AIoT Intelligent Video Box

FGV100

User Manual

V1.0.1

This manual applies to the following product models: FGV100

Xiamen Four-Faith Communication Co., Ltd
www.four-faith.com

Files Revised Record

Date	Version	Remark	Author
2024-05-11	V1.0.0	The initial release	YYL
2024-12-11	V1.0.1	Web page images and layout, AI Part	YYL

Copyright Declaration

Trademark Statement

Note: There may be differences in accessories and interfaces for different models. Please refer to the actual product for details.

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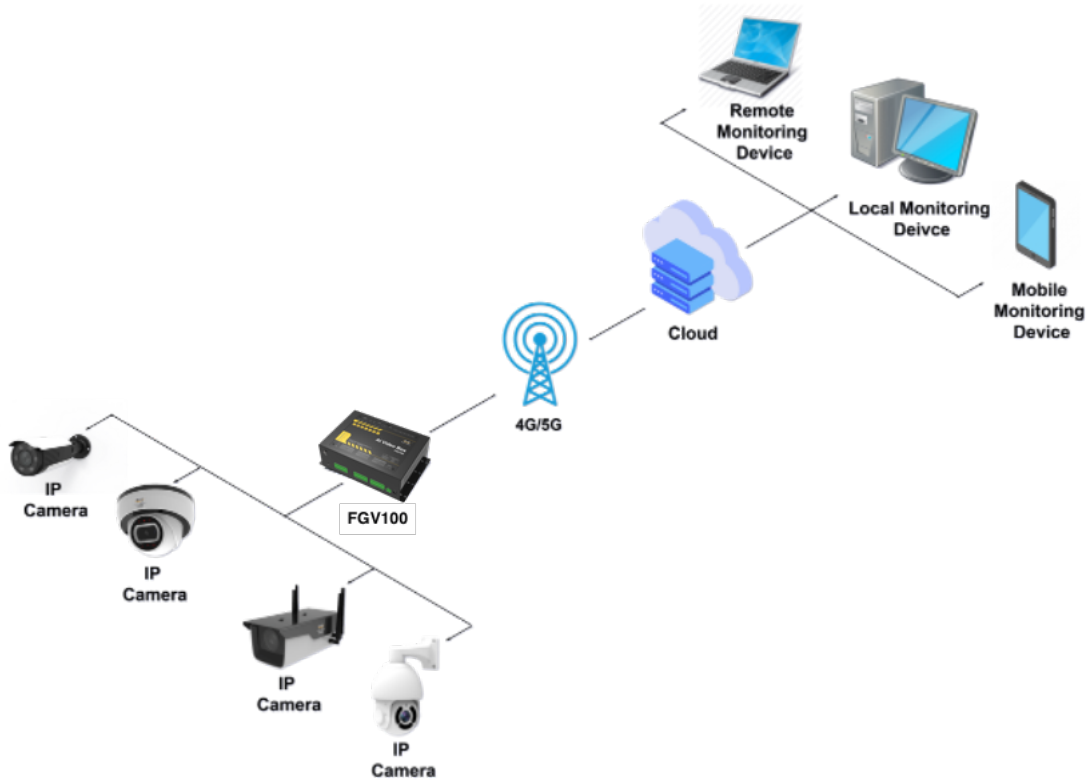
Chapter 1 Product Introduction

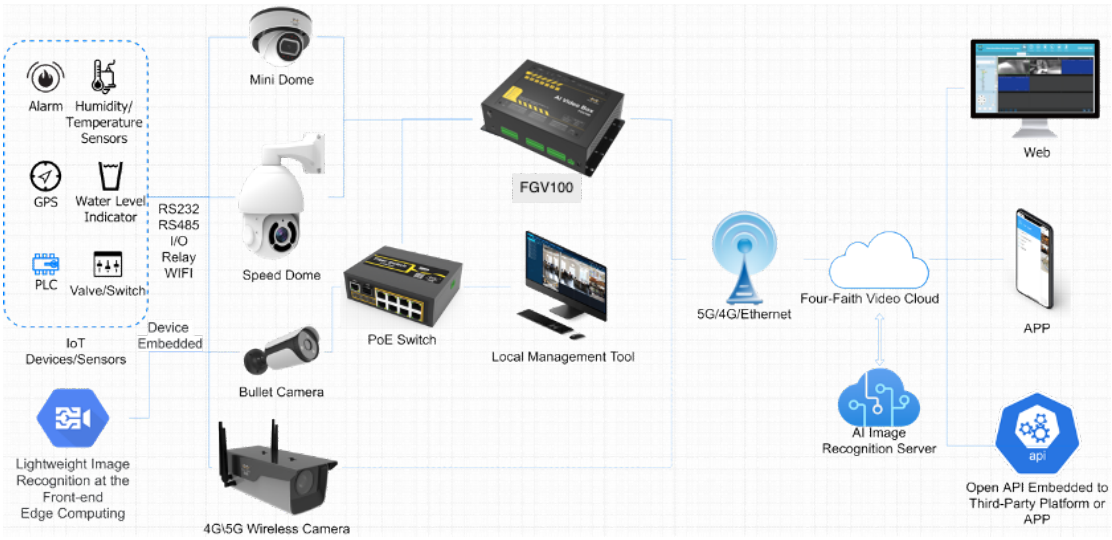
1.1. Product Overview

FGV100 is a 5G/4G AI Video Box tailored for intelligent surveillance. Featuring 5G/4G PoE/WiFi, 13Tops computing power, and seamless IoT integration, 4-channels PoE 1080p video input and 1-channel two-way voice input output. Product has Real-time video local storage/remote viewing, GPS positioning, motion detection, alarm recording and alarm video protection and alarm event reporting platform, support video local/remote playback and exporting of video recording, GPS remote positioning, hard disk error detection, hard disk health detection, and remote platform error reporting function, a variety of WAN port selection (WIFI/wired/cellular). With flexible expansion options, it ensures adaptable monitoring solutions. Compatible with the Four-Faith IoT platform, it enables comprehensive data and image monitoring, empowering users to build robust security architectures. Ideal for businesses seeking reliable surveillance infrastructure capable of meeting evolving security demands while leveraging advanced technology for enhanced surveillance capabilities.

System Framework:



Topology:



1.2. Product Features

Industrial-grade Design
● Wide power input (DC 9~36V, PoE DC 48V)
● Wide temperature design (-35℃~75℃)
● Metal shell, good heat dissipation, impact resistance, IP30
● Waterproof, dustproof, moisture-proof suitable for outdoor use (add waterproof water tank)
● Compact, light, flexible installation
● TF, SIM card and SATA are easy to install
● Low power consumption design, video standby state to achieve data acquisition and upload
● High-performance industrial-grade wireless module
● Industrial-grade components
Stability and Reliability
● WDT watch dog design to ensure system stability
● Support plug & play, automatically set up and start to record
● The use of a complete anti-drop mechanism to ensure the terminal always online
● Use hard disk storage to ensure high speed reading and writing of data and safe and stable
● Ethernet interface built-in 1.5KV electromagnetic isolation protection
● RS232/RS485 interface is lightning proof and surge proof
● SIM/UIM card interface built-in 15KV ESD protection
● Antenna interface lightning protection (optional)
● Built-in reverse phase protection and over voltage protection for power interface
Powerful Function

- Up to 4 channels full real-time coding, standard H. 264, H. 265 decoding format, lower code stream, better picture quality.
- 4 way display switch, according to different needs to choose.
- Support 4 channels of video and audio synchronous recording and playback.
- Support up to 4 channels 1080p IPC access, 4 channels 1080p decoding,
- IPC image capture and video recording.
- Support USB flash drive upgrade/remote upgrade/local web upgrade and another multiple upgrade methods.
- Built-in 4 POE network interfaces, supporting 802.3AF and AT protocols.
- RS232 and RS485 interfaces default to a transmission rate of 9600bps, with optional rates of 1200bps, 2400bps, 4800bps, and 19200bps.
- Support 6 ways digital input.
- Support 4 ways digital output.
- Support circuit board high temperature alarm, low temperature hard disk heating.
- Abundant indicator light, can quickly check the running state of the machine.
- Powerful server platform and client tools.
- A variety of media transmission, can be applied to a variety of network environment.
- Intelligent bitrate adjustment function to solve the impact of network bandwidth fluctuation in wireless environment.
- A variety of data export methods, USB flash drive local export, remote client download, local network data export.
- The removable hard disk can be directly mounted via USB cable to achieve the quick export and preview of data in the hard disk on the computer.
- Support a variety of video audio recording mode, manual video, timing video, motion detection video and alarm video.
- 6 working modes operate simultaneously: monitoring, video recording, playback, backup, network and cloud platform.
- Support double code stream, main code stream for local storage, to ensure high image quality; Secondary code stream network real-time transmission, to solve the bandwidth bottleneck problem.
- Support HDMI output.
- Local storage support hard disk, SD card, automatic overwrite.
- Supporting alarm video recording protection mechanism, can protect important video.
- Stable storage, sudden power failure protection.
- Power protection function, after power off the machine to ensure the integrity of data preservation.
- Low voltage data protection function.
- Rich switch mode, timing, normally open mode.
- WIFI module support client default and AP mode switching.
- Local configuration graphical interface, easy to operate.

- Voice intercom function.
- Rich configuration device parameters, local UI configuration, local network configuration, client remote configuration.
- Support NTP, built-in RTC, support timing restart, timing switch function.
- Support 5G network, WIFI and wired WAN three link network intelligent switching function, can achieve intelligent switching according to the preset priority.
- Support GPS/ Beidou positioning function (optional).
- Supports SATA hard disk access, and supports 512GB Micro SD card storage

❖ **Versatile All-in-One**
The FGV100 is specially designed for IoT scenarios, integrating high-definition cameras and IoT sensors. It collects data on-site such as temperature, humidity, rainfall, water level, and flow rate, while controlling valves, gates, and switches in a synchronized manner. Moreover, the product supports both NB-IoT and LoRa, two mainstream LPWAN communication methods, ensuring adaptability to complex on-site equipment interactions. With just one device, you can easily command all things.

❖ **Edge Computing**
The Four-Faith AI Smart Video Box combines edge computing and AI algorithms, breaking free from the limitations of traditional security monitoring that are solely used for post-event tracking and viewing records It enables intelligent algorithm recognition for various industry-specific scenarios. By integrating data collected from sensors, it achieves multi-dimensional monitoring without the need for human supervision, ensuring high-precision control on-site 24/7. With millisecond-level accurate recognition, it provides 360° security coverage, and through 5G network, real-time alerts are transmit-ted to remote locations for millisecond-level early warnings.

❖ **Tailored Customization**
With high-performance configuration, effortlessly achieve multi-object detection, edge perception, and decision-making. Featuring a built-in algorithm repository, freely combine and deploy algorithms and computing power, supporting integration of third-party algorithms, software, hardware, and AI algorithms, enabling multi-level open capabilities to meet various industry project requirements. Empower customers to customize products as needed and implement cutting-edge AIoT technology for practical application.

❖ **Open Empowerment Interface**
The AI Video Box can be paired with the Four-Faith Cloud Platform, offering a variety of configurations and large-screen interfaces for diverse industry applications. It provides robust middle-tier capabilities, supporting third-party platform and app integration. This facilitates seamless integration of video, data. and device management functions, enabling customers to quickly meet market demands and fulfill user application needs.

❖ **Wireless Interconnection**

Built-in industrial-grade 4G/5G high-speed wireless communication module ensures seamless real-time transmission of high-definition video through cellular networks, addressing broadband coverage challenges in demanding environments. Enables remote monitoring and control anytime, anywhere. Supports 5G LAN, 5G RedCap. and other typical 5G features, efficiently integrating with emerging IoT technologies in the industry.

1.3. Product Specification

Hardware System		
Item		**Content**
CPU		High-performance ARM 32-bits Cortex A55 Quad-core @ 1.8 GHz processor
FLASH		2GB
DDR3		8GB
GPU/NPU		Default: 1 Top, Optional: 3 Tops, 13 Tops and 26 Tops * NPU
Video & Audio Parameters		
Item		**Content**
IPC Video Capture	Input	4-channel 1920×1080@30fps video input
	Output	1 channel HDMI HD output 4 channels (1920×1080@30fps) Video Parallel Forwarding Capacity
	Video Decoding Standard	H. 265 / H. 264 decoding
	Network Video Access Protocol	ONVIF (version 3.0), RTSP, etc
	Video Decoding Performance	Video Decoding Capacity: 4 channels (1920×1080@30fps), H.256/H.264
IPC Audio Acquisition	Input	4-channel IPC terminal audio input acquisition
	Output	4 GUI interface audio playback
	Audio Coding Standard	G711-alaw, G711-Ulaw, ACC-LC

	Audio Sampling Rate	The sampling rate is 8KHz
Voice Intercom	The input	1, 3.5 mm port (electrical level: 2.0 the Vp - p, impedance: 1 k Ω)
	The output	1, 3.5 mm port (electrical level: 2.0 the Vp - p, impedance: 1 k Ω)
	Audio Compression Standard	ADPCM
	Audio bit rate	32 Kbps
	Voice Intercom	G726

Storage Parameters

Item	Content
Hard Disk Type	2.5-inch HDD/SSD drive with SATA interface * 2
Hard Drive Capacity	Maximum capacity up to 4TB (optional)
Hard Disk Access	1 hard drive with standard SATA interface, pluggable, support SATA3.0 rate
Hard Disk Heating	1 hard drive with a heating pad
TF Card Type	Standard Micro SD card
TF Card Capacity	256GB (optional)
TF Card Access	1 TF card, standard Micro SD card slot, support hot plug

Wireless Parameters(Optional)

Item	Content
The Wireless Module	Industrial wireless module (optional menu module or no module)
Standard	Support 5G NR, 4G LTE FDD, LTE TDD
Bandwidth	5G NR: DL 230Mbps, UL 230Mbps FDD-LTE: DL 150Mbps, UL 50Mbps TDD-LTE: DL 130Mbps, UL 35Mbps
Transmit Power	<23dBm
Sensitivity	<-97dBm

GPS Parameters

Item	Content

GPS Module	Dual-module positioning module, support both GPS and Beidou (optional)
Receiver Type	32 channels Support WAAS and EGNOS, MSAS, GAGAN
Maximum Update Rate	10 Hz
Positioning Accuracy	Location: 2.5m (CEP50)
Sensitivity	Tracking: - 162 dBm Recapture: -160 dBm Cold start: -148 dBm

WIFI Parameters

Item	Content
Standard and Frequency Band	Support IEEE 802.11b /g/n, 2.4GHz, Support AP mode and Client mode.
The Theory of Bandwidth	IEEE 802.11b/g: up to 54Mbps IEEE 802.11n: up to 75Mbps
Security Encryption	Support WEP, WPA, WPA2 and other encryption methods
Transmission Power	26dBm (11b), 21.5dBm (11g), 20dBm (11n)
Reception Sensitivity	< - 72 dBm @ 54Mbps

Other External Interfaces and Indicators

Number	Item	Content
1	WAN	1 * RJ45 10M/100M/1000M adaptive Ethernet port
2	LAN	4 * RJ45 10M/100M adaptive Ethernet port, support POE power AF&AT (optional)
3	Serial Interface	2 * standard RS485, 2 * standard RS232, 4 * standard RS232/485
4	The USB Interface	1 * USB2.0, 1 * USB3.0
5	Digital Input	6
6	Digital Output	4
7	Reset Button	Restore the factory default, long press 10 seconds
8	Indicator Light	POWER: Power indicator
		SYS: System operation indicator

		WLAN: WiFi indicator light
		ERROR: Video ERROR alarm indicator
		HDD: Hard drive indicator
		ONLINE: 5G status indicator

Power Supply

Item	Content
Power Interface	Terminal blocks, DC, dual redundant power sources
Power Supply Range	Terminal input: Wide voltage 9 to 36V DC input: Wide voltage 9 to 36V
Power Consumption	DC output: 1 x 12V 2A, 1 x 5V 2A (Compatible)

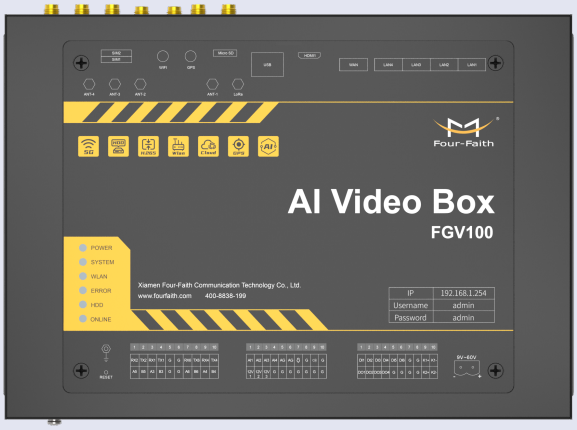
Physical Properties

Item	Content
Casting	Metal casing, IP30
Dimensions	182 x 152 x 80mm (Excluding antenna and mounting), customizable casing dimensions available

The other Parameters

Item	Content
Working Temperature	- 35 ~ + 75°C
Working Humidity	0%~90% (non-condensing)
Atmospheric Pressure	86kPa to 106kPa
Warranty	1 year

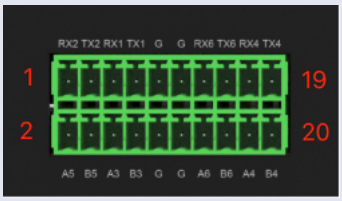
Interface Definition



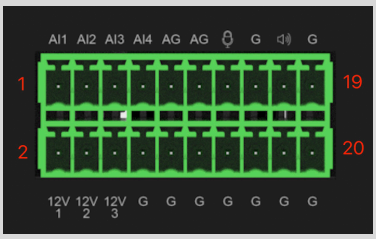
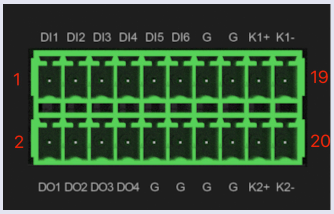
Number	Item	Content
1	Indicator Light	POWER Indicator: POWER on
		System: Video system power indicator: standby is off, and the video system is always on
		WLAN: Gigabit network indicator light: no WLAN connection off, access to WLAN port light
		ERROR: Video ERROR indicator light: the video will go out if there is no ERROR, and the video will flash if there is an ERROR
		HDD: Indicator of hard disk working status: it is always on when the hard disk is not connected, and the read-write data is flashing
		Online: module working status indicator light: the module will be off if it is not Online or not connected to the Internet

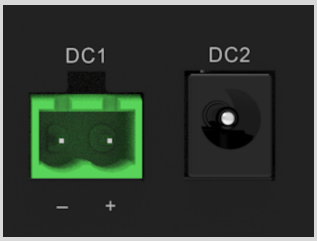
The Front Panel

Stitch Definition

Number	Identification	Picture	Definition	Instructions
1	Grounding Screw		Pin 1: GND	Access to the chassis.
2	Reset		Pin 1: RESET	Parameters restore factory default. Press this button for more than 10 seconds to restore factory default parameters of AI Box device.
3	Double Block 1		Pin 1: DEBUG_RS232_RX2 Pin 2: CPU_RS485_A5 Pin 3:	

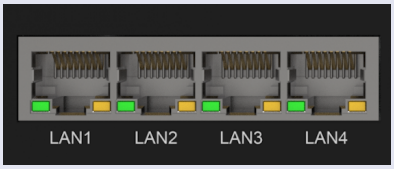
			DEBUG_RS232_TX2 Pin 4: CPU_RS485_B5 Pin 5: CPU_RS232_RX1 Pin 6: CPU_RS485_A3 Pin 7: MCU_RS232_TX1 Pin 8: MCU_RS485_B3 Pin 9: GND Pin 10: GND Pin 11: GND Pin 12: GND Pin 13: MCU_RS232_RX6 Pin 14: MCU_R485_A6 Pin 15: MCU_RS232_TX6 Pin 16: MCU_RS485_B6 Pin 17: MCU_RS232_RX4 Pin 18: MCU_RS485_A4 Pin 19: MCU_RS232_TX4 Pin 20: MCU_RS485_B4	

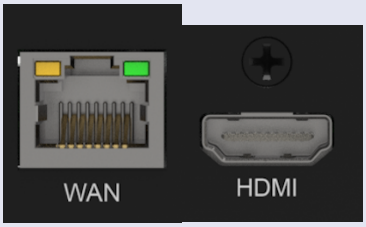
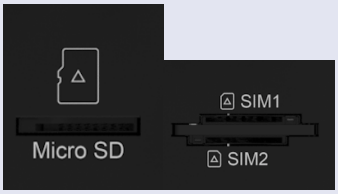
4	Double Block 2		Pin 1: AI1 Pin 2: 12V-1 Pin 3: AI2 Pin 4: 12V-2 Pin 5: AI3 Pin 6: 12V-3 Pin 7: AI4 Pin 8: G Pin 9: AG Pin 10: G Pin 11: AG Pin 12: G Pin 13: Microphone input Pin 14: G Pin 15: G Pin 16: G Pin 17: Audio Output Pin 18: G Pin 19: G Pin 20: G	
5	Double Block 3		Pin 1: DI1 Pin 2: DO1 Pin 3: DI2 Pin 4: DO2 Pin 5: DI3 Pin 6: DO3 Pin 7: DI4 Pin 8: DO4 Pin 9: DI5 Pin 10: G Pin 11: DI6 Pin 12: G Pin 13: G Pin 14: G Pin 15: G Pin 16: G	

			Pin 17: K1+ Pin 18: K2+ Pin 19: K1- Pin 20: K2-	
6	DC Input		Pin 1: Terminal Interface Pin 2: DC power Interface	

Rear Panel:

The Interface Definition

Number	Identification	Picture	Definition	Instructions
1	LAN1-4 Interface		4 x 10M/100M RJ45 Ethernet Port, PoE(Optional)	

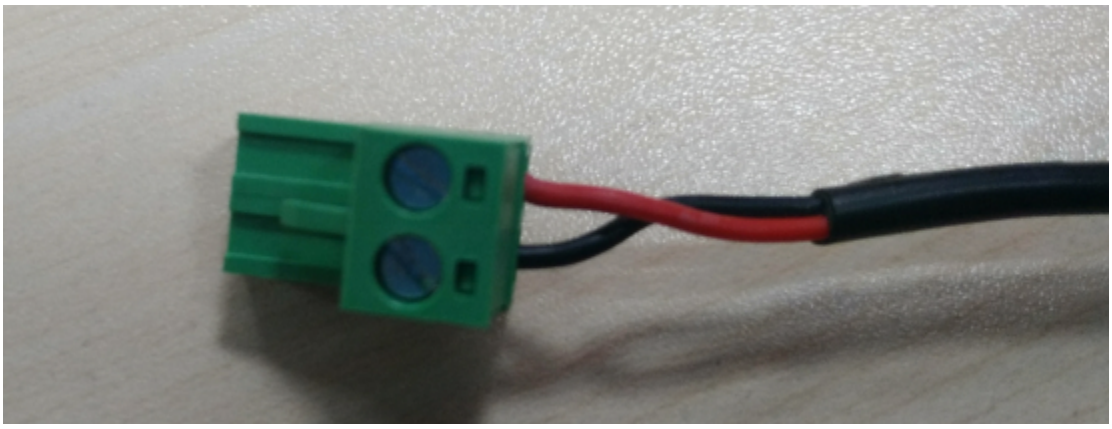
2	HDMI		HDMI	Video output, standard HDMI interface
3	WAN + 1 USB2. 0 + 1 USB3.0		WAN USB	RJ45 10M/100M/1000M adaptive Ethernet port. USB2.0 + USB3.0: supports mouse and USB flash drive access.
4	Antenna		GPS 5G WIFI LoRa	GPS: Directional antenna. 5G: Main 5G/4G antenna. WIFI: WIFI antenna. LoRa: LoRa antenna
5	Micro SD&SIM * 2		Micro SD SIM * 2	
6	Hard Disk		SATA heating chip power interface SATA hard disk power interface SATA data interface	

Algorithm (Optional)	
Item	**Content**
Algorithm Types	Supports various intelligent algorithms such as human and vehicle recognition, passenger flow statistics, water level detection, mask recognition, etc. Also, it supports in-depth customization of various target detection and tracking algorithms for industry-specific scenarios.
Algorithm Library Management	Supports algorithm parameter management and algorithm upgrade management.
Algorithm Configuration	Allows configuration of algorithms for different channels.
Algorithm Instances	1. Water level indicator instance: The maximum distance of the water level indicator: 50m(depending on the different model of camera) The maximum measuring range: 20m Resolution: 1cm Recognition Accuracy: +-2cm

Chapter 2 Installation of Device

2.1. Power Supply Installation

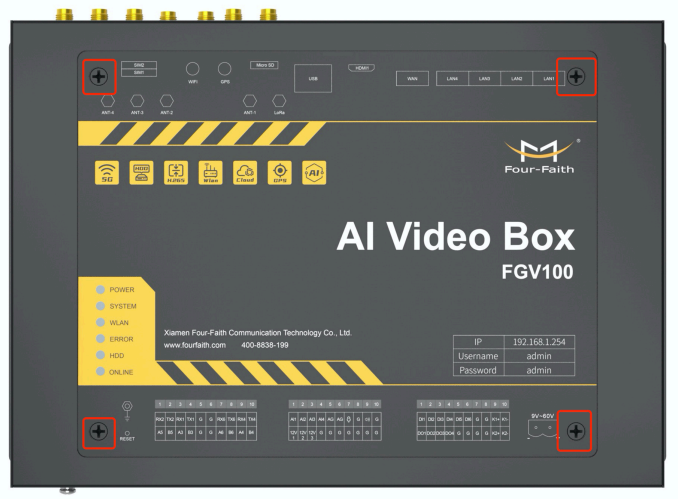
Remove the power adapter and power terminal from the package, install the positive and negative terminals of the power adapter on the power terminal in the correct access mode:

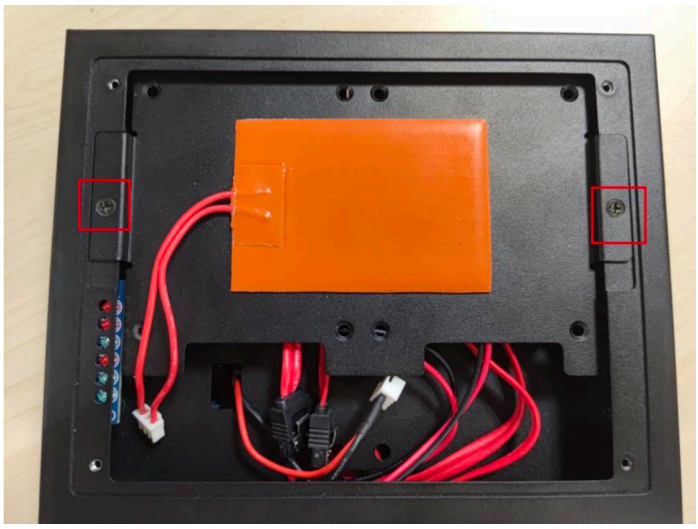


2.2. Hard Disk Installation

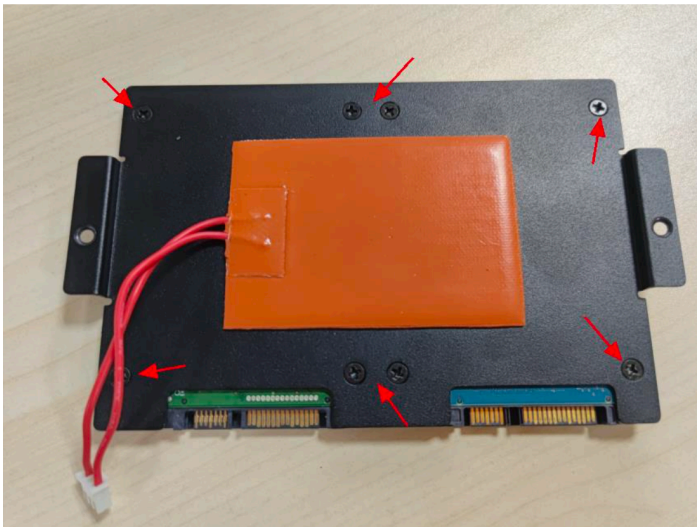
The main steps of hard disk installation are as follows:

1. Remove the four screws on the cover plate of the device, and continue to remove the two screws that fix the hard disk bracket after removing the cover.

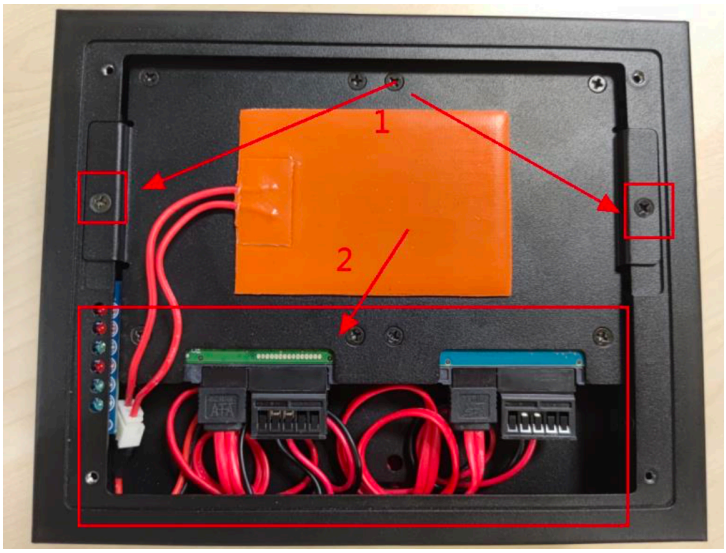




2. Fix the hard disk on the hard disk bracket in the following orientation and lock the screws.



3. Attach the hard drive bracket where the hard drive is installed to the lid of the device, and lock the two screws to secure the hard drive bracket. After that, refer to the screenshot below to connect the hard disk heating cable, SATA power cable, and data cable to the corresponding locations.



4. Cover the upper cover plate removed from the first step and lock the four screws.

Remarks: Screw specification: M3*5mm, Black cross countersunk head

Chapter 3 Web Page Configuration

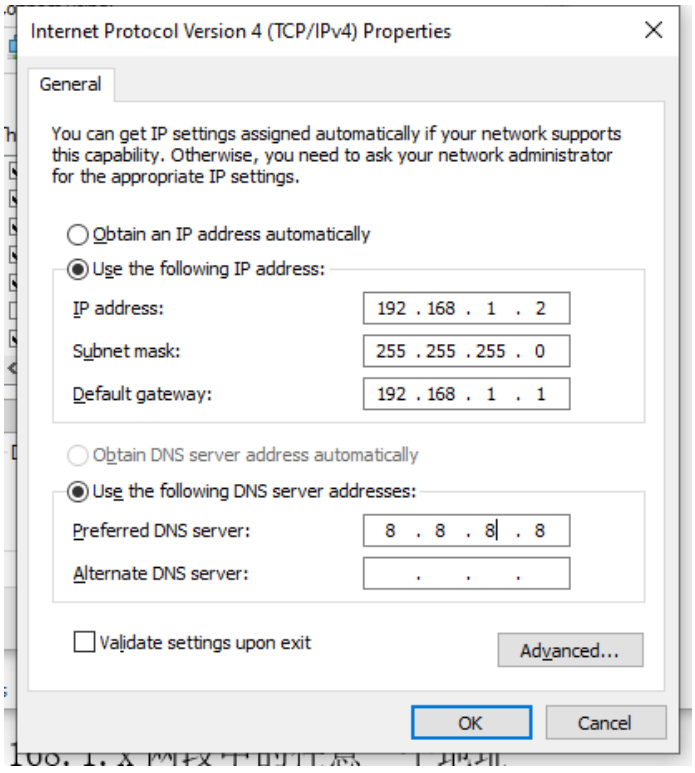
3.1. Configuration Connection

Before configuring the AI Box, you need to connect the Box to the PC for configuration through the factory configured network cable or WIFI. When connecting with WIFI, you must turn on the WIFI function and configure the corresponding routing SSID and password.

3.2. Login Configuration

3.2.1. PC IP Address Setting

Set the IP address of PC to 192.168.1.2(or other IP address of 192.168.1 network segment), set the subnet mask to 255.255.255.0, and set the default gateway to 192.168.1.1. DNS is set to a locally available DNS server.



3.2.2. Install Web Plugin

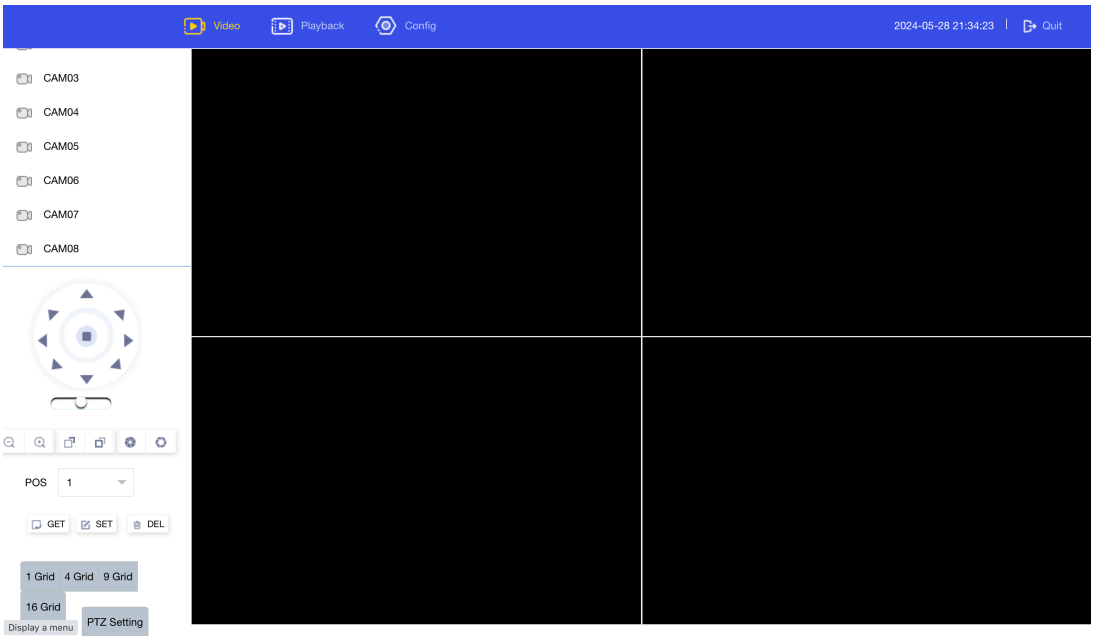
If you are using Internet Explorer, run the executable webVideoPlugin-xxx.exe program. In addition, you can use Google Chrome, this product supports plug-in-free video playback.

3.2.3. Login to the Box Web Page

This chapter describes the main functions of each page. Web tools can be accessed through a web browser using a computer connected to the AI Box.

Access the device's web-based Web management tool, launch IE or another browser, and enter the device's default IP address 192.168.1.254 in the "address" field. Press Enter. If you login to the Web page for the first time, you can see the page as follows, and prompt the user to enter the username and password. The default username and password of the device is admin (You can set this on the "System Configuration > System Management > User Management").

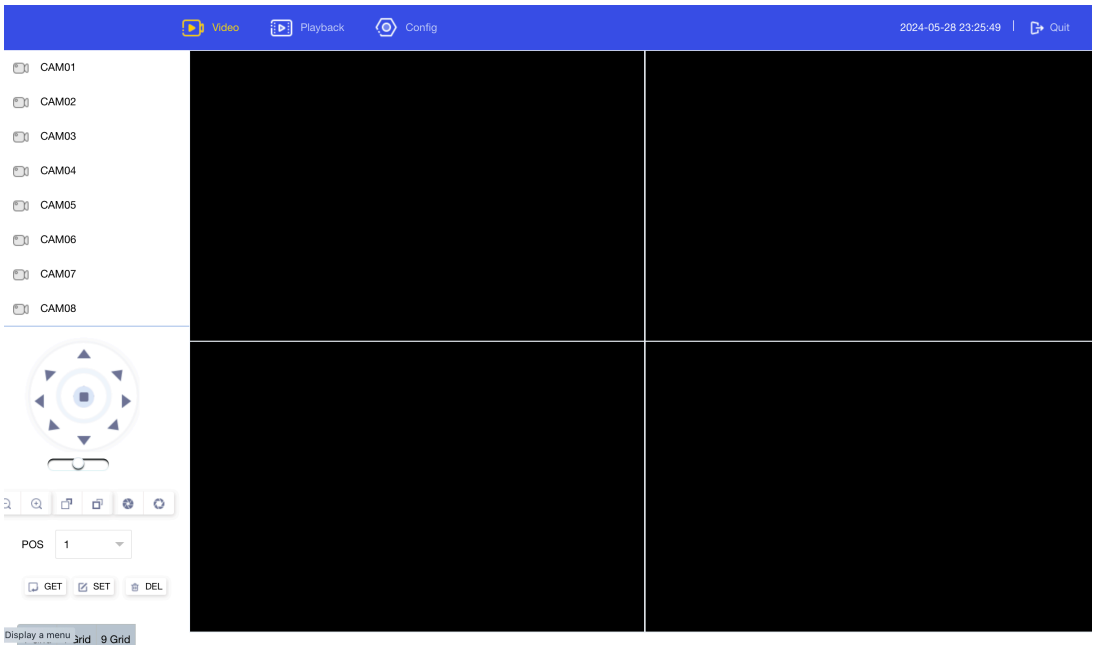
After login to the AI Box Web management tool, user can go to the web main page.



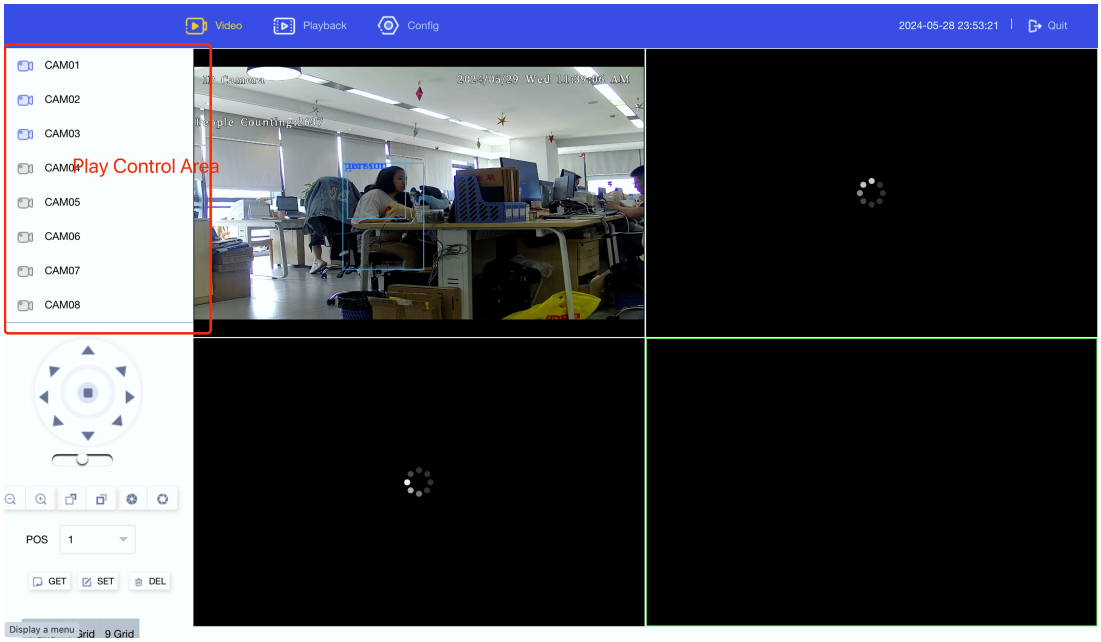
3.3. Real-Time Video

3.3.1. Real-Time Monitoring

Real-time monitoring includes: video preview, PTZ control, and split-screen switching and Preset points settings.



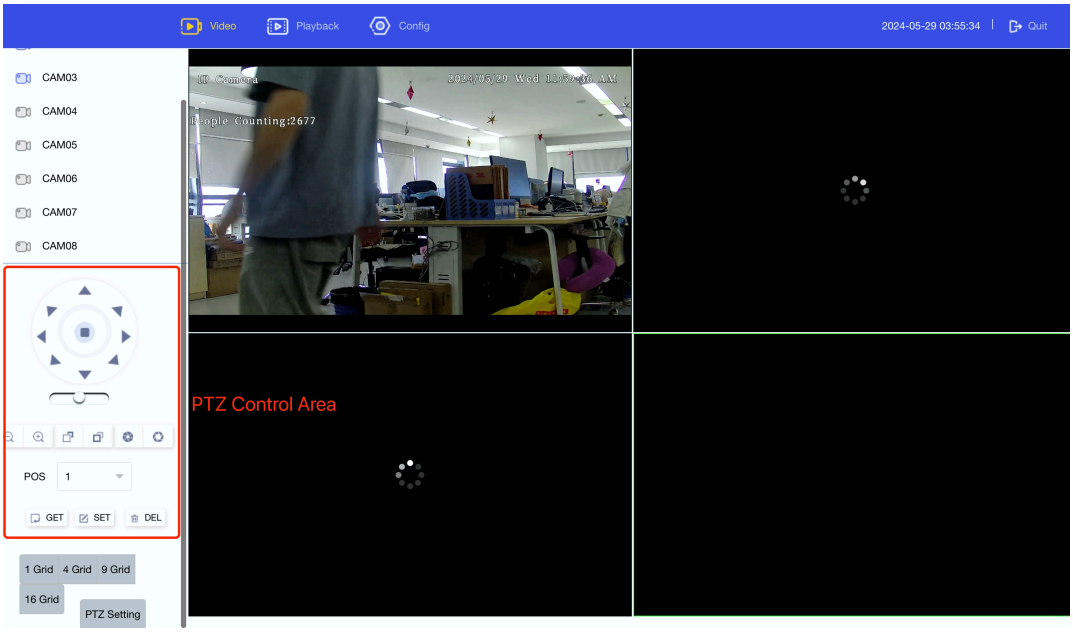
3.3.2. Video Preview



Enable: Select the video playing window on the right and click the channel name in the "Play Control Area" on the left to play the real-time preview of the clicked video in the selected play window (if the play window is not selected, the first free window will start playing).

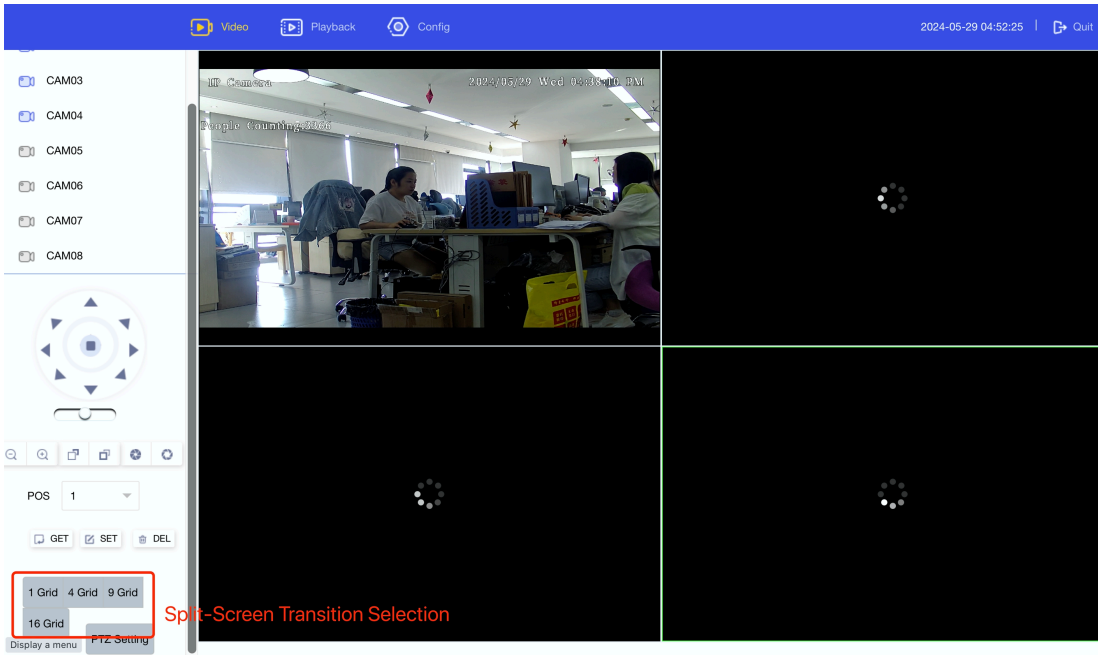
Disable: Click the "Play Control Area" channel again to close the video of the corresponding preview channel.

3.3.3. PTZ Control



Click the video playing window, select the channel, and click the "PTZ Control Area" on the left to control the PTZ of the selected channel.

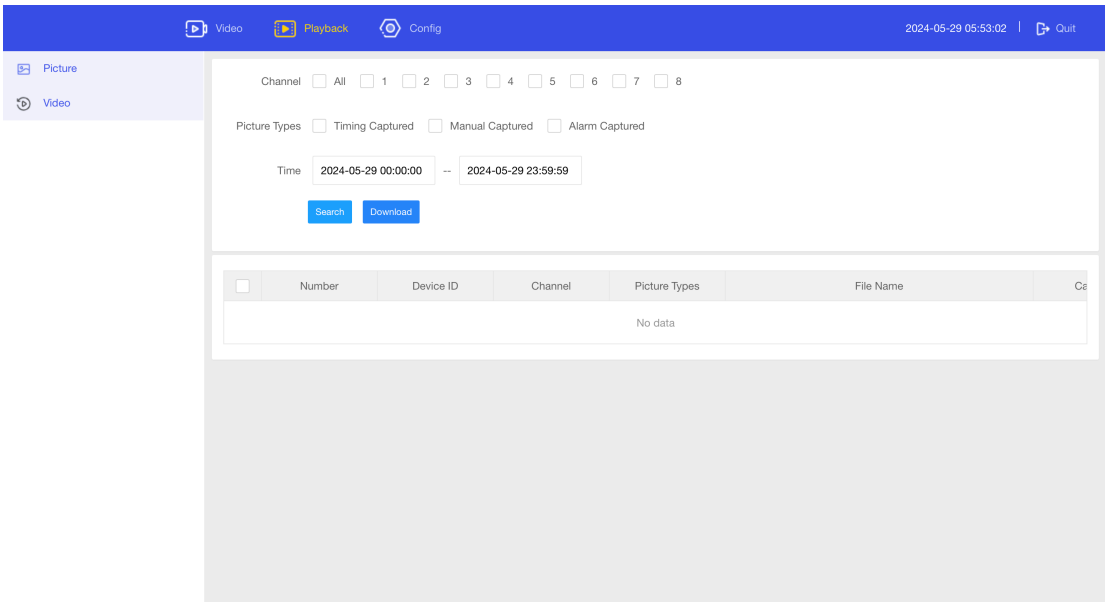
3.3.4. Preview Split-Screen Transition



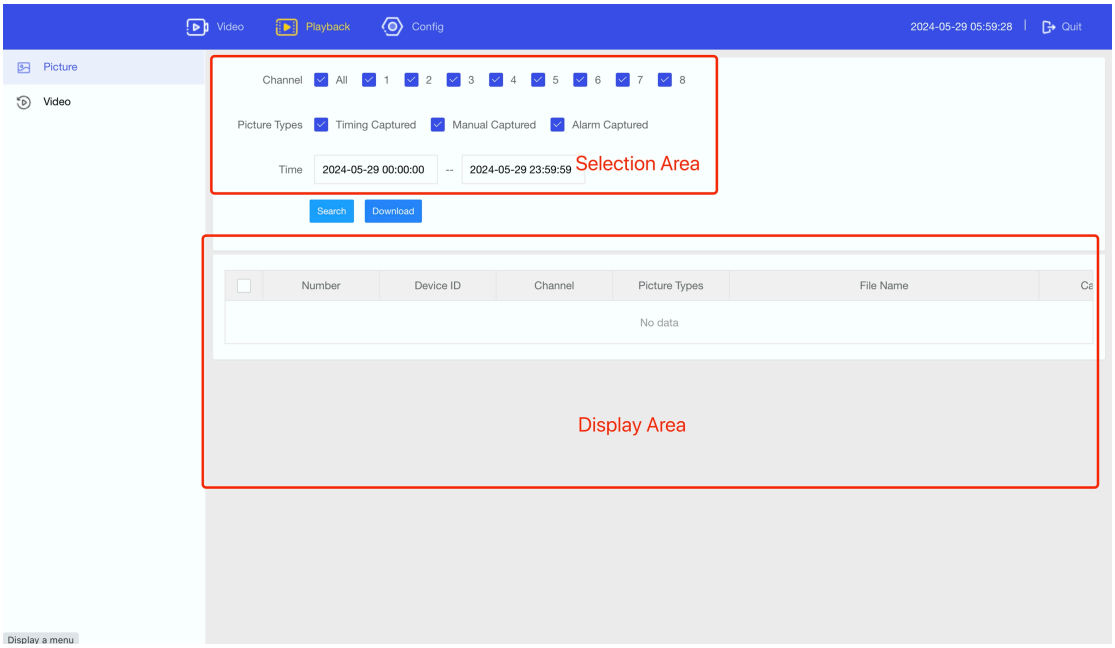
Click "Split PTZ Area" on the left to switch the number of split screens in the video playing window. This model supports up to 4 channels of real-time playing.

3.4. Playback

Click the "Playback" button on the top navigation bar to enter the playback function. The playback function includes: picture playback, video playback, click the left control navigation bar to switch functions.



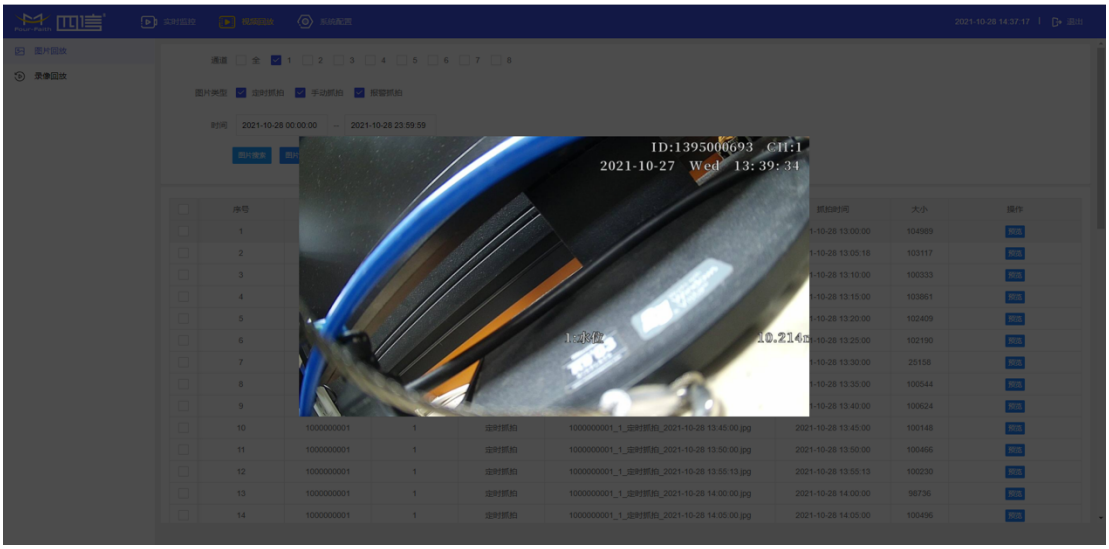
3.4.1 Picture Playback



In the Selection area, filter the required images and select the following items: channel, image type, and image storage time range.

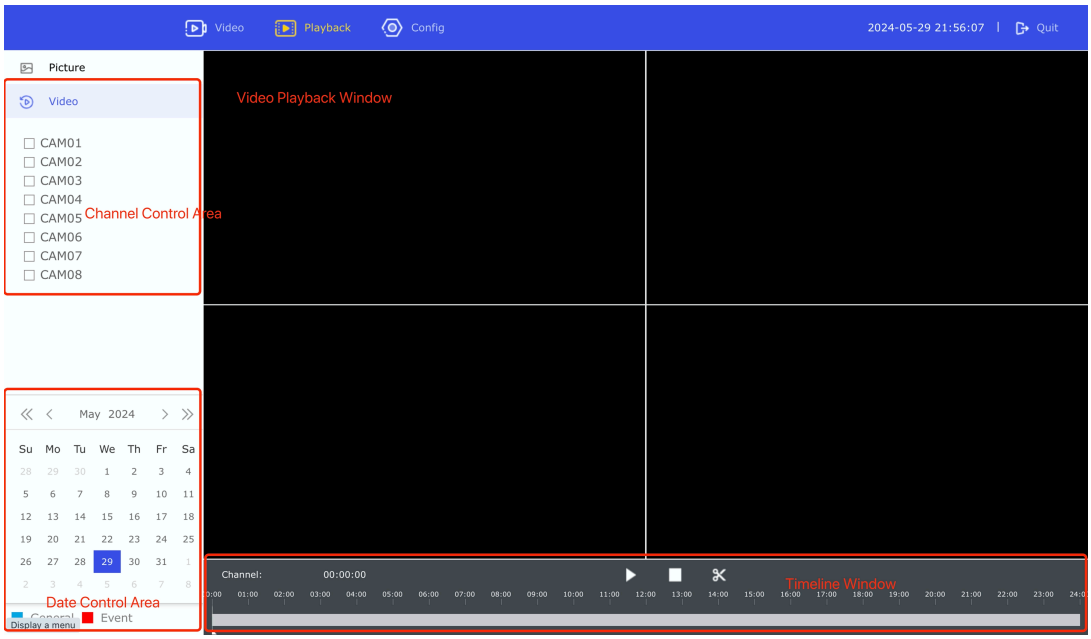
Search: Click the "Search" button, the searched images will be displayed in the "Display Area", and more than 50 images will be displayed in pagination.

Preview: Click "Preview" in the "Display Area" to preview the corresponding image, as shown in the following figure.



Download: Select the checkbox next to the “number”, and then click the "Download" button to download the images in batches.

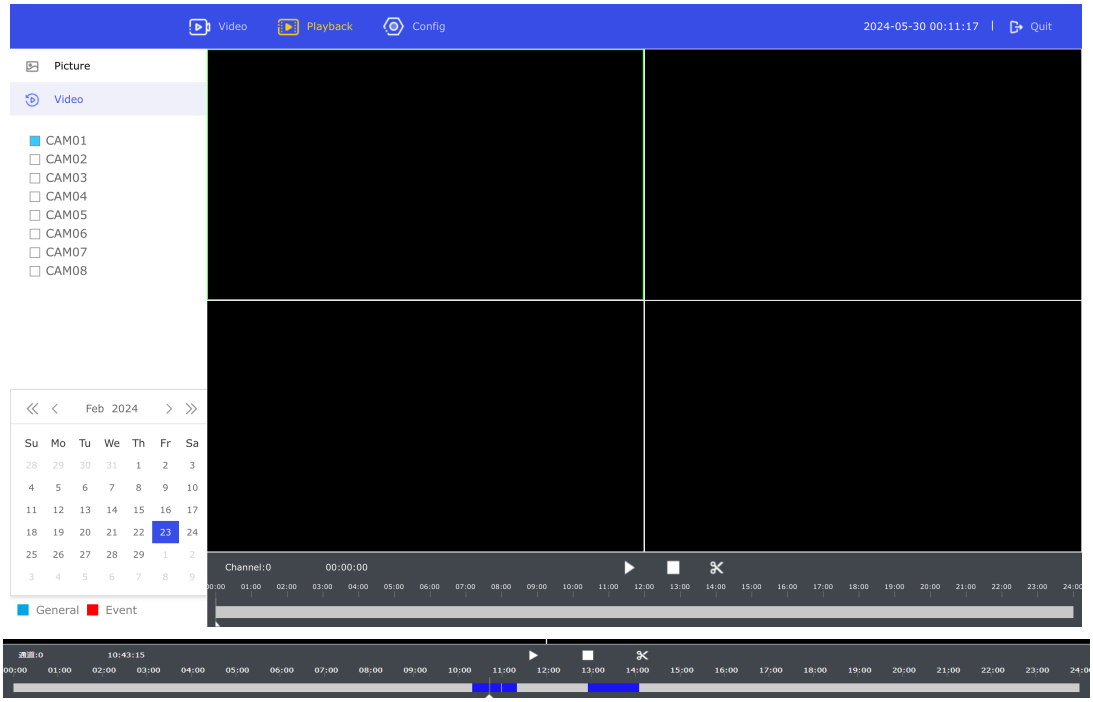
3.4.2 Video Playback



The control and display areas are roughly divided into: channel control area, date control area, video playback window, and timeline control window.

Examples:

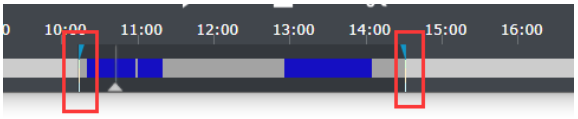
Search: Click on channel 1 in the channel control area, and then the date control area will show the date of the video that existed within a month. On the date of the recording “ ”, the recording data of the current day will be searched by default, and displayed in the “Timeline Display Window", as detailed in the figure below.

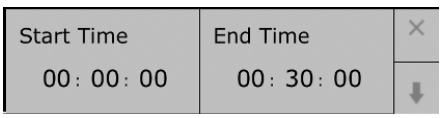


Play: Click the "Timeline Display Window" with the recording area, click "▶" button to start playing the video, and click the recording area of the progress bar during playing to jump to the corresponding time point to play.

Stop: Click "■"button to turn off all playing.

Video download: Click "✂" button, and the download window will pop up as shown in the figure below

You can drag  to adjust the downloaded video range, or you can directly modify the time value in

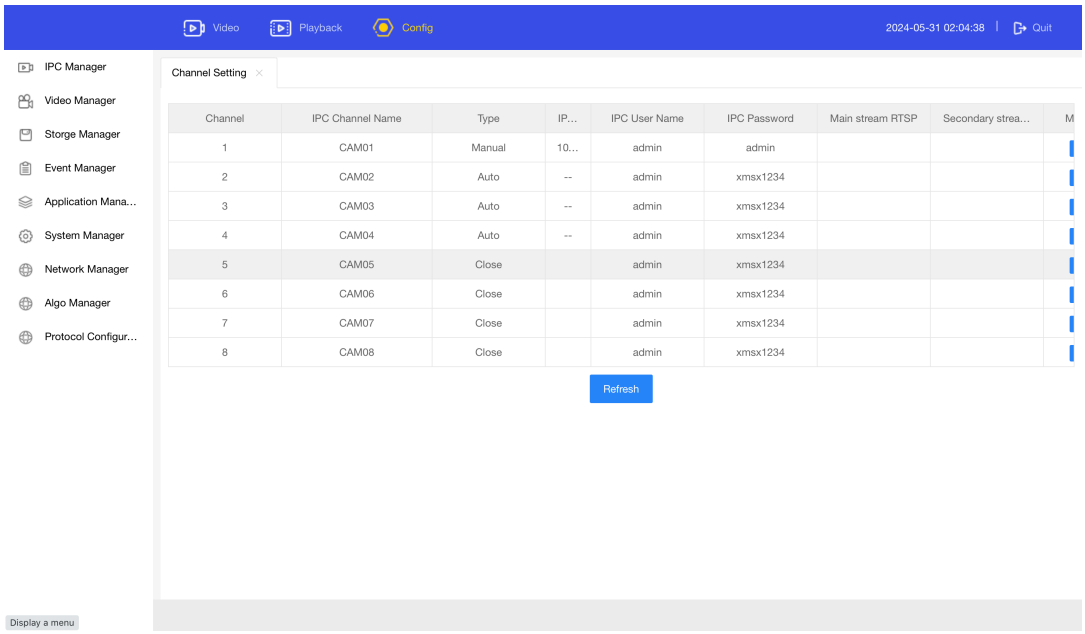


to adjust the downloaded video range, click  to start the download, if it is IE, the download directory is in the storage directory configured by the plug-in, if it is other browser, the download directory is in the browser's common download directory.

Multi-channel operation: Multiple videos can be played at the same time, but only one of the corresponding playback channels can be selected to download the videos of the corresponding channel, and there is no multi-channel download.

3.5. System Configuration

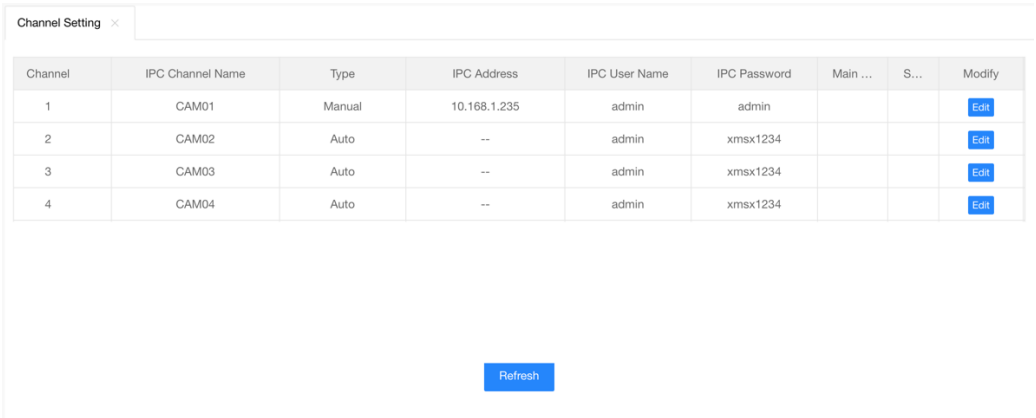
Click the button "Config" on the top navigation bar to enter the system configuration function.
The system configuration functions mainly include: IPC Manager, Video Manager，Storage Manager，Event Manager，Application Manager，System Manager，Network Manager，Algo Manager，and Protocol Configuration.



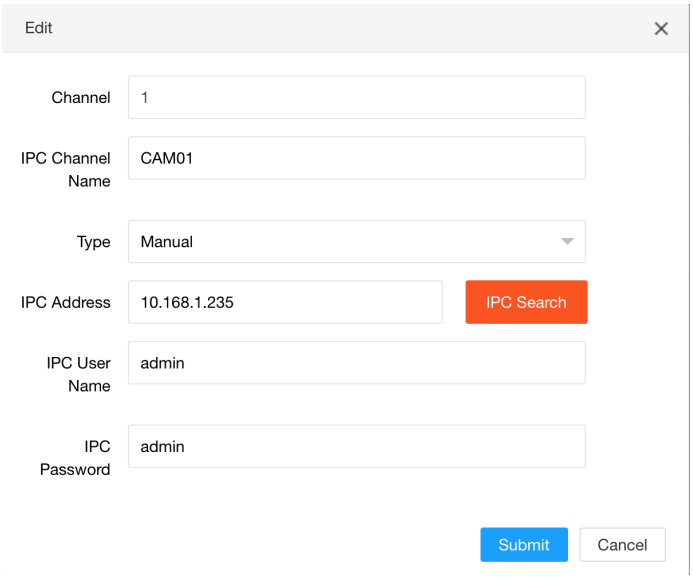
3.5.1. IPC Manager

IPC Manager includes Channel Setting, Code Setting, Output Setting.

3.5.1.1. Channel Setting



Edit: Clicking the "Edit" button is to edit the properties of a channel.



Channel properties contain:

IPC Channel Name: Displays the name of the channel location displayed in the real-time monitoring and video playback channel.

Type: Close, Manual, Auto, RTSP URL, DHCP.

Manual: You need to search for the IPC by clicking the IPC Search Button, or manually enter the address of the IPC, and the search button can only search for the IPC connected to the LAN port.

If you select Manual for Type, you need to manually enter the IPC address, log in to the IPC device and set it to IP Set to 192.168.63.XX network segment, if the http port of the IPC is not 80, please set it accordingly, for example: 192.168.63.XX:8080

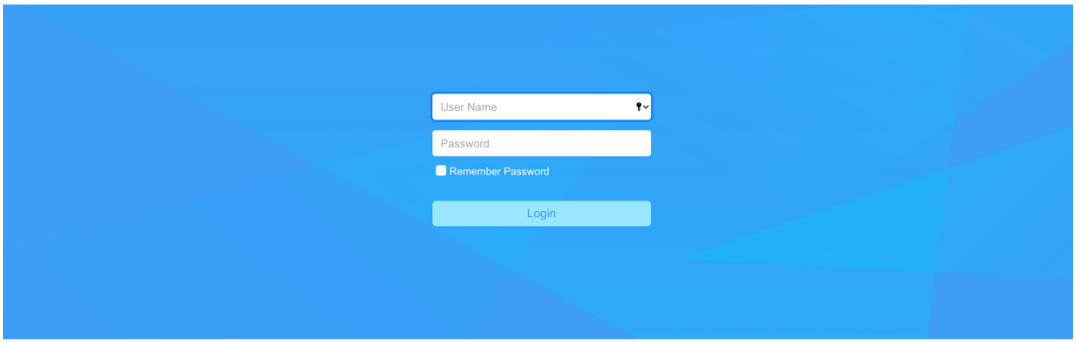
Auto: AI Box automatically selects the connection way to connect with IPC, user only need to input the IPC User Name and IPC Password.

RTSP URL/DHCP: RTSP URL mode needs to input IPC address and port, RTSP stream.(IPC ONVIF User Name and Password)

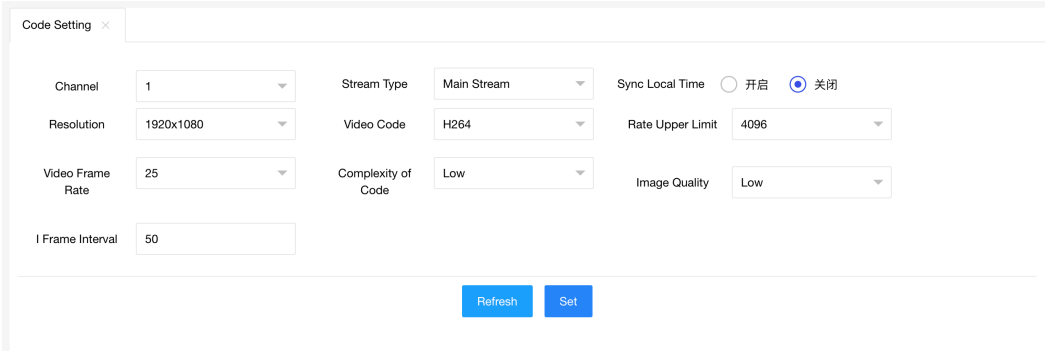
Close: As named.

IPC Username, IPC Password: Note that it is the username and password of the ONVIF account of the IPC.

IPC Link: Channel port forwarding can directly use the IP and forwarding port of AI Box to directly access the webpage of the IPC without connecting the LAN port, and complete some configurations specific to some IPC, if the webpage video of the IPC is not used port 80, you also need to configure the port forwarding of the video through the port forwarding in "Network Manager". After clicking the "IPC Link" button, in a new window through the http:// http://10.168.1.235, as shown below.



3.5.1.2. Code Setting



Channel: When switching channels, the AI Box will obtain the supported Stream Type, Resolution, Video Code, Rate Upper Limit, Video Frame Rate, Complexity, Image Quality, I-Frame Interval from IPC.
Stream Type: Configure the parameters of different streams of the IPC to switch the stream, including the Main Stream and Sub Stream.
Synchronize Local Time: Generally enabled, otherwise some IPC may refuse access because the time is out of sync.
Resolution: Toggling the Resolution of the corresponding Stream.
Video Code: Switch the coding of the corresponding stream: FGV100 supports H264 and H265 video encoding, do not configure other coding formats.
Rate Upper Limit: You can choose according to your needs, the higher the bitrate, the better the image quality.
Video Frame Rate: You can choose according to your needs.
Complexity: You can choose according to your needs, and the more complex it is, the higher the bitrate.
Image quality: You can choose according to your needs, the better quality it has, the

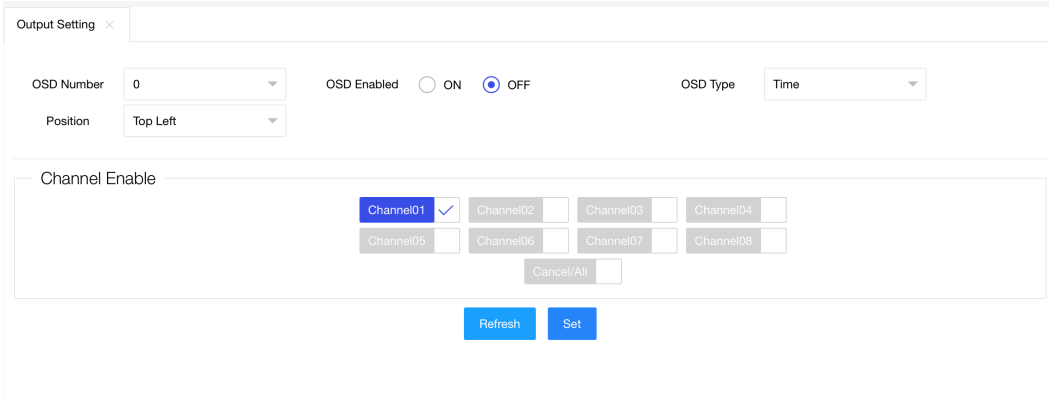
higher the bitrate.

I-frame interval: can be selected according to your needs.

Configuration suggestions:

1) If the storage requirements are relatively high, set the resolution to a relatively high resolution, and same for the frame rate, and transmit it to the network at the same time, If the transmission quality is required to be high, you do not need to choose the Sub Stream bitrate, and the video and network transmission are coded all through the Main Stream.
2) If the network bandwidth is limited, but there are relatively high requirements for storage, you can turn on the Sub Stream bitrate, the data encoded by the Main Stream will be used for local storage, and the data encoded by the Sub Stream will be used for network transmission.

3.5.1.3. Output Setting



OSD Number: 4 OSD control channel.

OSD Enabled: The corresponding channel OSD is enabled.

OSD Type: Including Time, Device ID, IPC Channel Name, GPS Information, Alarm, Extended Text, and Element Information(AI).

Position: Includes Top Left, Top Right, Bottom Left, Bottom Right, and Custom.

When the type is Extended Text: Configurable text 1~text 4 content.

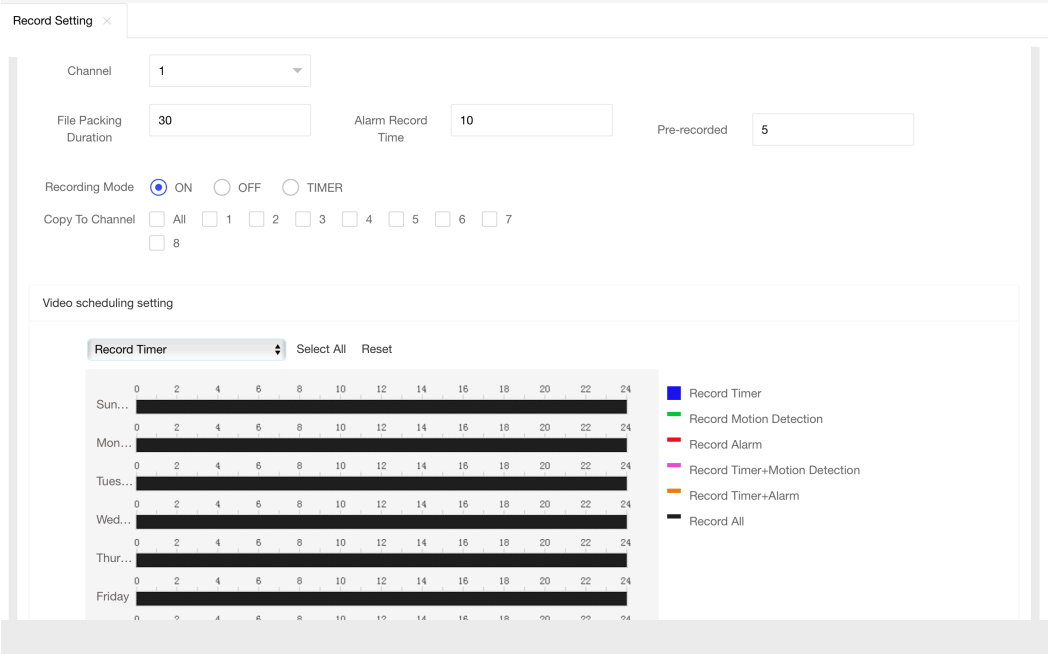
When the position is customized, you can configure the start coordinates of the corresponding OSD content through the coordinate system, which is x(-1.0~1.0),y(-1.0~1.0).

Boot Channel: The corresponding OSD control is only for the selected IPC channel.

3.5.2. Video Manager

Video Manager includes Record Setting, Capture, FTP Upload, and Camera Power.

3.5.2.1. Record Setting



File Packaging Duration:

In order to facilitate file retrieval and playback, the video file packaging time is too long which is unfavorable to the time spent on file retrieval and playback. If the video file packaging time is too short, the file is too trivial. So that it is not conducive to management. File packaging time ranges from 10 to 30 minutes.

Alarm Record Time: The duration of alarm recording, you can set the recording duration of the triggered alarm. The alarm time-lapse recording range is 1~30 minutes.

Pre-recorded:

For the alarm recording, it may be necessary to know what happened in the previous period before the alarm was triggered. The pre-recording duration can be set according to the requirements of the device. According to the length set by the channel, the video within the set time before the alarm occurs can be stored in the recording. Pre-recording ranges from 0 to 5 seconds.

Recording Mode:

- When the Recording Mode is "OFF", the selected channels are not recorded.
- When the Recording Mode is "ON", you can configure the recording schedule for the Selected channels, including File Packing Duration, Alarm Record Time, Pre-recorded, modes that trigger the recording, and the time periods in which they are enabled.
- TIMER Recording Mode: Users can set Timer Record Interval and Timer Record Time in this mode.

Copy To Channel:

Copy the configuration of the IPC channel to the selected channel.

Video Scheduling Setting: flexible configuration, specific operations are required, up to 4 Recording Modes can be configured in 1 day, pay attention to the Recording Mode of

the video time period.

For Example:

Explanation:

Monday to Friday:

0~3 o'clock will be timed to record, and the video recording is similar to the timer-only mode.

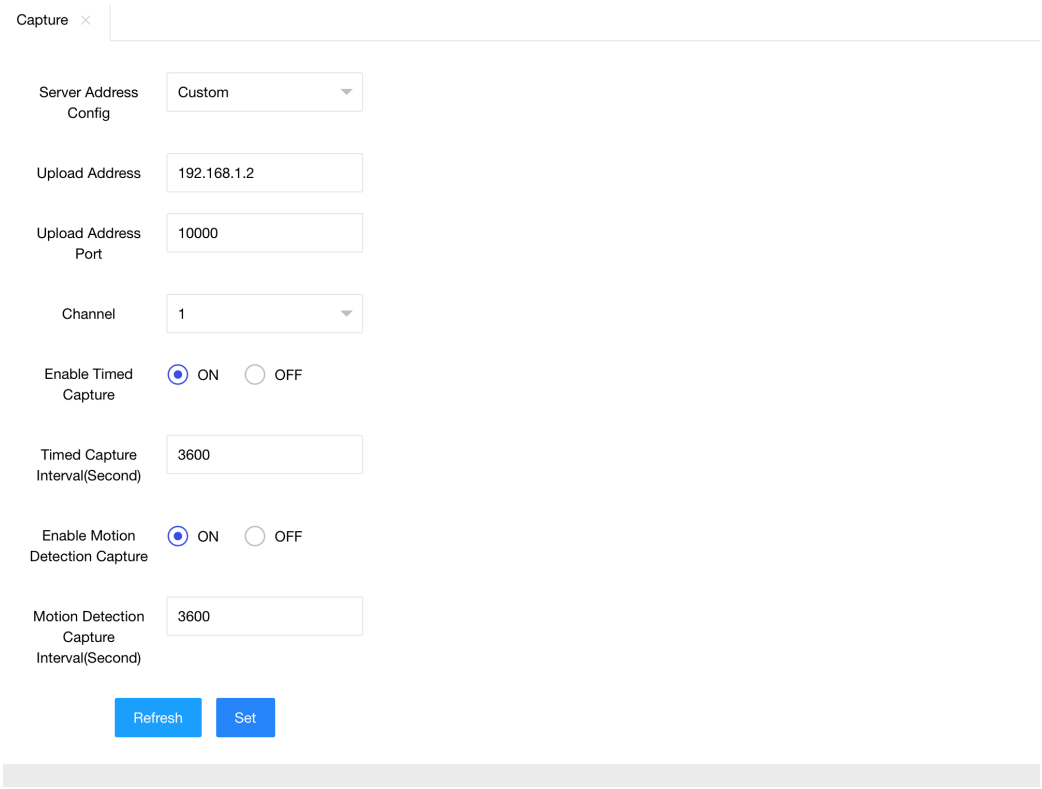
6~9 o'clock, the motion detection recording will be triggered, and the recording will only be triggered when the motion detection occurs, and the recording will not be recorded during other time periods.

12~15 o'clock will be timed + motion detection recording, under normal circumstances, timing recording, when motion detection occurs, motion detection recording will be triggered.

17~20 o'clock will be timed + motion detection + alarm recording, priority alarm recording > motion detection > timing, when the high priority recording occurs, will stop the low priority recording, enter the high priority recording.

There is no video recording on Saturdays and Sundays.

3.5.2.2. Capture



Server Address Config: Automatic Obtain, Custom

Automatic Obtain: The default option is Automatic Obtain, and the captured pictures will be sent to Four-Faith's network platform

Custom: If necessary, the captured images will be sent to the specified address (the server needs to implement the corresponding HTTP receiving program), and set the reporting address here

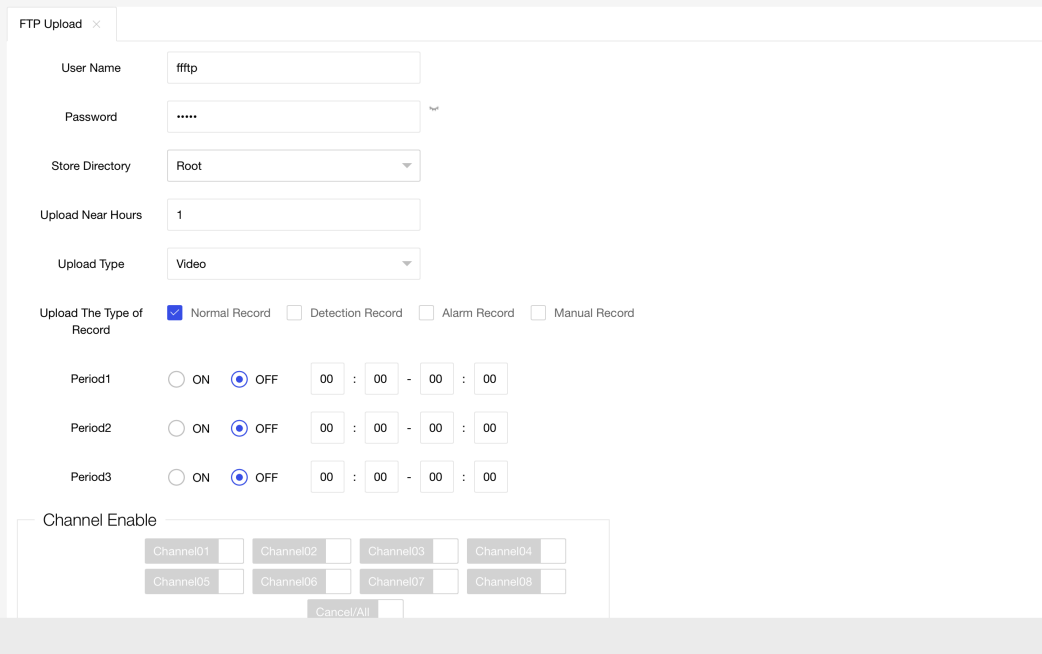
Enable Timed Capture: Enable or disable Timed Capture

Timed Capture Interval (Second): Set the Timed Capture Interval

Enable Motion Detection Capture: Enable or disable motion detection capture

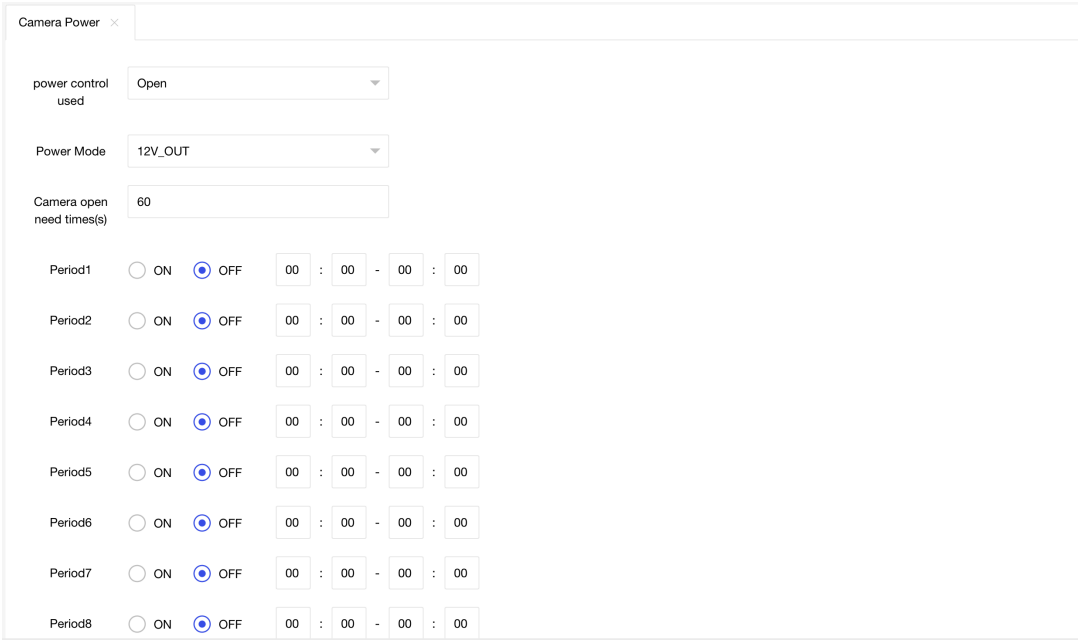
Motion Detection Capture Interval (Second): Set the motion detection trigger interval

3.5.2.3. FTP Upload



Upload Address Configuration: Automatic Obtain and Custom
Automatic Obtain: Four-Faith Video Platform issues FTP upload address (to be implemented).
Custom: Manually configure the FTP address and port
Upload Mode: PASV and PORT
Upload Address: IP (domain name) + port
User Name and Password: FTP account
Upload Near Hours: The data from the previous hours to the present is retrieved during the reporting period, and the retrieved data is reported.
Store Directory: Root, One Level, Two Level
One Level and Two Level: choose Device ID, Date(yyyy-mm), Custom
First Level, Second Level: If the Directory is in Custom mode, the directory name is customized.
Upload Type: Video, Picture.
Upload The Type of Record: When the Upload Type is Video(Normal, Alarm, Detection, Manual), or when the Upload Type is Picture (Record Timer, Networking Manual, Record Alarm)
Time period 1, Time period 2, and Time period 3: The time period in which Videos and Pictures are reported.
Channel Enable: Select the channel to upload videos and pictures.

3.5.2.4. Camera Power

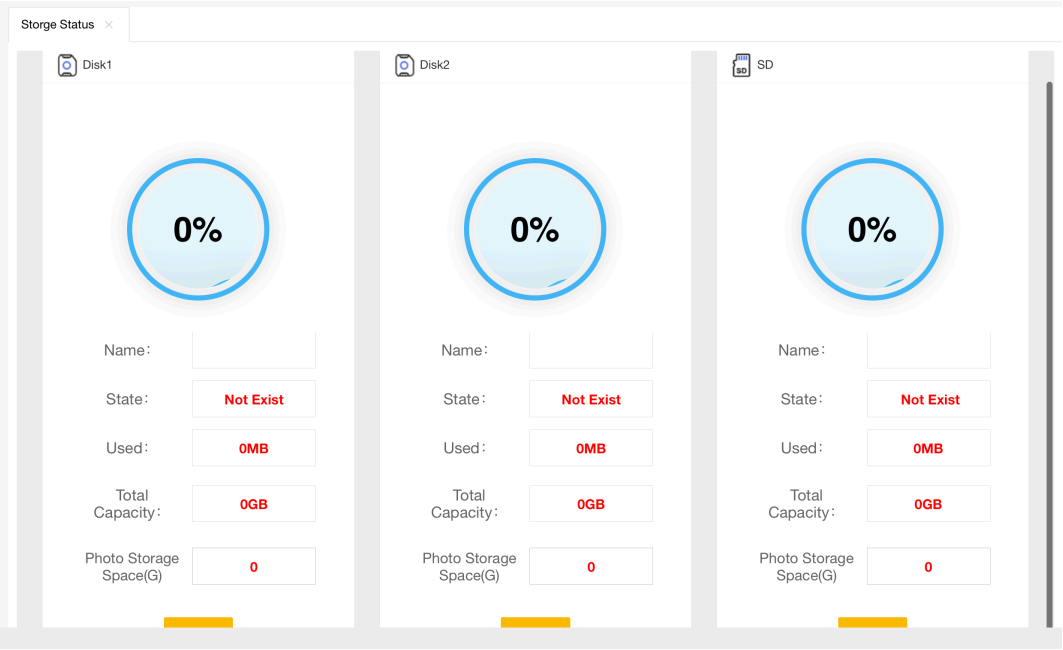


Power Control Used: Open, Timer
Power Mode: 12V_OUT, RELAY1, RELAY2, POE, RS485-2
Camera Open Need Times(s): User can set Camera Open Times needed
Period: User can set Open Time Period for every single IPC

3.5.3. Storage Manager

Storage Manager includes Storage Status

3.5.3.1. Storage Status



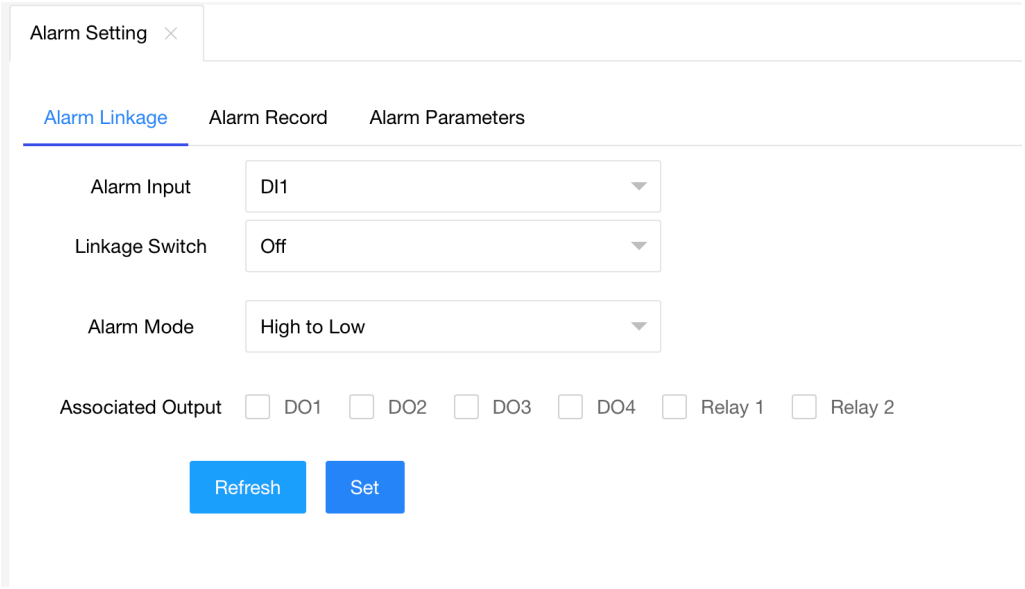
Read the status of the current device disk and SD Card:
Name: Device node.
State: Not Exist, Uninitialized, Initialized
Used, Total Capacity: As named.
Photo Storage Space(G): The amount of storage allocated to the Pictures
Refresh: Updates the status of the current disk and SD Card.
Format: Format a disk that has not been initialized or needs to be reformatted, and reallocate Picture storage space.

3.5.4. Event Manager

Event Manager includes Alarm Setting.

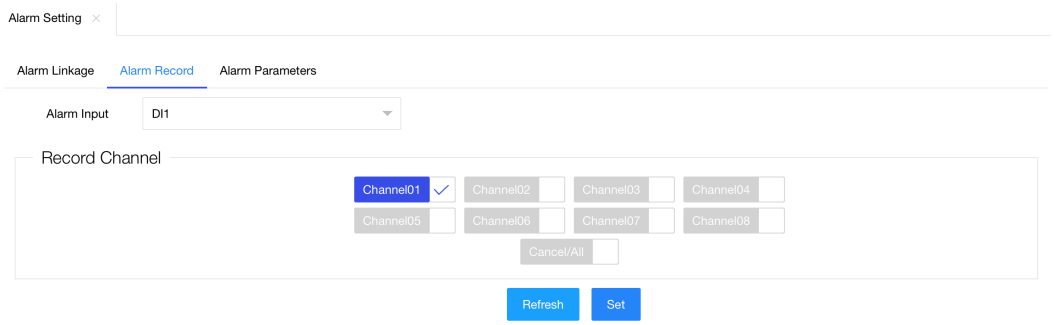
3.5.4.1. Alarm Setting

Alarm Setting includes Alarm Linkage, Alarm Record, and Alarm Parameters.
Alarm Linkage:



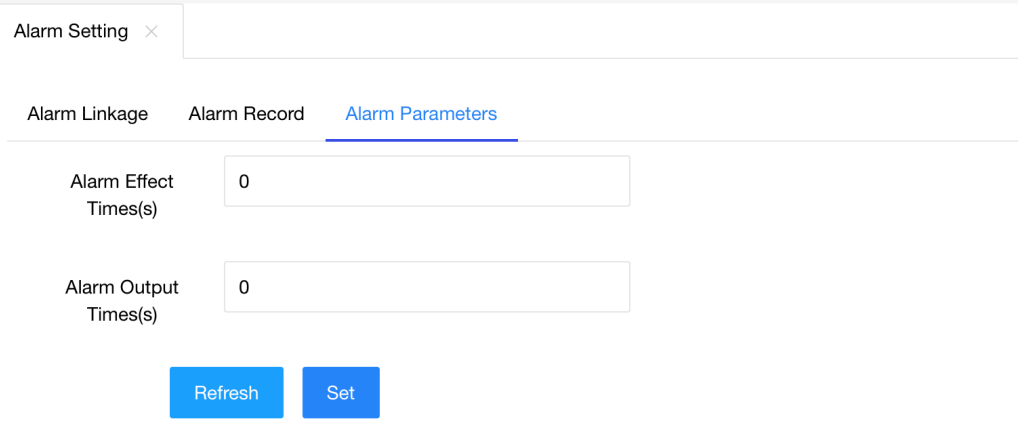
Alarm Input: DI1~DI6
Linkage Switch: ON/OFF
Alarm Mode: pull-up alarm (Low Level to High Level), pull-down alarm (High Level to Low Level)
Associated Output: Users can select the Associated Output interface.

Alarm Record:



Alarm Input: DI1~DI6
Record Channel: The video record channel when DI triggers the alarm.

Alarm Parameters:

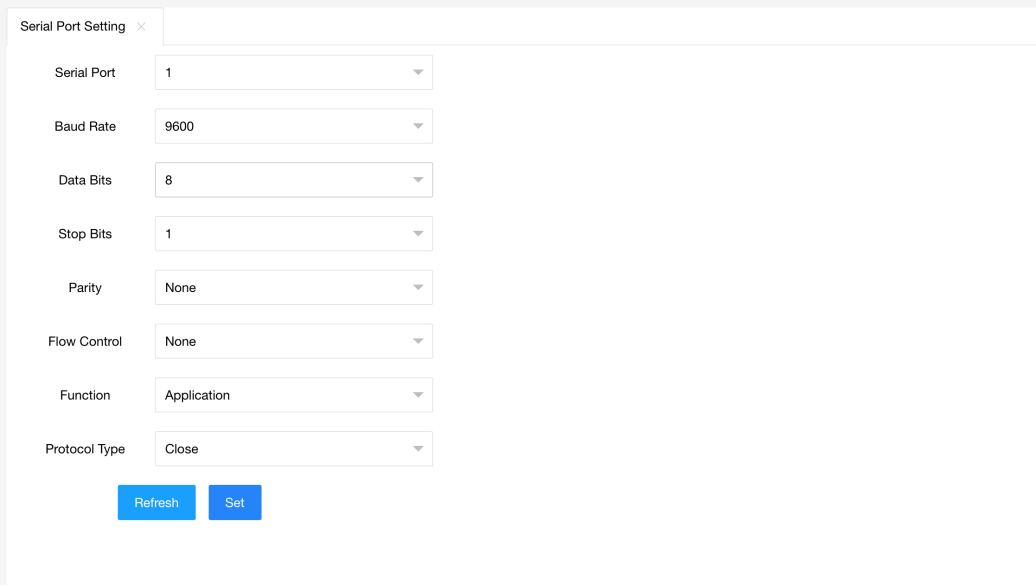


Users can set Alarm Effect Times and Alarm Output Times(seconds).

3.5.5. Application Manager

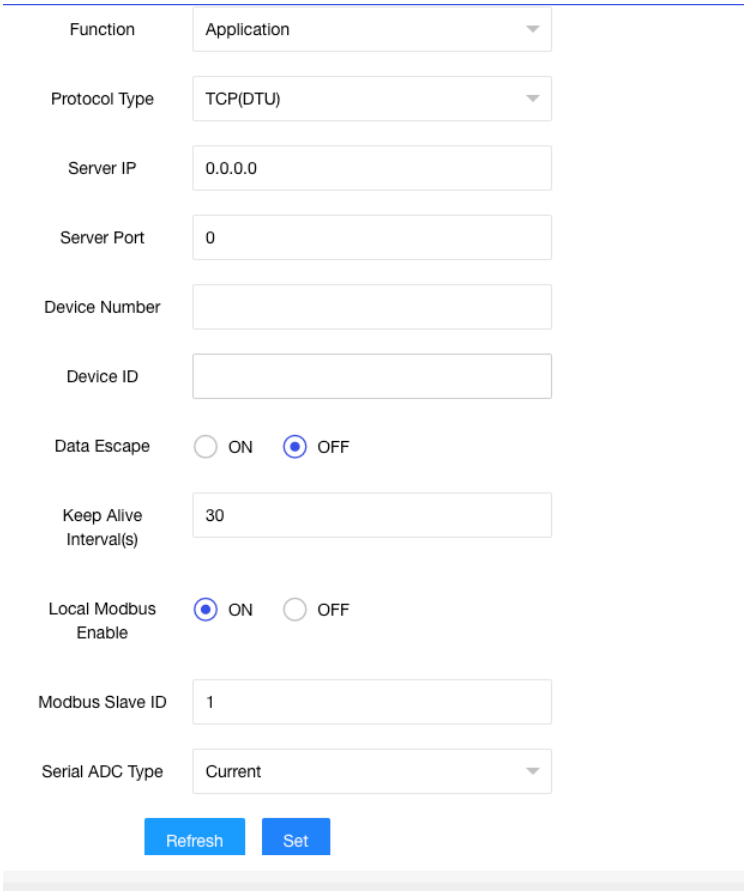
Application Manager includes Serial Port Setting, GPS Setting and Record Export

3.5.5.1. Serial Port Setting



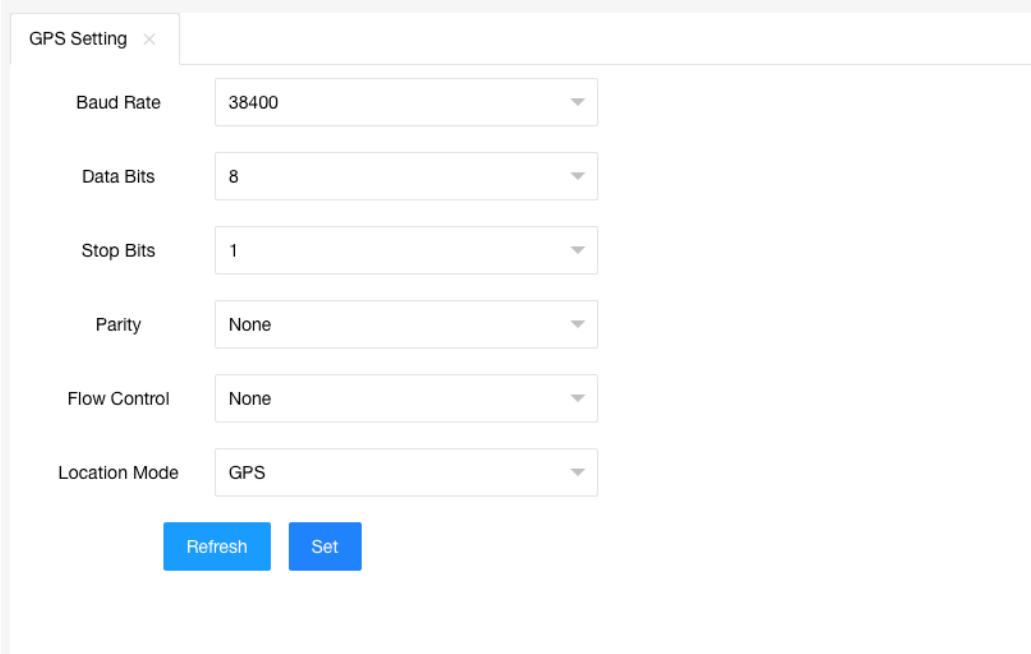
Serial Port: 1 corresponds to 232 serial ports (RX2, TX2) or 485 ports (A2, B2)
Baud Rate, Data Bits, Stop Bits, Parity, Flow Control: Serial Port Communication Parameters
Function: PTZ (Cloud Platform), Application, Close, LCD Display, LED Display
PTZ (Cloud Platform): The Cloud Platform used to control the camera on the 485.
Application: Serial RTU function
Close: As named.
LCD Display, LED Display: As named

When the Serial Port Function is Application:



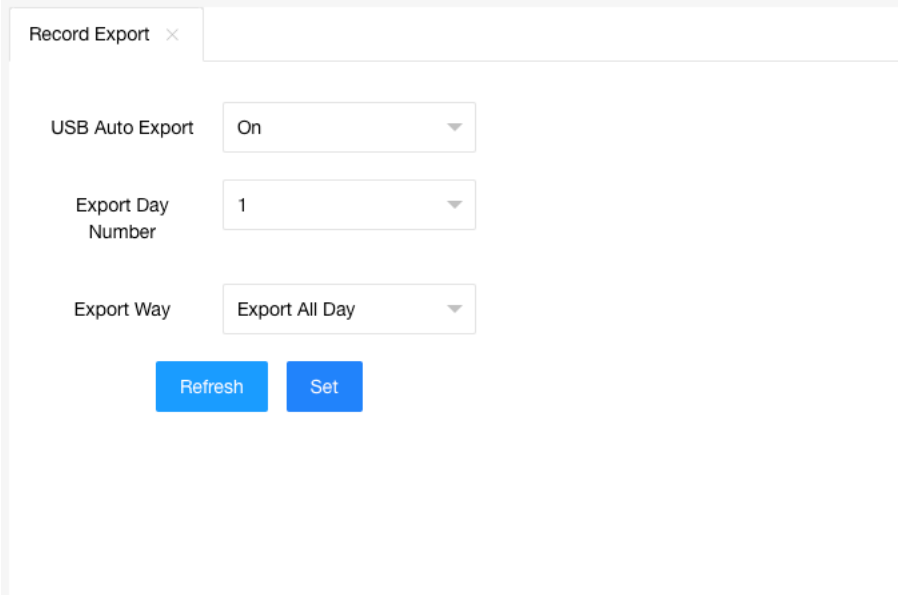
Protocol Type: UDP (DTU), Simple UDP, TCP (DTU), Simple TCP, TCP Server, TCST, Modbus TCP, Close: all as clients.
TCP server, TCST, Modbus TCP: The device itself acts as a server.
Close: Generally used for the collection of features in the specification version.
Server IP, Server Port: the IP address and port address of the server and client.
Device Number: a parameter in DTU mode, used to distinguish devices by socket, the input limit is 0~9 digits, length = 11.
Device ID: A PARAMETER IN TCP (DTU) MODE THAT IS USED TO DISTINGUISH DEVICES IN SOCKETS
Data Escape: a parameter in TCP (DTU) mode, used for TCP subcontracting 0xfd->0xfd 0xed 0xfe->0xfd 0xee
Keep Alive Interval(s): Stay connected.
Local Modbus Enable: Local Resource Acquisition (DI, ADC)
Modbus Slave ID: The address of the device collected by Modbus for local resource collection (DI, ADC).
Serial ADC Type: Current, Voltage.

3.5.5.2. GPS Setting



Baud Rate, Data Bits, Stop Bits, Parity, and Flow Control: common parameters of serial ports.
Location Mode: GPS, Beidou, GPS+Beidou.

3.5.5.3. Record Export

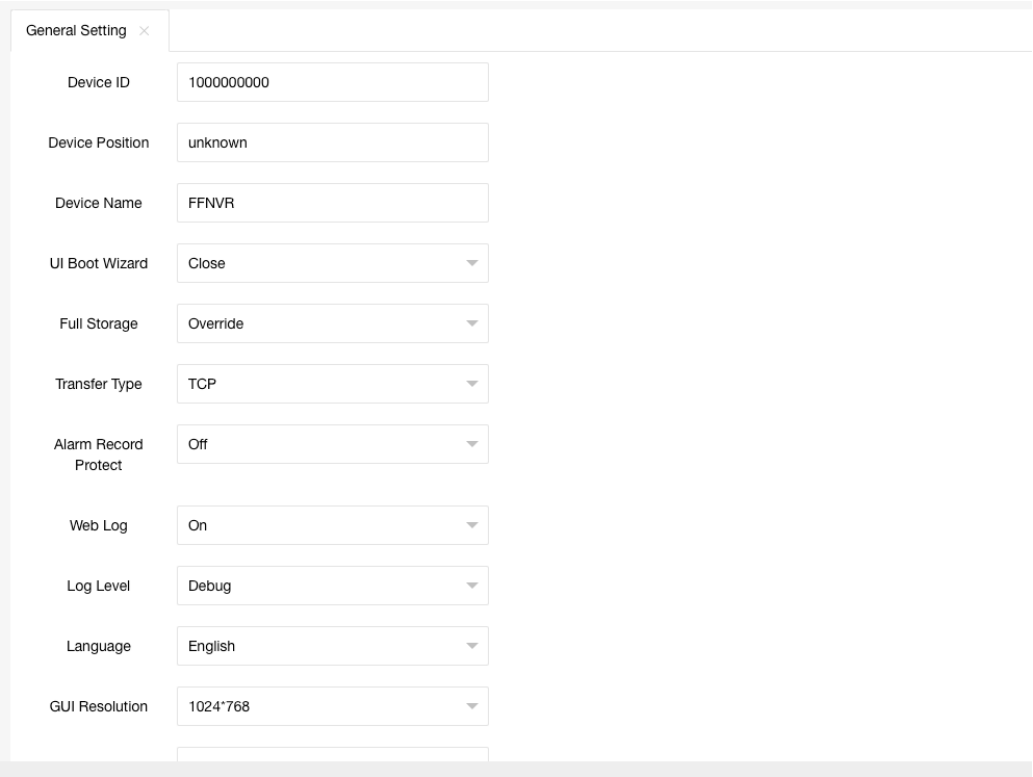


USB Auto Export: ON/OFF
Export Day Number: Users can select 1- 8 days
Export Way: Export All Day and Export Per 24 Hours

3.5.6. System Manager

System Manager includes General Setting, Account, Upgrade and Maintenance, System Information, and Command Debugging.

3.5.6.1. General Setting



Device ID: Set the device ID number and modify it according to the actual needs.
Device Position: Device position is the location information installed by the device, which can be configured with 0-20 characters (10 Chinese characters). The device name can be configured with 0-20 characters (10 Chinese characters).
UI Boot Wizard: UI Boot Wizard has Close and Open function.
Full Storage: When the storage full option is at stop recording, the device automatically stops recording when the recording the storage device is full; For overriding, when the device video storage is full, the device automatically overwrites the old video content from scratch with new video content.
Transfer Type: The platform uses RTP (TCP) without plug-ins, and the platform uses TCP mode if there are plug-ins. Transfer type means the transmission of video data to the server, including RTP/UDP/TCP. RTP is the streaming media transmission mode corresponding to the first-phase server, which is not supported by the post-phase server. UDP/TCP is the streaming media transmission mode corresponding to the phase ii server. UDP is a supplement to the RTP for retransmission of lost packets. Real-time transmission is stronger than that of TCP, and it is not easy to have a Mosaic.
Alarm Record Protect: If the alarm video protection is on and the video is fully covered,

it will automatically skip the alarm video and not cover it. The protection time is based on locking the alarm video protection (days).

Web Log: Print some of the program's logs into a file that can be called by the web, in the system information.

Log Level: Open web log information can be under the system information log information to view the latest logs to facilitate error location. Trace, Debug, Normal, Warning, Error, Fatal, and the logs will output logs with a ratio greater than or equal to the set level.

Language: Set the web display language, currently only support simplified Chinese and English.

GUI resolution: 1024*768, 1280*720, 1920*1080, 3840*2160, HDMI output UI resolution.

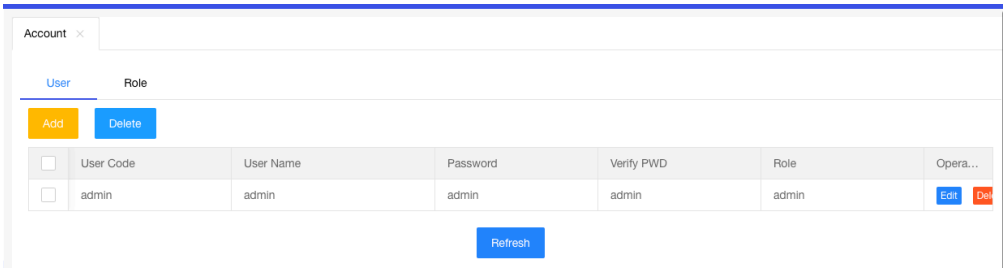
WebVideoProtocol: WebSockets, and Http.

WebVideoPort: User can set WebVideoPort, for example 8800.

3.5.6.2. Account

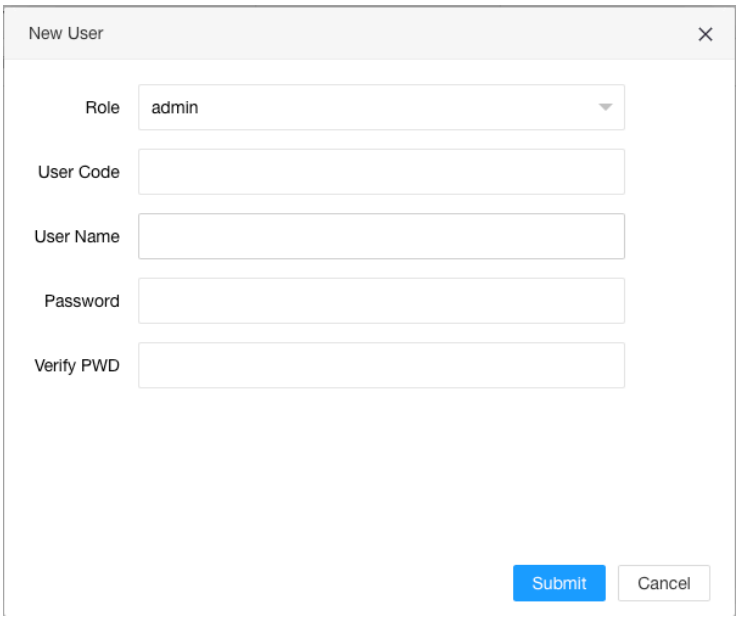
Account includes User Management and Role Management.

1. **User**



User operation includes Add, Delete, and Edit.

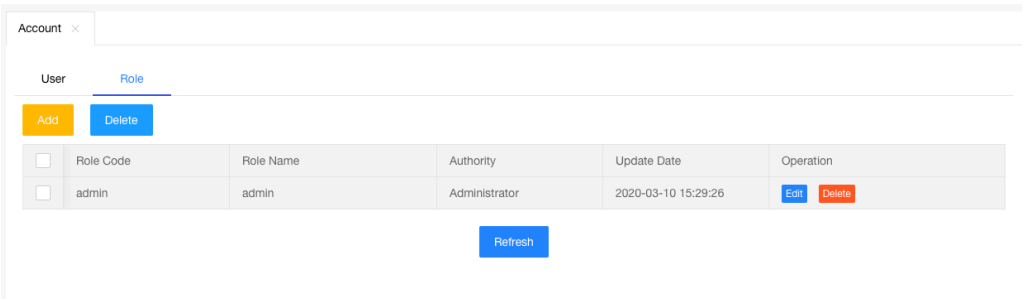
Add: Click the "Add" button and enter the Role, User Code, User Name, and Password.



Delete: Deletes the existing user and retains the admin user by default.

Edit: Click the "Edit" button to modify the role, code, name, and password of the selected user.

2. **Role**



Role operation includes Add, Delete, and Edit.

Add: Click the "Add" button to add Role Code, Role Name, and Authority (Administrator, Operator, Viewer).

Delete: Deletes the existing role and retains the admin role by default.

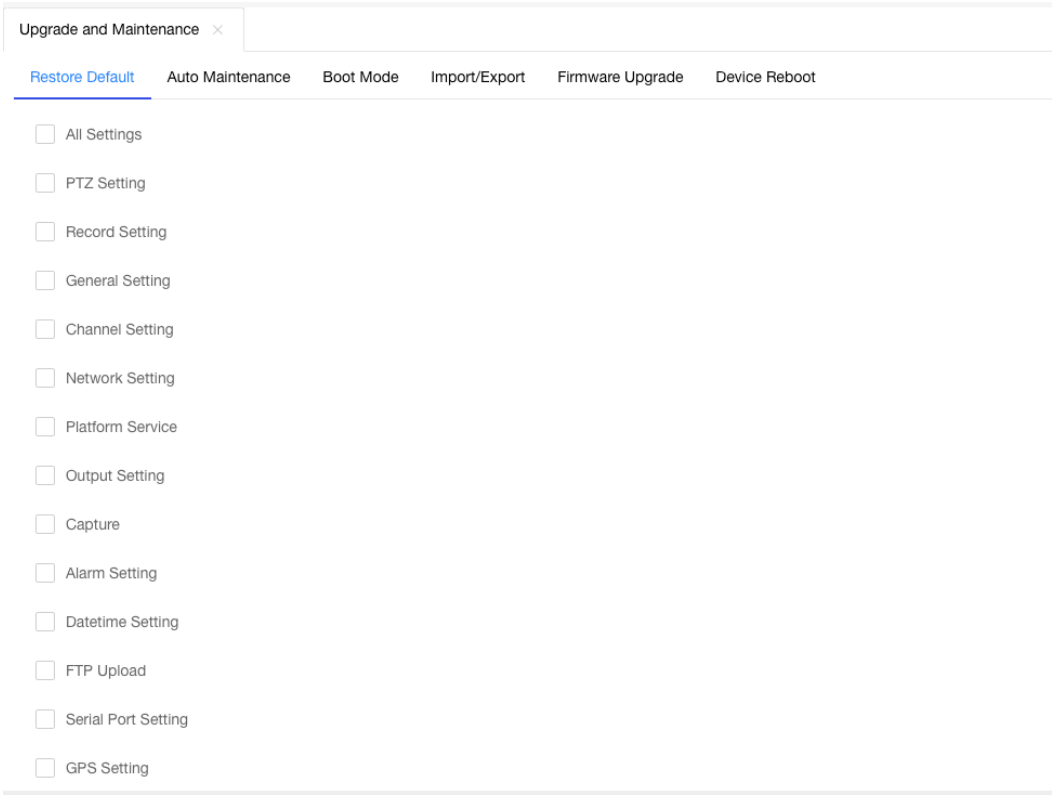
Edit: Click the "Edit" button to modify the properties of the selected character.

3.5.6.3. Upgrade and Maintenance

Upgrade and Maintenance includes Restore Default, Auto Maintenance, Boot Mode, Import/Export, Firmware Upgrade, and Device Reboot.

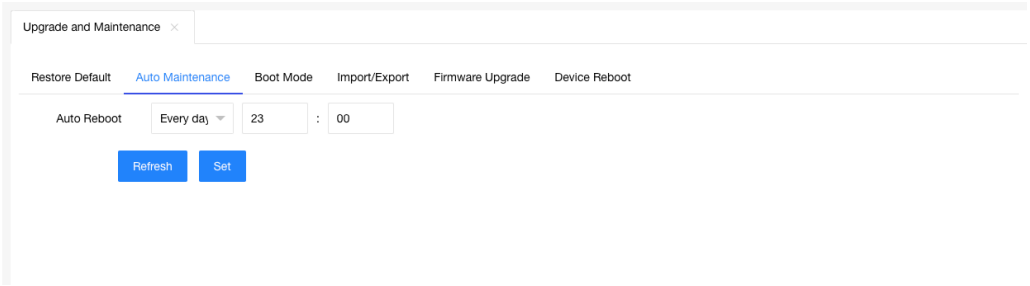
1. **Restore Default**

   Restore the corresponding configuration parameters to the factory configuration according to the selected option. You can select all items to be restored, or you can select specific items to restore specific parameters.



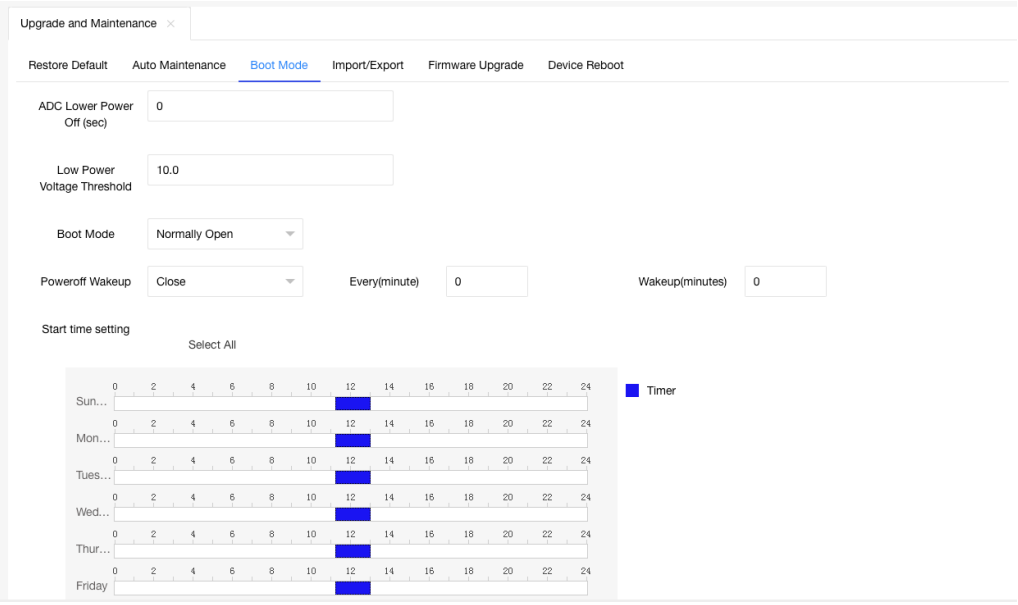
2. Auto Maintenance

Scheduled Auto Reboot function: Users can set the device Auto Reboot Time, they can choose Never, Every day, or Any day of the week, and then set the Auto Reboot time.



3. Boot Mode

ADC Lower Power Off: Users can set ADC Lower Power Off Time, the unit is second.
Low Power Voltage Threshold: for example 10.0
Boot Mode: include Normally Open and Timer
Poweroff Wakeup: Close and On

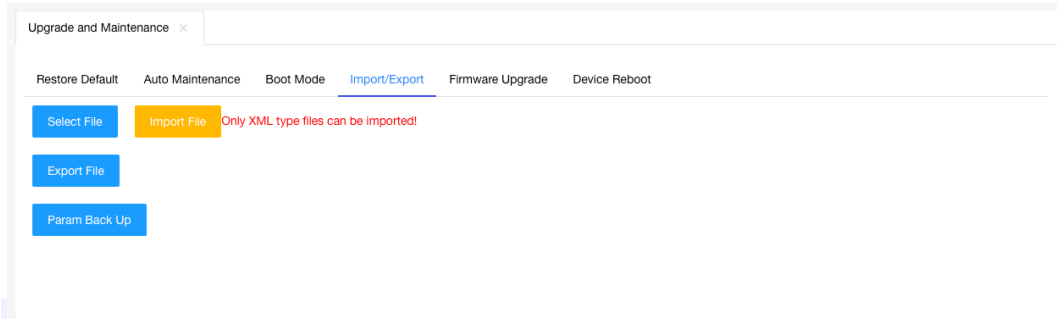


4. Import/Export

Import File: Load the parameter configuration file and restore the device settings to the content of the configuration file, the import file must be in XML format.

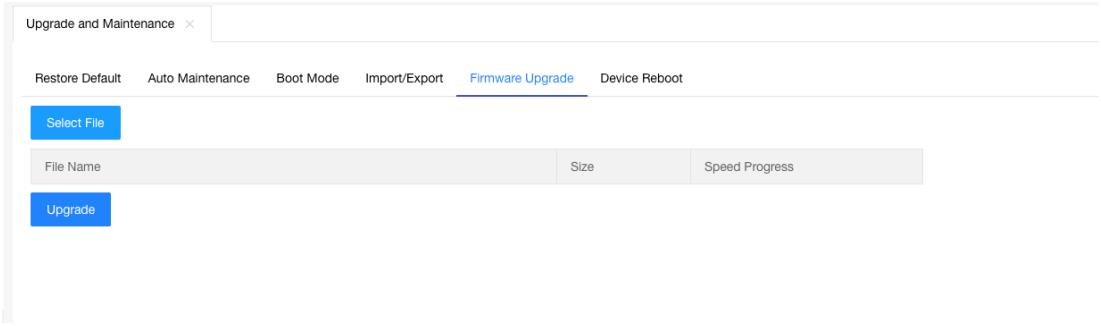
Export File: Export the current device parameter configuration in the form of a file, and the export file is stored in XML format.

Param Back Up: Parameters Back up function

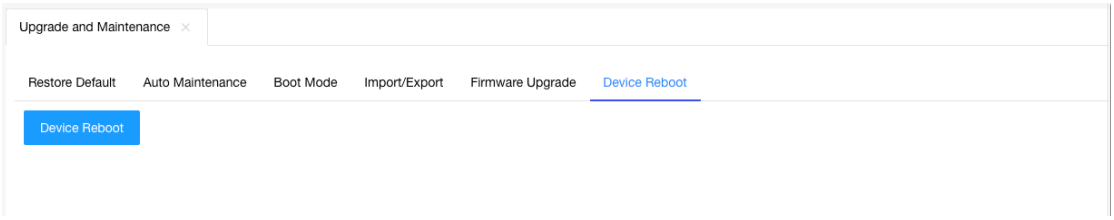


5. Firmware Upgrade

Click "Select File" to pop up the interface of selecting the file to be upgraded, select the package to be upgraded from the local area, click "Open", and then click the "Upgrade" button on the WEB page to upgrade the device system, if the upgraded version is the version of the current device, the device will automatically ignore and not do the upgrade processing. Please wait patiently for the upgrade to end, as the "Upgrade Successful" or "Upgrade Failed" message will be displayed on the web after the upgrade is completed.



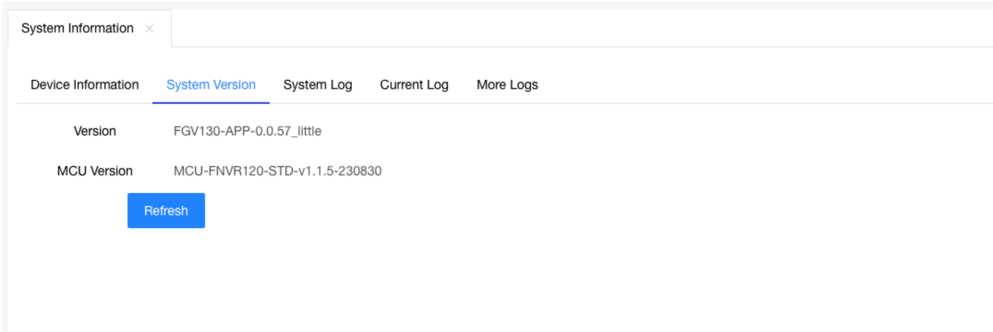
6. **Device Reboot**
   Device Reboot Button



3.5.6.4. System Information

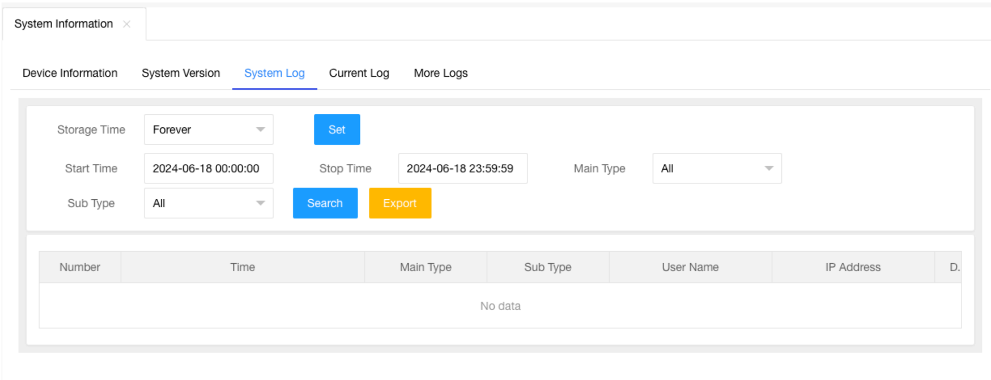
System information includes Device Information, System Version, System Log, Current Log, and More Logs

1. **Device information**
   System Operation Time: System Boot Time, Running Time, and Average CPU Usage.
   Record Status: Channel Number, Record Status (Camera Disconnected, No Recording, Normal Recording, Motion Detection Recording, Alarm Recording)
   OpenVPN Status: Connection Status and Network Address
   4G/5G Network Status: Network Interface(4G/5G), Connection Status, Dialting Card(Main/Backup), Signal Strength, Module Information, SIM Card Status, Network Type (GSM/WCDMA/TD-FDD/NR, Wire, WLAN etc.), Network Address (Assigned Network Address).
   GPS status: Hardware (Exist, Non-Exist), Antenna (Connected, Not Connected), location (Positioned, Not Positioned), Number of Satellites, Latitude, Longitude.
   WIFI Status: Connection Status, Signal Strength, Signal Quality.
2. **System Version**
   Displays the software and hardware version information of the device, including the system file version and application version information.



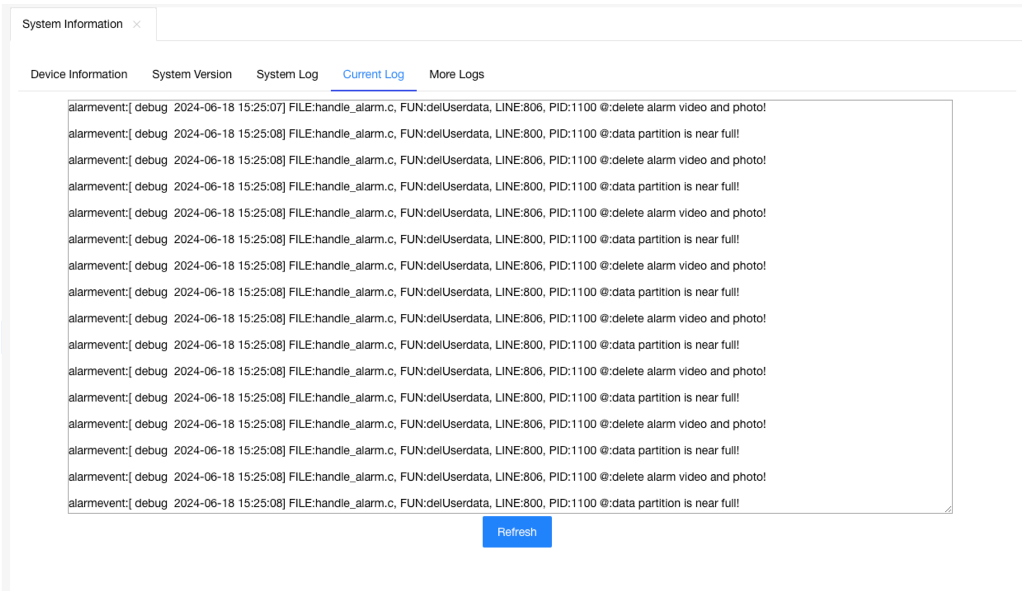
3. System Log

You can filter the system logs recorded by the device based on the search criteria.



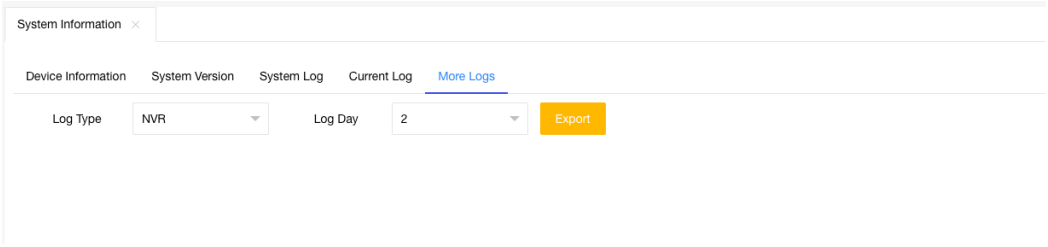
4. Current Log

The current debugging information is output to facilitate technical location of the problem, and the TXT format file can be exported.



5. More Logs

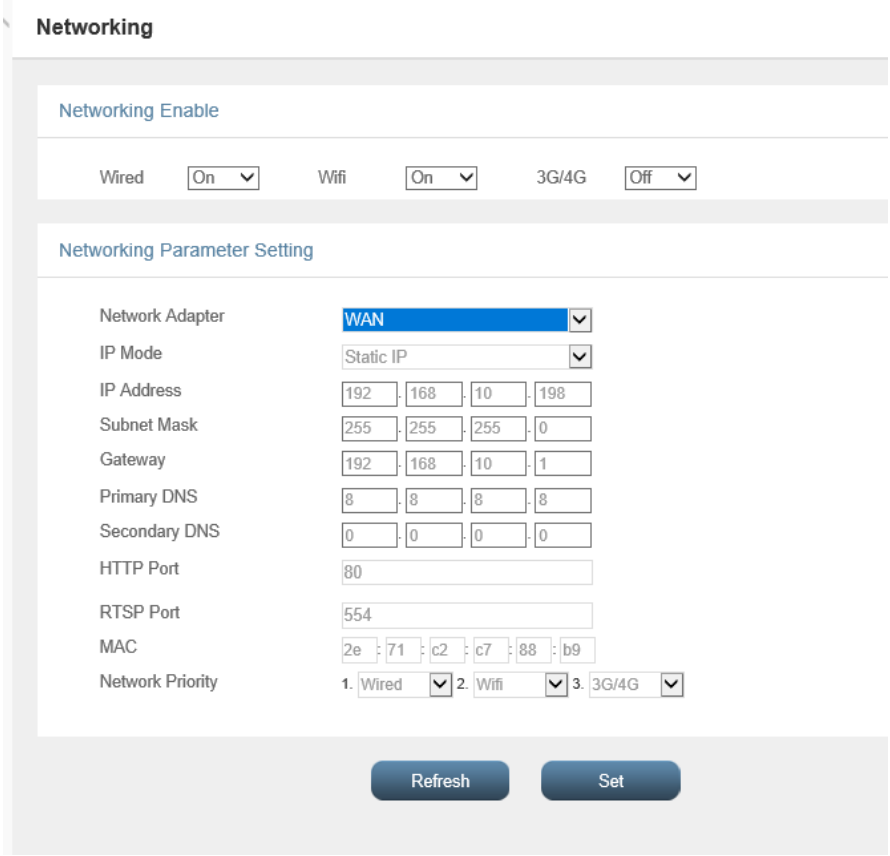
Users can choose NVR Log Type and Log Day to Export



3.5.7. Network Manager

Network Manager includes Network Setting, Platform Configuration and Advanced Network Setting.

3.5.7.1. Network Setting



Network Enablement:

User can turn on or off the different network connection option such as wired, WIFI and 4G/5G.

HTTP Port:

Allow user to configure the HTTP port. When the device is restarted, the browser must use

IP plus port to access the device. If the HTTP port is configured as "800", enter the address in the browser: http://192.168.9.127:800.

Network Priority:

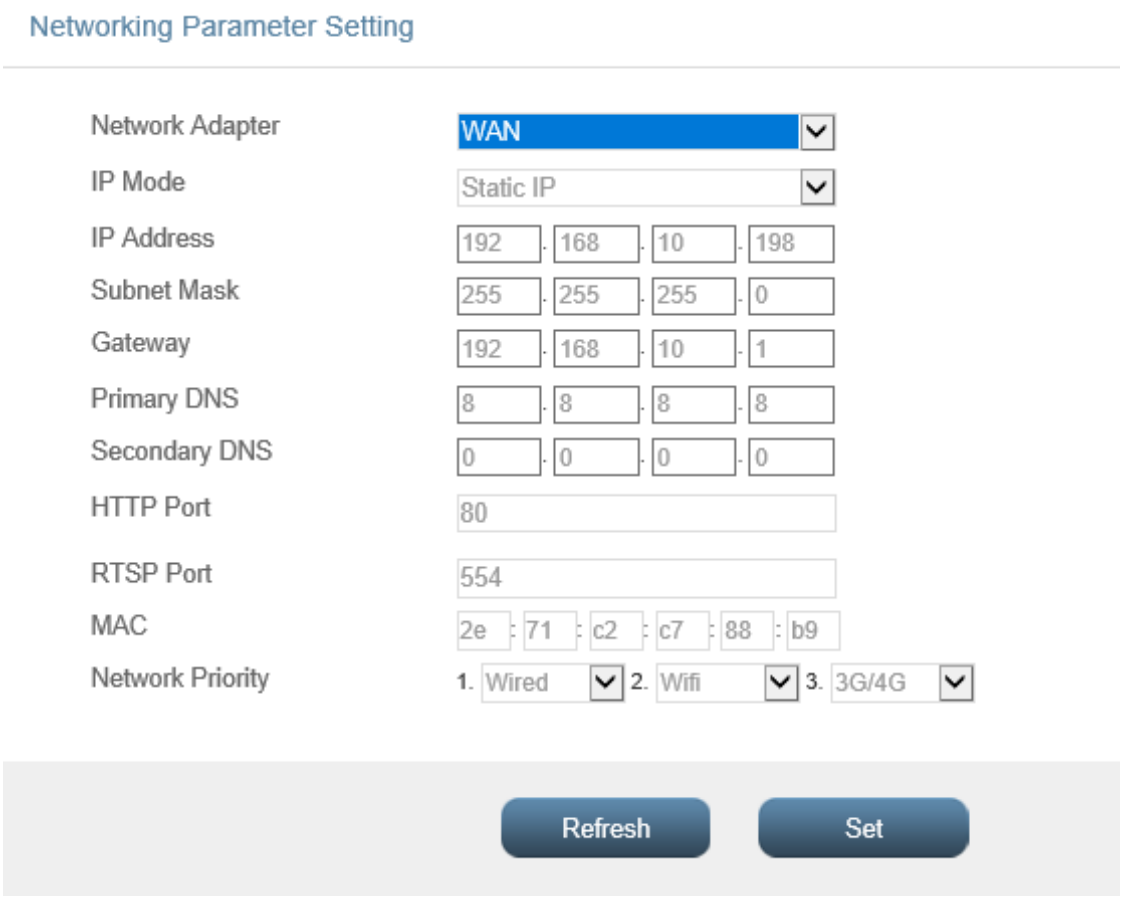
If configured as "wired", "WIFI" and "4G/5G" in turn, NVR device has priority over network wired communication mode to communicate with the server under the condition that the cable enable is turned on. When the wired communication is abnormal, it will switch to WIFI mode. If WIFI is also abnormal, it will switch to 4G/5G mode.

Network Adapter:

User can change the network adapter type such as WAN, LAN, WIFI and 4G/5G.

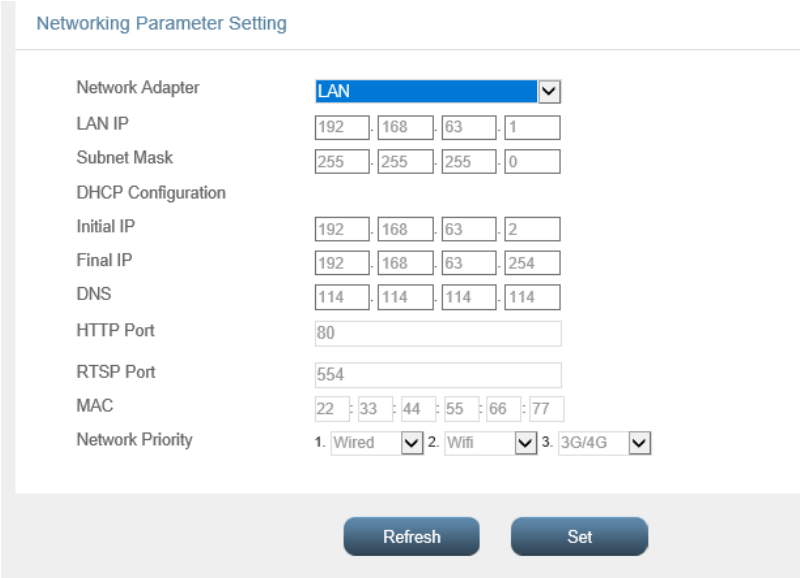
WAN Configuration:

User can edit the parameters of WAN such as IP mode, Primary DNS, Gate way and so on.



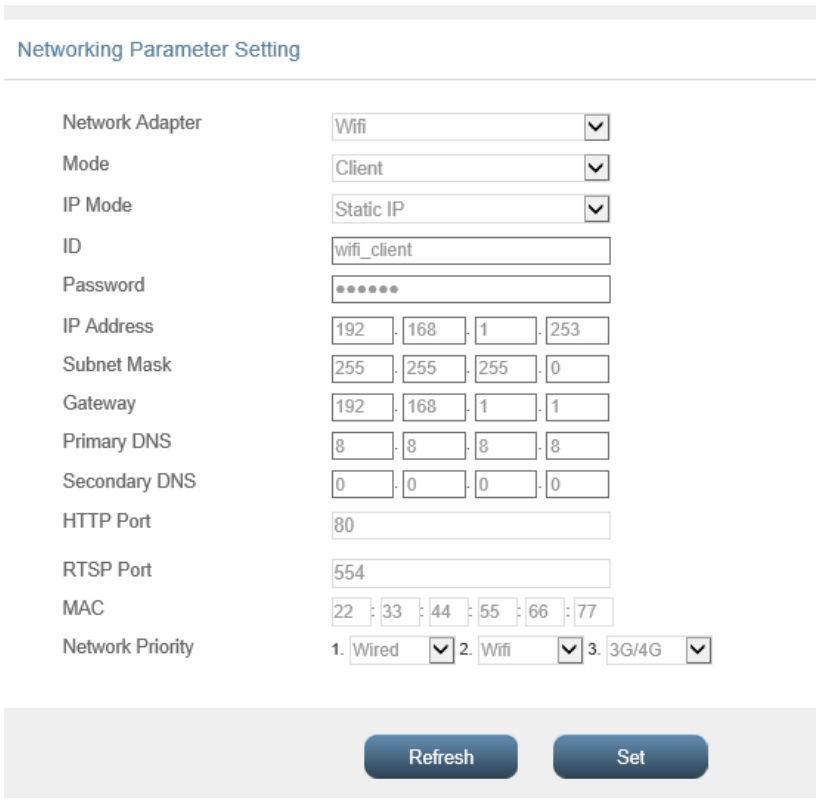
LAN Configuration:

User can edit the parameters of LAN such as LAN IP, start IP, end IP and so on.



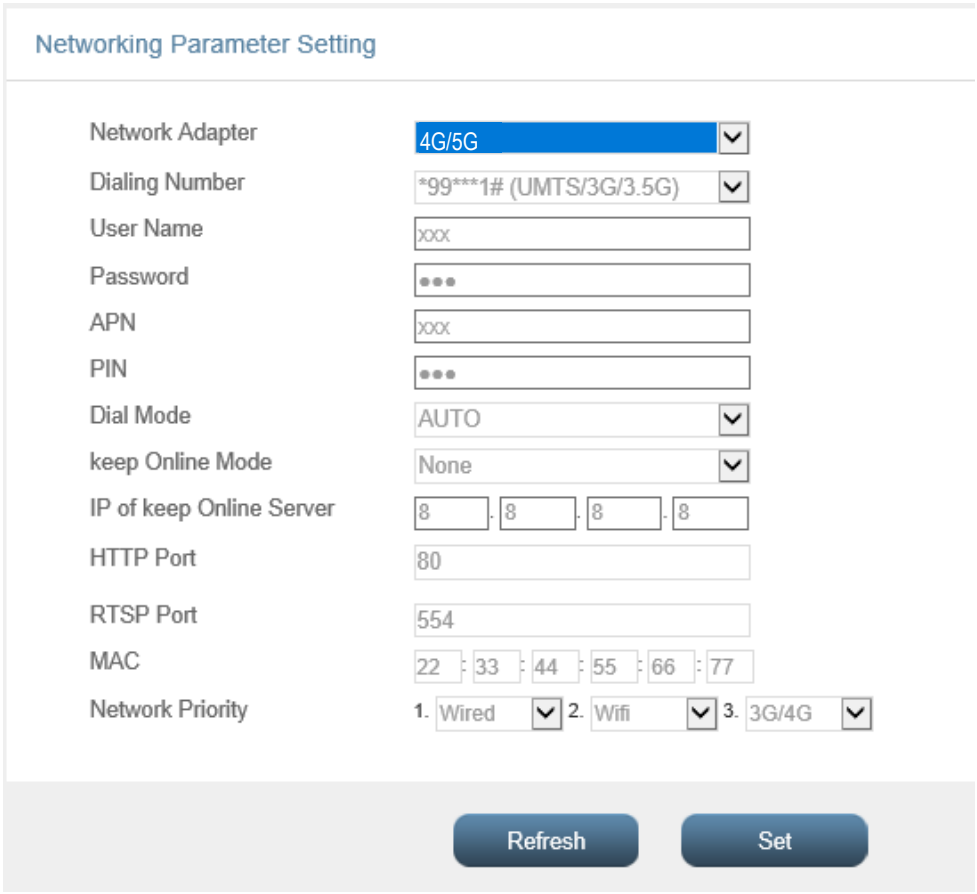
WIFI Configuration:

User can edit the parameters of WIFI such as WIFI mode, IP mode, end IP and so on. SSID and password of wireless router must be configured.



4G/5G Configuration:

User can edit the 4G/5G configuration and must configure the dialing number, username, password, APN, PIN code, online persistence detection, online persistence detection IP.



Call Center Number:
General unicom 3G select "*99# (UMTS/3G/3.5G)"
Telecom 3G option "#777(CDMA/EVDO)"
Mobile 3G select "*98*1# (TD-SCDMA)"
"#99***3# (4G/5G)" is the unified choice for all 4G/5G.

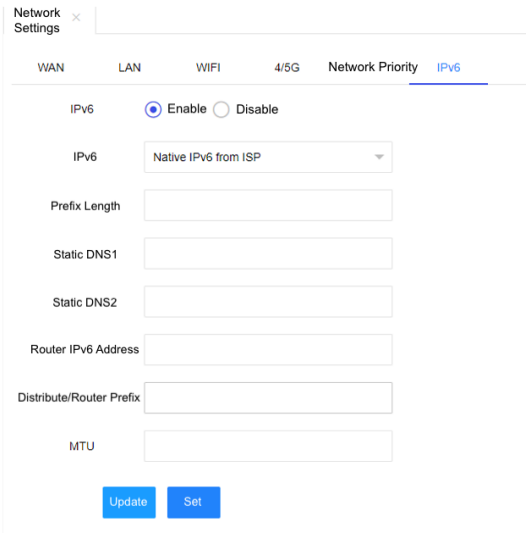
Username and Password:
Generally do not fill in or write (card) depending on the module.

APN:
Generally, do not fill in or write (card) depending on the module.

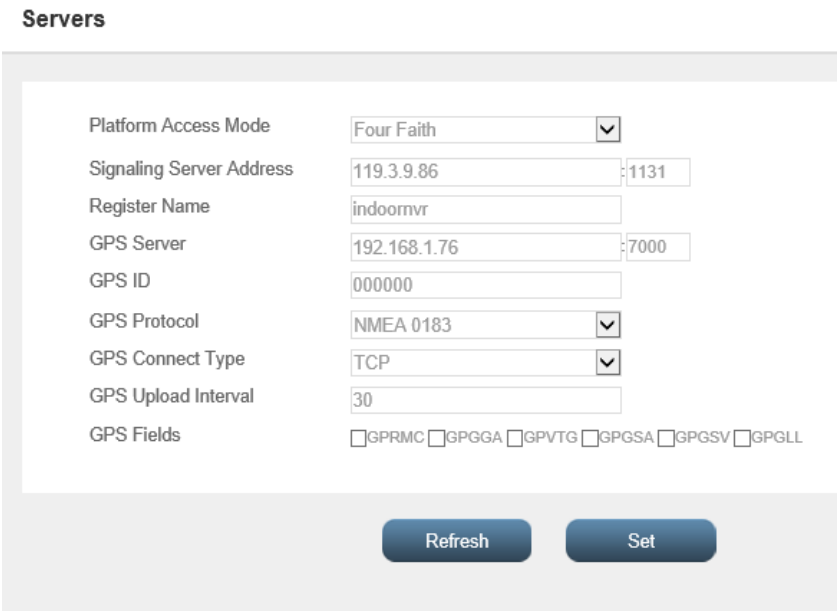
PIN:
Not by default.

Online Maintenance:
"None", "ping", "route", "PPP".In order to turn off the 4G/5G online holding function, in other ways, it can communicate with the online holding server to detect whether the 3G/4G is online or not, and automatically redial if it is abnormal.

IPv6 Configuration

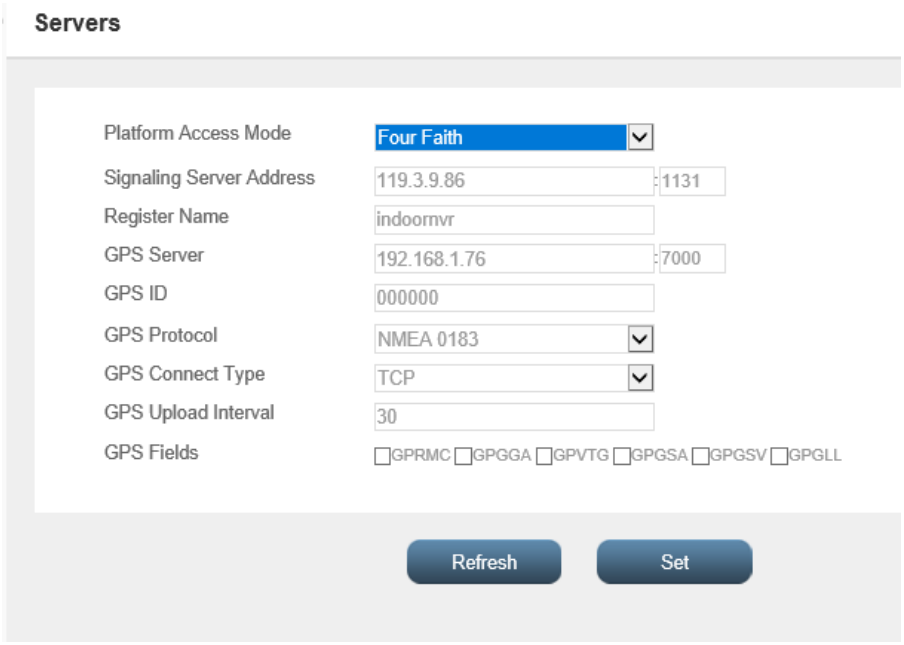


3.5.7.2. Platform Configuration



Platform Access Mode: Four-Faith, GB28181.

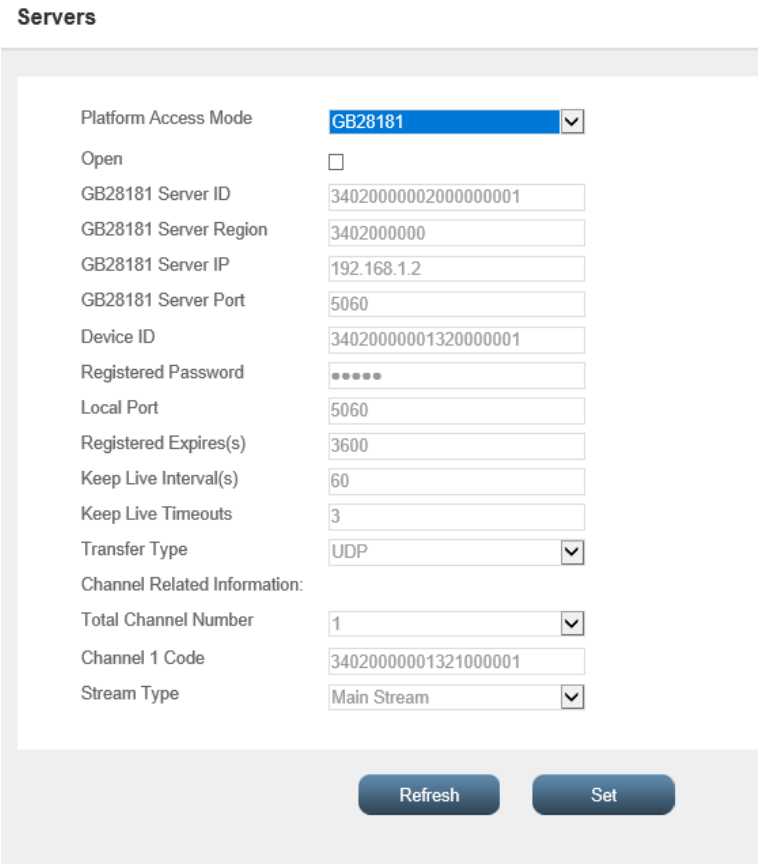
- **Platform access mode select the option of Four-Faith:**



Signaling Server Address: Device video platform address, only need to configure the login server address, other server addresses are given by the login server communication. The address can be represented by a domain name. For users without fixed IP, the device can be connected to the platform through the domain name if they need to apply for a domain name.

Video Device ID: Uniformly managed and distributed by the video platform.
GPS Server: Device GPS platform address, also can use the domain name login.
GPS ID: Uniformly managed and distributed by the GPS server platform.
GPS Protocol: NMEA0183, four faith
GPS Connection Type: TCP, UDP
GPS Upload Interval: Sets the interval of GPS upload data.
GPS Field: Check relevant fields according to actual needs.

- **Platform access mode select the option of GB28181:**



Open: Enable access to GB28181 platform.
Server ID: Uniformly managed and distributed by the server platform.
Region: The domain name of the server platform.
Server IP: The IP address of the server platform.
Server Port: The port of the server platform.
Device ID: Uniformly managed and distributed by the server platform.
Registered Password: Uniformly managed and distributed by the server platform.
Local Port: NVR technology SIP signaling port, default is 5060.
Registered Expires: Validity of SIP registration initiated by NVR and re-registered upon expiration.
Keep Alive Interval: The keep alive packet sending interval that NVR keeps in contact with the server.

3.5.7.3. Network Advanced Setting

Network Advanced Setting includes Port Configuration, Port Forwarding, VPN.

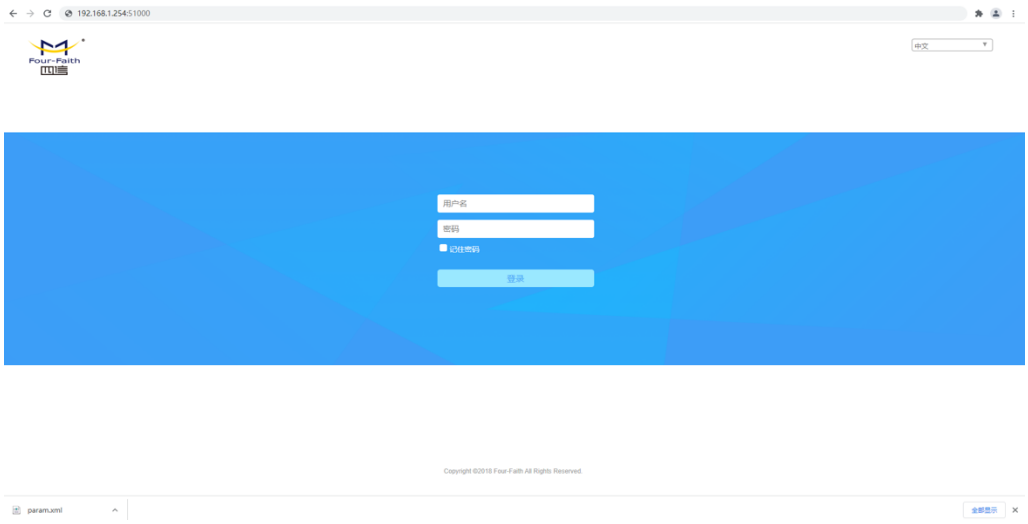
1. **Port Configuration:**

HTTP Port: Configure HTTP Port
RSTP Port: Configure RSTP Port

2. Port Forwarding

Add:

Click the "Add" button to enter the source port, destination IP address (IP address of the LAN port), and destination port As shown in the figure above, the browser access http://192.168.63.101:51000/ that is, the IPC web page is accessed.



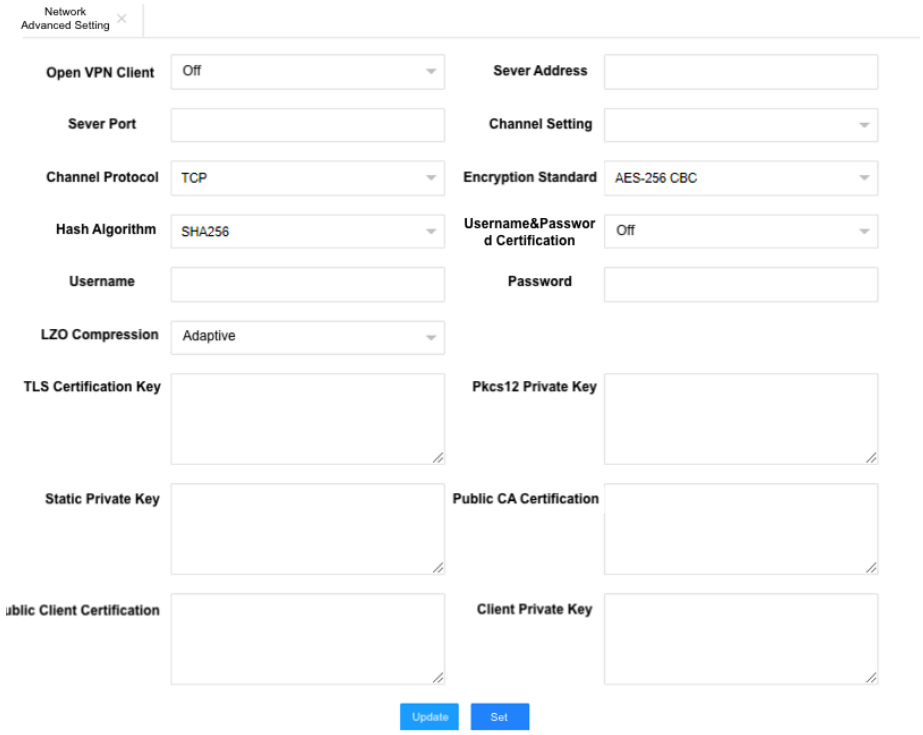
Edit:

Modify the source port, destination IP address, and destination port.

Delete:

Delete the port mapping table.

3. VPN

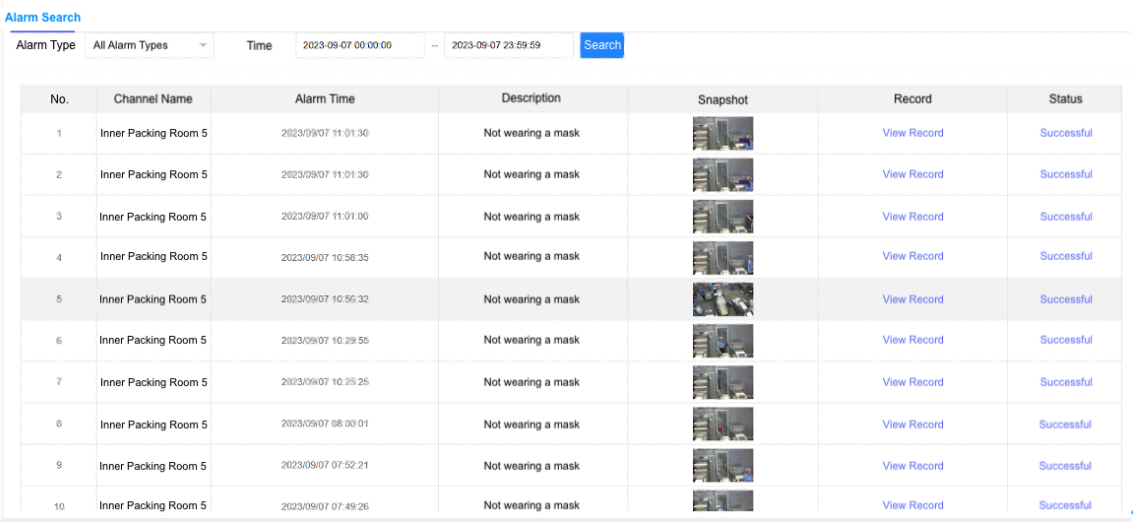


Configure the parameter area based on OpenVPN. Configurations such as certificates and private keys use copy to copy the certificate content into the input box without modifying it.

3.5.8. Algorithm Manager

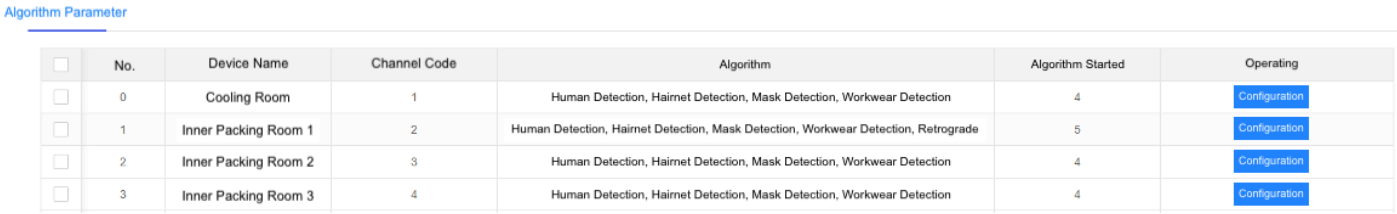
Algorithm Manager includes Alarm Management, Algorithm Parameter and Electronic Fence.

3.5.8.1. Algorithm Management



Select the alarm time and alarm type to query the alarm, view the alarm pictures and videos, and display whether the alarm is successfully reported to the platform

3.5.8.2. Algorithm Parameter



Displays the number of algorithms that are enabled for each video channel, and the algorithms are enabled **by channels.**

1. General Settings

   Alarm Suppression:

   The number of seconds between the next alarm will be generated

   Analyze the frame rate:

   The number of frames analyzed in one second, and the value range (0.01-10) represents 1 frame in 100 seconds to 10 frames in 1 second. The computing power of the device is limited, and the maximum number of 4 channels is 15 frames for the time being, and setting too high will cause frame loss

   Video Pre-Recording:

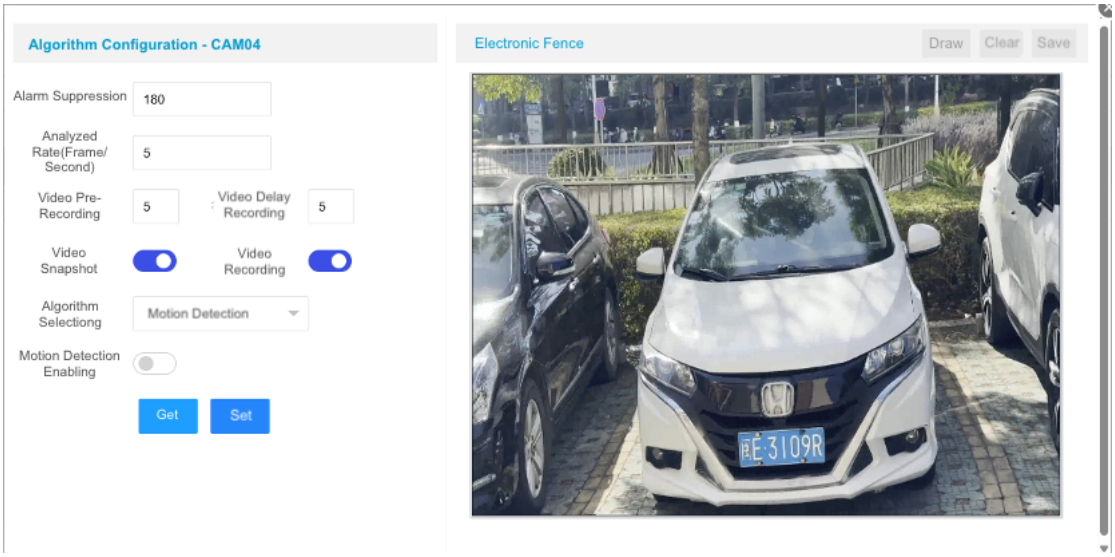
   The time when the alarm video is recorded before the alarm is generated

   Video Delay Recording:

   How long does an alarm video need to be recorded after an alarm is generated.

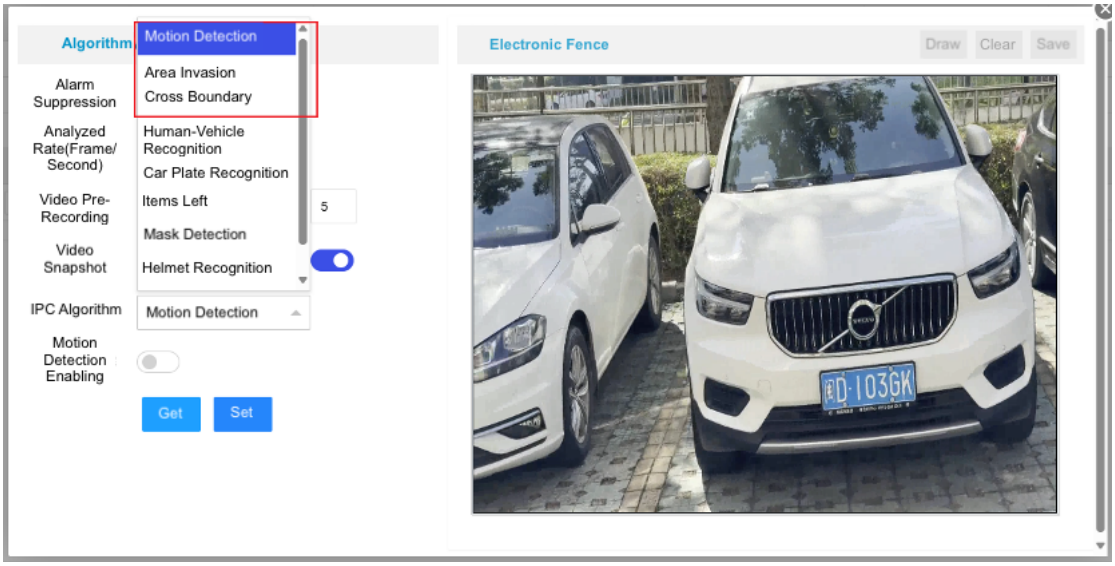
   Video Snapshot:

Whether an image needs to be captured when an alarm is generated



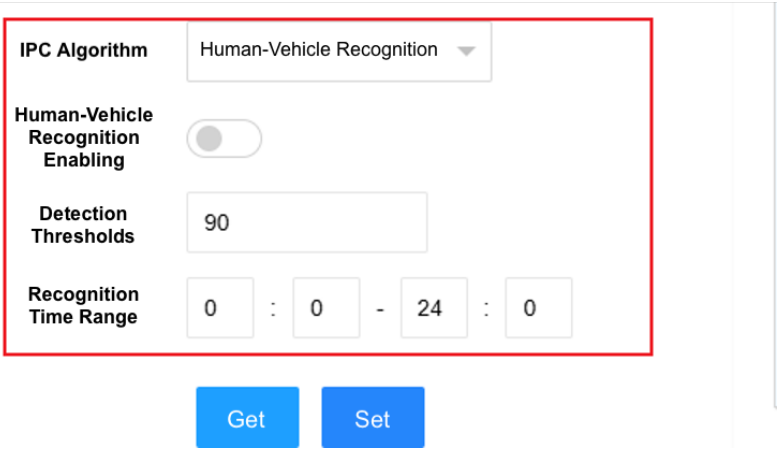
IPC algorithm:

You need to enable the corresponding algorithm of Hikvision IPC, and the corresponding algorithm of NVR will generate an alarm



2. AI Box Algorithm

Human-Vehicle Recognition



Car Plate Recognition

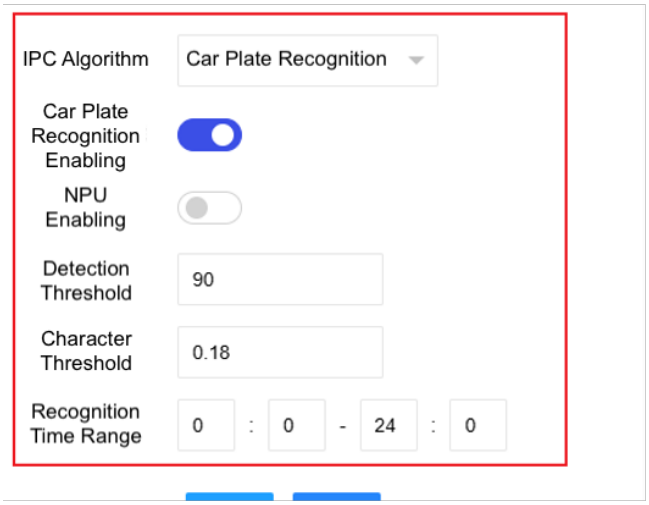
Special Fields Specification:

Detection Threshold:

The threshold at which the license plate was detected

Character threshold:

Adjusted based on the video environment (0.15-0.25)



The NPU can be turned on, and the computing module is used to recognize the license plate, speeding up the recognition.

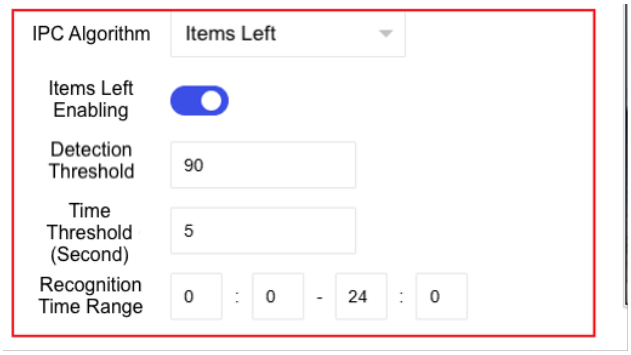
Items Left

This is Actually Capture difference.

Special Fields Specification:

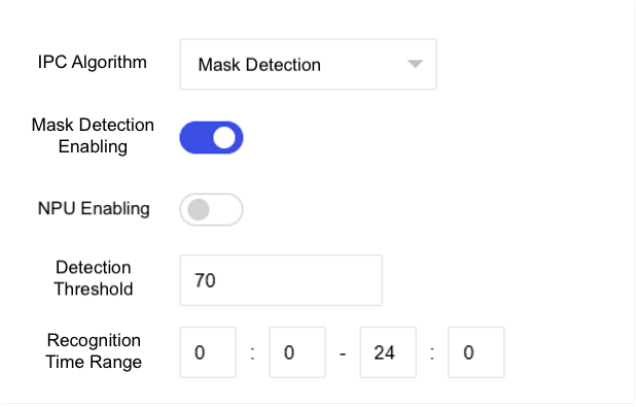
Time Threshold:

An alarm is generated only after the difference is satisfied



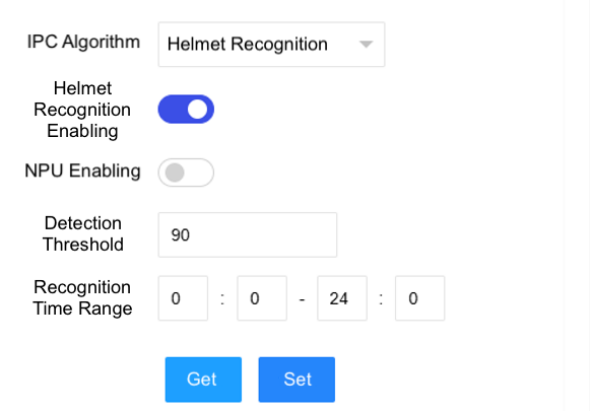
Mask Detection

Turn on NPU Enabling to use Computing Module(NPU) processing Algorithm.



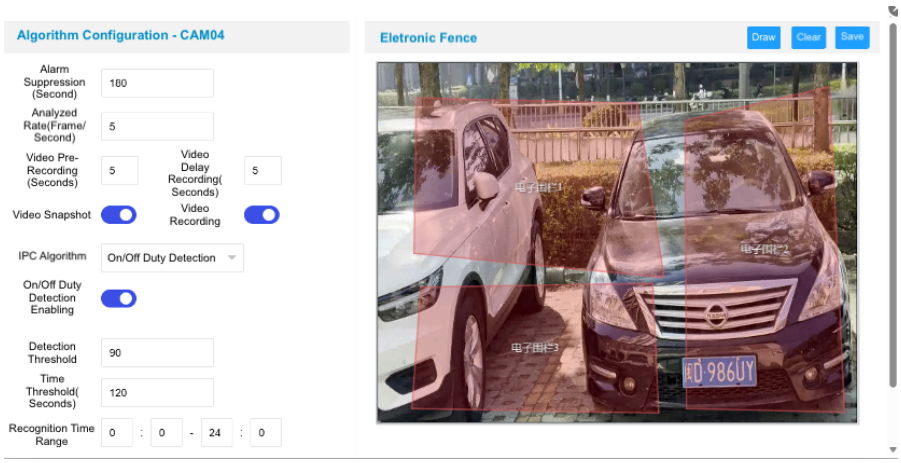
Helmet Recognition

Turn on NPU Enabling to use Computing Module(NPU) processing Algorithm.

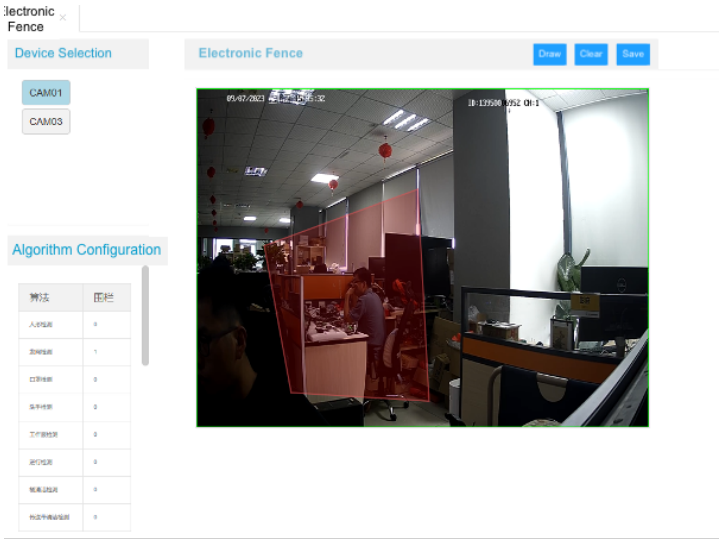


On/Off Duty Detection

With the use of electronic fence, the box selects the working position, judges that there are people at the station and continues to meet the time threshold, and if someone is on the job, it will be reported to be on the job, otherwise it will be reported to leave the post.



3.5.8.3. Electronic Fence

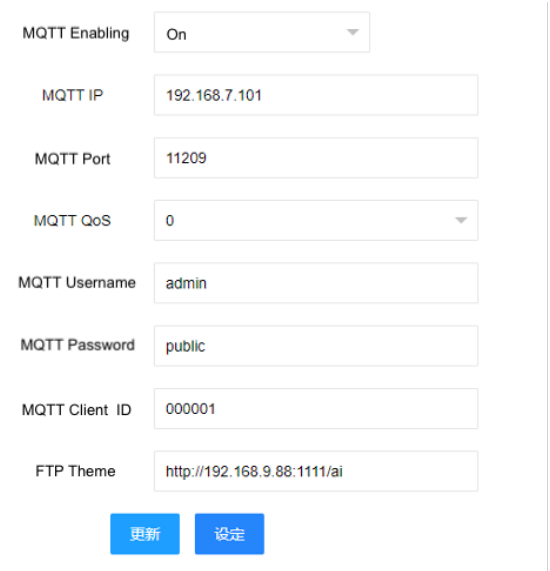


Select the algorithm judgment area, select the channel and the corresponding algorithm to draw the electronic fence of the corresponding algorithm and save it.

3.5.9. Protocol Configuration

Protocol configuration includes: MQTT configuration, hardware interface configuration and display, factor configuration, display, and storage.

3.5.9.1. MQTT Configuration



MQTT Enablement: Whether to send MQTT messages related to sensors and AI alarms to the platform.
MQTT IP: MQTT Server IP address.
MQTT port: IP address of the MQTT server.
MQTT QoS:

Message sending level:

QoS0, At most once;

QoS1, At least once;

QoS2, Exactly once, ensures only once.

MQTT Username:

The username of the connection server.

MQTT Password:

The password for connecting to the server.

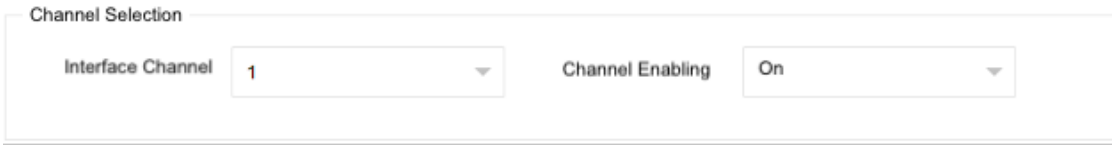
The MQTT client ID: Platform is used to distinguish between devices, which is unique to each device.

FTP Theme: AI alarm picture, video to view the prefix path remotely.

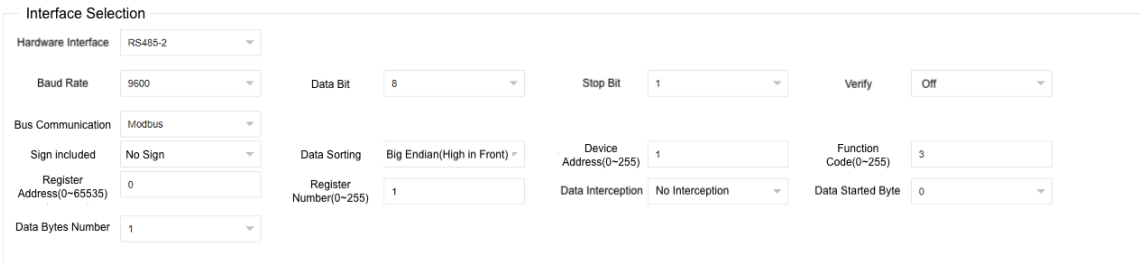
3.5.9.2. Hardware Interface Configuration and Display

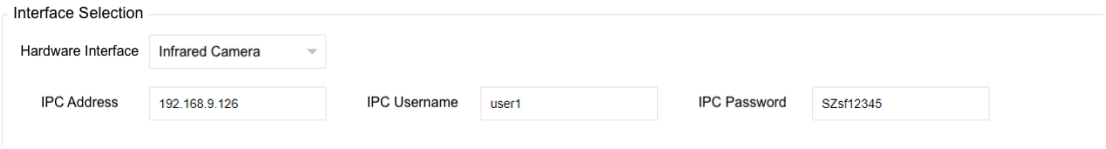
1. **Hardware Channel Configuration**

   Channel Selection: Select whether to start collecting data on the corresponding hardware interface



Interface Selection:





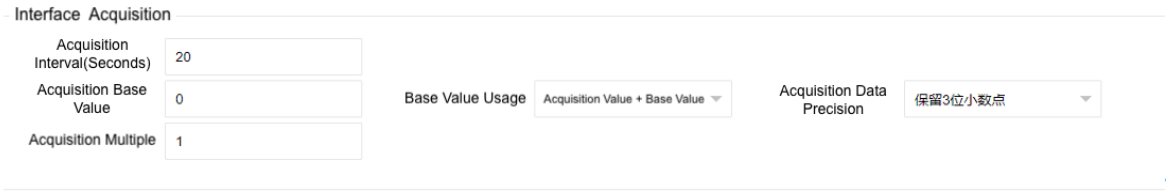
Serial Ports:

RS485-2, RS485-3, RS485-4: Serial port parameters and Modbus corresponding parameters are configured according to the actual situation.

Infrared Camera:

Enter the corresponding parameters of the infrared camera IPC to collect temperature information.

Interface Acquisition:



Acquisition Interval: The number of seconds at which the sensor value is collected

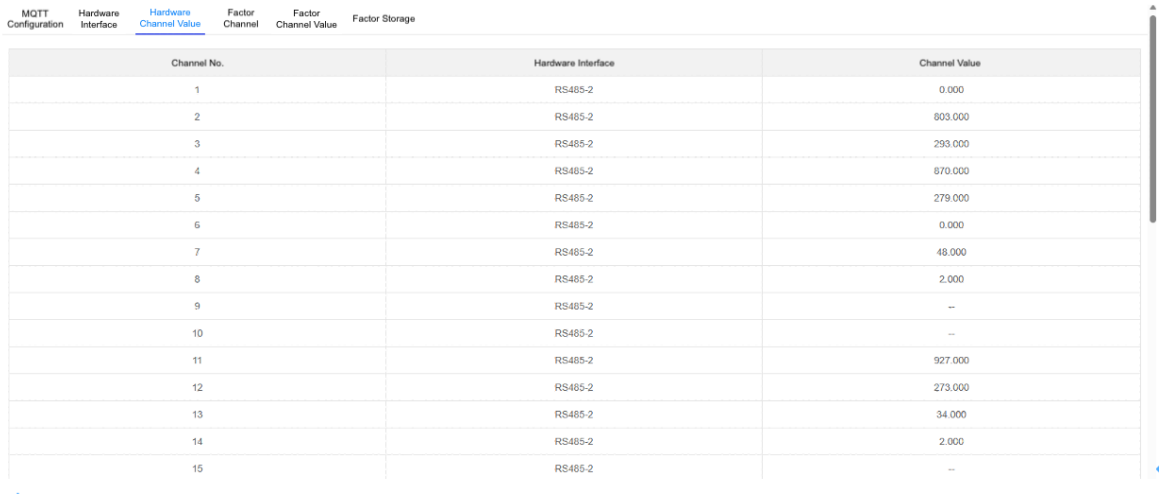
Base Value Usage: Process the collected values

Acquisition Data Precision: The final output value retains a few decimal places.

Acquisition Multiple: Process the collected values

2. Interface Acquisition

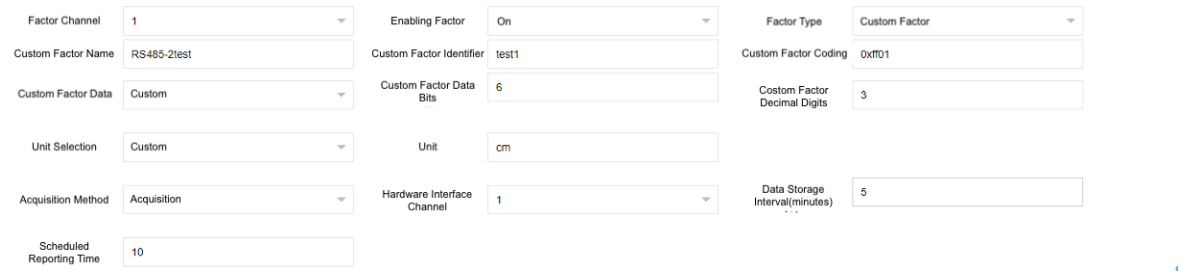
Displays the data collected by the hardware channel of the device



Channel No.	Hardware Interface	Channel Value
1	RS485-2	0.000
2	RS485-2	803.000
3	RS485-2	293.000
4	RS485-2	870.000
5	RS485-2	279.000
6	RS485-2	0.000
7	RS485-2	48.000
8	RS485-2	2.000
9	RS485-2	--
10	RS485-2	--
11	RS485-2	927.000
12	RS485-2	273.000
13	RS485-2	34.000
14	RS485-2	2.000
15	RS485-2	--

3.5.9.3. Factor Configuration, Display, Storage

1. Factor Configuration



Factor Channel: binding

Enabling Factor: On/Off

Factor Type: Custom factor

Custom Factor Name: The name of the factor as shown in the factor data

Custom Factor identifier: is the same as the sensor TSL ID set on the platform side

Custom Factor Coding: Local Identification Number

Custom Factor Data, Data Bits, and Decimal Digits: process the numerical values of the hardware channel

Unit Selection: Unit The numeric unit displayed locally

Acquisition Method: Acquisition

Hardware Interface Channel: Select the value collected by the hardware channel used for the sensor factor value

Data Storage Interval (Minutes): How often the factor value is saved

Scheduled Reporting Time: The number of seconds at which sensor values are uploaded to the cloud platform

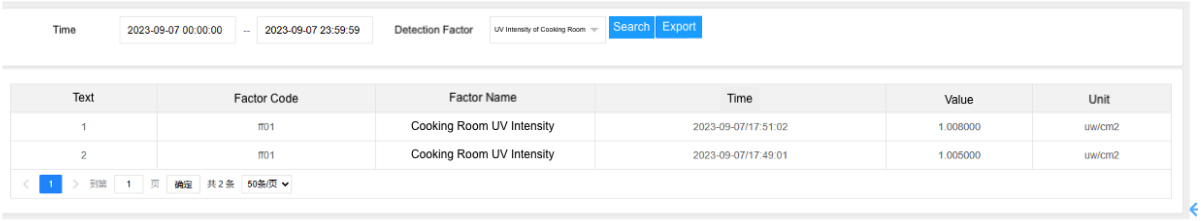
2. Factor Display

Display the reported platform factor value

Channel No.	Factor Name	Factor Unit	Channel Value
1	light_power11	cm	0.000
2	shidu12	cm	803.000
3	wendu12	cm	293.000
4	shidu13	cm	870.000
5	wendu13	cm	279.000
6	light_powe14	cm	0.000
7	anqind15	cm	48.000
8	anqijd15	cm	2.000
9	liuhuaqingnd16	cm	--
10	liuhuaqingjd16	cm	--
11	shidu17	cm	927.000
12	wendu17	cm	273.000
13	anqind18	cm	34.000
14	anqijd18	cm	2.000
15	liuhuaqingnd19	cm	--

3. Factor Storage

Query the historical acquisition value of the corresponding sensor factor channel



Text	Factor Code	Factor Name	Time	Value	Unit
1	ff01	Cooking Room UV Intensity	2023-09-07/17:51:02	1.008000	uw/cm2
2	ff01	Cooking Room UV Intensity	2023-09-07/17:49:01	1.005000	uw/cm2