User Guide

Roughneck® AI V2000 Series and Roughneck V2100 Series Cameras

XX318-00-04

Table of Content

Connection

Accessing the Camera

The camera can be accessed directly from its web page or using Vicon's PRONTO Device Manager, which can be found on Vicon's website. Note that when accessing the camera for the first time, a message will display to reset the password.

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

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., Chrome, 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."

This Camera is Not Secure

Please setup the password for this device.

User Name: ADMIN
Password:
Re-type Password:

Save

PRONTO Device Manager

PRONTO is Vicon's device manager (Discovery tool) that can be used to discover all Vicon cameras on a system.
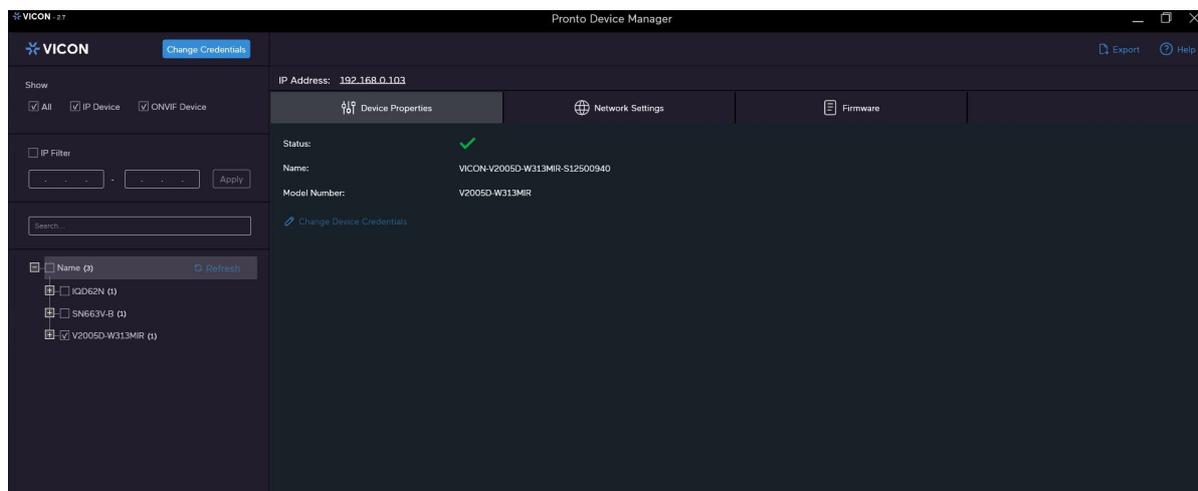
Figure: PRONTO Interface

- Upon startup of the PRONTO Device Manager, the tool's auto-discovery function generates a list of the discovered cameras on the network in a resource list.
- There are a variety of filtering options, including filter by All Devices/IP Device/ONVIF Device; IP range or text.
- There are tabs for Device Properties, Network Settings and Firmware.

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.
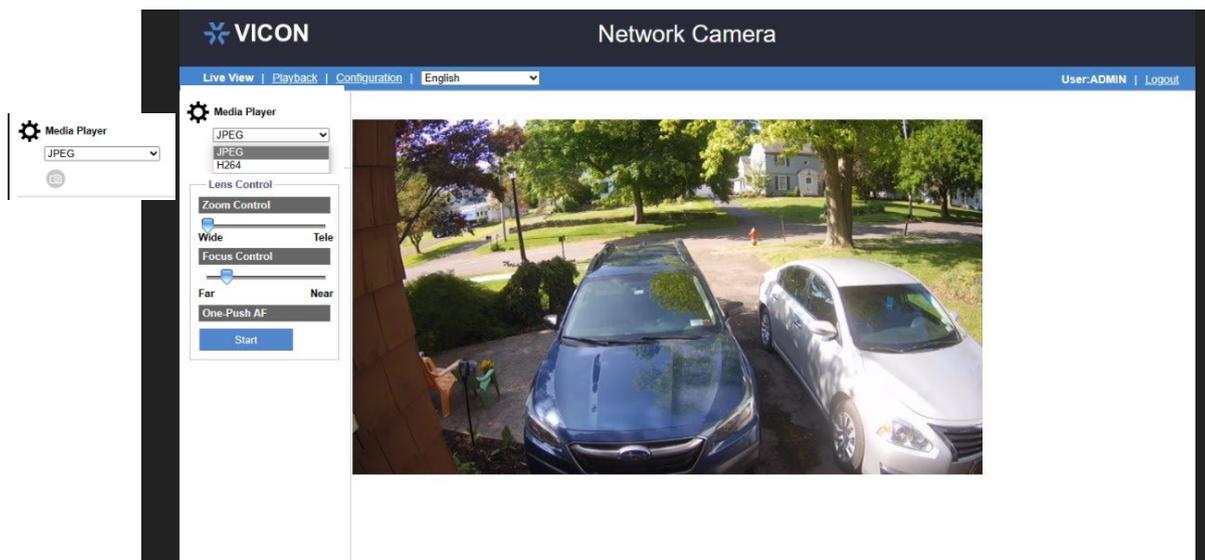
Figure: Live View (without AI)
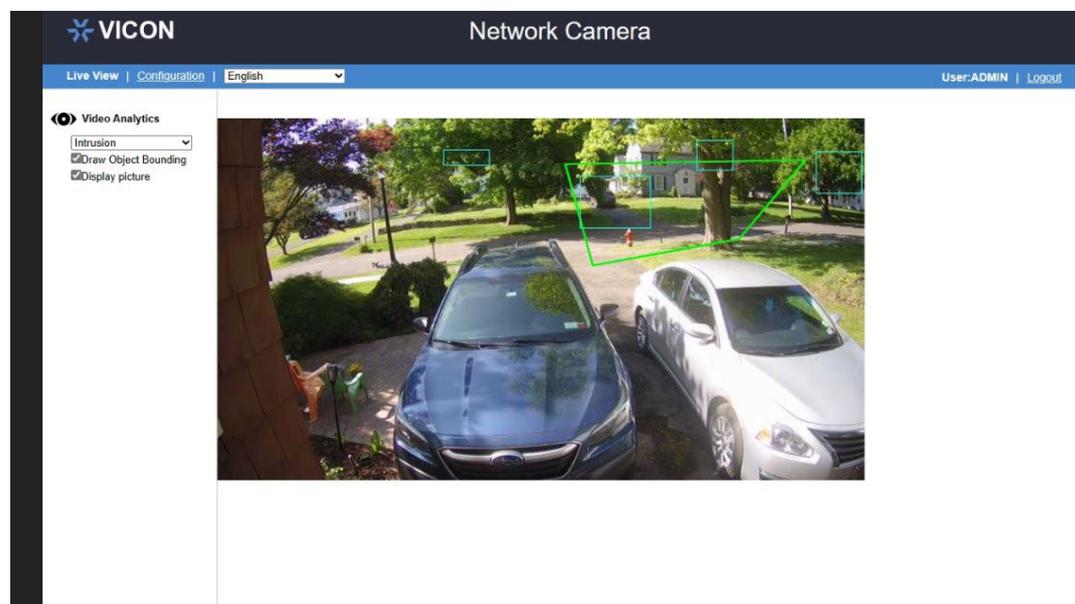
Figure: Live View (with AI)
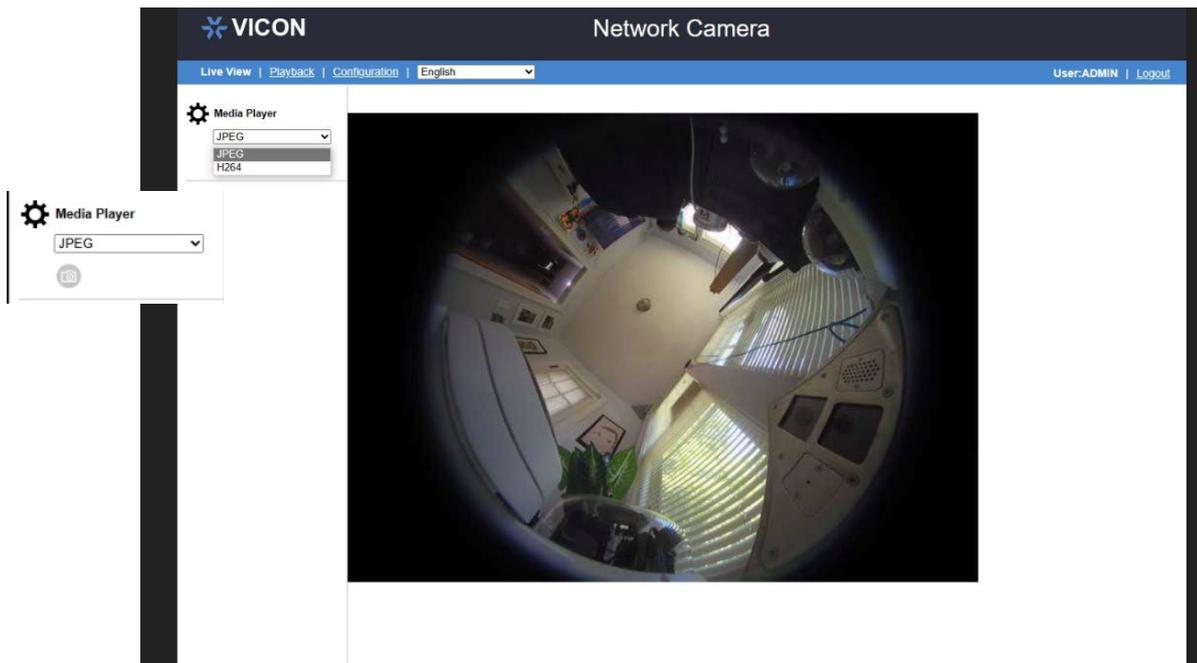
Figure: Live View (Fisheye model without AI)
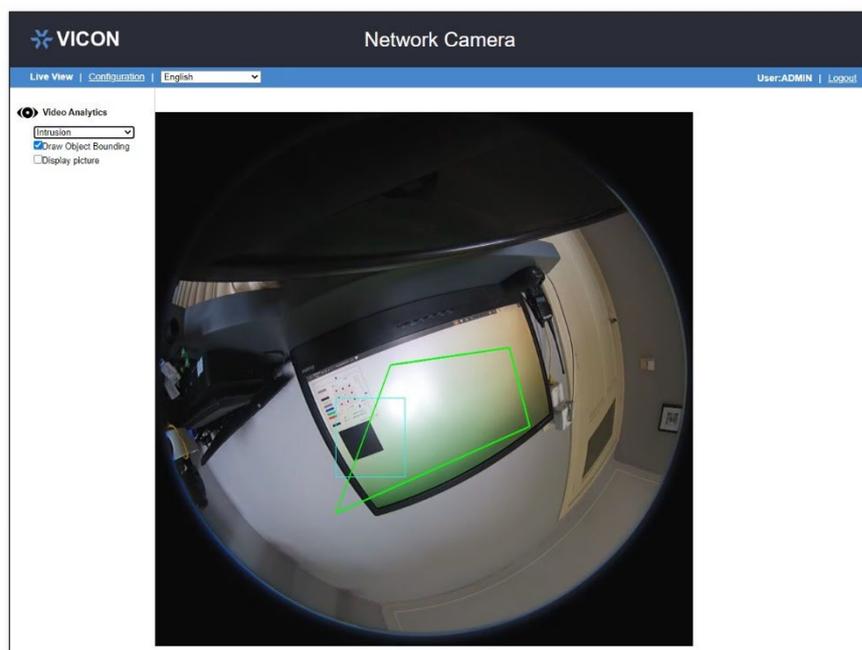
Figure: Live View (Fisheye model with AI)

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: JPEG and H.264; JPEG offers a broad range of browser options, including Chrome, Opera, etc., but has lower frame rate display. Additionally, in JPEG mode a Snapshot button ⬚ is provided for users to take a still picture and save it in a predefined folder.

Note	• "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.
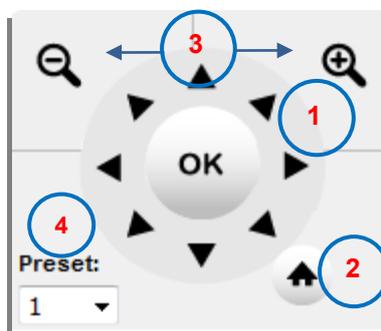
Figure: RS-485 Control Panel

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.

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

The Video Analytics must be enabled in Configuration for these to display on the Live screen. This is only available for those cameras that have Advanced 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 "Advanced Analytics, Video Analytics" section and that tab is open in Configuration. 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.
- Display Picture: When an object enters the area, an easily identifiable icon of a person or vehicle (rather than text) displays, showing its movement until it exits the area.

Note	• Keep the zoom level of the browser at 100% to display a normal live view.

Playback

The cameras provide a method to play video stored on a micro SD card.

Due to compatibility issues related to video and audio formats, when playing video stored on a micro SD card, it is highly recommended to use Chrome or Safari browser. Remember that both camera and browser must support the 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, the page displays.

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
The 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.
The selected date will now have 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.
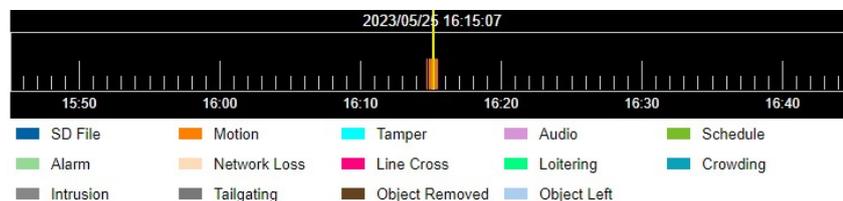

Figure: Timeline Area

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 the 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.

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

It 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 described in detail below.

Corridor: On/Off (Camera Dependent)

Vertically oriented scenes, e.g., sidewalk, aisle, hallway/corridor, require more details in vertical areas, so 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; 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

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

Note	• Refer to the datasheet for the camera model or the "Appendix: Product Comparison-Max resolution & frame rate" for details.

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.

Frame Rate: 30 ~ 1
Choose desired frames per second from the dropdown menu.

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. Note that if iStream is selected in Video, Enhanced Codec, this will be grayed out.

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 a bit rate value lower than default bit rate is selected, the image quality may deteriorate. When selecting a 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; it is recommended to select Off.

GOP: 1 ~ 60

GOP stands for Group of Picture length. Select the GOP length number from 1 to 60 for 60 Hz 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, a 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.

1.2   Dewarp for V2360W Panoramic Camera Only

Dewarp is a process of perspective correction of an image to reverse the effects of geometric distortions caused by the camera lens. According to 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 a user to control the settings pertaining to exposure mode and day/night modes. The screen will vary depending on the selections made.

Basic Settings

Figure: Exposure Basic Settings

Exposure Mode: Auto/Flickerless/Shutter Priority/Manual

There are 4 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 the 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 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 the 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. The Exposure Mode setting becomes disabled when True WDR is checked.

Enhanced WDR Level

Enhanced WDR, available when "True WDR" is activated, facilitates better quality of details within both bright and dark areas. This further strengthens and reinforces the optimal image result based on a perfect combination of both True WDR and Enhanced WDR. Slide to set enhancement level; the higher the number the better the enhancement of WDR level.

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.

DC Iris Control: Auto/Full (Box Camera only)

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, explained 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.

OFF   Upper 2/3   Lower 2/3   Center 1/3

Center 1/6   Left   Right
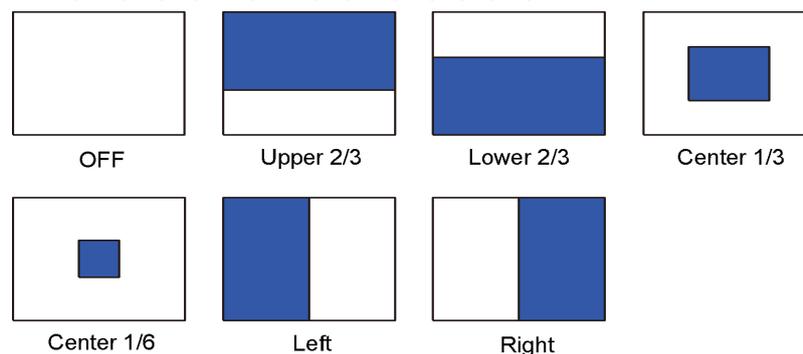
Figure: BLC Settings Illustrations

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.

Shutter Speed:

Selecting 1/10000 provides the fastest shutter speed; values available are dependent on selections.

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. Otherwise, a Max Gain slider is provided, 0 ~ 48.

Day Night Settings
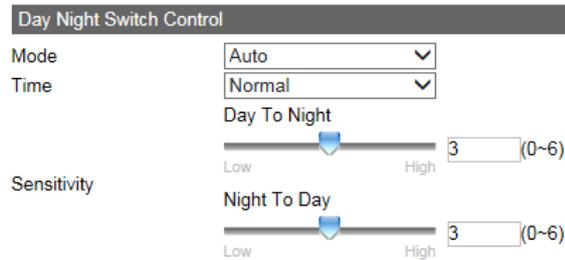
Figure: Day Night Switch Control Settings

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. Alarm1 is selected, the alarm input to triggers the change to the Day/Night setting.

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

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

Set the delay (buffered) time for switching between day and night modes. Fast means the 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 number) 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 number) indicates the 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 will display for adjustment. Note that the full P Iris functionality is only available when one of the supported lenses is mounted to the camera.

Note	• If using Vicon lens V4-13VF-P select TAMRON M118VP413IRCS_CS_Mount_P; if using V12-50VF-P select TAMRON M118VP1250IR_CS_Mount_P.

IR Control

Display is conditional on camera and selections made.

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.

Adaptive IR: On/Off (camera dependent)

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.

IR Level: Low/High (0~100)

Depending on selections made, a user can click and drag to adjust the IR intensity level 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 camera; 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.

HLC

Highlight compensation (HLC) allows the camera to compensate for high focus points of light, such as headlight, to reduce blooming that can wipe out detail and enhance the overall quality of the image. This feature is only available for Roughneck AI cameras.

Select On to enable HLC (High Light Compensation). Use the slider to adjust the level or enter a number in the field, 0-100.

2.2 White Balance

This section allows user to set the white balance values to meet ambient conditions for best color rendition.
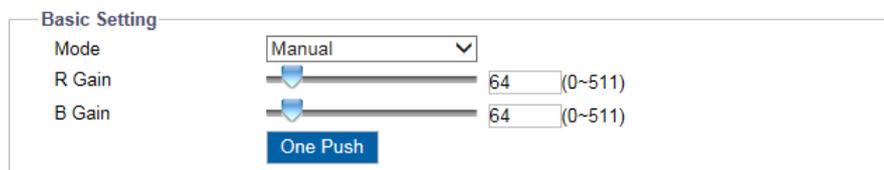
Figure: White Balance Settings

Basic Setting

Mode: Auto/ATW/Manual

- Auto: Continuously adjusts the camera color balance in accordance with any change in color temperature.
- 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 selected from the dropdown. When corridor mode is enabled, the image will rotate 270 degrees.

Orientation: Off/Flip and Mirror

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

3. Lens Control (Camera Dependent)

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.

- Advanced Focus Control
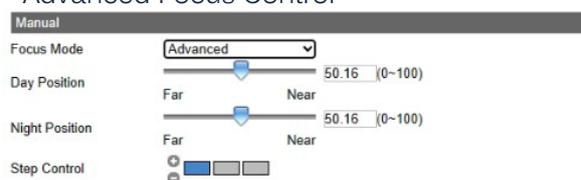
Step Control

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.

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 the 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 the 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.
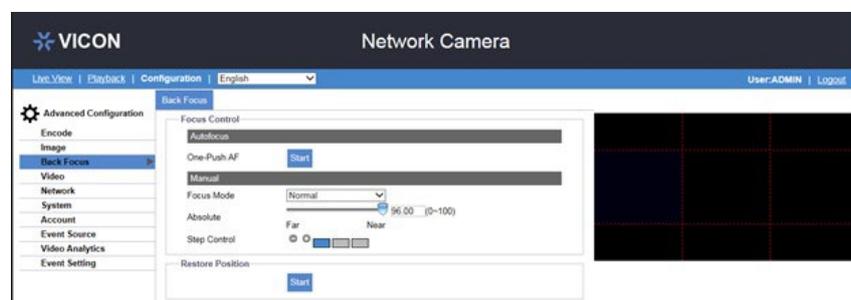
Figure: Back Focus\ABF Settings

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.
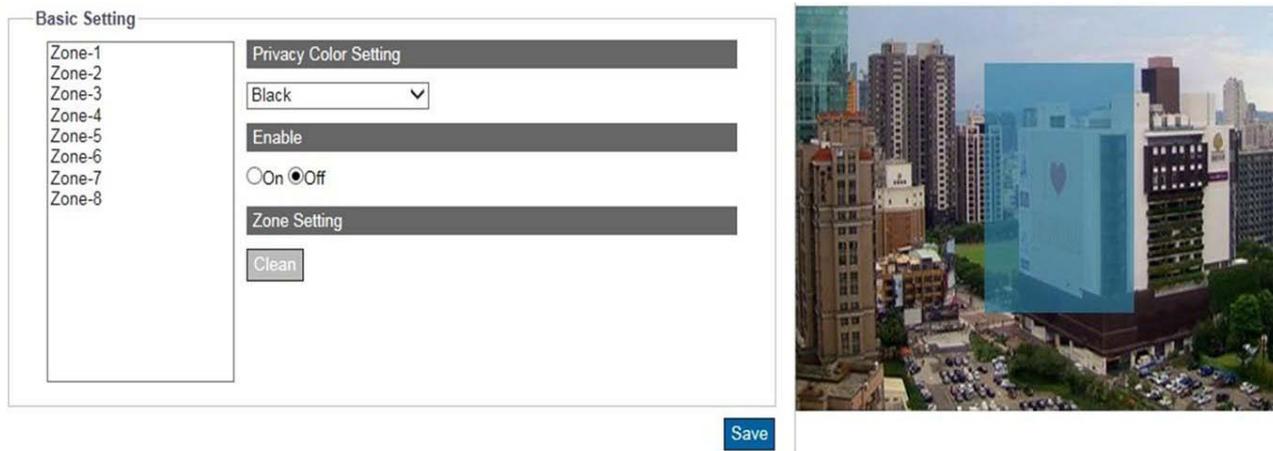
Figure: Privacy Zone Setting

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 both the 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 an 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 reduced 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:
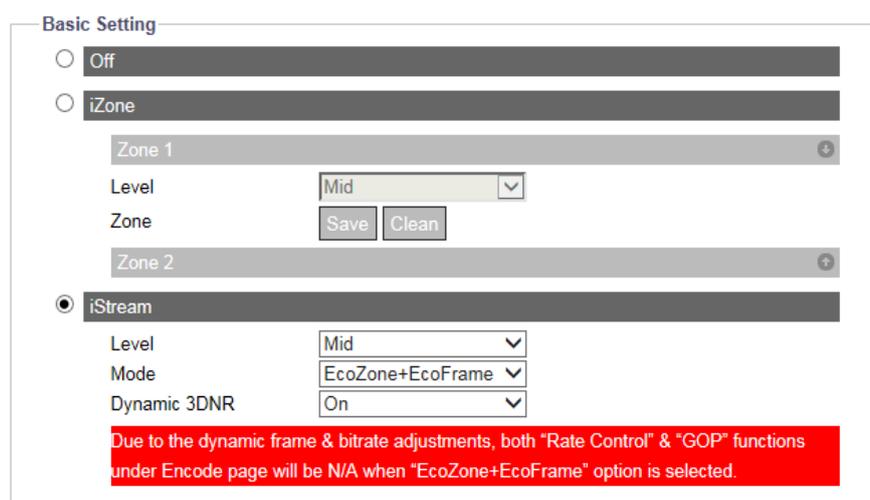
Figure: iStream Settings

- Level

Select Low, Mid or High to determine the level of bandwidth usage.

- Mode
  - 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 constantly 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

<div align="center">Figure: Network Basic Settings</div>

HTTP Port: 80/ 1025 ~ 65535

This protocol allows for TCP protocol quality without having to open specific ports for streaming. If using a firewall, the user 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

<div align="center">Figure: Network IP Settings</div>

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 at 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 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 section 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 selecting 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 FTP Client.

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 SFTP Client.

5.4 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 (On) 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 Multicast Auto Connection "On" will enable auto connection. Note that it is not required to enable authentication

before proceeding with RTSP. Museum Search can be turned On to enable (On by default). It is recommended to leave Museum Search set to On; if Museum Search is turned off, access to certain analytics features is also turned off, such as bounding boxes. Sensitivity of Museum Search can be set to Low, Mid High to control the number of search results (high will yield more results).

Streams
URL

Input a 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 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 and Port

Complex in its transmitting procedure and layer structure, Multicast streaming requires more specific settings containing Video Address and Port, Audio Address and Port and Meta Address and Port, all of which, as the UI indicates, have a certain IP address range (224.0.1.1 – 239.255.255.254) and Port range (1025-65535) for user to define individually.

5.5   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, 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 v2c

Enable: On/Off

Select "On" or "Off" to enable or disable SNMP v1 and SNMPv2c individually.
The Read/Write Community String from SNMP can be public or private; selecting public allows Read Only and 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 a password.

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" when a Mode is selected to enable or disable heartbeat function.

Heartbeat Interval: 5 ~ 600

Input desired value in seconds for Heartbeat Interval (when a Mode is selected).

Event: On/Off

Specifically designed for event occurrence, this option, when turned On (when a Mode is selected), 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.

5.6　802.1X

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 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.

5.7　Firewall

Under this menu, a 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 input IP addresses access to the IP camera.
- Deny: Select this option to not allow input IP addresses access to the IP camera.
- Off: Select this option if no actions will be made for input 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.

5.8 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	This is required to set up the value when selecting FreeDNS type.

5.9 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, a user can create a CSR (Certificate Signing Request) by filling in the following information: Country, Province, City, Common Name, Organization, Organization Unit and Email. For an installed certificate, the 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

5.10 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

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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)

Set the synchronization period using the slider or enter the number in the field, 1-24 hours.

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/Built-in Mic in (model dependent)
Select which audio source will be connected from the 2 options in the dropdown menu.

- Built-in Mic In
- Line In: via audio line 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. G.711 μ-law is primarily used in North America and G.711 a-law is used by most other countries in the rest of the world.

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) 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 an 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 or use Vicon's PRONTO Device Manager; refer to the Connection section of this manual.

System Information

Firmware Version	01.00.0.9.17396
Hardware Version	00.00
Product Name	C242A
Serial Number	T92150075
MAC Address	54:6d:52:00:58:98

Firmware Upload

Choose File   Upgrade

Figure: Firmware Settings

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

6.4 Initialization

Figure: Initialize Settings

System Frequency: 60Hz/50Hz

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

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.

6.5 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. Speak to your IT administrator before making any changes to this screen.

6.6 OSD

This section allows a 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 2 sets of OSD settings that can be enabled concurrently, as shown on the following table. Options change according to selections made.

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. Refer to the table above. OSD is enabled on the Event Source screen.

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 with the camera and the connected device, for proper operation.

Figure: RS485 Settings

Note	• RS485 function is available for 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: 389/1025 ~ 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.
Motion	Object Size, Sensitivity	✓	✓	On by default
Network	Wired Network Lost/ Wired Network Conflict	✓	-	Does not support HTTP Generic Event.
Schedule	Regular/Persist trigger event action, interval (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 an event occurs. Check box to enable.

Audio

- Enable: Audio output function will be enabled when an 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 the 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 an event occurs; be sure the 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 an event occurs.
- Subject: Preset the 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, the 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 setting page will display as below. By default, the boxes are all checked 24/7. User can individually establish up to 3 sets of time ranges for each day, where start and end times can be separately defined. Check the box on the right side to enable the defined time range, followed by clicking "Apply" for it to take effect. 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. The screenshot below shows that the 2 time ranges, Monday (08:00 – 24:00) and Tuesday (03:00 – 15:00), are properly defined and checked; the other days remain set for 24/7.

	Start Time	End Time	Action
Monday			
	08:00	23:59	☑
	00:00	23:59	☐
	00:00	23:59	☐
Tuesday			
	03:00	15:00	☑
	00:00	23:59	☐
	00:00	23:59	☐
Wednesday			
	00:00	23:59	☑
	00:00	23:59	☑
	00:00	23:59	☑
Thursday			
	00:00	23:59	☑
	00:00	23:59	☑
	00:00	23:59	☑
Friday			
	00:00	23:59	☑
	00:00	23:59	☑
	00:00	23:59	☑
Saturday			
	00:00	23:59	☑
	00:00	23:59	☑
	00:00	23:59	☑
Sunday			
	00:00	23:59	☑
	00:00	23:59	☑
	00:00	23:59	☑

Apply | Cancel

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 certain responses that are preset in 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   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. Motion is enabled by default.

Figure: Motion Detection Settings

Motion Zone Area Setting

Size Setting
Click Size Setting button; the button turns red. Using the cursor, draw a motion zone area of desired size in the position needed.

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 the camera is triggered only when a major change in motion or light occurs.

Click "Save" to have the settings take effect.

8.4   Network

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

Figure: Network Event Settings

Basic Setting

Wired Network Loss

Check the box to enable the detection of network loss. 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 Loss and Network Conflict.

8.5   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 alarm 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.

8.6 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.

8.7 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.

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

Figure: mSD Healthiness Settings

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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.

9.   Video Analytics

Note	•	The Video Analytics described below are for 2 MP cameras only.

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. The 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	•	Fisheye cameras do not support these 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.
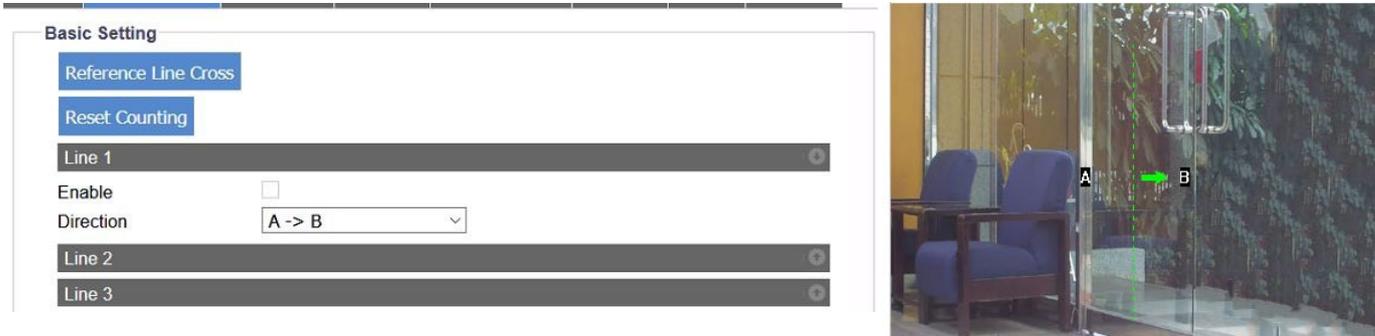
Figure: Line Counting Settings

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.
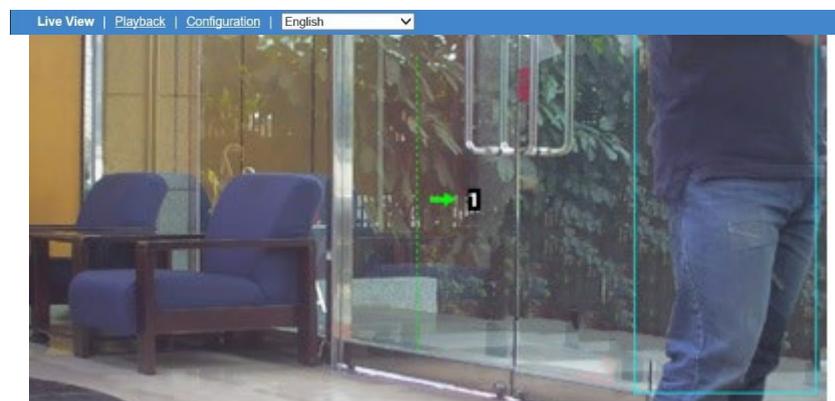
Figure: Line Counting Performance On Live View

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.
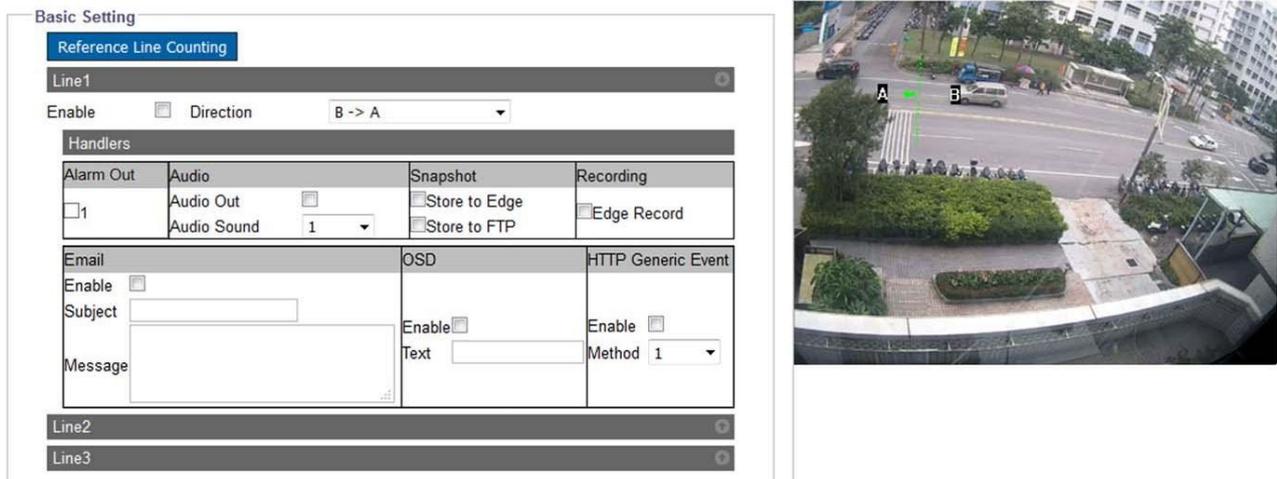
Figure: Line Cross Settings

<u>Basic Setting</u>

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.
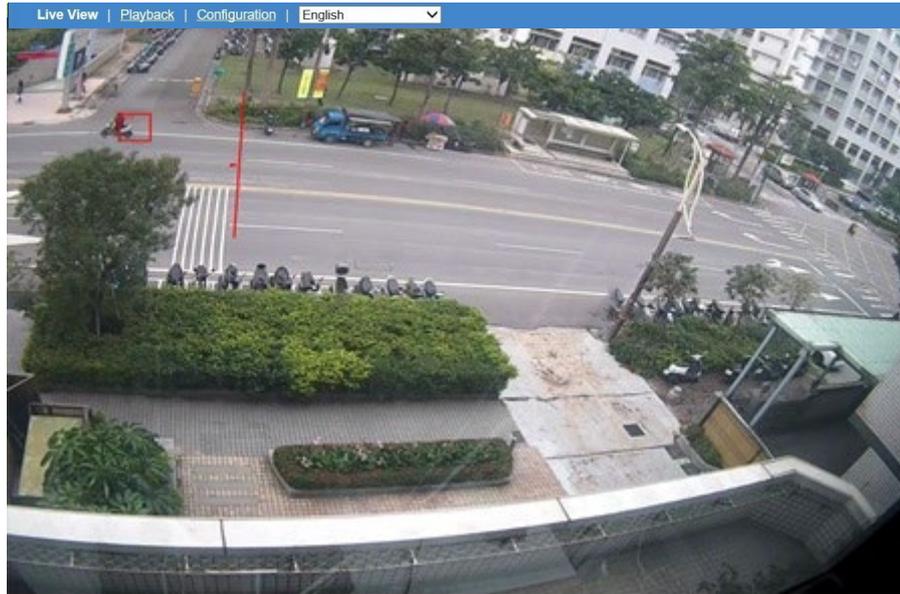
Figure: Line Cross Performance On Live View

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.
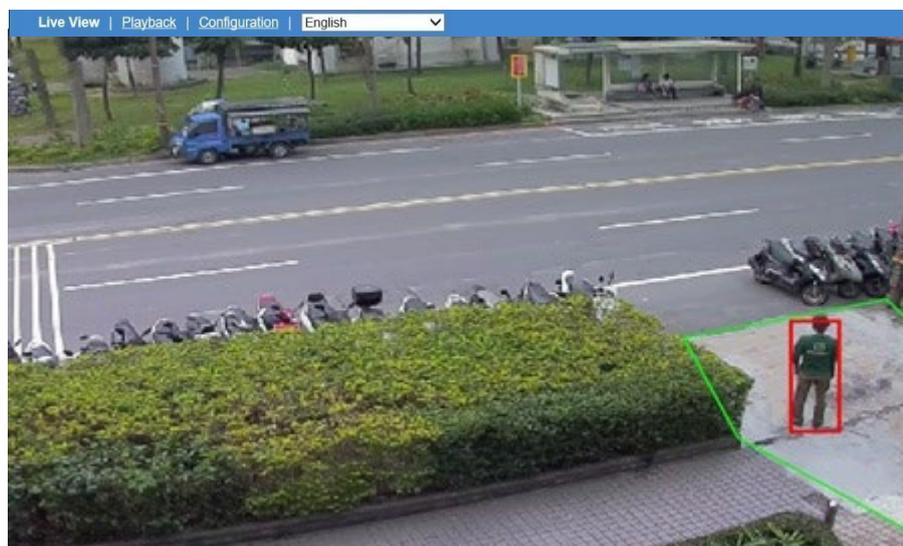

Figure: Loitering Performance On Live View

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.
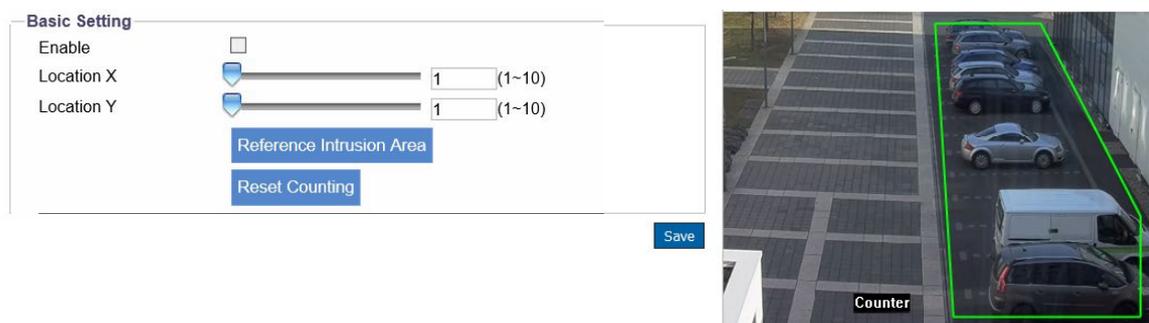

Figure: Area Counting Settings

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

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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

<u>Basic Setting</u>

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.
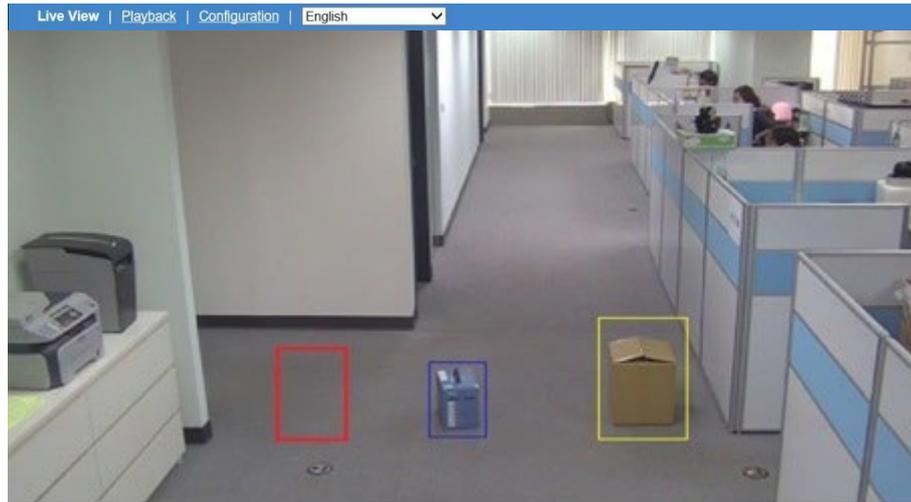
Figure: Object Removed Performance On Live View

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

<u>Basic Setting</u>

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.
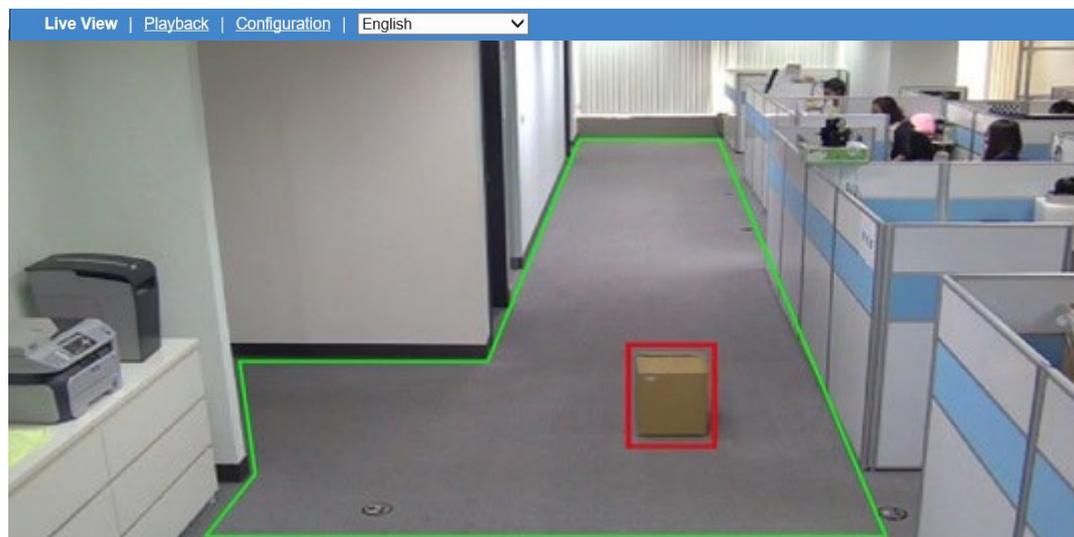

Figure: Object Left Performance On Live View

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. Video Analytics

Note	• The Video Analytics described below are for 5/8/12 MP cameras only.

Video Analytics with object classification technology processes digital video using a special AI algorithm to perform security related functions. Using these analytics provides a practical solution to reviewing hours of surveillance video to identify incidents that have been configured, increasing efficiency of security monitoring.

From the Configuration tab, select Advanced Analytics from the list on the left side. A new tab opens, and the left list now lists Video Analytics and Global setting. Each of these will be explained below.

The screen below displays, showing the Video Analytics available, Line Crossing (includes Line Counting), Loitering, Crowding, Intrusion, Tailgating, Object Removed and Object Left. Select the analytic to configure.
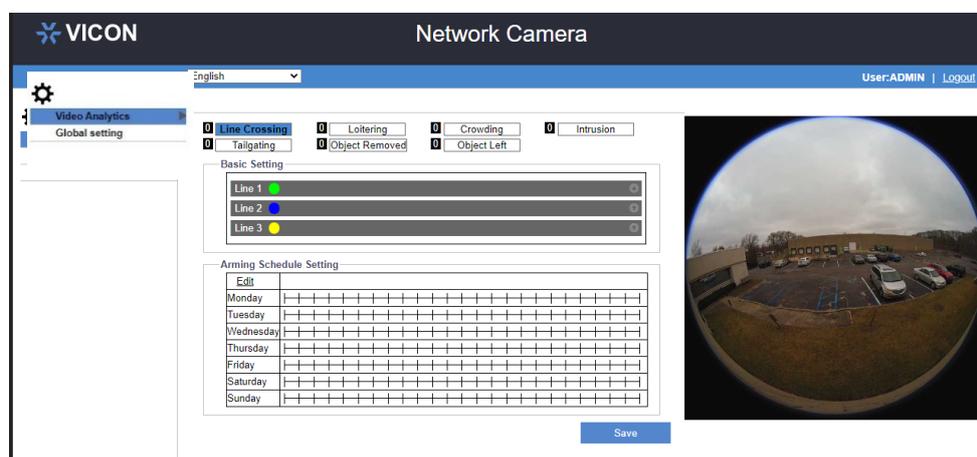
Video Analytics configurations are VA specific for Handler and Arming Schedule. The table below gives an overview of event source configuration and dependency.

Type	Settings		
	VA Specific	Handler	Arming Schedule
Line Cross (includes Counting)	Set line 1~3 and direction.	✓	✓
Loitering	Set area 1~3 and trigger interval.	✓	✓
Crowding	Set area 1~3.	✓	✓
Intrusion	Set area 1~3.	✓	✓
Tailgating	Set line 1~3, direction and trigger interval.	✓	✓
Object Removed	Set area 1~3 and trigger interval.	✓	✓
Object Left	Set area 1~3 and trigger interval.	✓	✓

Note	• VA functions availability vary by model; check "Appendix: Product Comparison-I/O Port" for details.

10.1   Line Crossing

Line Crossing is designed to establish borders to outline certain zones within the camera coverage. For example, these lines can outline an entry way or the perimeter of a property. This feature also does line counting and these values are presented in the analytics Live page; the line count is the number of times the line is crossed, based on the parameters configured for the analytic. Up to 3 lines can be configured, each noted by a different color, green, blue or yellow.
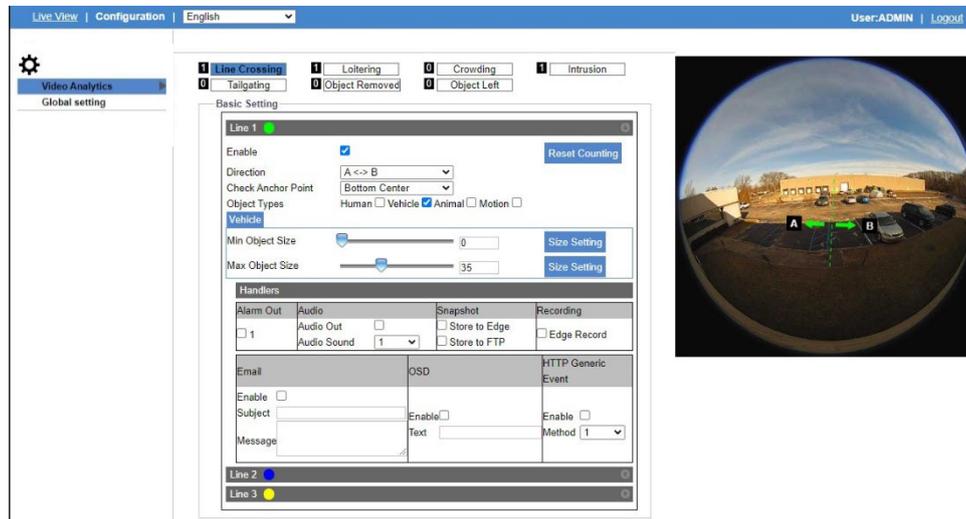
Figure: Line Crossing Settings

Basic Setting

Click the arrow on Line 1 to open the screen above. Click the arrows on Lines 2 and 3 as needed.

Enable: Check the box to allow configuring this function.

Direction
Select the line direction for crossing, A to B, B to A or in both directions, to help define the exact direction the line is crossed.

Anchor Points
Set the anchor point (Bottom Center/Right/Left, Top Center/Right/Left, Center Center) to designate where the object triggers the alarm, noting exactly where an object crosses the line. See Note on anchor points below.

Object Types
To further refine the event, check the type of object to detect crossing the line, human, vehicle, animal or any motion regardless of classification.

Min/Max Object Size
Use the slider to define the min/max object size or enter the exact number in the field provided (object size as a percentage of the image, 0-100%); select the Size Setting button to display a sample proportional graphic of the size being selected.

Method
Using the cursor, draw the line on the selected area of the preview picture. Click Save to have these lines take effect.

Performance
After saving the setting, on the Live page Line Crossing can be selected from the Video Analytics

dropdown. When an object moves across the designated line, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.2   Loitering

Loitering is designed to watch for suspect people/objects that enter and linger within a defined area for a defined period of time. Up to three areas can be defined for loitering, each with a different color, green, blue or yellow.
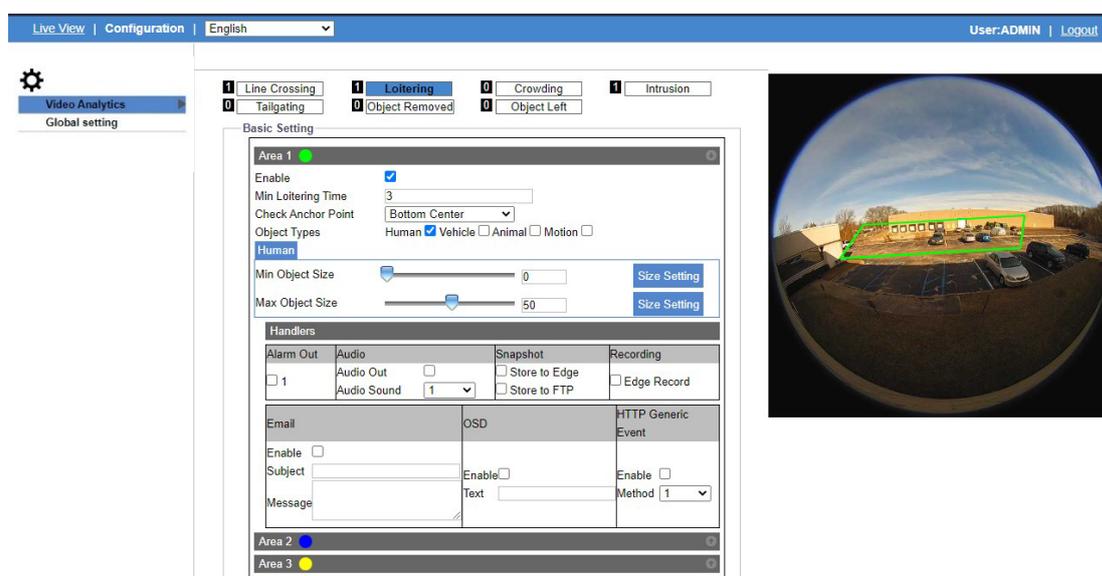
Figure: Loitering Settings

Basic Setting

Click the arrow on Area 1 to open the screen above. Click the arrows on Areas 2 and 3 as needed.

Enable: Check the box to allow configuring this function.

Min Loitering Time
Enter the time in the field provided (in seconds) to define how long the object has to remain in the area to be considered loitering.

Anchor Points
Set the anchor point (Bottom Center/Right/Left, Top Center/Right/Left, Center Center) to designate where the object triggers the alarm, so if an object stays in the area for longer than the defined time, the exact point of entry is available. See Note on anchor points below.

Object Types
To further refine the event, check the type of object to detect lingering in the area, human, vehicle, animal or any motion regardless of classification.

Min/Max Object Size
Use the slider to define the min/max object size or enter the exact number in the field provided (object size as a percentage of the image, 0-100%); select the Size Setting button to display a sample proportional graphic of the size being selected.

Method

Configure the Handlers section and Arming Schedule Setting according to the User Guide.

Using the cursor, define the area to be monitored for loitering; right click to close the ends of the outline of the area. Click Save to have these areas take effect.

Performance

After saving the setting, on the Live page Loitering can be selected from the Video Analytics dropdown. When an object stays in this area for longer than the designated time, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.3   Crowding

Crowding is designed to keep track of the number of people/objects in a designated area. This can be useful when it is necessary to minimize the number of people/objects in any given area to create an alarm when there is congestion in the defined area. Up to three areas can be defined for crowding, each with a different color, green, blue or yellow.
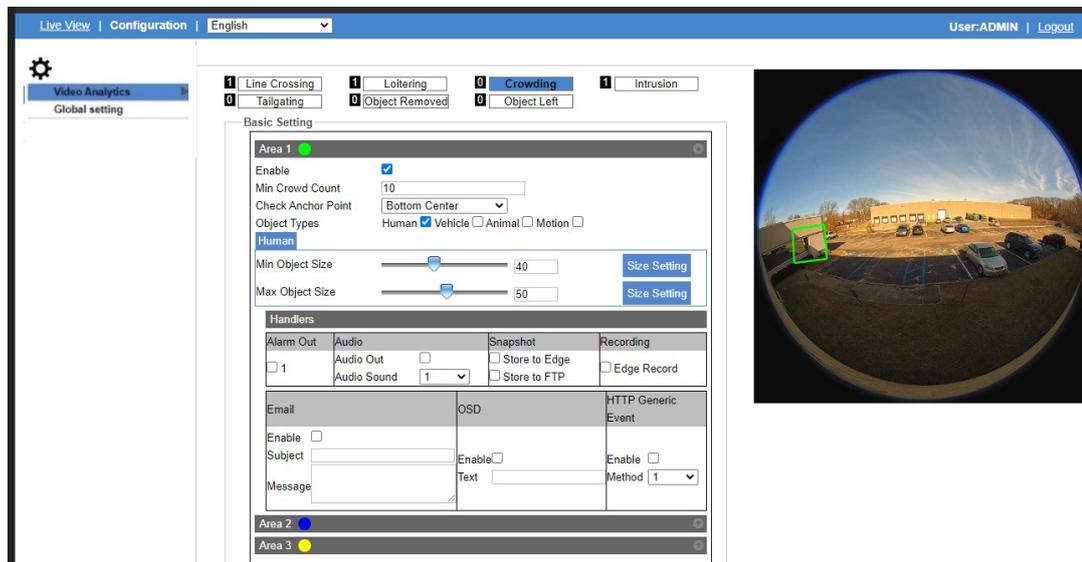
Figure: Crowding Settings

Basic Setting

Click the arrow on Area 1 to open the screen above. Click the arrows on Areas 2 and 3 as needed.

Enable: Check the box to allow configuring this function.

Min Crowd Count

Enter the number of objects in the field provided to define how many objects are to be considered a crowd.

Anchor Points

Set the anchor point (Bottom Center/Right/Left, Top Center/Right/Left, Center Center) to designate where the object triggers the alarm, so if more than the defined number of objects allowed enters the area, the exact point of entry is available. See Note on anchor points below.

Object Types

To further refine the event, check the type of object to detect what is gathering in the area, human, vehicle, animal or any motion regardless of classification.

Min/Max Object Size

Use the slider to define the min/max object size or enter the exact number in the field provided (object size as a percentage of the image, 0-100%); select the Size Setting button to display a sample proportional graphic of the size being selected.

Method

Configure the Handlers section and Arming Schedule Setting according to the User Guide.
Using the cursor, define the area to be monitored for crowding; right click to close the ends of the outline of the area. Click Save to have these areas take effect.

Performance

After saving the setting, on the Live page Crowding can be selected from the Video Analytics dropdown. When more than the designated number of objects enters this area, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.4   Intrusion

Intrusion can define an area to watch for any suspicious or unauthorized person/object that enters the specified area. This way a critical area can be monitored for any trespassing. Up to three areas can be defined for intrusion, each with a different color, green, blue or yellow.

Figure: Intrusion Settings

Basic Setting

Click the arrow on Area 1 to open the screen above. Click the arrows on Areas 2 and 3 as needed.

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

Anchor Points
Set the anchor point (Bottom Center/Right/Left, Top Center/Right/Left, Center Center) to designate where the object triggers the alarm, to capture the exact point of entry. See Note on anchor points below.

Object Types
To further refine the event, check the type of object to detect entering in the area, human, vehicle, animal or any motion regardless of classification.

Min/Max Object Size
Use the slider to define the min/max object size or enter the exact number in the field provided (object size as a percentage of the image, 0-100%); select the Size Setting button to display a sample proportional graphic of the size being selected.

Method
Configure the Handlers section and Arming Schedule Setting according to the User Guide.
Using the cursor, define the area to be monitored for intrusion; right click to close the ends of the outline of the area. Click Save to have these areas take effect.

Performance
After saving the setting, on the Live page Intrusion can be selected from the Video Analytics dropdown. When an object enters this area, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.5   Tailgating

Tailgating is designed to control access to a sensitive area and detect if more than one person/vehicle enters an area too close to the previous entry. Up to 3 lines can be configured, each noted by a different color, green, blue or yellow line.
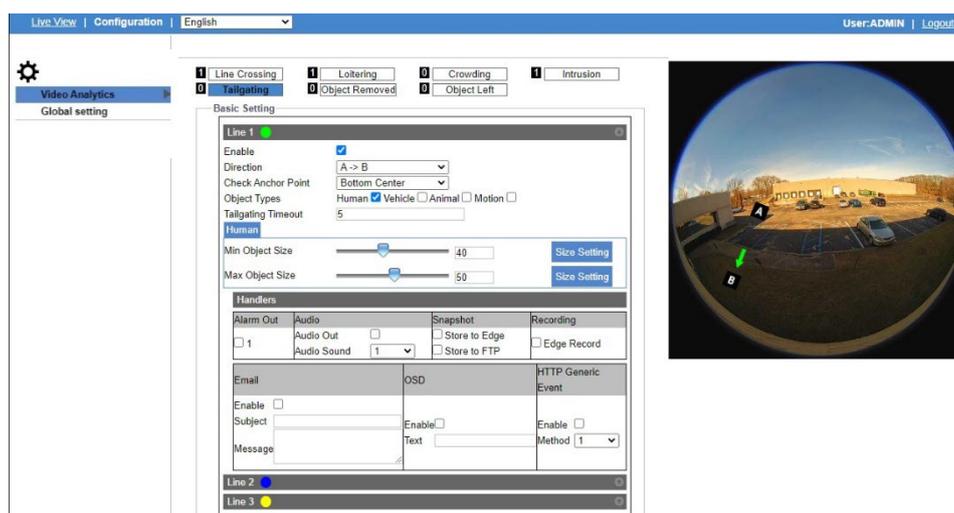
Figure: Tailgating Settings

Basic Setting

Click the arrow on Line 1 to open the screen above. Click the arrows on Lines 2 and 3 as needed.

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

Direction
Select the line direction for crossing, A to B, B to A or in both directions, to help define the exact direction the line is crossed too closely to the previous crossing.

Anchor Points
Set the anchor point (Bottom Center/Right/Left, Top Center/Right/Left, Center Center) to designate where the object triggers the alarm, the specific point where the object crosses the line too closely to the previous entry. See Note on anchor points below.

Object Types
To further refine the event, check the type of object that entered the area too closely to the previous entrance, human, vehicle, animal or any motion regardless of classification.

Tailgating Timeout
Define how much time (seconds) has to pass for another object to pass the line.

Min/Max Object Size
Use the slider to define the min/max object size or enter the exact number in the field provided (object size as a percentage of the image, 0-100%); select the Size Setting button to display a sample proportional graphic of the size being selected.

Method
Configure the Handlers section and Arming Schedule Setting according to the User Guide.
Using the cursor, draw the line on the selected area of the preview picture. Click Save to have these lines take effect.

Performance
After saving the setting, on the Live page Tailgating can be selected from the Video Analytics dropdown. When an object moves across the designated line too quickly after the previous, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.6   Object Removed

Object Removed detection was developed to guarantee that valuable or important objects are safeguarded in their location. Up to three areas can be defined for object removed, each with a different color, green, blue or yellow.

Figure: Object Removed Settings

Basic Setting

Click the arrow on Area 1 to open the screen above. Click the arrows on Areas 2 and 3 as needed.

Enable: Check the box to allow configuring this function.

Object Removed Duration
Enter a number to define how long a time (seconds) before it is considered removed.

Method
Configure the Handlers section and Arming Schedule Setting according to the User Guide.
Using the cursor, define the area to be monitored for observing object removal; right click to close the ends of the outline of the area. Click Save to have these lines take effect.

Performance
After saving the setting, on the Live page Object Removed can be selected from the Video Analytics dropdown. When an object is removed from this area, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

10.7   Object Left

Object Left is designed to prevent an object from being intentionally deposited in a critical place. If an object is left in a defined area, it can quickly be determined if it is suspicious. Up to three areas can be defined for object left, each with a different color (green, blue or yellow).

Figure: Object Left Settings

Basic Setting

Click the arrow on Area 1 to open the screen above. Click the arrows on Areas 2 and 3 as needed.

Enable: Check the box to allow configuring this function.

Object Left Duration
Enter a number to define how long (seconds) the object has to remain in the area before it is considered left.

Method
Configure the Handlers section and Arming Schedule Setting according to the User Guide.
Using the cursor, define the area to be monitored for observing object being left; right click to close the ends of the outline of the area. Click Save to have these lines take effect.

Performance
After saving the setting, on the Live page Object Removed can be selected from the Video Analytics dropdown. When an object is left in this area, the event will be highlighted on the screen. The bounding boxes that will display on Live and Playback video will be green for a person, blue for a vehicle and yellow for an animal.

Notes on Anchor Point: Setting the anchor point adds another dimension to fine-tune how an event is triggered. Since objects are represented as a bounding box, this pinpoints exactly where in that box the trigger occurs. By selecting the specific place in the bounding box (Bottom Center/Right/Left, Top Center/Right/Left, or Center Center) that the object triggers the alarm, each analytic event can be customized for different scenarios. When defining an area for Intrusion, Loitering, Crowding or Object Left/Removed, it would matter whether the object is approaching the area from the foreground, when it would be more likely to trigger at the top of the box, or from the background, when it is more likely to trigger at the bottom of the box. For line cross and tailgating, it would usually be preferential to select a bottom area, where the feet of a person or front of a vehicle would cross the line first and eliminate some random momentary line crosses.
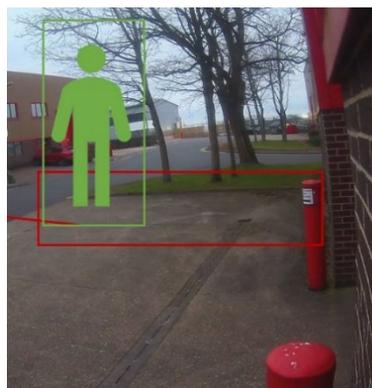
Entering from background. Feet enter area first; anchor point Bottom Center.
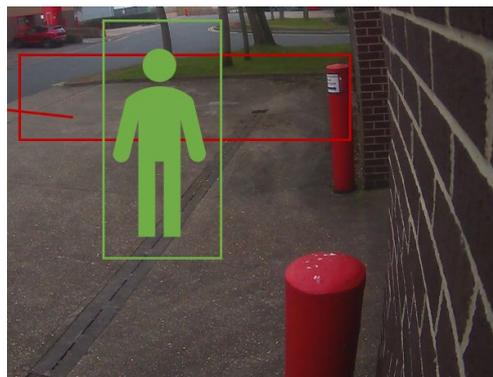
Entering from foreground. Head enters area first; anchor point Top Center.
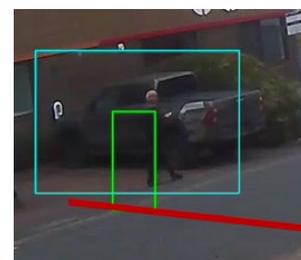
Crossing from background. Feet cross line first; anchor point Bottom Center.

10.8   Global setting

The Global setting area provides for general settings for all the Video Analytics.
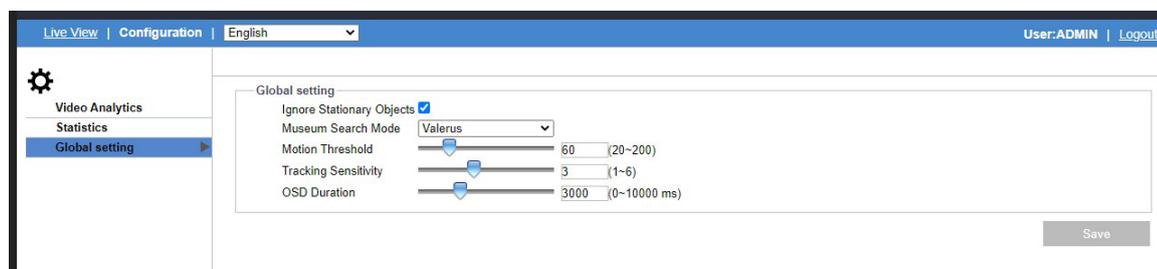
Use the checkbox to Ignore Stationary Objects when setting up analytics, for example to disregard a parked car even if the car is detected.

From Museum Search, select Valerus or ViconNet. If Valerus is selected, when this camera is used in the Valerus VMS, the advanced Museum Search will be functional by default, improving the ease and accuracy of doing museum searches. If ViconNet is selected, the feature is not supported in the VMS. Use the slider or enter an exact number in the field to set Motion Threshold and Tracking Sensitivity. This determines how often alarms will be alerted; the smaller the number, the more alarms will be set off.

OSD Duration determines how long the OSD text displays on the screen when an alarm occurs, if the OSD has been set up in the configuration of these analytics.

11. Event Setting

11.1 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" from the dropdown 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 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

Normal Method:

Post Duration: Infinite/5/10/15/30/Infinite (sec)
Set a period of duration for alarm output under Normal method. Infinite means unlimited and continuous triggering for alarm output.

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.

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 Frame

Define how many frames will be counted for alarm output.

Be sure to Save settings to have them take effect.

11.2 Email

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

Figure: Email Settings

Basic Setting

Authentication: No_Auth/SMTP_Plain/Login/TLS-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.

11.3 FTP

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

Figure: FTP Settings

Basic Setting

Server Address
Input an FTP server address.

Port: 21/1025 ~ 65535
Set "21" as default or change to dedicated number in the range provided. 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.

11.4 Record Setting

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

Figure: Record Settings

Basic Setting

Record Type: Video/Audio and Video
Choose which recording 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 clip duration and file size.
- Continuous: Camera is always recording video.

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.

11.5 SD Card

This section is designed to set up detailed settings for Edge Recording when events occur. Make sure the SD card is mounted, installed and formatted and the Edge Record function has been enabled in each event section to activate this function. The display will change according to the selections made.

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.

Status
Shows if SD card is inserted and mounted correctly or if an SD card is not inserted in the slot. When Status is shown to be Working normally, Capacity and Free Space fields will display.

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.

11.6 Snapshot

This section is designed to set up detailed settings for snapshot capture when events occur. Make sure the Snapshot function has been enabled 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 has occurred.

11.7 Sound

This section is designed to set up detailed settings for audio output sounds when events occur. Make sure the Audio Out function has been enabled 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.
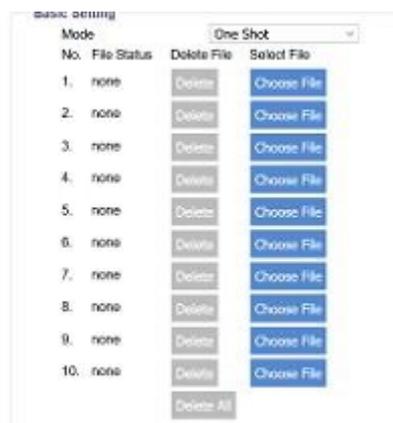
Figure: Sound Settings

Basic Setting

Mode: One Shot/Infinite

• One Shot: The sound of audio out will be played only 1 time.
• Infinite: 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.

Delete File

Click "Delete" to remove the sound file from the list. A Delete All button allows you to remove all files.

Select File

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

11.8 HTTP Generic Event

HTTP Generic Event can help user send messages and commands directly to a Network Video Recorder (NVR) that 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

Set 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 entered 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	
	V2102D-W313MIR	V2105D-W313MIR
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
Max Resolution & Frame Rate	2 MP at 30fps	5 MP 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)
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
IR Control	Smart IR	Smart IR
I/O Port	-	-
Event Trigger	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
Storage	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
RS485 Interface	-	-
ABF Control	-	-
Value Added	True WDR, 3DNR, Mirror/Flip	Digital WDR, 3DNR, Mirror/Flip

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/ V2008D-W818MIR	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	2 MP at 30fps	5 MP at 30fps	2 MP at 30fps	5 MP at 30fps	8 MP at 30fps	8 MP 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/ f8~18mm, F1.6~2.8 HD027135DB.ICR1-MFZ2.1(4K)2	CS/i-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	Smart/Adjustable IR	Smart/Adjustable IR	Adaptive IR, Smart IR	Adaptive IR, Smart IR	Adaptive IR, Smart IR	-
I/O Port	-	-	Audio 1/1 Alarm 1/1	Audio 1/1 Alarm 1/1	Audio 1/1 Alarm 1/1	Audio 1/1 Alarm 1/1
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	True WDR, 3DNR, Mirror/Flip	True WDR, 3DNR, Mirror/Flip	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA

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

Model Type	Bullet			Micro Dome		Panoramic
	V2002B-W313MIR	V2005B-W313MIR	V2008B-W310MIR/ V2008B-W818MIR	V2002D-W28IR	V2005D-W28IR	V2360W-12-1
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	5 MP at 30fps	8 MP at 30fps	2 MP at 30fps	5 MP at 30fps	12 MP 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/ f8~18mm, F1.6~2.8 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	Adaptive IR, Smart IR	Adaptive IR, Smart IR	Smart IR
I/O Port	Audio 1/1 Alarm 1/1	Audio 1/1 Alarm 1/1	Audio 1/1 Alarm 1/1	Audio 1/1	Audio 1/1	Audio 1/1 Alarm 1/1
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	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Mirror/Flip, VA	True WDR, 3DNR, Flip

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 synched to an NTP server.

1. **If user wants to record video continuously:**

   If a 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 minutes file sizes).

Regular (5 to 3600 sec)	Continuous	Records continuously and, when pressing Search button on playback page, updates timeline with the latest file with the pre-programmed duration.
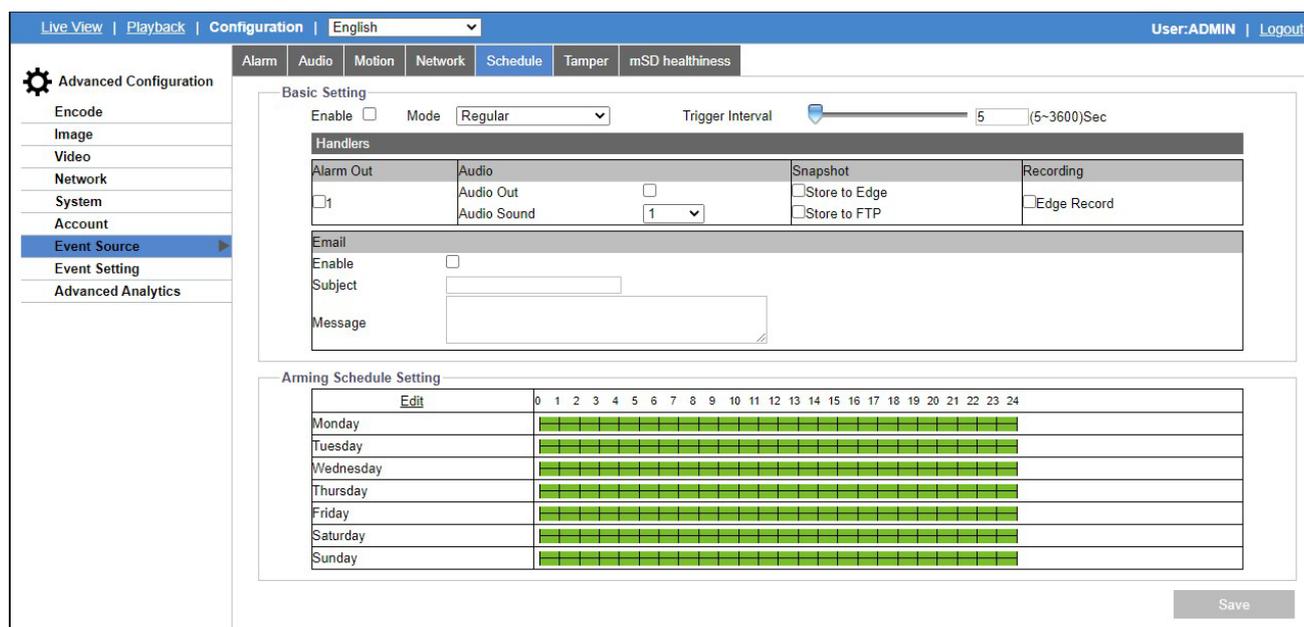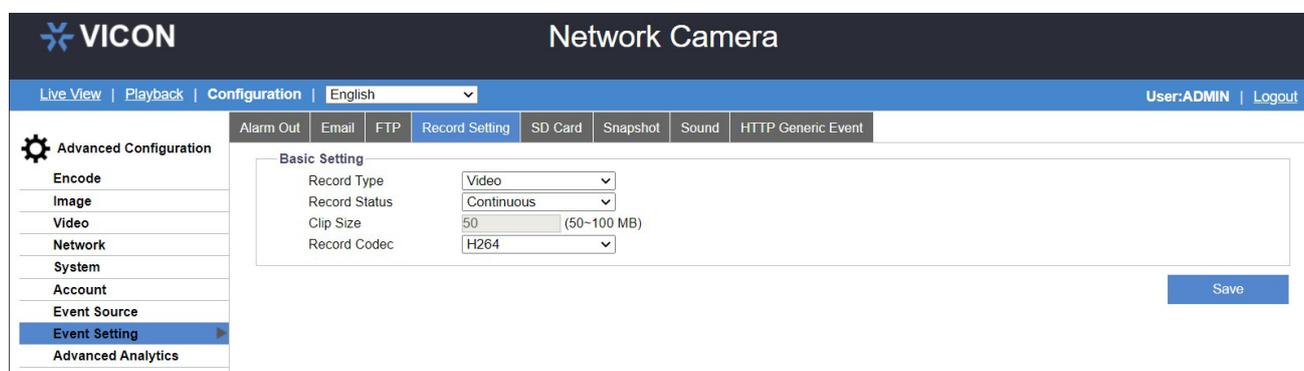
Playback:

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 the timeline after 50 MB file is generated. However, if the event is finished, then the green color will be blended with 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