User Guide

Roughneck® Pro and Roughneck V2000/V2100 Series Cameras

XX318-00-02

Vicon Industries Inc.
Tel: 631-952-2288) Fax: 631-951-2288
Toll Free: 800-645-9116
24-Hour Technical Support: 800-34-VICON (800-348-4266)
UK: 44/(0) 1489-566300
www.vicon-security.com

Table of Content

Connection

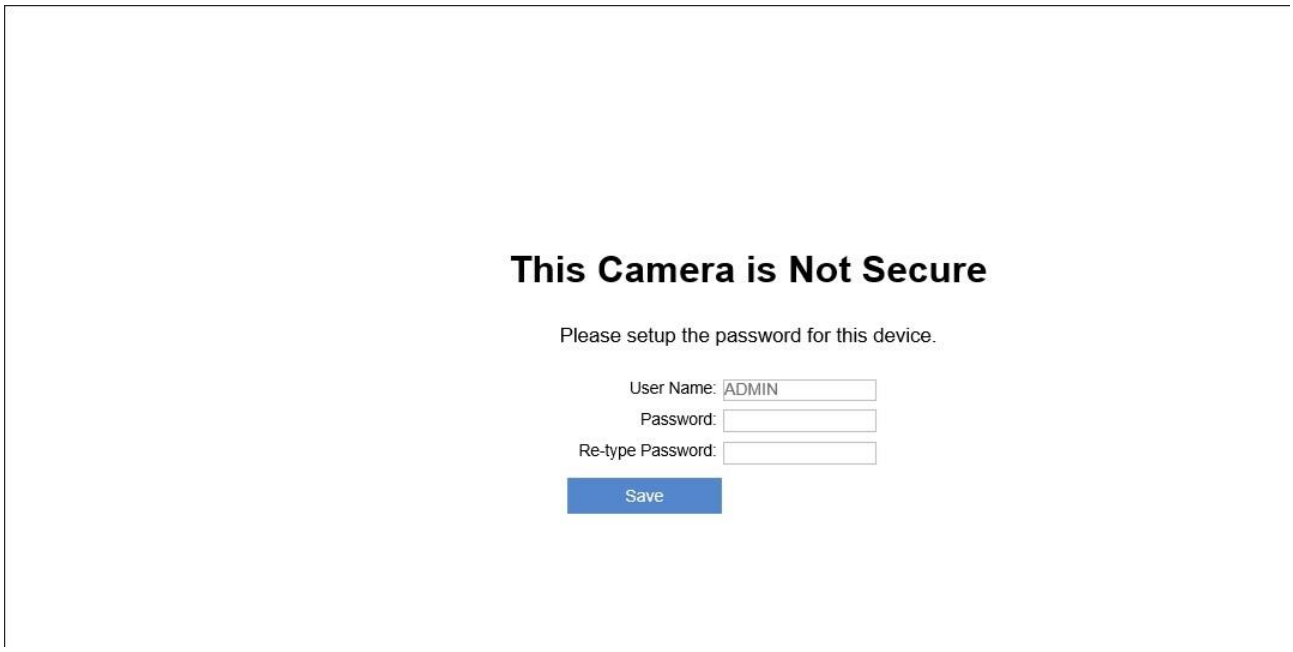
Default IP Address

Since this is a network-based camera, an IP address must be assigned. The camera's default IP address is obtained automatically through a DHCP server in your network; be sure to enable DHCP in "Network Settings." If DHCP is not available, the camera will use APIPA (link-local address); IPv4 link-local addresses are assigned from address block 169.254.0.0/16 (169.254.0.0 through 169.254.255.255).

Connecting from a Computer & Viewing Preparation

Connecting from a Computer

Make sure the camera and your computer are in the same subnet.
Check whether the network available between the camera and the computer by executing ping the default IP address. To do this, simply start a command prompt (Windows: from the "Start Menu", select "Program". Then select "Accessories" and choose "Command Prompt"), and type "Ping" and then type in your IP address. If the message "Reply from..." appears, it means the connection is available.
Start a browser e.g., Internet Explorer and enter IP address. A login window as shown below should pop up. In the window, enter the default user name: **ADMIN**; it is required to change the password for added security, which requires at least 8 characters including 1 uppercase letter, 1 special character, alphanumeric characters to log in.
Further administration on the unit can be found in "Configuration."



Viewing Preparation

Images of the unit can be viewed through various browsers. Before viewing, follow these steps to enable the display.
Enable Cookies as instructions below:

- In Internet Explorer, click **Internet Options** on the **Tools** menu.
- On the **Privacy** tab, move the settings slider to **Low** or **Accept All Cookies**.
- Click **OK**.

When a proxy server is used, click Internet Options on the Tools menus of Internet Explorer, select Connect tab, click LAN button, and set proxy server.
Change Security in Internet options as instructions below.

- On tool menu, click **Internet Options**.
- Press the **Security** tab.
- If the camera operates inside of the intranet, click the **Intranet** icon.
- If the camera operates outside of the intranet, click the **Internet** icon.
- Click **Custom Level**. This will open the Security Settings – Internet Zone screen.

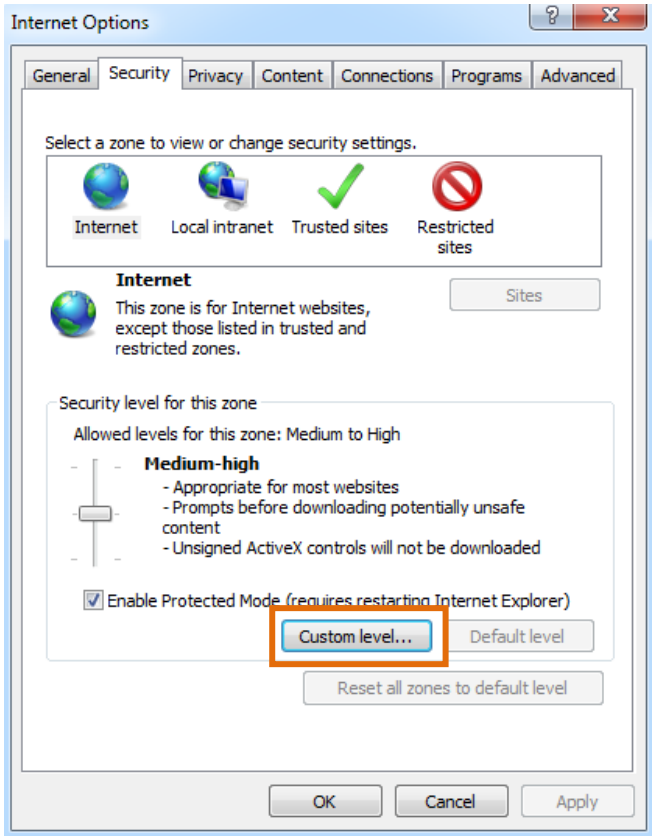


Figure: Security Settings 1/4

- Scroll down to the ActiveX controls and plug-ins radio buttons and set as follows.
- 【Download signed ActiveX controls】→ Prompt (recommended)
- 【Download unsigned ActiveX controls】→ Prompt
- 【Initialize and script ActiveX not marked as safe for scripting】→ Prompt

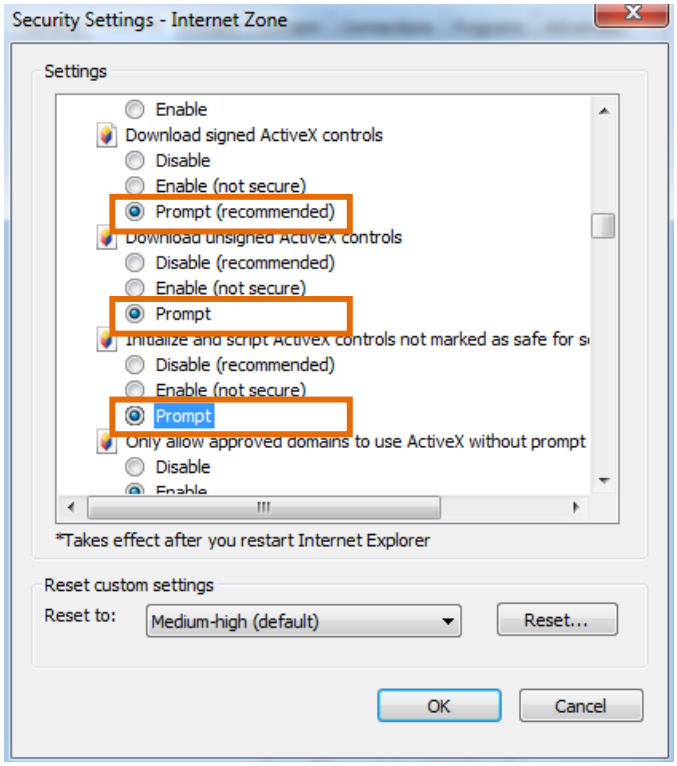


Figure: Security Settings 2/4

- 【Automatic prompting for ActiveX controls】→ **Enable**

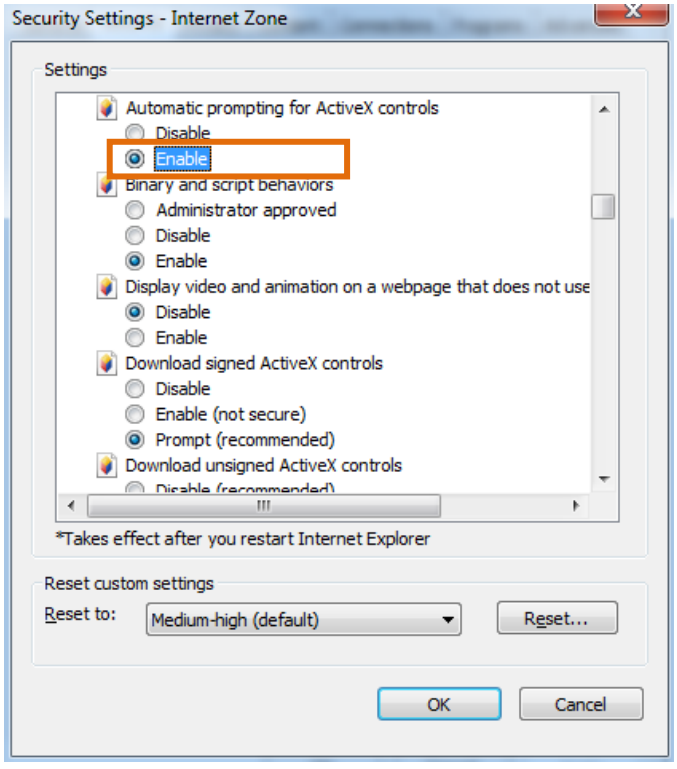


Figure: Security Settings 3/4

- 【Run ActiveX controls and plug-ins】→ Enable
- 【Script ActiveX controls marked safe for scripting*】→ Enable

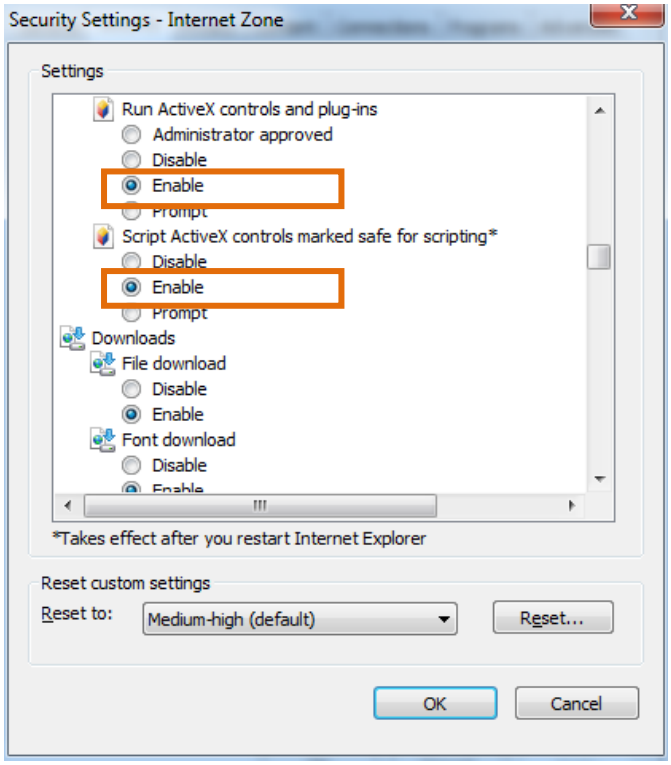


Figure: Security Settings 4/4

- Press **OK** to save the settings.
- Close the all browser windows and restart the browser. This will allow the new settings to take effect.
- Type your IP address into the browser.
- You should be able to see the camera image screen.

IP Toolbox

IP toolbox is a utility program that helps users to locate the camera(s) in local area network that computer is connected to. Note that IP Toolbox works only in Microsoft® Windows® XP, Microsoft Windows Vista, and Microsoft Windows 7 or above. Steps to get the utility program running are listed below.

1. Download the IP Toolbox folder to local computer. The latest IP Toolbox can be found on Vicon's website Camera Software Download page, vicon-security.com.
2. Double click on IPToolbox.exe in the IP toolbox's folder, and the IP Toolbox window should pop up as below.

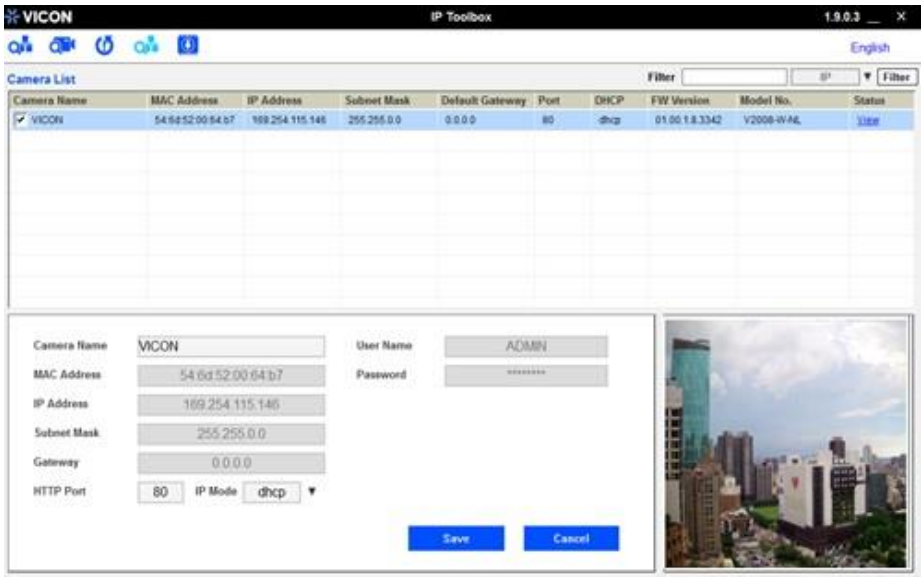


Figure: IP Toolbox

3. The window lists information of camera(s) in operation at the present time. Click the camera in the list for which you want to configure the network settings.
4. Configure the following settings as needed.

- **User Name & Password:** Before performing any operation to any listed camera, enter user name and password for the selected camera, and then click "**Verify**" for authentication purposes.
- **Camera Name:** Enter a descriptive name for the camera.
- **Network Settings:** If you have a DHCP server on your network to assign IP addresses to network devices, enable the "dhcp" option from dropdown menu of **IP MODE**. Otherwise, select "manual" to manually enter the values for **IP Address**, **Subnet Mask**, **Gateway** and **HTTP Port** fields.
- Click **"Save"** to enable the settings. Click "**Cancel**" to discard the settings.

5. Press "View" button: the designated browser page of the selected camera will pop up. Input the corresponding User Name & Password to log in to the specific page of camera.
6. Press "Refresh" button: all the cameras currently connected to the network will appear on the list.
7. Press "Initialize" button: there are three options, Software default, Hardware default, and Reboot camera, for user to perform the factory default or reboot the camera. After clicking the preferred item, a warning message will appear. Confirm again before you perform the selected function.
8. The "Filter" button on the upper-right corner allows user to perform filtering search, which means you can input certain keywords into the field and also narrow down the range by selecting the criteria from the dropdown menu for a target search on cameras connected.

9. Press **"Auto Set IP Address"** button to automatically give each camera an IP address from predefined range and connected to predefined network internet controller.
   - **User Name & Password:** Enter username and password for the current auto set IP address setting.
   - **Network Interface Controller:** Select desired network interface controller that each camera(s) will be connected to and also select the IP address and IP address range of the controller.

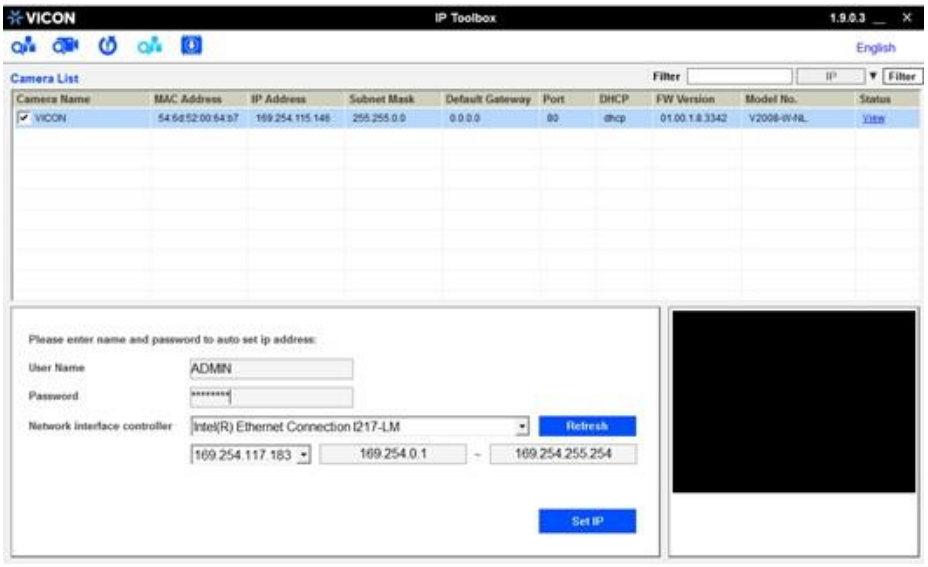


Figure: Auto Set IP Address

10. Click "FW Upgrade" button to upgrade the firmware of selected camera. A pop up window like the image below will display.

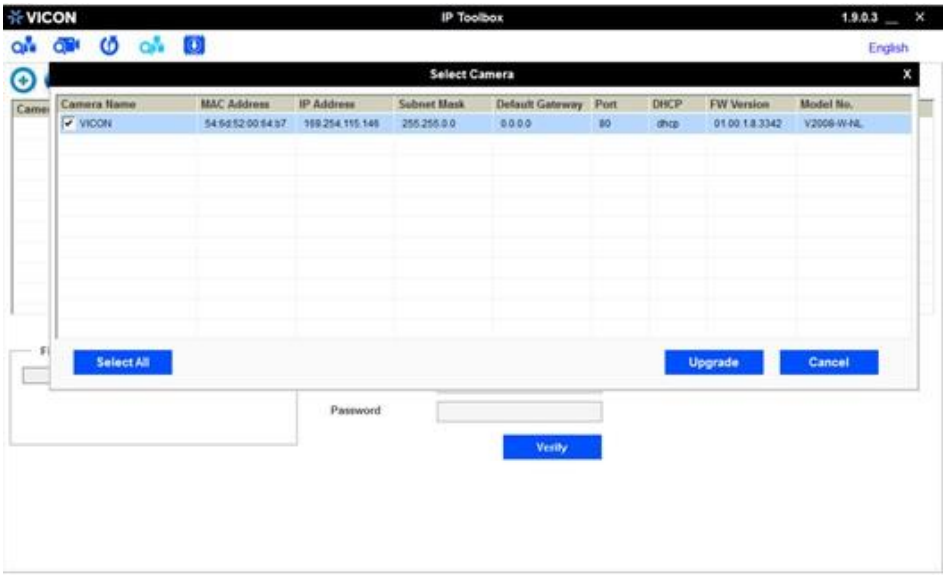


Figure: IP Toolbox FW Upgrade

Follow the steps below to complete firmware upgrade:

- Click  or  to add or remove camera to be upgraded (only verified cameras will be shown on this list).
- Select a camera or click "**Select All**" button to select a camera or all the cameras on the firmware upgrade list, respectively.
- Click "**Add**" or "**Cancel**" button to confirm the selected cameras for upgrade or to cancel the selection, respectively.
- Enter the path for the desired firmware (.tar) or click and then follow the instructions to find and upload the .tar file.
- When the process is complete, click  again to return to the list of all cameras located in the local network.

Live View

After accessing and logging in to the IP address of the camera, there are 3 main options on the upper left side: “Live View”, “Playback” and “Configuration.” The upper right corner indicates the current user level and has the “Logout” option, which allows user to log out by clicking it. In addition, the dropdown menu beside the Configuration tab is used for changing the UI language. This chapter mainly focuses on Live View; later chapters will detail Playback and Configuration.

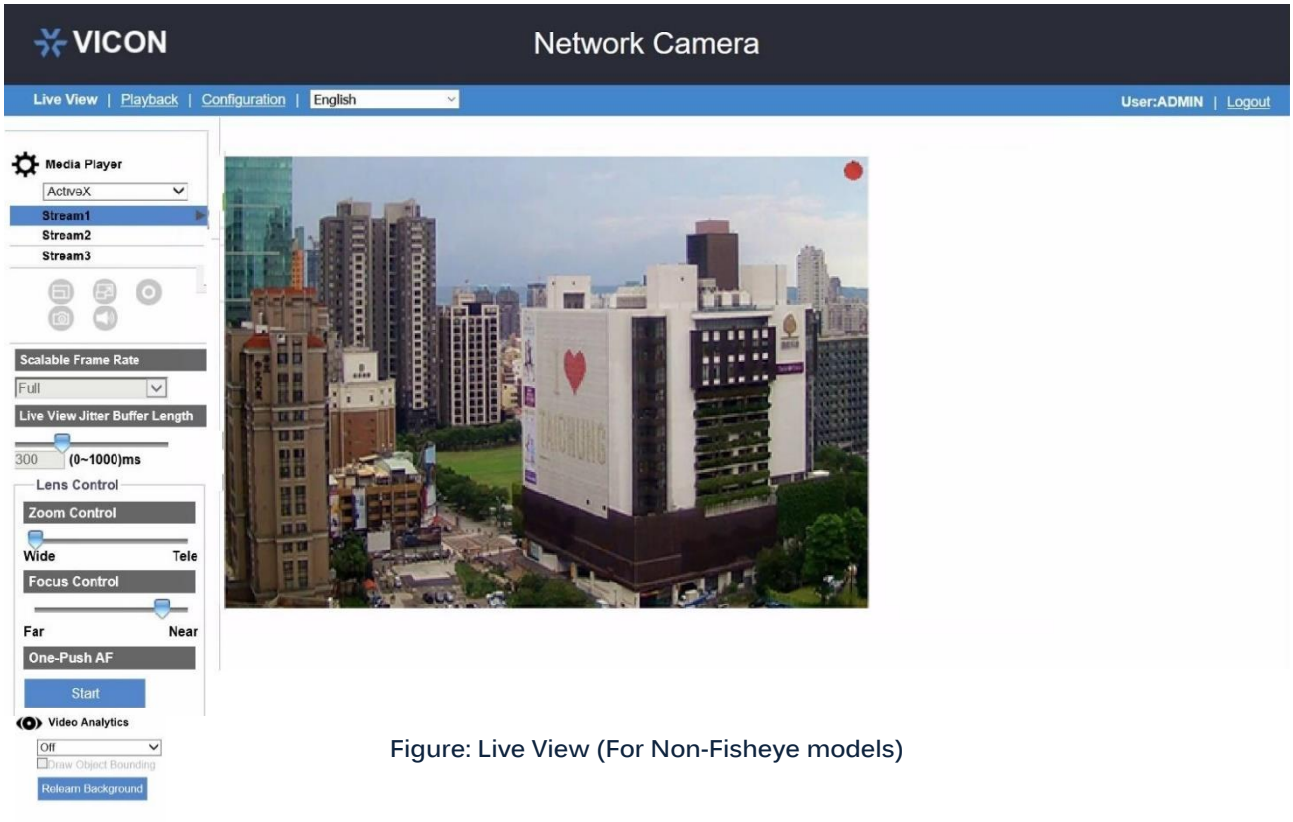


Figure: Live View (For Non-Fisheye models)

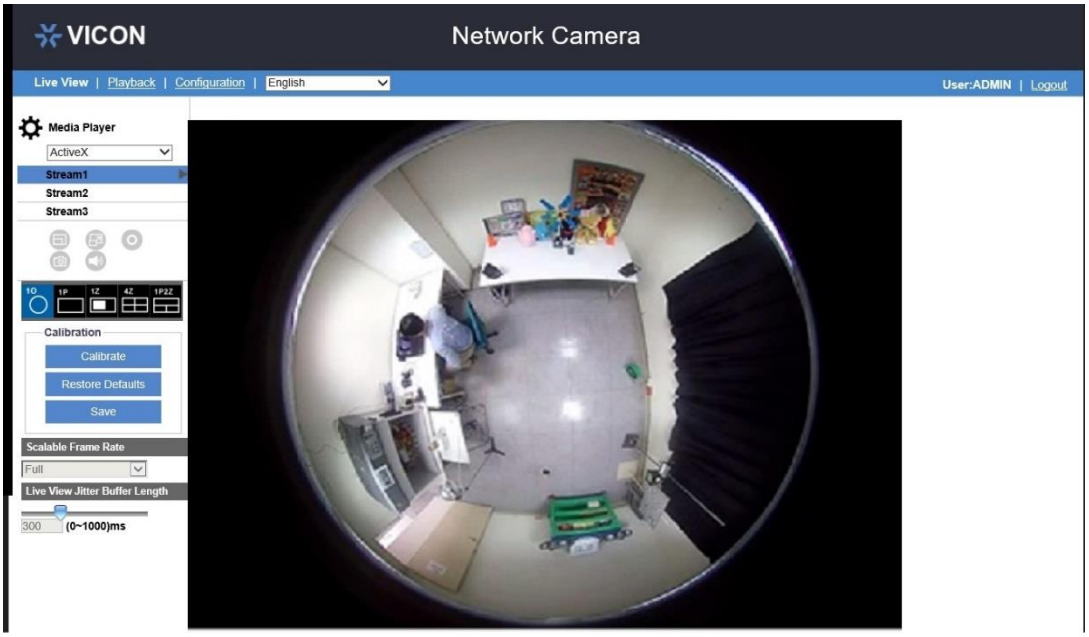


Figure: Live View (For Fisheye models)

In “Live View” page, user will have access to real-time Live View display.
The drop-down menu under “Media Player” title consists of 2 options for display: ActiveX and JPEG. ActiveX, only available in Internet Explorer, provides full functionality, better image quality and lower bandwidth consumption in Live View page. On the other hand, JPEG trades ActiveX advantages for broader browser options, including Chrome, Opera, etc., but has lower frame rate display.
Stream1/2/3 are available for user to switch among; configure each stream for better view in varied applications.

Note
- “Stream1/2/3” are available only in ActiveX mode, provided that the streams are enabled in “Encode” section.

Other items and icons under Live View are explained in detail below.

Icon	Definition
	The “Snapshot” button is for user to take a still picture (snapshot) and save it in a user predefined folder.
	The “Full Screen” button is for user to change to a full screen display (ESC to exit full screen).
	The “Manual Recording” button is for user to activate recording function.
	The icon on the upper-right corner of the video display indicates that live view video is being recorded.
	The “Audio Output” button is for user to toggle (on/off) the audio output function.
	The “Zoom Control” button is for user to manipulate digital zoom magnification. After clicking the button, hover the mouse cursor over the live view screen and then use the scroll wheel to perform digital zoom in or zoom out functions.

Table: Live View Icons Definition

Notes
- “Full Screen”, “Manual Recording”, “Audio Out”, and “Zoom Control” icons are available only in ActiveX mode, while “Snapshot” icon is available in both ActiveX and JPEG modes.
- “Audio Output” availability varies by different models; check the “Appendix: Product Comparison-I/O Port” for details.

RS-485 Control Panel

The control panel on the left side of the UI contains the full functionalities of external RS-485 device, which is compatible with the V2008 Box camera only. Refer to the detailed functions that follow.

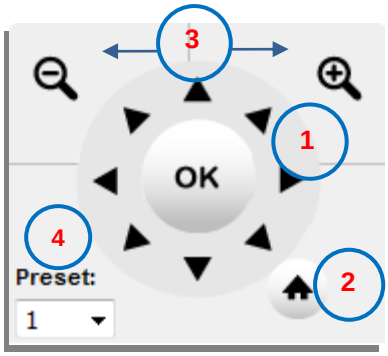


Figure: RS-485 Control Panel

1. **Directional Arrows**

Click and hold the arrow buttons to make RS-485 device move in the desired direction.

2. **Home Position**

Click the button to restore the RS-485 device to the default position.

3. **Zoom Control**

Click and hold the "Zoom In" button for a telescopic view and "Zoom Out" for a wide view.

4. **Preset Position**

Once the preset points of RS-485 device are defined, user can move to any wanted positions from the Preset dropdown menu.

Scalable Frame Rate

Due to multi-browsers support, the performance of live view will vary according to the efficiency of each browser and client device. Therefore, the "Scalable Frame Rate" is designed to help user dynamically adjust to a desired frame rate per browser applied for smooth video display. The option "Full" indicates a full frame rate display in response to the setting under "Encode" page, whereas "1/2" and "1/4" mean that display frame rate will be reduced to one half and one quarter, respectively. Turn "SVC-T**Error! Reference source not found.**" on before using this function. Refer to "*SVC-T*" for further details (only available in Activex mode).

Live View Jitter Buffer Length

Live View Jitter Buffer Length determines when to transmit media packets for Live View display based on packets it has collected, packets it is still waiting for and the timing required to playback the media. Dragging the adjustable bar of "Live View Jitter Buffer Length" to a higher value lessens the negative effect, namely choppy live video display, caused by transmission delay arising from network congestion. However, higher values also increase overall transmission latency.

Note	•	Live View Jitter Buffer Length is available only in ActiveX mode.

Lens Control

The specific Lens Control section under Live View is related to both lens and focus remote adjustments; refer to chapter "*3.1 Lens Control* for details on using this.

Video Analytics

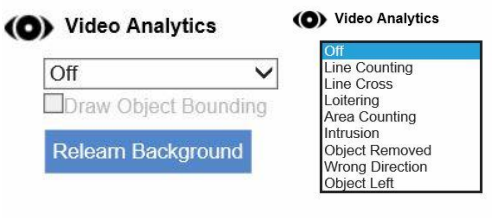


Figure: Video Analytics Panel

- Select a Video Analytics (VA) function from the dropdown menu. Make sure that the selected VA function is enabled in "Video Analytics" section. When "Off" is selected, the camera is not performing any VA function.
- Draw Object Bounding: Check this box to allow camera to activate motion detection and draw an area around the detected object. This function can be used only when a VA function is activated.
- Relearn Background: Click this button to save a new background that will be compared to current background later for motion detection purposes.

Notes

- Keep the zoom level of used browser at 100% to display a normal live view.
- While using a browser that does not support ActiveX, e.g., Chrome, some of the above sections will NOT be available.

Fisheye Control Panel

Icon	Definition
	Original fisheye view.
	Panoramic view.
	Dual panoramic views. 360° panoramic view is separated into 2 parts.
	One zone supports ePTZ movement.
	Four zones, each zone supports ePTZ movement.
	One panoramic view and two zones.

Table: Display Modes Icons Definition

The specific section in the left side of Live View as shown above relates to exclusively proprietary display modes provided by fisheye camera to let user fully use its wide panoramic coverage in a variety of display modes for different purposes. The complete details for this are addressed in the sub-chapter that follows.

Display Mode	Wall Mount	Ceiling Mount
Original Mode (1O)	✓	✓
Panoramic Display Mode (1P)	✓	✓
Dual Panoramic Display Mode (2P)		✓
Zone Display Mode (1Z)	✓	✓
Quad Zone Display Mode (4Z)	✓	✓
Panoramic Display Dual Zone Mode (1P2Z)	V	V

Display Modes

Original Mode (1O)

The original warped live view is sometimes not that accurate, due to few factors including assembly tolerance, to present a proper de-warped image under several display modes, e.g., 1P, 1P2Z. Therefore, the calibration section is specifically designed for user to readjust the central point of warped image to improve the de-warped performance to be closer to perfect.

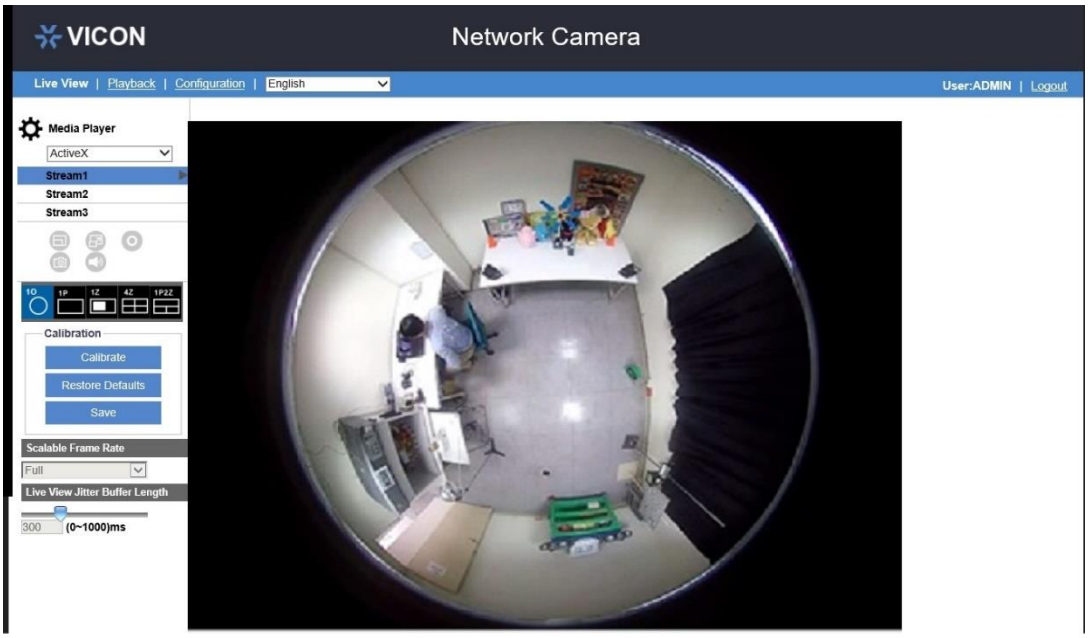


Figure: Original Display Mode

- Calibrate: After clicking the “Calibrate” button, user will see a red circle around the warped image. With mouse click on the image, user can pan or tilt the circle for a proper position.
- Restore Defaults: Click the “Restore Defaults” button to return the setting of warped image back to the factory defaults, which is helpful when user over calibrates the circle out of the border.
- Save: Click the “Save” button to make the calibration setting take effect.

Panoramic Display Mode (1P)

The original warped image is processed by a de-warping algorithm to generate a panoramic image so that the user can capture the details of the edges of the image. User can swipe the screen to scroll horizontally for optimal view.

Figure: Panoramic Display Mode

When user clicks the panoramic screen and drags the mouse from right side to left side, the panoramic image moves from right side to left side horizontally, and vice versa.

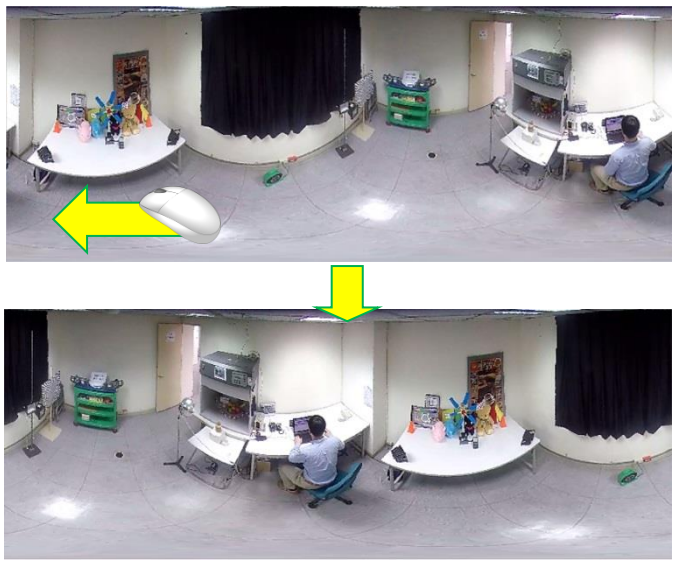


Figure: Panoramic Manipulation

Note	• Panoramic manipulation is only available when the camera is Ceiling Mount Type. If user needs more details, refer to section "*1.2 Dewarp*" for more information.

Dual Panoramic Display Mode (2P)

The Dual Panoramic Display Mode consists of two panoramic views, one for the left hemisphere of original warped live view and the other for the right hemisphere. When user swipes one of the panoramic screens horizontally, the other view will be moved synchronously.

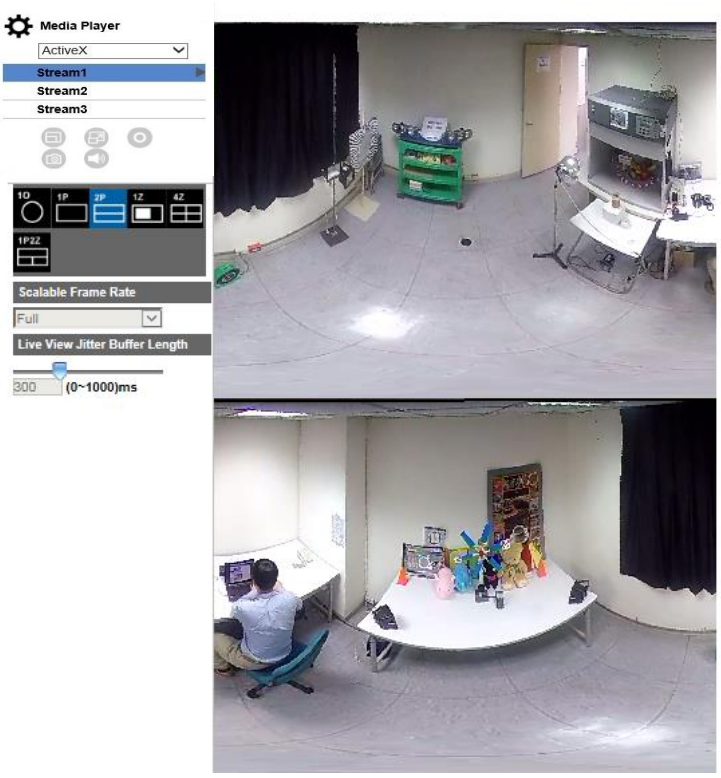


Figure: Dual Panoramic Display Mode

Figure: Dual Panoramic Manipulation

Zone Display Mode (1Z)

Zone display mode supports ePTZ function, allowing user to capture image as an optical PTZ camera. User can click and drag screen to adjust the field of view. If user needs to identify more details, user can zoom in or zoom out via scrolling mouse wheel.

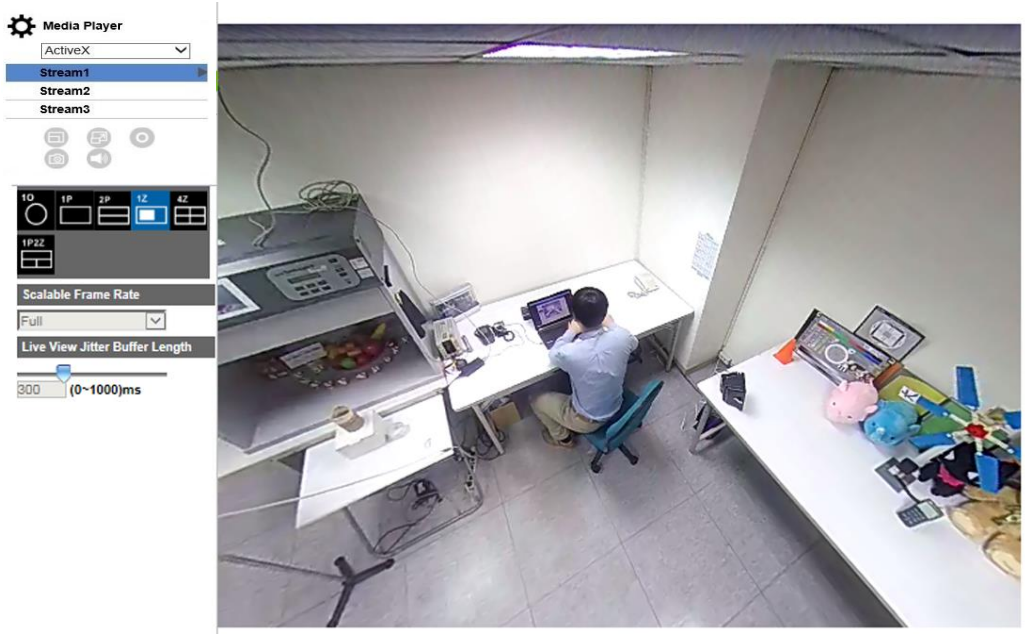


Figure: Zone Display Mode

Figure: ePTZ Zoom Manipulation

Figure: ePTZ Pan and Tilt Manipulation

Quad Zone Display Mode (4Z)

Quad Zone Display Mode is composed of four zone screens, so that user can monitor four different zones of the live view simultaneously. Furthermore, the indicative window, located on lower right side of screen, shows the relative positions/areas/zones (1, 2, 3, 4 distributed in the indicative window; refer to figure below) of the four zones captured into the quad view. User can use the mouse to perform ePTZ function in each zone or drag the number mark in the indicative window to change the locations for appropriate position.

Figure: Quad Zone Display Mode

Figure: FOV adjustment in Indicative window

Note	•	The indicative window can be changed position by clicking and dragging.

Panoramic Display Dual Zone Mode (1P2Z)

Panoramic Display Dual Zone Mode provides one panoramic view screen and two zone screens.

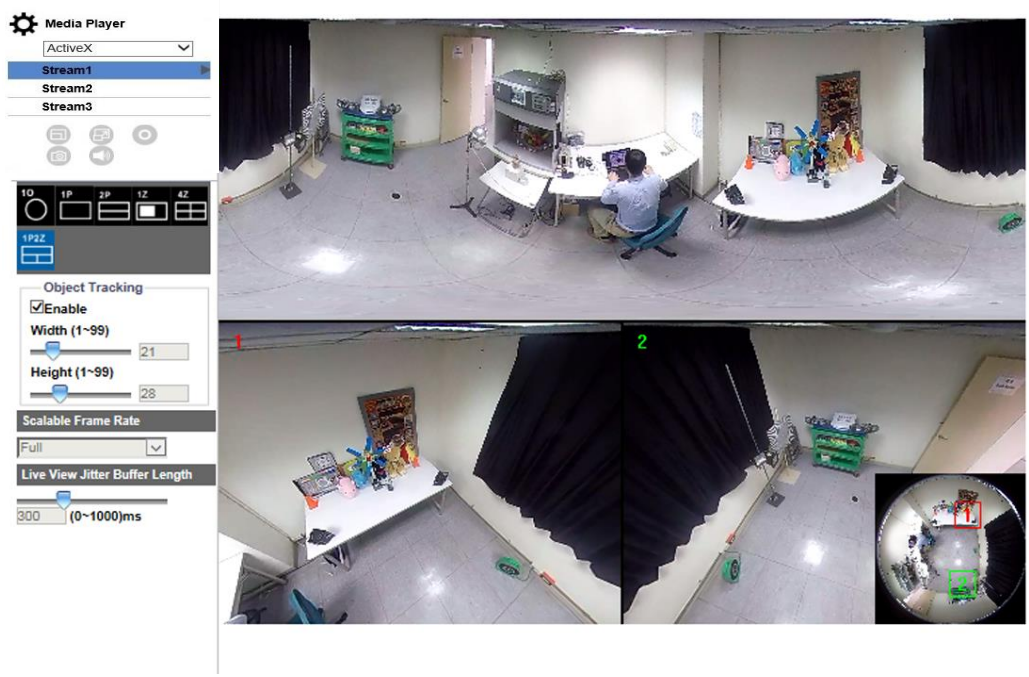


Figure: Panoramic Display Dual Zone Mode

Playback

The cameras provide a method to play video stored on micro SD card.
Due to compatibility issues related to video and audio formats; when playing video stored on micro SD card, it is highly recommended to use Chrome or Safari browser. Remember that both camera and browser must support same format; therefore, it is possible to use any other browser along with H.265 codec, as long as both camera and browser support H.265 format.
After clicking on the playback function on the upper left side next to Live View, a page appears as below.

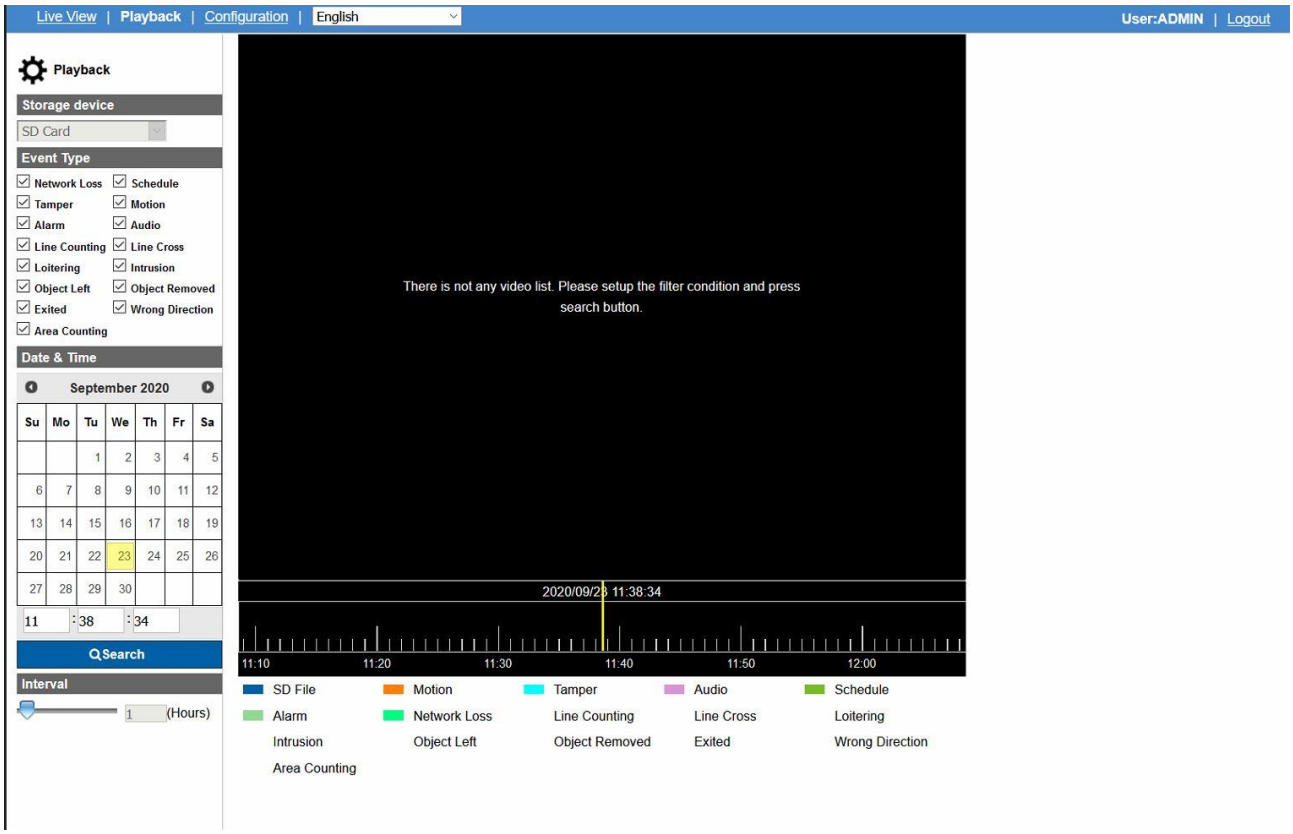


Figure: Playback

Storage device: SD Card

The camera supports a micro SD card storage device.

Event Type: Alarm/Audio/Network Loss/Schedule/Tamper/Motion

After selecting the edge storage, videos can be searched based on type of events that triggered video recording and date and time recording was stored.
Check the boxes to select the type of events that might trigger the video you are searching for.

Date & Time

User can select the exact date and time segment to search for recorded video by clicking on a date on the calendar and entering time, respectively.
Selected date will turn into a blue background on the calendar. The current date has a light brown background.
Finally click the search button to start searching for videos on timeline area, according to the

parameters chosen.

Timeline: 0.5 ~ 6 (hours)

Timeline is used for adjusting the time range of timeline area in terms of hours; each step from timeline changes half hour in timeline area. Timeline helps user get more details and a larger scale view of timeline area for easier search; 6 hours allows search in larger scale while 0.5 hour allows more details.

Timeline Area

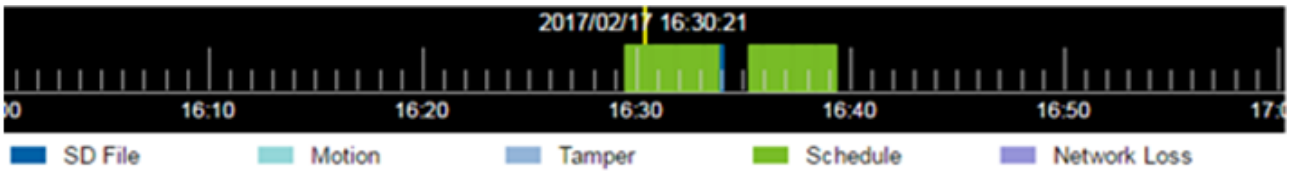


Figure: Timeline Area

User can click and then drag left or right to see other parts of the timeline area. Based on the search configuration, if there is a video list on micro SD card, it will be shown on timeline area in different colors, sizes and times, based on type, duration and time recorded, respectively. Refer to the illustration below timeline area to understand the relation between type and color.
Selected types will be shown in timeline area according to their respective color bars, while types that are not selected will be shown in dark blue bars represented as “SD File.”
Current or filtered date and time are shown at the upper center of timeline, where there is a vertical yellow line that represents the center of timeline area.

Display/Playback Toolbar

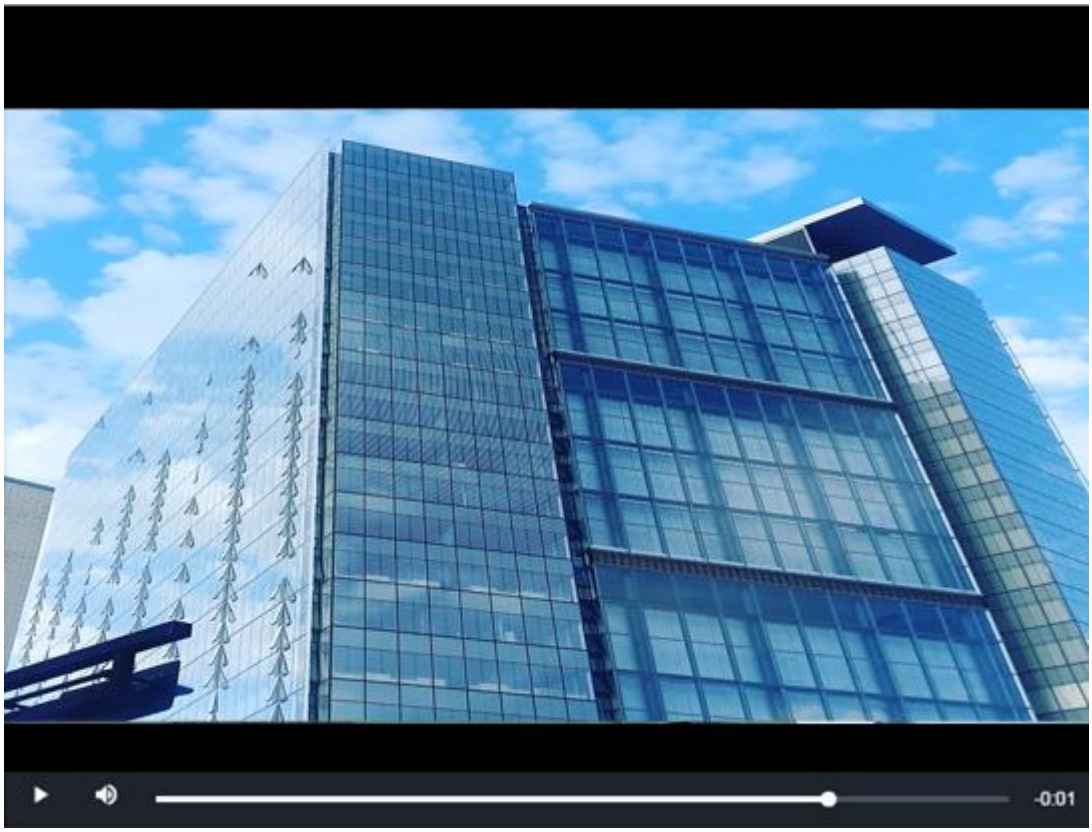


Figure: Display and Playback Toolbar

- To play a video, simply hover over a color bar on timeline area until a hover box displays; then click on the color bar for the recorded video to automatically start playing on the display.
- While the video is playing, user can hover over the displaying video to activate playback toolbar. Refer to table below for more details on Playback Toolbar.

Icon	Definition
	The “Pause” button is for temporarily stopping play of video
	The “Play” button is for starting to play video after pausing
	The “Mute” button is for silencing sound on the video
	The “Unmute” button is for turning sound back on in the video
	The “Volume” button is for adjusting how loud/soft the audio is on the video. Hover over mute or unmute button to activate volume button.
	Displaying video progress bar

Table: Playback Toolbar Icons Definition

Configuration

After clicking “Configuration”, the screen will display as below, with several menu options on the left side for users to configure. These will be explained one by one in the following chapters.

1. Encode

1.1 Encode

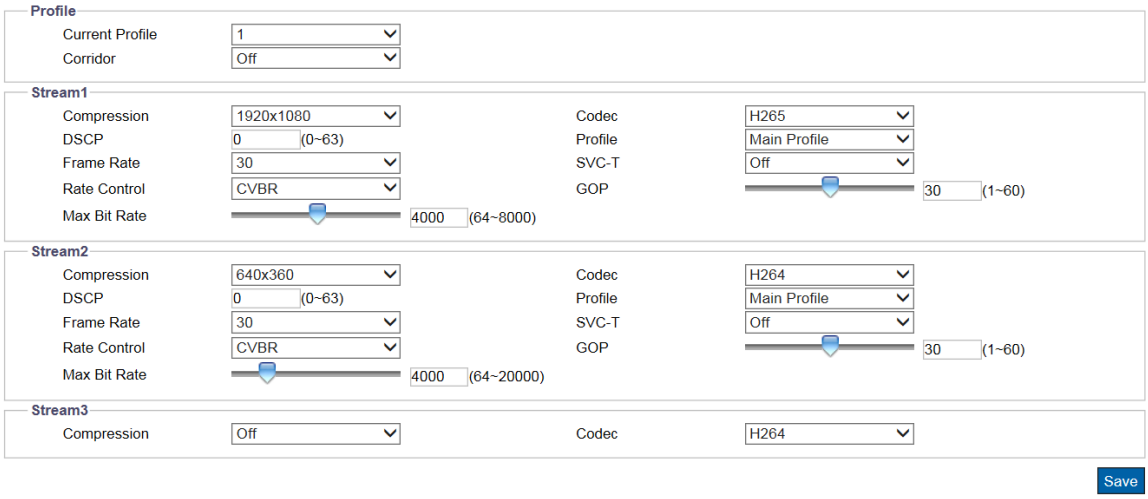


Figure: Encode Settings

Profile and Streams

Profile

Current Profile: 1/2/3

User is strongly recommended to define different settings under each stream to maintain better video transmission for varied network environments and applications. By default, there are 3 profiles, and each profile contains 3 streams for individual configuration. The detailed configurations for each stream are explicitly described in the following lines.

Corridor: On/Off

In vertically oriented scenes, e.g., sidewalk, aisle, hallway/corridor, because these scenes require more details in vertical areas, the common 16:9 aspect ratio is not appropriate, and a large portion of bandwidth is wasted in landscape field of view. In order to optimize the image result for corridor-like applications, click “On” to enable this function, so that the image will be rotated right 90 degrees to a 9:16 aspect ratio that perfectly fits portrait-like scenarios, reducing bandwidth and storage consumption.

Streams

Compression & Frame Rate

Compression options are 1920×1080, 1280×960, 1280×720, 800×600, 640×480, 640x360, 320x240 for the 2 MP models. Higher resolution values are model dependent and frame rates are corresponding to the resolution, streams and codec selected.

Notes	• Check “Appendix: Product Comparison-Max resolution & frame rate” for details. • Check “Table: Correlations of Resolution/Streams/FPS/Codecs” for the correlated values.

DSCP: 0 ~ 63

To classify and manage network traffic and provide quality of service (QoS) on today’s IP networks, Differentiated Services Code Point (DSCP) is a computer networking architecture that specifies a resource allocation to each device on a priority-based pattern for ideal bandwidth management. The bigger the value, the higher priority it will be.

Rate Control: CBR/VBR/CVBR

Choose one of the Rate Control modes depending on different situations. Higher bit rate value will result in better image quality with bigger file size and therefore consume more network bandwidth, while lower bit rate value has less loading on network bandwidth due to smaller file size but with inferior image quality.

CBR Bit Rate/Max Bit Rate: 64 ~ 20000 for H.264 codec, 64~8000 for H.265 codec

The default bit rate synchronizes with the maximum resolution, e.g. 2MP@30fps model has 4000 bps as default. It is recommended to use the default bit rate, as it provides a better balance between image quality and network bandwidth.
When bit rate value lower than default bit rate is selected, the image quality may deteriorate.
When selecting bit rate higher than default bit rate, there is a correlation between resolution and selected bit rate. Higher maximum resolution cameras are better suited to selection of bit rate higher than default bit rate than lower maximum resolution cameras.

Note	• CBR Bit Rate and Max Bit Rate options are available only when H.264 or H.265 codec is selected.

Quality Level: VBR; MJPEG: Low/Mid/High

Select the Quality Level number from 1 to 10 for H.264 and H.265 Codec with VBR Rate Control selected, or Quality Level Low/Mid/High for MJPEG Codec. “High” or “larger value” produces the highest image quality but increases the file size. By contrast, “low” or “smaller value,” produces the lowest image quality with decreased file size and network bandwidth consumption. For CVBR, select the limitation on the bit rate.

Codec: MJPEG/H.264/H.265

- MJPEG: Each video frame is individually compressed as a single jpeg image with full-scale contents and can be retouched easily. However, this results in larger file sizes and therefore tends to lose frames under limited network bandwidth.
- H.264: This widespread video compression format adopts intelligent technology to record variations in each frame rather than record each full frame. As a result, less network bandwidth is required, and file size tends to be smaller compared with the previous MJPEG codec.
- H.265: Also known as HEVC (High Efficiency Video Coding), H.265, the latest video compression standard, provides almost double the compression ratio at the same level of video quality compared with H.264. It efficiently reduces the redundant areas among different frames by using pattern comparison, enhanced difference-coding areas and variable-block-size segmentation.

Profile: High Profile/Main Profile

There are 2 different kinds of profiles for H.264 codec and 1 profile for H.265 codec compression ratios, where the protocol for each type varies. H.264 Codec supports Main Profile and High Profile profiles. H.265 Codec supports Main Profile only.
Users can select the preferred one for their applications or contact IT personnel for more information.

SVC-T

SVC-T supports the FPS adjustment on the client side, for example, users can adjust the FPS to 7.5, 15, 30, etc. Select Off or adjustment.

GOP: 1 ~ 60

GOP stands for Group of Picture length. Select the GOP length number from 1 to 60 for 60Hz Camera Type. Smaller number means the distance between 2 I-frames is smaller, which needs more network bandwidth while having better image quality. By contrast, larger number consumes less bandwidth but in an unstable network connection, video display may not be smooth. The available length number options of GOP will vary based on frame rate settings.

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
2M	16:9	H.264/H.265/MJPEG	30	1920x1080	1920x1080 + 1280x720 1920x1080 + 800x600 (All smaller resolution are available)	1920x1080 + 1280x720 + 640x360 1920x1080 + 1280x720 + 320x240 1920x1080 + 800x600 + 800x600 (All smaller resolution are available)
1.2M	4:3	H.264/H.265/MJPEG	30	1280x960	1280x960 + 1280x960 1280x960 + 1280x720 1280x960 + 800x600 (All smaller resolutions are available)	1280x960 + 1280x960 + 1280x720 1280x960 + 1280x960 + 800x600 1280x960 + 1280x960 + 640x480 1280x960 + 1280x960 + 640x360 1280x960 + 1280x960 + 320x240 1280x960 + 1280x720 + 1280x720 1280x960 + 1280x720 + 640x480 1280x960 + 1280x720 + 640x360 1280x960 + 1280x720 + 320x240 1280x960 + 800x600 + 800x600 (All smaller resolutions are available)
1M	16:9	H.264/H.265/MJPEG	30	1280x720	1280x720 + 1280x720 (All smaller resolutions are available)	1280x720 + 1280x720 + 1280x720 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	30	800x600	800x600 + 800x600 (All smaller resolutions are available)	800x600 + 800x600 + 800x600 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	30	640x480	640x480 + 640x480 (All smaller resolutions are available)	640x480 + 640x480 + 640x480 (All smaller resolutions are available)
1M	16:9	H.264/H.265/MJPEG	30	640x360	640x360 + 640x360 (All smaller resolutions are available)	640x360 + 640x360 + 640x360 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	30	320x240	320x240 + 320x240 (All smaller resolutions are available)	320x240 + 320x240 + 320x240 (All smaller resolutions are available)

Table: Correlations of Resolution/Streams/FPS/Codecs (2 MP models)

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
5M	4:3	H.264/H.265/MJPEG	30	2592x1944	2592x1944 + 1600x1200 2592x1944 + 1440x1080 2592x1944 + 1280x960 2592x1944 + 800x600 2592x1944 + 640x480 2592x1944 + 320x240	2592x1944 + 1600x1200 + 640x480 2592x1944 + 1600x1200 + 320x240 2592x1944 + 1440x1080 + 640x480 2592x1944 + 1440x1080 + 320x240 2592x1944 + 1280x960 + 1280x960 2592x1944 + 1280x960 + 640x480 2592x1944 + 1280x960 + 320x240 2592x1944 + 800x600 + 800x600 2592x1944 + 800x600 + 640x480 2592x1944 + 800x600 + 320x240 2592x1944 + 640x480 + 640x480 2592x1944 + 640x480 + 320x240 2592x1944 + 320x240 + 320x240
3.7M	16:9	H.264/H.265/MJPEG	60/30/30	2560x1440	2560x1440 + 640x360 2560x1440 + 320x180	2560x1440 + 640x360 + 640x360 2560x1440 + 640x360 + 320x180 2560x1440 + 320x180 + 320x180
3.7M	16:9	H.264/H.265/MJPEG	30	2560x1440	2560x1440 + 1920x1080 2560x1440 + 1280x720 2560x1440 + 640x360 2560x1440 + 320x180	2560x1440 + 1920x1080 + 640x360 2560x1440 + 1920x1080 + 320x180 2560x1440 + 1280x720 + 1280x720 2560x1440 + 1280x720 + 640x360 2560x1440 + 1280x720 + 320x180 2560x1440 + 640x360 + 640x360 2560x1440 + 640x360 + 320x180 2560x1440 + 320x180 + 320x180
3M	4:3	H.264/H.265/MJPEG	60/30/30	2048x1536	2048x1536 + 1600x1200	2048x1536 + 1600x1200 + 640x480 2048x1536 + 1600x1200 + 320x240
3M	4:3	H.264/H.265/MJPEG	30	2048x1536	2048x1536 + 2048x1536 2048x1536 + 1600x1200 2048x1536 + 1440x1080 2048x1536 + 1280x960 2048x1536 + 800x600 2048x1536 + 640x480 2048x1536 + 320x240	2048x1536 + 2048x1536 + 1280x960 2048x1536 + 2048x1536 + 800x600 2048x1536 + 2048x1536 + 640x480 2048x1536 + 2048x1536 + 320x240 2048x1536 + 1600x1200 + 1600x1200 2048x1536 + 1600x1200 + 640x480 2048x1536 + 1600x1200 + 320x240 2048x1536 + 1440x1080 + 640x480 2048x1536 + 1440x1080 + 320x240 2048x1536 + 1280x960 + 1280x960 2048x1536 + 1280x960 + 640x480 2048x1536 + 1280x960 + 320x240 2048x1536 + 800x600 + 800x600 2048x1536 + 800x600 + 640x480 2048x1536 + 800x600 + 320x240 2048x1536 + 640x480 + 640x480 2048x1536 + 640x480 + 320x240 2048x1536 + 320x240 + 320x240
3M	16:9	H.264/H.265/MJPEG	60/30/30	2304x1296	2304x1296 + 1920x1080	2304x1296 + 1920x1080 + 640x360 2304x1296 + 1920x1080 + 320x180
3M	16:9	H.264/H.265/MJPEG	30	2304x1296	2304x1296 + 2304x1296 2304x1296 + 1920x1080 2304x1296 + 1280x720 2304x1296 + 640x360 2304x1296 + 320x180	2304x1296 + 2304x1296 + 1920x1080 2304x1296 + 2304x1296 + 1280x720 2304x1296 + 2304x1296 + 640x360 2304x1296 + 2304x1296 + 320x180 2304x1296 + 1920x1080 + 1920x1080 2304x1296 + 1920x1080 + 640x360 2304x1296 + 1920x1080 + 320x180 2304x1296 + 1280x720 + 1280x720 2304x1296 + 1280x720 + 640x360 2304x1296 + 1280x720 + 320x180

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
						2304x1296 + 640x360 + 640x360 2304x1296 + 640x360 + 320x180 2304x1296 + 320x180 +320x180
2M	16:9	H.264/H.265/MJPEG	60/30/30	1920x1080	1920x1080 + 1920x1080	1920x1080 + 1920x1080 + 640x360
2M	16:9	H.264/H.265/MJPEG	60/30/30	1920x1080	1920x1080 + 1920x1080 1920x1080 + 1280x720 1920x1080 + 640x360 1920x1080 + 320x180	1920x1080 + 1920x1080 + 1920x1080 1920x1080 + 1920x1080 + 1280x720 1920x1080 + 1920x1080 + 640x360 1920x1080 + 1920x1080 + 320x180 1920x1080 + 1280x720 + 1280x720 1920x1080 + 1280x720 + 640x360 1920x1080 + 1280x720 + 320x180 1920x1080 + 640x360 + 640x360 1920x1080 + 640x360 + 320x180 1920x1080 + 320x180 + 320x180
2M	4:3	H.264/H.265/MJPEG	60/30/30	1600x1200	1600x1200 + 1600x1200 1600x1200 + 1440x1080 1600x1200 + 1280x960 1600x1200 + 800x600 1600x1200 + 640x480 1600x1200 + 320x240	1600x1200 + 1600x1200 + 1600x1200 1600x1200 + 1600x1200 + 1280x960 1600x1200 + 1600x1200 + 800x600 1600x1200 + 1600x1200 + 640x480 1600x1200 + 1600x1200 + 320x240 1600x1200 + 1440x1080 + 320x240 1600x1200 + 1280x960 + 1280x960 1600x1200 + 1280x960 + 640x480 1600x1200 + 1280x960 + 320x240 1600x1200 + 800x600 + 800x600 1600x1200 + 800x600 + 640x480 1600x1200 + 800x600 + 320x240 1600x1200 + 640x480 + 640x480 1600x1200 + 640x480 + 320x240 1600x1200 + 320x240 + 320x240
1.2M	4:3	H.264/H.265/MJPEG	60/30/30	1280x960	1280x960 + 1280x960 1280x960 + 800x600 1280x960 + 640x480 1280x960 + 320x240	1280x960 + 1280x960 + 1280x960 1280x960 + 1280x960 + 800x600 1280x960 + 1280x960 + 640x480 1280x960 + 1280x960 + 320x240 1280x960 + 800x600 + 800x600 1280x960 + 800x600 + 640x480 1280x960 + 800x600 + 320x240 1280x960 + 640x480 + 640x480 1280x960 + 640x480 + 320x240 1280x960 + 320x240 + 320x240
1M	16:9	H.264/H.265/MJPEG	60/30/30	1280x720	1280x720 + 1280x720 1280x720 + 640x360 1280x720 + 320x180	1280x720 + 1280x720 + 1280x720 1280x720 + 1280x720 + 640x360 1280x720 + 1280x720 + 320x180 1280x720 + 640x360 + 640x360 1280x720 + 640x360 + 320x180 1280x720 + 320x180 + 320x180

Table: Correlations of Resolution/Streams/FPS/Codecs (5 MP models)

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
8M	16:9	H.264/H.265/MJPEG	30	3840X2160	N/A	N/A
8M	16:9	H.264/H.265/MJPEG	15	3840X2160	3840x2160 + 1920x1080 3840x2160 + 1280x960 3840x2160 + 1280x720 3840x2160 + 800x600 (All smaller resolutions are available)	3840x2160 + 1920x1080 + 1920x1080 3840x2160 + 1920x1080 + 640x480 3840x2160 + 1920x1080 + 640x360 3840x2160 + 1920x1080 + 320x240 3840x2160 + 1280x960 + 1280x960 3840x2160 + 1280x960 + 640x480 3840x2160 + 1280x960 + 640x360 3840x2160 + 1280x960 + 320x240 3840x2160 + 1280x720 + 1280x720 3840x2160 + 1280x720 + 640x480 3840x2160 + 1280x720 + 640x360 3840x2160 + 1280x720 + 320x240 3840x2160 + 800x600 + 800x600 (All smaller resolutions are available)
6M	16:9	H.264/H.265/MJPEG	30	3264x1840	3264x1840 + 1920x1080 3264x1840 + 1280x720 3264x1840 + 800x600 (All smaller resolution are available)	3264x1840 + 1280x960 + 640x480 3264x1840 + 1280x960 + 640x360 3264x1840 + 1280x960 + 320x240 3264x1840 + 1280x720 + 1280x720 3264x1840 + 1280x720 + 640x480 3264x1840 + 1280x720 + 640x360 3264x1840 + 1280x720 + 320x240 3264x1840 + 800x600 + 800x600 (All smaller resolution are available)
5M	4:3	H.264/H.265/MJPEG	30	2592x1944	2592x1944 + 1920x1080 2592x1944 + 1280x960 2592x1944 + 1280x720 2592x1944 + 800x600 (All smaller resolutions are available)	2592x1944 + 1920x1080 + 640x480 2592x1944 + 1920x1080 + 640x360 2592x1944 + 1920x1080 + 320x240 2592x1944 + 1280x960 + 640x480 2592x1944 + 1280x960 + 640x360 2592x1944 + 1280x960 + 320x240 2592x1944 + 1280x720 + 1280x720 2592x1944 + 1280x720 + 640x480 2592x1944 + 1280x720 + 640x360 2592x1944 + 1280x720 + 320x240 2592x1944 + 800x600 + 800x600 (All smaller resolutions are available)
4M	16:9	H.264/H.265/MJPEG	30	2688x1520	2688x1520 + 1920x1080 2688x1520 + 1280x960 2688x1520 + 1280x720 2688x1520 + 800x600 (All smaller resolutions are available)	2688x1520 + 1920x1080 + 640x480 2688x1520 + 1920x1080 + 640x360 2688x1520 + 1920x1080 + 320x240 2688x1520 + 1280x960 + 1280x960 2688x1520 + 1280x960 + 640x480 2688x1520 + 1280x960 + 640x360 2688x1520 + 1280x960 + 320x240 2688x1520 + 1280x720 + 1280x720 2688x1520 + 1280x720 + 640x480 2688x1520 + 1280x720 + 640x360 2688x1520+ 1280x720 + 320x240 2688x1520 + 800x600 + 800x600 (All smaller resolutions are available)

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
3M	4:3	H.264/H.265/MJPEG	60	2048x1536	N/A	N/A
3M	4:3	H.264/H.265/MJPEG	30	2048x1536	2048x1536 + 2048x1536 2048x1536 + 1920x1080 2048x1536 + 1280x960 2048x1536 + 1280x720 2048x1536 + 800x600 (All smaller resolutions are available)	2048x1536 + 2048x1536 + 1280x720 2048x1536 + 2048x1536 + 800x600 2048x1536 + 2048x1536 + 640x480 2048x1536 + 2048x1536 + 640x360 2048x1536 + 2048x1536 + 320x240 2048x1536 + 1920x1080 + 1920x1080 2048x1536 + 1920x1080 + 640x480 2048x1536 + 1920x1080 + 640x360 2048x1536 + 1920x1080 + 320x240 2048x1536 + 1280x960 + 1280x960 2048x1536 + 1280x960 + 640x480 2048x1536 + 1280x960 + 640x360 2048x1536 + 1280x960 + 320x240 2048x1536 + 1280x720 + 1280x720 2048x1536 + 1280x720+ 640x480 2048x1536 + 1280x720 + 640x360 2048x1536 + 1280x720 + 320x240 2048x1536 + 800x600 + 800x600 (All smaller resolutions are available)
2M	16:9	H.264/H.265/MJPEG	30	1920x1080	1920x1080 + 1920x1080 1920x1080 + 1280x960 1920x1080 + 1280x720 1920x1080 + 800x600 (All smaller resolutions are available)	1920x1080 + 1920x1080 + 1920x1080 1920x1080 + 1920x1080 + 1280x960 1920x1080 + 1920x1080 + 1280x720 1920x1080 + 1920x1080 + 800x600 1920x1080 + 1920x1080 + 640x480 1920x1080 + 1920x1080 + 640x360 1920x1080 + 1920x1080 + 320x240 1920x1080 + 1280x960 + 1280x960 1920x1080 + 1280x960 + 640x480 1920x1080 + 1280x960 + 640x360 1920x1080 + 1280x960 + 320x240 1920x1080 + 1280x720 + 1280x720 1920x1080 + 1280x720 + 640x480 1920x1080 + 1280x720 + 640x360 1920x1080 + 1280x720 + 320x240 1920x1080 + 800x600 + 800x600 (All smaller resolutions are available)
2M	16:9	H.264/H.265/MJPEG	60/30/30	1920x1080	1920x1080 + 1920x1080 1920x1080 + 1280x960 1920x1080 + 1280x720 1920x1080 + 800x600 (All smaller resolutions are available)	1920x1080 + 1920x1080 + 1280x960 1920x1080 + 1920x1080 + 1280x720 1920x1080 + 1920x1080 + 800x600 1920x1080 + 1920x1080 + 640x480 1920x1080 + 1920x1080 + 640x360 1920x1080 + 1920x1080 + 320x240 1920x1080 + 1280x960 + 1280x960 1920x1080 + 1280x960 + 640x480 1920x1080 + 1280x960 + 640x360 1920x1080 + 1280x960 + 320x240 1920x1080 + 1280x720 + 1280x720 1920x1080 + 1280x720 + 640x480 1920x1080 + 1280x720 + 640x360 1920x1080 + 1280x720 + 320x240 1920x1080 + 800x600 + 800x600 (All smaller resolutions are available)
1.2M	4:3	H.264/H.265/MJPEG	60/30/30	1280x960	1280x960 + 1280x960 1280x960 + 1280x720 1280x960 + 800x600 (All smaller resolutions are available)	1280x960 + 1280x960 + 1280x720 1280x960 + 1280x960 + 800x600 1280x960 + 1280x960 + 640x480 1280x960 + 1280x960 + 640x360 1280x960 + 1280x960 + 320x240

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
						1280x960 + 1280x720 + 1280x720 1280x960 + 1280x720 + 640x480 1280x960 + 1280x720 + 640x360 1280x960 + 1280x720 + 320x240 1280x960 + 800x600 + 800x600 (All smaller resolutions are available)
1M	16:9	H.264/H.265/MJPEG	60/30/30	1280x720	1280x720 + 1280x720 (All smaller resolutions are available)	1280x720 + 1280x720 + 1280x720 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	60/30/30	800x600	800x600 + 800x600 (All smaller resolutions are available)	800x600 + 800x600 + 800x600 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	60/30/30	640x480	640x480 + 640x480 (All smaller resolutions are available)	640x480 + 640x480 + 640x480 (All smaller resolutions are available)
1M	16:9	H.264/H.265/MJPEG	60/30/30	640x360	640x360 + 640x360 (All smaller resolutions are available)	640x360 + 640x360 + 640x360 (All smaller resolutions are available)
1M	4:3	H.264/H.265/MJPEG	60/30/30	320x240	320x240 + 320x240 (All smaller resolutions are available)	320x240 + 320x240 + 320x240 (All smaller resolutions are available)

Table: Correlations of Resolution/Streams/FPS/Codecs (8 MP models)

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
12M	4:3	H.264/ H.265	20	4000x3000	NA	NA
12M	4:3	H.264/ H.265/ MJPEG	15	4000x3000	4000x3000 + 1280x960 4000x3000 + 960x960 (All smaller resolutions are available)	4000x3000 + 1280x960 + 1280x960 4000x3000 + 1280x960 + 600x600 4000x3000 + 1280x960 + 640x480 4000x3000 + 1280x960 + 480x480 4000x3000 + 1280x960 + 320x240 4000x3000 + 1280x960 + 240x240 4000x3000 + 960x960 + 960x960 4000x3000 + 960x960 + 600x600 4000x3000 + 960x960 + 640x480 4000x3000 + 960x960 + 480x480 4000x3000 + 960x960 + 320x240 4000x3000 + 960x960 + 240x240 4000x3000 + 800x600 + 800x600 (All smaller resolutions are available)
9M	1:1	H.264/ H.265/ MJPEG	20	3000x3000	3000x3000 + 1536x1536 3000x3000 + 1280x960 (All smaller resolutions are available)	3000x3000 + 1536x1536 + 600x600 3000x3000 + 1536x1536 + 640x480 3000x3000 + 1536x1536 + 480x480 3000x3000 + 1536x1536 + 320x240 3000x3000 + 1536x1536 + 240x240 3000x3000 + 1280x960 + 1280x960 3000x3000 + 1280x960 + 600x600 3000x3000 + 1280x960 + 640x480 3000x3000 + 1280x960 + 480x480 3000x3000 + 1280x960 + 320x240 3000x3000 + 1280x960 + 240x240 3000x3000 + 960x960+ 960x960 3000x3000 + 960x960+ 600x600 3000x3000 + 960x960+ 640x480 3000x3000 + 960x960+ 480x480 3000x3000 + 960x960 + 320x240 3000x3000 + 960x960 + 240x240 3000x3000 + 800x600 + 800x600 (All smaller resolutions are available)
5M	4:3	H.264/ H.265/ MJPEG	30	2592x1944	2592x1944 + 1536x1536 2592x1944 + 1280x960 (All smaller resolutions are available)	2592x1944 + 1536x1536 + 600x600 2592x1944 + 1536x1536 + 640x480 2592x1944 + 1536x1536 + 480x480 2592x1944 + 1536x1536 + 320x240 2592x1944 + 1536x1536 + 240x240 2592x1944 + 1280x960 + 1280x960 2592x1944 + 1280x960 + 600x600 2592x1944 + 1280x960 + 640x480 2592x1944 + 1280x960 + 480x480 2592x1944 + 1280x960 + 320x240 2592x1944 + 1280x960 + 240x240 2592x1944 + 960x960+ 960x960 2592x1944 + 960x960+ 600x600 2592x1944 + 960x960+ 640x480 2592x1944 + 960x960+ 480x480 2592x1944 + 960x960 + 320x240 2592x1944 + 960x960 + 240x240 2592x1944 + 800x600 + 800x600 (All smaller resolutions are available)

Resolution	Aspect Ratio	Codec	FPS	Single Stream	Dual Stream	Triple Stream
3.7M	1:1	H.264/ H.265/ MJPEG	30	1944x1944	1944x1944 + 1944x1944 1944x1944 + 2048x1536 (All smaller resolutions are available)	1944x1944 + 1944x1944 + 800x600 1944x1944 + 1944x1944 + 600x600 1944x1944 + 1944x1944 + 640x480 1944x1944 + 1944x1944 + 480x480 1944x1944 + 1944x1944 + 320x240 1944x1944 + 1944x1944 + 240x240 1944x1944 + 2048x1536 + 600x600 1944x1944 + 2048x1536 + 640x480 1944x1944 + 2048x1536 + 480x480 1944x1944 + 2048x1536 + 320x240 1944x1944 + 2048x1536 + 240x240 1944x1944 + 1536x1536 + 600x600 1944x1944 + 1536x1536 + 640x480 1944x1944 + 1536x1536 + 480x480 1944x1944 + 1536x1536 + 320x240 1944x1944 + 1536x1536 + 240x240 1944x1944 + 1280x960 + 1280x960 1944x1944 + 1280x960 + 600x600 1944x1944 + 1280x960 + 640x480 1944x1944 + 1280x960 + 480x480 1944x1944 + 1280x960 + 320x240 1944x1944 + 1280x960 + 240x240 1944x1944 + 960x960+ 960x960 1944x1944 + 960x960+ 600x600 1944x1944 + 960x960+ 640x480 1944x1944 + 960x960+ 480x480 1944x1944 + 960x960 + 320x240 1944x1944 + 960x960 + 240x240 1944x1944 + 800x600 + 800x600 (All smaller resolutions are available)
3M	4:3	H.264/ H.265/ MJPEG	30	2048x1536	2048x1536 + 2048x1536 2592x1944 + 1536x1536 (All smaller resolutions are available)	2048x1536 + 2048x1536 + 1280x960 2048x1536 + 2048x1536 + 960x960 2048x1536 + 2048x1536 + 800x600 2048x1536 + 2048x1536 + 600x600 2048x1536 + 2048x1536 + 640x480 2048x1536 + 2048x1536 + 480x480 2048x1536 + 2048x1536 + 320x240 2048x1536 + 2048x1536 + 240x240 2048x1536 + 1536x1536 + 600x600 2048x1536 + 1536x1536 + 640x480 2048x1536 + 1536x1536 + 480x480 2048x1536 + 1536x1536 + 320x240 2048x1536 + 1536x1536 + 240x240 2048x1536 + 1280x960 + 1280x960 2048x1536 + 1280x960 + 600x600 2048x1536 + 1280x960 + 640x480 2048x1536 + 1280x960 + 480x480 2048x1536 + 1280x960 + 320x240 2048x1536 + 1280x960 + 240x240 2048x1536 + 960x960 + 960x960 2048x1536 + 960x960 + 600x600 2048x1536 + 960x960 + 640x480 2048x1536 + 960x960 + 480x480 2048x1536 + 960x960 + 320x240 2048x1536 + 960x960 + 240x240 2048x1536 + 800x600 + 800x600 (All smaller resolutions are available)

Table: Correlations of Resolution/Streams/FPS/Codecs (12 MP models)

1.2 Dewarp for V2360W Panoramic Camera Only

Dewarp, a process of perspective correction of an image, to reverse the effects of geometric distortions caused by the camera lens. According the mounting type, the algorithm of Dewarp will process image properly.

Figure: Dewarp Setting

Basic Setting

Type: Wall Mount/Ceiling Mount

- Ceiling Mount: Supports panoramic manipulation in panoramic display mode and dual panoramic display mode so that user can scroll the panoramic screen and provides broader range for ePTZ manipulation.
- Wall Mount: Dual panoramic display mode is not provided, and user cannot scroll panoramic screen. Additionally, the ePTZ manipulation has limited range relatively.

2. Image

2.1 Exposure

This section allows user to control the settings pertaining to exposure mode and day/night modes.

Basic Settings

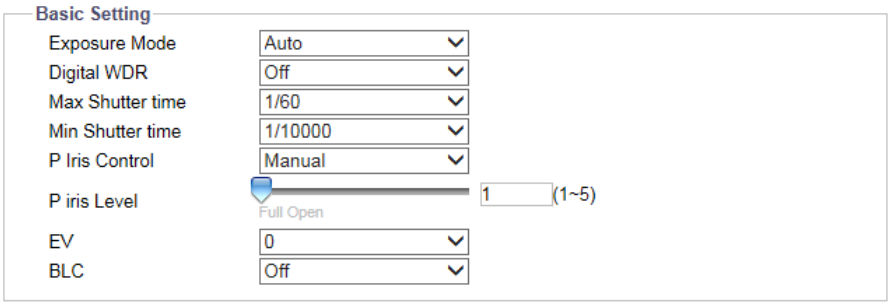


Figure: Exposure Basic Settings

Exposure Mode: Auto/Flickerless/Shutter Priority/Manual/True WDR

There are 5 modes to select from, which are described below.

- Auto: With certain pre-settings, before taking videos, the camera automatically determines the correct exposure for pictures without user input settings.
- Flickerless: This mode allows camera to override the shutter speed, which helps to avoid interference of fluorescent lights in some environments.
- Shutter Priority: It enables user to select a specific shutter speed for adjustment of aperture, ensuring a correct and proper exposure.
- Manual: A mode that allows user to manually control both gain value and shutter speed. It is recommended that only an experienced administrator use this mode.
- True WDR: This technology is intended to provide clear images even under backlight circumstances where intensity of illumination can vary widely, for example when both extreme bright and dark areas exist simultaneously in field of view. True WDR is a sensor-based technology that achieves proper exposure levels by capturing short and long exposures individually and combining them into a single frame to render a superior detail of image quality. Note that when True WDR is enabled, the maximum frame rate will be automatically decreased to 30fps if it was selected above 30fps originally.

DC Iris Control: Auto/Full

DC Iris Control, driven by electric currents, is one of the auto iris modes that helps the surveillance camera to automatically adjust its iris opening for better adaptation to environments with constant changes in light levels. There are 2 options below for selection:

- Auto: Iris opening will automatically change in accordance with the changing light levels within the current environment to present a better image quality.
- Full: Iris opening will be kept within the maximum value regardless of light levels in environment.

P Iris Control: Auto/Manual

More advanced than DC Iris, P Iris, with built-in stepper motor, assists camera to regulate the iris position precisely by considering volatile light conditions, thereby optimizing a result of crisp image with better depth of field. Two 2 options are available for selection as below:

- Auto: Iris position will automatically adjust accurately in accordance with the fluctuating light intensities within the current environment to display the best image quality.
- Manual: 1~5. Iris position will be kept within the selected level. 1 is for the fully open status, while 5 represents the minimum level for iris position.

EV: -2 ~ 2

This is the exposure compensation that makes the scenes either darker or brighter. Positive number provides the brighter image, while negative number provides the darker image.

Note	•	EV is NOT available when exposure mode “Manual” is selected.

BLC: Off/Upper/Lower/Central (1/3rd)/Central (1/6th)/Left/Right

Set an area for Backlight Compensation. Backlight Compensation is a function that sets the brightness of a selected area to optimal image level. This function is necessary when an autoiris lens closes quickly due to an intense light behind the object in the area being viewed, resulting in a display that is too dark and difficult to see. In this case, users can set the area corresponding to the area of the scene being viewed. The area size illustrations are as follows.

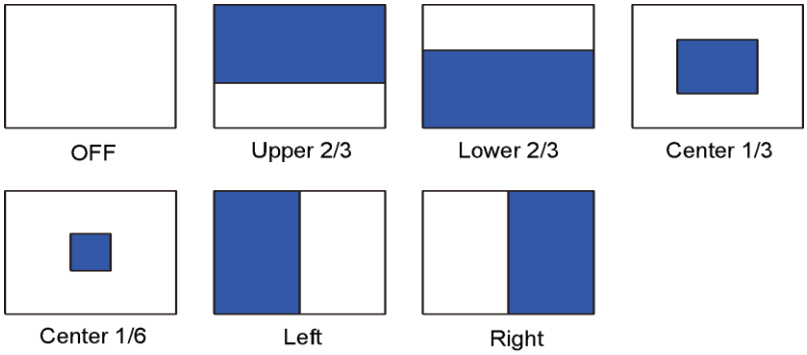


Figure: BLC Settings Illustrations

Note	•	BLC is NOT available when exposure mode “Manual” is selected.

Frequency: 50HZ/60HZ

In some cases, indoor lighting causes flickering; adjust the frequency to the power line frequency.

Note	•	Frequency is only available when exposure mode “Flickerless” is selected.

Digital WDR: High/Mid/Low/Off

In contrast to True WDR sensor-based technology, Digital WDR is based on a software algorithm that optimizes image quality by adjusting the gamma value. This facilitates better quality of details within both bright and dark areas in a way that there are clear details in both extreme areas; so that bright areas are not saturated and dark areas are not too murky. Select Off or Low/Mid/High.

Shutter Speed: 1/10000 ~ 1/7.5

Selecting 1/10000 provides the fastest shutter speed.

Note	•	Shutter Speed is only available when exposure mode is “Shutter Priority” or “Manual”.

Gain: 0 ~ 36

The larger the value, the more intensity of light comes into the camera and vice versa.

Note	•	Gain is only available when exposure mode “Manual” is selected.

Max Shutter Time: 1/8000 ~ 1

Select the maximum shutter time.

Note	•	Max Shutter Time is only available when exposure mode “Auto” is selected.

Min Shutter Time: 1/10000 ~ 1/120

Select the minimum shutter time.

Note	•	Min Shutter Time is only available when exposure mode “Auto” is selected.

Enhanced WDR Level: High/Mid/Low/Off

Similar to Digital WDR in some ways, Enhanced WDR, available when “True WDR” in Exposure Mode is activated, this facilitates better quality of details within both bright and dark areas, further strengthening and reinforcing the optimal image result based on perfect combination of both True WDR and Enhanced WDR. Selecting “High” provides the best enhancement of WDR level.

Day Night Settings

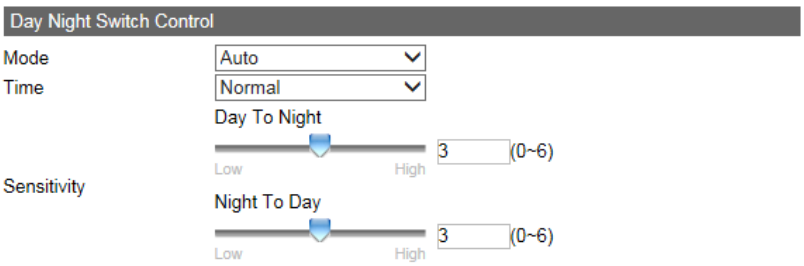


Figure: Day Night Switch Control Settings

Day Night Switch Control – Mode: Auto/Color/B/W

When Color mode is selected, the camera is forced to stay in Color mode permanently. Similarly, the camera stays in black-and-white mode when B/W is selected. Auto lets the camera switch between the two modes automatically, based on the light intensity.

Note	•	Only Color and B/W options are available when exposure mode “Manual” is selected.

Day Night Switch Control – Time: Fast/Normal/Slow

To set the delay (buffered) time for switching between day and night modes. Fast means camera instantly switches with nearly no delay time between day/night mode. Slow means camera has a longer delay buffered time prior to switching between day/night modes. Normal is between these two extremes.

Note	• Day Night Switch Control – Time is NOT available when exposure mode “Manual” is selected.

Day Night Switch Control – Sensitivity: Day to Night (0 ~ 6)/Night to Day (0 ~ 6)
This determines the sensitivity of the day/night mode switching mechanism. A larger value (High) means camera can auto switch from day to night or night to day mode based on minor light intensity change. Conversely, a smaller value (Low) indicates camera is going to switch from day to night or night to day mode based on major changes of surrounding light intensity.

Note	• Day Night Switch Control – Sensitivity is NOT available when exposure mode “Manual” is selected.

Lens Type (V2008 Box Camera only)

Select a lens type corresponding to mounted lens to perform the advantages from different iris controls. Note that the previous iris control mode will vary according to the option selected here.

Figure: Lens Type Settings

None Iris
Used when the mounted lens does not support either DC Iris or P Iris functionalities. This option is the entry selection for common lens type without advanced iris control mode.

DC Iris
Once DC Iris is selected, the DC Iris Control above will appear for iris adjustment.

P Iris
It is required to choose a compatible lens model from the dropdown menu once P Iris is selected. The P Iris Control above will appear for adjustment correspondingly. Note that full P Iris functionalities can take effect only when supported lens is mounted.

IR Control

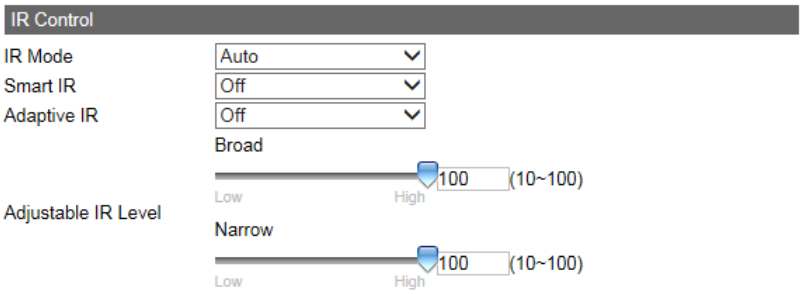


Figure: IR Control Settings

IR Mode: Auto/On/Off
Select “On” to enable IR LED permanently and select “Auto” to let camera switch IR LED on or off based on light intensity of different applications. Choose “Off” to turn off IR LED.

Smart IR: On/Off

Smart IR technology was developed via an intelligent algorithm to keep close objects from overexposure effect under low-light environment. Turn "On" Smart IR function to have camera dynamically adjust the shutter speed as well as the sensor gain to prevent overexposure. Additionally, digital WDR will be automatically activated to preserve the details on the dark area, if necessary.

Adaptive IR: On/Off

Adaptive IR, via built-in multiple groups of IR LEDs that are able to cover different angles from diversified field of views, is a cutting-edge technology practical for cameras with a motorized lens that generally have a common problem of uneven IR intensity in variable focal length. Select "On" to let camera adjust adaptive IR intensity automatically, whereas choosing "Off" will make the IR level adjustable bar display below.

Adjustable IR Level: Low/High (0~100)

User can click and drag to an adaptive IR intensity from "Low" to "High" level or. Also enter an exact value into the field for a specific IR intensity.

Notes	• IR Control is NOT available in Box model; check "Appendix: Product Comparison-IR Control" for details. • Adaptive IR function is supported in motorized lens models; check "Appendix: Product Comparison-IR Control" for details.

2.2 White Balance

This section allows user to set the white balance values to meet ambient conditions for best color rendition.

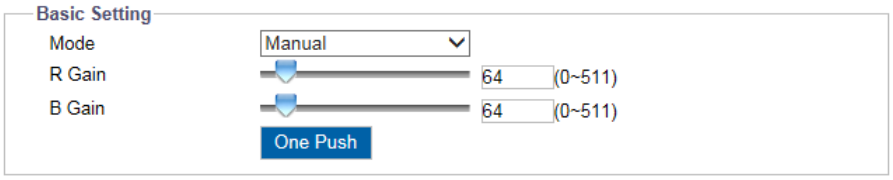


Figure: White Balance Settings

Basic Setting

Mode: Auto/ATW/Manual

- Auto: Continuously adjusts the camera color balance in accordance with any change in color temperature simultaneously.
- ATW: "Auto Tracing White Balance" automatically controls color temperature ranging from 2500°K to 10000°K.
- Manual - R Gain/B Gain: 0~511/One Push

R Gain/B Gain: 0 ~511

Allows users to adjust red color and blue color in the image.

One Push:

Click this button to make the camera rapidly adjust to the proper gain values depending on the ambient environment.

2.3 Basic Setting

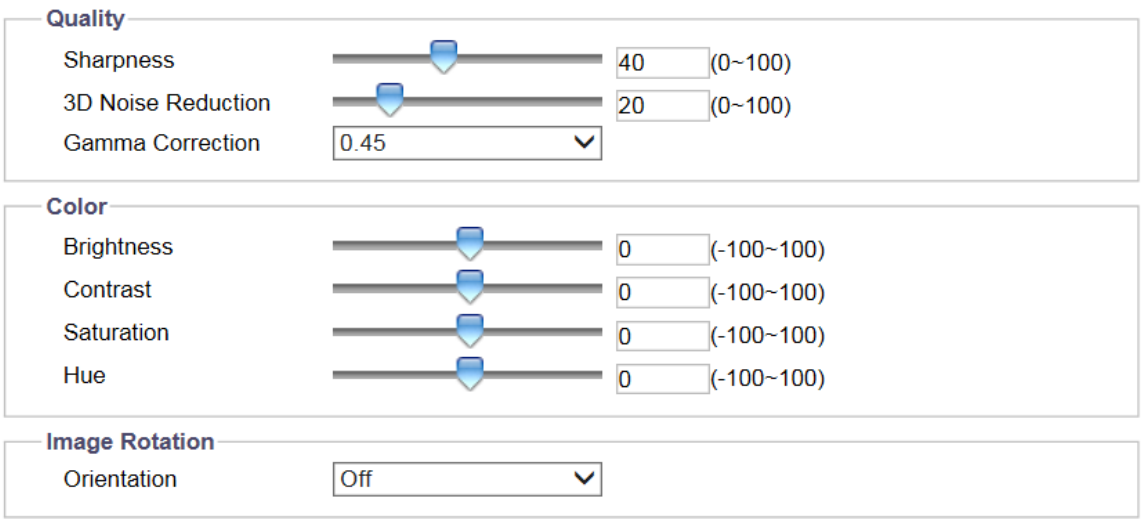


Figure: Basic Settings

Quality

Sharpness: 0 ~ 100

Increasing the sharpness value will define the edges and small features of viewing images. If the edges appear too smooth or blurred, increase the sharpness. Selecting higher value provides the sharper image.

3D Noise Reduction: 0 ~ 100

This is the process of removing noises from a signal and can be set to decrease noise on the screen. Selecting higher value provides the higher effect of noise reduction.

Gamma Correction: 1/0.45

Gamma correction is important for an image to display accurately when it is being viewed on different monitor screens. Set gamma correction between 1 and 0.45 for better rendition in varied screens.

Color

Item	Option/ Range	Description
Brightness	-100 ~ 100	Selecting the higher value provides the brighter image.
Contrast	-100 ~ 100	Selecting the higher value provides the higher contrast image.
Saturation	-100 ~ 100	Decreasing saturation brings the image closer to a grayscale (monochrome) image. Selecting 100 provides the highest image saturation.
Hue	-100 ~ 100	Selecting the higher value provides the deeper hue effect.

Image Rotation

The image can be rotated 180 or 270 degrees when that selected from the dropdown. When corridor mode is enabled, the image will rotate 270 degrees.

Orientation: Off/Flip

- Off: Disable video orientation function.
- 180°/270° Flip: Vertically change the display of the video.

3. Lens Control

3.1 Lens Control/Back Focus

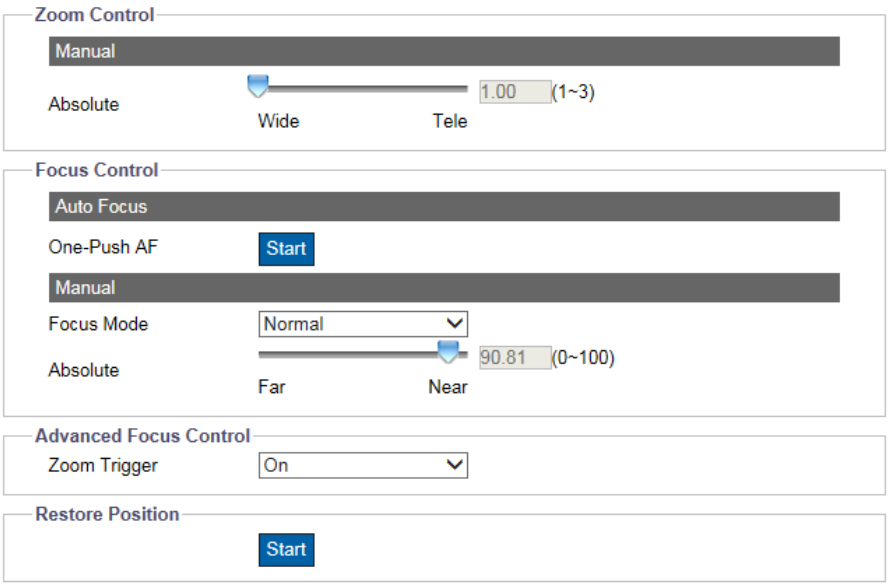


Figure: Lens Control/Back Focus Settings

Zoom Control

Absolute: 1 ~ 3

By dragging the bar for Manual Zoom Control, user can adjust lens zoom view between zoom in (Tele).and zoom out for a view of wide angle (Wide). The number at the right corner indicates the current zoom magnification, and a specific number can be entered there as well. Selecting 3 provides the highest magnification.

Focus Control

One-Push AF: Start

One-Push Auto focus is typically found in dome and bullet cameras with motorized lenses. The camera moves the lens during the autofocus process. Click “Start” to have the lens automatically and immediately focus.

Note	• One-Push AF is supported by motorized lens models; check “Appendix: Product Comparison-Lens Control” for details.

Manual

Focus Mode: Normal/Advanced

There are 2 options in the dropdown menu for selection of manual focus control, Normal and Advanced.

- Normal: The “Absolute” option below is designed for user to manually drag and adjust the bar to an appropriate back focus setting. “Near” is for close-up view, while “Far” goes with wide angle view. Adjust it based on the zoom magnification of lens for a proper back focus. The number at the right corner indicates the current back focus value; a specific number can be entered here as well.

- Advanced: Due to a defocus issue that sometimes occurs between day and night mode switch, the “Day Position” and “Night Position” sections here allow user to precisely define a specific value for back focus settings on both day mode and night mode individually, thereby improving the accuracy of back focus for different times on a large scale.

Step Control

There are 3 levels for step control; each level indicates the number of steps of every focus movement. For example, with level 1, every focus will move one step; with level 2, each focus will move 5 steps.

Advanced Focus Control

Zoom Trigger: On/Off

Due to the quick changes of surrounding light intensity between day and night environments, the lens focus will be affected by a certain amount. Selecting “On” has the focus update automatically based on the changes that occurred from day to night mode or vice versa.

Restore Position: Start

Click “Start” to restore the zoom magnification and focus of lens back to its default settings.

Note	• Lens Control section is supported only by motorized lens; check “Appendix: Product Comparison-Lens Control” for details.

Auto Back Focus (ABF)

This feature enables camera to adjust back focal length automatically. Currently, there are two different designs for ABF:

- Web interface one-key auto back focus.
- Press/Push the ABF button on back panel of camera.

Note	• Back Focus section is only available in V2008 box camera, and it only supports Focus Control, Restore Position and ABF functions. Check “Appendix: Product Comparison-ABF Control” for details.

4. Video

4.1 Privacy Zone

Privacy Zone enables user to block out a specific portion of the screen for privacy concerns. It must apply on all streams, TV output, and live view and it should not affect the motion detection behavior. There are up to 8 privacy zones for users to define. After setting up a privacy zone, the live view image will appear with a frame in the area; the color, size and position of the privacy zone can be customized by user's preference.

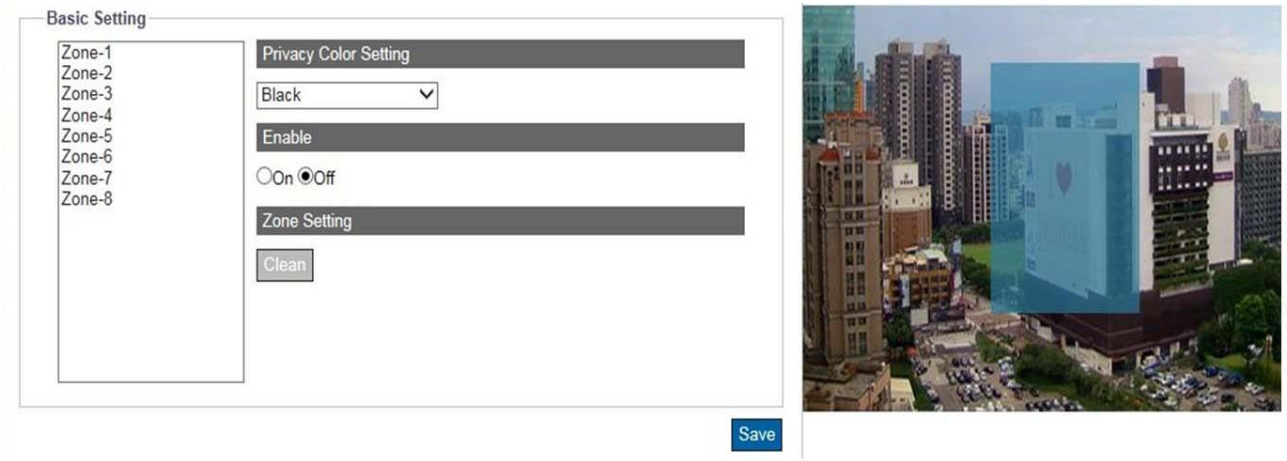


Figure: Privacy Zone Setting

To set up a privacy zone, user needs first Enable the privacy zone by clicking On. Select any of the eight privacy zones available; the cursor will change to a cross mark to draw the privacy area on the live scene. To adjust the privacy mask size, left click and drag outline to a desired privacy frame. Also, user can select a desired color (Black, Gray or White) for privacy zone. Press "Save" to make settings take effect. If you want to delete settings, click "Clean" to wipe out privacy zone settings.

Notes	• Be sure to set the privacy zone slightly larger than the actual area to ensure privacy concern.

4.2 Enhanced Codec

Enhanced codec is a method to keep low bitrate when H.264 is selected. The implementation of enhanced codec depends upon 2 key ideas.

Dynamic ROI: This is used for the camera to dynamically adjust compression based on what it believes is of interest in the scene. For example, the camera would be able to detect objects and identify which objects require higher or lower compression levels. The function is designed to reduce the bandwidth by decreasing the image quality on the static or irrelevant area within the whole scene.

Dynamic GOP: Adaptive GOP size. Comparing the average-sampling of current standard fixed GOP structure with dynamic GOP, the camera has great freedom in I-, P- and B-frame selection. The dynamic GOP structure keeps temporal important information of frames in the encoded video, which helps in adaptation to bandwidth decrease and temporal-SNR quality tradeoff decision. It also helps in storing more information with restricted resources, resulting in increasing code efficiency and better user perception.

The Enhanced Codec technology features the both iZone and iStream technologies to not only economically distribute leverage between different regions and compression levels, but also effectively reduce the average bit rate to level down the overall bandwidth usage, as the following explains.

Basic Setting

iZone

iZone is a feature that utilizes the intelligent algorithm to place diverse compression levels on different areas while retaining the target bitrate. By enabling this feature, user can designate a customized zone, which will be compressed less to enhance the clear image quality within the zone, while the undefined zone, being less important, will be sacrificed for image quality by higher compression ratio.

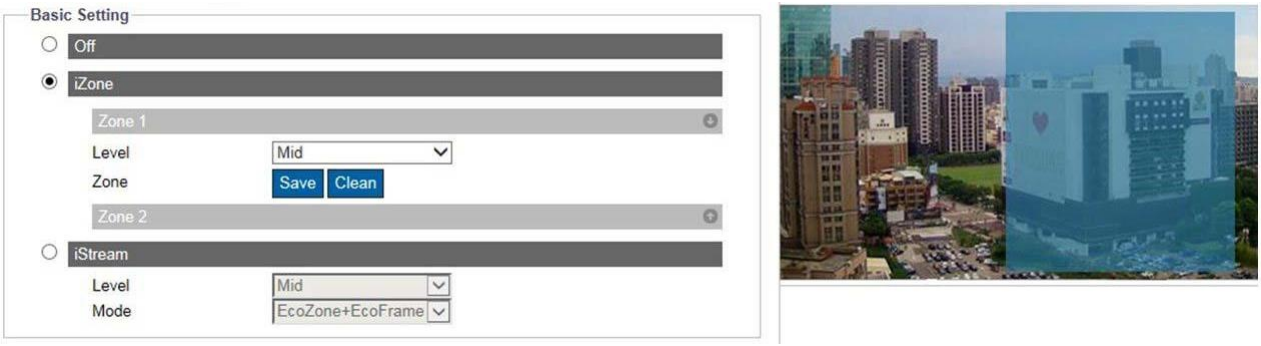


Figure: iZone Settings

First, click iZone to turn on one or both Zones. On the preview image, the cursor changes to a cross icon; left click and drag to outline a desired zone. User can select a level for each Zone. High level means higher image quality and lower compression in the Zone. Press “Save” to make settings take effect. To delete settings, click “Clean” to wipe out the selected Zone settings.

iStream

This is a groundbreaking technology that helps save network bandwidth efficiently while maintaining the clear image quality for critical image details based on the 2 cutting-edge features. Click iStreams to enable the features as follows:

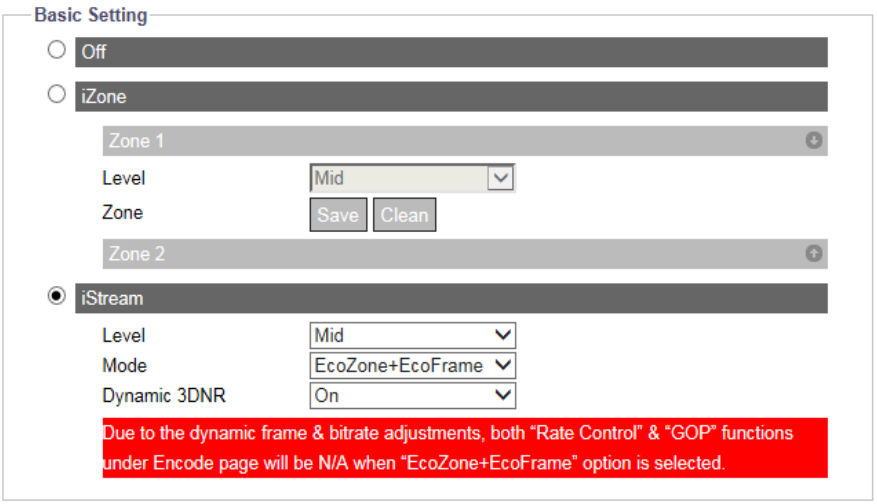


Figure: iStream Settings

- EcoZone

As opposed to iZone, the “EcoZone” can swiftly identify dynamic motion that occurred within a scene and retain its details with clear quality, whereas the rest of the areas, e.g., static background, will have a higher compression level, resulting in economically decreasing bandwidth on less important things but keeping the dynamic motion details for future forensic purpose. The intensity for EcoZone can be defined by the “Level” dropdown menu. High level means higher image quality and lower compression in the Zone.

- EcoFrame

Under Mode, select EcoFrame or EcoZone + EcoFrame. By enabling the proprietary EcoFrame function, the overall bitrate, i.e., bandwidth utilization, will be reduced even further. When less motion occurs within a scene, e.g., in a storeroom, I-frame number, which is needed when motion is in a scene, will be drastically reduced by EcoFrame activation. Based on divergent complexity of scenes and motion occurred, a large amount of bandwidth saving can be achieved to deliver a compact yet valuable performance on bandwidth utilization. Note that it is necessary to enable both EcoZone & EcoFrame functions simultaneously by selecting the option “EcoZone + EcoFrame,” since EcoFrame is an enhancing technology that is based on EcoZone to promote the overall large-scale efficiency. High level means higher image quality and lower compression in the Zone.

Notes	• Due to the attribute of dynamic bitrate management, “Rate Control” options (CBR, CVBR and VBR) under Encode page are NOT available when “EcoZone” function is activated. • Due to the dynamic frame & bitrate adjustments, both “Rate Control” & “GOP” options under Encode page are NOT available when “EcoZone + EcoFrame” function is enabled.

- Dynamic 3DNR

While 3DNR allows user to adjust noise reduction level manually, dynamic 3DNR dynamically and automatically adjusts to the best noise reduction level according to the amount of noise on the image. Lux level change is what triggers changes in noise reduction level for dynamic 3DNR. Higher lux activates smaller noise reduction level.
Be aware that using Dynamic 3DNR in a scene that contains motion may result in blurred image. When Dynamic 3DNR function is “On” the 3DNR function under Image will become unavailable.

5. Network

5.1 General

This section allows user to set detailed settings related to wired network condition for the camera.

Basic Settings

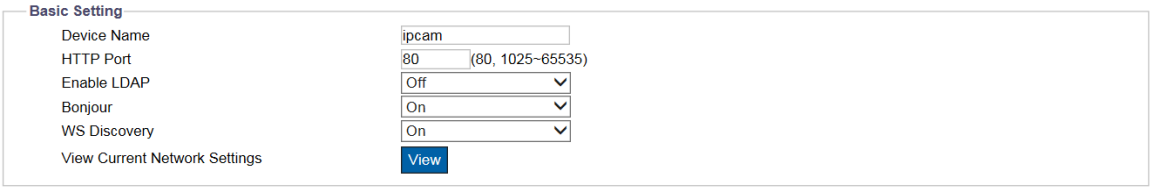


Figure: Network Basic Settings

HTTP Port: 1025 ~ 65535

This protocol allows for TCP protocol quality without having to open specific ports for streaming. User using a firewall can utilize this protocol to allow streaming data through it. It is recommended to use the default port number 80; however, if it is required to change the port number, contact your system administrator.

Enable LDAP: On/Off

For accessing and maintaining distributed directory information services over an Internet Protocol network, the Lightweight Directory Access Protocol (LDAP), an open, vendor-neutral, industry standard application protocol, has a major role in both intranet and internet applications to facilitate information sharing between devices.

Bonjour: On/Off

Bonjour is a specific protocol introduced by Apple Inc. to make IP devices, including IP cameras, easily found by software like Safari within local network based on zero configuration.

WS Discovery: On/ Off

WS-Discovery (Web Services Dynamic Discovery) is a mechanism that supports probing a network to find ONVIF capable devices.

View Current Network Settings: View

Click “View” to see your current network related settings.

IP Settings

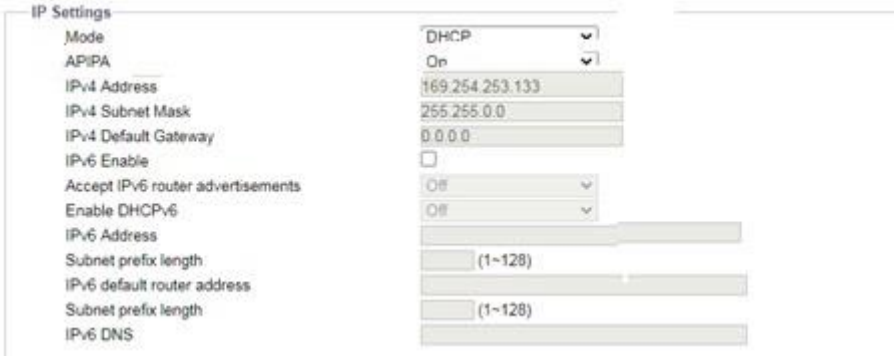


Figure: Network IP Settings

Description of IP Settings

Item	Option/ Range	Description
Mode	Manual	User can manually input IP address and the related settings.
	PPPoE	This is a point-to-point-based protocol that offers authentication, encryption and compression. It authenticates user with the predefined username and password.
	DHCP	The camera will automatically obtain an available dynamic IP address from the DHCP server each time it connects to the LAN.
APIPA	On/Off	APIPA (Automatic Private IP Addressing) helps reserve a certain address block for link-local addressing, which is very practical for assigning an IP address automatically for cameras when DHCP is not available within the connected internet environment.
IPv4 Address		Manually set an IP address under IPv4.
IPv4 Subnet Mask		Use default address: 255.255.255.0. If subnet mask is not properly configured, the unit may not be able to communicate with other devices.
IPv4 Default Gateway		Leave blank as default setting. No Default Gateway address required if not used. Ask your network administrator for further information.
Primary DNS		Same as above.
Secondary DNS		Same as above.
IPv6	Enable/ Disable	Enable/Disable IPv6 protocol.
Accept IPv6 router advertisements	On/Off	Check the box to activate RA (Router Advertisement) corresponding to RS (Router Solicitation) for IPv6 address designation.
Enable DHCPv6	On/Off	If enabled, the camera will automatically obtain an available dynamic IP address under IPv6 protocol from the DHCP server each time it connects to the LAN.

IPv6 Address		Manually set an IP address under IPv6 protocol.
Subnet prefix length	1 ~ 128	Set prefix length for subnet.
IPv6 default router address		Manually set a default router address under IPv6 protocol.
Subnet prefix length	1 ~ 128	Set prefix length for subnet.
IPv6 DNS		Set a DNS (Domain Name Server) under IPv6 protocol.

Wired Setting

Speed & Duplex: Auto/10 or 100 Half Duplex/10 or 100 Full Duplex
Due to the collision issue, Half Duplex can only send or receive information at one time, while Full Duplex is able to receive and transmit in full line rate simultaneously without the issue of collision. For the Mbps number, the larger the number, the faster the results; the smaller the number, the slower the results. “Auto” simply lets the camera to decide which mode to use.

UPnP

Enable UPnP: On/Off
When UPnP (Universal Plug & Play) is “On,” a device can be detected automatically by any computer in the LAN to skip the installation of the IP Toolbox utility.

Mode: IP and Device Name/Device Name/User Input
When the camera connects with the LAN, select one of the modes below for identification:

- IP and Device Name: The device name and IP address will be shown simultaneously.
- Device Name: Only device name will be shown.
- User Input: User can input a user-friendly customized name for the camera.

SSL

Enable SSL: On/Off
Turn Secure Sockets Layer (SSL) on to enable communication security mechanism over internet network.

5.2 FTP Server

FTP (File Transfer Protocol), transferring files via TCP-based network like the Internet, is a generally standard protocol that is adopted to transmit computer files from one host to another.
The camera can act as both FTP Server and FTP Client. This section describes how to use the camera as FTP Server while 8. Event Source section (Handlers → Snapshot: Store to Edge/Store to FTP) describes how to use the camera as FTP Client.

Basic Setting

Figure: FTP Settings

Enable: On/ Off

User can enable or disable FTP server by selectin On or Off from the dropdown.

Port: 21/1025 ~ 65535

Input a value or 21 by default into the port field to activate the FTP server function.

The login ID and password are shared with the user account, which can be changed by modifying the username and password of the user account.

- SD card access:

If the FTP Server is enabled, a user on a remote client can access files (video/image recording) stored on the camera's SD card via IE browser.

To log into the FTP server and access the SD card, simply enter ftp://<Login ID>:<Password>@<ip address> in the search field of Microsoft's Internet Explorer; the recordings will show up. The default setting, for example, is ftp://admin:1234@192.168.0.30. The maximum number of connections for FTP server is up to 30.

5.3 SFTP Server

SFTP (Secure File Transfer Protocol), used for transferring files via a more secure channel than FTP, is a network protocol that offers multiple file access, transfer and management over reliable data stream.

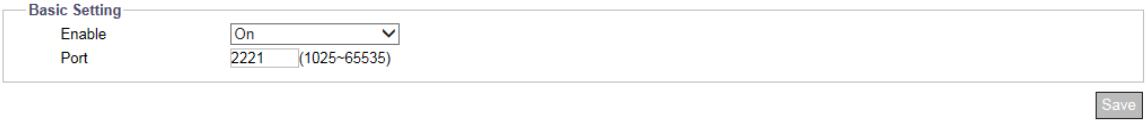


Figure: SFTP Settings

Enable: On/Off

User can enable or disable SFTP server by selecting On or Off from the dropdown.

Port: 1025 ~ 65535

Input a value into the port field to activate the SFTP server function.

- SD card access:

If the SFTP Server is enabled, a user on a remote client can access files (video/image recording) stored on the camera's SD card via IE browser.

To log into the SFTP and access the SD card, enter ftp://<Login ID>:<Password>@<ip address> in the search field of Microsoft's Internet Explorer; the recordings will show up. The default setting is ftp://admin:1234@192.168.0.30. The maximum number of connections for SFTP server is up to 30.

5.5 RTSP

RTSP is a standard protocol for connecting a client to establish and control streaming data over the web. If you want to allow third-party devices or software to access video/audio streams from the IP camera over the network, you must configure the RTSP ports. The major difference between Unicast and Multicast is how client and server communicate packets with each other. Specifically, Unicast transmits packets in a 1 to 1 device method, while Multicast transmits 1 to multiple devices. Therefore, Unicast requires large network bandwidth and uses more resources of server but is more stable because of its simple structure; by contrast, Multicast needs less bandwidth with resources and is more practical for multiple devices broadcast, with the condition that all relevant peripheral devices, like switch or router, support the multicast protocol. Select a method based on your network applications for best efficiency. For each RTSP session, there are 3 kinds of real-time data that can be configured, including video, audio and meta data. When codec related information is changed, the RTSP server will be restarted.

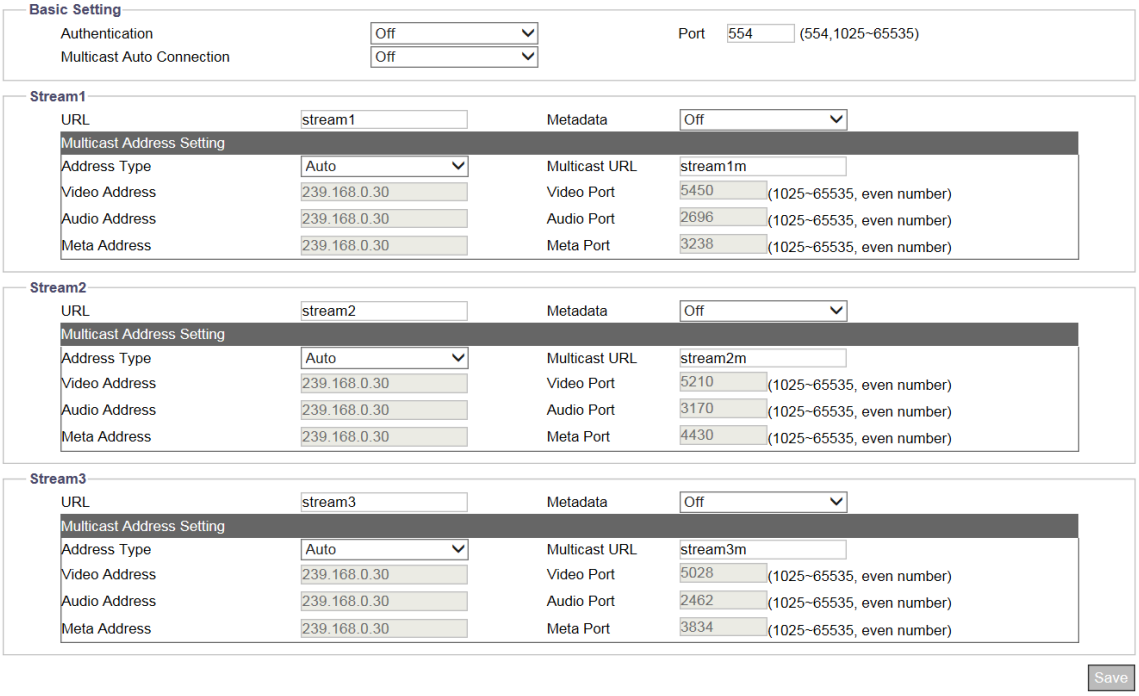


Figure: RTSP Settings

Basic Settings & Authentication

Enabling the authentication will improve the verifying mechanism and make the RTSP connection process more secure and much safer. To verify the RTSP, simply enter the Login ID, Password and Port (554 by default) with Authentication turned “On.” Turning Auto Connect “On” will enable auto connection. Note that it is not required to enable authentication before proceeding with RTSP.

URL

Input a preferred name for representing each RTSP Stream URL. This refers to Multicast URL protocol that is transmitting data via one host to a single host, consuming more network bandwidth but with a direct and simple transmission method. For Unicast, user can change port and url stream. After defining preferred URL name for each stream, via 3rd party software, enter the address like the following examples for RTSP URL streaming.

- rtsp://(camera IP address)/(URL stream 1)

- rtsp://(camera IP address)/(URL stream 2)
- rtsp://(camera IP address)/(URL stream 3)

For example: rtsp://192.168.0.30/URL stream1

Metadata: On/Off

Turn Metadata On from the dropdown to enable information about data, which means the data information will be allocated systematically, keeping similar data together by certain criteria and distinguishing dissimilar data organizationally to effectively transmit data information.

Multicast URL

Differing from URL, Multicast URL can transmit data from one host to a single host or to multiple hosts, consuming less network bandwidth with more flexibility. However, it is required to make sure that the peripherals connected to the camera are all compatible with Multicast in advance. For Multicast, user can change address, port and url stream. The address for Multicast is roughly the same as the previous URL. Refer to the samples below:

- rtsp://(camera IP address)/(Multicast URL stream 1)
- rtsp://(camera IP address)/(Multicast URL stream 2)
- rtsp://(camera IP address)/(Multicast URL stream 3)

For example: rtsp://192.168.0.30/Multicast URL stream1

Address Type: Auto/ Manual

By selecting “Manual,” user can enter the Video, Audio and Meta settings below, while “Auto” simply keeps the original settings by the camera.

Video, Audio and Meta Address/Port

Complex in its transmitting procedure and layer structure, Multicast streaming requires more specific settings containing Video Address/Port, Audio Address/Port and Meta Address/Port, all of which, as the UI indicates, have a certain IP address range (224.0.1.1 – 239.255.255.254) for user to define individually.

5.6 SNMP

SNMP (Simple Network Management Protocol) is an Internet standard protocol used for monitoring and managing the status of devices connected to IP networks.
Three versions of SNMP have been developed, namely, SNMPv1, SNMPv2c and SNMPv3, with the newest version featuring improvements in performance, flexibility and security.
When SNMP is “On,” upon request of SNMP server, network-attached devices display their status to SNMP server, which activates remote modifications if necessary.

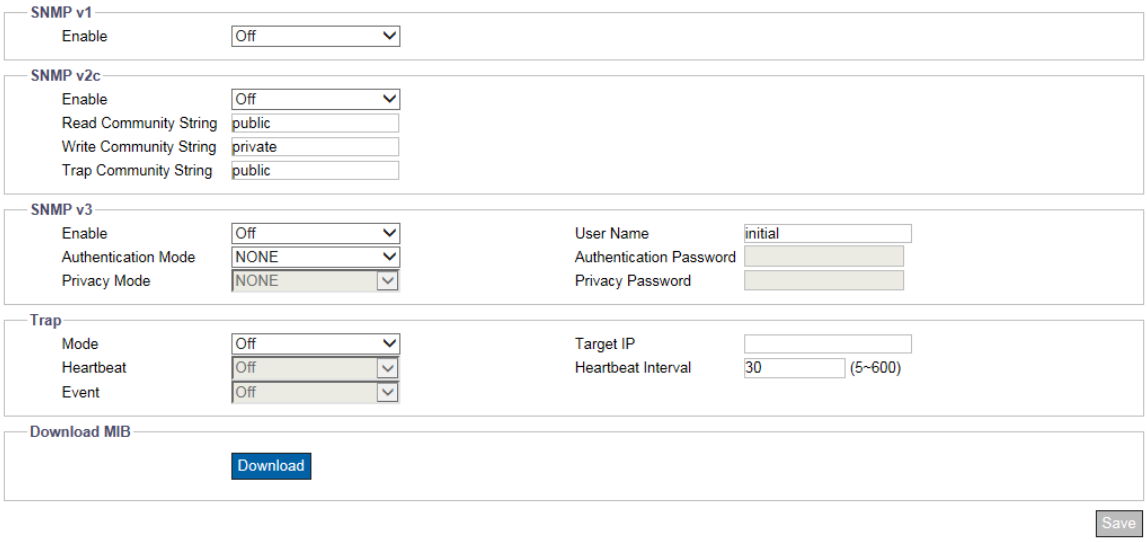


Figure: SNMP Settings

SNMP v1

Enable: On/Off

Select “On” or “Off” to enable or disable.

SNMP v2c

Enable: On/Off

Select “On” or “Off” to enable or disable.
The community name can be specified as a password for read, write or trap access to all supported SNMP objects; check the community string from SNMP server and input to the corresponding field in camera. Selecting Public allows Read Only; selecting Private allows Read-Write.

SNMP v3

Enable: On/Off

SNMP v3 provides more security features than SNMP v1/SNMP v2c. Select “On” in the dropdown to enable the function. Input User Name for SNMP v3 first. Then select desired modes for “Authentication” with “Privacy” and enter passwords paired with both protocols individually.

Trap

Mode: V1/V2C/V3/Off

Trap under SNMP allows a network-attached device to notify the SNMP server of significant events via unsolicited and irregular notification. Select which SNMP mode (v1, v2c or v3) to be enabled with Trap.

Target IP:

Input the IP address of SNMP server in “Target IP” field.

Heartbeat: On/Off

To ensure a network free from delayed notifications, “Heartbeat” communications protocol sends notifications at the selected interval. Select “On” or “Off” to enable or disable heartbeat function.

Heartbeat Interval: 5 ~ 600

Input desired value in seconds for Heartbeat Interval.

Event: On/Off

Specifically designed for event occurrence, this option, when turned On, will automatically record the log file of events that occurred for review afterwards.

Download MIB

Click “Download” to get specifics of MIB (Management Information Base). MIBs describe the structure of the management data of a device subsystem; which uses a hierarchical namespace containing object identifiers (OID). Each OID identifies a variable that can be read or set via SNMP.

5.7 802.1X

802.1X is an IEEE standard for port-based network access control and defines the encapsulation of the Extensible Authentication Protocol (EAP) over IEEE 802, which is known as EAP over LAN. Simply select a desired EAP protocol type from the dropdown menu and then input its required subfields to complete setup. Inner authentication mode can support CHAP, EAP-MSCHAPV2, MD5, MSCHAP, MSCHAPV2 and PAP.

Basic Setting

Protocol: None/EAP-MD5/EAP-TTLS/EAP-PEAP

- None: None of the protocols is selected by user.
- EAP-MD5: It is the only IETF Standards Track based EAP method and offers the minimal security.
- EAP-TTLS: Tunneled Transport Layer Security (TTLS) is an EAP protocol and is well-supported among wireless vendors. It further extends TLS protocol and is widely supported across a variety of platforms.
- EAP-PEAP: The Protected Extensible Authentication Protocol (PEAP) was jointly developed by Cisco Systems, Microsoft, and RSA Security and provides unique security for users.

5.8 Firewall

Under this menu, user can manually define several IP addresses to be allowed or denied access to the camera.

Figure: Firewall Settings

Basic Setting

Mode: Allow/Deny/Off

- Allow: Select this option to give inputted IP addresses access to the IP camera.
- Deny: Select this option to not allow inputted IP addresses access to the IP camera.
- Off: Select this option if no actions will be made for inputted IP addresses.

IP Address 1 ~ 10
Manually input IP addresses in each of the fields to be allowed or denied access. After entering the address, check the box in front of each address to activate the filters of allow or deny.

5.9 DDNS

Dynamic Domain Name Server (DDNS) is the system that can automatically upgrade DSN records without further manual editing in real time, resulting in faster and smoother web address directing.

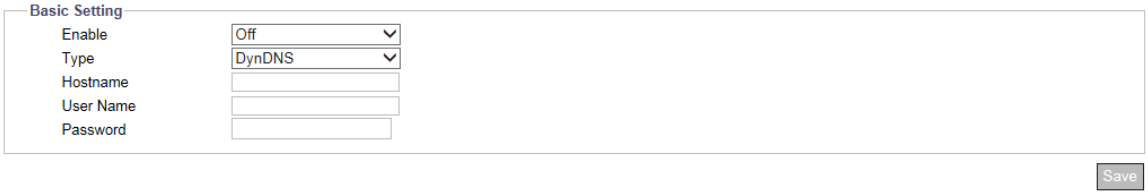


Figure: DDNS Settings

Basic Setting

Enable: On/Off
Type: DynDNS/No-IP/Two-DNS/FreeDNS
There are 4 types of DDNS for selection, explained as follows.

- DynDNS: One of the DDNS providers offering service with fee.
- No-IP: A DDNS provider offering free service. You must register before enabling this type.
- Two-DNS: A DDNS provider offering free service. You must register before enabling this type.
- FreeDNS: A DDNS provider offering free service. You must register before enabling this type.

Item	Description
Hostname	Define a specific hostname for DDNS.
User Name	Configure a privileged username for accessing to DDNS.
Password	Input the password associated with the privileged username.
Hash	It is required to set up the value when selecting FreeDNS type.

5.10 SSL

Method: None/Self Signed/Request/Upload Certificate

Secure Sockets Layer (SSL), the standard security technology for establishing encryption, allows sensitive information such as login credentials to be transmitted securely. Select the method from the dropdown.

- Self Signed: Self-signed certificate is a privately owned key that has no connection to a person or organization that performs an authorized certificate signing procedure. For self-signed certificate, user can create CSR (Certificate Signing Request) by filling in the following information: Country, Province, City, Common Name, Organization, Organization Unit and Email. For an installed certificate, user can view Common Name, Organization, Location, Country, Issuer, Start Date and End Date. Select it and input the required fields to display information of a self-signed certificate.

Note	• The certificate can be removed. • HTTPS will not work correctly if SSL is not enabled.

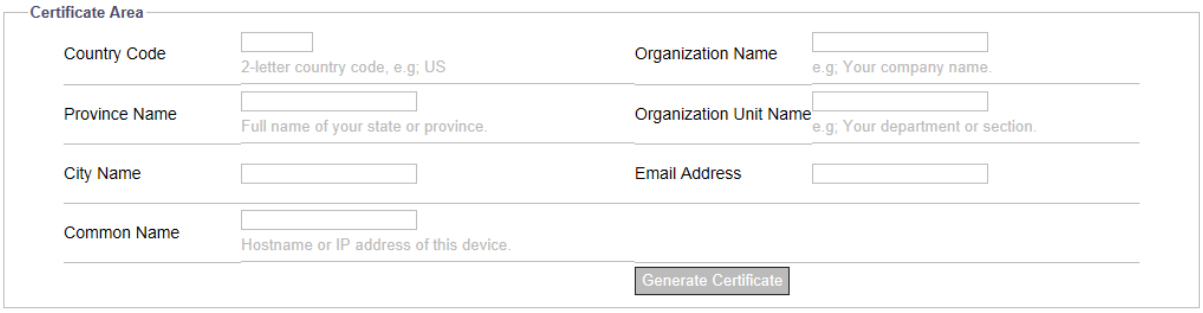


Figure: Self Signed & Request Settings

- Request

  Similar to the settings of Self-Signed, by clicking the “Generate Certificate” after inputting the required fields, Request will provide user, in addition to showing the information like self signed, with a download option of created certificate for future utilization.

- Upload Certificate

  After downloading the certificate from Request page, user can upload it to the camera via clicking “Upload” to locate the created certificate for “Upload Certificate.” In addition, it is required to browse and upload the other CA (Certificate Authority), which is issued by an authorized person or organization, followed by clicking the “Upload” to complete the SSL procedure.

Figure: Upload Certificate

5.11 QoS

QoS (Quality of Service) refers, specifically, to both resource control and traffic prioritization mechanisms by setting priorities to different applications or users with the intent of maintaining a certain level of performance on data flow. It is especially efficient when transport of traffic has additional requirements.

Figure: QoS Settings

Item	Option/ Range	Description
Enable		Check this box to enable the QoS function.
IPv4 Address		Input an IPv4 address for the fields of Priority 1 and 2 individually.
Netmask Bit	0 ~ 32	Enter a value into the fields for netmask bit in response to the IPv4 address assigned respectively.

6. System

6.1 Date & Time

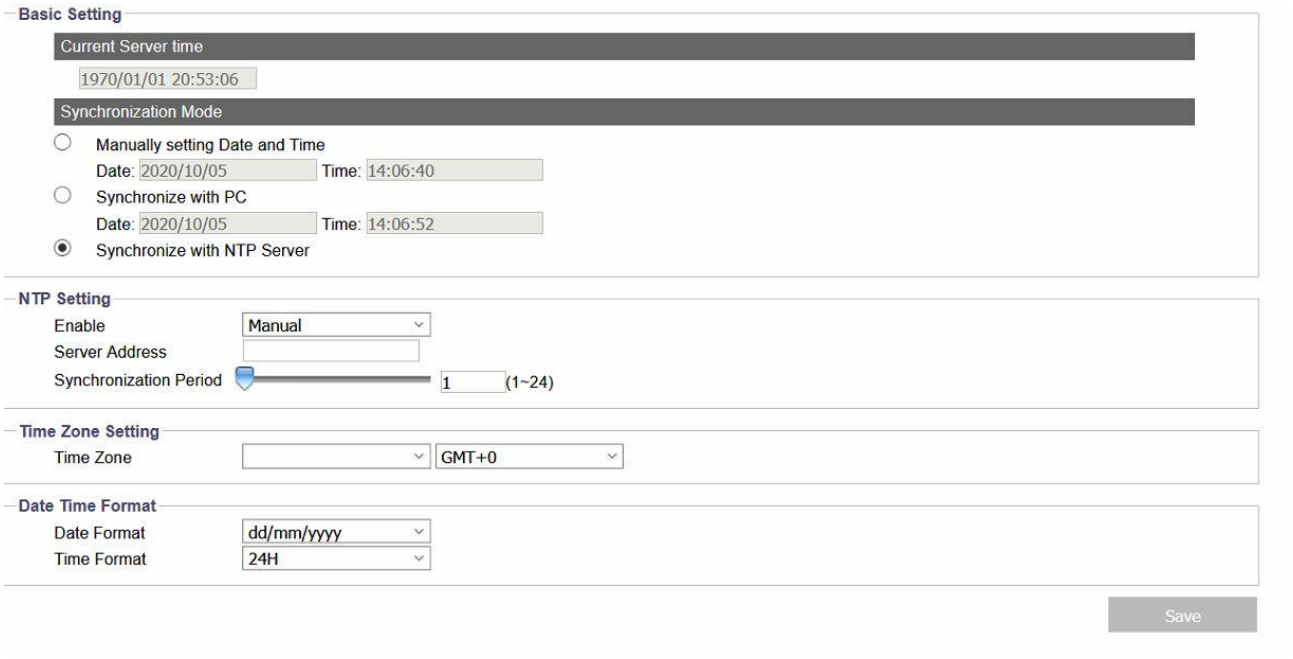


Figure: Date & Time Settings

Basic Setting

Current Server Time

The current date/time is displayed here.

Synchronization Mode: Manually/PC/NTP Server

- Manually: Enter information to set date and time manually and individually.
- Synchronize with PC: Select this option to synchronize date and time of the camera to be consistent with date and time of connected computer.
- Synchronize with NTP Server: Select this option to synchronize date and time of the camera with date and time of the assigned NTP server.

NTP Setting

Enable: Manual/From DHCP Server

Enable NTP by selecting “Manual,” which allows user to input desired NTP server address, or “From DHCP Server,” which obtains an NTP address assigned by DHCP Server.

Server Address

Input desired NTP server address in the field.

Synchronization Period: 1 ~ 24 (hour)

Time Zone Setting

First choose one of the regions from the left dropdown menu, and then select the corresponding city, based on your location country/area, from the right dropdown menu.

Date Time Format

Date Format: Select format of dd/mm/yyyy, mm/dd/yyyy or yyyy/mm/dd from the dropdown menu.

Time Format: Select format of 12 H or 24 H from the dropdown menu.

6.2 Audio

For those cameras equipped with audio input/output ports, the camera is able to connect with external audio devices for audio input and output individually. See the settings page and descriptions below for more details.

Figure: Audio Settings

Audio In Setting

Source: Line In/Mic In

Select which audio source will be connected from the 2 options in the dropdown menu.

- Line In: via audio line in source.
- Mic In: via microphone in source.

Enable: On/ Off

Set "On" to activate audio input/output functions when audio input/output devices are connected.

Encoding: G.711 A-law/G.711 µ-law

There are 2 audio codecs, G.711 a-law and G.711 µ-law, that can be selected for audio input encoding.

Level: High/Mid/Low

Three audio levels, Low/Mid/High, are selectable for audio input and output individually.

Notes	• The audio output performance is not influenced by the codec combination. • The camera only supports one user to use audio out. Once the audio out is in use, others cannot use this function on live view. • The encoding of audio output is determined by the transmitter (NVR or ActiveX) rather than the camera, the current supported formats are G.711 a-law and G.711 µ-law. • Audio function varies by model; check “Appendix: Product Comparison-I/O Port” for details.

6.3 Firmware

Information about camera firmware is displayed on this page. User can manually upgrade System Firmware if upgrade is available. All motion of camera will be stopped during the firmware upgrade. Be sure to close any other screens before performing a firmware upgrade. Never disconnect power or LAN cable during the upgrading process. It takes approximately 3 minutes for the unit to reboot after the firmware upgrade process. Click “Upload” to locate the firmware file and click “Upgrade” to proceed.

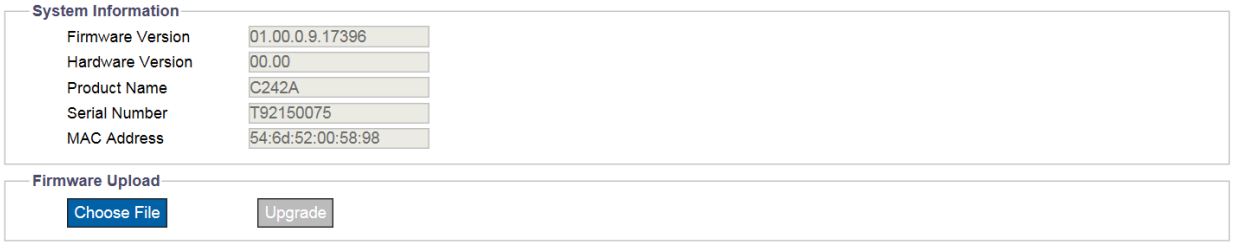


Figure: Firmware Settings

Note	• Power should not be turned off when upgrading firmware; this will cause the upgrade to fail and technical support may, therefore, be required.

6.4 Initialization

Figure: Initialize Settings

System Frequency: 60Hz/50Hz

Select “60Hz” or “50Hz” in accordance with different requirements. Once set to the correct frequency, flickering by fluorescent light can be reduced.

TV format: Full/16:9/4:3

Select an appropriate TV format from the dropdown menu in accordance with the aspect ratio of the monitor.

Import Setting

Click “Choose File” to locate a file and then click “Import” to upload configuration settings from local computer to the camera.

Export Setting

Click “Export” to download configuration settings to local computer.

Configuration Setting

Reboot

Click “Reboot” to simply reboot the camera.

Factory Default (Retain IP)

Click to reset all configuration settings back to factory defaults excluding network settings.

Factory Default

Click to reset all configuration settings back to factory defaults.

Advanced Security

This screen provides a mechanism to protect the network ports from cyber-security concerns. If any attack is found through consistent but abnormal network packets, the camera system will turn off the port attacked and send a warning email notification.

6.5 OSD

This section allows user to enable OSD (On Screen Display) settings. In addition, it extends the OSD function to the occurrence of events.

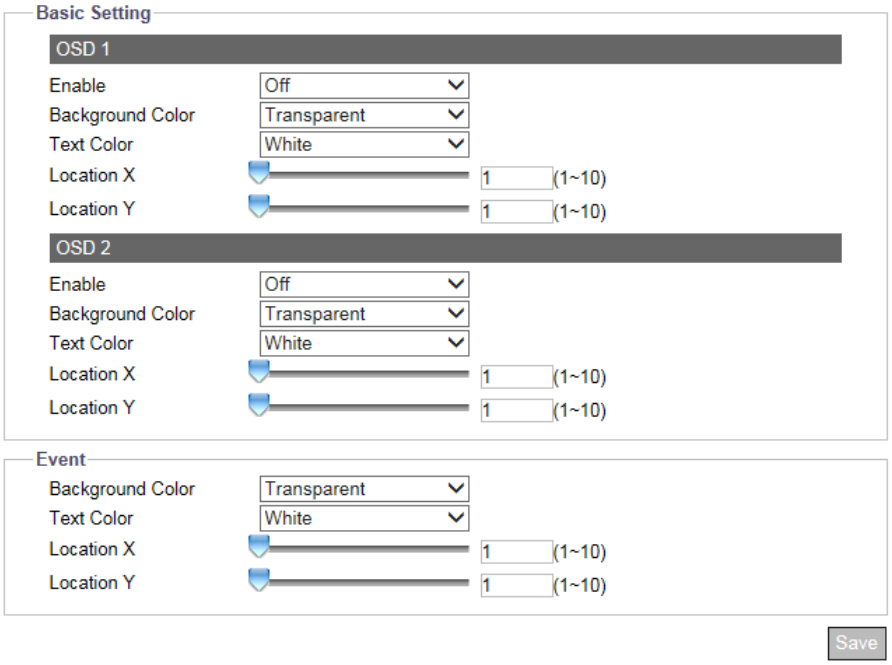


Figure: OSD Settings

Basic Setting

There are up to 2 sets of OSD settings that can be enabled concurrently as shown on the following table.

Function	Option/Range	Remark
Enable	Off/Device Name/Date/Text)	
Background Color	Black/Transparent	
Text Color	White/Black	Not supported for event.
Text Input	Type in text, up to 32 characters	Only available if Text is selected.

Location X	1~10	
Location Y	1~10	

Event

When an event is triggered, OSD can be displayed on screen to notify user.

6.6 Events

As an intelligent device, the IP camera is capable of automatically detecting many events, such as motion, tamper, network loss, alarm, etc., and taking actions to inform the user about these occurrences. The Event Search section assists administrator to have detailed, systematic analysis on each individual event with its type, counts and time.

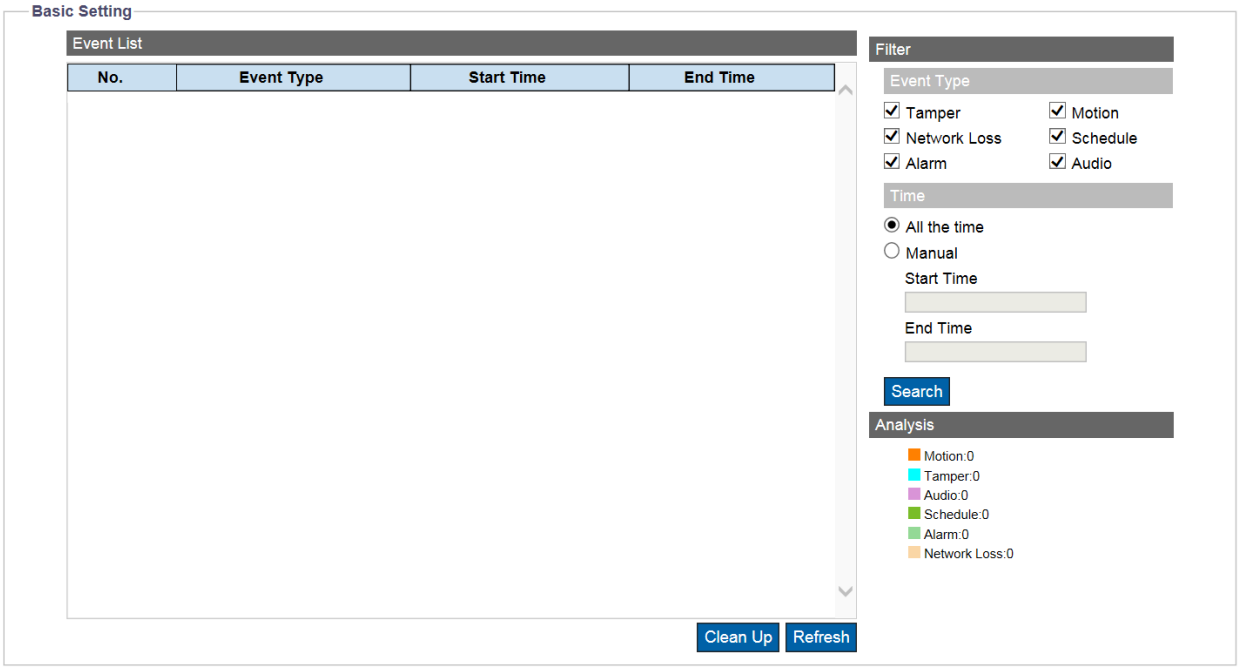


Figure: Events

Basic Setting

Event list displays all events identified by the camera, with information including types, starting time, and ending time. Click on “Refresh” to get the most updated list of events that are enabled for detection in Event Source. Click on “Clean Up” to clear this list.
Under Filter, select the type of events included and select either “All the time” or “Manual,” followed by input of time in “Start” and “End” time fields to define the time frame these types of events took place.
A list of counts of all the types of events is displayed under Analysis on the lower right that provides an overview of how frequently each type of the event took place.

6.7 RS485

When connecting the camera with external RS485-based device, user is required to define related parameters including “Baud Rate” and “Device Address,” both of which need to be compatible between the camera and the connected device, for proper operation.

Figure: RS485 Settings

Note	• RS485 function is available in box camera model only; check “Appendix: Product Comparison-RS485 Interface” for detail.

7. Account

7.1 Account Management

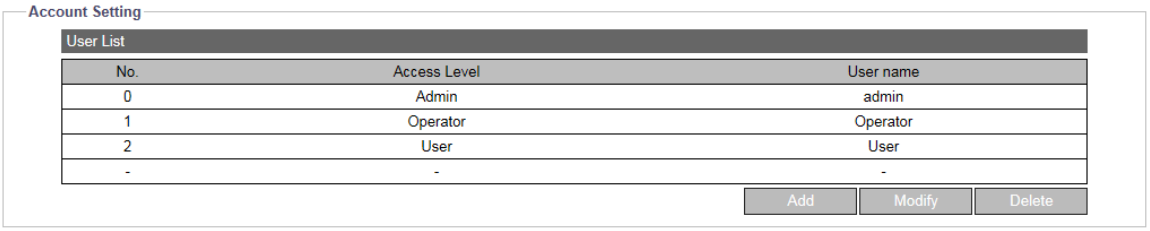


Figure: Account Settings

Account Setting

Access Level: Admin/Operator/User

- Admin: Admin level has the highest privilege control for accessing camera, allowing handling of both live view and all the configuration settings. The default username is ADMIN and password for Admin depends on user’s initial setting.
- Operator: Operator level can only access camera for live view, storage and remote lens control functions.
- User: User level can only access camera for live view function.

Add Users

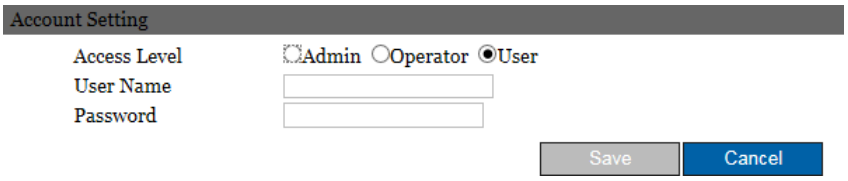


Figure: Add Admin/Operator/User

- Add: Place the mouse cursor over the blank row/column and click the “Add” button. A prompt window will display to enter a customized username and password for new user; the level (Admin, Operator or User) of user is also selected here.

Note	• Up to 10 users are available.

Modify & Delete Users

- Delete: Choose one of the users from the list and then click “Delete” to remove it immediately. (The default Admin cannot be deleted.)
- Modify: Choose one of the users from the list and enter updated information as necessary. Click

"Save" for the changes to take effect.

Cautions	• The login Username and Password must be 4 to16 characters long with a valid alphanumeric value only including '0' to '9', 'a' to 'z', 'A' to 'Z', '.','-','+','_'and '@'. • The username cannot be the same as any currently existing username, including "ADMIN". • A user may reset the Account Management system to the camera's default settings.

7.2 LDAP

For accessing and maintaining distributed directory information services over an Internet Protocol network, the Lightweight Directory Access Protocol (LDAP), an open, vendor-neutral, industry-standard application protocol, has a major role in both intranet and internet applications to facilitate information sharing between devices.

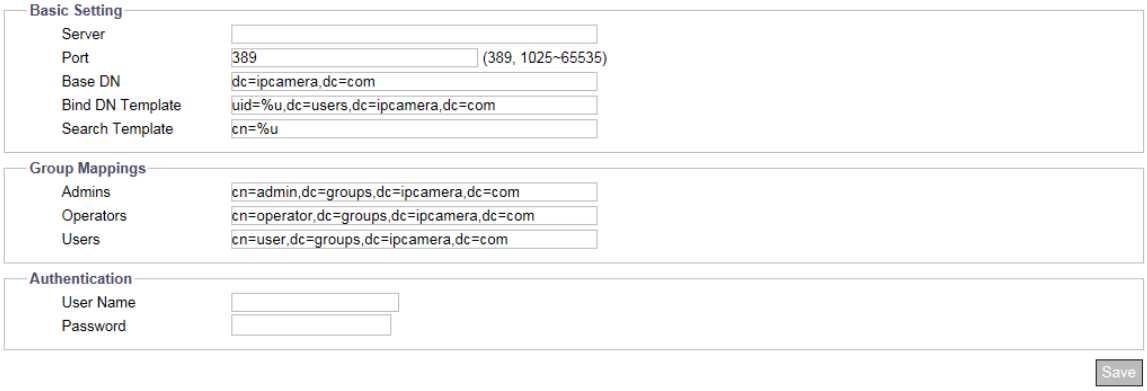


Figure: LDAP Settings

Basic Setting

Server

Input a server for LDAP.

Port: 1025 ~ 65535

It is recommended to use the default port number 389; however, if it is required to change the port number, contact your system administrator.

Base DN/Bind DN Template/Search Template

The strings within Base DN (Distinguish Name), Bind DN Template (sublevel of Base DN) and Search Template fields are updated by the LDAP server to be accessed. Refer to the fields here for later/further configuration.

Group Mappings

Admins/Operators/Users

Admins: Relates to the LDAP admin privileges, which are full access to live view functionalities.
Operators: Relates to the LDAP operator privileges, which are watching live view and operating snapshot, manual recording and full screen.
Users: Relates to the LDAP user privileges, which is only watching live view.
The strings within Admins, Operators and Users fields are updated by the LDAP server to be accessed. Refer to the fields here for later/further configuration.

Authentication

User Name

Enter a designated username for authentication to the accessed LDAP.

Password

Enter the password corresponding to the entered username for correct authentication.

Enable TLS

When TLS is enabled, the data transmission will be done through TLS mode, using encryption for the protection of data communication. (TLS is a widely adopted security protocol designed to facilitate privacy and data security for communications over the Internet, which encrypts internet traffic of all types, making secure internet communication, and therefore internet commerce, possible.)

8. Event Source

Event source configurations consist of Event Specific, Handler and Arming Schedule. The table below gives an overview of event source configurations and relevant remarks.

Type	Settings			Remark
	Event Specific	Handler	Arming Schedule	
Alarm	NO/NC	✓	✓	Model Dependent.
Audio	Sound Intensity	✓	✓	Model Dependent.
Defocus	-	✓	✓	
Motion	Object Size, Sensitivity	✓	✓	
Network	Wired Network Lost/ Wired Network Conflict	✓	-	Does not support HTTP Generic Event.
Schedule	Regular/Persist trigger event action (without event source as premise)	✓	✓	Does not support HTTP Generic Event.
Tamper	Sensitivity	✓	✓	
mSD healthiness	Free space/Mount failure	✓	-	

Handlers

Alarm Out

Alarm output function will be enabled when event occurs.

Audio

- Enable: Audio output function will be enabled when event occurs. Select On to activate this function or Off to disable it.
- Sound: 1~10

  10 sound types are available from the dropdown menu for audio output. Be sure to set up the sound file beforehand. Refer to the "*10.7 Sound*" section for details.

Note	• The availability of audio will vary by model; check "Appendix: Product Comparison-I/O Port" for details.

Snapshot: Store to Edge/Store to FTP

- Store to Edge: Check the box to save snapshot to the SD card when event occurs; be sure a customer-supplied SD card is inserted in the slot to use this option.
- Store to FTP: Check the box to save snapshot to the FTP remote device when event occurs. Note that under Handler, the camera acts as FTP client, while the remote device acts as FTP server; the FTP server path should be properly configured in advance in "*10.3 FTP*" section.

Recording

- Edge Record: Check the box to save the recorded video to the SD card when event occurs; be sure a customer-supplied SD card is inserted in the slot to use this option.

Email

- Enable: Check the box to enable an email to be sent to a predefined user when event occurs.
- Subject: Preset a subject of the email to be sent.
- Message: Preset message contents of the email to be sent.

OSD

- Enable: Check the box to enable the OSD function when event occurs.
- Text: Input desired text manually to display when event occurs.

HTTP Generic Event

- Enable: Check the box to enable the function when event occurs.
- Method: 1~10.

10 method types are available from the dropdown menu for message notification. After user sets the type of method, refer to "*10.8 HTTP Generic Event*" section for details about method setting.

Arming Schedule Setting: Monday ~ Sunday (24H)

Under this section, user can set up a custom schedule for recording video when alarm input signal occurs. The following table includes 7 days a week from Monday to Sunday, 24 hours group from 0 to 24 hours. Click the "Edit" button at the upper-left corner to enter the setting page.

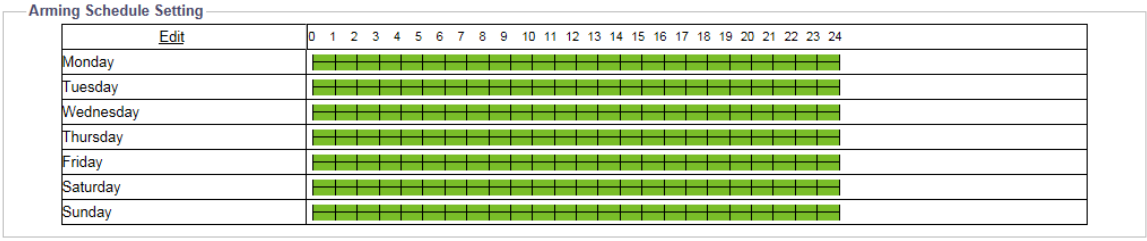


Figure: Arming Schedule Setting

After clicking “Edit,” the prompt setting page will display as below. User can individually establish up to 3 sets of time ranges for each day, where start and end time can be separately defined. Check the box at the right side to enable the defined time range, followed by clicking “Apply” for it to take effect. The screenshot below, for example, clearly shows that the 2 time ranges, Monday (08:00 – 24:00) and Tuesday (03:00 – 15:00), are properly defined and checked. The screenshot above shows that the defined time ranges are highlighted with bright green color to indicate any alarm input signal within the green time ranges will be recorded properly.

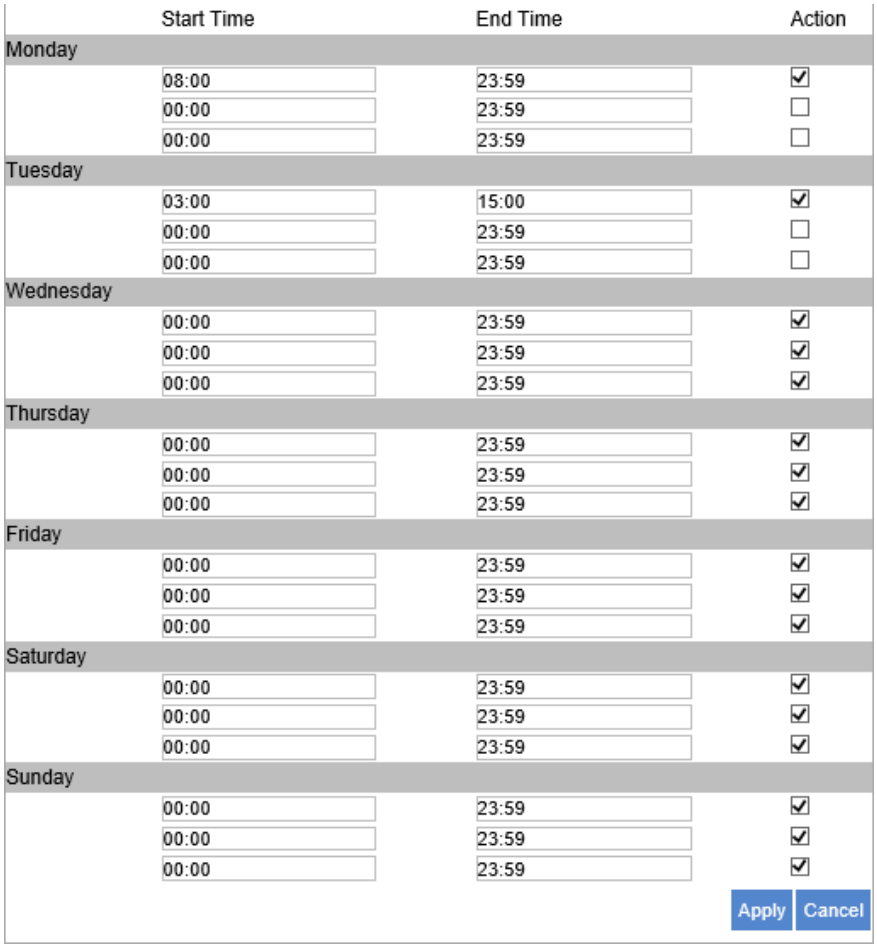


Figure: Arming Schedule Setting

8.1 Alarm

Connecting an alarm input device to the camera can expand alert functions. For example, when an infrared detector connected to the camera detects motion based on heat emission, an alarm input message will be sent to the camera. Additionally, by connecting to an alarm output device such as a siren, the camera will send a signal to notify the siren to activate it when receiving an alarm signal, either from alarm input device or other detection settings. This page is designed to establish related actions when the camera receives alarm input signal.

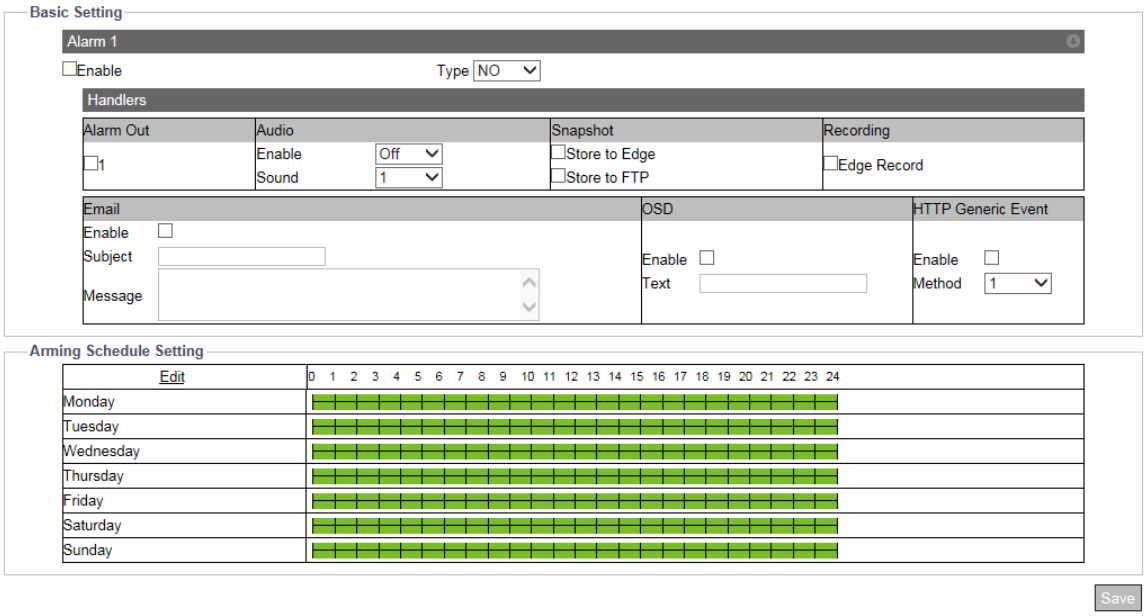


Figure: Alarm Event Settings

Basic Setting

Enable: Check the box to enable the alarm input function.

Type: NO/NC
NO (Normally Opened): An alarm will be triggered when the external contact closes.
NC (Normally Closed): An alarm will be triggered when the external contact opens.

8.2 Audio

By connecting to an audio input device, e.g., microphone, the camera can receive an audio input signal from the microphone and react with the certain responses that are preset under this section. Review the information below for details.

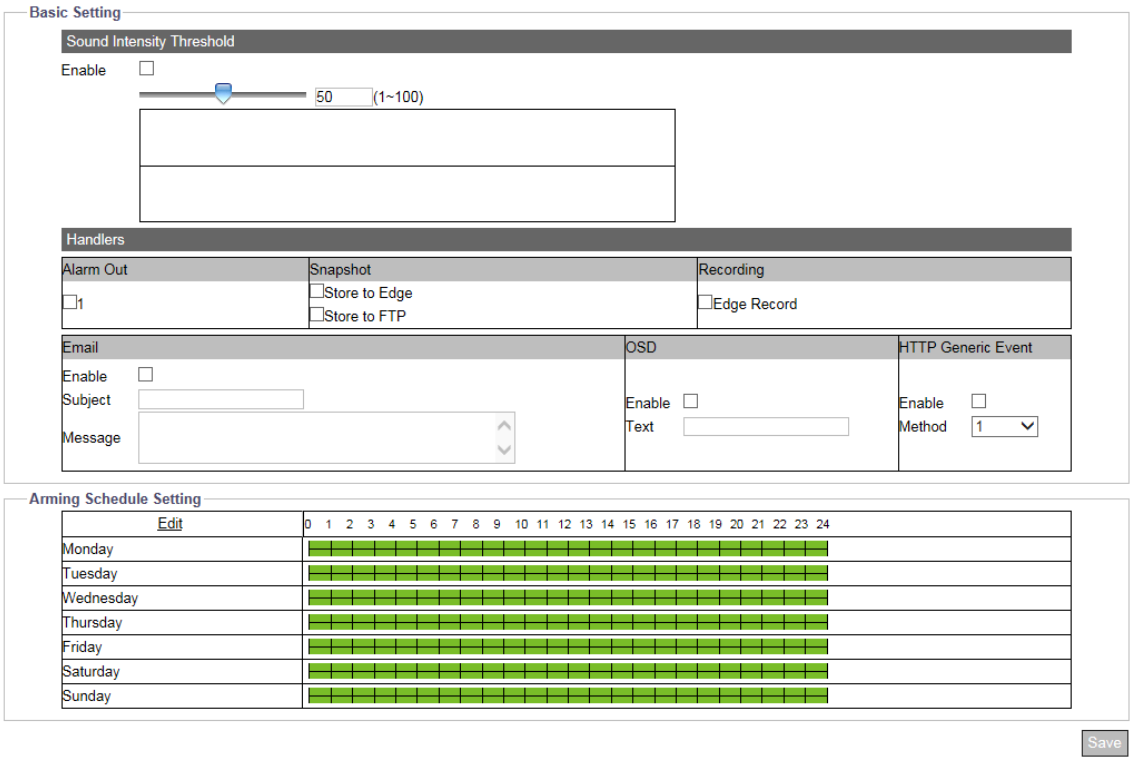


Figure: Audio Event Settings

Basic Setting

Enable: Check the box to enable the audio input event function.

Sound Intensity Threshold: 1 ~ 100
Define an exact sound intensity threshold to trigger the actions when the camera receives audio signal from the connected input device. Select 100 for the highest sound intensity threshold.

8.3 Defocus

This function is designed to establish related actions when the camera is subject to the defocus event.

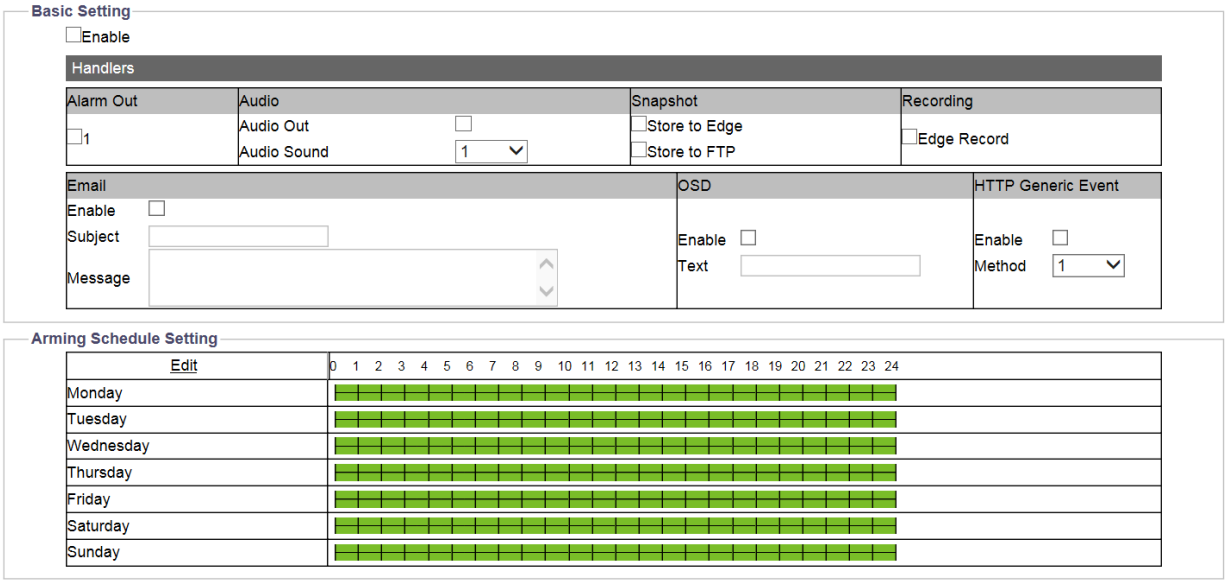


Figure: Defocus Event Settings

Basic Setting

Enable: Check the box to enable the defocus event function.

8.4 Motion

This function is designed to establish related actions when the camera detects motion issues. A maximum of 4 motion detection areas can be customized by users.

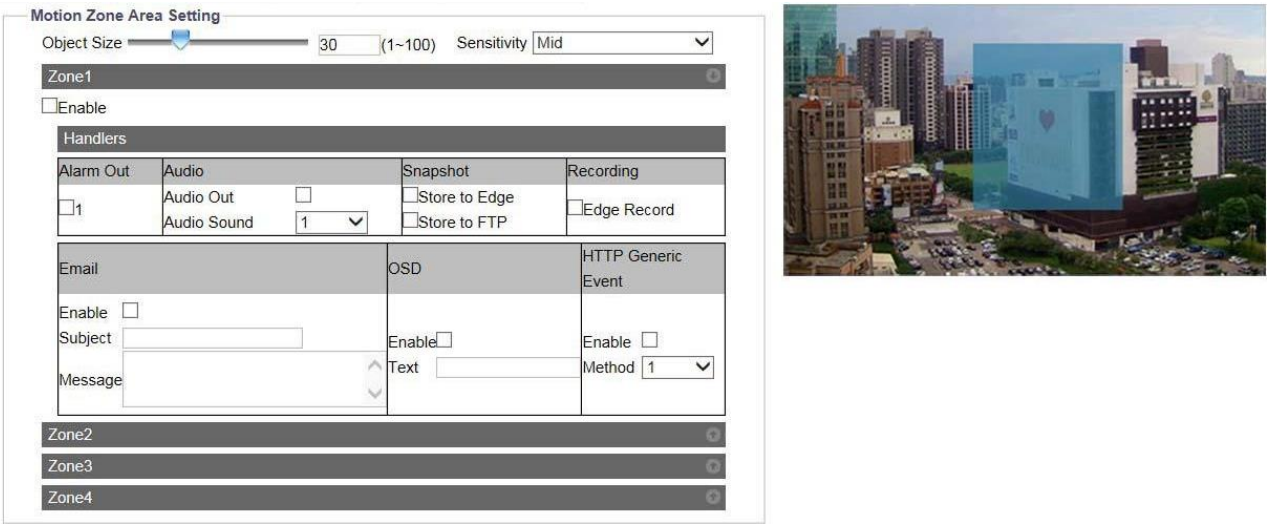


Figure: Motion Detection Settings

Motion Zone Area Setting

Object Size: 1 ~ 100
The lower the value, the smaller the object that can be detected, and vice versa.

Sensitivity: High/Mid/Low
Set the sensitivity for motion detection. High means that camera tends to be triggered with a slight motion or light change within the live view, while Low means that camera is triggered only when a major change in motion or light occurs.

Enable
Draw a desired size area in position on the preview image on the right-side for motion detection, followed by checking the Enable box and clicking “Save” to have the settings take effect.

8.5 Network

This function is designed to configure related actions when the camera is subject to network conflict or network lost events.

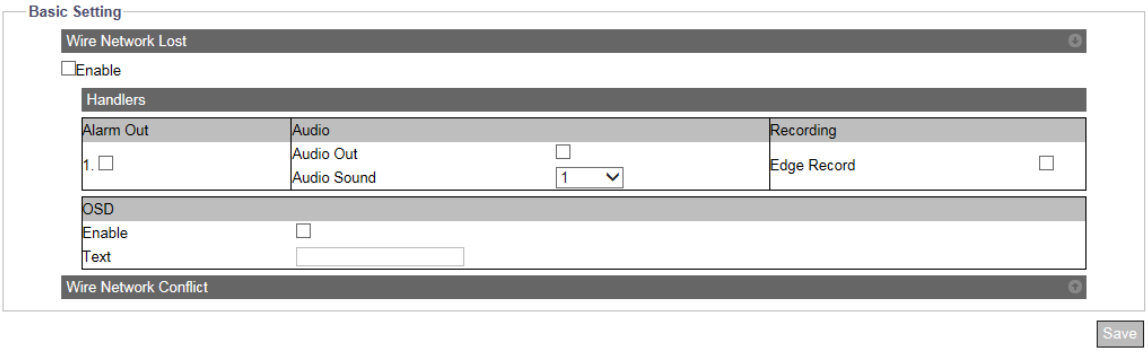


Figure: Network Event Settings

Basic Setting

Wired Network Loss

Check the box to enable the detection of network lost. When the camera loses internet access, the network loss event will be detected and recorded.

Wired Network Conflict

Check the box to enable the detection of network conflict. When another IP address conflicts with the camera, the network conflict event will be detected and recorded.

Note	• Press the arrow icon at the upper-right corner to expand or collapse the setting pages of Network Lost and Network Conflict.

8.6 Schedule

This function is designed to establish related actions for recording schedule, independent of any event.

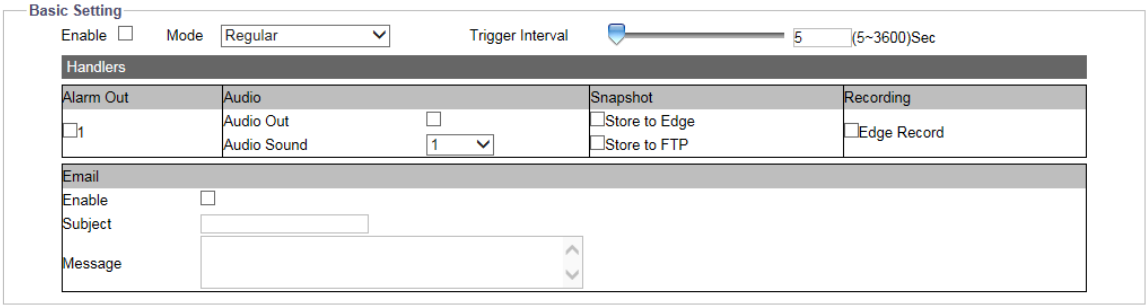


Figure: Recoding Schedule Settings

Basic Setting

Enable: Check the box to enable recording schedule function.

Mode: Regular/Persist

- Regular: When enabled; the recording schedule will progress regularly based on the trigger interval settings.
- Persist: When enabled, regardless of interval, the recording schedule will progress continuously.

Trigger Interval: 5 ~ 3600 (sec)

The trigger interval is the time between two alarms when in Regular mode. The interval time starts when the previous finishes through when the next alarm is triggered. For example, if an alarm is

triggered during 12:00:00, 12:00:10 (alarm duration of 10 seconds), the following alarm will not be triggered until 12:01:00 with a defined interval time of 60 seconds.

8.7 Tamper

This function is designed to establish related actions when the camera is subject to tamper events.

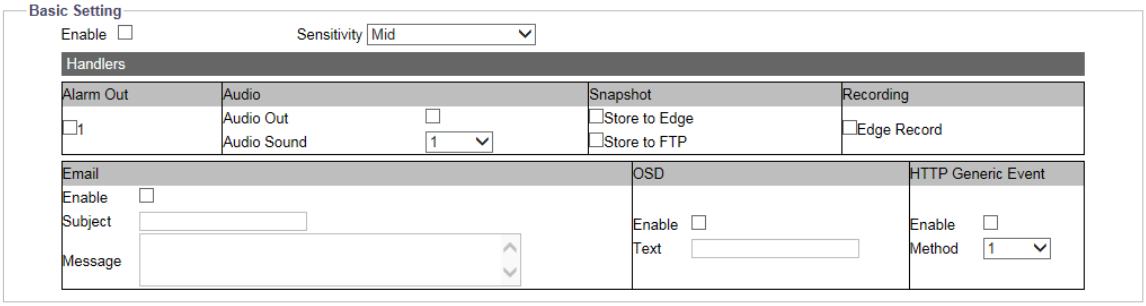


Figure: Tamper Detection Settings

Basic Setting

Enable: Check the box to enable tamper detection.

Sensitivity: High/Mid/Low
Set the sensitivity for tamper detection. High means that camera can be triggered with a minor tamper issue, while Low means that camera is triggered with only a major tamper issue.

8.8 mSD Healthiness

This function is designed to establish related actions when the inserted micro SD card has unexpected failed events or is running out of sufficient storage space.

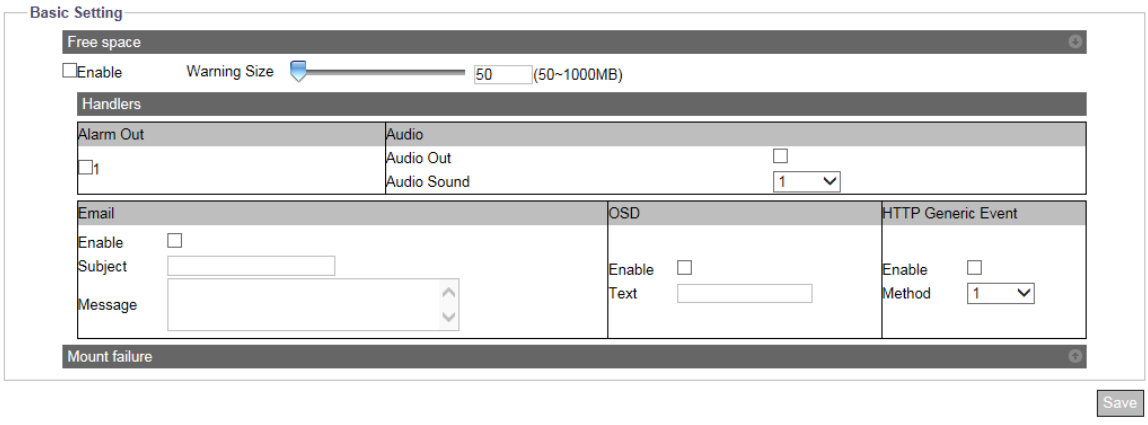


Figure: mSD Healthiness Settings

Micro SD Card Events

Free space
Check the box to enable the detection of insufficient space on the inserted micro SD card. When there is not enough space on the inserted micro SD card, the selected handlers will be activated. Slide the "Warning Size" bar to define a space threshold for trigger.

Mount failure

Check the box to enable the detection of failure of the inserted micro SD card. When any failure issue occurs on SD card, the selected handlers will be activated.

Note	• Press the arrow icon at the upper-right corner to expand or collapse the setting pages of “Free space” and “Mount failure.”

9. Video Analytics

Video Analytics (VA) comprises the proprietary algorithm to perform intelligent video analysis, e.g., to detect intrusion or loitering within defined zone from suspicious objects or to count people and traffic flow by designated line deployment. It is especially practical to monitor certain alert areas or key zones; this relieves administrator from constantly staying in front of the monitor by recording only critical scenes where events happen, facilitating interoperability and reducing required recording storage for surveillance camera.

Video Analytics configurations are VA specific for Handler and Arming Schedule. Table below gives an overview of event source configuration and dependency.

Type	Settings			Remark
	VA Specific	Handler	Arming Schedule	
General	Motion sensitivity and object size.	-	-	
Line Counting	Set line 1~3 and direction.	-	-	
Line Cross	Set line 1~3 and direction.	✓	✓	
Loitering	Set area and trigger interval.	✓	✓	
Area Counting	Set area.	-	-	
Intrusion	Set area.	✓	✓	
Object Removed	Set object and trigger interval.	✓	✓	
Wrong Direction	Set line and angle.	✓	✓	
Object Left	Set area and trigger interval.	✓	✓	

Notes

- When camera execute PTZ related commands, the VA functions should disable automatically.
- Fisheye cameras do not support VA functions
- VA functions availability varies by model, check “Appendix: Product Comparison-I/O Port” for details.

9.1 General

This page contains general settings shared by all VA functions. Prior to setting up each VA function individually, accurately define the fundamental settings here before advancing to other function settings.

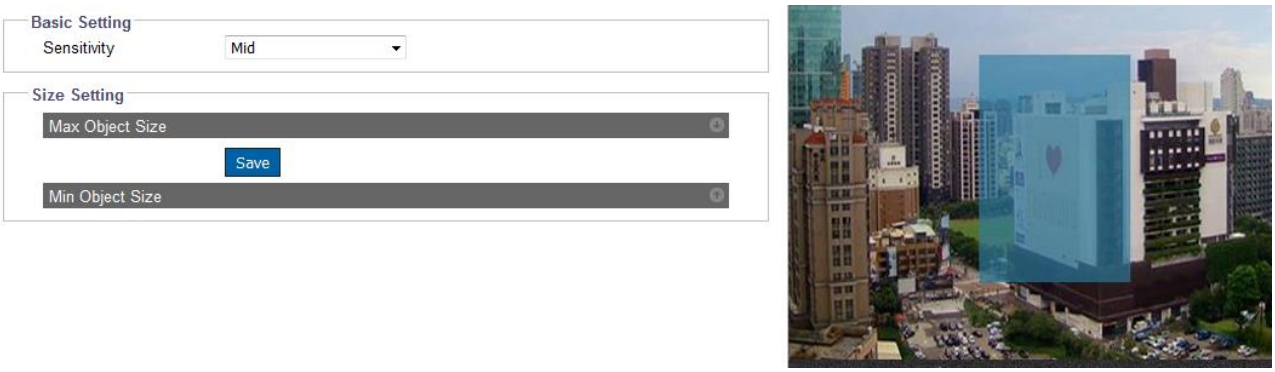


Figure: General Settings

Basic Setting

Sensitivity: High/Mid high/Mid/Mid Low/Low

Choose a sensitivity level from the dropdown menu to define a clear threshold for triggering all VA functions. High represents VA functions will be triggered easily by slight events, while Low allows for triggering only when major events occur.

Size Settings

Max Object Size

Draw a desired maximum object size within the right-side preview window, followed by clicking “Save” to enable the settings. Any object larger than the maximum size defined here will be neither detected nor triggered.

Min Object Size

Draw a desired minimum object size within the right-side preview window followed by clicking “Save” to enable the settings. Any object smaller than the minimum size defined here will be neither detected nor triggered.

Notes	• Press the arrow icon at the upper-right corner to expand or collapse the setting pages of “Max Object Size” and “Min Object Size” individually. • It is strongly recommended to define an accurate size range for the desired objects to be detected, so the accuracy of VA functions will be improved.

9.2 Line Counting

This function is designed to count the moving objects that passed through the designated line defined by users. Appropriate applications for this function, for instance, can be an entrance of a shopping mall or exit of a department store. It can also be applied to count the traffic flow of an intersection.

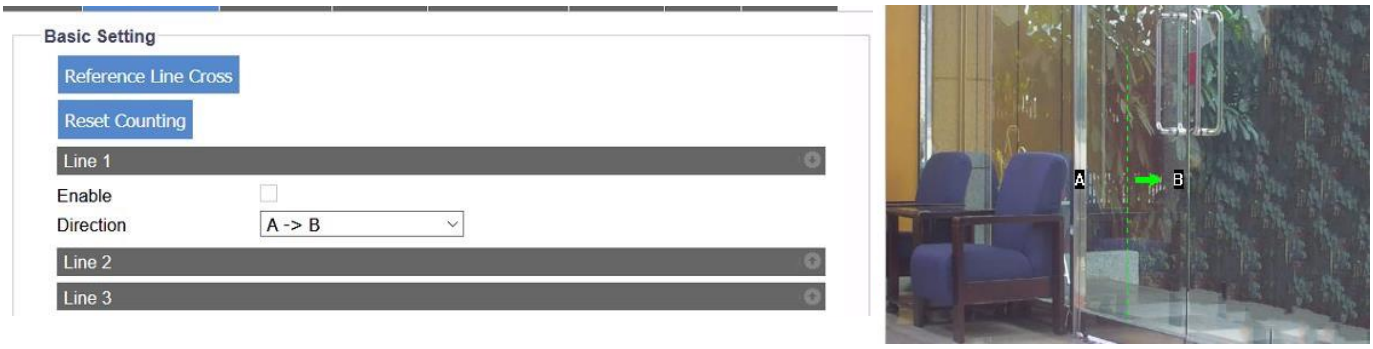


Figure: Line Counting Settings

Line Setting

Reference Line Cross

Pressing this button will allow user to apply the identical line deployment settings referred from Line Cross function, an easy way to copy and implement duplicate settings.

Reset Counting

Pressing the button will erase the accumulated counting records.

Line 1 ~ 3

Check the box to enable line setting. Press the arrow icon at the upper-right corner to expand or collapse the setting page of Line 1 to Line 3 individually. The options from Direction dropdown menu (A to B, B to A) helps user to define the exact direction to be counted.

Method

Press and hold the cursor on the right-side preview image to draw a line on the selected area, followed by clicking the “Save” button to have the settings take effect. Up to 3 lines can be assigned concurrently.

Figure: Line Counting Performance On Live View

Performance

Switch to the Live View page and select “Line Counting” from the lower-left Video Analytics dropdown menu. When there’s a moving object traveling through the designated line as in the above image, the number coming along with the arrow and line will increase (“1” shown in the image). Additionally, any moving object within the live view will be framed by a blue rectangle for clear identification.

9.3 Line Cross

This function is designed to establish borderlines to outline certain alerted zones within the camera coverage. For example, administrator can assign multiple lines bordering the area where a critical valuable object is located to efficiently monitor any suspect person crossing the borderlines deployed.

Figure: Line Cross Settings

Basic Setting

Reference Line Counting

Pressing this button will allow user to apply the identical line deployment settings referred from Line Counting function, an easy way to copy and implement duplicate settings.

Line 1 ~ 3

Check the box to enable line setting. Press the arrow icon at the upper-right corner to expand or collapse the setting page of Line 1 to Line 3 individually. The options from Direction dropdown menu (A to B, B to A) helps user to define the exact direction the line is crossed.

Method

Press and hold the cursor on the right-side preview image to draw a line on the selected area, followed by clicking the “Save” button to have the settings take effect. Up to 3 lines can be assigned concurrently.

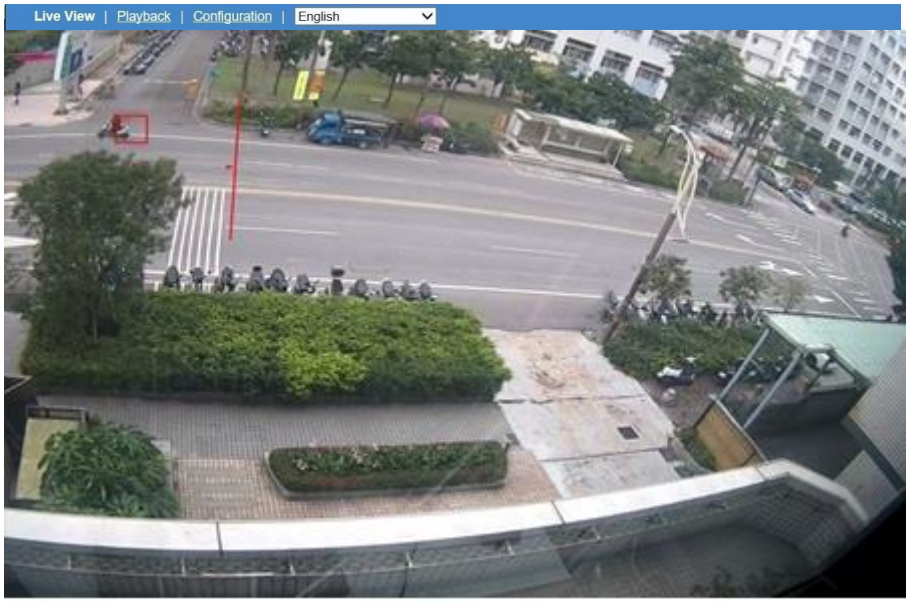


Figure: Line Cross Performance On Live View

Performance

Switch to the Live View page and select “Line Cross” from the lower-left Video Analytics dropdown menu. When there’s a moving object crossing the designated line as in the above image, both the crossed line and the rectangular frame enclosing the moving object are highlighted with red color for distinctive identification. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.4 Loitering

This function is designed to intelligently keep an eye on suspect objects that enter and linger for a certain period within the alerted area defined by administrator. This is a practical way to monitor a key zone without wasting human resources to keep vigil in front of monitor 24/7.

Figure: Loitering Settings

Basic Setting

Enable: Check the box to enable the loitering detecting function.

Trigger Interval: 5 ~ 300

Define a value for the threshold period to trigger loitering alarm by any suspect object that enters and lingers in the zone over that value.

Method

Draw a desired shape (octagon at the maximum) covering the key zone for loitering detection, followed clicking “Save” to have the settings take effect.

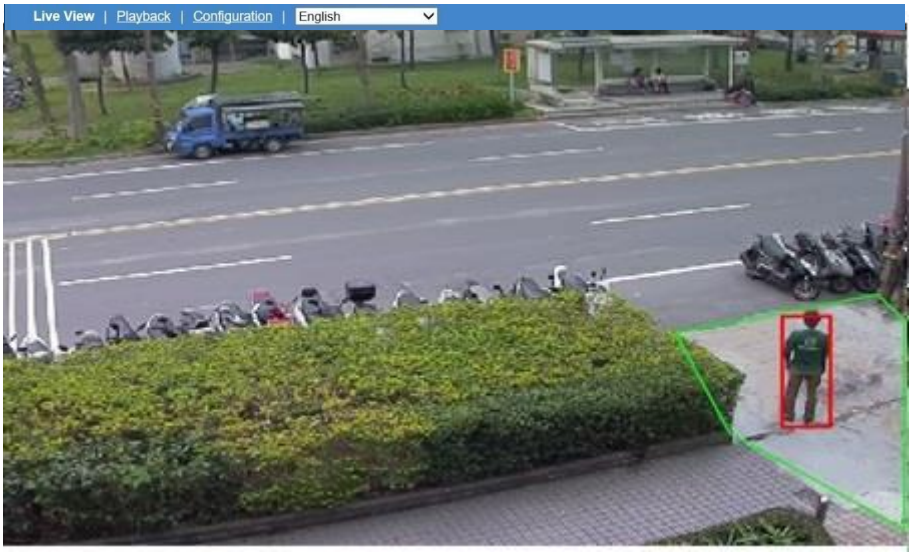


Figure: Loitering Performance On Live View

Performance

Switch to the Live View page and select “Loitering” from the lower-left Video Analytics dropdown menu. When there’s a moving object traveling into and lingering within the designated zone over a certain time defined by administrator, as shown in the above image, the rectangular frame enclosing the suspect object is highlighted with red color for distinctive identification. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.5 Area Counting

In some locations, e.g., parking lot, administrator may have the need to compile statistics on objects that get into or move off the location. By implementing the Area Counting function, administrator can easily gather statistics by intelligent surveillance camera.

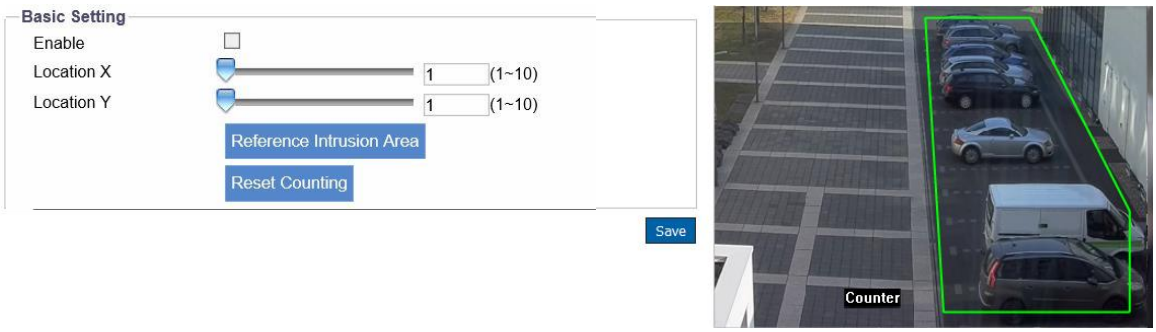


Figure: Area Counting Settings

Basic Setting

Enable: Check the box to enable the area counting function.

Location X & Location Y: 1 ~ 10

Input a value or slide the bar to define the exact location for the OSD counter, which records number accumulated by both exit and entry of the defined zone.

Reference Intrusion Area

Pressing the buttons will allow user to apply the identical area deployment settings referred from Intrusion Area function individually, an easy way to copy and implement duplicate settings.

Reset Counting

Pressing the button will erase the accumulated counting records.

Method

Draw a desired shape (octagon at the maximum) covering the desired zone for area counting and define a location for OSD counter, followed by clicking “Save” to have the settings take effect.

Figure: Area Counting Performance On Live View

Performance

Switch to the Live View page and select “Area Counting” from the lower-left Video Analytics dropdown menu. When there’s a moving object entering or moving off the designated area defined by administrator, as in the above image, the OSD counter will show the digit that represents the accumulated number of objects entering and leaving the designated area. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.6 Intrusion

Different from Line Cross, Intrusion is a function where administrator can define an irregular shaped an area (octagonal at the maximum) to watch if any suspicious object enters the area . Using Intrusion, administrator can effortlessly have command of a critical zone and receive a prompt warning if any object trespasses the defined critical zone in real-time.

Figure: Intrusion Settings

Basic Setting

Enable: Check the box to enable the intrusion detecting function.

Reference Area Counting

Pressing the buttons will allow user to apply the identical area deployment settings referred from Area Counting function individually, an easy way to copy and implement duplicate settings.

Method

Draw a desired shape (octagon at the maximum) covering the critical zone for intrusion detection, followed by clicking “Save” to have the settings take effect.

Figure: Intrusion Performance On Live View

Performance

Switch to the Live View page and select “Intrusion” from the lower-left Video Analytics dropdown menu. When there’s a moving object trespassing into the designated critical zone defined by administrator, as in the above image, both the rectangular frame enclosing the suspect object and the defined zone are highlighted with red color for distinctive identification. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.7 Object Removed

Object Removed detection was developed with the objective to guarantee that selected valuable objects are properly monitored and safeguarded. For example, the owner of a jewelry store would want to secure that each piece of jewelry is protected.

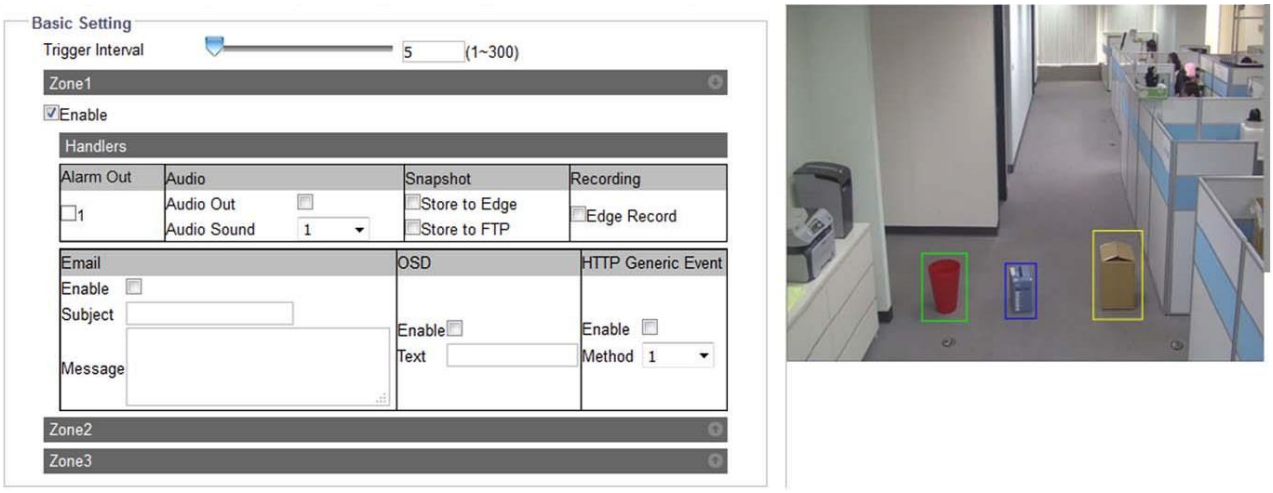


Figure: Object Removed Settings

Basic Setting

Trigger Interval (1 ~ 300)

Define an exact threshold of time period to trigger object removed detection. Either use the slider or enter an exact number in the field.

Zone 1 ~ 3

Check the box to enable each zone setting. Press the arrow icon at the upper-right corner to expand or collapse the setting page of Zone 1 to Zone 3 individually.

Method

Draw a desired rectangular zone covering the critical item for object removed detection, followed by clicking “Save” to have the settings take effect. Up to 3 zones can be set up having varied color indications.

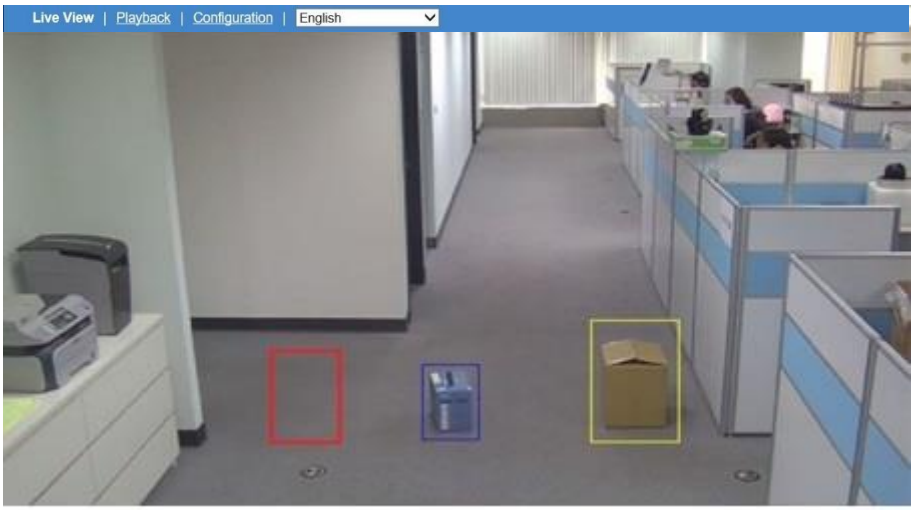


Figure: Object Removed Performance On Live View

Performance

Switch to the Live View page and select “Object Removed” from the lower-left Video Analytics dropdown menu. When any of the items marked by colorful zones is taken away, as in the above image, the zone will be highlighted with red color to indicate the original item was removed. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.8 Wrong Direction

The Wrong Direction function can be used to track vehicles or people that move in a direction that is not permitted. It can help control vehicles that may violate regulations for one-way street or people entering through an exit.

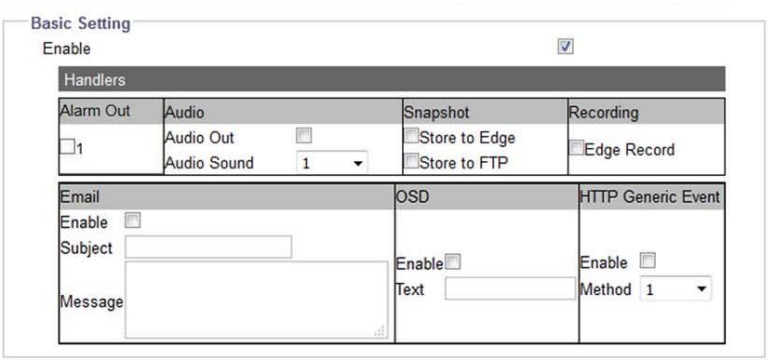


Figure: Wrong Direction Settings

Basic Setting

Enable: Check the box to enable the wrong direction detecting function.

Method

Press and hold the mouse to draw a green line on targeted area; the blue included angle in the proximity of the green line appears to indicate the permitted range for vehicles passing. By contrast, the areas out of the boundary of included angle are the sensitive zones to trigger wrong direction detection once any vehicle enters. The blue included angle can be enlarged up to 180° and shrunk to

the lowest 15° for flexible applications. Also, direction of included angle can be adjusted by simply press and hold to move the middle arrow.

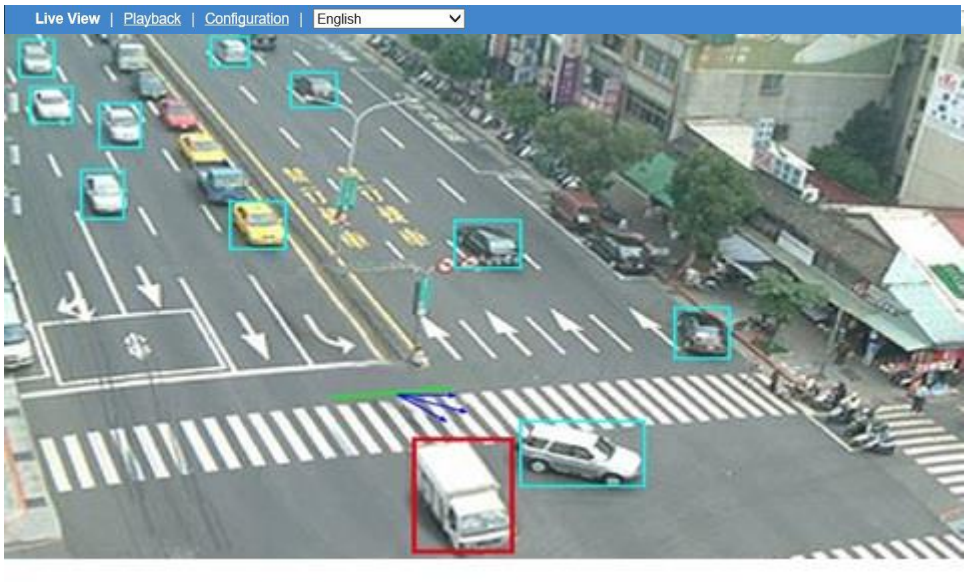


Figure: Wrong Direction Performance On Live View

Performance

Switch to the Live View page and select “Wrong Direction” from the lower-left Video Analytics dropdown menu. When there’s a moving vehicle crossing the green line but toward a direction away from the permitted range, i.e., blue included angle, the rectangular frame enclosing the detected vehicle, as in the above image, is highlighted by red color for distinctive identification. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

9.9 Object Left

The detection function “Object Left” is specifically designed to prevent an object from being intentionally deposited in a critical place, e.g., entrance of building or subway station. If a person deliberately leaves an object, such as a backpack, it can be intelligently detected and determined a suspicious abandoned object.

Figure: Object Left Settings

Basic Setting

Enable: Check the box to enable the object left detecting function.

Trigger Interval: 5 ~ 300

Define a value for the threshold period to trigger object left alarm for any suspicious object that was left within the zone over the value.

Method

Draw a desired shape (octagon at the maximum) covering the key zone for object left detection, followed by clicking “Save” to have the settings take effect.

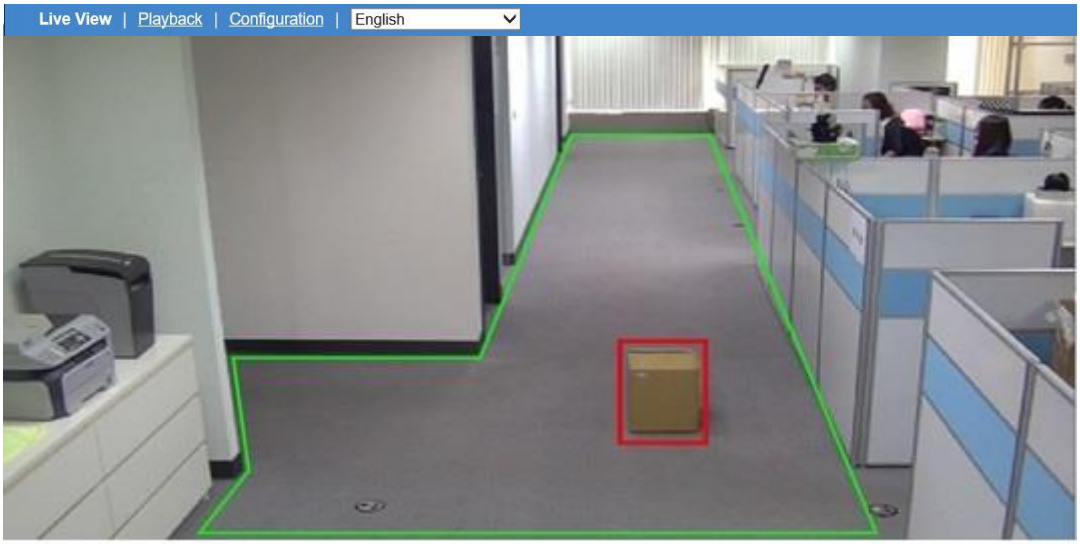


Figure: Object Left Performance On Live View

Performance

Switch to the Live View page and select “Object Left” from the lower-left Video Analytics dropdown menu. When there’s a suspicious object left within the designated zone over a certain period of time defined by administrator, as in the above image, the rectangular frame enclosing the suspicious object is highlighted with red color for distinctive identification. Additionally, any moving object within the live view will be framed by a blue rectangle for clear recognition.

10. Event Setting

10.1 Alarm Out

This section is designed to set up detailed settings for alarm output(s) when events occur. Make sure you have enabled alarm output in each event section to activate this function.

Figure: Alarm Output Settings

Alarm Out

Enable: Select "On" to activate this function.

Note	The available number of alarm output(s) will vary by model; check "Appendix: Product Comparison-I/O Port" for details.

Method: Pulse/Normal

There are 2 methods to proceed with alarm output. The fields available change according to method.

- Normal: The standard method to execute alarm output function, where user can define a a duration from options in Post Duration dropdown menu.

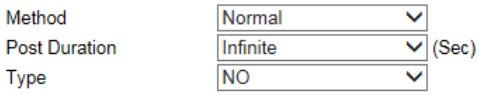


Figure: Normal Method Settings

- Pulse: Selecting this method, user can specifically define both the duration and interval time individually for alarm output. Additionally, counts for alarm output can also be customized.

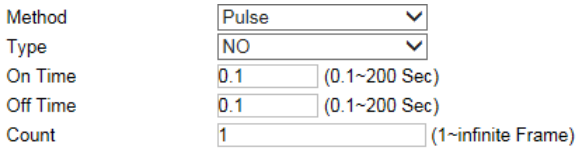


Figure: Pulse Method Settings

Post Duration: Infinite/5/10/15/30/Infinite (sec), Normal Method

Set a period of duration for alarm output under Normal method. Infinite means unlimited and continuous triggering for alarm output.

For Pulse Method:

Type: NO/NC

Define which type to use for triggering alarm output.

- NO (Normally Open): An alarm will be triggered when the external contact closes.
- NC (Normally Closed): An alarm will be triggered when the external contact opens.

On Time: 0.1 ~ 200 (sec)

Define a specific duration for alarm output.

Off Time: 0.1 ~ 200 (sec)
Define a specific interval for each alarm output triggering.

Count: 1 ~ Infinite
Define how many counts will be performed for alarm output.

Be sure to Save settings to have them take effect.

10.2 Email

This section is designed to set up detailed settings for email notification when events occur. Make sure you have enabled email sending in each event section to activate this function.

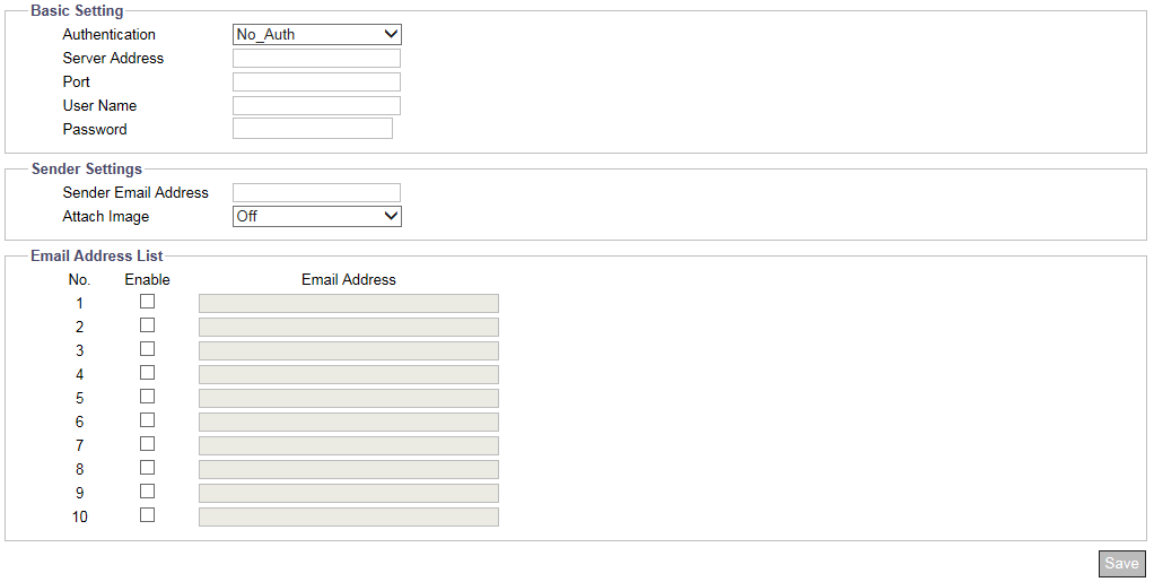


Figure: Email Settings

Basic Setting

Authentication: No_Auth/SMTP_Plain/Login/TSL-TTLS
Select an authentication type; a detailed description for each follows:

- No_Auth: No restriction.
- SMTP_Plain: PLAIN is the name of a registered SASL authentication mechanism, which serves as a parameter to the AUTH command. The PLAIN authentication mechanism is described in RFC 2595. Plain is the least secure of all the SASL authentication mechanisms, since the password is sent unencrypted across the network.
- Login: The Login mechanism is supported by Microsoft's Outlook Express and some other clients.
- TLS_TTLS: TLS is usually implemented on top of any of the Transport Layer protocols encapsulating the application-specific protocols, such as HTTP, FTP, SMTP, NNTP and XMPP. The TLS protocol allows client-server applications to communicate across a network in a way designed to prevent eavesdropping and tampering. TTLS can also be used to tunnel an entire network stack to create a VPN, as is the case with OpenVPN.

Server Address
Input a designated server address for email notification.

Port
Set “25” as default or change to a dedicated number. Discuss with your IT administrator for details if necessary.

User Name
Input a user name with privileges to access the server.

Password
Input the password associated with the user name.

Sender Settings

Sender Email Address
Enter the sender email address into the field.

Attach Image: On/Off
Select “On” from the dropdown to enable attaching the detected image of events to the email being sent.

E-mail Address List:

This function is designed to notify multiple users via email when events occur.

Figure: Email Address List

- Check “Enable” to send email to the selected address.
- Email Address: Input an email address to which events will be sent. A maximum of 10 email addresses can be defined.

10.3 FTP

This section is designed to set up detailed settings for FTP image storing when events occur. Make sure you have enabled FTP function in each event section to activate this function.

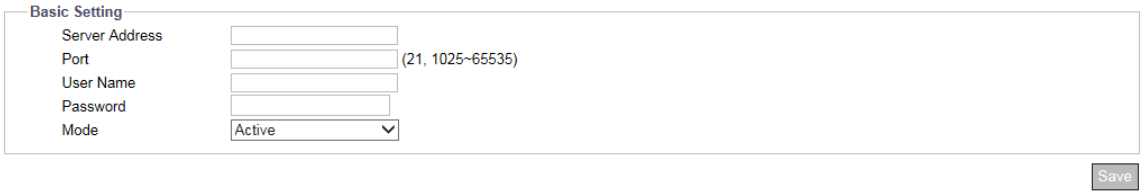


Figure: FTP Settings

Basic Setting

Server Address
Input an FTP server address.

Port: 1025 ~ 65535
Set “21” as default or change to dedicated number. Discuss with your IT administrator for details if necessary.

User Name
Input a user name with privileges to access the server.

Password
Input the password associated with the user name.

Mode: Active/Passive
Select the connection mode to be utilized; detailed descriptions follow:

- Active: Selecting this option, the camera will keep reconnecting with the designated FTP site, which uses more network bandwidth but delivers instant response to FTP.
- Passive: By selecting this option, the camera will only connect with the designated FTP site when necessary, which greatly helps to save the network bandwidth.

10.4 Record Setting

This section is designed to set up detailed settings for video recording. Make sure you have enabled recording function in each event section to activate this function.

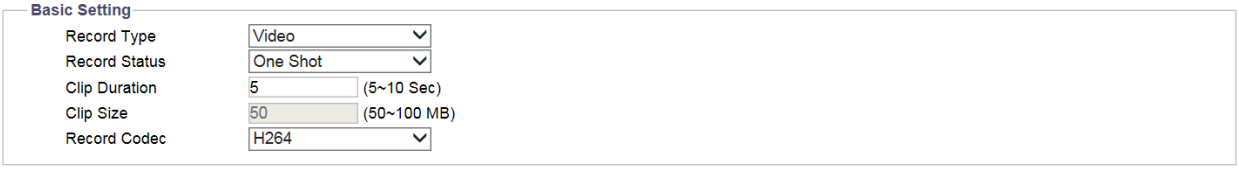


Figure: Record Settings

Basic Setting

Record Type: Video/Audio and Video

Choose which record type to use:

- Audio And Video: Both video and audio will be recorded.
- Video: Only video will be recorded.

Record Status: One Shot/Continuous

Define the method of recording.

- One Shot: Camera records video with designated duration and file size.
- Continuous: Camera keeps recording video continuously.

Clip Duration: 5 ~ 10 (sec)

Set the length limit for recording file (One Shot only).

Clip Size: 50 ~ 100 (MB)

Define the file size for recording file (One Shot only).

Record Codec: H.264/H.265

Choose type of video codec.

- H.264: Camera records video with H.264 video file format.
- H.265: Camera records video with H.265 video file format.

Recording Stream

After the Record Codec has been set, the system would find the corresponding stream, starting from Stream 1 to Stream 3. The camera records the first stream that matches the Record Codec.

Example:
If the Record Codec it set as H.264, and the encode setting is as follows
Stream 1: H.264
Stream 2: H.265
Stream 3: H.265
Then stream 1 would be used for recording.
If the setting is:
Stream 1: H.265
Stream 2: H.264
Stream 3: H.264
Then stream 2 would be used for recording.

10.5 SD Card

This section is designed to set up detailed settings for Edge Recording when events occur. Make sure you have enabled Edge Record function in each event section to activate this function.

Figure: SD Card Settings

Basic Setting

Overwrite: On/Off

This means that recorded files will be overwritten when SD card is at full capacity. The recording program will erase the earliest file (FIFO) and store another new file when the remaining capacity of mounted SD card is below 20 MB. Select ON to enable this function. Be sure an SD card is installed.

Status

Shows if SD card is inserted and mounted correctly or if an SD card is not inserted in the slot.

Encrypted Mode: On/Off

Encryption Mode allows user to decide whether the data on the SD card is encrypted or not. When "On," all data that will be saved on the SD card is encrypted. Conversely, when "Off," all data that will be saved on the SD card is NOT encrypted.

Encryption Key

Available when Encryption Mode is "On," Encryption Key allows user to enter a password, which will be used for decrypting and accessing the video file on the SD card.

SD Format

Click "Format" to start formatting the mounted SD card.

Notes	• Formatting the SD card, will always delete any data in the SD card no matter if Encryption Mode is "On" or "Off." • To access data stored on the SD card from Windows OS or Mac OS, a third party ext4 driver or application is required.

Refer to Appendix 2 for details on continuous recording on an SD card.

10.6 Snapshot

This section is designed to set up detailed settings for snapshot capture when events occur. Make sure you have enabled Snapshot function in each event section to activate this function.

Figure: Snapshot Settings

Basic Setting

Pre Event Capture Count: 1 ~ 10 (Frame)

Set the number of frames to be captured prior to an event.

Event Capture Interval: 1 ~ 10 (sec)
Set a time interval ranging from 1 to 10 seconds between each snapshot capture.

Post Event Capture Count: 1 ~ Infinite (Frame)
Set the number of frames to be captured after an event occurred.

10.7 Sound

This section is designed to set up detailed settings for audio output sounds when events occur. Make sure you have enabled Audio Out function in each event section to activate this function.

Note	• The availability of Sound will vary by model, check “Appendix: Product Comparison-I/O Port” for details.

Figure: Sound Settings

Basic Setting

Mode: One Shot/Infinite

- One Shot: The sound of audio out will be played only 1 time.
- Infinite: Infinite keeps the sound playing continuously.

No.
The numerical order list of each sound file.

File Status

The current status of each sound file is clearly shown here.

Select File

Click the “Choose File” button to open the window for selecting a desired sound file from your local computer.

Delete File
Simply click “Delete” to remove the sound file from the list. A Delete All button allows you to remove all files.

10.8 HTTP Generic Event

HTTP Generic Event can help user send messages and commands directly to Network Video Recorder (NVR), which supports CGI commands function. User can customize the messages and commands as needed.

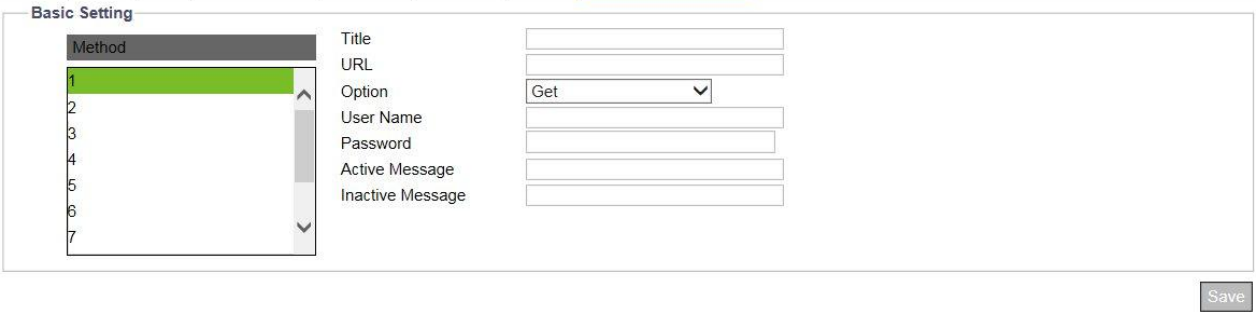


Figure: HTTP Generic Event Settings

Basic Setting

Method
Select one of the 10 selectable events that can be communicated to the VMS/NVR, which supports HTTP generic event, for the trigger event.

Title
Preset the title of messages.

URL
Input the web address of NVR. Refer to the user manual for the NVR for the details on finding web address.

Option: Get/Post
Select the mode of notification transmission as needed.

- Get: Get is a simple and fast method to transmit messages, but it is less secure than Post.
- Post: Post is a more complex way to transmit messages, but it is also safer than Get.

User Name
Enter a designated user name for authentication to the accessed NVR.

Password
Enter the password corresponding to the inputted user name for correct authentication.

Active Message: Camera will send an active message to NVR when the trigger event occurs.

Inactive Message: Camera will send an inactive message to NVR when the trigger event ends.

Appendix 1: Product Comparison

Model Type	Dome		Mini Bullet	
	V2102D-W313MIR	V2105D-W313MIR	V2102B-W28IR	V2105B-W28IR
Video Compression	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG
Max Resolution & Frame Rate	2Mp at 30fps	5Mp at 30fps	2Mp at 30fps	5Mp at 30fps
Lens Control	f3.1mm~10mm, F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f2.8mm, F1.8, fixed Ricom MTV2.8-IR(3MP)-E-P	f2.8mm, F1.6, fixed Ricom MTV2.8-IR(3MP)-E-P
Day & Night	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time
IR Control	-	-	-	-
I/O Port	-	-	-	-
Event Trigger	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness
Event Actions	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication
Storage	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot
Internet Security	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering
RS485 Interface	-	-	-	-
ABF Control	-	-	-	-
Value Added	Digital WDR, 3DNR, Mirror	Digital WDR, 3DNR, Mirror	Digital WDR, 3DNR, Mirror	Digital WDR, 3DNR, Mirror

Note: Product specifications and pictures are subject to change without prior notice.

Model Type	Bullet		Dome			Box
	V2102B-W313MIR	V2105B-W313MIR	V2002D-W313MIR	V2005D-W313MIR	V2008D-W310MIR	V2008-W-NL
Video Compression	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG
Max Resolution & Frame Rate	2Mp at 30fps	5Mp at 30fps	2Mp at 30fps	5Mp at 30fps	8Mp at 30fps	8Mp at 30fps
Lens Control	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(6MP)	f3.6mm~10mm , F1.5~2.8 HD027135DB.ICR1-MFZ2.1(4K)2	CS mount (lens is not included)
Day & Night	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time
IR Control	-	-	Adaptive IR, Smart IR	Adaptive IR, Smart IR	Adaptive IR, Smart IR	-
I/O Port	-	-	Audio 1/1 Alarm 1/1 (option)	Audio 1/1 Alarm 1/1 (option)	Audio 1/1 Alarm 1/1 (option)	Audio 1/1 Alarm 1/1 (option)
Event Trigger	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness
Event Actions	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication
Storage	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot
Internet Security	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering
RS485 Interface	-	-	-	-	-	1
ABF Control	-	-	-	-	-	External ABF Control
Value Added	Digital WDR, 3DNR, Mirror	Digital WDR, 3DNR, Mirror	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA

Note: Product specifications and pictures are subject to change without prior notice.

Model Type	Bullet			Micro Dome		Panoramic
	V2002B-W313MIR	V2005B-W313MIR	V2008B-W313MIR	V2002D-W28IR	V2005D-W28IR	V2360W-12
Video Compression	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG	H.265/HEVC MP H.264 MP/BP H.264 HP (>=720p) MJPEG
Max Resolution & Frame Rate	2Mp at 30fps	5Mp at 30fps	8Mp at 30fps	2Mp at 30fps	5Mp at 30fps	12Mp at 20fps
Lens Control	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(4MP)	f3.1mm~10mm , F1.4~2.8 HD027135DB.ICR1-MFZ2.1(6MP)	f3.6mm~10mm , F1.5~2.8 HD027135DB.ICR1-MFZ2.1(4K)2	f2.8mm, F1.8, fixed Ricom MTV2.8-IR(3MP)-E-P(M1G)	f2.8mm, F2.0, fixed Ricom MTV2.8-IR(6MP)-C-P(M1G)	Fisheye fixed lens
Day & Night	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time	Modes: Auto, color, BW D/N switch sensitivity D/N switch time
IR Control	Adaptive IR, Smart IR	Adaptive IR, Smart IR	Adaptive IR, Smart IR	Smart IR	Smart IR	Smart IR
I/O Port	Audio 1/1 Alarm 1/1 (option)	Audio 1/1 Alarm 1/1 (option)	Audio 1/1 Alarm 1/1 (option)	Audio 1/1	Audio 1/1	Audio 1/1 Alarm 1/1 (option)
Event Trigger	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness	Schedule, Motion, Tampering, Network Loss Detection, Audio Intensity Detection, Alarm Input, mSD Healthiness
Event Actions	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication	Schedule recording (*JPG/MP4) E-mail notification (*JPG) FTP recording (*JPG) SD Card recording (*JPG/MP4) OSD indication
Storage	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot	1 x micro SDHC/SDXC slot
Internet Security	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering	HTTPS, IEEE 802.1X, digest authentication, IP filtering
RS485 Interface	-	-	-	-	-	-
ABF Control	-	-	-	-	-	-
Value Added	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror, VA	Digital WDR, 3DNR, Mirror

Note: Product specifications and pictures are subject to change without prior notice.

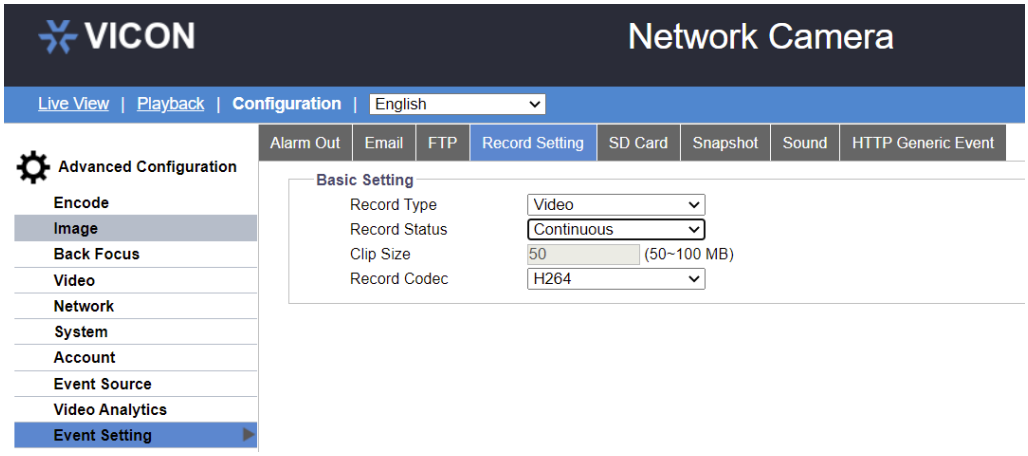
Appendix 2: Continuous Recording to an SD Card

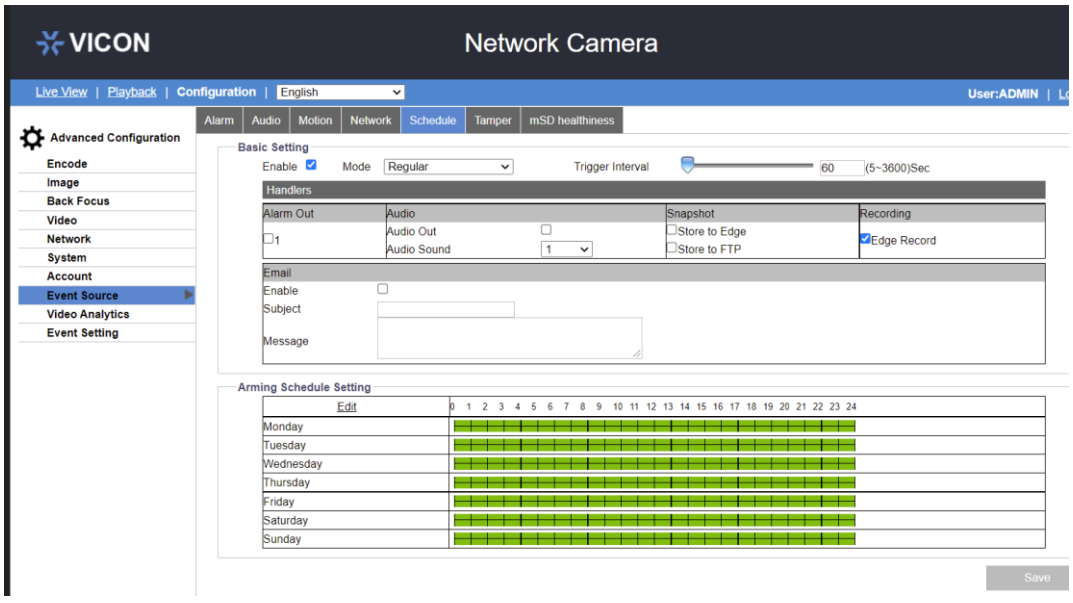
There are two options for continuous recording to the uSD card, regular and persist.

Regular uses pre-defined intervals. The date/time must be set properly to record the clips, preferably with time synced to an NTP server.

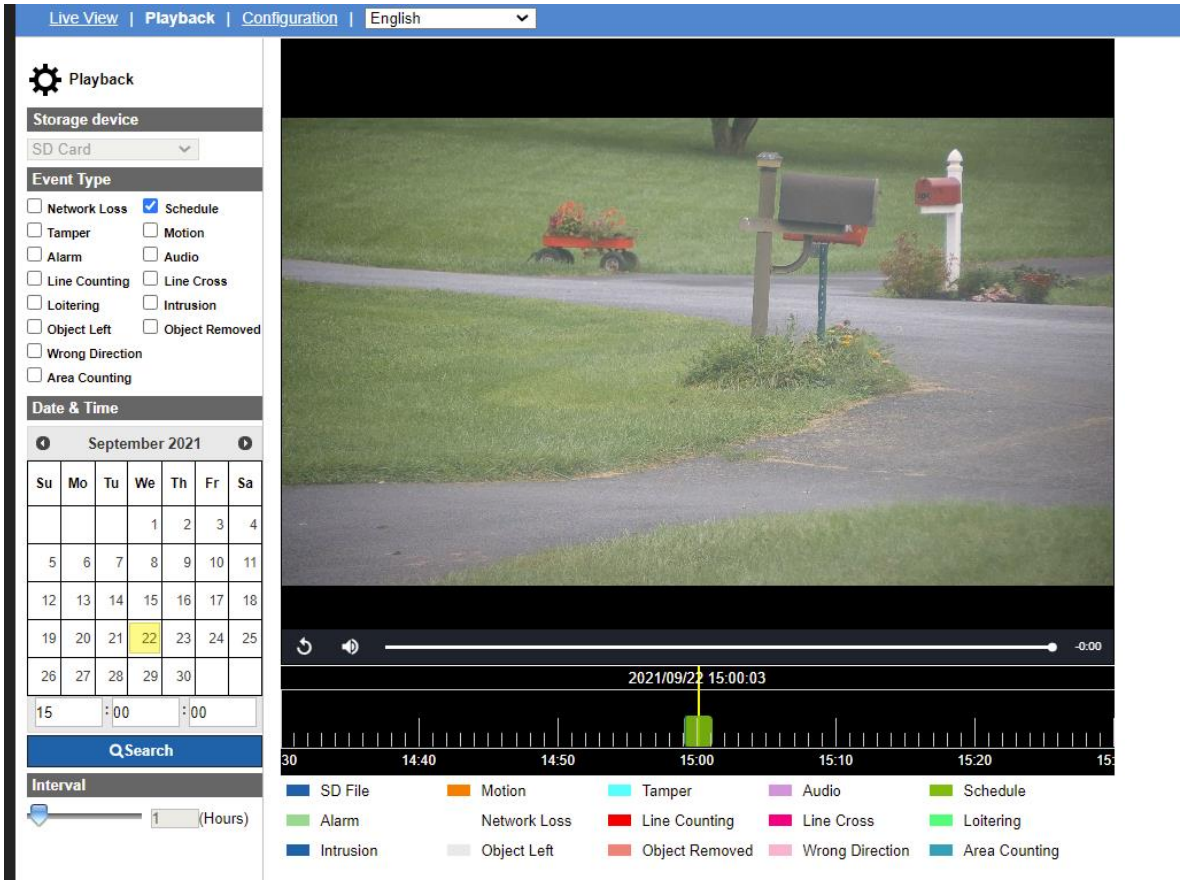
1. **If user wants to record video continuously:**
   If user wants to record continuously (24/7) and wants the timeline on playback able to be updated, it is suggested to use the following setting. The recommended duration is 120 seconds to 300 seconds (2 to 5 minute file sizes).

Regular (5 to 3600 sec)	Continuous	Records continuously and when pressing search button on playback page the updated timeline with the latest file with the pre-programmed duration.

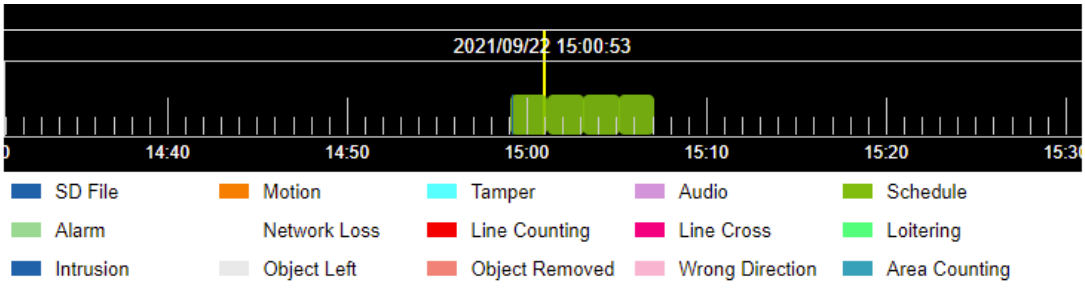




Playback:



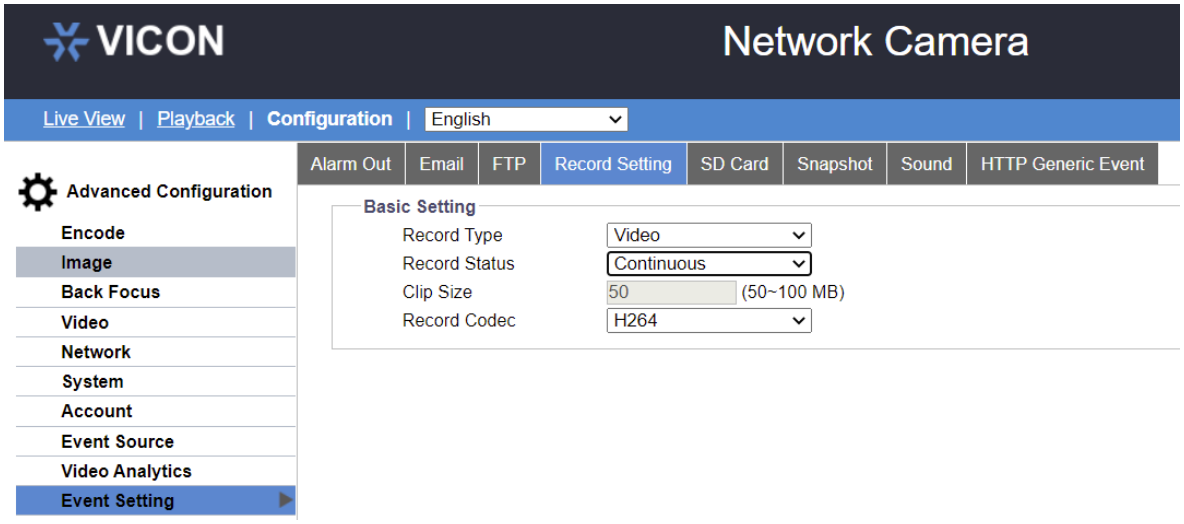
Press Search to update the timeline.

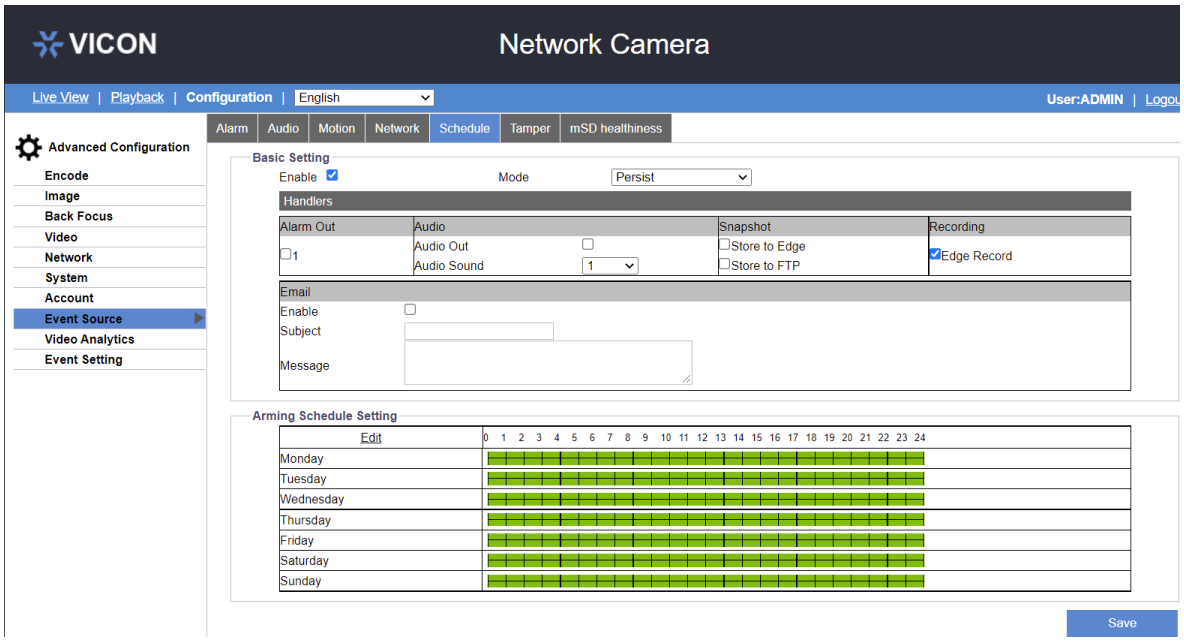


The selected clip will play, and the playback will stop at the end of the clip. Click on the next clip to play it back.

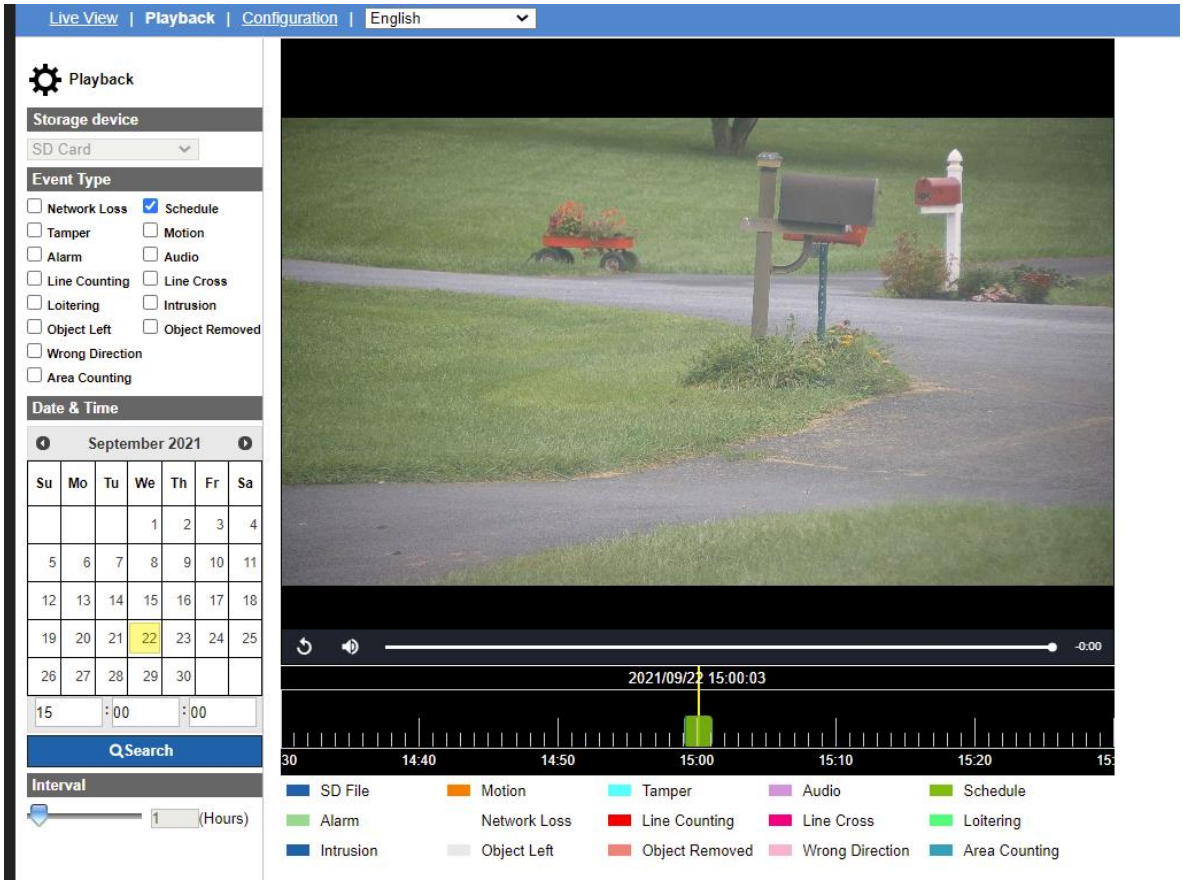
2. **If user wants to use persist mode and see the timeline updated:**

If the event has not ended yet, you can see the blue color on timeline after 50MB file is generated. However, if the event is finished, then the green color will be blended on the blue timeline.

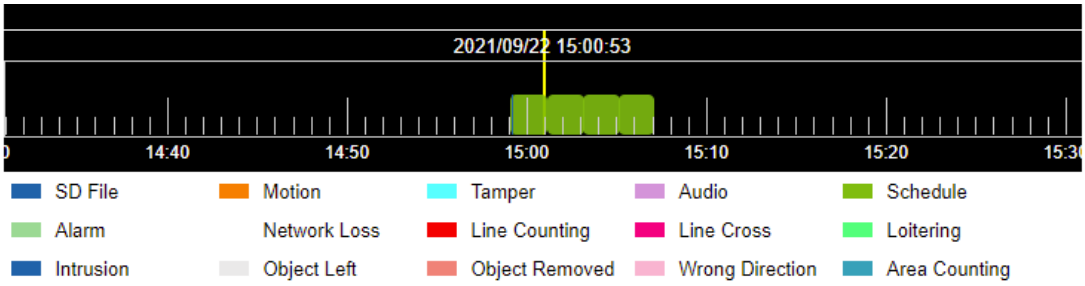




Playback:



Press Search to update the timeline.



The selected clip will play, and the playback will stop at the end of the clip. Click on the next clip to play it back.

VICON INDUSTRIES INC.

For office locations, visit the website: vicon-security.com