EAS Acousto-Magnetic Antenna

User's Manual

ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD. V1.0.0

Foreword

General

This manual introduces the functions and operations of the EAS Acousto-Magnetic Antenna (hereinafter referred to as "the Device").

Models

DHI-ISC-EAA6000-P

DHI-ISC-EAA6000-R

DHI-ISC-EAE0000-110

DHI-ISC-EAE0000-220

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
V1.0.0	First release.	July 2021

Privacy Protection Notice

As the device user or data controller, you might collect the personal data of others such as their face, fingerprints, and car 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 the proper way of using the device, danger and property damage preventions. Before using the device, read this manual carefully. Follow the instructions and keep this manual properly for future reference.

Operating Requirements

- Transport, use and store the device under allowed humidity and temperature conditions.
- Prevent liquids from splashing or dripping on the device. Make sure that there are no objects filled with liquid on top of the device to avoid liquids flowing into it.
- Install the device in a well-ventilated place, and do not block the vents of the device.
- Do not press hard, vibrate violently, or soak the device.
- Use factory package or same-quality material for packaging when transporting the device.
- It is recommended to use this device with a surge protection device(SPD) to improve the lightning protection effect.
- It is recommended to ground the earthing hole of the device to improve device reliability.
- It is recommended to install the device 2 meters away from the escalator to improve device reliability.

Power Requirements

- Only use the wire assembly (power cable) recommended in this area and use it within its rated specifications.
- Only use the standard power adapter of the device, otherwise the user will be responsible for personnel injury or device damage.
- Use a power supply that meets the requirements of SELV (Safety Extra Low Voltage) and supply power in accordance with the rated voltage of (IEC60065) or (IEC60950-1 compliant with Limited Power Source). The specific power supply requirements are subject to the device label.
- Connect the device to the grid power output socket with protective ground connection.
- Strictly grounded and powered independently.

Contents

1 Overview

1.1 Introduction

The development of information recognition technology has greatly improved the intelligence of commercial retail stores, helping to reduce labor costs and enhance economies of scale. The development and production of EAS technology have effectively improved logistics management and reduced the loss of merchandise.

This operation/configuration manual describes how to assemble, configure and maintain the EAS antenna system.

1.2 Features and Advantages

- **Self-diagnosis function**
  Automatic diagnosis after power-on, effective identification system, and avoiding more than 95% of external interference sources.
- **Reading distance**
  The maximum detection distance of labels is 800 mm–900 mm, and the maximum detection distance of tags is 900 mm–1400 mm.
- **Invention patent: Digital receiving technology**
  High stability without temperature drift, which is the core concept of DSP technology.
- **High integration**
  Small size, short cable, excellent ability for anti high-frequency interference.
- **Integrated transceiver mode**
  The primary and replica antenna are both integrated transceivers, and the detection effects of the primary and replica antenna are the same.
- **Wide applicability**
  High detection rate, low false alarm rate; fully compatible with all AM labels and tags.

2 Appearance

EAS Acousto-Magnetic Antenna is an advanced as well as software-driven Electronic Article Surveillance for shopping malls and supermarkets. It can overcome the influence of the environment and detect 58 KHz labels and tags. It has strong stability and high detection distance. The Acousto-Magnetic system includes a primary antenna with two replica antennas, no other controllers are needed, which makes installation in large supermarkets or multi-export venues very convenient. Consequently, Acousto-Magnetic system is regarded as the best choice by various stores and supermarkets.

Figure 2-1 Appearance

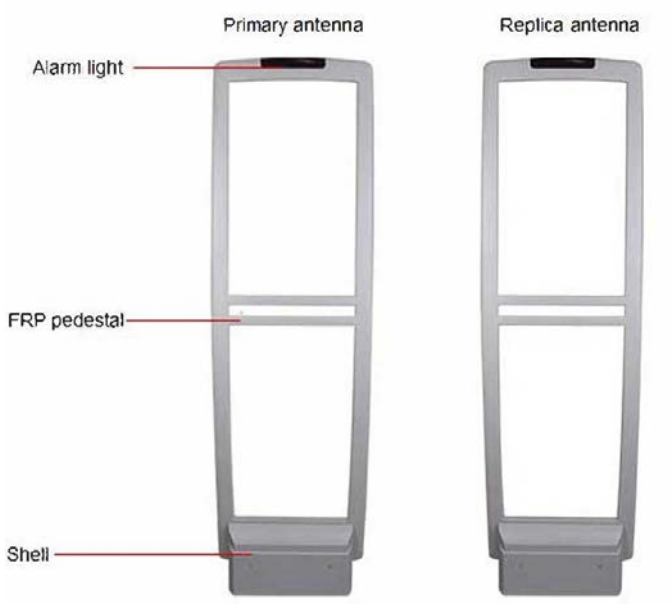
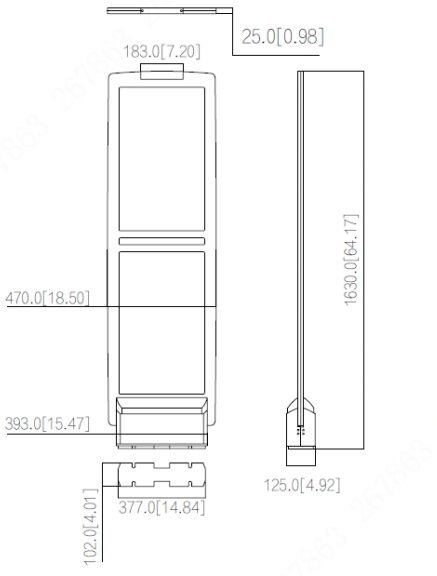


Figure 2-2 Dimensions (Unit: mm [inch])



3 Installation and Configuration

3.1 Cautions

- Only use for indoors, it is recommended to shut down the device during non-business hours.
- Do not cover the device and keep it ventilated.
- Pay attention to sun protection, waterproof and moisture-proof.
- Only be installed by professionals and strictly enforce safety regulations.
- Strictly grounded and powered independently.
- Operating temperature: –5 ℃ to 50 ℃

3.2 Packing List

Table 3-1 Packing list

Packing list	Image	Packing Box
Primary antenna		
Replica antenna		
Connection cable		
AC110 Power supply OR AC220 Power supply		

3.3 Installation and Configuration

3.3.1 Preparations before You Begin

Table 3-2 Tool requirements

Name	Image	Name	Image
Phillips and slotted screwdrivers		M10×100 expansion screw × 4	
Marker × 1		Open-end wrenches	
Cutting Machine × 1		Hammer × 1	
Fine sand		Scuff-plate	
Power drill × 1		Configuration cable × 1	

- Site survey: Equipment installation must be at least 2 meters away from large electrical appliances, escalators, metal panels, etc.
- After determining the installation location, use a marker to draw lines, punch holes, and cut grooves. Then clean up the site.




- Install and fix the equipment: Put fine sand in the cutting groove to protect the cables and fill the gaps. Next install the scuff-plate on the floor. Then fix the equipment.




- The equipment installation is complete.


3.3.2 Description of Primary Antenna TX Board Ports and Manual Configuration of Hardware

Figure 3-1 TX board ports

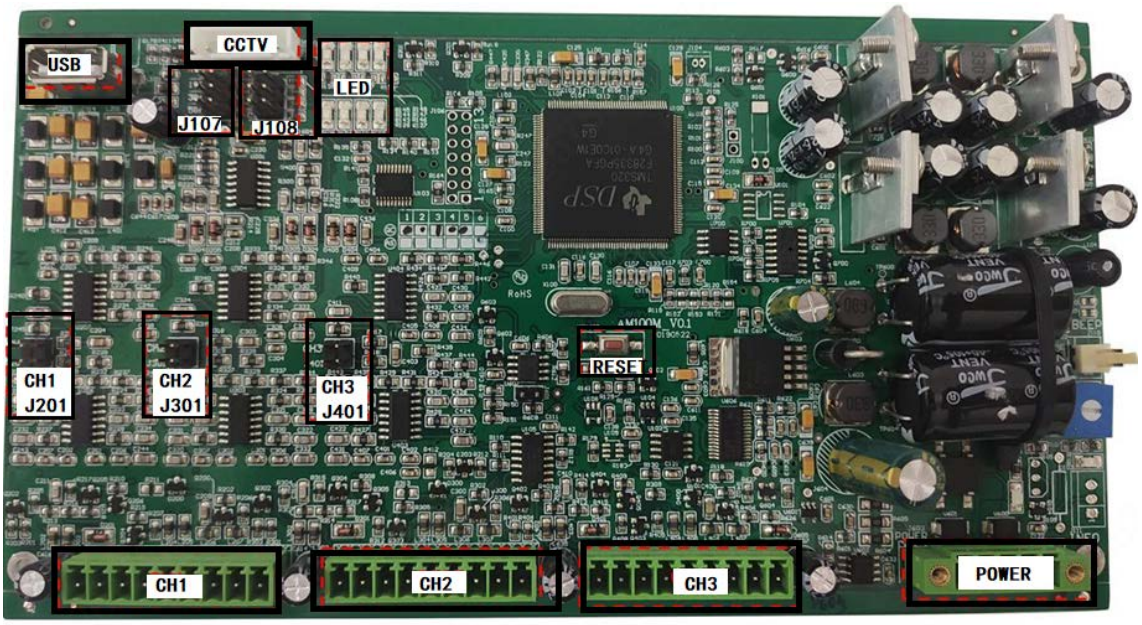
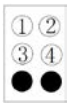
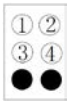
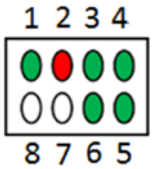


Table 3-3 Description of TX board ports and manual configuration of hardware

Port	Function	Settings
CH1/CH2/CH3	By default, CH1 is for connecting RX board of primary antenna; CH2 and CH3 is for connecting replica antenna as needed.	Use 9 Pin cable to connect, remember that cold plug, electrical hot plug will cause damage to the TX board.
Power Port	1 power input port.	Use the 5 Pin power cord to connect, remember that cold plug, electrical hot plug will cause damage to the TX board.
USB Port	1 USB port for software configuration.	Use the dedicated blue configuration cable to connect.
CCTV Port	1 Port per antenna.	Optional, not required.
J201/J301/J401	Corresponding to the channel signals of CH1, CH2, and CH3, which is for strengthening the function of noise reduction.	It is recommended to be used under the guidance of technicians.

Port	Function	Settings
RESET	1 Physical button for system reset.	When the fault indicator is red, you can reset the system by the following steps. 1. Take out a spare jumper and install it on J108-3&4. 2. Press the reset button once and wait for 10 seconds. 3. Remove the jumper cap. 4. Press the **RESET** button again. 5. After the system resets successfully, there will be an alarm sound.
J107 ● 1&2=L Low  ● 3&4=M Medium  ● 5&6=H High 	System alarm threshold From top to bottom: Low, Medium, High ● **Jumper in L**: low alarm threshold high sensitivity long detection distance ● **Jumper in M**: a balanced setting ● **Jumper in H**: high alarm threshold low sensitivity short detection distance	Quick setting of system alarm threshold The alarm threshold of each channel can be individually set by software. When a false alarm occurs in the system, on-site people can solve problems by software with the remote guidance of maintenance personnel, which greatly reduces the amount of maintenance on site. When making settings through the software on site, all connections of threshold must be disabled.

Port	Function	Settings
J108 ● 1&2= Transmission off  ● 3&4= Factory reset  ● 5&6= Channel locking display 	● **J108-1&2**: Turn off the transmission of the entire system. You can choose to turn off the transmission of the system when the system is synchronizing with the ambient equipment. ● **J108-3&4**: Used in conjunction with the system reset button. ● **J108-5&6**: The signal indicator will locking display the signal strength of the current channel (current channel means the channel displayed by the current channel indicator), and will no longer cycle.	—

Port	Function	Settings
 ● 1=Working mode ● 2=Failure ● 3=Channel 2 ● 4=Channel 1 ● 5-8= signal interference intensity (from left to right means the interference intensity increases)	The interpretation of the channel indicator is as follows: ● Working mode: ◇  The first one from the left in the first row is a working indicator. If the indicator flashes slowly, the program is under normal working conditions. If the indicator does not flash, the program is not running. ◇  The two rightmost lights in the first row are the channel indicator lights (light 3 and light 4). Under normal working conditions, the system alternately displays the signal strength of three channels. These two lights display the signal strength of the current channel. The rightmost light is on for channel 1. The second light from the right is on for channel 2. Both lights are on for channel 3. ◇  The three rightmost lights in the second row are the indicator lights for channel noise and environmental interference signals (light 6 to light 8). If 1 to 2 lights are on, it means normal. If 3 or more lights are on, it means large interference. In this case, shortening the installation distance and adjusting the sensitivity of the machine should be considered. ● Under abnormal conditions: ◇  The second indicator light from the left in the first row is a fault indicator. If this light is on, it means that the TX board is running faulty. ◇  When the 4 lights in the second row are all on, it means that the interference is too large or the channel signal is too weak (when the lights flicker more than 3 times), and the system is not working properly. In this case, on-site environment and phase synchronization should be checked.	

3.3.3 Description of RX Board Ports and Manual Configuration of Hardware

Figure 3-2 RX board ports

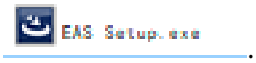
Table 3-4 RX board ports and manual configuration of hardware

Port	Description
J1	Use 9 Pin cable to connect to CH1/CH2/CH3 of the TX board of primary antenna, remember that cold plug, electrical hot plug will cause damage to the TX board.
J10 ● 1&2=L Low ● 3&4=M Medium ● 5&6=H High	Set the sensitivity of antenna receiving. From top to bottom: Low, Medium, High It can be adjusted according to ambient conditions on site, and the factory default setting is **M**. When there is a lot of interference on site, try to place the jumper in a low gear(**L**) to reduce the antenna's ability to sense interference, improve the antenna's ability to detect, and reduce the false alarm rate.
RX	1 receiving coil for connecting the antenna.
LIGHT	1 alarm indicator for connecting the antenna.
BEEP	1 Buzzer port.
R166	1potentiometer for adjusting alarm volume. Use a Philips screwdriver, turn clockwise to increase the volume, and turn counterclockwise to decrease the volume.
J7	1 port for power indicator.

JUMPER	Spare jumper.

3.4 Software debugging

3.4.1 Software Installation

Step 1 Install and debug software applications with software compression package 

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Step 2 Install and debug the module driver with driver compression package **CH341SER.EXE.**

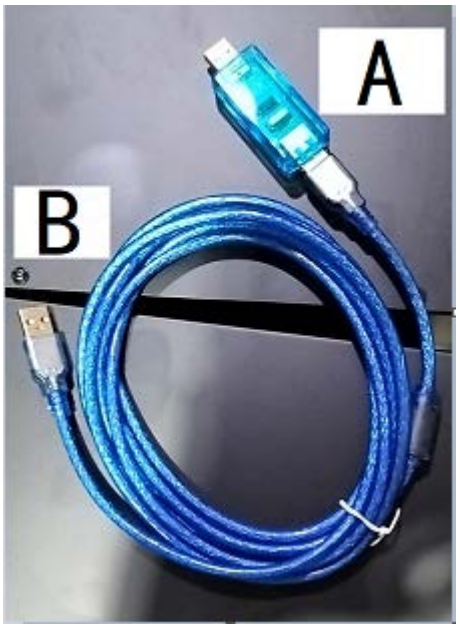
Step 3 Check whether the installation of step1&2 is successful.

Right-click on the computer desktop and select **My Computer> Device Manager> Port**.

Step 4 Use blue configuration cable to connect TX board and computer.

Port B is for connecting TX board, Port A is for connecting computer.

Figure 3-3 Configuration cable



Step 5 After finishing the connection of TX board and computer, **COM** interface will appear at software of computer 

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Select **Serial port**, and then click **Open**. All the default parameters of the system will appear if you click **Query**.

Step 6 Click **Close** when finishing all the configuration.

3.4.2 Interface Parameter Description

3.4.2.1 Interface Parameter

Figure 3-4 Software parameter

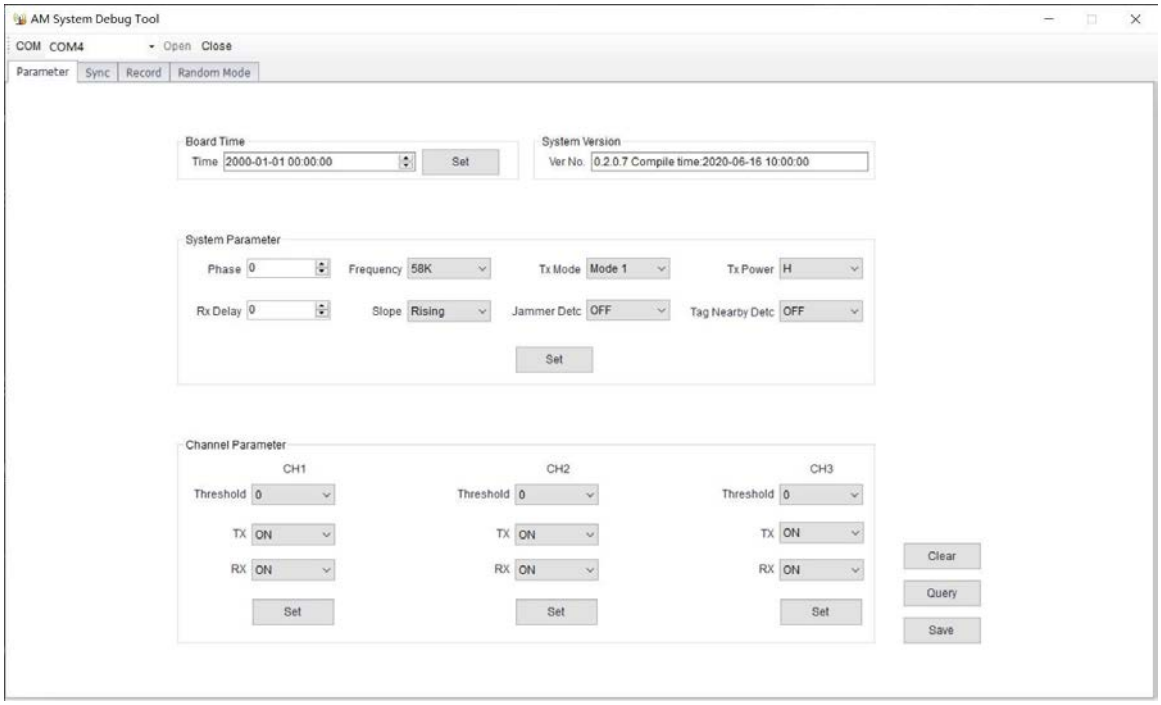


Table 3-5 Interface parameter description

Parameter	Default Parameter	Parameter Range	Description
Phase		0–119	Set the phase.
Frequency	58 K	57.8 K/58 K/58.2 K/58.4 K/58.6 K	Change accordingly to the label's frequency.
Tx Mode	Mode1	Mode1/Mode2/Mode 3/Mode4/Mode5	Change accordingly to the ambient environment, mode 1 to mode 3 is available now.
Tx Power	High	High/Medium/Low	No need to set up.
Rx Delay		0–100	No need to set up.
Slope	Rising	Rising/Falling	If there is always jitter between the external phase and system phase when the system is synchronized, try to change the slope. ⚠ By default, the left is Null line, the right is Fire line.

Parameter	Default Parameter	Parameter Range	Description
Jammer Detc	OFF	ON/OFF	Detect whether there is Jammer Detc around the antenna that maliciously interfere with the antenna's normal work. When a malicious signal is detected, the antenna indicator will "flash 4 times—pause—flash 4 times—pause". To ensure the good use of the antenna, it is necessary to eliminate the source of interference.
Tag Nearby Detc	OFF	OFF/S/M/L	Detect whether there are 58KHz labels or tags around the antenna that affects the antenna's normal work. The antenna indicator will "flash 2 times—pause—flash 2 times—pause", which prompts clerks to check. There are three choices for selecting: small label, medium label and large label. Choose the corresponding label according to the label used by the store.
Threshold		0–5	The higher the value, the higher the alarm threshold. When the antenna is prone to intermittent false alarms, choose to increase the threshold (When setting the threshold in the software, make sure that J107 and TX board are disconnected, otherwise the setting of J107 will affect the software settings).
TX	ON	ON/OFF	Transmission function on or off.
RX	ON	ON/OFF	Receiving function on or off.
Set			Click this button after changing the parameters.
Clear			Clear the setting.
Query			Query the current (parameters need to click this button after opening the serial port).
Save			Save the set parameters to the TX board.

3.4.2.2 Sync Interface Parameters

The system synchronization bar graphically displays the ambient environment and the signal of antenna, which is convenient for the installer to set the single board phase and eliminate interference. There are four components: Environment, Surrounding Phase, Channel Signal, and Debug phase. Environment and surrounding phase display the data calculated by the selected channel. For clear positioning, select a channel with a clean signal for calculation and debugging.

Figure 3-5 Sync interface

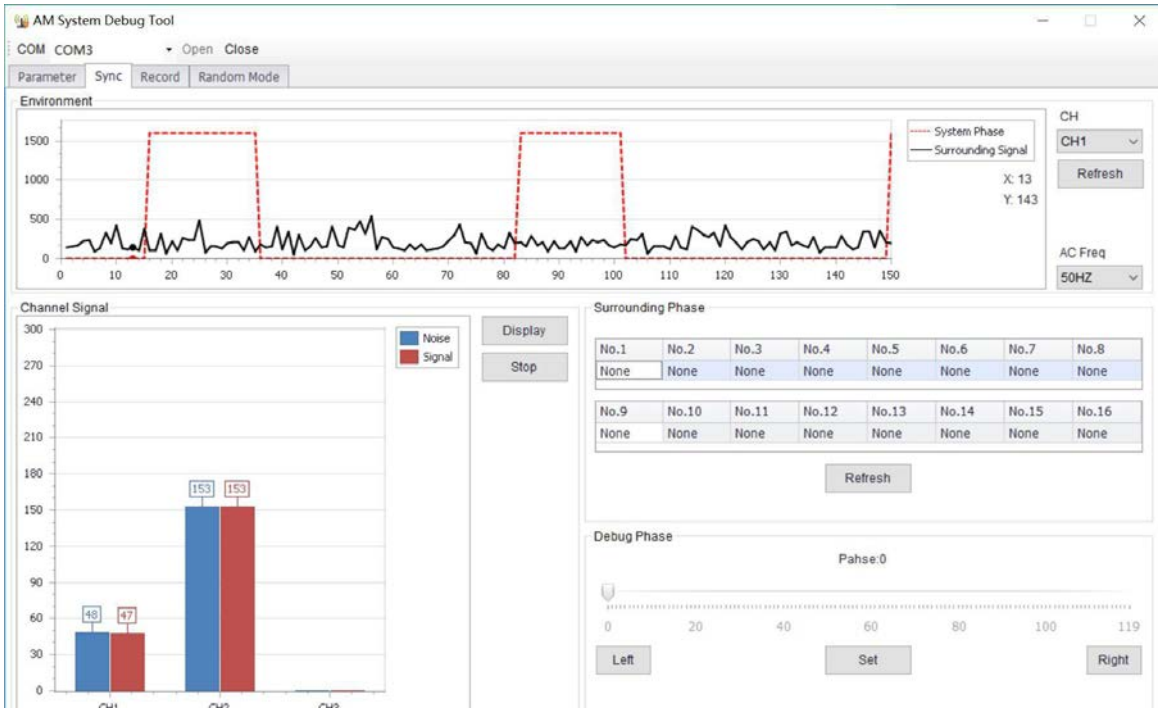


Table 3-6 Description of sync interface parameters

Parameter	Description
Environment	
System Phase	The red square indicates the situation of signal transmission.
Surrounding Signal	The black square indicates the surrounding signal. It's convenient to use the mouse to calculate the phase differences between antenna system and peripherals.
Channel Signal	
Noise	Noise of surroundings
Signal	Interference strength of the signal in the surroundings
Surrounding Phase	Click **Refresh** and the antenna will automatically collect environmental data and upload the calculated phase value.
Debug Phase	Use the mouse to change the phase value so that the upper right corner of the red square and that of black square are on the same line.
Function Key	
CH	Select the channel to be debugged.
Refresh	Select the corresponding phase channel and click **Refresh**. The antenna will collect the ambient data and upload it to the system for synchronization. To facilitate system synchronization, select the channel with the best signal for configuration. If signal interference of the channel is very large, choose one of the antennas to reduce the sensitivity of the hardware (J10) on the RX board, and restore it to the initial state after the synchronization is over.
AC Freq AC	Select 50 Hz or 60 Hz according to the local power supply voltage

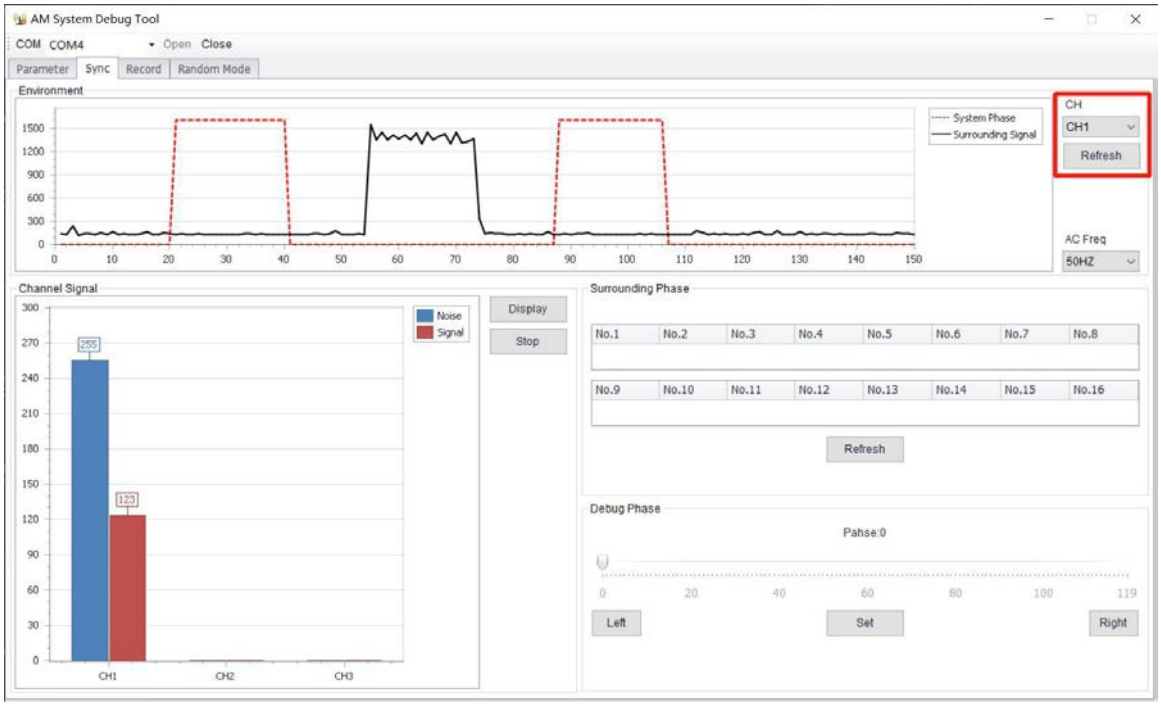
Parameter	Description
Display	Click **Display**, and the antenna will automatically upload the channel signal and background noise.
Stop	Click **Stop** after debugging. The obtained phase will be transmitted to the system through the parameter setting interface and saved.
Left-Right	Switch **Left** and **Right** in the debug phase. The software will shift the phase of a scale to the left or right and send it to the antenna. The antenna will be adjusted automatically after clicking **Set**.
Set	If using the mouse to change the phase to a new range, click **Set**, otherwise the software will not transmit this value to the machine.

3.4.2.3 Phase Sync of Acousto-Magnetic System

Step 1 Select the corresponding phase channel and click **Refresh**.

The primary antenna will collect the ambient data and upload it for display. To facilitate system synchronization, select the channel with the best signal and least interference for debugging.

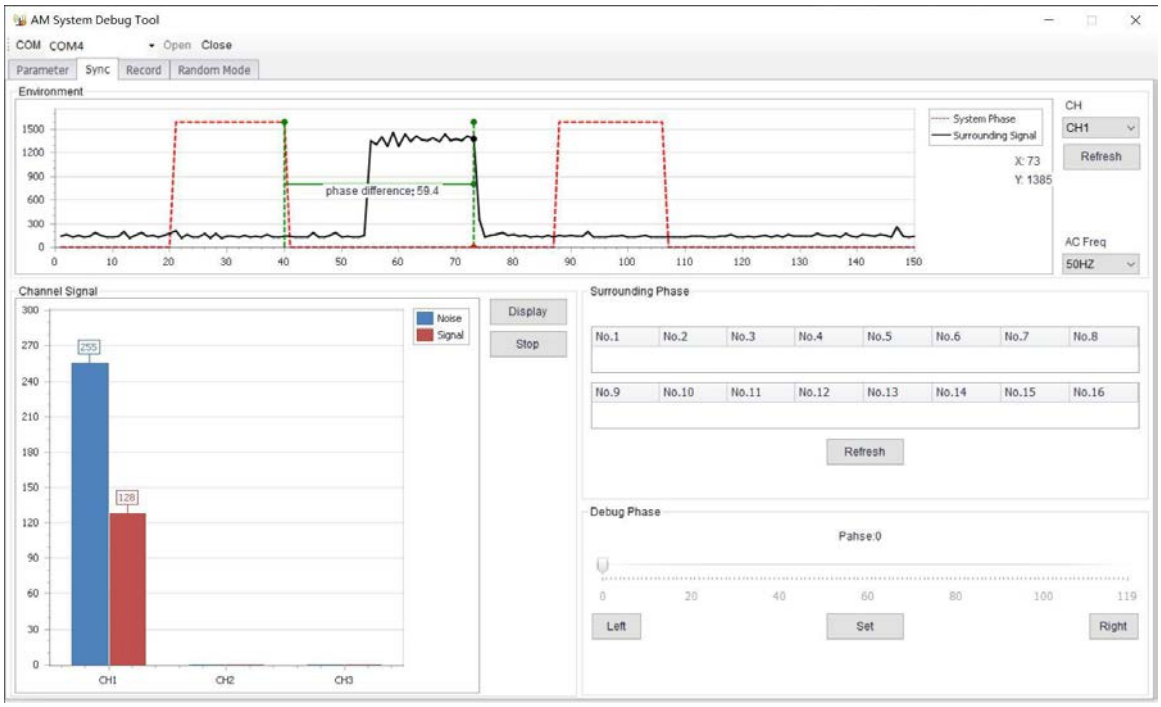
Figure 3-6 Channel selection



Step 2 Click **Left**, select the system phase as the starting point, move the mouse to the ambient data (other phases) as the end point, and the system will automatically calculate the phase difference.

The calculation is based on the falling edge, and the phase alignment is also based on the falling edge alignment.

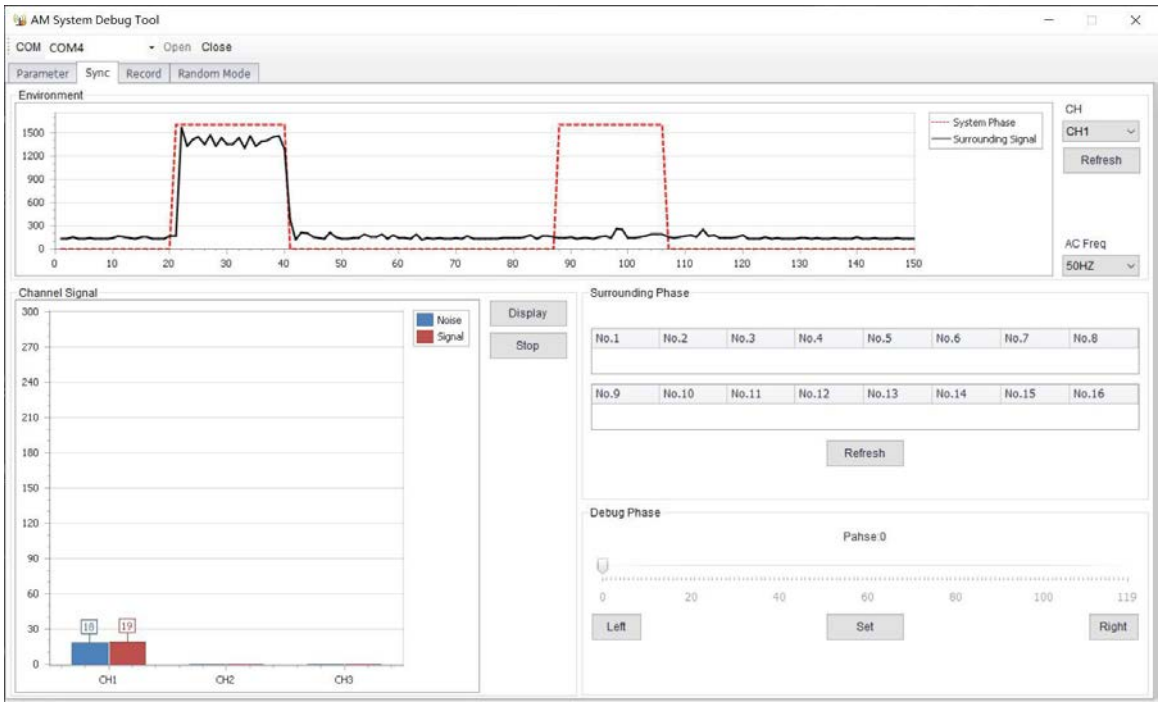
Figure 3-7 Phase difference calculation



Step 3 Enter the obtained phase difference value into **Phase** in **Parameter Setting** and click **Set** and **Save**.

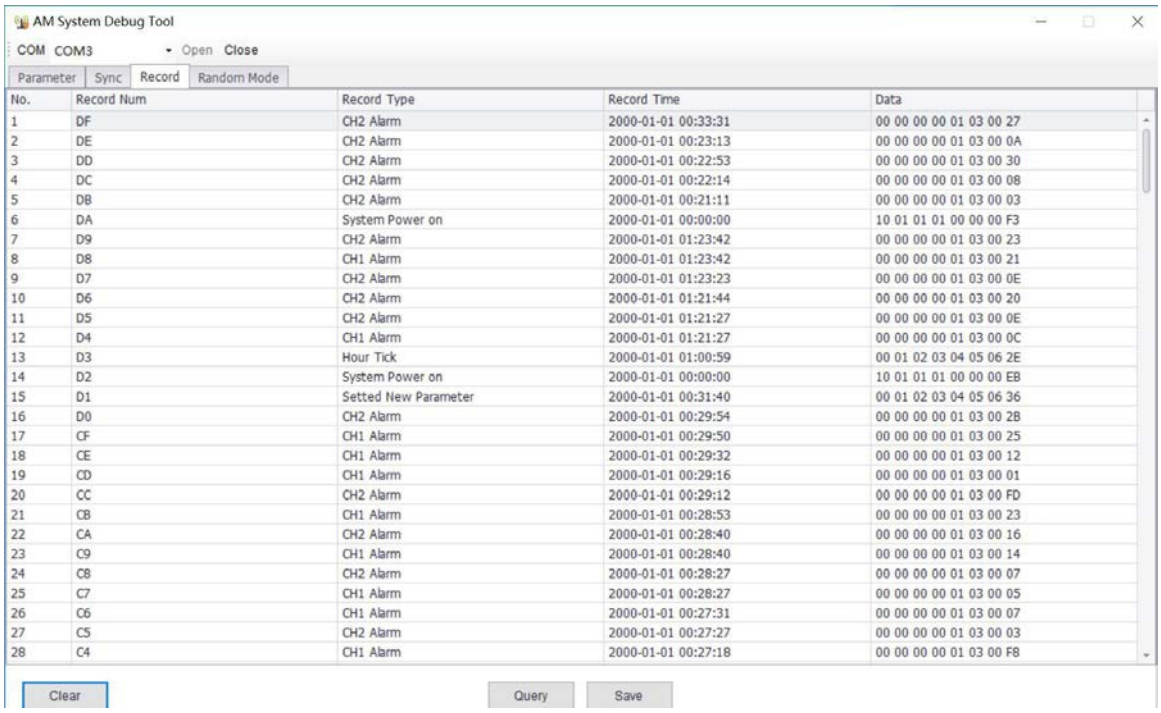
If you observe that the noise and signal displayed by the channel signal are the smallest, it means phase synchronization is completed.

Figure 3-8 Phase sync



3.4.2.4 Alarm Records

Figure 3-9 Alarm records view



No.	Record Num	Record Type	Record Time	Data
1	DF	CH2 Alarm	2000-01-01 00:33:31	00 00 00 00 01 03 00 27
2	DE	CH2 Alarm	2000-01-01 00:23:13	00 00 00 00 01 03 00 0A
3	DD	CH2 Alarm	2000-01-01 00:22:53	00 00 00 00 01 03 00 30
4	DC	CH2 Alarm	2000-01-01 00:22:14	00 00 00 00 01 03 00 08
5	DB	CH2 Alarm	2000-01-01 00:21:11	00 00 00 00 01 03 00 03
6	DA	System Power on	2000-01-01 00:00:00	10 01 01 01 00 00 00 F3
7	D9	CH2 Alarm	2000-01-01 01:23:42	00 00 00 00 01 03 00 23
8	D8	CH1 Alarm	2000-01-01 01:23:42	00 00 00 00 01 03 00 21
9	D7	CH2 Alarm	2000-01-01 01:23:23	00 00 00 00 01 03 00 0E
10	D6	CH2 Alarm	2000-01-01 01:21:44	00 00 00 00 01 03 00 20
11	D5	CH2 Alarm	2000-01-01 01:21:27	00 00 00 00 01 03 00 0E
12	D4	CH1 Alarm	2000-01-01 01:21:27	00 00 00 00 01 03 00 0C
13	D3	Hour Tick	2000-01-01 01:00:59	00 01 02 03 04 05 06 2E
14	D2	System Power on	2000-01-01 00:00:00	10 01 01 01 00 00 00 EB
15	D1	Setted New Parameter	2000-01-01 00:31:40	00 01 02 03 04 05 06 36
16	D0	CH2 Alarm	2000-01-01 00:29:54	00 00 00 00 01 03 00 2B
17	CF	CH1 Alarm	2000-01-01 00:29:50	00 00 00 00 01 03 00 25
18	CE	CH1 Alarm	2000-01-01 00:29:32	00 00 00 00 01 03 00 12
19	CD	CH1 Alarm	2000-01-01 00:29:16	00 00 00 00 01 03 00 01
20	CC	CH2 Alarm	2000-01-01 00:29:12	00 00 00 00 01 03 00 FD
21	CB	CH1 Alarm	2000-01-01 00:28:53	00 00 00 00 01 03 00 23
22	CA	CH2 Alarm	2000-01-01 00:28:40	00 00 00 00 01 03 00 16
23	C9	CH1 Alarm	2000-01-01 00:28:40	00 00 00 00 01 03 00 14
24	C8	CH2 Alarm	2000-01-01 00:28:27	00 00 00 00 01 03 00 07
25	C7	CH1 Alarm	2000-01-01 00:28:27	00 00 00 00 01 03 00 05
26	C6	CH1 Alarm	2000-01-01 00:27:31	00 00 00 00 01 03 00 07
27	C5	CH2 Alarm	2000-01-01 00:27:27	00 00 00 00 01 03 00 03
28	C4	CH1 Alarm	2000-01-01 00:27:18	00 00 00 00 01 03 00 F8

Table 3-7 Alarm parameter description

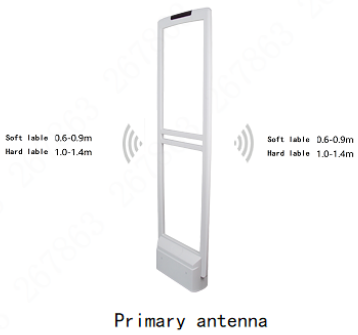
Parameter	Description
Record Type	
CH1/CH2/CH3 Alarm	Corresponding to alarm record of the signal channel.
Hour Tick	After the system is powered on, this record will be automatically generated every hour.
System Power On	The system is powered on normally. If the system continuously displays this record, check whether the power supply is normal.
Settled New Parameter	This record will automatically appear when you change the relevant parameter settings.
Function Key	
Clear	Click **Clear** to clear the screen.
Query	Click **Query** to upload the antenna record data, and save the most recent 255 records at most.
Save	Click **Save** to save the record to a specified file.

3.4.2.5 Deployment Guidance of Acousto-Magnetic Antenna Products

Both ends of the Acousto-Magnetic antenna can detect tags and labels. Using this feature, we can flexibly arrange for different channel widths.

- Channel widths: About 1 m–2 m

Figure 3-10 One primary antenna



- Channel widths: About 2 m–4 m

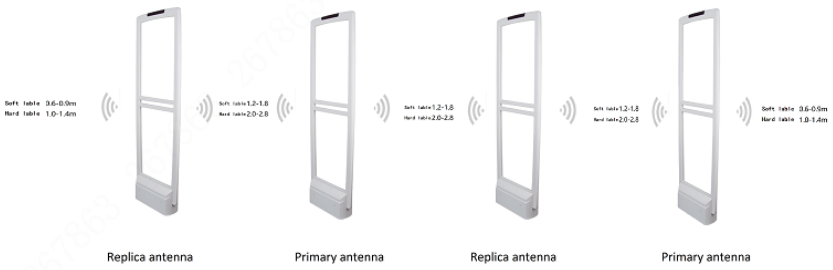
Figure 3-11 One primary and one replica antennas

- Channel widths: About 4 m–6 m

Figure 3-12 One primary and two replica antennas

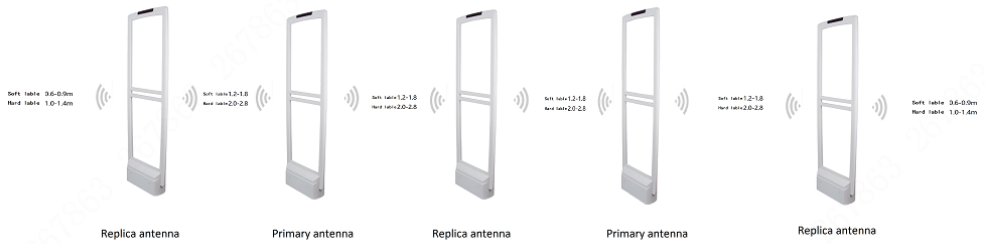
- Channel widths: About 6 m–8 m

Figure 3-13 Two primary and two replica antennas



- Channel widths: About 8 m–10 m

Figure 3-14 Two primary and three replica antennas



By analogy, one primary antenna can work with two replica antennas, and the primary antenna can also work alone, which can greatly meet the requirements of different channel widths.

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**

    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.

ENABLING A SAFER SOCIETY AND SMARTER LIVING

ZHEJIANG DAHUA VISION TECHNOLOGY CO., LTD.
Address: No.1199 Bin'an Road, Binjiang District, Hangzhou, P. R. China | Website: www.dahuasecurity.com | Postcode: 310053
Email: overseas@dahuatech.com | Fax: +86-571-87688815 | Tel: +86-571-87688883