GANZ

User Manual

Device setting Guide

For AI AIBOX

V.1.0.8

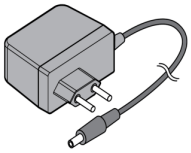
Caution: The contents of this manual are subject to change at any time without prior notice.

1. Overview

2. Components

1. Components

Cable clamp

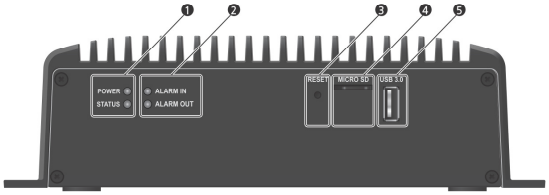


Adapter

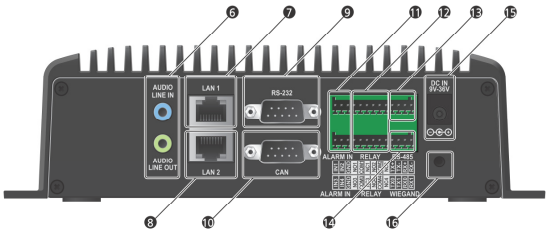
Screw

2. Names and Functions

- Front View

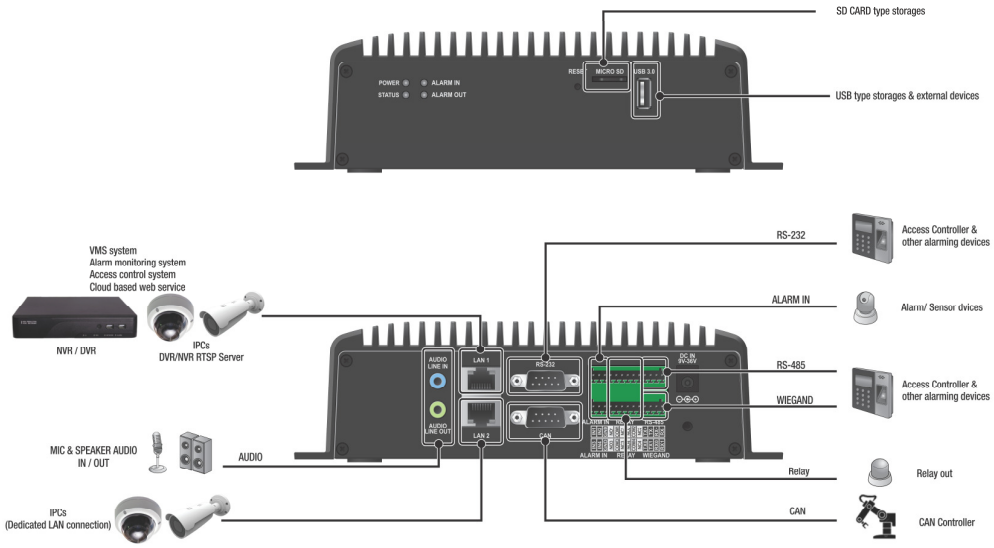


- Rear View



No.	Item	Description
❶	LED	Indicator LED for POWER / STATUS
❷	LED	Indicator LED for ALARM IN / ALARM OUT
❸	RESET	Factory reset button.
❹	MICRO SD	Slot for inserting a micro SD card.
❺	USB	Universal Serial Bus(USB) port for additional devices such as USB Memory Stick
❻	AUDIO	Connect the audio line input and output.
❼	LAN1	RJ-45 port for connecting internet and other platforms such as interoperable VMS, recorders and IP cameras.
❽	LAN2	RJ45 port for connecting IPCs and other devices through a separate LAN.
❾	RS-232	Connect the remote control device for RS232 communication.
❿	CAN	Connect the remote control device for CAN communication.
⓫	ALARM IN	Connect the sensor / alarm input signal wires.
⓬	RELAY OUT	Connect the relay output signal wire.
⓭	RS-485	Connect the remote control device for RS-485 communication.
⓮	WIEGAND	Connect the Wiegand input and output signal wires.
⓯	DC JACK	Connect the power plug of the provided 12V adapter.
⓰	CLAMP HOLE	DC JACK cable clamp fixed hole

Basic Layout.

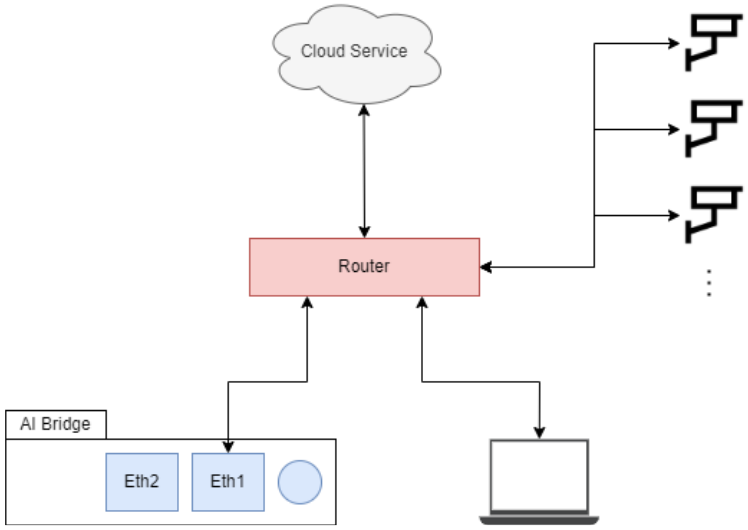


3. AI AIBOX Device Settings

AI AIBOX is an AI video analysis device that analyzes multi-channel video using various types of AI algorithms to extract meaningful objects or identify various situations visually detected on the screen.
AI algorithms can be used to extract objects and follow the event after judging the situation with AI metadata. Based on AI analytics information, event condition and alarm types can be set as wanted. You can also accumulate and visualize your data to create analytical data that enables you to gain insights from continuous, otherwise meaningless data.
The document below explains the basic connection method of AI AIBOX, the structure of the system setting UI, and the setting method.

1. Device installation

1.1 Installing the AI AIBOX Device

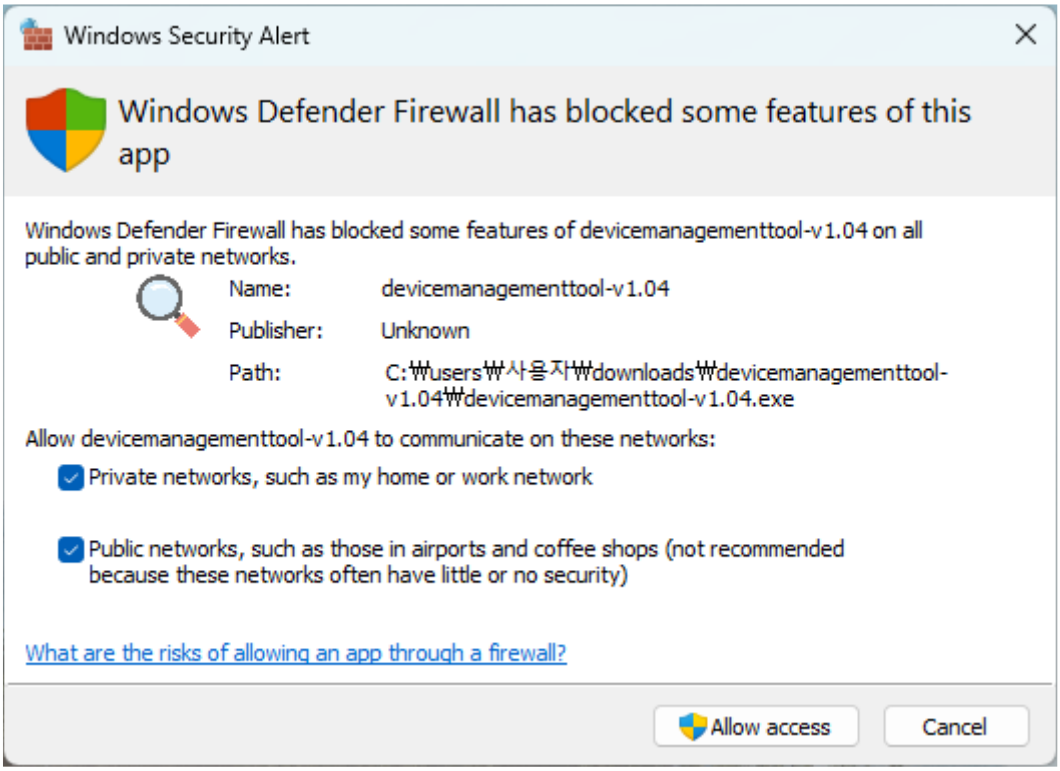


1. Install AI AIBOX on a network connected to the Internet and run a DHCP server.
2. Connect the network cable to the ETHERNET 1 port of AI AIBOX.
3. The AI AIBOX boots up immediately when the adapter is powered on due there does not have separate power button.
4. It takes about 1 minute for connecting to the PC after the device completes booting.

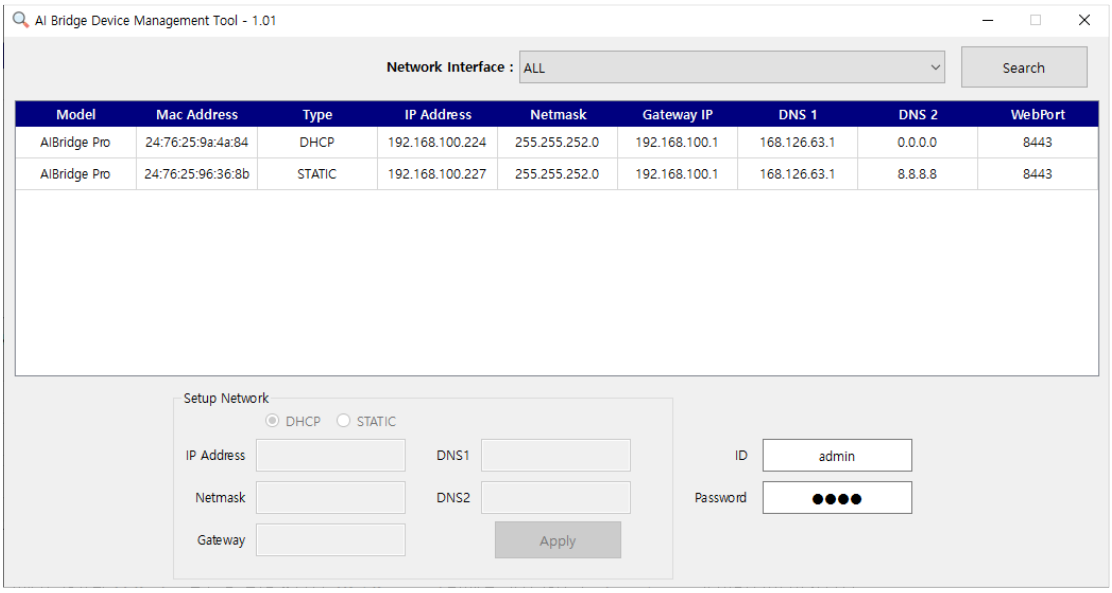
2. Search for devices on the network

2.1 Download the Device Management Tool

Download and install the Device Management Tool from the link below. AI AIBOX is possible to search the device's IP and set the network via the Device Management Tool program provided by GANZ.
DeviceManagementTool-v1.03
When the install file runs, the firewall setting window will appear as below. For smoothly using, it is recommended to allow the entire network.

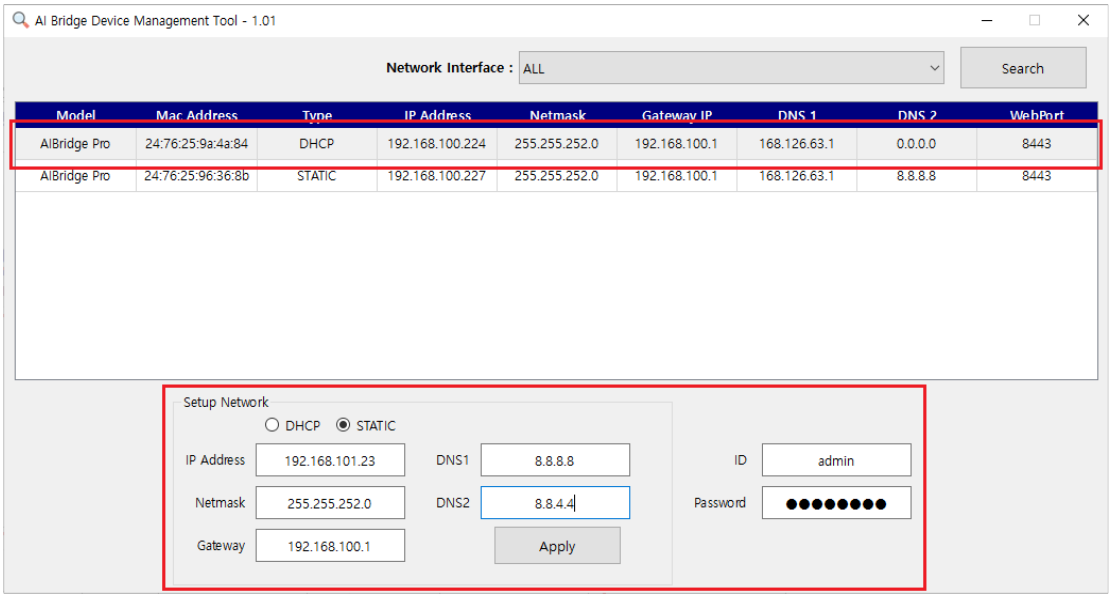


2.2 Running screen



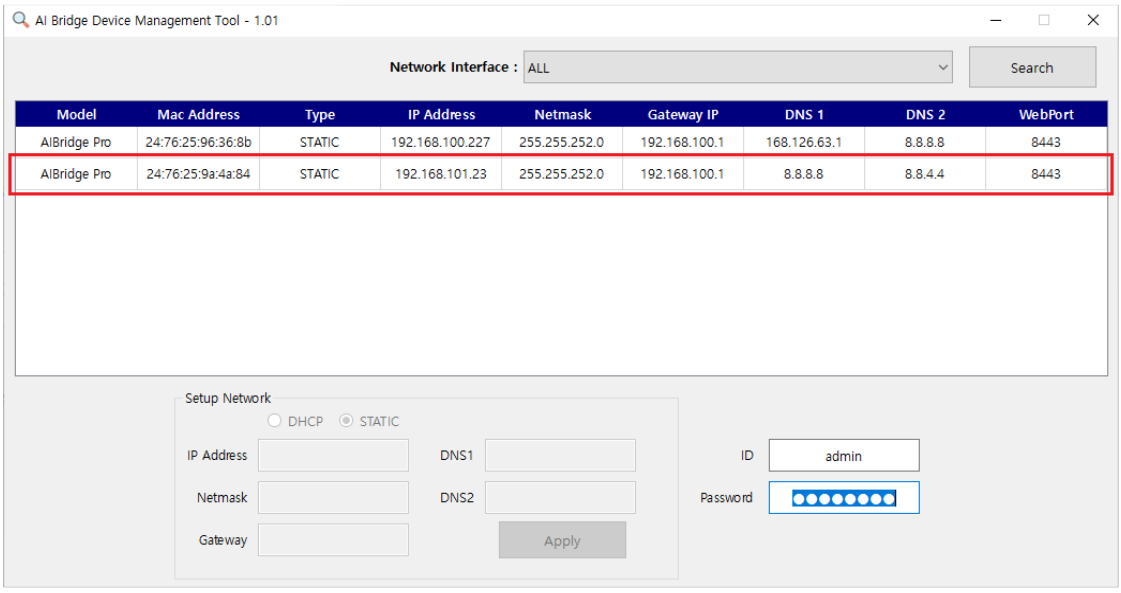
- When run for the first time, it shows a list of AI AIBOXs connected to the network. In the ID / Password field, admin / 1234 is entered by default.
- **When the AI AIBOX is in “factory default or factory reset” status, “1234” is set as a temporary password for network settings in the tool**
- If the AI AIBOX is not shown, please check the network cable is connected to ETHERNET 1 properly.

2.3 Setting screen



1. Click the device that wants to change the network settings from the list.
2. Enter the network information to set in the Setup Network section below.
3. Enter the ID / Password of the device.
   - If the AI AIBOX is in “factory default or factory reset”, enter admin / 1234.
4. Click the Apply button.

2.4 Screen after settings applied

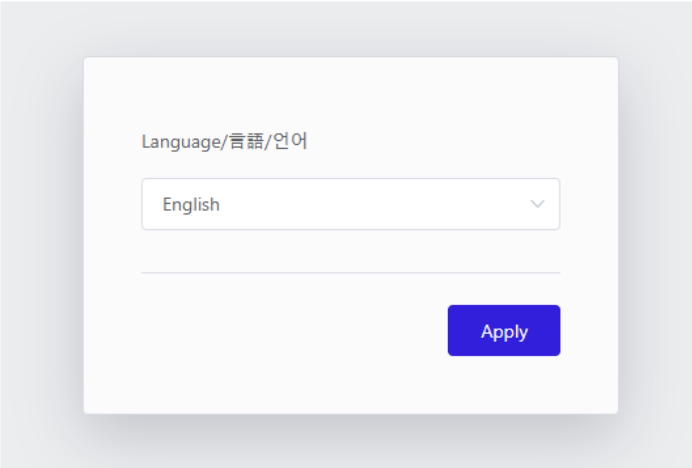


1. After a while by pressing the Apply button, the network setting of the device will be updated in the list.
- If the network settings have not been changed, it is due ID or Password being incorrect, please check again.
2. After setting the network, double-click the device information in the list to access the AI AIBOX.
- The AI AIBOX webpage will open in the default browser in Windows.

3. Initial access settings

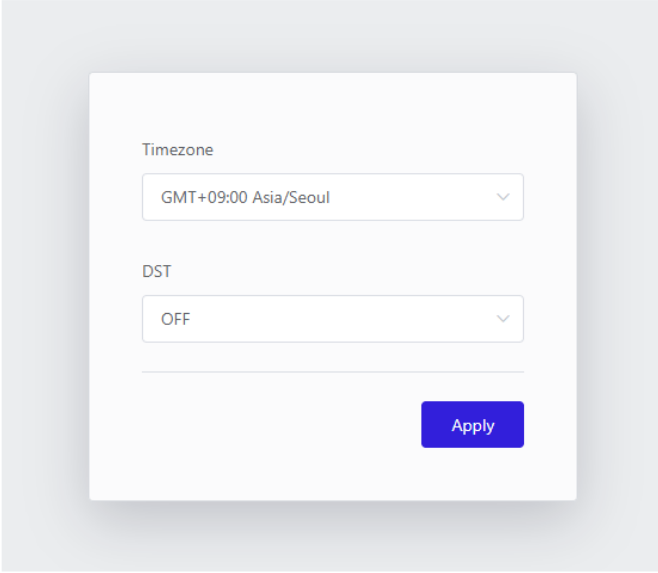
When accessing the AI AIBOX for the first time, the initial setting wizard is displayed.
To use the AI AIBOX, complete the setup in the order shown in the UI.

3.1 Device language settings



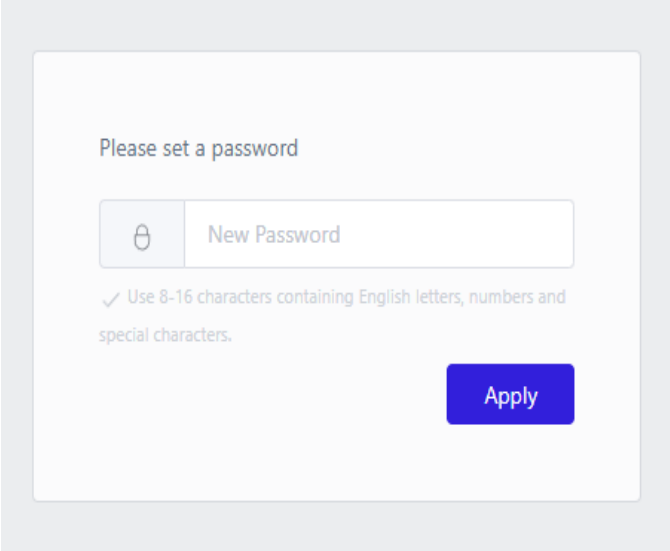
The appropriate language is set as the default to match your browser's language settings. If you want a different language, select the desired language from the drop-down box.

3.2 Device Time-zone settings



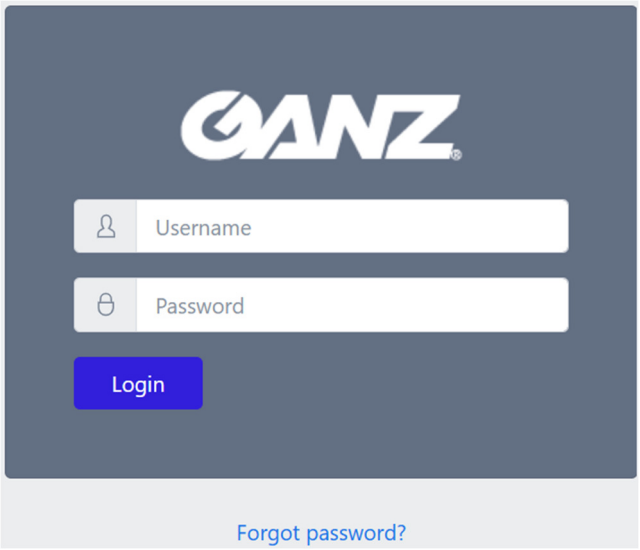
Set the password want to use. The password can use the alphabet, numbers, and special characters, and it should be set to 8 to 16 characters.

3.3 Initial password setting of Device



When accessing the AI AIBOX for the first time, the initial password setting UI is displayed. Set the password want to use.
The password can use the alphabet, numbers, and special characters, and it should be set to 8 to 16 characters.

3.4 Accessing to Device and setting the remote support settings

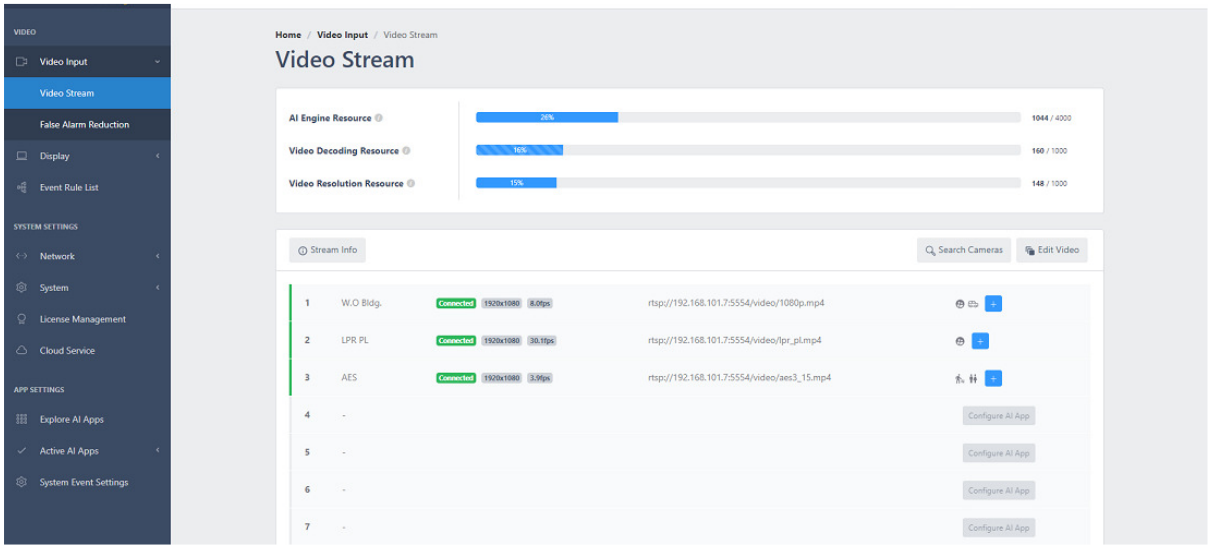


Log in using the device's account information using admin as the ID and the password set in the previous step.

4. Video source setup

4.1 Camera Video Input Setting

To enable the AI AIBOX to receive and analyze video from a camera, you must first set up the camera's connecting information.



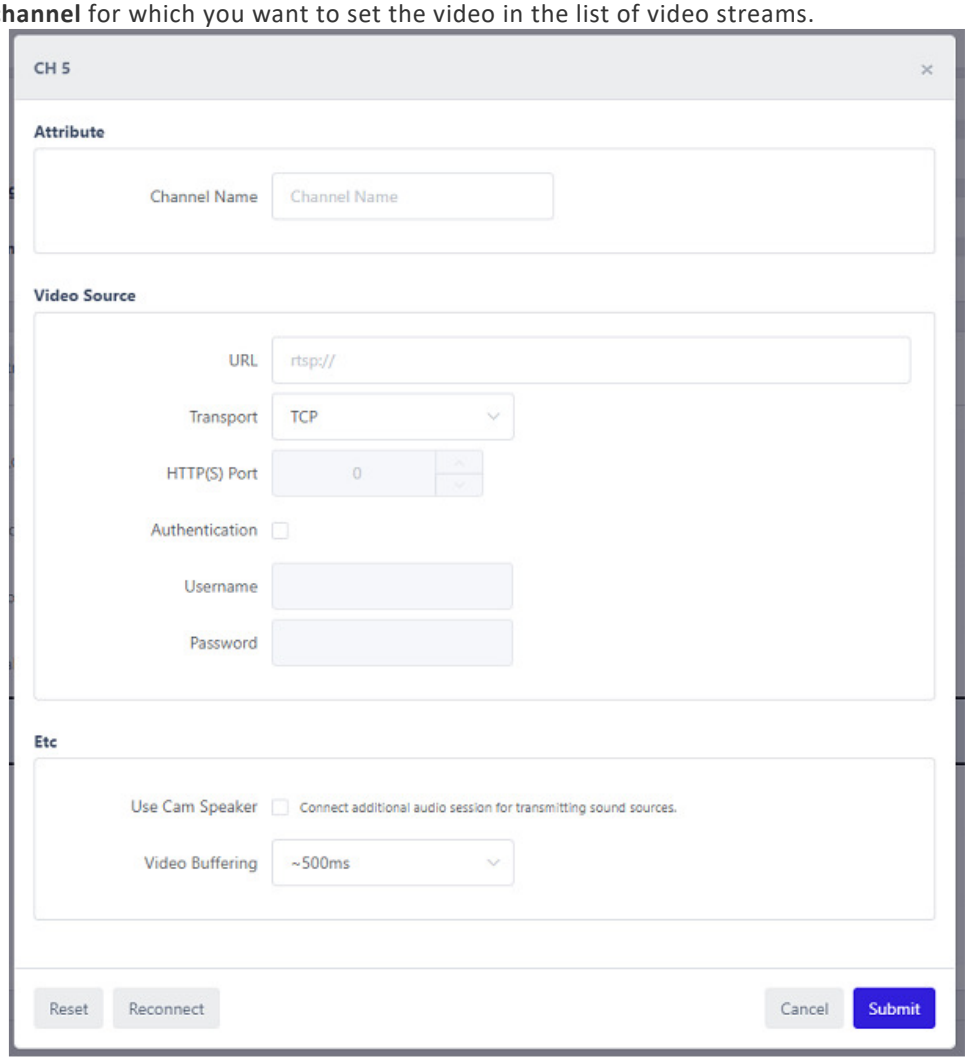
Click the **'Video Stream'** in the sidebar navigation menu displays the settings menu for receiving video from the camera.

① The **'AI Engine Resource'** displays usage relative to maximum AI processing capability. Each app requires a different AI processing capacity, so be careful not to set over the maximum processing. The **'Video Decoding Resource'** shows current usage based on the maximum amount of video the AI AIBOX can receive and process from the camera. The **'Video Resolution Resource'** shows the usage against the maximum resolution available on the AI AIBOX. No item will exceed the limit.

② The **'Video Stream'** settings allows you to set the video stream information accessible over the network.

4.2 Video Stream For Each Channel Setting

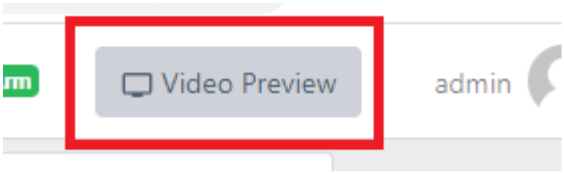
Click the **channel** for which you want to set the video in the list of video streams.



① Enter the **Channel Name**
② Enter the **RTSP URL** of the camera.
③ Select a transport protocol. The transport protocol specifies the protocol of the transport layer used to import the video stream.
④ Set the credentials needed for receiving the video stream. Usually, the ID and password of the IP camera are used.
⑤ If you want to use a camera speaker, check the **'Use Camera Speaker'.**
⑥ Set the maximum video buffering time. If, due to network conditions or camera types, video information is not transmitted smoothly and is received in a sudden burst, AI AIBOX can redistribute it into smooth videos according to the buffering setting. As the 'Video Buffering' setting is a maximum value, the actual buffering will be less than the set value if there are no problems with the camera and network performance.

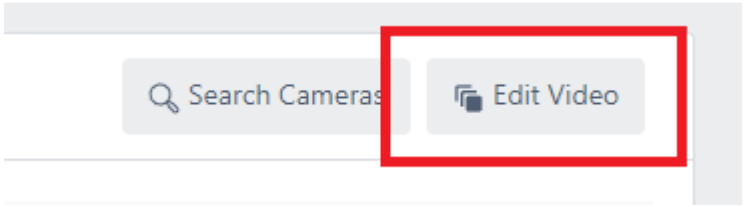
4.3 Check The Video Stream Connection Setting

You can check that the video stream you have set up is being received correctly. To check the receiving video stream, click the **'Video Preview'**.



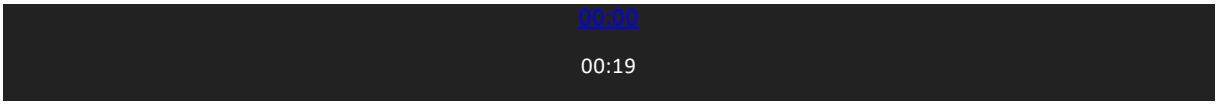
4.4 Multiple channels of video stream at once

Set up multiple channels of video streams at once. You can set up multiple channels of video streams in bulk using copy and paste, as well as features such as Apply to All.
To use the Bulk Setup feature, click the **'Edit Video'** button in the Video Stream Settings area.



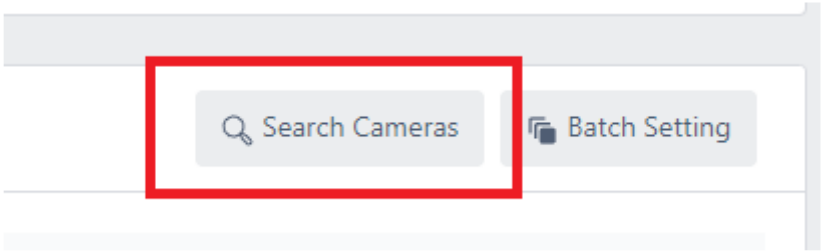
The 'Batch Setting' allows you to set the name, RTSP URL, transport, and authentication information for all channels at once.
The settings you enter in the Apply All line at the top can be applied to all channels by clicking the tick button for each setting.

Video clip guide (Refer to the on-line Technical document)

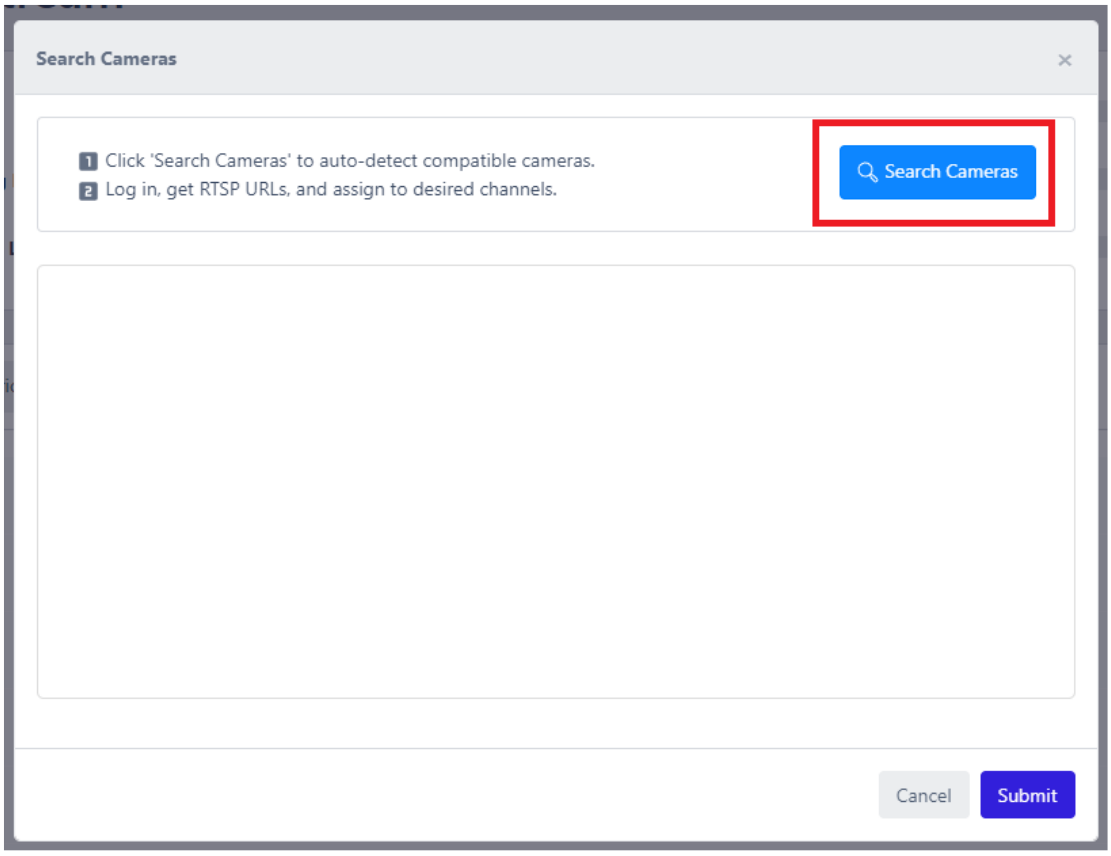


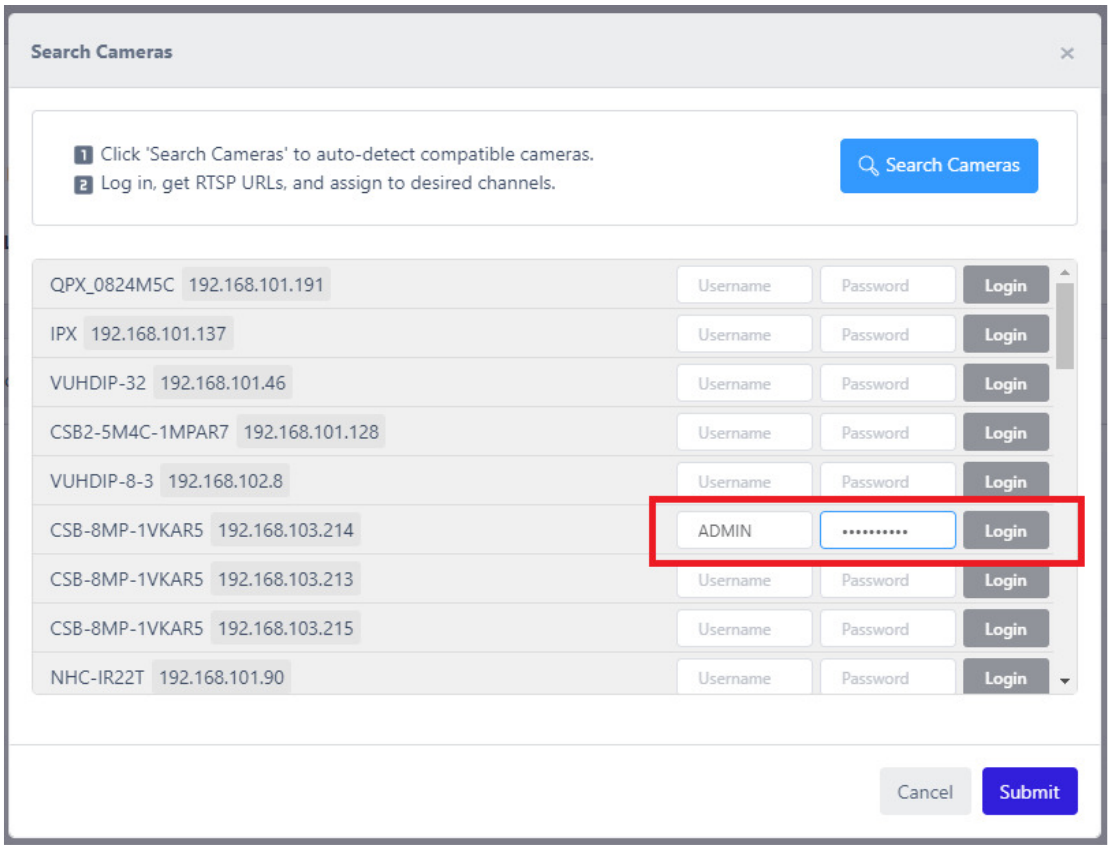
4.5 Searching for setting ONVIF cameras

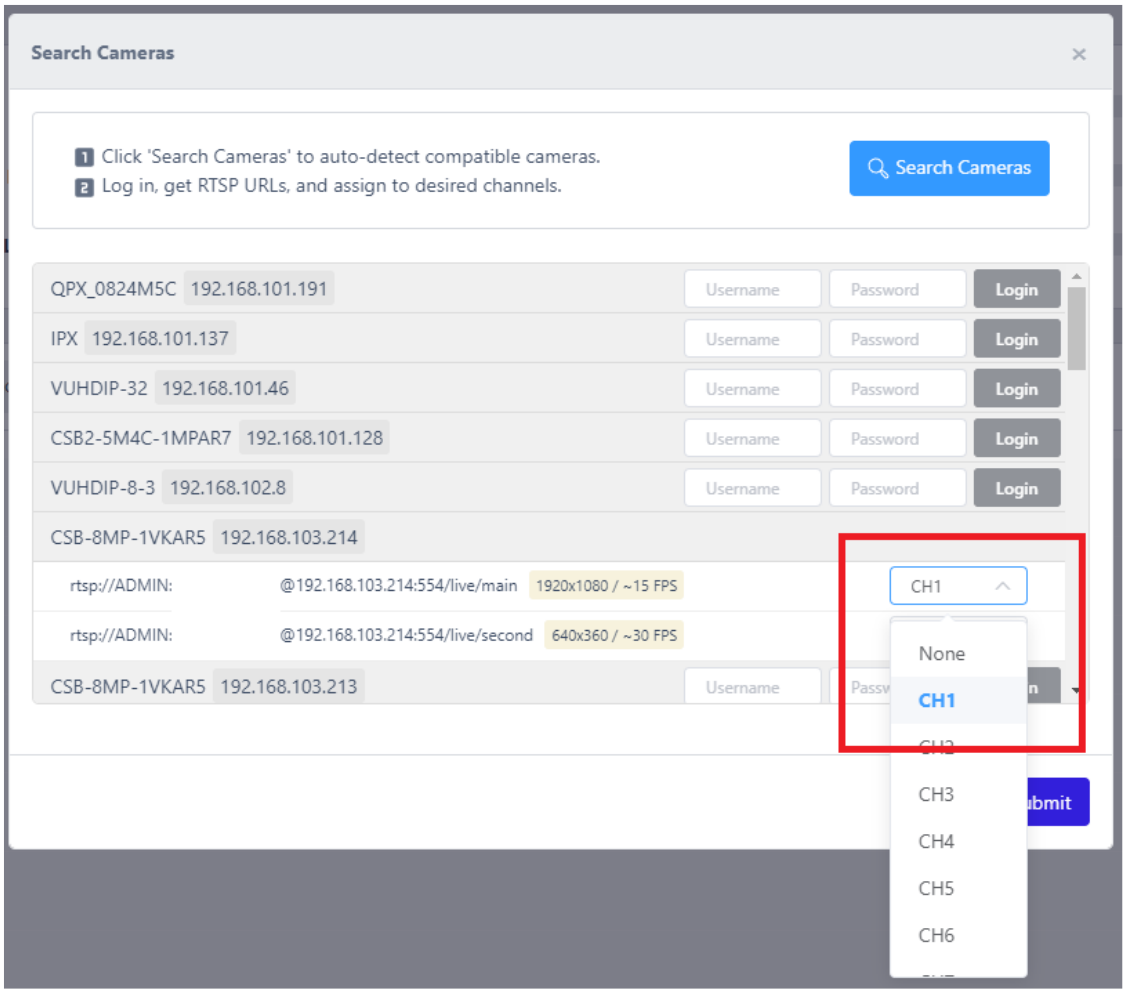
ONVIF is a standard for the interoperability of physical security devices. For network cameras that support the ONVIF standard, you can set up video streams using Discovery. To use the discovery feature, click the **'Search Cameras'**.



Search for your camera in the ONVIF search pop-up, then enter your credentials to see a list of video streams supported by your camera. Assign the streams you wish to analyze to a channel on the AI AIBOX.

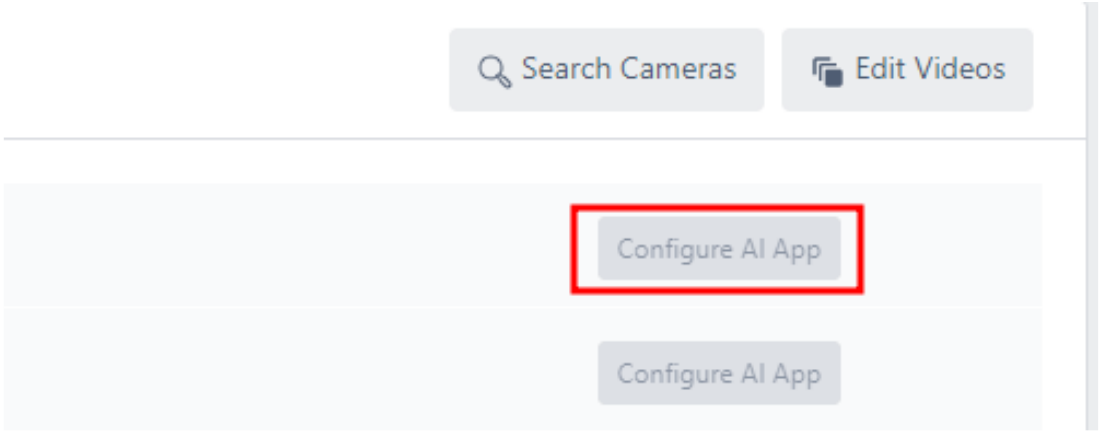

Search Cameras
1 Click 'Search Cameras' to auto-detect compatible cameras.
2 Log in, get RTSP URLs, and assign to desired channels.
Search Cameras
Cancel
Submit


Search Cameras
1 Click 'Search Cameras' to auto-detect compatible cameras.
2 Log in, get RTSP URLs, and assign to desired channels.
Search Cameras
QPX_0824M5C 192.168.101.191
IPX 192.168.101.137
VUHDIP-32 192.168.101.46
CSB2-5M4C-1MPAR7 192.168.101.128
VUHDIP-8-3 192.168.102.8
CSB-8MP-1VKAR5 192.168.103.214
CSB-8MP-1VKAR5 192.168.103.213
CSB-8MP-1VKAR5 192.168.103.215
NHC-IR22T 192.168.101.90
Username
Password
Login
ADMIN
Cancel
Submit



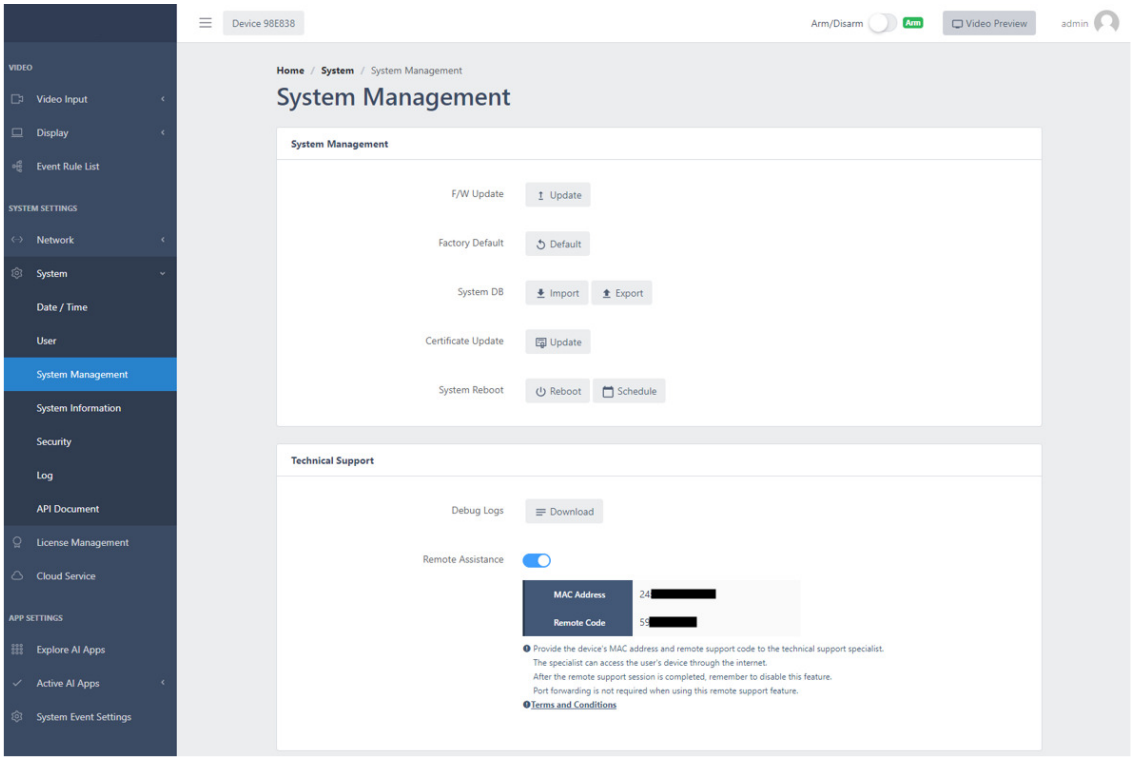
4.6 Searching for setting ONVIF cameras

Once the video stream is set up and connected, click the 'Configure AI App' button, select the appropriate app, and set the event action rule.



5. Remote support settings

5.1 Remote support Settings



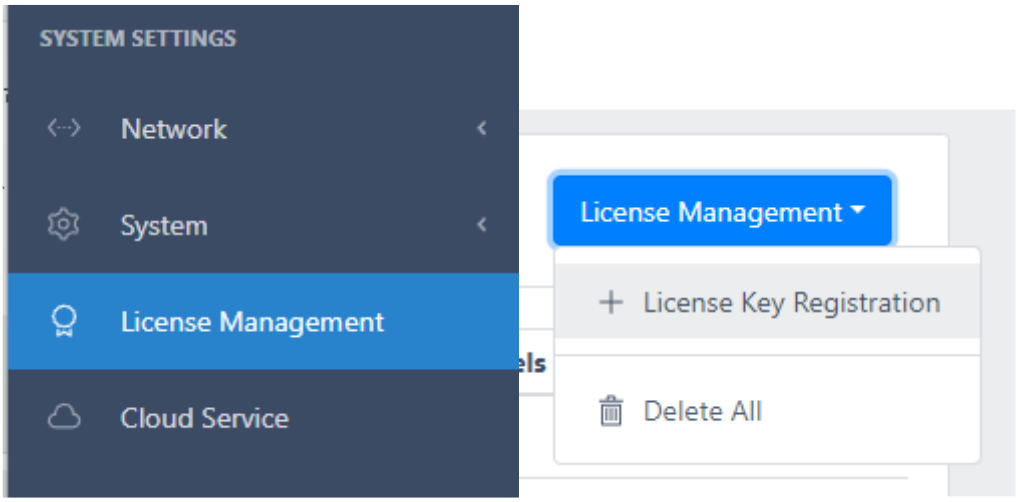
Enable the Remote Assistance function in the System > System Management > Technical Support menu. You can receive remote technical support by sharing the Mac Address and Remote Code displayed on the UI.

4. Application usage guide

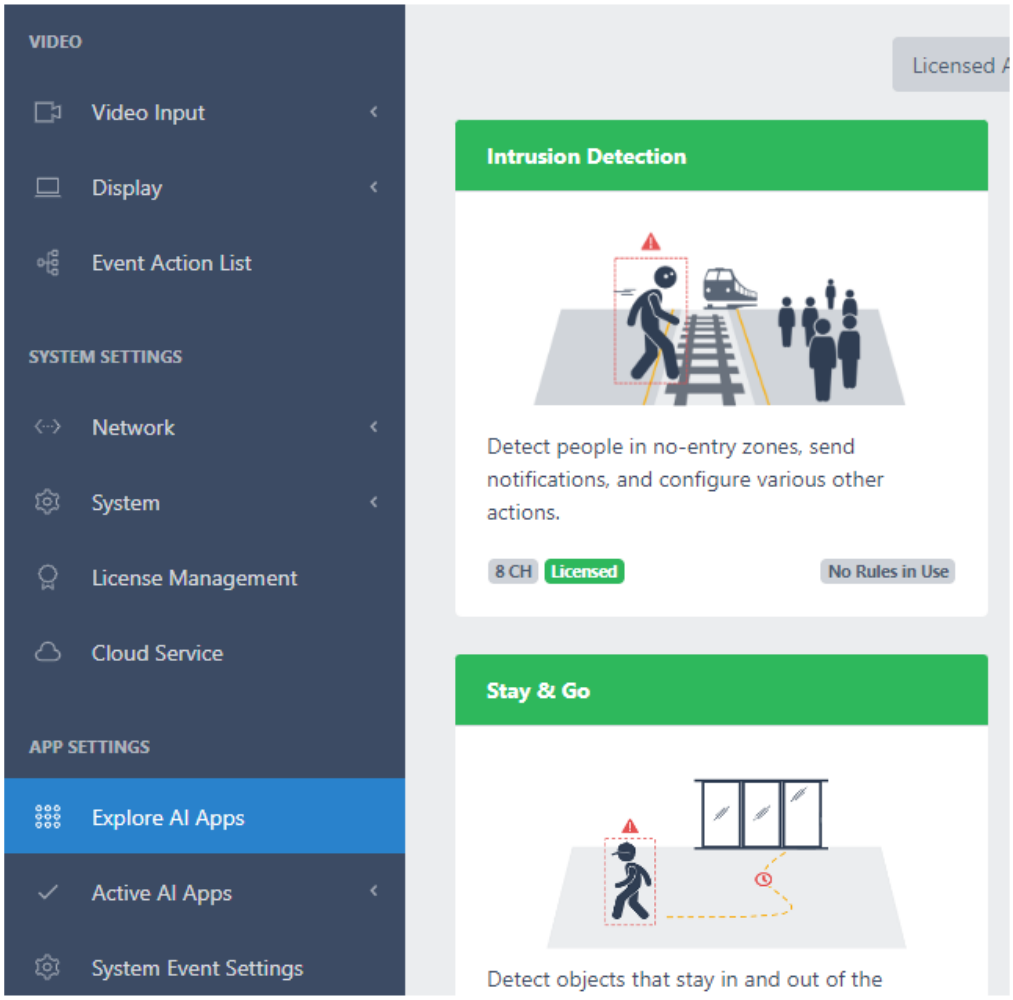
AI AIBOX works by adding various applications in the form of add-ons.
To add and use the application to the device, a license to use the application should be issued from the device dealer.

1. Application Activate

To activate additional apps, you need a license for each application.
Licenses are issued by the seller of the device in the form of a .json file, which you register and use in the ‘License Management’.



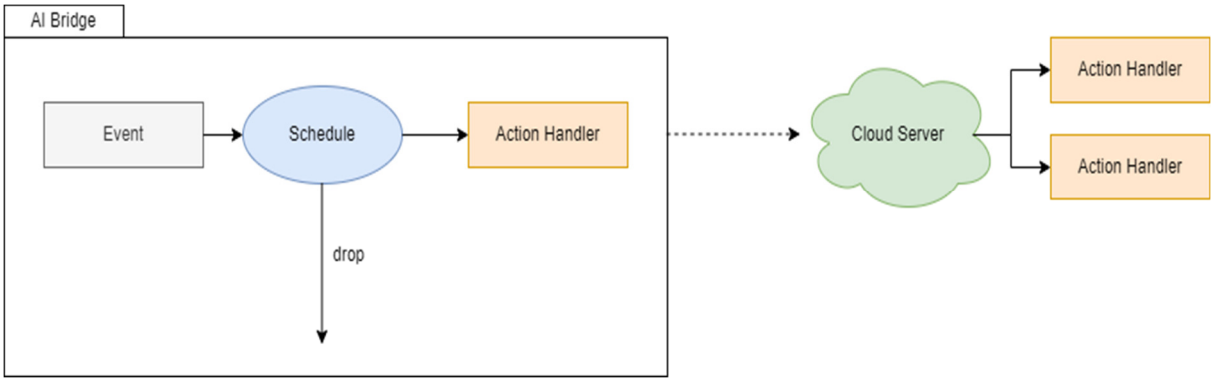
If the device has a license, the app will appear as a green header in the 'Explore AI apps' menu.



In the 'Explore AI apps', you can click on the app that you want to use to go to the settings menu for that app.

2. Event Action Setting Guide

Many of the various applications supported by AI AIBOX have a structure that performs predefined actions for events detected based on AI.
By defining events and setting related actions, notification on real-time events can be used for a variety of purposes.

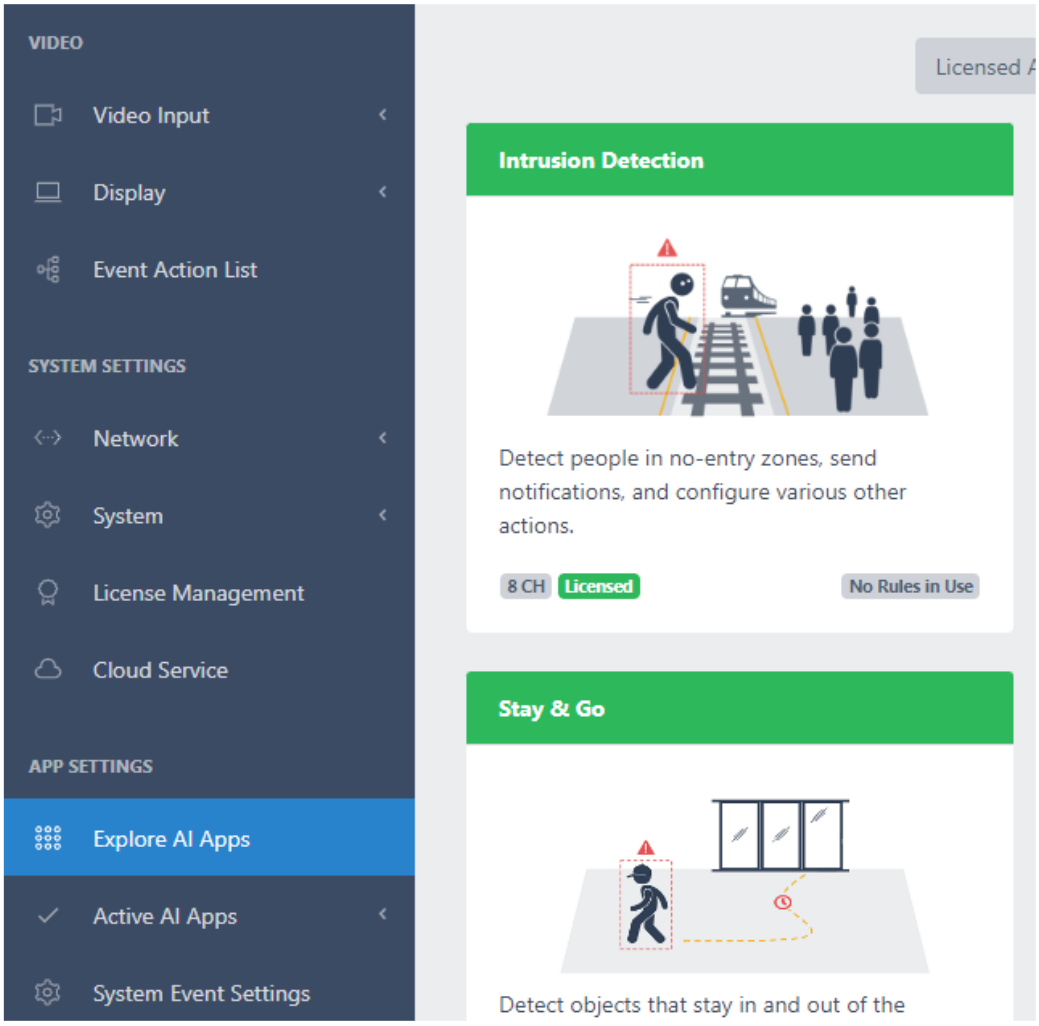


When an event is triggered by the event action setting, the schedule is checked. If the event occurs at other times with the schedule, the event is dropped without any event action.

If the action run time is set, the action that can be run on the edge is run first.

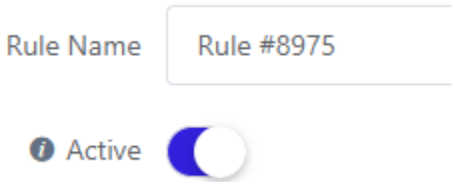
2.1 Alarm setting example (Intrusion)

To set up an intrusion detection event action, click the **'Explore AI Apps – Intrusion Detection'** in the sidebar navigation menu.



To set a new detection rule, click the  button in the intrusion detection settings.

2.1.1 Event Action Rules Setting

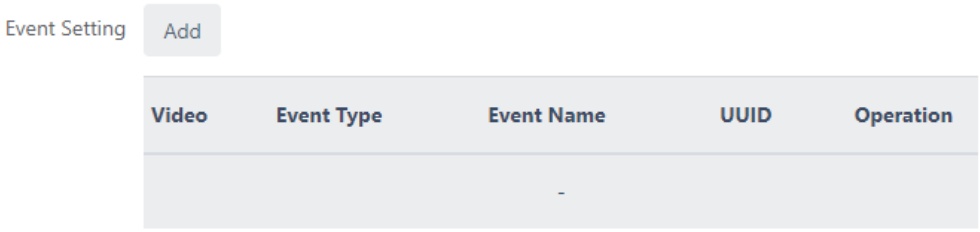


1. Enter a name for the rule. A random default value is entered, change this if necessary. You can also identify the rule by the name you enter in the action performed by the action handler.

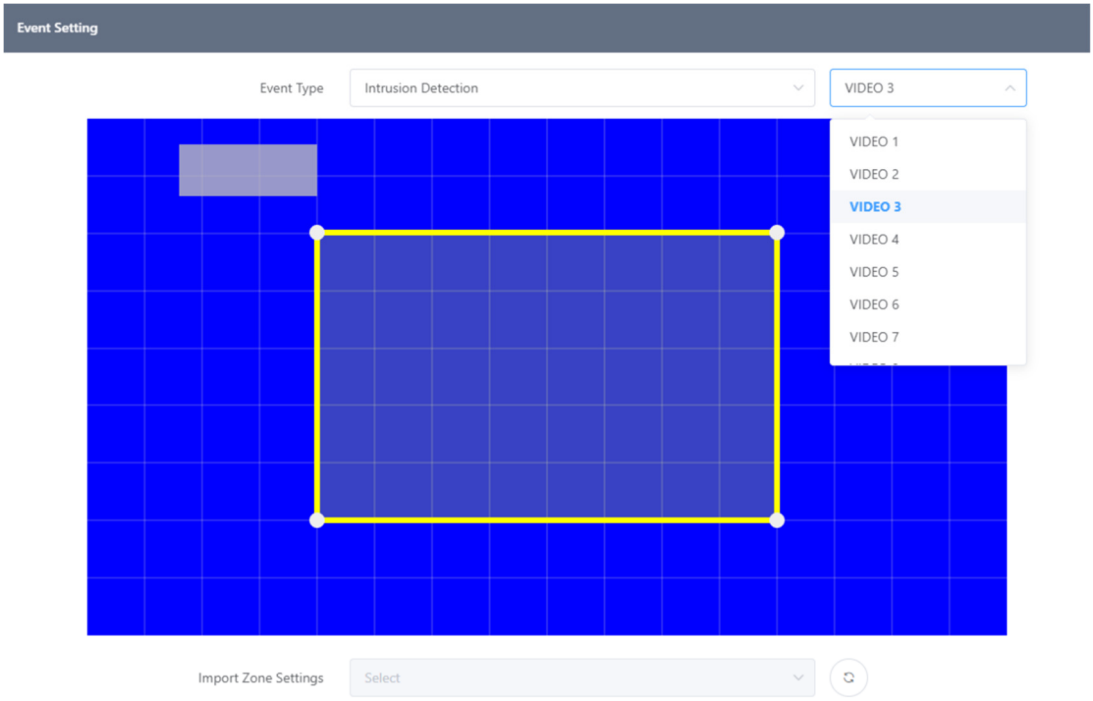
2. If you want to activate the event action rule upon creation, turn on the '**Active**' switch.

2.1.2 Event Setting

1. Click the Add button to set up the event.

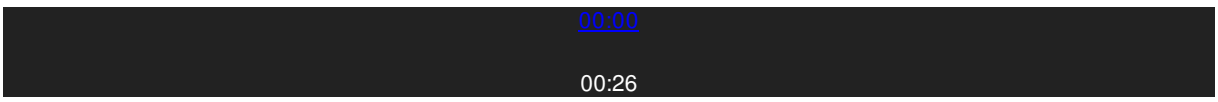


2. Select the video want to detect via the dropdown to the right of the Event Type.



Please refer to the video to properly set the detection zone. The detection zone can be set using the functions below. Alternatively, you can select zone information generated from other event settings by importing zone information.

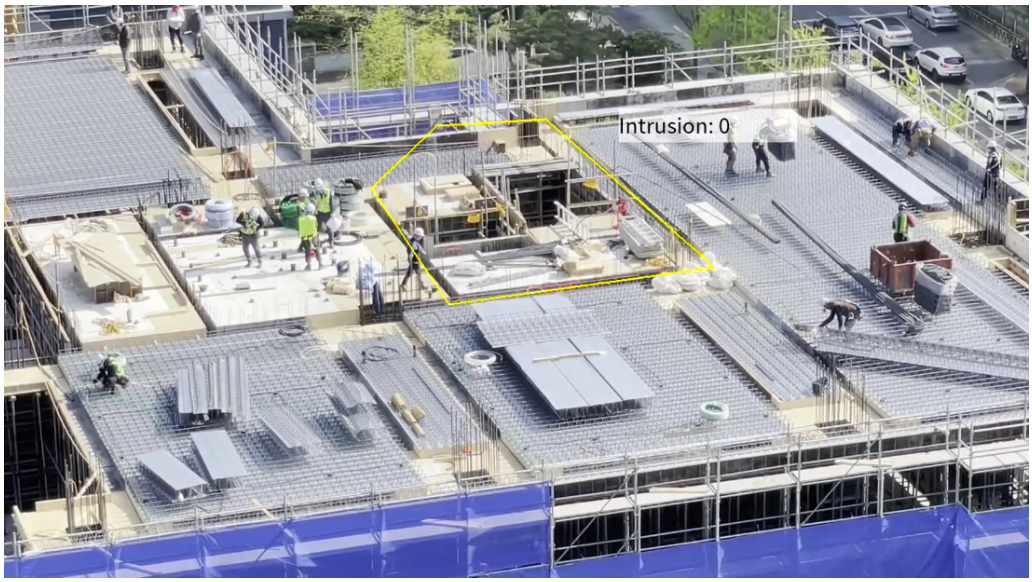
Video clip guide (Refer to the on-line Technical document)



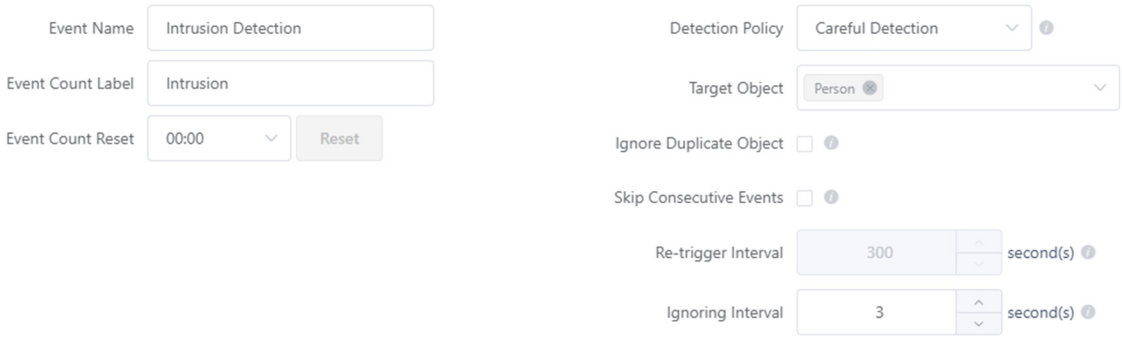
- Drag the detection zone to **move the entire area**.

- Drag the **vertex to move** it.
- Click the yellow line to **add a new vertex** at that point.
- Right-click the vertex to remove it.
- Drag the gray box to move the label position.

After done, the video will look like below with the event zone ad label set up above.



3. Click the Apply & View button to save after setting for each option.



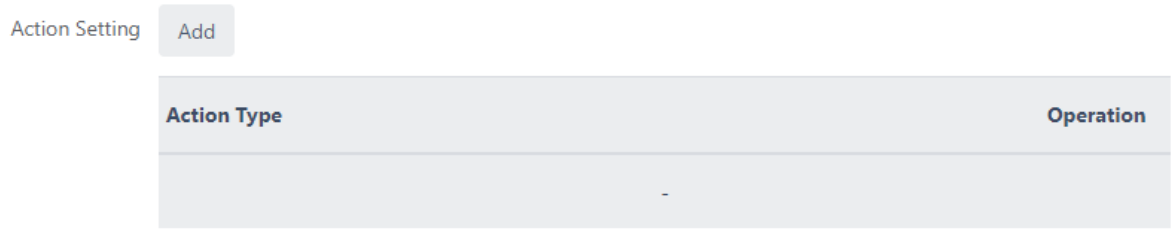
- Event Name : Enter the name of the event zone you created above.
- Detection Policy : Select whether to make event judgments about objects quickly or cautiously. When setting up a careful detection policy, objects are observed for a period of time to ensure that events are raised as accurately as possible. This can reduce false alarms at the expense of slightly delayed events. When setting a fast detection policy, the event is raised as soon as the object is detected. In this case, the time to observe the object is minimized in order to make a quick decision, which may result in false positives.

- Event Count Label : Enter the name of the label widget drawn over the video.
- Target Object : Select the event detection target. Person, Vehicle, and bike can be set.
- Event Count Reset : Set whether the event counts value or not. When enabled, the count value is reset at the set time.
- Ignore Duplicate Object : When checked, the same object will be ignored if it enters the event area again.
- Skip Consecutive Events : When checked, ignores events caused by new objects as long as the detected event target remains in the event zone.
- Re-trigger Interval : When Ignore Duplicate option is enabled, if there are still detected event targets in the zone, the event will occur again every set time.
- Ignoring Interval : Do not occur new events during the set time after an event occurs.

2.1.3 Action Settings

Define the event action to take when the event set occurs in Action Setting.

1. Click the Add button to add a new action item.

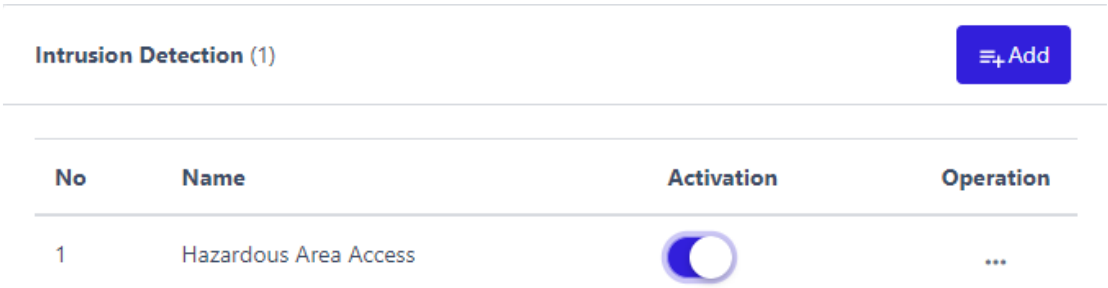


2. Set each action want to perform when an event occurs. Please refer to the Action setting Guide for the types of actions supported and how to set them up.

2.1.4 Finish setup

1. Click the Submit button at the very bottom to save intrusion detection event settings after setting up the event, action in the event action rule set page.

2. If everything is set up correctly, you can see the new event in the list on the Intrusion Detection application screen.



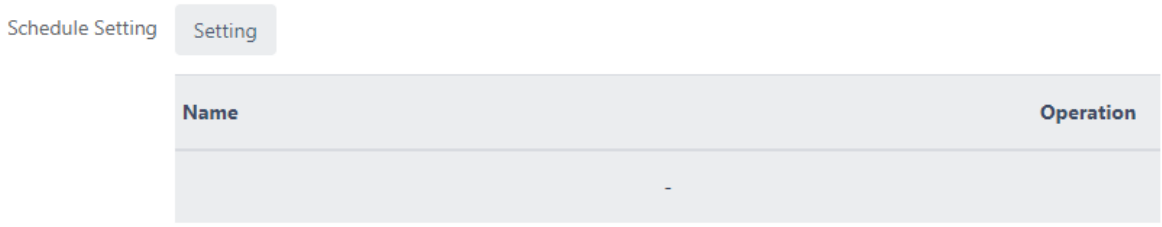
2.1.5 Filter settings (optional)

Schedule and Combined Rule filters can be used to set up event filters to drive actions. The schedule and Combined Rule filter settings described below are not required to configure an action rule, so you only need to set them if necessary.

2.1.5.1 Schedule settings

Set up event action schedules that operate over a period of time to set the time for sending the notification whenever an event occurs.

1. Click the Setting button to set the event action schedule.



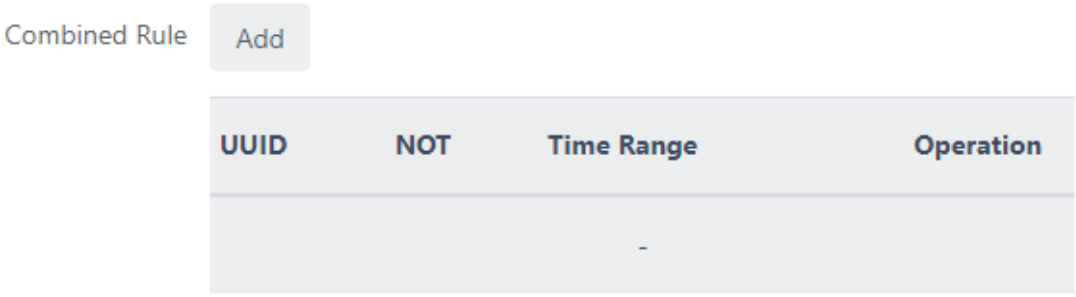
2. Add a schedule to drive action when an event occurs. Please refer to the Schedule Setting Guide for more information on how to set up a schedule.

2.1.5.2 Combined Rule condition settings

Set compound conditions on event actions to perform more complex forms of event filtering. The following items can be set as compound conditions.

- Rules set in the application in the form of an event action
- Events that make up a rule are set in an application in the form of an event action
- System I/O devices, such as alarm inputs or virtual alarm inputs

1. Click the Add button to set the combined rule condition.

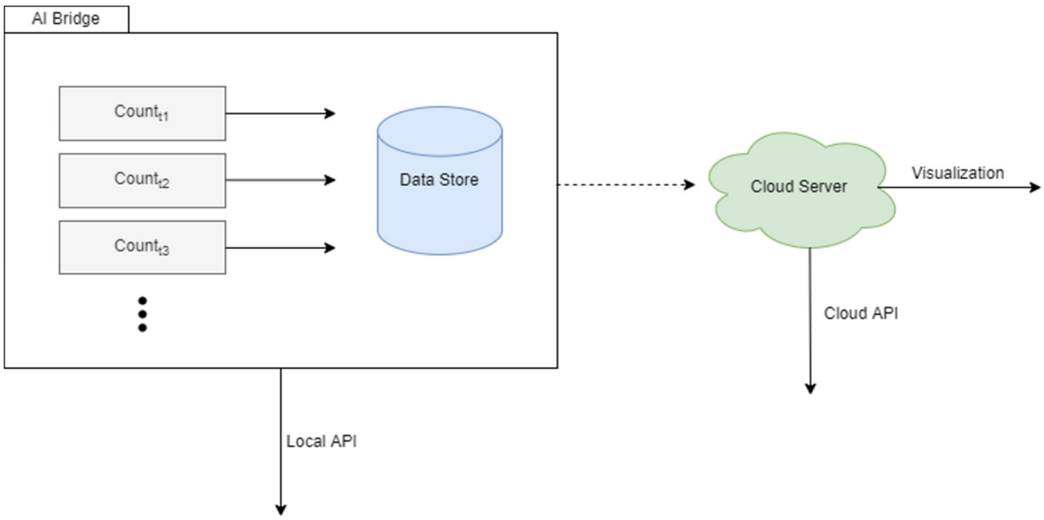


2. Please refer to the Combined Rule Setting Guide for more information on setting up.

3. Counter Setting Guide

The counter application counts the number of AI-detected objects. The count value can be utilized by defining various actions.

3.1 Counter working process



By setting up a counter application, AI AIBOX counts objects internally and archives the counting data to internal storage at regular intervals.

The stored data can be retrieved directly from the edge through the API. Edge storage has limitations in areas such as storage period, network configuration, and service delivery performance.

3.2 Counter Setting Example (Occupancy Counting)

Utilize the Occupancy Counting application to count people in real-time not only in stores, but also in buildings, specific areas of buildings, floors, or any other unit.

3.2.1 Counting Method

Occupancy counting operates according to the following methods.

1. Count the number of people entering from all possible entrances to the target space.

2. Count the number of people exiting at all possible exits from the target space.

3. Aggregate and store **the number of people entering – the number of people exiting** for each data collection cycle.

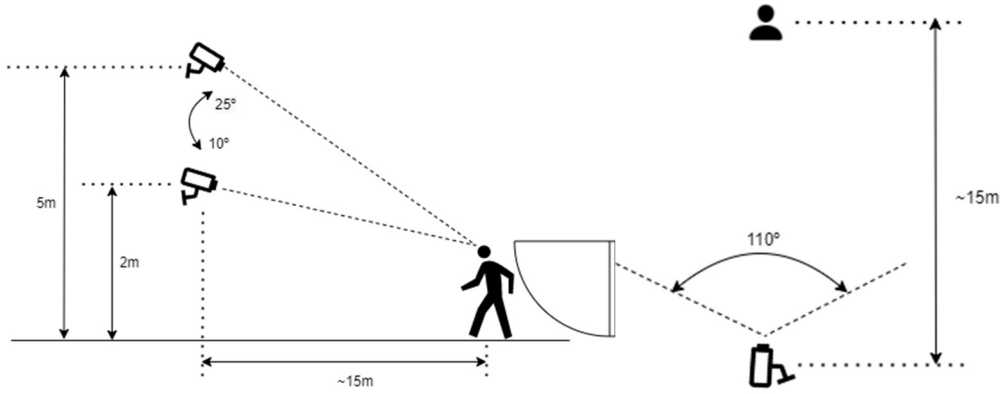
3.2.2 Counting Condition

To ensure that the count value is as accurate as possible, follow these guidelines.

- Compliance with entrance and exit camera installation guide.
- No one enters or leaves the target space other than the designated entrances and exits.
- Specify a daily counter reset time when no one is inside the target space.

3.2.3 Camera Installation Condition

Camera tilt angle	**10º~25º**
Camera installation height	**2m~5m**
Camera horizontal angle	**40º~110º**
Camera resolution	**Over 1280×720, 16:9 Ratio**
FPS frame per second	**6~30**
Transmission bitrate	**2Mbps~10Mbp**
Minimum detection object size	**Horizontal 32px, Vertical 64x**
Distance between camera to object	**~ 15m**



3.2.4 AI AIBOX Counter Setting

1. To set up counting people in a space, click the **'Explore AI Apps' – 'Occupancy Counting'** in the sidebar navigation menu.

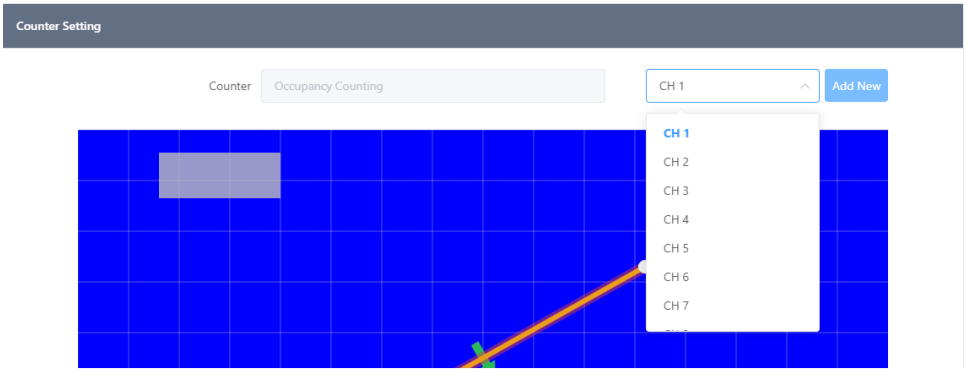
2. Click the  button to create a new counter in the upper-right corner of the Occupancy Counting list.

3. Enter the name in the **"Name"** session to distinguish this event action from the other events. Later, you can use the name you enter here to distinguish the event in event history lookups or in actions performed by the action handler.

4. Click the Add Zone button to add the enter/exit zone. If there are multiple entrances and exits, every entrance and exit be added as a counting zone.

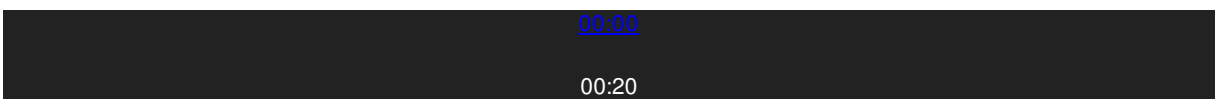
3.2.5 Counting Zone Setting

1. Select the video you want to count from the **Select Video dropdown** in the top right corner.



2. To properly set up the counting area, please refer to the video. The counting area can be set using the functions below.

Video clip guide (Refer to the on-line Technical document)



- Drag the vertex to **move it**
- Click the yellow line to **add a new vertex** at that point

- Right-click the vertex to remove it
- Drag the gray box to move the label position

3. Click the Apply button to save after setting each option. Set the counting zone to every entrance and exit the same as above to count the whole passengers.

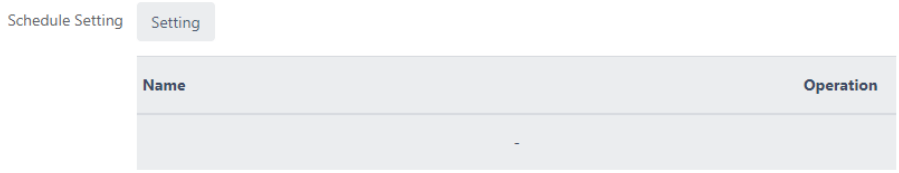
- Zone Name : Enter the name of this zone.
- Counting Zone : Select the direction of people passing by needed to count as an event

3.2.6 Schedule settings (optional)

You can reset the counter at times when there are no people in the target space, such as at night or during non-business hours.

You can set up a wipe schedule as a daily, weekly, or monthly wipe. You can also add multiple wipe schedules.

1. Click the Setting button to set the event action schedule.

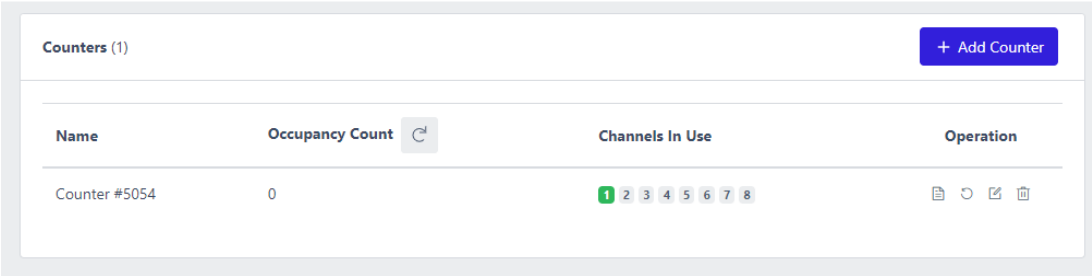


2. Add a schedule to drive action when an event occurs. Please refer to the Schedule Setting Guide for more information on how to set up a schedule.

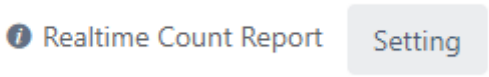
3.2.7 Finishing the setup

1. When you've finished setting up all the entry and exit people counters and reset schedules, click the Submit button at the bottom of the page to submit your in-space people counter settings.

2. If everything is set up correctly, you can see what you've set up in the list of people counters in the space.

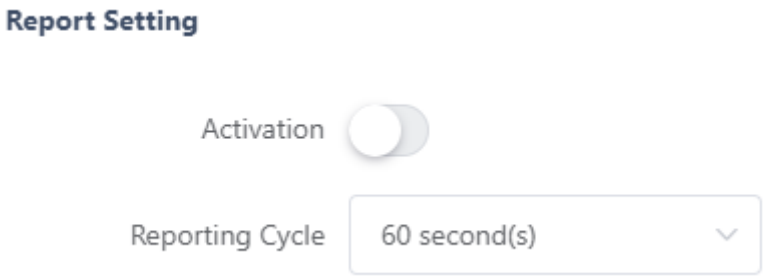


3.2.8 Setting up real-time reporting (optional)



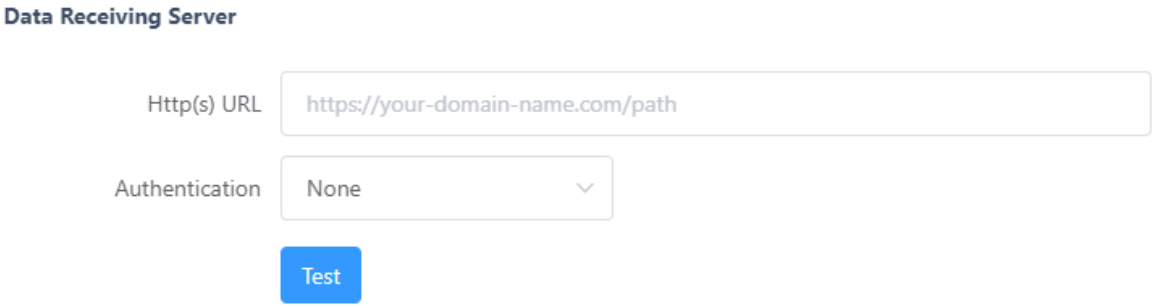
This feature allows you to send count values to a user-configured HTTP server in real time. Not setting it does not affect the behavior of the counter.
Click the “Settings” button to configure the real-time count reporting feature.

3.2.8.1 Reporting setting



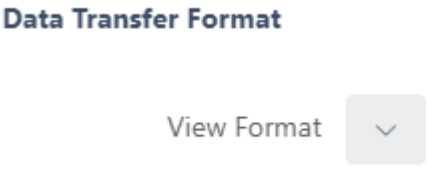
To enable real-time reporting, turn on the switch in the Activation button.
The frequency of real-time reporting is set in the Reporting cycle item.

3.2.8.2 Data Receiving Server



To receive real-time count data, configure the server information.
Add the HTTP or HTTPS server URL and authentication settings if you have authentication capabilities.
The authentication method can be configured as Basic, Digest or Token.
You can use the Test button to check that the device can send data to the server normally once you’ve set up the data receiving server. When the “Test” button is clicked, data will be sent to the configured HTTP server in the same format as the real time count data of the actual meter.

3.2.8.3 Data Transfer Format

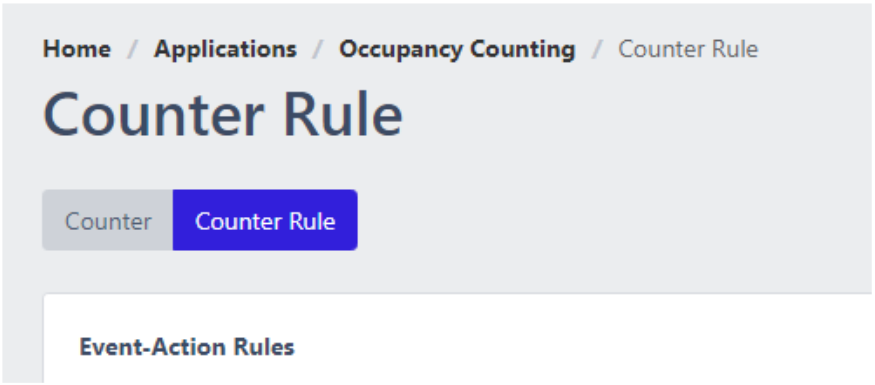


Under Data transfer format, click the button in the View format item to see the live count data transfer protocol information.

3.3 Counter Action Rule Setting Example

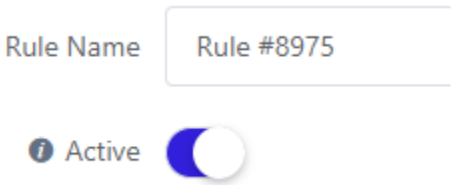
You can set events and create action rules based on the counter values of the counters you set.

Each counter app includes a separate menu where you can set up rules.



To add a new counter rule, click  the in the top right corner of the rules list.

3.3.1 Event Action Rule Preferences Setting

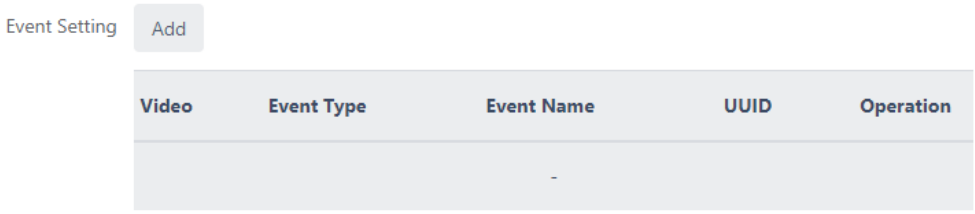


1. Enter a **name** for the rule. A random default value is entered, change this if necessary. You can also identify the rule by the name you enter in the action performed by the action handler.

2. If you want to activate the event action rule upon creation, turn on the **'Active'** switch.

3.3.2 Event setting

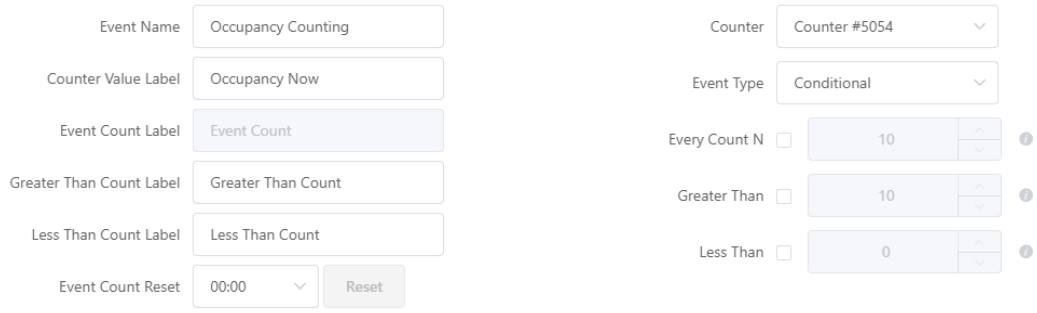
1. Click the  to set the event.



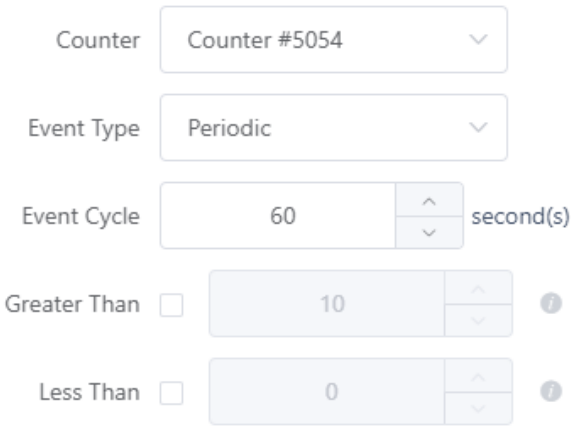
2. Select the channel on which you want the event widget to appear and specify the location of the widget. The channel on which the event occurs will also be set to the channel on which the widget will be displayed.

3. Specify the target counter for the event in Counters. If there are any counters set up in the Counters application, they will be displayed in the list.

- There are two **event types**.
    - Conditional – the event is triggered when the specified counter's value meets a specified condition.
        - Every Count N – Triggers an event when the count value of the counter goes above or below a multiple of the N you set. For example, if N=10, an event is fired when the count value changes from 9 to 10, 19 to 20, or 10 to 9, etc.
    - If you added a range condition, such as greater than/less than, to the condition for every count N – Even if the interval N changes, the event will not occur if the range condition is violated.
        - If the item greater than the setting is greater than the item less than the setting – the event is fired if only one of the two conditions is met. ex) True if "X>10 OR X < 5" if X>10, X<5
        - If the item Greater than the setting is less than the item Less than the setting – the event is fired only when both conditions are satisfied. ex) True if "X>5 AND X<10" if 5<X<10
    - Greater Than – The event is triggered the moment the counter's count value becomes greater than the setting.
    - Less Than – The event is triggered the moment the counter's count value becomes less than the setting.
        - The Greater Than or Less Than events are mutually independent, so there is no condition under which one must be greater or less than the other. The event is triggered when the count value becomes greater or less than the number you set.

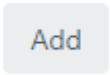


- Periodic – The count event occurs at regular time intervals.
    - Events occur at regular intervals based on the event cycle you set.
    - If you have added a range condition such as greater than/less than setting as a condition every cycle – every count N, the range condition will operate the same way as the setting.

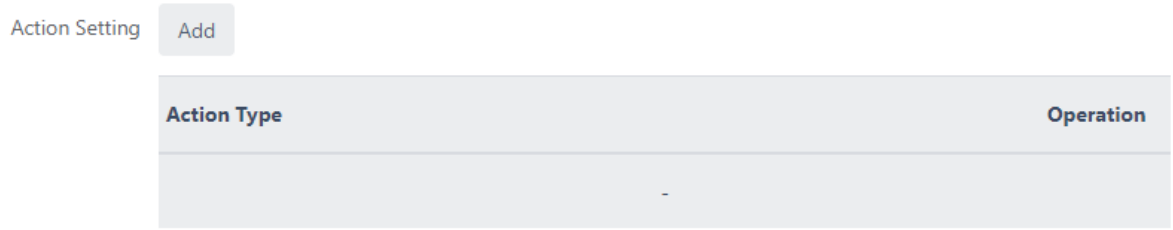


3.3.3 Action Settings

Define the event action to take when the event set occurs in Action Setting.

1. Click the 

button to add a new action item.

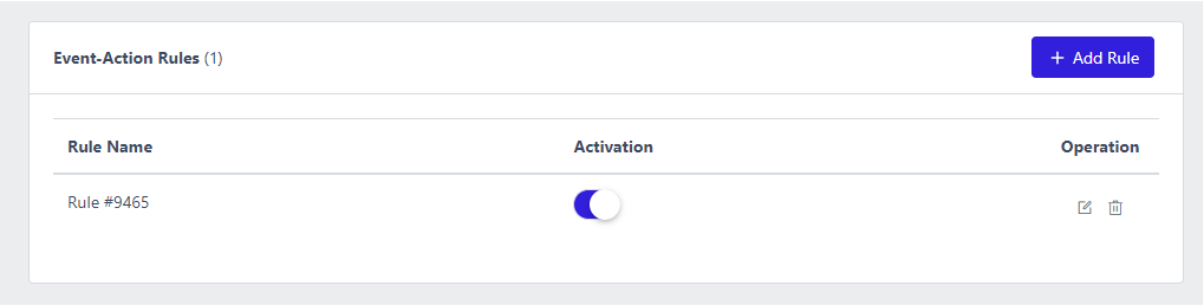


2. Set each action want to perform when an event occurs. Please refer to the Action Setting Guide for the types of actions supported and how to set them up.

3.3.4 Finish setup

1. Click the Submit button at the very bottom to save intrusion detection event settings after setting up the event, action in the event action rule set page.

2. If everything is set up correctly, you can see the new event in the list on the Intrusion Detection application screen.



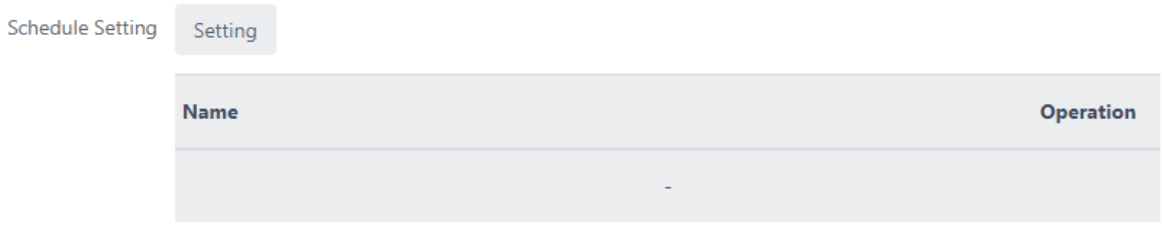
3.3.5 Filter settings (optional)

Schedule and Combined Rule filters can be used to set up event filters to drive actions. The schedule and Combined Rule filter settings described below are not required to configure an action rule, so you only need to set them if necessary.

3.3.5.1 Schedule settings

Set up event action schedules that operate over a period of time to set the time for sending the notification whenever an event occurs.

1. Click the Setting button to set the event action schedule.



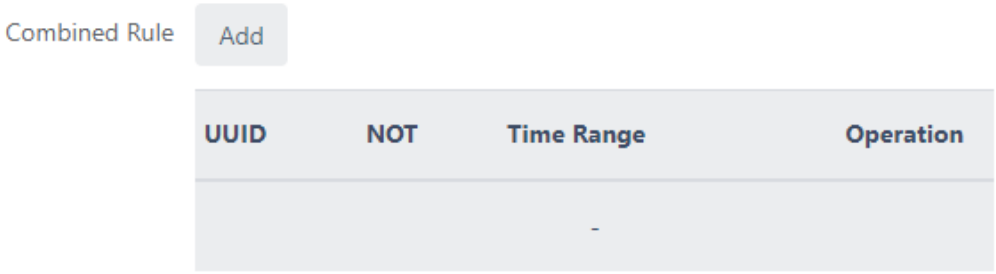
2. Add a schedule to drive action when an event occurs. Please refer to the Schedule Setting Guide for more information on how to set up a schedule.

3.3.5.2 Combined Rule condition settings

Set compound conditions on event actions to perform more complex forms of event filtering. The following items can be set as compound conditions.

- Rules set in the application in the form of an event action
- Events that make up a rule are set in an application in the form of an event action
- System I/O devices, such as alarm inputs or virtual alarm inputs

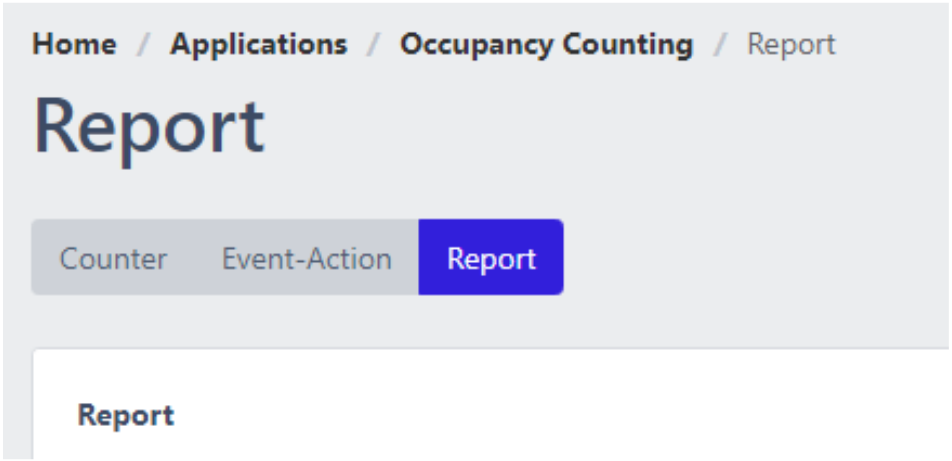
1. Click the Add button to set the combined rule condition.



2. Please refer to the Combined Rule Setting Guide for more information on setting up.

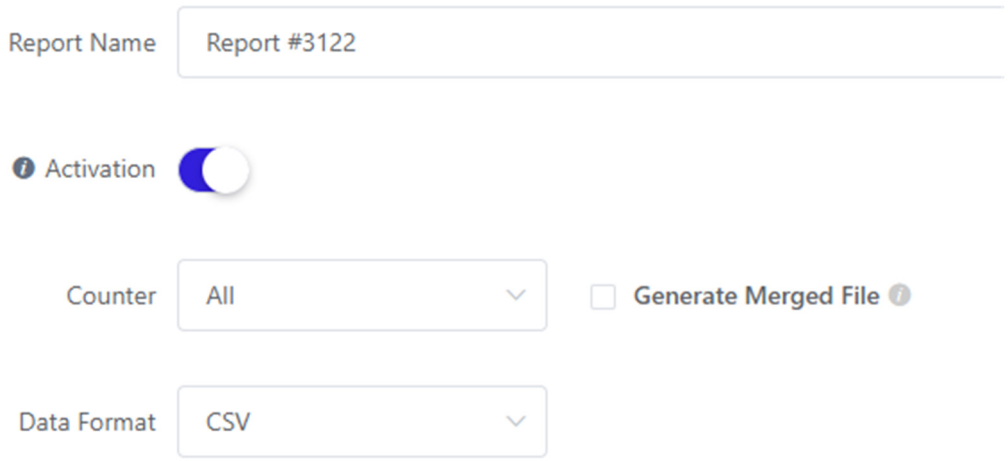
3.4 Periodic Reporting Setting Example

You can periodically report the counts collected by the counters you have set up to storage, such as FTP, email or AWS S3.
Each counter application has a separate menu where you can set up reporting.



To add a new counter rule, click the + Add Report button in the top right corner of the report list.

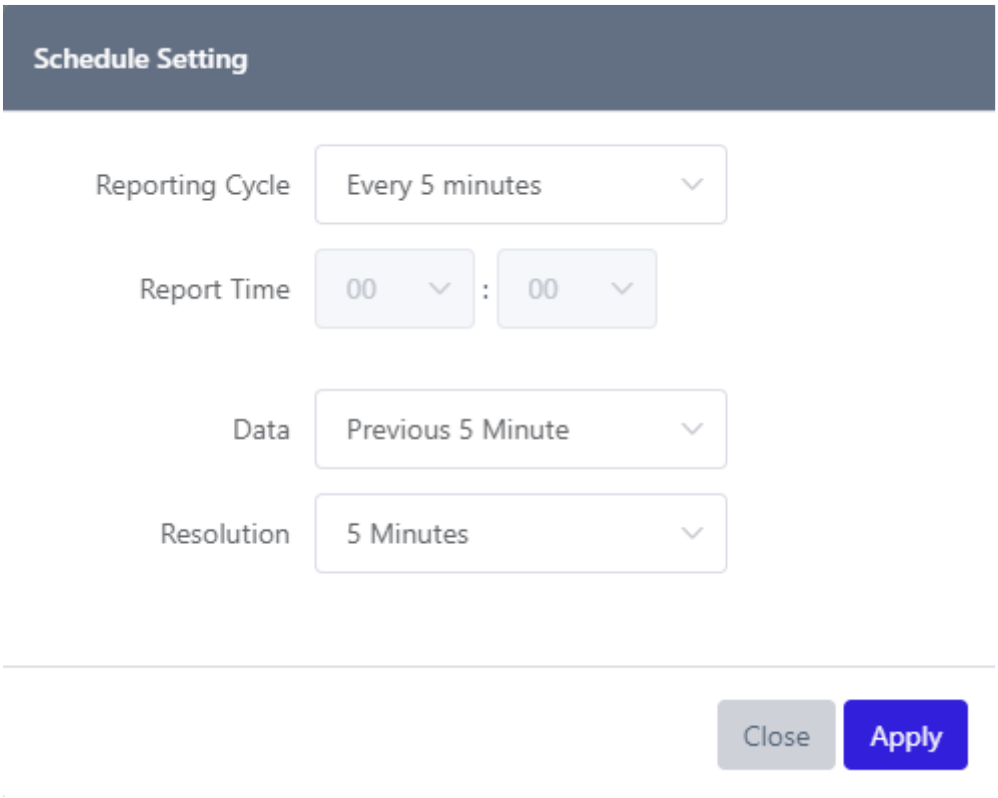
3.4.1 Reporting Preferences Settings



1. **Report Name** : Enter the name to identify this report setting. A random default value is inserted, change this if required.
    - Once you have set a report name, you can use the {{REPORT NAME}} token in the report file name or the directory name in the receiver settings to specify this report name in the report file name or the directory name in the receiver settings.
2. **Activation** : Check the Enable box if you want to enable the report function simultaneously with generation.
3. **Counter** : Set Counters specifies the counters that are included in the report. Counters must be set in advance. The report will include **all counters** that are set when you select **All**.
4. **Data Format :** The Data Format setting specifies the type of reporting data. You can report data in CSV or JSON format.

3.4.2 Schedule Settings

Schedule settings allow you to set reporting frequency, reporting time, reported data scope and reported data units. You can register multiple schedules. Each schedule will send data independently.



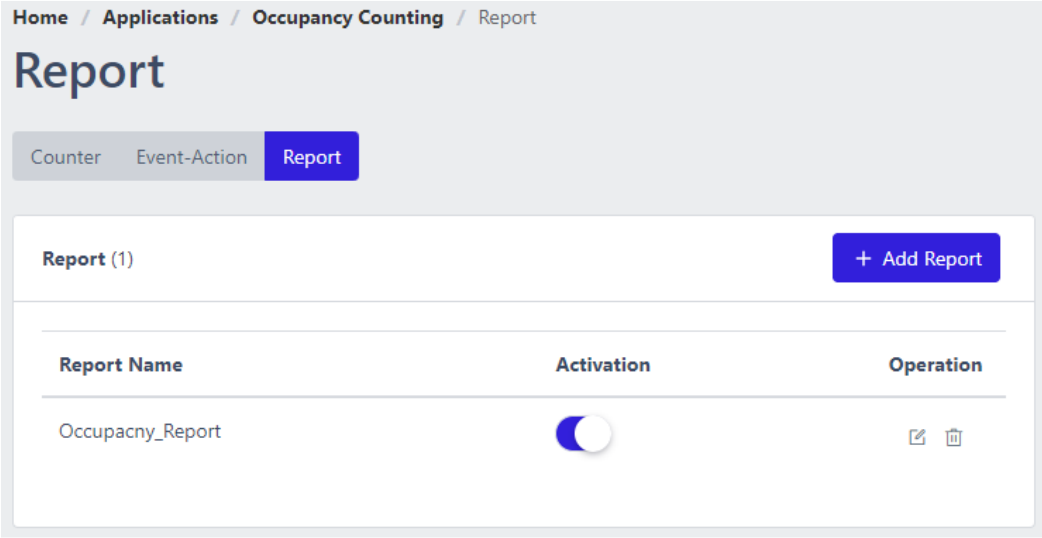
1. **Reporting Cycle** : Set the frequency of data reports.
2. **Report Time** : Set when to report based on reporting cycle.
3. **Data** : Set the scope of reporting data.
4. **Resolution** : Set the units for aggregating report data.

3.4.3 Recipient settings

Recipient settings are similar to action settings in Event action rule settings. You can set a destination for the report to be delivered to.
File transfer protocols are supported such as FTP (SFTP), email and AWS S3.
For detailed settings, refer to the Action Settings Guide.

3.4.4 Finish the setup

Once you've finished setting up your preferences, schedule settings and recipients, click the button at the bottom of the page to submit your reporting settings.
You will see your settings in the list on the Counter Reporting screen if everything is set up correctly.



3.5 Counter Statistics Report Format Guide

3.5.1 Reporting data format

If you've set up reporting, then a statistical report is sent when the next cycle comes around.

Statistical reports are sent as CSV or JSON type data, depending on your settings.

Multiple zones can be set for a single counter. For example, **Counter #1234** can have multiple zones set for it, such as **Zone #1234**, **Zone #1235**, **Zone #1236**, … etc.

Therefore, the format of the statistics report sent is also variable depending on the counter's settings.

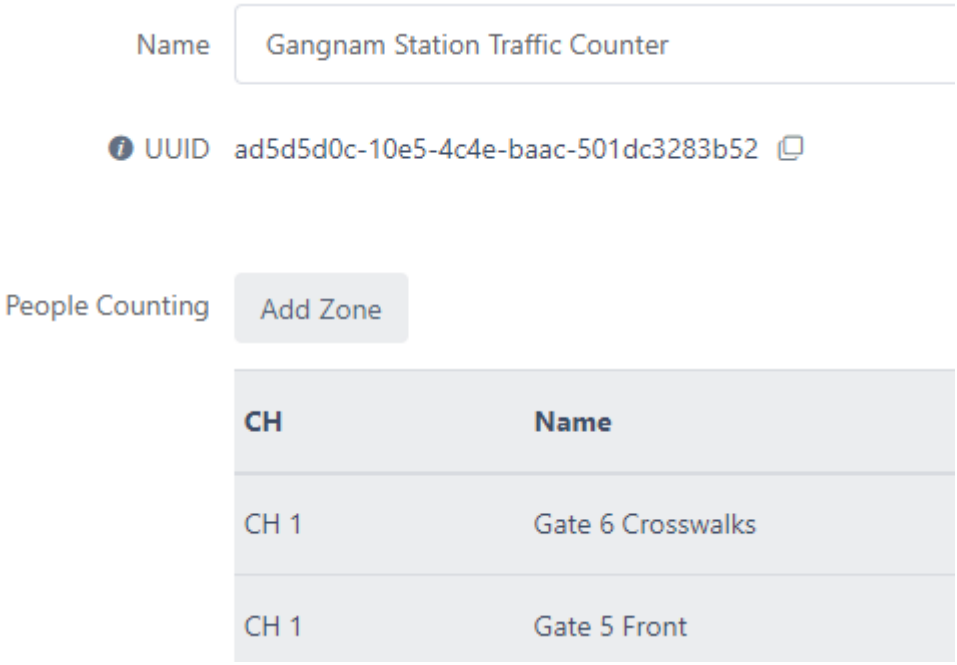
In general, the format of the statistical report will include the following data according to the **counter-zone** hierarchy.

1. Total sum data from the counter
2. Data by each zone

You can see the format of the data being sent referring an example below.

3.5.2 [People counting] Example of statistical reporting data

If you have the following counters and report set up to periodically receive data from them through reporting settings.

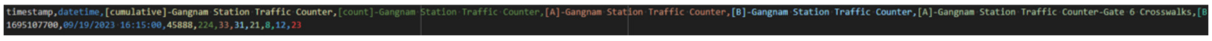


The counter is named **Gangnam Station Traffic Counter**, and it has two counting areas set up: the **Gate 6 Crosswalks**, and **Gate 5 Front**.

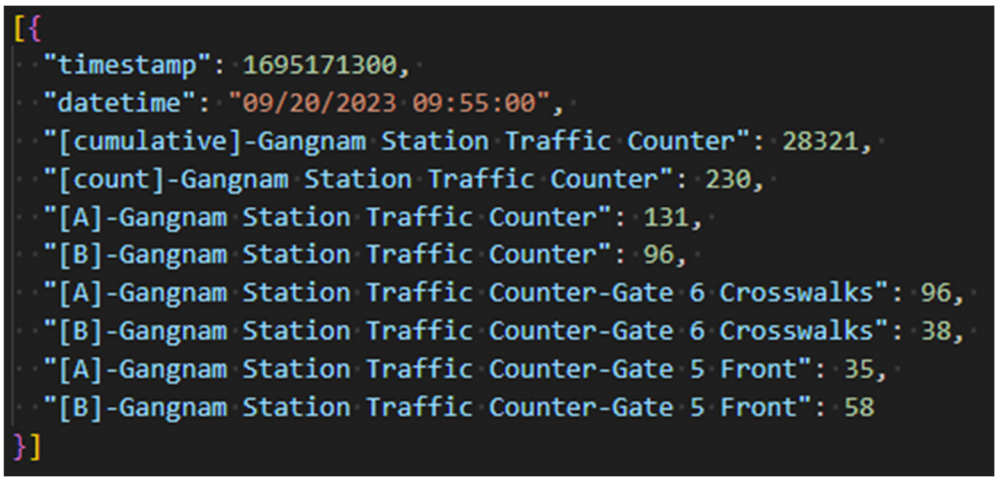
By adding reporting settings in the PeopleCounting app, you can receive statistical reports periodically for these counters.

Below is an example of a statistical report set to send in CSV format every 5 minutes.

3.5.3 Example data in CSV format



Example data in JSON format



Each line contains the following data

Aggregation start time from counters

1. timestamp
    - The Unix Epoch value of when the data started being collected.
2. datetime
    - Date and time values from when the data started being collected. It is set in the format specified in the System-Date and Time setting.

Aggregated statistical data from counters

1. **[cumulative]-counter name** (Ex. [cumulative]-Gangnam Station Traffic Counter)
    - The total sum of the counting data aggregated since this counter was last reset.
    - The cumulative value of the aggregated data from all zone is set in the counter.
    - [cumulative]-counter name = the [cumulative] value of the previous time data + the [count] of the current time data.
    - If there is a count reset schedule, the cumulative value is initialized at that time.
2. **[count]-counter name** (Ex. [count]-Gangnam Station Traffic Counter)
    - The number of aggregates this counter during at that time.
    - Equal to the sum of all counts counted this time in each zone.
3. **[A]-counter name** (Ex. [A]-Gangnam Station Traffic Counter)
    - Sum of all A-direction counts set in this counter
4. **[B]-counter name** (Ex. [B]-Gangnam Station Traffic Counter)
    - Sum of all B-direction counts set in this counter

Statistical data from the individual areas that configure the counter

1. [A]-counter name-zone name (Ex. [A]-Gangnam Station Traffic Counter-Gate 6 Crosswalks)
    - Aggregate value in the A direction for the zone
2. [B]-counter name-zone name (Ex. [B]-Gangnam Station Traffic Counter-Gate 6 Crosswalks)
    - Aggregate value in the B direction for the zone

3.5.4 [Vehicle Counting] Example of statistical reporting data

This is the same as the report format in the PeopleCounting app.

3.5.5 [Occupancy] Example of statistical reporting data

Example data in JSON format


```
[{
  "timestamp": 1695171300,
  "datetime": "09/20/2023 09:55:00",
  "[occupancy]-Building_Occupancy": 2626,
  "[increase]-Building_Occupancy": 11,
  "[entry]-Building_Occupancy": 92,
  "[exit]-Building_Occupancy": 81,
  "[entry]-Building_Occupancy-Front_Door": 5,
  "[exit]-Building_Occupancy-Front_Door": 7,
  "[entry]-Building_Occupancy-Back_Door": 86,
  "[exit]-Building_Occupancy-Back_Door": 74
}]
```

Aggregation start time from counters

1. timestamp
    - The Unix Epoch value of when the data started being collected.
2. datetime
    - Date and time values from when the data started being collected. It is set in the format specified in the System-Date and Time setting.

Aggregated statistical data from counters

1. **[occupancy]-counter name** (Ex. [occupancy]-Building_Occupancy)
    - The number of people currently occupied by this counter.
    - [occupancy]-counter name = All entering counting – All exiting counting, since this counter was last reset
2. **[increase]-counter name** (Ex. [increase]-Building_Occupancy)
    - The change in the number of occupied people that this counter has counted at this time.
    - The sum of the (Entry-Exit) values of all zones set in this counter.
3. **[entry]-counter name** (Ex. [entry]-Building_Occupancy)
    - The sum of entering count from all zones that is set in this counter.
4. **[exit]-counter name** (Ex. [exit]-Building_Occupancy)
    - The sum of exiting count from all zones that is set in this counter.

Statistical data from the individual areas that configure the counter

1. [entry]-counter name-zone name (Ex. [entry]-Building_Occupancy-Back_Door)
    - The aggregate number of people entering the zone
2. [exit]-counter name-zone name(Ex. [exit]-Building_Occupancy-Back_Door))
    - The aggregate number of people exiting the zone

5. Reduce False Detection Setting

Deep learning object detection cannot be 100% accurate.
There are several tools to reduce false detections and false alarms.
Learn more about these features below, and add settings to reduce false detection.

- Object Size Filter
- Object Exclusion Area

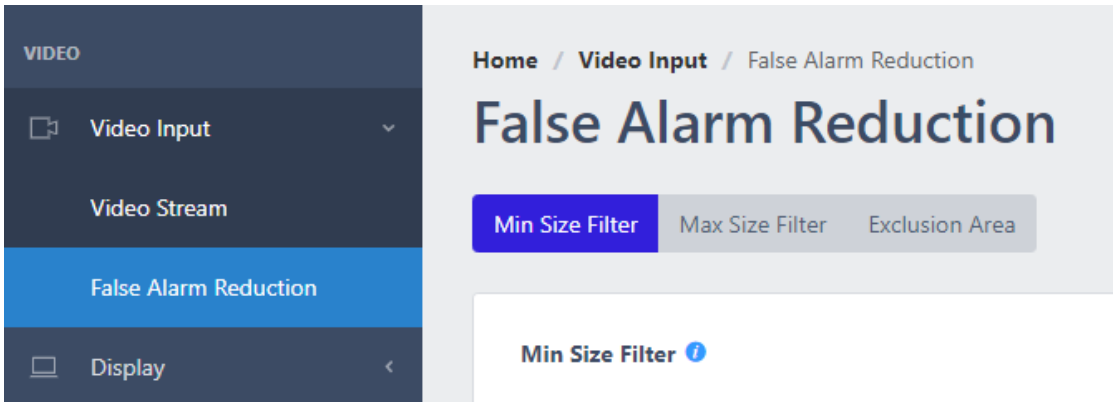
1. Object Size Filter

Within the same field of view, the size of objects of the same type will be approximately constant, or if the field of view is narrow and the distance is close, the size of objects at the top and bottom will increase and decrease at a constant rate and be detected.
These characteristics can be used to exclude detected objects from events if their size is too large or small compared to expectations.

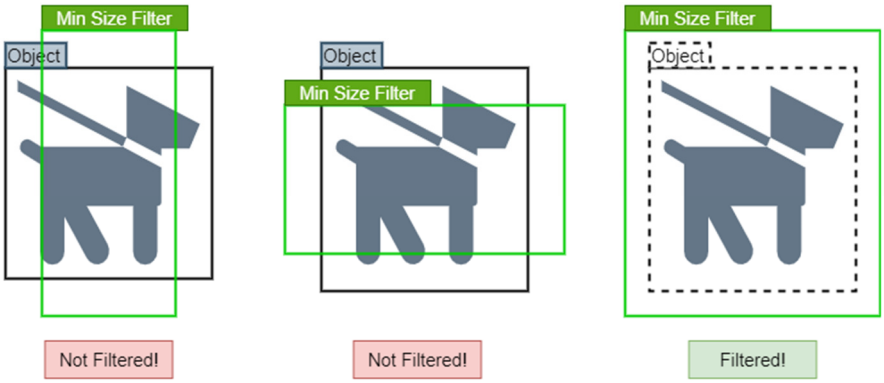
1.1 Object Minimum Size Filter

The Object Minimum Size Filter is a setting that allows a detected object to be recognized as an object only if the size of its bounding box is greater than the size of the box you set.

To access the settings, click Object Size Filter in the sidebar menu and select Min Size Filter in the body area.



1.1.1 How To Filter The Minimum Object Size



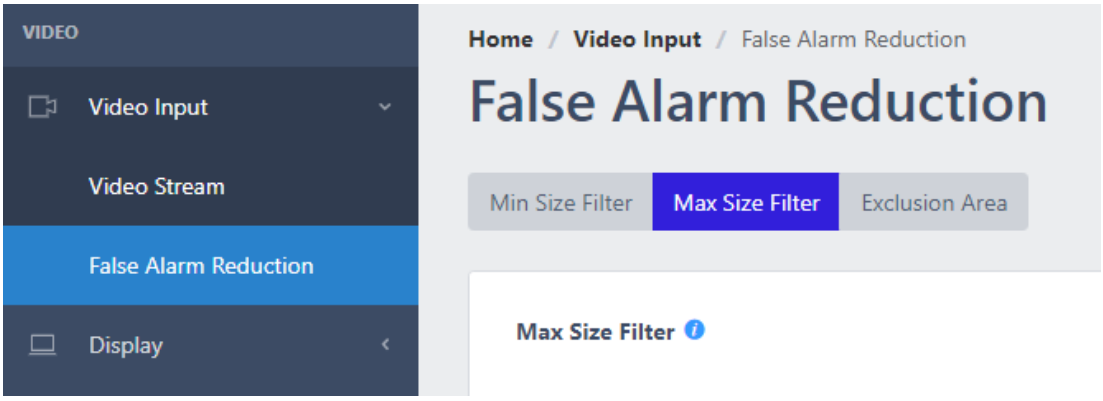
If the bounding box of an object is even larger by one horizontal or vertical dimension than the minimum size filter of the object, it will not be filtered out. Only when the object's bounding box is completely within the minimum size filter will the object be filtered out. See the illustration above to see how the minimum size filter works and which objects are filtered based on the object's bounding box size.

※ Notes
The object minimum size filter is not applied to fire detection.
The object minimum size filter is not applied to fallen detection.

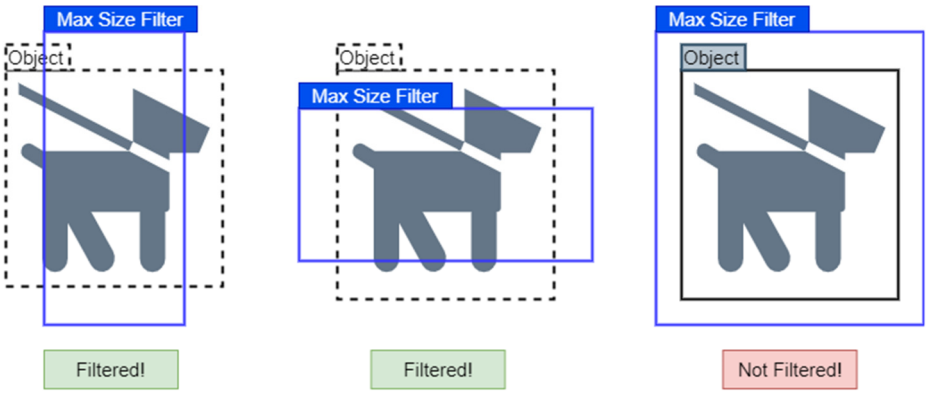
1.2 Object Maximum Size Filter

The Max Size Filter is a setting that only recognizes a detected object as an object if its bounding box is smaller than the specified box size.

To access the settings, click Object Size Filter in the sidebar menu and select Max Size Filter in the body area.



1.2.1 How To Filter The Maximum Object Size

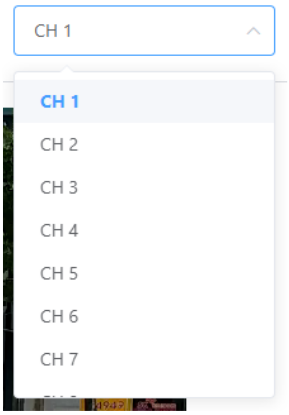


If the bounding box of an object is even larger by one horizontal or vertical dimension than the maximum size filter of the object, it will be filtered out. Only when the object's bounding box is completely within the maximum size filter will the object not be filtered out. See the illustration above to see how the maximum size filter works and which objects are filtered based on the object's bounding box size.

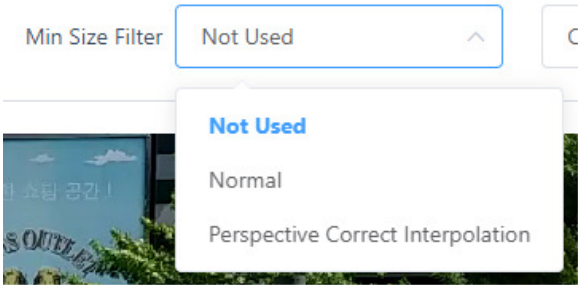
※ Notes
The object maximum size filter is not applied to fire detection.

1.2.2 Filters Set Up

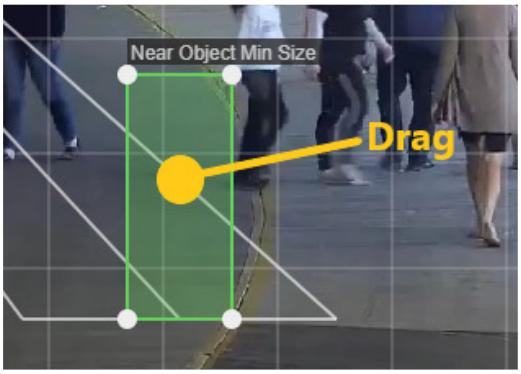
1. Select the channel you want to set the Minimum Size Filter.



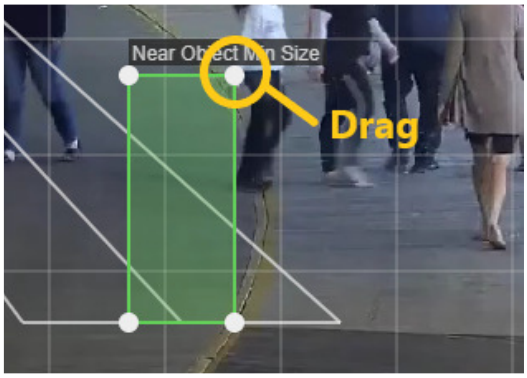
2. Select a Minimum Size Filter type.



3. Drag the filter area to move the filter position.



4. Drag the vertex of the filter box to change the size of the filter.

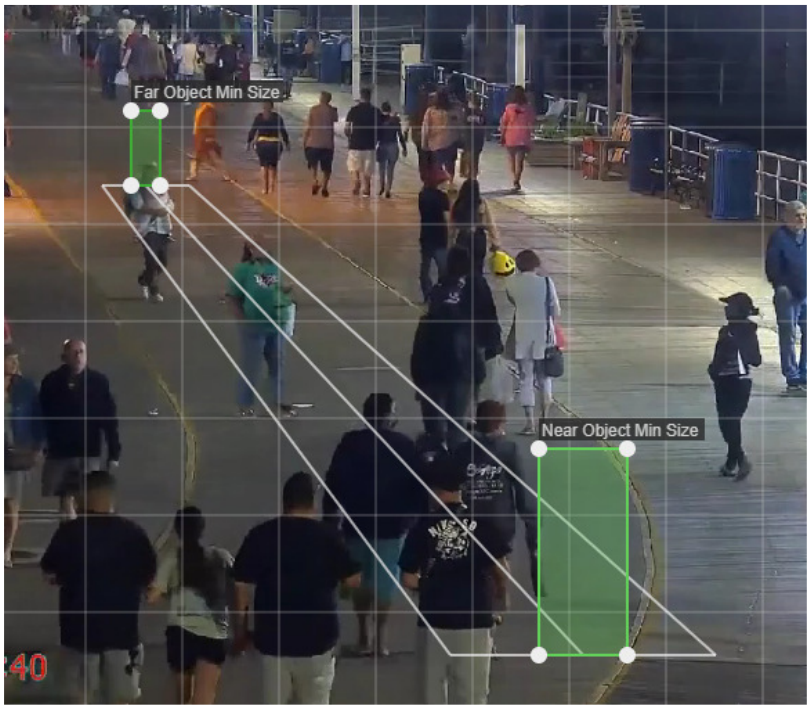


1.2.3 Filter Types

1. Not Used
   1) No use Minimum Size Filter for this channel.

2. Normal
   1) Use a Normal type of Minimum Size Filter.
   2) Typically used when the viewing angle is distant, and the screen area contains objects of approximately similar size.
   3) Set a single box and compares all objects to the size of that box. Objects smaller than the box are filtered out.

3. Perspective Correct Interpolation
   1) Set two boxes based on perspective.
   2) Set the Near Object Min Size box smaller than the size of objects in the near part of the screen at the bottom.
   3) Set the Far Object Min Size box smaller than the size of objects in the far part of the screen at the top.
   4) A minimum size filter box, calculated as a percentage of the near box and far box, is applied per screen area.
   5) Minimum Size Filter with perspective applied based on where the object appears.



1.2.4 Save, Load, And Reset The Settings

1. Save : Click the Save button at the bottom of the screen to save the position and size information of the filter setting.

2. Load : Click the Load button to load the most recently saved information of the filter that is set on that channel.

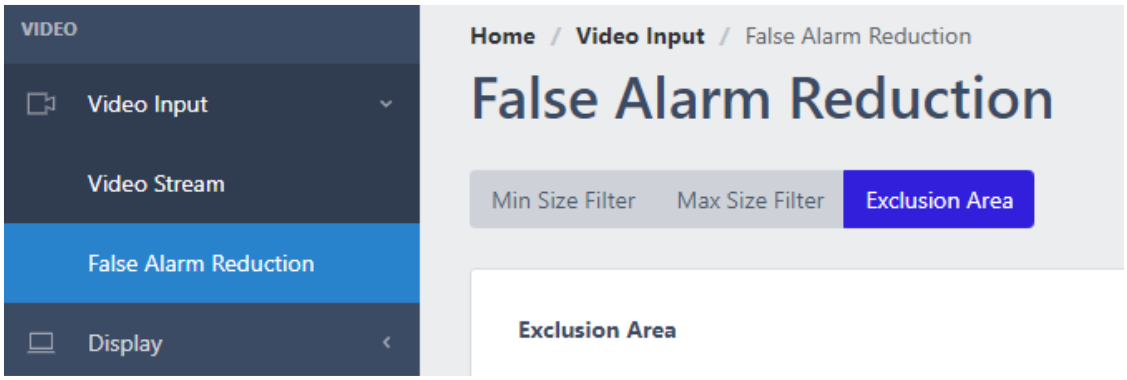
3. Reset : Click the Reset button at the bottom left of the screen to delete and reset the filter settings for that channel.

2. Exclusion Area

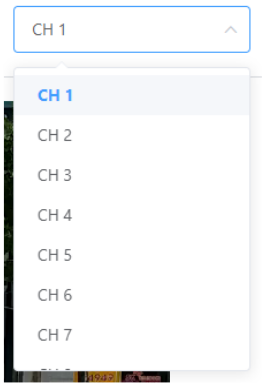
Exclusion zones can be used to filter out the same type of false detection that is consistently occurring in the same location. Objects in the area you added as an exclusion zone will be ignored and will not trigger an event.

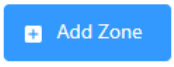
2.1 Exclusion Zone Settings

1. Click the “False Alarm Reduction > Exclusion Area” in the sidebar menu to access the settings menu.



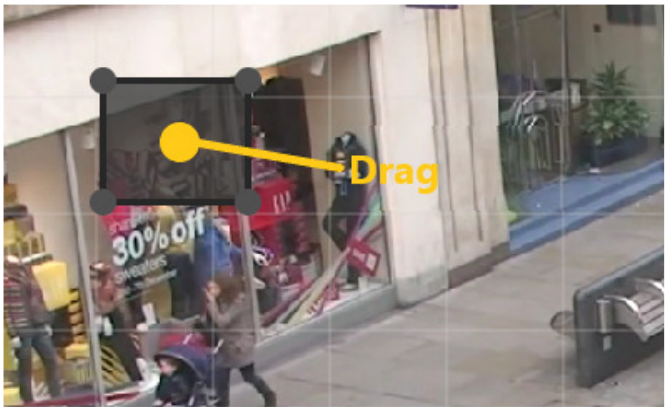
2. Select the channel you want to exclude.



3. Click the 

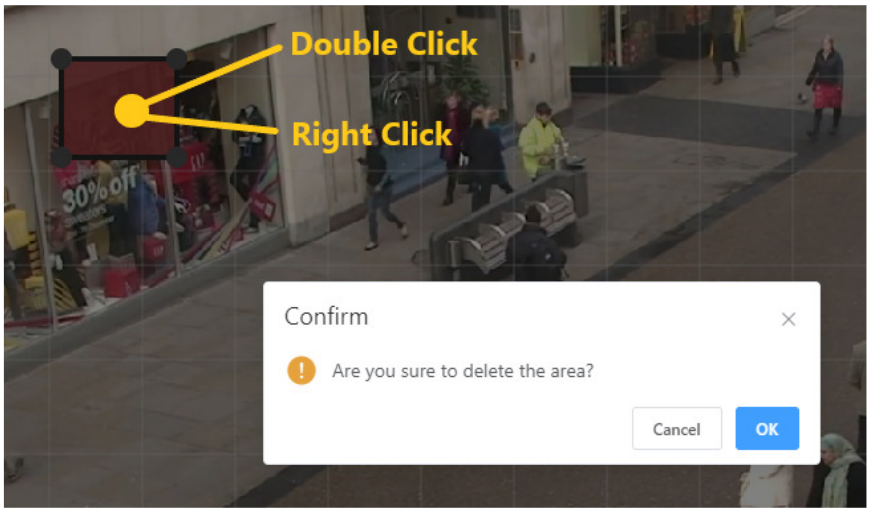
button to create an exclusion zone box. Up to 10 exclusion zones can be set.

4. Drag the exclusion zone to move it.



5. Drag the vertex of the exclusion zone box to change the size of the zone.

6. Double-click or right-click the exclusion zone to delete it.



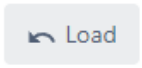
※Caution
It is recommended that the exclusion area is as small as possible to prevent actual objects from being filtered out by the exclusion area settings.

Even if the exclusion zone does not cover the entire object, the object is excluded as long as its center is within the exclusion zone.

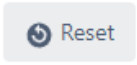
2.2 Save, Load, And Reset The Settings

1. Save : Click the 

button at the bottom of the screen to save the position and size information of the filter setting.

2. Load : Click the 

button to load the most recently saved information of the filter that is set on that channel.

3. Reset : Click the 

button at the bottom left of the screen to delete and reset the filter settings for that channel.

6. Arm/Disarm Setting Guide

In the Disarm settings, you can set the disarm for whether the action is triggered when an event occurs.

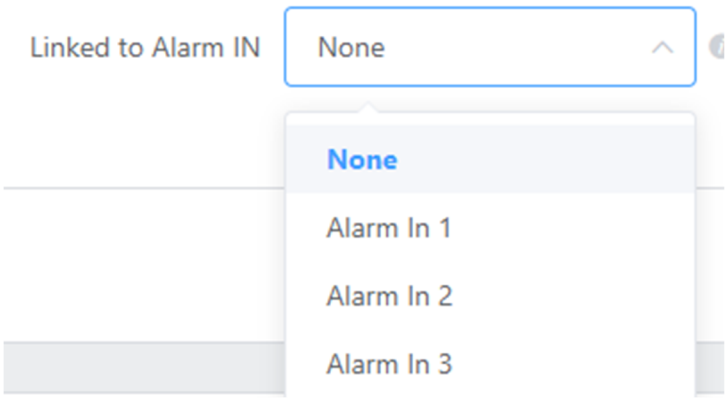
1. Arm/Disarm Overview

In a disarmed state, no actions are triggered when an event occurs. In addition to the settings that are enabled by default on **webpage**, you can change the state by entering **alarm input**, **schedule**, etc.

You can change the global disarm status of the device via 

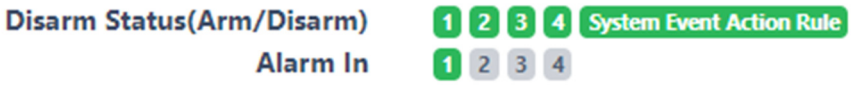
button in the top header.
If you checked the Arm activation button even when disarmed in the Arm/Disarm rule settings, the action will run.

2. Global Disarm



The global disarm status is synchronized with the status of the selected alarm input.
When linked to an alarm input, the disarm status cannot be changed via the webpage and API.

3. Arm/Disarm Instant Settings

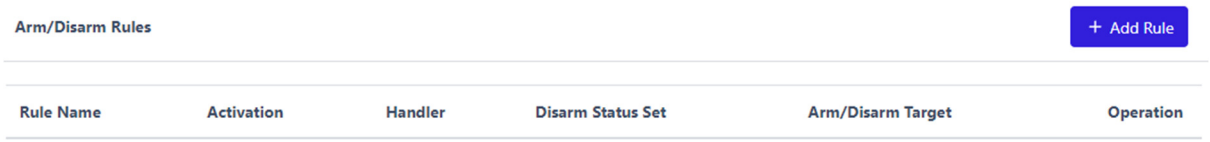


※ Disarm Configuration

- Global: t can be configured in the top header of the UI, allowing you to control the operation of all device actions. This setting takes priority over per-channel settings and system action disarm rules
- All: You can configure the Arm or Disarm operation of all channels and specified actions..
- Per channel: You can configure the operation of all channels and the specified actions
- System Event Action Rule: You can set whether an action set in a system event/action rule is triggered or not.

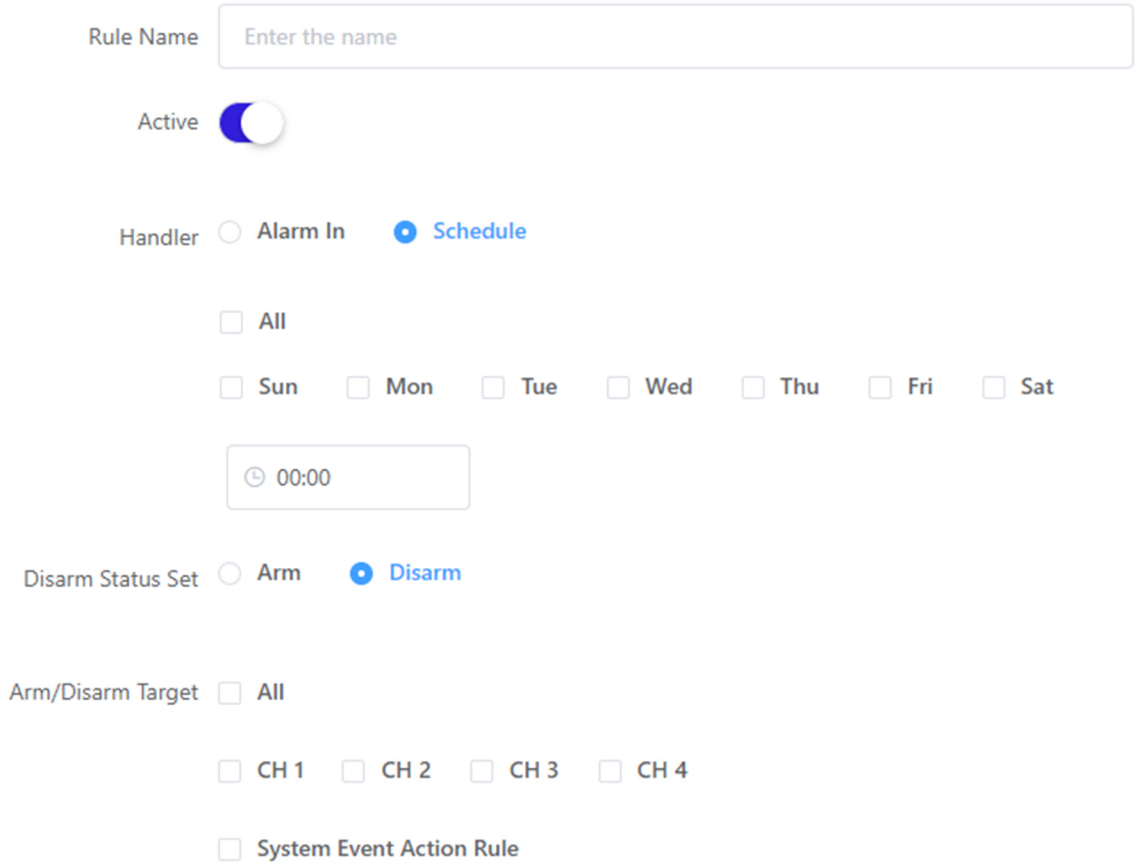
In the Arm/Disarm instant settings, you can set the status of all, per-channel, and system event action rule individually via the buttons. In Arm/Disarm Instant Settings.
If the status of the global disarm is set to disarmed, the event action will not run regardless of the per-channel armed status.

4. Arm/Disarm Rules



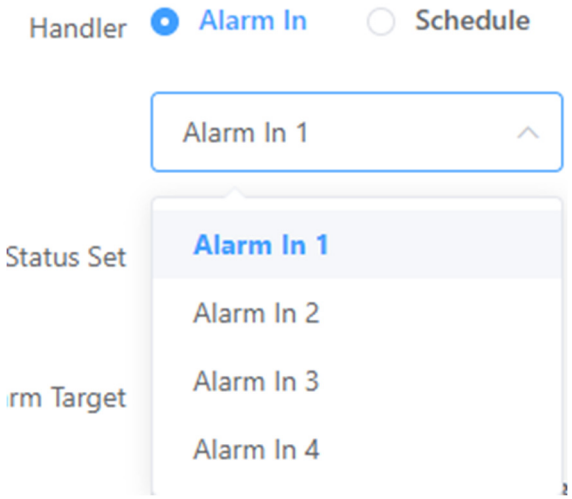
On the Arm/Disarm Settings screen, you can add a rule by clicking 

button.



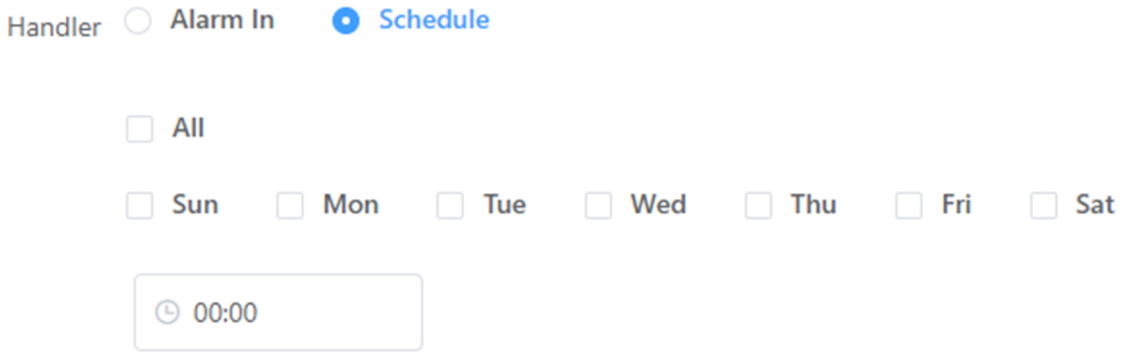
1. Enter a **rule name** to distinguish of rule.
2. The **activate button** sets the rule's activation status.
3. **The handler** specifies whether this rule is for alarm input or schedule.
4. **Disarm state set** configures the arm/disarm state when the rule triggers.
5. **Arm/Disarm target** chooses the entities affected by the rule.

4.1 Alarm Input



You can set up a rule by specifying the alarm input to use.

4.2 Schedule



You can set a schedule to change disarm status.
You can set a schedule by setting a target day and specifying a time. For example, you can set a rule to disarm every Saturday at 00:00.

7. Action setting guide

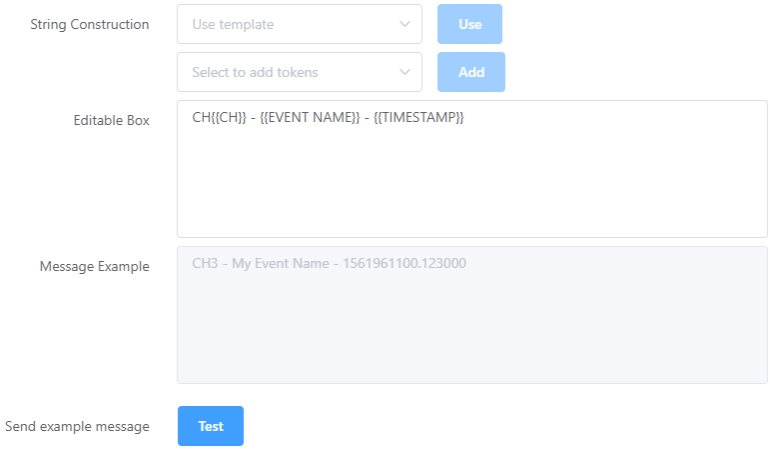
Various types of actions you want to trigger when an AI event occurs can send alarm notifications by defining the event actions in the event action settings.
Users can send real-time events over the network to specific servers or clients, such as **alarm output, voice audio through the camera speaker**, as well as **HTTP, FTP, etc**. And the system can be configured in conjunction with various pre-integrated **VMS**, such as Nx Witness, Cortrol, Milestone, Genetec, etc.

Utilizing Event Meta Tokens & Creating Action Message Guide

Action handlers that use the network can send messages using various event meta-information, such as the **event name** and the **event occurring time**.
When you set up an action handler of the type that sends a message from a device, the action message you want to send is configured in a format that you edit yourself.
By using the various event meta tokens provided when editing an action message, you can easily add dynamic event meta information to your action message.
This approach to action handlers allows users to write and use protocols with a high degree of freedom, depending on the protocols of the target device or server you want to interact with, without requiring additional development.

1 Edit Action Message UI Components

The Edit Action Message UI consists of a **template settings control, a token settings control, an edit box, an example box,** and **a test button**.

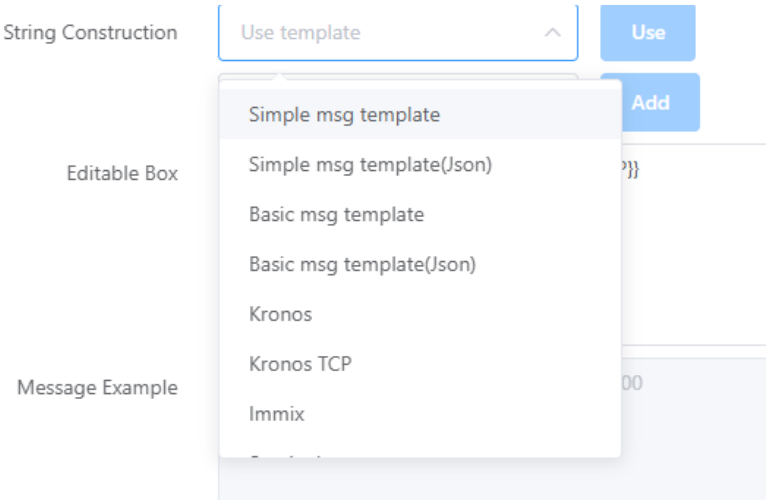


1.1 Edit box, Example box, and Test button

Typically, when composing a message, you type the message you want to send into the edit box. The typed message can contain an event metadata token in the form of {{XXX}} event metadata token. A list of available event metadata tokens is displayed in the Token Settings control dropdown list.
Click the Test button to actually send the hypothetical action message you see in the example box and test the integration with the recipient you're setting up.

1.2 Template Settings Controls

Use the Set Template control to set an action message in the form of a predefined template directly in the edit box.



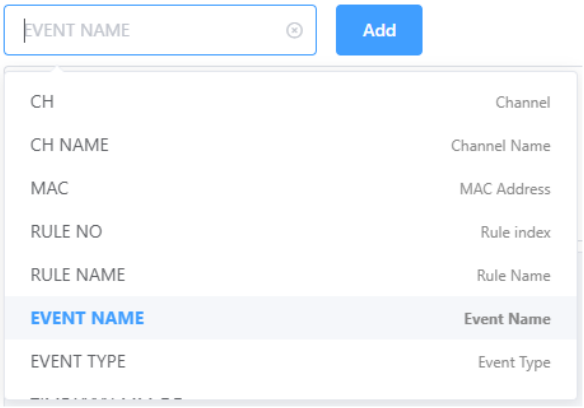
1. Select the template you want to set from the drop-down list.

2. Click the Use button on the right.

※Caution
When you use a template message, everything in the edit box is replaced with the template message. If you are working on something, you will lose your work if you replace it with the template message, so be careful when using it.

1.3 Token Settings Controls

You can insert event metadata into the action message using the Token Settings control.



1. Select the token you want to set from the drop-down list.

2. Click the Add button on the right.

The selected event metadata token is added to the edit box, and the virtual event metadata appears in the example box.

The token string can be moved anywhere in the edit box. The list of supported tokens and details of each are described below in the manual.

2 How to use object token {{::OBJ[XXX]}}

In the list of event metadata tokens, tokens of the form {{::OBJ[XXX]}} must be used according to specified rules. {{::OBJ[XXX]}} is a token representing different information about the object(s) causing the event.
An event may contain multiple objects, and the event's object information token is repeatedly replaced by object count.
Therefore, to specify where to repeat the syntax from and to for object information tokens, you must use a separate token, which is a list of objects.
The rules for using the OBJ token are as follows.

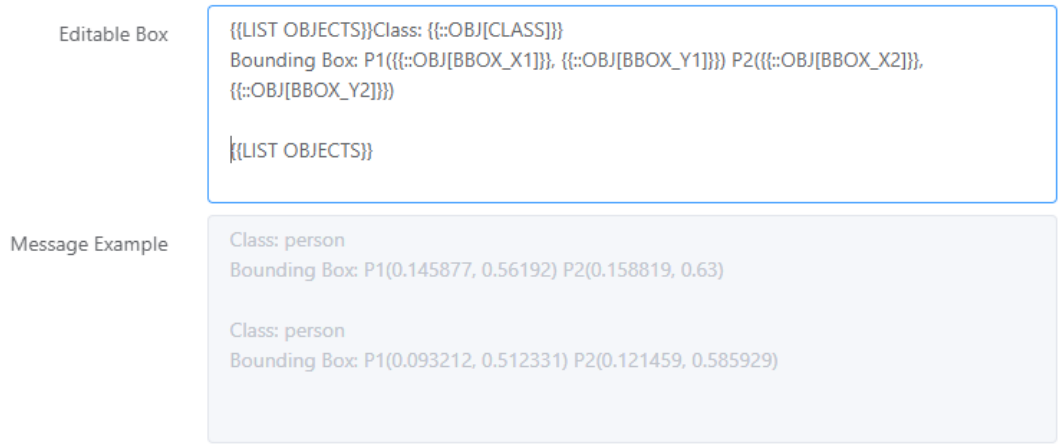
- All {{::OBJ[XXX]}} tokens must be placed between two {{LIST OBJECTS}} or {{LIST OBJECTS[PARAM=COMMA]}} tokens, with the first LIST token signifying the start of the iteration and the second LIST token signifying the end of the iteration.
- All {{::OBJ[XXX]}} tokens must be placed between two {{LIST OBJECTS}} or {{LIST OBJECTS[PARAM=COMMA]}} tokens, with the first LIST token signifying the start of the iteration and the second LIST token signifying the end of the iteration.
- A list of object information starting with {{LIST OBJECTS}} and ending with {{LIST OBJECTS[PARAM=COMMA]}} and a list of object information starting with {{LIST OBJECTS[PARAM=COMMA]}} must both end with {{LIST OBJECTS[PARAM=COMMA]}}.
- Object information enclosed in {{LIST OBJECTS}} has no delimiter to separate the items, and the string inside the list is simply repeated.
- {{LIST OBJECTS[PARAM=COMMA]}} appends a comma (",") character to separate items in the list.

To understand how to use the rule, see the following sample.

2.1 1st Example of using an object token

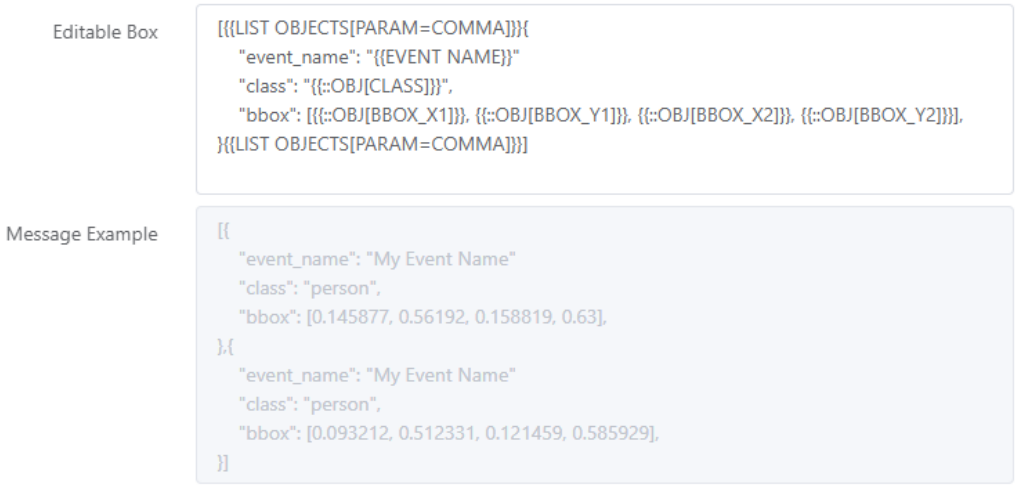
The "{{LIST OBJECTS}}" token repeats the string between it and the next "{{LIST OBJECTS}}" token for the number of event objects. The message between the {{LIST OBJECTS}} is repeated twice because the fictional event used to construct the example message contains two person objects.
In the above example, the string is "{{::OBJ[CLASS]}}" and "{{::OBJ[CLASS]}}[newline]". This has resulted in a different message in the example field.

2.2 2nd Example of using an object token



It is an example message sending object information by adding the bounding box positions of two persons' objects containing a fictional event. The plain text remains the same, and the OBJ token repeats the object information syntax twice the number of objects.

2.3 3rd Example of using an object token



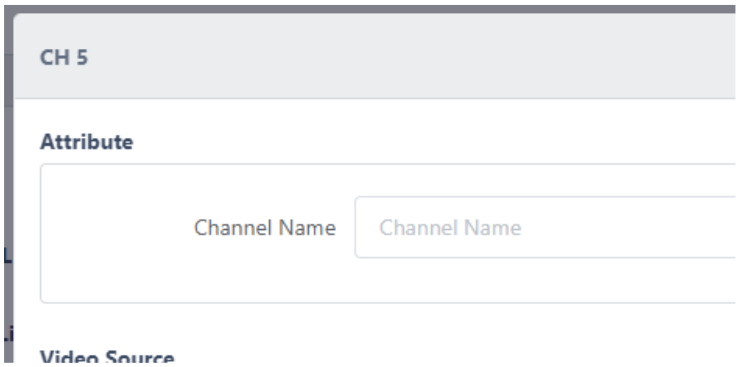
If you use the {{LIST OBJECTS[PARAM=COMMA]}} token to enclose the phrases of the list of object information, it will add a comma (,) between each phrase if there is more than one event object.
You can use this to build JSON strings, even if you use repeating object information sentences.

2.4 Event Metadata Token List

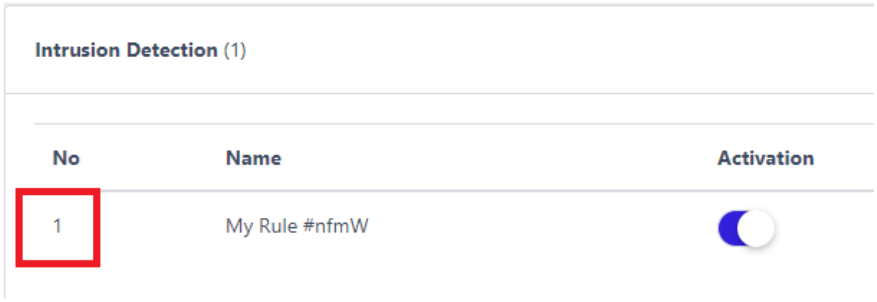
This section describes each of the supported event metadata tokens.
The event metadata tokens are categorized into four groups: event source, event information, object information, and time information about the object that generated the event.

1. Event sources and information
It is a list of tokens for basic information about the event, such as where it happened on what equipment.

- {{CH}}
  - The channel number where the event occurred (1-8) {{CH NAME}}
  - Channel name where the event occurred
  - Video Source – the channel name specified in the video stream setup

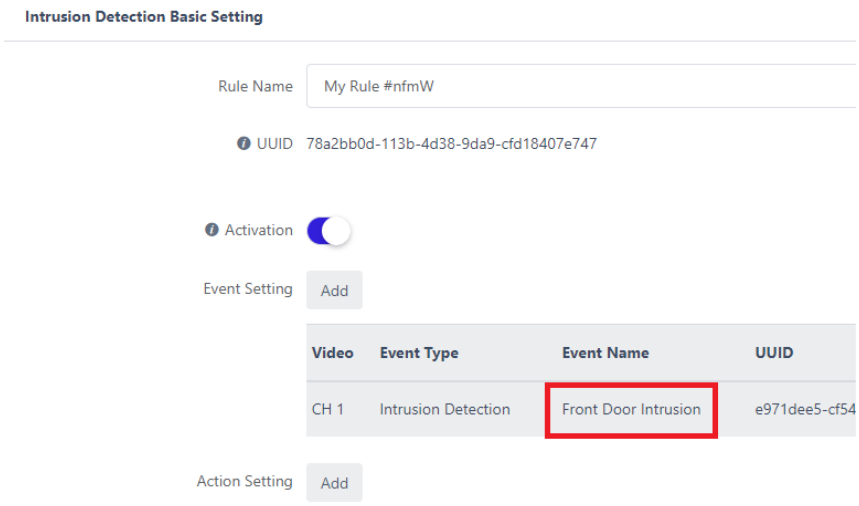


- {{MAC}}
  - Device MAC address
- {{RULE NO}}
  - The action rule ID containing the event

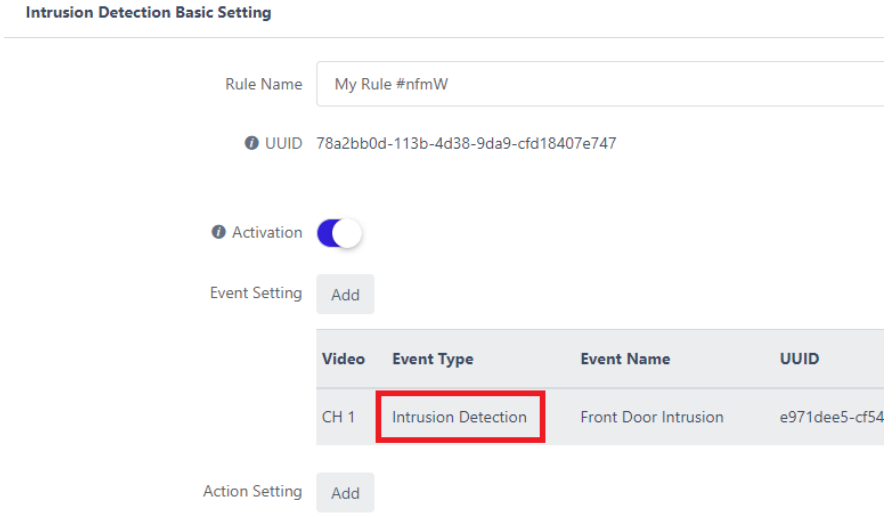


- {{RULE NAME}}
  - The action rule name containing the event

- {{EVENT NAME}}
  - Event name



- {{EVENT TYPE}}
  - Event type



- {{# OF OBJECTS}}
  - Number of event objects

2. Event time-related tokens

For example, if the event was at 18:43:9.739 on 7 March 2023 in the GMT+9:00 time zone, each time token would be replaced as follows.

- {{TIME YYYY-MM-DD}}
  - Event date ex) 2023-03-07
- {{TIME YYYYMMDD}}
  - Event date ex) 20230307
- {{TIME DD/MM/YYYY}}
  - Event date ex) 07/03/2023
- {{TIME YYYY}}
  - Event year with 4-digit ex) 2023
- {{TIME YY}}
  - Event year with 2-digit ex) 23
- {{TIME mm}}

    - Event month with 2-digit ex) 03
- {{TIME dd}}
    - Event date with 2-digit ex) 07
- {{TIME HH}}
    - Event occurrence hour on a 24-hour basis ex) 18
- {{TIME MM}}
    - Event occurrence minute with 2-digit ex) 43
- {{TIME SS}}
    - Event occurrence second with 2-digit ex) 09
- {{TIME MS}}
    - Event occurrence millisecond ex) 739
- {{TIMESTAMP}}
    - Timestamp of the event occurrence time ex) 1678182189.739000
- {{TIME ISO8601}}
    - ISO8601 standard format for the event occurrence time ex) 2023-03-07T18:43:09.739000+09:00
- {{UTC ISO8601}}
    - UTC time in ISO 8601 standard format for the event occurrence time ex) 2023-03-07T09:43.09.739000+00:00
- {{TIME}}
    - Event time format as designated ex) 07 March 2023 18:43:09

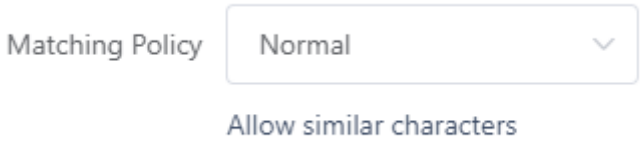
3. Token for object information

- {{LIST OBJECTS}} ~ {{LIST OBJECTS}}
    - Repeat as many times as objects to output the internal syntax.
- {{LIST OBJECTS[PARAM=COMMA]}} ~ {{LIST OBJECTS[PARAM=COMMA]}}
    - Use commas (,) to separate repeated statements, and repeat the internal syntax as many times as there are objects
- {{::OBJ[INDEX]}}
    - The event object's index, starting from 0
- {{::OBJ[TRACK ID]}}
    - Object tracking ID
- {{::OBJ[CLASS]}}
    - Object class. Different apps and event types detect different objects.
    - person / car / bike / violence / fire / abandoned / animal / man / woman / helmet / no-helmet / vest / no-vest / fallen / lp / …
- {{::OBJ[SCORE]}}
    - Object confidence score value
    - The value is for reference and is not appropriate to make a general judgment.
- {{::OBJ[BBOX_X1]}}
    - The X coordinate of the top left point of the object's bounding box.
    - The coordinate system is normalized to 0-1. The left end is 0, the right end is 1.
- {{::OBJ[BBOX_Y1]}}
    - The Y coordinate of the top left point of the object's bounding box
    - The coordinate system is normalized to 0-1. The top end is 0, the bottom end is 1.
- {{::OBJ[BBOX_X2}}
    - The X coordinate of the right bottom point of the object's bounding box.
- {{::OBJ[BBOX_Y2}}
    - The Y coordinate of the right bottom point of the object's bounding box.

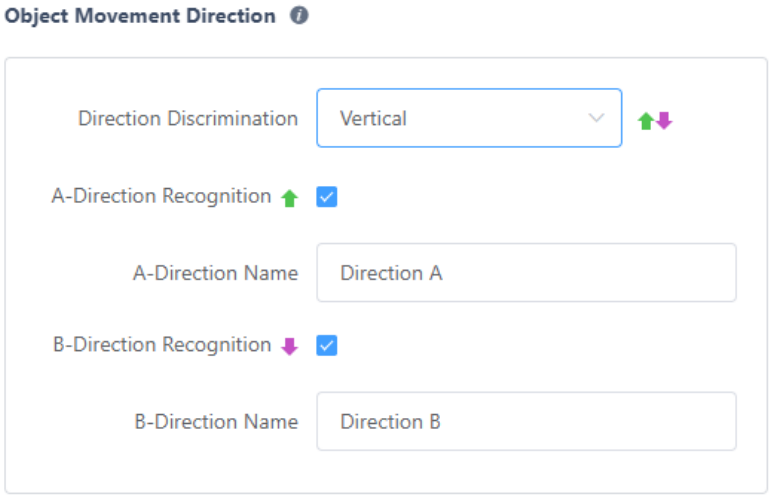
4. Token for displaying LPR object information

When using LPR object information, you must use {{LIST OBJECTS}} or {{LIST OBJECTS[PARAM=COMMA]}} to enclose the object display syntax, as with normal object information.

- {{::OBJ[LP_TEXT_DETECTED]}}
  - The plate number by License plate recognition
- {{::OBJ[LP_TEXT_DB]}}
  - The plate number registered to DB by the user
  - LP_TEXT_DETECTED and LP_TEXT_DB are usually the same. However, if you are using a loose matching policy, they may be matched even if they are not exact matches.



- {{::OBJ[LP_GROUP_NAME]}}
  - Group name containing the user's registered plate number in DB.
  - If the number is in several groups at the same time, it is replaced by a comma (,) separated list of group names.
    - ex) Group 1, Group 2
- {{::OBJ[LP_ID]}}
  - Index number registered in DB
- {{::OBJ[LP_NOTE]}}
  - The note on the plate number the user has registered in DB.
- {{::OBJ[LP_COUNTRY_CODE]}}
  - Country code of the recognized vehicle number
    - 2-digit alphabetic country code for LPR-EU. Replaced by EU if not detected.
    - 2-digit alphabetic state code for LPR-US. Replaced by US if not detected.
    - Replaced by JP for LPR-JP.
    - Replaced by KR for LPR-KR.
  - {{::OBJ[MOVEMENT_DIR]}}
    - The direction of movement of the recognized vehicle number (indicated by A or B).
  - {{::OBJ[MOVEMENT_DIR_NAME]}}
    - The event name you set for the direction of movement of the recognized vehicle number.
    -



6. Object attributes information token

When you activate the Basic Attributes app or the Advanced Attributes app, additional analysis of detected person's attribute information is performed.
If you want to include object attribute information in an action message, the object display syntax should be start and end with {{LIST OBJECTS}} or {{LIST OBJECTS[PARAM=COMMA]}}.
Please refer to the token information for representing the attributes below.

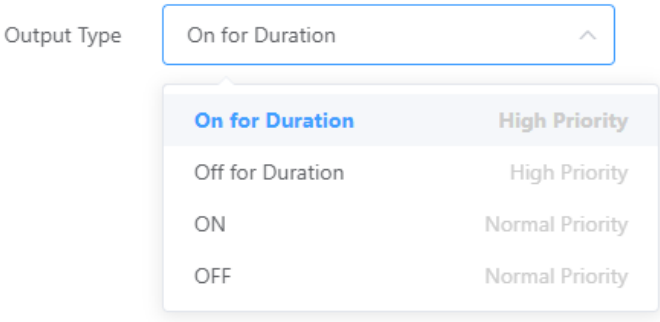
- {{::OBJ[ATTR_TOP_COLOR]}}
  - Top clothes color
  - When top clothes color is analyzed, it will be replaced with one of black, white, red, purple, yellow, gray, blue, green.
  - If the estimated top clothes color is unclear, it is replaced with an empty string.
- {{::OBJ[ATTR_BOTTOM_COLOR]}}
  - Bottom clothes color
  - When bottom clothes color is analyzed, it will be replaced with one of black, white, red, purple, yellow, gray, blue, green.
  - If the estimated bottom clothes color is unclear, it is replaced with an empty string.
- {{::OBJ[ATTR_GENDER]}}
  - Gender
  - When gender is analyzed, it will be replaced with one of man, woman.
  - If the estimated gender is unclear, it is replaced with an empty string.
- {{::OBJ[ATTR_AGE]}}
  - Age group
  - If age group is analyzed, it will be replaced with one of young, teenager, adult, old.
  - If the estimated age group is unclear, it is replaced with an empty string.
- {{::OBJ[ATTR_BACKPACK]}}
  - Presence of backpack
  - If presence of backpack is analyzed, it will be replaced with one of yes, no.
- {{::OBJ[ATTR_BAG]}}
  - Presence of bag
  - If presence of bag is analyzed, it will be replaced with one of yes, no.
- {{::OBJ[ATTR_HANDBAG]}}
  - Presence of handbag
  - If presence of handbag is analyzed, it will be replaced with one of yes, no.
- {{::OBJ[ATTR_CLOTHES]}}
  - Clothes type
  - If clothes type is analyzed, it will be replaced with one of dress, pants.
- {{::OBJ[ATTR_HAIR]}}
  - Hair length
  - If hair length is analyzed, it will be replaced with one of short, long.
- {{::OBJ[ATTR_HAT]}}
  - Presence of hat
  - If Hat on is analyzed, it will be replaced with one of yes, no.
- {{::OBJ[ATTR_SLEEVE_LENGTH]}}
  - Top sleeve length
  - If the top sleeve wear length is analyzed, it will be replaced with one of short, long.
- {{::OBJ[ATTR_DOWN_LENGTH]}}
  - Bottom wear length
  - If the bottom wear length is analyzed, it will be replaced with one of short, long.

1. System

1. Relay

Relays are functions that output digital signals through device I/O terminals. Relays can be used to control a warning light or to operate with a door lock as a door control signal.
Relay actions can be added from the Action Settings.

Select the action type to **Relay**, you'll see the relevant settings at the bottom.



The relay's output type is actually two settings, ON/OFF, but the settings screen is configured to allow you to select four different items. The definitions for each output type are as follows.

Output type	**Description**	**Priority**
On for Duration	ON output maintains during the duration time	High
Off for Duration	ON output maintains during the duration time	High
ON	Changes alarm output status to ON	Normal
OFF	Changes alarm output status to OFF	Normal

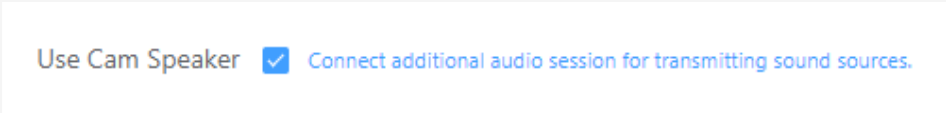
You'll notice that the right side of each output type describes its priority. Since there are a limited number of relays, and many event action items can be assigned to them, this creates an issue of control over the relay device.

※ Relay type control policy
1. If multiple relay actions are the same priority, the last one to occur takes control
2. If a higher and lower priority actions are competing, the higher relay type takes control. Higher priority alarms have a duration, so the last lower priority action takes control after the time elapses.
3. Low-priority items have no duration, so they permanently change the default state of the output until a new request is made by another event action.

2. Camera speaker Output

If IP camera connected to the AI AIBOX supports audio output through speakers, you can drive an event action to emit audio output.
Camera speaker output operates based on the protocols defined by the ONVIF Audio Backchannel standard.

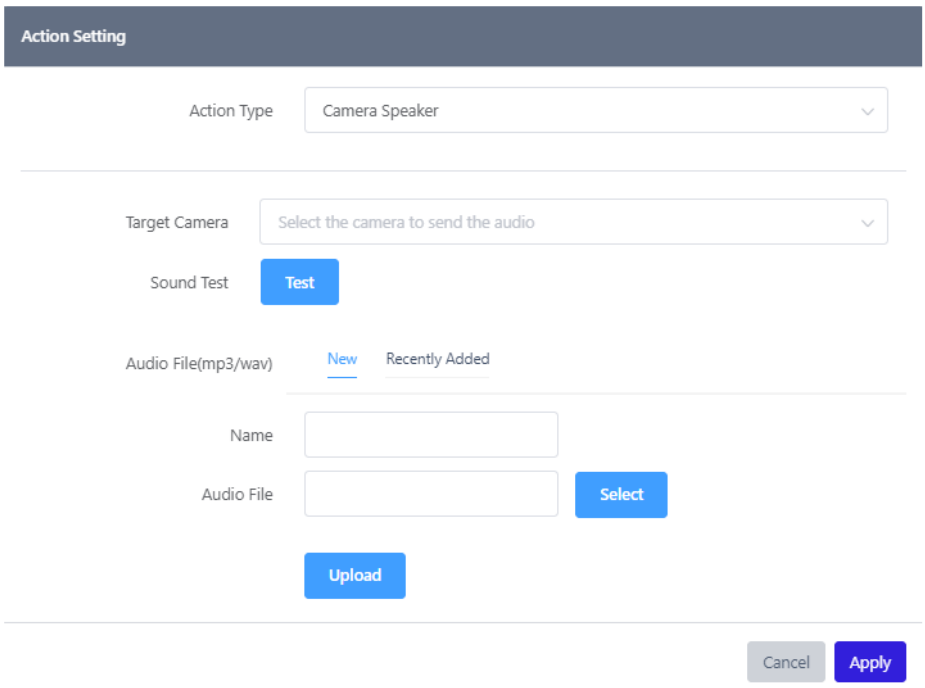
※ Preconditions
To run the Camera Speaker Output action, you must set the video stream to connect an additional audio session for sound transmission.
Make sure the following settings are checked for the camera you want to use in the **Video stream – Etc** settings.



2.1 Action Settings

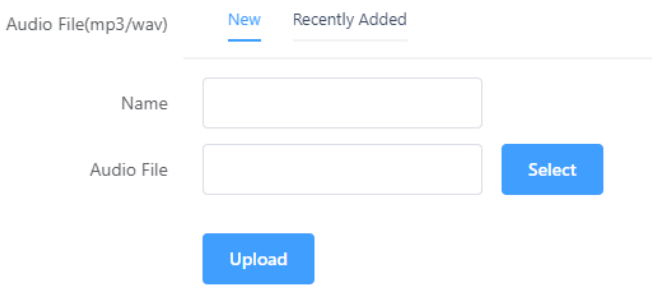
The camera speaker output action can be added from the Action Settings.

1. Select the Action Type to **Camera Speaker**, then, the relevant settings at the bottom.

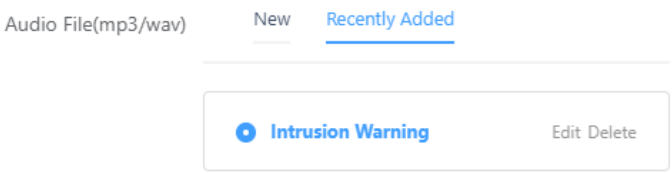


2. Select a camera connected to the AI AIBOX to output speaker sound

3. Select a sound source to send to the camera. Sound files can be uploaded on the **New** menu. MP3 and WAV formats are available.



Alternatively, select the audio file on the existing list to send to the camera.

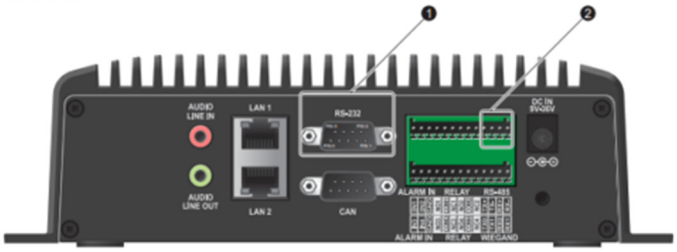


3. RS485(RS232)

You can send messages through the RS485 or RS232 interface when an application event occurs. (RS232 is not supported on some models.)

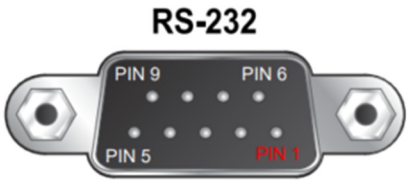
3.1 Basic Interface Wiring

- Rear View



❶ RS-232 (DB-9) Connector Pinout

Below is the pinout of a typical 9 pin RS-232 connector, this connector type is also referred to as a DB-9 connector.
A computer's COM port (DTE) is usually male, and any peripheral devices you connect to this port usually have a female connector (DCE).



Pin	Signal	DTE Signal Direction	Description
1	-	-	-
2	RXD	IN	Receive Data : Pin 2 (RXD) is connected to Pin 3 (TXD) of another device.
3	TXD	OUT	Transmit Data : Pin 3 (TXD) is connected to Pin 2 (RXD) of another device.
4	-	-	-
5	GND	-	Signal Ground : Pin 5 (GND) is commonly connected across all devices.
6	-	-	-
7	-	-	-
8	-	-	-
9	-	I-	-

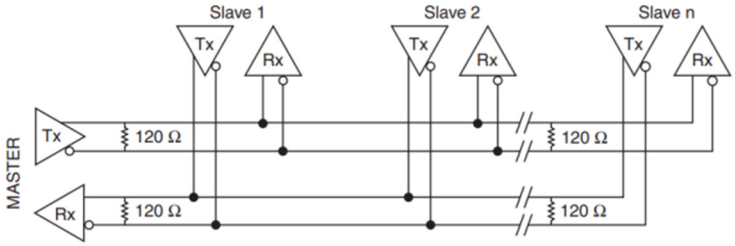
❷ RS-485 Connector Pinout

Pin	Signal	Signal Direction	Description
1	TX+	Transmit Data+	Device A's TX+ is connected to Device B's RX+
2	TX-	Transmit Data-	Device A's TX- is connected to Device B's RX-
3	RX+	Receive Data+	Device A's RX+ is connected to Device B's TX+
4	RX-	Receive Data-	Device A's RX- is connected to Device B's TX-

RS-485 Topologies

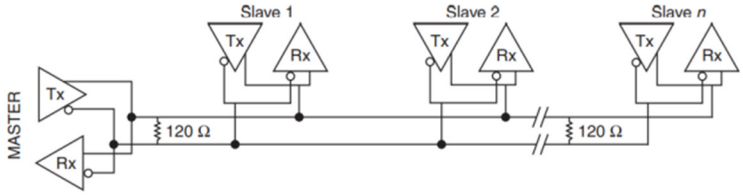
Connecting RS485 4-wire to 4-wire (Full Duplex)

This is an example of a standard 4-wire RS485 device to RS485 device configuration.



Connecting RS485 4-wire to 2-wire (Half Duplex)

For 2-wire transmission, you will need to short the transmit (TXD) and receive (RXD) signals together on the RS-485 port.
Wire the 2-wire device's send pin (TXD) to both TXD- and RXD-. Wire the device's receive pin (RXD) to both TXD+ and RXD+.



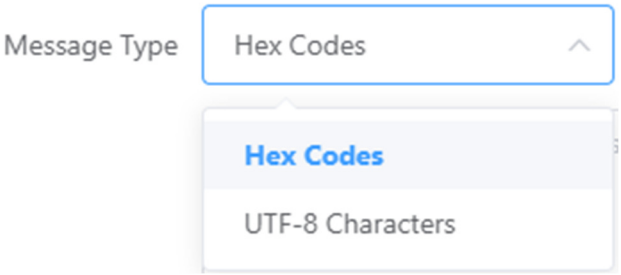
3.2 Action Setup

The setup procedures for RS485 and RS232 are the same, with the only difference being the output interface.

You can add an RS485 or RS232 action from the action settings screen.

When you set the **Action Type** to **RS485**, the related settings will be displayed below.

3.3 Message Type

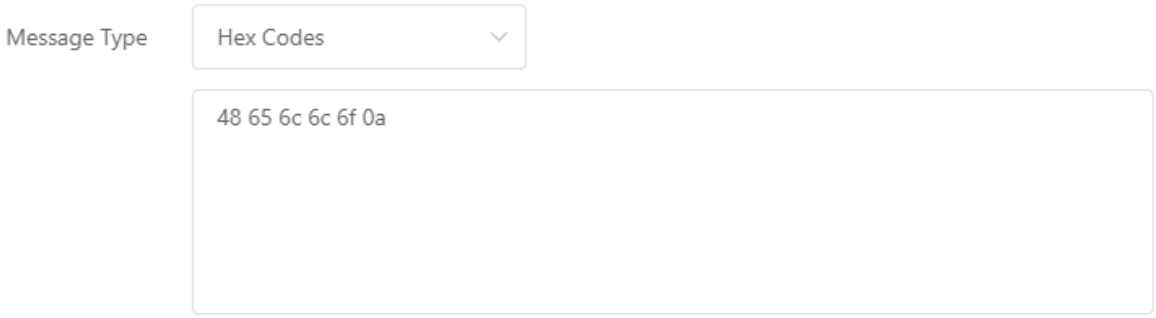


You can set the message type to either Hex Codes or UTF-8 formats. The default setting is Hex Codes.

Hex Codes

When you select the Hex Codes format, you can transmit binary data using hexadecimal values. Event metadata tokens cannot be used when transmitting binary data; instead, you must use fixed binary data. Please refer to the setup example provided.

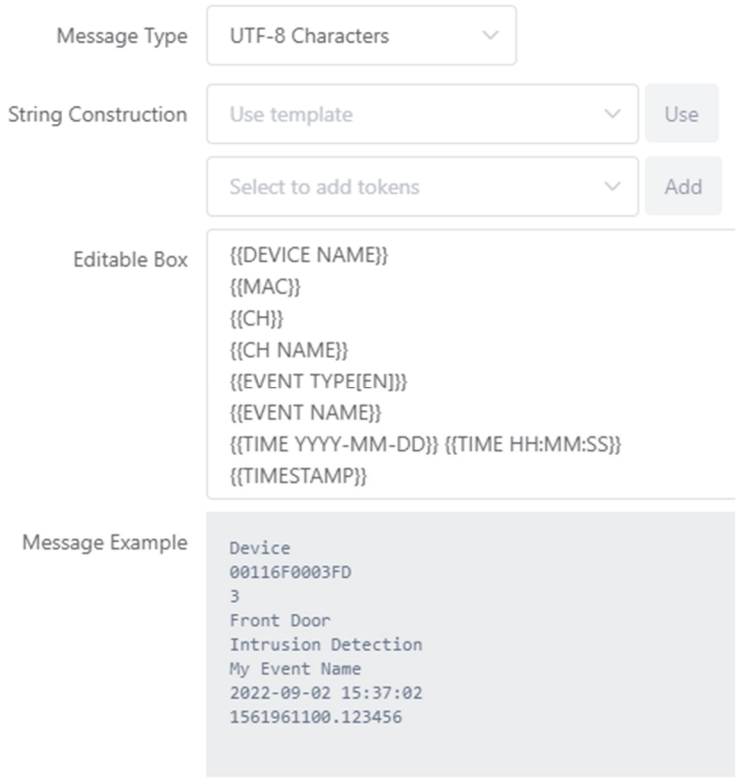
Setup Example



UTF-8

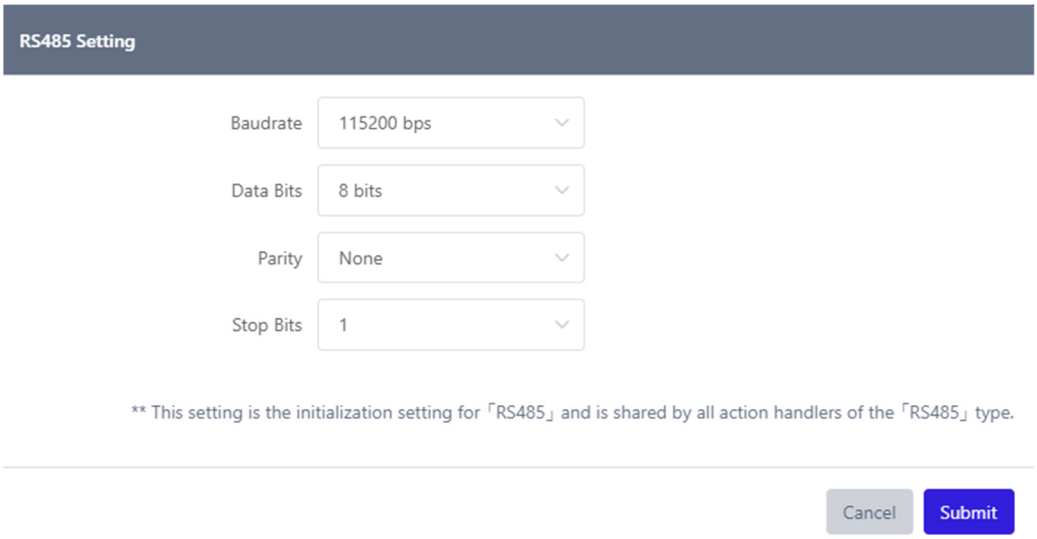
The UTF-8 format allows settings to be configured using Tokens and templates. Please refer to the setup example provided.

Setup Example



3.4 RS485 (RS232) Setting

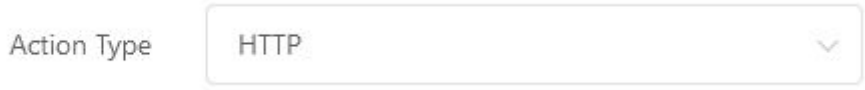
Configure Baudrate, DataBits, Parity, and StopBits. These settings are shared across all items of the same action type. Therefore, if you change settings in a specific action handler, it will apply to all action handlers.



2. NETWORK

1. HTTP

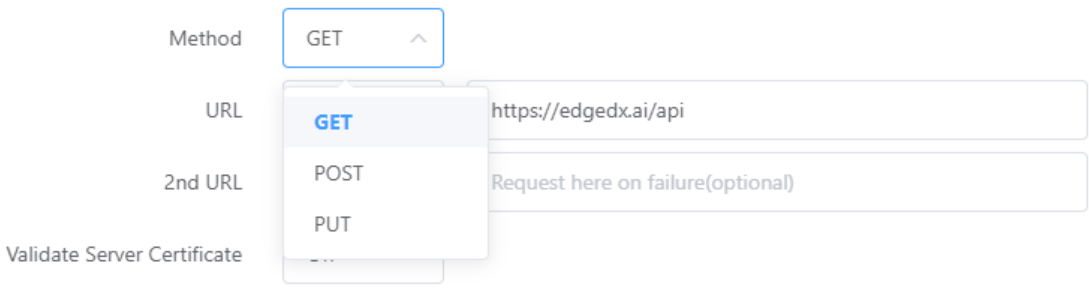
When an event occurs, the device can upload event information and snapshot images to an external HTTP server. Messages to be uploaded can be easily edited using token variables.

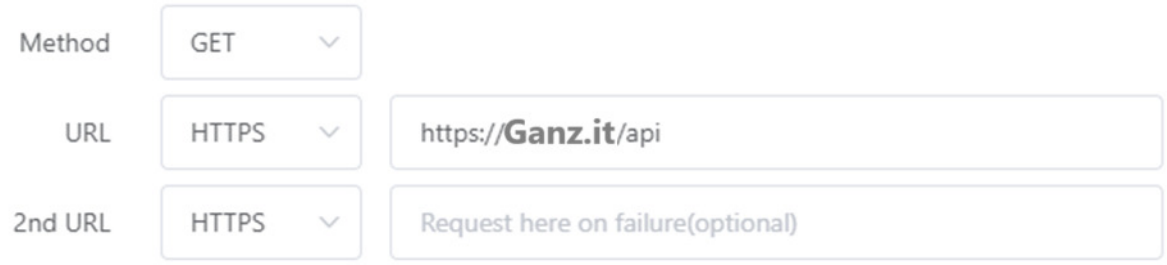


Select the Action Type to **HTTP API**, then the relevant settings at the bottom

1.1 URL Settings

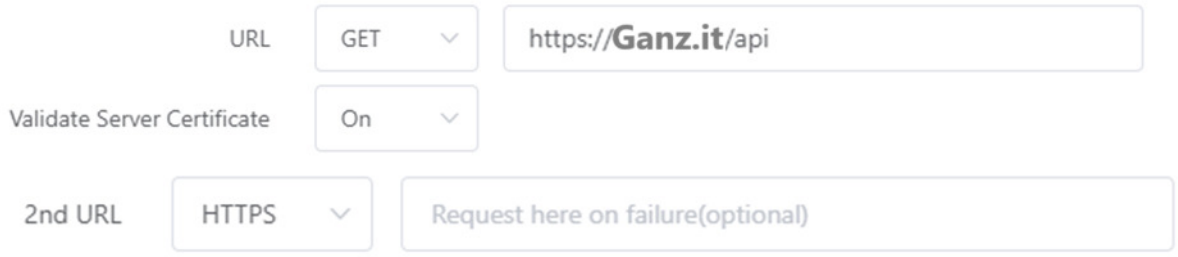
1. Select the HTTP API URL and Method.



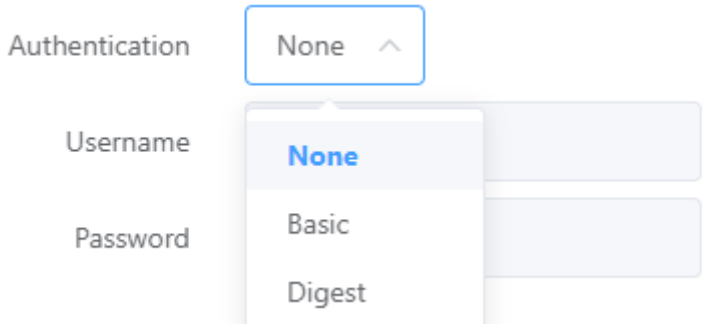


- 2nd URL :If you configure a 2nd URL, the request to the 2nd URL is automatically retried only if the request to the primary URL fails.
  However, if the request to the primary URL is successful, the request to the secondary URL will not be made. The 2nd URL is not a required value, so you do not have to set it

2. If you input **Https** protocols, the Validate Server Certificate is activated.

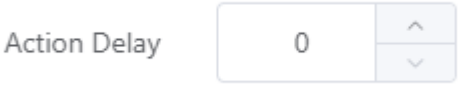


1.2 Authentication



Authentication methods are available None, Basic, and Digest.

1.3 Action Delay

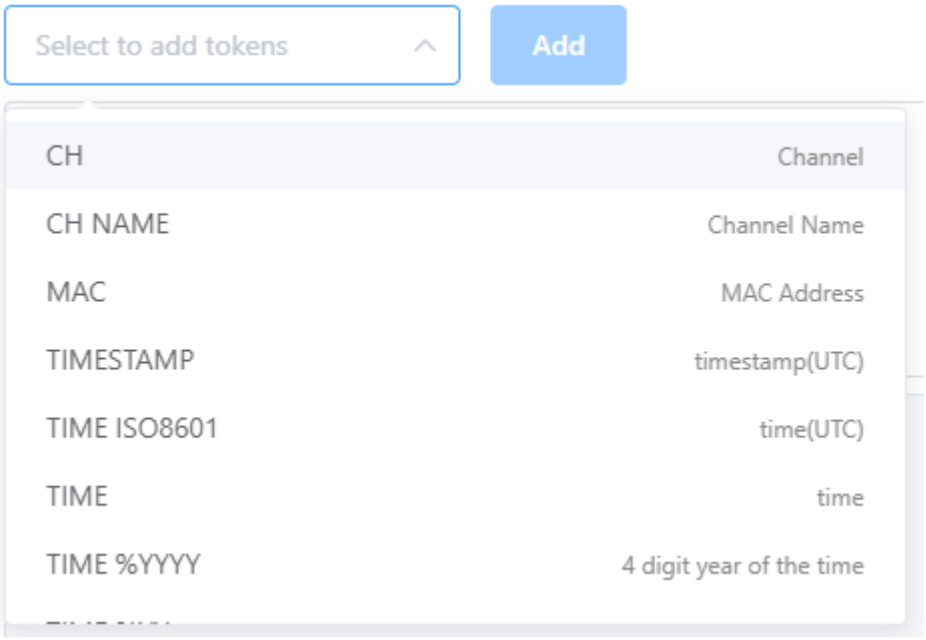


After the event occurs, the message is sent after a delay of the amount of time specified in Action Delay.

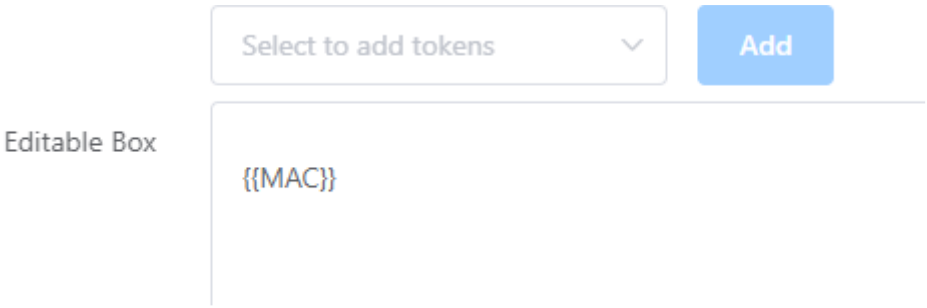
Normally, you can leave it at the default value of 0.

1.4 Show event data

API request data can contain event information.



1. Enter event data values using predefined tokens.



2. Select the desired token value from the combo box.

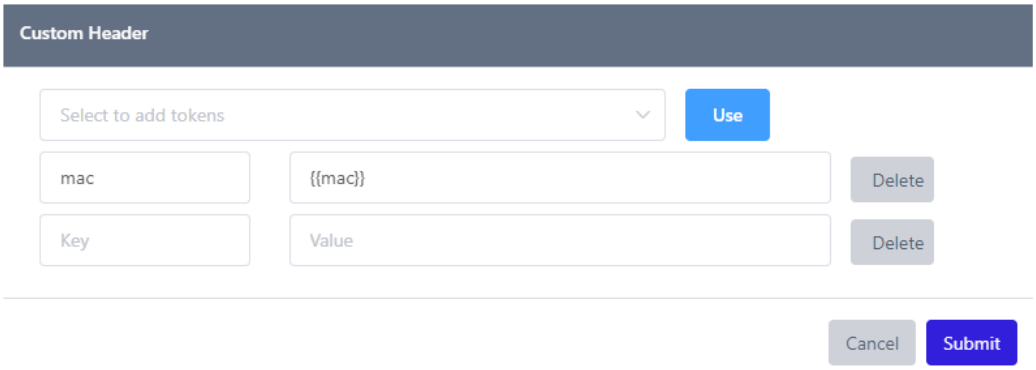
- The selected token value will be added as {{token}} in the form of {{token}}.
- When sending actual data, this part is replaced by event data.
- Tokens can only be used where they can be input via the combo box.

1.5 Custom Header Settings

1. Click the 

button to set the header

2. You can use event data tokens on the Custom Header settings page. To use a token, select the text field and add the token. It is only available for Value.



1.6 Query Settings

The query string can be configured in the same way as the header.
Once set, you will see a quick view of the query string.

1.7 Content-type

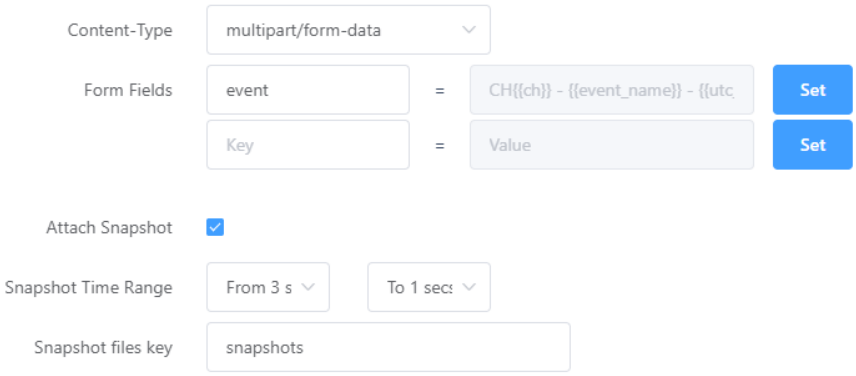
Selecting Content Type will display the Type settings page.

Content-type : multipart/form-data

From Field Settings

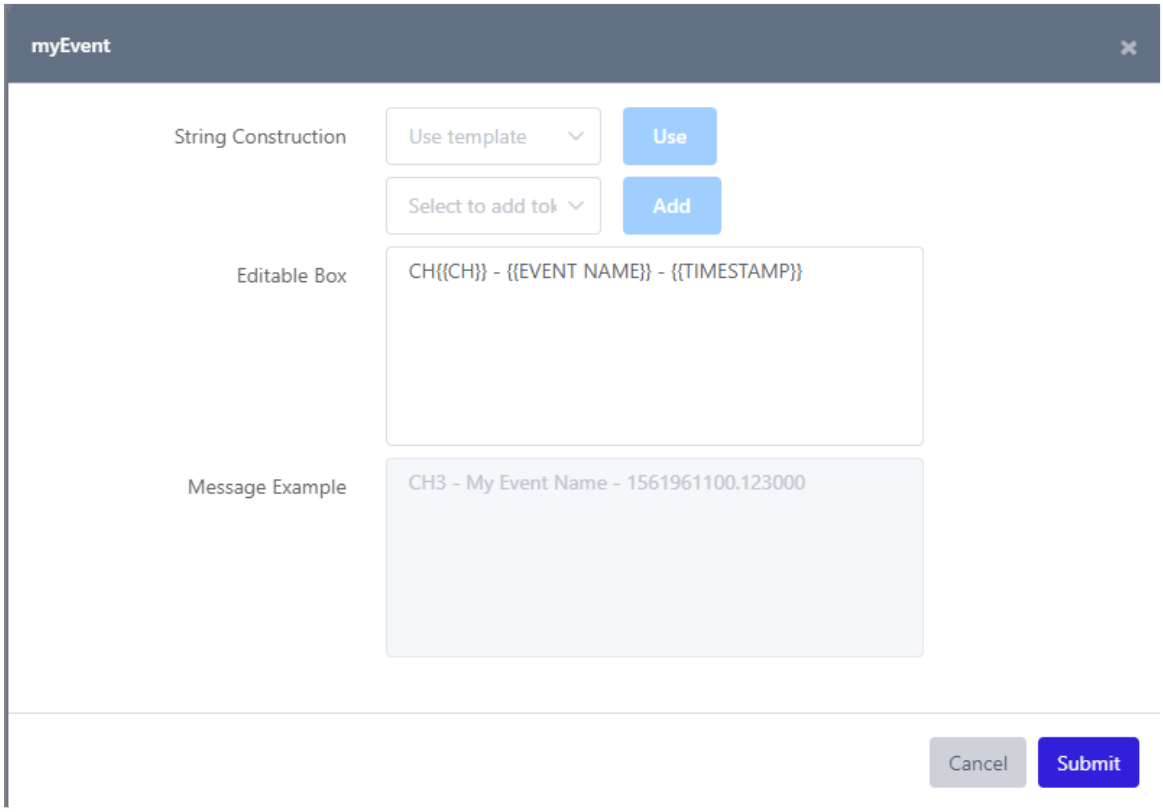
1. Click the 

button to set the data.

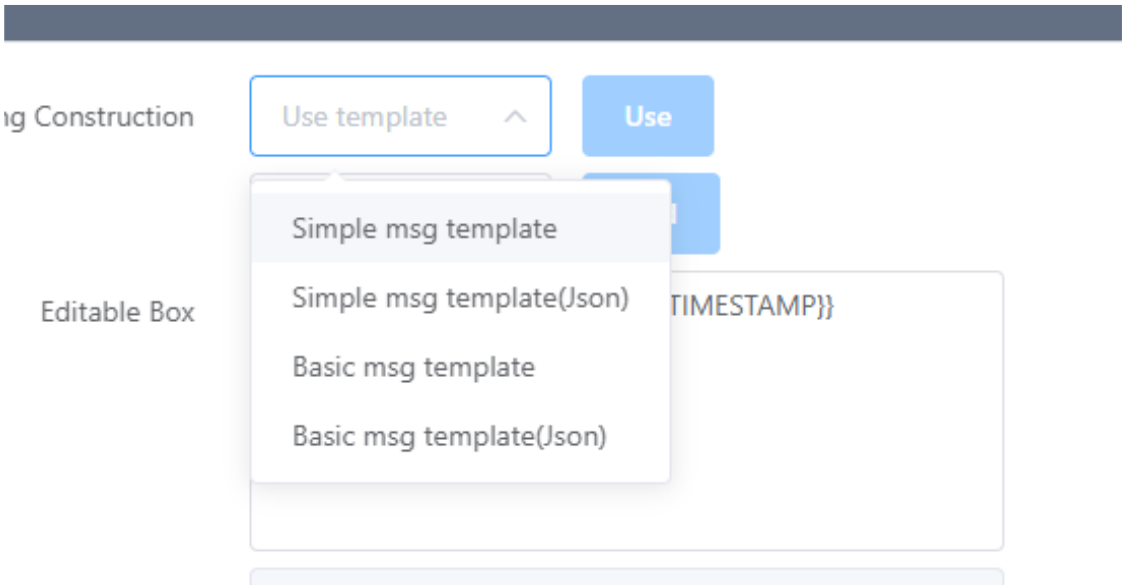


2. If you click the 

button, the settings window pop-upUse the event data token to set the value. There's also a simple template.

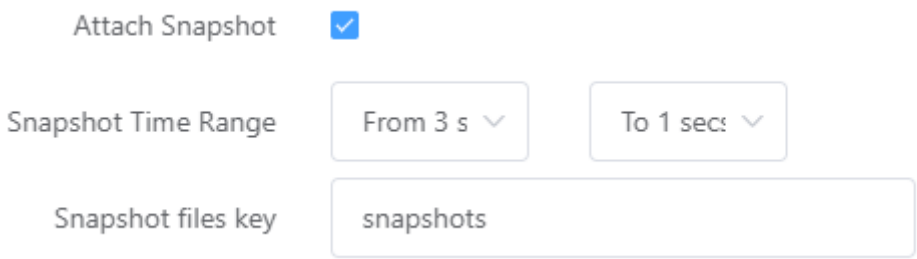


- There are also simple templates available.



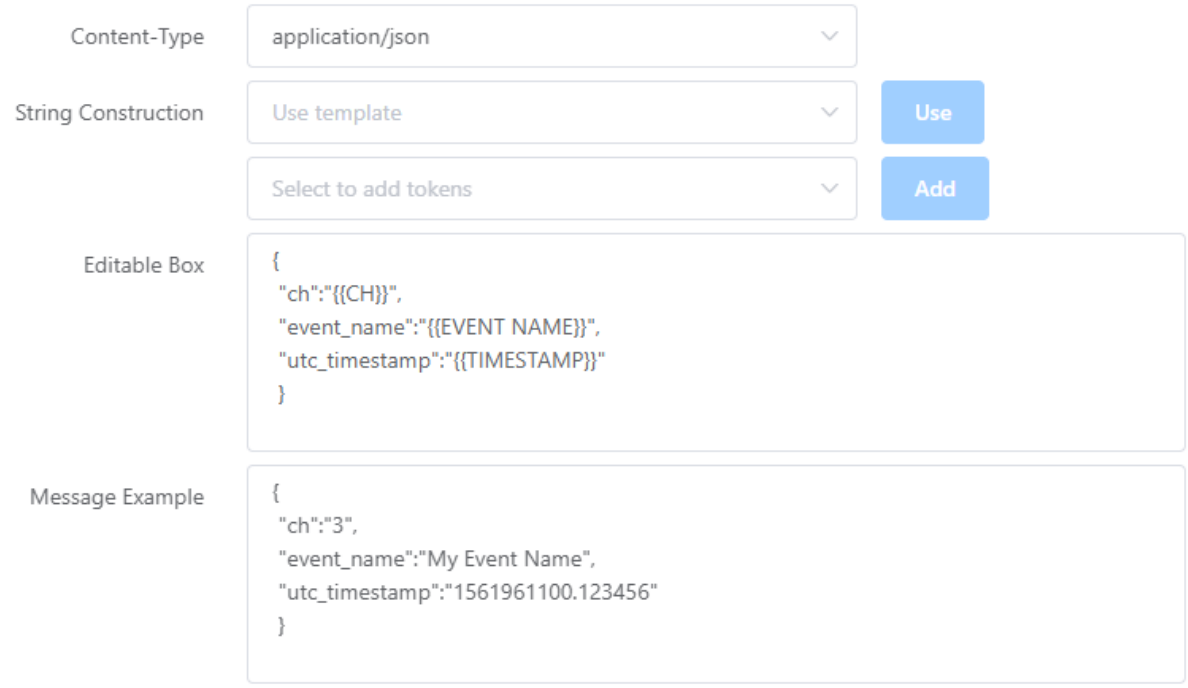
Snapshot settings

multipart/form-data allows snapshots to be appended.



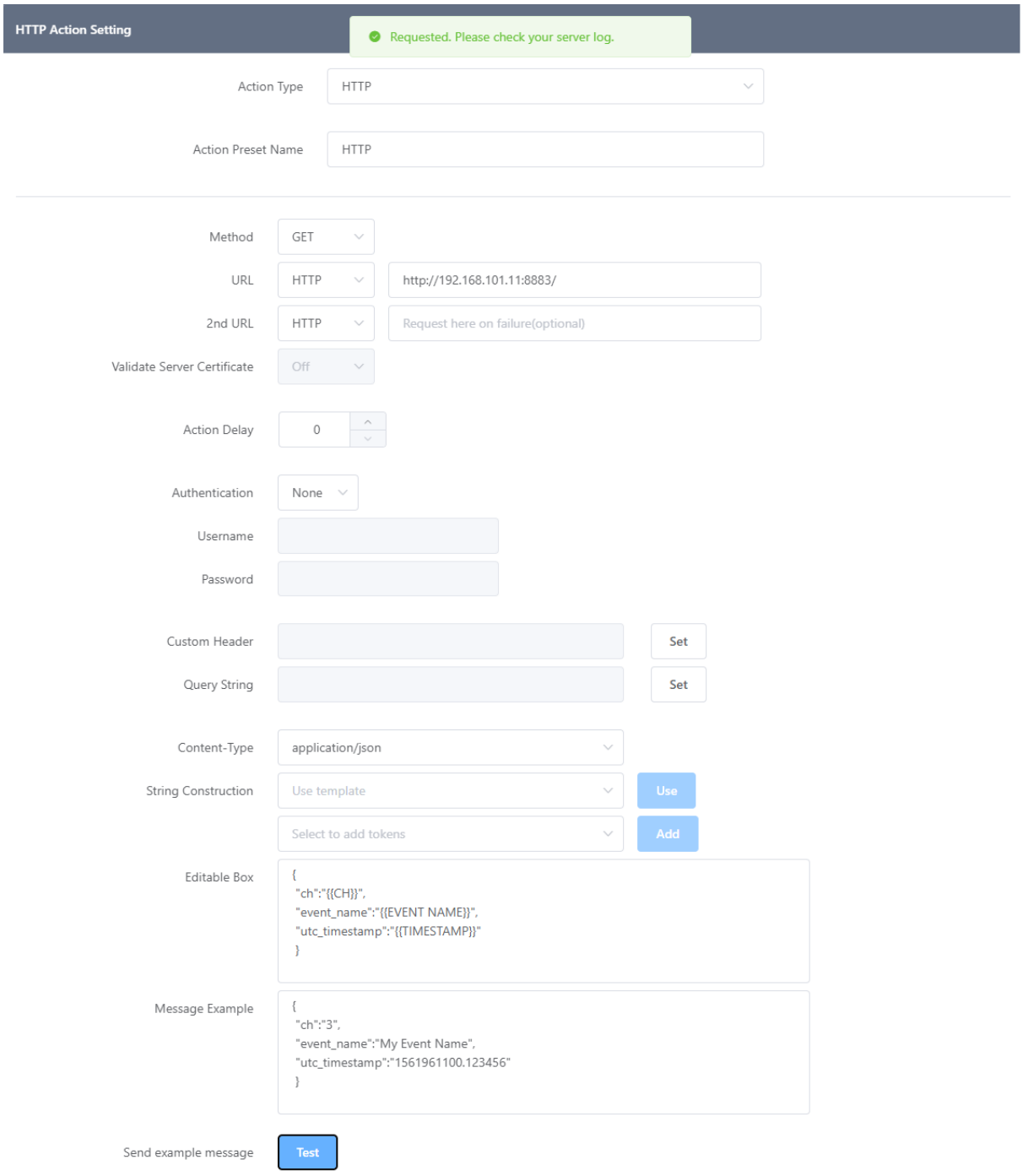
Content-type: Application/Json

Application/Json provides event data token functionality and template functionality.
It also provides templates in the form of Json.



1.8 Message test

You can test your setup data using the Test button at the bottom.
Success is displayed at the top.



2. FTP Upload

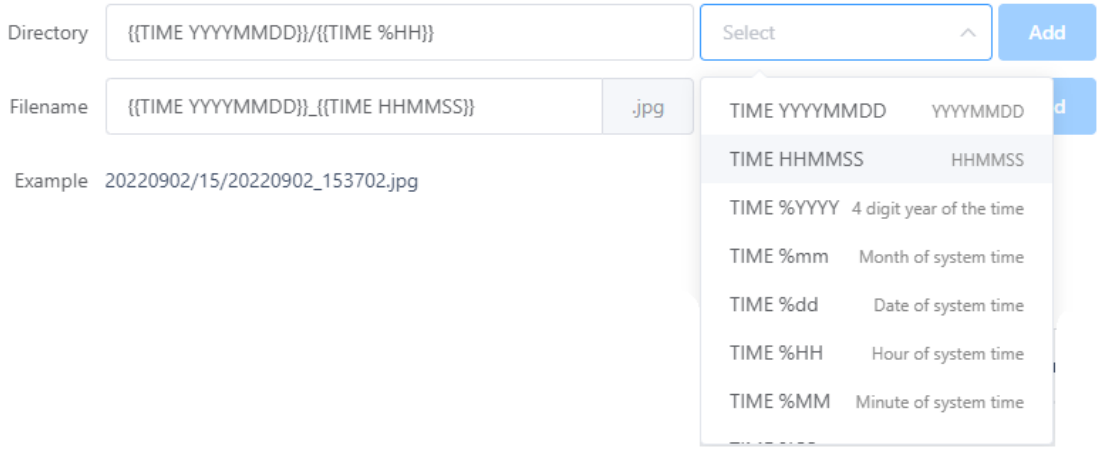
FTP upload allows you to upload an event snapshot to an FTP server when an application event occurs. The directory and file name to store the snapshot file can be set variably using the event's metadata.
The FTP Upload can be added from the Action settings. Select the Action Type to FTP, then, the relevant settings at the bottom.

2.1 Snapshot Time Range Settings

1. Set the time range for uploading snapshots based on the time of the event.

In the example set above, snapshots taken from 2 seconds before the event to 1 second after the event will be uploaded.
Periodic snapshots are taken at least once per second for each channel, in addition to event snapshots.

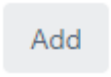
2.2 Snapshot Upload Directory and File Name Format Settings



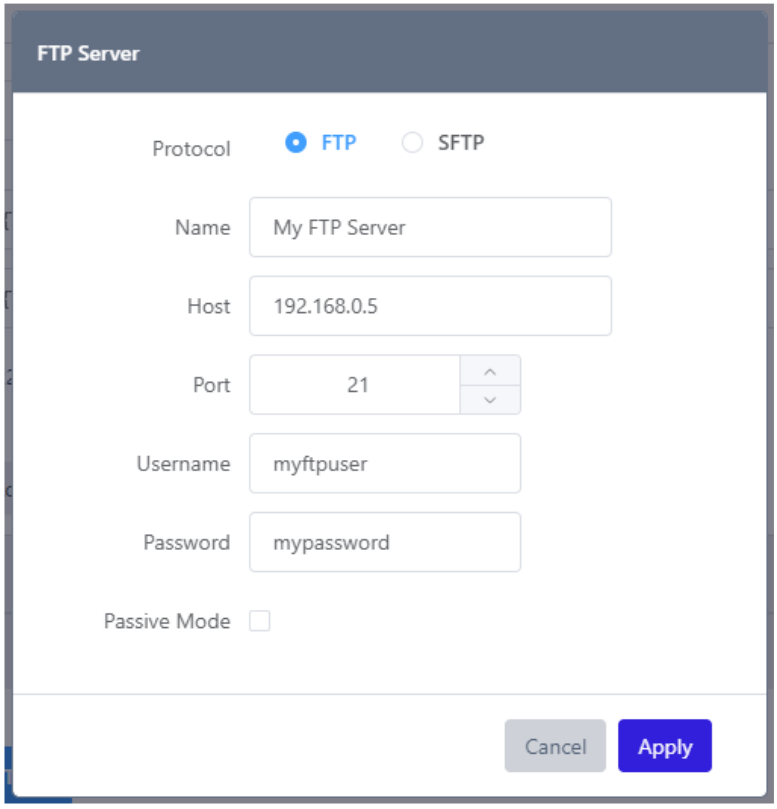
- **Directory** : Specify the location where the snapshot image is stored when the FTP Upload action is performed.
    - Event metadata can be included in this setting. Setting the path to include timestamps, as in the setting example above, specifies the upload directory based on the event time. The snapshot will be saved to the root directory of the FTP connection if this setting is not specified.
- **Filename** : Snapshot file names can be set similarly to directories.
    - The extension for snapshot file names is automatically set to .jpg, so there is no need to change it in the preferences.
- If you specify a snapshot file name, the Example shows an example path to the snapshot created by the directory and file name you specify.

2.3 FTP Server settings

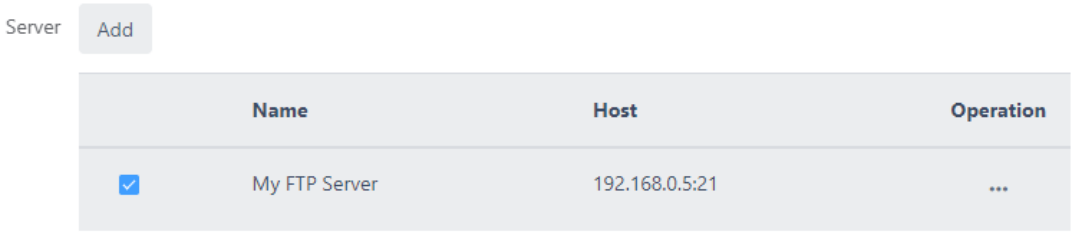
In the Server item, add the FTP server settings you want to transmit.
Once added, the FTP server settings can be used to set up other rules or FTP uploading actions in other applications.

1. Click the 

button to add new server settings.



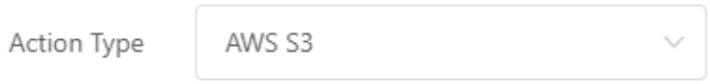
2. Enter the destination FTP server information and click the Apply button.



After adding an FTP server setting, a new entry is added to the FTP server list.
Select the desired server in the FTP server list to complete setting up the server.

3. AWS S3 Upload

AWS S3 Upload action uploads event snapshots to AWS S3 storage when an application event occurs. The passkey value for the storage storing the snapshot file can be set using event metadata.
AWS S3 Upload Action can be added from the Action settings. Select the Action Type to **AWS S3**, then, the relevant settings at the bottom.

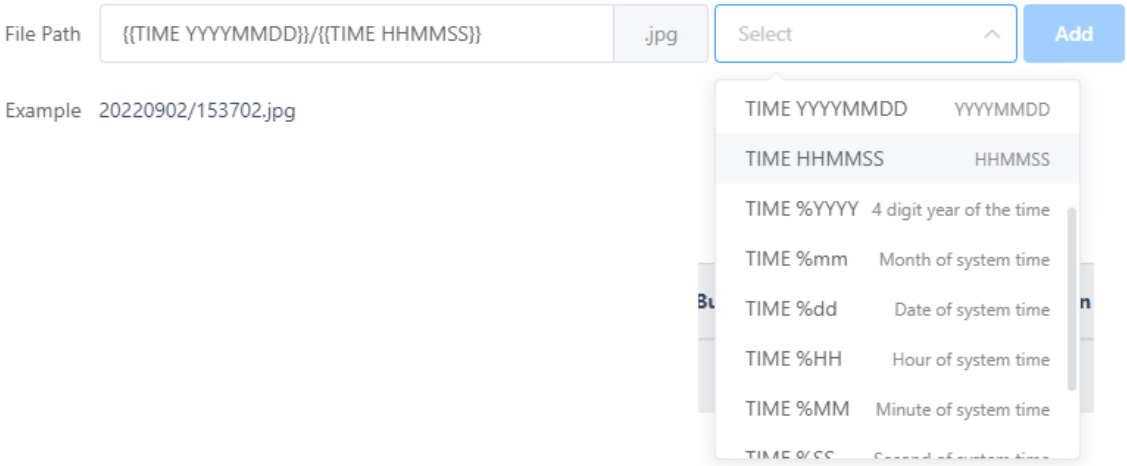


3.1 Snapshot Time Range Settings

1. Set the time range for uploading snapshots based on the time of the event.

In the example set above, snapshots taken from 2 seconds before the event to 1 second after the event will be uploaded. Periodic snapshots are taken at least once per second for each channel, in addition to event snapshots.

3.2 Snapshot Upload File Path Settings



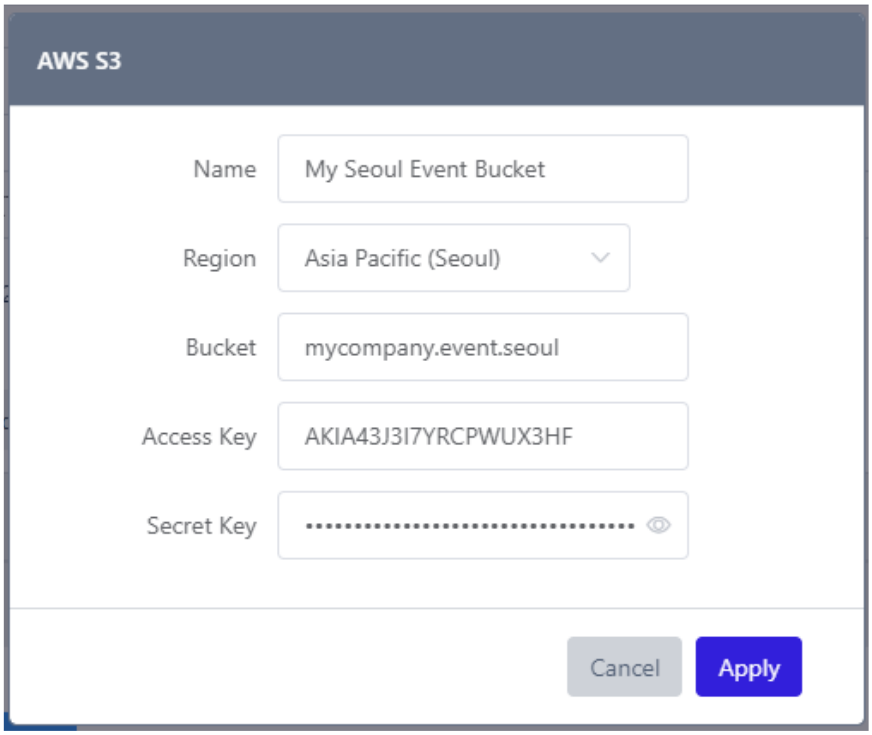
- **File Path** : Specify the path where the snapshot is stored.
  - Event metadata can be included in this setting. Setting the path to include time metadata, as in the example above, sets the upload file path based on the time the event occurred.
  - Set a file path excluding the Region and Bucket parts. You only need to set the path within the bucket where the file will be saved.
- After setting the file path, the Example section shows an example snapshot path.

3.3 AWS S3 Storage Settings

Add AWS S3 storage settings to the Server item.
Once added, AWS S3 storage settings can be used to set other rules or to set AWS S3 upload actions in other applications.

1. Click the 

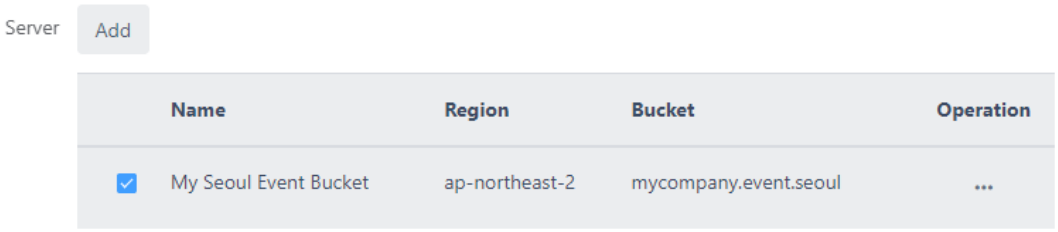
button to add new server settings.



2. Enter your target AWS S3 store information.

3. Click the Apply button to save the settings.

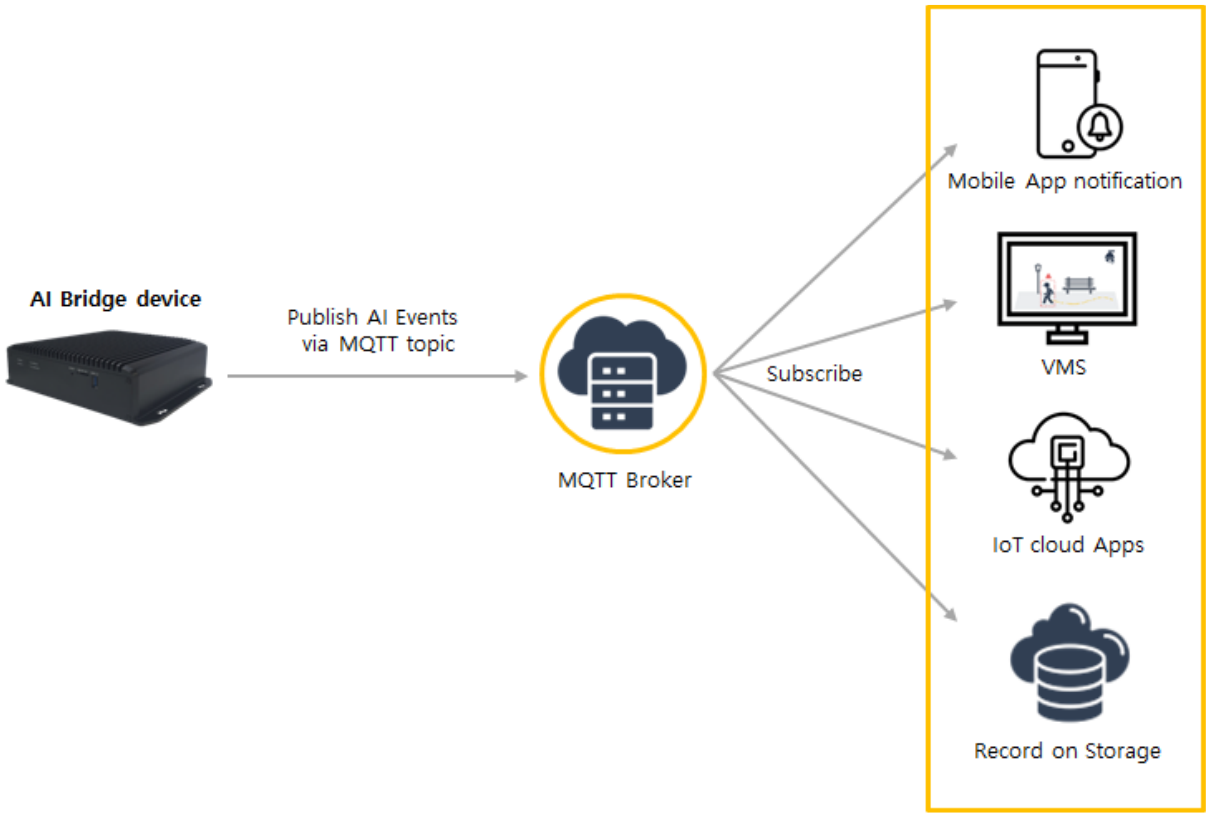
4. Once your AWS S3 storage has been added, it will be listed.



■ Once you have ticked the destination box, the setup process for your AWS S3 storage is complete.

4. MQTT Publish

You can use the publish feature of MQTT to integrate AI AIBOX with a variety of devices.



4.1 MQTT ?

MOTT(Message Queuing Telemetry Transport) is a lightweight messaging protocol that is ideal for efficient communication in low-bandwidth or unreliable network environments, particularly with IoT(Internet of Things) devices. Its lightweight nature makes it specifically designed for delivering messages between remotely connected devices.

4.1.1 MQTT Features

- Lightweight protocol :MQTT is an efficient protocol for low-bandwidth and resource-constrained environments.
- Asynchronous communication : Clients able to send first and receive messages at a later time.
- Quality of Service(QoS) Level: MQTT also offers various Quality of Service (QoS) levels to guarantee message delivery reliability.
- Last Will and Testament(LWT) messages: The messages is sent when a client experiences an unexpected disconnection.

4.1.2 Main components of MQTT

- Broker

  The MQTT broker is server as a relay between clients, transmitting messages.
  The broker receives messages from clients and forwards them to other clients subscribed to the topic.
  The broker typically functions as a centralized server, serving as the hub for all message exchange.
- Client

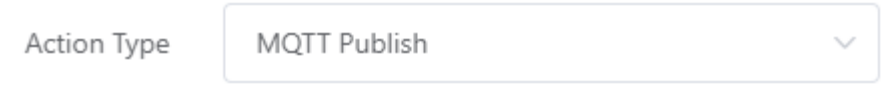
  MQTT clients are endpoints that send and receive messages.
  Clients can publish messages to the broker or subscribe to specific topics.
  Clients can take many forms, including IoT devices, mobile apps, and server applications.

- Topic

  Topics in MQTT define how messages are categorized.
  Topics are strings that can be hierarchical. (Ex: “home/livingroom/temperature”)
  Clients subscribe to the topics they are interested in, and receive messages only about those topics.
- Message Payload

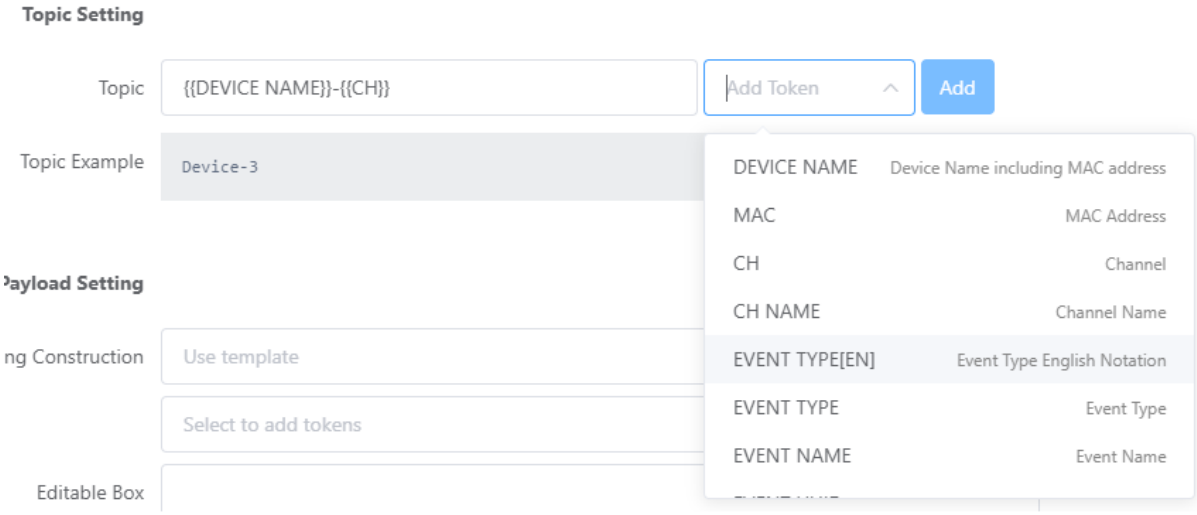
  The message payload is the data component of the MQTT message.
  It can vary in form, including text or binary data, and its size is determined by the broker’s implementation.
  The message payload contains the information that the client wants to send to other clients.

4.2 How to set up the MQTT Publish action



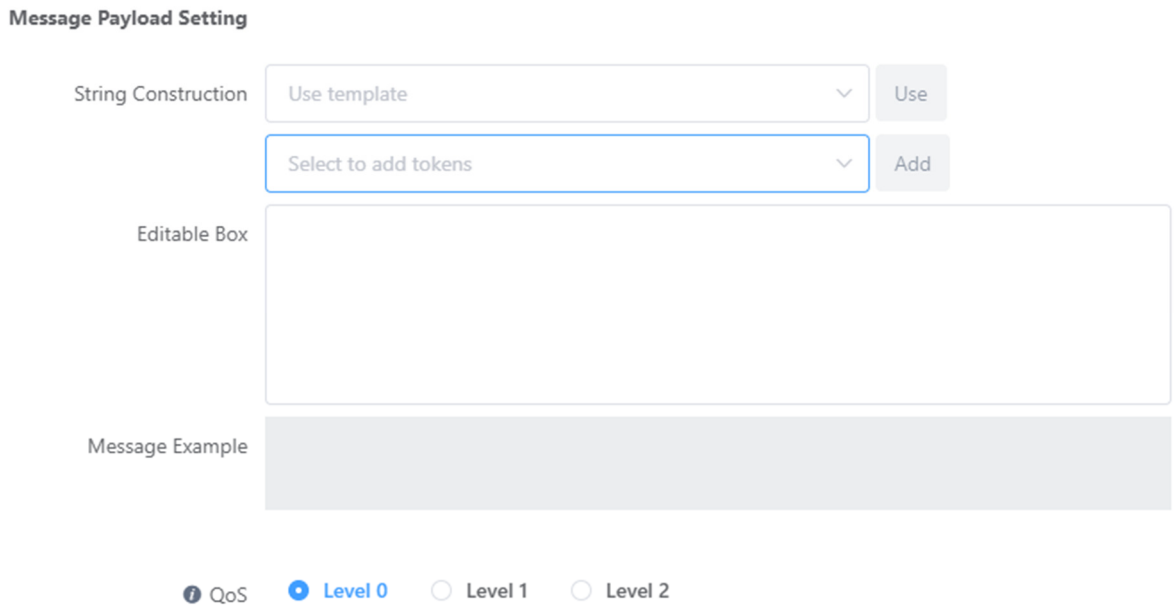
Select **“MQTT Publish”** as the **action type** and click “Add” to show the relevant settings.

4.2.1 Topic Setting



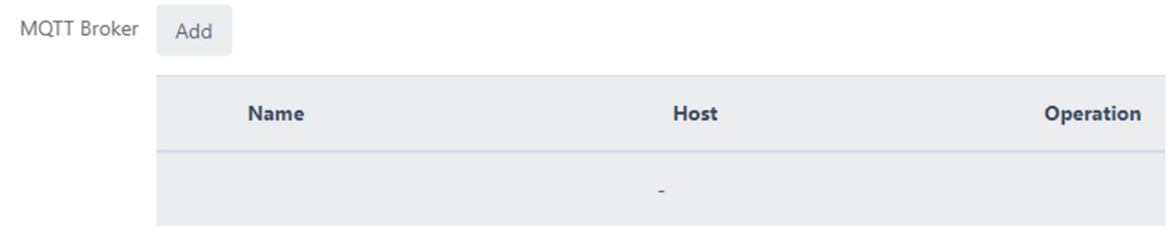
Set the Topic. You can input which can be a specific phrase or a predefined token.

4.2.2 Message Payload Setting

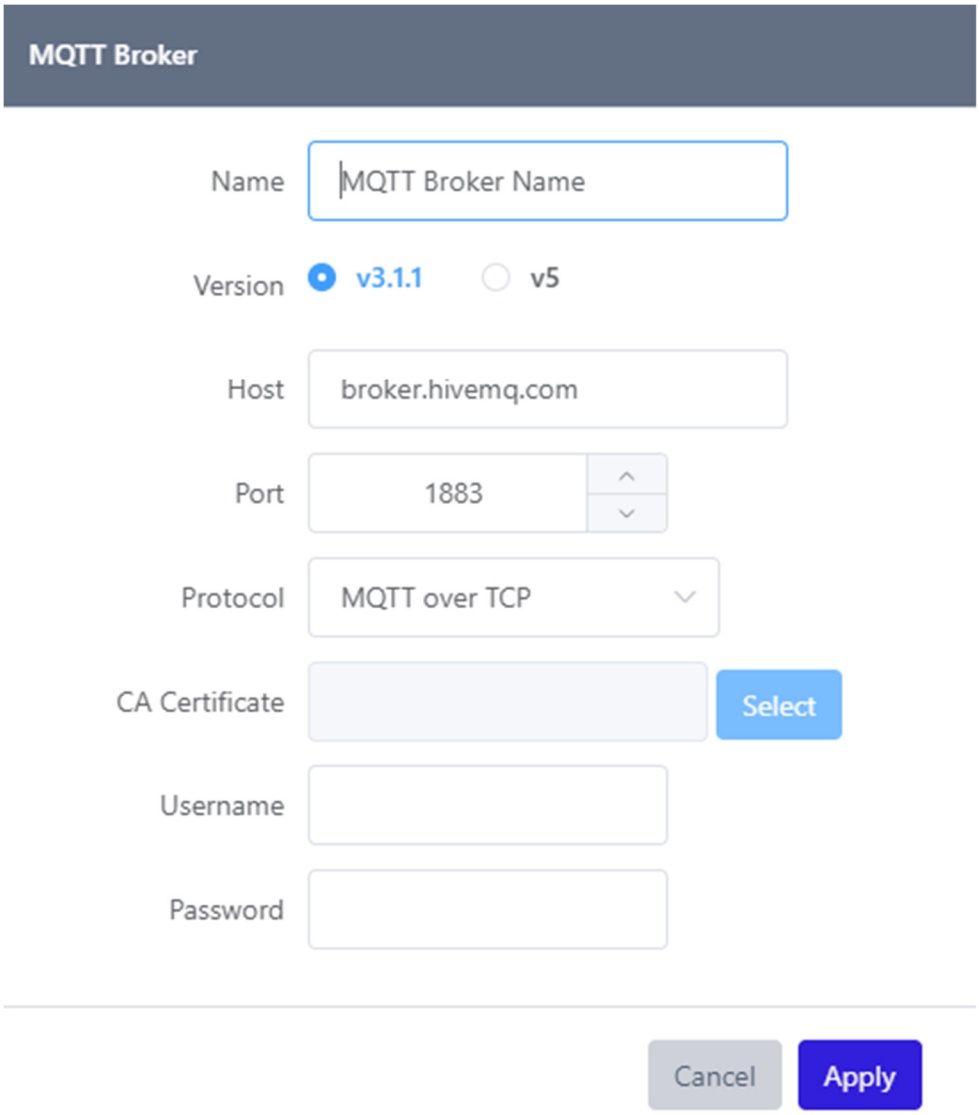


You can set the Message Payload and set the QoS level.
Please refer to "Utilizing Event Meta Tokens & Creating Action Message Guide" for how to set the Message Payload.

4.2.3 MQTT Broker Setting



You can add an MQTT Broker, or select a Broker to use from the added MQTT Brokers.
Click the 'Add' button to display a menu to add an MQTT Broker.



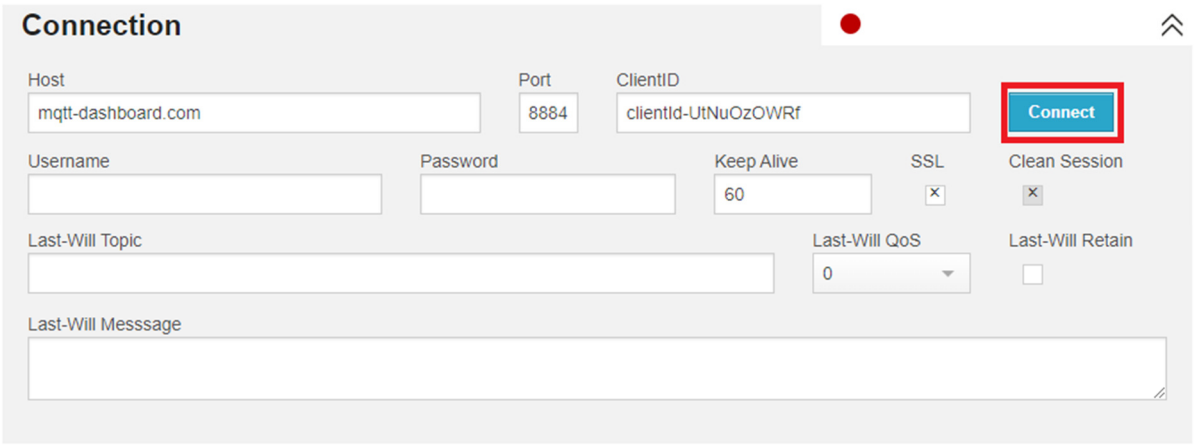
You can set the name of the MQTT Broker and set the MQTT Broker access information.
If you need help with access information, contact your MQTT Broker representative.

4.3 How to test the MQTT Publish action

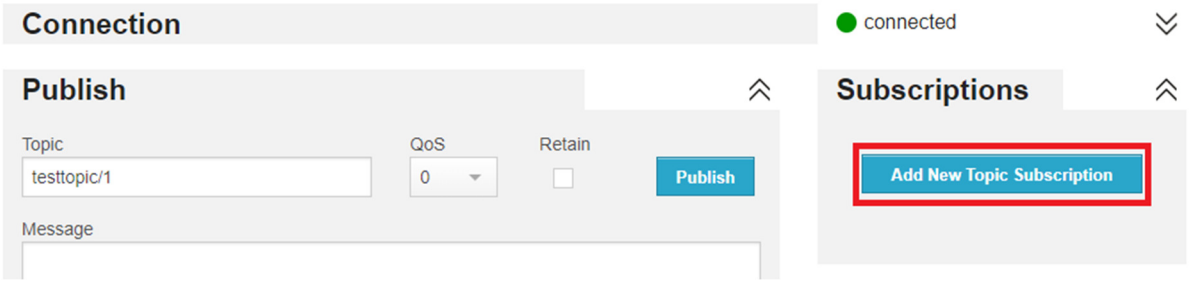
Here show you how to test using the MQTT Broker and MQTT Web Client, both of which are available for free from hivemq.

4.3.1 MQTT Client : Subscribe Setting

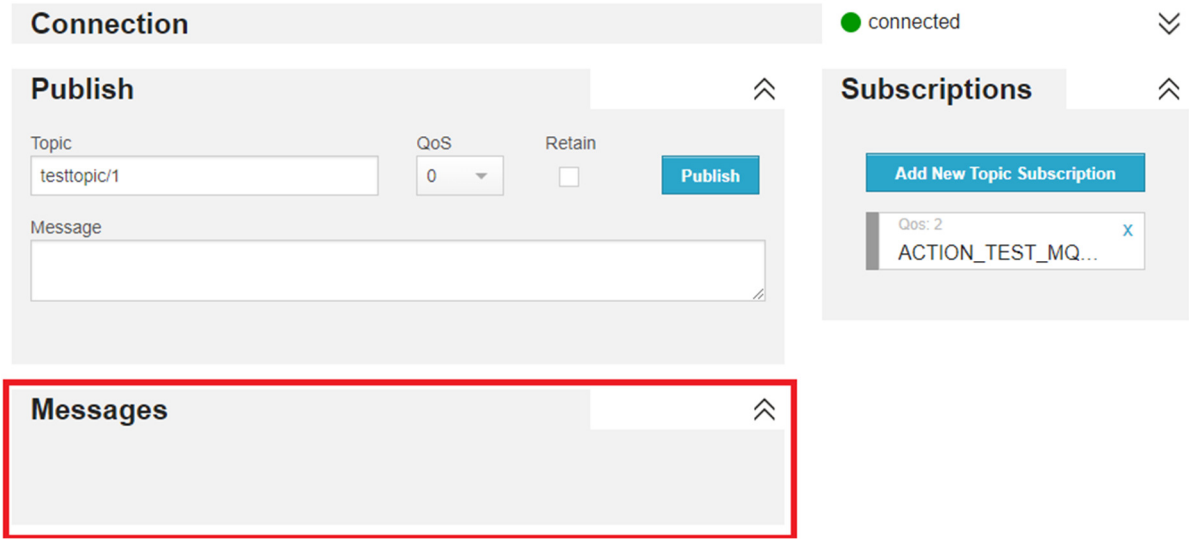
Access to hivemq's MQTT Web Client. Click the Connect button, as the connection to the hivemq free broker is already established by default.



Click the “Add New Topic Subscription” button after connecting, and then input the name of the Topic (“ACTION_TEST_MQTT_PUBLISH”) you wish to configure in the MQTT Publish action.

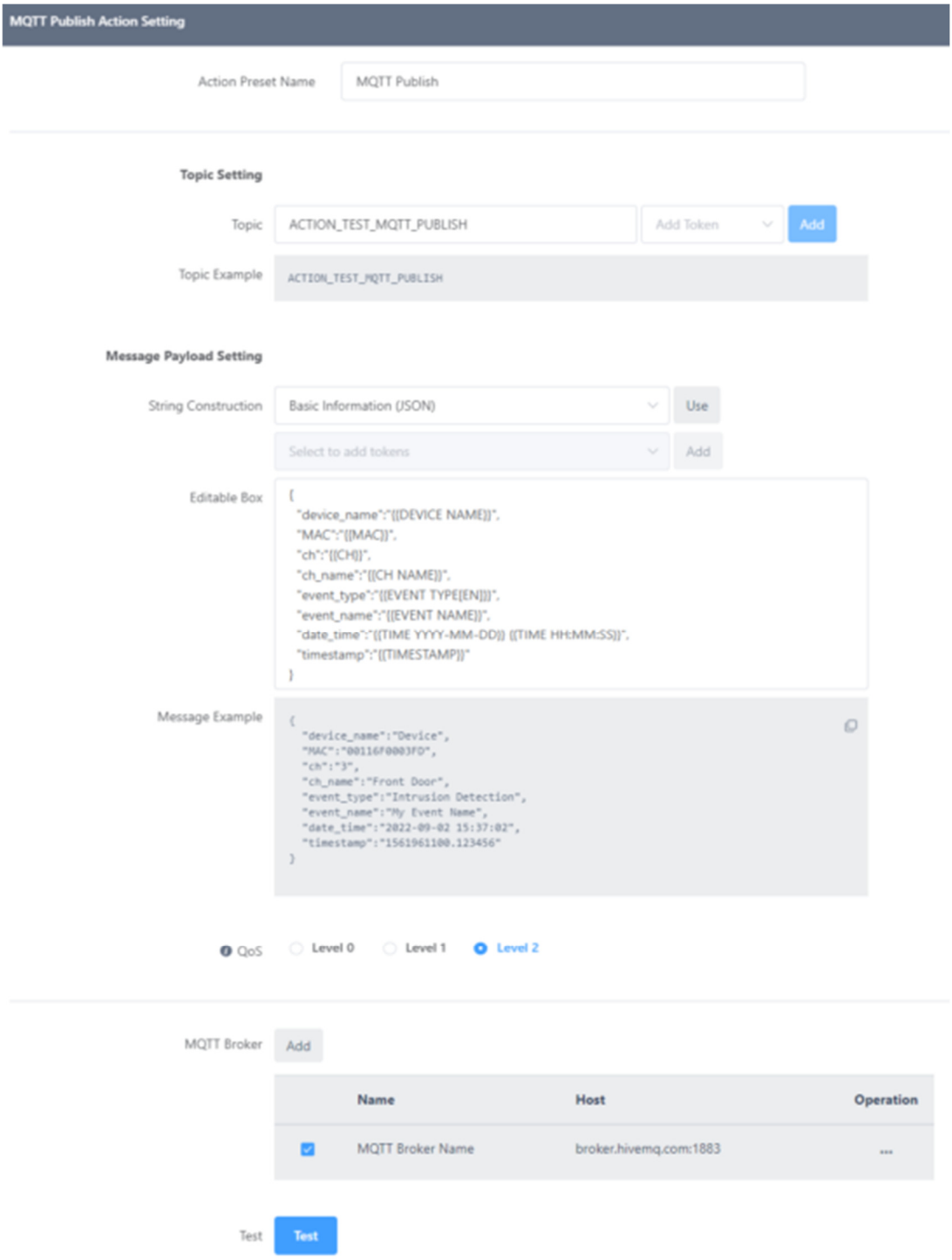


Once set up, you will see a page below. Check the Message section of this page for the test result once you have set up the MQTT Publish action.

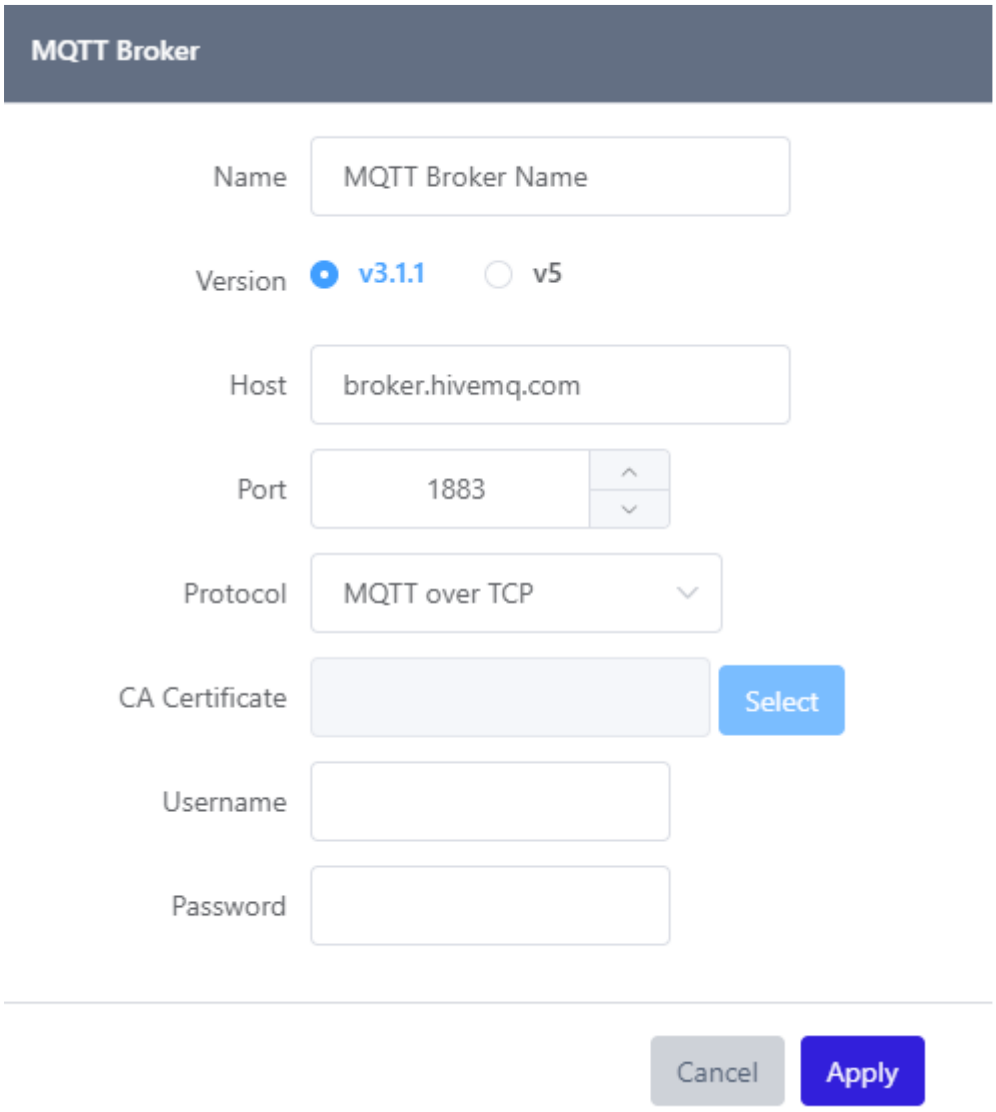


4.3.2 MQTT Publish Action Setting

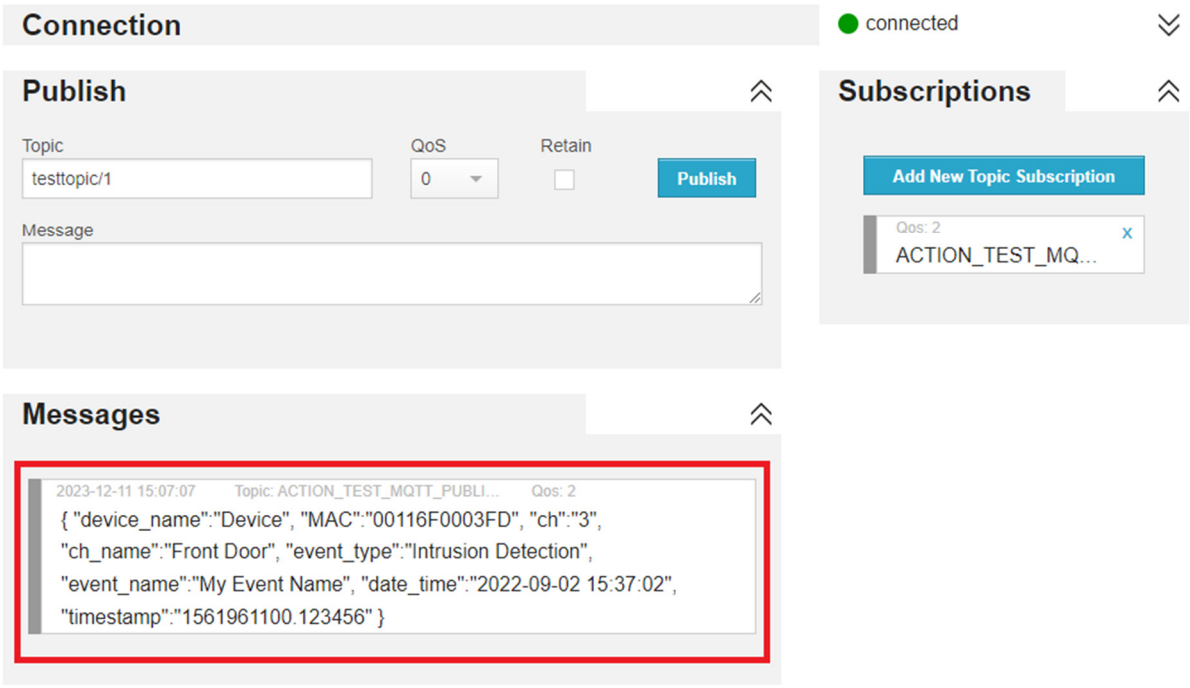
Set up the MQTT Publish action as follows.



Set up the MQTT Broker as follows.



After configuration, click the Test button to run the MQTT Publish Test Action. When you see the MQTT Web Client, the test result is displayed as shown below.



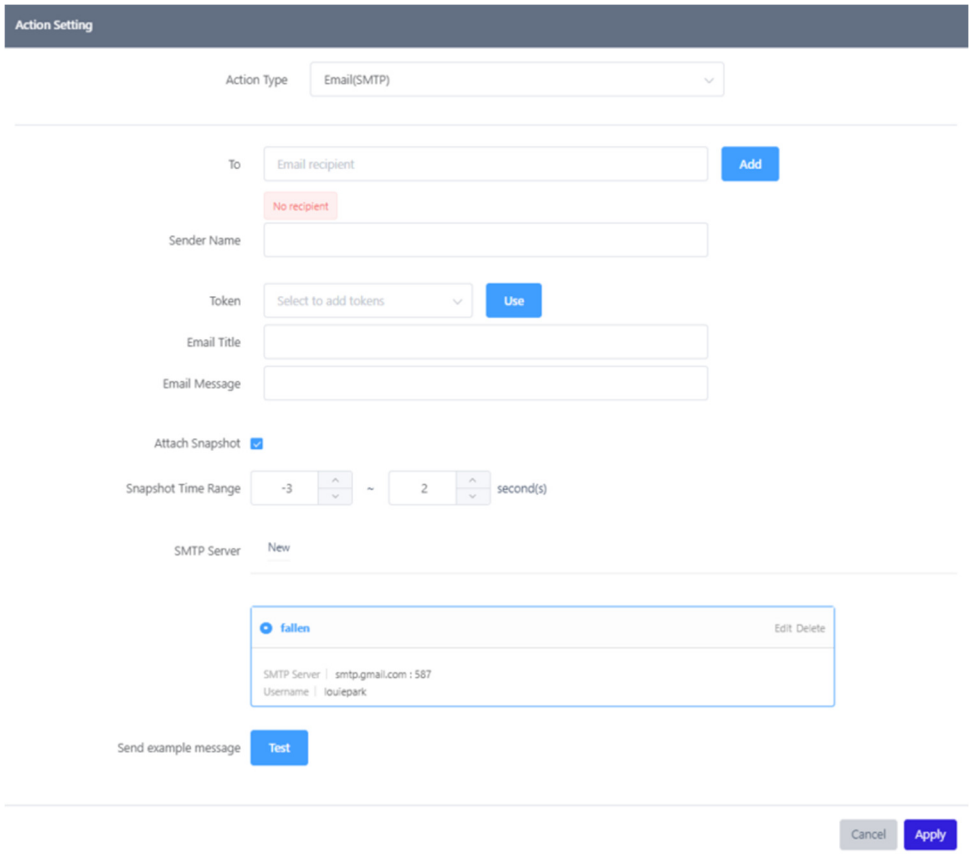
5. Email Alarm

You can email event snapshots and event metadata information when an event occurs.

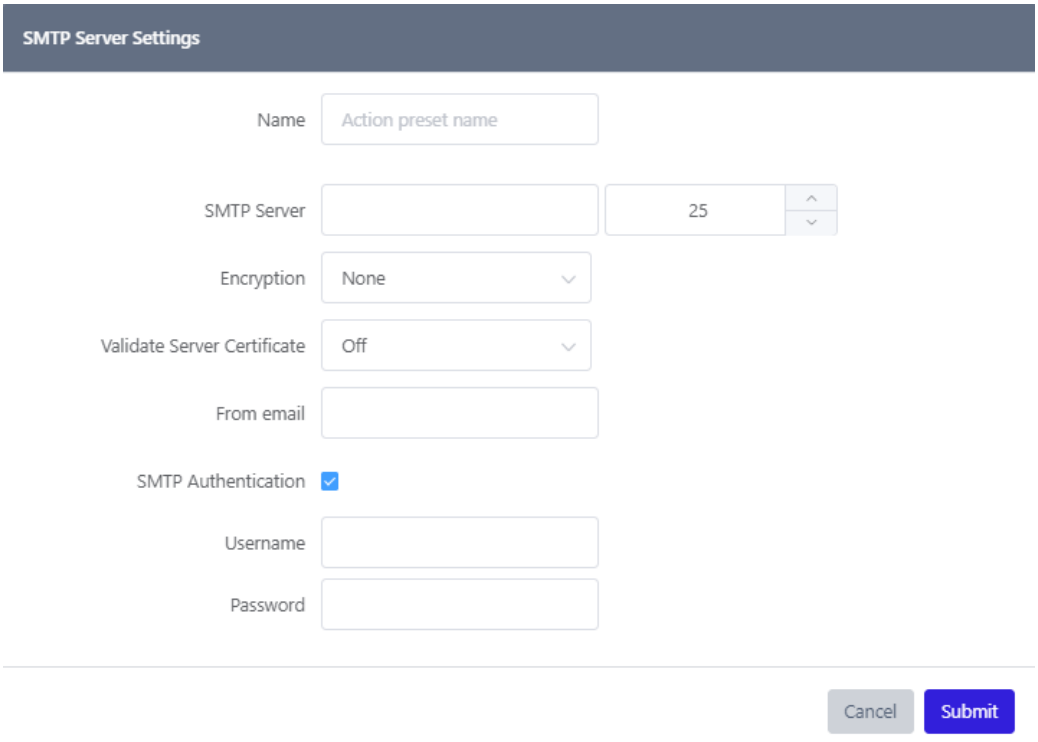
5.1 Email Action using an SMTP Server Settings

Email actions using an SMTP server can be added from the Action settings.

1. Select the Action Type to Email(SMTP), then, the relevant settings at the bottom. If you set up your own SMTP server and credentials, you can configure an email action using that SMTP server.

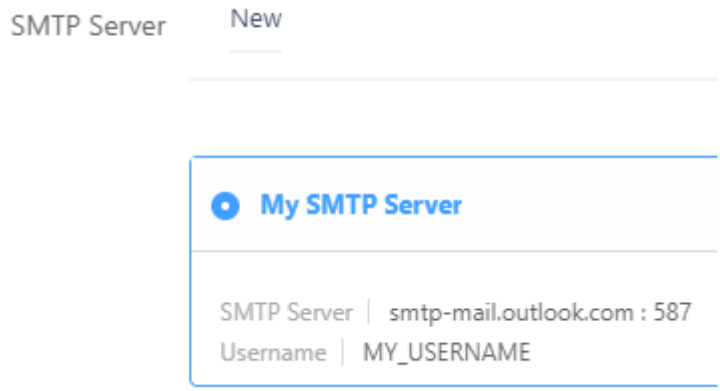


2. Click the New tap to add a new SMTP server configuration. Registered SMTP server configuration can be referenced to all event actions.



- **Name** : Enter a SMTP name.
- **SMTP Server** : Enter the address and SMTP server port.
- **Encryption**: Select the encryption method used by the server, such as SSL/TLS.
- **Validate Server Certificate** : If you set the Validate server certificate item to ON, the server includes a procedure to verify the certificate presented by the server with a certificate authority. If you use a certificate that a certificate authority has not verified, the email will not be sent.
- **From email** : Enter the sender's email address if required by the SMTP server.
- **SMTP Authentication**: Enter the SMTP server authentication information.

1. If an SMTP server is added, it shows in the SMTP server list. Select one to configure the email alarm action.



3. VMS

1. Cortrol Plug-in Integration Guide

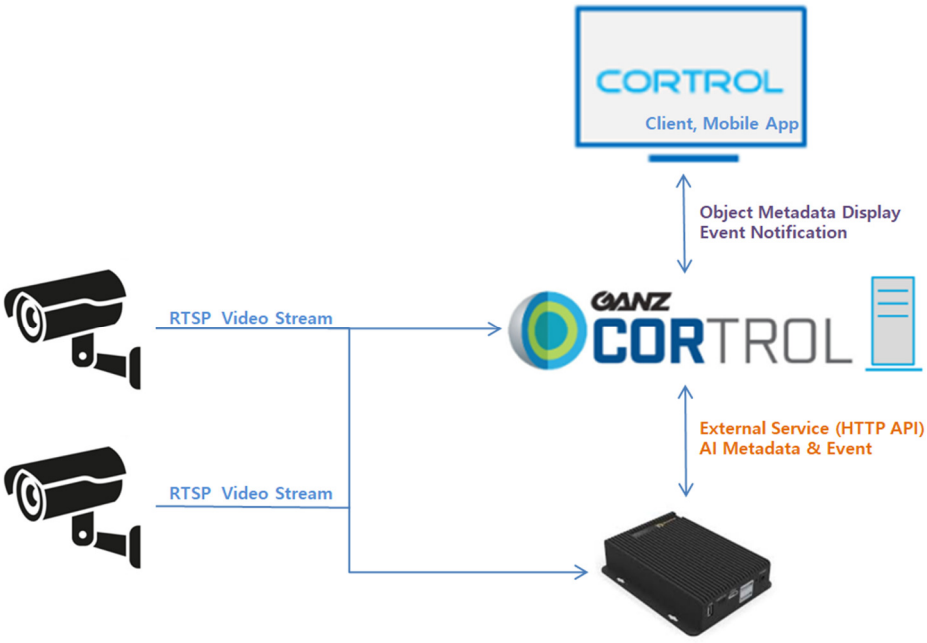
1.1 Introduction

1.1.1 Prerequisites

• **AIAIBOX FW** version **10124** or greater.

• **Ganz Cortrol Premier VMS** version **1.22** or greater.

1.1.2 Learn about integration architecture



• IP Camera transmits video stream to **Cortrol VMS** and **AIAIBOX**.

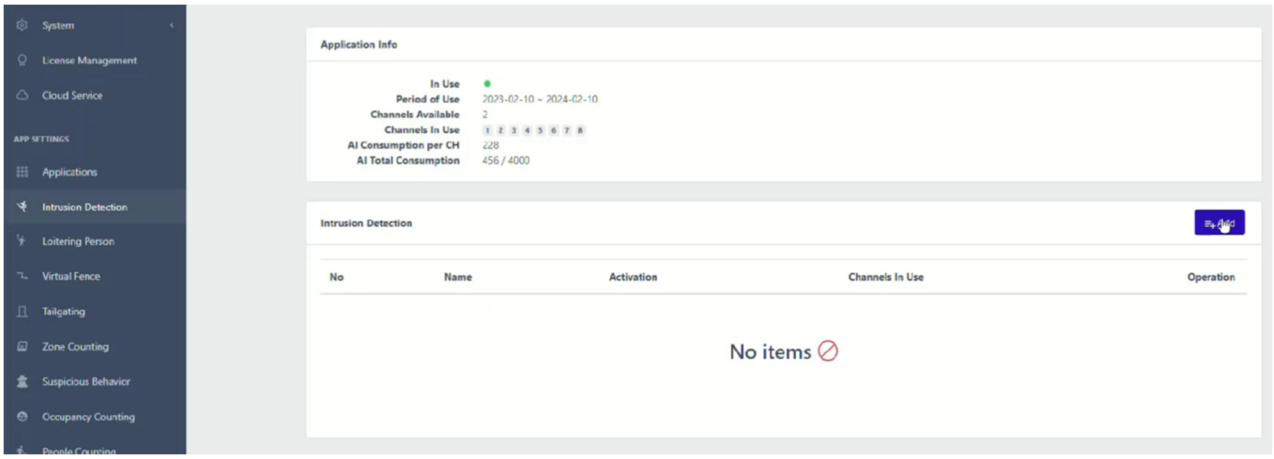
• **AIAIBOX** analyzes the received video stream by AI Apps and sends **Metadata & Event** to **Cortrol VMS**.

• **AIAIBOX** responds to **Cortrol VMS**'s search requests.

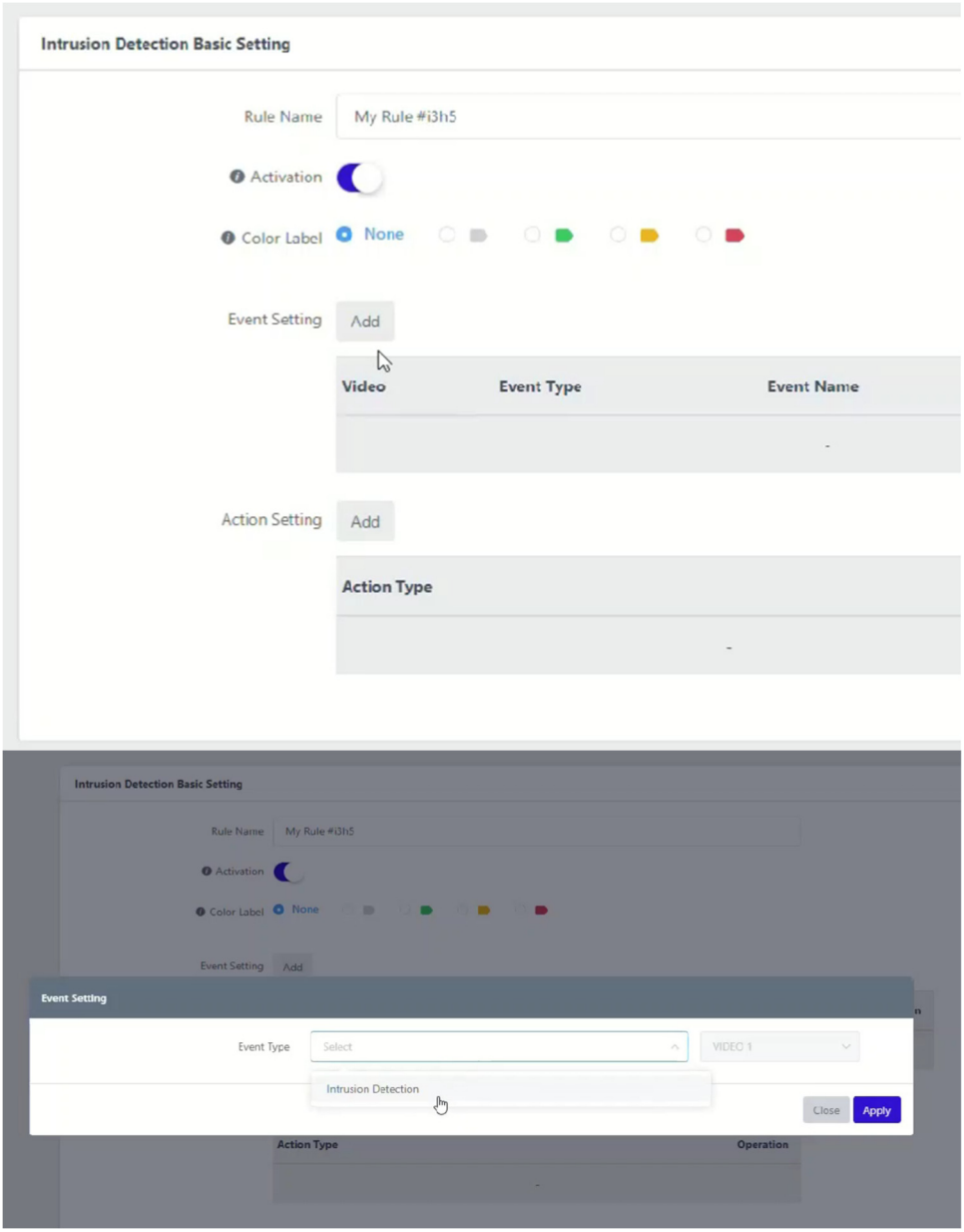
1.2 Configuration

1.2.1 AIAIBOX Configuration

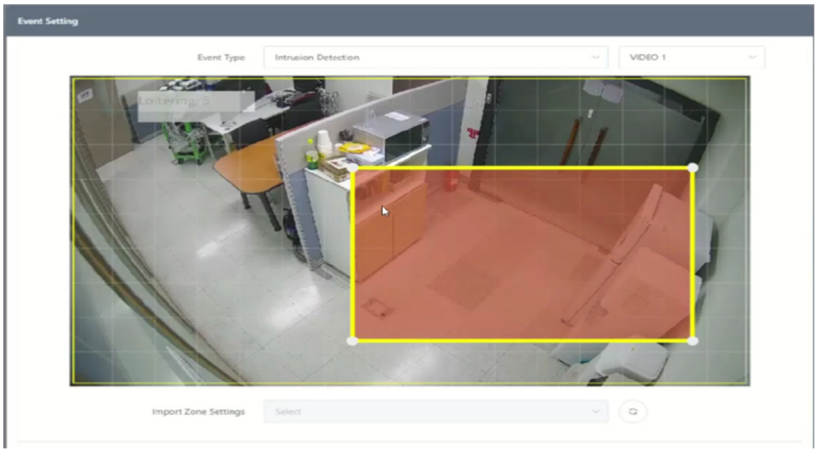
Add AI app settings.



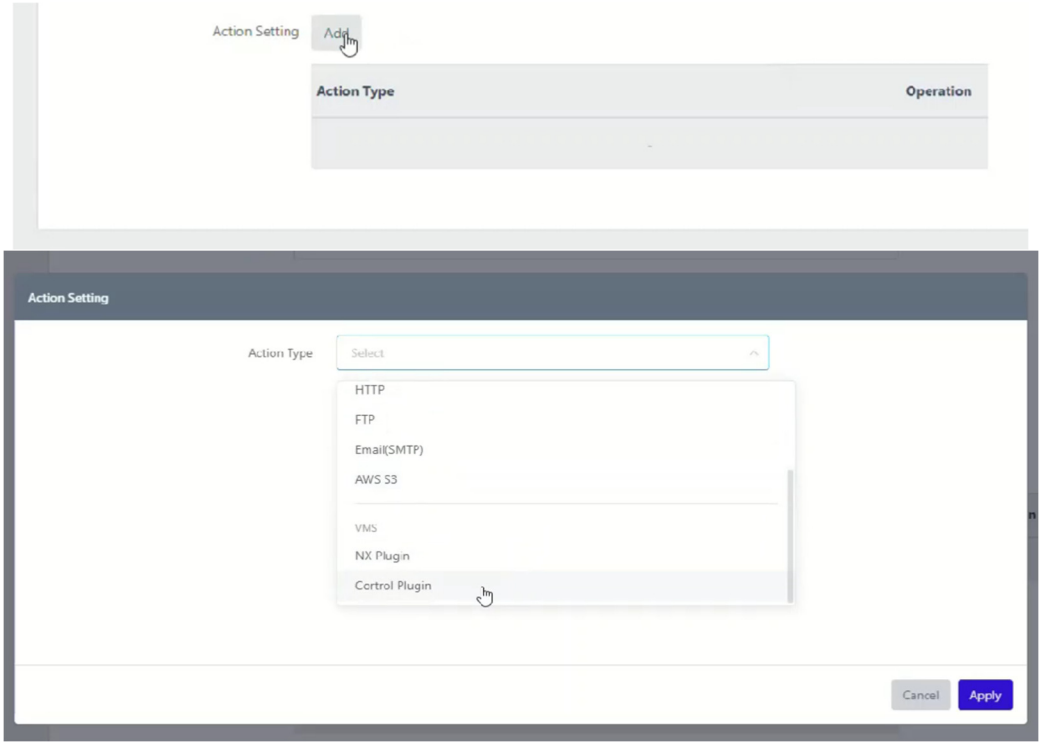
Add Event Setting.



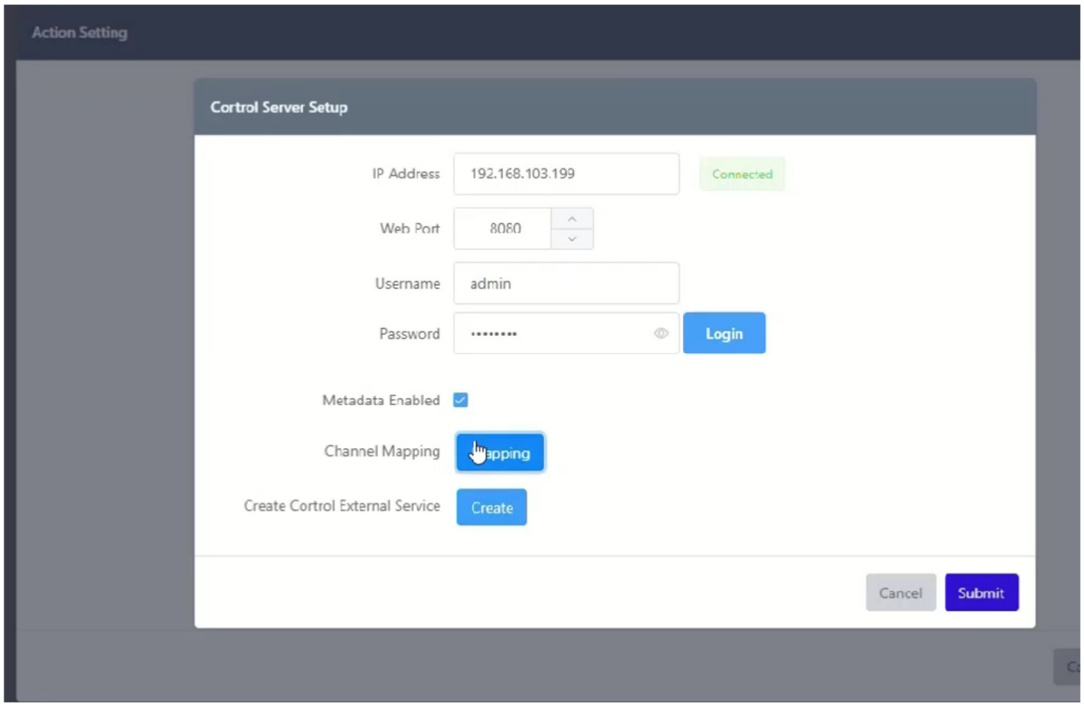
Zone or detailed setting of AI App.



Add Control Plug-in Action Setting.



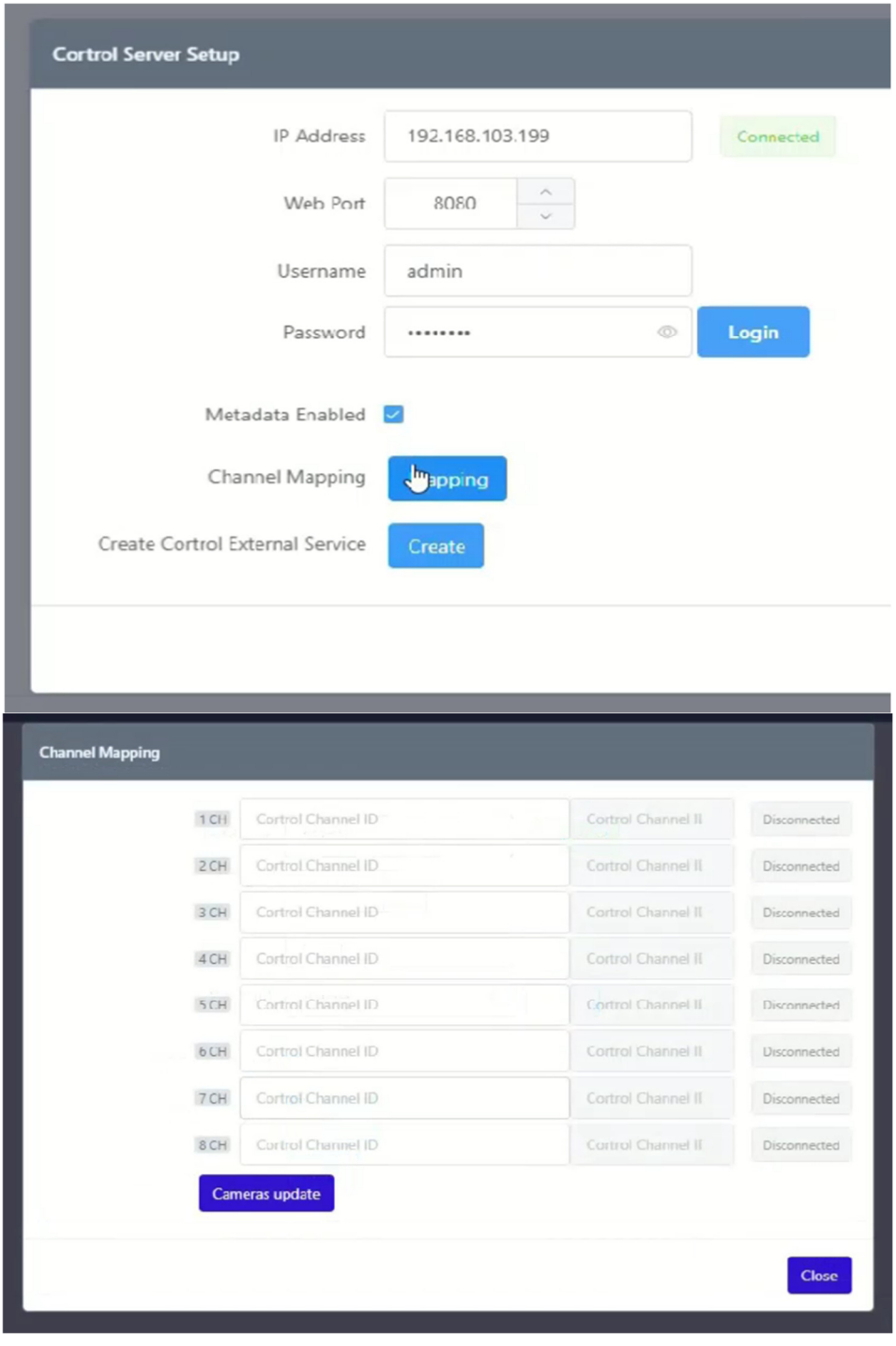
Enter the **Control VMS** information (Server Address, Port number, Username, Password)
You can check if the **Control VMS** settings are correct through the **"Login"** button.



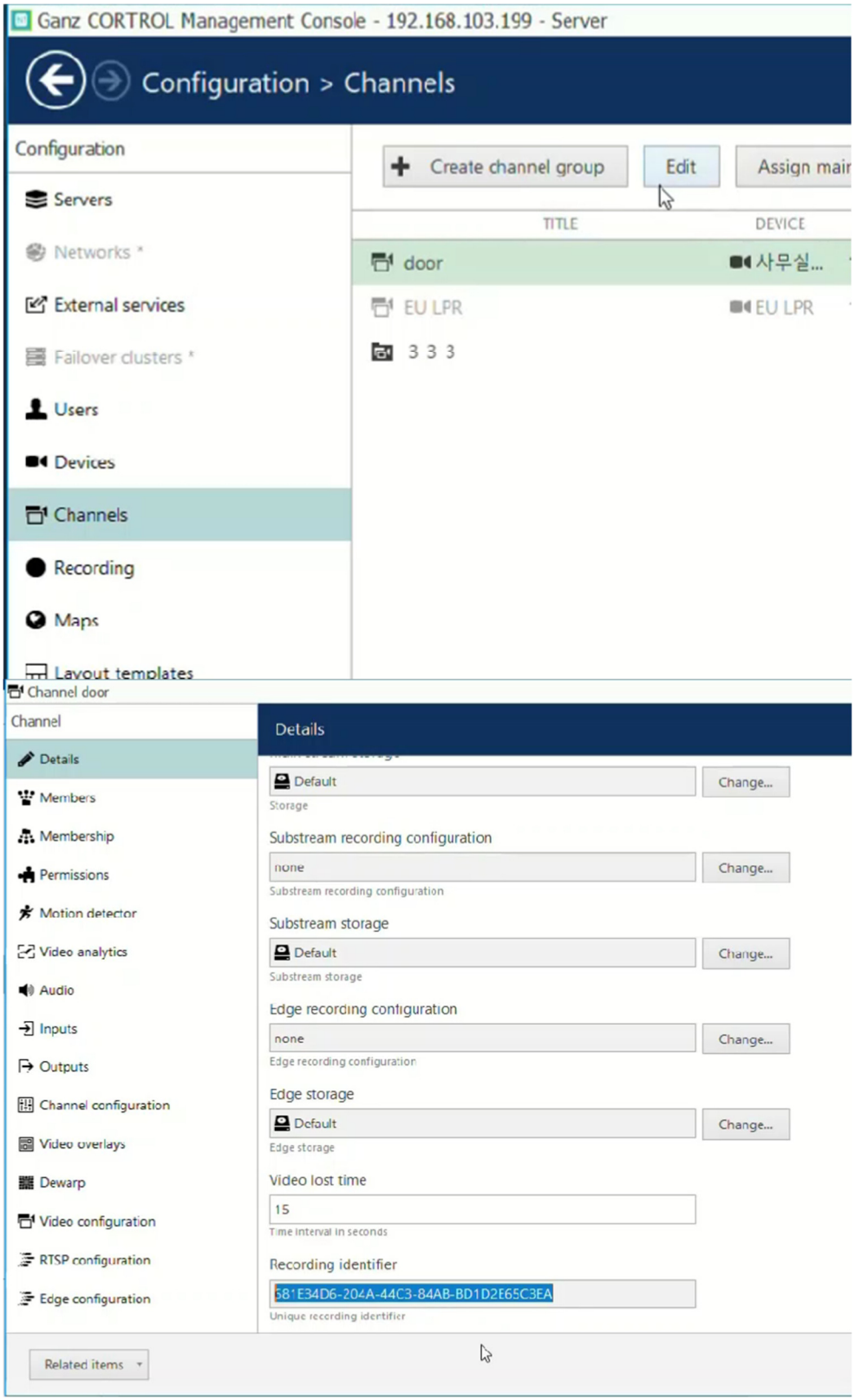
Note. When **"Metadata Enable"** is enabled, AIAIBOX transmits object **Metadata** detected by **AI** to **Control VMS**. Please note that performance issues may occur if the AI app is installed in an environment where **many objects are detected**.

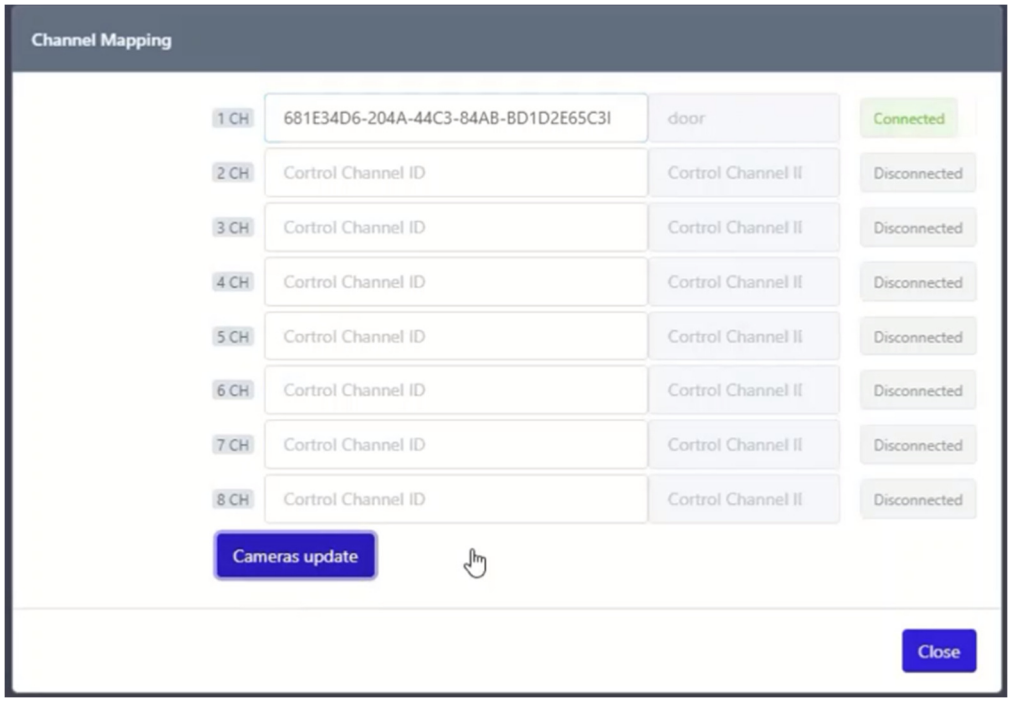
1.2.2 AIBOX Channel Mapping

Set up the relationship between the **AIAIBOX** channel and the channel of **Cortrol VMS**.
Press the **“Mapping”** button to open the settings pop-up window.



Enter the **Recording identifier (UUID)** of the channel registered in **Control VMS** into **AIAIBOX**.
Recording identifier (UUID) can be obtained from the **Details** menu of Channel in **Cortrol Management Console**.

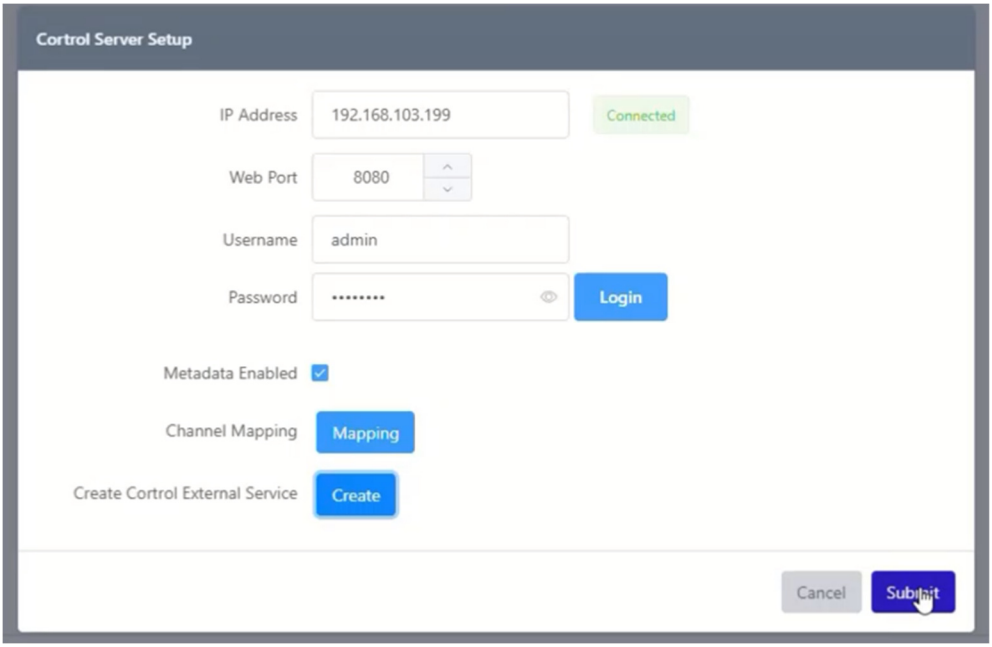

Ganz CORTROL Management Console - 192.168.103.199 - Server
Configuration > Channels
Configuration
Servers
Networks *
External services
Failover clusters *
Users
Devices
Channels
Recording
Maps
Layout templates
Create channel group
Edit
Assign mair
TITLE
DEVICE
door
사무실...
EU LPR
EU LPR
3 3 3
Channel door
Channel
Details
Members
Membership
Permissions
Motion detector
Video analytics
Audio
Inputs
Outputs
Channel configuration
Video overlays
Dewarp
Video configuration
RTSP configuration
Edge configuration
Details
Default
Change...
Storage
Substream recording configuration
none
Change...
Substream recording configuration
Substream storage
Default
Change...
Substream storage
Edge recording configuration
none
Change...
Edge recording configuration
Edge storage
Default
Change...
Edge storage
Video lost time
15
Time interval in seconds
Recording identifier
58'E34D6-204A-44C3-84AB-BD1D2E65C3EA
Unique recording identifier
Related items



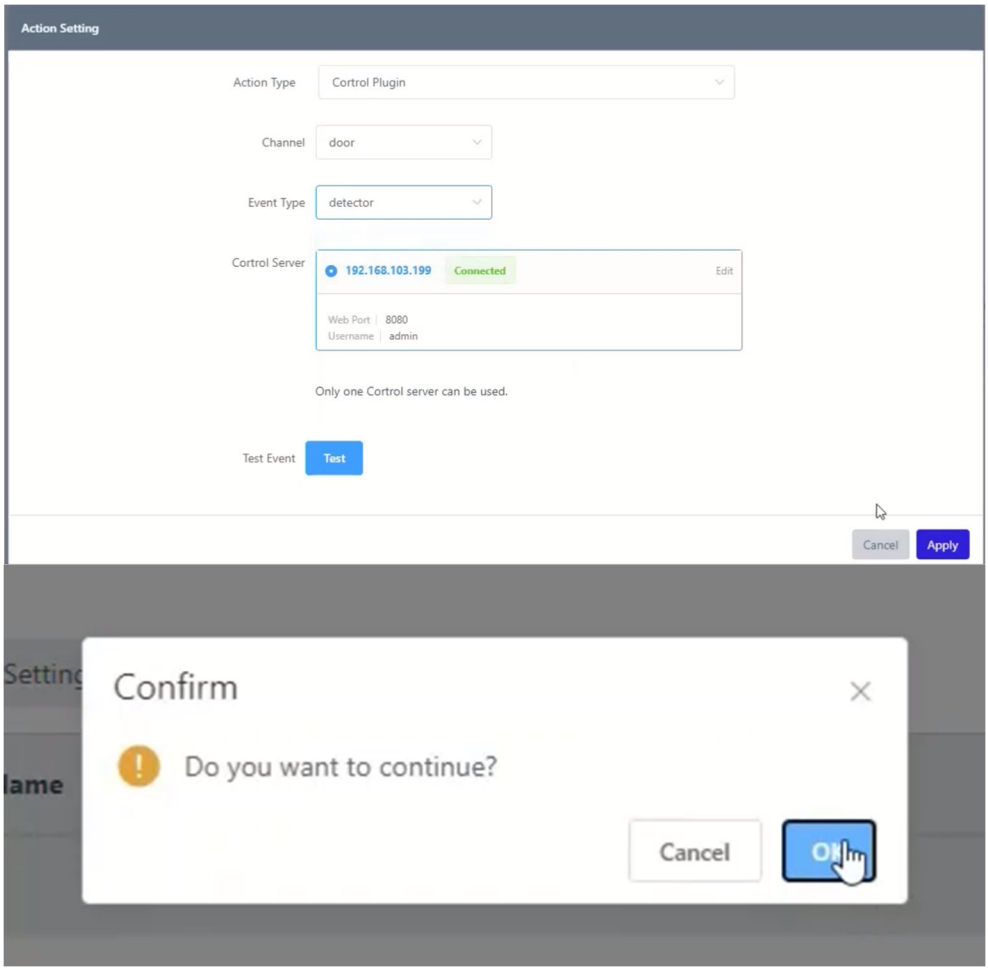
Enter the **Recording identifier (UUID)** and press the **"Camera update"** button to check if it is entered correctly. If the channel is connected successfully, green Connected is displayed.

1.2.3 Create Control External Service

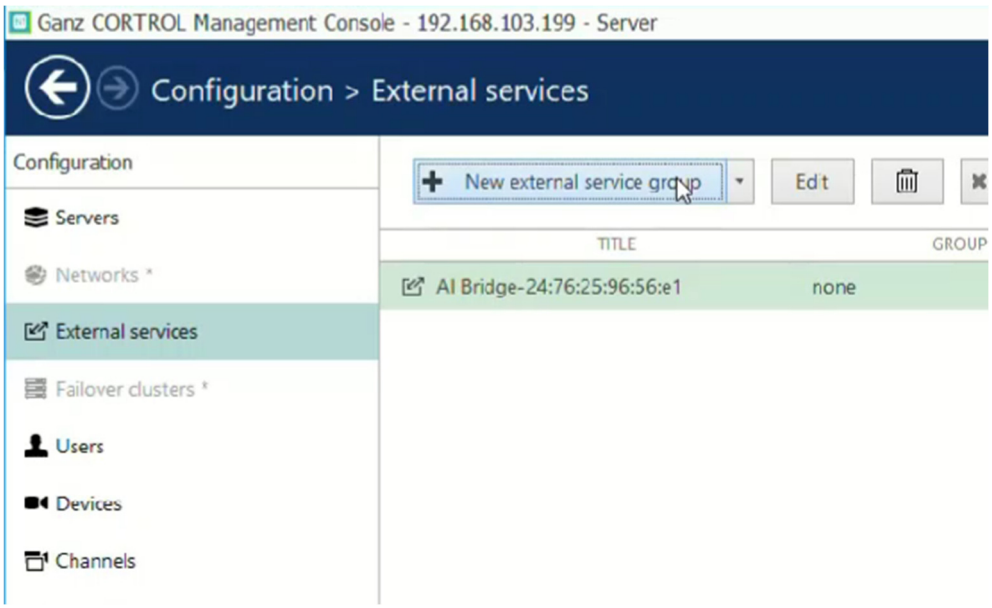
Create an external service by clicking the **"Create"** button on **AIAIBOX's "Control VMS Setup page"**.



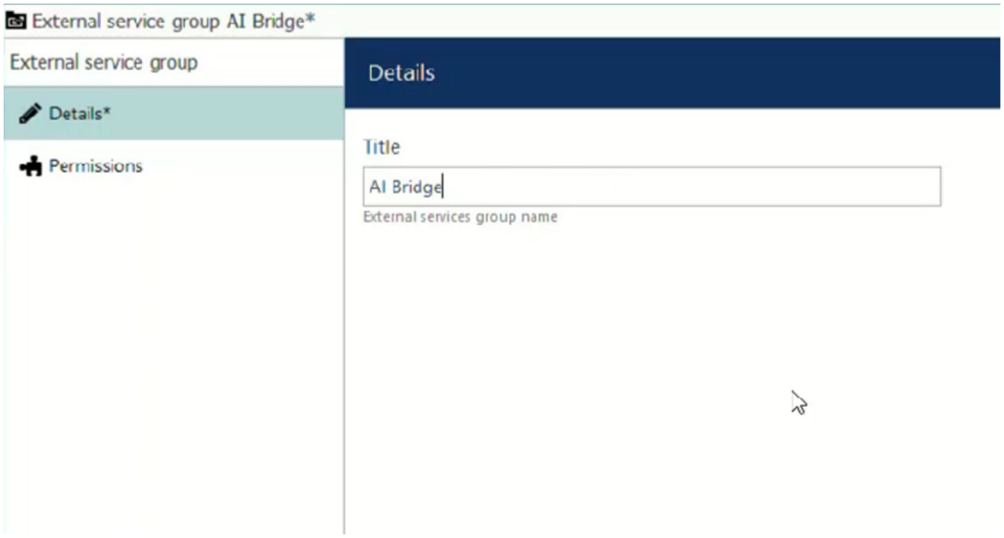
Click the **"Apply"** button to save the Control Server settings.



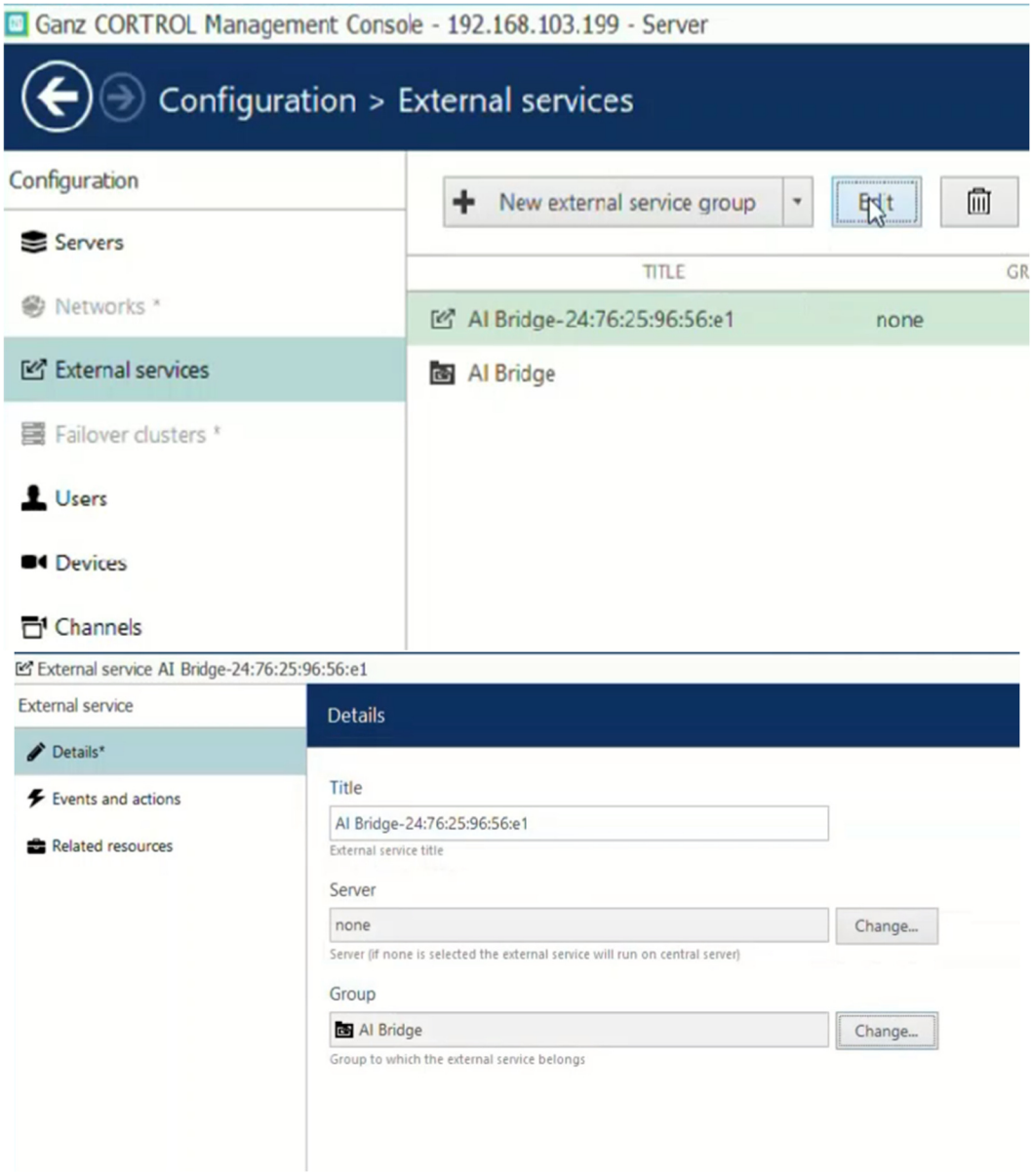
If you see the device registered in the format **"AIAIBOX-MacAddress"** in the External Service tab of the **Control Management Console**, it's OK.
Next, Create an External Service Group.



Enter the name of the new External Service Group as **"AI AIBOX"**.

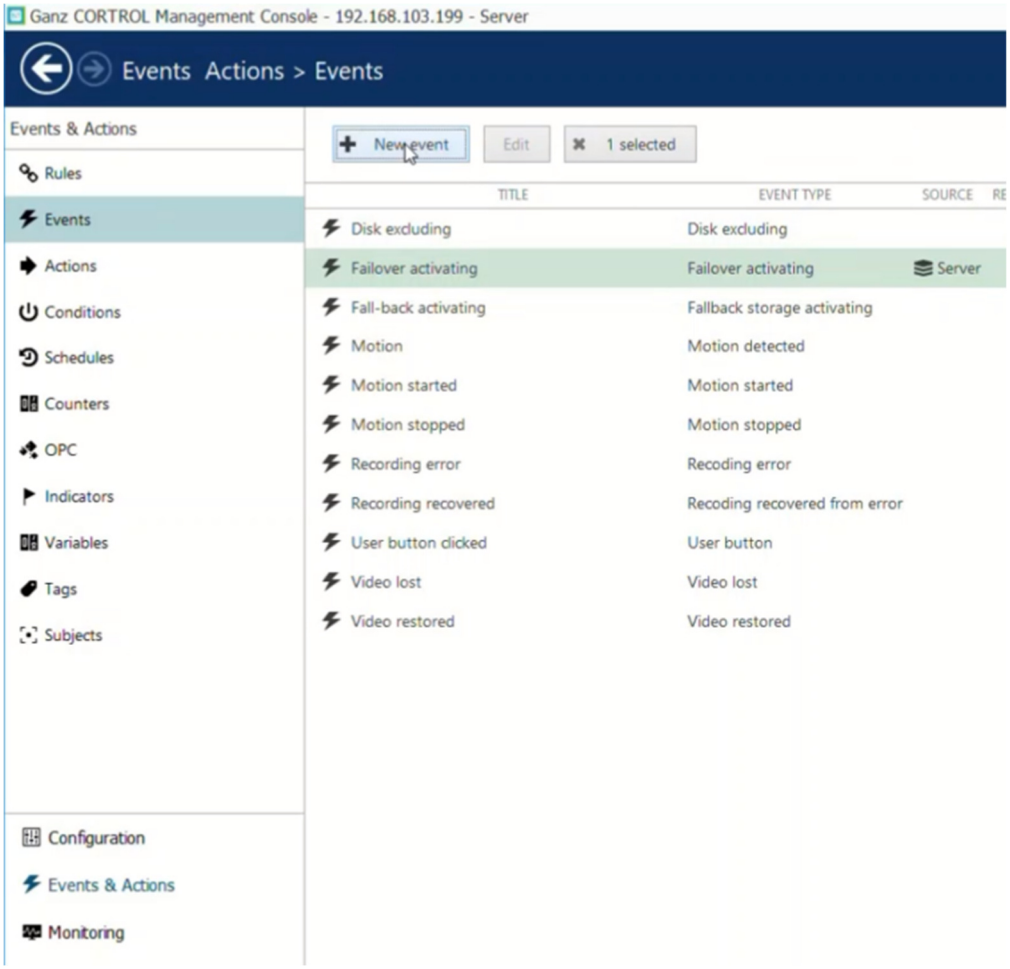


Assign **AIAIBOX** to the new External Service Group.

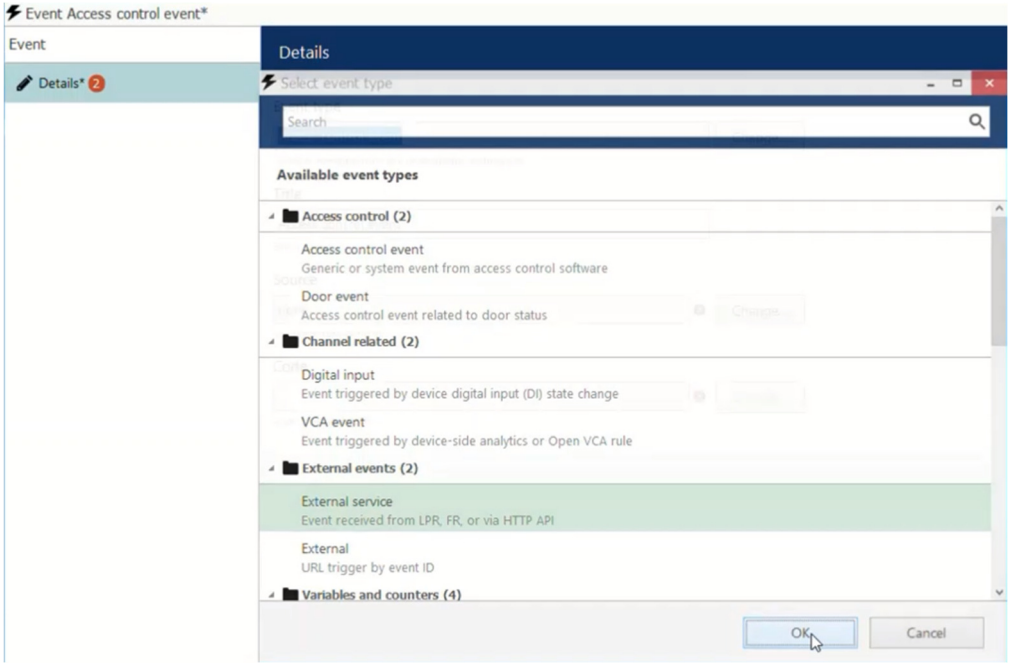


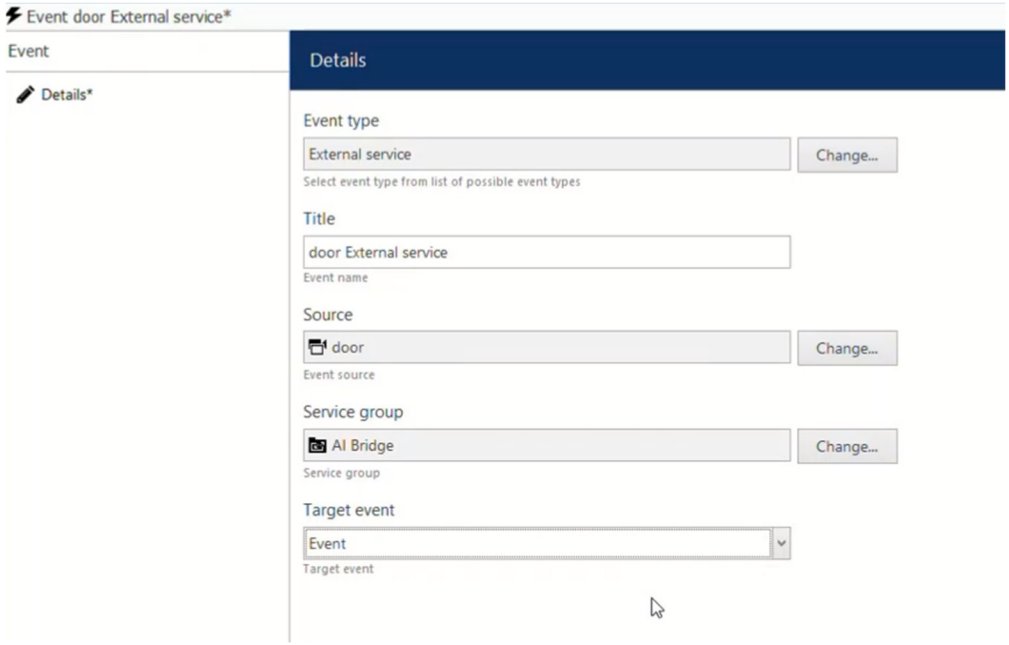
1.2.4 Create Cortrol Event & Rule

We need to configure the events, actions, and rules that will be sending notifications
Click the **"+New Event"** button to add a new event.

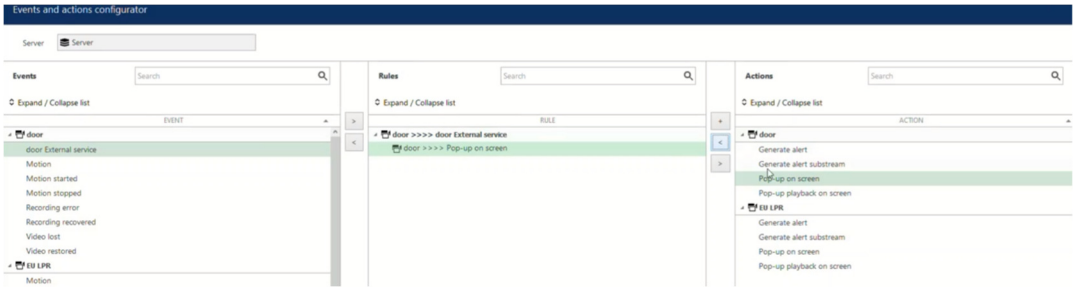


Select Event Type as **External Event – External Service**.



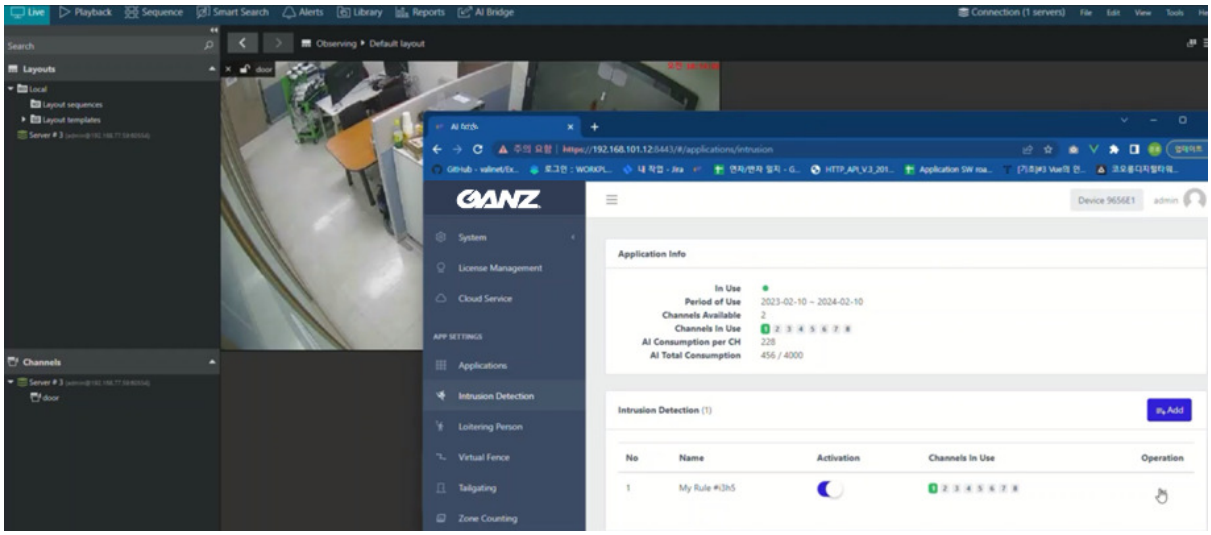


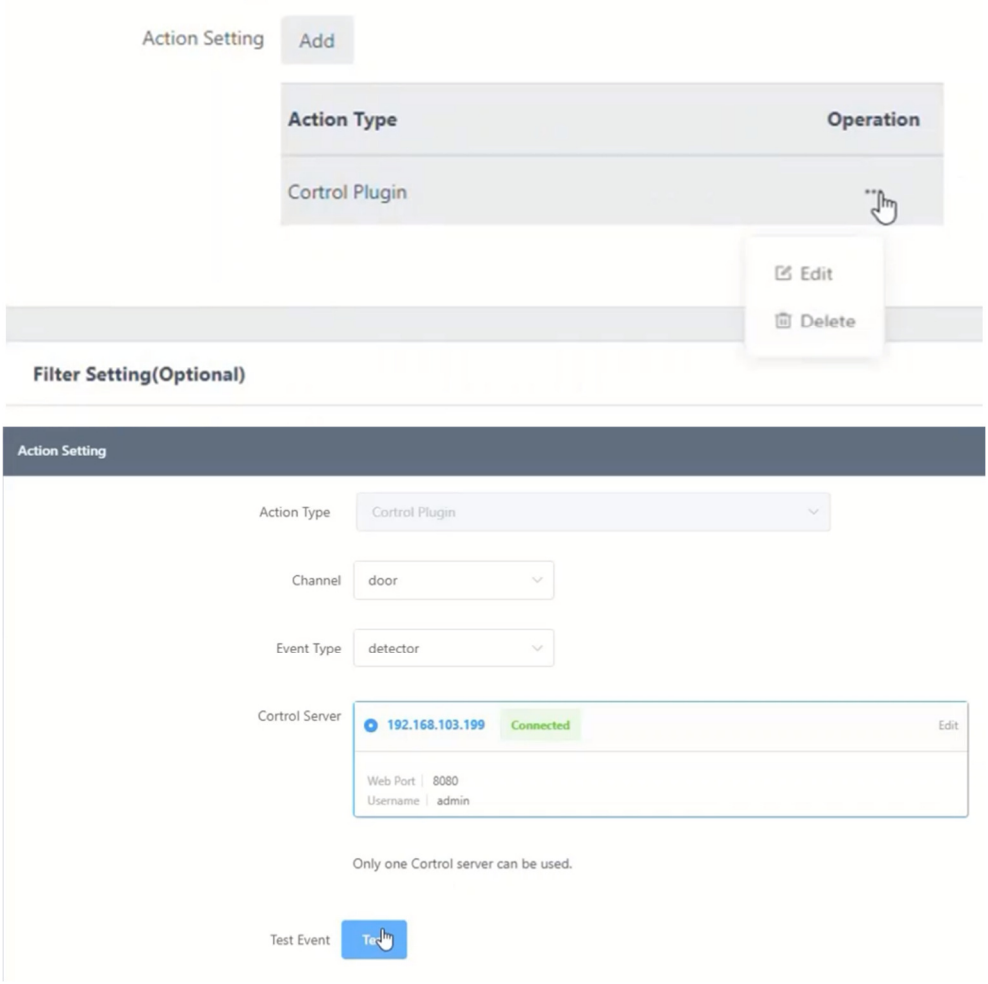
Create a rule by combining the created event type and action.



1.2.5 AIAIBOX Rule Test

In **AIBOX's** Control Setup page, use the event **"Test"** button to test whether the setting is successful.

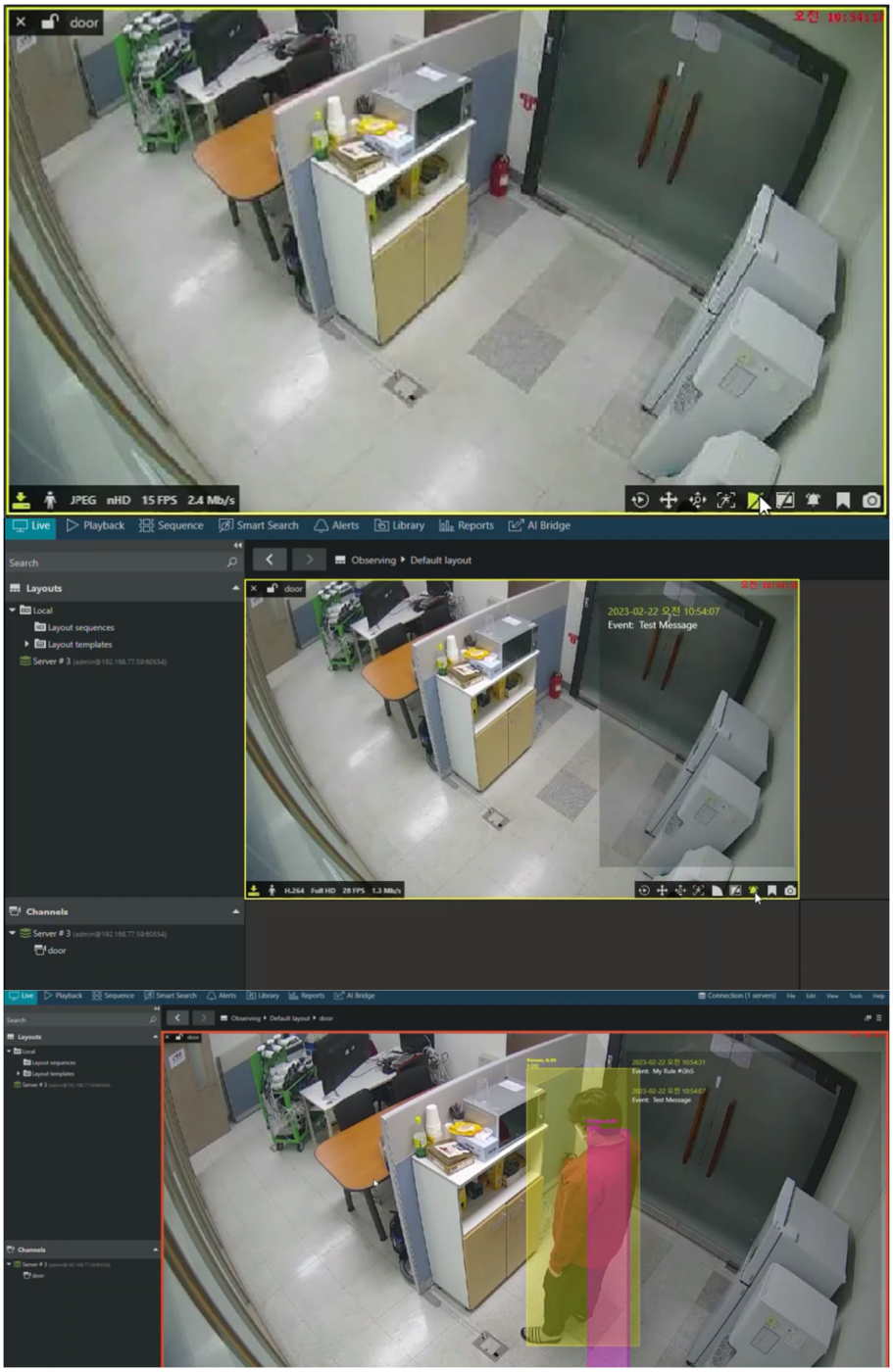




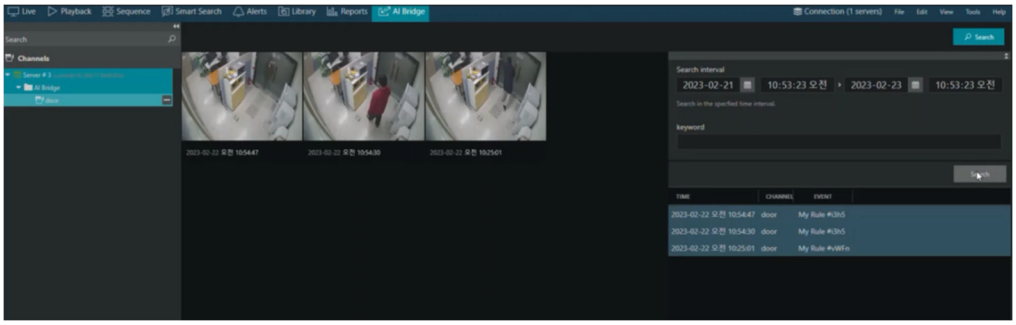
1.3 Demo

1.3.1 Live

Set the **Control Client** to display **Metadata** and **Alarms** to check if it works with **AIBOX**.
(Click the icon at the bottom of the video)



1.3.2 Search



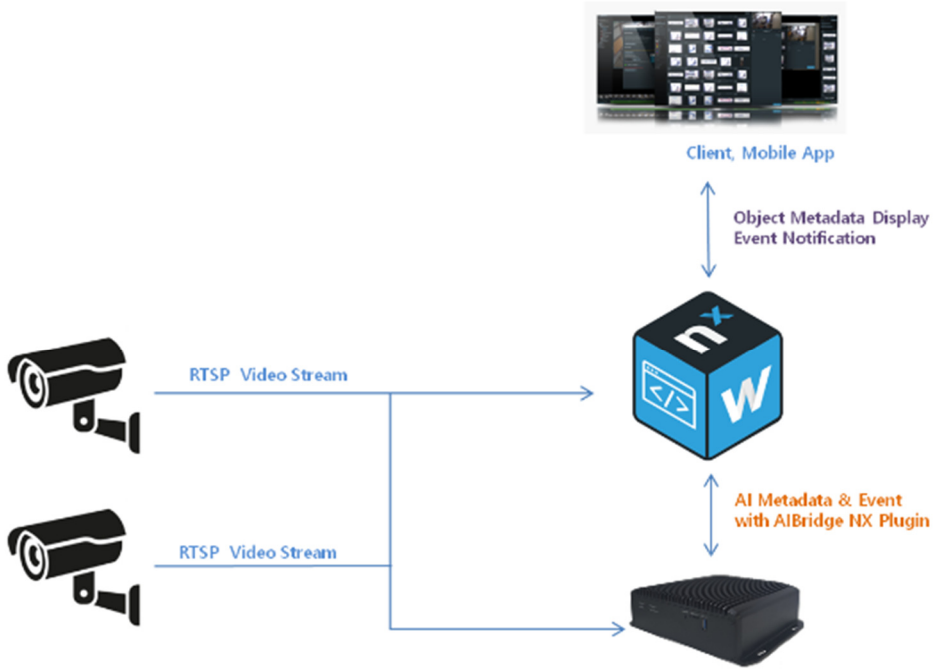
2. AIBOX Plugin Integration Guide for Network Optix VMS

1 Introduction

1.1 Prerequisites

- **AIBOX FW** version **10137** or greater.
- **Network Optix Witness VMS** version **4.2.0.32840** or greater.
- **Network Optix Witness VMS** version **5.0.0.35745** or greater.

1.2 Learn about integration architecture



- IP Camera transmits video stream to **NX VMS** and **AIAIBOX**.
- **AIBOX** analyzes the received video stream by AI Apps.
- **AIBOX** sends **metadata & event** to **NX VMS** with AIAIBOX NX Plugin.

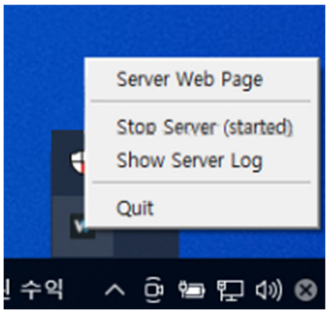
2 AIBOX NX VMS Plugin Install & Configuration

2.1 Install Nx Witness VMS

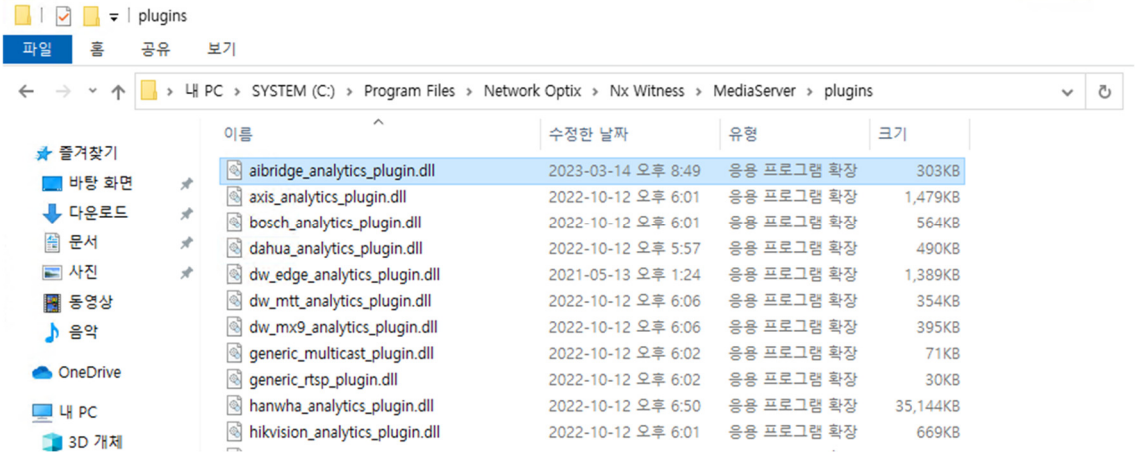
Install the Nx Witness VMS v5.X or later. You will need both Server and Client, as the Client will be used in configuration.

2.2 Install AIBOX Plugin (On Windows)

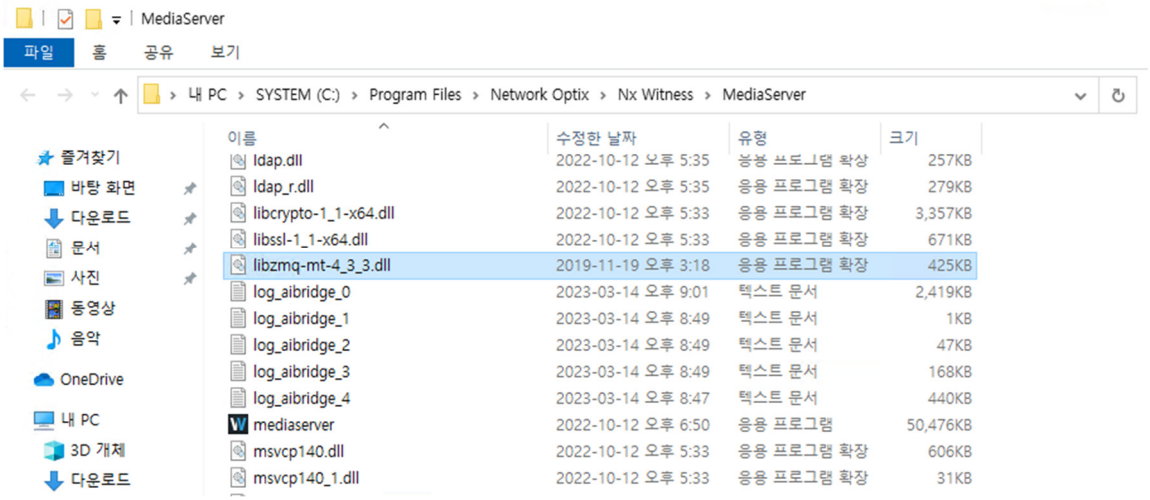
1. Stop the Nx Witness server by right-clicking the tray icon and selecting Stop Server.



2. Download the AIAIBOX analytics plugin from our Customer Portal and unzip.
Copy the "**aibridge_analytics_plugin.dll"** file to {NxInstallPath}\plugins\ usually on "C:\Program Files\Network Optix\Nx Witness\MediaServer\plugins".

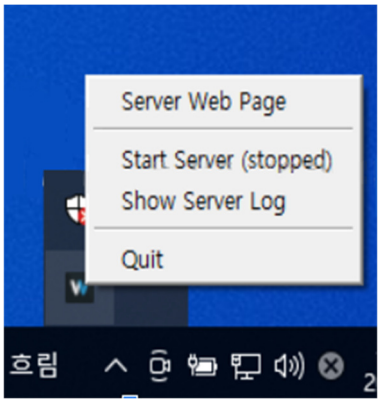


3. Copy the **libzmq-mt-4_3_3.dll** file to {NxInstallPath}\ usually on "C:\Program Files\Network Optix\Nx Witness\MediaServer\".

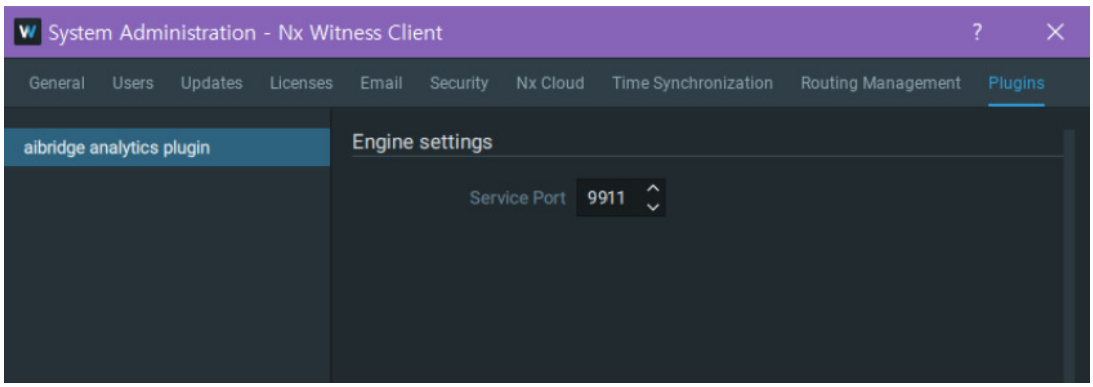


4. Download & Install vc_redist.x64.exe
(https://aka.ms/vs/16/release/vc_redist.x64.exe)

5. Start the Nx Witness server by right-clicking the tray icon and selecting Start Server.



6. Setup communication port & Setup Firewall
In the AIAIBOX analytics plugin engine setting menu, (Network Optix VMS System Administration > Plugins Menu) set a unique port (**9911**) . This is a TCP port which is used for communication between the Nx Witness AIAIBOX analytics plugin and AIAIBOX.

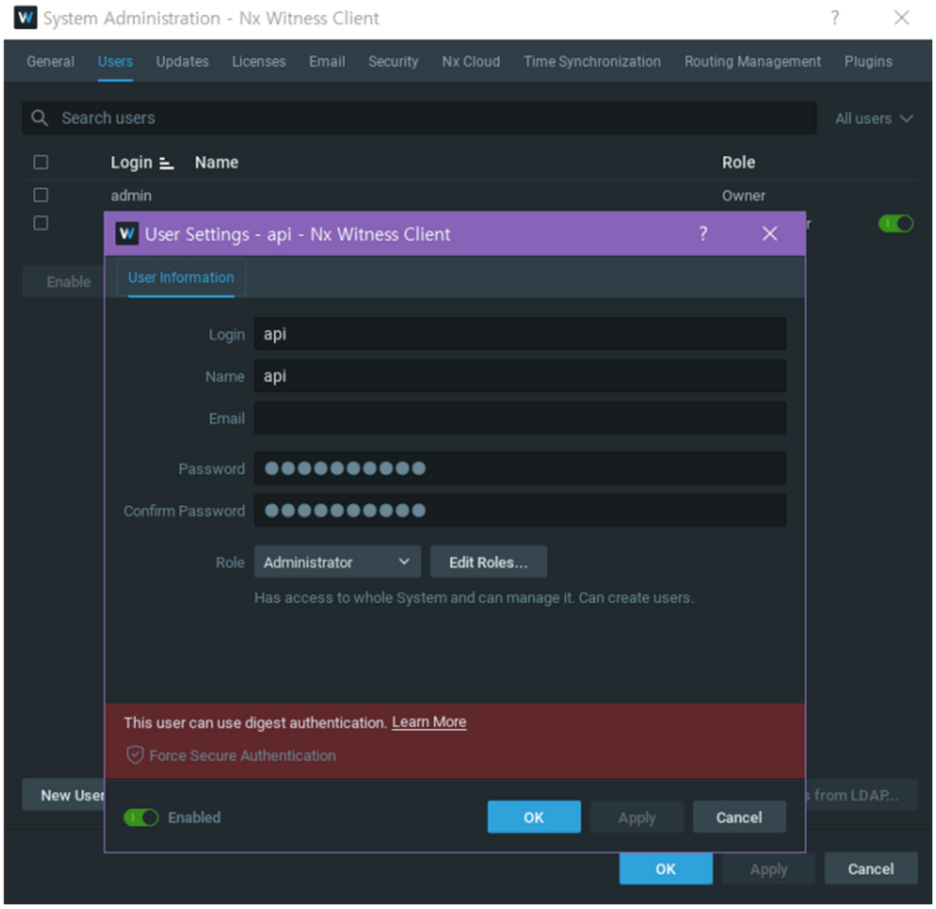


7. If your Windows is using a firewall, add New Rule in Windows Firewall Setup > Advanced Settings > Inbound Rules > New Rule.

Note) How to Add a Rule or Port to a Windows 10 Firewall
https://www.youtube.com/watch?v=JsEulhg5P8k

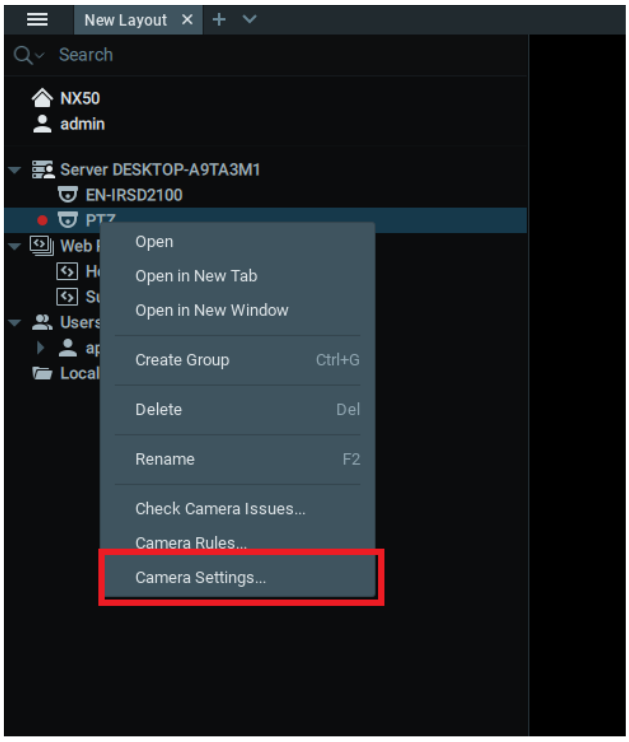
2.3 Add NX api Account

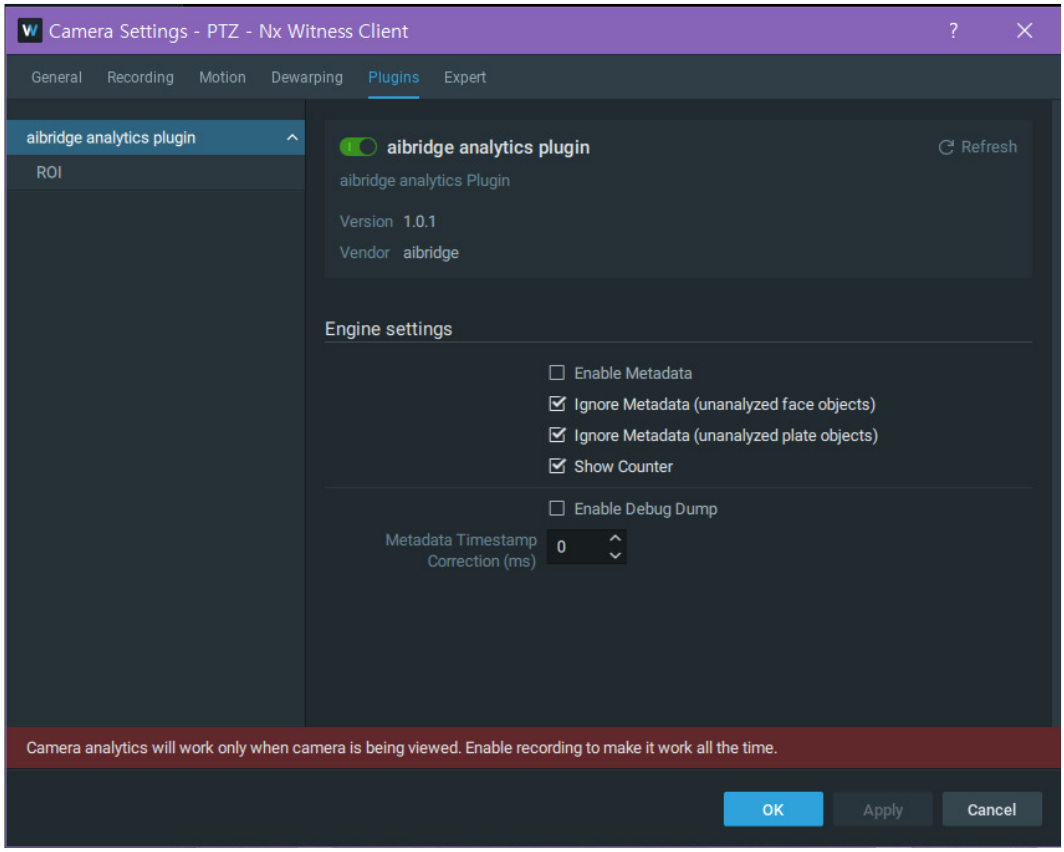
Add NX “api” account to be used by AIAIBOX.
When creating an account, **enable digest authentication and set the administrator role.**



2.4 Enable video channels to use AIBOX analytics plugin

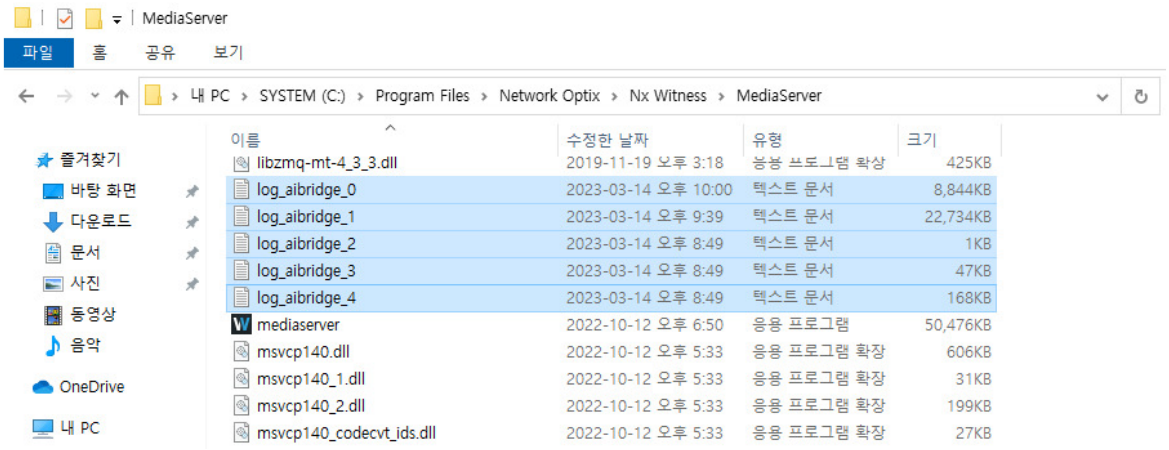
In the NX client left panel, right-click the camera you want to process with AIBOX and select Camera Settings. In the Plugins tab, enable the AIBOX analytics plugin.





1. Enable Metadata : **It is not recommended to use it except for installation or debugging purposes.** Even if this option is disabled, the object on which the event occurred is automatically displayed (saved).
2. Ignore Metadata (unanalyzed face objects) : Face information that has not been analyzed is ignored.
3. Ignore Metadata (unanalyzed plate objects) : plate(LPR) information that has not been analyzed is ignored.
4. Show Counter : show number of Event Occurred.
5. Enable Debug Dump : **It is not recommended to use it except for installation or debugging purposes**.

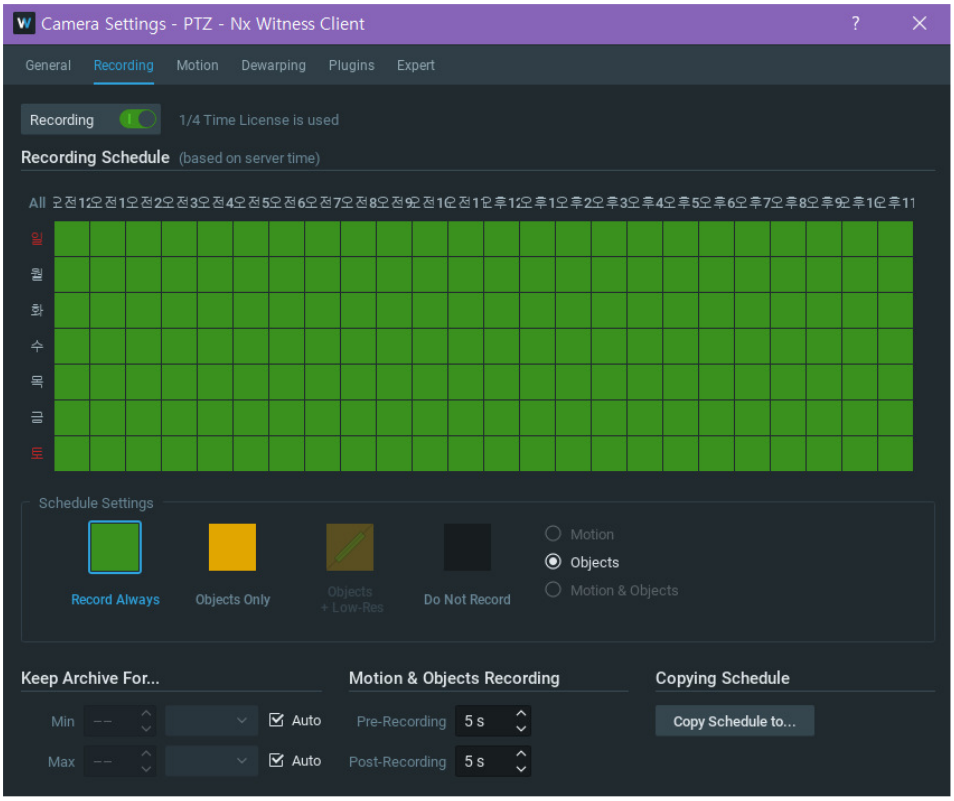
A large size of log files can be stored in the {NxInstallPath}\ usually on “C:\Program Files\Network Optix\Nx Witness\MediaServer\”. **It should be disabled in a production environment.**



6. Metadata Timestamp correction : Metadata (bounding box) is buffered for the set time. (Metadata is displayed delayed for the set time.)

2.5 Enable video channel recording

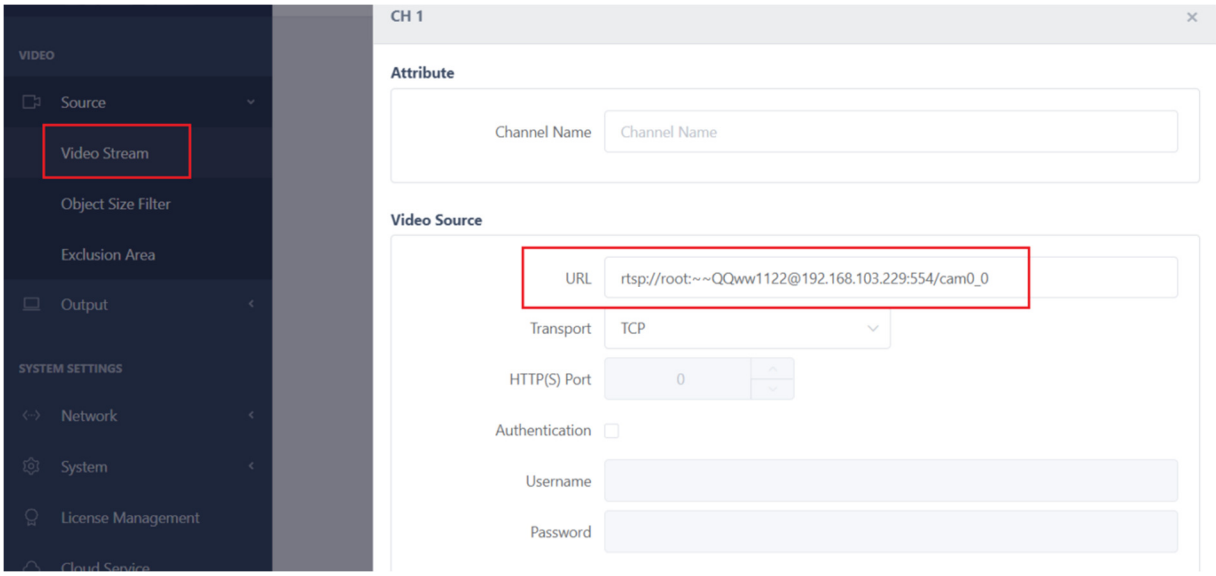
Non-recording analysis channels cannot use the EVENT and OBJECT panel in NX VMS.



3. AIBOX Configuration

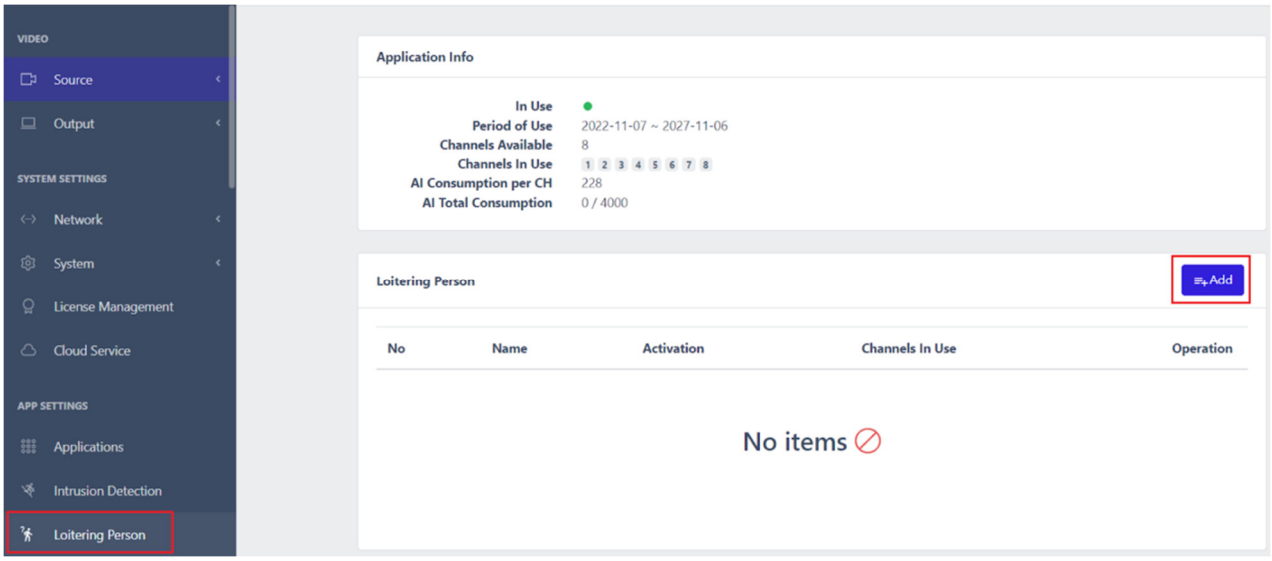
Let's set up to integrate the Loitering Person app with the AIAIBOX Nx VMS Plugin.

3.1 Setting the video source

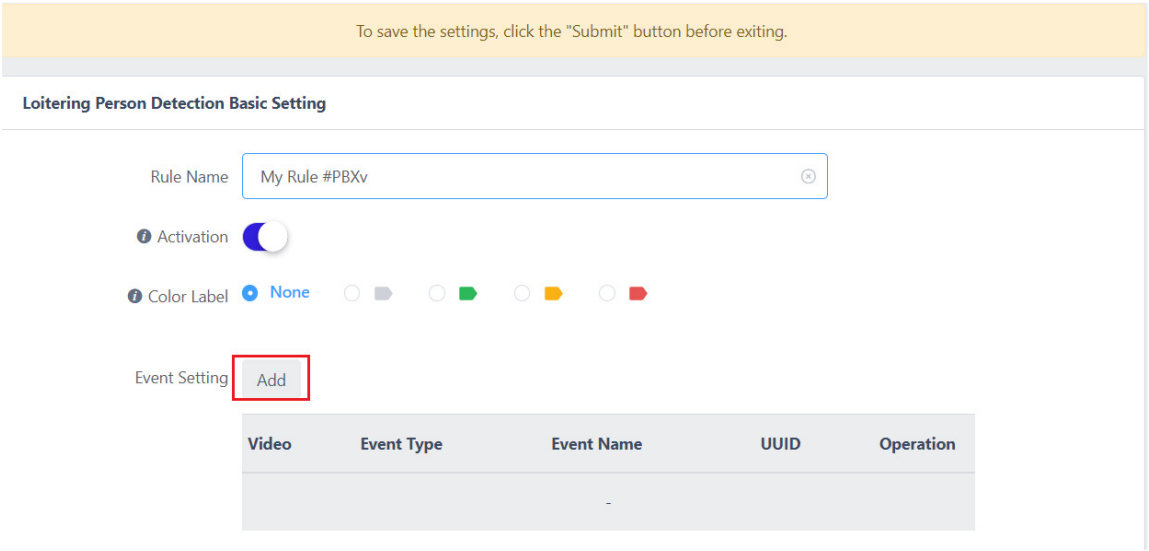


3.2 Setting up the Loitering Person app

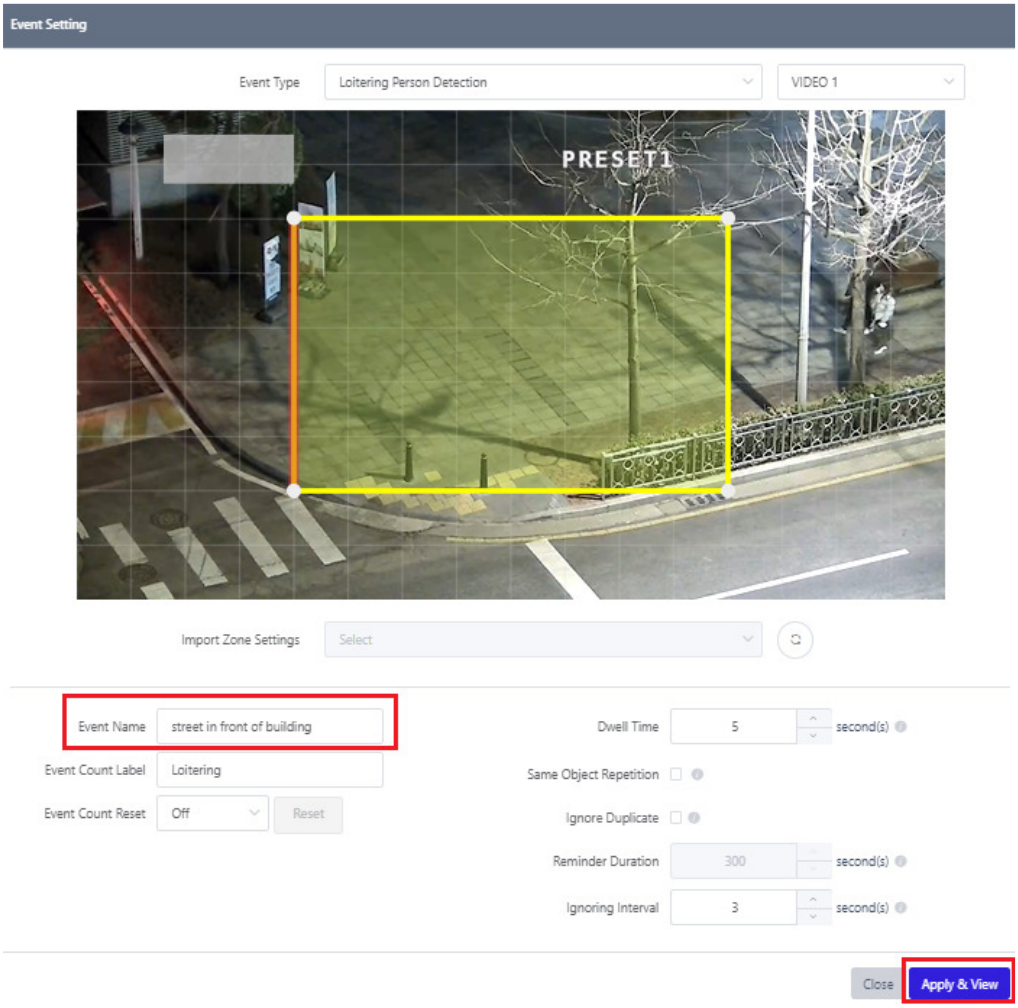
3.2.1 Add Rule



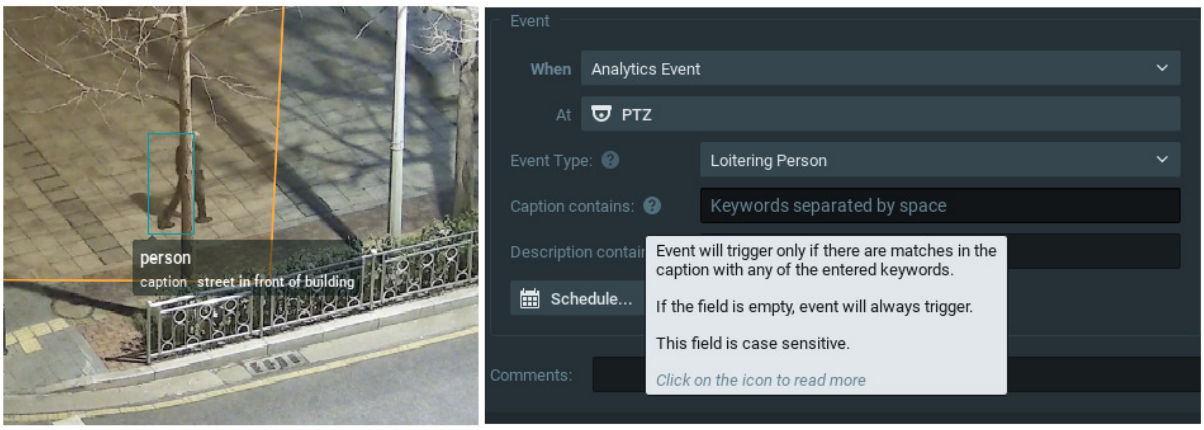
3.2.2 Adding event video source



3.2.3 Setting Event Configuration



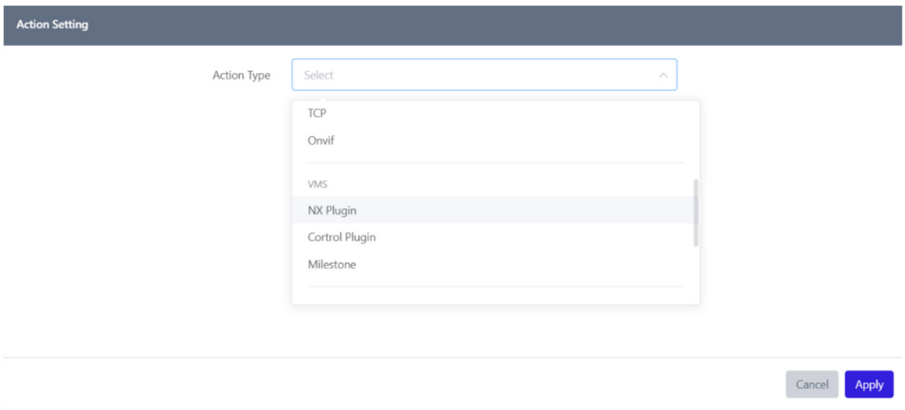
AIBOX's Event Name field is displayed as Caption field in NX VMS. It is recommended to enter a name that can identify the event. It is tagged to the object as shown in the figure below. Also, when registering a rule, you can set a detailed rule through text comparison in the caption field.



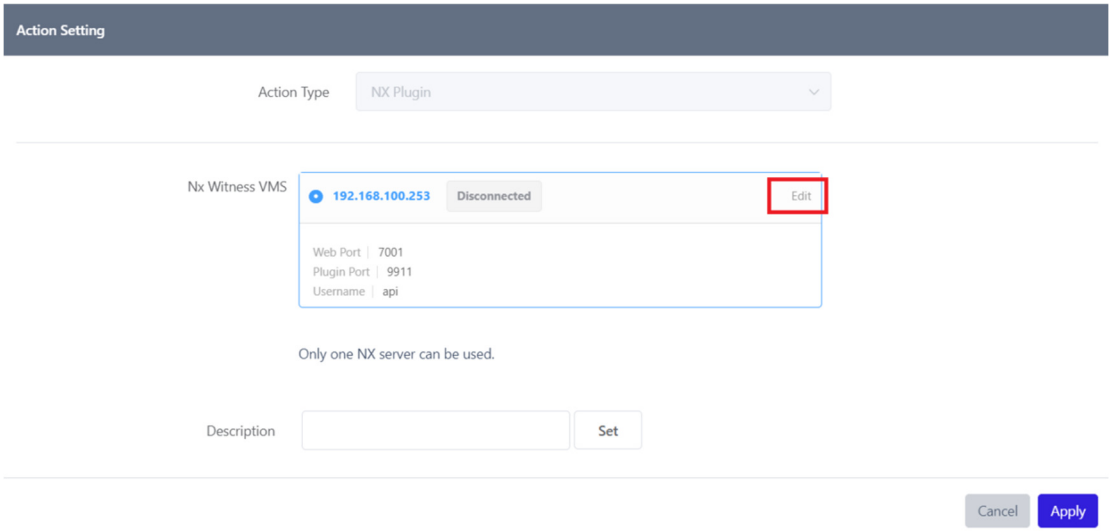
3.3 Adding NX Plugin action handler

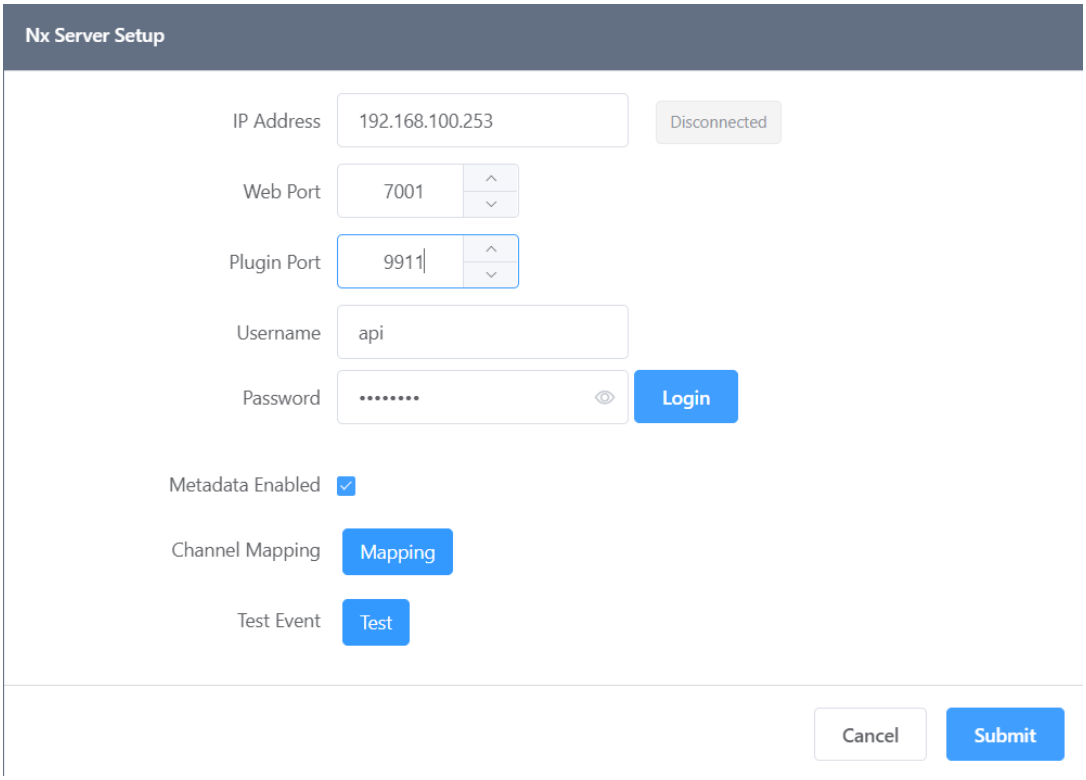
3.3.1 Add Action Setting

3.3.2 Select VMS / Nx Plugin

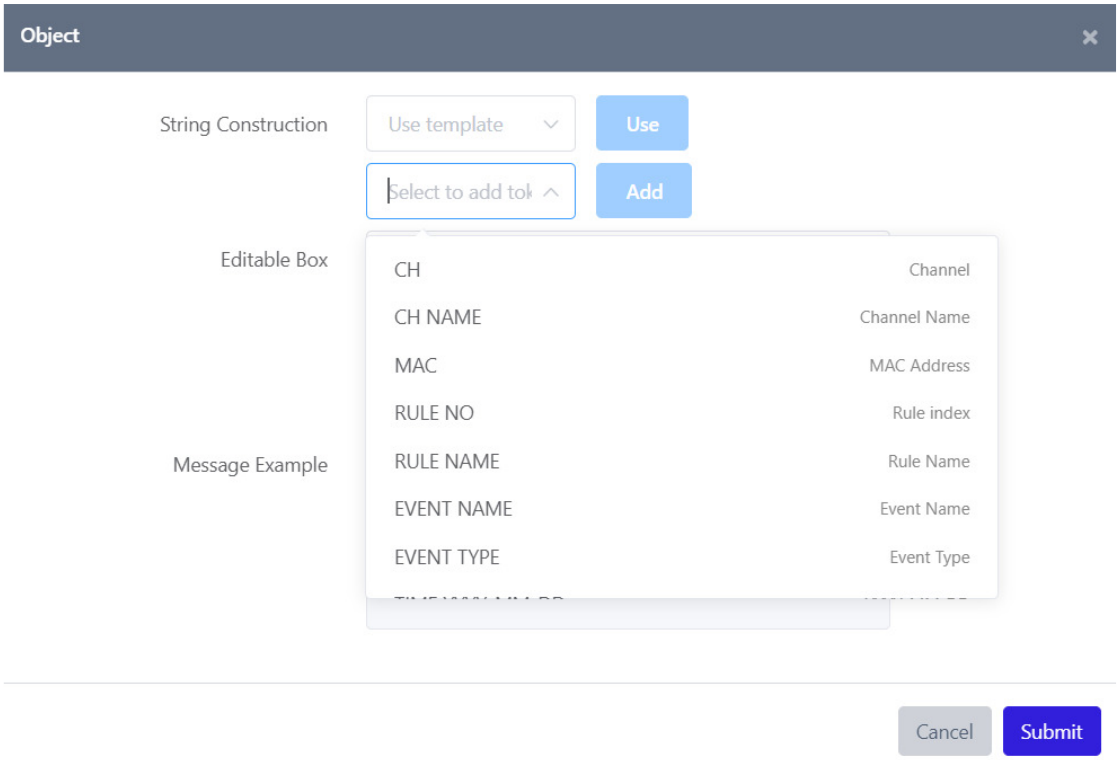


3.3.3 Editing VMS IP and Account



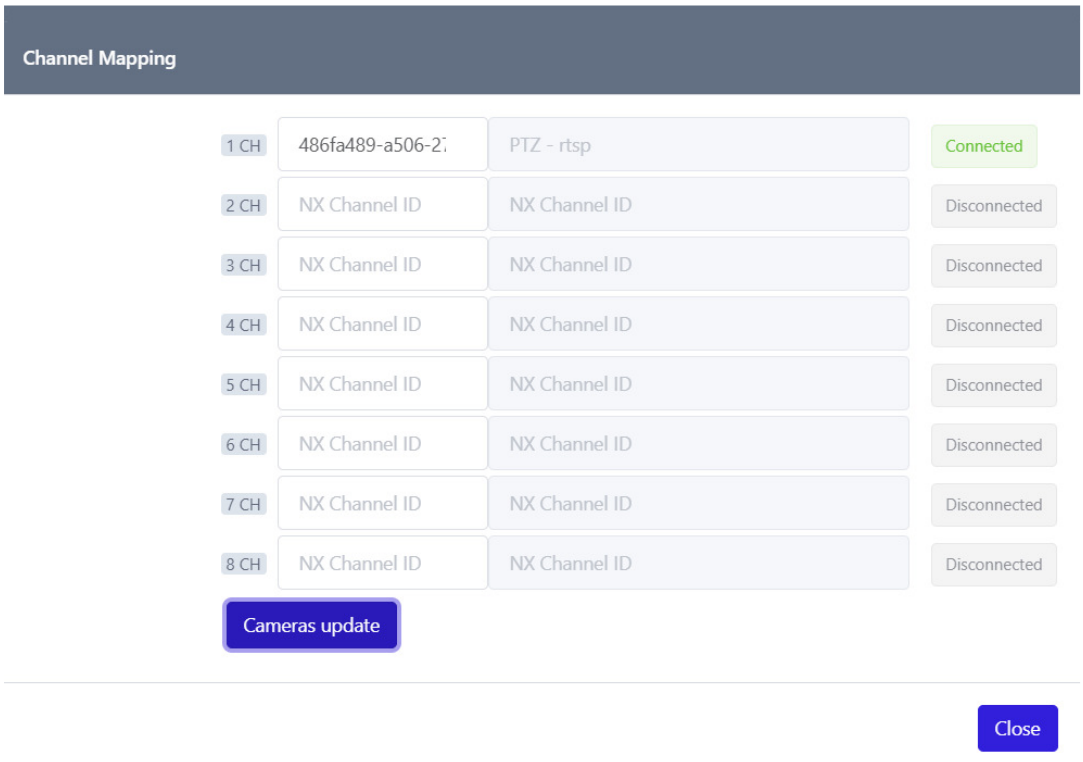


Enter the **“api” (case sensitive) account information** added in the previous step and **test using the Login button**. If the test is successful, you will see a connected green status indicator.
Additional object information can be passed to NX VMS through the Description field. (For example, LPR app license plate recognition information, group information)

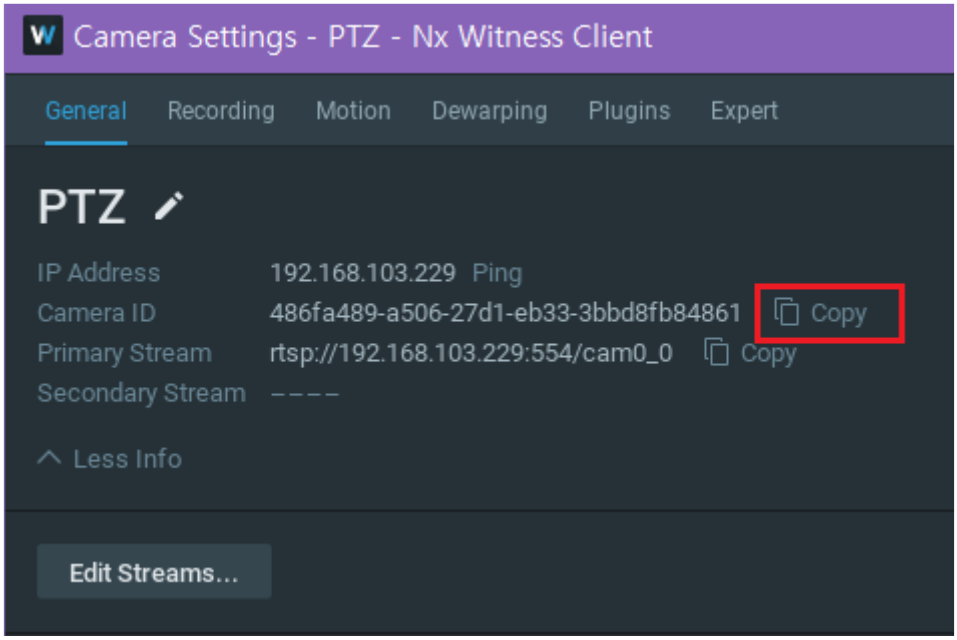


3.**3**.4 Channel Mapping

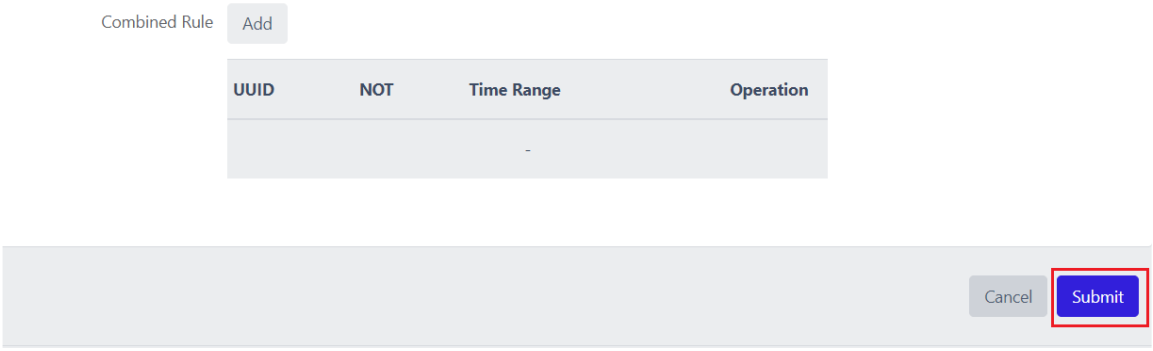
Channel information connection between AIAIBOX and NX VMS is required. If the channel id is entered correctly, the green Connected status will be displayed when you click the Camera Update button.



NX channel ID (Camera ID) information can be copied from the camera setup menu of NX VMS.



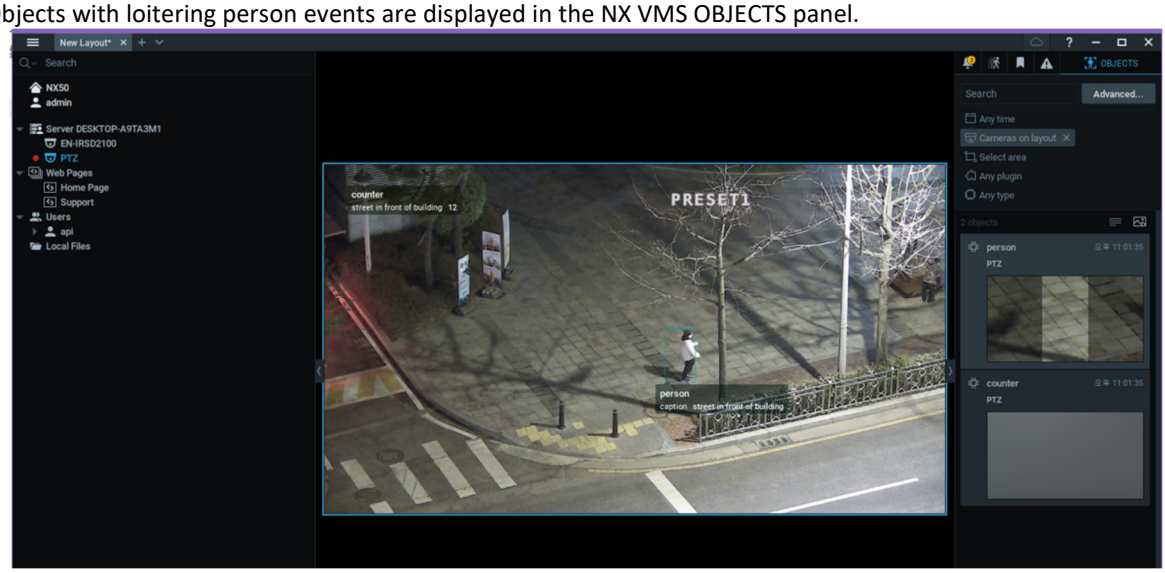
3.2.5 After completing all settings, click the Submit button at the bottom of the webpage. Your settings will not be saved unless you click the submit button.



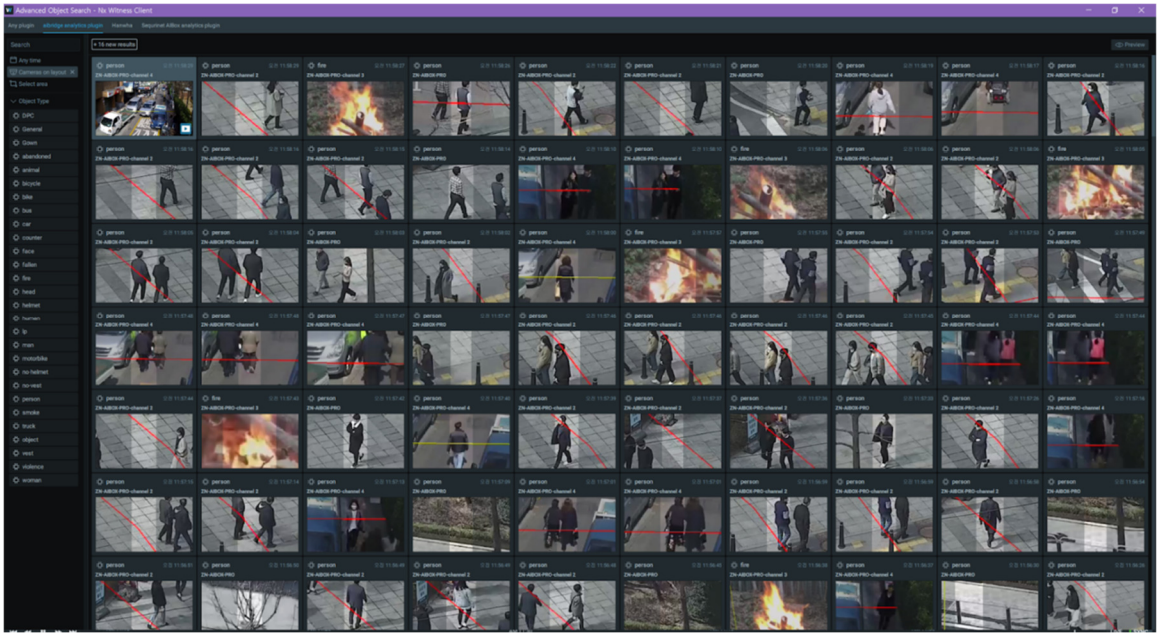
3. Demo

3.1 Live

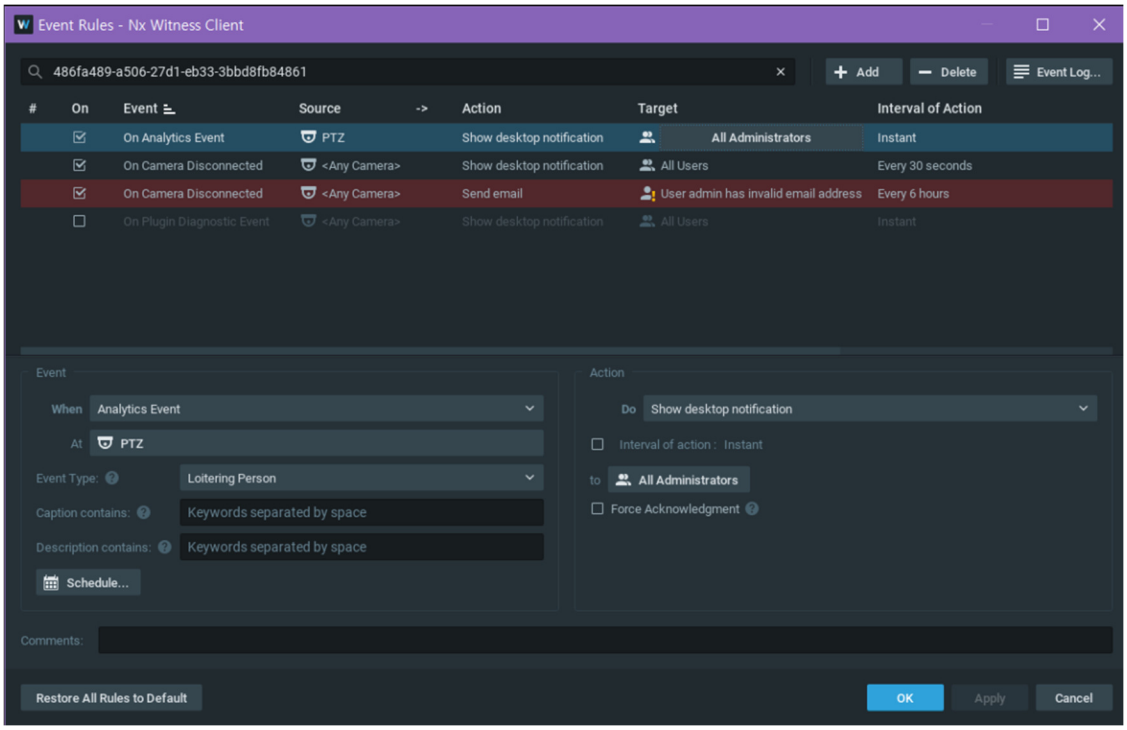
Objects with loitering person events are displayed in the NX VMS OBJECTS panel.

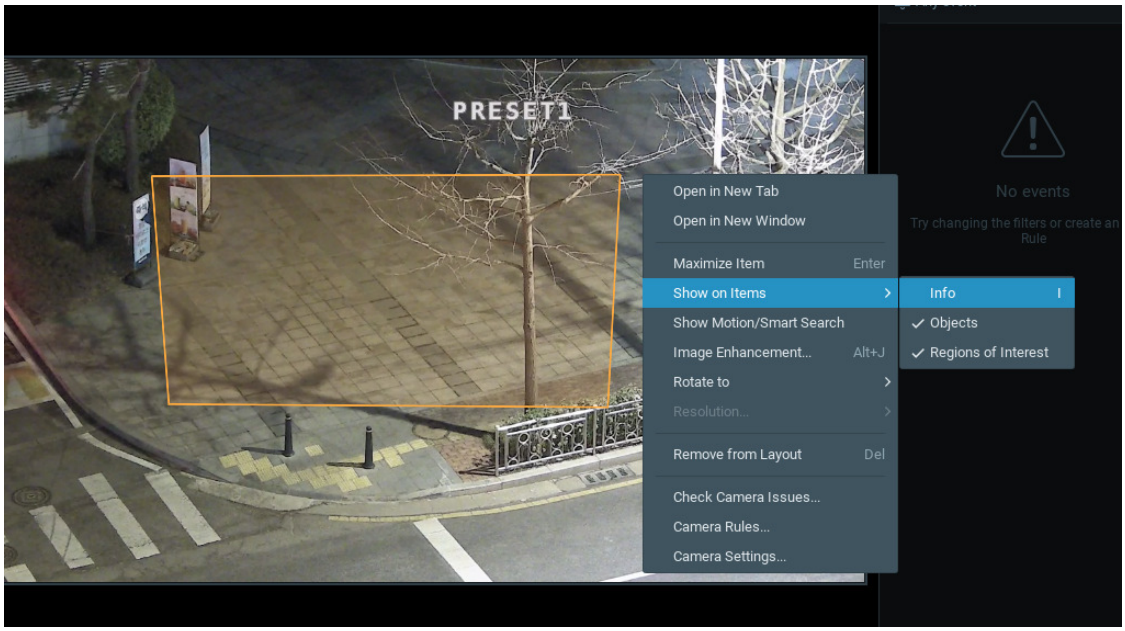


Saved objects can be searched through the Object “Advanced” menu of NX VMS.

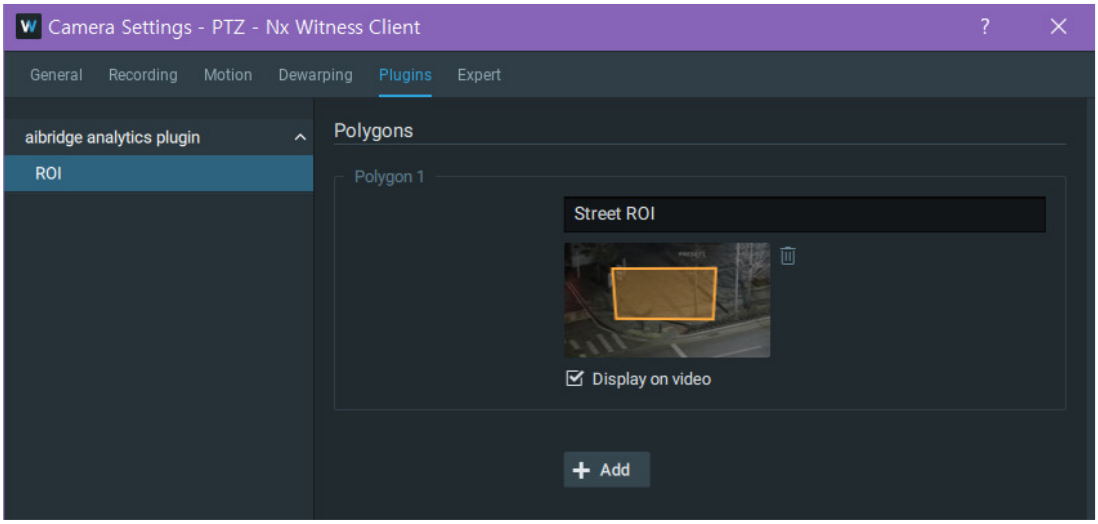


When objects are not visible, activate Objects in “Show on Items” in the popup menu of the video window.





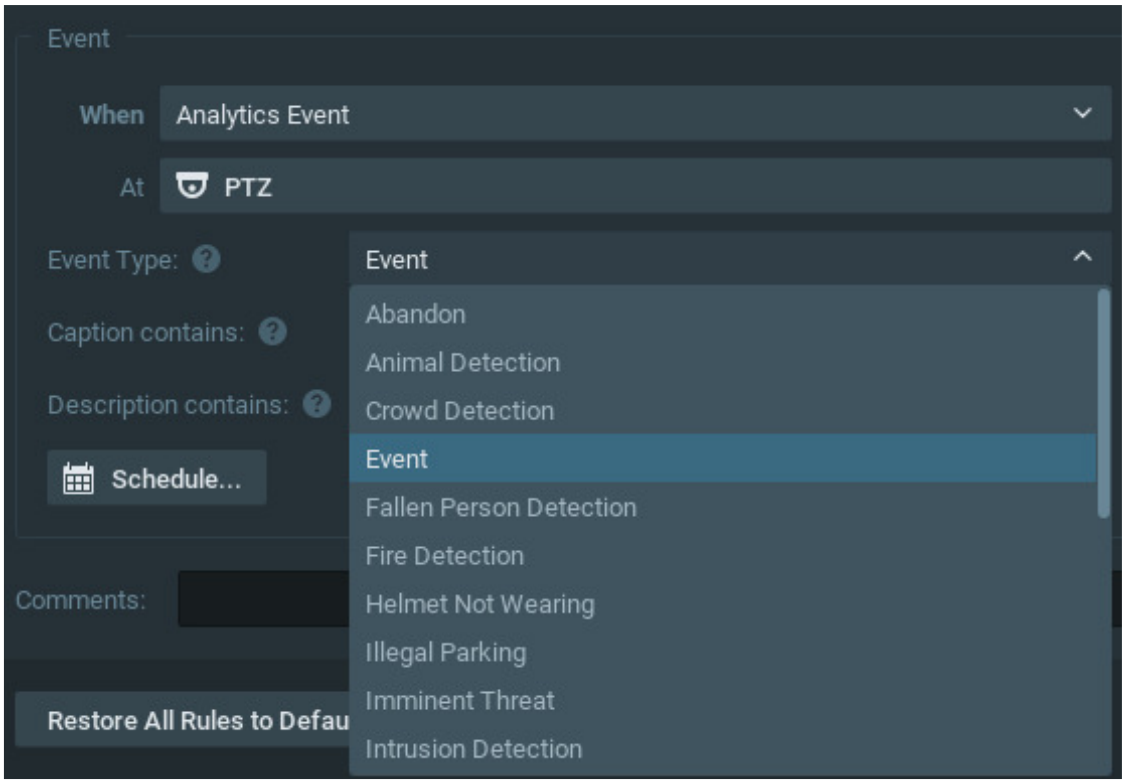
You can then manually specify the ROI area. It is automatically synchronized with the ROI(zone) information of AIAIBOX through AIAIBOX F/W upgrade in the future.



3.2 Add Nx VMS Event Rules

If you set the desktop notification action by adding Camera Rules in NX VMS, you can see the event in the NX VMS EVENTS panel.
When registering camera rules, pay attention to the “Event Type” setting. If the APP set in AIBOX and the Event Type do not match, the event will not occur.

note) If the AIBOX Analytics plugin is not up-to-date, there may be no App Event Type supported by AIAIBOX FW. In that case, select “Event” as the Event Type.



3. AIBOX Integration Guide for Milestone XProtect VMS

1. Introduction

1.1 Prerequisites

- **AIBOX FW** version **102700** or greater.
- **Milestone XProtect 2023 R1** or greater.

1.2 Learn about integration architecture

There are two ways to integrate AIAIBOX with Milestone XProtect VMS:

1. Case 1
   The AIAIBOX receives the RTSP video stream from the IPCAM and provides the annotated video and event data after AI analysis. The annotated video is transcoded to provide object recognition information, bounding boxes, zone information, and more from AIAIBOX's AI analysis.

2. Case 2
   Both AIBOX and Milestone XProtect VMS simultaneously receive the RTSP video stream from the IPCAM, and the AIBOX sends the AI analysis events to XProtect VMS. It can also receive the RTSP stream from Milestone XProtect VMS instead of the IPCAM's RTSP video stream.

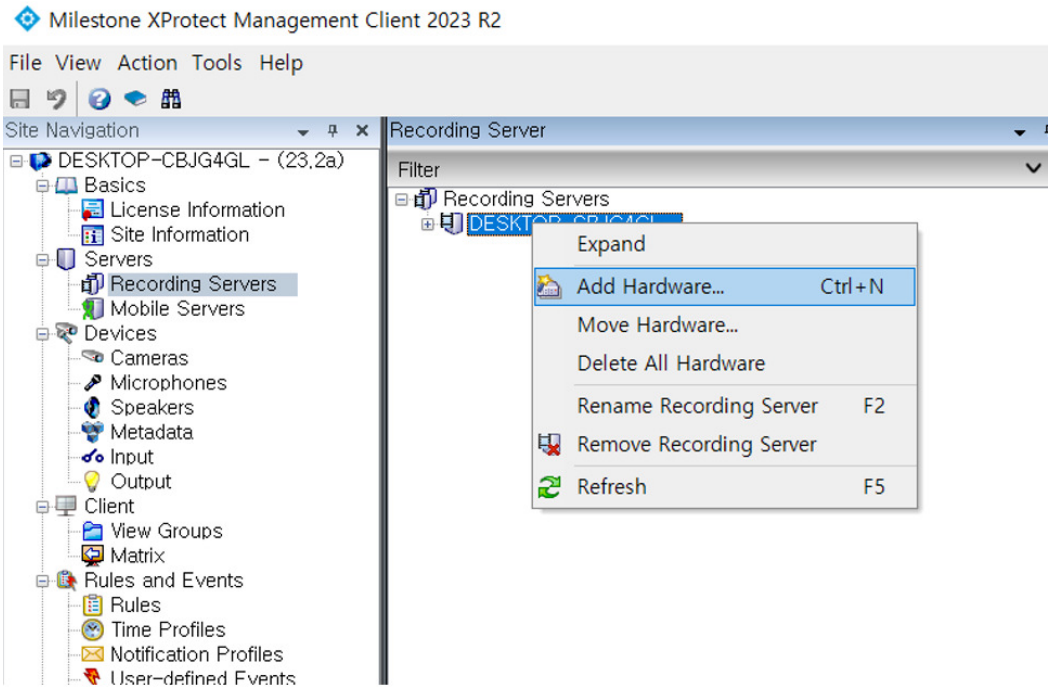
2. Configuration

2.1 Milestone xProtect VMS Configuration

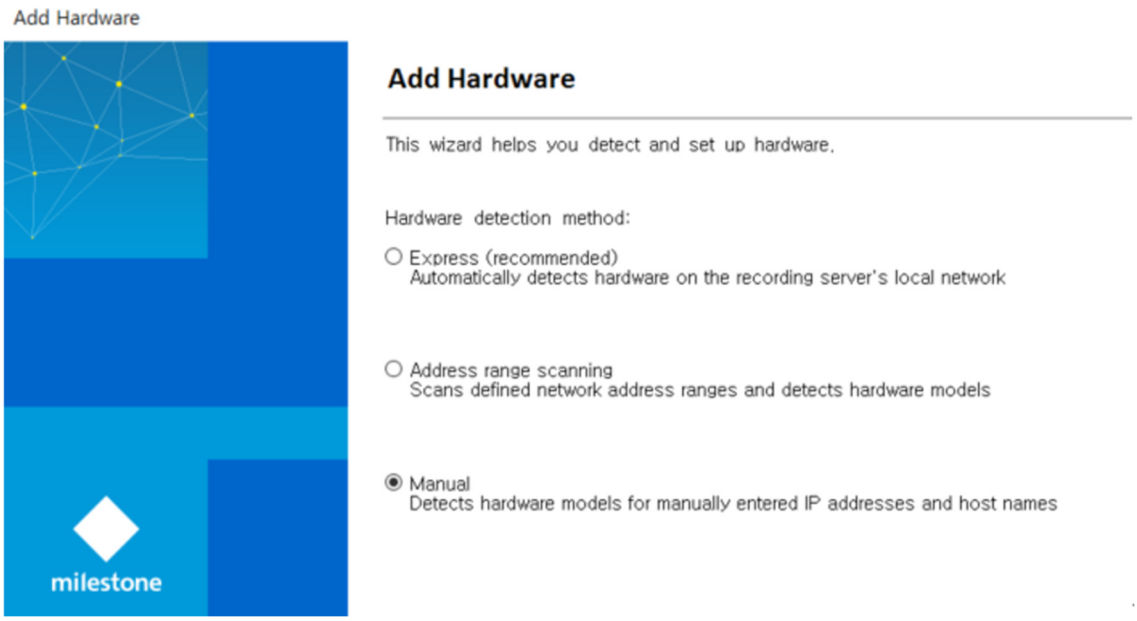
We will explain how to integrate AIAIBOX with Milestone XProtect VMS using the Case1 method.
Note:
For the Case2 integration type, you can skip step 1(Adding the AIAIBOX to Milestone XProtect VMS) and proceed from step 2(Enable the XProtect analytics events).

2.1.1 Adding the AIAIBOX to Milestone XProtect VMS.

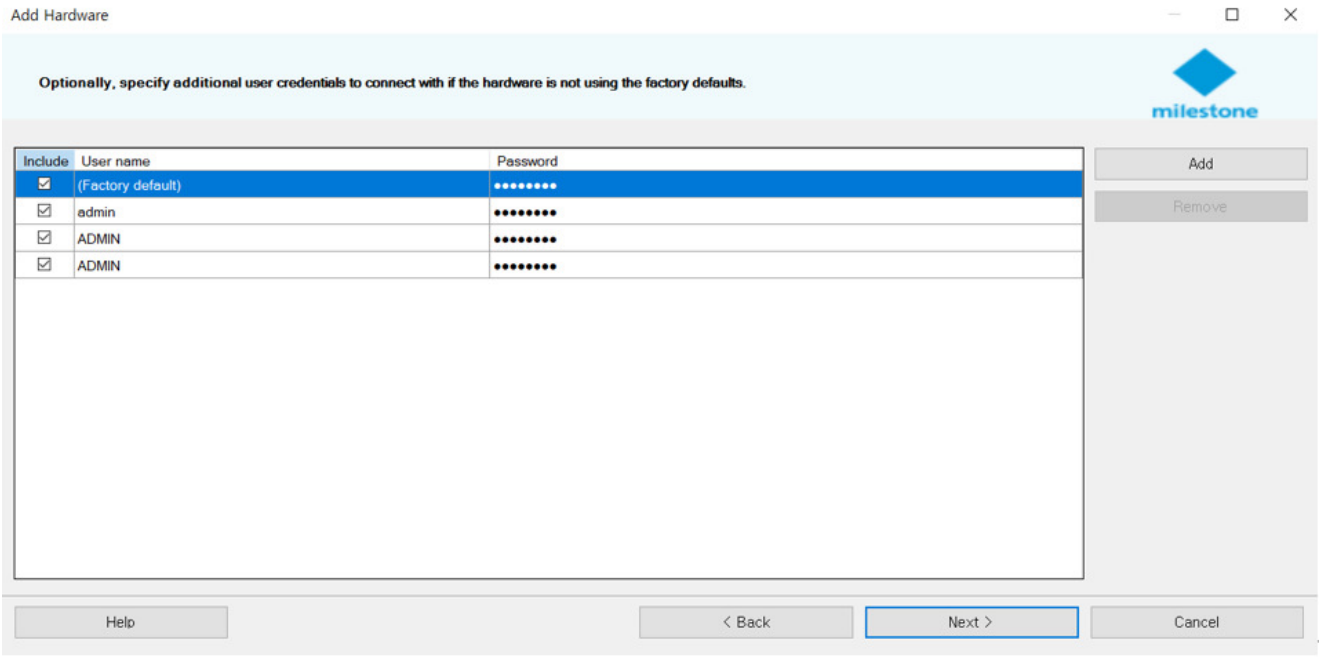
In the XProtect Management Client, select **"Add Hardware"**.



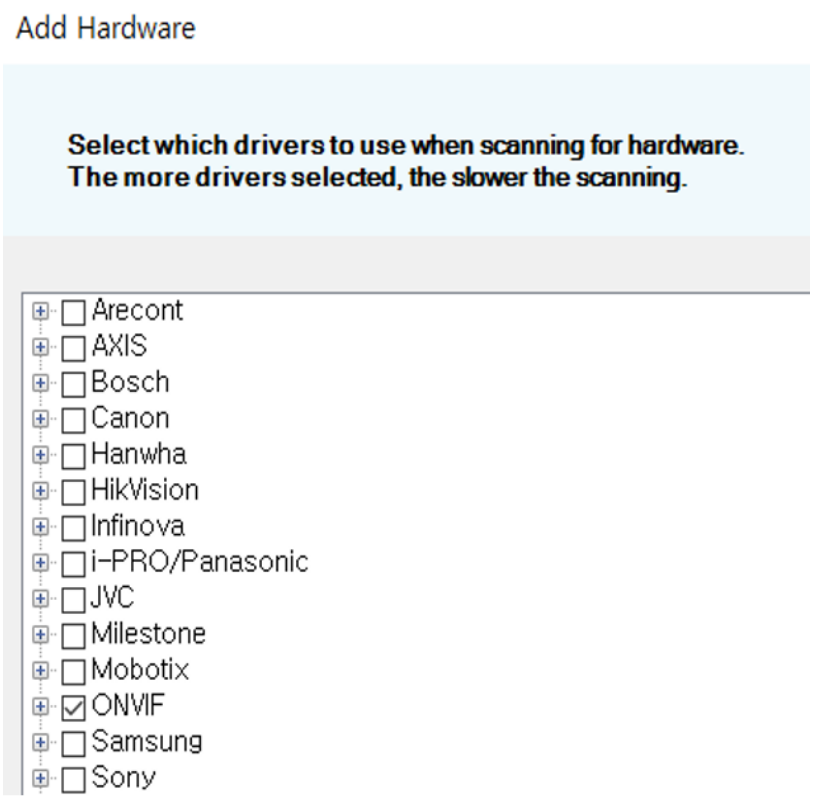
If you know the IP address of the AIAIBOX device, choose “**Manual**”.



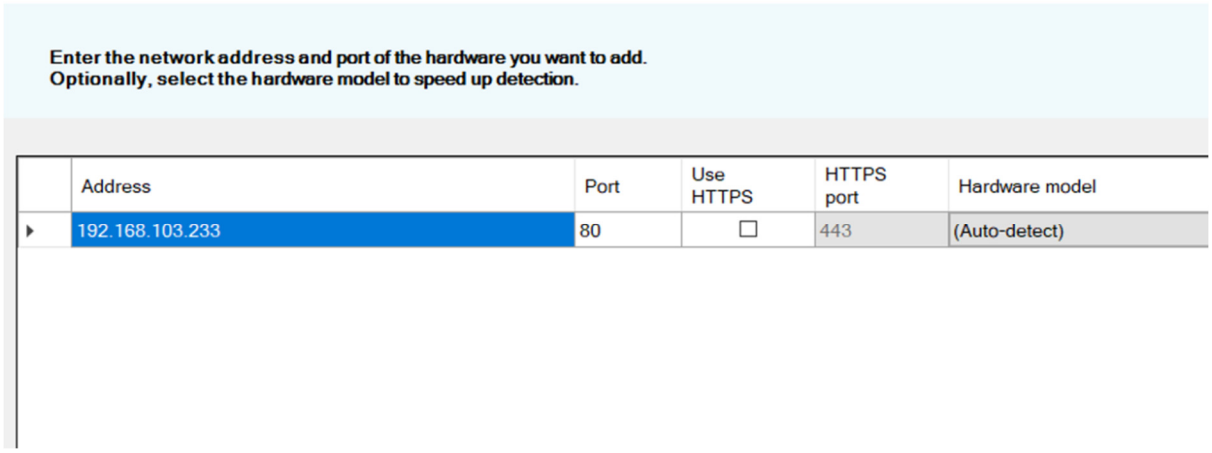
Enter the **login** information for the AIBOX.



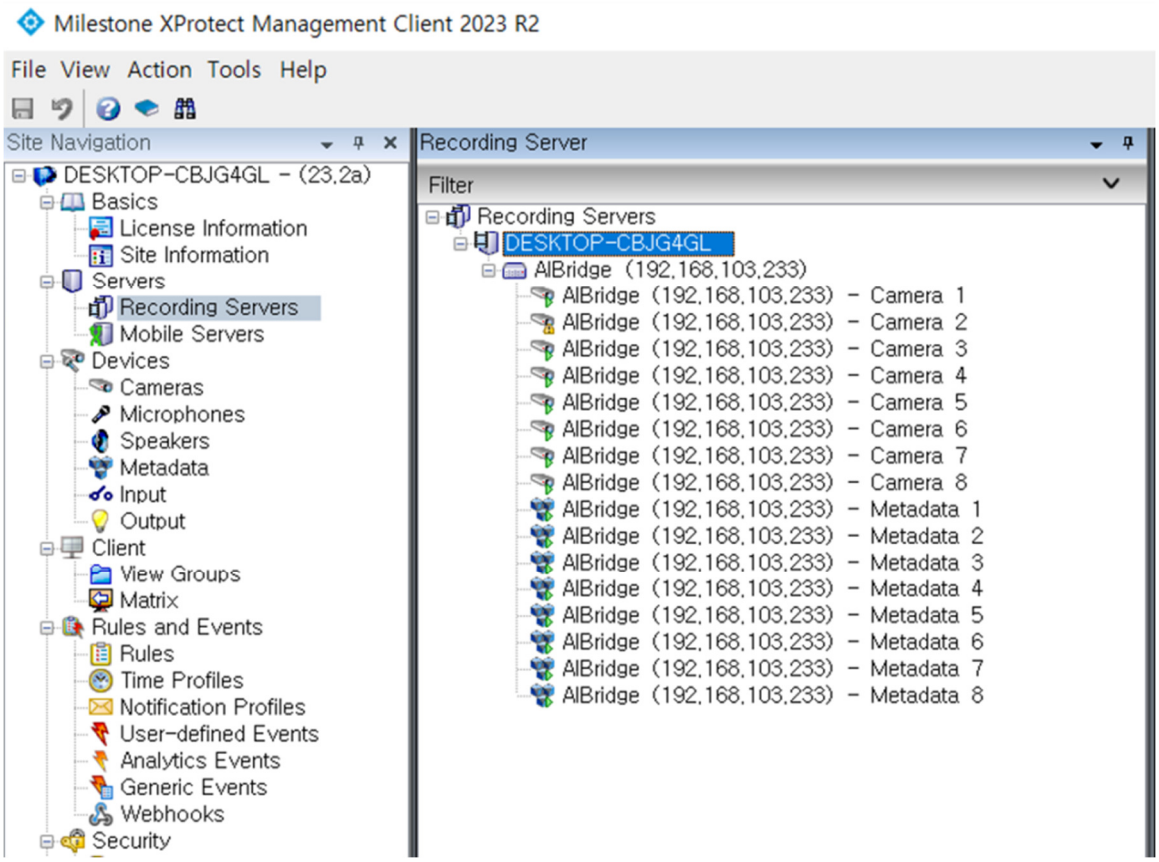
Select **“ONVIF”** from the device driver options.



Enter the IP address information of the AIBOX. If you haven't changed the onvif service port settings of AIBOX, the Port is 80. HTTPS is not used.

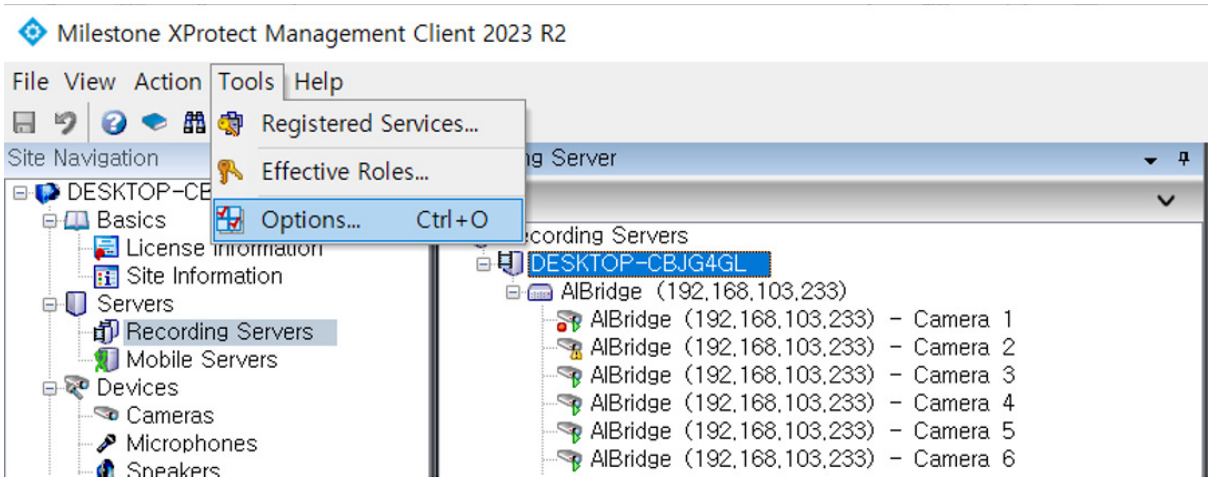


Add the detected AIAIBOX hardware and change the name as desired. If this fails, recheck the setup and try again.

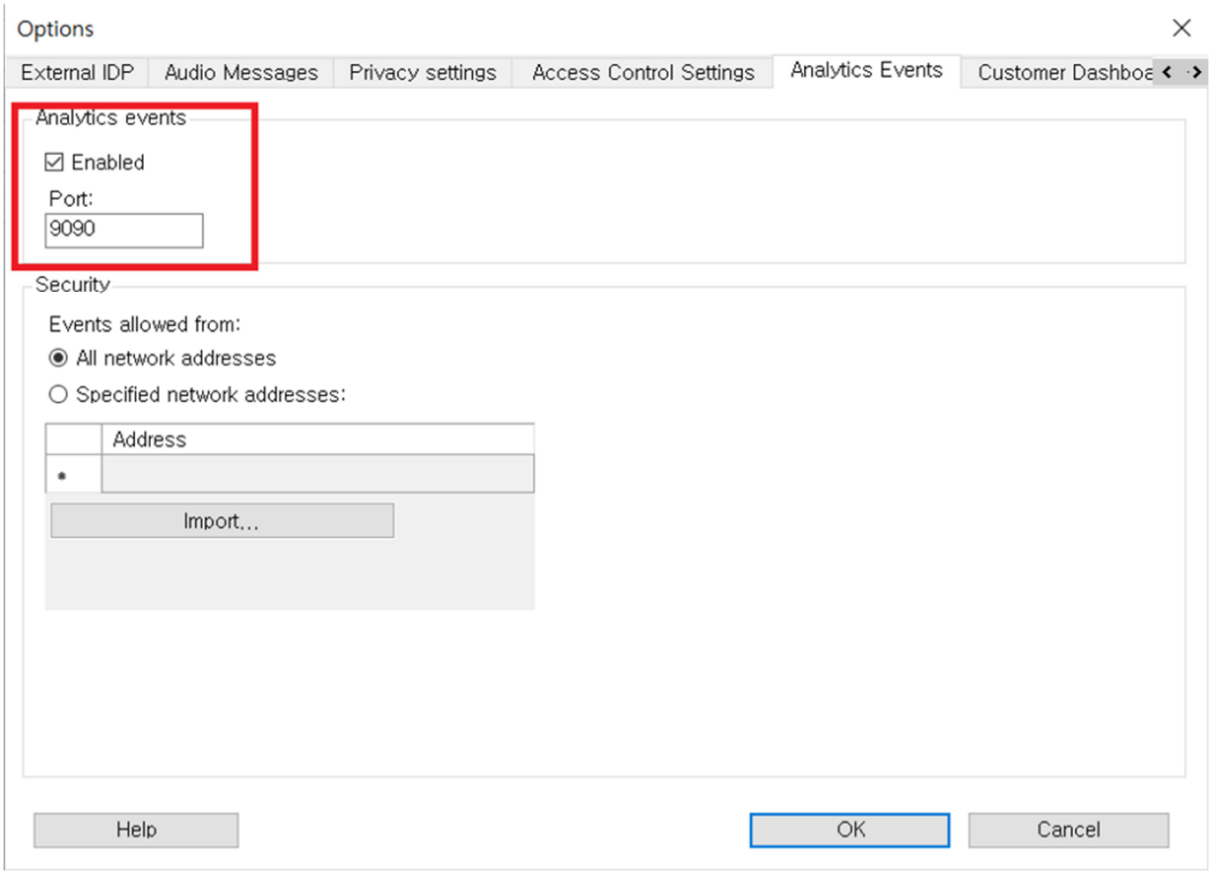


2.1.2 Enable the XProtect analytics events

Click on the **Tools > Options** menu in the XProtect Management Client.

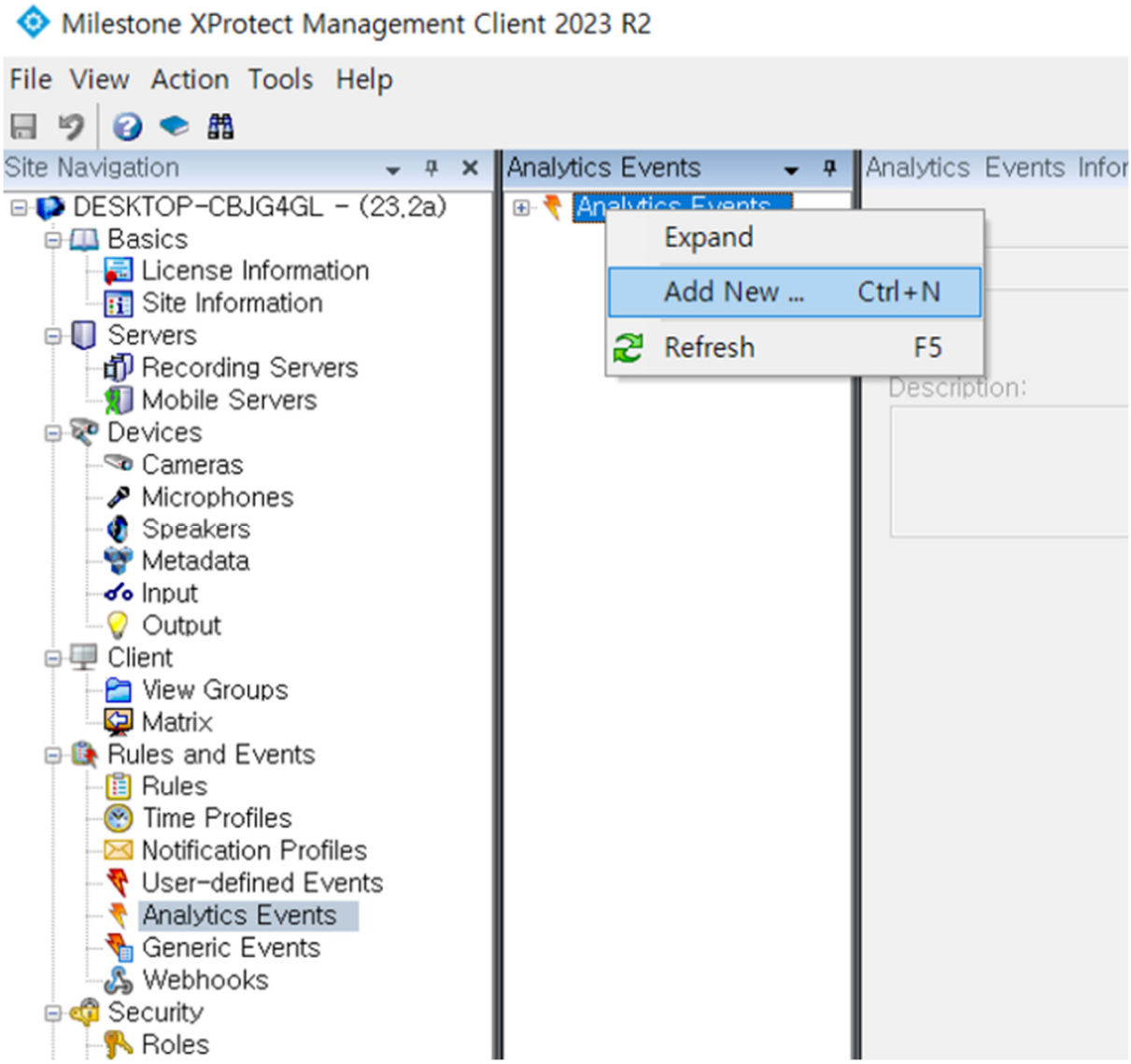


In the Analytics Event tab, check the Enabled checkbox. The service port must be open in the firewall. If you change the service port, you must enter the same port number when registering the AIBOX's Milestone action handler.

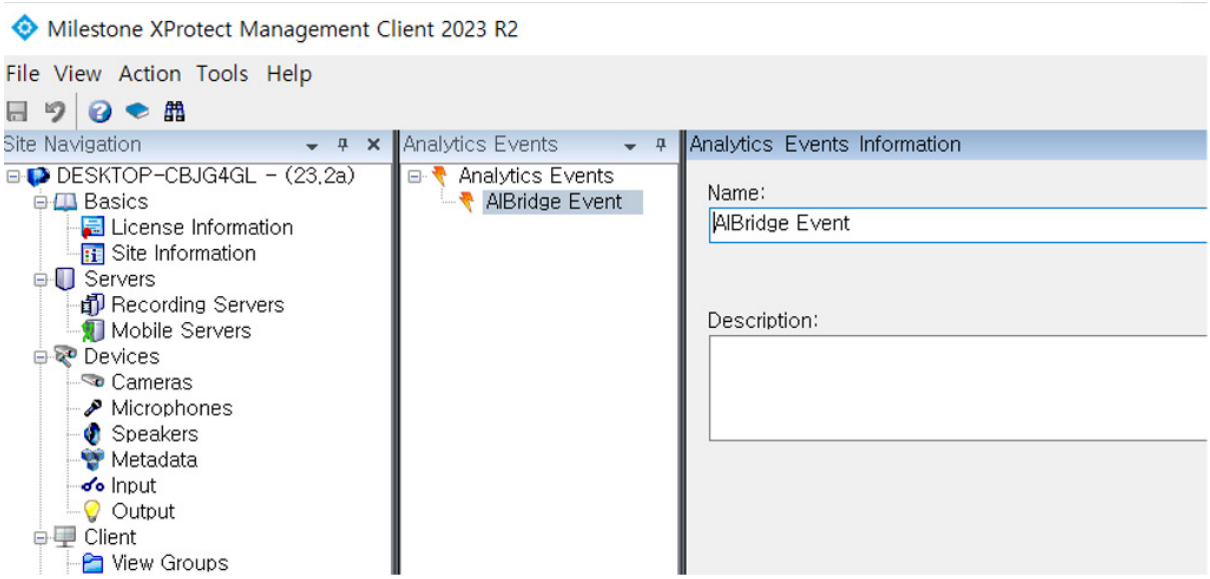


2.1.3 Add analytics events and alarm definitions.

In the XProtect Management Client, select "**Analytics events**" from the left panel, right-click, and choose "**Add New**".

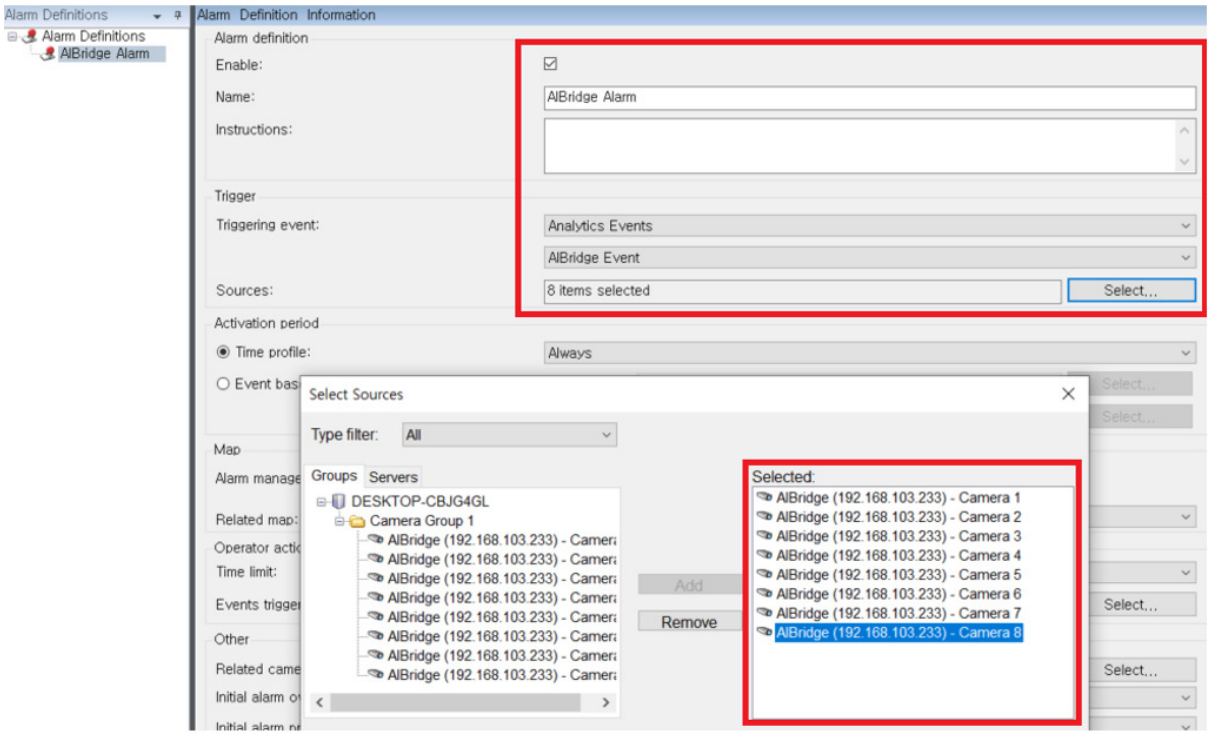


Enter the event name as "**AIBOX Event**". This value is an essential key for distinguishing events between AIAIBOX and XProtect. It must be entered in the "**Message key**" property in the Milestone Action handler settings of AIAIBOX.



In the XProtect Management Client, add “Alarm definitions”.
Select “**Analytics Events**” for the Trigger Event item, and choose the “**AIBOX Event**” you added earlier. For the Trigger Source item, add the channel of the AIAIBOX.

Note: When registering the Trigger Source, if you add the IPCAM channel instead of the AIAIBOX camera channel, it operates as the Case2 integration type.

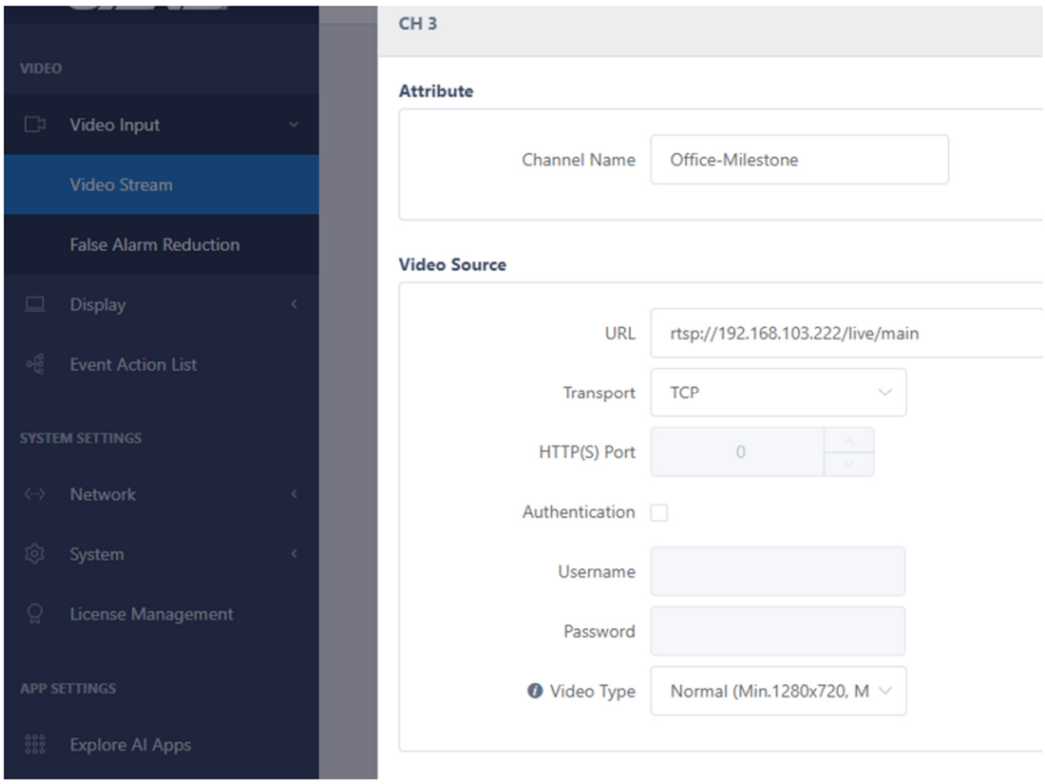


2.2 AIBOX Configuration

2.2.1 Add Video Stream

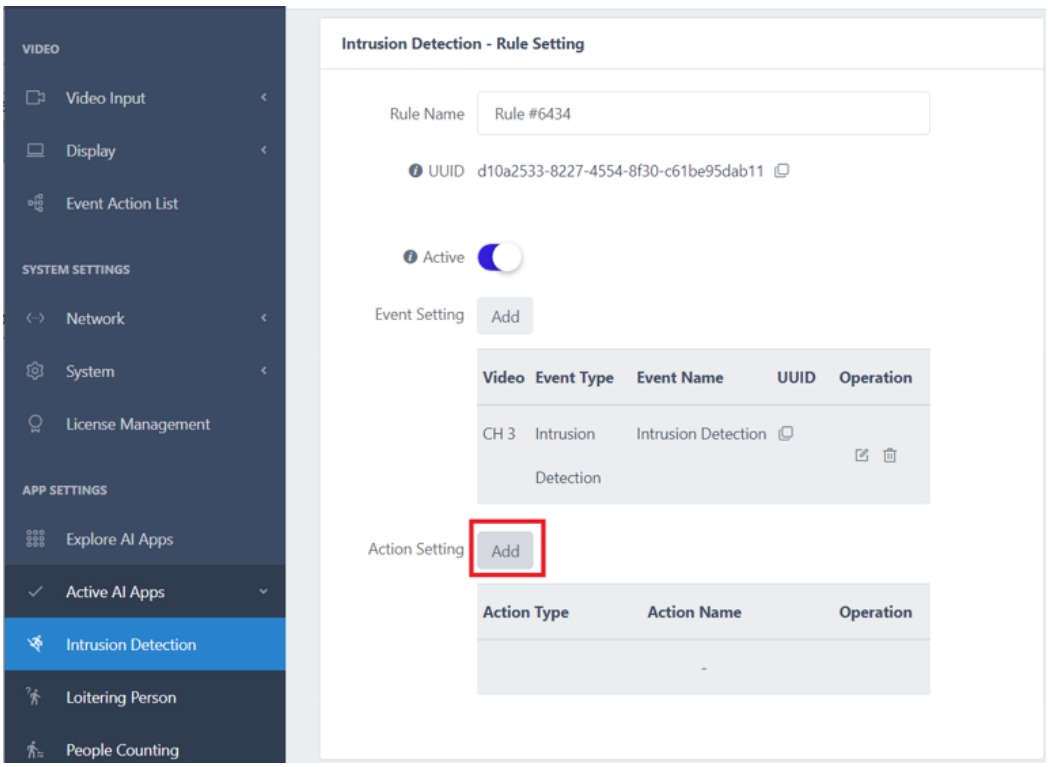
Set (add) the video stream. You can add it either by using an Onvif device search or by directly adding the IPCAM

RTSP stream address.



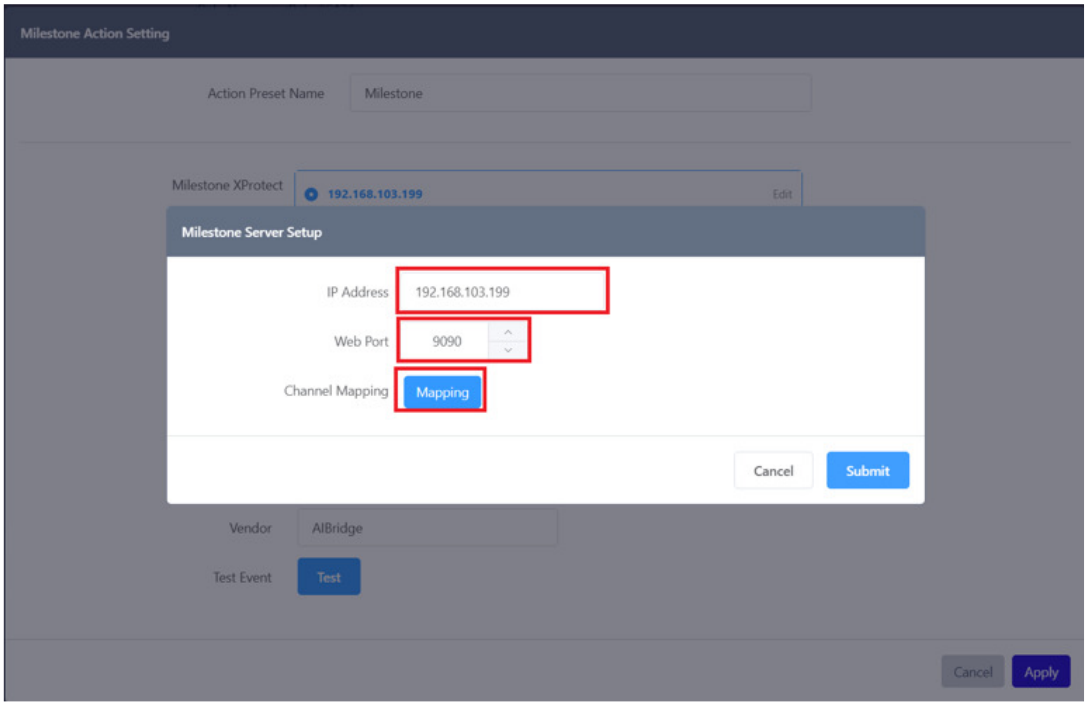
2.2.2 Set up the AI App

Select the desired AI App and set the AI event for the channel. In the Actions Setting, click the Add button to add the Milestone action handler.



2.2.3 Enter the Milestone XProtect VMS Server Information

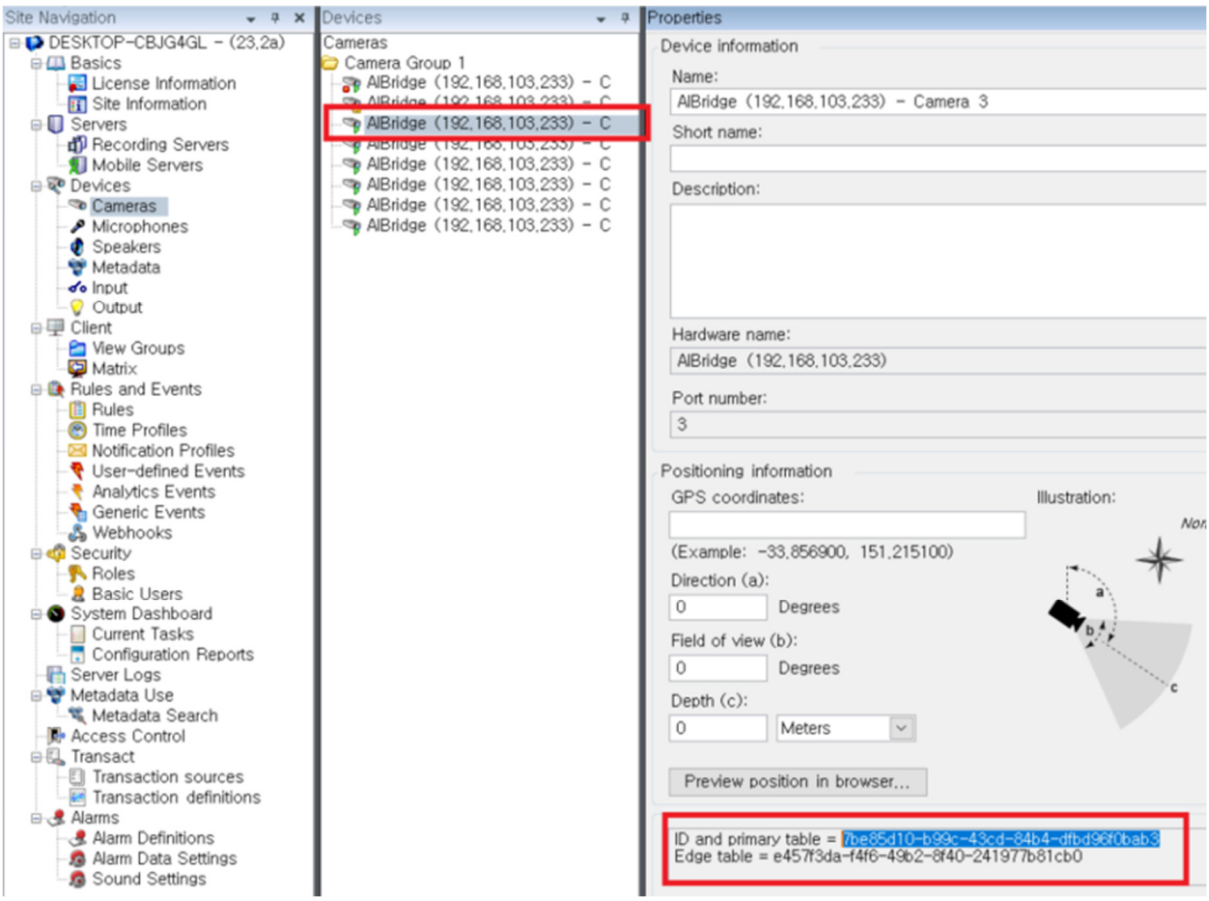
Enter the IP address of the Milestone XProtect VMS and the Analytic Event service port number. Then click the channel "**Mapping**" button.



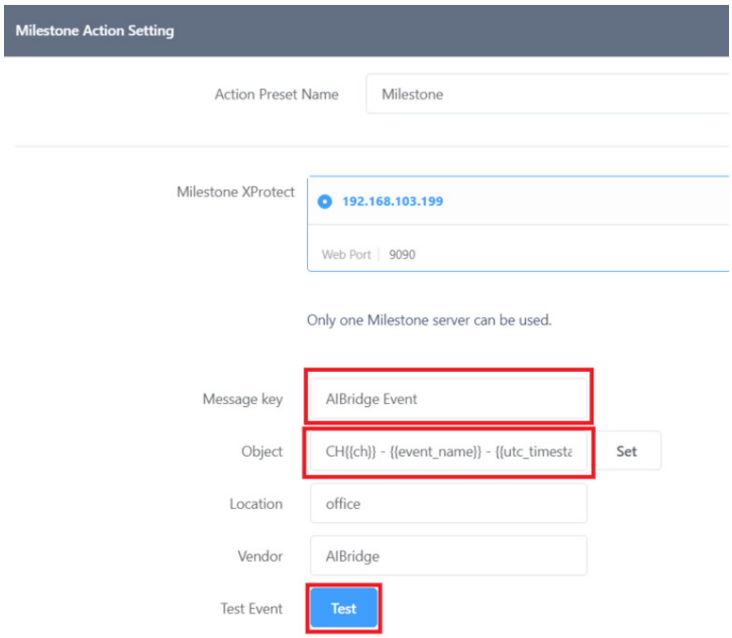
Enter the Camera Channel ID of Milestone XProtect VMS.

Note: If you enter the IPCAM channel ID information instead of the AIAIBOX camera channel ID in the camera mapping information, it operates as the Case2 integration type.

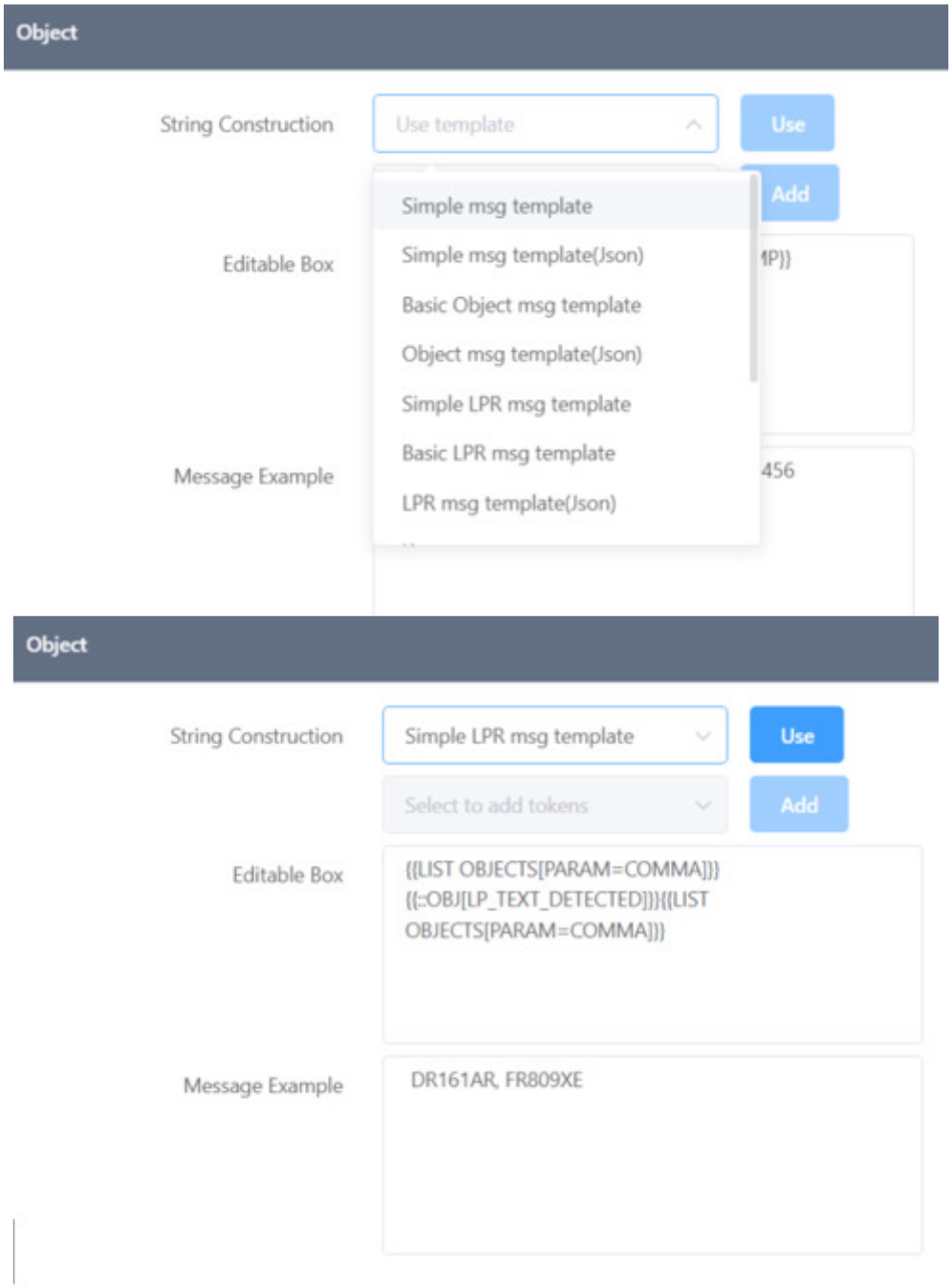
You can find the UUID for the Camera Channel ID by selecting the channel with the mouse while holding down the CTRL key and then looking at the bottom of the info tab.



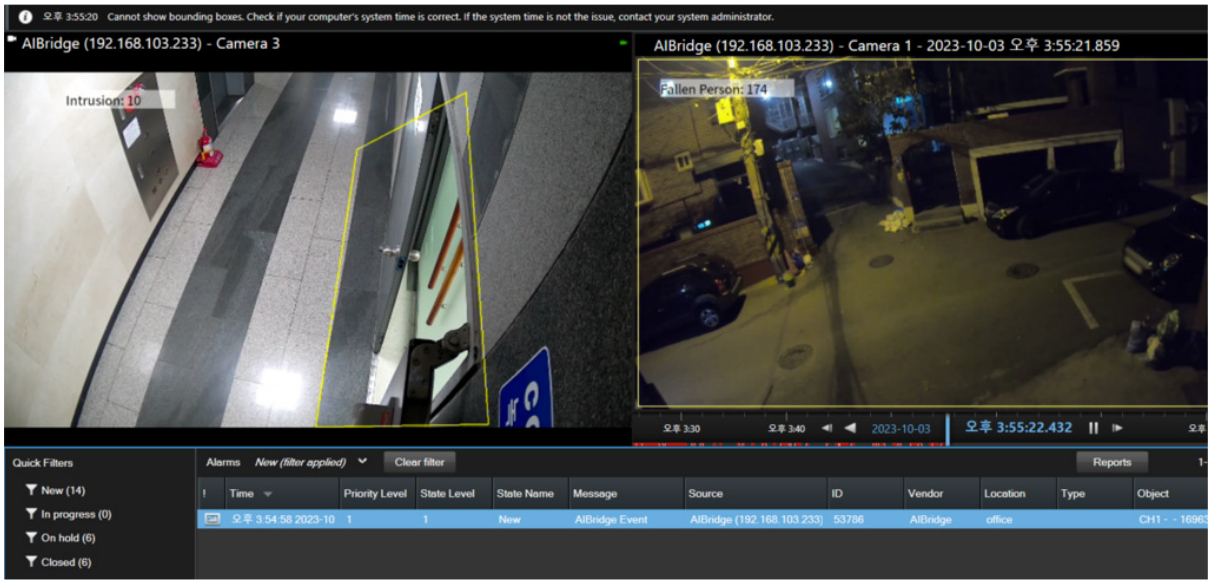
For the “Message Key” property, input the name of the “Analytic Event” that you added in Milestone XProtect. In this guide, we have entered it as **“AIBOX Event”**.



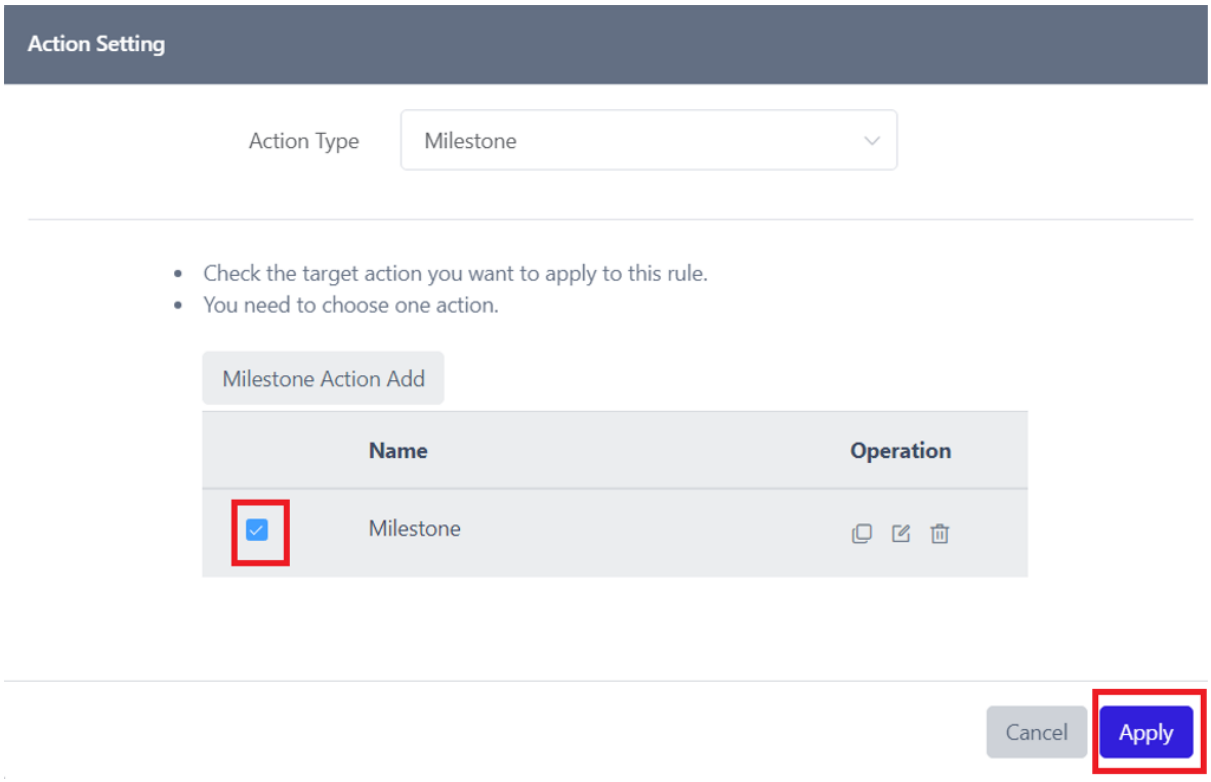
The Object field can be utilized in various ways. You can enter event texts, LPR information, etc., so you can send additional information in the Milestone XProtect Alarm Manager.



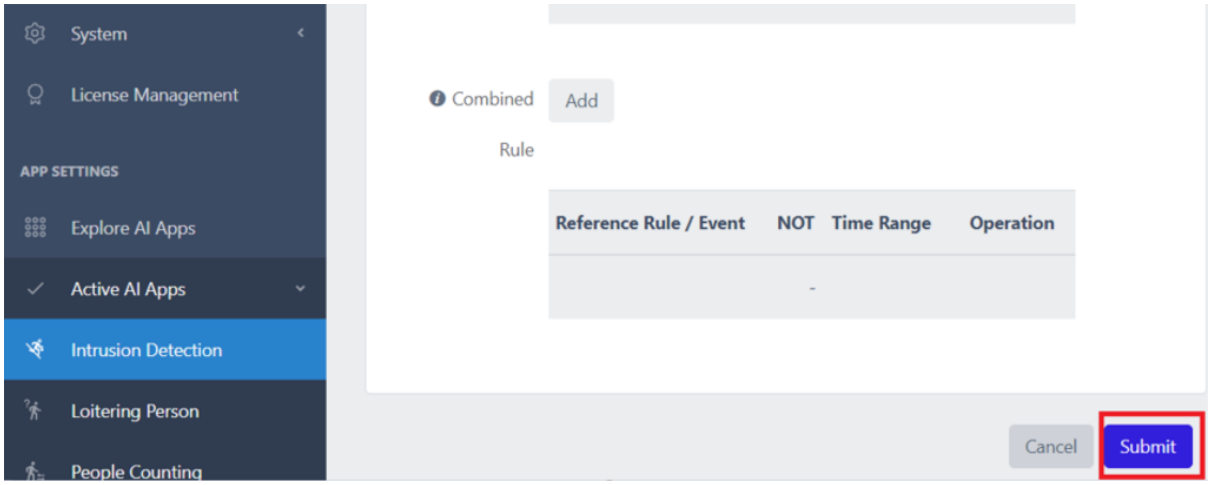
Note: If you want to set the Object property differently for each AI App, you can create a separate Milestone Action handler for each AI App.
By pressing the “Test” button, you can check the Test Event in the Milestone XProtect Client.



If the event test is successful, check the “Activate Milestone action handler” checkbox and press the “Apply” button to save the handler settings.



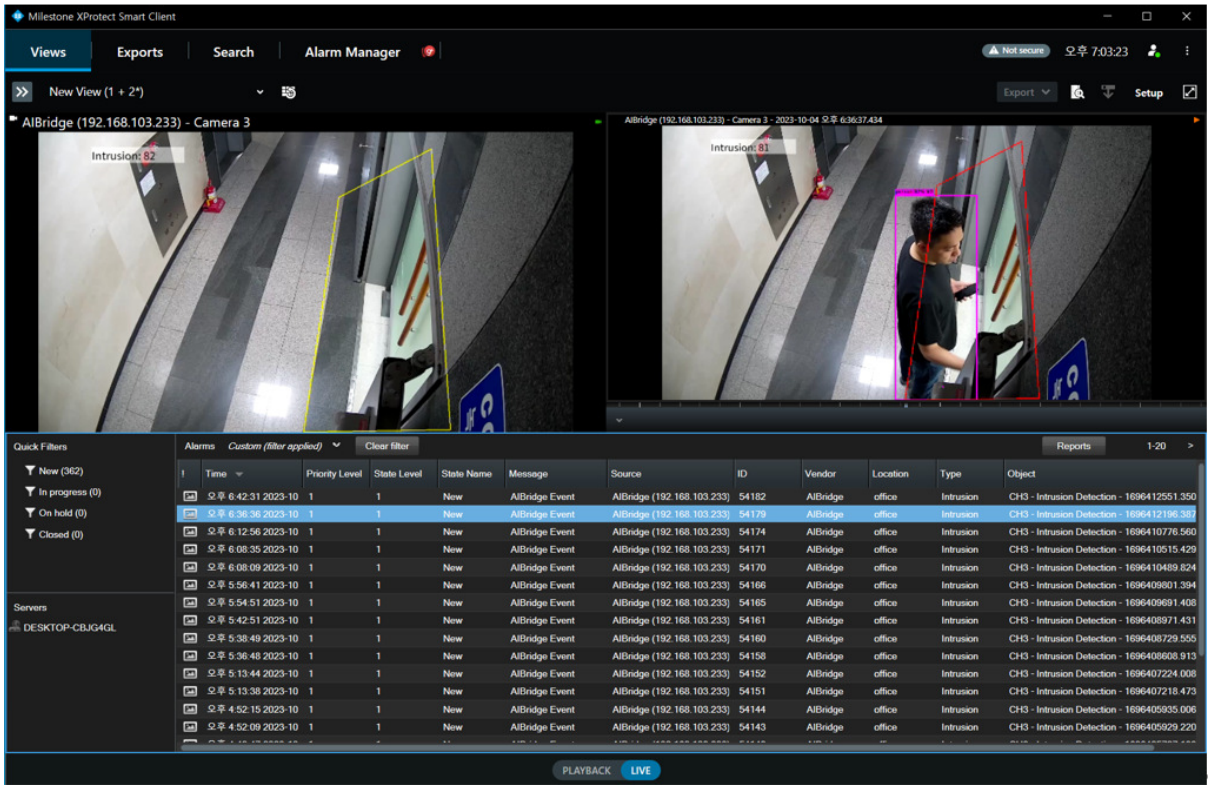
Finally, press the “Submit” button located at the bottom of the AI App settings to save all configurations.



3. Demo

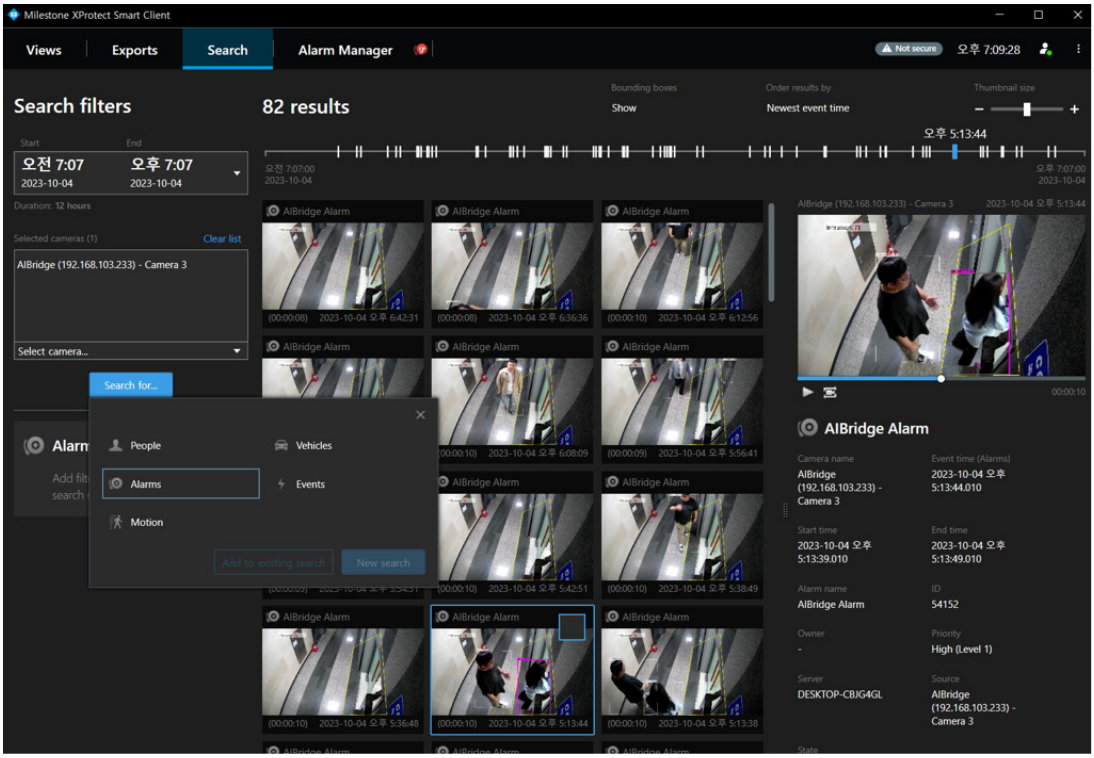
3.1 Live

In the Live screen of the XProtect Smart Client, the analytics events will be listed within the Alarms panel as well as the annotated video.



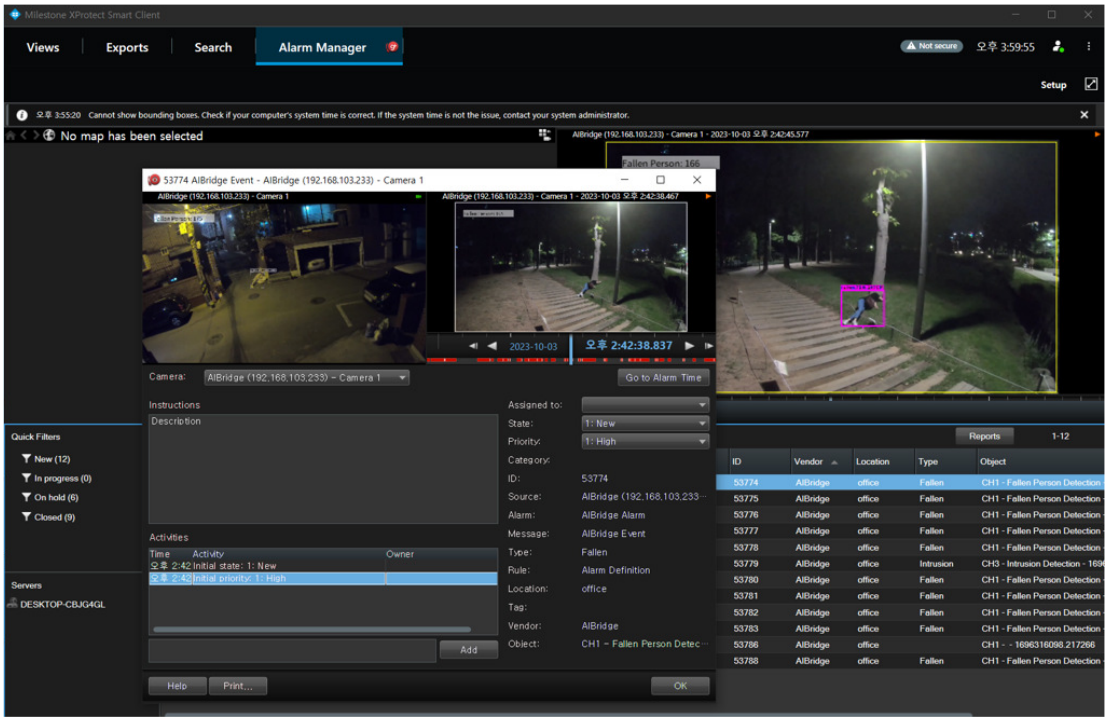
3.2 Search

In the search menu, click on the “Search for..” button and select Alarms to search for AI Events.



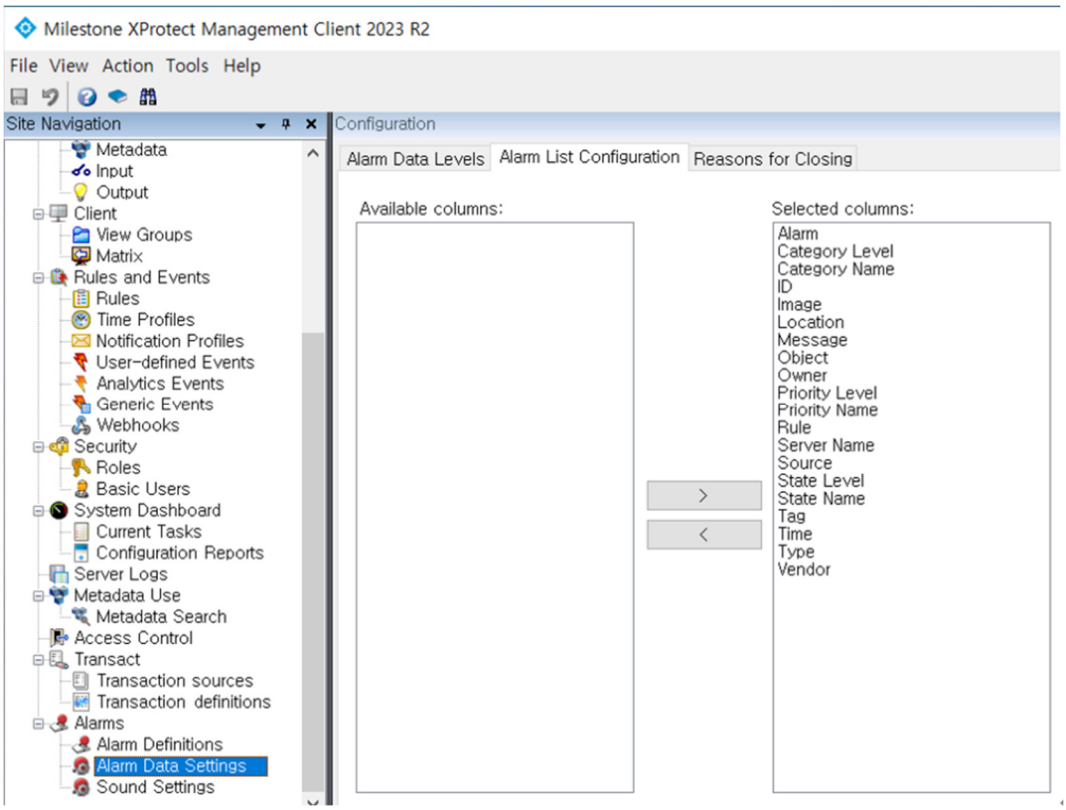
3.3 Alarm Manager

1. In the Alarm Manager, by clicking on an individual alarm, you can check detailed event occurrence information with recorded video.

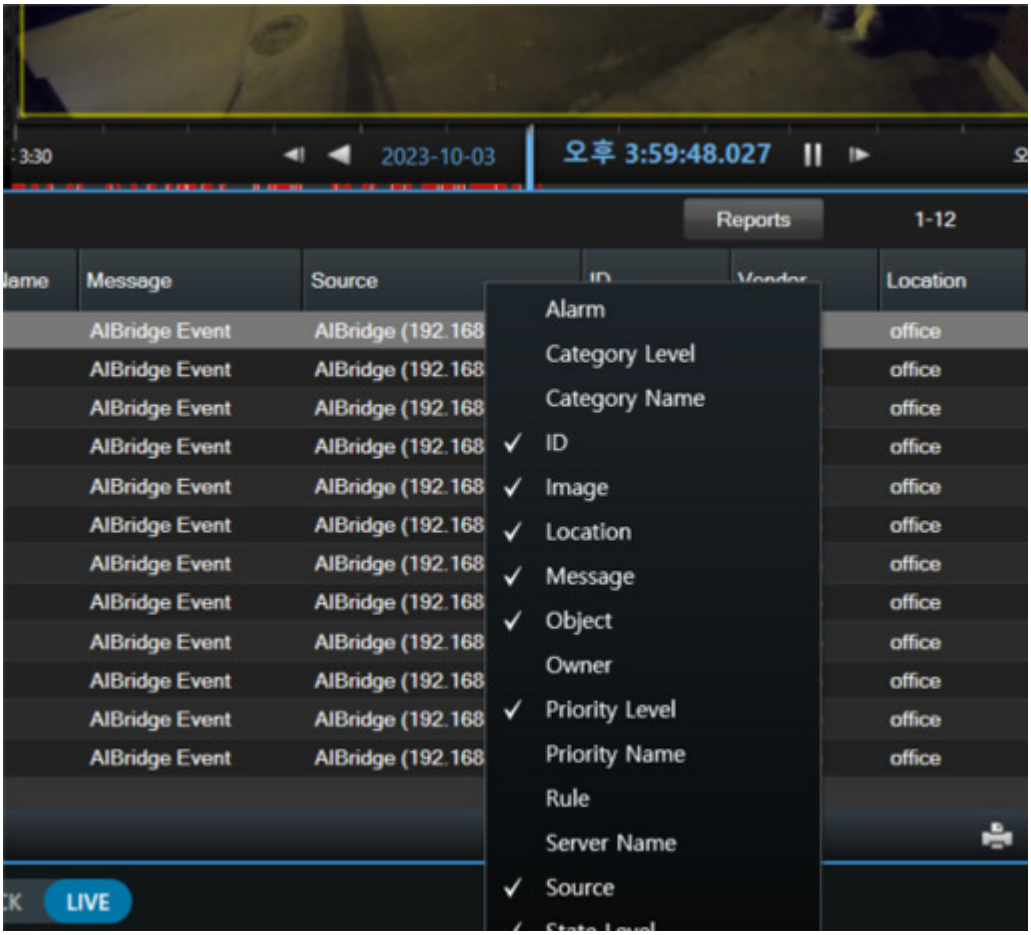


Note: The Alarm Manager is supported in Milestone XProtect Express+ and higher versions.

2. To display analytic event properties in the Smart Client, you might need to adjust settings in the Management Client. First, navigate to “Alarms” and then to “Alarm Data Settings”. From there, choose the event properties you want and transfer them from the left panel to the right.

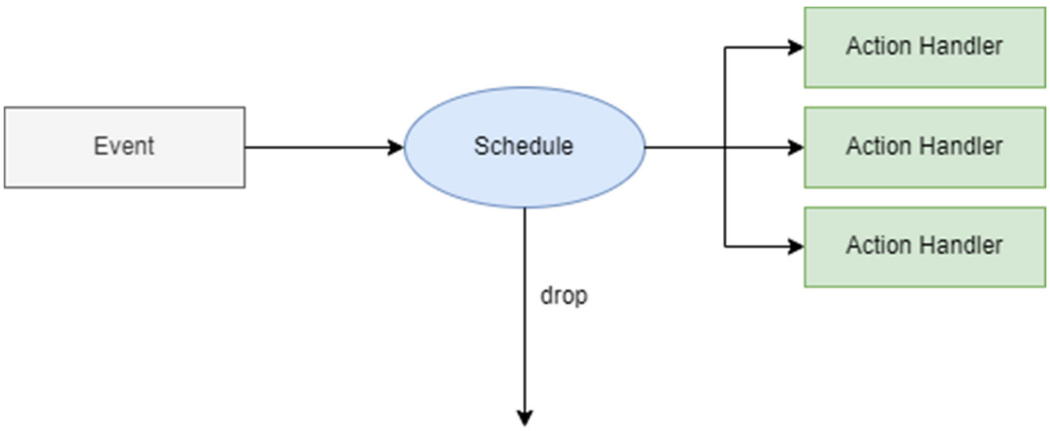


3.To display the event properties in the Smart Client, right clicking on the event header and select the fields to display



7. Schedule Setting Guide

A schedule can be set in all event action settings to trigger actions when events occur.



1. Schedule Overview

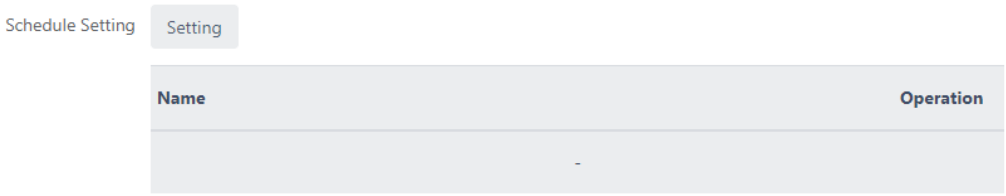
The schedule operates over a period of time to set the time for sending the notification whenever an event occurs. Depending on **weekly, monthly,** and **yearly** schedules can be set.
Additionally, specific dates can be designated as **exclusion schedules**. Actions will not be triggered during the exclusion schedule. Exclusion schedules are prior to regular schedules. This means that the action will not be triggered if an event occurs during a period that is included in both the exclusion and the regular schedule.

The schedule for event action settings operates according to the following policy.

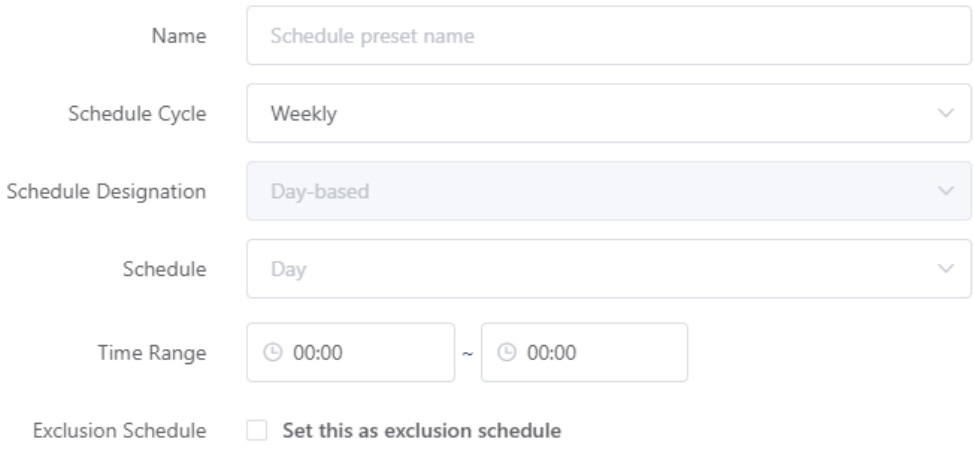
※ Schedule Application Policy
1. If no schedule is set in event actions, all events will always trigger the set action.
2. If multiple schedules are registered in event actions, the action will be triggered if one of them is true at least.
3. If an exclusion schedule is included, the action will not be triggered even if another schedule is true.
4. Schedules are set for each event action, but once created, they can be added in all event actions.

2. Create a New Schedule

1. Click the Setting button to add a schedule.



2. Click the Add New button to create a new schedule at the bottom.

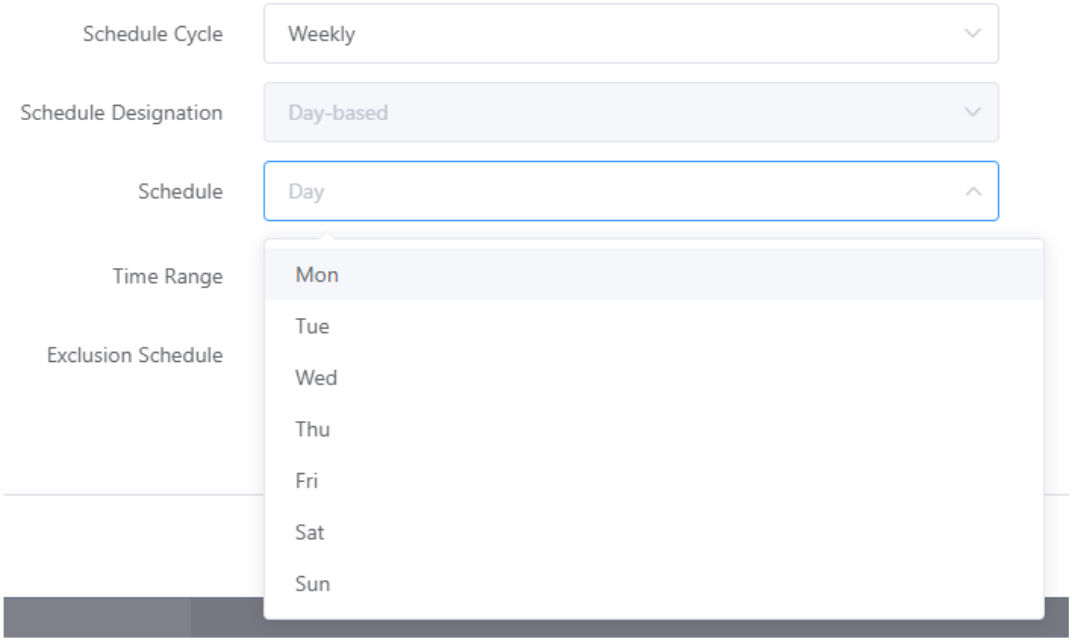


Name : Enter a schedule name on “Name”(e.g. working hours, holidays).

Schedule Cycle : Set the “schedule cycle” for how often the schedule should repeat as weekly, monthly, or yearly.
Schedule Designation : Select whether the schedule is based on days of the week or specific dates.
Schedule & Time range : Set the days/dates/Time.
Exclusion Schedule : Check the box to set the schedule as an exclusion schedule.

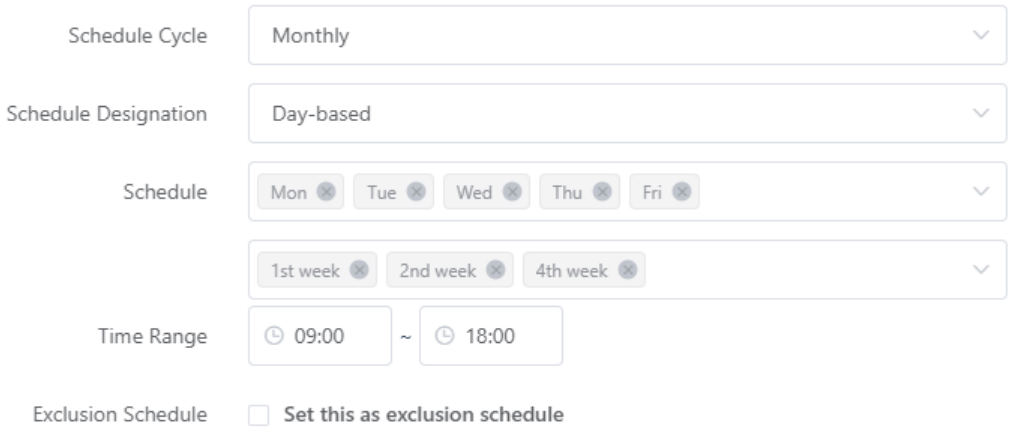
3. Weekly Schedule

1. Since weekly schedules cannot specify dates, the schedule Designation is fixed to Day-based of the week. You can set the target days and specify the time range to create a schedule. For example, you can set a schedule for **every Monday to Friday**.

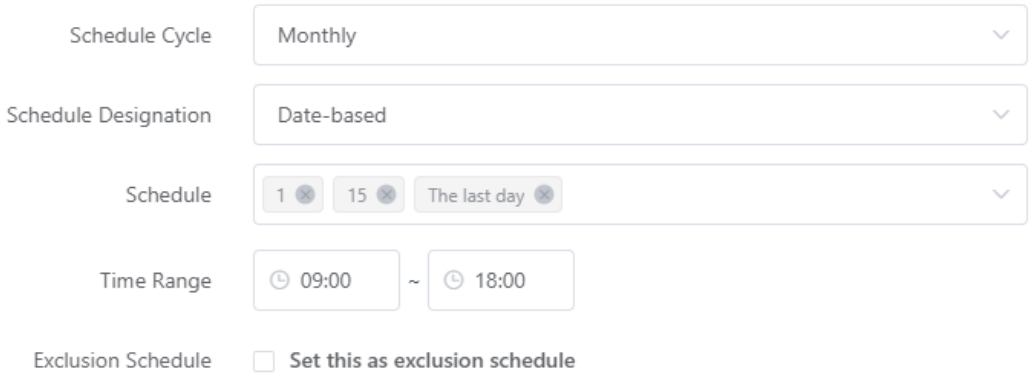


4. Monthly Schedule

1. For monthly schedules that use the Day-based option, you can specify by a week of the month. For example, you can set a schedule for **every second week of the month, Monday to Friday**.

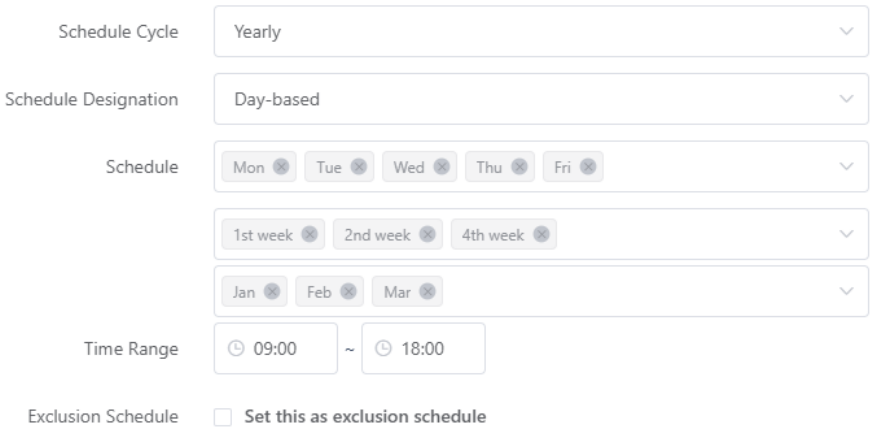


2. For monthly schedules that use the Date-based option, you can specify the dates of the month for the schedule. For example, you can set a schedule for the **1st, 15th, and the last day of the month.**

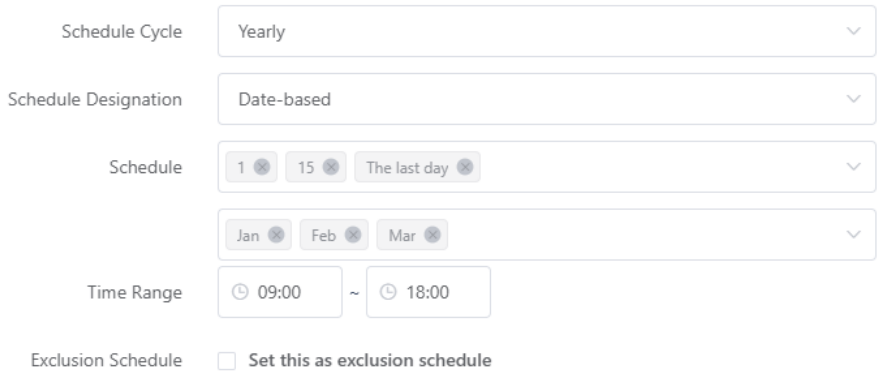


5. Yearly Schedule

1. For yearly schedules that use the Day-based option, you can specify the target month, week, and day. For example, you can set a schedule for **the second Monday to Friday of January to March every year.**



2. For yearly schedules that use the Date-based option, you can specify the dates for each target month. For example, you can set up a schedule on **the 1st, 15th, and the last day of January to March.**



6. Time Schedule Setting

The time schedule sets to run on the specified date. The time schedule follows the policy below.

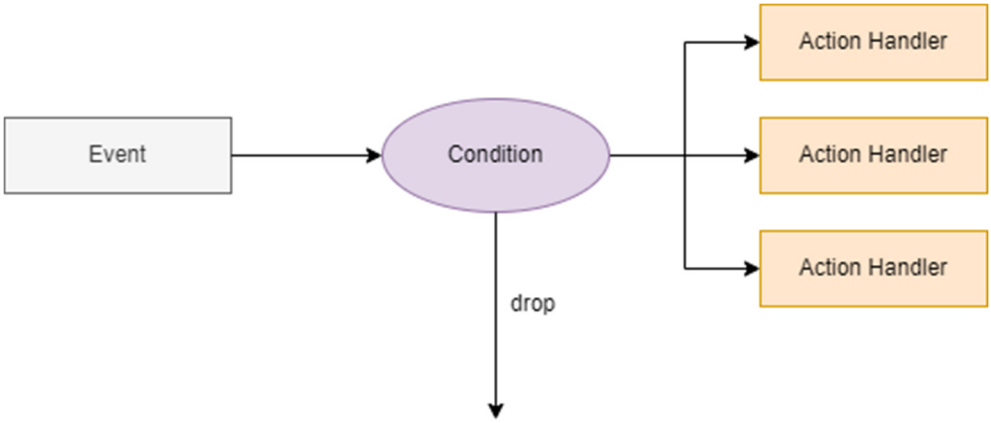
1. If the start time is faster then the end time, the schedule will be applied according to the specified time in the day. (e.g. 09:00~18:00)
2. If the start and end time are the same, the schedule will be applied for the entire 24 hours of that day. (e.g. 00:00~00:00)
3. If the start time is later than the end time, the schedule will be applied from the start time of that day until the end time of the next day. (e.g. 21:00~09:00)

7. Exclusion Schedule

You can set a schedule as an exclusion schedule, which takes priority over the regular schedule. If any of the exclusion schedules are active during the scheduled time of an event action, the action will not be triggered.

8. Combined Rule Setting Guide

You can set compound rule conditions to trigger actions when events occur in event action settings.



1. Overview of Compound Rule Conditions

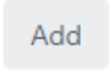
When setting up event action rules for each application, you can set conditions for triggering actions. In addition to setting scheduling conditions, you can also set conditions based on various system conditions to determine whether event actions should be triggered.
By utilizing the state of basic system resources such as alarm inputs or virtual alarm inputs, you can automatically control rules. If there are other event action settings that have been previously set up, you can also set conditions based on whether or not the event has occurred.
For example, if you want to turn on a warning light and broadcast a warning message to the camera through an alarm output for a residential intrusion event, you can reduce false alarms by setting the following conditions.

- Schedule (20:00~07:00)
- If even one person is detected outside the perimeter of the residential area within the last 10 seconds before the residential intrusion event occurs
- If alarm input signal 1 is being triggered

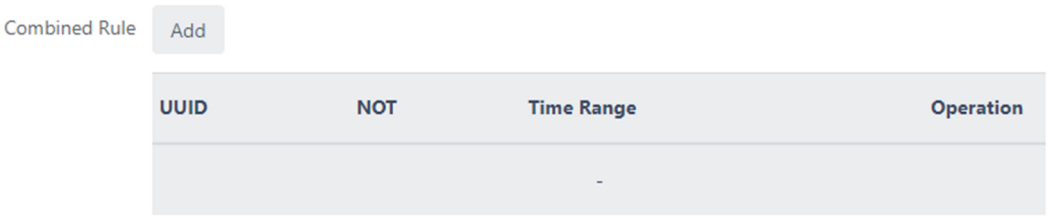
2. Combined Rule Conditions Setting

The following are the items that can be set as compound rule conditions

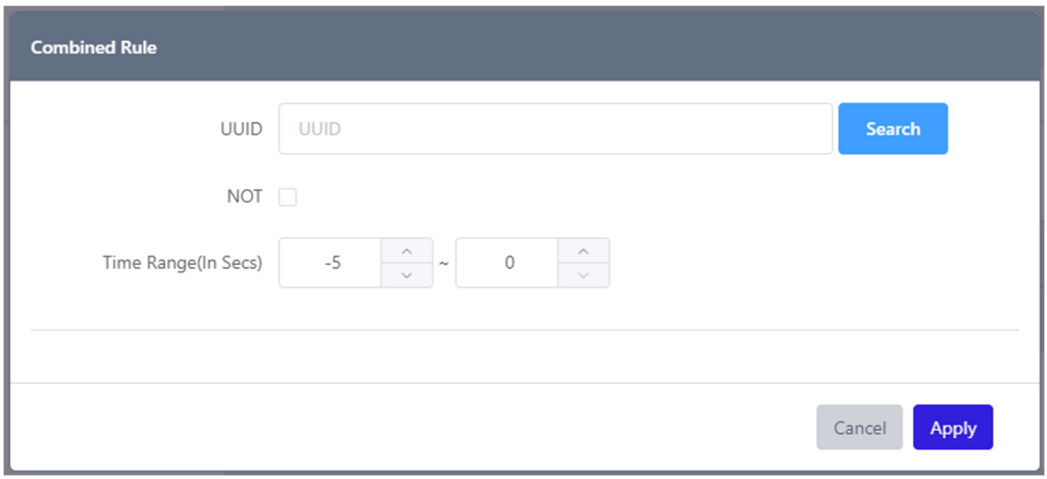
- Rules set up in the application
- Events specified by the application's rules.
- System I/O devices such as alarm inputs or virtual alarm inputs

1. Click the 

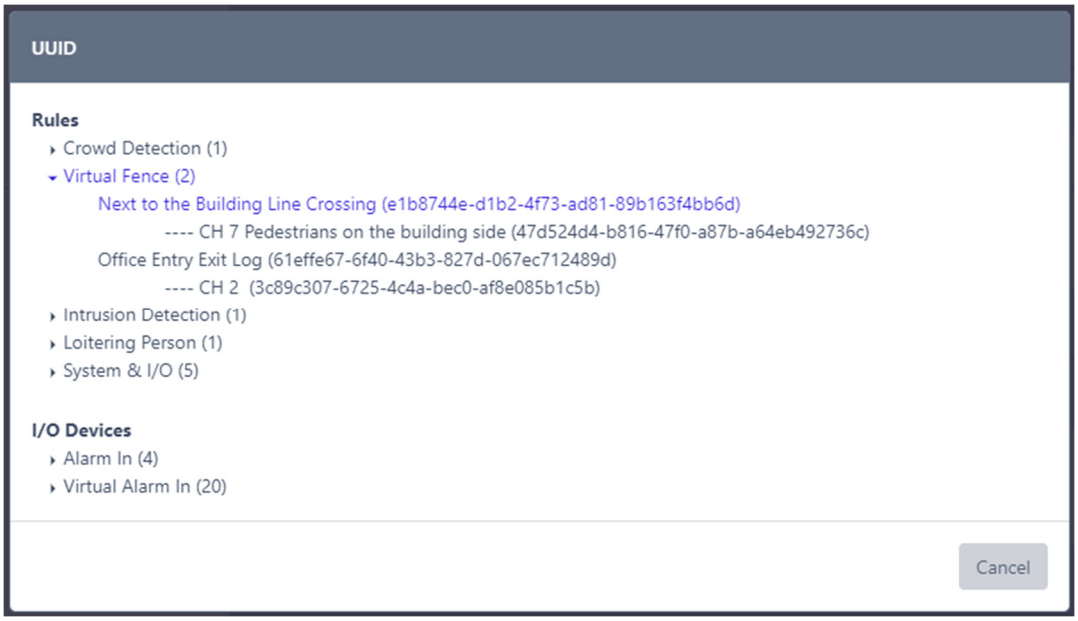
button to add a new condition on the event action setup screen.



2. Click the Apply button to save after set the each options.



UUID : Ender the UUID value assigned to a target event, rule, or system device. When setting up an event action in the application, both the event and rule receive a unique UUID. You can input the UUID of the event or rule that you want to set up as a condition. Alternatively, Click Search button next to the UUID field allows you to search for and input a previously set-up item.

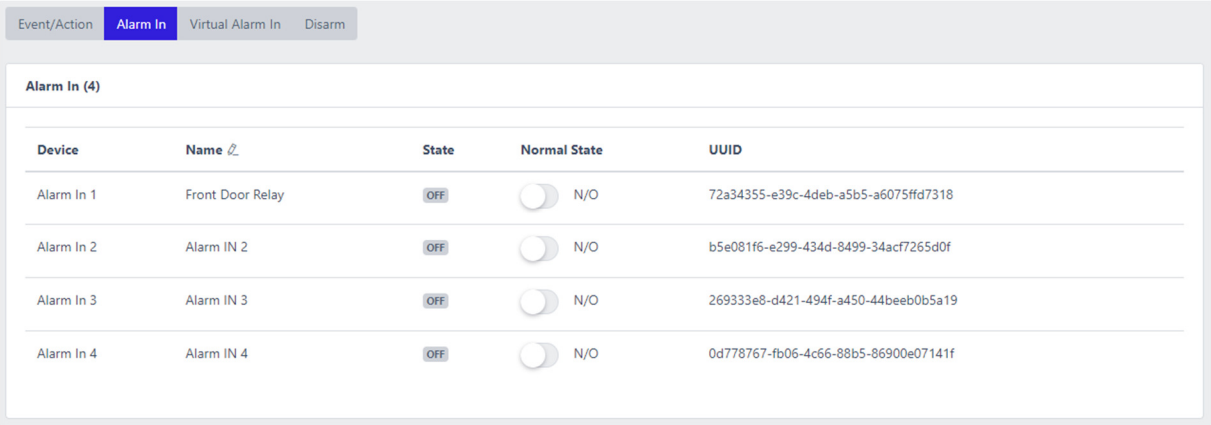


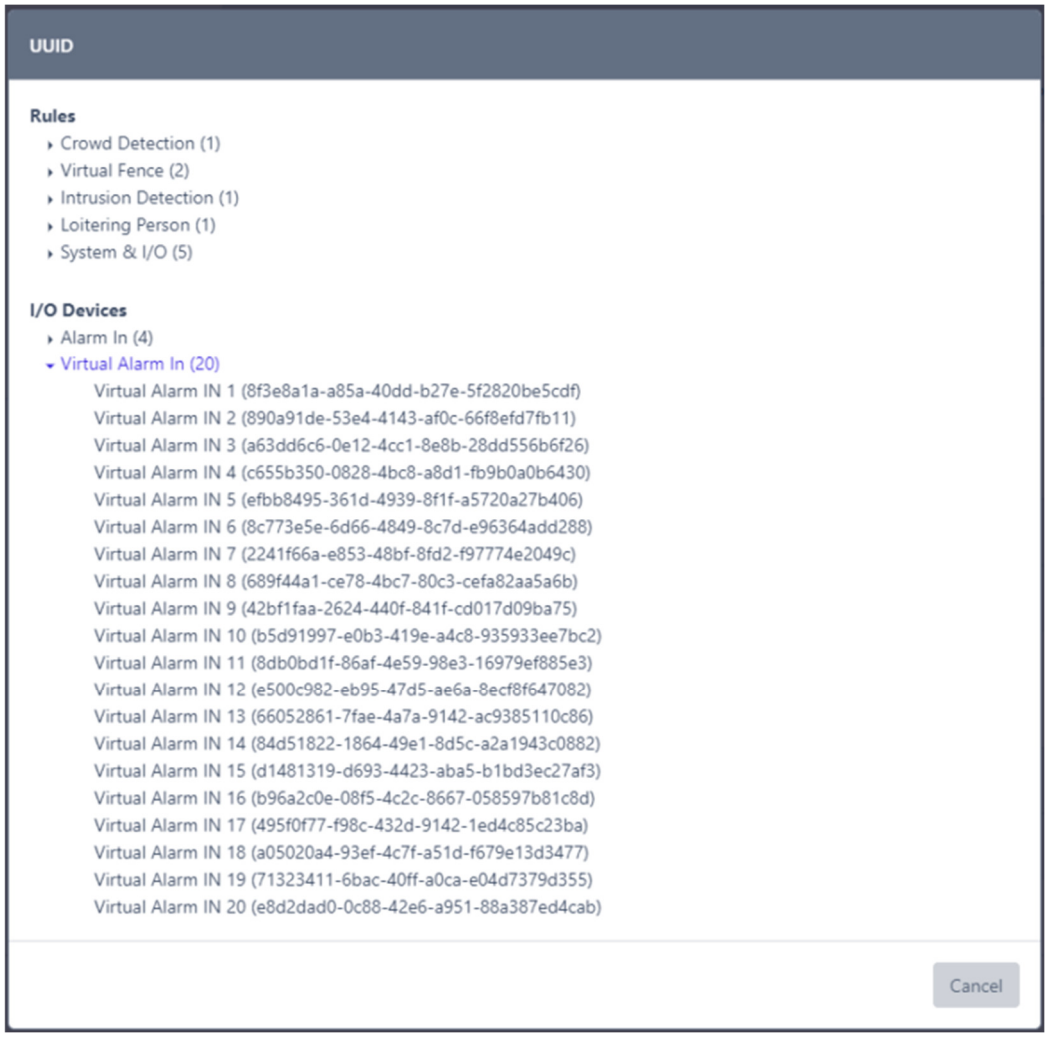
NOT : If NOT is checked, the condition will be true if the UUID event or rule is false. For example, if you specify the UUID of “Event A” and check the NOT checkbox, the condition will be true if “Event A” did not occur.

Time Range(In Secs) : Time Range field is used to set the valid time range for UUID events or rules. When an event for the rule occurs, if a UUID condition event occurs within the Time Range set based on the event occurrence time, the condition is considered true.

3. System I/O Combined Condition Settings

All rules and their events in currently used applications can be set as compound rule conditions.
Additionally, **alarm** and **virtual alarm inputs** can always be set as conditions for composite rules, even without setting up a separate event action rule.
These inputs have a unique resource UUID assigned to them in their initial state, and can be selected as a separate item in the UUID search UI.




UUID
Rules
Crowd Detection (1)
Virtual Fence (2)
Intrusion Detection (1)
Loitering Person (1)
System & I/O (5)
I/O Devices
Alarm In (4)
Virtual Alarm In (20)
Virtual Alarm IN 1 (8f3e8a1a-a85a-40dd-b27e-5f2820be5cdf)
Virtual Alarm IN 2 (890a91de-53e4-4143-af0c-66f8efd7fb11)
Virtual Alarm IN 3 (a63dd6c6-0e12-4cc1-8e8b-28dd556b6f26)
Virtual Alarm IN 4 (c655b350-0828-4bc8-a8d1-fb9b0a0b6430)
Virtual Alarm IN 5 (efbb8495-361d-4939-8f1f-a5720a27b406)
Virtual Alarm IN 6 (8c773e5e-6d66-4849-8c7d-e96364add288)
Virtual Alarm IN 7 (2241f66a-e853-48bf-8fd2-f97774e2049c)
Virtual Alarm IN 8 (689f44a1-ce78-4bc7-80c3-cefa82aa5a6b)
Virtual Alarm IN 9 (42bf1faa-2624-440f-841f-cd017d09ba75)
Virtual Alarm IN 10 (b5d91997-e0b3-419e-a4c8-935933ee7bc2)
Virtual Alarm IN 11 (8db0bd1f-86af-4e59-98e3-16979ef885e3)
Virtual Alarm IN 12 (e500c982-eb95-47d5-ae6a-8ecf8f647082)
Virtual Alarm IN 13 (66052861-7fae-4a7a-9142-ac9385110c86)
Virtual Alarm IN 14 (84d51822-1864-49e1-8d5c-a2a1943c0882)
Virtual Alarm IN 15 (d1481319-d693-4423-aba5-b1bd3ec27af3)
Virtual Alarm IN 16 (b96a2c0e-08f5-4c2c-8667-058597b81c8d)
Virtual Alarm IN 17 (495f0f77-f98c-432d-9142-1ed4c85c23ba)
Virtual Alarm IN 18 (a05020a4-93ef-4c7f-a51d-f679e13d3477)
Virtual Alarm IN 19 (71323411-6bac-40ff-a0ca-e04d7379d355)
Virtual Alarm IN 20 (e8d2dad0-0c88-42e6-a951-88a387ed4cab)
Cancel