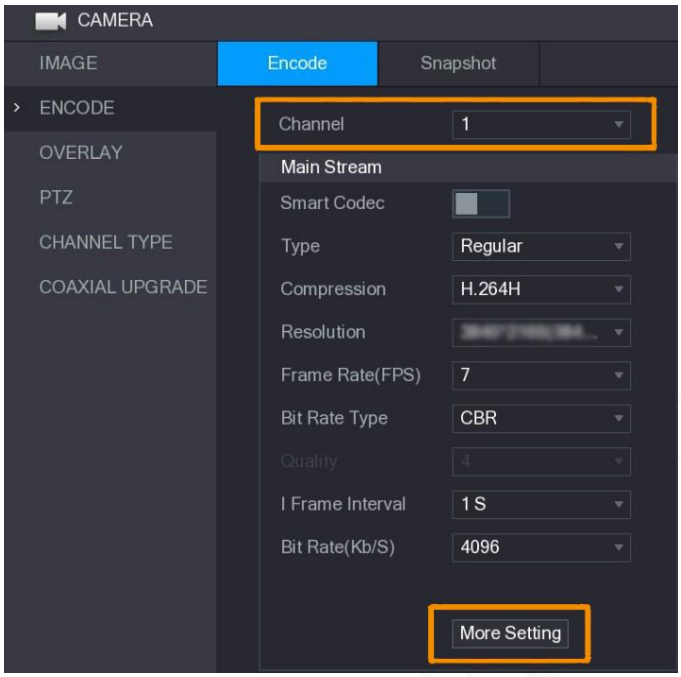

## 4.2 Setting Audio Input

Audio input is available on select models.

Step 1 On the **Main Menu** interface, select **CAMERA > ENCODE > Encode**. See Figure 4-2.

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

Figure 4-2 Encode setting



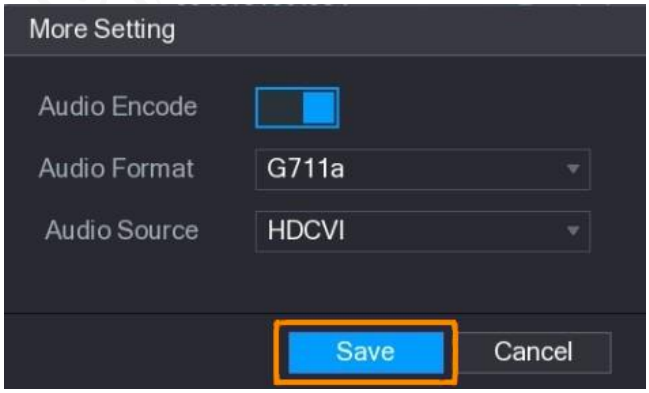

Step 3 Under Main Stream, click **More Setting**.

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 4-3 More setting




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

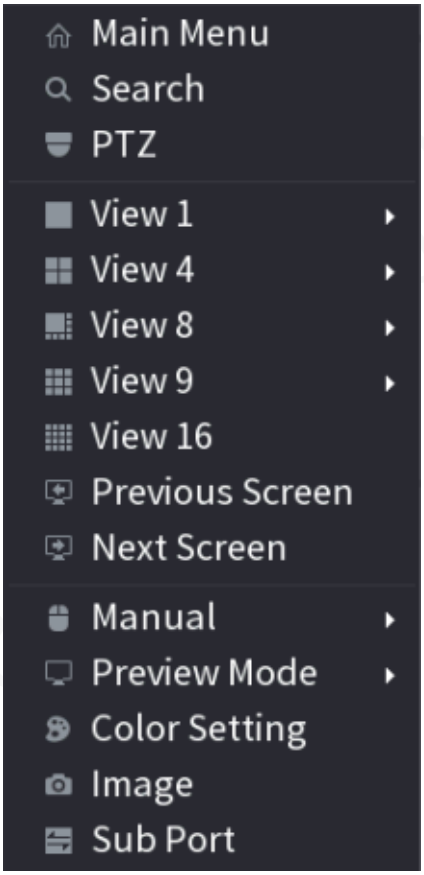
# 4.3 Operating PTZ Control Panel

## 4.3.1 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. See Figure 4-4.

Figure 4-4 Shortcut menu




Step 2 Click **PTZ** and click to extend the menu. See Figure 4-5.

Figure 4-5 PTZ setting options


Step 3 Click . The **MENU OPERATION** panel is displayed. See Figure 4-6.

Figure 4-6 Menu Operation panel

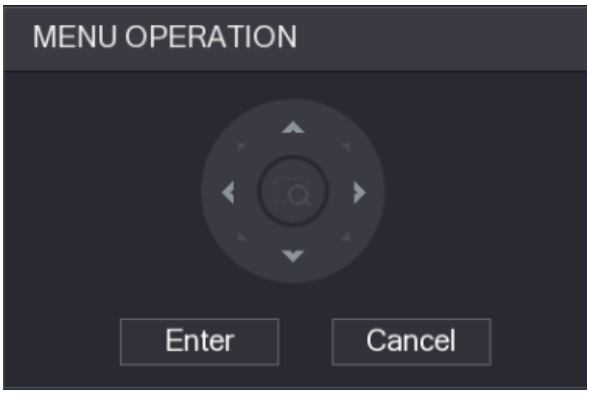


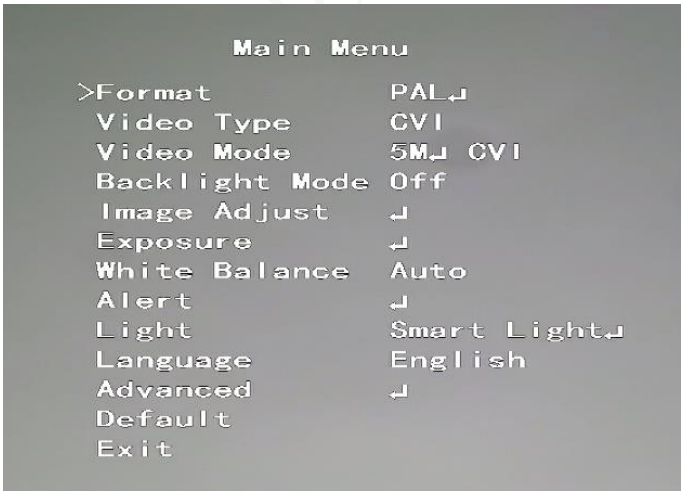

Table 4-1 Menu operation panel function

| 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 4-7 OSD menu




## 4.3.2 Operating Auto Focus (AF)

Table 4-2 Parameter of AF

| Parameter | Description |
|---|---|
| Zoom | : Zoom out.<br>: Zoom in. |

| Parameter | Description |
| --- | --- |
| Focus | : Focus far.<br>: Focus near. |
| Iris | : Auto focus.<br>: 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. |

# 5 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 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 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.