

# Network Video Recorder

## Quick Start Guide

**V1.0.0**






# Foreword

## General

This Quick Start Guide (hereinafter referred to be "the Manual") introduces the functions and operations of the NVR devices (hereinafter referred to be "the Device").

## Safety Instructions

The following categorized signal words with defined meaning might appear in the Manual.

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

## Revision History

No.	Version	Revision Content	Release Time
1	V1.0.0	First release.	July 2019

## Privacy Protection Notice

As the device user or data controller, you might collect personal data of others such as face, fingerprints, car plate number, Email address, phone number, GPS and so on. You need to be in compliance with the local privacy protection laws and regulations to protect the legitimate rights and interests of other people by implementing measures including but not limited to: providing clear and visible identification to inform data subject the existence of surveillance area and providing related contact.

## 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 regions. For detailed information, see 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, please refer to our 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 occurred when using the device.
- If there is any uncertainty or controversy, please refer to our final explanation.

# Important Safeguards and Warnings

The following description is the correct application method of the Device. Read the Manual carefully before use to prevent danger and property loss. Strictly conform to the Manual during application and keep it properly after reading.

## Operating Requirement

- Install the PoE front-end devices indoors.
- Do not place and install the device in an area exposed to direct sunlight or near heat generating device.
- Do not install the device in a humid, dusty or fuliginous area.
- Keep its horizontal installation, or install it at stable places, and prevent it from falling.
- Do not drip or splash liquids onto the device; don't put on the device anything filled with liquids, in order to prevent liquids from flowing into the device.
- Install the device at well-ventilated places; don't block its ventilation opening.
- Use the device only within rated input and output range.
- Do not dismantle the device arbitrarily.
- Transport, use and store the device within allowed humidity and temperature range.

## Power Requirement

- Make sure to use the designated battery type. Otherwise there may be explosion risk.
- Make sure to use batteries according to requirements. Otherwise, it may result in fire, explosion or burning risks of batteries!
- To replace batteries, only the same type of batteries can be used.
- Make sure to dispose the exhausted batteries according to the instructions.
- The product shall use electric wires (power wires) recommended by this area, which shall be used within its rated specification.
- Make sure to use standard power adapter matched with this Device. Otherwise, the user shall undertake resulting personnel injuries or Device damages.
- Use power supply that meets SELV (safety extra low voltage) requirements, and supply power with rated voltage that conforms to Limited Power Source in IEC60950-1. For specific power supply requirements, please refer to device labels.
- Products with category I structure shall be connected to grid power output socket, which is equipped with protective grounding.
- Appliance coupler is a disconnecting Device. During normal use, please keep an angle that facilitates operation.

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## 1



## Installing the Device



The Device does not support wall mount.

## 1.1 Checking the Components

When you receive the Device, please check against the following checking list. If any of the items are missing or damaged, contact the local retailer or after-sales engineer immediately.

Sequence	Checking items		Requirement
1	Package	Appearance	No obvious damage.
		Packing materials	No broken or distorted positions that could be caused by hit.
		Accessories	No missing.
2	Labels	Labels on the Device	<ul style="list-style-type: none"> <li>• Device model conforms to the purchase order.</li> <li>• Not torn up.</li> </ul>  <p>Do not tear up or throw away the labels; otherwise the warranty services are not ensured. You need to provide the serial number of the product when you call the after-sales service.</p>
3	Device	Appearance	No obvious damage.
		Data cables, power cables, fan cables, mainboard	No connection loose.  <p>If there is any loose, please contact the company after-sales service in time.</p>

## 1.2 Installing HDD

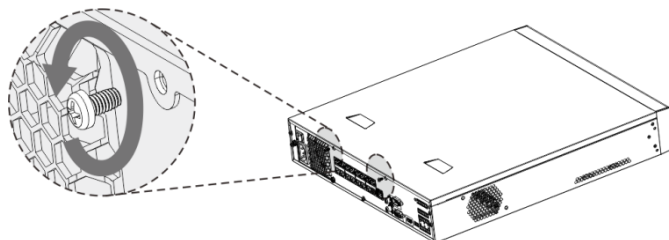
For the first time installation, check whether the HDD has been installed or not. We recommend to use HDD of enterprise level or surveillance level. It is not recommended to use PC HDD.



- Shut off the power before you replace the HDD.
- Different models have different HDD numbers. The actual product shall prevail.

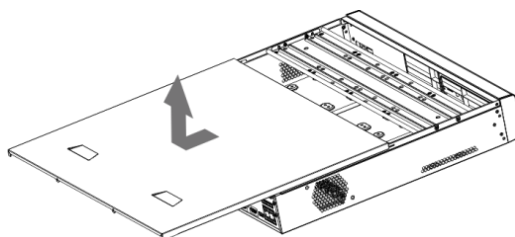
**Step 1** Remove the fixing screws on the rear panel of the device.

Figure 1-1 Remove the screws



**Step 2** Remove the case cover along the direction shown in the following arrow.

Figure 1-2 Remove case cover



**Step 3** Remove the screws on the sides of HDD bracket to take out the bracket.

- 4-HDD device has one HDD bracket. For the way to remove the bracket, see Figure 1-3.
- 8-HDD device has two HDD brackets. For the way to remove the brackets, see Figure 1-4.

Figure 1-3 Remove HDD bracket (4-HDD)

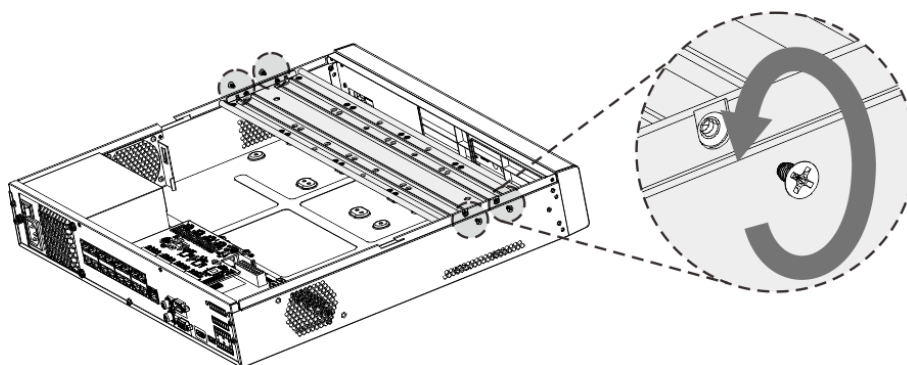
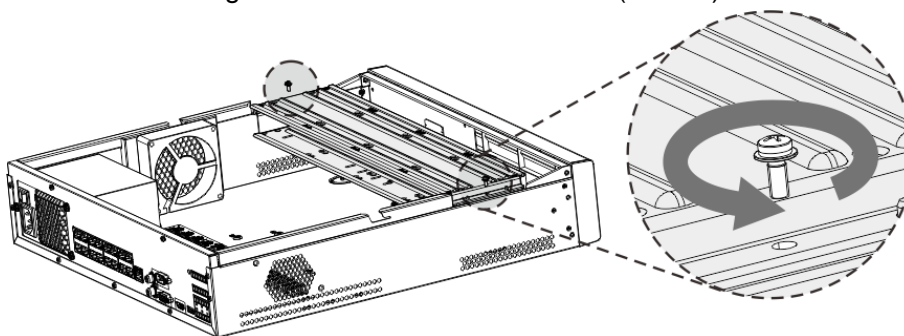
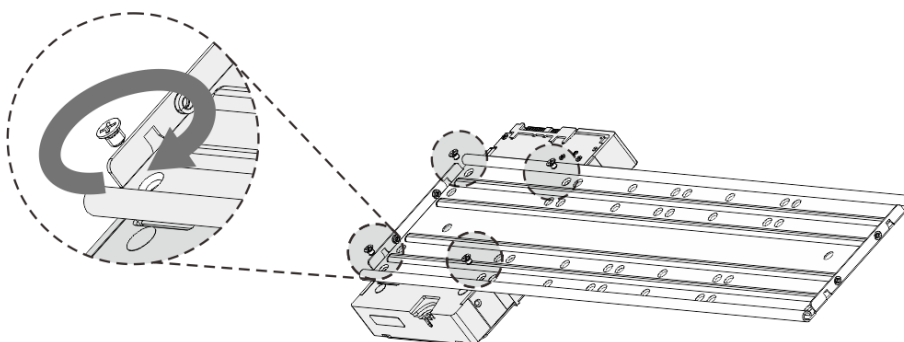


Figure 1-4 Remove HDD bracket (8-HDD)



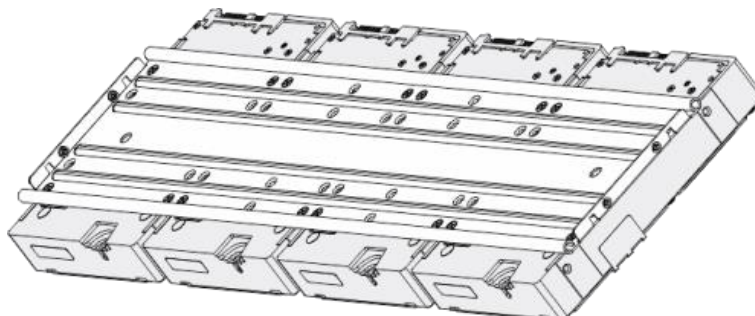
**Step 4** Match the four screw holes on the HDD with the four holes on the bracket and then fasten the screws. The HDD is fixed to the bracket.

Figure 1-5 Fix the HDD (1)



**Step 5** Refer to Step 4 to install other HDDs.

Figure 1-6 Fix the HDD (2)

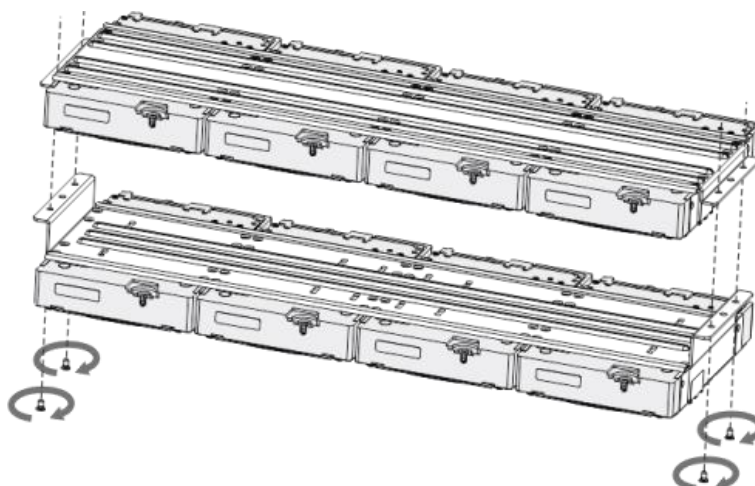


**Step 6** Lock the two HDD brackets.



This step is required for 8-HDD devices only.

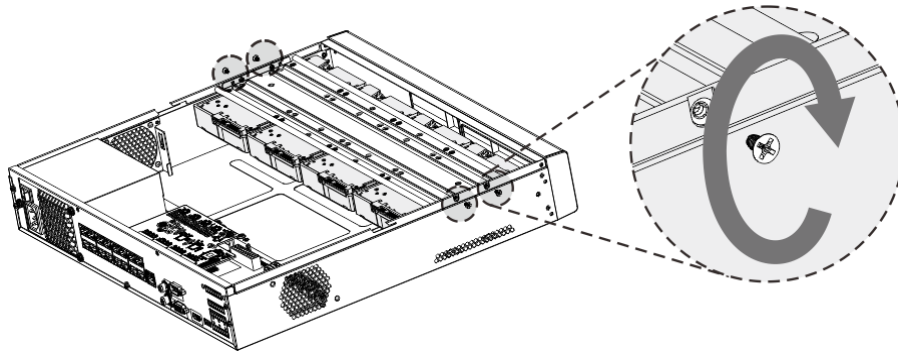
Figure 1-7 Lock two HDD brackets





**Step 7** Place the bracket to the device and then fasten the screws on the sides of the bracket.

Figure 1-8 Fasten HDD bracket

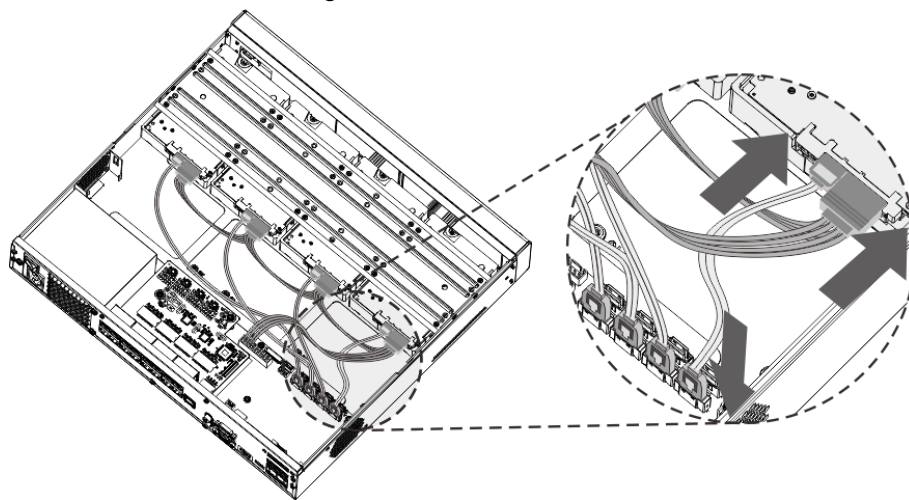


**Step 8** Connect the HDD data cable and power cable to the device.



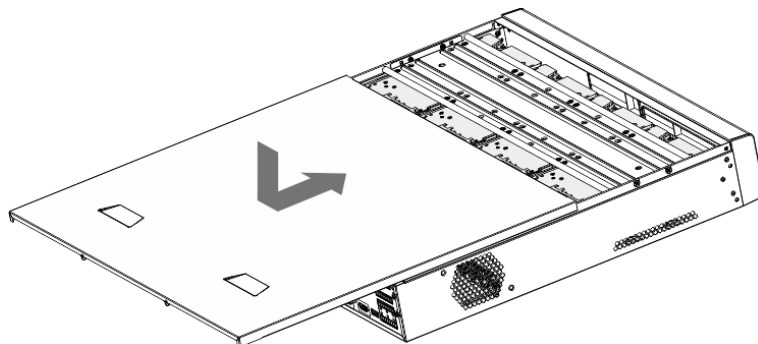
Figure 1-9 takes 4-HDD device as an example. The actual product shall prevail.

Figure 1-9 Connect cables



**Step 9** Put back the cover and fasten the screws on the rear panel to complete the installation.

Figure 1-10 Complete installation



# 2 Device Structure



- The following figures are for reference only. The actual product shall govern.
- See *User's Manual* for detailed information.

Figure 2-1 Front panel

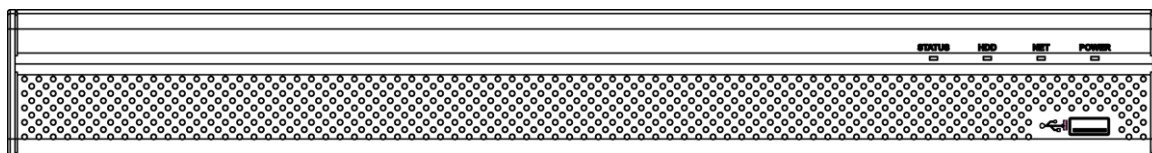


Table 2-1 Description of front panel functions

Icon	Name	Description
STATUS	Status indicator	After booting up the Device, the indicator glows blue.
HDD	HDD status indicator	<ul style="list-style-type: none"> <li>• The indicator is off when the HDD is normal.</li> <li>• The indicator glows blue when the HDD is in malfunction.</li> </ul>
NET	Network status indicator	<ul style="list-style-type: none"> <li>• The indicator is off when the network is normal.</li> <li>• The indicator glows blue when the network is in malfunction.</li> </ul>
POWER	Power status indicator	The indicator glows blue when the power supply is normal.
	USB 2.0 port	Connects to external devices such as USB storage device, keyboard and mouse.

Figure 2-2 Rear panel

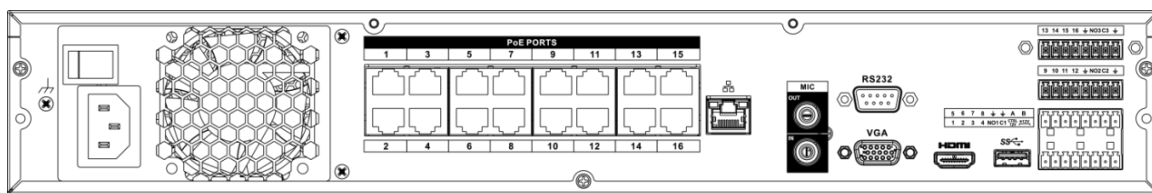





Table 2-2 Description of rear panel functions

Icon	Port Name	Function
	Power button	Turns on/off the NVR.
	Power input port	Input power.
MIC IN	Audio input port	Bidirectional talk input port. It is to receive analog audio signal from devices such as microphone, sound pickup.
MIC OUT	Audio output port	Audio output port. It is to output analog audio signal to devices such as sound box. <ul style="list-style-type: none"> <li>• Bidirectional talk output.</li> <li>• Audio output for 1-window video monitor.</li> </ul>

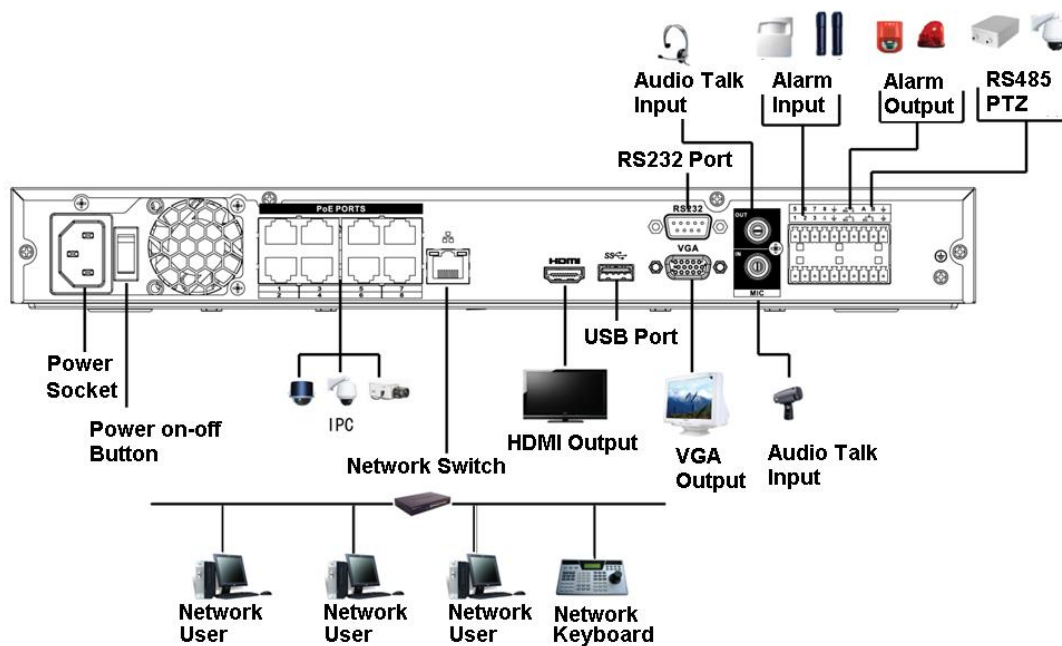
Icon	Port Name	Function
		<ul style="list-style-type: none"> <li>● Audio output for 1-window video playback.</li> </ul>
1-16	Alarm input port (1-16)	<ul style="list-style-type: none"> <li>● There are four groups: 1-4, 5-8, 9-12 and 13-16. They receive signals from external alarm source. Alarm input includes two types; NO (normal open) and NC (normal close).</li> <li>● When your alarm input device is using external power, make sure the device and the NVR have the same GND.</li> </ul>
	GND	Alarm input ground port.
NO1-NO3	Alarm output port 1-3	<ul style="list-style-type: none"> <li>● Three groups of alarm output ports (NO1-C1; NO2-C2; NO3-C3). Output alarm signal to the external alarm device. Make sure power supply is available for the external alarm device.</li> <li>● NO: Normal open alarm output port.</li> <li>● C: Alarm output public end.</li> </ul>
C1-C3		
A	RS-485 port	<ul style="list-style-type: none"> <li>● RS485_A port. Control cable A of the 485 device. It connects external devices such as speed dome and PTZ.</li> <li>● RS485_B port. Control cable B of the 485 device. It connects external devices such as speed dome and PTZ.</li> </ul>
B		
CTRL 12V	-	Controllable 12V power output. It is to control the on-off alarm relay output. It can be used to control the device alarm output. At the same time, it can also be used as the power input source of some devices such as alarm detector.
+12V	-	+12V power output port. It can provide power to some peripheral devices such as camera and alarm device. Make sure the power supply of peripheral device shall be below 1A.
	Network port	10M/100M/1000Mbps self-adaptive Ethernet port. Connect to the network cable.
eSATA	eSATA port	External SATA port. It can connect device with SATA port. You need to jump the HDD when there is peripherally connected HDD.
USB port	USB port	Connect to devices such as mouse, USB storage device and USB burner.
RS-232	RS-232 port	It is for general COM debugging to configure IP address and transfer transparent COM data.
HDMI	HDMI port	High definition audio and video signal output port. It transmits uncompressed high definition video and multiple-channel audio data to display devices with HDMI port.
VGA	VGA port	VGA video output port. Output analog video signal. It can connect to the monitor to view analog video.
	GND	Ground.

# 3 Connection



- The following figure is for reference only. The actual product shall prevail.
- See User's Manual for detailed information.

Figure 3-1 Device connection



# 4 GUI Operations



Slight difference might be found on the interfaces of different models. Following figures are for reference only. The actual product shall govern.

## 4.1 Booting Up



Before the boot up, please make sure:

- The rated input voltage shall match with the device power requirement. Make sure the power wire connection is ready and then turn on the power button.
- For device security, connect the Device to the power adapter first and then connect it to the power socket.
- Always use the stable current. It is recommended to use UPS.

Connect the Device to the monitor, plug into the power socket, and then press the power button to boot up the Device.

## 4.2 Initializing the Device

When booting up for the first time, you need to configure the password information for **admin** (by default). To guarantee device security, keep the login password for admin properly and modify it regularly.

Step 1 Turn on the Device.

The **Device Initialization** interface is displayed. See Figure 4-1.

Figure 4-1 Enter password

Device Initialization

1. Enter Password → 2. Unlock Pattern → 3. Password Protection

User admin

Password  Use a password that has 8 to 32 characters, it can be a combination of letter(s), number(s) and symbol(s) with at least two kinds of them.(please do not use special symbols like ' "; &)



Conf...

Pro...

Next

**Step 2** Configure the password information for admin. For details, see Table 4-1.

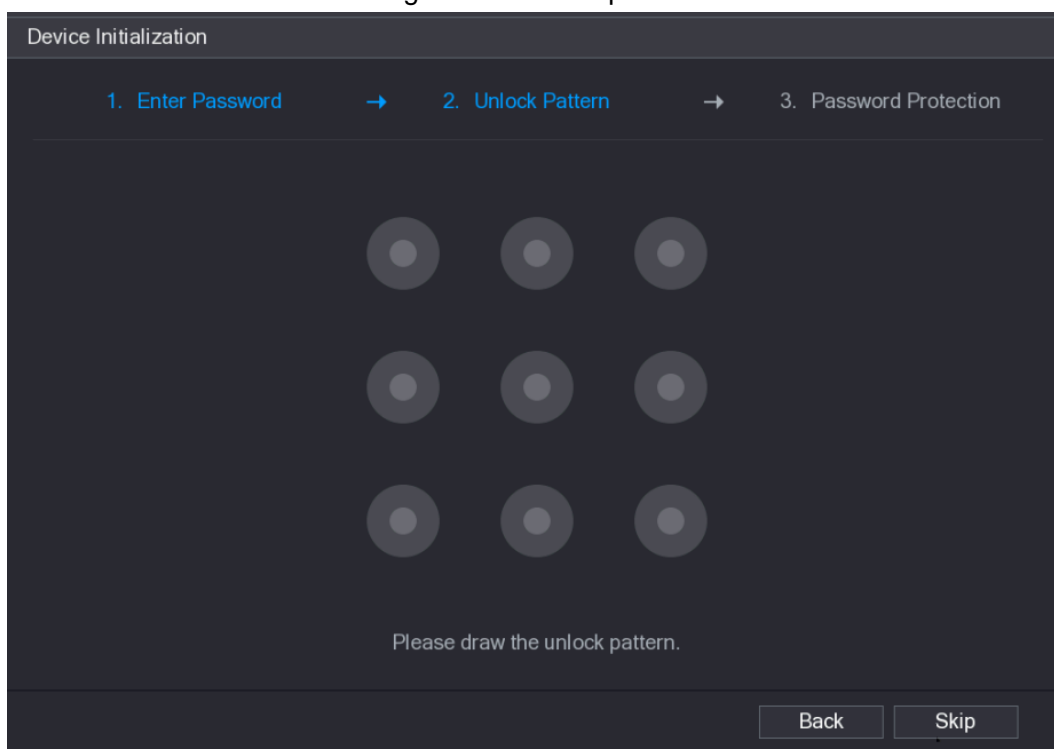
Table 4-1 Password information description

Parameter	Description
User	By default, the user is <b>admin</b> .
Password	In the <b>Password</b> box, enter the password for admin.
Confirm Password	The new password can be set from 8 characters through 32 characters and contain at least two types from number, letter and special characters (excluding "", "", ";", ":" and "&").
Prompt Question	In the <b>Prompt Question</b> box, enter the information that can remind you of the password.  On the login interface, click  and the prompt will display to help you reset the password.

**Step 3** Click **Next**.

The **Unlock Pattern** setting interface is displayed. See Figure 4-2.

Figure 4-2 Unlock pattern

**Step 4** Draw an unlock pattern.

After setting unlock pattern, the password protection setting interface is displayed. See Figure 4-3.



- Once you have configured the unlock pattern, the system will require the unlock pattern as the default login method. If you skip this setting, enter the password for login.
- If you do not want to configure the unlock pattern, click **Skip**.

Figure 4-3 Password protection

Device Initialization

1. Enter Password → 2. Unlock Pattern → 3. Password Protection

Email Address   To reset password, please input properly or update in time

Security Questions

Question 1 What is your favorite children's book?

Answer

Question 2 What was the first name of your first boss?

Answer

Question 3 What is the name of your favorite fruit?

Answer


Save

**Step 5** Configure the protection parameters for password. For details, see Table 4-2.



- After configuration, if you forgot the password for admin user, you can reset the password through the reserved email address or security questions. For details about resetting the password, see *User's Manual*.
- If you do not want to configure the settings, disable the email address and security questions functions on the interface.

Table 4-2 Password protection parameter description

Password Protection Mode	Description
Email Address	Enter the reserved email address. In the <b>Email Address</b> box, enter an email address for password reset. In case you forgot password, enter the security code that you will get from this reserved email address to reset the password of admin.
Security Questions	Configure the security questions and answers. In case you forgot password, entering the answers to the questions can make you reset the password.
 <p>If you want to configure the email or security questions function later or you want to change the configurations, select <b>Main Menu &gt; ACCOUNT &gt; USER</b>.</p>	

**Step 6** Click **OK** to complete the settings.

The **Startup Wizard** interface is displayed. For details about quick settings during startup, see "4.4 Startup Wizard."

## 4.3 Resetting Password

If you forgot the admin password, you can reset the password by the following ways:

- When the password reset function is enabled, you can scan the QR code on the local interface to reset the password.
- When the password reset function is disabled, there are two situations:
  - ◇ If you configured security questions, you can reset the password by the security questions.
  - ◇ If you did not configure the security questions, you can only use the reset button on the mainboard to restore the Device to factory default.




Reset button is for some series product only.

**Step 1** Click  on the login interface.

The **Reset Password** interface is displayed. See Figure 4-4.



- On the unlock pattern interface, click **Forgot Unlock Pattern** to switch to the password login interface, and then click .



- If you have not input email address in device initialization, the interface is shown as in Figure 4-5. Configure an email address, click **Next**, and then the Device goes to Figure 4-4.

Figure 4-4 Reset password (1)

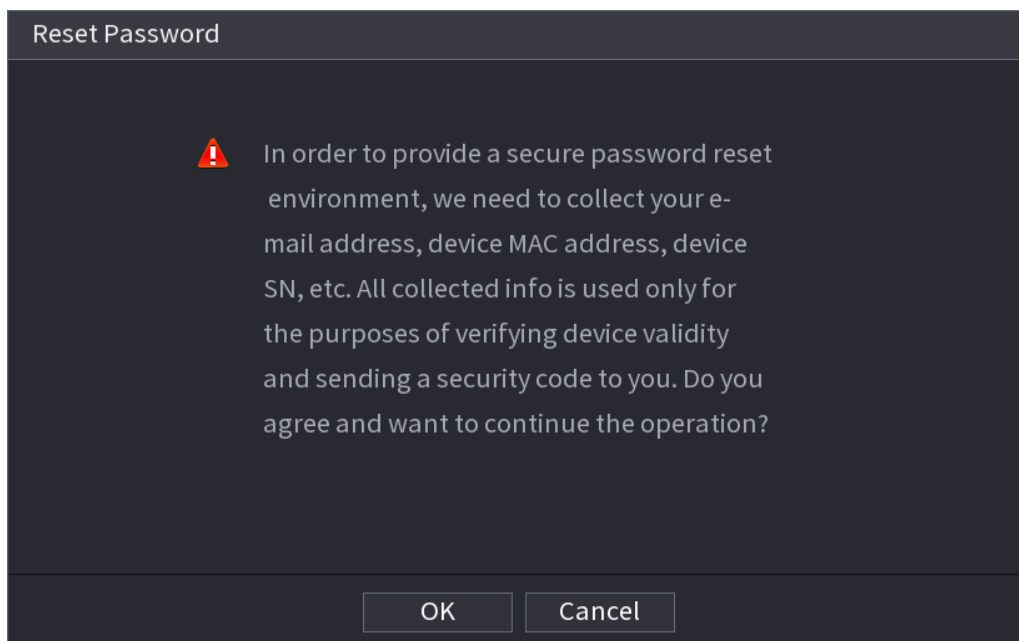
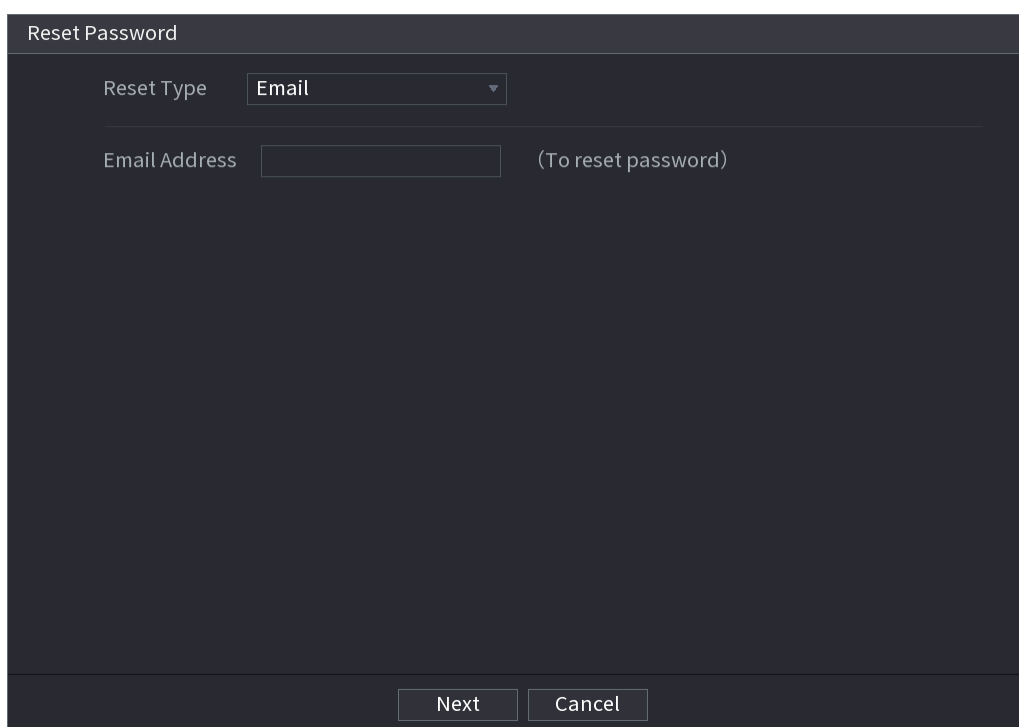


Figure 4-5 Reset password (2)



**Step 2** Click **OK**.

The password resetting interface is displayed. See Figure 4-6.



After clicking OK, we will collect your personal information such as cell phone number, MAC address and device serial number. The collected information is used for verifying device legality and sending security code. Please read the notice carefully and confirm if you agree with the collection or not.

Figure 4-6 Reset password (3)

Reset Password

Reset Type:

SN:

Note(For admin only):

Option 1. Please download EasyViewer and then from More-Reset Device Password, scan the left QR code.

Option 2. Please use an APP to scan the left QR code to get encryption strings. And then send the strings to support\_gpwd@htmicrochip.com.

Scan the QR code on the actual interface

The security code will be delivered to 1\*\*\*@qq.com.

Security code

**Step 3** Reset login password.

- Email

In Figure 4-6, follow the prompts on the interface to scan the QR code, and then enter the security code you get via the assigned email.



- For the same QR code, you can scan max twice to get two security codes. Refresh the QR code if you want to get security code again.
  - The security code in your email is only valid for 24 hours.
- Security questions

In Figure 4-6, in the **Reset Type** drop-down list, select security question. The security question interface is displayed. See Figure 4-7. Enter the preset correct answers in the text boxes.

Figure 4-7 Reset password (4)

Reset Password

Reset Type: Security Questions

Question 1: What is your favorite children's book?  
Answer:

Question 2: What was the first name of your first boss?  
Answer:

Question 3: What is the name of your favorite fruit?  
Answer:

Next Cancel

**Step 4** Click **Next**.

The interface to set new password is displayed. See Figure 4-8.

Figure 4-8 Reset password (5)

Reset Password

Reset password of (admin)

New Password:

Use a password that has 8 to 32 characters, it can be a combination of letter(s), number(s) and symbol(s) with at least two kinds of them.(please do not use special symbols like ' ; : & )

Confirm Password:

Save Cancel

**Step 5** Enter the new password and confirm it.



The password can be set from 8 characters through 32 characters and contain at least two types from number, letter and special character (excluding "", "", ";", ":" and "&"). It is recommended to set a password of high security according to the prompt.

**Step 6** Click **OK** to complete the settings.

## 4.4 Startup Wizard



After completing all items on the startup wizard, the startup wizard automatically hides when booting up the Device next time.

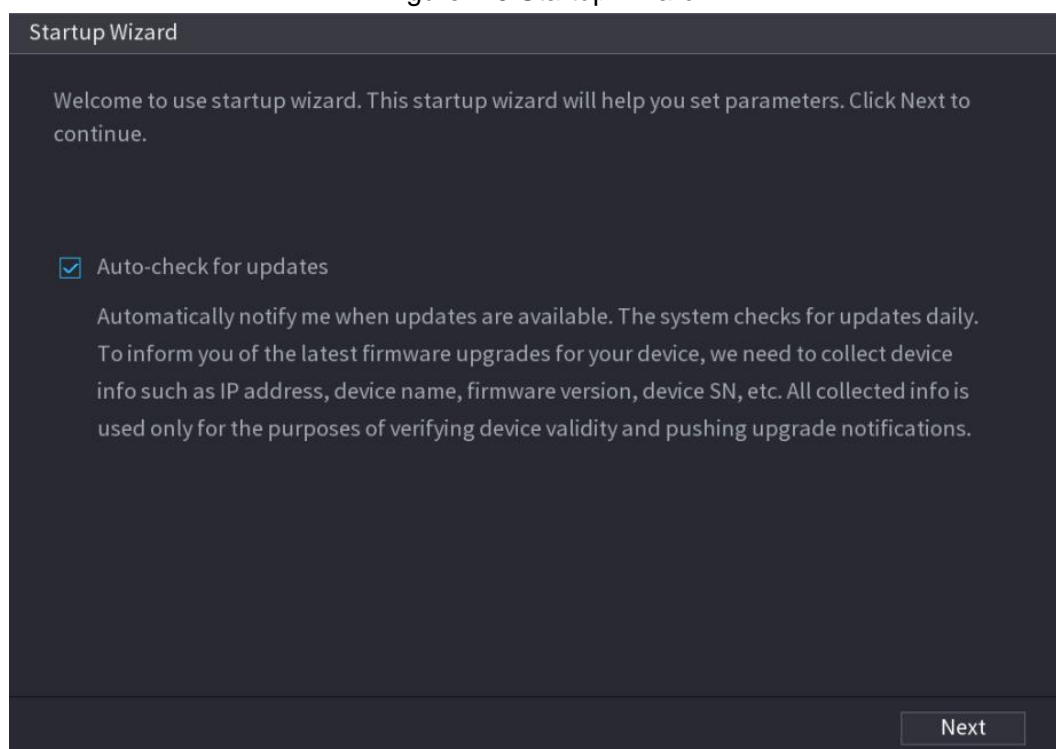
After you successfully initialize the Device, the **Startup Wizard** is displayed. See Figure 4-9. Click **Next**, log in the Device, and then you can enter the startup wizard to configure the Device quickly. For details, see *User's Manual*.

- Selecting the check box of **Auto-check for updates**, the Device automatically checks for new application every day.



After auto-check for updates is enabled, in order to inform you of the latest firmware upgrades, we will collect your personal information such as IP address, device name, firmware version and device SN. The collected information is used for verifying device legality and pushing upgrade notice.

Figure 4-9 Startup wizard



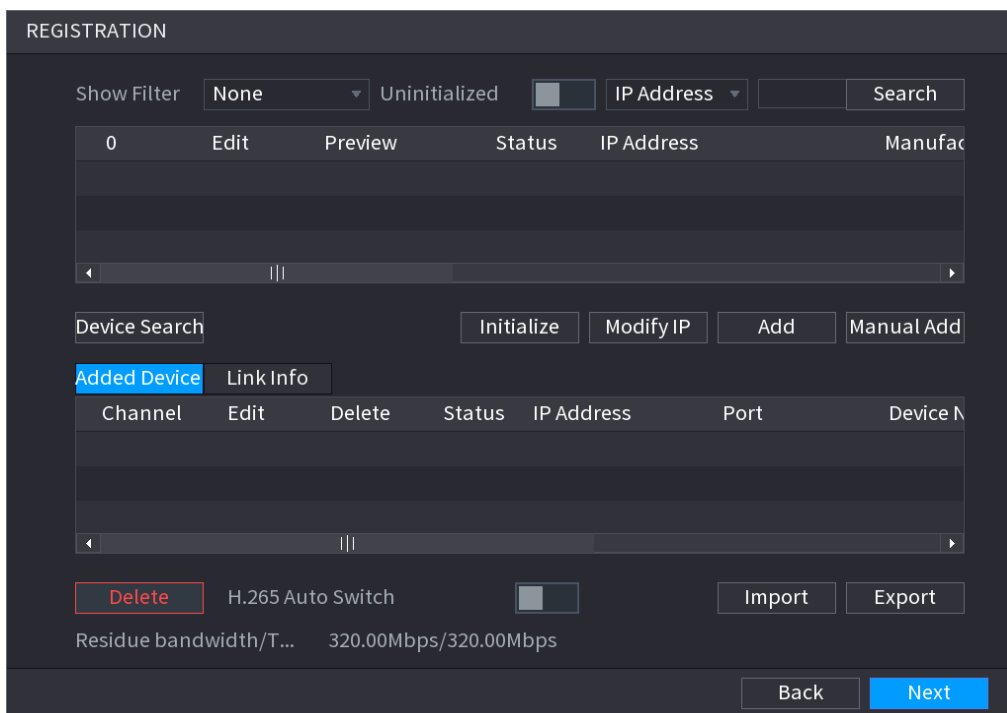
## 4.5 Registration

Select **Main Menu > CAMERA > Registration**. The **Registration** interface is displayed. See Figure 4-10.

You can register remote devices through the following two ways:

- Click **Device Search**. In the result list, double-click the remote device or select the check box in front of the device, and then click **Add** to register the remote device.
- Click **Manual Add** and enter the IP address of the remote device to register it.

Figure 4-10 Registration



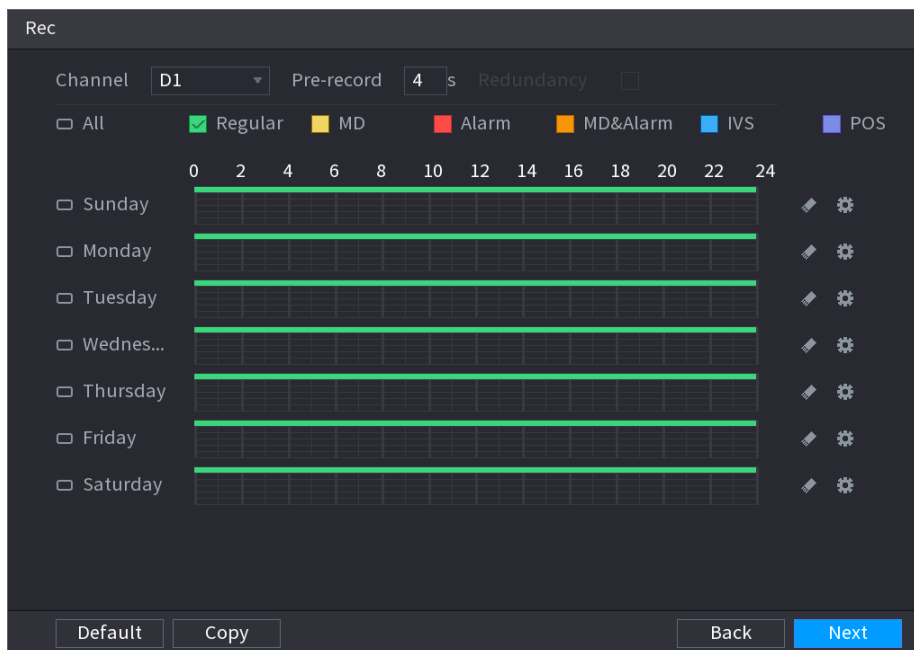
## 4.6 Schedule

All channels are 24-hour recording continuously by factory default. You can customize the record period and record type.

**Step 1** Select **Main Menu > STORAGE > SCHEDULE > Rec.**

The **Rec** interface is displayed. See Figure 4-11.


Figure 4-11 Schedule



**Step 2** Configure parameters such as channel, pre-record, ANR and record type.

- After setting one HDD to be redundant disk, select the **Redundancy** check box to realize video file backup. It is to save video files to different HDDs at the same time. Once one of the HDDs is damaged, there is still a backup file in another disk to ensure data reliability.
- Select the **ANR** check box to enable this function. When the IPC is out of network access, it keeps on recording and saves the records in the SD card. After the network is recovered, IPC transmits the records during the network outage back to the NVR device to ensure record integrity.

**Step 3** Set the schedule period. It includes drawing and editing.

- Drawing: Press and hold down the left button of the mouse and drag the mouse in the time figure to draw the period.
- Editing: Click  to configure the period and then click **OK**.

**Step 4** Click **Apply** or **OK** to save the settings.



The configured record schedule can come into effect only when the auto record function is enabled. For details to enable auto record, see *User's Manual*.

## 4.7 Instant Playback








Move the mouse to the top center of the current channel preview interface and you can see the control bar. See Figure 4-12. Click  in the control bar and the system starts to reply the records 5 minutes to 60 minutes ago in the current channel.

Figure 4-12 Control bar



For icon description on the control bar, see Table 4-3.

Table 4-3 Control bar icon description

No.	Icon	Description
1		Instant playback
2		Digital zoom
3		Instant backup
4		Manual snapshot
5		Bidirectional talk
6		Switch bit streams

# 5 Logging in Web

You can log in the Web interface of the Device via browsers such as Safari, Firefox and Chrome.

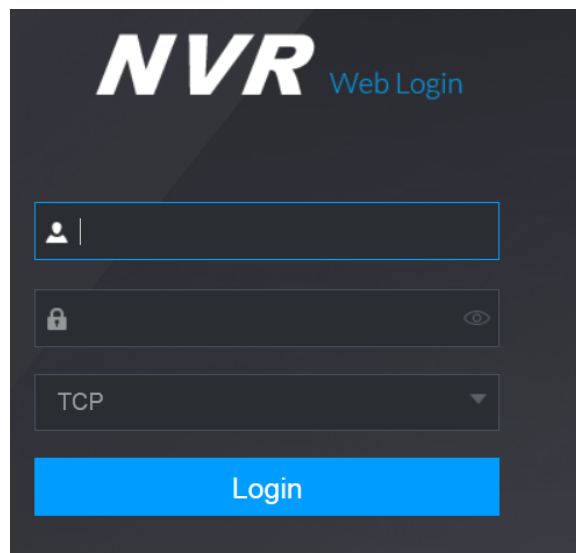


- Slight difference might be found on the interfaces of different models. Following figures are for reference only. The actual product shall govern.
- Use ChromeApp to log in the Web if the Chrome version is 45 or higher. Go to the Chrome online store to download the ChromeApp installation package.
- Before logging in Web, make sure the network connection between PC and the Device is ready.

**Step 1** Open the browser and enter the IP address of the Device into the address bar. Press Enter key.

The **Login** interface is displayed. See Figure 5-1.

Figure 5-1 Login



**Step 2** Enter the username and password.

The default username is admin, and the login password is the one you set in device initialization. To ensure device security, it is recommended to modify the admin password regularly and keep it properly.

**Step 3** Click **Login**.

The **Preview** interface is displayed. On the Web interface, you can perform operations such as system settings, device management and network settings. For details, see *User's Manual*.



- When you log in Web for the first time, install the control according to system prompts.
- When you want to upgrade the control, delete the original control first. See the following two ways to delete the control:



- ◇ Enter C:\Program Files\webrec\WEB30\WebPlugin, and run the uninstall tool **uninst.exe**. The system automatically deletes the control.
- ◇ Enter C:\Program Files\webrec and delete the **Single** folder.

# 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 equipment 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 equipment (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 equipment 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 equipment network security:**

### **1. Physical Protection**

We suggest that you perform physical protection to equipment, especially storage devices. For example, place the equipment 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 equipment (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 equipment 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. Enable Whitelist

We suggest you to enable whitelist function to prevent everyone, except those with specified IP addresses, from accessing the system. Therefore, please be sure to add your computer's IP address and the accompanying equipment's IP address to the whitelist.

## 8. MAC Address Binding

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

## 9. Assign Accounts and Privileges Reasonably

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

## 10. 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.

## 11. 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.

## 12. Secure Auditing

- Check online users: we suggest that you check online users regularly to see if the device is logged in without authorization.
- Check equipment log: By viewing the logs, you can know the IP addresses that were used to log in to your devices and their key operations.

## 13. Network Log

Due to the limited storage capacity of the equipment, 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.

## 14. Construct a Safe Network Environment

In order to better ensure the safety of equipment 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.