Network Camera

User's Manual

- 1/2.8" 5.14MP Sony Progressive scan CMOS Sensor
- 2592 x 1944 (5MP 4:3) / 2560 x 1440 (4mp 16:9)
- Triple Streaming (H.265, H.264, MJPEG)
- 2D & 3DNR (Digital Noise Reduction)
- D-WDR(digital - Wide Dynamic Range)
- Corridor Format (90°/270° Rotation)
- Lens Distortion Compensation (LDC)
- Min. Illumination 0Lux (IR LED On)
- Power DC12V, PoE (IEEE802.3af)

Important Information Before Using This Manual

This is a fundamental guide for operating a S&M Technology network camera. Whether you are a first-time user or someone with experience using similar devices, it is essential to read this manual carefully before using the product. Pay close attention to the warnings and precautions outlined in this manual to ensure safe and effective use of the product. Following these safety guidelines will help prevent accidents and damage to property.

- The manufacturer is not liable for any damage to the product caused by the use of unauthorized parts or accessories or by failure to follow the instructions in this manual.
- The information in this manual is believed to be accurate as of the publication date. However, some features may not be described, and the manufacturer cannot be held responsible for any issues arising from their use. The content may change without notice, and future editions may be issued to incorporate any revisions.
- First-time users and those unfamiliar with the network camera should seek assistance from their retailer for installation and use.
- For expansion, repair, or disassembly purposes, always contact the retailer and request professional help.
- Both retailers and users should be aware that this product has been certified for electromagnetic compatibility for commercial use. If the product was unintentionally sold or purchased, please ensure it is replaced with a consumer version.

Safety Symbols

In-Text Symbols

- **Caution**: Important information regarding a specific function.
- **Note**: Useful information about a specific function.

Safety Precautions

WARNING

RISK OF ELECTRIC SHOCK
DO NOT OPEN

Warning: To reduce the risk of electric shock,
do not remove the cover or back.
There are no user-serviceable parts inside.
Refer servicing to qualified personnel.

Important Safety Instructions

1. **Read Instructions**
   All safety and operating instructions should be read before using the equipment.
2. **Retain Instructions**
   Keep the safety and operating instructions for future reference.
3. **Cleaning**
   Unplug the equipment before cleaning. Do not use liquid aerosol cleaners. Use a damp, soft cloth for cleaning.
4. **Attachments**
   Never add any attachments or equipment without the approval of the manufacturer, as such additions may result in fire, electric shock, or personal injury.
5. **Water and Moisture**
   Do not use this equipment near water or in contact with water.
6. **Placement and Accessories**
   Ensure the equipment is installed on a wall or ceiling strong enough to support it. Improper installation could cause the equipment to fall, resulting in injury or damage. Follow the manufacturer's instructions for mounting and use only approved mounting kits. When moving the equipment, do so carefully, as quick stops or excessive force can cause the equipment to overturn. Do not place the equipment in an enclosed space. Adequate ventilation is necessary to prevent overheating and reduce the risk of fire.
7. **Power Sources**
   The equipment should be powered only from the type of source indicated on the labeling. If unsure of the power requirements, consult the dealer or local power company. Consider installing an Uninterruptible Power Supply (UPS) system for safe operation, preventing damage from unexpected power outages.
8. **Power Cord**
   Always disconnect the power and cables before handling the equipment.
9. **Lightning**
   For added protection during lightning storms, or when the equipment is left unused for long periods, unplug it from the wall outlet and disconnect any antenna or cable system. This will prevent lightning and power surge damage. Use a surge protector if lightning is common in the area.
10. **Overloading**
    Avoid overloading wall outlets or extension cords, as this could result in fire or electric shock.
11. **Objects and Liquids**
    Never insert objects into the equipment's openings, as they may contact dangerous voltage points or cause a short circuit. Avoid spilling liquids on the equipment.
12. **Servicing**
    Do not attempt to service this equipment yourself. Refer servicing to qualified service personnel.
13. **Damage Requiring Service**
    If the equipment shows signs of damage such as the following, unplug it and consult qualified service personnel:
    A. Damage to the power supply cord or plug
    B. Spilled liquid or impact damage
    C. Exposure to rain or water
    D. If the equipment does not operate normally, follow the operating instructions to avoid unnecessary adjustments that could cause further damage.
    E. If the equipment has been dropped or the casing is damaged
    F. A noticeable change in performance indicates a need for servicing.
14. **Replacement Parts**
    When replacing parts, ensure that the service technician uses parts specified by the manufacturer or parts with equivalent characteristics. Unauthorized substitutions could result in fire, electric shock, or other hazards.

15. **Safety Check**
    After any service or repair, ask the service technician to perform safety checks to ensure the equipment is in proper working condition.
16. **Installation**
    Installation should be carried out by a qualified technician and must comply with local codes.
17. **Maximum Ambient Temperature (Tmra)**
    Ensure that the equipment's maximum recommended operating temperature (Tmra) is specified, so the customer and installer can determine a suitable operating environment.

WEEE (Waste Electrical & Electronic Equipment)

Proper Disposal of This Product
(Applicable in the European Union and countries with separate waste collection systems)

The symbol displayed on the product or its packaging indicates that this device should not be disposed of with household waste at the end of its life cycle. To prevent potential environmental harm or health risks from improper disposal, please separate it from other waste and recycle it responsibly. This will promote the sustainable reuse of materials.
For Household Users:
Contact the retailer from whom you purchased the product, or your local government office, for information on how to dispose of this product in an environmentally responsible manner.
For Business Users:
Consult your supplier to check the terms and conditions in the purchase agreement. This product should not be mixed with other commercial waste for disposal.

Contents

OVERVIEW

This camera is a megapixel motorized network camera module with a built-in web based viewer accessible by multiple browsers.
This camera supports dual compression formats and triple streaming simultaneously. The three standard compression formats include H.265, H.264 and MJPEG. The streams can be configured to a variety of resolutions, bit rates and frame rates.

* **NOTE**
The several features are dependent on camera model.

System Requirements

1. Operating System
• Windows Vista (32 bit) Ultimate, Business Edition
• Windows 7, 8 (32/64 bit), 10, 11 (32/64 bit) Ultimate, Professional Edition

2. Processor
• Intel Core i3 2.4 GHz or higher
• Intel Core i5, i7 2.8 GHz or higher

3. Memory
• 4 GB or more

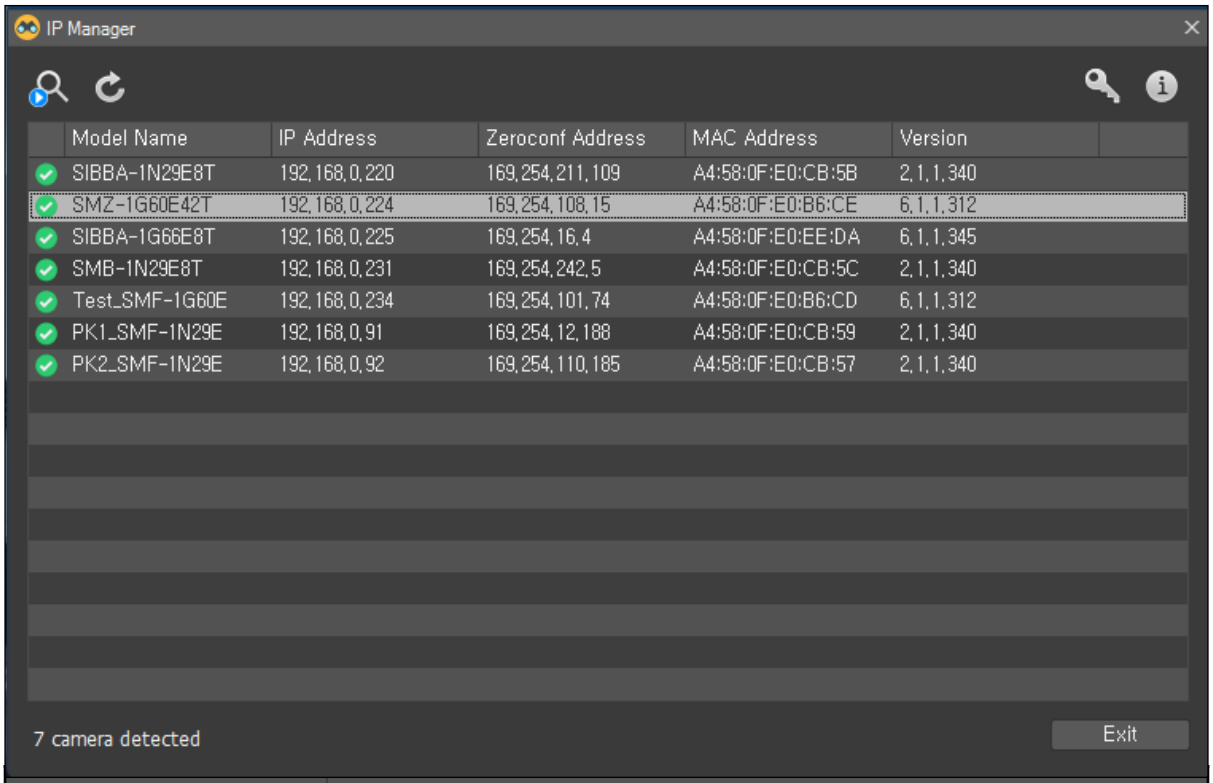
4. Resolution
• 1280X1024 pixels or higher (32 bit color)

5. Web Browser
• Microsoft Internet Explorer Ver. 9 or Higher
• Safari (Plug-in free viewer only)
• Google Chrome (Plug-in free viewer only)

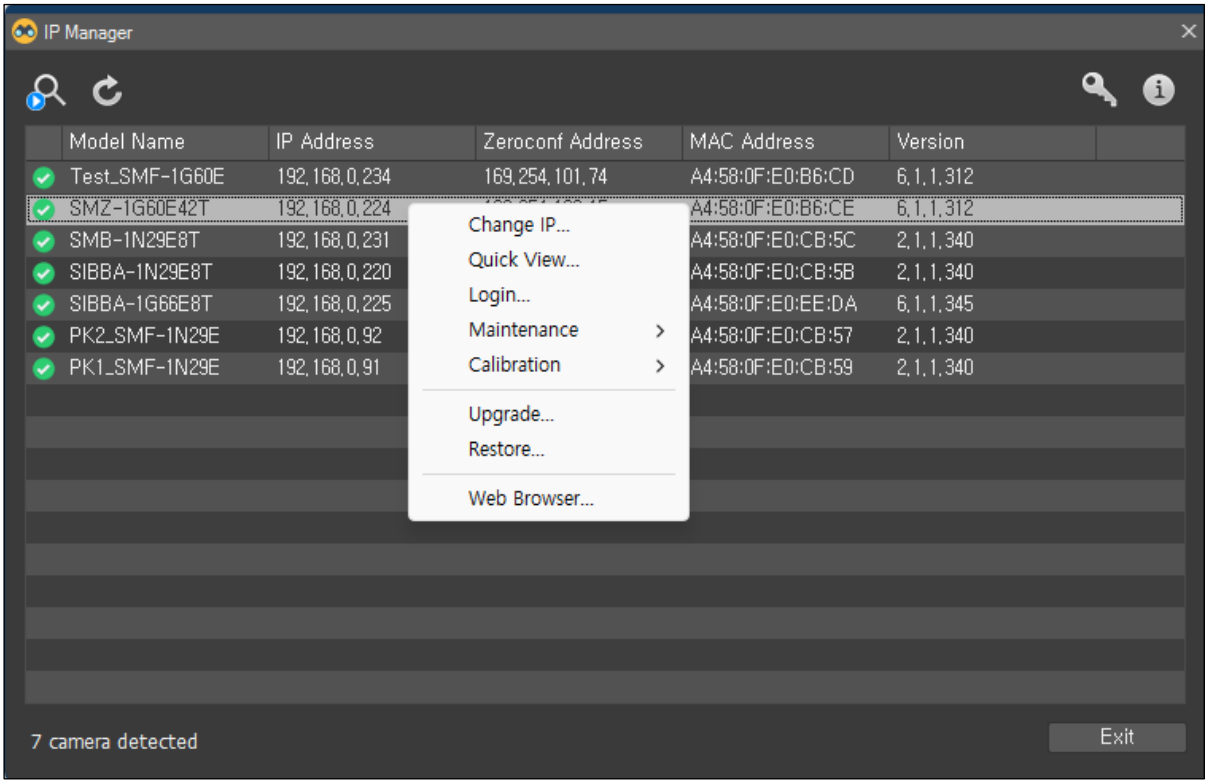
IP MANAGER USAGE

IP Manager Setting

Run the IP Manager.exe 



Designation	Function
Stop Discovery	Product Navigation stop or restart.
Start Discovery	
Refresh	
Model Name	The model name of the connected camera.
IP Address	The IP address of the camera.
Zeroconf Address	Zero configuration networking (zeoconf) is a set of techniques that automatically creates a usable Internet Protocol (IP) network without manual operator intervention or special configuration servers. Zero configuration networking allows devices such as computers and printers to connect to a network automatically. Without zeroconf, a network administrator must set up services, such as Dynamic Host Configuration Protocol(DHCP) and Domain Name System(DNS), or configure each computer's network settings manually, which may be difficult and time-consuming.
MAC Address	IP camera MAC Address
Version	The firmware version of the product.



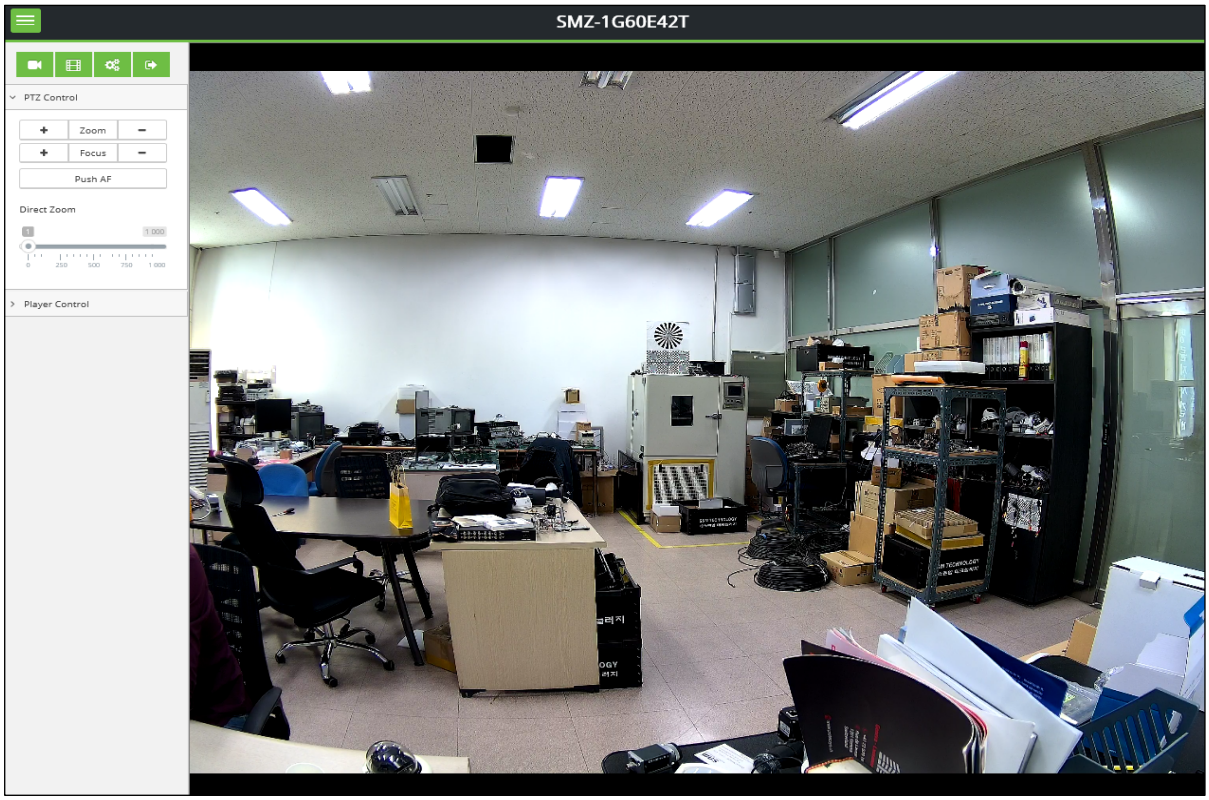
Change IP : Select a product and click this button to reset the product's IP address.
Quick View : Displays live video.
Login : The default user name / password are **admin / admin**
Maintenance : Click the "Scan" tab, then select a product under the "Maintenance" tab to restart or reset camera settings.

- Restart : Restarts the network camera.
- Reset : Resets all parameters, except IP setting to the factory default.
- Default : Resets all parameters to the factory default.

Calibration : Performs white pixel compensation.
Upgrade : Provides the latest firmware to the camera. Upgrading with a firmware file updates the camera's Functionality and improves reliability.
Web Browser : Connects to the camera's homepage.

Accessing the IP camera

1. Open Web browser
   Launch a web browser (e.g., Internet Explorer)
2. Enter IP address
   Type the camera's IP address into the browser's address bar.
   • The default IP address is **192.168.0.10**
   • The default User ID and Password is **admin / admin**



Show Menu and Live Video

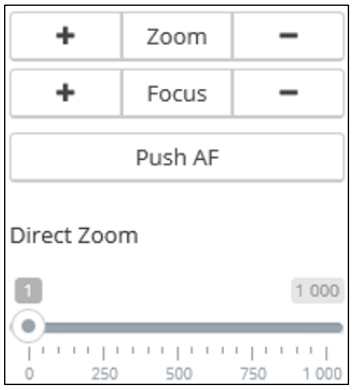
Display Live Video

Playback Image

Enter Setup Menu

Exit Current Login and/or Enter New Login

PTZ Control



Zoom + : Enlarges the image to bring the subject closer.
Zoom - : Zooms out to provide a wider field of view.
Focus + : Reduces the focus distance to sharpen closer subjects..
Focus - : Increases the focus distance to improve clarity of subjects farther away.
Push AF : Automatically, adjusts focus when the button is pressed.
Direct Zoom : Enables direct control of the lens zoom for easy zoom-in and zoom-out operations.

Player Control


Pause: Freeze the current windows


Snapshot: Take a picture of the video image currently on display


Speaker: Set the speaker volume


Microphone: Enable or Disable the microphone


Record: Record the current video image

Display: Shows the display mode options.
- Window Fit: Automatically fit the live video to the current window size.
- Full Screen: Displays the current video size into full screen size.
- Custom: Allows manual adjustment of video size from Min.0% to Max.200%.

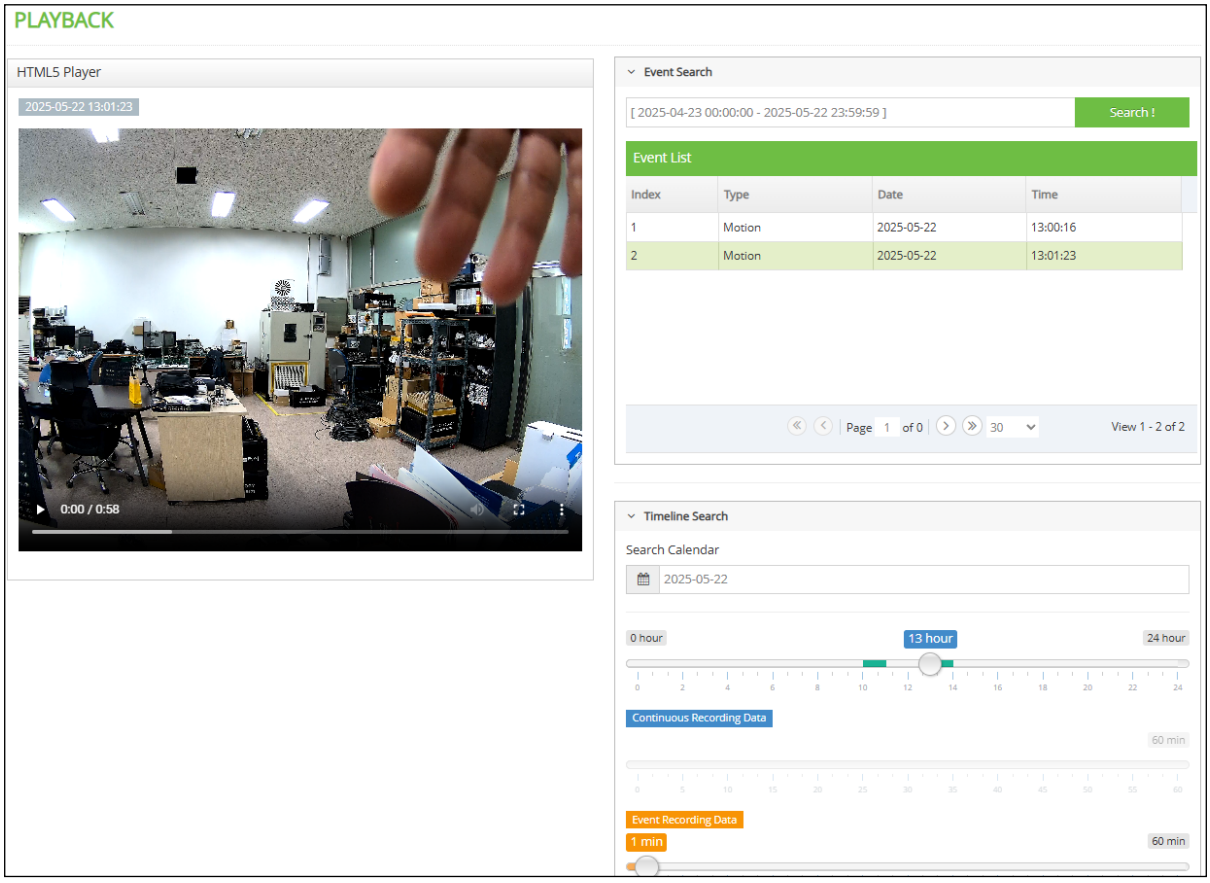
Protocol: Specifies the protocol that used for communication.
- HTTPS: Hypertext Transfer Protocol Secure (SSL/TLS)
- HTTP: Hyper Text Transfer Protocol
- TCP: Transmission Control Protocol
- UDP: User Datagram Protocol

Video Stream

Source: Specifies the video stream source.
- Stream1: Shows resolution and frame rate of Stream 1.
- Stream2: Shows resolution and frame rate of Stream 2.
- Stream3: Shows resolution and frame rate of Stream 3.

*** NOTE : The total number of streams depends on camera model.**

Playback

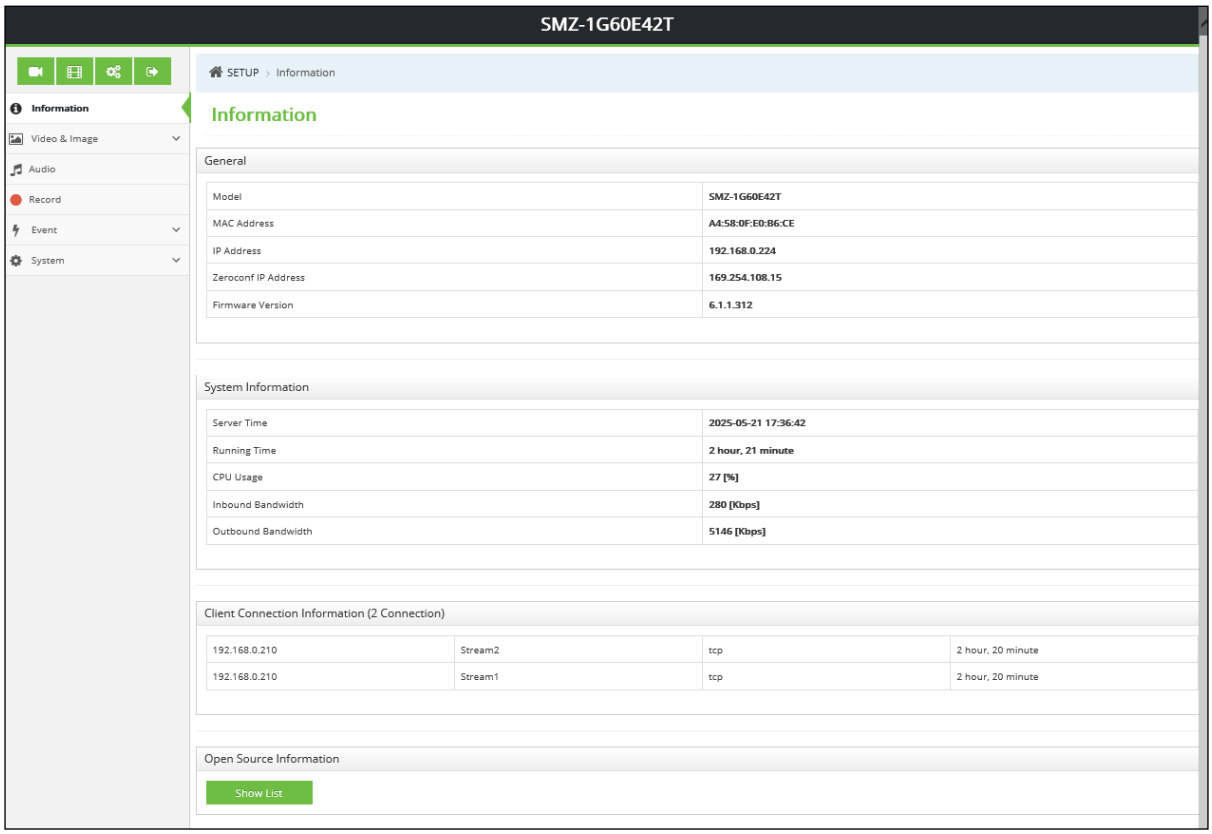


HTML5 Player: Displays video recored on the SD Card.
Event Search: Enter parameters to search for specific event items.
Event List: Displays information about detected events.
Timeline Search: Enables timeline-based search of recorded data.
Search Calendar: Displays a one-month calendar view.

- Hour: Represents a 24-hour period for each day.
- Continuous Recording Data: Indicates continuous recording for each hour.
- Event Recording Data: Indicates event-based recording for each hour.

SETUP

[Information]



General: Displays basic information about the camera, such as Model name, MAC address, IP address, Zeroconf IP address, and firmware version.

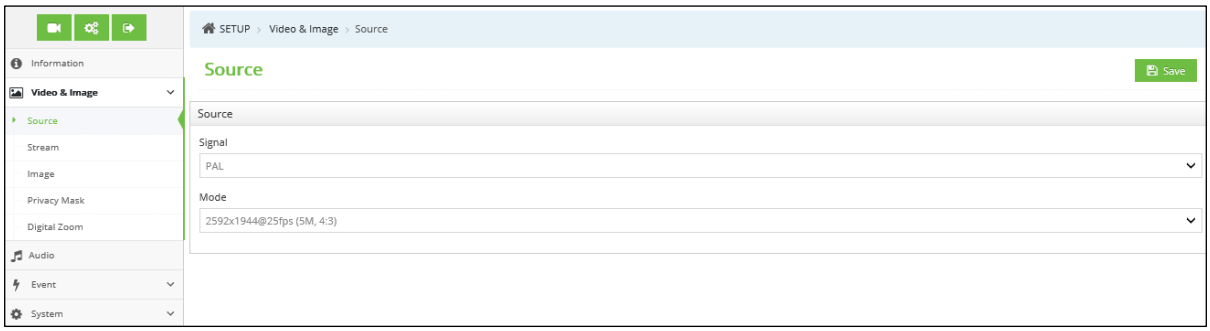
System Information: Displays system information, including Server time, Running time, CPU usage, inbound bandwidth, and Outbound bandwidth.

Open Source Information: Displays a list of open-source components used in the camera.

[Video & Image]

Source

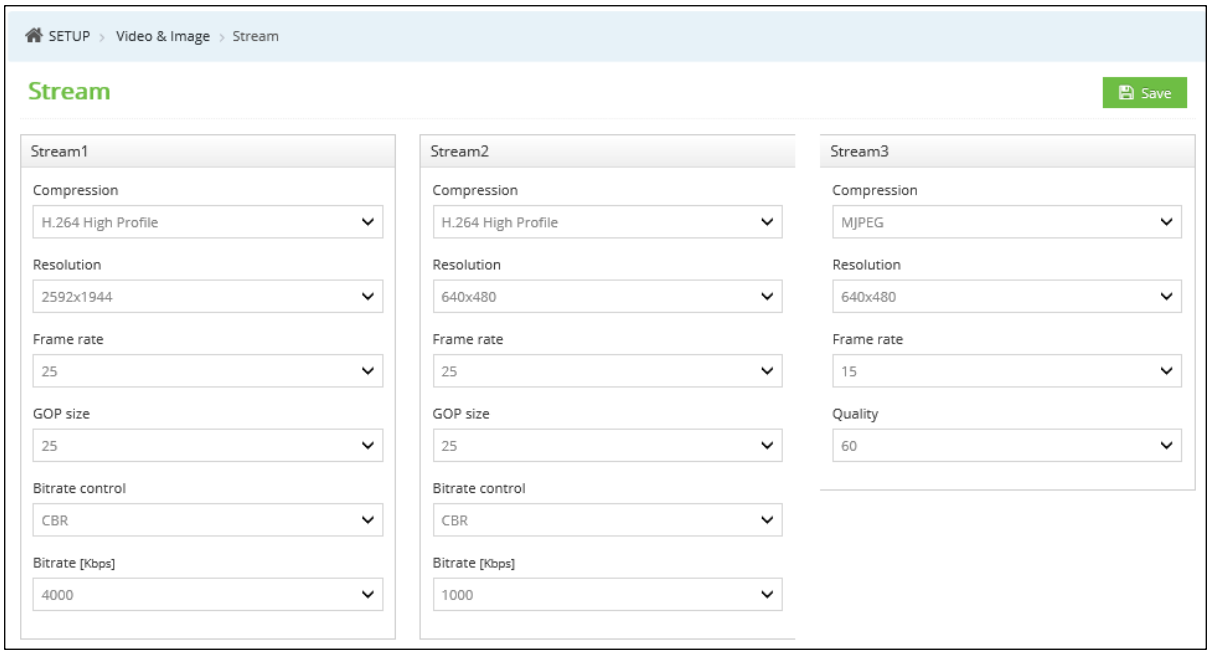
Specifies the video source. Depending on the selected signal or mode, each stream configuration may be affected and the streaming will be automatically adjusted based on system performance.



Signal: Selects the video standard signal: NTSC or PAL.
Mode: Specifies the video mode to be used. In this menu, resolution, image quality (megapixel), frame rate, and aspect ratio can be selected.

Stream

Configures the setting for H.264, H.265, and MJPEG video streams.



Compression: Select the video compression standard for the stream (e.g., H.264, H265, or MJPEG)
Resolution: Specify the resolution as the width (pixel columns) by height (Pixel rows).
Frame rate: Set the frame rate for video stream in frames per second (fps).
GOP size: The Group of Pictures (GOP) setting determines the number of partial frames between full frames in the video stream.
In a typical scene-such as a door opening and a person walking through, only the movement of the door and the person is encoded. The stationary background, which has not changed, is not encoded in the partial frames but is encoded in the full frames.
By using partial frames, video compression is more efficient, reducing the overall size of the video file. As the GOP value increases, more partial frames are generated between full frames. This results in a lower video size and reduced bandwidth usage. However, higher GOP values can impact image quality, as less frequent full frames may reduce the sharpness of movement

or detail. This setting is available only with H.264 or H.265 compression. A higher GOP value is recommended only on stable, high-reliability networks. Consult your network administrator before making changes to Before adjusting the GOP size, consult with your network administrator to ensure compatibility with your system and network conditions.

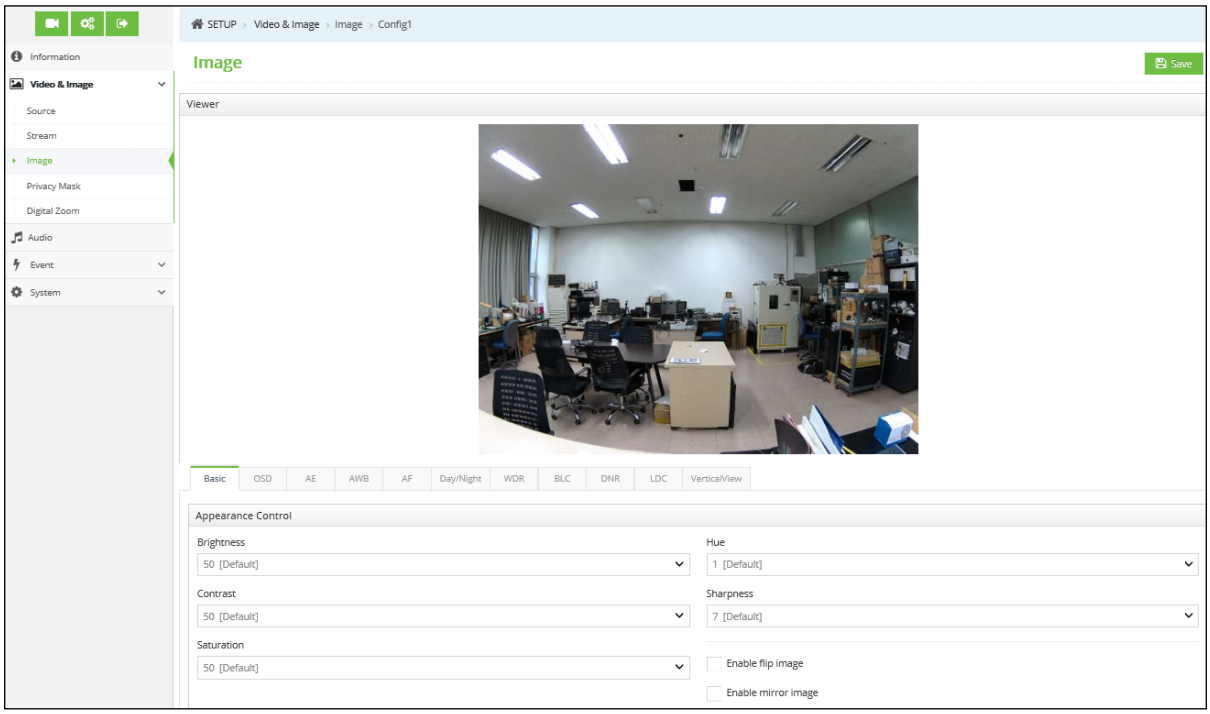
Bitrate control: The bitrate can be configured to either VBR (Variable Bit Rate) or CBR (Constant Bit Rate), depending on the needs.

- **VBR (Variable Bit Rate)**: The bitrate is dynamically adjusted based on the complexity of the image. It allocates more bandwidth for scenes with higher activity, such as fast-moving objects, and less bandwidth for scenes with minimal movement or less detail. This helps optimize bandwidth usage while maintaining video quality.
- **CBR (Constant Bit Rate)**: This setting allows you to specify a fixed target bitrate, resulting in a consistent bandwidth consumption. While this ensures predictable network usage, the bitrate typically needs to increase for scenes with more activity. However, this can negatively affect frame rate and image quality in such cases, as the fixed bitrate may not be sufficient for high-motion or complex scenes.

Bitrate: This setting specifies the video stream quality in kilobits per second (kbps). A higher bitrate generally improves video quality but also increases the bandwidth requirement.

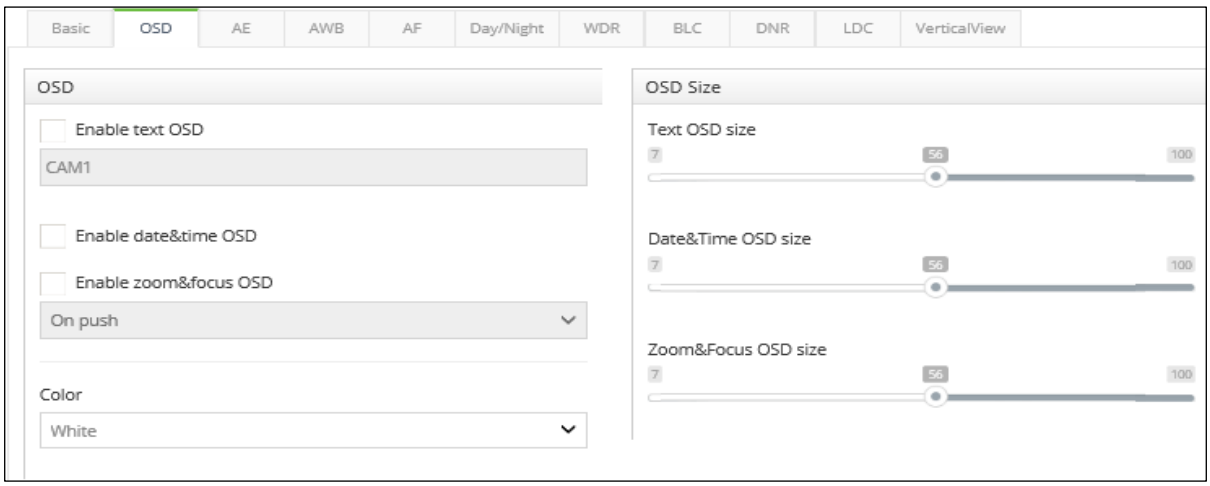
Image

(Image) Basic: The image appearance settings allow adjustment of various camera parameters and camera orientation. It is recommended to fine-tune these parameters to achieve optimal image quality based on the installation environment.



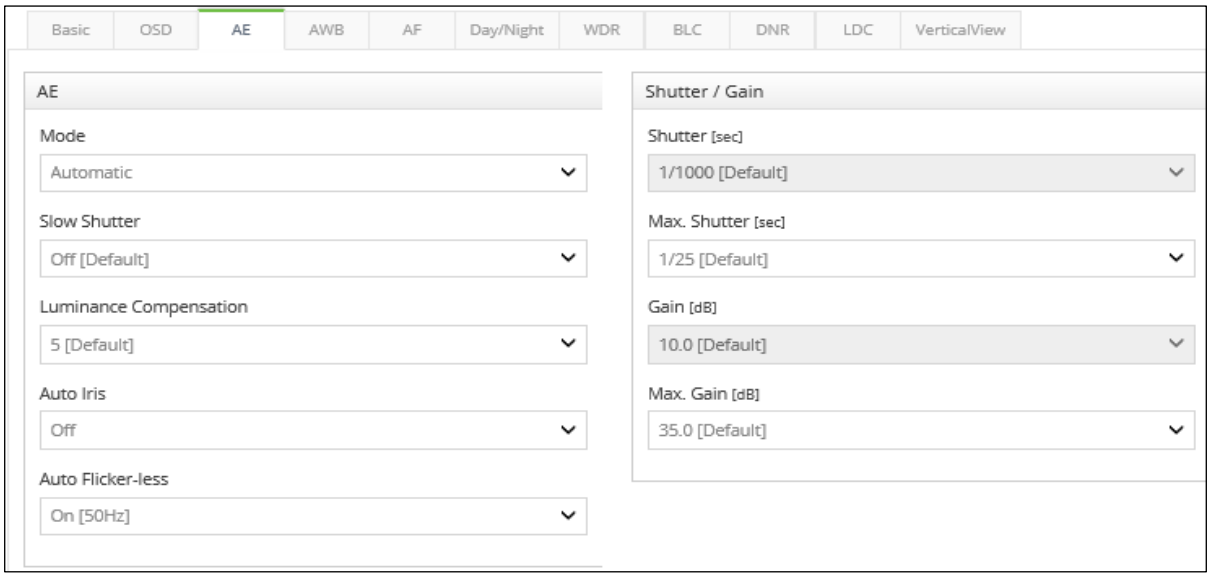
Brightness: Controls the brightness level of the image.
Contrast: Adjusts the difference between dark and light areas in the image.
Saturation: Controls the intensity of colors in the image.
Hue: Adjusts the overall color tone of the image.
Sharpness: Controls the edge definition and clarity of the image.
Enable Flip Image: Rotates the image 180 degrees vertically (upside down).
Enable Mirror Image: Flip the image 180 degrees horizontally (left to right), creating a mirrored view.

(Image) OSD: The On-Screen Display (OSD) function overlays camera status information directly onto the video stream.



Enable text OSD: Displays user-defined text, such as the camera name.
Enable date & time OSD: Displays the current date and time from the camera.
Enable zoom & focus OSD: Displays the current zoom level and focus mode.
Color: Selects the color for the OSD text.
Text OSD Size: Adjusts the font size of the user-defined text.
Day & Time OSD Size: Adjust the font size of the date and time display.
Zoom & Focus OSD Size: Adjust the font size of the zoom and focus display.

(Image) AE: Configures exposure control to optimize image quality based on lighting conditions. This camera supports both automatic and manual exposure modes.
The shutter and gain settings affect the level of motion blur and image noise. To adapt to varying lighting conditions, available storage and bandwidth, it is often necessary to prioritize either low motion blur or low image noise. This camera supports different exposure strategies for normal-light and low-light environment.
Shutter speed determines how long the camera sensor is exposed to light and is measured in seconds (s).



Mode: Adjust the exposure method used by the camera. In automatic mode, the sensor's gain, shutter speed, and aperture are adjusted automatically to achieve optimal image brightness. In the manual mode, user can control the gain and shutter speed directly to fine-tune exposure settings for specific environments or lighting conditions.

Slow Shutter: Allows more light to reach the sensor by increasing shutter speed, producing a brighter image in low-light conditions. However, slower shutter speeds may cause motion blur in moving objects.

Auto Iris: Controls the shutter speed, gain, and aperture of the mechanical iris lens to adjust luminance. In this mode, luminance is primarily regulated using gain and aperture while keeping exposure time fixed.

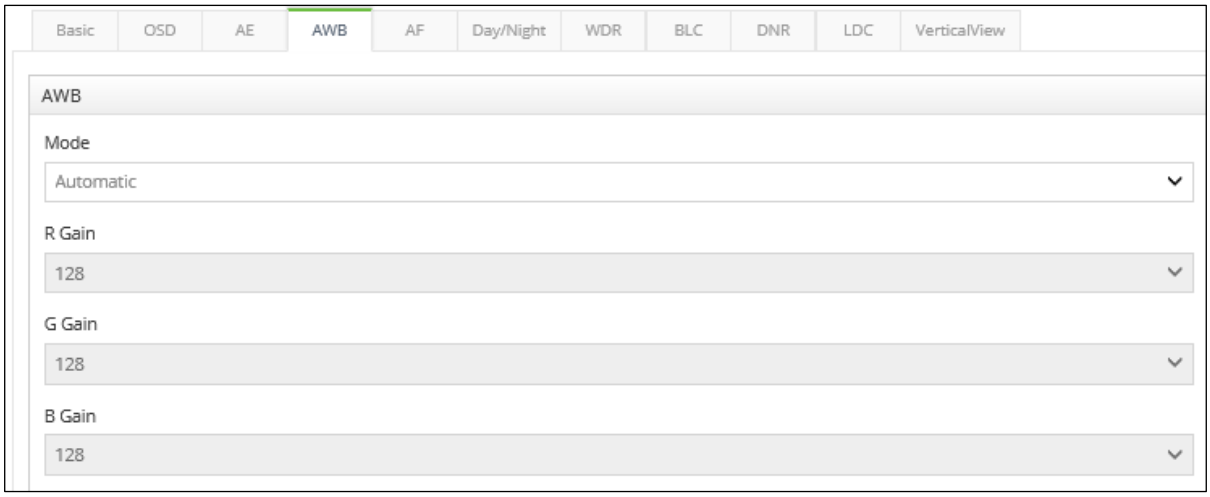
Shutter: Adjusts luminance by controlling the gain while maintaining a fixed shutter speed.

Max. Shutter: Sets the maximum allowable shutter speed within the specified range.

Gain: Represents the level of amplification applied to the image. Higher gain improves visibility in low-light conditions but may increase image noise.

Max. Gain: Sets the maximum allowable gain within a specified range.

(Image) AWB: Auto White Balance (AWB) ensures that colors appear consistent regardless of the color temperature of the light source. The camera can automatically detect the lighting conditions and adjust white balance accordingly. Alternatively, the light source type can be manually selected from the drop-down list.



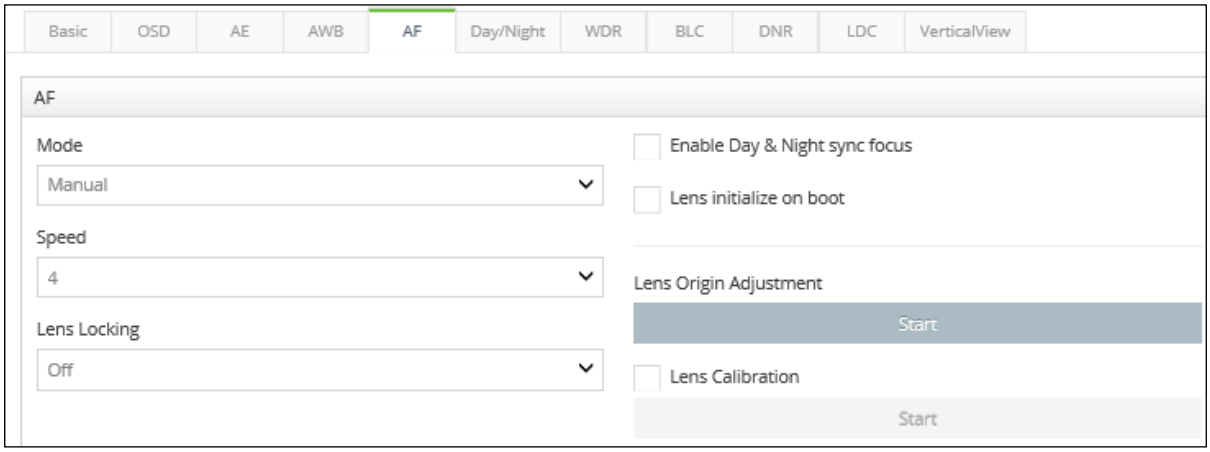
Mode: Configures the white balance mode. The default setting is ATW-Indoor.

R Gain (Red Gain Adjustment): Adjusts the gain level for the red channel to fine-tune the white balance.

G Gain (Green Gain Adjustment): Adjusts the gain level for the green channel to fine-tune the white balance. This setting is generally used less frequently but can be useful in specific lighting conditions.

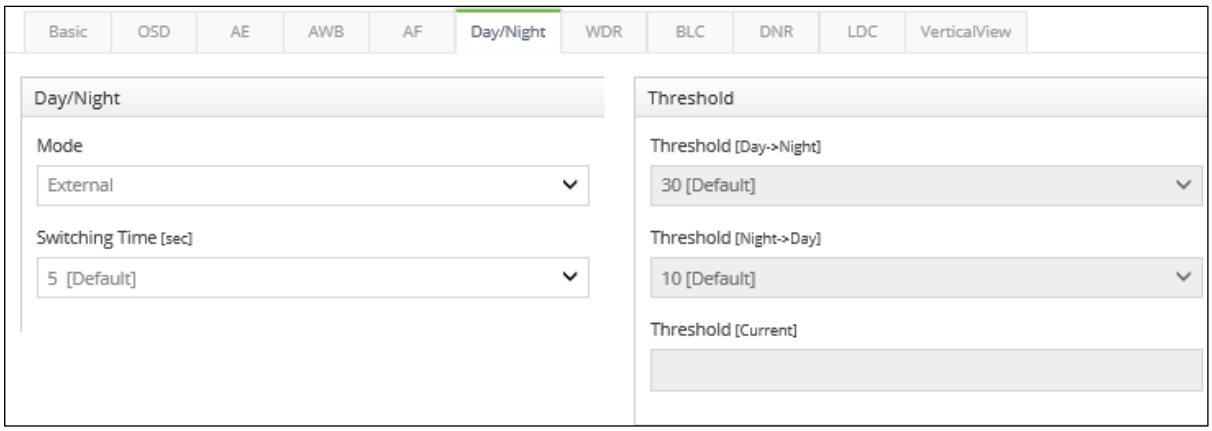
B Gain (Blue Gain Adjustment): Adjusts the gain level for the blue channel to fine-tune the white balance.

(Image) AF: Auto Focus (AF) control adjusts the lens to achieve optimal image sharpness, either manually or automatically.



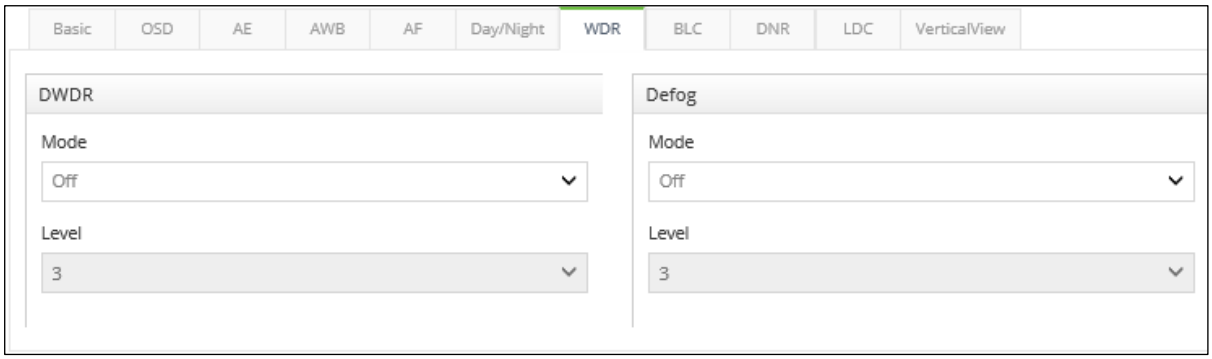
Speed: Adjusts the focus speed. The higher value results in faster focusing
Lens locking: Retains the current lens focus position to prevent unintended changes.
Enable Day & Night sync focus: Automatically adjusts the focus whenever the camera switches between day and night modes.
'**Lens initialize on boot**': Activates automatic lens initialization every time the camera powers on.
Lens Origin Adjustment: Resets the lens settings to the default state.
Lens Calibration: Performs lens calibration during initial setup or after installation. This process is required to ensure proper operation and must be completed before using the camera.

(Image) Day/Night: The IR cut filter blocks infrared (IR) light from reaching the image sensor. In low-light conditions, such as nighttime or when using an IR lamp, set the mode to Night to increase light sensitivity and allow the camera to capture infrared light. The image will be displayed in black and white in Night mode. Set the mode to Automatic to switch between Day and Night automatically based on lighting conditions.



Mode: Configures the IR cut filter transition mode.
Switching Time: Adjusts the IR cut filter transition time, setting the delay after detecting the transition point.
Threshold: Sets the threshold level for the IR cut filter based on the installation environment. Make sure the "Threshold [Night → Day]" value is higher than the "Threshold [Day → Night]" value to prevent Day / Night hunting.

(Image) WDR: Adjusts the Wide Dynamic Range to improve image quality in scenes with both bright and dark areas. This feature modifies brightness using slope and contrast adjustments on the tone curve.



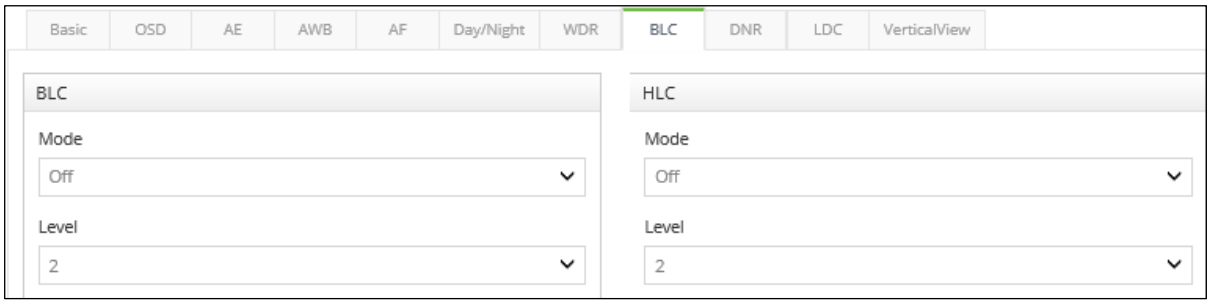
DWDR: Digital-WDR is a digital technology that enhances image quality in scenes with both bright and dark areas by adjusting brightness and contrast.
Mode: Selects the DWDR mode.

*** Note: DWDR functionality depends on the camera model.**

Defog: Automatically detects foggy conditions and enhances image clarity. This feature improves visibility in foggy environments through intelligent image analysis.

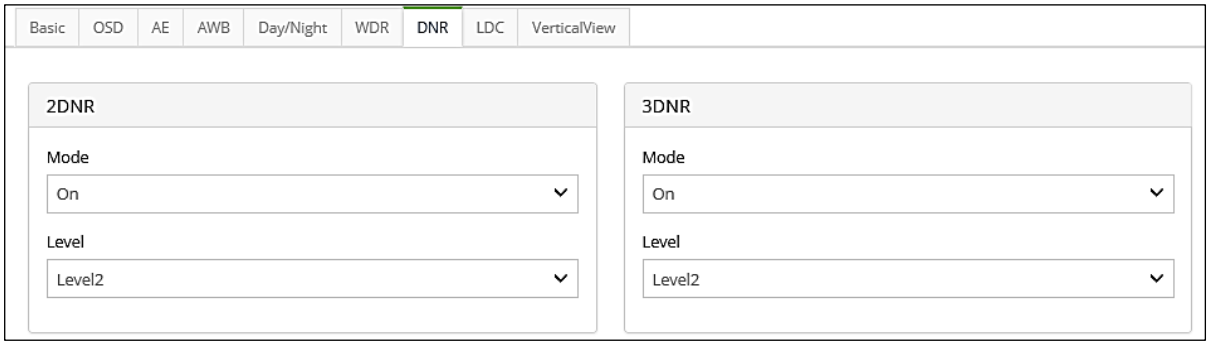
Mode: Selects the Defog mode.
Level: Adjusts the level of the Defog effect.

(Image) BLC: Brightens subjects darkened by strong backlighting by prioritizing the center subject and ignoring bright background light.



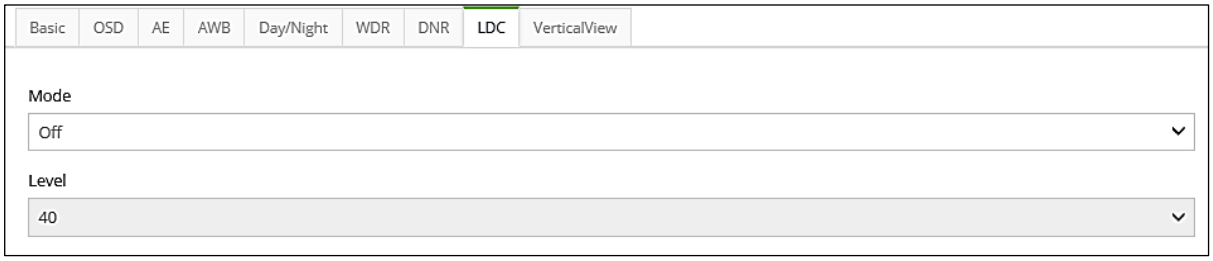
Mode: Selects the BLC mode to apply.
Level: Adjusts the BLC level to optimize subject brightness.
HLC: Reduces the impact of intense light sources, such as headlights or spotlights.
Mode: Selects the HLC mode to apply.
Level: Adjust the HLC level to balance bright and dark areas.

(Image) DNR: Reduces image noise to improve overall picture quality.



2D-NR / 3D-NR: The noise reduction (NR) reduces image noise to enhance video quality. The 2D-NR function removes noise within a single frame by analyzing pixel correlation, while the 3D-NR function minimizes noise across multiple frames by utilizing frame memory and analyzing inter-frame correlations.
Mode: The default setting is off.
Level: Select a noise reduction level from Level 1, Level 2, Level 3, or Level 4.

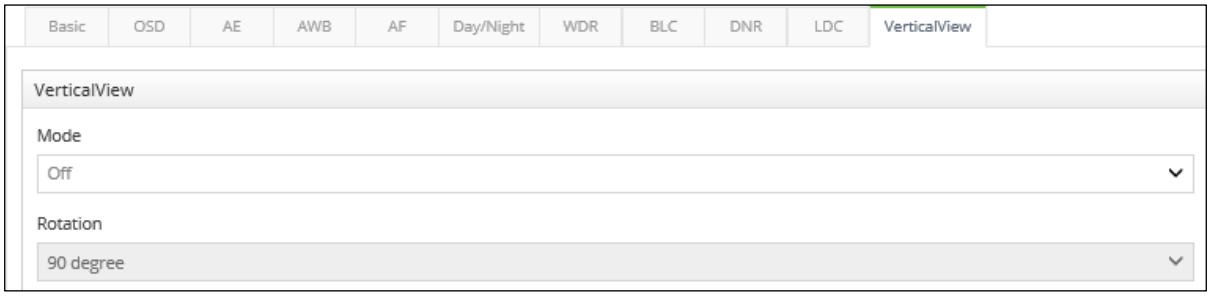
(Image) LDC (Lens Distortion Correction): Corrects distortions caused by wide-angle lenses to produce a more natural image. Simple-LDC corrects vertical distortions only; vertical lines are straightened, but horizontal lines may remain curved.



Mode: The default setting is off.
Level: Select one of the available correction levels.

*** Note: The functionality of LDC depends on the camera model.**

(Image) Vertical View: The Vertical View format provides a vertically oriented video stream optimized for monitoring narrow areas such as corridors, hallways, or aisles. This feature maximizes image usability while minimizing bandwidth and storage usage. For network cameras with a native 16:9 aspect ratio, the Corridor Format adjusts the video to a 9:16 aspect ratio for better coverage in vertical spaces.



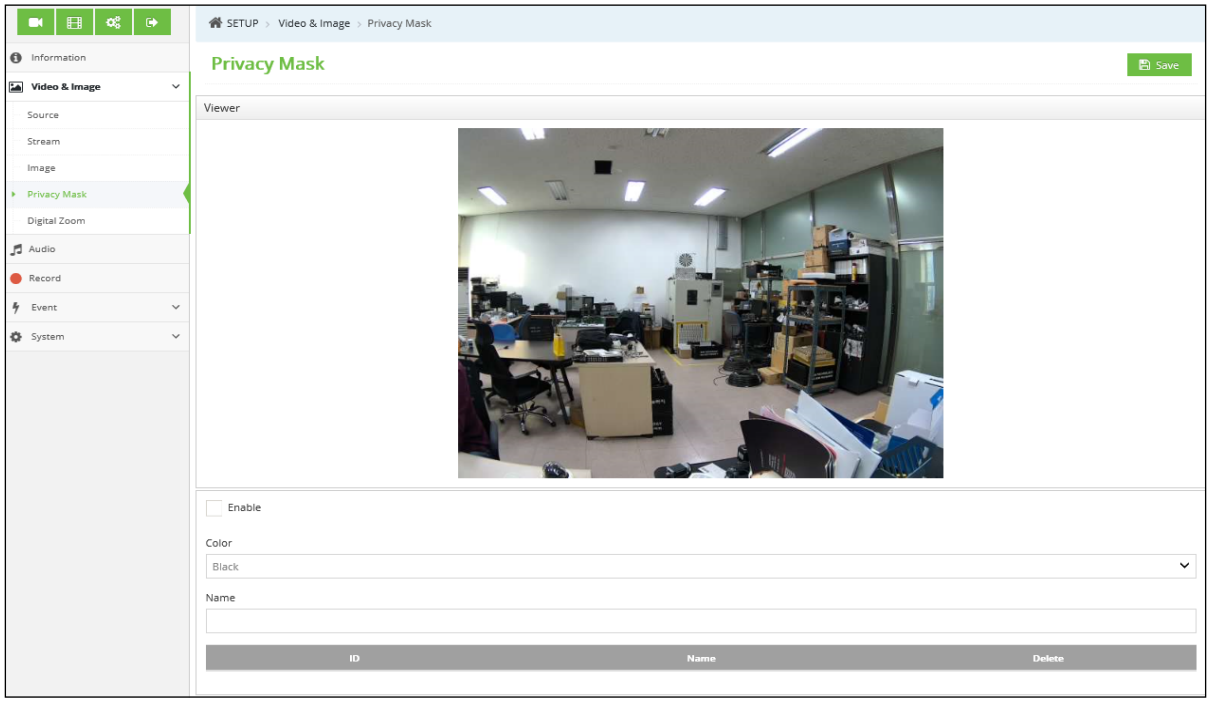
Mode: The default setting is off.
Rotation: Configure the image rotation angle as needed.

*** Note: The functionality of Vertical View depends on the camera model.**

Privacy Mask

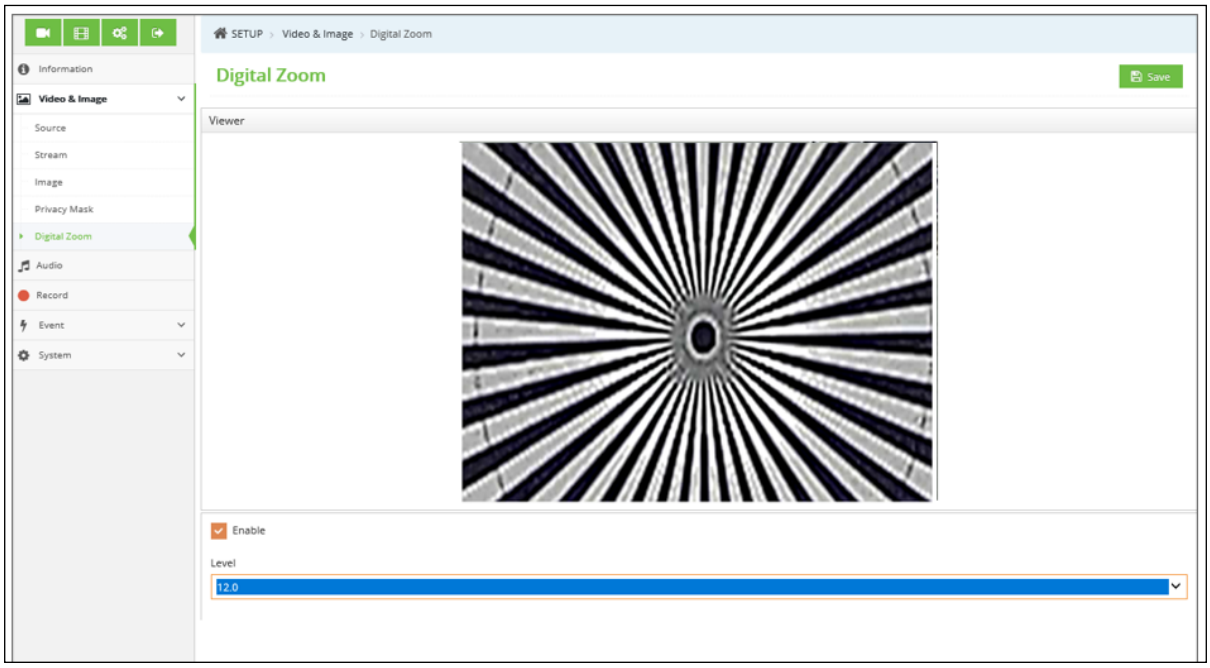
A privacy mask is a solid-colored area that blocks visibility of specific regions in the camera's field of view. This function is used to protect sensitive zones within the monitoring area. The Privacy Mask List displays all configured masks and indicates whether each mask is currently enabled.
Users can add new masks, resize them using the mouse, and assign names. The mask color is automatically applied after saving. To set the privacy mask,

1. Check the Enable box to activate the privacy mask function.
2. Right-click on the screen and define the desired area.
3. Enter a mask name and click Save.
4. To delete a mask area from the list, click the X icon

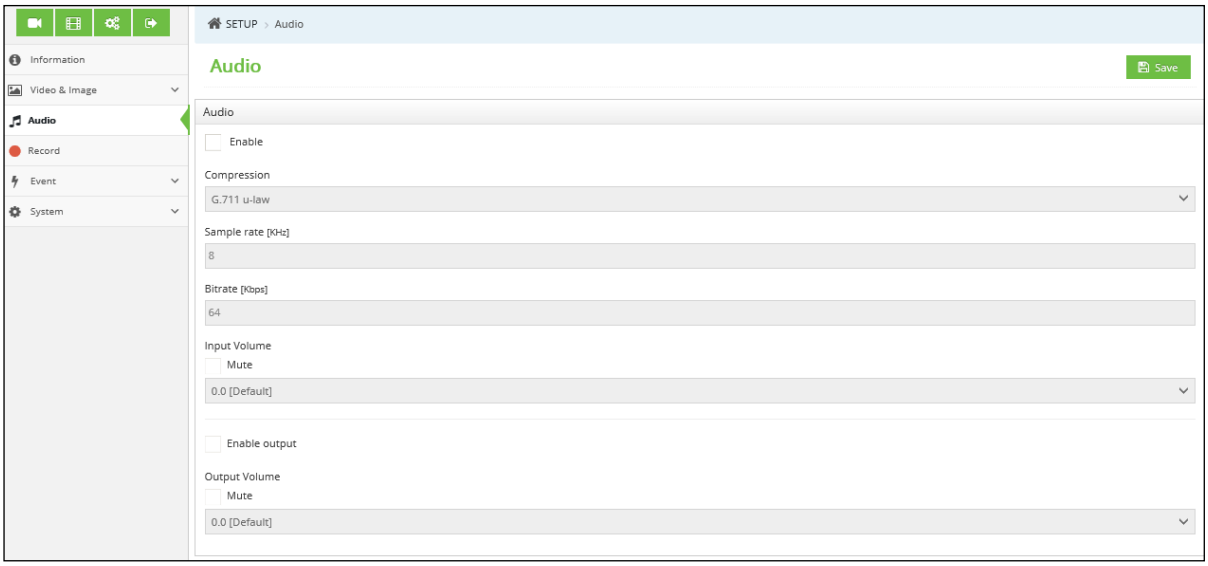


Digital Zoom

Click the Enable checkbox to activate digital zoom. The digital zoom ratio can be set from x1 to x12. To apply the desired zoom level, click the Save to finalize the setting.



[Audio]



Audio: Enables audio by clicking the enable audio checkbox. This page provides instructions for configuring the camera's basic audio settings. The camera supports full-duplex audio, allowing simultaneous transmission and reception of audio in both directions.

Compression: G.711 is the international standard for encoding wired-telephone audio on a 64kBit/s channel. It uses PCM (Pulse Code Modulation) with an 8 kHz sample rate. The default setting is G.711 μ-law.

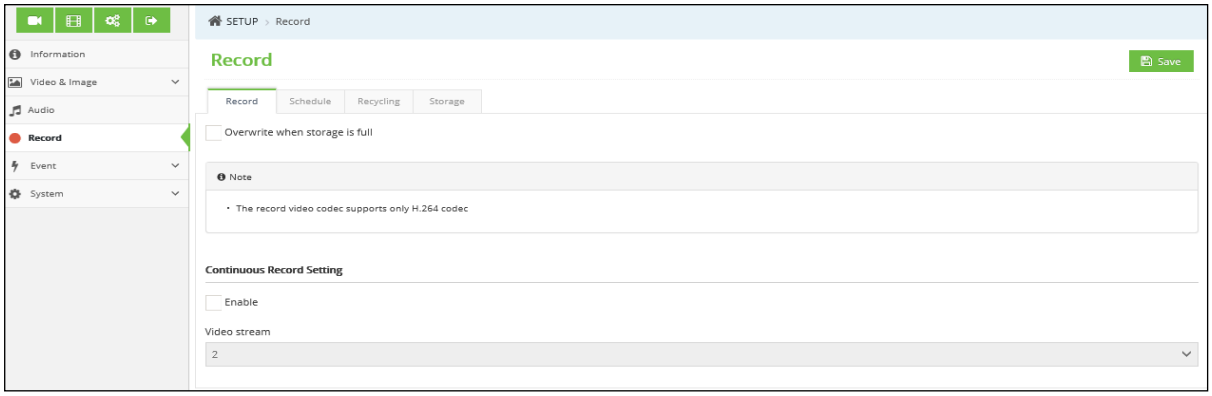
Sample rate: Indicates the number of times per second the sound is sampled. The default setting is 8 kHz.

*** Note: G.711, also known as Pulse Code Modulation (PCM), is a widely used waveform codec. It uses a sampling rate of 8,000 samples per second, with a tolerance of 50 parts per million (ppm). Non-uniform (logarithmic) quantization with 8 bits is used to represent each sample, resulting in a 64 kbit/s bit rate. There are two variants; μ-law, mainly used in North America, and A-law, used in most other regions.**
G.711 μ-law provides higher resolution for stronger signals, while A-law offers more quantization levels for lower signal levels.

Input volume: Indicates the input gain level, adjustable from -12.00 to 12.00 dB, with a default setting of 0 dB. The input can be muted by selecting the Mute checkbox.

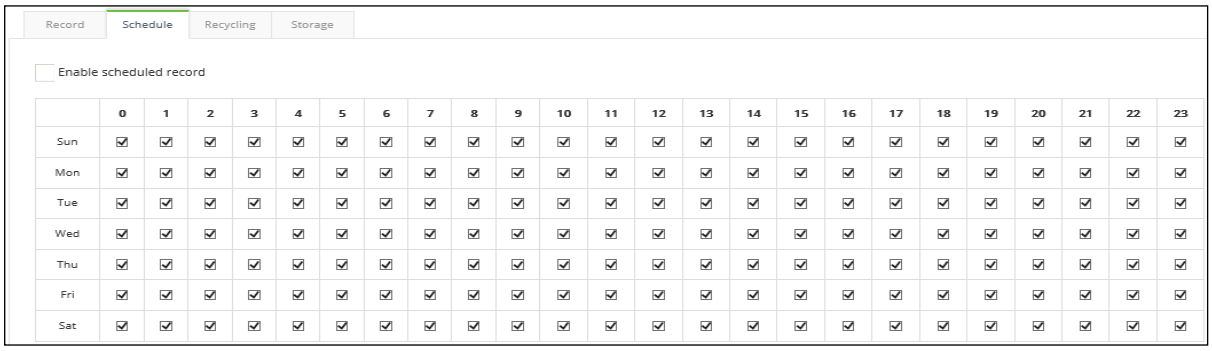
Output volume: Indicates the output gain level, adjustable from -24 dB to 9dB, with a default setting of 0 dB. The output can be muted by selecting the Mute checkbox.

[Record]



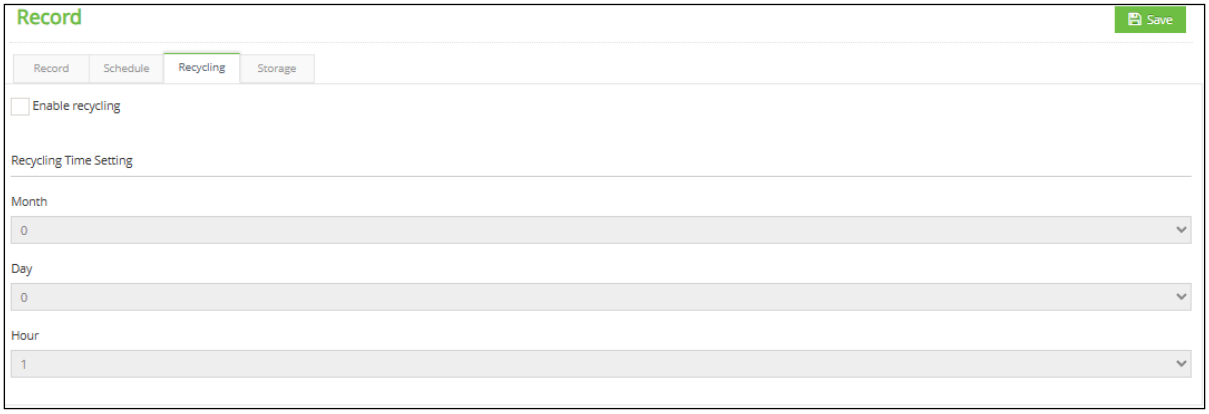
Record: When the network camera detects an event, it records the video stream to an SD Memory card (not supplied). The service is enabled by checking the box.

Continuous Recording Setting: To enable continuous recording, check the box and select the stream to be recorded.



Schedule: To enable scheduled recording, check the box and configure the setting based on time and day.

- **Hour**: Sets the time range for recording.
- **Day**: Selects the days for recording.



Recycling: The Recycling tab allows configuration of automatic deletion of old recorded video files to manage storage space efficiently.

Enable Recycling: Check this box to activate automatic deletion of old recordings at specified intervals, freeing storage space.

Recycling Time Setting: Configures how frequently the system deletes (recycles) recorded data. The recycling interval is determined by a combination of the following parameters:

- **Month**: Sets the number of months to retain recordings before deletion.
- **Day**: Sets the number of days to retain recordings before deletion.
- **Hour**: Sets the number of hours to retain recording before deletion.

*** Note: Enabling recycling without setting appropriate intervals may result in unintended loss of important video footage. Retention setting should be reviewed carefully before enabling this feature.**

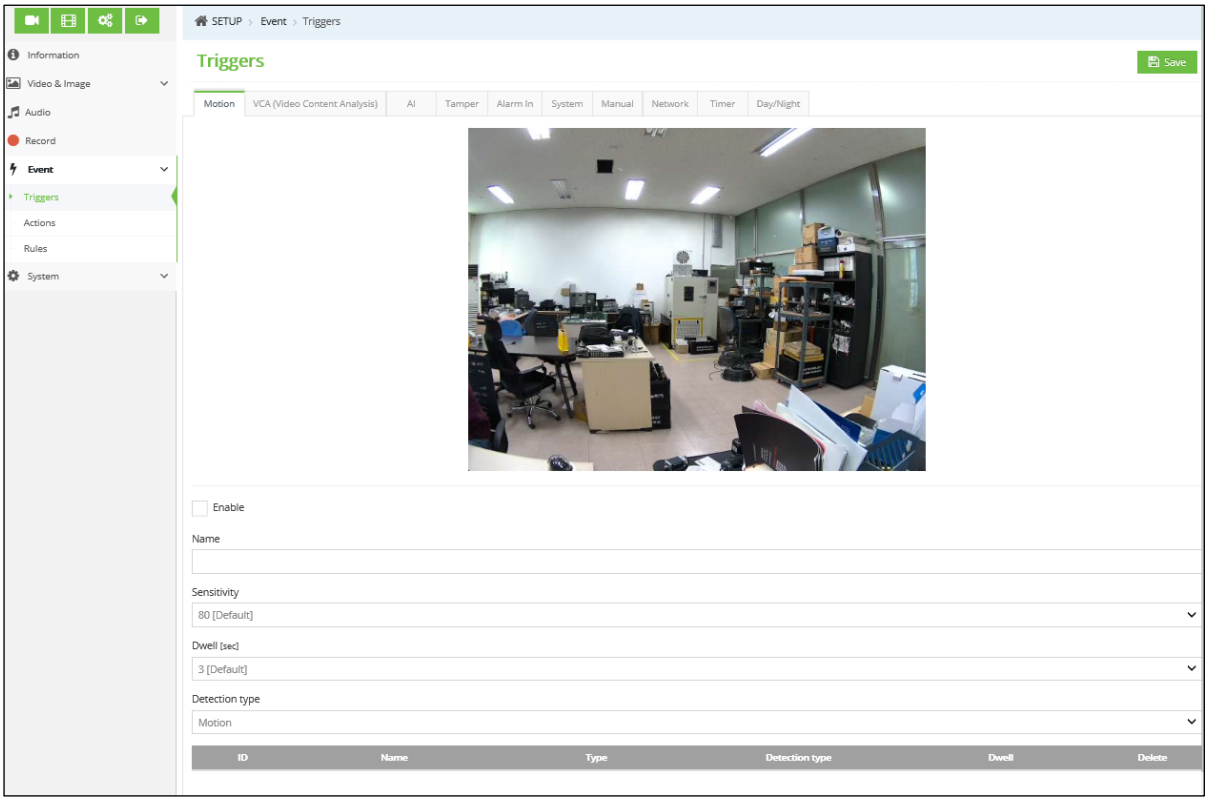
Storage: Supports an SD card as a recording device.
- **Format**: Click the Format button to format the SD card.
- **Remove**: Safely remove or eject the storage device.

Storage Information: Displays the current status of the SD card.

[Event]

Triggers

(Triggers) Motion: Motion detection generates an alarm whenever movement occurs (or stops) in the field of view. A total of up to 8 Motion or Mask areas can be created and configured.

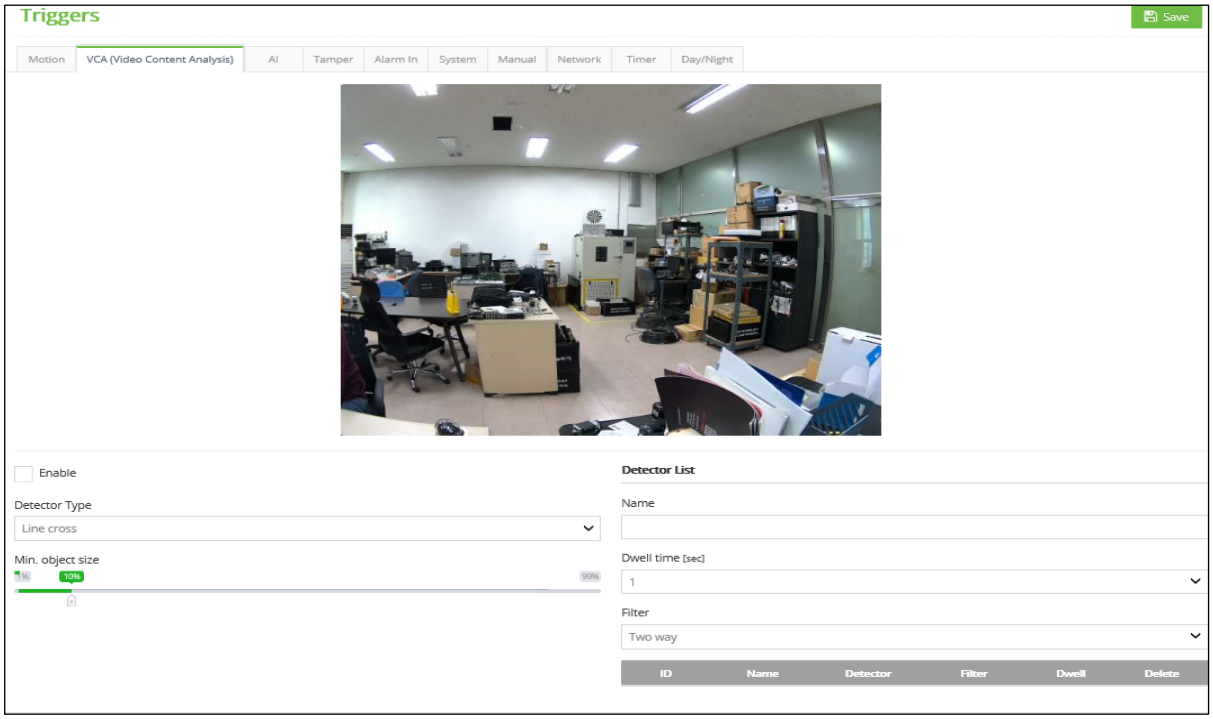


Name: Specifies the name of the motion or mask area.
Sensitivity: Adjusts the sensitivity level for motion detection.
Dwell time: Configures the duration that the motion or mask signal remains active as a trigger input source.

Once motion detection areas are configured, this camera can perform designated actions when motion is detected. Possible actions include uploading data, triggering alarm output, and sending email notifications.
To create a motion or mask area:
1. Right-click to open the menu.
2. Select Create detection area or Create masking area.
3. Click and drag the mouse to define area.
   • Create detection area — Defines the area where motion should be detected.
   • Create masking area — Defines the area where motion should be ignored.

To delete a motion or mask area, click the Delete button.

(Triggers) VCA (Video Content Analysis): The VCA trigger function enables intelligent event detection based on the movement and behavior of objects within the camera's field of view.

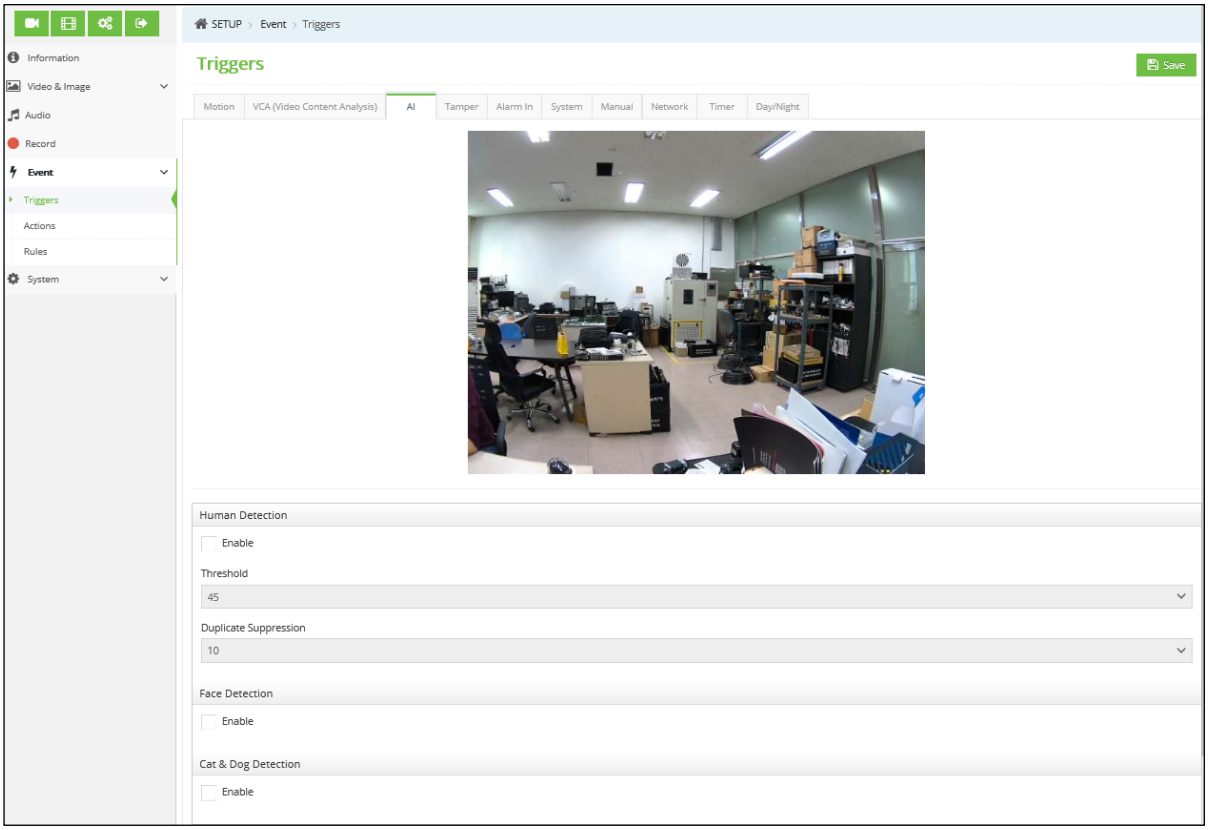


Enable: Enables VCA event detection based on the selected detector type and configuration.
Detector Type
- **Line cross**: Triggers an event when an object crosses a predefined virtual line in the video feed.

Minimum Object Size: Sets the minimum object size (0%-99%) for detection using the slider. This helps filter out small objects and reduce false alarms.

Detector List Settings:
Name: Assigns a custom name to each detector rule for identification.
Dwell Time [sec]: Sets the time (in seconds) that an object must remain in the detection area to trigger an event.
Filter: Selects the detection direction
- Two way: Detects movement in both directions across the detection line.
- CW (Clockwise): Detects objects crossing the line in the clockwise direction, based on the orientation of the detection line
- CCW (Counter-Clockwise): Detects objects crossing the line in the counter-clockwise direction.

(Triggers) AI: The Triggers menu allows configuration of AI-based detection features to enhance surveillance accuracy and reduce false alarms. These features use intelligent video analytics to detect specific objects or events within the camera's field of view.



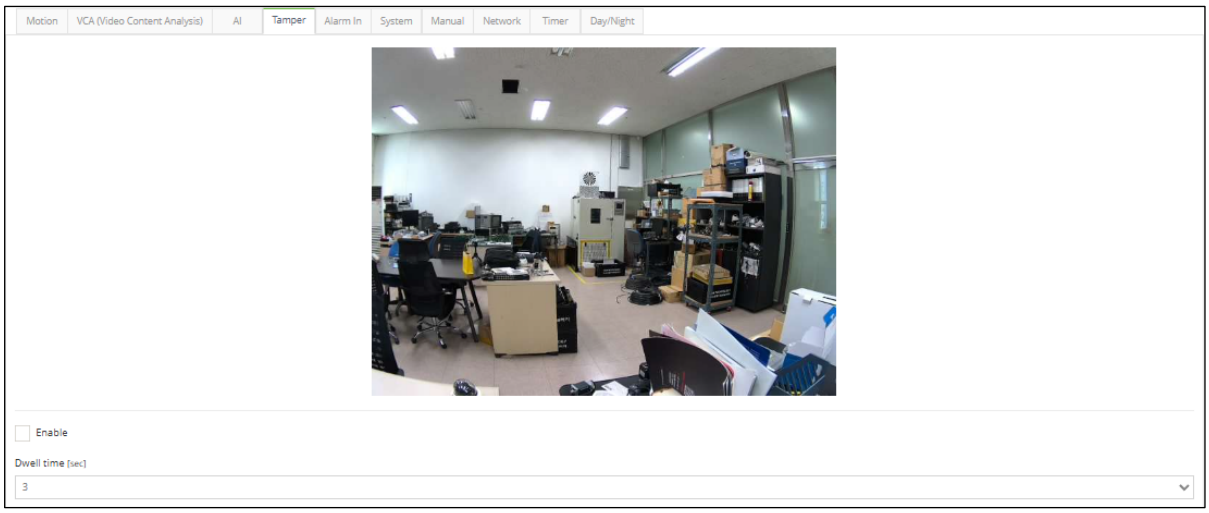
Human Detection: Enables the AI-based detection for human presence within the camera view.

- **Threshold**: Adjusts the detection sensitivity. A lower value increases sensitivity, allowing detection of smaller or partially visible persons. A higher value reduces sensitivity to minimize false positives.
- **Duplicate Suppression**: Sets the interval (in seconds) to suppress duplicate detections of the same person. This prevents repeated alerts for individuals remaining in the frame.

Face Detection: Enables detection of human faces. When activated, the camera attempts to locate and focus on faces within the monitored area.

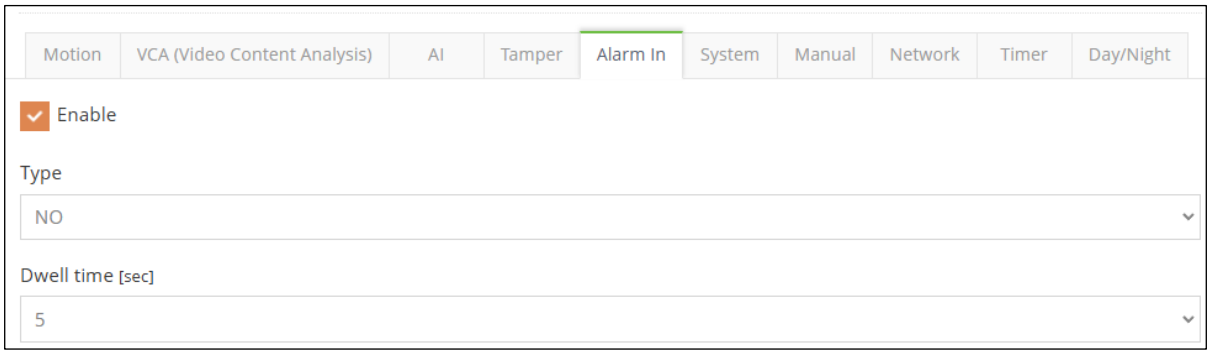
Cat & Dog Detection: Enables AI detection trained to identify cats and dogs. This helps reduce unnecessary alerts in environments where animals need to be distinguished from human intruders.

(Triggers) Tamper: Detects if the camera's view is obstructed, rotated, or tampered with. When such an event occurs, a warning is immediately sent to the administrator.



Dwell time: Configure the duration the tampering event must persist to trigger an alarm.

(Triggers) Alarm In: Enables the alarm input function when the Enable checkbox is selected.



Type: Specifies the input signal type. The default setting is NO.

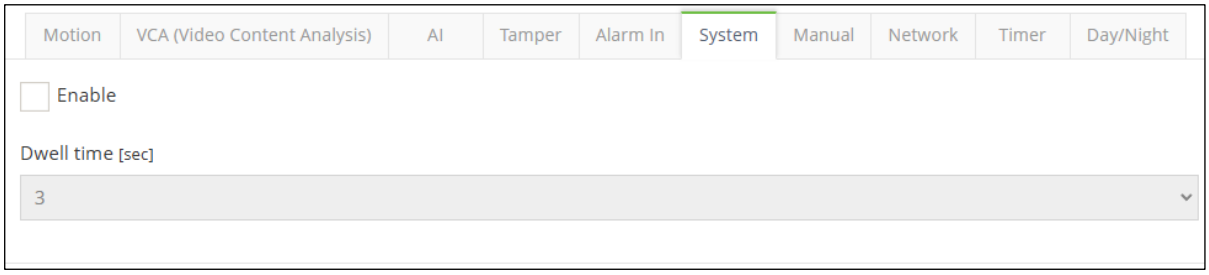
- **NO (Normal Open):** The input remains inactive while the circuit is open.
- **NC (Normal Close):** The input remains active when the circuit is closed. When the circuit is interrupted, the input changes state.

An input on the camera is considered open circuit when disconnected or when voltage is present.

Dwell time: Configure the duration the alarm input signal must persist to act as a valid input signal.

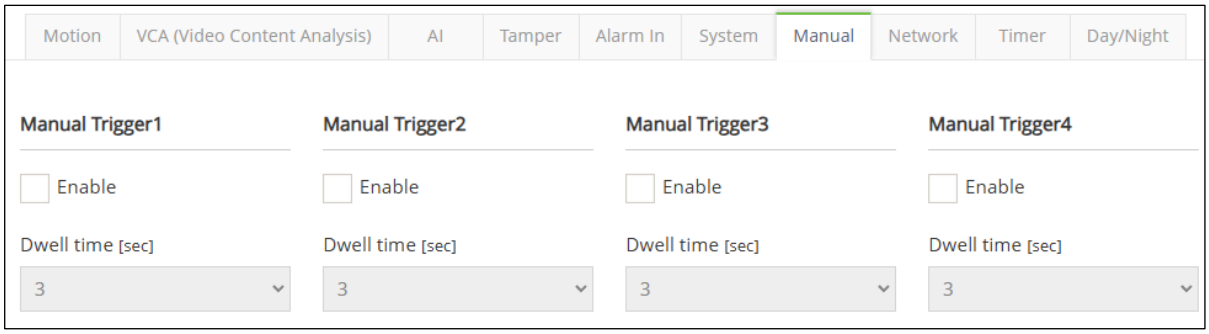
*** Note: The total number of alarm in input is depends on camera model**

(Triggers) System: Triggers an event each time the Network Camera is starts.



Dwell time: The default setting is 3 seconds.

(Triggers) Manual: The Manual Trigger activates alarm output signaling, transfers a JPEG file to the FTP server, and sends email to SMTP server whenever operator clicks Manual Trigger button in the Live View window.



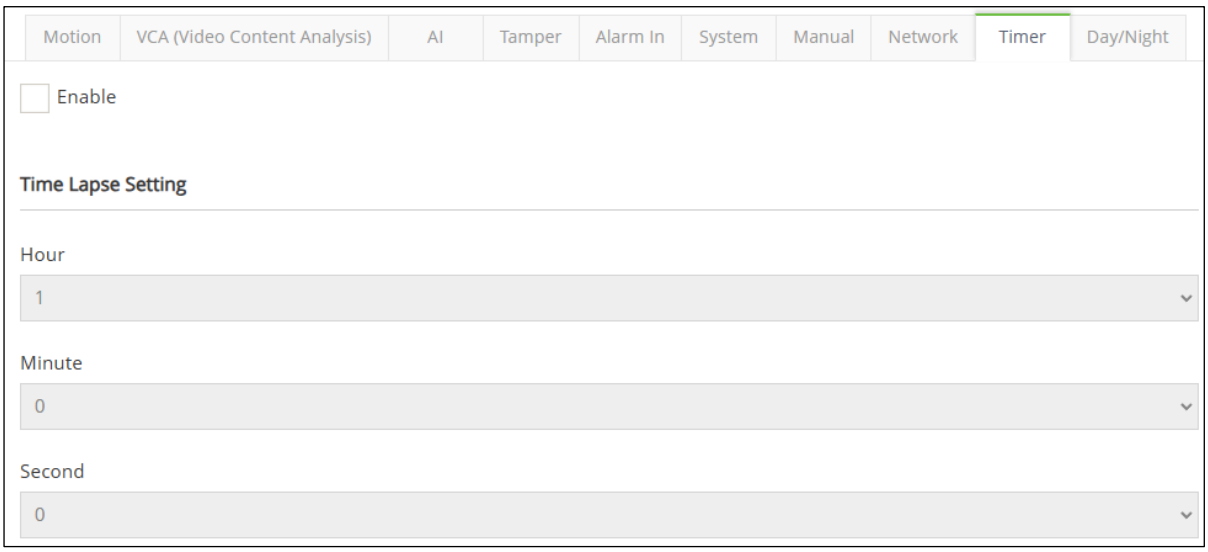
Dwell time: The default setting is 3 seconds.

*** Note: Dwell time refers to the duration the alarm output remains active as an output signaling source.**

(Triggers) Network: Triggers and event each time the network connection fails. Check the box to activate the Network Loss event.

Dwell time: The default setting is 3 seconds.

(Triggers) Timer: Triggers an event according to the configured time settings. Check the box to activate the Time Lapse Setting.



Time Lapse Setting: The default setting is 3 seconds.

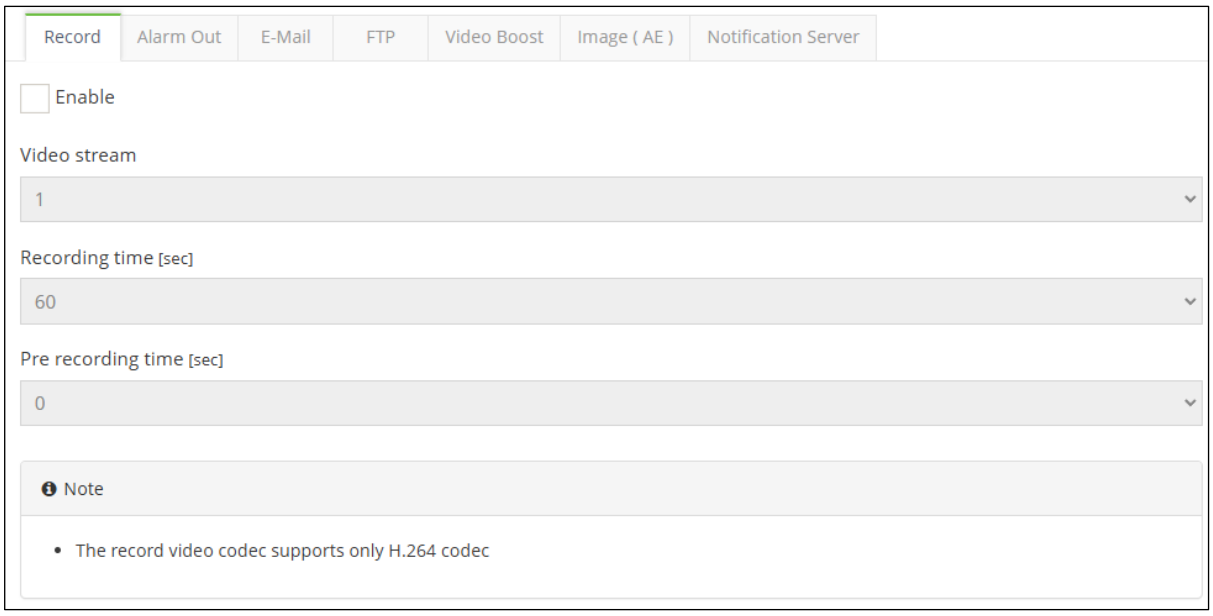
- **Hour:** Set the event trigger every hour.
- **Minute:** Set the event trigger every minute.
- **Second:** Set the event trigger every second.

(Triggers) Day/Night: Triggers an event each time the camera switches between Day and Night mode. Check the box to activate the Day/Night event trigger.

Dwell time: The default setting is 3 seconds.

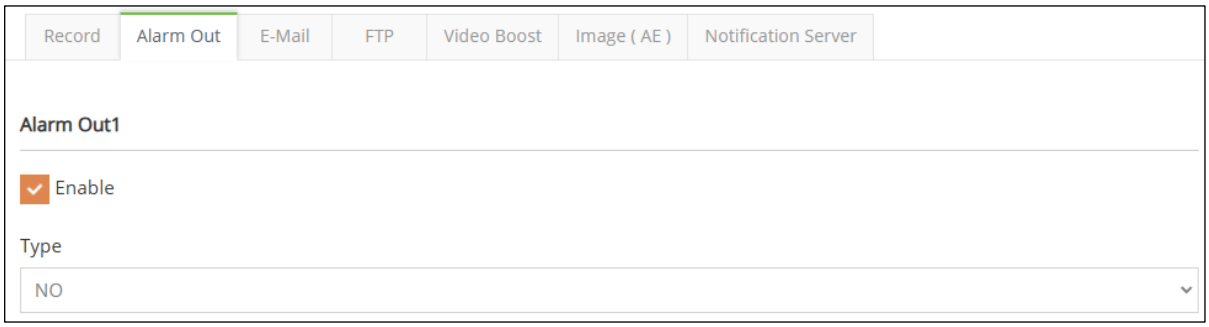
Actions

(Actions) Record: When the network camera detects an event, it can record the video stream to the SD memory card (not supplied). Check the box to enable this feature.



Video stream: Select the video stream to be recorded when an event is triggered.
Recording: Set the recording duration.
Pre-event recording: Set the time to record before the event occurs.

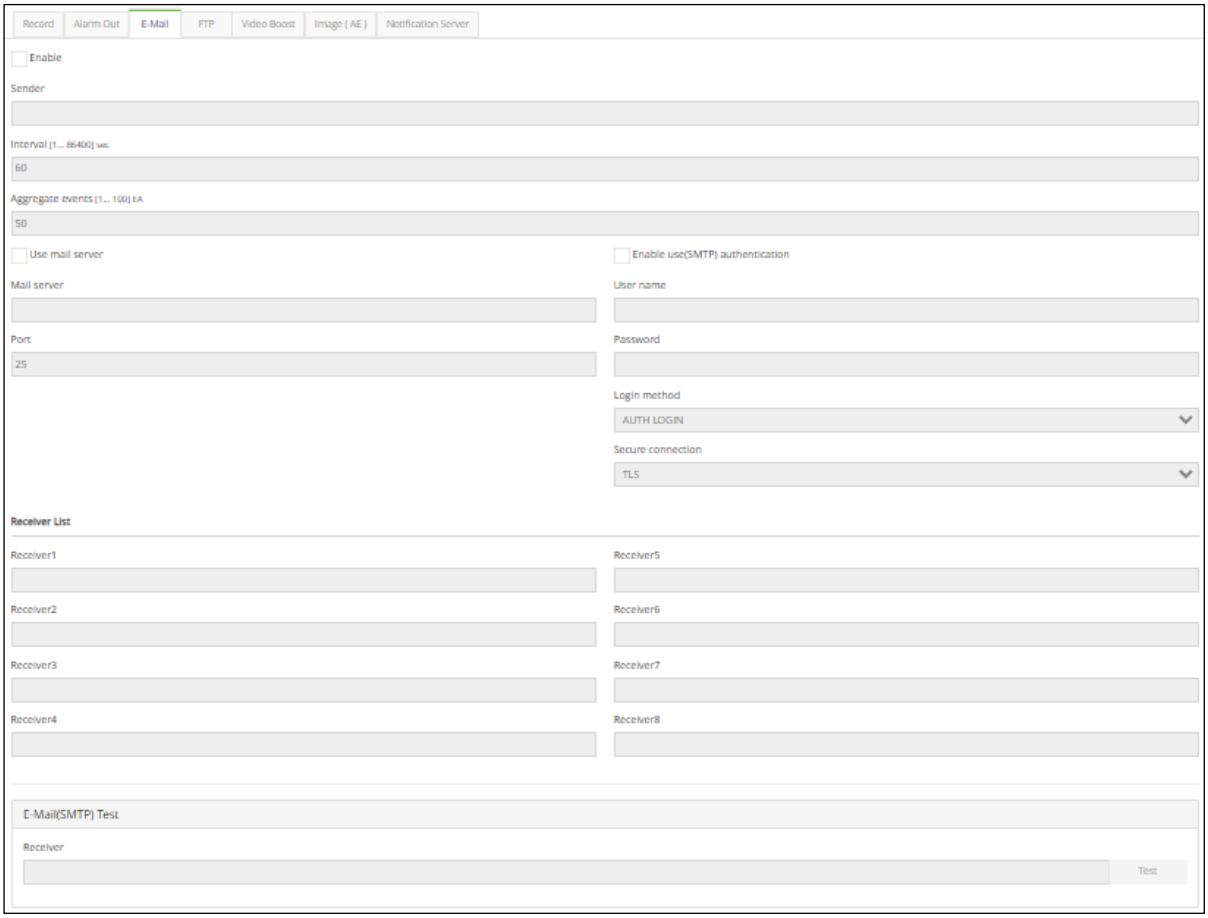
(Actions) Alarm Out: Configure the alarm output supported by the camera. The alarm fort can be set to Normally Open (NO) or Normally Close (NC) state.



Type: The default setting is NO.

*** Note: The total number of alarm output ports depends on the camera model.**

(Actions) E-Mail: Use the Simple Mail Transfer Protocol (SMTP) server to send an email notification when an event is triggered. The camera can be configured to send event alert and messages via SMTP.



Sender: Enter the E-mail address to be used as the sender.
Interval: Set the interval (in seconds) between email notifications after an even occurs.
Aggregate events: Specify the number of events required before an email is sent. Once the count is reached, an email will be triggered.
Use mail server: Check this box to enable sending via a specific mail server and configure the following settings:

- **Mail Server:** Enter the hostname or IP address of the mail server.
- **Port:** Enter the SMTP server port number. Valid range: 1-65535. The default is 25.

*** Note:**
- If a hostname is used, a valid DNS server must be configured in Network > Basic settings.
- If your mail server requires authentication, check the Use (SMTP) authentication checkbox to enable login authentication. Please consult with your network administrator, if you want to change the port number.

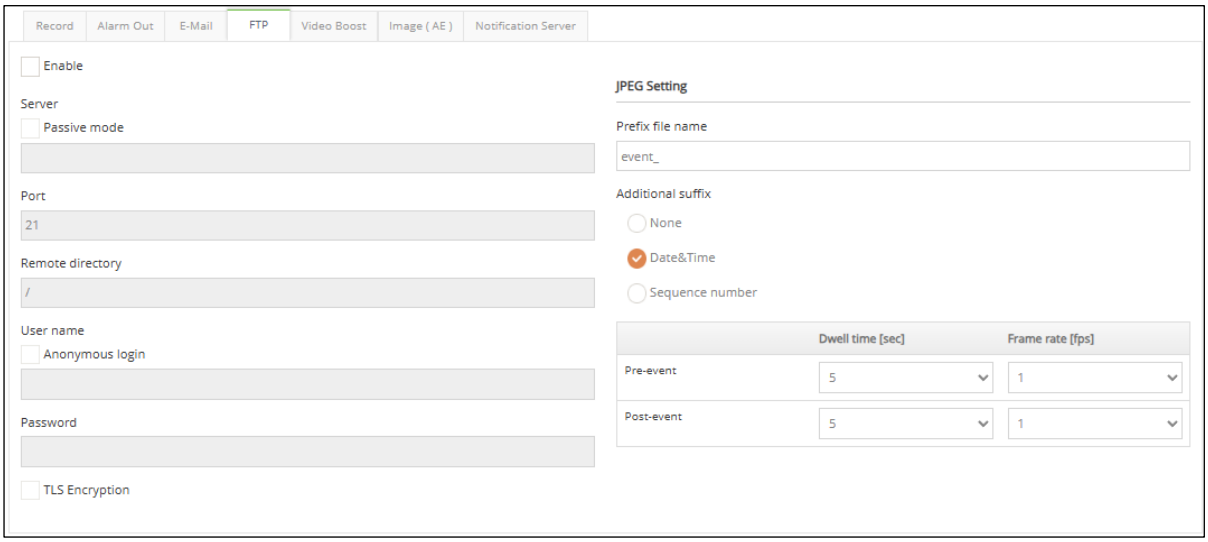
Enable use (SMTP) authentication: Check this box if your email server requires authentication.

- **User name:** Enter the User name as provided by the network administrator.
- **Password:** Enter the Password provided by the network administrator.
- **Login method:** Select the SMTP authentication method supported by the server.

*** Note: If the SMTP server uses the PLAIN or LOGIN authentication mechanism, the camera will send the username and password to the server.**
The LOGIN mechanism is supported by Microsoft and some other clients. Most other clients support the PLAIN mechanism. Because these methods transmit credentials in plain text, it is recommended to use STARTTLS to encrypt the connection between the camera and the SMTP server for secure communication.

Receiver List: Enter the recipient's email addresses in the Receiver List field.
Receiver 1~8: Enter up to 8 email addresses to receive notification.
Email (SMTP) Test: To verify the email server connection and recipient address, enter the email address and click the Test button. If the setup is correct, a test email will be sent successfully.
- **Receiver:** Enter the recipient's email address to test email delivery.

(Actions) FTP: This feature enables the camera to upload files to a specified FTP server when an event is triggered. Enable FTP by selecting the Enable FTP checkbox and confiture the settings.



Server: Enter the IP address or host name of the target FTP server.
- **Passive Mode:** Under normal conditions, the network camera requests the FTP server to open a data connection. When this option is selected, the camera sends a PASV command to the FTP server, initiating a passive FTP connection. In passive mode, the camera establishes both the control and data connections to the FTP server. This configuration is typically recommended when a firewall exists between the camera and the FTP server.

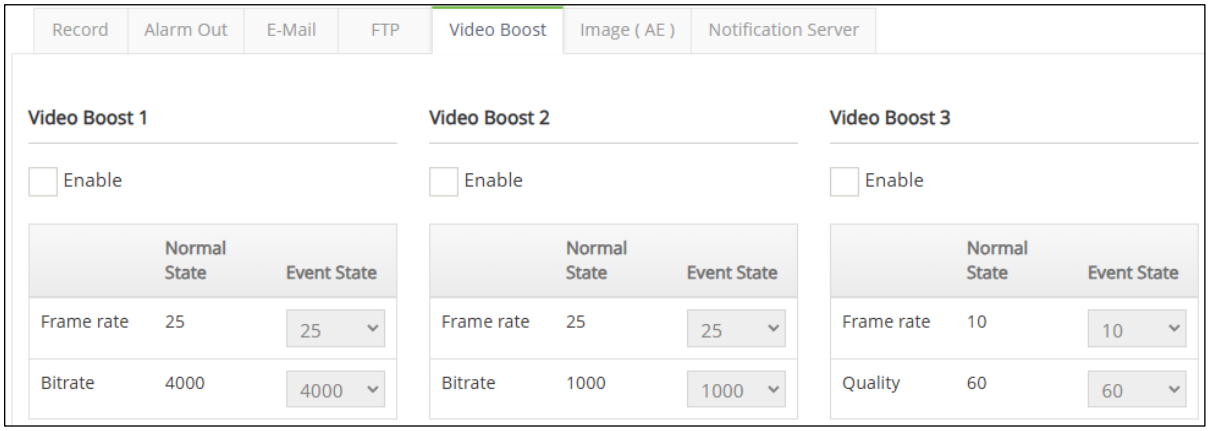
Port: Enter the port number used by the FTP server. The Port number can be set in the range of 1 to 65535. The default setting is 21.
Remote directory: Specify the path to the directory where uploaded images will be stored. If the directory does not exist on the FTP server, an error message will be displayed during upload.
User name: Enter the User name provided by the network administrator.
- **Anonymous login:** Check the Anonymous login checkbox to allow access to the FTP server.

Password: Enter the Password provided by the network administrator.

*** Note: To log in to the FTP server without a password, check the "Anonymous login" checkbox.**

JPEG Setting: Configure JPEG image settings for FTP upload.
Prefix file name: Enter a name for the JPEG image file (1 to 32 alphanumeric characters).
Additional suffix: Specify additional information to append to the JPEG file name.
Pre-event: Define how many JPEG images to capture before the event, along with the dwell time and frame rate.
Post-event: Define how many JPEG images to capture after the event, along with the dwell time and frame rate.

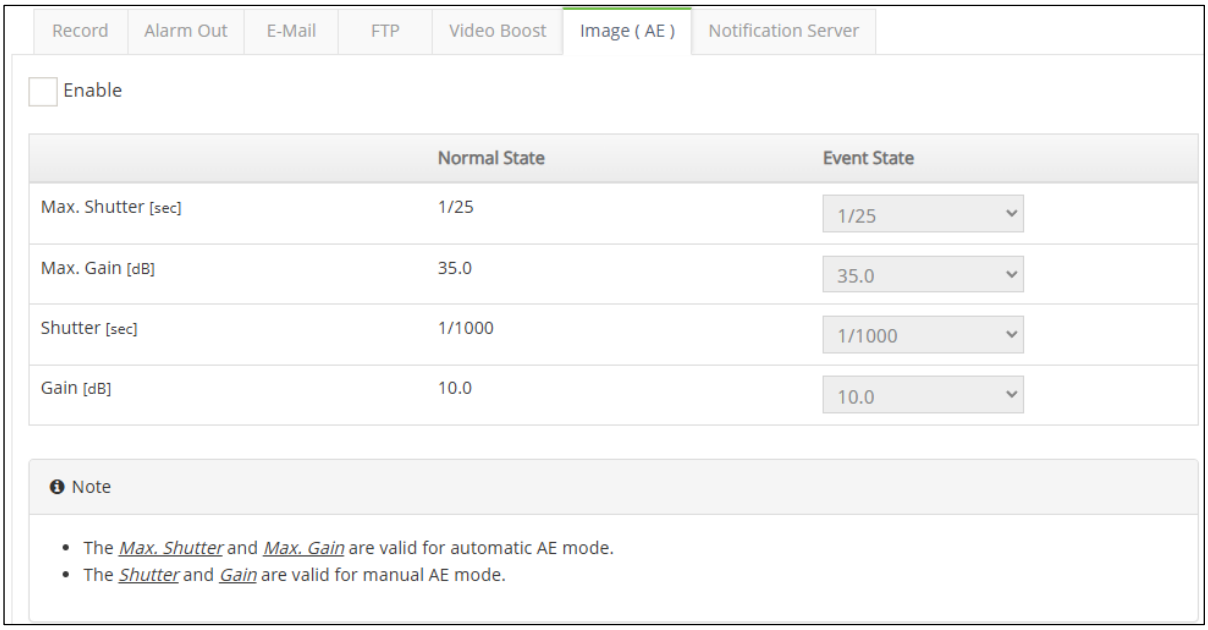
(Actions) Video Boost: Boosts the streaming performance based on the video stream configuration when an event is detected according to the event rule settings.



- **Normal State:** Displays the current frame rate and bitrate.
- **Event State:** Sets the frame rate and bitrate to be applied during video boost mode.

*** Note: The total number of video boosts depends on the camera model.**

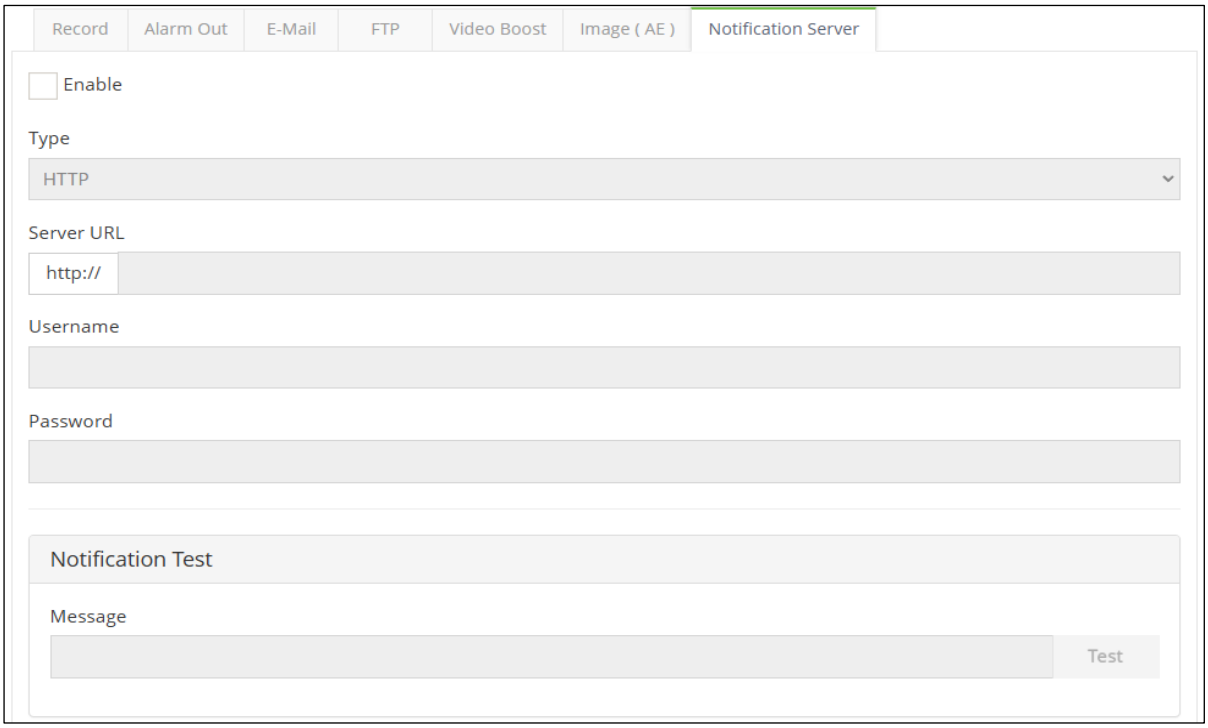
(Actions) Image (AE): Adjust the shutter and gain values when an event is detected according to the event rule settings.



- **Normal State:** Displays the normal shutter and gain values.
- **Event State:** Sets the shutter and gain values to be applied during the event.

*** Note: The Image (AE) function depends on the camera model.**

(ACTIONS) Notification Server: Sends event information to a specified server when the camera detects an event.

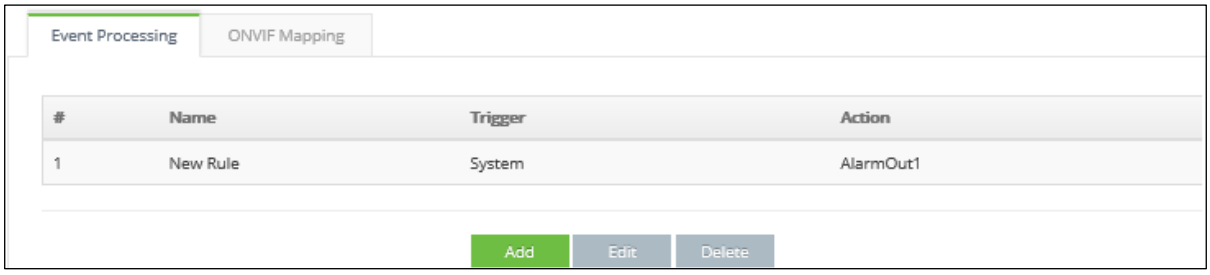


- **Type:** Select the command type.
- **Server URL:** Enter the URL of the target server.
- **Username:** Enter the server user name.
- **Password:** Enter the server password.

Notification Test: Enter a test message and click the Test button to verify server functionality.

Rules

Displays the current event configuration status. when an event is activated, common actions include uploading images to a specified destination, sending email notifications, or activating output ports.
(Rules) Event Processing: Defines how the camera responds to events based on a specified set of parameters. Events can be configured to trigger actions according to the user's requirements.

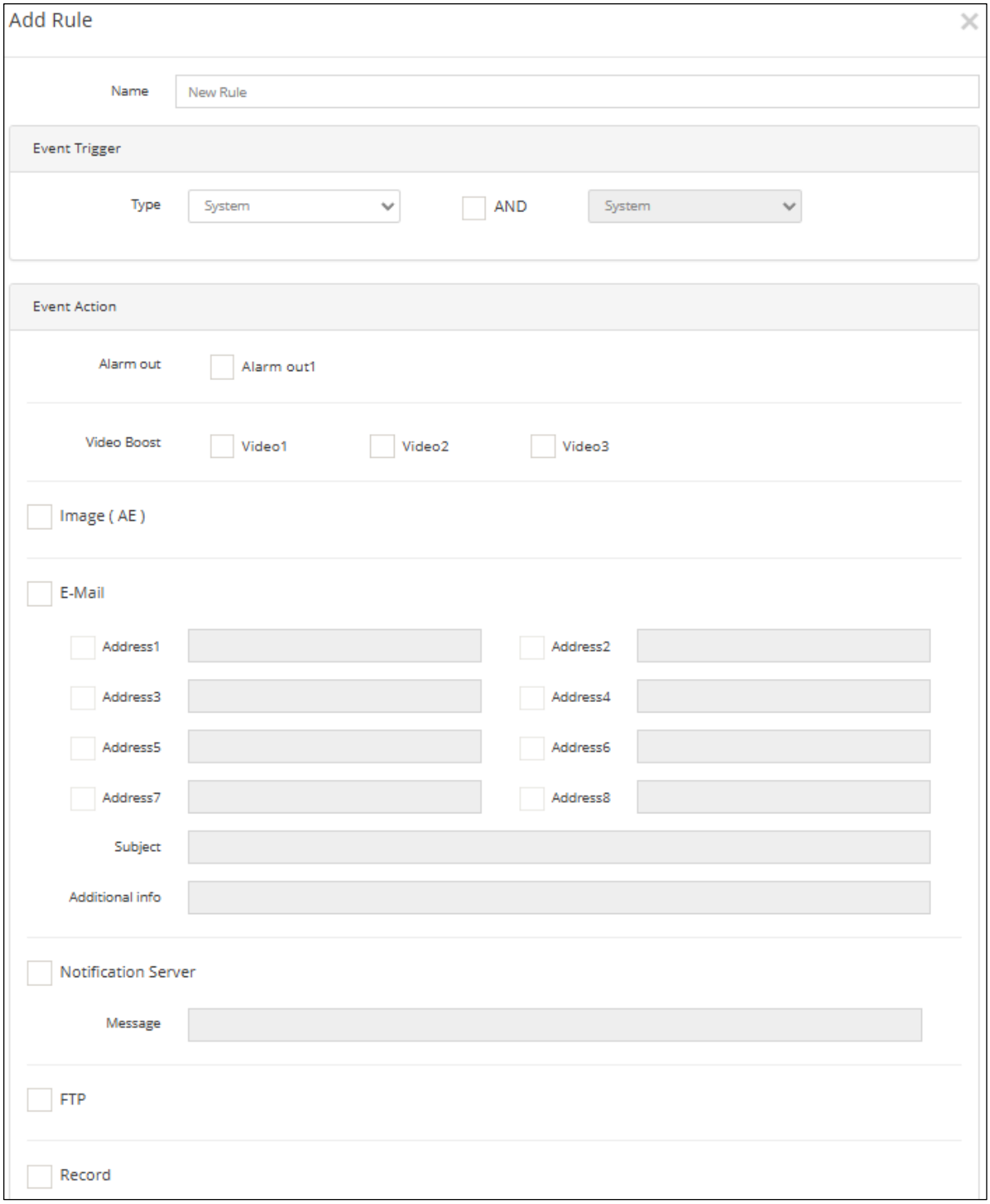


Name: Displays the user-defined name of the event rule.
Trigger: Displays the source that activates the event (e.g., Alarm-In, Manual Trigger, VMD, and etc.). configured by the user.
Action: Displays the configured output action such as SMTP, FTP, Alarm-out, Audio alert, or SD card recording (availability depends on camera model).

*** Note: To add a new event, click the Add button. This opens a dialog window, where all necessary settings for the new event map can be configured.**

Add: Add a new event map entry. Select the event and click the Add button to create it.
Edit: Modifies an existing event map entry. Select the event and click the Modify button.
Delete: Removes an existing event map entry. Select the event and click the Delete button.

Add Rule: The Add Rule page allows configuration of actions triggered by specific events, such as Alarm-In, Manual trigger, Motion Detection, etc.

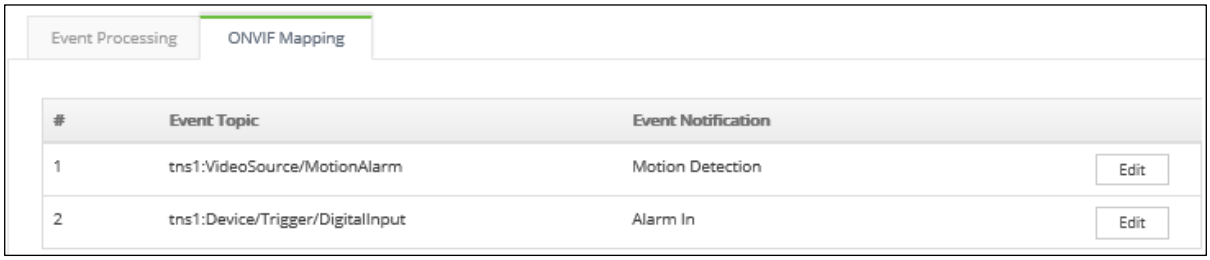


Name: Enter a name for the event (1 to 31 alphanumeric characters).
Event Trigger: Displays the type of event source to be configured.
Type: Select the event source type. To add a trigger condition for the event action, check the And box and select one or more trigger types.
Event Action: Specifies the actions the camera will perform when the event is triggered.
Alarm out: Enables the alarm output port by selecting the 'Alarm output1' checkbox.
Video Boost: Enables the Video Boost stream by checking the checkbox.
Image (AE): Enables the Shutter and Gain state change by selecting the checkbox.
E-mail: Enables email notifications by checking the Email box. To include recipients, check the box next to each email address.

*** Note: To include an additional message in the email, click the Additional info box and enter your message (0 to 255 alphanumeric characters).**

Notification Server: Enter the message to notify the server.
FTP: Enables image uploading to an FTP server by checking the FTP box. Images will be uploaded in JPEG format.

(Rules) ONVIF Mapping: An ONVIF mapping is a set of parameters that define how the camera performs certain actions according to the ONVIF standard.

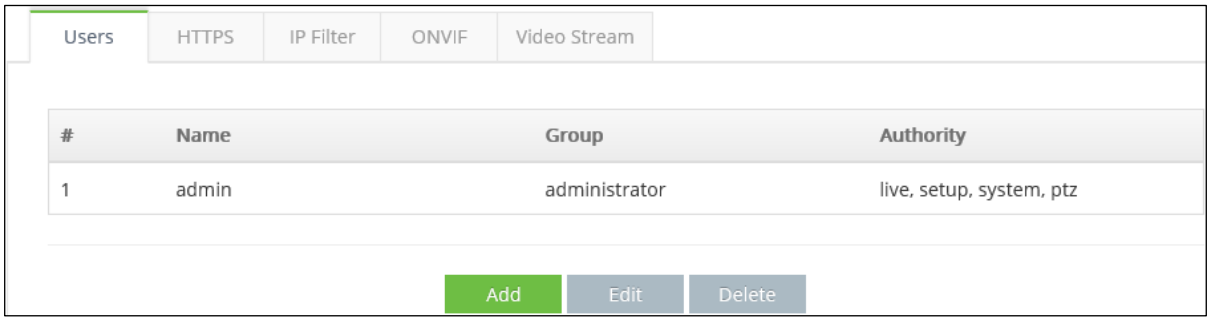


- **Event Topic:** Describes the event topic on this camera.
- **Event Notification:** Indicates the selected event type.
- **Edit:** Select one of the available event notification types to configure.

[System]

Security

(Security) Users: Manage user accounts by adding, editing, or removing users. Access permissions depend on the user group, and the authority level is displayed automatically for each user.



Name: Displays registered user name.
Group: Displays the assigned permission group.
Authority: Displays the permission level for accessing camera menus.
• Use the Add, Edit, or Delete buttons to manage user accounts.

Add User
1. Click the Add button. A new pop-up window appears.
2. Enter the user name (1 to 14 alphanumeric characters).
   • User names are not case-sensitive.
3. Enter the Password (1 to 8 alphanumeric characters).
   • Passwords are case-sensitive.
4. Re-enter the password in the Confirm Password field.
5. Select a user group to assign appropriate permissions.
6. Click OK button to save and create the user.

Edit User
1. Select a user from the User List.
2. Click the Edit button. A pop-up window appears.
3. Enter the new password (1 to 8 alphanumeric characters).
   • Passwords are case-sensitive.
4. Re-enter the password in the Confirm Password field.
5. Select a new group from the Group list if needed.
6. Click OK button to save the changes.

To delete a user:
1. Select a user from the User List.
2. Click the Delete button. A confirmation dialog appears.
3. Click OK button to remove the user from the User List.

(Security) HTTPS
Connection mode: Select the desired connection mode. The default is HTTP & HTTPS.

- **HTTP**: Transmits sensitive data without encryption. Only URLs starting with with http:// are supported.
- **HTTPS**: Uses HTTPS (Hypertext Transfer Protocol over SSL) to transmit encrypted data. Only URLs starting with https:// are supported
- **HTTP & HTTPS**: Supports both protocols simultaneously. Accessing the camera via a standard http:// URL does not encrypt sensitive data. To ensure encryption, use a https:// URL.

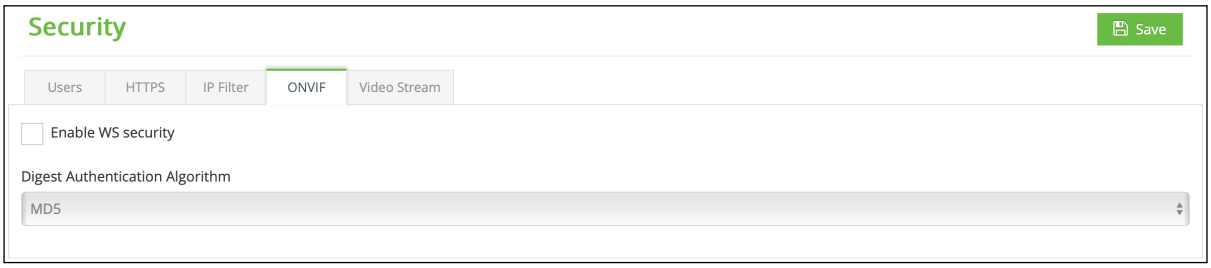
*** Note:**
- To ensure security on the internet, all major web browsers provide configurable security levels for SSL-enabled site. SSL (Secure Socket Layer) encrypts communications, preventing unauthorized access to user credentials such as usernames and passwords.
- SSL requires a signed certificates to authenticate web browser access to the camera. This camera can generate a self-signed certificate using OpenSSL.
- If the HTTP connection policy is set to HTTP, access vis https:// will not be possible.
- Self-signed certificates generated by the camera are valid for 10 years.

(Security) IP Filter: Provides IP filtering configuration options, including enable/disable toggle, priority, policy, and IP address range settings. The default setting is Disabled.

Enable IP address filtering: Check this box to enable IP address filtering. This allows the addition of IP addresses or subnets to be allowed or denied.
Enable (On/Off): Activate or deactivate each IP filtering rule.
Priority: Determines the order of precedence if multiple filtering rules overlap.
Policy: Defines whether the listed IP range is to be Allowed or Denied.
Start IP: Enter the start IP address to ALLOW/ DENY in the selected IP range.
End IP: Enter the end IP address to ALLOW/ DENY in the selected IP range.

*** Note:**
- To add a subnet, use CIDR (Classless Inter-Domain Routing) notation. For example: 192.168.1.0/24 adds IP addresses from 192.168.1.1 to 192.168.1.254. For more detail, contact the network administrator.
- If accessing the camera through a proxy server, the proxy server's IP address must be added to allowed list.

(Security) ONVIF: This camera supports an authentication via the Web Services Security protocol, allowing connection to ONVIF-compatible devices using a user ID and password.

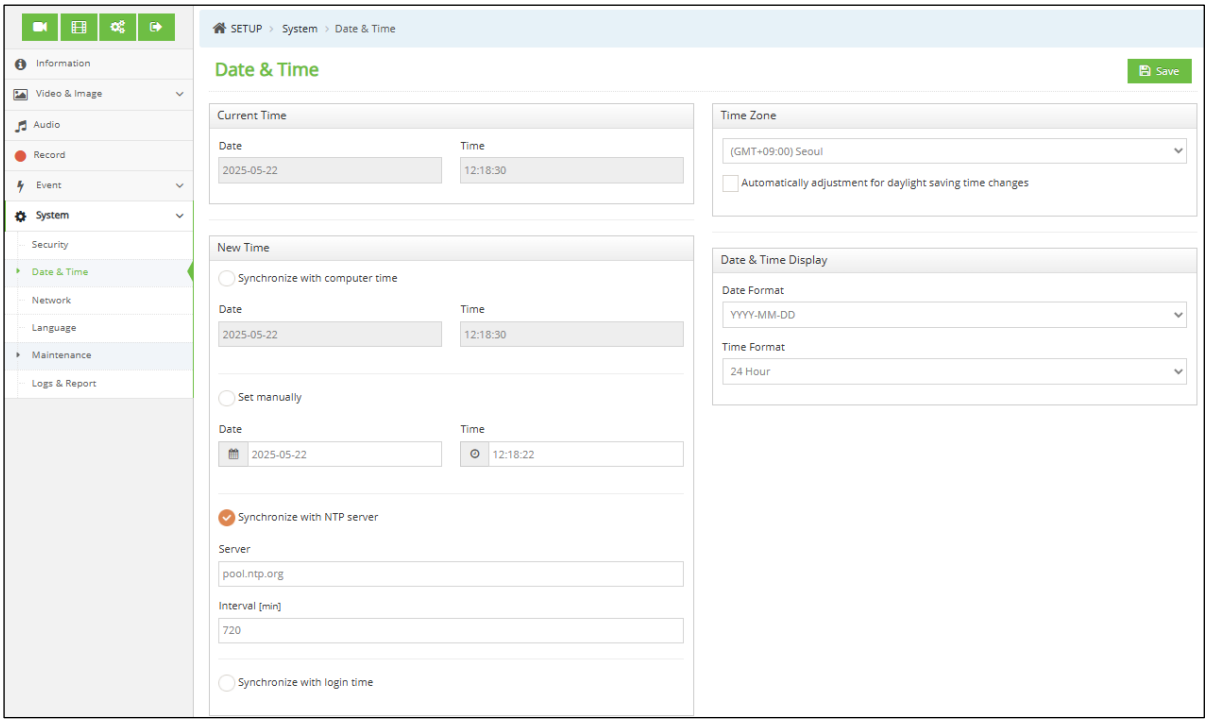


Enable WS security: When enabled, this feature applies a standard command set to ensure message integrity and confidentiality during ONVIF communication.
By default, this option is disabled, meaning the camera attempts to connect to other ONVIF devices without requiring authentication.

(Security) Video Stream: This camera supports secure video streaming by enforcing user authentication when accessing video via the RTSP protocol.

Enable RTSP Authorization: Enable this setting to require a valid user ID and password for RTSP video streaming. When activated, external systems such as VMS (Video Management Software) or other RTSP clients mush authenticate before accessing the video feed.

Date & Time



(Date & Time) **Current Time:** Displays the camera's current system date and time.
- **Date:** Default value is 1970-01-01.
- **Time:** Default value is 00:00:00.

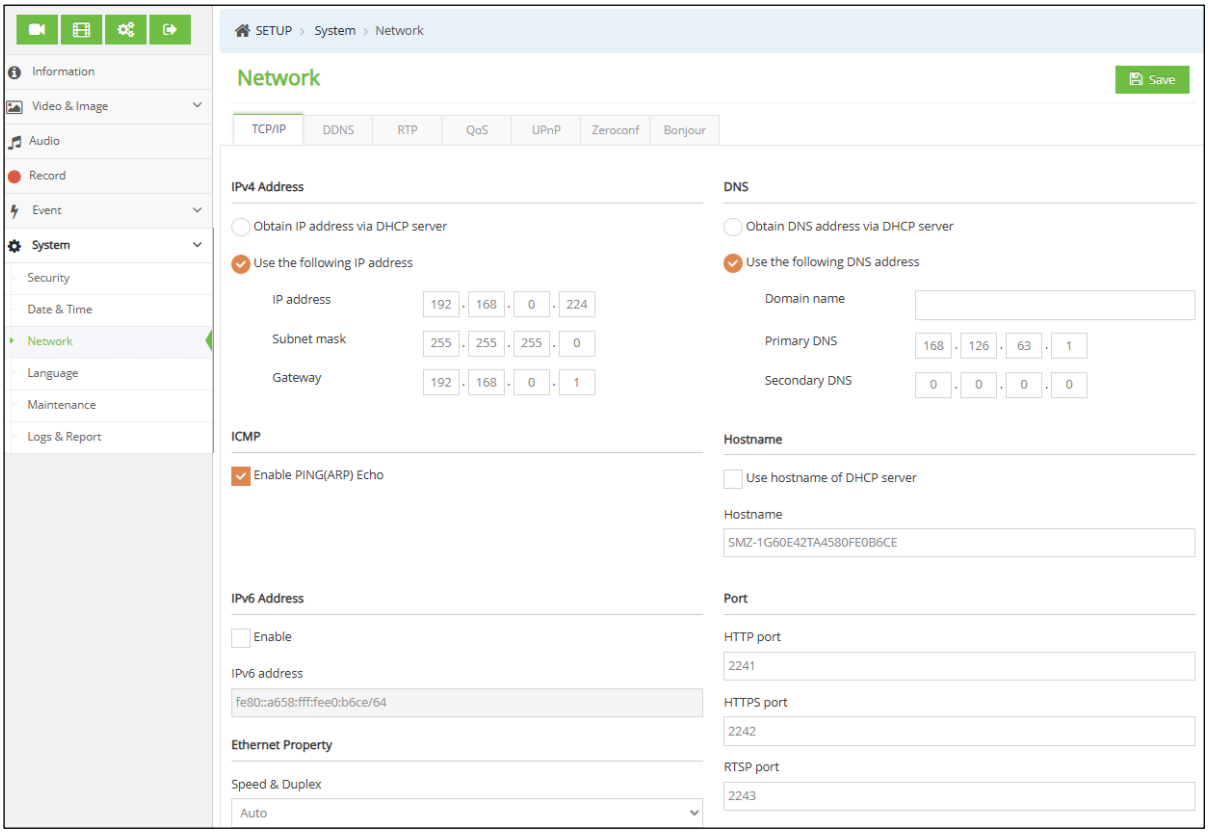
(Date & Time) **New Time:** Specifies how the systems is set.
- **Synchronize with computer time:** Sets the camera time based on the current time of the connected computer.
- **Set manually:** Allows manual input of the date and time.
- **Synchronize with NTP Server:** Automatically synchronizes with the specified NTP server every 60 minutes. The server's IP address or hostname must be configured in the corresponding field.

(Date & Time) **Time Zone:** Sets the time zone according to the camera's location.
- **Time zone:** The default setting is GMT.
- **Automatically adjust for daylight saving changes:** check this box to apply daylight saving time (DST) Automatically.

(Date & Time) **Date & Time Display:** Configures how the date and time appear on screen.
- **Date Format:** Default setting is YYYY-MM-DD.
- **Time Format:** Default setting is 24 hours.

Network

(Network) TCP/IP



IPv4 Address: Automatically assigns an IP address via DHCP (Host Configuration Protocol) when a DHCP server is available on the network.

Obtain IP address via DHCP server: Enable this option to assign the IP address automatically. All related fields become read-only.

Use the following IP address: Assign the IP address manually.
- **IP address:** Specify a unique IP address for the camera.
- **Subnet mask:** Enter the subnet mask used in the network.
- **Gateway:** Enter the default router (gateway) address used to connect devices on different networks.

ICMP (Internet Control Message Protocol): Used for network diagnostics and error reporting.
- **Enable PING (ARP) Echo:** Activate this function to allow the camera to respond to PING or ARP Echo requests

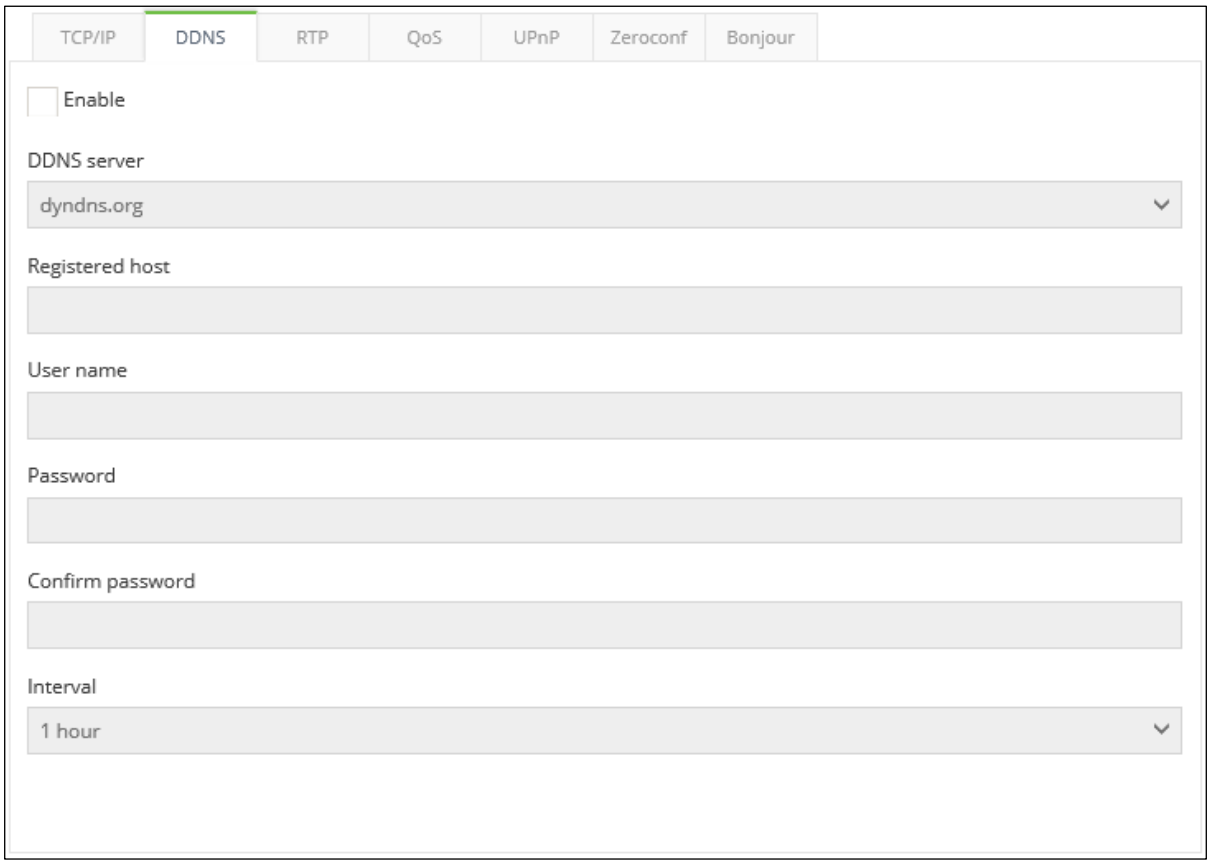
IPv6 Address: Enable IPv6 configuration by checking the corresponding box. IPv6 setting must be configured via the network router.

DNS: DNS (Domain Name Service) translates hostnames to IP addresses.
- **Obtain DNS server via DHCP server:** Automatically obtains DNS server addresses from the DHCP server. Other DNS fields become read-only.
- **Use the following DNS server address:** Set DNS addresses manually.
- **Domain name:** Enter the domain used by the camera.
- **Primary DNS server:** Enter the IP address of the primary DNS server.
- **Secondary DNS server:** Enter the IP address of the secondary DNS server.

Hostname: Allows access to the camera using a hostname instead of an IP address. The hostname is typically the same as the DNS-assigned name.

Port: Configure communication ports used for web and video streaming access.
- **HTTP port:** Default is 80 and the range is 1024-65535.
- **HTTPS port:** Default is 443 and the range is 1024-65535.
- **RTSP port:** Default is 554 and the range is 1024-65535.

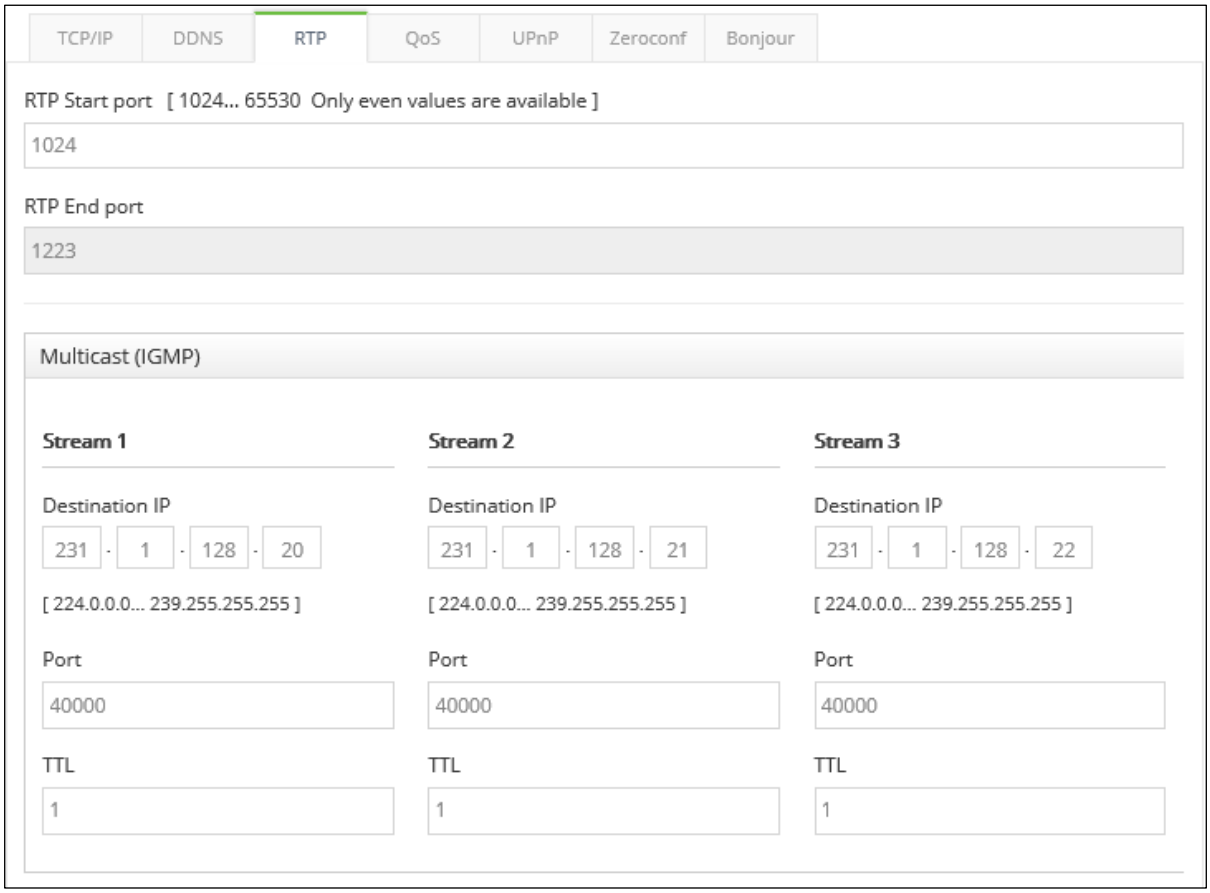
(Network) DDNS: The DDNS (Dynamic DNS) feature provides a unique URL (web address) to access the camera over the internet. It allows users to assign a host name to the network camera, enabling easier and more consistent remote access even when the camera's IP address changes.



DDNS server: Enter the name of the DDNS server.
Registered host: Enter the registered host name.
User name: Enter the user name registered with the DDNS provider.
Password: Enter the password for accessing the DDNS server.
Confirm password: Re-enter the password to confirm.
Interval: Set the interval (in hours) for regularly updates to the DDNS server. The default setting is 1 hour.

* Note:
- Registration with a DDNS service is required before using this function.
- If the camera's IP address changes, the DDNS service must be updated with the new address.
- Updates occur at regular intervals, regardless of whether automatic updates are enabled.
- To activate the DDNS function, select the Enable DDNS checkbox.

Network) RTP: The RTP (Real-time Transport Protocol) Port range defines the range of ports used for video and audio streaming. These ports are automatically selected within the specified range and are particularly useful when connecting the camera through a NAT router with manually configured port mapping.



* Note: Set the start and end ports to define the range allowed RTP unicast or multicast communication.

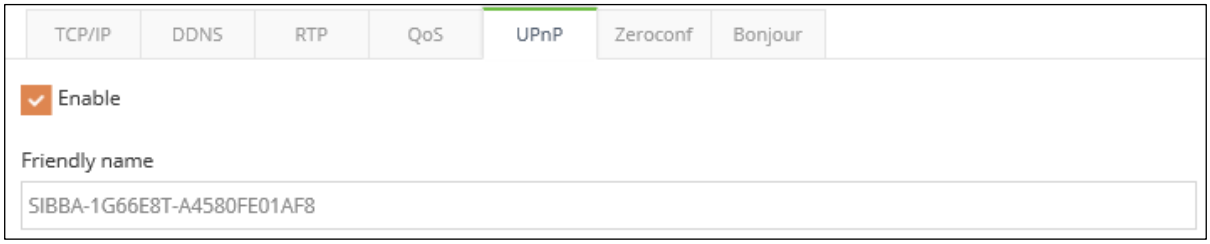
Start port: Specify the starting port number within the range of 3000-39800. The default value is 3000.
End port: Specify the ending port number within the range of 3000-39800. The default value is 30199.
Multicast (IGMP): Enable multicast to deliver video or audio data to multiple devices simultaneously using IGMP (Internet Group Management Protocol).

- **Destination IP:** Enter the multicast IP address where the data should be sent.
- **Port:** Enter the port number that the receiving devices will use to receive multicast data.
- **TTL (Time To Live):** Define how many network routers (measured in hops) the multicast packets can pass through before it is discarded. This controls the distribution range of multicast traffic.

(Network) QoS (Quality of Service): Prioritize network traffic to ensure smooth video streaming and maintain reliable performance of other network services.

- Video/Audio DSCP: Set traffic priority for video and audio data.
- Event/Alarm DSCP: Set traffic priority for event and alarm notifications.
- Management DSCP: Set traffic priority for network management and control data.

(Network) UPnP: The UPnP feature is enabled by default, allowing automatic detection of the network camera by operating systems and clients that support this protocol.

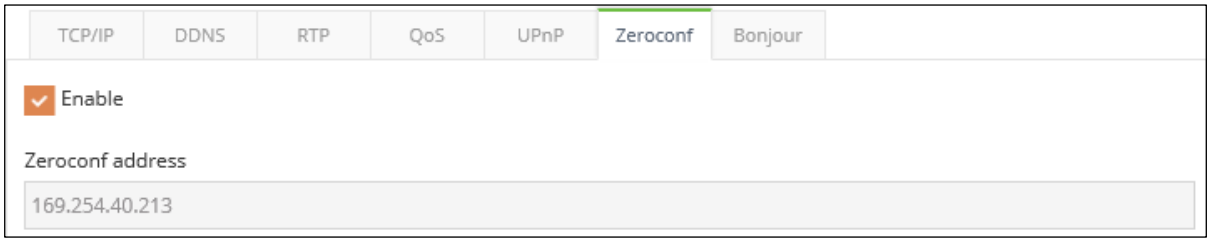


- **UPnP (Universal Plug & Play):** Enable or disable the UPnP by toggling the checkbox. The default setting is enabled.

Friendly name: Enter a description (1 to 32 alphanumeric characters) in the Friendly name box. When UPnP is enabled, the camera is automatically detected, and a new icon appears in the format " Model Name-MAC address".

*** Note: UPnP must also be enabled on the Windows computer. To enable, open control panel -> Add/Remove programs -> Add/Remove Windows Components -> Networking services -> Details -> Enable UPnP service.**

(Network) Zeroconf: Zero Configurations Networking (Zeroconf) is a set of protocols that allows devices to automatically create a functional IP network without requiring manual configuration or dedicated servers.
Zeroconf enables devices, such as computers and printers to connect to a network without user intervention. Without zeroconf, configuring services like DHCP and DNS or setting network parameters manually can be complex and time-consuming. Zeroconf is enabled by default.



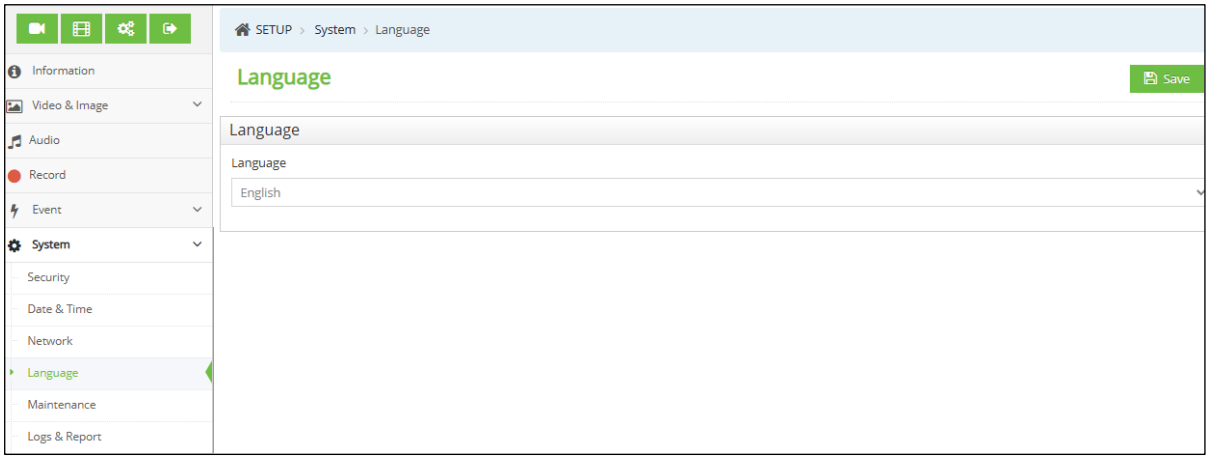
Zeroconf address: The default zeroconf IP address is 169.254.xxx.xxx

(Network) Bonjour: Bonjour is Apple's implementation of zero-configuration networking (zeroconf), a set of protocols that allow network devices to automatically discover and communicate with each other. This technology simplifies setup, enabling users without technical experience to easily configure and use devices on the network.

Friendly name: Enter the preferred name for the device.

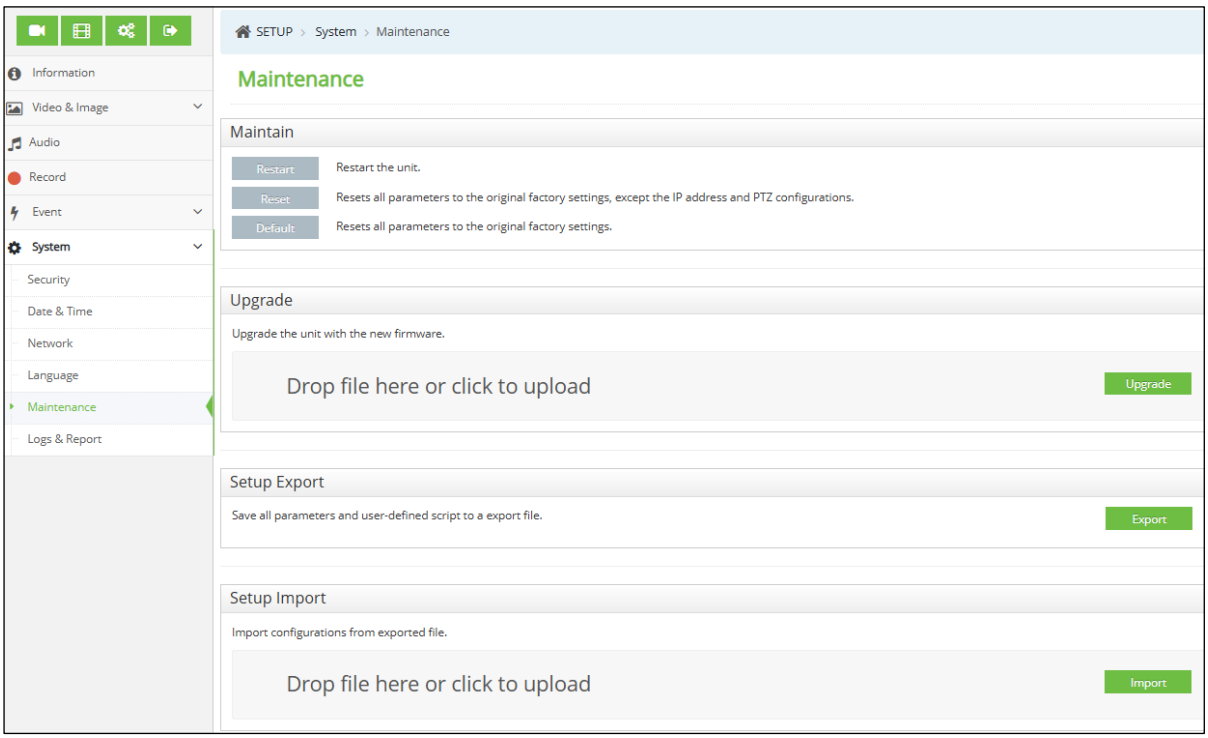
Language

The default language setting is English.



Maintenance

Provides options for software reset and firmware upgrade to assist in troubleshooting the camera.



Restart: Restarts the camera without changing any settings. Use this option if the camera is not functioning as expected.

Reset: Restarts the camera and resets most settings to factory defaults, except for the following.

- Boot protocol (DHCP or static)
- Static IP address
- Default router
- Subnet mask
- System time

Default: Use with caution. Pressing this button restores all camera settings to factory defaults, including the IP address.

Upgrade: Provides the latest firmware for the camera. When upgrading the firmware using a file, the camera receives the latest available features and improved reliability. Keeping the firmware up to date is important for optimal performance and security. To upgrade:

1. Click the Browse button.
2. Select the firmware file from the computer.
3. Click the Upgrade button.

*** Note: Do not disconnect power during the upgrade process. The camera will automatically restart after completion (Approximately 2~3 minutes).**

Setup Export: Saves all current parameters and user-defined scripts to a backup file. Click Backup button to create the file.

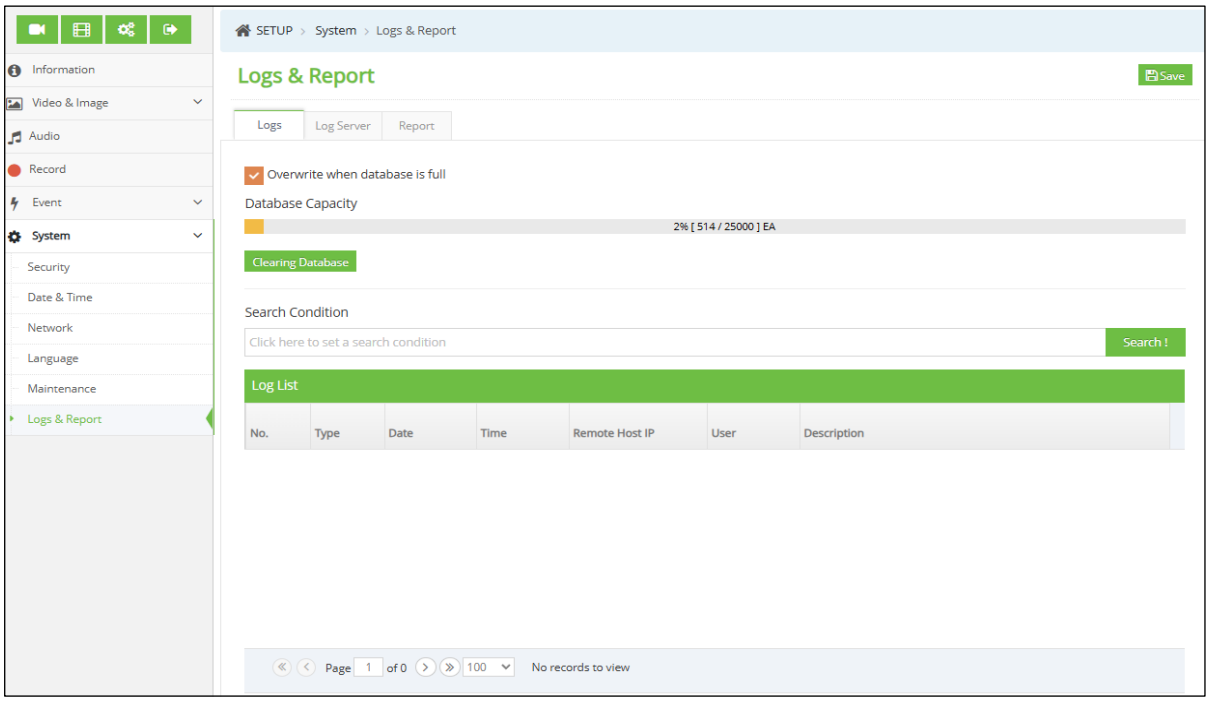
Setup Import: Restores the camera configuration from a previously saved backup file. Click Browse to select the file, then click Restore.

*** Note: Setup Export and Import functions apply only to the same camera running the same firmware version. They are not interested for configuring multiple units or firmware upgrades.**

Logs & Report

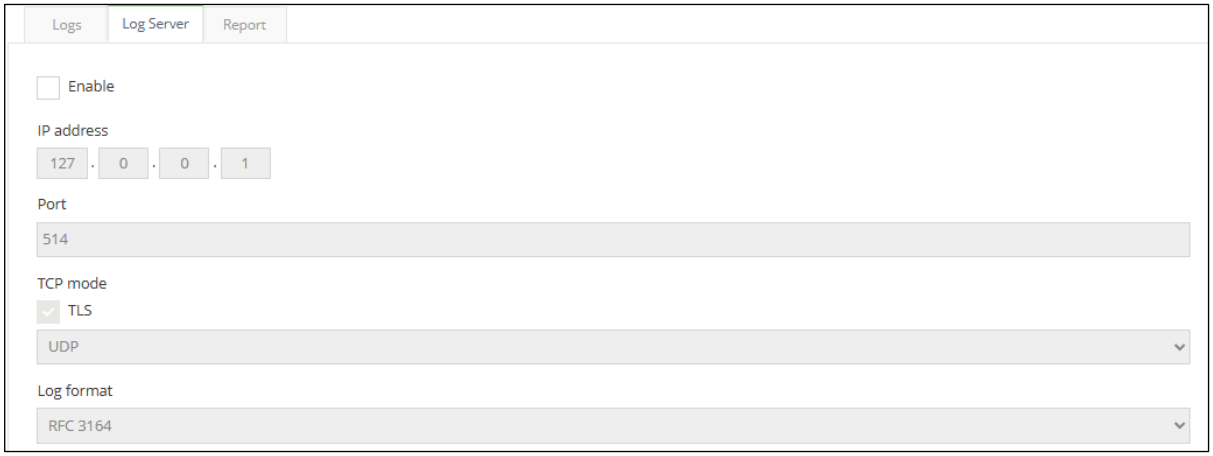
Logs: The log files record events that have occurred on the device since the last system restart. These logs serve as a valuable diagnostic tool for troubleshooting and system analysis.

Report: The report provides key information about the system's status and configuration.



- **Database Capacity:** Displays the current capacity of the log storage database.
- **Clearing Database;** Deletes all log files currently stored in the database.
- **Search Condition:** Enter specific keywords or parameters to filter and search for log entries.
- **Log List:** Shows a list of logged events based on the search condition or full database.

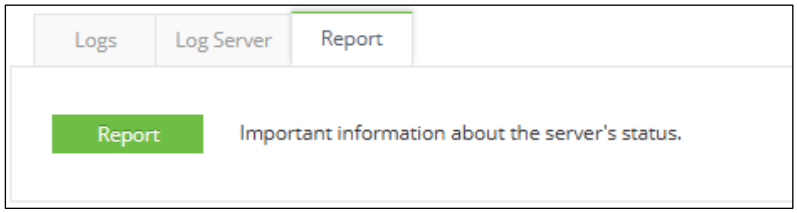
Log Server: Allows the camera to transmit system logs to an external server for centralized monitoring, auditing and diagnostics.



- **Enable:** Activate or deactivates log server communication. When enabled, the camera will transmit log data to the configured server.
- **IP Address:** Specifies the IP address of the external log server to which the logs will be transmitted.
- **Port:** Indicates the network port used for communication with the log server.
- **TCP Mode:** Allows selection of the transport protocol for log transmission.
- **TLS**: Transmits logs over a secure, encrypted connection. This is recommended for enhanced security.
- **UDP**: Uses the User Datagram Protocol for faster but less reliable transmission.

Log Format: Specifies the structure or standard used for transmitting log message.

Report: Provides detailed information about the camera's current status. This includes firmware version, MAC address, system information, IP address, and network connection status. This report is useful for diagnostics and should be included when submitting support requests.



Troubleshooting

If a problem is suspected to be caused by incorrect configuration or some other minor issue, refer to the troubleshooting guide below.

Upgrading the Firmware

Firmware is software that determines the functionality of the network camera. One of the first actions when troubleshooting a problem should be to check the current firmware version. The latest version may contain a correction for the particular issue. The current firmware version in the camera is displayed in the Basic Configuration or About section. For the latest firmware, contact your product administrator. Detailed instructions on how to perform the upgrade process are provided with each new release. See also the Maintenance/Upgrade section for more information.

General Troubleshooting

The following list covers some of the problems that may be encountered and suggests possible remedies:
Symptom → Possible Causes or Corrective Actions

1. The camera cannot be accessed by some clients.
→ If using a proxy server, try disabling the proxy setting in your browser. Check all cabling and connectors.
2. The camera works locally, but not externally.
→ Check if there are firewall settings that need to be adjusted. Check if there are router settings that need to be configured.
3. Poor or intermittent network connection.
→ If using a network switch, ensure the port on the device uses the same setting for the network connection type (speed/duplex).
4. The camera cannot be accessed via a host name.
→ Check that the host name and DNS server settings are correct.
5. Unable to log in.
→ When HTTPS is enabled, ensure the correct protocol (HTTP or HTTPS) is used. When attempting to log in, you may need to manually type in http or https in the browser's address bar.
6. No image using Refresh and/or slow updating of images.
→ If images are very complex, try limiting the number of clients accessing the camera.
7. Images only shown in black & white.
→ Check the Video & Image setting.
8. Blurred images.
→ Refocus the camera.
9. Poor image quality.
→ Increasing lighting can often improve image quality. Check that there is sufficient lighting in the monitored area. Check all image and lighting settings.
10. Rolling dark bands or flickering in image.
→ Try adjusting the Exposure Control setting under AE and AWB settings.
11. H.264/H.265 not displayed in the client.
→ Ensure that the correct network interface is selected in the Video & Image/Stream settings.
12. Multicast H.264/H.265 not displayed in the client.
→ Check with your network administrator to ensure the multicast addresses used by the camera are valid for your network. Ensure that the Enable multicast checkbox is selected in the System/Network/RTP tab. Check with your network administrator if a firewall is preventing viewing.
13. Multicast H.264/H.265 only accessible by local clients.
→ Check if your router supports multicasting, or if the router settings between the client and the server need to be configured. The TTL value may need to be increased.
14. Color saturation is different in H.264/H.265 and Motion JPEG.
→ Modify the settings for your graphics adapter. Refer to the adapter's documentation for more information.

15. Poor audio quality.
→ Too many users/clients connected to the camera may affect the sound quality. Try limiting the number of clients allowed to connect.
16. Distorted audio.
→ Ensure the correct Audio Input source is selected. Select Microphone for a connected external microphone. Select Line for a connected line-in source.

*** Note: If additional assistance is needed, refer to the User Manual or contact your network administrator.**